



National Weather Service Customer Satisfaction Survey

Hydrologic Services Program

Final Report 2006

CFI Group
Claes Fornell International



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Introduction



Introduction

This report presents the results from the 2006 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 that end the Research Summary give recommendations about how NWS managers may most effectively act on these findings. Following these are sections including further detail on survey results, verbatim customer 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.

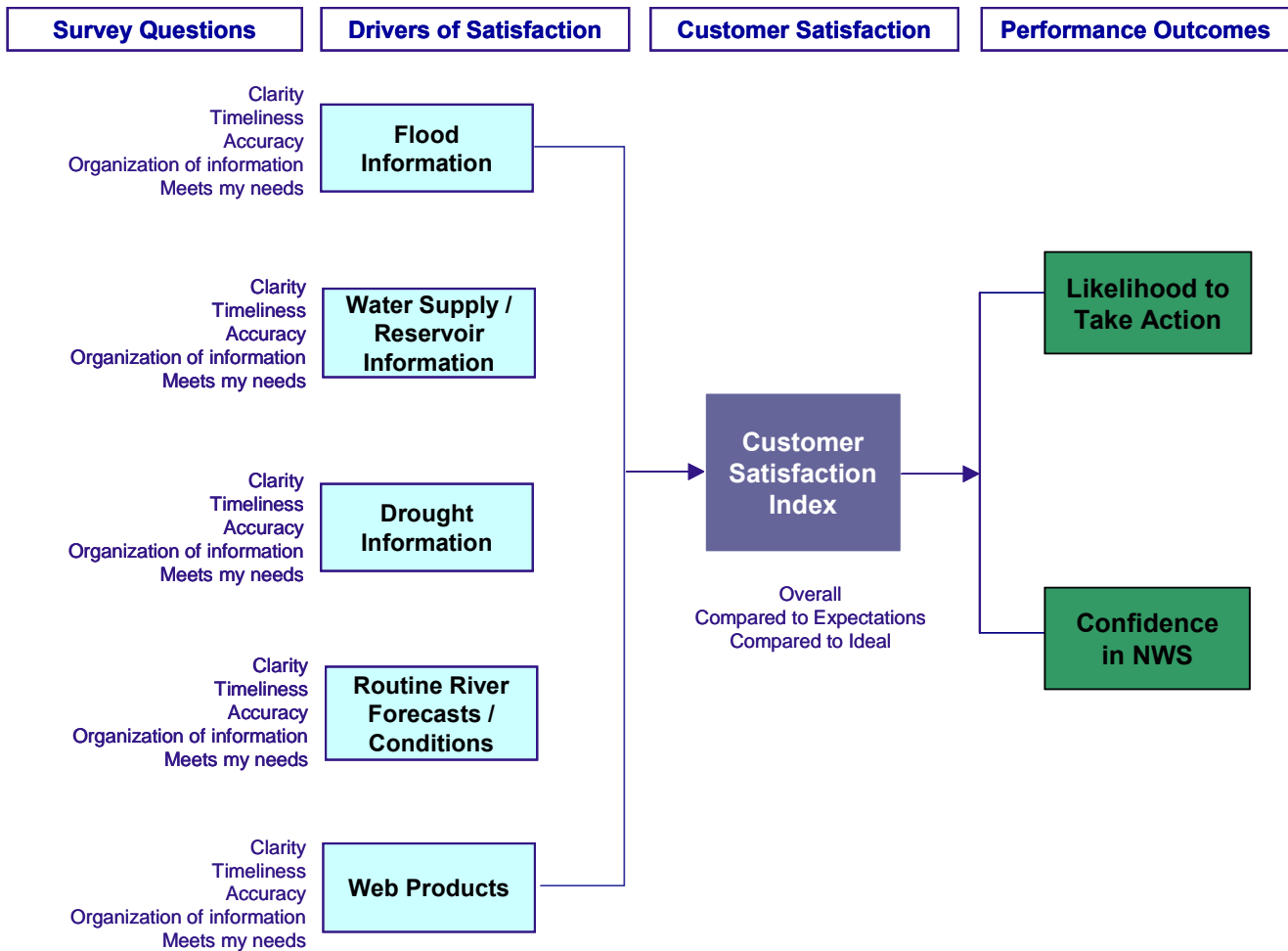
The heart of the CFI Group methodology is the Customer Satisfaction Model, found on the next page. The model flows from left to right in a chain of cause-and-effect. On the far left side are **Attributes** - actual questions about various aspects of the NWS Hydrologic Services Program’s performance from 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



