

# National Weather Service Customer Satisfaction Survey

Hydrologic Services Program

Final Report 2008





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# **Executive Summary**





# **Executive Summary**

National Weather Service Hydrologic Services has conducted a satisfaction survey of their products and services users since 2004. The study has been conducted by CFI Group, a firm that specializes in the application of the ACSI methodology to individual organizations. This methodology measures quality, satisfaction and performance and links them to outcomes.

The 2008 survey was conducted during the period from August 21 through September 24. More than 1,900 responses were collected from the survey which was posted on the NWS website. The majority of respondents (43%) indicated that they used hydrologic information primarily for their personal use, followed by emergency management (22%) and recreation (5%). Most indicated several methods to receive NWS hydrologic information, and 95% access information through the website.

Overall, Flood Warnings, Watches and Statements are the most frequently used while drought information and water supply and/or reservoir information are least frequently used. Usage varies by type of customer. For example, Shippers and Water Resource managers indicate a much higher frequency of use for routine river forecasts and observed conditions than the average. Communications/News indicate the most frequent usage of Flood Warnings, Watches and Information.

The Customer Satisfaction score for 2008 is 80 (on a 0 to 100 scale), representing a statistically significant 2-point improvement since the last measure in 2006. Customer satisfaction with NWS Hydrologic Services is explained by 7 major service areas: Customer Service, Data Services, Web Products, Water Supply/Reservoir Information, Drought Information, Routine River Forecasts/ Conditions, and Flood Information. The survey contained specific questions for each of these areas. NWS is generally performing well in all these areas as scores range from 80 to 91.





### Executive Summary continued

The 2008 results show Flood Information and Water Supply/Reservoir Information have the largest impact on satisfaction; Web Products, Routine River Forecasts/Conditions and Data Services have moderate impacts; and, Customer Service and Drought Information have relatively low impacts. Customer Satisfaction affects outcome measures such as the Confidence in NWS that improved 2 points since the last measure in 2006.

The significant improvement in Satisfaction and in three of its principal drivers is a result of NWS successfully implementing the recommendations from prior studies. Even so, the results point to opportunities for continued improvement:

- \* **Focus on resources** Flood Information should have first priority followed by Water Supply/Reservoir Information and Web Products.
- \* **Improve Functionality and Visual Appeal of Graphics** Visual representation remains important with users of all types with a need to have products that users can understand with minimal help from the NWS.
- \* **Target User Groups and Geographic Areas** Shipping, Agriculture and Water Resources had lower scores in high impact areas with "timeliness of information" receiving the lowest scores.
- \* Address Water Managers Preferences Water managers indicated a high usefulness of a Water Supply Volume Inflow Forecast Map and a Water Supply Volume Inflow Forecast Progression.





# Introduction





# Introduction

This report presents the results from the 2008 National Weather Service Hydrologic Services customer satisfaction survey. The results presented in this report serve as a decision tool for use in conjunction with other customer and management information available to the National Weather Service Hydrologic Services Program.

The "Research Summary" section provides a synopsis of the survey process and outlines the major findings from the analysis. The conclusions and recommendations in the Research Summary provide NWS managers with suggested action items based on these findings. Following these are sections including further detail on survey results, customer verbatim comments, and the questionnaire.

### Analysis Methodology

The analytical methodology used to evaluate the survey results is consistent with that used in the American Customer Satisfaction Index (ACSI). The ACSI (www.theACSI.org), established in 1994, is a uniform, cross-industry measure of satisfaction with goods and services available to U.S. consumers, including both the private and public sectors. It is produced by the National Quality Research Center at the University of Michigan Business School under the direction of Dr. Claes Fornell.

CFI Group, a management consulting firm that specializes in the application of the ACSI methodology to individual organizations, uses the ACSI methodology to identify the causes of customer satisfaction and relates satisfaction to organizational performance measures such as the rate of customer complaints and customer confidence in the service they receive. The methodology measures quality, satisfaction, and performance, and links them within a structural equation model using a Partial Least Squares methodology. By using this system, CFI Group's analysis overcomes customers' inherent difficulty to precisely report the relative effects of the many factors influencing their satisfaction. Using CFI Group's results, organizations like the National Weather Service can identify those factors that will most improve customer satisfaction and other measures of organizational performance.

The core of the CFI Group methodology is the Customer Satisfaction Model, found on the next page. The model flows from left to right in a chain of cause-and-effect. On the far left side are **Attributes** actual questions about various aspects of the NWS Hydrologic Services Program's performance from the survey itself. These roll up into **Components** representing general areas of performance that drive **Customer Satisfaction**. The **Customer Satisfaction Index (CSI)** is measured separately by three questions - overall satisfaction, satisfaction compared to expectations, and satisfaction compared to an "ideal." The CSI is a leading indicator of the organizational Performance Outcomes, which include respondents' confidence that the NWS will do a

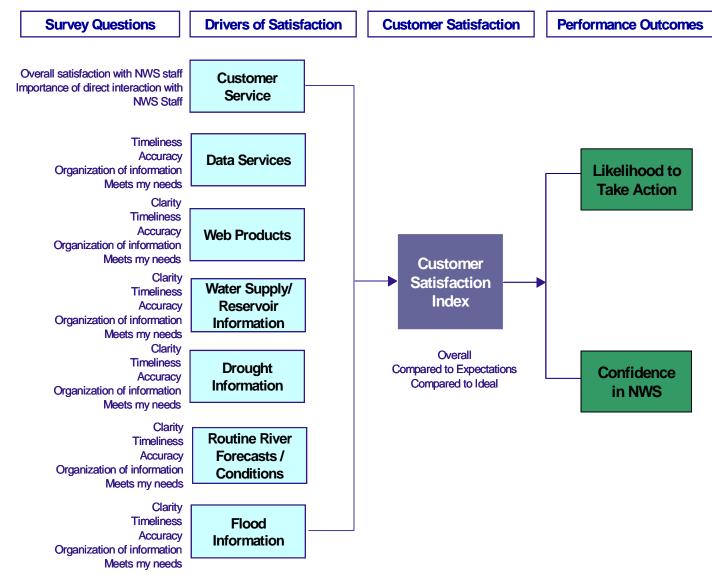




# Introduction continued

good job of providing forecasts, watches and warnings in the future, and their likelihood to take action based on the hydrologic information they receive from the National Weather Service.

The results presented in this report precisely quantify both current levels of performance on all the model elements, and the predicted impacts of quality and satisfaction improvements on performance outcomes. As the NWS Hydrologic Services Program improves its performance on Attributes and Components, the CSI will increase, resulting in improved outcomes. The analysis results help to pinpoint the areas of greatest leverage to drive these desirable outcomes, and thus serve as the springboard for NWS to develop successful and cost-effective strategies to continue to satisfy its customer base.







### Introduction continued

### Key Words for Understanding this Report

Results from this analysis are presented through various discussions, charts, and tables provided in this report. To understand these clearly, refer to the following definitions:

**Attribute –** Attributes reflect different aspects or qualities of a component experienced by customers, which may contribute to satisfaction. Each attribute is captured by a specific scaled question from the questionnaire.

**Attribute Rating –** An attribute rating is the average of all responses to each question. Each rating has been converted to a 0-100 scale. In general, it indicates how negatively (low ratings) or positively (high ratings) customers perceive specific issues.

**Component –** Each component is defined by a set of attributes that are conceptually and empirically related to each other. For example, a component entitled "Flood Information" may include questions regarding "clarity" and "conciseness" of flood information.

**Component Score** (or simply "score") – A component score represents that component's "performance". In general, they tell how negatively (low scores) or positively (high scores) customers feel about the organization's performance in general areas. Quantitatively, the score is the weighted average of the attributes that define the component in the CFI Group model. These scores are standardized on a 0-100 scale.

**Component Impact** (or simply "impact") – The impact of a component represents its ability to affect the customer's satisfaction and future behavior. Components with higher impacts have greater leverage on measures of satisfaction and behavior than those with lower impacts. Quantitatively, a component's impact represents the amount of change in Overall Satisfaction that would occur if that component's score were to increase by 5 points.





# **Research Summary**





# **Research Summary**

### Background

The project began with discussions between CFI Group and members of the NWS Hydrologic Services Program to establish the goals of the survey and the subsequent analysis, and determine how these may or may not have differed versus prior years. The survey was conducted initially in 2004 to establish a baseline benchmark for customer satisfaction with the Hydrologic Services Program products and services. The 2006 survey measured progress versus 2004 to identify successes as well as opportunities for further improvement. The 2008 survey measured progress versus 2006 as well as an additional three sections that focus on products and features the NWS currently offers or may offer in the future. These three sections are Internet Services, Water Resources Services, and Data Services and they help gauge demand for product improvement as well as additional information types and formats.

The survey was conducted via the web, August 21 - September 24, 2008. The survey was posted on NWS web pages, allowing for anonymous response. During the survey period, 1,976 responses were collected (slightly more than in 2006). As was the case in 2006, respondents report using hydrologic information primarily for personal use or emergency management. The next page provides additional demographic information.

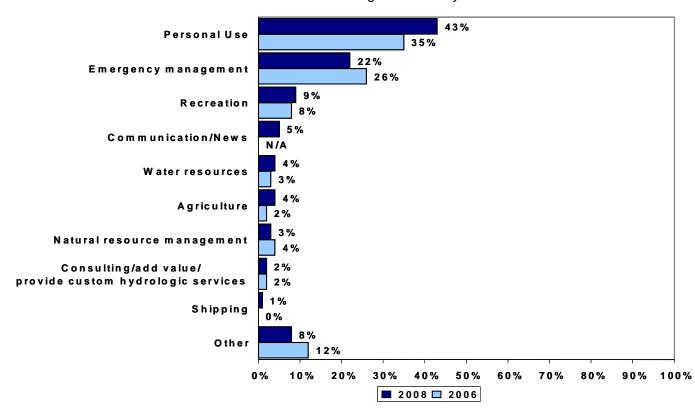


Figure 1: Primary Use





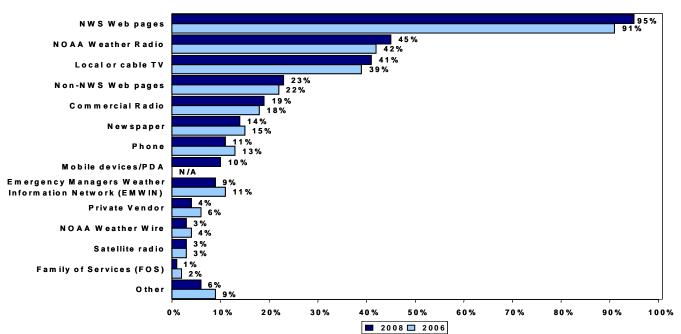


Figure 2: Means by which Receive NWS Hydrologic Information

Figure 2 shows that respondents primarily receive information via the NWS Web pages, while many also receive it via NOAA Weather Radio and Local or cable TV. Note that multiple selections were allowed. Figure 3 illustrates that Flood Information is accessed most frequently by survey respondents.

Overall, Flood Warnings, Flood Watches and Flood Statements are the most frequently used while drought information and water supply and/or reservoir information is least frequently used. However, usage does vary by primary use. For example, Shippers and Water Resource managers indicate much higher frequency of use for routine river forecasts and observed conditions than the average. Similarly, Communications/News indicates the most frequent usage of Flood Warnings, Flood Watches and Flood Information.

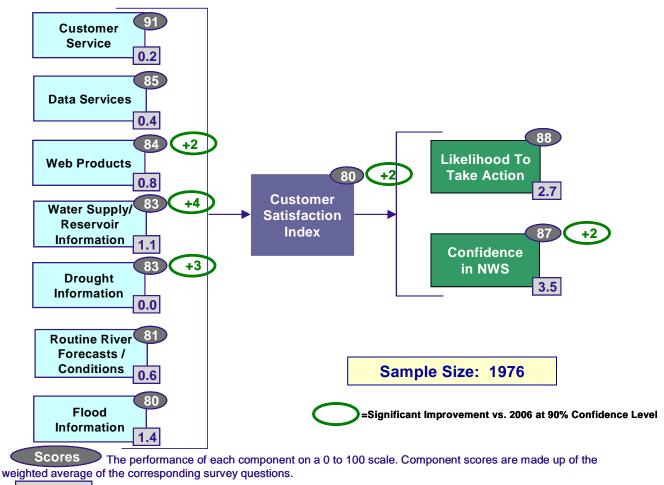
	Several Times per Day	Once per Day	Once per Week	Once per Month	Do Not Use	Not Familiar with this Information
Flood Warnings, Flood Watches, and Flood Statements (n=1976)	51%	19%	6%	11%	10%	3%
Hydrologic Statements and Hydrologic Summaries providing <b>routine river</b> <b>forecasts and observed conditions</b> (n=1976)	17%	20%	20%	20%	17%	5%
Hydrologic Outlooks providing <b>drought</b> information (n=1970)	3%	8%	16%	23%	40%	10%
Hydrologic Outlooks providing information on <b>water supply and/or</b> <b>reservoir information</b> (n=1976)	3%	6%	9%	16%	51%	15%

Figure 3: Frequency of Obtaining Text Information





### **Model Results**



**Impacts** The change in target variable that results from a five point change in a component score. For example, a 5-point gain in Flood Information would yield a 1.4-point improvement in Satisfaction.

The figure above shows the complete satisfaction model for the Hydrologic Services Program. This is a cause-and-effect model where the components of the customer experience (**Flood Information**, the **Web Products**, etc.) influence the **Customer Satisfaction Index (CSI)**, which in turn drives changes in customer behaviors such as **Likelihood to Take Action**, and attitudes such as their **Confidence** that the NWS will do a good job of providing forecasts, watches and warnings in the future. Each component is comprised of a group of questions from the survey related to a particular area; for example, the **Flood Information** component is comprised of questions asking respondents to rate the flood information on "clarity," "timeliness" and so on. Note that the Customer Satisfaction Index is measured independently of the quality components by three survey questions (overall satisfaction, satisfaction compared to expectations, and satisfaction compared to an "ideal"); it is not an average or an index of the scores for the model components themselves.



Improvements in any of the left-hand-side components will have a positive influence on customer satisfaction. These changes can be quantified by the component's *impact*, which indicates the amount by which satisfaction would increase if a component were to improve by 5 points. For example, if **Flood Information** were to improve from 80 to 85, the **CSI** would improve by 1.4 points (from 80 to 81.4), the predicted impact of **Flood Information**. Impacts represent the *independent* effect of each quality component on the CSI (i.e., the effect with "all else being equal"), and are also *additive* - that is, improvements in several components will cause the CSI to go up by the sum of their impacts.

Likewise, if the CSI were to rise 5 points, the model predicts that the scores for **Likelihood to Take Action** and **Confidence** would change by the amount of their impacts (2.7 and 3.5, respectively). The impact logic also operates on the downside: decreased levels of performance on any component will lead to lower satisfaction scores commensurate with their impacts.

The satisfaction model provides guidance about where to focus efforts to improve satisfaction. Those components with relatively high impact and low score should be the highest priority for improvement. Those with higher scores and lower impacts should assume lower priority. Assigning a particular area lower-priority does not mean that it is not *important*. Large changes in performance levels on any component (e.g., 10 points or more, either up or down) will likely affect the CSI score, even if the component(s) in question have an impact of 0.0.

While in 2006 Flood Information and Routine River Forecasts / Conditions had the greatest leverage on satisfaction, the 2008 results show Flood Information and Water Supply/Reservoir Information have the largest impact on satisfaction. These currently score very well, so maintaining current service levels and making any improvements possible are recommended. Web Products, Routine River Forecasts / Conditions, and Data Services are moderate impact areas, and certainly would impact satisfaction if improvements were made. Customer Service and Drought Information are relatively low impact areas, so the NWS should consider them third-tier priorities for improvement.





### Benchmarks

The NWS Hydrologic Services Program continues to perform very well, as the overall customer satisfaction score is 80. The benchmarks provided in Figure 4 show that Hydrology scores better than the ACSI average, which includes all public and private industries measured (75.1). Hydrology also outperforms the Federal Government average of all agencies surveyed (67.8) and many of the other National Weather Service entities that have measured in the past. The Hydrologic Services Program should be very proud of their customer satisfaction scores.

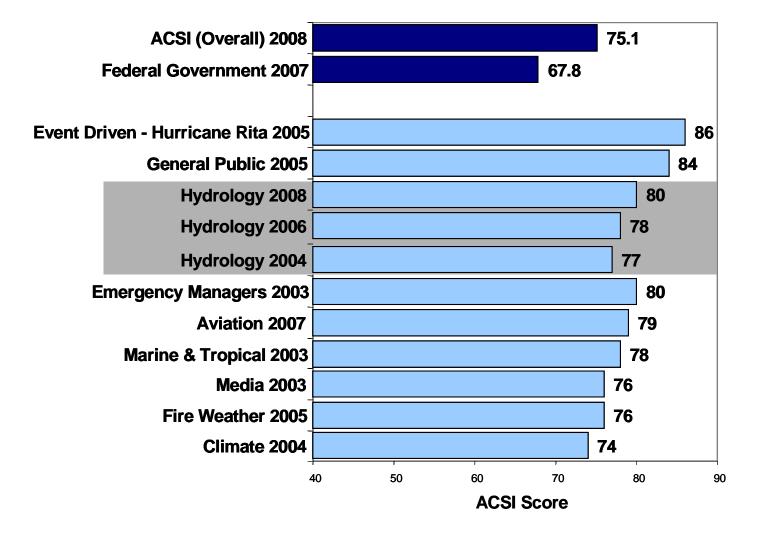


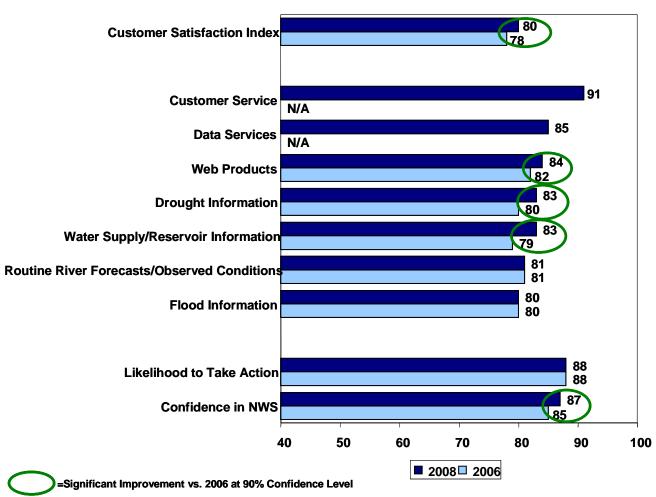
Figure 4: ACSI & Federal Government Benchmarks

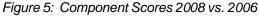




### Score Comparisons 2008 vs. 2006

Overall, there are significant differences between various components of 2008 vs. 2006, including the CSI score. The score range is between 80 and 91 (Figure 5). Customers continue to view the information they receive from the NWS Hydrologic Services Program with a high degree of satisfaction. Web Products, Drought Information, and Water Supply/Reservoir Information have all had significant increases in score, and resulting from this is a significant increase in the Confidence in NWS.



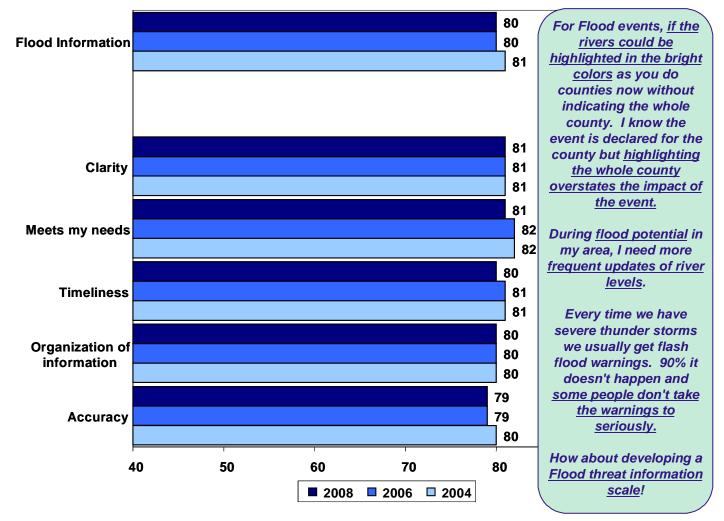






#### **Flood Information**

Figure 6: Flood Information component and attribute scores 2008 vs. 2006 and 2004



Flood Information performs very well with a score of 80 (the same as in 2006) and also has the highest impact on satisfaction (1.4). All attributes score very well (79-82). It is important to maintain current levels of service in this area and fine tune wherever possible. Verbatim comments such as those located next to Figure 6 offer other recommendations specific to flood information. A full listing of verbatim comments can be found later in the report.





#### **Flood Information continued**

10-11. What is the minimum amount of time you need to take effective precautionary actions against...

	Less than 30 minutes	Between 30 and 45 minutes	Between 45 and 60 minutes	Between 1 and 2 hours	More than 2 hours
Flash Flood Warnings	21%	24%	24%	21%	11%

	Less than 30 minutes	Between 30 and 60 minutes	Between 1 and 2 hours	Between 2 and 6 hours	More than 6 hours
Flood Warnings	16%	24%	27%	19%	14%

	Score
Importance of the disinclination between a flood warning and a flash flood warning	85

Communication/News had the largest percentage indicating "less than 30 minutes" as the minimum time needed to take precautionary actions against both Flash Flood Warnings and Flood Warnings (35% and 26%, respectively.)





#### Water Supply/Reservoir Information

Water Supply/Reservoir Information scores significantly higher than in 2006, with a very strong score of 83. This is also a high impact area (1.1), demonstrating the critical nature of providing this information, and the importance of providing it in the most user-friendly manner possible. Usefulness was asked for displaying both observations and forecasts of water resources properties and water supply volume inflow forecast information. Respondents score the usefulness of displaying observations and forecasts properties higher (77 to 71).

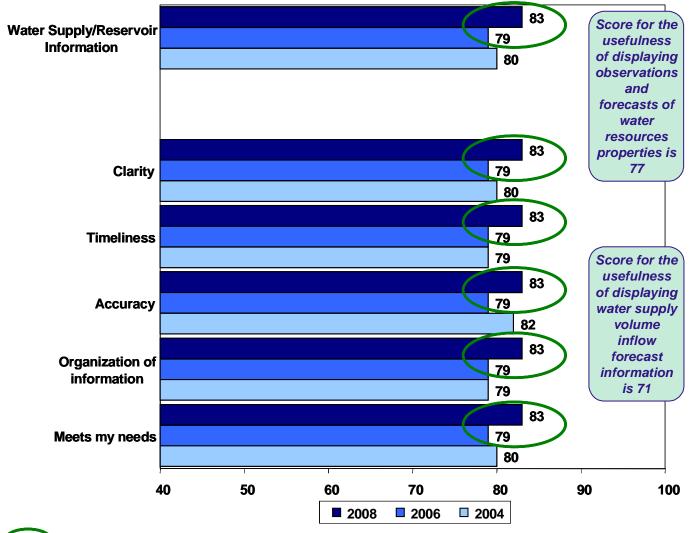


Figure 7: Water Supply/Reservoir Information component and attribute scores 2008 vs. 2006

=Significant Improvement vs. 2006 at 90% Confidence Level





#### High Satisfaction Driver Segmentation

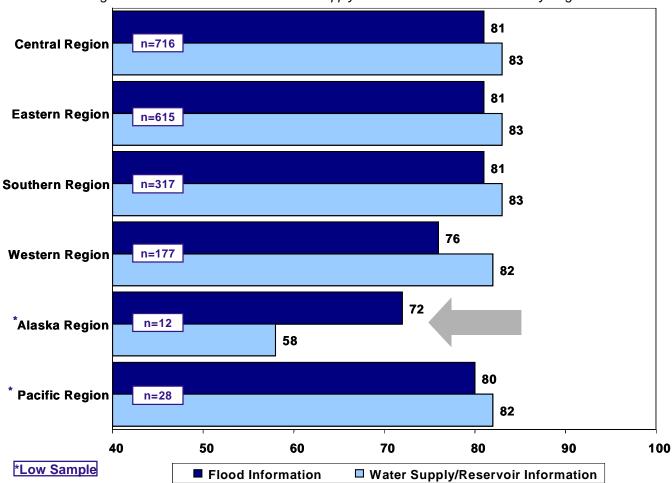


Figure 8: Flood Information and Water Supply/Reservoir Information Scores by Region

Figure 8 compares scores for the top two drivers of satisfaction (Flood Information and Water Supply/Reservoir Information) by region. While all regions score well in these areas, the Alaska Region scores slightly lower, however it is also lower in sample size. In looking for opportunities to fine-tune scores for these drivers of satisfaction, the Alaska Region could lend insight.

Figure 9 shown on the next page shows the scores by Primary Use of information. Again, the caveat is that for some of these groups, the sample size is low. Nevertheless, Shipping and Consulting score comparatively lower. The NWS should consider reaching out to these groups for further improvement opportunities, if that falls in line with current priorities. Beyond the scores, the verbatim comments provided on the bottom of the following page shows customer commentary that lends further support that the NWS Hydrologic information successfully suits a range of customer needs.





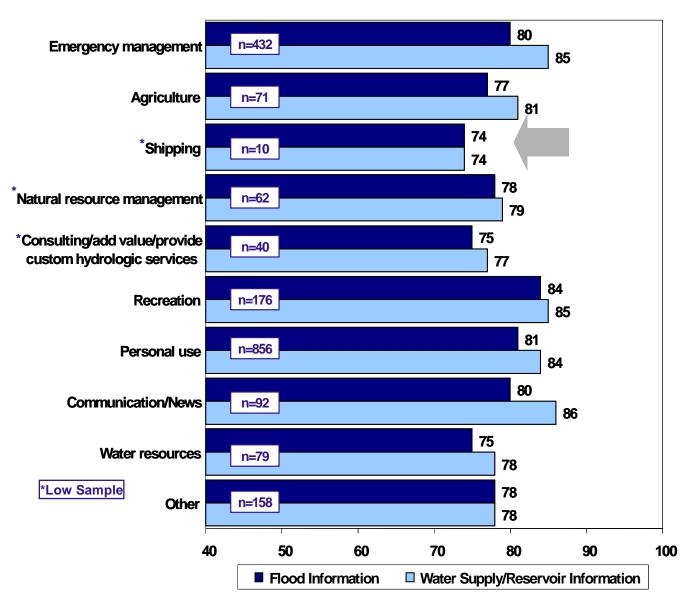


Figure 9: Flood Information and Water Supply Reservoir Information Scores by Primary Use

I'm a <u>retired newsman</u> and research info to let local outlets know what the long or short term problems are that might be coming our way and I enjoy all the info.





#### **Routine River Forecasts/Conditions**

The Routine River Forecasts/Conditions component scores the same as 2006, very strong (81) with an impact of 0.6. The attributes making up Routine River Forecasts/Conditions also score well, between 81-82, with most scores holding from 2006. This component has a decreased impact on satisfaction (0.6) compared to 2006 (1.1).

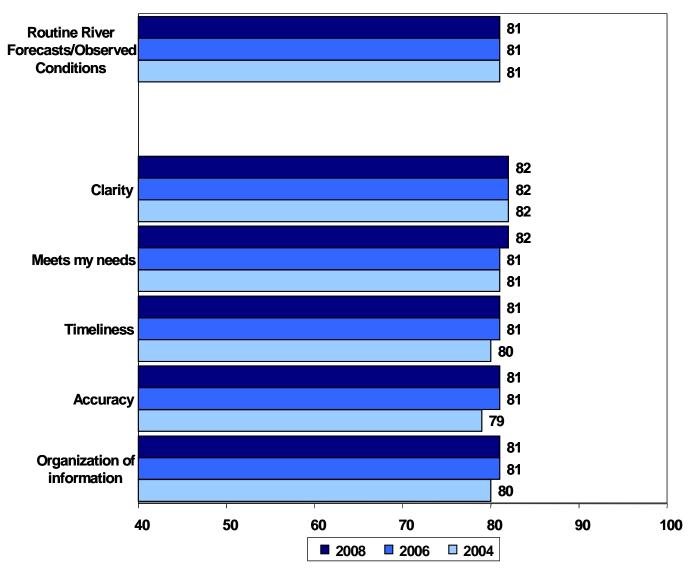


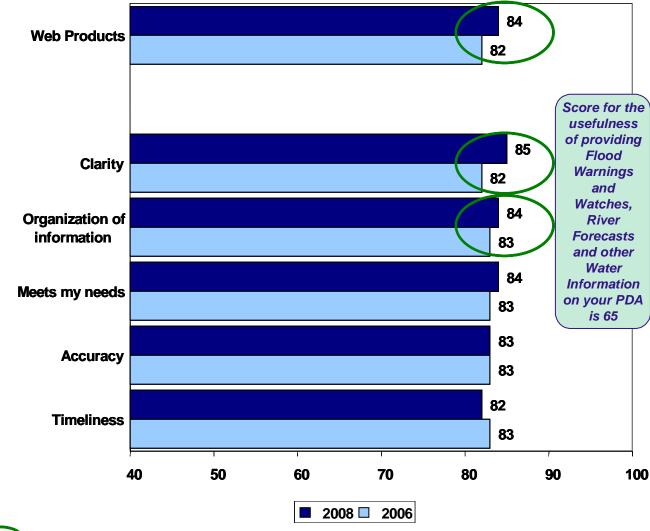
Figure 10: Routine River Forecasts/Conditions component and attribute scores 2008 - 2004

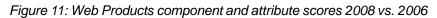




#### Web Products

Web Products scored significant higher than in 2006, with a strong score of 84 and an impact of 0.8. Clarity and organization of information also scored significant higher than in 2006. Respondents were also asked to score the usefulness of providing Flood Warnings and Watches, River Forecasts and other Water Information on their PDA, and the resulting score of 65 shows this is not a priority for many respondents.





=Significant Improvement vs. 2006 at 90% Confidence Level





#### Data Services

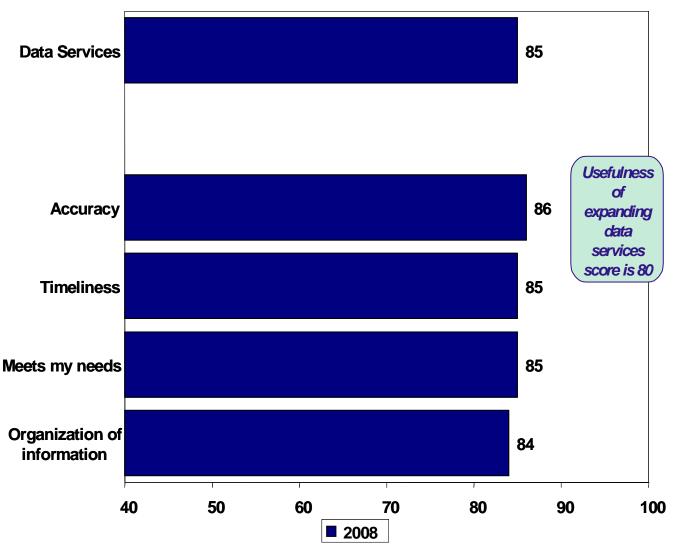


Figure 12: Data Services component and attribute scores 2008 vs. 2006

Data Services scores well, 85, and has an impact of 0.4. Respondents were also asked to score the usefulness of expanding data services, and this also scored well (80).





#### **Customer Service**

Customer Service was the highest scoring component, with a score of 91. The impact of Customer Service on Satisfaction is 0.2.

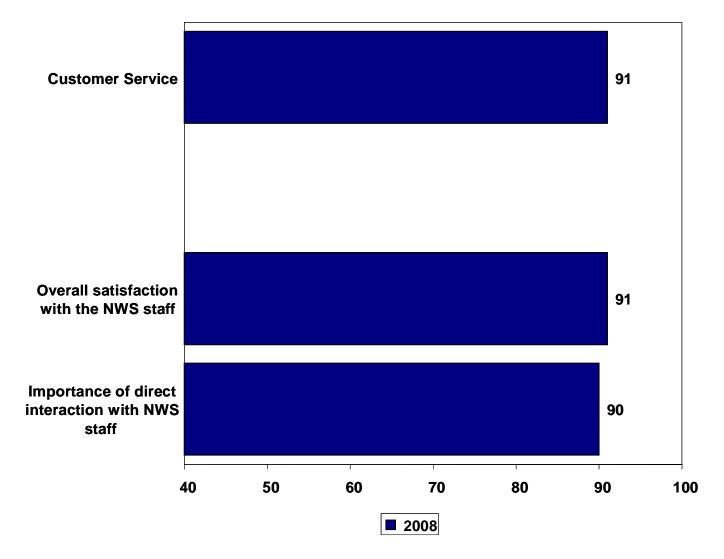


Figure 13: Customer Service component and attribute scores 2008 vs. 2006





#### **Customer Service continued**

About one fourth of all respondents have directly interacted with NWS staff in the past 6 months. However, Water Resources and Emergency Management report the largest percentage with direction interaction (61% and 57%, respectively). Shipping has the largest percentage (33%) indicating more than 25 hours of direct interaction in a typical year followed by Water Resources (27%). "Getting more information from the forecaster than available in exisiting products" was the most frequently mentioned reason for interaction with NWS staff regardless of primary use.

Number of Hours Spent Directly Interacting with NWS Staff during a Typical Year	%
Less than 5 hours	50%
5 to 10 hours	24%
11 to 25 hours	14%
More than 25 hours	12%

Purpose of Direct Interaction with	%	
NWS Staff*		
Explanation or interpretation of available forecast products	55%	
Gain an understanding of forecaster confidence in forecast products	50%	
Synthesize available forecast products and information for your specific needs	56%	
Get more information from forecaster than available in existing products	64%	

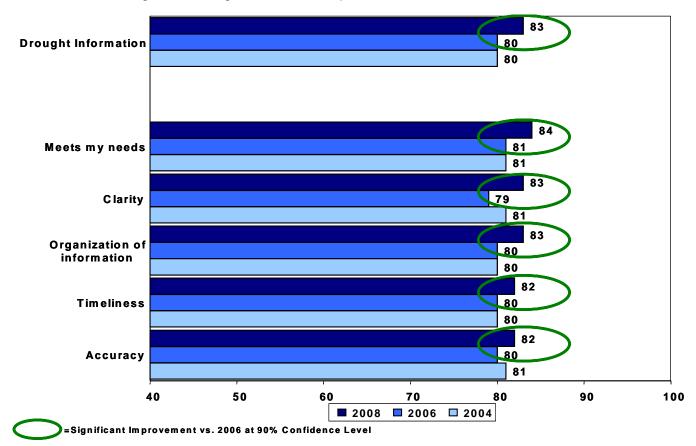
26% of respondents have directly interacted with NWS staff in the past 6 months





#### **Drought Information**

Figure 14: Drought Information component and attribute scores 2008 vs. 2006



Drought Information scored significantly higher compared to 2006, with a satisfaction score of 88. This component has an impact on satisfaction of 0.0. All of the attributes that comprise Drought Information also had significant increases in score vs. 2006. When comparing Drought Scores by Region for 2008 vs. 2006, most regions showed consistent scores, with the exception of Alaska, which had a large drop in score.

<u>Drought Scores by</u> <u>Region</u>
Central: 83 (79 in 2006)
Eastern: 83 (83 in 2006)
Southern: 82 (83 in 2006)
Western: 82 (76 in 2006)
Alaska: 50* (95 in 2006)
Pacific: 85* (64 in 2006)

#### \*Low Sample





### Segment Analysis

#### **Region**

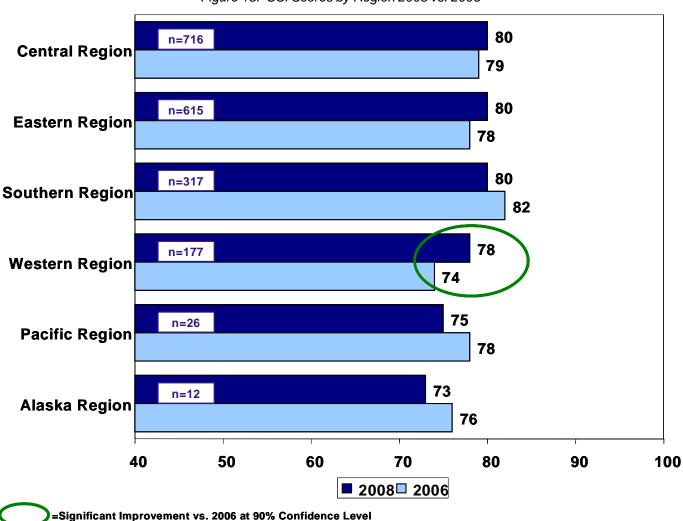


Figure 15: CSI Scores by Region 2008 vs. 2006

Region customer satisfaction scores range from 73 to 80, and show mixed improvement and decreases. Note the low samples for the Pacific and Alaska region. The Central, Western, and Southern regions score better than the others, with the Alaska region scoring on the low end of the range. While a 73 is still a good score, the Alaska region may want to reach out to its customers to pinpoint any opportunities to improve service.





#### Primary Use

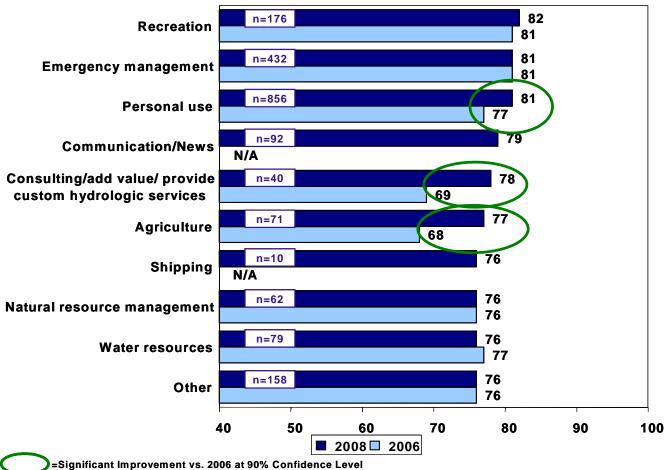


Figure 16: CSI Scores by Primary Use 2008 vs. 2006

=Significant improvement vs. 2006 at 90% Confidence Level

Many user groups show improvement over 2006, including Personal Use, the largest responding population. A number of the groups, Personal Use, Consulting, and Agriculture, showed significant improvement versus 2006. Shipping, Natural Resource Management, and Water Resources scored satisfaction lower that the other groups. Should the NWS resolve to determine how to better provide information by reaching out to specific groups, the opportunity exists within these three groups.





#### **Primary Sector**

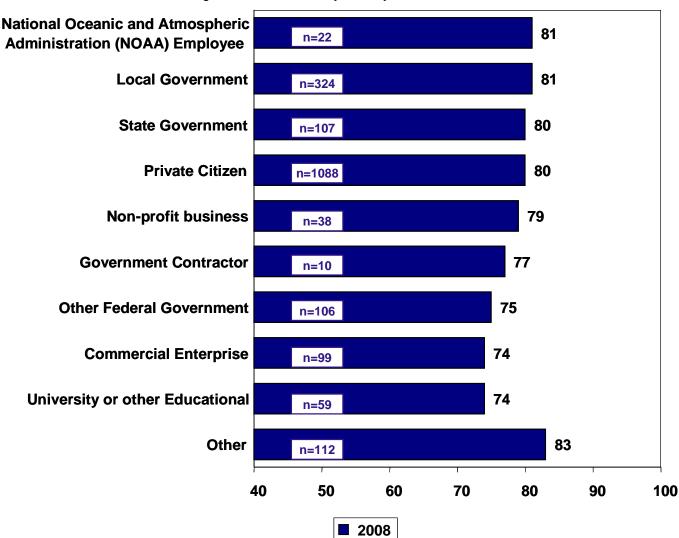


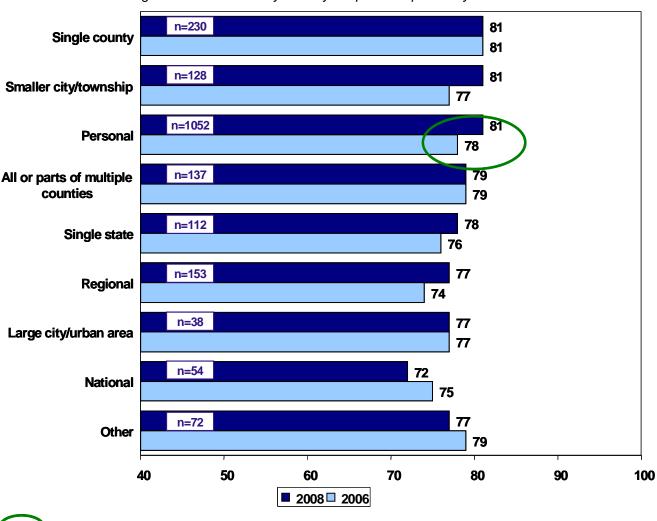
Figure 17: CSI Scores by Primary Sector 2008 vs. 2006

Primary Sector satisfaction scores range from 74 to 83. Satisfaction is highest among NOAA and Local Government employees, however the majority of the sample is Private Citizens. Those comprising the sectors of Commercial Enterprise and University or other Educational had the lowest satisfaction scores.





### Primay Scope







=Significant Improvement vs. 2006 at 90% Confidence Level

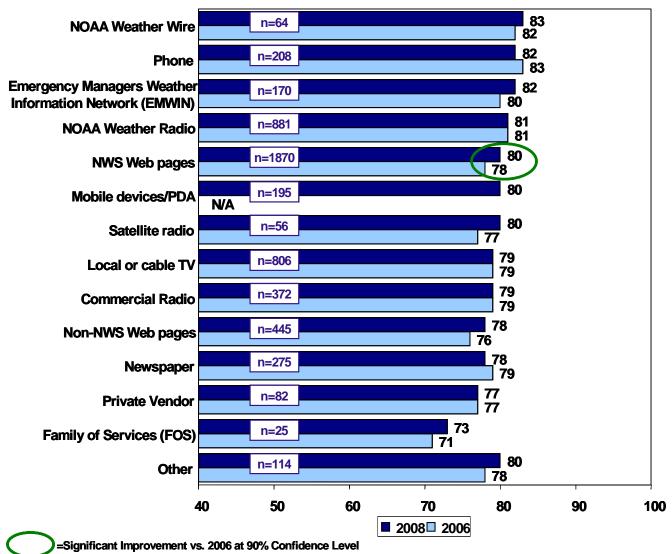
Satisfaction scores by Primary Scope of Responsibility range from 72 to 81, and for the most part show no change or improvement over 2006. Those whose Primary Scope of Responsibility is Personal showed a significant increase in satisfaction compared to 2006. The respondents that chose National as their Primary Scope of Responsibility scored satisfaction the lowest. The majority of respondents chose Personal as their Primary Scope.





### Means of Receiving Hydrologic Information

Figure 19: CSI Scores by Means of Receiving Hydrological Information 2008 vs. 2006



Compared to 2006, the 2008 results show no change or increases in CSI among the majority of Means for Receiving Hydrological Information.





## **Additional Findings**

After the core model questions, respondents were given the option to complete three additional survey segments. The information collected for Internet Services is included below, with Water Resources Services and Data Services information starting on pages 41 and 48 respectively.

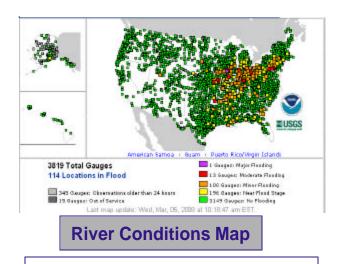
### Survey Part II: Internet Services

The first of the three voluntary sections is Internet Services. This section contains questions regarding current and proposed graphical formats that exhibit hydrological information. There were a total of 488 respondents to the Internet Services section, with the majority of these respondents primarily using hydrological information for either personal use or emergency management.

Number of Completes for Internet Services by Primary Use	n
Personal use	187
Emergency Management	120
Recreation	37
Water resources	29
Natural Resource Management	20
Agriculture	14
Communication/news	14
Consulting/add value/provide custom hydrologic services	12
Shipping	0
Other	55

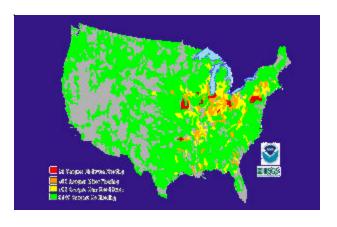






### Survey Part II: Internet Services continued

Average: 76
73: Visual Appeal
77: Ease of Understanding
78: Tells me what I need to know



### **General River Basins**

Average: 70
67: Visual Appeal
72: Ease of Understanding
70: Tells me what I need to know



River Conditions Regional Map

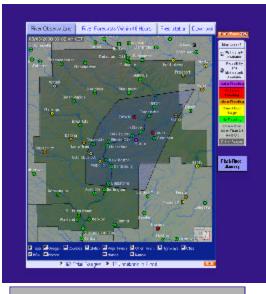
### Average: 87

- 86: Visual Appeal
- 88: Ease of Understanding
- 86: Tells me what I need to know





### Survey Part II: Internet Services continued



**Current Flood Conditions** 

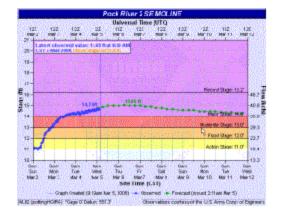
Average: 86	
85: Visual Appeal	
86: Ease of Understanding	
86: Tells me what I need to kn	ow



## Hydrograph Flood Severity

Average: 87

- 87: Visual Appeal
- 88: Ease of Understanding
- 87: Tells me what I need to know



### Hydrograph Level/Flow

Average: 87

- 86: Visual Appeal
- 88: Ease of Understanding
- 88: Tells me what I need to know





### Survey Part II: Internet Services continued



# Hydrograph Low Flow Threshold Average: 83 83: Visual Appeal

- 84: Ease of Understanding
- 83: Tells me what I need to know
- 82: Usefulness of hydrograph when making decisions during periods of low flow

#### Inundation where river is 18 feet above flood



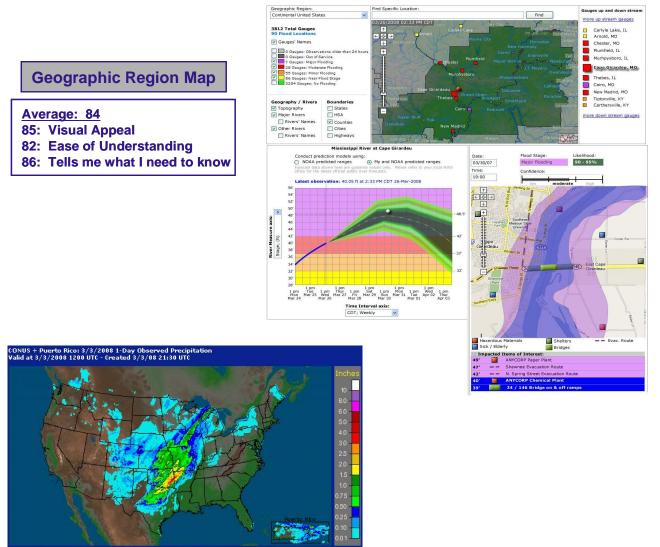
# **Flood Depth Map** Average: 86 85: Visual Appeal

- 84: Ease of Understanding
- 86: Tells me what I need to know
- 89: Usefulness of areal extent and depth of floodwaters in decision making process





### Survey Part II: Internet Services continued



🗹 Topo 🗹 Pcpn Amount 📕 Counties 📕 Rivers 🗹 States 📕 Highway/City 📕 RFC Boundary

#### **High-resolution Precipitation Estimates Map**

Average: 89 90: Visual Appeal 90: Ease of Understanding 88: Tells me what I need to know





### Survey Part II: Internet Services continued



Usage	Yes	No
Use precipitation frequency estimates	51%	49%
Use PMP estimates	32%	68%

Web Pages	Yes	No
Familiar with Precipitation Frequency Data Server web page	55%	45%
Familiar with Hydrometeorological Reports web page	54%	46%

Score for	
usefulness	
of having	
updated	
guidelines	
for PMP	
estimates is	
91	
	,

Score for usefulness of having updated precipitation frequency updates is 85





### Survey Part III: Water Resources Services

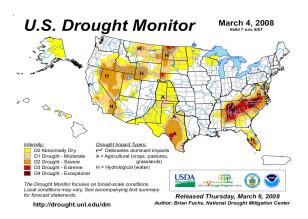
The second of the voluntary sections is Water Resources Services. This section contains questions concerning drought, snow, water temperature, soil depths, and a section of questions for water managers. There were a total of 270 respondents for this section. Forty percent of these respondents continued on to the Water Manager questions that were at the end of the section. Of the 270 respondents, more than half primarily used hydrological information for either primary use or emergency management.