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



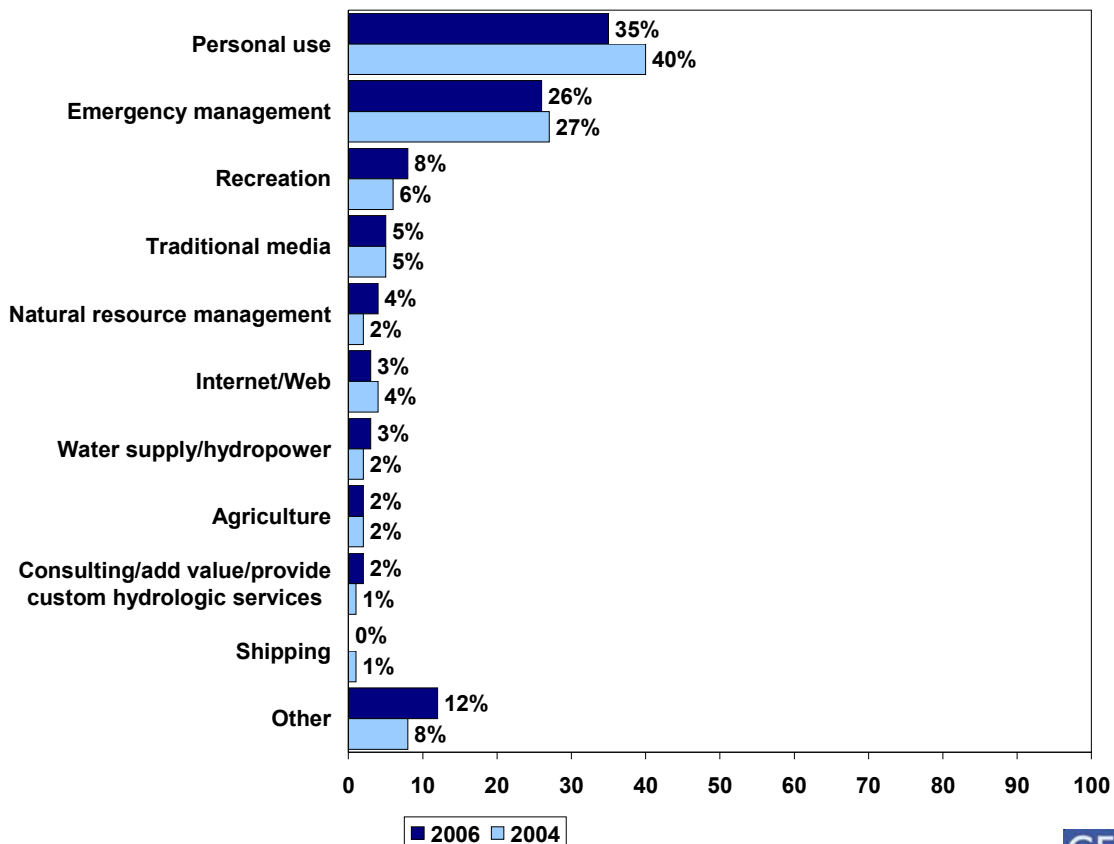
Research Summary

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 vs. 2004. 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. As was the case in 2004, the 2006 survey also gauged demand for additional information types and formats. Beyond the core model questions, respondents were asked to voluntarily complete questions related to Flood Risks, Digital Services and Uncertainty & Probability.

The survey was conducted via the web, August 10 - September 13, 2006, a full month earlier than in 2004. The NWS provided the survey link to various customers, which allowed for anonymous feedback. The survey was also posted on NWS web pages. During the survey period, 1,668 responses were collected. As was the case in 2004, respondents report using hydrologic information primarily for personal use or emergency management. The next page provides additional demographic information.

Figure 1: Primary Use or Commercial Sector





Research Summary continued

Figure 2: Means by which Receive NWS Hydrologic Information

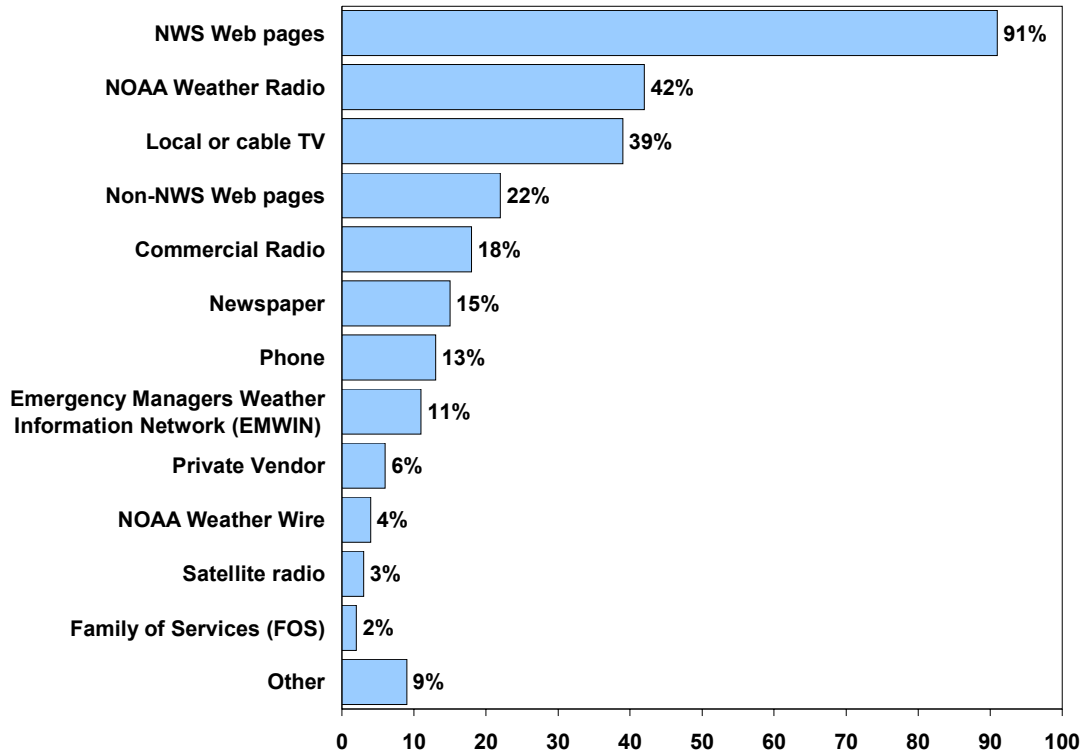


Figure 2 shows that respondents primarily receive information via the NWS Web pages, while many also receive it via NOAA Weather Radio and TV. Note that multiple selections were allowed. Figure 3 illustrates that Flood Information is accessed most frequently by survey respondents.

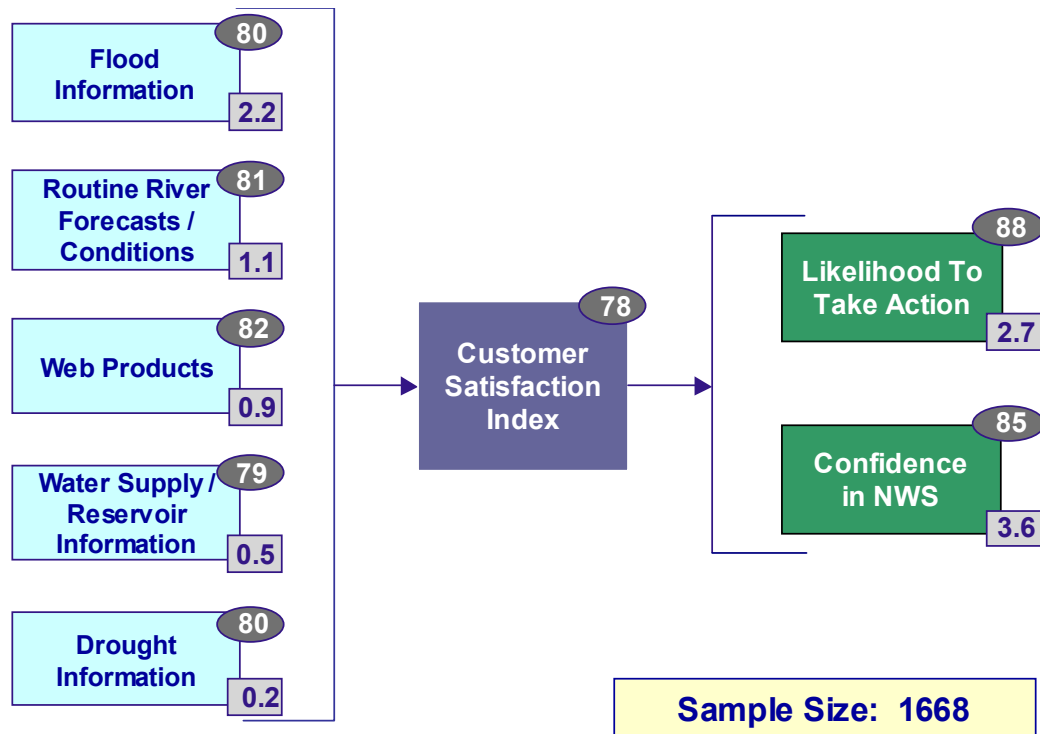
Figure 3: Frequency of Obtaining Text Information