Number of Completes for Water Resources Services by Primary Use	n
Personal use	91
Emergency Management	55
Water resources	29
Natural Resource Management	24
Agriculture	16
Recreation	12
Communication/news	9
Consulting/add value/provide custom hydrologic services	6
Shipping	1
Other	27





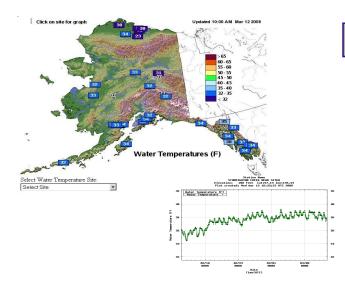
### Survey Part III: Water Resources Services continued

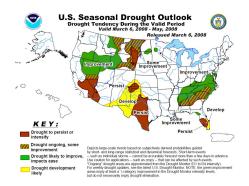


### **Observed Drought Conditions Map**

#### Average: 88

- 90: Visual Appeal
- 90: Ease of Understanding
- 88: Tells me what I need to know
- 83: Usefulness of observed drought conditions in decision making process





### **Drought Trends Map**

#### Average: 87

- 89: Visual Appeal
- 89: Ease of Understanding
- 87: Tells me what I need to know
- 81: Usefulness of trends for drought over next three months in decision making process

### **Observed Water Temperatures Map**

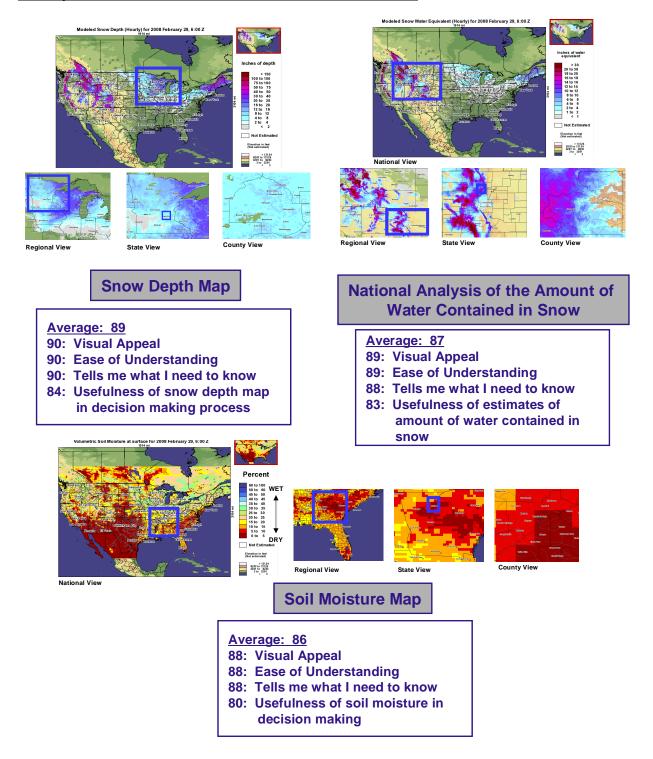
#### Average: 82

- 87: Visual Appeal
- 88: Ease of Understanding
- 87: Tells me what I need to know
- 70: Usefulness of observed water temperatures in decision making process
- 76: Usefulness of receiving water temperatures forecasts for river, streams and lakes for the next five days





### Survey Part III: Water Resources Services continued







### Survey Part III: Water Resources Services continued

Soil Depth where Soil Moisture is Important*	%
Surface and near-surface	73%
Sub-surface, including typical rooting zone depths (e.g., 20-50 cm to 100-150 cm)	65%
Deeper sub-surface, down to 2-3 meters	29%

Usefulness of Water Resources Properties Forecast	Score
Usefulness of water resources properties forecast for current conditions	90
Usefulness of water resources properties forecast for 48-72 hours	84
Usefulness of water resources properties forecast for 3-5 days	77
Usefulness of water resources properties forecast for 5-7 days	73
Usefulness of water resources properties forecast for more than 1 week to 1 month	65
Usefulness of water resources properties forecast for more than 1 month	60

## 57% of respondents say soil moisture at multiple discrete levels is of more value to them; 43% feel that a single value describing bulk soil moisture is more valuable

\*Select all that apply





Survey Part III: Water Resources Services continued

Spatial Scale Describing the Extent of Coverage for which Information would be Important in your Organization	%
National	10%
Regional	29%
Group(s) of watersheds within a large river basin	30%
Single watershed	21%
Sub-watershed	10%

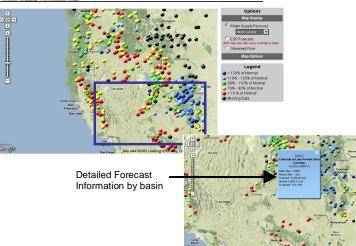
# Score for usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant is 81





### Survey Part III: Water Resources Services Water Manager Questions

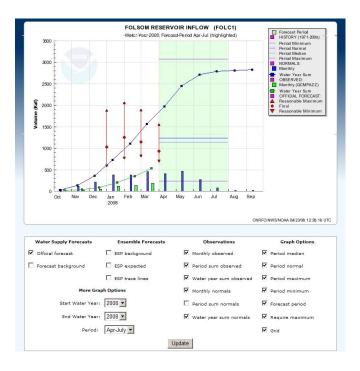
Water Supply Forecasts Map



### Water Supply Volume Inflow Forecast Map

#### Average: 86

- 88: Visual Appeal
- 88: Ease of Understanding
- 86: Tells me what I need to know
- 81: Usefulness of water supply
- volume inflow forecast map 89: Usefulness of water supply volume inflow forecast map
  - for the entire United States



### Water Supply Volume Inflow Forecast Progression

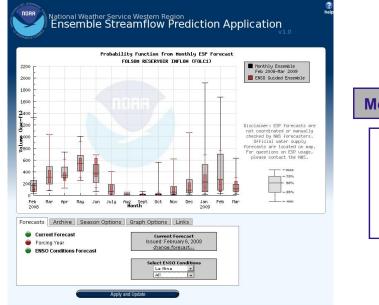
#### Average: 87

- 88: Visual Appeal
- 86: Ease of Understanding
- 90: Tells me what I need to know
- 82: Usefulness of water supply volume inflow forecast uncertainty





### Survey Part III: Water Resources Services Water Manager Questions continued



#### **Monthly Ensemble Volume Forecast**

#### Average: 83

- 85: Visual Appeal
- 83: Ease of Understanding
- 86: Tells me what I need to know
- 79: Usefulness of monthly ensemble volume forecasts

Mon	Climate Scenario 2 V Enable? Temperature Change 0 2 V Precibiation Normal 100 V precentivear Graph can take between 30 seconds and 5 mini thly Probabilities for Climate Change at	
00 E		
		- 10 P-1 F1 F1

### **Climate Sensitivity Study**

#### Average: 76

- 78: Visual Appeal
- 76: Ease of Understanding
- 79: Tells me what I need to know
- 72: Usefulness of climate sensitivity studies





### Survey Part IV: Data Services

The final voluntary section is Data Services. There were a total 235 respondents that completed this section, and more than half primarily used hydrological information for personal use or emergency management. This section contains questions regarding both the usefulness of various data methods and the number of tools that can be used for digital information.

Number of Completes for Data Services by Primary Use	n
Personal use	78
Emergency Management	59
Water resources	23
Natural Resource Management	13
Communication/news	10
Consulting/add value/provide custom hydrologic services	10
Recreation	8
Agriculture	6
Shipping	0
Other	28





Usefulness of Having Access to Flood Watches and Warnings	Score
Usefulness of having access to Flood Watches and Warnings as text	87
Usefulness of having access to Flood Watches and Warnings in XML, including CAP	75
Usefulness of having access to Polygons specifying the area covered by Flood Watches and Warnings	86

Usefulness of Having Access to Hydrologic Model Data	Score
Basin boundaries	82
Historical data used to calibrate models (e.g., Mean Areal Precipitation)	78
Hydrologic model parameters (e.g., soil moisture accounting parameters)	72
Hydrologic model states (e.g., current soil moisture accounting contents)	71
Unit Hydrograph parameters	74
Routing parameters (e.g., lag parameters, attenuation parameters)	72
Rating Curve	74

Usefulness of Having Access to Hydrologic Model Outputs	Score
Raw ensemble streamflow prediction traces	72
Climate forecast adjusted ensemble streamflow prediction traces	73
Statistical water supply forecast	74
Flash flood guidance	86





Observations	Score
Precipitation	96
Snow accumulation	88
Snow water equivalent	82
River stage/flow	90
Soil moisture	76
Air temperature	87
Dew point	81
Wind speed	84
Atmospheric freezing level	70
Potential evaporation	72
Soil frost depth	66
Forecast	Score
Precipitation	95
Temperature	90
Instantaneous streamflow/stage	86
Streamflow or stage forecast uncertainty information	83
Cumulative streamflow	78
Atmospheric freezing level	68





Text	Score
ASCI	84
XML (eXtended Markup Language), including CAP (Common Alerting Protocol)	79
Point Data	Score
ASCII text	82
XML, including GML (Geographic Markup Language)	80
SHEF (Standard Hydrologic Exchange Format)	64
Shapefile	75
KML (Keyhole Markup Language)	68
Lines, Vectors, Contours	Score
ACSII text	75
XML, including GML	76
Shapefile	78
KML (Keyhole Markup Language)	70
Grids, Arrays, Rasters	
ASCII text	74
Shapefile	77
KML (Keyhole Markup Language)	68
GeoTIFF	78
Bit-mapped graphics (e.g., .png) + Wordfile	74
NetCDF (Network Common Data Form)	63
GRIB (GRIdded Binary, versions I and II)	59
BUFR (Binary Universal Form for the Representation of meteorological data)	58





Usefulness of Various Digital Information Methods	Score
Download (e.g., ftp)	88
Web map service	91
Web feature service	90
Web coverage service	89
RSS (Real Simple Syndication)	79
WAP (Wireless Application Protocol)	76
Usefulness of metadata	82
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	81





GIS-Commercial	%
ESRI	38%
Custom Application	19%
Autodesk	12%
Intergraph	7%
Erdas Imagine	4%
ENVI	4%
Idrisi	3%
Other (e.g., Excel, MapInfo, Global Mapper, WDSSII, etc)	9%

GIS-Open Source	%
Geotools	18%
Custom Application	17%
GRASS	9%
ILWIS (GNU)	5%
SAGA	5%
Other (e.g., maps, Geomedia, Spreadsheets, GDAL, etc)	9%





Scientific Data Analysis, Modeling and Visualization	%
Custom Application	17%
NCAR Graphics/NCL	11%
AWIPS	10%
MatLab	10%
GEMPAK	6%
IDL	6%
CrADS	4%
PV-Wave	4%
AVS5	3%
Vis5D	3%
Other (e.g., HEC products, Excel, GeoMedia, WDSS II)	9%

Other Categories	%
Keyhole Markup Language viewers	37%
GPS/Navigation	31%
Image Processing/Computer Graphics	31%
TV/Media Groups	26%
CAD Tools	17%
Geo-aware Databases	11%
Specialized Spatial Information Services	5%
Other (e.g., HTML, JavaScript, MarPlot)	5%





### **Conclusions & Recommendations**

The performance of the National Weather Service Hydrologic Services Program showed significant improvement in Satisfaction in its third year of measurement. With a customer satisfaction score of 80, the NWS performs among the highest of federal government agencies. Several components that drive satisfaction also showed significant improvements compared to 2006 - Web Products, Water Supply/Reservoir Information and Drought Information. One of the outcomes of CSI Confidence in NWS, also improved significantly. As was found in prior studies, NWS is appreciated for the services they provide.

### Recommendations

The significant improvement in Satisfaction and in three of its principal drivers is a result of NWS successfully implementing the recommendations from prior studies. In particular, NWS has focused on understanding the needs of different primary users - such as emergency management, water resources, agriculture, shipping, communications, recreation, and personal use – and revising and developing specific products to meet their needs. The results of this study indicate that, even with significant progress, there are opportunities for continued improvement.

The areas below are recommended for improvement based on the results of the 2008 study.

#### **Focus of Resources**

Flood Information continues to have high impact but scores lower (relative to the other components) and should be the first priority in any improvement efforts. However, Water Supply/Reservoir Information and Web Products are second and third, respectively, in impact on Satisfaction. While both are high scoring, NWS must keep resources focused on maintaining the current level of performance in these areas.

#### Improve Functionality and Visual Appeal of Graphics

Visual representation remains important with users of all types, and about 95% get products via the Internet and "visual appeal" and "ease of understanding" are critical. It is important to have products that users can understand with minimal help from NWS since a large percentage of users indicate personal use as their primary need. NWS should work with government and business users (e.g., emergency managers, water resource managers, shippers, etc.) to provide training or tutorials if necessary to help meet their needs.





Respondents rated a number of existing and proposed new products in the three voluntary sections at the conclusion of the survey: Internet, Water Resources, and Data Services. Among existing products, respondents rated the following maps above 85 on all areas (visual appeal, ease of understanding and tells me what I need to know): River Conditions Regional Map, Hydrograph Flood Severity, Hydrograph Level/Flow, and High-resolution Precipitation Estimates. Among proposed products, the Flood Depth Map and Water Supply Volume Inflow Forecast Map were rated above 85 in usefulness.

#### **Target User Groups and Geographic Areas**

Shipping, Agriculture and Water Resources had lower scores than other user groups for the high impact areas of Flood and Water Supply/Reservoir Information. For all groups, timeliness of information had the lowest scores and might be the one area to focus on initially. Respondents from the Alaska Region also had lower scores for Flood and Water Supply/Reservoir Information as well as Drought Information. All attributes in these areas scored far below the average for other regions. Follow up with NWS personnel familiar with the Alaska Region might provide insight into why these three areas in particular have low scores.

#### Address Water Managers Preferences

Water managers indicated a high usefulness of a Water Supply Volume Inflow Forecast Map and a Water Supply Volume Inflow Forecast Progression. On the other hand, they indicated somewhat less usefulness for a Monthly Ensemble Volume Forecast and Climate Sensitivity Studies.

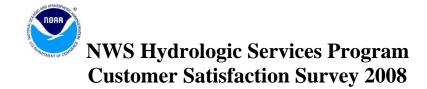




National Weather Service Hydrologic Services Program Customer Satisfaction

# Questionnaire





#### **Introduction**

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) is committed to serving the needs of all of its customers. The NWS is undertaking research on how satisfied users are and would appreciate your feedback. The purpose of this research, conducted in partnership with the federal government as part of the American Customer Satisfaction Index, is to help the NWS improve its flood and water forecast information services for you and others like you. NWS flood and water forecast information services encompasses flash flood and river flood warnings, watches and statements; recreational and water supply forecasts; precipitation analysis information as well as general river level information including historical records of high flows and impacts of these water levels.

Your answers are voluntary, but your opinions are very important for this research. Your responses will be held completely confidential, and you will never be identified by name. CFI Group, a third party research and consulting firm, is administering this survey via a secure server. The time required to complete this survey will be dependent on how certain questions are answered, but it will likely take approximately 20 minutes, and is authorized by Office of Management and Budget Control No. 1505-0191.

Please click on the "Next" button below to begin the survey.

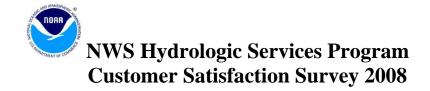
#### SURVEY PART I

#### **Information About You**

The following questions are intended to help us better understand your responses by allowing us to classify responses by geographic area and by type of users. As with the entire survey, your responses are completely voluntary.

- 1) What is your postal zip code?
- 2) What is your primary use of hydrologic information provided by the National Weather Service? (select one)
  - a) Emergency management
  - b) Communication/News (e.g., radio, TV, print, internet)
  - c) Water resources (supply/hydropower)
  - d) Agriculture
  - e) Shipping (e.g., barge)
  - f) Natural resource management
  - g) Consulting/add value/provide custom hydrologic services
  - h) Recreation
  - i) Personal use
  - j) Other (**please specify**)



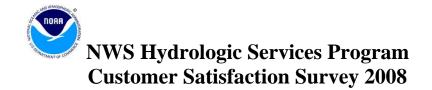


- 3) What sector do you represent? (please select one)
  - a) National Oceanic and Atmospheric Administration (NOAA) Employee
  - b) Other Federal Government
  - c) State Government
  - d) Local Government
  - e) Government Contractor
  - f) Commercial Enterprise
  - g) Non-profit business
  - h) University or other Educational
  - i) Military
  - j) Private Citizen
  - k) Foreign
  - l) Other (please specify)
- 4) (If 3a=true, ask question 4, else skip) What is your NOAA line office?
  - a) National Weather Service
  - b) National Environmental Satellite, Data, and Information Service
  - c) National Marine Fisheries Service
  - d) National Ocean Service
  - e) Office of Marine and Aviation Operations
  - f) Office of Oceanic and Atmospheric Research
  - g) Office of Program Planning and Integration
  - h) Other

#### 5) (If 3b=true, ask question 5, else skip) What federal agency do you represent?

- a) Bureau of Land Management
- b) Bureau of Reclamation
- c) Federal Emergency Management Agency
- d) Federal Highway Administration
- e) Federal Energy Regulatory Commission
- f) Forrest Service
- g) National Aeronautics and Space Administration
- h) National Resources Conservation Services
- i) National Science Foundation
- j) Nuclear Regulatory Commission
- k) Office of Surface Mining
- 1) U.S. Army Corps of Engineers
- m) U.S. Department of Agriculture Agriculture Research Service
- n) U.S. Department of Interior
- o) U.S. Environmental Protection Agency
- p) Other (please specify)
- 6) What is the primary scope of your responsibility?





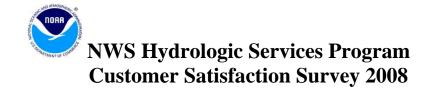
- a) National
- b) Regional (all or parts of multiple states)
- c) Single state
- d) All or parts of multiple counties, parishes or boroughs
- e) Single county, parish or borough
- f) Large city/urban area (population greater than 100,000)
- g) Smaller city/township (population less than 100,000)
- h) Personal
- i) Other (please specify)
- 7) By what means do you receive National Weather Service hydrologic information? (Select all that apply)
  - a) National Weather Service Web pages
  - b) Non-National Weather Service Web pages
  - c) Phone
  - d) Mobile devices/PDA
  - e) NOAA Weather Radio
  - f) NOAA Weather Wire
  - g) Family of Services (FOS)
  - h) Emergency Managers Weather Information Network (EMWIN)
  - i) Local or cable TV
  - j) Commercial Radio
  - k) Satellite radio
  - l) Newspaper
  - m) Private Vendor
  - n) Other (please specify)

### <u>General Satisfaction with the National Weather Service Flood and Water Forecast</u> <u>Information Services</u>

#### **Drivers of Satisfaction: Flood Information**

- 8) During flood events in the last 12 months, please indicate the frequency with which you have used Flood Warnings, Flood Watches, and Flood Statements provided by the National Weather Service.
  - a) Several times per day
  - b) Once per day
  - c) Once per week
  - d) Once per month
  - e) Do not use
  - f) Not familiar with this information
- 9) (If Usage Indicated in Q8) Referring specifically to flood information (i.e., Flood Warnings, Flood Watches, Flood Statements) provided by the National Weather Service, on





a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the quality of the flood information on the following:

- a) Clarity
- b) Timeliness
- c) Accuracy
- d) Organization of information
- e) Meets my needs
- 10) A flood warning is issued by the National Weather Service when flooding is imminent or occurring. A flash flood warning is issued when time is of the essence, indicating immediate action such as an evacuation or road closure is necessary to protect lives and property. On a 10-point scale where 1 means Not Important at all and 10 means Very Important please rate the importance of the distinction between a flood warning and a flash flood warning. (If rated <=5, skip to 12)</p>

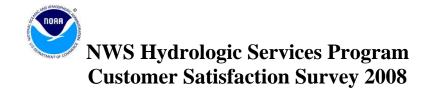
# The NWS strives to provide as much lead time as possible for its warnings so that users can take effective precautionary measures. The 10-year average (October 1, 1998- September 30, 2007) annual lead time for flash flood warnings is 49.1 minutes.

- 11) Thinking about how you respond to NWS **flash flood warnings**, what is the *minimum* amount of time you need to take effective precautionary actions?
  - a) Less than 30 minutes
  - b) Between 30 and 45 minutes
  - c) Between 45 and 60 minutes
  - d) Between 1 and 2 hours
  - e) More than 2 hours
- 12) Thinking about how you respond to NWS **flood warnings**, what is the *minimum* amount of time you need to take effective precautionary actions?
  - a) Less than 30 minutes
  - b) Between 30 and 60 minutes
  - c) Between 1 and 2 hours
  - d) Between 2 and 6 hours
  - e) More than 6 hours

#### **Drivers of Satisfaction: Routine River Forecasts/Observations**

- 13) During the last 12 months, please indicate the frequency with which you have used Hydrologic Statements and Hydrologic Summaries of routine river forecasts and observed conditions provided by the National Weather Service.
  - a) Several times per day
  - b) Once per day
  - c) Once per week
  - d) Once per month



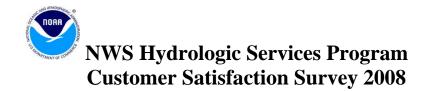


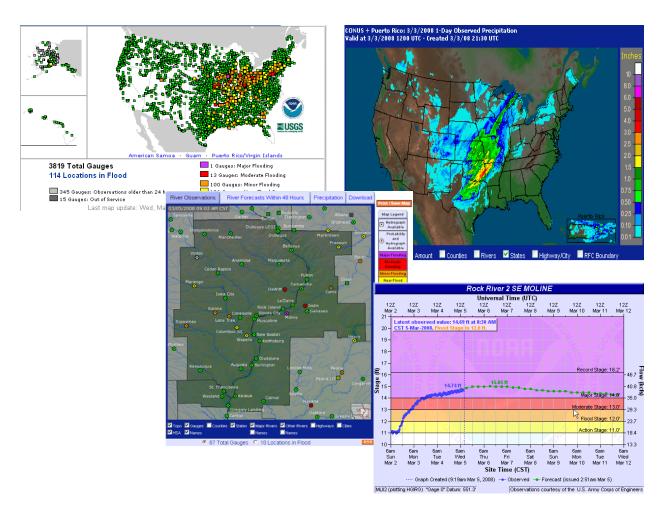
- e) Do not use
- f) Not familiar with this information
- 14) (**If Usage Indicated in Q13**) Referring specifically to NWS' Hydrologic Statements and Hydrologic Summaries providing **routine river forecasts** and **observed conditions**. On a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the quality of the routine river forecasts and observed conditions information on the following:
  - a) Clarity
  - b) Timeliness
  - c) Accuracy
  - d) Organization of information
  - e) Meets my needs

#### **Drivers of Satisfaction: Internet Services**

- 15) The National Weather Service provides a suite of hydrologic information on the Internet, primarily in graphical format as part of its Advanced Hydrologic Prediction Service. How frequently do you visit these web pages?
  - a) Several times per day
  - b) Once per day
  - c) Once per week
  - d) Once per month
  - e) Do not use
  - f) Not familiar with this information

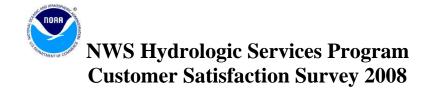






- 16) (**If Usage Indicated in Q15**)Consider the National Weather Service suite of hydrologic information on the Internet, as represented by the above four images. On a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the following:
  - a) Clarity
  - b) Timeliness
  - c) Accuracy
  - d) Organization of information
  - e) Meets my needs
- 17) Many services of all kinds are now being provided to users on mobile devices such as PDAs and Cell Phones (e.g. Blackberry). Using a 1 to 10 point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of the NWS providing Flood Warnings and Watches, River Forecasts and other water information on your PDA.





#### **Drivers of Satisfaction: Customer Services**

- 18) In the last 6 months have you directly interacted with NWS staff to discuss hydrologic forecast and/or warning information?
  - a) Yes
  - b) No (**skip to 23**)
- 19) Consider your most recent interaction with NWS staff to discuss hydrologic forecast and/or warning information. On a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied, please rate your overall satisfaction with this interaction.
- 20) On a 10-point scale where 1 means Not Important at all and 10 means Very Important, please rate the importance of your direct interaction with NWS staff to discuss hydrologic forecast and/or warning information.
- 21) During a typical year, approximately how many hours do you directly interact with NWS staff to discuss hydrologic forecast and/or warning information?
  - a) Less than 5 hours
  - b) 5-10 hours a year
  - c) 11-25 hours a year
  - d) More than 25 hours a year

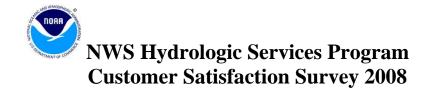
22) Please select the purpose of your direct interaction with NWS staff (select all that apply)

- a) Explanation or interpretation of available forecast and/or warnings products/information
- b) Gain an understanding of forecaster confidence in forecast and/or warning products/information
- c) Integrate all available forecast and/or warning products/information for your specific needs
- d) Get more information from forecaster than available in existing forecast and/or warning products/information

#### **Drivers of Satisfaction: Water Resources including Drought Information**

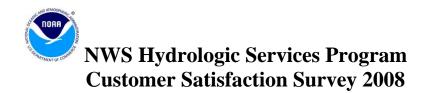
- 23) During the last 12 months, please indicate the frequency with which you have used Hydrologic Outlooks providing **drought information** (link to DGT.txt) provided by the National Weather Service.
  - a) Several times per day
  - b) Once per day
  - c) Once per week
  - d) Once per month
  - e) Do not use
  - f) Not familiar with this information

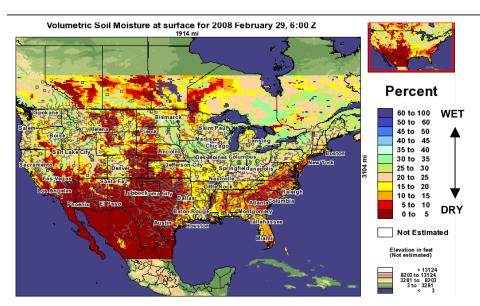




- 24) (**If Usage Indicated in Q23**) Referring specifically to NWS' Hydrologic Outlooks providing **drought information**, on a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the quality of the drought information on the following:
  - a) Clarity
  - b) Timeliness
  - c) Accuracy
  - d) Organization of information
  - e) Meets my needs
- 25) During the last 12 months, please indicate the frequency with which you have used Hydrologic Outlooks providing information on **water supply and/or reservoirs (link to ESF.txt)** provided by the National Weather Service.
  - a) Several times per day
  - b) Once per day
  - c) Once per week
  - d) Once per month
  - e) Do not use
  - f) Not familiar with this information
- 26) (**If Usage Indicated in Q25**) Referring specifically to NWS' Hydrologic Outlooks providing **information on water supply and/or reservoirs**. On a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the quality of the information on water supply and/or reservoirs on the following:
  - a) Clarity
  - b) Timeliness
  - c) Accuracy
  - d) Organization of information
  - e) Meets my needs

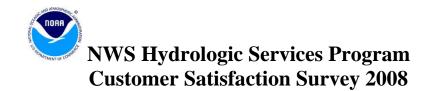


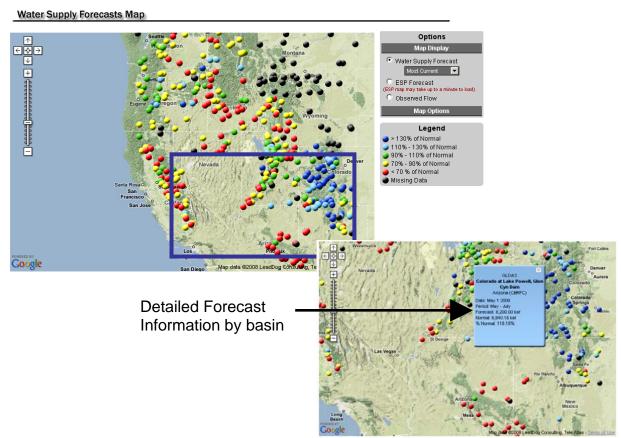




27) The NWS is developing the capability to display observations and forecasts of water resources properties (e.g. snow depth, snow water equivalent, soil moisture, evaporation) as illustrated in the above image. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of displaying observations and forecasts of water resources properties.





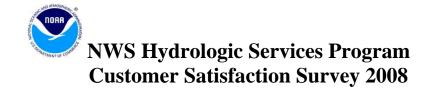


28) For the Western United States, the NWS has developed the capability to display water supply volume inflow forecast into reservoirs as illustrated in the above image. The user can zoom to an individual forecast point and display how the forecast progresses, compare the forecast to historical inflow, and display verification information. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of displaying water supply volume inflow forecast information.

#### **Drivers of Satisfaction: Data Services**

- 29) The National Weather Service (NWS) provides the capability to download data and information from the Internet (e.g., graphics, numerical information, including river observations analysis, and forecasts). Have you downloaded data provided by the National Weather Service in the last year? (**YES or NO**)
- 30) (**If Usage Indicated in Q29**) Referring specifically to the capability to download data and information provided by NWS. On a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the quality of the data services on the following:
  - a) Timeliness
  - b) Accuracy
  - c) Organization of information





- d) Meets my needs
- 31) If the NWS were to expand data services capabilities to include access to more digital data with increased number of data formats, using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of expanding our data services.

#### **Customer Satisfaction Index**

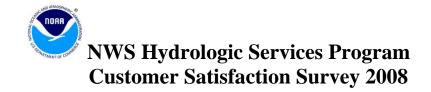
Now, please think about your overall satisfaction with the NWS Hydrologic Services Program, that portion of the NWS that focuses on water resources, including river forecasts and flood warnings.

- 32) (Sat1) First, please consider all of your experiences with the NWS Hydrologic Services Program. Using a 10-point scale on which 1 means Very Dissatisfied and 10 means Very Satisfied, how satisfied are you with the NWS Hydrologic Services Program?
- 33) (Sat2) To what extent has the NWS Hydrologic Services Program fallen short of, or exceeded your expectations? Using a 10-point scale on which 1 now means Falls Short of your Expectations and 10 means Exceeds your Expectations, to what extent has the NWS Hydrologic Services Program fallen short of, or exceeded your expectations?
- 34) (Sat3) Forget the NWS Hydrologic Services Program for a moment. Now, imagine an ideal hydrologic services program. How well do you think the NWS Hydrologic Services Program compares with that ideal hydrologic services program you just imagined? Please use a 10-point scale on which 1 means Not Very Close to the Ideal, and 10 means Very Close to the Ideal.

#### **Desired Outcomes**

- 35) Using a 10-point scale where 1 means Not at all Likely and 10 means Very Likely, how likely would you be to take action based on the forecast and warning information you receive from the NWS Hydrologic Services Program?
- 36) Using a 10-point scale, on which 1 means Not at all Confident and 10 means Very Confident, how confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts and warnings in the future?
- 37) If you have any additional comments that may help the NWS improve its flood and water forecast information services, please provide them below.
- 38) This is the end of part one of the survey. To allow the NWS to expand and improve hydrologic services we would greatly appreciate additional feedback from you on the topics identified below. Each of these categories represents new/enhanced services that were

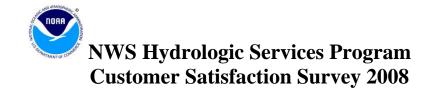




identified in previous surveys as critical needs. Each topic should take about 8 minutes to complete. If you wish to continue, please select the area you are most interested in from the following. You will be given the opportunity to stop or select other areas of interest after completion of your first selection. Thank you in advance for your thoughtful feedback!

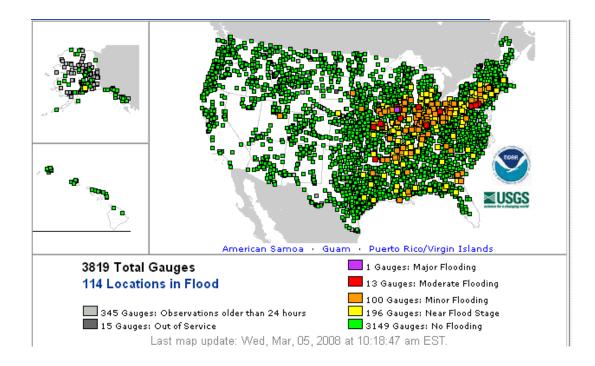
- a) Internet Services (includes a suite of hydrologic information primarily in graphical format)
- b) Water Resource Services (including drought, water temperature, snow, soil moisture and water supply information) (go to Water Resources Forecasts and Information)
- c) Data Services and product formats (go to Data Services )
- d) I do not wish to continue





### Survey Part II

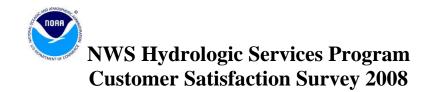
# **Internet Services**

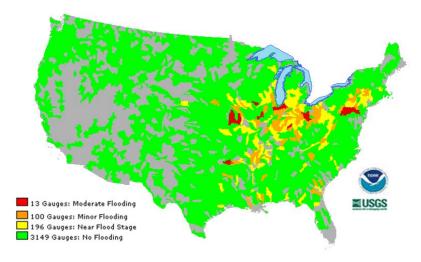


II.1)The map above shows conditions at specific locations on rivers throughout the country. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the map on the following:

- a) Visual appeal
- b) Ease of understanding
- c) Tells me what I need to know about river conditions throughout the country

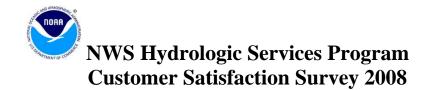


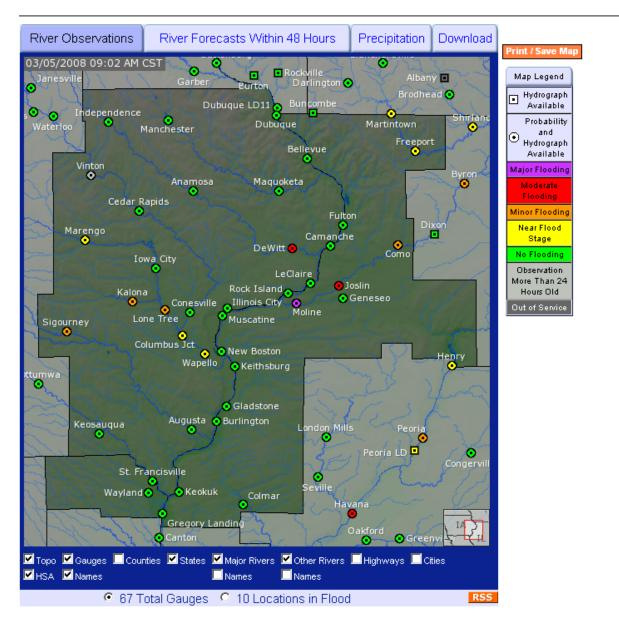




- II.2) The map above (not currently available) shows general conditions for river basins throughout the country. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the map on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about river conditions throughout the country

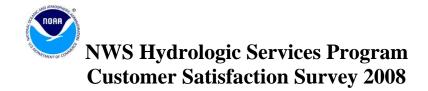


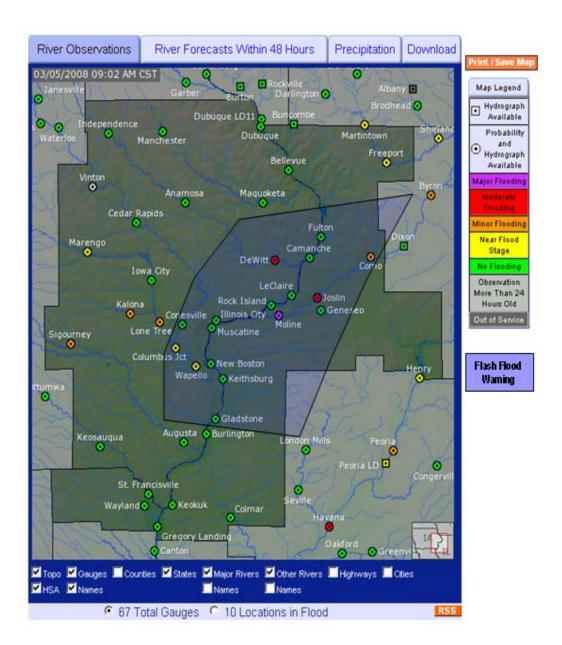




- II.3) The map above shows a color-coded status of current river conditions for the area served by the National Weather Service Office in the Quad Cities area of Iowa and Illinois. (A similar map is available for each of the over 100 National Weather Service Offices covering the country.) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the map on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about river conditions



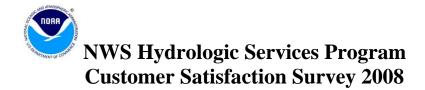


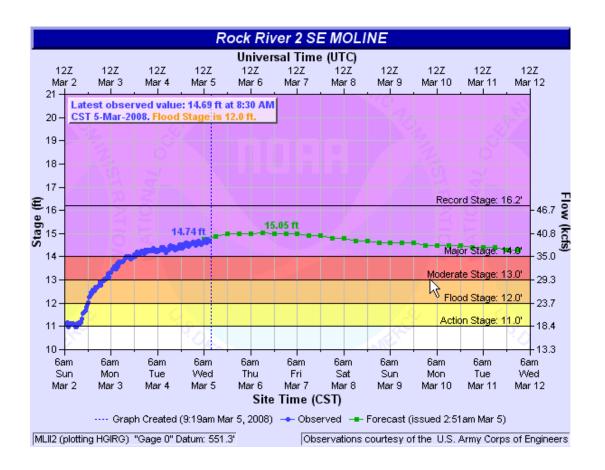


II.4) The map above (not currently available) shows current flood conditions and Flash Flood Warnings for the area served by the National Weather Service Office in the Quad Cities area of Iowa and Illinois. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the map on the following:

- a) Visual appeal
- b) Ease of understanding
- c) Tells me what I need to know about current flooding conditions

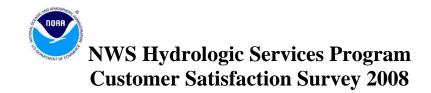


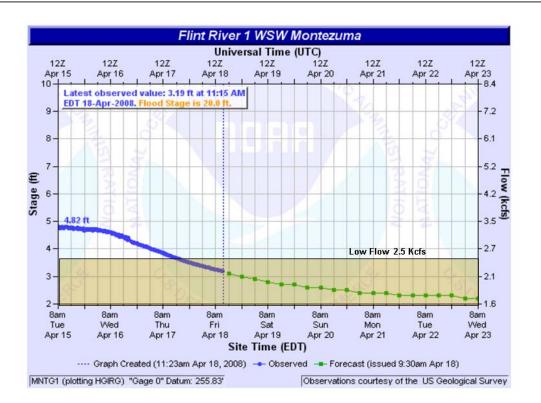




- II.5) The graph above shows how the level/flow at Moline, IL, on the Rock River varied in the past, as well forecast conditions. This graph is known as a hydrograph. (Similar hydrographs are available for more than 2500 locations throughout the county.) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the graph on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about forecast levels
- II.6) The hydrograph above also shows color-coded flood severity categories. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate how useful this information is in the following areas:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about flood impacts



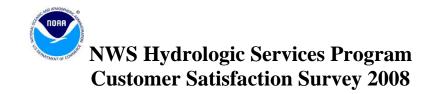




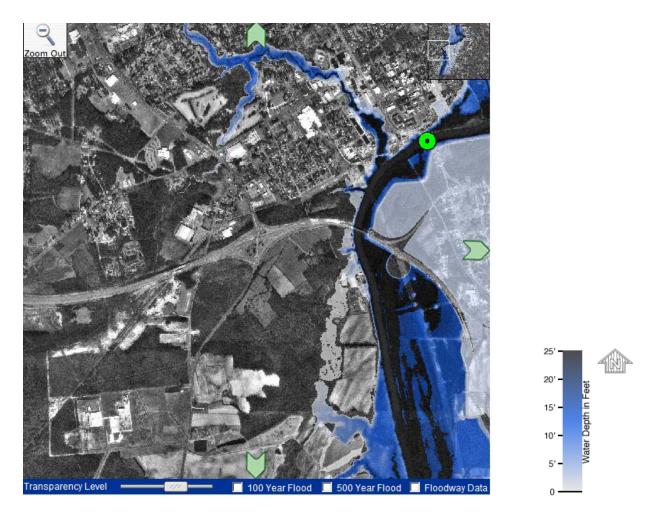
- II.7) The hydrograph above also shows a color-coded low flow threshold. When levels fall below this threshold, adverse impacts occur. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate how useful this information is in the following areas:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about low flow
- II.8)In addition to a low-flow threshold (shown in the hydrograph above), specific information about impacts can be provided. Examples include:
  - i) 2.5 Kcfs: If this flow is sustained for 72 hours, consumptive surface water appropriations in all contributing upstream major watersheds may be subject to suspension
  - ii) 1.7 Kcfs: Flow maintenance or dredging is required to sustain navigation
  - iii) 1.4 Kcfs: The intake for the Montezuma Water Treatment Facility will not be able to draw water.

Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate how useful this type of information would be when making decisions during periods of low flow.



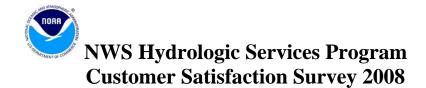


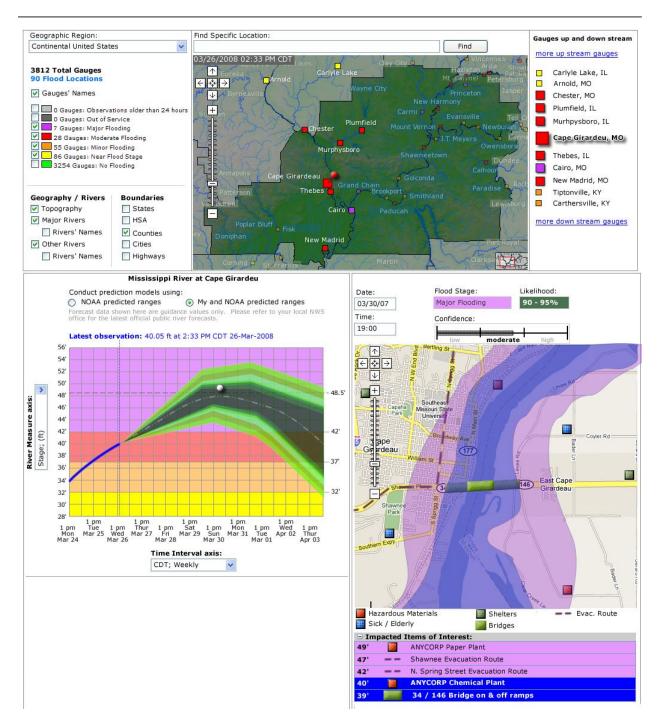
Inundation where river is 18 feet above flood



- II.9)The map above shows the areal extent and depth of floodwaters when the stage (river level) at Tarboro, NC on the Tar River is 18 ft above flood level. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the flood inundation map on the following:a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about flood impacts
- II.10) This is a new service not available everywhere. If this service was available in your area, using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of this information in your decision making processes?

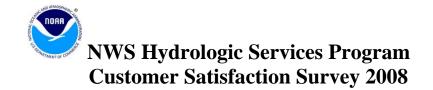






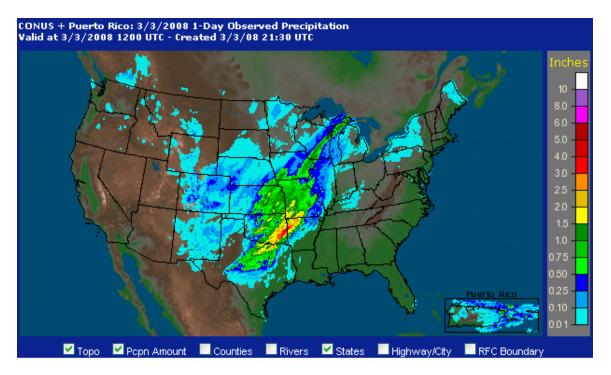
II.11) The images above (not currently available) show the geographic region of river forecasts. When a point is selected, the image emphasizes the river points upstream and downstream of the selected point. For the selected point, the lower left panel shows the current forecast with associated uncertainty information. The lower right panel shows the current state of the river's extent (shaded in blue) and the extent of the river for the user





selected river stage (shaded in purple). Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above image on the following:

- a) Visual appeal
- b) Ease of understanding
- c) Tells me what I need to know about river forecasts

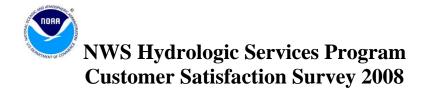


- II.12) The graph above shows high-resolution precipitation estimates for the contiguous 48 states and Puerto Rico. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above graph on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about precipitation estimates

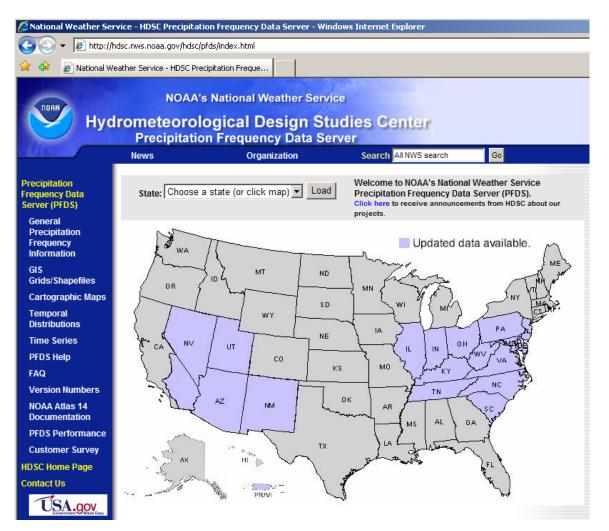
### Precipitation Frequency and Probable Maximum Precipitation

- II.13) Precipitation frequency estimates are typically used for hydrometeorological design applications among other uses. Do you use precipitation frequency estimates?
  - a) Yes
  - b) No (**skip to II.16**)
- II.14) The Precipitation Frequency Data Server is the National Weather Service's web portal to official precipitation frequency estimates. Are you familiar with this web page?
  - a) Yes



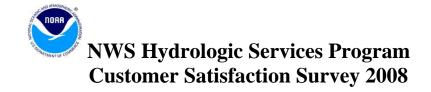


b) No



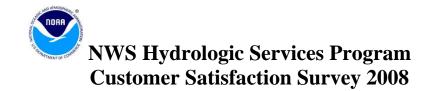
- II.15) The map above shows the web interface to the Precipitation Frequency Data Server, which provides access to precipitation frequency estimates for the United States. Areas highlighted in blue contain updated precipitation frequency estimates from NOAA Atlas 14 (2006) while areas highlighted in gray contain links to previous precipitation frequency documents (ranging from 1961-1977). Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, how useful would it be for the remainder of the US (gray areas on the map) to have updated precipitation frequency estimates?
- II.16) Probable Maximum Precipitation (PMP) estimates are typically used for hydrometeorological design applications for major construction projects that have significant risk to life and property among other uses. Do you use PMP estimates?
  - a) Yes
  - b) No (skip to II.19)





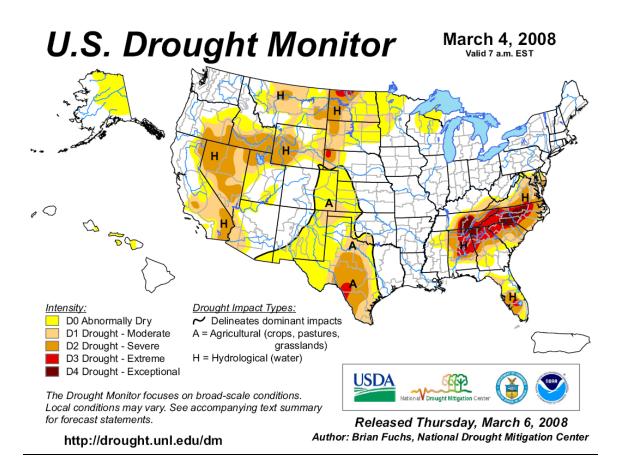
- II.17) The National Weather Service's Hydrometeorological Design Studies Center provides a web portal to official guidelines (Hydrometeorological Reports) for estimating PMP estimates. Are you familiar with this web page?
  - a) Yes
  - b) No
- II.18) Estimates of probable maximum precipitation (PMP) are used in the design of dams and nuclear power plants. This ensures they will not fail with catastrophic results under rainfall conditions that could occur. Guidelines for dam safety are prepared by the Federal Emergency Management Agency and States are responsible for ensuring safe design. The Nuclear Regulatory Commission oversees nuclear power plants. NWS has developed the guidelines for estimating PMP. However some guidelines date back to 1963 and do not include data gathered or techniques developed since then. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, how useful would it be to have updated guidelines for estimating PMP estimates?
- II.19) If you have any additional comments you would like to provide the NWS regarding Internet Services including how we can better represent or display the information, please do so below.