	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=1,573)	23%	22%	19%	28%	5%	2%
Hydrologic Outlooks providing information on water supply and/or reservoir information (n=1,511)	6%	11%	18%	27%	26%	12%
Hydrologic Outlooks providing drought information (n=1,499)	4%	10%	20%	32%	25%	9%
Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions (n=1,500)	9%	18%	24%	27%	15%	7%
Other information (n=629)	13%	14%	10%	8%	27%	28%



Research Summary continued

Model Results



Scores The performance of each component on a 0 to 100 scale. Component scores are made up of the weighted average of the corresponding survey questions.

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 2.2-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.



Research Summary continued

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 2.2 points (from 78 to 80.2), 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 3.6, 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.

As was the case in 2004, **Flood Information** and **Routine River Forecasts / Conditions** have the greatest leverage on satisfaction. These currently score very well, so maintaining current service levels / making any improvements possible are recommended. **Web Products** is a moderate impact area, and certainly would impact satisfaction if improvements were made. **Water Supply** and **Drought Information** are relatively low impact areas, so the NWS should consider them third-tier priorities.

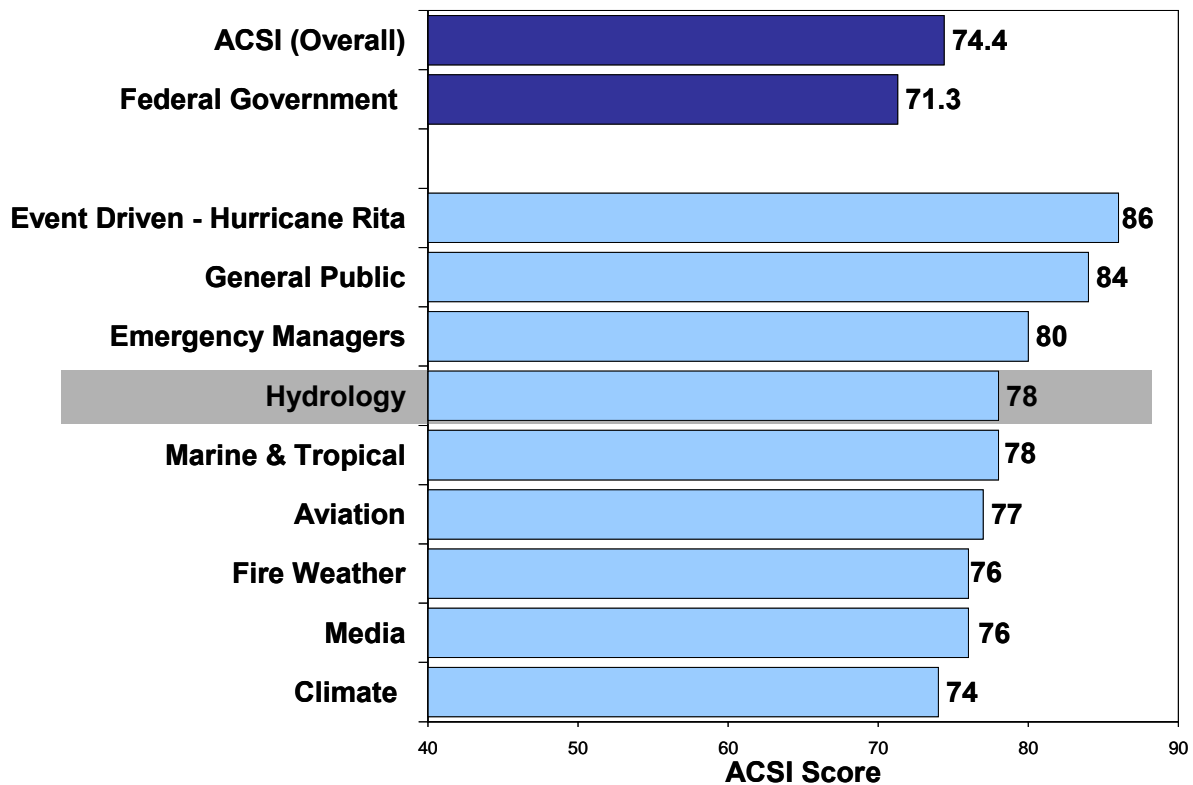


Research Summary continued

Benchmarks

The NWS Hydrologic Services Program continues to perform very well, as the overall customer satisfaction score is 78. The benchmarks provided in Figure 4 show that Hydrology scores better than the ACSI average, which includes all public and private industries measured (74.4). Hydrology also outperforms the Federal Government average of all agencies surveyed (71.3) and many of the other National Weather Service entities that have measured in the past. The Hydrologic Services Program can be very proud of their customer satisfaction scores.

Figure 4: ACSI & Federal Government Benchmarks



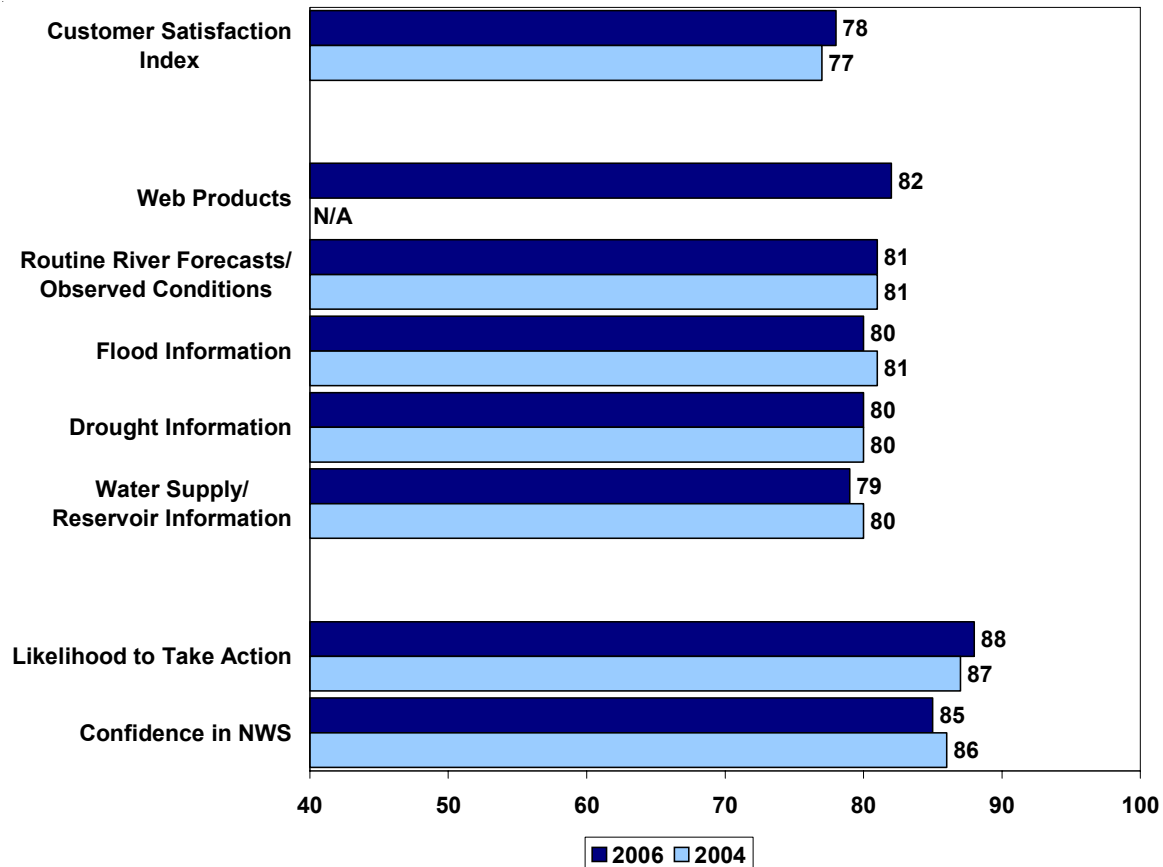


Research Summary continued

Score Comparisons 2006 vs. 2004

Overall, there is little score differentiation between the various components of 2006 vs. 2004, all continue to score very high between 79 and 82 (Figure 5). Customers continue to view the information they receive from the NWS Hydrologic Services Program with a high degree of satisfaction. The following pages identify specific populations of users that score areas a bit lower than others. This will be important in looking at incremental improvement opportunities.