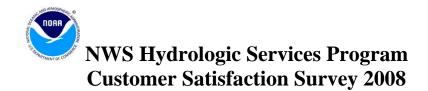
## SURVEY PART III

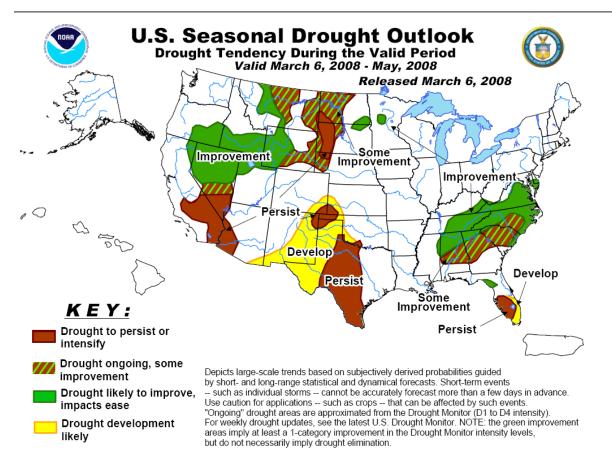
#### Water Resources Forecasts and Information



- III.1) The product above shows observed drought conditions for the contiguous 48 states and Alaska. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information in your decision making process? (If rated <=5, skip to III.3)
- III.2) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above product on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about drought conditions

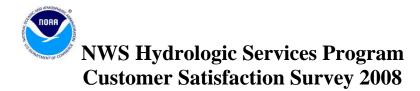


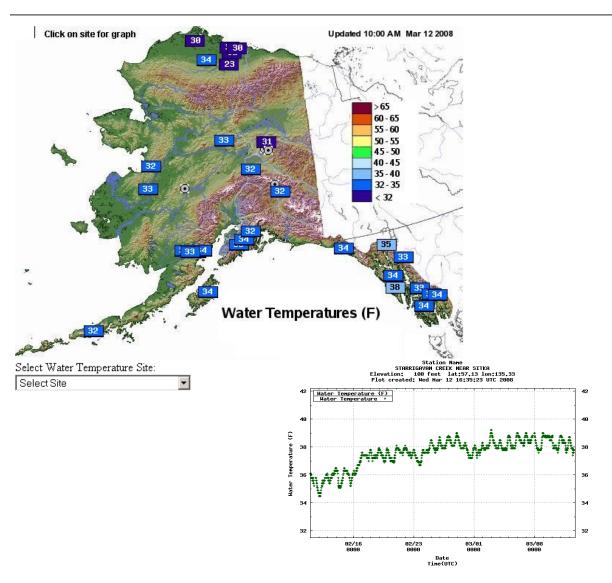




- III.3) The product above shows a forecast of large-scale trends for drought over the next three months for the contiguous 48 states and Alaska. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information in your decision making processes? (If rated <=5, skip to III.5)</p>
- III.4) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above product on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about forecasted drought conditions

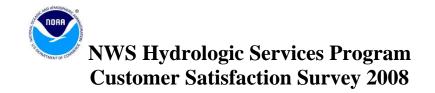




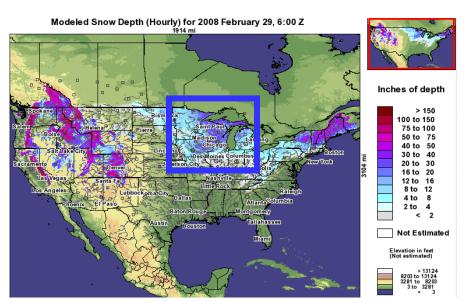


- III.5) The map above shows observed water temperatures of Alaska's rivers, streams and lakes. Capabilities exist for the user to select a location and view a chart showing how the water temperature has changed with time. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information for your area of interest in your decision making processes? (If rated <=5, skip to III.8)</p>
- III.6) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the map above on the following:
  - a) Visual appeal
  - b) Ease of understanding

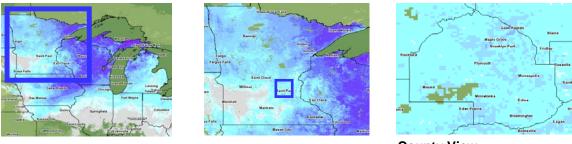




- c) Tells me what I need to know about the water temperatures
- III.7) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of receiving water temperature **forecasts** for rivers, streams and lakes for the next five days.



**National View** 



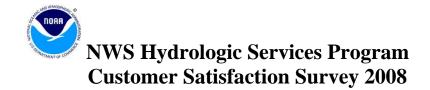
**Regional View** 

**State View** 

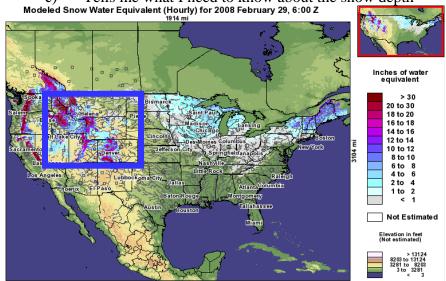
**County View** 

III.8) The product above shows estimates of snow depth for the contiguous 48 states. Capabilities exist for the user to zoom into various areas such as states, counties, basins, rivers and cities. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of this information in your decision making processes? (Include Option 'Snow data not relevant for my area') (If rated <=5 or not relevant, skip to III.10)</p>

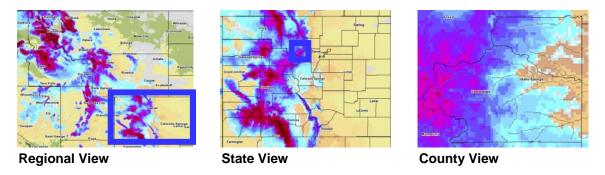




- III.9) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above product on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about the snow depth

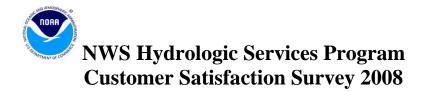


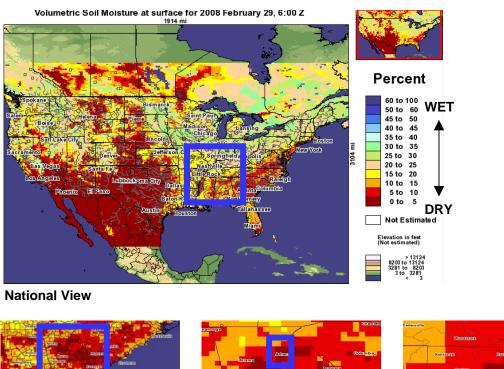
**National View** 

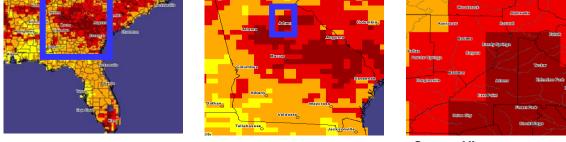


- III.10) The product above shows estimates of the amount of water contained in snow for the contiguous 48 states. Capabilities exist for the user to zoom into various areas including states, counties, basins, rivers and cities. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of this information in your decision making processes? (Include Option 'Snow data not relevant for my area') (If rated <=5 or not relevant, skip to III.12)</p>
- III.11) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above product on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about the amount of water contained in snow









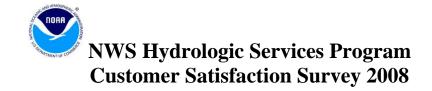
**Regional View** 

**State View** 

County View

- III.12) The product above shows estimates of top layer soil moisture for the contiguous 48 states. Capabilities exist for the user to select other depths as far down as 2-3 meters and zoom into various areas including states, counties, basins, rivers and cities. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information in your decision making processes? (If rated <=5, skip to III.16)</p>
- III.13) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above product on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about soil moisture





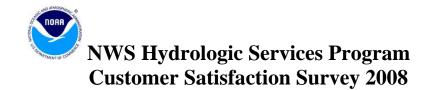
III.14) At what soil depths is soil moisture information important to you? (select all that apply)

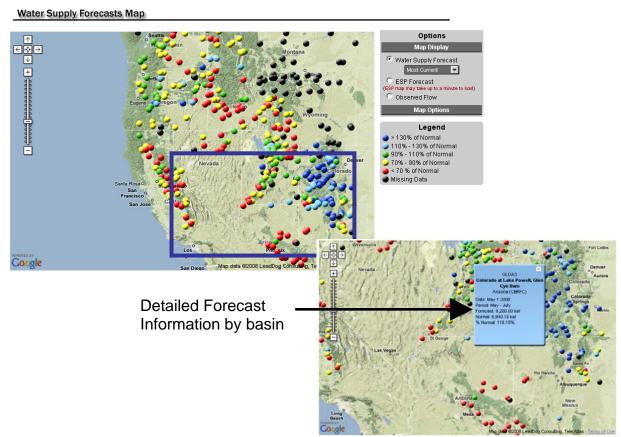
- a) Surface and near-surface
- b) Sub-surface, including typical rooting zone depths (e.g. 20-50 cm to 100-150 cm)
- c) Deeper sub-surface, down to 2-3 meters
- III.15) Please indicate which information is more valuable to you:

a) A single value describing bulk soil moisture properties, such as the average soil moisture for the upper X cm of soil

- b) Soil moisture at multiple discrete levels, e.g. 0-5 cm, 5-20 cm, 20-40 cm, etc.
- III.16) Forecasts of water resources properties (e.g. snow water equivalent, soil moisture, evaporation) can be made on multiple time periods. Considering that uncertainty generally increases with longer forecast periods, using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of the receiving water resources information for the following forecast time periods:
  - a) Analysis of current conditions
  - b) 48-72 hours
  - c) 3-5 days
  - d) 5-7 days
  - e) More than 1 week to 1 month
  - f) More than 1 month
- III.17) Which spatial scale below best describes the **extent of coverage** unit for which consistent water resources information products would be important in your organization (please select only one):
  - a) National
  - b) Regional (e.g. large river basins, such as Colorado River, Missouri River, etc.)
  - c) Group(s) of watersheds within a large river basin
  - d) Single watershed
  - e) Sub-watershed
- III.18) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of the receiving analytical products calculated from water resources data sets and metadata to make the information more relevant and help me make better decisions. Examples of such derivative products might include percent of normal, similarity to previous times, expected impact on various activities such as agriculture, etc.
- III.19) The following questions focus on information for water managers and not necessarily the general public. Would you like to continue? (No, Skip to III.29)

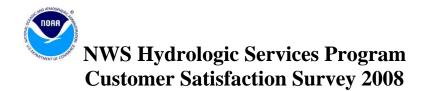


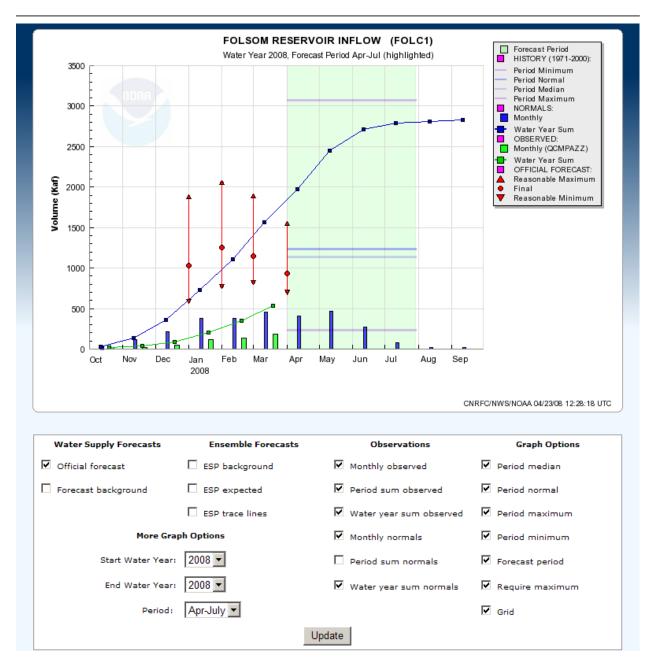




- III.20) The graphic above shows the water supply volume inflow forecast for the 2008 water supply season (April through July) as a percent of normal. Capabilities exist for the user to zoom into more detailed forecast information for specific basins. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information in your decision making processes? (If rated <=5, skip to III.23)</p>
- III.21) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above graphic on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about the water supply forecast
- III.22) Currently, this graphic is available in the western region of the United States. Using a 10point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of providing this information for the entire United States.

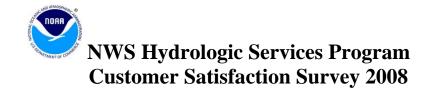






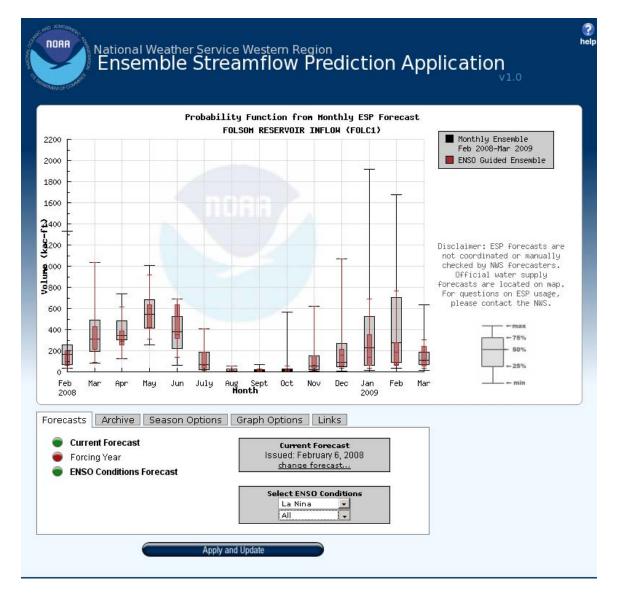
III.23) The graphic above shows seasonal water supply volume forecast progression for an April through July volume for the Folsom, California Reservoir. With the red lines, this graph depicts the history of the forecast for the April through July volume as it progresses through the runoff season. Additionally, the blue bars show the monthly normals and the blue line shows the water year sum of the monthly normals. The green bars show the observed monthly volume and the green line shows the water year sum of the observed volume. The minimum, median, normal, and maximum April through July volumes are shown as straight lines in the forecast graphic to user needs. Using a 10-point scale





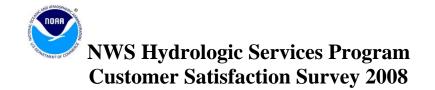
where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information in your decision making processes? (If rated <=5, skip to III.25)

- III.24) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above graphic on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about the seasonal water supply forecast evolution



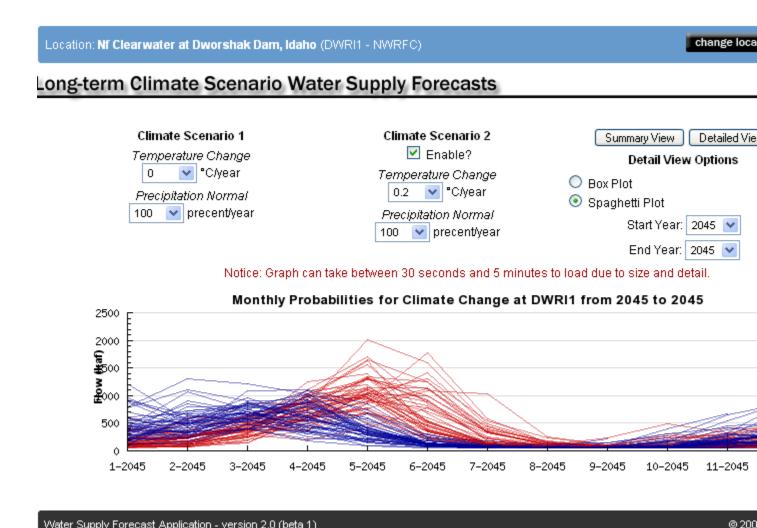
III.25) The graphic above shows the monthly ensemble volume forecasts for the Folsom, California Reservoir. The ensemble forecasts provide ranges of possible outcomes giving forecast users a measure of forecast uncertainty. Superimposed in red are the ensemble





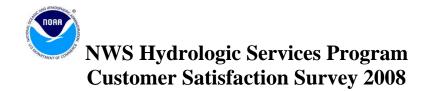
forecasts for user selected ENSO conditions (LaNina shown). The interface allows the user many selectable options to tailor the forecast graphic to user needs. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information in your decision making processes? (If rated <=5, skip to **III.27**)

- III.26) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above graphic on the following:
  - Visual appeal a)
  - b) Ease of understanding
  - c) Tells me what I need to know about water supply volume forecast uncertainty



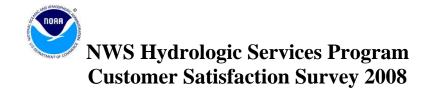
Water Supply Forecast Application - version 2.0 (beta 1)

Group Fornell International



- III.27) The interface above provides the ability to conduct climate sensitivity studies for select river forecast points. The interface allows the user many selectable options to tailor the climate sensitivity study to the user needs. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of this information in your decision making processes? (If rated <=5, skip to III.29)</p>
- III.28) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above graphic on the following:
  - a) Visual appeal
  - b) Ease of understanding
  - c) Tells me what I need to know about climate sensitivity for a select river forecast point
- III.29) If you have any additional comments you would like to provide the NWS regarding Water Resources including how we can better represent or display the information, please do so below.





# SURVEY PART IV

#### **Data Services (Internet/Web)**

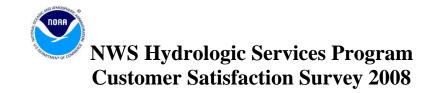
The National Weather Service (NWS) provides information on the Internet (e.g., graphics, numerical information, including river observations analysis, and forecasts) and is examining how to best meet users requirements for digital information. We seek to understand what information is of greatest value to you, what formats are most useful, and how you can effectively access NWS-provided information.

- IV.1) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of having access to the following information:
  - a) Flood Watches and Warnings as text
  - b) Flood Watches and Warnings coded in XML (eXtended Markup Language),

including CAP (Common Alerting Protocol)

- c) Polygons specifying the area covered by Flood Watches and Warnings
- IV.2) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of having access to the following information:
  - a) Observations
    - i) Precipitation
    - ii) Snow accumulation
    - iii)Snow water equivalent
    - iv)River stage/flow
    - v) Soil moisture
    - vi)Air Temperature
    - vii) Dew point
    - viii) Wind speed
    - ix)Atmospheric freezing level
    - x) Potential evaporation
    - xi)Soil frost depth
  - b) Forecast
    - i) Precipitation
    - ii) Temperature
    - iii)Instantaneous streamflow/stage
    - iv)Streamflow or stage forecast uncertainty information
    - v) Cumulative streamflow (total volume over fixed period of time)
    - vi)Atmospheric freezing level
- IV.3) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful please rate the usefulness of having access to the following hydrologic model data:
  - a) Basin boundaries
  - b) Historical data used to calibrate models (e.g. Mean Areal Precipitation)





- c) Hydrologic model parameters [e.g. soil moisture accounting parameters]
- d) Hydrologic model states [e.g. current soil moisture accounting contents]
- e) Unit Hydrograph parameters
- f) Routing parameters [e.g., lag parameters, attenuation parameters]
- g) Rating Curve
- IV.4) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of having access to the following hydrologic model outputs: (Include option 11="Not familiar with this data"):
  - a) Raw ensemble streamflow prediction traces
  - b) Climate forecast adjusted ensemble streamflow prediction traces
  - c) Statistical Water Supply Forecast
  - d) Flash Flood Guidance
- IV.5) Digital information can be provided in a number of different formats. Using a 1 to 10 point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of the following: (Include option 11="Not familiar with this format"):
  - a) Text
    - i) ASCII

ii)XML (eXtended Markup Language), including CAP (Common Alerting Protocol)

- b) Point Data
  - i) ASCII text
  - ii)XML, including GML (Geographic Markup Language)
  - iii) SHEF (Standard Hydrologic Exchange Format)
  - iv) Shapefile

v)KML (Keyhole Markup Language)

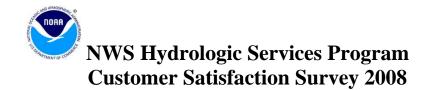
### c) Lines, Vectors, Contours

- i) ASCII text
- ii)XML, including GML
- iii) Shapefile
- iv) KML (Keyhole Markup Language)

# d) Grids, Arrays, Rasters

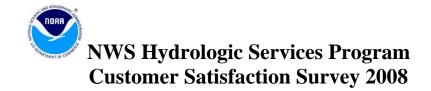
- i) ASCII text
- ii)Shapefile
- iii) KML (Keyhole Markup Language)
- iv) GeoTIFF
- v)Bit-mapped graphics (e.g., .png) + Worldfile
- vi) NetCDF (Network Common Data Form)
- vii) GRIB (GRIdded Binary, versions I and II)
- viii) BUFR (Binary Universal Form for the Representation of meteorological data)
- IV.6) Digital information can be made available in a number of different ways. Using a 1 to 10 point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of the following: (Include option 11="Not familiar with this access mode"):





- a) Download (e.g., ftp)
- b) Web map service
- c) Web feature service
- d) Web coverage service
- e) RSS (Real Simple Syndication)
- f) WAP (Wireless Application Protocol)
- IV.7) Please select the tools you use to process digital information provided by NWS. (select all that apply)
  - a) GIS Commercial
    - i) ESRI
    - ii) Intergraph
    - iii) Idrisi
    - iv) Erdas Imagine
    - v) ENVI
    - vi) Autodesk
    - vii)Custom Application
    - viii) Other (Please Specify)
  - b) GIS Open Source
    - i) GRASS
    - ii) SAGA
    - iii) ILWIS (GNU)
    - iv) Geotools
    - v) Custom Application
    - vi) Other (Please Specify)
  - c) Scientific Data Analysis, Modeling and Visualization
    - i) IDL
    - ii) PV-Wave
    - iii) MatLab
    - iv) Vis5D
    - v) GEMPAK
    - vi) GrADS
    - vii)AVS5
    - viii) NCAR Graphics/NCL
    - ix) AWIPS
    - x) Custom Application
    - xi) Other (Please Specify)
  - d) Other Categories
    - i) Keyhole Markup Language (KML) viewers (e.g., Google Earth, World Wind)
    - ii) Geo-aware Databases
    - iii) Specialized Spatial Information Systems (e.g., Decision Support please specify)
    - iv) GPS/Navigation
    - v) TV/Media Graphics
    - vi) CAD Tools





- vii) Image Processing / Computer Graphics viii) Other (Please Specify)
- IV.8) Using a 1 to 10 point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of metadata.
- IV.9) For geospatial data, using a 1 to 10 point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of the NWS consistently adhering to Open Geospatial Consortium standards.
- IV.10) If you have any additional comments you would like to provide the NWS regarding Data Services, please do so below.





National Weather Service Hydrologic Services Program Customer Satisfaction

# **Score Detail & Segmentation**



#### NWS Hydrology Customer Satisfaction 2008 Table of Scores, Impacts, & Significant Differences

	2004 Scores	2006 Scores	2008 Scores	Significant Difference	2008 Impacts
Flood Information n=1720		80	80		1.4
Clarity	81	81	81		
Timeliness	81	81	80		
Accuracy	80	79	79		
Organization of information	80	80	80		
Meets my needs	82	82	81		
Routine River Forecasts/Observed Conditions n=1527		81	81		0.6
Clarity	82	82	82		
Timeliness	80	81	81		
Accuracy	79	81	81		
Organization of information	80	81	81		
Meets my needs	81	81	82		
Web Products n=1496		82	84	1	0.8
Clarity		82	85	✓	
Timeliness		83	82		
Accuracy		83	83		
Organization of information		83	84	✓	
Meets my needs		83	84		
Customer Service n=521		-	91		0.2
Overall satisfaction with the NWS staff			91		
Importance of direct interaction with NWS staff			90		
Drought Information n=976		80	83	1	0.0
Clarity	81	79	83	<ul> <li>✓</li> </ul>	
Timeliness	80	80	82	~	
Accuracy	81	80	82	✓	
Organization of information	80	80	83	1	
Meets my needs	81	81	84	✓	
Water Supply/Reservoir Information n=661		79	83	1	1.1
Clarity	80	79	83	<ul> <li>✓</li> </ul>	
Timeliness	79	79	83	✓	
Accuracy	82	79	83	1	
Organization of information	79	79	83	✓	
Meets my needs	80	79	83	1	
Data Services n=923	-		85		0.4
Timeliness			85		0.4
Accuracy			86		
Organization of information			84		
Meets my needs			85		
Customer Satisfaction Index n=1887	77	78	80	1	
Overall satisfaction which the NWS Hydrologic Services Program	82	82	85		
How well NWS Hydrologic Services Program meets your expectations	74	75	75		
How West NVS in yologic Services rogram compares to an "ideal" hydrologic services program	74	75	77	~	
non mon nyeloogie contees negan comparea te an racar nyeloogie services program	17	10		1	L
Likelihood to Take Action n=1924	87	88	88		2.7
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	87	88	88		
Confidence in NWS n=1931	86	85	87	✓	3.5
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	86	85	87	√	
Sample Size	2352	1668	1976	1	
Jampie Size	2002	1000	19/0	1	

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Aggregate

The is gover primary use of hydrologic information provided by the National Weather Service         22%           Communication/News         5%           Valuer resources         5%           Valuer resources         4%           Appring         4%           Synping         5%           Sile Coverment         5%           Sile Coverment         5%           Sile Coverment         5%           Sile Coverment         5%           Soverment Contractor         5%           Commontal Enterptise         5%           Soverment Contractor         5%           Soverment Contractor         5%		2008
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Yale resources         4%           Stripping         4%           Stripping         1%           Statural resource management         3%           Carsulting/side value/provide custom hydrologic services         2%           Cereation         9%           Premonal Use         700           The main of the services         9%           Statural resource of respondents         19%           Statural Coverning         7000           Statural Coverning         7000           Statural Coverning         5%           Sournment Constructor         1%           Constructor         1%           Constructor         1%           Statural Coverning         3%		22%
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Affice of Marine and Aviation Operations        Affice of Oceanic and Atmospheric Research     5%       Difice of Oceanic and Atmospheric Research        Diffee of Oceanic and Atmospheric Research        Diffee of Program Planning and Integration        Diffee of Program Planning and Integration        What federal agency do you represent        Sureau of Land Management Agency     2%       Sureau of Land Management Agency     5%       rederal Emergency Management Agency     5%       rederal Energy Regulatory Commission     1%       Sederal Energy Regulatory Commission     3%       rorest Service     3%       Vational Resources Conservation Services     17%       Vational Resources Conservation Services     2%       Jiffee of Surface Mining        J.S. Army Corps of Engineers     2%       J.S. Department of Agriculture Research Service        J.S. Department of Instruct Resear		
Office of Oceanic and Atmospheric Research     5%       Office of Program Planning and Integration        Diffice of Program Planning and Integration        Total number of respondents     22       What federal agency do you represent     2%       Bureau of Land Management     2%       Sureau of Reclamation     2%       Ederal Energy Regulatory Commission     5%       Federal Energy Regulatory Commission     3%       Vational Aeronautics and Space Administration        Vational Resources Conservation Services     17%       Vational Resources Conservation Services     17%       Vational Resources Conservation Services     2%       Sureau of Indiguture Research Service        J.S. Department of Agriculture Research Service        J.S. Department of Interior     25%       J.S. Environmental Protection Agency     25%       Vitte is the primary scope of your responsibility        Vational Resources        Vational Resources        Single state     6%       Not parts of multiple counties     7%       Single state     6%       Not parts of multiple counties     7%       Single county     12%       Single state     6%       Not parts of multiple counties     <		
Office of Program Planning and Integration        Ther     Total number of respondents       22     What federal agency do you represent       Bureau of Land Management     2%       Sureau of Land Management Agency     2%       ederal Emergency Management Agency     5%       rederal Emergency Management Agency     5%       rederal Emergency Management Agency     3%       rederal Energy Regulatory Commission     1%       rederal Alendro Space Administration     3%       vational Resources Conservation Services     17%       Valcear Regulatory Commission        Valcear Regulatory Commission     2%       Jffice of Surface Mining        J.S. Department of Agriculture Research Service        J.S. Department of Agriculture Research Service        J.S. Environmental Protection Agency        Valter     Total number of respondents     106       Mat is the primary scope of your responsibility        valtonal     3%       Regional     6%       Nil or par		5%
Dther       Total number of respondents       22         What federal agency do you represent       2%         Bureau of Land Management       2%         Sureau of Reclamation       2%         Gederal Emergency Management Agency       5%         ederal Highway Administration       5%         rederal Emergency Management Agency       5%         ederal Emergency Regulatory Commission       3%         Torest Service       3%         Vational Resonantics and Space Administration          valicinal Resonantics and Space Administration          Valicinal Resonances Conservation Services       11%         Valice of Surface Mining          1.S. Army Corps of Engineers       27%         1.S. Department of Agriculture Research Service          1.S. Department of Interior          1.S. Department of Interior       25%         Vite of Surface Mining          1.S. Department of Interior          1.S. Department of Interior          1.S. Environmental Protection Agency          Vite of Surface Mining          1.S. Environment of Agriculture Agric		
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J.S. Environmental Protection Agency        Dther     12%       Total number of respondents     106       What is the primary scope of your responsibility        Valional     3%       Regional     8%       Single state     6%       All or parts of multiple counties     7%       Single county     12%       arge city/urban area     2%       Smaller city/township     6%       Dther     4%		
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Total number of respondents       106         What is the primary scope of your responsibility          National       3%         Regional       8%         Single state       6%         All or parts of multiple counties       7%         Single county       12%         arge city/urban area       6%         Smaller city/township       6%         Personal       53%         Other       4%		
What is the primary scope of your responsibility       3%         National       3%         Regional       8%         Single state       6%         All or parts of multiple counties       7%         Single county       12%         .arge city/urban area       2%         Smaller city/township       6%         Personal       53%         Other       4%		
National     3%       Regional     8%       Single state     6%       NI or parts of multiple counties     7%       Single county     7%       arge city/urban area     2%       Smaller city/township     6%       Personal     53%       Other     4%		106
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Single state     6%       All or parts of multiple counties     7%       Single county     12%       .arge city/urban area     2%       Smaller city/township     6%       Personal     53%       Other     4%		
All or parts of multiple counties     7%       Single county     12%       Large city/urban area     2%       Smaller city/township     6%       Personal     53%       Other     4%		
Single county     12%       Large city/urban area     2%       Smaller city/township     6%       Personal     53%       Other     4%		
Large city/urban area         2%           Smaller city/township         6%           Personal         53%           Dther         4%		
Smaller city/township         6%           Personal         53%           Dther         4%		
Personal         53%           Dther         4%		
Other 4%		
T_1_1 L	Total number of respondents	4%

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Aggregate

	2008
y what means do you receive text-based National Weather Service hydrologic information	
WS Web pages	95%
on-NWS Web pages	23%
hone	11%
lobile devices/PDA	10%
OAA Weather Radio	45%
OAA Weather Wire	3%
amily of Services (FOS)	1%
mergency Managers Weather Information Network (EMWIN)	9%
ocal or cable TV	41%
ommercial Radio	19%
atellite radio	3%
ewspaper	14%
rivate Vendor	4%
ther	6%
Total number of respondents	1976
requency of using flood watches, flood warnings, and flood statements provided in text format	
everal times per day	51%
nce per day	19%
nce per week	6%
nce per month	11%
o not use	10%
ot familiar with this information	3%
Total number of respondents	1976
nportance of the distinction between a flood warning and a flash flood warning	
here 0 is "Not important at all" and 100 is "Very important"	85
Total number of respondents	1932
linimum amount of time needed to take effective precautionary actions for flash flood warnings	
ess than 30 minutes	21%
etween 30 and 45 minutes	24%
etween 45 and 60 minutes	24%
etween 1 and 2 hours	21%
lore than 2 hours	11%
Total number of respondents	1720
linimum amount of time needed to take effective precautionary actions for flood warnings	
ess than 30 minutes	16%
etween 30 and 60 minutes	24%
etween 1 and 2 hours	27%
etween 2 and 6 hours	19%
lore than 6 hours	14%
Total number of respondents	1976
requency of using routine river forecasts provided in text format	
everal times per day	17%
nce per day	20%
nce per week	20%
nce per month	20%
o not use	17%
of familiar with this information	5%
Total number of respondents	1976
requency of visiting web pages providing a suite of hydrologic information	
everal times per day	14%
nce per day	20%
nce per veek	20%
nce per month	20%
o not use	14%
of the dise	14%
Total number of respondents	10%
sefulness of providing Flood Warnings and Watches, River Forecasts and other water information on your PDA	1970
Solutions of providing Flood Warnings and Watches, river Forecasts and unler watch information on your FDA	05
/here 0 is "Not at all useful" and 100 is "Very useful"	65

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Aggregate

	2008
Have directly interacted with NWS staff	
Yes	26%
No	74%
Total nu	umber of respondents 1976
During a typical year, how many hours do you directly interact with NWS staff	
Less than 5 hours	50%
5-10 hours a year	24%
11-25 hours a year	14%
More than 25 hours a year	12%
	umber of respondents 522
Purpose of your personal communications with NWS staff	
Explanation or interpretation of available forecast products	55%
Gain an understanding of forecaster confidence in forecast products	50%
Synthesize available forecast products and information for your specific needs	56%
Get more information from forecaster than available in existing products	64%
	umber of respondents 522
Frequency of using drought information provided in text format	
Several times per day	3%
Once per day	8%
Once per week	16%
	23%
Once per month Do not use	40%
Not familiar with this information	40%
	umber of respondents 1976
Frequency of using information on water supply and/or reservoir information provided in text format	
Several times per day	3%
Once per day	6%
Once per week	9%
Once per month	16%
Do not use	51%
Not familiar with this information	15%
	umber of respondents 1976
Usefulness of displaying observations and forecasts of water resources properties	
Where 0 is "Not at all useful" and 100 is "Very useful"	77
	umber of respondents 1772
Usefulness of displaying water supply volume inflow forecast information	
Where 0 is "Not at all useful" and 100 is "Very useful"	71
	umber of respondents 1301
Downloaded the data provided by the National Weather Service in the last year	
Yes	47%
No	53%
	umber of respondents 1976
Usefulness of expanding our data services	
Where 0 is "Not at all useful" and 100 is "Very useful"	80
Total ni	umber of respondents 1731

# NWS Hydrology Customer Satisfaction 2008 Table of Scores Internet Services

	2008
River conditions map	
Visual appeal	73
Ease of understanding	77
Tells me what I need to know about river conditions throughout the country	78
General river basin	
Visual appeal	67
Ease of understanding	72
Tells me what I need to know about river conditions throughout the country	70
River conditions regional map	
Visual appeal	86
Ease of understanding	88
Tells me what I need to know about river conditions throughout the country	86
Current flood conditions	
Visual appeal	85
Ease of understanding	86
Tells me what I need to know about current flooding conditions	86
Hydrograph level/flow	
Visual appeal	86
Ease of understanding	88
Tells me what I need to know about forecast levels	88
Hydrograph flood severity	
Visual appeal	87
Ease of understanding	88
Tells me what I need to know about flood impacts	87
Hydrograph low flow threshold	
Visual appeal	83
Ease of understanding	84
Tells me what I need to know about low flow	83
Usefulness of hydrograph when making decisions during periods of low flow	82
Flood depth map	
Visual appeal	85
Ease of understanding	84
Tells me what I need to know about the depth of the water	86
Usefulness of areal extent and depth of floodwaters in decision making process	89
Geographic region map	05
Visual appeal	85
Ease of understanding	82
Tells me what I need to know about river forecasts High-resolution precipitation estimates map	86
	00
Visual appeal	90
Ease of understanding Tells me what I need to know about precipitation estimates	
	88
Use precipitation frequency estimates Yes	51%
No	49%
NO Familiar with Precipitation Frequency Data Server web page	49%
Familiar with Precipitation Frequency Data Server web page	55%
No	45%
How useful would it be for the remainder of the US to have updated precipitation frequency estimates	40 /0
Usefulness of having updated precipitation frequency estimates	85
Use PMP estimates	00
Yes	32%
No	68%
Familiar with Hydrometeorological Reports web page	00 /0
Yes	54%
No	46%
Usefulness of updated guidelines for PMP estimates	40 /0
Usefulness of updated guidelines for PMP estimates	91
Osciantess of aparted guidelines for this estimates	31

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Water Resources Services

	2008
Observed drought conditions map	
Usefulness of observed drought conditions in decision making process	83
Visual appeal	90
Ease of understanding Tells me what I need to know about drought conditions	90
Drought trends map	00
Usefulness of trends for drought over next three months in decision making process	81
Visual appeal	89
Ease of understanding	89
Tells me what I need to know about forecasted drought conditions	87
Observed water temperatures map Usefulness of observed water temperatures in decision making process	70
Visual appeal	87
Total appeal Ease of understanding	88
Tells me what I need to know about the water temperatures	87
Usefulness of receiving water temperature forecasts for rivers, streams and lakes for the next five days	76
Snow depth map	• ·
Usefulness of snow depth map in decision making process	<u>84</u> 90
Visual appeal Ease of understanding	90
Tells me what I need to know about snow depth	90
National analysis of the amount of water contained in snow	
Usefulness of estimates of amount of water contained in snow	83
Visual appeal	89
Ease of understanding	89
Tells me what I need to know about water contained in snow Seit mainture man	88
Soil moisture map Usefulness of soil moisture in decision making	80
Usual appeal	88
Tase of understanding	88
Tells me what I need to know about soil moisture	88
At what soil depths is soil moisture information important to you	
Surface and near-surface	73%
Sub-surface, including typical rooting zone depths	65%
Deeper sub-surface, down to 2-3 meters Information more valuable to you	29%
A single value describing bulk soil moisture	43%
Soil moisture at multiple discrete levels	57%
Usefulness of water resources properties forecast	
Usefulness of water resource properties forecast for current conditions	90
Usefulness of water resource properties forecast for 48-72 hours	84
Usefulness of water resource properties forecast for 3-5 days Usefulness of water resource properties forecast for 5-7 days	73
Usefulness of water resource properties forecast for more than 1 week to 1 month	65
Usefulness of water resource properties forecast for more than 1 month	60
Spatial scale describing the extent of coverage unit for which information would be important in your organization	
National	10%
Regional	29%
Group(s) of watersheds within a large river basin Single watershed	<u>30%</u> 21%
ange watershed Sub-watershed	10%
Usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant	1070
Usefulness of receiving analytical products calculated from water resources data	81
Continue to water managers' questions	
Continue to water managers' questions	40%
Water supply volume inflow forecast map Usefulness of water supply volume inflow forecast map	04
OSEDIDESS OF WARELSDOOR VOIDUE TOTOW TOTECAST TOTO	<u>81</u> 88
	88
Visual appeal	86
Visual appeal Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States	89
Visual appeal Test of understanding Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression	
Visual appeal Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression	82
Visual appeal Test Standing Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Visual appeal Visual appeal	82 88
Visual appeal Test Standing Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Visual appeal Ease of understanding	82 88 86
Visual appeal Content of the water supply forecast Content of the entire United States Content of the	82 88
Visual appeal Test Standing Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Visual appeal Ease of understanding	82 88 86
Visual appeal Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Visual appeal Ease of understanding Tells me what I need to know about the seasonal water supply forecast evolution Monthly ensemble volume forecast	82 88 86 90
Visual appeal Content of the entry of the en	82 88 86 90 79
Visual appeal Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States  Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Usefulness of understanding Tells me what I need to know about the seasonal water supply forecast evolution Monthly ensemble volume forecast Usefulness of moderstanding Tells me what I need to know about water supply volume forecast uncertainty Tells me what I need to know about water supply volume forecast uncertainty	82 88 86 90 79 85
Visual appeal Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression Visual appeal Ease of understanding Tells me what I need to know about the seasonal water supply forecast evolution Monthly ensemble volume forecast Usefulness of understanding Tells me what I need to know about the forecast SVIsual appeal Ease of understanding Tells me what I need to know about the forecast SVIsual appeal Usefulness of monthly ensemble volume forecast Usefulness of understanding Tells me what I need to know about water supply volume forecast SVIsual appeal Ease of understanding Tells me what I need to know about water supply volume forecast uncertainty Usefulness of climate sensitivity studies	82 88 90 79 85 83 83 86
Visual appeal Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of understanding Tells me what I need to know about the seasonal water supply forecast evolution Monthly ensemble volume forecast Usefulness of monthly ensemble volume forecasts Visual appeal Ease of understanding Tells me what I need to know about water supply volume forecast uncertainty Usefulness of climate sensitivity studies Usefulness of climate sensitivity studies	82 88 86 90 79 85 85 83
Visual appeal Content of the entire of the e	82 88 86 90 79 85 83 83 86 72
Visual appeal Ease of understanding Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression Usefulness of understanding Tells me what I need to know about the seasonal water supply forecast evolution Monthly ensemble volume forecast Usefulness of monthly ensemble volume forecasts Visual appeal Ease of understanding Tells me what I need to know about water supply volume forecast uncertainty Usefulness of climate sensitivity studies Usefulness of climate sensitivity studies	82 88 90 79 85 83 83 86
Visual appeal Content of the sensitivity studies Visual appeal Content of the sensitiv	82 88 86 90 79 85 83 83 86 72 72

# NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format

	2008
Usefulness of having access to Flood Watches and Warnings	
Usefulness of having access to Flood Watches and Warnings as text	87
Usefulness of having access to Flood Watches and Warnings coded in XML, including CAP	75
Usefulness of having access to Polygons specifying the area covered by Flood Watches and Warnings	86
Observations	
Precipitation	96
Snow accumulation	88
Snow water equivalent	82
River stage/flow	90
Soil moisture	76
Air Temperature	87
Dew point	81
Wind speed	84
Atmospheric freezing level	70
Potential evaporation	72
Soil frost depth	66
Forecast	00
Precipitation	95
Temperature	90
Instantaneous streamflow/stage	86
Streamflow or stage forecast uncertainty information	83
Cumulative streamflow	78
Atmospheric freezing level	68
Basin Boundaries	00
Basin boundaries	82
Historical data used to calibrate models	02
Historical data used to calibrate models	78
Hydrologic Model	10
Hydrologic Model Hydrologic model parameters	72
Hydrologic model states	72
Unit Hydrograph parameters	74
Routing Parameters	74
Routing parameters	72
Rating Curve	12
Rating Curve	74
Raw ensemble streamflow prediction traces	74
Raw ensemble streamflow prediction traces	70
	72
Climate forecast adjusted ensemble streamflow prediction traces Climate forecast adjusted ensemble streamflow prediction traces	70
	73
Statistical Water Supply Forecast	74
Statistical Water Supply Forecast	74
Flash Flood Guidance	00
Flash Flood Guidance	86
Text	
	84
XML	79
Point Data	
	82
	80
SHEF	64
Shapefile	75
KML	68
llines Vesters and Conteurs	
Lines, Vectors, and Contours	
ASCII	75
ASCII XML	76
ASCII	

# NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format

	2008
Grids, Arrays, and Rasters	
ASCII	74
Shapefile	77
KML	68
GeoTIFF	78
Bit-mapped graphics + Worldlife	74
NetCDF	63
GRIB	59
BUFR	58
Digital Information Availability Download	88
Web map service	<u> </u>
Web feature service	90
Web coverage service	89
RSS	79
WAP	76
GIS - Commercial	10
ESRI	38%
Intergraph	7%
Idrisi	3%
Erdas Imagine	4%
ENVI	4%
Autodesk	12%
Custom Application	19%
Other	9%
GIS - Open Sources	
GRASS	9%
SAGA	5%
ILWIS (GNU)	5%
Geotools	18%
Custom Application	17%
Other	9%
Scientific Data Analysis, Modeling and Visualization IDL	69/
PV-Wave	<u>6%</u> 4%
MatLab	10%
Vis5D	3%
GEMPAK	6%
CrADS	4%
AVS5	3%
NCAR Graphics/NCL	11%
AWIPS	10%
Custom Application	17%
Other	9%
Other Categories	
Keyhole Markup Language viewers	37%
Geo-aware Databases	11%
Specialized Spatial Information Systems	5%
GPS/Navigation	31%
TV/Media Graphics	26%
CAD Tools	17%
Image Processing/ Computer Graphics	31%
Other	5%
Usefulness of metadata	00
Usefulness of metadata	82
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	01
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	81