Figure 5: Component Scores 2006 vs. 2004

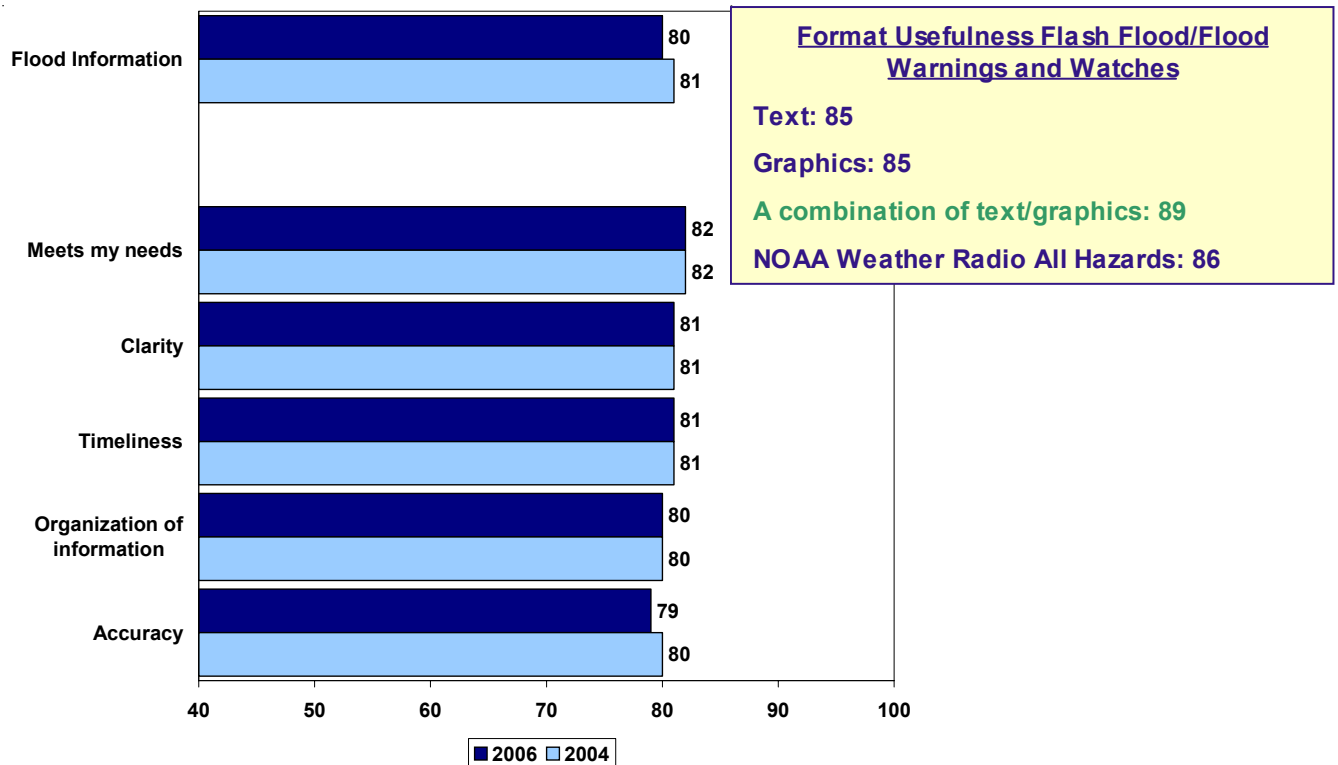




Research Summary continued

Flood Information

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



Flood Information performs very well with a score of 80 (not a substantive change over 2004) and also has the highest impact (2.2). All attributes score very well (79-82). It is important to maintain current levels of service in this area and fine tune wherever possible. Respondents also were asked to rate format usefulness of receiving Flash Flood/Flood Warnings and Watches (Figure 6). “A combination of text/graphics” (89) received the highest marks. The NWS should continue to provide information in this format where possible. Verbatim comments such as those located in Figure 7 offer other recommendations specific to flood information. A full listing of verbatim comments can be found beginning on page 69.

Figure 7: Customer Verbatim Commentary