# NWS Hydrology Customer Satisfaction 2008 Table of Scores Region

	Central Region	Eastern Region	Southern Region	Western Region	Alaska Region	Pacific Region
Flood Information	81	81	81	76	72	80
Clarity	81	82	82	77	71	80
Timeliness	81	80	80	77	70	80
Accuracy	79	80	80	73	71	76
Organization of information	81	81	81	74	76	80
Meets my needs	82	82	82	77	73	82
Routine River Forecasts/Observed Conditions	82	82	81	78	74	79
Clarity	83	82	83	79	75	81
Timeliness	81	81	80	78	73	79
Accuracy	82	82	81	78	71	77
Organization of information	82	82	82	78	79	76
Meets my needs	82	82	81	78	72	81
Web Products	84	84	84	81	71	78
Clarity	85	85	86	83	72	79
Timeliness	83	83	83	80	67	84
Accuracy	83	84	84	79	69	85
Organization of information	84	84	85	83	79	75
Meets my needs	84	84	84	80	70	78
Customer Service	91	92	89	86	92	-
Overall satisfaction with the NWS staff	91	93	89	86	94	
Importance of direct interaction with NWS staff	90	90	90	85	89	
Drought Information	83	83	82	82	50	85
Clarity	83	83	83	81	44	88
Timeliness	82	83	82	81	56	82
Accuracy	82	83	81	80	50	88
Organization of information	83	83	83	82	56	83
Meets my needs	85	84	83	83	44	86
Water Supply/Reservoir Information	83	83	83	82	58	82
	84	84	83	81	61	84
Jany Timeliness	83	83	82	81	56	84
Accuracy	82	84	83	81	61	84
Organization of information	83	83	83	82	56	76
Meets my needs	83	83	83	81	56	83
Meets my needs Data Services Data Services	85	85	85	81	76	83
Data der vices	85	86	85	81	73	86
	85	86	86	82	82	83
Accuracy Overviewing the demonstrate	85	85	85	81	78	81
Organization of information	85	85	85		69	81
Meets my needs		85	85	81	69 73	75
Customer Satisfaction Index Overall satisfaction with the NWS Hydrologic Services Program	80 85	80	80	78 83	73	75
	75	76	75	83		
How well NWS Hydrologic Services Program meets your expectations	75	76		74	62	72
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	78	11	77	/4	75	/1
Likelihood to Take Action	89	89	87	88	83	85
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	89	89	87	88	83	85
Confidence in NWS	88	87	86	87	81	83
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	88	87	86	87	81	83
Sample Size	716	615	317	177	12	28

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Region

	Orminal	0	0	0	0	Control	ntural Existence		<b>M</b> /2 - 1	Alester	Desitie
	Central	Eastern	Southern	Western	Alaska	Pacific					
	Region	Region	Region	Region	Region	Region					
What is your primary use of hydrologic information provided by the National Weather Service Emergency management	23%	18%	29%	13%	17%	11%					
Communication/News	4%	4%	5%	6%							
Water resources	3%	3%	7%	8%		4%					
Agriculture	3%	3%	6%	3%		4%					
Shipping	1%					4%					
Natural resource management	3%	3%	3%	6%	17%						
Consulting/add value/provide custom hydrologic services	2%	2%	3%	2%	17%						
Recreation	10%	9%	6%	13%	17%	4%					
Personal Use	43%	51%	33%	40%	25%	61%					
Other	8%	7%	8%	9%	8%	14%					
Total number of respondents What sector do you represent	716	615	317	177	12	28					
What sector do you represent National Oceanic and Atmospheric Administration (NOAA) Employee		1%	2%	2%	17%						
Valorial Oceanie and Annophene Administration (NOA) Employee	3%	4%	10%	9%							
State Government	4%	5%	8%	3%	17%	14%					
Local Government	22%	11%	20%	11%	17%						
Government Contractor						4%					
Commercial Enterprise	5%	5%	5%	5%	8%	4%					
Non-profit business	2%	2%	1%	2%	8%	7%					
University or other Educational	2%	3%	5%	3%	8%						
Military											
Private Citizen	56%	61%	42%	58%	25%	68%					
Foreign				1%							
Other	4%	7%	7%	7%		4%					
Total number of respondents	716	615	317	177	12	28					
What is your NOAA line office National Weather Service	100%	100%	86%	100%	100%						
National Environmental Satellite, Data, and Information Service											
National Linnointena Saleme, Data, and montation device											
National Ocean Service											
Office of Marine and Aviation Operations											
Office of Oceanic and Atmospheric Research			14%								
Office of Program Planning and Integration											
Other											
Total number of respondents	2	7	7	3	2						
What federal agency do you represent											
Bureau of Land Management				13%							
Bureau of Reclamation			6%								
Federal Emergency Management Agency Federal Highway Administration	4%	12%	3%								
Federal Energy Regulatory Commission	4%										
Forest Service	478		3%	6%							
National Aeronautics and Space Administration											
National Resources Conservation Services	17%	12%	13%	38%							
National Science Foundation											
Nuclear Regulatory Commission		8%									
Office of Surface Mining			3%								
U.S. Army Corps of Engineers	30%	35%	25%	25%							
U.S. Department of Agriculture Agriculture Research Service											
U.S. Department of Interior	39%	27%	28%	13%							
U.S. Environmental Protection Agency	4%	8%	19%	 6%							
Other Total number of respondents	23	26	32	16							
What is the primary scope of your responsibility	25	20	32	10							
National	2%	3%	1%	5%							
Regional	6%	8%	11%	12%	8%	4%					
Single state	5%	4%	7%	4%	17%	14%					
All or parts of multiple counties	6%	7%	9%	7%							
Single county	15%	8%	15%	8%	17%	4%					
Large city/urban area	2%	2%	3%	2%							
Smaller city/township	8%	6%	6%	5%	17%	4%					
Personal	54%	60%	43%	53%	42%	57%					
Other Table 1 and	3%	3%	5%	5%		18%					
Total number of respondents	716	615	317	177	12	28					

# NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Region

	Central	Eastern	Southern	Western	Alaska	Pacific
	Region	Region	Region	Region	Region	Region
By what means do you receive text-based National Weather Service hydrologic information						
NWS Web pages	96%	95%	91%	95%	100%	100%
Non-NWS Web pages	19%	26%	24%	24%	17%	25%
Phone	10%	11%	13%	11%	8%	4%
Mobile devices/PDA	11%	8%	14%	6%		-
NOAA Weather Radio	50%	47%	39%	29%	33%	25%
NOAA Weather Wire	3%	3%	5%	2%		
Family of Services (FOS)	1%		3%	2%		
Emergency Managers Weather Information Network (EMWIN)	10%	6%	12%	5%		4%
Local or cable TV	39%	44%	41%	29%		50%
Commercial Radio	20%	22%	14%	13%		14%
Satellite radio	2%	3%	3%	3%		4%
Newspaper	14%	15%	12%	12%		25%
Private Vendor	5%	4%	4%	3%		
Other	4%	6%	8%	7%	17%	7%
Total number of respondents	716	615	317	177	12	28
Frequency of using flood watches, flood warnings, and flood statements provided in text format						
Several times per day	52%	52%	49%	45%	58%	57%
Once per day	21%	16%	17%	20%	25%	29%
Once per week	6%	6%	6%	7%	8%	4%
Once per month	11%	14%	12%	8%		4%
Do not use	9%	8%	13%	17%		4%
Not familiar with this information	2%	2%	3%	3%	8%	4%
Total number of respondents	716	615	317	177	12	28
Importance of the distinction between a flood warning and a flash flood warning	86	85	83	85	60	87
Where 0 is "Not important at all" and 100 is "Very important"	86	85	83	85	60	87
Minimum amount of time needed to take effective precautionary actions for flash flood warnings						
Less than 30 minutes	20%	23%	14%	28%		32%
Between 30 and 45 minutes	27%	23%	23%	16%	43%	24%
Between 45 and 60 minutes	23%	25%	21% 30%	26%	43% 14%	24%
Between 1 and 2 hours	19%	19%		18%		12%
More than 2 hours	11% 634	10% 538	12% 269	12% 148	7	8% 25
Total number of respondents	034	536	209	146	/	25
Minimum amount of time needed to take effective precautionary actions for flood warnings Less than 30 minutes	16%	17%	12%	18%	8%	32%
Between 30 and 60 minutes	25%	24%	23%	26%	8% 17%	32%
Detween 30 and 0 minutes Between 1 and 2 hours	25%	24%	30%	20%	17%	29%
Between 2 and 6 hours	18%	18%	23%	19%	42%	4%
Derwein 2 and o hours	15%	13%	12%	16%	17%	4%
Total number of respondents	716	615	317	177	12	28
Frequency of using routine river forecasts provided in text format	110	010	517		12	20
Several times per day	20%	14%	18%	14%	50%	18%
Once per day	22%	19%	18%	24%	17%	25%
Once per week	21%	21%	20%	18%	17%	4%
Once per month	20%	23%	20%	18%	8%	21%
Do not use	13%	18%	16%	21%		25%
Not familiar with this information	4%	5%	8%	6%	8%	7%
Total number of respondents	716	615	317	177	12	28
Frequency of visiting web pages providing a suite of hydrologic information						
Several times per day	17%	13%	14%	11%	25%	14%
Once per day	21%	17%	22%	22%	42%	25%
Once per week	23%	21%	17%	16%	17%	4%
Once per month	21%	25%	19%	20%		7%
Do not use	11%	15%	16%	17%		21%
Not familiar with this information	8%	9%	12%	14%	17%	29%
Total number of respondents	714	614	315	176	12	28
Usefulness of providing Flood Warnings and Watches, River Forecasts and other water information on your PDA	67	62	68	65	40	65
Where 0 is "Not at all useful" and 100 is "Very useful"	67	62	68	65	40	65

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Region

	Control	Feetern	Southern	Mastawa	Alaska	Pacific
	Central Region	Eastern Region	Region	Western Region	Region	Region
Have directly interacted with NWS staff		-	-	-		
Yes	28%	22%	32%	26%	33%	
No	72%	78%	68%	74%	67%	100%
Total number of responder	ts 716	615	317	177	12	28
During a typical year, how many hours do you directly interact with NWS staff						
Less than 5 hours	53%	57%	42%	50%	25%	
5-10 hours a year	26%	18%	24%	20%	50%	
11-25 hours a year	12%	13%	15%	13%		
More than 25 hours a year	9%	12%	19%	17%	25%	
Total number of responder	ts 204	134	100	46	4	
Purpose of your personal communications with NWS staff						
Explanation or interpretation of available forecast products	55%	56%	51%	48%	75%	
Gain an understanding of forecaster confidence in forecast products	44%	50%	56%	63%	50%	
Synthesize available forecast products and information for your specific needs	56%	47%	63%	54%	50%	
Get more information from forecaster than available in existing products	63%	65%	61%	70%	50%	
Total number of responder	ts 204	134	100	46	4	
Frequency of using drought information provided in text format						
Several times per day	3%	2%	4%	2%		4%
Once per day	8%	7%	8%	4%		4%
Once per week	15%	19%	18%	15%		
Once per month	24%	22%	22%	25%	17%	32%
Do not use	41%	41%	36%	41%	50%	43%
Not familiar with this information	9%	9%	11%	12%	33%	18%
Total number of responder	ts 716	615	317	177	12	28
Frequency of using information on water supply and/or reservoir information provided in text format						
Several times per day	2%	2%	3%	3%		7%
Once per day	6%	6%	8%	3%		
Once per week	7%	10%	10%	18%	17%	
Once per month	11%	16%	21%	23%		18%
Do not use	56%	51%	43%	43%	58%	54%
Not familiar with this information	18%	15%	15%	10%	25%	21%
Total number of responder	ts 716	615	317	177	12	28
Usefulness of displaying observations and forecasts of water resources properties	77	79	77	78	57	66
Where 0 is "Not at all useful" and 100 is "Very useful"	77	79	77	78	57	66
Usefulness of displaying water supply volume inflow forecast information	68	72	70	80	63	66
Where 0 is "Not at all useful" and 100 is "Very useful"	68	72	70	80	63	66
Downloaded the data provided by the National Weather Service in the last year						
Yes	46%	45%	52%	47%	42%	36%
No	54%	55%	48%	53%	58%	64%
Total number of responder	ts 716	615	317	177	12	28
Usefulness of expanding our data services	80	79	82	79	74	74
Usefulness of expanding our data services	80	79	82	79	74	74

#### NWS Hydrology Customer Satisfaction 2008 Significant Difference Table Region

	Central Region			Eastern Region			
	2006	2008	Significant Difference	2006	2008	Significant Difference	
Flood Information	81	81		81	81		
Clarity	80	81		83	82		
Timeliness	83	81		80	80		
Accuracy	79	79		78	80		
Organization of information	80	81		81	81		
Meets my needs	83	82		82	82		
Routine River Forecasts/Observed Conditions	82	82		82	82		
Clarity	82	83		83	82		
Timeliness	83	81		82	81		
Accuracy	81	82		80	82		
Organization of information	81	82		83	82		
Meets my needs	83	82		82	82		
Web Products	82	84		83	84		
Clarity	81	85	√	84	85		
Timeliness	84	83		83	83		
Accuracy	83	83		83	84		
Organization of information	81	84	√	85	84		
Meets my needs	83	84		85	84		
Customer Service	-	91		-	92		
Overall satisfaction with the NWS staff		91			93		
Importance of direct interaction with NWS staff		90 83			90		
Drought Information	79		✓ ✓	83	83		
Clarity	78 79	83 82	✓ ✓	83	83 83		
Timeliness	79 78	82	✓ ✓	82 83	83		
Accuracy Organization of information	78	83	↓ ↓	84	83		
	80	85	↓ ↓	84	84		
Meets my needs	76		· ·				
Water Supply/Reservoir Information	76	83 84	×	<b>81</b> 81	83 84		
Clarity Timeliness	76	83	✓ ✓	80	83		
Intreminess Accuracy	75	82	✓ ✓	81	84		
Organization of information	75	83	~	82	83		
Meets my needs	77	83	· ·	81	84		
Meets my needs Data Services	-	85	·		85		
Timelines		85			86		
Initialities		86			86		
Accuracy Organization of information		85			85		
Meets my needs	-	86			85		
Customer Satisfaction Index	79	80		78	80		
Overall satisfaction with the NWS Hydrologic Services Program	83	85		83	85	✓	
How well NWS Hydrologic Services Program meets your expectations	77	75	1	75	76		
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	77	78		74	77	$\checkmark$	
Likelihood to Take Action	89	89		90	89		
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	89	89		90	89		
Enventional or lake autompassa of the hydrologic information you receive nom the National Weatter Service	85	88		86	87		
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	85	88	✓ ✓	86	87		
			· · ·			·	
Sample Size	281	716		368	615		

#### NWS Hydrology Customer Satisfaction 2008 Significant Difference Table Region

	Southern Region			Western Region			
	2006	2008	Significant Difference	2006	2008	Significant Difference	
Flood Information	85	81	✓	77	76		
Clarity	84	82	$\checkmark$	78	77		
Timeliness	85	80	~	78	77		
Accuracy	85	80	~	74	73		
Organization of information	84	81	~	75	74		
Meets my needs	86	82	✓	79	77		
Routine River Forecasts/Observed Conditions	84	81		78	78		
Clarity	85	83		79	79		
Timeliness	84	80	✓	78	78		
Accuracy	83	81		78	78		
Organization of information	83	82		78	78		
Meets my needs	84	81	√	78	78		
Web Products	85	84		79	81		
Clarity	85	86		79	83	√	
Timeliness	86	83	~	81	80		
Accuracy	86	84		80	79		
Organization of information	85	85		79	83		
Meets my needs	86	84		80	80		
Customer Service		89		-	86		
Overall satisfaction with the NWS staff		89			86		
Importance of direct interaction with NWS staff		90			85		
Drought Information	83	82		76	82	✓	
Clarity	82	83		76	81	✓	
Timeliness	84	82		76	81	~	
Accuracy	84	81		74	80	~	
Organization of information	82	83		76	82	✓	
Meets my needs	84	83		77	83	~	
Water Supply/Reservoir Information	83	83		76	82	✓	
Clarity	83	83		76	81	✓	
Timeliness	83	82		76	81	✓	
Accuracy	84	83		75	81	✓	
Organization of information	83	83		76	82	✓	
Meets my needs	83	82		76	81	✓	
Data Services		85			81		
Timeliness		86			81		
Accuracy		86			82		
Organization of information		85			81		
Meets my needs		85			81		
Customer Satisfaction Index	82	80		74	78	1	
Overall satisfaction with the NWS Hydrologic Services Program	86	85		79	83	√	
How well NWS Hydrologic Services Program meets your expectations	80	75	√	71	74		
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	80	77		71	74	I	
Likelihood to Take Action	91	87		86	88		
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	91	87	· · · · · · · · · · · · · · · · · · ·	86	88		
Confidence in NWS	89	86	1	82	87	✓	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	89	86	√ 	82	87		
Sample Size	261	317		373	177		

#### NWS Hydrology Customer Satisfaction 2008 Significant Difference Table Region

		Alaska Region	_	Pacific Region			
	2006	2008	Significant Difference	2006	2008	Significant Difference	
Flood Information	87	72	1	81	80		
Clarity	90	71	$\checkmark$	83	80		
Timeliness	80	70		72	80		
Accuracy	84	71	~	74	76		
Organization of information	89	76		86	80		
Meets my needs	88	73	√	85	82		
Routine River Forecasts/Observed Conditions	85	74		88	79		
Clarity	91	75	~	89	81		
Timeliness	79	73		78	79		
Accuracy	86	71	√	89	77		
Organization of information	86	79		86	76		
Meets my needs	84	72		85	81		
Web Products	84	71		81	78		
Clarity	88	72	√	80	79		
Timeliness	80	67		80	84		
Accuracy	83	69		80	85		
Organization of information	84	79		81	75		
Meets my needs	85	70		83	78		
Customer Service	-	92		-	-		
Overall satisfaction with the NWS staff	-	94	1			1	
Importance of direct interaction with NWS staff		89	4				
Drought Information	95	50	1	64	85		
Clarity	97	44	1	64	88	√	
Timeliness	97	56	✓	71	82	, , , , , , , , , , , , , , , , , , ,	
Accuracy	93	50	~	60	88	✓	
Organization of information	94	56	1	67	83		
Meets my needs	92	44	1	58	86		
Water Supply/Reservoir Information	82	58	1	76	82		
Clarity	81	61	1	75	84		
Timeliness	74 83	56 61	✓ ✓	75	84 84		
Accuracy		56	✓ ✓	83			
Organization of information	86		× 	78	76		
Meets my needs Data Services	81	56 76	Ý	69	83 83		
Timeliness		73			86 83		
Accuracy Organization of information		82 78	+		83	+	
		78 69	+		81 82	+	
Meets my needs Customer Satisfaction Index	76	73		78	75		
Customer Satisfaction index Overall satisfaction with the NWS Hydrologic Services Program	82	73		81	78		
Overall satisfaction with region ways regulation of the second structure str	75	62	4	76	78	4	
How Well WWS Hydrologic Services Program compares to an "ideal" hydrologic services program	75	75		76	72		
Likelihood to Take Action	89	83		87	85		
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	89	83		87	85		
Confidence in NWS	89	81		83	83		
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	89	81		83	83		
Sample Size	19	12		15	28		

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Internet Services Region

Net call appealImage and the probability of t		Central Region	Eastern Region	Southern Region	Western Region	Alaska Region	Pacific Region
Size of uncertaining tions note income towa door the conduct net conduct net source towa door the conduct net conduct net source towards on the conduct net con	River conditions map					1	
Table may it need is low adout her origins manybold the county786178	Visual appeal	72		77	66	78	
General relation total accoss total accoss total accoss total accoss total accoss total accoss total accoss total accoss total accoss 							
Yalal speal66666775665967776768Taki ne vial reade1000 with vier coordions invegutout the county736768 <td></td> <td>78</td> <td>81</td> <td>78</td> <td>72</td> <td>85</td> <td>72</td>		78	81	78	72	85	72
San of universamply         73         70         71         70         67         67         63         77           Bine wait and bow about yee drowings hreghout houty         73         60         67         70         63         78           Bine wait and bow about yee drowings hreghout houty         77         68         880         88         67         78         88           Sand undersamply         66         880         88         87         78         88           Sand undersamply         76         86         87         81         61         78         88           Sand undersamply         78         88							
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Base of understanding			<u> </u>				
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#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Water Resources Services Region

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National         10%         11%         8%         12%             Group (G)         variable scheme         27%         37%         38%             Group (G)         variable scheme         27%         37%         34%         38%             Sigh variable scheme         27%         37%         34%         38%             Sigh variable scheme         27%         37%         34%         38%             Sigh variable scheme         764         47%         37%         67% <td< td=""><td>Descriptions of water resource properties forecast to the transmission would be important in your organization</td><td>04</td><td>54</td><td>04</td><td>15</td><td></td><td>-</td></td<>	Descriptions of water resource properties forecast to the transmission would be important in your organization	04	54	04	15		-
Group (a) values hands within a large river basin         27%         31%         34%         35%             Sub- water hands         8%         14%         3%         8%         100%            Sub- water hands         8%         14%         3%         8%         100%            Sub- water resources data sets and metadata to make the information more relevant         80         80         84         92         89            Usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant         80         80         84         92         89            Usefulness of receiving analytical products calculated from water resources data         80         80         80         84         92         89             Visit         Continue of respondents         80         84         92         89	National		11%				
Single watershed22%24%8%Single watershed8%14%3%8%1Call number of respondes909538261Use under sciencing analytical products calculated from water resources data sets and metadata to make the information more relevant8080849288Use under sciencing analytical products calculated from water resources data8080849288	Regional						
Sub-watershadPhy14%3%B%100%Data UndershadTal an under drisgowal909538261Defunces of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant8080849280Defunces or calculated from water resources data8080849280Contine to water manager? questions37%35%47%46%100%Yes53%54%							
Total number of respondents         90         95         38         26         1            Useduness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant         80         80         84         92         89            Continue to water managers' questions         80         87         47%         48%         100%            Yes         37%         38%         47%         46%         100%            No         57%         58%         65%         58         54%            Vest appel         77         79         89         93         78            Used understanding         80         65         38         88         89            Used understanding         80         88         88         89             Used understanding         80         90         89         88         88         89            Used understanding         80         90         90         94         86         78            Used understanding         81         92         89         89							
Use during any icial products calculated from water resources data sets and metadata to make the information more relevantImage of the instant of							
Use during any lical products calculated from water resources data         80         84         92         89            Continue to ware manages "questions         Image: Section Sectin Section Sectin Section Section Section Section Section Sectin Sec		90	90	30	20	1	
Continue to water managers' questions         Image: Part of the section of the		80	80	84	92	89	
Yes         37%         38%         47%         46%         100%            No         63%         62%         53%         54%             Mater supply volume inflow forecast map         63%         62%         53%         54%            Used unders of water supply volume inflow forecast map         77         79         89         93         91         89            Used unders diver supply volume inflow forecast map         86         89         93         91         89            Used unders supply volume inflow forecast map         90         89         88         88         89            Tells me what i need to know about the water supply volume inflow forecast map for the entire United States         89         90         94         86         78            Usefulnes of water supply volume inflow forecast map for the entire United States         87         81         92         89         89            Usefulnes of water supply volume inflow forecast map for the entire United States         87         81         92         89         89            Usefulnes of water supply volume inflow forecast map for the entire United States         87         81	Continue to water managers' questions						
Total number of respondents         89         95         38         26         1            Visual appeal         77         79         89         93         78            Visual appeal         86         89         93         91         89            Ease of understanding         90         89         88         88         89            Tells me what i need to know about the water supply forecast         80         89         90         94         86         78            Tells me what i need to know about the water supply forecast map for the entire United States         89         90         94         86         78            Statef supply volume inflow forecast map for the entire United States         89         90         94         86         78            Visual appeal         78         81         92         89         89            Visual appeal         87         877         877         93         89         89            Visual appeal         86         88         90         84         78            Visual appeal         87         77         76 <td>Yes</td> <td></td> <td></td> <td></td> <td></td> <td>100%</td> <td></td>	Yes					100%	
Water supply volume inflow forecast map         Image: mage inflow forecast map         Image:	No						
Used unders and water supply volume inflow forecast map         77         79         89         93         78		99	95	38	26	1	
Visual appeal         Description         B8         P3         P3<		77	79	89	93	78	
Ease of understanding         90         89         88         88         89            Table methal need to know about the water supply forecast         85         88         85         88         89            Usefulness of water supply volume inflow forecast map for the entire United States         89         90         94         86         78            Water supply volume inflow forecast progression         78         81         92         89         89            Visual appeal         78         81         92         89         89            Visual appeal         87         87         93         89         89            Visual appeal         86         88         90         84         78            Visual appeal         87         76         93         89             Used Unses of wonthly essensal water supply forecast evolution         91         89         90         84         78            Used Unsers of wonthly ensemble volume forecasts         75         76         95         85         89            Used Unsers of clinde sensitivity studes         88         85 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Tells mekal lneed to know about the water supply forecast         88         85         88         89            Uberdiness of water supply volume inflow forecast may for the entire United States         89         90         94         86         78            Uberdiness of water supply volume inflow forecast progression         78         81         92         89         89            User supply volume inflow forecast progression         78         81         92         89         89            Visual appel         87         87         93         89         89            Ease of understanding         86         88         90         94         89            Ease of understanding         75         76         95         89             Ease of understanding         88         85         88         81	Ease of understanding						
Water supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression         Image: model of the supply volume inflow forecast progression<	Tells me what I need to know about the water supply forecast					89	
Usefulness of water supply volume inflow forecast progression         92         89         89            Sisual appeal         87         87         93         89         89            Ease of understanding         86         88         90         84         78            Ease of understanding         86         88         90         84         78            Ease of understanding need to know about the seasonal water supply forecast evolution         91         89         90         94         89            Usefulness of methy ensemble volume forecast         75         76         95         85         89            Usefulness of methy ensemble volume forecasts         75         76         95         85         89            Usefulness of methy ensemble volume forecasts         88         85         88         85         89            Usefulness of climate sensitivity studies         90         84         86         81         89            Usefulness of climate sensitivity studies         90         84         86         81         89            Usefulness of climate sensitivity studies         90         <		89	90	94	86	78	
Visual appeal         87         87         93         89         89            Tells me what i need to know about the seasonal water supply forecast evolution         96         86         88         90         84         78            Tells me what i need to know about the seasonal water supply forecast evolution         91         89         90         94         89            Usefulness of monthly ensemble volume forecasts         75         76         95         85         89            Visual appeal         88         85         88         85         89            Visual appeal         88         85         88         85         89            State of understanding         88         85         88         86         81         89            Tells me what i need to know about water supply volume forecast uncertainty         90         84         86         81         89            Usefulness of climate sensitivity studies         90         84         86         81         89            Usefulness of climate sensitivity studies         10         87         71         87         84         89		70	04	00	00	00	
Ease of understanding         86         88         90         84         78            Item watch it need to know about the seasonal water supply forecast evolution         91         89         90         94         89            Item match it need to know about the seasonal water supply forecast evolution         91         89         90         94         89            Item match item about the seasonal water supply forecast evolution         75         76         95         85         89            Used understanding         88         85         88         85         89            Ease of understanding         86         82         86         81         89            Used/unders of climate sensitivity studies         90         84         86         89            Used/unders of climate sensitivity studies         00         84         86         89            Used/unders of climate sensitivity studies         65         71         87         84         86           Used/unders of climate sensitivity studies							
Tells me what I need to know about the seasonal water supply forecast evolution         91         89         90         94         89            Usefulness of monthly ensemble volume forecast         75         76         95         85         89            Usefulness of monthly ensemble volume forecasts         75         76         95         85         89            Visual appeal         88         85         88         85         89            Ease of understanding         86         82         86         81         89            Usefulness of climate sensitivity studies         86         82         86         81         89            Usefulness of climate sensitivity studies         90         84         86         82         83         85            Usefulness of climate sensitivity studies         9         71         87         88         85            Usefulness of climate sensitivity studies                Usefulness of climate sensitivity studies                Usefulness of climate sensitivity studies </td <td></td> <td></td> <td></td> <td>90</td> <td>84</td> <td>78</td> <td></td>				90	84	78	
Monthly ensemble volume forecast         Image: Constraint of the semble volume forecast         Image: Constraint of th	Tells me what I need to know about the seasonal water supply forecast evolution			90			
Usedulenses of monthly ensemble volume forecasts         75         76         95         85         89            Siveal appeal         88         85         80         85         89            Ease of understanding         88         85         80         85         89            Tells me what 1 need to know about water supply volume forecast uncertainty         90         84         86         89            Usefulness of cilmate sensitivity studies         90         84         86         89            Usefulness of cilmate sensitivity studies         -         -         -         -         -           Usefulness of cilmate sensitivity studies         -         -         -         -         -           Usefulness of cilmate sensitivity studies         -         -         -         -         -           Usefulness of cilmate sensitivity studies         -	Monthly ensemble volume forecast						
Ease of understanding         86         82         86         81         89            Ease of understanding         90         84         86         89         78            Usefuness of climate sensitivity studies         90         84         86         89         78            Usefuness of climate sensitivity studies         65         71         87         89            Climate sensitivity studies         65         71         87         89            Visual appeal         75         82         83         79         67            Seas of understanding         72         82         79         76         78	Usefulness of monthly ensemble volume forecasts						
Tells me what I need to know about water supply volume forecast uncertainty         90         84         86         89         78            UserUness of climate sensitivity studies         65         71         87         84         89            Usefunces of climate sensitivity studies         65         71         87         84         89            Climate sensitivity studies         65         71         87         84         89            Visual appeal         75         82         83         79         67            Sase of understanding         72         82         79         76         78	Visual appeal						
Usefulness of climate sensitivity studies         Image: Sensitivity studies         Image: Sensitivity studies         Image: Sensitivity studies           Usefulness of climate sensitivity studies         65         71         87         89							
Usefulness of climate sensitivity studies         65         71         87         84         89            Climate sensitivity studies         r		90	64	db	99	/8	
Climate sensitivity study         r         r         r         r           Visual appeal         75         82         83         79         67            Sase of understanding         72         82         79         76         78		65	71	87	84	89	
Visual appeal         75         82         83         79         67            Ease of understanding         72         82         79         76         78	Climate sensitivity study			0.			
Ease of understanding 72 82 79 76 78	Visual appeal						
Tells me what I need to know about climate sensitivity for a select river forecast point 78 83 80 78 89	Ease of understanding						
	Tells me what I need to know about climate sensitivity for a select river forecast point	78	83	80	78	89	

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Region

	Central Region	Eastern Region	Southern Region	Western Region	Alaska Region	Pacific Region
Usefulness of having access to Flood Watches and Warnings						
Usefulness of having access to Flood Watches and Warnings as text	85	88	92	84	78	100
Usefulness of having access to Flood Watches and Warnings coded in XML, including CAP	77	70	87	67		67
Usefulness of having access to Polygons specifying the area covered by Flood Watches and Warnings	88	84	93	78	67	89
Observations	-					
Precipitation	96	96	99	99	89	100
Snow accumulation	91	92	68	88	93	89
Snow water equivalent	83	85	67	87	89	89
River stage/flow	89	90	92	84	96	100
Soil moisture Air Temperature	75 87	73 86	84 89	74 90	81 85	100 100
	83	77	85	90 80	74	94
Dew point Wind speed	87	80	90	88	85	94 100
Atmospheric freezing level	72	66	75	70	78	89
Potential evaporation	73	65	86	69	78	100
Soil frost depth	72	64	63	54	81	89
Forecast	12	04	03	54	01	03
Precipitation	95	95	99	92	89	100
Temperature	90	90	94	84	89	100
Instantaneous streamflow/stage	86	86	91	82	93	100
Streamflow or stage forecast uncertainty information	81	84	87	79	74	100
Cumulative streamflow	78	75	83	76	78	100
Atmospheric freezing level	70	65	72	56	78	89
Basin Boundaries						
Basin boundaries	79	81	84	89	93	94
Historical data used to calibrate models						
Historical data used to calibrate models	77	75	80	88	100	94
Hydrologic Model						
Hydrologic model parameters	70	70	82	70	100	94
Hydrologic model states	68	70	80	67	100	94
Unit Hydrograph parameters	73	72	79	70	100	94
Routing Parameters						
Routing parameters	70	70	76	72	100	94
Rating Curve						
Rating Curve	70	72	80	75	100	89
Raw ensemble streamflow prediction traces						
Raw ensemble streamflow prediction traces	70	71	75	75	89	89
Climate forecast adjusted ensemble streamflow prediction traces						
Climate forecast adjusted ensemble streamflow prediction traces	71	73	77	73	89	89
Statistical Water Supply Forecast			=1	70		
Statistical Water Supply Forecast	71	77	71	76	89	94
Flash Flood Guidance	0.1	00	00	70	70	400
Flash Flood Guidance	84	89	90	78	78	100
Text ASCII	80	84	89	94	100	100
XML	80	84 78	89	94 75	100	100
Point Data		10	00	75		100
ASCII	80	79	88	92	100	100
XML	77	80	86	92 79	11	100
SHEF	61	64	75	63	56	72
Shapefile	76	72	84	72	67	94
KML	65	66	82	63		89
Lines, Vectors, and Contours	03		52			
ASCII	77	70	84	78	100	100
XML	74	78	83	65	11	100
Shapefile	79	74	86	81	67	94
KML	69	69	79	63		89
Grids, Arrays, and Rasters						
ASCII	76	70	84	76	78	100
Shapefile	75	75	91	77	67	94
KML	66	68	79	59		89
GeoTIFF	79	76	80	77	89	94
Bit-mapped graphics + Worldlife	75	75	78	69	22	94
NetCDF	57	65	72	59	22	94
GRIB	55	66	67	49		72
BUFR	56	66	60	51		72

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Region

	Central	Eastern	Southern	Western	Alaska	Pacific
	Region	Region	Region	Region	Region	Region
Digital Information Availability		-	-			
Download	86	88	93	92	89	94
Web map service	92	89	95	94	83	94
Web feature service	90	88	96	93	83	94
Web coverage service	89	87	95	90	83	94
RSS	78	77	88	72	44	94
WAP	77	73	89	62	44	61
GIS - Commercial						
ESRI	34%	34%	50%	35%	33%	50%
Intergraph	7%	8%	9%			
Idrisi	4%	3%	3%			
Erdas Imagine	3%	5%	6%			
ENVI	4%	5%	3%	6%		
Autodesk	9%	14%	15%	6%	33%	
Custom Application	21%	16%	21%	29%		
Other	8%	10%	12%			
Total number of respondents	76	86	34	17	3	2
GIS - Open Services						
GRASS	4%	14%	12%	6%		
SAGA	4%	5%	9%			
ILWIS (GNU)	1%	7%	9%			
Geotools	18%	17%	29%	6%		
Custom Application	22%	17%	9%	24%		
Other	9%	8%	9%		33%	
Total number of respondents	76	86	34	17	3	2
Scientific Data Analysis, Modeling, and Visualization						
IDL	5%	6%	3%	6%		
PV-Wave	3%	6%		6%		
MatLab	7%	12%	12%	18%		
Vis5D	1%	7%				
GEMPAK	3%	8%	9%	6%	33%	
CrADS	1%	6%	6%	6%		
AVS5	1%	5%	6%			
NCAR Graphics/NCL	7%	13%	15%	18%		
AWIPS	5%	15%	12%	6%	33%	
Custom Application	17%	20%	12%	24%		
Other	7%	8%	12%	6%	33%	50%
Total number of respondents	76	86	34	17	3	2
Other Categories						
Keyhole Markup Language viewers	36%	38%	44%	35%	33%	
Geo-aware Databases	11%	5%	24%	12%		50%
Specialized Spatial Information Systems	7%	5%	6%			
GPS/Navigation	25%	27%	56%	24%	67%	50%
TV/Media Graphics	28%	28%	26%	12%	33%	
CAD Tools	17%	15%	26%	6%	33%	
Image Processing/ Computer Graphics	30%	29%	41%	41%	33%	50%
Other Total and the of some states of	4%	6%	9%			
Total number of respondents	76	86	34	17	3	2
Usefulness of metadata	77	00	00	07	70	400
Usefulness of metadata	77	83	86	87	72	100
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	70	00	00	70	00	100
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	79	80	90	73	89	100

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Primary Use of Hydrologic Information

	Emergency management	Communication/News	Water resources	Agriculture	Shipping	Natural resource management	Consulting/add value/provide custom hydrologic services	Recreation	Personal use	Other
Flood Information	80	80	75	77	74	78	75	84	81	78
Clarity	81	80	76	77	79	78	76	85	82	78
Timeliness	80	82	77	78	71	82	77	82	82	76
Accuracy	78	80	73	75	68	77	75	82	81	76
Organization of information	81	81	75	76	77	79	72	83	81	78
Meets my needs	80	78	76	77	73	78	75	86	83	80
Routine River Forecasts/Observed Conditions	80	81	78	77	75	80	75	84	83	78
Clarity	82	81	81	77	80	81	75	85	83	79
Timeliness	80	82	78	76	75	81	75	83	82	75
Accuracy	80	83	76	77	69	80	77	84	83	77
Organization of information	81	83	79	76	78	81	73	82	82	80
Meets my needs	80	78	78	77	74	80	77	86	83	80
Web Products	83	82	81	78	87	83	80	85	85	80
Clarity	85	82	83	79	90	86	80	87	86	83
Timeliness	82	83	81	78	87	81	78	84	84	75
Accuracy	82	83	80	77	87	84	80	85	85	80
Organization of information	85	83	81	79	86	85	81	84	85	81
Meets my needs	83	81	81	78	86	82	82	86	85	80
Customer Service	93	89	88	86	95	90	89	94	89	86
Overall satisfaction with the NWS staff	92	89	90	85	96	91	89	96	91	85
Importance of direct interaction with NWS staff	94	89	85	89	93	89	90	92	84	87
Drought Information	83	85	81	73	66	80	74	85	84	80
Clarity	82	85	81	76	69	82	74	85	84	80
Timeliness	83	83	79	74	75	80	72	85	83	80
Accuracy	82	85	81	71	58	81	73	84	84	78
Organization of information	84	86	82	73	64	80	73	85	84	80
Meets my needs	84	85	82	72	61	80	78	87	85	82
Water Supply/Reservoir Information	85	86	78	81	74	79	77	85	84	78
Clarity	85	86	79	84	78	80	78	85	84	78
Timeliness	84	86	80	79	76	79	77	82	84	77
Accuracy	85	87	78	83	67	78	75	87	83	78
Organization of information	84	85	78	80	82	82	76	84	84	79
Meets my needs	85	84	77	80	69	79	78	87	84	79
Data Services	86	85	84	80	76	81	79	86	86	81
Imeliness	87	84	85	79	78	82	78	86	87	81
Accuracy	86	87	85	81	72	86	80	88	87	84
Accuracy Organization of information	86	84	82	80	81	77	79	82	86	81
Meets moreds	86	84	84	81	72	80	79	86	86	80
Restance Satisfaction Index	81	79	76	77	76	76	78	82	81	76
Overall stisfaction with the NVS Hydrologic Services Program	86	83	83	82	81	80	87	86	85	82
Overall satisfaction with the rows involution services integration How well NWS hydrologic Services Program meets your expectations	76	76	70	74	74	73	77	77	76	71
How NWS Hydrologic Services Program compares to an expectations	78	77	72	72	69	74	72	79	70	73
	18	11	12	12	69	74	12	79	79	13
Likelihood to Take Action	91	90	83	84	96	86	84	88	89	86
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	91	90	83	84	96	86	84	88	89	86
Confidence in NWS	88	88	83	84	79	82	85	88	88	83
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	88	88	83	84	79	82	85	88	88	83
Sample Size	432	92	79	71	10	62	40	176	856	158

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Use

		ergency agement	Communication/News	Water resources	Agriculture	Shipping	Natural resource management	Consulting/add value/provide custom hydrologic services	Recreation	Personal use	Other
What is your primary use of hydrologic information provided by the National Weather Service											
Emergency management Communication/News			100%						-		
Water resources				100%					-		
Agriculture					100%						
Shipping						100%					
Natural resource management							100%				
Consulting/add value/provide custom hydrologic services				-				100%	-		
Recreation									100%		
Personal Use							-			100%	
Other											100%
	mber of respondents	432	92	79	71	10	62	40	176	856	158
What sector do you represent		40/	10/	00/					40/	401	00/
National Oceanic and Atmospheric Administration (NOAA) Employee Other Federal Government		1% 4%	1%	3% 39%	17%	10%			1%	1%	3% 13%
State Government		4% 10%	1%	39%	3%	10%	26% 44%	8%	1%	2%	8%
Local Government		63%	3%	13%	3%		5%	5%	1%	2%	11%
Government Contractor						10%	576	8%		2.70	1%
Commercial Enterprise		1%	34%	11%	8%	50%	3%	50%	2%		8%
Non-profit business		3%	2%	3%		10%	5%	5%	2%	1%	3%
University or other Educational		2%	3%	4%	3%		5%	5%	4%	2%	8%
Military		1%					2%				
Private Citizen		9%	38%	8%	66%		6%	13%	88%	88%	29%
Foreign			1%	-					-		1%
Other		7%	16%	13%		10%	5%	5%	2%	2%	16%
	mber of respondents	432	92	79	71	10	62	40	176	856	158
What is your NOAA line office											
National Weather Service	1	00%		100%					100%	100%	100%
National Environmental Satellite, Data, and Information Service National Marine Fisheries Service											
National Ocean Service				-							
Office of Marine and Aviation Operations			-								
Office of Oceanic and Atmospheric Research			100%								
Office of Program Planning and Integration											
Other											
	mber of respondents	3	1	2					1	11	4
What federal agency do you represent											
Bureau of Land Management											10%
Bureau of Reclamation		6%		3%							
Federal Emergency Management Agency		28%						-			
Federal Highway Administration							-				5%
Federal Energy Regulatory Commission				3%							10%
Forest Service							13%		-		5%
National Aeronautics and Space Administration National Resources Conservation Services				6%	67%		50%		-		
National Science Foundation				0%	07%		50%				
Nuclear Regulatory Commission				3%							5%
Office of Surface Mining				-				33%			
U.S. Army Corps of Engineers		28%		48%		100%	6%	33%			29%
U.S. Department of Agriculture Agriculture Research Service											
U.S. Department of Interior		22%		32%			19%	33%	-	50%	33%
U.S. Environmental Protection Agency				-	-						
Other		17%		3%	33%		13%			50%	5%
	mber of respondents	18		31	12	1	16	3		4	21
What is the primary scope of your responsibility		001	101	00/	00/	100/	001	000/	10/	401	50/
National		2%	4%	8%	6%	10%	8%	28%	1%	1%	5%
Regional Single state		5% 7%	23%	39% 15%	3% 8%	30%	15% 31%	25%	5% 2%	3% 1%	15% 15%
Single state All or parts of multiple counties		10%	4%	15%	8% 7%	20%	24%	13%	2%	2%	15%
All or parts of multiple counties Single county		10% 40%	4%	4%	7%	20%	24%	10%	2%	2%	8% 13%
Large city/urban area		40 % 5%	4%	1%		20%		5%	1%	1%	1%
Smaller city/township		19%	8%	9%	6%		3%		3%	2%	5%
Personal		7%	25%	6%	58%	10%	6%	3%	85%	88%	27%
Other		5%	3%	4%	6%	10%	8%	3%	2%	1%	11%
Total nu	mber of respondents	432	92	79	71	10	62	40	176	856	158
								•			

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Use

		Emergency management	Communication/News	Water resources	Agriculture	Shipping	Natural resource management	Consulting/add value/provide custom hydrologic services	Recreation	Personal use	Other
By what means do you receive text-based National Weather Service hydrologic information											
NWS Web pages		94%	96%	95%	97%	80%	94%	100%	95%	95%	94%
Non-NWS Web pages		28%	24%	29%	15%	30%	32%	40%	16%	19%	26%
Phone		24%	9%	28%	4%	20%	10%	8%	6%	3%	13%
Mobile devices/PDA		24%	9%	9%	4%		2%	8%	5%	5%	11%
NOAA Weather Radio		61%	46%	24%	46%	40%	21%	25%	34%	44%	40%
NOAA Weather Wire		8%	8%	1%				3%		2%	3%
Family of Services (FOS)		1%	7%	3%	1%				1%		4%
Emergency Managers Weather Information Network (EMWIN)		26%	11%	4%			5%	5%	1%	3%	6%
Local or cable TV		48%	32%	29%	27%	60%	32%	33%	30%	45%	33%
Commercial Radio		23%	11%	9%	23%	40%	16%	18%	13%	20%	17%
Satellite radio		2%	1%	1%	1%	10%			4%	4%	3%
Newspaper		15%	9%	9%	17%	10%	19%	20%	13%	14%	13%
Private Vendor		8%	18%	6%				3%	2%	2%	2%
Other	<b>T</b>	8%	4%	13%	3%	10%	5% 62	5% 40	3%	4%	13%
	Total number of respondents	432	92	79	71	10	62	40	176	856	158
Frequency of using flood watches, flood warnings, and flood statements provided in text format		0.40/	050/	5000	400/	000/	000/	400/	400/	450/	500/
Several times per day		64%	65%	59%	49%	60%	29%	40%	43%	45%	59%
Once per day		13%	16%	11%	20%	40%	13%	18%	24%	22%	15%
Once per week		5%	7%	5%	6%		18%	3%	6%	7%	3%
Once per month		12%	11%	9%	6%		15%	15%	10%	13%	9%
Do not use		5%	1%	10%	14%		23%	23%	15%	11%	11%
Not familiar with this information	<b>T</b>	2%		5%	6%		3%	3%	2%	3%	2%
	Total number of respondents	432	92	79	71	10	62	40	176	856	158
Importance of the distinction between a flood warning and a flash flood warning		87 87	81	84	82	98	76	82	84	85	86
Where 0 is "Not important at all" and 100 is "Very important"		87	81	84	82	98	76	82	84	85	86
Minimum amount of time needed to take effective precautionary actions for flash flood warnings		17%	0.5%	470/	100/		450/	470/	000/	0.494	470/
Less than 30 minutes		21%	35%	17%	10% 29%		15% 27%	17% 29%	23% 21%	24%	17%
Between 30 and 45 minutes			29%	18%	29%	10%				26%	19%
Between 45 and 60 minutes		26%	20%	23%		30%	27%	20%	25%	23%	20%
Between 1 and 2 hours		25%	11%	25%	29%	20%	15%	29%	16%	19%	28%
More than 2 hours	<b>T</b>	11%	5%	17%	8%	40%	17%	6%	15%	9%	16%
	Total number of respondents	390	82	65	62	10	48	35	150	744	134
Minimum amount of time needed to take effective precautionary actions for flood warnings		100/	0.001	00/	14%		400/	100/	4.407	000/	1.10/
Less than 30 minutes		12% 27%	26%	9% 16%	14%		16% 11%	13%	14% 23%	20% 25%	11% 23%
Between 30 and 60 minutes		27%	29%	29%	23%	20%	26%	30%	23%	25%	23%
Between 1 and 2 hours Between 2 and 6 hours		28%	12%	29%	18%	30%	26%	25%	19%	18%	25%
More than 6 hours		13%	3%	22%	15%	50%	24%	15%	19%	11%	25%
More than 6 hours	Total assessment of an and a sta	432	92	24%	71		62	40	19%	856	25%
Frequency of using routine river forecasts provided in text format	Total number of respondents	432	92	79	//	10	02	40	176	000	156
Several times per day		22%	20%	22%	14%	40%	11%	18%	16%	12%	28%
		22%	20%	22%	25%	40%	10%	13%	25%	20%	20%
Once per day Once per week		18%	18%	25%	25%	10%	18%	23%	25%	20%	16%
Once per month		22%	15%	25%	27%	30%	31%	18%	16%	21%	15%
Do not use		13%	15%	15%	15%	30%	26%	25%	10%	21%	15%
Not familiar with this information		4%	11%	4%	4%		5%	5%	2%	7%	4%
	Total number of respondents	432	92	79	71	10	62	40	176	856	158
Frequency of visiting web pages providing a suite of hydrologic information	rotar number or respondents	7.74	32	13		10	02	70	110	000	100
Several times per day		16%	14%	18%	10%	20%	6%	18%	11%	12%	27%
Once per day		22%	20%	16%	27%	20%	18%	13%	26%	18%	21%
Once per week		20%	24%	25%	17%	2070	21%	23%	19%	21%	17%
Once per month		19%	18%	15%	24%	30%	24%	23%	24%	21%	19%
Do not use		13%	16%	11%	13%	30%	18%	8%	13%	16%	8%
Not familiar with this information		9%	8%	14%	10%		13%	13%	7%	11%	8%
	Total number of respondents		91	79	71	10	62	40	176	853	157
Usefulness of providing Flood Warnings and Watches, River Forecasts and other water information on		73	56	67	47	63	58	40 61	59	63	73
Where 0 is "Not at all useful" and 100 is "Very useful"	yourida	73	56	67	47	63	58	61	59	63	73
Willie o is live at all decidi alle too is vely decidi		13	50		+/		38	0		55	13

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Use

	Emergency management	Communication/News	Water resources	Agriculture	Shipping	Natural resource management	Consulting/add value/provide custom hydrologic services	Recreation	Personal use	Other
Have directly interacted with NWS staff										
Yes	57%	39%	61%	15%	30%	26%	33%	9%	10%	30%
No	43%	61%	39%	85%	70%	74%	68%	91%	90%	70%
Total number of re-	spondents 432	92	79	71	10	62	40	176	856	158
During a typical year, how many hours do you directly interact with NWS staff										
Less than 5 hours	38%	64%	33%	82%	33%	50%	62%	87%	78%	49%
5-10 hours a year	30%	31%	27%	9%		31%	15%	13%	10%	17%
11-25 hours a year	19%	3%	13%	9%	33%	6%	8%		5%	21%
More than 25 hours a year	13%	3%	27%		33%	13%	15%		7%	13%
Total number of re-	spondents 245	36	48	11	3	16	13	15	88	47
Purpose of your personal communications with NWS staff										
Explanation or interpretation of available forecast products	67%	56%	58%	18%	100%	50%	38%	20%	36%	47%
Gain an understanding of forecaster confidence in forecast products	57%	50%	52%	64%	33%	50%	69%	40%	28%	51%
Synthesize available forecast products and information for your specific needs	67%	53%	63%	45%	67%	63%	54%	20%	30%	51%
Get more information from forecaster than available in existing products	70%	67%	73%	45%		50%	38%	80%	53%	60%
Total number of re-	spondents 245	36	48	11	3	16	13	15	88	47
Frequency of using drought information provided in text format	-									
Several times per day	2%	7%	3%	7%	10%	5%	3%	2%	3%	4%
Once per day	8%	17%	10%	10%	20%	2%	5%	5%	7%	4%
Once per week	16%	15%	20%	24%		15%	23%	12%	17%	15%
Once per month	22%	23%	27%	24%	10%	27%	18%	22%	24%	25%
Do not use	45%	30%	28%	25%	60%	44%	45%	49%	38%	41%
Not familiar with this information	7%	8%	13%	10%		8%	8%	10%	11%	13%
Total number of re-	spondents 432	92	79	71	10	62	40	176	856	158
Frequency of using information on water supply and/or reservoir information provided in text format										
Several times per day	2%	5%	5%	4%		5%	3%	3%	2%	3%
Once per day	6%	12%	8%	3%	30%	5%	5%	5%	5%	4%
Once per week	10%	5%	22%	11%		10%	13%	13%	8%	9%
Once per month	16%	16%	22%	15%	20%	23%	23%	14%	15%	15%
Do not use	52%	46%	30%	45%	40%	48%	48%	51%	53%	52%
Not familiar with this information	14%	15%	14%	21%	10%	10%	10%	15%	16%	17%
Total number of re	spondents 432	92	79	71	10	62	40	176	856	158
Usefulness of displaying observations and forecasts of water resources properties	76	83	77	78	92	77	79	75	78	76
Where 0 is "Not at all usefull" and 100 is "Verv useful"	76	83	77	78	92	77	79	75	78	76
Usefulness of displaying water supply volume inflow forecast information	69	73	64	64	78	71	75	69	72	77
Where 0 is "Not at all useful" and 100 is "Very useful"	69	73	64	64	78	71	75	69	72	77
Downloaded the data provided by the National Weather Service in the last year										
Yes	58%	52%	65%	42%	40%	58%	73%	39%	37%	62%
No	42%	48%	35%	58%	60%	42%	28%	61%	63%	38%
Total number of re-		92	79	71	10	62	40	176	856	158
Usefulness of expanding our data services	83	84	82	72	72	79	87	72	79	82
Where 0 is "Not at all useful" and 100 is "Very useful"	83	84	82	72	72	79	87	72	79	82

	E	mergency managen	nent	Communication/News			
	2006	2008	Significant Difference	2006	2008	Significant Difference	
Flood Information	82	80	✓		80		
Clarity	83	81			80		
Timeliness	83	80	~		82		
Accuracy	81	78	~		80		
Organization of information	82	81			81		
Meets my needs	84	80	✓		78		
Routine River Forecasts/Observed Conditions	82	80			81		
Clarity	83	82			81		
Timeliness	83	80	~		82		
Accuracy	81	80			83		
Organization of information	82	81			83		
Meets my needs	82	80			78		
Web Products	83	83			82		
Clarity	83	85			82		
Timeliness	83	82			83		
Accuracy	83	82			83		
Organization of information	84	85			83		
Meets my needs	84	83			81		
Customer Service		93			89		
Overall satisfaction with the NWS staff		92			89		
Importance of direct interaction with NWS staff		94			89		
Drought Information	82	83			85		
Clarity	81	82			85		
Timeliness	82	83			83		
Accuracy	81	82			85		
Organization of information	82	84			86		
Meets my needs	83	84			85		
Water Supply/Reservoir Information	80	85	1		86		
Clarity Cappy Control and Cappy Control Capty	80	85	✓		86		
Timeliness	80	84	~		86		
Accuracy	81	85	~		87		
Organization of information	81	84	√ 		85		
Meets my needs	80	85	· · ·		84		
Data Services		86			85		
Jaid Gervices		87			84		
Intreminess Accuracy		86	1		87	+	
Accuracy Organization of information		86			87	1	
Organization of montation Meets my needs		86	1		84	+	
Needs my needs Customer Satisfaction Index	81	81			79		
Customer Satisfaction index Overall satisfaction with the NWS Hydrologic Services Program	85	86			83		
How well NWS Hydrologic Services Program meets your expectations	79	76	~		76		
How Well NWS Hydrologic Services Program meets your expectations How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	79	76	ř		76		
now revealing the revealed and compares to an interal involution services program	19	10	1			I	
Likelihood to Take Action	91	91			90		
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	91	91			90		
Confidence in NWS	88	88			88		
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	88	88			88		
Sample Size	426	432			92		

		Water resources			Agriculture	
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	79	75		72	77	
Clarity	80	76		74	77	
Timeliness	79	77		72	78	
Accuracy	75	73		71	75	
Organization of information	79	75		73	76	
Meets my needs	83	76		72	77	
Routine River Forecasts/Observed Conditions	81	78		75	77	
Clarity	82	81		78	77	
Timeliness	83	78		75	76	
Accuracy	77	76		76	77	
Organization of information	81	79		75	76	
Meets my needs	79	78		72	77	
Web Products	78	81		77	78	
Clarity	78	83		78	79	
Timeliness	80	81		78	78	
Accuracy	78	80		78	77	
Organization of information	78	81		79	79	
Meets my needs	78	81		72	78	
		88		-	86	
Overall satisfaction with the NWS staff		90			85	
Importance of direct interaction with NWS staff		85			89	
Drought of one of the factor with two statistics of the factor of the fa	75	81		72	73	
Clarity	73	81	√	73	76	
Jiany Timeliness	76	79		72	74	
Timenness Accuracy	76	81		72	74	4
Accuracy Organization of information	75	82		71	73	4
	75		~			
Meets my needs		82	, v	70	72	
Water Supply/Reservoir Information	77 78	78 79		68 67	81 84	<b>₩</b>
Carity						
	75 77	80		65	79	~
Accuracy		78		71	83	~
Organization of information	78	78		70	80	√
Meets my needs	77	77		62	80	√
Data Services		84			80	
Timeliness		85			79	
Accuracy		85			81	
Organization of information		82			80	
Meets my needs		84			81	
Customer Satisfaction Index	77	76		68	77	1
Overall satisfaction with the NWS Hydrologic Services Program	79	83		74	82	✓
How well NWS Hydrologic Services Program meets your expectations	76	70		65	74	✓
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	75	72		65	72	
Likelihood to Take Action	83	83		85	84	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	83	83		85	84	
Confidence in NWS	80	83		76	84	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	80	83		76	84	
Sample Size	48	79		37	71	

		Shipping		Natu	ral resource manag	ement
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information		74		76	78	
Clarity		79		76	78	
Timeliness		71		77	82	
Accuracy		68		73	77	
Organization of information		77		76	79	
Meets my needs		73		78	78	
Routine River Forecasts/Observed Conditions		75		78	80	
Clarity		80		80	81	
Timeliness		75		79	81	
Accuracy		69		77	80	
Organization of information		78		77	81	
Meets my needs		74		78	80	
Web Products		87		80	83	
Clarity		90		81	86	
Timeliness		87		81	81	
Accuracy		87		78	84	1
Organization of information		86		82	85	
Meets my needs		86		81	82	
Customer Service		95			90	
Overall satisfaction with the NWS staff	-	96			91	1
Importance of direct interaction with NWS staff	-	93	-		89	1
Drought Information	-	66		74	80	
Clarity		69		75	82	
Timeliness		75		74	80	1
Accuracy		58		74	81	
Organization of information		64		72	80	
Meets my needs		61		73	80	
Water Supply/Reservoir Information		74		75	79	
Clarity		78		74	80	
Timeliness		76 67		74 74	79 78	
Accuracy						
Organization of information		82		76	82	
Meets my needs		69 76		75	79 81	
Data Services						
Timeliness		78			82	
Accuracy		72			86 77	
Organization of information		81 72			80	+
Meets my needs						
Customer Satisfaction Index Overall satisfaction with the NWS Hydrologic Services Program		76 81		76 80	76 80	
How well NWS Hydrologic Services Program meets your expectations		74		80 71	73	+
How weii Nw's Hydrologic Services Program meets your expectations How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program		69		71 74	73	+
		09	1	/4	/4	1
Likelihood to Take Action		96		86	86	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service		96		86	86	
Confidence in NWS		79		83	82	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future		79		83	82	
Sample Size	-	10		63	62	

	Consulting/add va	alue/provide custom	hydrologic services		Recreation	
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	74	75		82	84	
Clarity	77	76		83	85	
Timeliness	75	77		83	82	
Accuracy	72	75		79	82	
Organization of information	73	72		82	83	
Meets my needs	71	75		85	86	
Routine River Forecasts/Observed Conditions	75	75		85	84	
Clarity	78	75		85	85	
Timeliness	75	75		84	83	
Accuracy	75	77		84	84	
Organization of information	73	73		85	82	
Meets my needs	74	77		86	86	
Web Products	77	80		85	85	
Clarity	77	80		85	87	
Timeliness	80	78		84	84	
Accuracy	75	80		85	85	
Organization of information	78	81		84	84	
Meets my needs	75	82		87	86	
Customer Service		89			94	
Overall satisfaction with the NWS staff		89			96	
Importance of direct interaction with NWS staff		90			92	
Drought Information	69	74		82	85	
Clarity	72	74		79	85	
Timeliness	70	72		80	85	
Accuracy	69	73		81	84	
Organization of information	69	73		84	85	
Meets my needs	66	78		85	87	
Water Supply/Reservoir Information	73	77		82	85	
Clarity	77	78		83	85	
Timeliness	75	77		81	82	
Accuracy	73	75		79	87	$\checkmark$
Organization of information	72	76		83	84	
Meets my needs	70	78		84	87	
Data Services		79			86	
Timeliness		78			86	
Accuracy		80			88	
Organization of information		79			82	
Meets my needs		79			86	
Customer Satisfaction Index	69	78	1	81	82	
Overall satisfaction with the NWS Hydrologic Services Program	74	87	$\checkmark$	85	86	
How well NWS Hydrologic Services Program meets your expectations	66	77	$\checkmark$	78	77	
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	63	72		78	79	
Likelihood to Take Action	80	84		90	88	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	80	84		90	88	
Confidence in NWS	75	85		87	88	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	75	85	✓	87	88	
Sample Size	35	40		137	176	

		Personal use		Other				
	2006	2008	Significant Difference	2006	2008	Significant Difference		
Flood Information	80	81		81	78			
Clarity	81	82		82	78			
Timeliness	80	82		81	76	~		
Accuracy	78	81	~	78	76			
Organization of information	79	81		81	78			
Meets my needs	82	83		82	80			
Routine River Forecasts/Observed Conditions	81	83		82	78			
Clarity	82	83		83	79			
Timeliness	81	82		81	75	✓		
Accuracy	81	83		80	77			
Organization of information	81	82		83	80	1		
Meets my needs	82	83		82	80	1		
Web Products	83	85	1	81	80			
Clarity	82	86	· ·	81	83			
Juniy Timeliness	83	84	-	83	75	✓		
Tarrenness Accuracy Accuracy	84	85	-	81	80			
	83	85	✓	82		-		
Organization of information	83		•		81			
Meets my needs		85 89		80	80			
Customer Service					86			
Overall satisfaction with the NWS staff		91			85			
Importance of direct interaction with NWS staff		84			87			
Drought Information	80	84	1	80	80			
Clarity	80	84	~	80	80			
Timeliness	80	83	~	81	80			
Accuracy	81	84	✓	78	78			
Organization of information	80	84	~	81	80			
Meets my needs	82	85	~	81	82			
Water Supply/Reservoir Information	79	84	✓	79	78			
Clarity	79	84	~	78	78			
Timeliness	79	84	~	80	77			
Accuracy	79	83	~	78	78			
Organization of information	79	84	✓	79	79			
Meets my needs	80	84	✓	79	79			
Data Services		86			81			
Timeliness		87			81			
Accuracy		87			84			
Organization of information	-	86			81	1		
Meets my needs		86			80	1		
Customer Satisfaction Index	77	81	1	76	76			
Overall satisfaction with the NWS Hydrologic Services Program	81	85	✓ ✓	81	82			
Overall satisfaction with the two single services Frogram How well NWS Hydrologic Services Program meets your expectations	74	76	+ ·	73	71	+		
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	74	76	~	73	73			
now reversing an object services in ogram compares to an indean ingulologic services program	/4	19	· ·	/1	13			
Likelihood to Take Action	87	89	✓	86	86			
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	87	89	~	86	86			
Confidence in NWS	85	88	✓	82	83			
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	85	88	√ 	82	83			
Sample Size	561	856		188	158	T		

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Internet Services Primary Use

	Emergency management	Communication/News	Water resources	Agriculture	Shipping	Natural resource management	Consulting/add value/provide custom hydrologic services	Recreation	Personal use	Other
River conditions map										
Visual appeal	77	64	74	75		67	82	77	71	72
Ease of understanding	79	66	79	78		72	86	78	76	76
Tells me what I need to know about river conditions throughout the country	81	72	80	78		74	88	81	77	76
General river basin										
Visual appeal	71	69	66	59		52	73	77	67	64
Ease of understanding	74	69	74	63		63	73	78	71	69
Tells me what I need to know about river conditions throughout the country	73	67	74	66		61	71	77	70	67
River conditions regional map	89	80	81	82		82	93	88	86	84
Visual appeal Ease of understanding	89	83	85	84		86	93	90	88	87
Tells me what I need to know about river conditions throughout the country	88	83	85	82		80	87	88	85	84
Current flood conditions	00	81	04	02		65	87	00	85	04
Visual appeal	88	75	81	84		82	89	86	85	83
Ease of understanding	88	79	82	87		83	88	88	87	85
Tells me what I need to know about current flooding conditions	88	82	83	84		79	87	86	87	82
Hydrograph level/flow										
Visual appeal	90	82	88	83		86	84	86	84	86
Ease of understanding	90	85	89	84		82	89	89	87	86
Tells me what I need to know about forecast levels	90	87	87	83		84	90	89	89	88
Hydrograph flood severity	1									
Visual appeal	90	83	87	83		87	89	87	87	86
Ease of understanding	91	85	86	84		85	92	89	89	87
Tells me what I need to know about flood impacts	89	81	87	81		84	83	89	87	84
Hydrograph low flow threshold										
Visual appeal	84	79	84	79	-	83	92	84	80	87
Ease of understanding	85	79	82	79		79	92	85	84	88
Tells me what I need to know about low flow	85	76	79	78		79	90	82	81	88
Usefulness of hydrograph when making decisions during periods of low flow	83	82	85	72		81	85	83	82	84
Flood depth map										
Visual appeal	90	84	84	93		80	95	87	82	87
Ease of understanding	89	87	84	86		82	92	88	80	85
Tells me what I need to know about the depth of the water	90	89	84	87		79	94	89	83	85
Usefulness of areal extent and depth of floodwaters in decision making process	94	80	86	90		83	99	89	87	86
Geographic region map		70		70					0.1	
Visual appeal	88 87	73 66	84 79	79		83	91	81 81	84 82	84
Ease of understanding Tells me what I need to know about river forecasts	89	70	84	79 81		78 83	91 94	86	85	81 84
High-resolution precipitation estimates map	89	70	84	81		83	94	86	85	84
Visual appeal	92	84	92	89		86	94	93	89	89
Ease of understanding	91	81	90	90		88	93	93	90	89
Tells me what I need to know about precipitation estimates	90	79	86	84		86	93	94	89	85
Do you use precipitation frequency estimates	30		50	54		50	33	34		
Ves	62%	36%	72%	50%		75%	75%	35%	40%	58%
No	38%	64%	28%	50%		25%	25%	65%	60%	42%
Total number of respondents		14	29	14		20/0	12	37	187	55
Familiar with Precipitation Frequency Data Server web page										
Yes	58%	100%	57%	57%		60%	89%	54%	51%	38%
No	42%		43%	43%		40%	11%	46%	49%	63%
Total number of respondents		5	21	7	-	15	9	13	74	32
How useful would it be for the remainder of the US to have updated precipitation frequency estimates										
Usefulness of having updated precipitation frequency estimates	83	87	85	89		89	79	79	89	84
Do you use PMP estimates										
Yes	37%	21%	72%	43%	-	60%	50%	22%	20%	36%
No	63%	79%	28%	57%		40%	50%	78%	80%	64%
Total number of respondents	120	14	29	14		20	12	37	187	55
Familiar with Hydrometeorological Reports web page										
Yes	52%	67%	48%	67%		42%	67%	38%	61%	55%
No	48%	33%	52%	33%		58%	33%	63%	39%	45%
Total number of respondents	44	3	21	6		12	6	8	38	20
Usefulness of updated guidelines for PMP estimates										
Usefulness of updated guidelines for PMP estimates	88	81	91	87		90	100	97	91	96

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Water Resources Services Primary Use

	Emergency	Communication/News	Water	Agriculture	Shipping	Natural resource	Consulting/add value/provide	Recreation	Personal use	Other
Alexand Journal Transferrence	management		resources			management	custom hydrologic services			
Observed drought conditions map Usefulness of observed drought conditions in decision making process	82	75	86	89	100	81	85	68	86	74
Visual appeal	93	91	91	92	89	86	89	92	89	88
Ease of understanding Tells me what I need to know about drought conditions	93 89	91 93	89 89	90 87	89 89	86 84	93 85	92 92	91 88	86 82
Tensi ine what need to know about drought conducts Drought trends map	69	93	09	07	09	04	80	92	00	02
Usefulness of trends for drought over next three months in decision making process	83	69	78	88	100	75	80	73	84	76
Visual appeal Ease of understanding	94	83	89 88	88 89	100	84 87	81 80	94 93	89 90	84 80
Lease or united straining Tells me what I need to know about forecasted drought conditions	90	87	86	84	100	85	78	91	87	80
Observed water temperatures map		-								
Usefulness of observed water temperatures in decision making process Visual appeal	66 91	76 79	75 87	61 85	89 78	61 77	69 89	68 92	76 89	66 85
Ease of understanding	91	83	85	83	67	77	92	90	90	85
Tells me what I need to know about the water temperatures	89	86	84	88	78	76	89	90	90	84
Usefulness of receiving water temperature forecasts for rivers, streams and lakes for the next five days Snow depth map	77	68	81	47	89	61	72	90	82	73
Usefulness of snow depth map in decision making process	83	75	73	83	89	82	85	91	88	83
Visual appeal	91	92	89	94	89	84	87	96	91	85
Ease of understanding Tells me what I need to know about snow depth	92 91	92 89	89 89	91 94	89 89	85 87	83 80	96 97	92 92	83 84
Teles ine what meet to know adout show depth	91	09	09	34	69	8/	80	97	92	04
Usefulness of estimates of amount of water contained in snow	85	75	75	81	100	81	91	73	87	81
Visual appeal Ease of understanding	92 91	93 93	89 89	92 91	89 89	84 85	83 87	94 93	89 89	83
Tells me what I need to know about water contained in snow	89	89	89	88	89	85	87	93	89	82 83
Soil moisture map										
Usefulness of soil moisture in decision making Visual appeal	80 93	76	74	91 82	100	79 83	94 87	72	81 89	76 83
Visuai appear Ease of understanding	92	87	84	84	89	85	93	93	89	83
Tells me what I need to know about soil moisture	89	91	84	84	89	89	87	94	91	81
At what soil depths is soil moisture information important to you Outfors endeage settlement of the soil of the so	85%	67%	79%	60%	100%	76%	100%	71%	67%	60%
Surface and near-surface Sub-surface, including typical rooting zone depths	43%	83%	50%	87%		71%	50%	71%	76%	65%
Deeper sub-surface, down to 2-3 meters	17%	33%	46%	33%		47%	17%	29%	25%	35%
Total number of respondent.	s 46	6	24	15	1	17	6	7	79	20
Information more valuable to you A single value describing bulk soil moisture	63%	83%	46%	53%	100%	29%	50%	29%	33%	20%
Soil moisture at multiple discrete levels	37%	17%	54%	47%		71%	50%	71%	67%	80%
Total number of respondent	s 46	6	24	15	1	17	6	7	79	20
Usefulness of water resources properties forecast Usefulness of water resource properties forecast for current conditions	88	86	90	96	89	86	96	82	93	89
Usefulness of water resource properties forecast for drein containers	83	81	85	92	89	72	94	82	86	83
Usefulness of water resource properties forecast for 3-5 days	75	68	81	85	89	67	89	68	80	74
Usefulness of water resource properties forecast for 5-7 days Usefulness of water resource properties forecast for more than 1 week to 1 month	70 61	57 50	78 69	75 67	67 44	62 63	87 81	73 74	76 67	71 62
Usefulness of water resource properties forecast for more than 1 week of Inform Usefulness of water resource properties forecast for more than 1 month	53	49	64	69	22	61	80	68	61	57
Spatial scale describing the extent of coverage unit for which information would be important in your organization										
National Regional	5% 27%	11% 56%	7% 48%	19% 19%	100%	4% 33%	17%	8% 17%	14% 25%	7% 22%
regional Group(s) of watersheds within a large river basin	55%	22%	48% 24%	38%	100%	33% 13%	67%	33%	25%	37%
Single watershed	9%	11%	14%	25%		42%		8%	27%	22%
Sub-watershed Total number of respondent	4% s 55		7%	 16		8% 24	17%	33%	15% 91	11% 27
Usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more releant number or respondence	5 00	9	29	10	1	24	0	12	91	
Usefulness of receiving analytical products calculated from water resources data	81	78	84	89	78	79	91	77	82	75
Continue to water managers' questions Yes	40%	33%	93%	38%	100%	54%	67%	33%	17%	48%
185	60%	67%	93% 7%	63%	100%	46%	33%	67%	83%	52%
Total number of respondent		9	29	16	1	24	6	12	90	27
Water supply volume inflow forecast map	79	74	81	73	89	82	97	89	85	75
Usefulness of water supply volume inflow forecast map Visual appeal	79 95	100	81	73	89	82	97 94	78	90	75 84
Ease of understanding	93	100	83	82	89	88	92	97	91	82
Tells me what I need to know about the waters supply forecast Used-blene of under super underso influence for the calles I billed. States	89	100	84	80	89	85	92	72	92	83
Usefulness of water supply volume inflow forecast map for the entire United States Water supply volume inflow forecast progression	93	89	91	84	89	76	97	92	93	86
Usefulness of water supply volume inflow forecast progression	87	74	81	64	44	77	100	81	88	81
Visual appeal	93	93	88	83		82	92	93	85	83
Ease of understanding Tells me what I need to know about the seasonal water supply forecast evolution	93 93	89 89	85 89	81 81		80 85	92 94	100 96	88 95	81 85
Monthly ensemble volume forecast										
Usefulness of monthly ensemble volume forecasts	83	70	79	62	67	77	100	81	83	74
Visual appeal Fase of understanding	91 86	85 85	82 79	89 85	78 78	80 81	94 92	100	85 83	83 79
Ease or unicet startuning Tells me what I need to know about water supply volume forecast uncertainty	81	85	84	85	78	85	92	100	93	85
Usefulness of climate sensitivity studies										
Usefulness of climate sensitivity studies Climate sensitivity study	63	63	71	56	44	76	92	92	83	68
Unimate sensitivity study Visual appeal Visual appeal	88	100	76	67		74	86	72	80	77
Ease of understanding	87	100	72	56		77	86	75	78	70
Tells me what I need to know about climate sensitivity for a select river forecast point	83	100	77	64		78	89	72	82	76

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Primary Use

Oddport bit of the set of t		Emergency management	Communication/News	Water resources	Agriculture	Shipping	Natural resource management	Consulting/add value/provide custom hydrologic services	Recreation	Personal use	Other
Control<	Usefulness of having access to Flood Watches and Warnings										
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SHEF         68         71         69          63         67         22         60         58           Shapefilo         85         69         90         72          91         81         47         61         69           KML         75         76         75         70          64         71         30         65         62           Lines, Vectors, and Contours         77         61         79         87          80         76         78         70         78           Shapefilo         77         61         79         87          80         76         78         78         72           Shapefilo         83         79         65         72          80         74         81         78         72           Shapefilo         77         76         73         70          95         81         47         67         74           Stapefilo         77         76         73         70          95         81         47         68         74         75           Stapefilo         77	XML		89		72				80	80	73
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Shapefile         84         72         88         72          96         81         47         65         75           KML         75         76         70         67          57         67         30         67         65         65         65         65         65         75         57         67         30         67         65         75           GeoTIFF         82         78         79         75          90         87         63         72         75           Bit-mapped graphics + Worldlife         79         54         74         75          80         71         68         74         74           NetCDF         65         46         56         67          62         67         42         67         62           GRIB         66         70         40         50          54         22         62         62	Grids, Arrays, and Rasters										
KML         75         76         70         67          57         67         30         67         65           GeoTIFF         6201         78         79         75          90         87         63         74         75           Bit-mapped graphics + Worldlife         79         54         74         75          80         71         68         74         74           NeCDF         65         46         56         67          62         67         42         62 <td>ASCII</td> <td></td>	ASCII										
KML         75         76         70         67          57         67         30         67         65           GeoTIFF         6201         78         79         75          90         87         63         74         75           Bit-mapped graphics + Worldlife         79         54         74         75          80         71         68         74         74           NeCDF         65         46         56         67          62         67         42         62 <td>Shapefile</td> <td></td> <td>72</td> <td>88</td> <td></td> <td></td> <td>96</td> <td>81</td> <td></td> <td>65</td> <td>75</td>	Shapefile		72	88			96	81		65	75
Bit-mapped graphics + Worldlife         79         54         74         75          80         71         68         74         74           NetCDF         65         46         56         67          62         67         42         67         62         67         42         66         62         67         42         62	KML										
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GRIB         66         70         40         50          50         54         22         62         62           BUFR         64         65         45         50          52         54         22         60         63	NetCDF				67				42		
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	BUFR	64	65	45	50		52	54		60	63

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Primary Use

	Emergency management	Communication/News	Water resources	Agriculture	Shipping	Natural resource management	Consulting/add value/provide custom hydrologic services	Recreation	Personal use	Other
Digital Information Availability										
Download	90	75	95	91		93	99	81	85	82
Web map service	94	64	92	80		88	96	97	91	92
Web feature service	95	64	91	78		87	88	97	91	88
Web coverage service	94	64	89	78		87	86	96	90	84
RSS	86	67	82	78		58	78	87	80	70
WAP	85	62	64	75		61	77	50	76	78
GIS - Commercial										
ESRI	49%	10%	83%	33%		85%	50%	13%	13%	39%
Intergraph	5%	10%	9%	17%			10%	13%	6%	7%
Idrisi	2%	20%						13%	3%	7%
Erdas Imagine		20%	9%				10%	13%	3%	4%
ENVI	5%	10%	4%				10%	13%	3%	4%
Autodesk	10%	20%	9%			31%	30%	13%	8%	18%
Custom Application	19%	70%	17%	33%		8%	10%	38%	12%	21%
Other	7%	20%	4%			15%	10%	13%	8%	11%
Total number of respondents	59	10	23	6		13	10	8	78	28
GIS - Open Services										
GRASS	2%	20%	13%				20%	13%	13%	11%
SAGA	7%	10%	4%	-				13%	3%	7%
ILWIS (GNU)	3%	10%		-			20%	13%	5%	4%
Geotools	27%	20%	17%	-		15%	10%	13%	17%	14%
Custom Application	15%	40%	4%	50%		8%	10%	38%	18%	18%
Other	8%		4%	-		15%	20%	13%	9%	7%
Total number of respondents	59	10	23	6		13	10	8	78	28
Scientific Data Analysis, Modeling, and Visualization										
IDL	5%	20%	4%				20%	13%	5%	4%
PV-Wave	2%	20%					10%	13%	4%	4%
MatLab	3%	10%	17%	17%			30%	13%	9%	14%
Vis5D		20%				8%	10%	13%	3%	4%
GEMPAK	3%	40%					20%	13%	4%	11%
CrADS	3%	20%					20%	13%	3%	4%
AVS5	3%	10%					10%	13%	3%	4%
NCAR Graphics/NCL	8%	10%	4%			8%	30%	13%	12%	14%
AWIPS	8%	20%	9%				10%	13%	12%	14%
Custom Application	15%	40%	17%	33%		15%	20%	38%	13%	11%
Other	7%	10%	13%	17%		8%	20%	13%	8%	11%
Total number of respondents	59	10	23	6		13	10	8	78	28
Other Categories										
Keyhole Markup Language viewers	41%	50%	35%	17%		23%	60%	25%	35%	36%
Geo-aware Databases	14%	10%	13%			8%	10%	13%	10%	7%
Specialized Spatial Information Systems	5%	10%				8%	10%	13%	5%	4%
GPS/Navigation	37%	20%	26%	50%		31%	50%	25%	26%	29%
TV/Media Graphics	27%	70%		33%		23%	30%	13%	23%	36%
CAD Tools	19%	20%	26%			23%	40%	25%	12%	14%
Image Processing/ Computer Graphics	24%	30%	39%	50%		31%	50%	38%	28%	39%
Other	8%					8%	-	38%	4%	
Total number of respondents	59	10	23	6		13	10	8	78	28
Usefulness of metadata										
Usefulness of metadata	85	89	91	76		79	87	51	81	74
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards										
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	84	80	91	64		88	90	71	75	76

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Primary Sector

	National Oceanic and Atmospheric Administration (NOAA) Employee	Other Federal Government	State Government	Local Government	Government Contractor	Commercial Enterprise	Non-profit business	University or other Educational	Private Citizen	Other
Flood Information	81	76	79	81	80	75	80	75	81	81
Clarity	79	77	78	82	85	75	82	75	82	81
Timeliness	80	78	80	81	81	77	78	74	81	79
Accuracy	83	73	78	79	75	76	74	72	80	80
Organization of information	79	74	79	82	83	74	83	75	81	82
Meets my needs	84	79	78	81	80	72	83	77	83	83
Routine River Forecasts/Observed Conditions	82	78	79	81	81	77	85	77	82	82
Clarity	78	79	79	82	89	78	85	77	83	83
Timeliness	83	79	79	80	83	77	83	78	81	79
Accuracy	85	76	80	80	72	78	84	74	82	84
Organization of information	81	78	80	81	75	78	83	76	82	83
Meets my needs	84	80	79	80	83	74	89	79	83	83
Web Products	82	82	86	83	85	77	86	84	84	83
Clarity	79	85	88	84	89	78	86	85	86	84
Timeliness	81	78	85	83	86	76	85	84	83	79
Accuracy	82	79	86	82	79	79	88	80	84	84
Organization of information	85	84	85	85	84	77	87	85	84	84
Meets my needs	85	82	85	83	84	76	87	85	85	83
Customer Service	91	88	92	93	93	88	97	85	89	91
Overall satisfaction with the NWS staff	91	87	92	92	89	89	100	86	91	92
Importance of direct interaction with NWS staff	90	91	91	93	100	87	93	84	86	89
Drought Information	81	79	83	84	82	77	84	78	84	82
Clarity	80	79	84	83	86	78	86	79	84	81
Timeliness	81	80	81	84	83	75	85	78	83	82
Accuracy	84	77	83	84	78	77	81	74	83	81
Organization of information	82	79	83	85	78	78	83	80	84	82
Meets my needs	83	79	84	86	86	77	90	78	84	84
Water Supply/Reservoir Information	89	78	81	85	71	75	95	75	84	83
Clarity	86	78	82	85	78	75	95	73	85	82
Timeliness	91	80	81	84	67	75	95	77	84	83
Accuracy	90	78	81	85	67	75	95	75	84	84
Organization of information	88	78	82	85	70	76	94	75	84	83
Meets my needs	91	77	82	85	74	72	94	77	84	84
Data Services	91	81	86	87	88	79	90	79	86	84
Timeliness	93	79	88	87	90	81	92	81	86	83
Accuracy	92	84	88	87	82	82	89	81	86	84
Organization of information	88	81	84	86	89	77	87	76	85	83
Meets my needs	90	81	85	86	88	77	92	76	86	84
Customer Satisfaction Index	81	75	80	81	77	74	79	74	80	83
Overall satisfaction with the NWS Hydrologic Services Program	84	83	84	86	84	79	84	82	85	87
How well NWS Hydrologic Services Program meets your expectations	81	69	77	76	73	70	73	68	76	81
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	77	70	76	78	72	70	77	69	79	82
	÷	•								
Likelihood to Take Action	91	84	88	91	84	87	88	84	89	89
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	91	84	88	91	84	87	88	84	89	89
Confidence in NWS	90	83	86	88	81	82	87	84	88	88
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	90	83	86	88	81	82	87	84	88	88
Sample Size	22	106	107	324	10	99	38	59	1088	112

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Sector

	National Oceanic and Atmospheric	Other Federal	State	Local	Government	Commercial	Non-profit	University or other	Private	
	Administration (NOAA) Employee	Government	Government	Government	Contractor	Enterprise	business	Educational	Citizen	Other
What is your primary use of hydrologic information provided by the National Weather Service										
Emergency management	14%	17%	39%	83%	20%	6%	32%	14%	3%	28%
Communication/News	5%		1%	1%		31%	5%	5%	3%	13%
Water resources Agriculture	9%	29%	6% 2%	3% 1%		9% 6%	5%	5% 3%	1% 4%	9%
		1%	2%		10%	5%	3%	3%	4%	1%
Shipping Natural resource management		15%	25%			2%	3% 8%	5%		3%
Consultaria/add value/provide custom hydrologic services		3%	1%	1%	30%	20%	5%	3%		2%
Recreation	5%		2%			4%	8%	12%	14%	3%
Personal Use	50%	4%	12%	5%	30%	4%	24%	31%	69%	19%
Other	18%	20%	11%	6%	10%	12%	11%	22%	4%	23%
Total number of re	espondents 22	106	107	324	10	99	38	59	1088	112
What sector do you represent										
National Oceanic and Atmospheric Administration (NOAA) Employee	100%									
Other Federal Government State Government		100%	100%				-			
Local Government				100%			-			
Government Contractor				100%	100%		-			
Commercial Enterprise						100%	-			
Non-profit business		-		-			100%	-		-
University or other Educational								100%		
Military							-			
Private Citizen	-								100%	
Foreign										
Other										100%
Total number of re	espondents 22	106	107	324	10	99	38	59	1088	112
What is your NOAA line office	05%									
National Weather Service National Environmental Satellite, Data, and Information Service	95%									
National Environmental Satellite, Data, and information Service										
National Ocean Service										
Office of Marine and Aviation Operations										
Office of Oceanic and Atmospheric Research	5%									
Office of Program Planning and Integration										
Other								-	-	
Total number of re	espondents 22									
What federal agency do you represent										
Bureau of Land Management		2%								
Bureau of Reclamation Federal Emergency Management Agency		2% 5%								
Federal Energency Management Agency Federal Highway Administration		5%						-	-	
Federal Energy Regulatory Commission		3%								
Forest Envice		3%								
National Aeronautics and Space Administration										
National Resources Conservation Services		17%								
National Science Foundation										
Nuclear Regulatory Commission		2%								
Office of Surface Mining		1%								
U.S. Army Corps of Engineers		27%								
U.S. Department of Agriculture Agriculture Research Service										
U.S. Department of Interior		25%								
U.S. Environmental Protection Agency Other		12%								
Total number of re		106								
What is the primary scope of your responsibility		100								
National	9%	19%			50%	14%	5%	3%		4%
Regional	41%	41%	4%	1%		28%	13%	17%	3%	17%
Single state	5%	22%	55%	1%		8%	5%	12%	1%	2%
All or parts of multiple counties	18%	12%	25%	5%	20%	24%	29%	8%	1%	18%
Single county		4%	3%	58%		5%	5%	2%	1%	13%
Large city/urban area	5%			8%	10%	2%			1%	1%
Smaller city/township	5%	1%	1%	26%		2%	11%	12%	1%	13%
Personal	14%	1%	7%		10%	5%	21%	31%	91%	17%
Other Total number of a	espondents 22	1% 106	6% 107	2% 324	10%	11% 99	11% 38	15% 59	1% 1088	16% 112
Total number of n	esponuents 22	100	107	324	10	33	30	29	1000	112

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Sector

				-		-					
		National Oceanic and Atmospheric	Other Federal	State	Local	Government	Commercial	Non-profit	University or other	Private	Other
		Administration (NOAA) Employee	Government	Government	Government	Contractor	Enterprise	business	Educational	Citizen	
By what means do you receive text-based National Weather Service hydrologic information											
NWS Web pages		91%	97%	91%	94%	100%	96%	87%	98%	95%	93%
Non-NWS Web pages Phone		36%	33% 30%	25% 14%	25% 26%	40%	34% 8%	32%	25% 8%	18%	29% 13%
Phone Mobile devices/PDA		5%	30%	14%	26%	20%	10%	8%	8% 14%	5%	13%
NOAA Weather Radio		50%	30%	36%	64%	40%	32%	45%	53%	41%	49%
NOAA Weather Natio		5%	1%	7%	8%	40%	5%	3%	2%	2%	49%
Family of Services (FOS)		5%	3%	4%	1%		6%	570	2%	270	1%
Emergency Managers Weather Information Network (EMWIN)			3%	14%	25%	20%	5%	18%	7%	3%	18%
Local or cable TV		32%	34%	42%	47%	80%	26%	39%	46%	41%	38%
Commercial Radio		18%	10%	17%	27%	40%	10%	24%	29%	18%	17%
Satellite radio		5%		2%	2%		2%		5%	3%	3%
Newspaper		9%	16%	13%	15%	30%	7%	16%	19%	14%	14%
Private Vendor			3%	4%	9%		13%	3%	3%	2%	7%
Other		18%	8%	8%	8%	10%	8%	3%	2%	4%	13%
Total n Frequency of using flood watches, flood warnings, and flood statements provided in text format	number of respondents	22	106	107	324	10	99	38	59	1088	112
Several times per day		59%	50%	46%	63%	40%	63%	55%	41%	48%	53%
Once per day		9%	17%	40%	12%	40%	15%	11%	20%	48%	17%
Once per week		9%	8%	7%	5%		4%	3%	10%	7%	4%
Once per work		14%	8%	15%	13%	20%	8%	16%	12%	11%	14%
Do not use		9%	14%	15%	6%	10%	8%	13%	14%	10%	8%
Not familiar with this information			4%	4%	2%		2%	3%	3%	3%	4%
Total r.	number of respondents	22	106	107	324	10	99	38	59	1088	112
Importance of the distinction between a flood warning and a flash flood warning		74	80	85	89	90	81	85	83	85	86
Where 0 is "Not important at all" and 100 is "Very important"		74	80	85	89	90	81	85	83	85	86
Minimum amount of time needed to take effective precautionary actions for flash flood warnings											
Less than 30 minutes		28%	10%	16%	12%	20%	28%	26%	20%	23%	33%
Between 30 and 45 minutes		22%	21% 20%	21%	26% 27%	40%	21%	20%	33% 24%	23%	22% 24%
Between 45 and 60 minutes		28%		26%		20%	18%			23%	
Between 1 and 2 hours More than 2 hours		11%	32% 18%	25% 12%	25% 9%	20%	18% 15%	23%	10% 12%	20%	13% 8%
	number of respondents	18	92	92	296	10	82	35	49	940	96
Minimum amount of time needed to take effective precautionary actions for flood warnings	umber or respondents	10	32	32	230	10	02	35	+9	340	30
Less than 30 minutes		18%	7%	18%	9%		16%	18%	10%	18%	27%
Between 30 and 60 minutes		18%	17%	21%	29%	50%	24%	16%	20%	25%	18%
Between 1 and 2 hours		32%	28%	31%	27%	30%	23%	32%	39%	25%	27%
Between 2 and 6 hours		18%	26%	16%	21%	10%	19%	24%	22%	17%	19%
More than 6 hours		14%	22%	14%	14%	10%	17%	11%	8%	14%	10%
	number of respondents	22	106	107	324	10	99	38	59	1088	112
Frequency of using routine river forecasts provided in text format		200/	17%	19%	20%	40%	24%	18%	14%	15%	21%
Several times per day Once per day		32%	22%	21%	20%		24%	10%	14%	22%	13%
Once per week		14%	22%	21%	18%	10%	14%	16%	19%	22%	25%
Once per week		14%	19%	13%	23%	20%	25%	16%	24%	20%	20%
Do not use		9%	18%	20%	14%	30%	12%	32%	19%	17%	17%
Not familiar with this information		9%	4%	8%	3%		6%	8%	7%	6%	4%
	number of respondents	22	106	107	324	10	99	38	59	1088	112
Frequency of visiting web pages providing a suite of hydrologic information											
Several times per day		29%	19%	12%	16%	30%	18%	14%	14%	13%	14%
Once per day		24%	25%	24%	20%	10%	18%	16%	12%	20%	19%
Once per week		29%	18%	19%	22%	10%	16%	11%	29%	20%	22%
Once per month		10%	19%	16%	21%	40%	27%	30%	22%	22%	15%
Do not use		10%	12% 7%	15% 14%	13% 7%	10%	11% 9%	14%	15%	14% 10%	17% 13%
Not familiar with this information	number of respondents	21	7% 106	14%	7%		9% 99	16% 37	8% 59	10%	13%
Usefulness of providing Flood Warnings and Watches, River Forecasts and other water information on your PDA		71	53	75	322	10 67	63		59	1087	75
Where 0 is "Not at all useful" and 100 is "Very useful"		71	53	75	75	67	63	69	56	61	75
		/1	33	13	15	1 07	33	03	30	01	1.5

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Sector

	National Oceanic and Atmospheric Administration (NOAA) Employee	Other Federal Government	State Government	Local Government	Government Contractor	Commercial Enterprise	Non-profit business	University or other Educational	Private Citizen	Other
Have directly interacted with NWS staff										
Yes	82%	55%	38%	60%	20%	31%	16%	29%	10%	39%
No	18%	45%	62%	40%	80%	69%	84%	71%	90%	61%
Total number of respondent	3 22	106	107	324	10	99	38	59	1088	112
During a typical year, how many hours do you directly interact with NWS staff										
Less than 5 hours	28%	29%	24%	42%		65%	67%	53%	85%	52%
5-10 hours a year	6%	29%	24%	31%	50%	23%	17%	24%	11%	23%
11-25 hours a year	17%	17%	24%	17%	50%	3%		12%	2%	18%
More than 25 hours a year	50%	24%	27%	10%		10%	17%	12%	2%	7%
Total number of respondent	18	58	41	196	2	31	6	17	108	44
Purpose of your personal communications with NWS staff										
Explanation or interpretation of available forecast products	67%	57%	56%	68%	50%	45%	50%	41%	37%	41%
Gain an understanding of forecaster confidence in forecast products	56%	59%	66%	54%	100%	39%	67%	71%	31%	50%
Synthesize available forecast products and information for your specific needs	56%	69%	68%	67%	100%	61%	33%	59%	26%	45%
Get more information from forecaster than available in existing products	61%	67%	78%	70%		68%	17%	35%	57%	57%
Total number of respondent	18	58	41	196	2	31	6	17	108	44
Frequency of using drought information provided in text format										
Several times per day	14%	1%	2%	2%	10%	5%	8%	5%	2%	5%
Once per day	5%	8%	5%	9%	10%	13%	5%	5%	7%	9%
Once per week	23%	25%	17%	15%		14%	11%	25%	15%	19%
Once per month	27%	27%	26%	23%	20%	23%	24%	22%	23%	18%
Do not use	27%	34%	45%	43%	60%	37%	47%	39%	40%	37%
Not familiar with this information	5%	5%	6%	8%		7%	5%	3%	11%	13%
Total number of respondent	3 22	106	107	324	10	99	38	59	1088	112
Frequency of using information on water supply and/or reservoir information provided in text format										
Several times per day	14%	3%	5%	2%		3%	5%	2%	2%	2%
Once per day	5%	6%	6%	5%	20%	14%	3%	3%	5%	4%
Once per week	14%	12%	12%	10%		5%	3%	8%	8%	20%
Once per month	27%	23%	17%	16%	10%	13%	16%	27%	15%	16%
Do not use	32%	45%	49%	51%	70%	51%	61%	51%	52%	44%
Not familiar with this information	9%	11%	12%	15%		14%	13%	8%	17%	14%
Total number of respondent	s 22	106	107	324	10	99	38	59	1088	112
Usefulness of displaying observations and forecasts of water resources properties	77	80	79	76	82	76	76	81	77	78
Where 0 is "Not at all useful" and 100 is "Very useful"	77	80	79	76	82	76	76	81	77	78
Usefulness of displaying water supply volume inflow forecast information	81	71	71	69	76	75	72	78	70	73
Where 0 is "Not at all useful" and 100 is "Very useful"	81	71	71	69	76	75	72	78	70	73
Downloaded the data provided by the National Weather Service in the last year										
Yes	36%	62%	64%	57%	90%	59%	45%	63%	38%	60%
No	64%	38%	36%	43%	10%	41%	55%	37%	62%	40%
Total number of respondent	3 22	106	107	324	10	99	38	59	1088	112
Usefulness of expanding our data services	86	84	80	83	83	79	84	86	77	79
Where 0 is "Not at all useful" and 100 is "Very useful"	86	84	80	83	83	79	84	86	77	79

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Internet Services Primary Sector

	National Oceanic and Atmospheric	Other Federal	State	Local	Government	Commercial	Non-profit	University or other	Private	
	Administration (NOAA) Employee	Government	Government	Government	Contractor	Enterprise	business	Educational	Citizen	Other
River conditions map						2	24011000	Lucutional		
Visual appeal	81	72	71	78	85	73	78	67	71	79
Ease of understanding	88	78	78	80	74	78	80	75	75	80
Tells me what I need to know about river conditions throughout the country	83	79	79	84	59	79	87	71	76	81
General river basin										
Visual appeal	67	56	61	74	67	71	62	74	67	74
Ease of understanding	74	67	70	77	67	72	70	76	70	74
Tells me what I need to know about river conditions throughout the country	74	65	69	78	56	69	65	69	69	74
River conditions regional map	1									
Visual appeal	86	77	85	89	78	84	92	86	86	90
Ease of understanding	83	83	86	90	78	86	94	85	88	90
Tells me what I need to know about river conditions throughout the country	83	80	83	91	63	82	90	87	85	88
Current flood conditions	00	70	00	00	67	84	91	05	84	88
Visual appeal Ease of understanding	88	76 79	86 85	89 90	67	84 86	91 85	85 87	86	90
Tells me what I need to know about current flooding conditions	88	79	82	90	59	85	89	85	85	90
Hydrograph level/flow	00		02	31	35	00	03	00	00	30
Visual appeal	89	83	89	89	89	82	94	89	84	89
Ease of understanding	94	84	87	89	89	86	91	90	87	90
Tells me what I need to know about forecast levels	92	87	87	90	78	86	98	90	88	90
Hydrograph flood severity	02	0,	01	00	10		00		00	<u> </u>
Visual appeal	92	84	90	89	89	84	95	85	87	87
Ease of understanding	96	84	89	90	81	87	93	92	88	87
Tells me what I need to know about flood impacts	88	83	88	89	78	83	98	82	86	86
Hydrograph low flow threshold										
Visual appeal	88	83	84	84	89	84	83	85	81	89
Ease of understanding	86	81	82	87	85	84	88	88	83	90
Tells me what I need to know about low flow	79	79	84	85	81	84	88	77	81	91
Usefulness of hydrograph when making decisions during periods of low flow	90	83	90	83	67	79	93	81	80	89
Flood depth map	1									
Visual appeal	88	80	88	90	89	85	92	90	83	92
Ease of understanding	85	79	89	90	89	83	82	90	82	90
Tells me what I need to know about the depth of the water	88	80	86	92	89	86	76	92	84	90
Usefulness of areal extent and depth of floodwaters in decision making process	89	85	90	94	89	90	82	97	86	95
Geographic region map	00	84	05	07	00	87	84	87	00	90
Visual appeal Ease of understanding	86	84	85 80	87 86	89 89	87	84	87	83 80	90 89
Tells me what I need to know about river forecasts	92	83	82	89	89	89	84	90	84	91
High-resolution precipitation estimates map	52	03	02	09	09	09	04	90	04	31
Visual appeal	93	92	89	90	89	90	95	94	89	86
Ease of understanding	97	90	89	90	89	88	98	94	90	86
Tells me what I need to know about precipitation estimates	96	85	86	89	89	88	98	91	88	86
Do you use precipitation frequency estimates										
Yes	88%	87%	55%	60%	67%	43%	50%	50%	40%	70%
No	13%	13%	45%	40%	33%	57%	50%	50%	60%	30%
Total number of respondents		38	31	80	3	23	12	16	246	30
Familiar with Precipitation Frequency Data Server web page										
Yes	100%	64%	41%	56%	100%	90%	33%	50%	50%	48%
No		36%	59%	44%		10%	67%	50%	50%	52%
Total number of respondents	7	33	17	48	2	10	6	8	98	21
How useful would it be for the remainder of the US to have updated precipitation frequency estimates										
Usefulness of having updated precipitation frequency estimates	92	86	83	85	100	89	74	88	85	86
Do you use PMP estimates										4
Yes	75%	71%	45%	34%		35%	33%	38%	21%	50%
No	25%	29%	55%	66%	100%	65%	67%	63%	79%	50%
Total number of respondents	8	38	31	80	3	23	12	16	246	30
Familiar with Hydrometeorological Reports web page	4000/	500/	040/	400/		500/	500/	500/	570/	070/
Yes	100%	56%	21%	48%		50%	50%	50%	57%	67%
No	6	44% 27	79% 14	52% 27		50% 8	50% 4	50%	43%	33%
Total number of respondents Usefulness of updated guidelines for PMP estimates	D	21	14	21		δ	4	D	51	15
Usefulness of updated guidelines for PMP estimates Usefulness of updated guidelines for PMP estimates	91	94	92	88		93	89	93	89	93
Useruniess of updated guidenness IOI FINIF estimates	31	34	92	00		30	03	93	03	30

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Water Resources Services Primary Sector

	National Oceanic and Atmospheric	Other Federal	State	Local	Government	Commercial	Non-profit	University or other	Private Citizen	Other
	Administration (NOAA) Employee	Government	Government	Government	Contractor	Enterprise	business	Educational		
Observed drought conditions map Usefulness of observed drought conditions in decision making process	83	85	80	86	78	83	78	85	82	83
Useral appeal	96	88	87	93	67	88	89	94	90	90
Ease of understanding	91	87	87	93	100	89	89	86	91	91
Tells me what I need to know about drought conditions	93	87	84	90	67	90	83	77	89	90
Drought trends map	81	79	78	81	56	80	81	81	82	83
Usefulness of trends for drought over next three months in decision making process Visual appeal	93	86	86	93	44	81	94	96	82	91
visuur appeal Ease of understanding	89	86	87	92	44	84	97	90	90	93
Tells me what I need to know about forecasted drought conditions	91	84	87	92	44	80	92	83	87	89
Observed water temperatures map										
Usefulness of observed water temperatures in decision making process	87	67	65	66	44	68	94	78	72	74
Visual appeal Ease of understanding	87 89	85 84	82 82	92 91	-	80 82	89 94	88 85	88 89	92 93
Ease of understanding Tells me what I need to know about the water temperatures Tells me what I need to know about the water temperatures	91	83	79	90		85	94	89	89	92
Usefulness of receiving water temperature forecasts for rivers, streams and lakes for the next five days	87	64	72	80	-	72	83	81	78	83
Snow depth map	•									
Usefulness of snow depth map in decision making process	87	77	80	87	67	71	86	88	87	84
Visual appeal Ease of understanding	96	86 85	86 86	92 93	78 78	85 84	94 94	94 93	90 92	91 92
Lase of understantung Tells me what I need to know about snow depth Tells me what I need to know about snow depth	96	86	85	93	78	83	94	93	92	92
National analysis of the amount of water contained in snow			00			00			~~	
Usefulness of estimates of amount of water contained in snow	91	78	82	90	67	75	89	82	83	84
Visual appeal	89	87	85	92	44	86	94	89	89	93
Ease of understanding Tells me what I need to know about water contained in snow	<u>89</u> 91	86 86	84 85	92	78 56	86 84	94 89	85 86	89 89	94 93
Letis me what Lineed to Know about water contained in show Soil moisture map	91	86	85	90	56	84	89	86	89	93
Soir moisture map Usefulness of soil moisture in decision making	83	74	78	84	67	88	89	85	79	76
Visual appeal	85	83	82	91	56	84	96	90	90	90
Ease of understanding	85	82	83	92	78	85	96	90	90	91
Tells me what I need to know about soil moisture	89	80	88	88	44	88	100	86	90	90
At what soil depths is soil moisture information important to you Surface and near-surface	100%	73%	75%	73%	100%	85%	67%	70%	67%	85%
Sub-suface and rear sources	83%	50%	58%	58%		62%	100%	90%	70%	62%
Deeper sub-surface, down to 2-3 meters	33%	35%	25%	24%		31%	67%	30%	25%	54%
Total number of respondents	6	26	24	33	1	13	3	10	92	13
Information more valuable to you	33%	42%	50%	55%	100%	62%		20%	38%	38%
A single value describing bulk soil moisture Soil moisture at multiple discrete levels	33%	42% 58%	50%	45%	100%	62% 38%	100%	20%	38%	38%
Son master at multiple discrete reveis Total number of respondents	6	26	24	33	1	13	3	10	92	13
Usefulness of water resources properties forecast	0					10			UL.	10
Usefulness of water resource properties forecast for current conditions	98	91	88	87	100	97	100	95	90	86
Usefulness of water resource properties forecast for 48-72 hours	89	86	73	86	100	91	86	83	85	84
Usefulness of water resource properties forecast for 3-5 days	91	80	67	78	89	87	83	70	77	76
Usefulness of water resource properties forecast for 5-7 days Usefulness of water resource properties forecast for more than 1 week to 1 month	85	73 62	66 63	72 63	78 56	85 74	81 78	60 58	73 65	75 71
Usefulness of water resource properties forecast for more than 1 month	76	57	56	53	56	74	81	61	59	70
Spatial scale describing the extent of coverage unit for which information would be important in your organization										
National	17%	9%	3%	5%		20%	25%		12%	6%
Regional	17%	42%	30%	22%	100%	27%	25%	33%	26%	38%
Group(s) of watersheds within a large river basin Single watershed	17%	27% 15%	30% 30%	54% 16%		40% 7%	25%	50% 8%	22% 26%	31% 19%
Sub-vatershed	50%	6%	6%	3%		7%	25%	8%	14%	6%
Total number of respondents		33	33	37	1	15	4	12	113	16
Usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant	•									
Usefulness of receiving analytical products calculated from water resources data	89	82	79	80	100	85	94	88	79	84
Continue to water managers' questions Yes	67%	82%	42%	46%		53%	50%	50%	19%	56%
165 No	33%	18%	58%	54%	100%	47%	50%	50%	81%	44%
Total number of respondents		33	33	37	1	15	4	12	112	16
Water supply volume inflow forecast map	•									
Usefulness of water supply volume inflow forecast map	94	79 83	76 91	89 94		81 84	100 94	72 98	78 84	78 90
Visual appeal Ease of understanding	94 92	83	91 88	94 93		84 83	94 94	98	84 89	90
Ease or unicet startuning Tells me what I need to know about the water supply forecast	92	82	91	90		86	94	80	84	87
Usefulness of water supply volume inflow forecast may for the entire United States	93	86	89	97		94	100	84	89	78
Water supply volume inflow forecast progression										
Usefulness of water supply volume inflow forecast progression	94	79	66	91		88	94	82	82	81
Visual appeal	92 81	86	84 83	98 97		89 89	94 94	89 84	82	83 83
Ease of understanding Tells me what I need to know about the seasonal water supply forecast evolution	81 89	83	83	97 95		89 90	94	84	85 90	83
Tensi ne what need to know about the seasonal water supply interast evolution Monthly ensemble volume forecast		03	00	35					30	00
Usefulness of monthly ensemble volume forecasts	94	76	68	87		83	100	87	74	76
Visual appeal	89	78	83	95		84	94	87	85	89
Ease of understanding	83	76	83	90		79	89	84	83	87
Tells me what I need to know about water supply volume forecast uncertainty Usefulness of climate sensitivity studies	83	81	81	87		86	100	87	91	91
Usefulness of climate sensitivity studies Usefulness of climate sensitivity studies	89	68	61	78		65	100	69	77	65
Climate sensitivity study						00	100			
Visual appeal	83	70	70	93		80	89	86	74	87
Ease of understanding	78	68	70	90		76	83	72	73	87
Tells me what I need to know about climate sensitivity for a select river forecast point	83	70	74	87		85	100	83	76	89

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Primary Sector

	National Oceanic and Atmospheric	Other Federal	State	Local	Government	Commercial	Non-profit	University or other	Private	
	Administration (NOAA) Employee	Government	Government	Government	Contractor	Enterprise	business	Educational	Citizen	Other
Usefulness of having access to Flood Watches and Warnings										
Usefulness of having access to Flood Watches and Warnings as text	93	83	84	93		74	67	81	89	94
Usefulness of having access to Flood Watches and Warnings coded in XML, including CAP	78	72	67	86		74	78	78	70	87
Usefulness of having access to Polygons specifying the area covered by Flood Watches and Warnings	89	82	84	95		73		81	86	87
Observations										
Precipitation	100	98	98	95		94	100	93	96	99
Snow accumulation	94	78	91	85		82	78	73	92	97
Snow water equivalent	91	79	87	80		84	56	73	80	97
River stage/flow	100	89	95	91		97	89	98	85	97
Soil moisture	83	71	81	79		79	56	86	71	92
Air Temperature	94	78	81	88		82	78	91	89	94
Dew point	93	63	71	81		78	78	87	86	89
Wind speed	85	68	75	91		81	78	88	87	91
Atmospheric freezing level	83	53	67	74		70	33	74	71	82
Potential evaporation Soil frost depth	78	73	72 66	71 69		81 71	78 100	83 61	68 66	82 86
Forecast	78	52	66	69		71	100	61	66	80
Precipitation	100	94	91	94		91	100	95	97	99
Temperature	98	82	83	94		85	100	95	97 93	99
Instantaneous streamflow/stage	98	87	85	90		90	100	87	82	99
Streamflow or stage forecast uncertainty information	93	85	80	87		90 87	100	86	78	91
Cumulative streamflow	80	75	81	81		83	100	71	75	85
Atmospheric freezing level	80	51	70	72		68	56	60	68	85
Basin Boundaries	80	51	10	12		00	50	00	00	05
Basin boundaries	87	88	87	79		90	100	89	76	90
Historical data used to calibrate models	61	00	01	13		50	100	03	10	30
Historical data used to calibrate models	80	87	75	77		87	78	85	73	87
Hydrologic Model		0.	10			0,	10		10	01
Hydrologic model parameters	76	78	69	72		87	56	86	66	84
Hydrologic model states	78	74	65	72		85	56	83	66	86
Unit Hydrograph parameters	80	83	76	73		85	78	82	67	80
Routing Parameters			. 9						÷.	
Routing parameters	85	85	63	72		77	56	80	65	81
Rating Curve										
Rating Curve	91	88	74	73		81	56	81	65	83
Raw ensemble streamflow prediction traces										
Raw ensemble streamflow prediction traces	76	73	67	72		75	78	83	69	79
Climate forecast adjusted ensemble streamflow prediction traces										
Climate forecast adjusted ensemble streamflow prediction traces	83	72	73	73		75	67	85	70	79
Statistical Water Supply Forecast										
Statistical Water Supply Forecast	74	73	81	70		76	56	75	74	80
Flash Flood Guidance										
Flash Flood Guidance	89	76	81	90		80	67	91	89	87
Text										
ASCII	96	86	87	82		83	100	80	82	86
XML	80	74	74	86		85	78	78	76	86
Point Data										
ASCII	84	88	86	83		79	100	80	78	90
XML	73	79	72	86		85	78	80	77	89
SHEF	83	78	65	65		60	33	69	53	88
Shapefile	82	87	93	85		71	33	84	55	90
KML	78	79	68	76		62	33	78	56	89
Lines, Vectors, and Contours		00	05	07		74		70	70	00
ASCII	80	82	85	67		74		72	73	90
XML	76	75	71	82		72		72	75	90
Shapefile KMI	78	88	91	85 79		70 61		87	62	93 91
	76	11	63	/9		01		75	101	91
Grids, Arrays, and Rasters	03	00	70	60		77	100	74	70	96
ASCII	69	82	78	69		77		71	72	86
Shapefile	89	90	86	84		71	100	81	61	88
KML	84 73	75	63	75		60	100	65	59	89
GeoTIFF		86	84	85		75	100	77	68	93
Dia second describion of Mandallia	13									
Bit-mapped graphics + Worldlife	80	81	73	80		63	100	69	70	86
NetCDF	80 87	81 69	47	63		44	100	67	61	83
	80	81								

#### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Primary Sector

Digital Information Availability Download Web map service	National Oceanic and Atmospheric Administration (NOAA) Employee	Other Federal Government	State Government	Local Government	Government Contractor	Commercial Enterprise	Non-profit business	University or other	Private	Other
Download Web map service	96						Jusiness	Educational	Citizen	Other
Download Web map service						• •				
Web map service		90	93	91		90	100	95	81	95
		90	92	95		86	78	86	91	89
Web feature service	93	90	90	95		79	56	86	90	87
Web coverage service	85	89	90	95		77	56	80	89	86
RSS	94	77	66	88		69	44	81	76	93
WAP	84	70	70	88		67	22	83	71	96
GIS - Commercial						<u>.</u>				
ESRI	67%	61%	73%	52%		40%		73%	13%	25%
Intergraph	17%	14%	5%	2%				9%	8%	
Idrisi	17%	4%		5%					4%	
Erdas Imagine	17%	11%		2%				9%	3%	
ENVI	17%	4%	5%	5%		7%		9%	3%	
Autodesk	33%	14%	9%	11%		27%		18%	8%	17%
Custom Application	17%	18%	14%	23%		40%		9%	16%	25%
Other	17%	7%	9%	7%		7%		27%	5%	25%
Total number of responden	s 6	28	22	44		15	1	11	96	12
GIS - Open Services										
GRASS	67%	11%		7%		13%	1	18%	8%	1
SAGA	17%	4%	9%	5%			1	9%	4%	-
ILWIS (GNU)	17%	7%	5%	2%		7%	1		5%	-
Geotools	50%	18%	18%	27%			1	27%	16%	8%
Custom Application	17%	11%	14%	18%		27%	-	18%	18%	25%
Other		7%	5%	11%		7%	-	27%	6%	17%
Total number of responden	s 6	28	22	44		15	1	11	96	12
Scientific Data Analysis, Modeling, and Visualization										
IDL	17%	11%		5%		7%			7%	
PV-Wave	17%	7%		5%					4%	
MatLab	17%	18%	5%	2%		7%		45%	9%	
Vis5D	17%	7%	5%						4%	
GEMPAK	67%	11%	5%			20%			4%	
CrADS	17%	7%	5%	2%		7%			4%	
AVS5	17%	7%	5%	2%					3%	
NCAR Graphics/NCL	17%	11%	9%	5%		7%		45%	10%	8%
AWIPS	83%	18%	5%	11%					7%	8%
Custom Application	17%	18%	18%	18%		33%		9%	13%	25%
Other		14%	5%	5%		7%		27%	9%	17%
Total number of responden	s 6	28	22	44		15	1	11	96	12
Other Categories										
Keyhole Markup Language viewers	83%	32%	41%	48%		47%		45%	25%	50%
Geo-aware Databases	17%	14%	5%	16%				18%	9%	8%
Specialized Spatial Information Systems	17%	7%	5%	7%					4%	8%
GPS/Navigation	50%	21%	36%	41%		20%		55%	27%	17%
TV/Media Graphics	33%	11%	18%	30%		27%		36%	26%	42%
CAD Tools	17%	29%	27%	18%		20%		27%	13%	
Image Processing/ Computer Graphics	50%	39%	36%	32%		33%	-	45%	26%	25%
Other		4%	5%	9%			-		6%	
Total number of responden	s 6	28	22	44		15	1	11	96	12
Usefulness of metadata										
Usefulness of metadata	91	89	81	84		79	78	90	74	93
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards										
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	98	87	90	87		81		90	69	92

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Primary Scope of Responsibility

	National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
Flood Information	72	77	78	78	81	78	82	82	77
Clarity	73	78	77	78	81	78	84	82	80
Timeliness	76	79	79	78	80	77	81	81	75
Accuracy	72	76	78	76	79	74	79	81	76
Organization of information	70	77	77	79	83	80	83	81	76
Meets my needs	72	77	79	78	81	78	82	84	77
Routine River Forecasts/Observed Conditions	74	78	81	79	81	79	82	83	81
Clarity	73	79	80	79	82	78	84	84	82
Timeliness	76	79	80	78	80	79	80	82	79
Accuracy	75	76	81	79	82	80	81	83	80
Organization of information	71	78	82	80	82	80	82	82	80
Meets my needs	74	78	82	79	81	78	82	83	80
Web Products	76	80	85	83	83	84	84	85	81
Clarity	79	82	87	84	84	83	86	86	82
Timeliness	74	79	85	81	83	83	83	84	80
Accuracy	76	80	85	83	83	84	83	84	80
Organization of information	77	81	85	84	84	86	85	85	83
Meets my needs	74	80	84	84	83	84	84	85	82
Customer Service	76	87	94	91	92	94	93	90	94
Overall satisfaction with the NWS staff	72	87	93	93	92	93	93	92	96
Importance of direct interaction with NWS staff	84	87	95	89	92	97	94	86	90
Drought Information	69	77	82	83	84	82	83	84	80
Clarity	69	78	82	82	84	80	83	84	81
Timeliness	70	77	81	83	84	82	83	84	79
Accuracy	71	76	82	83	83	82	83	84	77
Organization of information	68	79	83	83	85	82	82	84	81
Meets my needs	68	78	84	86	86	83	83	85	79
Water Supply/Reservoir Information	72	77	82	84	88	80	81	85	80
Clarity	70	78	82	84	88	79	83	85	79
Timeliness	76	77	83	83	87	82	79	84	80
Accuracy	75	75	82	85	87	80	82	84	80
Organization of information	71	77	82	83	87	81	82	84	80
Meets my needs	68	77	83	84	88	79	80	85	80
Data Services	78	82	86	84	85	86	86	86	81
Timeliness	74	82	86	85	85	84	86	87	82
Accuracy	81	84	88	84	86	86	87	87	83
Organization of information	80	79	84	82	85	88	85	86	81
Meets my needs	76	82	85	84	85	85	84	87	79
Customer Satisfaction Index	72	77	78	79	81	77	81	81	77
Overall satisfaction with the NWS Hydrologic Services Program	78	82	84	84	87	83	86	85	81
How well NWS Hydrologic Services Program meets your expectations	67	72	75	74	76	73	77	76	74
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	68	75	73	76	79	73	78	79	74
Likelihood to Take Action	80	87	89	87	90	90	90	89	86
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	80	87	89	87	90	90	90	89	86
Confidence in NWS	80	84	87	84	88	84	88	88	85
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	80	84	87	84	88	84	88	88	85
Sample Size	54	153	112	137	230	38	128	1052	72

# NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Scope of Responsibility

	National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
What is your primary use of hydrologic information provided by the National Weather Service									
Emergency management	17%	15%	27%	31%	76%	55%	63%	3%	31%
Communication/News Water resources	7% 11%	14% 20%	4% 11%	18% 8%	2% 1%	3% 3%	5% 5%	2%	4% 4%
Agriculture	7%	1%	5%	8% 4%	2%	3%	3%		4% 6%
Shipping	2%	2%	578	4 %	1%			4 /8	1%
Natural resource management	9%	6%	17%	11%	1%		2%		7%
Consulting/add value/provide custom hydrologic services	20%	7%	4%	4%	2%	5%			1%
Recreation	2%	5%	3%	2%	1%	3%	4%	14%	6%
Personal Use	9%	15%	8%	12%	5%	26%	11%	72%	17%
Other	15%	15%	21%	9%	9%	5%	6%	4%	24%
Total number of respondents	54	153	112	137	230	38	128	1052	72
What sector do you represent									
National Oceanic and Atmospheric Administration (NOAA) Employee	4%	6%	1%	3%		3%	1%		1%
Other Federal Government	37%	28%	21%	9%	2%		1%		1%
State Government		3%	53%	20%	1%	719/	1%	1%	8%
Local Government Government Contractor	 9%	3%	2%	11% 1%	82%	71%	65%		7% 1%
Government Contractor Commercial Enterprise	26%	18%	7%	18%	2%	5%	2%		15%
Commercial Enterprise	4%	3%	2%	8%	1%		3%		6%
University or other Educational	4%	7%	6%	4%			5%	2%	13%
Military	2%	1%	2%						3%
Private Citizen	7%	19%	5%	11%	6%	16%	11%	94%	19%
Foreign		1%		1%					
Other	7%	12%	2%	15%	6%	3%	12%	2%	25%
Total number of respondents	54	153	112	137	230	38	128	1052	72
What is your NOAA line office									
National Weather Service	100%	100%	100%	100%		100%	100%	100%	
National Environmental Satellite, Data, and Information Service									
National Marine Fisheries Service									
National Ocean Service									
Office of Marine and Aviation Operations									
Office of Oceanic and Atmospheric Research Office of Program Planning and Integration									100%
Other Other									
Total number of respondents	2	9	1	4		1	1	3	1
What federal agency do you represent	-	, , , , , , , , , , , , , , , , , , ,						0	
Bureau of Land Management	10%								
Bureau of Reclamation		5%							
Federal Emergency Management Agency	5%	9%							
Federal Highway Administration	5%								
Federal Energy Regulatory Commission	10%	2%					-		
Forest Service	5%	5%							
National Aeronautics and Space Administration									
National Resources Conservation Services	20%	5%	26%	23%	75%	-			
National Science Foundation									
Nuclear Regulatory Commission Office of Surface Mining	10%	2%							
U.S. Army Corps of Engineers		2% 51%	 17%	15%	25%				
U.S. Department of Agriculture Agriculture Research Service									
U.S. Department of Interior	20%	12%	52%	31%			100%		100%
U.S. Environmental Protection Agency									
Other	15%	9%	4%	31%				100%	
Total number of respondents	20	43	23	13	4		1	1	1
What is the primary scope of your responsibility									
National	100%								
Regional		100%							
Single state			100%	-					
All or parts of multiple counties				100%					
Single county					100%				
Large city/urban area						100%			
Smaller city/township				-			100%		
Personal								100%	
Other Total support of recordents									100%
Total number of respondents	54	153	112	137	230	38	128	1052	72

# NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Scope of Responsibility

	Natio	nal Re	gional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
By what means do you receive text-based National Weather Service hydrologic information										
NWS Web pages	98%		96%	95%	94%	94%	97%	92%	95%	94%
Non-NWS Web pages	46%		33%	34%	28%	24%	26%	23%	17%	32%
Phone	17%		24%	18%	12%	27%	18%	11%	3%	15%
Mobile devices/PDA	11%		8%	10%	12%	23%	26%	21%	5%	13%
NOAA Weather Radio	17%		36%	32%	50%	64%	63%	53%	42%	40%
NOAA Weather Wire	7%		4%	5%	4%	7%	16%	3%	1%	1%
Family of Services (FOS)	6%		5%	4%	3%			2%		
Emergency Managers Weather Information Network (EMWIN)	7%		8%	9%	18%	24%	21%	14%	3%	14%
Local or cable TV	37%		33%	37%	40%	42%	55%	42%	42%	42%
Commercial Radio	20%		15%	13%	15%	25%	39%	21%	17%	28%
Satellite radio	6%		2%	1%		3%	5%	2%	3%	6%
Newspaper	11%		14%	12%	13%	15%	26%	14%	14%	17%
Private Vendor	6%		5%	8%	11%	6%	24%	5%	2%	
Other	7%		10%	7%	4%	9%	13%	6%	4%	11%
Total number of	f respondents 54		153	112	137	230	38	128	1052	72
Frequency of using flood watches, flood warnings, and flood statements provided in text format										
Several times per day	39%		59%	49%	61%	57%	66%	61%	46%	56%
Once per day	22%		14%	14%	12%	13%	13%	17%	22%	21%
Once per week	6%		7%	8%	5%	5%	5%	5%	7%	1%
Once per month	15%	,	8%	13%	10%	16%	5%	9%	12%	10%
Do not use	13%		10%	13%	10%	6%	8%	7%	11%	8%
Not familiar with this information	6%		2%	4%	1%	2%	3%	2%	3%	4%
Total number of			153	112	137	230	38	128	1052	72
Importance of the distinction between a flood warning and a flash flood warning	80		83	83	86	88	88	87	85	84
Where 0 is "Not important at all" and 100 is "Very important"	80		83	83	86	88	88	87	85	84
Minimum amount of time needed to take effective precautionary actions for flash flood warnings								<u>,</u>		
Less than 30 minutes	21%		18%	21%	16%	14%	15%	18%	24%	22%
Between 30 and 45 minutes	19%		23%	23%	32%	26%	24%	23%	23%	13%
Between 45 and 60 minutes	17%		19%	27%	29%	26%	26%	24%	23%	20%
Between 1 and 2 hours	21%		26%	20%	14%	25%	26%	24%	20%	22%
More than 2 hours	23%		15%	9%	8%	9%	9%	10%	10%	23%
Total number of			133	96	119	203	34	115	908	64
Minimum amount of time needed to take effective precautionary actions for flood warnings	i i coportaorno i c		100	00	110	200	01	110	000	
Less than 30 minutes	11%		13%	14%	14%	10%	16%	15%	19%	15%
Between 30 and 60 minutes	26%		18%	21%	25%	30%	32%	28%	24%	17%
Between 1 and 2 hours	26%		25%	30%	32%	28%	21%	23%	26%	25%
Between and 6 hours	20%		25%	18%	17%	21%	21%	20%	17%	18%
Between 2 and o hours	17%		18%	16%	12%	11%	11%	14%	13%	25%
Total number of			153	112	137	230	38	128	1052	72
Frequency of using routine river forecasts provided in text format			100	112	137	200	50	120	1002	12
Several times per day	22%		22%	23%	17%	20%	13%	23%	14%	19%
Once per day	13%		22%	19%	16%	20%	26%	20%	21%	19%
Once per week	20%		22%	20%	19%	18%	20%	16%	21%	13%
Once per month	20%		18%	16%	23%	23%	18%	23%	20%	22%
Do not use	19%		18%	19%	19%	15%	16%	23%	17%	19%
Not familiar with this information	19%		5%	4%	6%	4%	5%	5%	6%	7%
Total number of			5% 153	4%	137	230		5%	1052	72
	respondents 54		103	112	13/	230	38	128	1052	12
Frequency of visiting web pages providing a suite of hydrologic information	0.40/		1.00/	179/	109/	170/	119/	159/	1.29/	159/
Several times per day	24%		18%	17%	12%	17%	11%	15%	13%	15%
Once per day	24%		23%	22%	22%	18%	19%	20%	19%	27%
Once per week	20%		20%	20%	21%	21%	25%	23%	20%	15%
Once per month	20%		18%	15%	28%	22%	17%	21%	22%	14%
Do not use	6%		14%	16%	9%	15%	14%	11%	15%	10%
Not familiar with this information	6%		8%	10%	8%	7%	14%	11%	10%	18%
Total number of			153	111	136	230	36	128	1051	71
Usefulness of providing Flood Warnings and Watches, River Forecasts and other water information on your PDA	64		63	67	72	75	77	69	61	59
Where 0 is "Not at all useful" and 100 is "Very useful"	64		63	67	72	75	77	69	61	59

# NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Primary Scope of Responsibility

		National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
Have directly interacted with NWS staff										
Yes		33%	53%	41%	45%	62%	53%	34%	9%	25%
No		67%	47%	59%	55%	38%	47%	66%	91%	75%
Total nu	mber of respondents	54	153	112	137	230	38	128	1052	72
During a typical year, how many hours do you directly interact with NWS staff										
Less than 5 hours		39%	41%	17%	54%	38%	40%	63%	85%	72%
5-10 hours a year		28%	22%	35%	26%	34%	15%	21%	9%	11%
11-25 hours a year		11%	12%	22%	11%	20%	15%	14%	3%	11%
More than 25 hours a year		22%	25%	26%	8%	8%	30%	2%	3%	6%
Total nu	mber of respondents	18	81	46	61	142	20	43	93	18
Purpose of your personal communications with NWS staff										
Explanation or interpretation of available forecast products		44%	58%	57%	46%	68%	60%	60%	38%	44%
Gain an understanding of forecaster confidence in forecast products		50%	58%	65%	49%	57%	55%	47%	26%	61%
Synthesize available forecast products and information for your specific needs		61%	57%	78%	56%	63%	60%	65%	26%	56%
Get more information from forecaster than available in existing products		61%	69%	72%	51%	70%	80%	47%	57%	83%
Total nu	mber of respondents	18	81	46	61	142	20	43	93	18
Frequency of using drought information provided in text format										
Several times per day		7%	5%	3%	4%	2%	5%	1%	3%	3%
Once per day		6%	9%	7%	11%	6%	11%	9%	7%	8%
Once per week		22%	19%	19%	18%	17%	18%	16%	15%	14%
Once per month		20%	24%	26%	25%	25%	21%	22%	23%	26%
Do not use		39%	38%	41%	36%	41%	39%	42%	40%	40%
Not familiar with this information		6%	5%	4%	6%	10%	5%	9%	12%	8%
Total nu	mber of respondents	54	153	112	137	230	38	128	1052	72
Frequency of using information on water supply and/or reservoir information provided in text format										
Several times per day		6%	4%	4%	2%	2%	3%	2%	2%	3%
Once per day		7%	10%	7%	11%	5%	5%	5%	5%	4%
Once per week		4%	12%	14%	12%	10%	3%	11%	8%	14%
Once per month		24%	19%	17%	18%	16%	24%	22%	14%	14%
Do not use		48%	44%	46%	46%	50%	50%	48%	53%	54%
Not familiar with this information		11%	10%	12%	11%	17%	16%	12%	18%	11%
Total nu	mber of respondents	54	153	112	137	230	38	128	1052	72
Usefulness of displaying observations and forecasts of water resources properties		81	79	79	78	76	75	79	77	76
Where 0 is "Not at all useful" and 100 is "Very useful"		81	79	79	78	76	75	79	77	76
Usefulness of displaying water supply volume inflow forecast information		82	74	69	73	68	78	69	70	72
Where 0 is "Not at all useful" and 100 is "Very useful"		82	74	69	73	68	78	69	70	72
Downloaded the data provided by the National Weather Service in the last year					-				-	
Yes		61%	62%	69%	55%	60%	53%	46%	37%	54%
No N		39%	38%	31%	45%	40%	47%	54%	63%	46%
	mber of respondents	54	153	112	137	230	38	128	1052	72
Usefulness of expanding our data services		85	81	85	80	83	83	82	77	78
Where 0 is Not at all useful and 100 is "Very useful"		85	81	85	80	83	83	82	77	78
there are not an aborat and 100 to Very doctal		00	01	00	00	00	00	02		10

		National			Regional	
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	78	72		77	77	
Clarity	79	73		78	78	
Timeliness	77	76		79	79	
Accuracy	79	72		73	76	
Organization of information	77	70		76	77	
Meets my needs	80	72		78	77	
Routine River Forecasts/Observed Conditions	81	74		78	78	
Clarity	81	73		79	79	
Timeliness	82	76		80	79	
Accuracy	83	75		75	76	
Organization of information	80	71		78	78	
Meets my needs	79	74		78	78	
Web Products	81	76		78	80	
Clarity	81	79		79	82	
Timeliness	81	74		80	79	
Accuracy	83	76		75	80	
Organization of information	80	77		77	81	
Meets my needs	81	74		76	80	
Customer Service		76		-	87	
Overall satisfaction with the NWS staff		72			87	
Importance of direct interaction with NWS staff		84			87	
Drought Information	78	69		74	77	
Clarity	76	69		74	78	
Timeliness	77	70		75	77	
Accuracy	80	71		73	76	
Organization of information	78	68		75	79	
Meets my needs	79	68		75	78	
Water Supply/Reservoir Information	78	72		75	77	
Clarity	78	70		76	78	
Timeliness	78	76		76	77	
Accuracy	80	75		73	75	
Organization of information	76	71		75	77	
Meets my needs	80	68		75	77	
Data Services		78		-	82	
Timeliness		74			82	
Accuracy		81			84	
Organization of information		80			79	
Meets my needs		76			82	
Customer Satisfaction Index	75	72		74	77	
Overall satisfaction with the NWS Hydrologic Services Program	79	78		78	82	~
How well NWS Hydrologic Services Program meets your expectations	69	67		71	72	
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	76	68		70	75	✓
Likelihood to Take Action	86	80		85	87	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	86	80		85	87	
Confidence in NWS	85	80		81	84	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	85	80		81	84	
Sample Size	40	54		169	153	

		Single state		All or	parts of multiple co	ounties
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	80	78		81	78	
Clarity	77	77		82	78	✓
Timeliness	82	79		81	78	
Accuracy	79	78		80	76	$\checkmark$
Organization of information	79	77		80	79	
Meets my needs	82	79		82	78	
Routine River Forecasts/Observed Conditions	79	81		81	79	
Clarity	79	80		83	79	
Timeliness	79	80		82	78	
Accuracy	78	81		81	79	
Organization of information	80	82		82	80	
Meets my needs	80	82		80	79	
Web Products	81	85		84	83	
Clarity	82	87	✓	83	84	
Timeliness	83	85		85	81	√
Accuracy	79	85	√	84	83	
Organization of information	82	85		85	84	
Meets my needs	81	84		82	84	
Customer Service		94			91	
Overall satisfaction with the NWS staff		93			93	
Importance of direct interaction with NWS staff		95			89	
	77	82	*	80	83	
Clarity	77	82		80	82	
Timeliness	77	81	,	80	83	
Accuracy	75	82	1	81	83	
Organization of information	77	83	1	81	83	
Meets my needs	79	84	1	79	86	✓
Water Supply/Reservoir Information	77	82	1	81	84	4
Carity	76	82	1	80	84	
Timeliness	77	83	✓ ✓	80	83	
Accuracy	75	82	v	84	85	
Organization of information	78	82	~	81	83	
Meets my needs Data Services	78	83 86	~	80	84 84	
						4
Timeliness	-	86 88			85 84	
Accuracy		88				
Organization of information Meets my needs		84			82 84	+
Meets my needs Customer Satisfaction Index	76	85 78		79	84 79	+
Overall satisfaction index Overall satisfaction with the NWS Hydrologic Services Program	76	78 84	✓	84	84	
How well NWS Hydrologic Services Program meets your expectations	79	75	*	77	74	+
How well NWS Hydrologic Services Program meets your expectations How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	74	75		76	74	+
now www.c.nyurologic octatices nografii compares to an lidear inyurologic services program	/4	13	1	10	10	
Likelihood to Take Action	86	89		90	87	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	86	89		90	87	
Confidence in NWS	84	87		85	84	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	84	87		85	84	
Sample Size	120	112		167	137	<u> </u>

		Single county	_		Large city/urban ar	
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	82	81		82	78	
Clarity	82	81		82	78	
Timeliness	82	80		84	77	
Accuracy	79	79		78	74	
Organization of information	82	83		83	80	
Meets my needs	84	81		84	78	
Routine River Forecasts/Observed Conditions	83	81		78	79	
Clarity	84	82		77	78	
Timeliness	84	80	~	80	79	
Accuracy	82	82		80	80	
Organization of information	83	82		77	80	
Meets my needs	83	81		77	78	
Web Products	83	83		82	84	
Clarity	83	84	-	82	83	
Timeliness	82	83		81	83	-
Accuracy	83	83		81	84	
Organization of information	83	84		82	86	
Meets my needs	84	83		83	84	_
Customer Service	-	92		-	94	
Overall satisfaction with the NWS staff	-	92			93	
Importance of direct interaction with NWS staff	83	92			97	_
Drought Information		84		79	82	
Clarity	82	84 84		79	80	
Timeliness	83 82	84		79 80	82 82	
Accuracy Organization of information	82	85		79	82	
Meets my needs Water Supply/Reservoir Information	83 79	86		80	83	
Water Suppry/Reservoir Information	79	88 88	✓	78 83	80 79	
Carry Timeliness	80	87	v √	81	82	
Timenness Accuracy	79	87	✓ ✓	82	80	
Accuracy Organization of information	79	87	✓ ✓	82	81	
Meets my needs	79	88	v √	77	79	
Weeks in y needs Data Services Data Services		85	, , , , , , , , , , , , , , , , , , ,	-	86	-
Jaid Services		85			84	
Immeliness Accuracy		86	1		86	+
Organization of information		85			88	+
Meets my needs	-	85		-	85	
Customer Satisfaction Index	81	81		77	77	
Overall satisfaction with the NWS Hydrologic Services Program	84	87	√	81	83	
Overall satisfaction with the wrve inspection of the stronger of the strongero	79	76		74	73	+
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	79	79	1	74	73	1
Likelihood to Take Action	90	90		85	90	
Likelihood to take action Likelihood to take action based on the hydrologic information you receive from the National Weather Service	90	90		85	90	
Elicentodo to take actanti base on are nyotologic information you receive non are realional weather service Confidence in NWS	87	88		85	84	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	87	88		85	84	
Sample Size	259	230		48	38	

		Smaller city/townsh	ip		Personal	
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	79	82		81	82	
Clarity	79	84	$\checkmark$	81	82	
Timeliness	78	81		81	81	
Accuracy	76	79		80	81	
Organization of information	80	83		80	81	
Meets my needs	81	82		83	84	
Routine River Forecasts/Observed Conditions	79	82		83	83	
Clarity	79	84		83	84	
Timeliness	79	80		82	82	
Accuracy	77	81		82	83	
Organization of information	81	82		82	82	
Meets my needs	79	82		83	83	
Web Products	79	84	1	84	85	
Clarity	80	86	√	83	86	√
Timeliness	80	83	1	85	84	
Accuracy	81	83		85	84	
Organization of information	79	85	✓	84	85	
Meets my needs	81	84		85	85	
Customer Service	-	93			90	
Overall satisfaction with the NWS staff		93			92	
Importance of direct interaction with NWS staff	78	94			86	
Drought Information		83		81	84	✓ ✓
Clarity	78	83		80	84	v ✓
Timeliness	78 77	83 83		81 82	84 84	~
Accuracy	81	82	Ŷ	81	84	✓
Organization of information						v ✓
Meets my needs	80 78	83		83	85	, v
Water Supply/Reservoir Information Clarity	77	81 83		80 79	85 85	✓
Clany Timeliness	77	79	· ·	79	84	v ✓
Immeliness Accuracy	80	82		79 80	84	· · ·
Accuracy Organization of information	79	82	4	80	84	v ✓
Granization of information Meets my needs	79	80	4	81	85	<b>↓</b>
Meets Infriedus Data Services Data Services		86			86	· ·
Jacober Services		86			87	
Interness Accuracy Accuracy		87	+		87	+
Accuracy Organization of information		85	+		86	1
An and a second s		84			87	
Customer Satisfaction Index	77	81		78	81	1
Overall satisfaction intex	82	86		82	85	✓
Overal satisfaction with the investing of Gerviews Frogram How well NWS Hydrologic Services Program meets your expectations	74	77	+	75	76	· ·
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	74	78		75	79	$\checkmark$
Likelihood to Take Action	87	90		88	89	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	87	90		88	89	
Confidence in NWS	84	88	1	85	88	1
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	84	88	$\checkmark$	85	88	✓
Sample Size	99	128		667	1052	

Constant         Constant			Other	
Clarity         66         60           Clarity         75         76           Accuracy         78         76           Comparation of information         71         77           Resulting River Fracesst/Observed Conditions         78         77           Carly         83         80         77           Timeliness         82         80         77           Carly         82         80         77           Timeliness         82         80         77           Carly         78         80         78           Carly         78         80         78           Carly         79         80         79           Carly         79         80         79           Importance of information         77         77         77		2006	2008	Significant Difference
Timeliness         80         75           Accuracy         78         76           Organization of information         81         76           Reading my needs         82         81           Threadiness         82         70           Accuracy         83         80           Organization of information         82         70           Accuracy         83         80           Organization of information         82         80           Meets my needs         82         80           Chardy meets         83         80           Meets my needs         82         80           Chardy meets         83         80           Meets my needs         84         80           Chardy meets         84         80           Meets my ne	Flood Information	81		
Accuracy         76         76           Oparazitation of information         81         76           Mets my needs         79         77           Return RVer Processit/Observed Conditions         83         81           Clarity         86         82         81           Clarity         86         82         81           Internetsen         86         82         80           Organization of information         82         80         81           Mets my needs         82         80         81         82           Organization of information         82         80         80         80           Mets my needs         82         80				
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Organization of information     84     83       Detest my needs     -     94       Customer Service     -     96       Importance of direct interaction with NWS staff     -     90       Drought Information     79     80       Castomer Service     -     90       Drought Information     79     80       Castomer Service     81     81       Organization of information     78     77       Castomer Service     78     77       Organization of information     77     81       Meters my needs     80     79       Castomer Service Information     84     80       Meter my needs     84     80       Castomer Service Information     84     80       Meter my needs     84     80       Castomer Service Information     84     80       Meter my needs     84     80       Organization of information     84     80       Meters my needs     -     81     81       Organization of information     84     80       Meters my needs     -     81       Organization of information     -     81       Meter my needs     -     81       Organization of information     - <td></td> <td></td> <td></td> <td></td>				
Meets my needs     85     82       Customer Service     -     94       Overall astistaction with twe NWS staff     -     96       Importance of direct interaction with NWS staff     -     96       Drught Information     79     80       Clarity     81     81       Timeliness     83     79       Accuracy     78     77       Organization of information     77     81       Meets my needs     80     79       Water SupplyReservoir Information     84     80       Clarity     84     79       Timeliness     84     80       Clarity     84     80       Clarity     84     80       Creatization of information     84     80       Clarity     84     80       Creatizety     84     80       Organization of information     84     80       Clarity     84     80       Creatizety     81     80       Organization of information     84     80       Clarity     84     80       Creatizety     81     80       Organization of information     84     80       Customer Statistiction Index     -     81				
Customier Service          94           Overall satisfaction with the NWS staff          96           Importance of direct interaction with NWS staff          90           Oragin Linearcian with NWS staff          90           Clastly         81         81         81           Clastly         81         81         81           Timeliness         83         79         80           Accuracy         78         77         81           Organization of information         77         81         84           Meets my needs         80         79         80           Customy         844         80         84         80           Crastration of information         84         80         84         80           Cuarby         844         80         84         80           Organization of information         84         80         84         80           Meets my needs         63         80         84         80           Organization of information          81         84         80           Timeliness          81         83         80				
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Drought Information         79         80           Clarity         81         81         81           Timeliness         83         77           Accuracy         78         77           Organization of information         77         81           Meets my needs         80         79           Mets VigNeservoir Information         77         81           Clarity         84         80           Timeliness         84         80           Accuracy         84         80           Organization of Information         84         80           Clarity         84         80           Timeliness         84         80           Accuracy         81         80           Organization of Information         84         80           Meets my needs         83         80           Data Services          81           Organization of Information          82           Imaginess          81           Accuracy          81           Organization of Information          81           Organization of Information          77 <td></td> <td></td> <td></td> <td>-</td>				-
Clarity         81         81           Timeliness         83         79           Accuracy         78         77           Organization of information         77         81           Water Supply/Reservoir Information         84         80           Clarity         84         80           Corganization of information         84         80           Organization of information         84         80           Meets my needs         83         80           Data Services         -         82           Timeliness         -         82           Accuracy         -         83           Organization of information         -         83           Timeliness         -         82           Accuracy         -         82           Organization of information filter         -         81           Meets my needs         -         82         1           Customer Satistaction Index         -         79         <				
Timeliness       83       79         Accuracy       78       77         Organization of information       77       81         Meets my needs       80       79         Water SupplyReservoir Information       84       80         Clarity       84       80         Clarity       84       80         Timeliness       84       80         Accuracy       81       80         Organization of information       84       80         Meets my needs       83       80         Organization of information       84       80         Meets my needs       83       80         Data Services        81         Timeliness        82         Accuracy        82         Organization of information        82         Meets my needs        79         Customer Satisfaction with the NWS Hydrologic Services Program        79         Organization of information        79       1         How well NWS Hydrologic Services Program meets your expectations       76       74       1         How well NWS Hydrologic Services Program meets your expecta				
Accuracy       78       77         Organization of information       77       81         Water Supply/Reservoir Information       80       79         Water Supply/Reservoir Information       84       80         Clarity       84       79         Timeliness       84       80         Accuracy       84       80         Organization of information       84       80         Meets my needs       83       80         Organization of information       84       80         Meets my needs       83       80         Data Services        81         Timeliness        81         Accuracy        81         Organization of information        81         Meets my needs        81         Organization of information        81         Meets my needs        79         Organization of information        81         Meets my needs        79         Organization of information        79         Meets my needs        79         Overall satisfaction with the NWS Hydrologic Ser				
Organization of information     77     81       Meets my needs     80     79       Clarity     84     80       Clarity     84     79       Timeliness     84     80       Accuracy     81     80       Organization of information     84     80       Accuracy     81     80       Organization of information     84     80       Accuracy     81     80       Organization of information     84     80       Imaliness     84     80       Accuracy     81     80       Organization of information     84     80       Timeliness     83     80       Accuracy      81       Organization of information      81       Accuracy      83       Organization of information      83       Meets my needs      83       Organization of information      81       Meets my needs      81       Organization of information      81       Meets my needs      79       Organization of information      79       Verall satification with the NWS Hydrologic Services Program meets your expectations <td></td> <td></td> <td></td> <td></td>				
Water Supply/Reservoir Information       80       79         Water Supply/Reservoir Information       84       80         Clarity       84       80         Timeliness       81       80         Accuracy       81       80         Organization of information       84       80         Meets my needs       83       80         Data Services        81         Timeliness        81         Accuracy        82         Organization of information        83         Meets my needs        81         Data Services        82         Timeliness        83         Accuracy        83         Organization of information        81         Meets my needs        79         Customer Satisfaction with the NWS Hydrologic Services Program       79       77         Overall satisfaction with the NWS Hydrologic Services Program compares to an "ideal" hydrologic services program       76       74         How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program meets you receive from the National Weather Service       88       86				
Water Supply/Reservoir Information     84     80       Clarity     84     79       Timeliness     84     80       Accuracy     81     80       Organization of information     84     80       Meets my needs     83     80       Data Services     83     80       Timeliness      81       Accuracy      81       Organization of information     83     80       Data Services      81       Timeliness      81       Accuracy      81       Organization of information      82       Accuracy      83       Organization of information      83       Meets my needs      81       Organization of information      81       Meets my needs      79       Overall satisfaction with the NWS Hydrologic Services Program     82     81       How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       Likelihood to Take Action     88     86       Likelihood to take action based on the hydrologic in	Organization of information	77	81	
Clarity     84     79       Timeliness     84     80       Accuracy     81     80       Organization of information     84     80       Meets my needs     83     80       Data Services     83     80       Timeliness      81       Accuracy      81       Data Services      82       Accuracy      83       Organization of information      82       Accuracy      83       Organization of information      81       Meets my needs      83       Organization of information      81       Organization of information      81       Overall satisfaction with the MVS Hydrologic Services Program     82     81       How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     88     86       Confidence in NWS     85     85       How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future     85     85	Meets my needs	80	79	
Timeliness     84     80       Accuracy     81     80       Organization of information     84     80       Meets my needs     83     80       Data Services      81       Timeliness      81       Accuracy      81       Organization of information      81       Timeliness      82       Accuracy      83       Organization of information      83       Meets my needs      81       Meets my needs      79       Overall satisfaction with the NWS Hydrologic Services Program     76     74       How well NWS Hydrologic Services Program meets your expectations     76     74       How WS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       Likelihood to Take Action     88     86       Likelihood to take action based on the hydrologic information you receive from the National Weather Service     85     85       How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future     85     85	Water Supply/Reservoir Information	84	80	
Accuracy     81     80       Organization of information     84     80       Data Services     83     80       Timeliness      81       Accuracy      81       Organization of information      81       Accuracy      83       Organization of information      83       Meets my needs      83       Organization of information      81       Organization of information      81       Overall satisfaction with the NWS Hydrologic Services Program     79     77       Overall satisfaction with the NWS Hydrologic Services Program meets your expectations     76     74       How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       Likelihood to Take Action     88     86       Confidence in NWS     85     85       How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future     85     85	Clarity	84	79	
Accuracy     81     80       Organization of information     84     80       Data Services     83     80       Timeliness      81       Accuracy      81       Organization of information      81       Accuracy      83       Organization of information      83       Meets my needs      83       Organization of information      81       Organization of information      81       Overall satisfaction with the NWS Hydrologic Services Program     79     77       Overall satisfaction with the NWS Hydrologic Services Program meets your expectations     76     74       How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       Likelihood to Take Action     88     86       Confidence in NWS     85     85       How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future     85     85				
Organization of information     84     80       Meets my needs     83     80       Data Services      81       Timeliness      82       Accuracy      83       Organization of information      83       Meets my needs      83       Customer Staffaction Index      79       Overall satisfaction with the NWS Hydrologic Services Program     82     81       How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       Likelihood to take action     88     86       Confidence in NWS     85     85       How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future     85     85		81	80	
Meets my needs     83     80       Data Services      81       Timeliness      82       Accuracy      83       Organization of information      81       Meets my needs      81       Overall satisfaction with the NWS Hydrologic Services Program      79       Overall satisfaction with the NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       Likelihood to Take Action     88     86       Confidence in NWS     85     85       How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future     85     85		84	80	
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Accuracy        83         Organization of information        81         Meets my needs        79         Customer Satisfaction with HWS Hydrologic Services Program       82       81         Overall satisfaction with HWS Hydrologic Services Program meets your expectations       76       74         How well NWS Hydrologic Services Program compares to an "ideal" hydrologic services program       76       74         Likelihood to Take Action       88       86         Confidence in NWS       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85				
Organization of information        81         Meets my needs        79         Customer Statisfaction Index       79       77         Overall satisfaction with the NWS Hydrologic Services Program       82       81         How well NWS Hydrologic Services Program meets your expectations       76       74         How WS Hydrologic Services Program compares to an "ideal" hydrologic services program       76       74         Likelihood to Take Action       88       86         Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85				
Meets my needs      79       Customer Satisfaction Index     79     77       Overall satisfaction with the NWS Hydrologic Services Program     82     81       How well NWS Hydrologic Services Program meets your expectations     76     74       How WWS Hydrologic Services Program compares to an "ideal" hydrologic services program     76     74       Likelihood to Take Action     88     86       Likelihood to Take Action Based on the hydrologic information you receive from the National Weather Service     88     86       Confidence in NWS     85     85       How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future     85     85				+
Customer Satisfaction Index       79       77         Overall satisfaction with the NWS Hydrologic Services Program       82       81         How well NWS Hydrologic Services Program meets your expectations       76       74         How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program       76       74         Likelihood to Take Action       88       86         Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85				+
Overall satisfaction with the NWS Hydrologic Services Program       82       81         How well NWS Hydrologic Services Program meets your expectations       76       74         How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program       76       74         Likelihood to Take Action       88       86         Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85				
How well NWS Hydrologic Services Program meets your expectations       76       74         How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program       76       74         Likelihood to Take Action       88       86         Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85				
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program       76       74         Likelihood to Take Action       88       86         Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85				
Likelihood to Take Action       88       86         Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85				+
Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85	How INVIS Hydrologic Services Program compares to an "ideal" hydrologic services program	/6	/4	1
Likelihood to take action based on the hydrologic information you receive from the National Weather Service       88       86         Confidence in NWS       85       85         How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future       85       85	Likelihood to Take Action	88	86	
Confidence in NWS         85         85           How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future         85         85				
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future 85 85				
	Sample Size	59	72	

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Internet Services Primary Scope of Responsibility

	National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
River conditions map									
Visual appeal	66	74	74	68	79	83	77	71	79
Ease of understanding	69	78	81	71	82	82	77	76	83
Tells me what I need to know about river conditions throughout the country	69	78	82	71	85	81	85	77	83
General river basin									
Visual appeal	61	60	61	64	75	70	71	69	71
Ease of understanding	61	69	70	72	76	73	75	71	77
Tells me what I need to know about river conditions throughout the country	60	67	71	68	75	76	77	70	75
River conditions regional map									
Visual appeal	82	82	81	87	91	90	88	86	89
Ease of understanding	82	85	85	86	91	91	89	88	91
Tells me what I need to know about river conditions throughout the country	80	81	83	86	89	94	90	85	87
Current flood conditions	71	82	00	86	89	04	00	0 <i>E</i>	07
Visual appeal	71	84	83 84	84	91	94 93	90 90	85 87	87 88
Ease of understanding Tells me what I need to know about current flooding conditions	72	83	83	85	90	95	90	86	83
Hydrograph level/flow	12	65	03	65	30	30	32	00	03
Visual appeal	81	82	90	84	90	86	90	86	89
Ease of understanding	81	85	90	84	90	79	90	88	89
Tells me what I need to know about forecast levels	79	86	91	87	90	86	92	89	88
Hydrograph flood severity	13	00	31	01	30	00	32	09	00
Visual appeal	82	84	90	85	89	86	92	88	86
Ease of understanding	79	87	91	86	90	83	92	89	89
Tells me what I need to know about flood impacts	76	83	88	82	88	84	92	88	85
Hydrograph low flow threshold	10	00	00	02	00		52	00	00
Visual appeal	84	83	84	80	85	80	85	82	86
Ease of understanding	81	84	85	80	87	79	88	84	88
Tells me what I need to know about low flow	77	81	83	79	88	74	87	82	87
Usefulness of hydrograph when making decisions during periods of low flow	82	84	89	79	85	86	79	81	81
Flood depth map									
Visual appeal	81	84	90	89	92	93	89	83	86
Ease of understanding	81	83	88	88	92	88	87	82	85
Tells me what I need to know about the depth of the water	82	84	87	90	93	93	87	84	85
Usefulness of areal extent and depth of floodwaters in decision making process	90	87	90	93	94	95	93	86	89
Geographic region map									
Visual appeal	85	84	84	85	90	83	88	83	86
Ease of understanding	82	82	82	78	89	80	84	81	84
Tells me what I need to know about river forecasts	85	85	85	82	91	87	89	85	87
High-resolution precipitation estimates map									
Visual appeal	84	91	90	91	90	91	90	90	88
Ease of understanding	83	91	91	90	90	96	90	90	87
Tells me what I need to know about precipitation estimates	84	88	88	86	90	91	89	89	86
Do you use precipitation frequency estimates									
Yes	81%	68%	67%	55%	63%	64%	66%	38%	41%
No	19%	32%	33%	45%	37%	36%	34%	62%	59%
Total number of respondents	16	59	36	31	51	11	29	233	22
Familiar with Precipitation Frequency Data Server web page									
Yes	85%	60%	67%	41%	66%	57%	47%	47%	44%
No	15%	40%	33%	59%	34%	43%	53%	53%	56%
Total number of respondents	13	40	24	17	32	7	19	89	9
How useful would it be for the remainder of the US to have updated precipitation frequency estimates									
Usefulness of having updated precipitation frequency estimates	93	83	89	90	84	91	74	86	86
Do you use PMP estimates									
Yes	44%	47%	61%	48%	41%	9%	31%	20%	36%
No	56%	53%	39%	52%	59%	91%	69%	80%	64%
Total number of respondents	16	59	36	31	51	11	29	233	22
Familiar with Hydrometeorological Reports web page									
Yes	86%	61%	41%	40%	52%		67%	55%	50%
No	14%	39%	59%	60%	48%	100%	33%	45%	50%
Total number of respondents	7	28	22	15	21	1	9	47	8
Usefulness of updated guidelines for PMP estimates									
Usefulness of updated guidelines for PMP estimates	98	92	95	88	87	100	93	88	94

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Water Resources Services Primary Scope of Responsibility

	National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
Observed drought conditions map				-					
Usefulness of observed drought conditions in decision making process	82 86	78 89	85 87	76 94	84 91	87 91	81 94	85 90	81 94
Visual appeal Ease of understanding	88	88	85	94	91	93	94	90 91	94 94
Tells me what I need to know about drought conditions	84	90	82	91	90	76	91	89	87
Drought trends map	70	70			77			84	84
Usefulness of trends for drought over next three months in decision making process Visual appeal	79 79	76 87	84 84	74 94	92	84 87	80 95	84 89	84 96
Visual appear Ease of understanding	80	88	85	92	92	82	95	90	93
Tells me what I need to know about forecasted drought conditions	78	84	84	89	91	78	96	87	91
Observed water temperatures map	60	73	67	64	61	71	67	74	80
Usefulness of observed water temperatures in decision making process Visual appeal	80	73	81	89	93	89	90	89	91
Ease of understanding	84	87	82	81	91	86	90	90	91
Tells me what I need to know about the water temperatures	84	87	80	89	90	81	90	89	88
Usefulness of receiving water temperature forecasts for rivers, streams and lakes for the next five days	65	72	72	74	84	75	79	79	82
Snow depth map Usefulness of snow depth map in decision making process	76	75	82	78	84	89	91	88	87
Visual appeal	85	87	87	92	90	87	97	91	92
Ease of understanding	85	88	85	93	93	80	95	92	91
Tells me what I need to know about snow depth National analysis of the amount of water constantiand in snow	86	88	84	94	94	76	95	92	91
National analysis of the amount of water contained in snow Usefulness of estimates of amount of water contained in snow	73	76	86	74	87	93	84	84	90
Visual appeal	82	87	85	93	90	91	94	89	91
Ease of understanding	85	88	83	95	91	82	93	89	89
Tells me what I need to know about water contained in snow Soil moisture map	80	88	84	95	90	73	92	90	90
Son moisture map Usefulness of soil moisture in decision making	73	75	77	84	90	93	73	81	83
Visual appeal	81	85	83	86	89	84	94	90	94
Ease of understanding	84	85	82	89	90	87	92	90	92
Tells me what I need to know about soil moisture At what soil depths is soil moisture information important to you	83	84	82	93	89	71	92	90	92
Ak what son deputs is son moistaire miorination important to you Surface and near-surface	54%	85%	86%	93%	83%	40%	73%	65%	62%
Sub-surface, including typical rooting zone depths	69%	59%	57%	73%	52%	80%	55%	73%	46%
Deeper sub-surface, down to 2-3 meters	31%	37%	36%	40%	17%	20%	27%	26%	31%
Total number of respondents	13	27	28	15	23	5	11	86	13
A single value describing bulk soil moisture	38%	56%	32%	53%	57%	60%	45%	34%	54%
Soil moisture at multiple discrete levels	62%	44%	68%	47%	43%	40%	55%	66%	46%
Total number of respondents	13	27	28	15	23	5	11	86	13
Usefulness of water resources properties forecast Usefulness of water resource properties forecast for current conditions	84	87	92	89	88	91	89	93	88
Usefulness of water resource properties forecast for 48-72 hours	79	84	76	81	86	91	85	87	85
Usefulness of water resource properties forecast for 3-5 days	74	77	72	71	77	91	79	79	81
Usefulness of water resource properties forecast for 5-7 days Usefulness of water resource properties forecast for more than 1 week to 1 month	76 72	74 62	68 70	69 53	71 63	84 73	75 67	73 64	79 76
Usefulness of water resource properties forecast for more than 1 month	73	58	60	51	56	69	60	60	70
Spatial scale describing the extent of coverage unit for which information would be important in your organization									
National	29% 35%	12% 41%	3% 26%	50%	8% 12%	20%	40%	13% 25%	7% 20%
Regional Group(s) of watersheds within a large river basin	18%	32%	37%	20%	48%	80%	40%	20%	53%
Single watershed	6%	6%	31%	20%	24%		20%	27%	7%
Sub-watershed	12%	9%	3%	10%	8%			15%	13%
Total number of respondents	17	34	35	20	25	5	15	104	15
Usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant Usefulness of receiving analytical products calculated from water resources data	76	82	82	80	79	86	79	81	89
Continue to water managers' questions									
Yes	47%	79%	49%	60%	40%	40%	53%	19% 81%	27%
No Total number of respondents	53% 17	21% 34	51% 35	40% 20	60% 25	60% 5	47% 15	81% 103	73% 15
Water supply volume inflow forecast map									
Usefulness of water supply volume inflow forecast map	75	80	81	71	88	100	83	84	86
Visual appeal	76	85	87	92	94	89	96	90	94
Ease of understanding Tells me what I need to know about the water supply forecast	81 81	87 82	84 85	88	93 89	83	96 96	90 91	92 92
Usefulness of water supply volume inflow forecast map for the entire United States	84	83	87	88	97	100	100	92	97
Water supply volume inflow forecast progression									
Usefulness of water supply volume inflow forecast progression Visual appeal	82 74	79 89	81 81	65 90	91 97	100 100	83 96	87 86	97 97
Visual appeal Ease of understanding Ease of understanding	74	89	81	90	97 96	100	96 94	86 90	97 94
Tells me what I need to know about the seasonal water supply forecast evolution	78	89	86	92	92	100	94	94	94
Monthly ensemble volume forecast				07		100	70		
Usefulness of monthly ensemble volume forecasts Visual appeal	71 76	80 85	77	67 82	89 92	100	79 93	83 87	86 97
Visua appear Ease of understanding	75	82	79	81	92 88	100	93 89	86	81
Tells me what I need to know about water supply volume forecast uncertainty	76	85	81	88	85	100	89	94	86
Usefulness of climate sensitivity studies									
Usefulness of climate sensitivity studies Climate sensitivity study	68	72	64	61	82	100	60	80	86
Climate sensitivity study Visual appeal	67	74	69	84	87	89	100	79	94
Ease of understanding	71	71	66	78	87	78	100	78	83
Tells me what I need to know about climate sensitivity for a select river forecast point	70	73	72	89	82	83	100	81	89

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Primary Scope of Responsibility

	National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
Usefulness of having access to Flood Watches and Warnings	1								
Usefulness of having access to Flood Watches and Warnings as text Usefulness of having access to Flood Watches and Warnings coded in XML, including CAP	76 71	82 62	79 66	91 75	91 88	96 89	98 96	90 75	87 70
Usefulness of having access to Plogons specifying the area covered by Flood Watches and Warnings	70	78	81	91	94	100	96	88	82
Observations	10	10	01	31	34	100	30	00	02
Precipitation	97	96	98	98	96	100	94	96	94
Snow accumulation	86	79	90	83	89	87	84	92	84
Snow water equivalent	85	81	87	86	82	80	84	79	84
River stage/flow	93	91	95	90	91	94	100	85	96
Soil moisture	78	73	83	75	79	72	87	72	83
Air Temperature	86 85	82 71	84 75	85 80	86 78	91 80	94 89	90 87	79 73
Dew point Wind speed	84	76	75	83	86	98	98	87	80
Atmospheric freezing level	76	61	62	77	72	65	91	70	75
Potential evaporation	79	72	80	67	72	69	86	68	79
Soil frost depth	74	56	67	65	71	62	79	66	75
Forecast									
Precipitation	96	91	92	98	94	100	97	97	96
Temperature	93	83	84	87	91	94	97	94	87
Instantaneous streamflow/stage	91	87	87	85	90	96	91	82	90
Streamflow or stage forecast uncertainty information	90	86	81	84	87	98	87 84	76	89
Cumulative streamflow Atmospheric freezing level	84 77	77 59	77 62	75 65	82 71	87 61	84 91	74 67	84 78
Basin Boundaries	11	29	62	CO	/1	01	91	67	78
Basin boundaries	88	91	86	87	71	96	86	76	86
Historical data used to calibrate models			00	0.			00	10	00
Historical data used to calibrate models	88	84	82	73	74	85	85	73	89
Hydrologic Model									
Hydrologic model parameters	87	77	79	67	66	84	88	65	89
Hydrologic model states	80	73	75	66	67	87	85	66	89
Unit Hydrograph parameters	80	81	83	70	70	78	88	67	84
Routing Parameters	00	00	70	64	64	92	87	66	04
Routing parameters Rating Curve	80	82	73	04	64	92	6/	00	84
Rating Curve	85	86	81	65	67	94	86	65	86
Raw ensemble streamflow prediction traces			0.	00	0,	0.	00	00	00
Raw ensemble streamflow prediction traces	71	76	63	70	66	94	89	70	87
Climate forecast adjusted ensemble streamflow prediction traces									
Climate forecast adjusted ensemble streamflow prediction traces	73	77	67	70	69	89	90	70	89
Statistical Water Supply Forecast									
Statistical Water Supply Forecast	70	75	74	67	68	82	87	74	85
Flash Flood Guidance Flash Flood Guidance	89	76	77	85	86	100	99	90	93
Text	09	70		65	00	100	99	90	93
ASCII	77	81	87	89	83	93	86	83	83
XML	71	72	68	84	80	89	95	82	83
Point Data									
ASCII	72	83	85	80	86	81	78	81	88
XML	75	77	69	79	77	96	90	82	92
SHEF	66	73	63	52	67	39	78	57	90
Shapefile	77	73	88	88	81	87	80	60	89
KML	73	65	63	74	61	91	81	63	91
Lines, Vectors, and Contours ASCII	69	74	79	67	73	69	72	77	85
XML	77	66	66	74	73	98	92	81	92
Shapefile	79	72	87	87	82	98	83	68	89
KML	75	62	59	72	71	82	85	69	91
Grids, Arrays, and Rasters									
ASCII	68	73	74	66	73	69	81	77	85
Shapefile	83	72	83	88	80	93	83	66	87
KML	74	59	61	69	69	82	80	66	89
GeoTIFF	81	78	80	74	84	93	83	72	89
Bit-mapped graphics + Worldlife	81	72	70	58	82	75	83	75	89
NetCDF GRIB	79 67	59 46	44 36	43 54	64 64	100	87 84	66 60	87 87
BUFR	67	46 49	36	54	62		84 84	59	87
	07	49	33	52	02	-	04	59	03

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Primary Scope of Responsibility

	National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
Digital Information Availability									
Download	86	89	90	95	90	98	96	83	90
Web map service	88	91	88	87	92	98	98	91	91
Web feature service	87	90	85	86	92	100	99	90	89
Web coverage service	86	88	80	88	91	100	99	90	83
RSS	85	85	69	70	81	100	92	76	86
WAP	84	75	69	74	77	100	94	72	84
GIS - Commercial									
ESRI	69%	56%	68%	58%	46%	83%	30%	10%	18%
Intergraph	15%	8%	4%		7%		10%	7%	9%
Idrisi	23%	6%		-			10%	2%	
Erdas Imagine	15%	8%		5%	4%			2%	
ENVI	23%	3%		5%	7%			2%	9%
Autodesk	23%	17%	16%	11%	7%	33%	20%	8%	9%
Custom Application	23%	28%	16%	32%	21%	17%	30%	13%	
Other	8%	11%	8%	21%	4%			6%	27%
Total number of respondents	13	36	25	19	28	6	10	87	11
GIS - Open Services									
GRASS	46%	14%		5%	4%	17%		9%	
SAGA	23%	3%	4%	5%	4%		10%	2%	9%
ILWIS (GNU)	15%	6%	4%		4%		10%	5%	
Geotools	23%	19%	8%	21%	36%		30%	14%	18%
Custom Application	23%	19%	16%	16%	18%	17%	30%	17%	
Other		8%	8%	16%	4%	17%		7%	36%
Total number of respondents	13	36	25	19	28	6	10	87	11
Scientific Data Analysis, Modeling, and Visualization									
IDL	31%	3%		5%	11%			6%	
PV-Wave	15%	8%			7%			2%	
MatLab	46%	11%	12%	5%	4%	17%	10%	7%	
Vis5D	15%	3%	4%	5%	4%			2%	
GEMPAK	31%	8%	4%	16%	4%			2%	9%
CrADS	23%	3%	4%	5%	4%		10%	2%	
AVS5	15%	3%	4%		4%		10%	2%	
NCAR Graphics/NCL	31%	14%	8%	11%	7%		20%	7%	18%
AWIPS	23%	25%		5%	14%		10%	6%	9%
Custom Application	23%	25%	12%	21%	18%	17%	30%	13%	
Other	8%	17%	8%	5%	4%		10%	8%	27%
Total number of respondents	13	36	25	19	28	6	10	87	11
Other Categories									
Keyhole Markup Language viewers	46%	50%	28%	58%	39%	67%	30%	25%	36%
Geo-aware Databases	15%	11%		5%	14%	17%	40%	8%	18%
Specialized Spatial Information Systems	15%			5%	7%	17%	20%	5%	
GPS/Navigation	31%	31%	28%	37%	36%	33%	50%	26%	27%
TV/Media Graphics	31%	22%	20%	21%	32%	33%	40%	24%	27%
CAD Tools	31%	22%	24%	16%	14%	33%	20%	11%	18%
Image Processing/ Computer Graphics	62%	33%	28%	37%	21%	33%	50%	29%	18%
Other		6%	4%	5%	7%		10%	6%	
Total number of respondents	13	36	25	19	28	6	10	87	11
Usefulness of metadata									
Usefulness of metadata	84	83	84	76	82	96	93	78	85
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	-								
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	84	84	88	76	85	100	89	73	89

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Means of Receiving Hydrologic Information

	National Weather Service Web pages	Non-National Weather Service Web pages	Phone	Mobile devices/ PDA	NOAA Weather Radio	NOAA Weather Wire	Family of Services (FOS)
Flood Information	80	78	80	81	81	83	76
Clarity	81	81	81	81	81	82	77
Timeliness	80	79	81	80	80	84	74
Accuracy	79	76	76	78	79	83	76
Organization of information	80	77	81	82	81	82	76
Meets my needs	81	79	81	82	82	83	77
Routine River Forecasts/Observed Conditions	81	79	81	81	82	81	76
Clarity	82	81	83	82	82	82	74
Timeliness	80	80	81	80	81	80	75
Accuracy	81	79	80	80	82	82	76
Organization of information	81	79	81	81	82	82	76
Meets my needs	81	79	82	81	82	80	76
Web Products	83	82	83	83	84	86	77
Clarity	85	83	85	85	85	87	77
Timeliness	82	81	82	82	83	86	78
Accuracy	83	81	80	82	84	86	76
Organization of information	84	82	84	85	85	87	77
Meets my needs	84	81	83	83	85	84	77
Customer Service	91	91	93	95	92	93	90
Overall satisfaction with the NWS staff	91	91	93	94	93	93	89
Importance of direct interaction with NWS staff	90	91	94	96	92	94	92
Drought Information	83	80	83	83	84	84	74
Clarity	83	80	83	83	83	82	75
Timeliness	82	80	83	81	83	84	72
Accuracy	82	80	81	83	83	83	75
Organization of information	83	80	83	83	83	83	74
Meets my needs	83	81	85	85	85	84	74
Water Supply/Reservoir Information	83	80	84	83	84	80	68
Clarity	83	81	84	82	85	81	72
Timeliness	83	80	84	81	84	80	64
Accuracy	83	80	83	84	84	82	73
Organization of information	83	80	83	83	84	78	65
Meets my needs	83	81	84	84	85	81	67
Data Services	85	84	86	85	86	90	84
Timeliness	85	84	87	85	86	88	82
Accuracy	86	85	86	85	87	91	85
Organization of information	84	83	85	84	85	90	83
Meets my needs	85	84	87	85	86	93	87
Customer Satisfaction Index	80	78	82	80	81	83	73
Overall satisfaction with the NWS Hydrologic Services Program	85	83	88	86	86	88	81
How well NWS Hydrologic Services Program meets your expectations	75	73	77	76	76	79	68
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	77	74	78	76	78	81	67
Likelihood to Take Action	89	88	91	91	90	90	84
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	89	88	91	91	90	90	84
Confidence in NWS	87	85	87	88	88	88	81
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	87	85	87	88	88	88	81
Sample Size	1870	445	208	195	881	64	25

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Means of Receiving Hydrologic Information

	Emergency Managers Weather Information Network (EMWIN)	Local or cable TV	Commercial Radio	Satellite Radio	Newspaper	Private Vendor	Other
Flood Information	82	80	79	77	78	78	80
Clarity	82	81	79	78	79	78	82
Timeliness	82	81	80	76	79	80	80
Accuracy	80	78	77	73	77	77	79
Organization of information	83	80	79	78	78	78	80
Meets my needs	83	82	80	78	79	79	81
Routine River Forecasts/Observed Conditions	82	81	81	77	79	79	80
Clarity	82	82	81	78	79	78	81
Timeliness	81	81	81	77	79	78	78
Accuracy	82	81	80	77	78	80	81
Organization of information	82	81	80	76	78	79	81
Meets my needs	83	82	81	76	79	78	80
Web Products	85	84	84	81	82	81	83
Clarity	87	85	84	81	83	82	84
Timeliness	84	84	84	82	82	81	83
Accuracy	84	83	83	81	80	80	82
Organization of information	86	84	84	81	83	83	83
Meets my needs	86	84	85	80	83	81	83
Customer Service	94	92	93	90	90	92	90
Overall satisfaction with the NWS staff	94	92	93	90	91	92	91
Importance of direct interaction with NWS staff	94	92	92	90	89	92	90
Drought Information	84	82	80	78	80	83	81
Clarity	84	82	80	78	81	82	80
Timeliness	84	81	81	78	79	81	81
Accuracy	83	81	80	76	80	82	80
Organization of information	84	82	80	78	80	82	81
Meets my needs	86	83	81	78	81	84	82
Water Supply/Reservoir Information	86	83	81	74	79	82	78
Clarity	86	83	81	75	80	85	79
Timeliness	87	83	82	73	80	83	77
Accuracy	87	82	80	72	78	84	78
Organization of information	85	83	80	73	79	80	79
Meets my needs	86	83	81	74	79	80	79
Data Services	87	85	86	86	85	87	86
Timeliness	88	86	86	88	85	88	89
Accuracy	87	86	86	87	86	88	86
Organization of information	87	84	85	83	83	85	84
Meets my needs	88	86	86	86	85	88	85
Customer Satisfaction Index	82	79	79	80	78	77	80
Overall satisfaction with the NWS Hydrologic Services Program	87	85	85	83	83	83	85
How well NWS Hydrologic Services Program meets your expectations	77	75	73	76	72	72	76
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	79	77	76	78	75	73	76
Likelihood to Take Action	92	89	90	90	89	90	87
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	92	89	90	90	89	90	88
Confidence in NWS	89	87	87	86	86	85	86
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	89	87	87	86	86	85	86
Sample Size	170	806	372	56	275	82	114

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Means of Receiving Hydrologic Information

	NWS Web	Non-NWS	Phone	Mobile	NOAA Weather	NOAA Weather	Family of	Emergency Managers Weather	Local or cable	Commercial	Satellite radio	Newspaper	Private	Other
	pages	Web pages	THONE	devices/PDA	Radio	Wire	Services (FOS)	Information Network (EMWIN)	TV	Radio	Gaterinte radio	Newspaper	Vendor	Other
What is your primary use of hydrologic information provided by the National Weather Service														
Emergency management	22%	27%	50%	53%	30%	53%	24%	66%	26%	24%	43%	27%	16%	32%
Communication/News	5%	5%	4%	4%	5%	11%	24%	6%	4%	3%	21%	3%	2%	4%
Water resources	4%	5%	11%	4%	2%	2%	8%	2%	3%	3%	6%	2%	2%	9%
Agriculture	4%	2%	1%	2%	4%	-	4%	-	2%	4%		4%	2%	2%
Shipping		1%	1%	-	-		-	-	1%			1%	2%	1%
Natural resource management	3%	4%	3%	1%	1%			2%	2%	4%		3%	-	3%
Consulting/add value/provide custom hydrologic services	2%	4%	1%	2%	1%	2%	-	1%	2%	3%	1%	2%	-	2%
Recreation	9%	6%	5%	4%	7%		4%	1%	7%	8%	5%	6%	13%	5%
Personal Use	43%	36%	14%	23%	43%	25%	12%	17%	48%	44%	21%	45%	55%	26%
Other	8%	9%	10%	9%	7%	8%	24%	5%	6%	7%	4%	7%	9%	18%
Total number of respondents	1870	445	208	195	881	64	25	170	806	275	82	372	56	114
What sector do you represent														(
National Oceanic and Atmospheric Administration (NOAA) Employee	1%	2%	2%	1%	1%	2%	4%	-	1%	1%		1%	2%	4%
Other Federal Government	6%	8%	15%	4%	4%	2%	12%	2%	4%	6%	4%	3%	-	8%
State Government	5%	6%	7%	6%	4%	11%	16%	9%	6%	5%	5%	5%	4%	8%
Local Government	16%	18%	40%	44%	24%	42%	16%	48%	19%	18%	35%	23%	14%	23%
Government Contractor	1%	1%		1%				1%	1%	1%	-	1%	-	1%
Commercial Enterprise	5%	8%	4%	5%	4%	8%	24%	3%	3%	3%	16%	3%	4%	7%
Non-profit business	2%	3%	1%		2%	2%		4%	2%	2%	1%	2%	-	1%
University or other Educational	3%	3%	2%	4%	4%	2%	4%	2%	3%	4%	2%	5%	5%	1%
Military		1%	1%					1%			1%			
Private Citizen	55%	43%	18%	27%	51%	27%	20%	19%	55%	55%	26%	52%	66%	35%
Foreign				1%										
Other	6%	7%	7%	8%	6%	6%	4%	12%	5%	6%	10%	5%	5%	13%
Total number of respondents	1870	445	208	195	881	64	25	170	806	275	82	372	56	114
What is your NOAA line office														(
National Weather Service	95%	88%	75%	100%	100%	100%	100%		100%	50%		75%	-	75%
National Environmental Satellite, Data, and Information Service										-			-	
National Marine Fisheries Service												-	-	
National Ocean Service						-				-				
Office of Marine and Aviation Operations														
Office of Oceanic and Atmospheric Research	5%	13%	25%			-				50%		25%	100%	25%
Office of Program Planning and Integration														
Other						-				-				
Total number of respondents	20	8	4	1	11	1	1		7	2		4	1	4
What federal agency do you represent										-				
Bureau of Land Management	2%					-								
Bureau of Reclamation	2%	3%	6%		3%	-			3%					
Federal Emergency Management Agency	5%	3%	9%		9%			33%	6%			9%		
Federal Highway Administration	1%													11%
Federal Ingents regulatory Commission	2%	3%			-				6%					11%
Forest Service	3%	3%			6%				6%	6%		9%		
National Aeronautics and Space Administration					-									
National Resources Conservation Services	17%	20%	16%		9%		33%	-	17%	18%		9%		11%
National Research Condition	1176	2070	10%	-	576		00%	-	1170	10%		576		1170
Nuclear Regulatory Commission	2%	6%	3%		-						33%		-	
Volcear Regulatory Commission	1%	576			-						5576		-	
U.S. Army Coros of Engineers	28%	29%	47%	43%	31%	100%	67%	33%	19%	24%	33%	45%	-	33%
U.S. Department of Adriculture Adriculture Research Service	20%	29%	47%	43%	31%	100%	6/%		19%	24%	33%	45%	-	
U.S. Department of Agriculture Agriculture Research Service	26%	26%	16%	43%	28%			33%	36%	35%	33%	27%	-	
U.S. Environmental Protection Agency	20%	20%	16%	43%	20%				30%	35%	33%	21%	-	
U.S. Environmental Protection Agency Other Other	12%	9%	3%	14%	13%				8%	18%			-	33%
Other Total number of respondents	12%	9%	3%	1470	13%				36	18%		11	-	33%
r dar number of respondents	103	33	JZ	1 /	32	1 /	1 3	3	30	17	3	11		0

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Means of Receiving Hydrologic Information

	NWS Web	Non-NWS		Mobile	NOAA Weather	NOAA Weather	Family of	Emergency Managers Weather	Local or cable	Commercial			Private	
	pages	Web pages	Phone	devices/PDA	Radio	Wire	Services (FOS)	Information Network (EMWIN)	TV	Radio	Satellite radio	Newspaper	Vendor	Other
What is the primary scope of your responsibility														
National	3%	6%	4%	3%	1%	6%	12%	2%	2%	2%	4%	3%	5%	4%
Regional Single state	8% 6%	11%	18% 10%	6% 6%	6% 4%	9% 9%	32% 20%	8%	6% 5%	8% 5%	10%	6% 4%	5% 2%	14% 7%
All or parts of multiple counties	7%	9%	8%	8%	8%	9%	16%	14%	7%	7%	18%	6%	2 /6	5%
Single county	12%	12%	30%	27%	17%	25%	-	32%	12%	12%	16%	16%	11%	18%
Large city/urban area	2%	2%	3%	5%	3%	9%	-	5%	3%	4%	11%	4%	4%	4%
Smaller citytownship Personal	6% 53%	7%	7% 15%	14% 26%	8% 51%	6% 23%	12% 8%	11%	7% 54%	7% 52%	9% 22%	7% 49%	5% 61%	7% 33%
reisonai Other	4%	5%	5%	5%	3%	23%		6%	4%	4%		5%	7%	7%
Total number of respondents	1870	445	208	195	881	64	25	170	806	275	82	372	56	114
By what means do you receive text-based National Weather Service hydrologic information								94%	94%					
NWS Web pages Non-NWS Web pages	100% 23%	98% 100%	96% 46%	97% 43%	95% 27%	94% 47%	88% 60%	94% 32%	94% 34%	97% 40%	94% 54%	96% 38%	100% 54%	78% 32%
Nori-NW S Web pages	11%	22%	46%	43%	16%	38%	36%	25%	34%	40%	32%	20%	29%	20%
Mobile devices/PDA	10%	19%	33%	100%	17%	44%	40%	32%	15%	12%	41%	16%	25%	13%
NOAA Weather Radio	45%	54%	68%	77%	100%	72%	64%	78%	63%	63%	70%	72%	82%	52%
NOAA Weather Wire	3%	7%	12%	14%	5%	100%	40%	17%	5%	4%	16%	7%	18%	6%
Family of Services (FOS) Emergency Managers Weather Information Network (EMWIN)	1% 9%	3%	4% 21%	5% 28%	2% 15%	16% 45%	100%	6% 100%	1% 11%	1% 10%	11% 33%	2% 14%	9% 23%	2% 14%
Lineigency managers weather information wetwork (Linvin) Local or cable TV	41%	61%	57%	62%	58%	66%	44%	51%	100%	84%	61%	88%	86%	40%
Commercial Radio	19%	32%	36%	31%	31%	39%	28%	30%	41%	58%	29%	100%	71%	20%
Satellite radio	3%	7%	8%	7%	5%	16%	20%	8%	6%	10%	7%	11%	100%	6%
Newspaper	14% 4%	24%	25%	17%	20%	17%	12%	16%	29% 6%	100% 5%	18%	43% 6%	48% 11%	19%
Private Vendor Other	4% 5%	8%	13% 11%	17%	6% 7%	20%	36% 8%	16% 9%	6%	5%	100%	6%	11%	100%
Total number of respondents	1870	445	208	195	881	64	25	170	806	275	82	372	56	114
Frequency of using flood watches, flood warnings, and flood statements provided in text format														
Several times per day	52%	49%	61%	63%	55%	66%	60%	66%	51%	48%	67%	49%	59%	54%
Once per day Once per week	19%	18%	16% 5%	12%	17%	8% 8%	12%	9% 4%	19%	23% 7%	10%	21%	18% 7%	15%
Once per month	11%	12%	12%	12%	12%	9%	8%	4%	13%	11%	15%	13%	9%	11%
Do not use	10%	11%	6%	7%	8%	6%	4%	6%	9%	9%	2%	8%	4%	10%
Not familiar with this information	2%	3%		1%	2%	3%	4%	2%	2%	2%	1%	2%	4%	5%
Total number of respondents Importance of the distinction between a flood warning and a flash flood warning	1870	445	208	195	881 87	64	25	170	806	275	82	372	56	114
Where 0 is "Not important at all" and 100 is "Very important"	85	85	88	86	87	88	85	92	86	87	89	87	88	88
Minimum amount of time needed to take effective precautionary actions for flash flood warnings	00	00	00	00	01		00	51	00	0,	00	01	50	00
Less than 30 minutes	21%	20%	17%	21%	23%	42%	39%	25%	20%	21%	26%	22%	26%	21%
Between 30 and 45 minutes	24%	24%	21%	26%	26%	17%	17%	25%	26%	22%	29%	25%	23%	19%
Between 45 and 60 minutes Between 1 and 2 hours	24% 21%	26% 20%	26% 23%	23% 20%	24% 19%	20%	13% 13%	22%	25% 19%	27% 20%	18% 18%	27%	25% 13%	22% 22%
More than 2 hours	10%	10%	13%	9%	8%	5%	17%	7%	10%	10%	10%	9%	13%	17%
Total number of respondents	1631	389	191	171	794	60	23	162	711	245	73	333	53	101
Minimum amount of time needed to take effective precautionary actions for flood warnings														
Less than 30 minutes	16%	13%	14%	12%	18%	25%	12%	21%	16%	16%	15%	16%	20%	21%
Between 30 and 60 minutes Between 1 and 2 hours	24% 27%	24% 29%	23% 26%	24% 27%	26% 26%	30% 20%	28%	26% 26%	28% 26%	23% 29%	24% 32%	25% 27%	25% 16%	18% 25%
Between 1 and 2 hours Between 2 and 6 hours	19%	20%	24%	25%	18%	13%	28%	18%	18%	18%	20%	18%	25%	17%
More than 6 hours	14%	13%	13%	12%	11%	13%	12%	8%	12%	14%	10%	13%	14%	19%
Total number of respondents	1870	445	208	195	881	64	25	170	806	275	82	372	56	114
Frequency of using routine river forecasts provided in text format Several times per day	17%	18%	22%	20%	16%	31%	24%	26%	16%	14%	16%	15%	29%	24%
Saveral times per day Once per day	21%	18%	22%	20%	16%	23%	24%	26%	20%	14%	21%	23%	29%	24%
Once per week	20%	16%	20%	21%	21%	25%	16%	19%	17%	16%	12%	16%	14%	21%
Once per month	21%	22%	18%	18%	21%	8%	24%	22%	21%	22%	28%	22%	18%	11%
Do not use	16%	18%	13%	15%	15%	11%	8%	12%	20%	21%	22%	19%	14%	21%
Not familiar with this information Total number of respondents	5% 1870	4% 445	3% 208	3% 195	5% 881	2% 64		2% 170	5% 806	4% 275	1% 82	5% 372	5% 56	11% 114
Frequency of visiting web pages providing a suite of hydrologic information	10/0	440	200	190	001	04	20	170	000	213	02	3/2	30	1.14
Several times per day	14%	16%	18%	20%	14%	27%	16%	25%	14%	14%	11%	11%	16%	16%
Once per day	20%	17%	25%	25%	22%	24%	24%	22%	18%	18%	20%	20%	25%	18%
Once per week	21%	23%	21%	22%	23%	24%	36%	20%	21%	21%	30%	21%	20%	18%
Once per month	22%	21%	16% 14%	15%	21% 12%	13%	20%	16% 11%	21% 15%	20%	20%	20%	15%	24%
Do not use Not familiar with this information	13% 9%	13%	14% 6%	10%	12%	6% 6%	4%	11%	15%	13%	13%	15% 12%	18%	12%
Total number of respondents	1864	442	206	194	880	63	25	169	805	274	82	370	55	113
Usefulness of providing Flood Warnings and Watches, River Forecasts and other water information on your PDA	65	72	76	89	70	84	79	80	68	71	70	63	78	63
Where 0 is "Not at all useful" and 100 is "Very useful"	65	72	76	89	70	84	79	80	68	71	70	63	78	63

#### NWS Hydrology Customer Satisfaction 2008 Non-modeled Response Table Means of Receiving Hydrologic Information

	NWS Web	Non-NWS	Phone	Mobile	NOAA Weather	NOAA Weather	Family of	Emergency Managers Weather	Local or cable		Satellite radio	Newspaper	Private	Other
	pages	Web pages		devices/PDA	Radio	Wire	Services (FOS)	Information Network (EMWIN)	TV	Radio			Vendor	
Have directly interacted with NWS staff														
Yes	27%	35%	66%	55%	33%	59%	76%	64%	28%	28%	59%	32%	32%	41%
No	73%	65%	34%	45%	67%	41%	24%	36%	72%	72%	41%	68%	68%	59%
Total number of responde	ts 1870	445	208	195	881	64	25	170	806	275	82	372	56	114
During a typical year, how many hours do you directly interact with NWS staff														
Less than 5 hours	50%	43%	34%	33%	48%	26%	42%	42%	46%	56%	46%	48%	44%	43%
5-10 hours a year	24%	25%	21%	23%	25%	21%	26%	27%	28%	21%	31%	27%	22%	23%
11-25 hours a year	14%	15%	24%	24%	15%	24%	32%	18%	16%	17%	10%	14%	11%	15%
More than 25 hours a year	13%	17%	20%	19%	13%	29%	-	14%	10%	6%	13%	12%	22%	19%
Total number of responde	ts 499	155	137	108	295	38	19	108	223	77	48	120	18	47
Purpose of your personal communications with NWS staff														
Explanation or interpretation of available forecast products	55%	59%	73%	66%	59%	71%	42%	63%	60%	62%	65%	62%	67%	60%
Gain an understanding of forecaster confidence in forecast products	51%	58%	64%	59%	53%	66%	47%	57%	56%	53%	65%	53%	50%	49%
Synthesize available forecast products and information for your specific needs	56%	65%	75%	74%	58%	82%	68%	69%	65%	60%	65%	60%	56%	70%
Get more information from forecaster than available in existing products	65%	72%	82%	80%	66%	82%	95%	69%	69%	65%	71%	65%	78%	77%
Total number of responde	ts 499	155	137	108	295	38	19	108	223	77	48	120	18	47
Frequency of using drought information provided in text format														
Several times per day	3%	4%	3%	4%	4%	8%	8%	5%	3%	2%	4%	3%	11%	3%
Once per day	8%	7%	9%	8%	9%	14%	8%	12%	8%	7%	7%	6%	9%	4%
Once per week	17%	17%	15%	16%	18%	27%	36%	20%	16%	16%	20%	16%	25%	12%
Once per month	24%	27%	27%	29%	26%	25%	24%	19%	25%	27%	24%	28%	23%	20%
Do not use	40%	38%	39%	35%	36%	20%	20%	38%	39%	38%	41%	38%	27%	49%
Not familiar with this information	9%	8%	8%	7%	8%	6%	4%	6%	9%	10%	4%	8%	5%	11%
Total number of responde	ts 1870	445	208	195	881	64	25	170	806	275	82	372	56	114
Frequency of using information on water supply and/or reservoir information provided in text format														
Several times per day	3%	4%	5%	2%	3%	8%	-	5%	2%	1%	4%	2%	9%	3%
Once per day	6%	8%	7%	8%	6%	13%	20%	8%	6%	4%	9%	5%	11%	7%
Once per week	10%	9%	10%	9%	10%	11%	16%	11%	8%	11%	6%	10%	11%	9%
Once per month	16%	16%	22%	17%	16%	19%	16%	17%	16%	17%	12%	16%	20%	18%
Do not use	50%	47%	44%	49%	49%	39%	36%	52%	53%	51%	60%	51%	39%	48%
Not familiar with this information	15%	16%	13%	14%	14%	11%	12%	8%	15%	15%	10%	15%	11%	15%
Total number of responde		445	208	195	881	64	25	170	806	275	82	372	56	114
Usefulness of displaying observations and forecasts of water resources properties	77	78	79	80	78	79	86	80	77	77	85	77	75	77
Where 0 is "Not at all useful" and 100 is "Very useful"	77	78	79	80	78	79	86	80	77	77	85	77	75	77
Usefulness of displaying water supply volume inflow forecast information	71	75	73	75	72	80	79	73	71	74	77	73	67	69
Where 0 is "Not at all useful" and 100 is "Very useful"	71	75	73	75	72	80	79	73	71	74	77	73	67	69
Downloaded the data provided by the National Weather Service in the last year														
Yes	48%	56%	63%	60%	50%	64%	72%	64%	45%	43%	67%	48%	54%	45%
No	52%	44%	37%	40%	50%	36%	28%	36%	55%	57%	33%	52%	46%	55%
Total number of responde	ts 1870	445	208	195	881	64	25	170	806	275	82	372	56	114
Usefulness of expanding our data services	80	84	85	88	83	88	84	86	81	82	88	80	85	81
Where 0 is "Not at all useful" and 100 is "Very useful"	80	84	85	88	83	88	84	86	81	82	88	80	85	81

	NWS Web pages			Non-NWS Web pages			
	2006	2008	Significant Difference	2006	2008	Significant Difference	
Flood Information	80	80		79	78		
Clarity	81	81		79	81		
Timeliness	81	80		80	79		
Accuracy	78	79		77	76		
Organization of information	80	80		78	77		
Meets my needs	82	81		80	79		
Routine River Forecasts/Observed Conditions	81	81		79	79		
Clarity	82	82	1	80	81		
Timeliness	82	80		80	80		
Accuracy	81	81		79	79		
Organization of information	81	81		79	79		
Meets my needs	81	81		79	79		
Web Products	83	83		80	82		
Clarity	82	85	√	80	83	√	
Timeliness	83	82		80	81	_	
Accuracy	83	83		80	81		
Organization of information	83	84	✓	80	82	_	
Meets my needs	83	84 91		80	81	_	
Customer Service				-	91		
Overall satisfaction with the NWS staff		91			91		
Importance of direct interaction with NWS staff Drought Information	80	90 83		77	91 80		
Clarity Clarity	79	83	<b>↓</b>	76	80	¥ √	
	80	82	↓ ↓	76	80	*	
Timeliness	80	82	v 	77	80		
Accuracy Organization of information	80	83	↓ ↓	78	80		
Organization or information Meets my needs	81	83	↓ ↓	78	80	✓	
Water Supply/Reservoir Information	79	83	v •	78	80	· ·	
Water Supply/Reservoir Information Clarity	79	83	✓ ✓	77	81	✓	
Clany Timeliness	79	83	· · · · · · · · · · · · · · · · · · ·	77	80	· ·	
Timeniness Accuracy	79	83	· ·	76	80	-	
Organization of information	79	83	· · · · · · · · · · · · · · · · · · ·	76	80	-	
Granization of information Meets my needs	79	83	<b>↓</b>	77	81		
Meets my needs Data Services Data Services		85	•	-	84		
Data Services		85			84		
Internets Accuracy		86	+		85	1	
Accuracy Organization of information		84	+		83	1	
Meets my needs		85	-		84		
Customer Satisfaction Index	78	80	1	76	78		
Overall satisfaction white NWS Hydrologic Services Program	82	85	·	81	83	~	
Verial satisfies of the transmission of transmission of the transmission of the transmission of the transmission of transmission of the transmission of transmission of transmission of the transmission of transmission o	75	75	· ·	73	73		
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	75	77	$\checkmark$	73	74		
Likelihood to Take Action	88	89		87	88		
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	88	89		87	88		
Confidence in NWS	85	87	✓	83	85		
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	85	87	~	83	85		
Sample Size	1516	1870		371	445		

	Phone			Mobile devices/PDA			
	2006	2008	Significant Difference	2006	2008	Significant Difference	
Flood Information	84	80	✓		81		
Clarity	85	81	$\checkmark$		81		
Timeliness	84	81			80		
Accuracy	82	76	√		78		
Organization of information	84	81	√		82		
Meets my needs	85	81	√		82		
Routine River Forecasts/Observed Conditions	86	81	1		81		
Clarity	87	83	~		82		
Timeliness	86	81	√		80		
Accuracy	84	80			80		
Organization of information	87	81	~		81		
Meets my needs	85	82	√		81		
Web Products	84	83			83		
Clarity	85	85			85		
Timeliness	85	82			82		
Accuracy	83	80	√		82		
Organization of information	85	84	1		85		
Meets my needs	85	83			83		
Customer Service	-	93			95		
Overall satisfaction with the NWS staff		93	1		94		
Importance of direct interaction with NWS staff		94			96		
Drought Information	83	83			83		
Clarity	82	83			83		
Timeliness	83	83			81		
Accuracy	83	81			83		
Organization of information	83	83			83		
Meets my needs	84	85			85		
Water Supply/Reservoir Information	83	84			83		
Clarity	83 83	84			82		
Timeliness Accuracy	83	84 83			81 84		
	83						
Organization of information	83	83 84			83 84		
Meets my needs Data Services		86			85		
Jaid Services		86			85		
		86			85		
Accuracy Organization of information		85	+		85		
Organization of information Meets my needs		87			85		
Meetis my needs Customer Satisfaction Index	83	82			80		
Cursal satisfaction index Overall satisfaction with the NWS Hydrologic Services Program	87	88			80		
Overall satisfaction with the two's hydrologic services Frogram How well NWS Hydrologic Services Program meets your expectations	81	77	✓		76		
now wein www.snyurologic.services program compares to an "ideal" hydrologic services program	81	78	v		76		
	01	10	1		10	1	
Likelihood to Take Action	92	91			91		
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	92	91			91		
Encembod to date autor based on the hydrologic information you receive nom the National Weather Service	88	87			88		
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	88	87			88		
new constant are yes and are three hydrologic controls integrating and a good job of providing forecasts, watches and watchings in the future	00		I	<u> </u>	00	1	
Sample Size	223	208		1516	195		

	NOAA Weather Radio			NOAA Weather Wire			
	2006	2008	Significant Difference	2006	2008	Significant Difference	
Flood Information	83	81	1	83	83		
Clarity	84	81	✓	84	82		
Timeliness	83	80	~	86	84		
Accuracy	81	79	~	83	83		
Organization of information	82	81		82	82		
Meets my needs	84	82	~	84	83		
Routine River Forecasts/Observed Conditions	84	82	1	86	81		
Clarity	85	82	~	86	82		
Timeliness	84	81	~	87	80	✓	
Accuracy	83	82	✓	86	82		
Organization of information	84	82	√	86	82		
Meets my needs	84	82	✓	85	80		
Web Products	84	84		86	86		
Clarity	84	85		85	87		
Timeliness	85	83		87	86		
Accuracy	84	84		86	86		
Organization of information	84	85		86	87		
Meets my needs	85	85		86	84		
Customer Service		92		-	93		
Overall satisfaction with the NWS staff		93			93		
Importance of direct interaction with NWS staff		92			94		
Drought Information	82	84		81	84		
Clarity	82	83		80	82		
Timeliness	82	83		82	84		
Accuracy	82	83		81	83		
Organization of information	82	83		83	83		
Meets my needs	83	85		83	84		
Water Supply/Reservoir Information	81	84	1	84	80		
Clarity	81	85	✓	83	81		
Timeliness	81	84	~	84	80		
Accuracy	81	84	~	85	82		
Organization of information	81	84	~	84	78		
Meets my needs	81	85	✓	85	81	1	
Data Services	-	86		-	90		
Timeliness		86			88		
Accuracy		87			91	1	
Organization of information		85			90		
Reets my needs		86			93	1	
Customer Satisfaction Index	81	81		82	83		
Overall satisfaction with the NVS Hydrologic Services Program	85	86		85	88		
How well NWS Hydrologic Services Program meets your expectations	78	76	✓	79	79		
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	78	78		80	81		
Likelihood to Take Action	91	90	✓	93	90		
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	91	90	√	93	90		
Confidence in NWS	87	88		90	88		
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	87	88		90	88		
Sample Size	693	881		73	64		

	F	amily of Services (F	OS)	Emergency Managers Weather Information Network (EMWIN)				
	2006	2008	Significant Difference	2006	2008	Significant Difference		
Flood Information	77	76		82	82			
Clarity	75	77		82	82			
Timeliness	78	74		82	82			
Accuracy	77	76		80	80			
Organization of information	74	76		81	83			
Meets my needs	80	77		84	83			
Routine River Forecasts/Observed Conditions	77	76		82	82			
Clarity	77	74		82	82			
Timeliness	79	75		82	81			
Accuracy	76	76		81	82			
Organization of information	78	76		81	82			
Meets my needs	75	76		82	83			
Web Products	81	77		84	85			
Clarity	81	77		83	87	√		
Timeliness	78	78		84	84			
Accuracy	79	76		83	84			
Organization of information	82	77		84	86			
Meets my needs	78	77		84	86			
Customer Service		90			94			
Overall satisfaction with the NWS staff		89			94			
Importance of direct interaction with NWS staff		92			94			
Drought Information	80	74		81	84			
Clarity	75	75		80	84	√		
Timeliness	80	72		80	84			
Accuracy	79	75		80	83			
Organization of information	81	74		81	84			
Meets my needs	83	74		81	86	✓		
Water Supply/Reservoir Information	77	68		79	86	-		
Clarity	76	72		78	86	✓		
Timeliness	78	64		78	87	√		
Accuracy	76	73		79	87	✓		
Organization of information	76	65		78	85	✓		
Meets my needs	77	67		79	86	~		
Data Services		84			87			
Timeliness		82			88	+		
Accuracy		85			87	+		
Organization of information		83 87			87	+		
Meets my needs					88			
Customer Satisfaction Index	<b>71</b> 74	73 81		80 84	82			
Overall satisfaction with the NWS Hydrologic Services Program					87			
How well NWS Hydrologic Services Program meets your expectations	69 69	68 67		78 77	77 79	+		
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	09	107		11	19	1		
Likelihood to Take Action	81	84		91	92			
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	81	84		91	92			
Confidence in NWS	75	81		86	89			
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	75	81		86	89			
Sample Size	31	25		190	170			

		Local or cable TV	,		Commercial Radio	)
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	81	80		82	79	✓
Clarity	82	81		83	79	✓
Timeliness	82	81		82	80	✓
Accuracy	79	78		80	77	✓
Organization of information	81	80		82	79	✓
Meets my needs	83	82		84	80	✓
Routine River Forecasts/Observed Conditions	82	81		83	81	1
Clarity	83	82		84	81	
Timeliness	83	81		84	81	
Accuracy	82	81		83	80	✓
Organization of information	82	81		83	80	√
Meets my needs	83	82		84	81	
Web Products	83	84		82	84	
Clarity	82	85	✓	82	84	
Timeliness	83	84		83	84	
Accuracy	83	83		82	83	
Organization of information	83	84		82	84	
Meets my needs	84	84		82	85	
Customer Service		92			93	
Overall satisfaction with the NWS staff		92			93	
Importance of direct interaction with NWS staff		92			92	
Drought Information	80	82		80	80	
Clarity	79	82	~	79	80	
Timeliness	80	81		79	81	
Accuracy	80	81		79	80	
Organization of information	80	82		80	80	
Meets my needs	81	83		81	81	
Water Supply/Reservoir Information	80	83	✓	80	81	
Clarity	79	83	~	81	81	
Timeliness	80	83	~	82	82	
Accuracy	80	82		80	80	
Organization of information	80	83	~	80	80	
Meets my needs	80	83	~	80	81	
Data Services		85		-	86	
Timeliness		86			86	
Accuracy		86	1		86	
Organization of information		84			85	1
Reets my needs		86			86	1
Customer Satisfaction Index	79	79		79	79	
Overall satisfaction with the NWS Hydrologic Services Program	83	85		83	85	
How well NWS Hydrologic Services Program meets your expectations	77	75	✓	76	73	1
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	76	77		77	76	1
Likelihood to Take Action	90	89		90	90	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	90	89		90	90	
Confidence in NWS	86	87		87	87	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	86	87		87	87	
Sample Size	653	806		292	372	

		Satellite radio			Newspaper	
	2006	2008	Significant Difference	2006	2008	Significant Difference
Flood Information	81	77		82	78	1
Clarity	81	78		83	79	~
Timeliness	81	76		83	79	~
Accuracy	78	73		81	77	~
Organization of information	78	78		81	78	~
Meets my needs	84	78		83	79	~
Routine River Forecasts/Observed Conditions	79	77		83	79	1
Clarity	78	78		82	79	
Timeliness	81	77		84	79	~
Accuracy	79	77		83	78	√
Organization of information	77	76		83	78	√
Meets my needs	78	76		83	79	√
Web Products	79	81		83	82	
Clarity	78	81		82	83	
Timeliness	80	82		83	82	
Accuracy	80	81		83	80	
Organization of information	76	81		83	83	
Meets my needs	79	80	+	84	83	-
Ruesting Revus	-	90			90	
Overall satisfaction with the NWS staff	-	90			90	
Importance of direct interaction with NWS staff	73	90 78		81	89 80	
Drought Information	73					
Clarity		78		80	81	
Timeliness	72	78		81	79	
Accuracy	75	76		81	80	
Organization of information	73	78		81	80	
Meets my needs	76	78		82	81	
Water Supply/Reservoir Information	74	74		81	79	
Clarity	75	75		81	80	
Timeliness	76	73		81	80	
Accuracy	77	72		81	78	
Organization of information	75	73		81	79	
Meets my needs	75	74		81	79	
Data Services		86			85	
Timeliness		88			85	
Accuracy		87			86	
Organization of information		83			83	
Meets my needs		86			85	
Customer Satisfaction Index	77	80		79	78	
Overall satisfaction with the NWS Hydrologic Services Program	81	83		83	83	
How well NWS Hydrologic Services Program meets your expectations	75	76		76	72	✓
How NWS Hydrologic Services Program compares to an "ideal" hydrologic services program	76	78		78	75	
Likelihood to Take Action	91	90		90	89	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	91	90		90	89	
Confidence in NWS	85	86		86	86	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	85	86		86	86	
Sample Size	53	56		253	275	

	2006	2008	Significant Difference
Flood Information	82	80	
Clarity	81	82	
Timeliness	83	80	
Accuracy	81	79	
Organization of information	81	80	
Meets my needs	83	81	
Routine River Forecasts/Observed Conditions	82	80	
Clarity	84	81	
Timeliness	81	78	
Accuracy	81	81	
Organization of information	84	81	
Meets my needs	82	80	
Web Products	83	83	
Clarity	84	84	
Timeliness	85	83	
Accuracy	83	82	
Organization of information	84	83	
Meets my needs	81	83	
Customer Service	-	90	
Overall satisfaction with the NWS staff		91	
Importance of direct interaction with NWS staff		90	
Drought Information	80	81	
Clarity	79	80	
Timeliness	81	81	
Accuracy	78	80	
Organization of information	80	81	
Meets my needs	80	82	
Water Supply/Reservoir Information	79	78	
Clarity	79	79	
Timeliness	79 79	77 78	
Accuracy			
Organization of information	80	79	
Meets my needs	79	79	
Data Services		86	
Timeliness		89	
Accuracy Organization of information		86 84	-
Organization of information		84	
Meets my needs Customer Satisfaction Index	78	85 80	
Overall satisfaction with the NWS Hydrologic Services Program	84	80	
How well NWS Hydrologic Services Program meets your expectations	76	76	
now wein NWS nyotologic services Program interes your expectations How NWS Hydrologic Services Program compares to an 'ideal' hydrologic services program	76	76	
	/4		
Likelihood to Take Action	87	87	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	87	88	
Confidence in NWS	87	86	
How confident are you that the NWS Hydrologic Services Program will do a good job of providing forecasts, watches and warnings in the future	87	86	
Sample Size	148	114	

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Internet Services Means of Receiving Hydrologic Information

	NWS Web pages	Non-NWS Web pages	Phone	Mobile devices/PDA	NOAA Weather Radio	NOAA Weather Wire	Family of Services (FOS)
River conditions map							
Visual appeal	73	73	74	73	73	74	67
Ease of understanding	77	78	80	77	77	76	74
Tells me what I need to know about river conditions throughout the country	79	79	80	80	79	80	74
General river basin							
Visual appeal	67	66	68	71	69	73	65
Ease of understanding	72	72	73	74	73	78	72
Tells me what I need to know about river conditions throughout the country	71	71	70	73	72	77	69
River conditions regional map							
Visual appeal	86	87	89	87	88	89	79
Ease of understanding	88	88	91	88	89	90	88
Tells me what I need to know about river conditions throughout the country	86	85	88	85	87	88	83
Current flood conditions							
Visual appeal	85	84	84	84	87	80	80
Ease of understanding	87	86	87	87	88	85	89
Tells me what I need to know about current flooding conditions	86	85	86	86	88	83	90
Hydrograph level/flow							
Visual appeal	86	85	85	85	87	83	70
Ease of understanding	88	87	85	86	87	85	81
Tells me what I need to know about forecast levels	89	87	85	86	89	84	79
Hydrograph flood severity							
Visual appeal	87	87	85	87	88	81	70
Ease of understanding	89	88	84	88	89	83	80
Tells me what I need to know about flood impacts	87	85	82	84	87	80	75
Hydrograph low flow threshold							
Visual appeal	83	82	83	80	82	76	69
Ease of understanding	84	85	83	83	85	79	81
Tells me what I need to know about low flow	83	81	82	83	83	82	79
Usefulness of hydrograph when making decisions during periods of low flow	82	83	85	86	84	86	86
Flood depth map							
Visual appeal	86	86	88	85	87	88	83
Ease of understanding	85	85	88	85	86	90	90
Tells me what I need to know about the depth of the water	86	86	90	88	88	92	90
Usefulness of areal extent and depth of floodwaters in decision making process	89	90	94	92	91	96	92
Geographic region map							
Visual appeal	85	84	83	86	85	80	68
Ease of understanding	83	81	80	82	83	79	69
Tells me what I need to know about river forecasts	86	84	84	86	86	81	72
High-resolution precipitation estimates map							
Visual appeal	90	90	88	91	91	90	85
Ease of understanding	90	91	88	91	91	87	84
Tells me what I need to know about precipitation estimates	89	89	84	88	90	85	88
Do you use precipitation frequency estimates	00		01		00	00	00
Yes	51%	61%	70%	51%	49%	62%	56%
No	49%	39%	30%	49%	51%	38%	44%
Total number of respondents	470	147	64	65	237	21	9
Familiar with Precipitation Frequency Data Server web page					20,	2.	
Yes	55%	60%	73%	58%	57%	69%	60%
No No	45%	40%	27%	42%	43%	31%	40%
Total number of respondents	242	89	45	33	117	13	5
How useful would it be for the remainder of the US to have updated precipitation frequency estimates	E 12						<u> </u>
Usefulness of having updated precipitation frequency estimates	85	86	89	87	88	90	81
Do you use PMP estimates				0.			
boyou use r wir esumates Yes	33%	38%	61%	34%	35%	57%	33%
No	67%	62%	39%	66%	65%	43%	67%
Total number of respondents	470	147	64	65	237	21	9
Familiar with Hydrometeorological Reports web page	470	177	04	00	201	21	3
Yes	53%	59%	62%	68%	58%	58%	33%
No	47%	41%	38%	32%	42%	42%	67%
Total number of respondents	154	56	39	22	84	12	3
Usefulness of updated guidelines for PMP estimates	104	30	39		04	12	3

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Internet Services Means of Receiving Hydrologic Information

	Emergency Managers Weather	Local or cable	Commercial	Satellite radio	Newspaper	Private	Other
	Information Network (EMWIN)	тν	Radio	Satellite Taulo	Newspaper	Vendor	Other
River conditions map	·						
Visual appeal	76	71	71	74	71	63	68
Ease of understanding	78	75	77	74	77	67	72
Tells me what I need to know about river conditions throughout the country	78	76	77	70	77	69	72
General river basin	70	07	00	74	05		0.1
Visual appeal Ease of understanding	70 76	67 72	68 74	71 69	65 70	62 68	64 68
Tells me what I need to know about river conditions throughout the country	78	69	74	64	66	71	64
River conditions regional map	13	09	71	04	00	71	04
Visual appeal	91	85	86	88	86	82	84
Tase of understanding	91	86	88	90	89	85	87
Tells me what I need to know about river conditions throughout the country	89	82	85	85	86	86	82
Current flood conditions		02	00	00	00	00	02
Visual appeal	89	85	85	83	85	83	82
Ease of understanding	90	85	87	84	87	86	83
Tells me what I need to know about current flooding conditions	89	84	86	83	87	88	81
Hydrograph level/flow							
Visual appeal	87	86	84	72	84	77	80
Ease of understanding	87	86	84	73	85	77	80
Tells me what I need to know about forecast levels	89	87	86	73	87	80	81
Hydrograph flood severity							
Visual appeal	88	87	85	75	87	79	82
Ease of understanding	88	88	86	76	87	80	82
Tells me what I need to know about flood impacts	88	85	84	74	84	79	79
Hydrograph low flow threshold							
Visual appeal	82	81	80	74	82	73	81
Ease of understanding	84	84	84	77	83	77	81
Tells me what I need to know about low flow	86 88	82 83	83 81	78 84	81 85	77 79	78 79
Usefulness of hydrograph when making decisions during periods of low flow Flood depth map	88	63	61	84	60	79	79
Visual appeal	92	85	87	90	85	84	84
Ease of understanding	91	85	87	90	87	81	80
Tells me what I need to know about the depth of the water	92	86	89	92	87	85	84
Usefulness of areal extent and depth of floodwaters in decision making process	95	90	91	99	91	89	86
Geographic region map		00	01	00	01	00	00
Visual appeal	85	84	84	81	83	79	78
Ease of understanding	83	81	83	78	82	77	75
Tells me what I need to know about river forecasts	85	84	86	78	85	81	78
High-resolution precipitation estimates map							
Visual appeal	94	90	89	82	89	86	84
Ease of understanding	93	91	90	82	90	85	83
Tells me what I need to know about precipitation estimates	93	90	89	83	89	87	80
Do you use precipitation frequency estimates							
Yes	63%	51%	45%	64%	53%	69%	62%
No	37%	50%	55%	36%	47%	31%	38%
Total number of respondents	52	200	73	28	96	16	39
Familiar with Precipitation Frequency Data Server web page	070/	500/	500/	FC0/	E 70/	C 40/	E 40/
Yes	67% 33%	52% 48%	58% 42%	56% 44%	57% 43%	64% 36%	54% 46%
No Total number of respondents		48% 101					46%
Total number of respondents How useful would it be for the remainder of the US to have updated precipitation frequency estimates	33	101	33	18	51	11	24
Usefulness of having updated precipitation frequency estimates	86	88	90	89	92	78	89
Do you use PMP estimates	00	00	30	03	32	10	03
Yes	50%	31%	33%	32%	35%	44%	41%
No	50%	70%	67%	68%	65%	56%	59%
Total number of respondents	52	200	73	28	96	16	39
Familiar with Hydrometeorological Reports web page		200		20			
Yes	69%	61%	63%	44%	65%	86%	56%
No	31%	39%	38%	56%	35%	14%	44%
Total number of respondents		61	24	9	34	7	16
Usefulness of updated guidelines for PMP estimates	•						
ocoranioco or apaatoa galacinico foi i ini coliniateo							

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Water Resources Services Means of Receiving Hydrologic Information

				Mahila				
	NWS Web pages	Non-NWS Web pages	Phone	Mobile devices/PDA	NOAA Weather Radio	NOAA Weather Wire	Family of Services (FOS)	
Observed drought conditions map								
Usefulness of observed drought conditions in decision making process	83	84	81	84	85	90	76	
Visual appeal Ease of understanding	90 90	88 89	90 88	91 91	92 91	87 90	84 89	
Ease of understarbuilty Tells me what I need to know about drought conditions Tells me what I need to know about drought conditions	88	86	87	87	89	90	87	
Drought trends map								
Usefulness of trends for drought over next three months in decision making process	82	84	80 89	84	85	94	67	
Visual appeal Ease of understanding	89 89	87 87	89	92 90	91 90	84 87	84 82	
Tells me what I need to know about forecasted drought conditions	87	86	84	86	89	88	84	
Observed water temperatures map								
Usefulness of observed water temperatures in decision making process Visual appeal	70	69 88	70 89	65 90	73	73 84	36	
visual appear Ease of understanding	88	87	89	88	89	84	67	
Tells me what I need to know about the water temperatures	88	87	89	84	88	86	89	
Usefulness of receiving water temperature forecasts for rivers, streams and lakes for the next five days	76	76	74	76	79	88	61	
Snow depth map Usefulness of snow depth map in decision making process	84	81	78	74	86	91	70	
Visual appeal	90	87	87	85	90	82	76	
Ease of understanding	90	88	89	87	91	86	87	
Tells me what I need to know about snow depth National empirical in a server	90	89	91	88	91	86	89	
National analysis of the amount of water contained in snow Usefulness of estimates of amount of water contained in snow	83	82	77	76	83	86	64	
Visual appeal	89	88	92	89	89	90	86	
Ease of understanding	89	87	91	88	90	91	83	
Tells me what I need to know about water contained in snow Soil moisture map	89	87	90	86	90	91	78	
Son moisture map Usefulness of soil moisture in decision making	81	82	77	79	82	86	80	
Visual appeal	88	87	88	87	87	89	81	
Ease of understanding	88	87	86	86	88 88	88 92	75	
Tells me what I need to know about soil moisture At what soil depths is soil moisture information important to you	88	86	83	86	88	92	89	
Surface and near-surface	73%	81%	76%	77%	72%	64%	75%	
Sub-surface, including typical rooting zone depths	65%	64%	54%	68%	69%	55%	75%	
Deeper sub-surface, down to 2-3 meters Total number of respondents	30% 215	31% 80	27% 37	32% 31	32% 108	27% 11	25% 4	
Information more valuable to you	215	80	37	31	108	11	4	
A single value describing bulk soil moisture	42%	41%	51%	42%	42%	45%	50%	
Soil moisture at multiple discrete levels	58%	59%	49% 37	58%	58%	55%	50%	
Total number of respondents Usefulness of water resources properties forecast	215	80	37	31	108	11	4	
Usefulness of water resource properties forecast for current conditions	91	89	89	90	91	87	78	
Usefulness of water resource properties forecast for 48-72 hours	84	85	85	85	86	86	80	
Usefulness of water resource properties forecast for 3-5 days	77 73	78 74	76 76	77 70	78 74	84 90	73 91	
Usefulness of water resource properties forecast for 5-7 days Usefulness of water resource properties forecast for more than 1 week to 1 month	66	67	66	63	67	79	89	
Usefulness of water resource properties forecast for more than 1 month	61	61	59	58	61	71	78	
Spatial scale describing the extent of coverage unit for which information would be important in your organization	9%	9%	13%	8%	9%	42%	33%	
National Regional	28%	9% 24%	13%	28%	9% 29%	42%	33%	
Group(s) of watersheds within a large river basin	30%	38%	38%	42%	32%	25%	17%	
Single watershed	21%	17%	17%	19%	21%	8%	33%	
Sub-watershed Total number of respondents	11% 257	12% 92	4% 47	3% 36	9% 128	 12	6	
Usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant	207	92	47	30	128	12	8	
Usefulness of receiving analytical products calculated from water resources data	82	81	81	82	81	75	61	
Continue to water managers' questions	400/	540/	700/	500/	000/	500/	500/	
Yes No	42% 58%	51% 49%	70% 30%	50% 50%	39% 61%	50% 50%	50% 50%	
Total number of respondents	256	92	47	36	128	12	6	
Water supply volume inflow forecast map								
Usefulness of water supply volume inflow forecast map	81 88	81 86	79 88	84 90	85 88	80 94	74 56	
Visual appeal Ease of understanding	88	86	88	90	90	94 94	56 89	
Tells me what I need to know about the water supply forecast	86	85	85	87	86	94	59	
Usefulness of water supply volume inflow forecast map for the entire United States	89	86	88	88	92	100	78	
Water supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression	82	85	83	86	90	96	56	
User lunges of water supply volume innow forecast progression Visual appeal Visual app	88	88	87	92	89	96	78	
Ease of understanding	87	87	86	90	89	91	78	
Tells me what I need to know about the seasonal water supply forecast evolution  Hardtheese researched use faces faces faces faces faces for the seasonal water supply forecast evolution	90	90	92	92	92	91	89	
Monthly ensemble volume forecast Usefulness of monthly ensemble volume forecasts	79	81	79	85	83	81	59	
Usual appeal Visual appeal	86	85	88	88	88	98	72	
Ease of understanding	83	81	84	81	84	93	67	
Tells me what I need to know about water supply volume forecast uncertainty therefore and a function and the supply volume forecast uncertainty	86	85	88	87	88	93	67	
Usefulness of climate sensitivity studies Usefulness of climate sensitivity studies	72	78	74	78	79	80	59	
Climate sensitivity study								
Visual appeal	78	79	81	82	81	96	44	
Ease of understanding Tells me what I need to know about climate sensitivity for a select river forecast point	76 79	78 81	78 80	79 83	76 79	96 96	44 39	
	19	01	ou	03	19	30	38	

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Water Resources Services Means of Receiving Hydrologic Information

	Emergency Managers Weather Information Network (EMWIN)	Local or cable TV	Commercial Radio	Satellite radio	Newspaper	Private Vendor	Other
Observed drought conditions map							
Usefulness of observed drought conditions in decision making process	85	83	83	79	83	73	79
Visual appeal	94	89	89	91	91	89	91
Ease of understanding Tells me what I need to know about drought conditions	94 92	89 87	88 86	90 89	90 86	90 92	88 88
Drought trends map	92	0/	00	69	00	92	00
Usefulness of trends for drought over next three months in decision making process	89	83	84	83	86	75	78
Visual appeal	94	89	89	86	88	91	86
Ease of understanding	93	89	89	84	88	93	85
Tells me what I need to know about forecasted drought conditions Obsequed under temperatures measurements	94	87	87	83	86	93	80
Observed water temperatures map Usefulness of observed water temperatures in decision making process	71	70	73	71	71	59	68
Usual appeal	89	87	85	91	90	91	85
Ease of understanding	87	87	87	89	88	91	86
Tells me what I need to know about the water temperatures	89	87	87	90	85	96	86
Usefulness of receiving water temperature forecasts for rivers, streams and lakes for the next five days	78	79	82	90	81	91	77
Snow depth map Usefulness of snow depth map in decision making process	89	84	88	90	90	64	73
Usual appeal	91	88	87	84	88	85	87
Ease of understanding	92	89	89	91	89	89	86
Tells me what I need to know about snow depth	93	89	89	92	89	91	87
National analysis of the amount of water contained in snow							
Usefulness of estimates of amount of water contained in snow	88	82	83	78	86	60	66
Visual appeal	90 91	87 86	87 87	90 94	88 88	93 91	89 90
Ease of understanding Tells me what I need to know about water contained in snow	91	86	87	94 93	88	91 93	90 88
Soli molisture map		~~	0.		0.		55
Usefulness of soil moisture in decision making	85	80	82	81	83	81	72
Visual appeal	91	86	88	91	87	84	85
Ease of understanding	92	87	87	84	88	83	83
Tells me what I need to know about soil moisture	93	88	89	87	87	89	81
At what soil depths is soil moisture information important to you Surface and near-surface	78%	73%	67%	86%	70%	80%	76%
Sub-suface and real solate	61%	67%	67%	57%	79%	70%	71%
Deeper sub-surface, down to 2-3 meters	30%	30%	36%	14%	42%	40%	35%
Total number of respondents	23	105	42	7	53	10	17
Information more valuable to you							
A single value describing bulk soil moisture Soil moisture at multiple discrete levels	43% 57%	42% 58%	38% 62%	57% 43%	34% 66%	40% 60%	41% 59%
Soi masture at multiple discrete levels Total number of respondents	23	105	42	43%	53	10	59% 17
Usefulness of water resources properties forecast							
Usefulness of water resource properties forecast for current conditions	85	89	88	78	89	83	83
Usefulness of water resource properties forecast for 48-72 hours	86	84	84	80	87	86	83
Usefulness of water resource properties forecast for 3-5 days	75	77	77	73	77	75	70
Usefulness of water resource properties forecast for 5-7 days Usefulness of water resource properties forecast for more than 1 week to 1 month	75 64	74 66	76 70	88 81	76 70	78 64	77 64
Usefulness of water resource properties forecast for more than 1 week of Inform	57	61	64	79	65	58	61
Spatial scale describing the extent of coverage unit for which information would be important in your organization	0,	01	01			00	01
National	15%	10%	6%	11%	11%	33%	10%
Regional	27%	29%	34%	22%	30%	25%	24%
Group(s) of watersheds within a large river basin	35%	33%	30%	33%	30%	8%	29%
Single watershed Sub-watershed	8% 15%	18% 10%	18% 12%	33%	17% 12%	17% 17%	29% 10%
Total number of respondents		125	50	9	66	12	21
Usefulness of receiving analytical products calculated from water resources data sets and metadata to make the information more relevant				-			
Usefulness of receiving analytical products calculated from water resources data	78	81	81	77	81	74	81
Continue to water managers' questions							
Yes bio	50% 50%	39%	44%	56% 44%	47% 53%	58% 42%	81% 19%
No Total number of respondents	26	61% 125	56% 50	44% 9	53%	42%	19%
Water supply volume inflow forecast map		120	00	ÿ			21
Usefulness of water supply volume inflow forecast map	91	81	83	72	80	80	75
Visual appeal	87	84	87	80	83	73	83
Ease of understanding	94	85	89	96	86	93	85
Tells me what I need to know about the water supply forecast Usefulness of water supply volume inflow forecast map for the entire United States	85 95	83 90	86 94	76 93	79 88	76 82	79 87
Used supply volume infow forecast progression Water supply volume infow forecast progression	90	90	34	93	00	02	07
Vale a supply volume inflow forecast progression Usefulness of water supply volume inflow forecast progression	90	83	89	83	85	76	85
Visual appeal	97	85	87	89	88	89	84
Ease of understanding	96	83	85	87	84	92	80
Tells me what I need to know about the seasonal water supply forecast evolution	96	89	92	87	87	94	86
Monthly ensemble volume forecast Undriverse of monthly unsemble volume forecast	90	80	84	72	80	78	76
Usefulness of monthly ensemble volume forecasts Visual appeal	90	80	90	100	80	78	76 84
Visual appeal Ease of understanding	89	81	87	92	86	86	79
Tells me what I need to know about water supply volume forecast uncertainty	89	85	91	97	89	89	84
Usefulness of climate sensitivity studies							
Usefulness of climate sensitivity studies	76	76	80	69	77	76	70
Climate sensitivity study	80	76	82	81	78	81	74
Visual appeal Ease of understanding	78	76	82	81 75	78	81	74 71
Ease of understanding Tells me what I need to know about climate sensitivity for a select river forecast point	80	75	80	75	74	81	71 78
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### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Means of Receiving Hydrologic Information

Herdeland and Andreas and Plant Markers and Maryland	NWS Web pages	Non-NWS Web pages	Phone	Mobile devices/PDA	NOAA Weather Radio	NOAA Weather Wire	Family of Services (FOS)
Usefulness of having access to Flood Watches and Warnings Usefulness of having access to Flood Watches and Warnings as text	87	87	84	91	90	93	78
Usefulness of having access to Flood Watches and Warnings coded in XML, including CAP Usefulness of having access to Polygons specifying the area covered by Flood Watches and Warnings	75 86	73 83	73 82	80 91	77 89	83 91	63 83
Observations Precipitation	97	98	98	98	97	99	97
Snow accumulation	88	88	83	85	89	98	83
Snow water equivalent River stage/flow	82 90	82 91	81 92	78 92	82 90	96 98	81 96
Soil moisture Air Temperature	76 87	75 85	73 87	81 90	76 89	84 97	74 95
Dew point Wind speed	81 84	81 83	74 81	83 88	84 87	86 93	98 95
Atmospheric freezing level	70	68	66	74	74	85	89
Potential evaporation Soil frost depth	72 66	72 66	71 60	72 66	73 71	85 82	85 76
Forecast Precipitation	96	96	95	97	97	97	95
Temperature	90	90	90	92	93	95	95
Instantaneous streamflow/stage Streamflow or stage forecast uncertainty information	87 83	87 85	91 89	89 86	88 85	98 97	89 100
Cumulative streamflow Atmospheric freezing level	78 67	78 65	83 63	78 72	80 73	88 83	89 89
Basin Boundaries			85	76	81	99	97
Historical data used to calibrate models	82	83					
Historical data used to calibrate models Hydrologic Model	78	78	79	72	77	93	93
Hydrologic model parameters Hydrologic model states	72	76 74	71 67	67 69	73 73	91 83	91 83
Unit Hydrograph parameters	74	78	72	70	74	85	89
Routing Parameters Routing parameters	72	74	75	67	73	77	78
Rating Curve Rating Curve	74	77	77	71	75	82	87
Raw ensemble streamflow prediction traces							
Raw ensemble streamflow prediction traces Climate forecast adjusted ensemble streamflow prediction traces	72	74	74	70	74	81	83
Climate forecast adjusted ensemble streamflow prediction traces Statistical Water Supply Forecast	73	74	74	71	75	83	83
Statistical Water Supply Forecast	74	74	72	70	74	79	85
Flash Flood Guidance Flash Flood Guidance	87	88	87	91	90	96	95
Text ASCII	83	83	84	84	85	78	73
XML	79	75	74	81	81	85	76
ASCII	82	81	84	78	84	73	68
XML SHEF	80 64	79 65	76 70	80 63	82 67	84 63	75 52
Shapefile KML	75	78	79	78	75	77	65
Lines, Vectors, and Contours	68	68	69	72	69	74	64
ASCII XML	75 76	73 76	69 70	67 76	76 80	70 79	54 65
Shapefile KML	78 70	80 68	80 75	82 75	80 75	81 75	69 61
Grids, Arrays, and Rasters							
ASCII Shapefile	74 77	72 78	70 82	68 79	75 78 71	71 77	47 62
KML GeoTIFF	68 77	67 78	74 79	72 80	71 81	68 80	51 74
Bit-mapped graphics + Worldlife	74	74	73	74	78	76	61
NetCDF GRIB	62 58	62 58	56 49	66 66	68 66	51 69	39 78
BUFR Digital Information Availability	57	55	49	60	63	57	60
Download	88	88 92	86	90	88	90	80 91
Web map service Web feature service	91 90	90	91 93	93 93	92 92	93 97	91
Web coverage service RSS	89 79	87 78	90 83	91 82	90 83	97 84	91 73
WAP GIS - Commercial	76	75	78	84	79	84	58
ESRI	37%	45%	54%	46%	35%	23%	43%
Intergraph Idrisi	7%	3% 5%	11% 4%	6% 2%	7% 4%	8% 15%	14% 29%
Erdas Imagine ENVI	4% 4%	5% 5%	4% 4%	2% 4%	4% 4%	8% 15%	14% 14%
Autodesk	12%	16%	15%	15%	12%	15%	14%
Custom Application Other	18% 8%	21% 7%	20% 4%	23% 8%	21% 9%	69% 15%	71% 43%
Total number of respondents GIS - Open Services	227	86	46	52	131	13	7
GRASS SAGA	8%	9%	11%	8% 4%	7%	8%	14%
ILWIS (GNU)	4% 4%	5% 2%	4% 4%	2%	5% 5%	15% 8%	29% 29%
Geotools Custom Application	17% 17%	17% 15%	22% 20%	29% 17%	21% 21%	23% 54%	43% 29%
Other	9%	5%	11% 46	10%	8%	8%	- 7
Total number of respondents	227	86			131	13	
IDL PV-Wave	6% 4%	7% 3%	7% 4%	6% 	7% 4%	15% 8%	29% 14%
MatLab Vis5D	9% 3%	12% 5%	9% 2%	12% 2%	8% 4%	15% 15%	14%
GEMPAK	6%	9%	4%	6%	7%	23%	57%
CrADS AVS5	4% 3%	5% 2%	2% 2%	4% 2%	5% 4%	15% 8%	43% 29%
NCAR Graphics/NCL AWIPS	11% 9%	10% 12%	9% 13%	12% 8%	11% 11%	15% 15%	29% 29%
Custom Application	16%	13%	17%	17%	18%	46%	29%
Other Total number of respondents	10% 227	5% 86	9% 46	12% 52	6% 131	8% 13	29% 7
Other Categories Keyhole Markup Language viewers	36%	44%	48%	50%	40%	54%	57%
Geo-aware Databases	11%	7%	13%	13%	14%	23%	29%
Specialized Spatial Information Systems GPS/Navigation	5% 30%	5% 28%	4% 33%	6% 46%	8% 31%	8% 23%	14% 43%
TV/Media Graphics CAD Tools	25% 17%	31% 15%	28% 24%	40% 17%	35% 17%	62% 46%	86%
Image Processing/ Computer Graphics	31%	30%	37%	37%	35%	54%	57%
Other Total number of respondents	5% 227	3% 86	4% 46	8% 52	6% 131	13	14% 7
Usefulness of metadata Usefulness of metadata	82	81	82	82	82	81	73
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	81	80	81	83	82	79	67
o aeromeas or revolo consistently aurening to open deuspatial Consonium standards	61	dU	01	03	02	19	0/

### NWS Hydrology Customer Satisfaction 2008 Table of Scores Data Services and Products Format Means of Receiving Hydrologic Information

	Emergency Managers Weather Information Network (EMWIN)	Local or cable TV	Commercial Radio	Satellite radio	Newspaper	Private Vendor	Other
Usefulness of having access to Flood Watches and Warnings Usefulness of having access to Flood Watches and Warnings as ted Usefulness of having access to Flood Watches and Warnings coded in XML, including CAP Usefulness of having access to Polygons specifying the area covered by Flood Watches and Warnings Observations	92 81 92	90 77 87	89 77 87	83 65 71	89 70 80	88 77 91	78 67 77
Precipitation	98 93	96 89	97 91	100 96	96	99	95 83
Snow accumulation Snow water equivalent	87	81	84	87	92 84	85 79	87
River stage/flow Soil moisture	96 84	88 73	90 75	94 69	91 74	94 73	95 71
Air Temperature	95	88	90	94	85	90	87
Dew point Wind speed	91 96	82 84	83 85	86 94	81 80	88 90	78 84
Atmospheric freezing level	89 79	70	76	86	70	78	73
Potential evaporation Soil frost depth	79 79	69 64	70 69	83 76	72 64	69 57	76 67
Forecast Precipitation	97	96	96	100	96	99	92
Temperature	95	91	94	97	88	96	89
Instantaneous streamflow/stage Streamflow or stage forecast uncertainty information	90 88	86 82	86 82	90 90	86 84	86 85	88 87
Cumulative streamflow	84	77	79	91	76	78	88
Atmospheric freezing level Basin Boundaries	85	66	72	80	68	77	71
Basin boundaries	87	80	80	95	84	82	90
Historical data used to calibrate models Historical data used to calibrate models	82	76	77	94	79	78	87
Hydrologic Model				94			80
Hydrologic model parameters Hydrologic model states	75 75	70 69	72 71	94 83	77 72	77 72	80 75
Unit Hydrograph parameters	80	71	73	84	75	75	76
Routing Parameters Routing parameters	76	69	71	83	75	70	76
Rating Curve	78			82	77	76	79
Rating Curve Raw ensemble streamflow prediction traces		72	74				
Raw ensemble streamflow prediction traces Climate forecast adjusted ensemble streamflow prediction traces	79	72	73	81	73	75	78
Climate forecast adjusted ensemble streamflow prediction traces	79	73	74	82	71	68	81
Statistical Water Supply Forecast Statistical Water Supply Forecast	77	73	74	87	74	69	79
Flash Flood Guidance							
Flash Flood Guidance Text	91	87	87	96	86	91	84
ASCII	86	84	86	68	83	86	75
XML Point Data	83	80	79	73	76	78	63
ASCII	82	81	83	68	81	74	72
XML SHEF	82	81 63	78 65	69 57	74 62	80	67 58
Shapefile	80	72	72	58	70	72	76
KML Lines, Vectors, and Contours	69	66	66	56	62	72	70
ASCII	78	74	76	65	78	68	59
XML Shapefile	80 81	77 75	77 75	70 62	70 73	78 81	62 76
KML	74	69	70	60	63	71	69
Grids, Arrays, and Rasters ASCII	78	72	75	65	75	67	61
Shapefile	80	75 68	76	65 57	75 63	79	75
KML GeoTIFF	69 84	75	68 77	57 65	78	72 75	66 72
Bit-mapped graphics + Worldlife NetCDF	72 57	73 63	77 64	72 54	72 63	63 46	55 53
GRIB	64	60	61	53	57	59	42
BUFR Digital Information Availability	61	57	60	53	57	50	44
Download	87	88	88	80	84	89	78
Web map service Web feature service	92	91 91	90 89	95 95	92 92	91 91	85 85
Web coverage service	91	89	88	91	90	90	84
RSS WAP	83 80	81 75	83 77	95 88	80	85 82	78 69
GIS - Commercial							
ESRI Intergraph	53% 13%	34% 6%	39% 14%	45% 5%	33% 9%	25% 17%	71% 13%
Idrisi	10% 7%	4% 5%	8% 6%	5% 5%	4% 5%	17% 8%	13% 8%
Erdas Imagine ENVI	13%	4%	6%	5%	4%	8%	13%
Autodesk Custom Application	17% 43%	13% 18%	22% 8%	10% 45%	11% 22%	33% 33%	25% 21%
Other	3%	7%	11%	10%	7%		4%
Total number of respondents GIS - Open Services	30	112	36	20	55	12	24
GRASS	7%	9%	8%	5%	9%	17%	17%
SAGA ILWIS (GNU)	17% 10%	4% 4%	8% 8%	5% 5%	5% 7%	17% 17%	13% 8%
Geotools	37%	23%	14%	10%	24%	33%	17%
Custom Application Other	33% 7%	18% 7%	11% 17%	30% 10%	20% 11%	42% 8%	21% 13%
Total number of respondents		112	36	20	55	12	24
Scientific Data Analysis, Modeling, and Visualization IDL	10%	7%	8%	10%	5%	8%	8%
PV-Wave MatLab	7% 10%	4% 10%	6% 14%	5% 5%	4% 13%	8% 25%	8% 21%
Vis5D	7%	4%	6%	10%	4%	8%	8%
GEMPAK CrADS	17% 10%	7% 4%	6%	20% 10%	5% 4%	8%	17%
AVS5	10%	3%	6% 6%	5%	4%	8% 8%	8% 8%
NCAR Graphics/NCL AWIPS	20% 23%	11% 12%	11% 8%	10% 10%	13% 13%	17% 25%	8% 17%
Custom Application Other	33%	12% 15% 8%	14% 17%	30% 5%	16% 9%	25% 8%	29% 17%
Total number of respondents Other Categories	30	112	36	20	55	12	24
Keyhole Markup Language viewers Geo-aware Databases	57% 33%	38% 13%	31% 14%	50% 15%	40% 13%	58% 33%	63% 17%
Specialized Spatial Information Systems	13%	5%	8%	15%	9%	17%	4%
GPS/Navigation TV/Media Graphics	47% 50%	29% 35%	28% 39%	20% 45%	35% 42%	42% 67%	38% 25%
CAD Tools	33%	17%	22%	10%	18%	33%	29%
Image Processing/ Computer Graphics Other	50% 3%	33% 5%	33% 14%	35% 5%	40% 9%	42% 8%	42% 4%
Total number of respondents		5%	14% 36	5% 20	9% 55	12	4%
Usefulness of metadata Usefulness of metadata	76	79	82	74	81	81	81
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards							
Usefulness of NWS consistently adhering to Open Geospatial Consortium standards	80	78	78	69	82	71	78