The information is too broad about warnings. This causes the public to take risks because they don't think it's going to affect them.

More updates during moderate to major flooding conditions.

E-mail notification for when forecasts are updated.

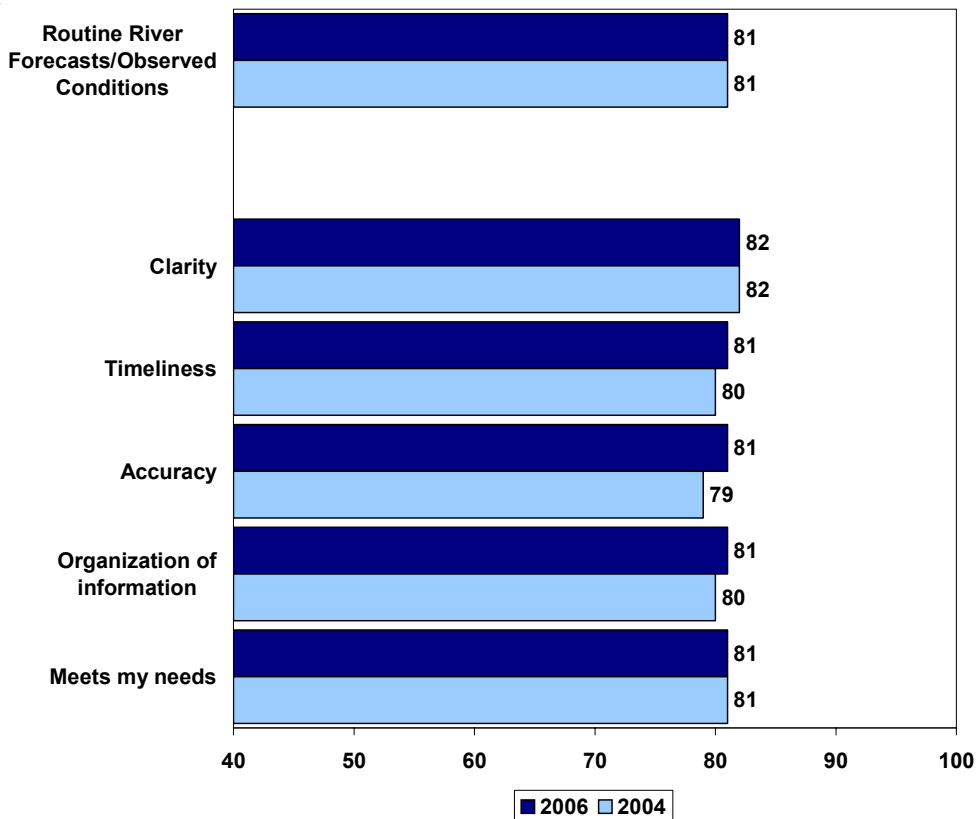


Research Summary continued

Routine River Forecasts/Information

The Routine River Forecasts/Information component scores the same as 2004, very strong (81). 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. Again, format usefulness was asked for both river forecasts and river/stream observations (Figure 8) and customers feel most strongly that information should be provided in a combination of text/graphics (86). The next page analyzes these key driver's performance as it relates to different segments of the population.

Figure 8: Routine River Forecasts/Information component and attribute scores 2004-2006



Format Usefulness River Forecasts

- Text: 80
- Graphics: 83
- A combination of text/graphics: 86
- Digital: 73
- NOAA Weather Radio All Hazards: 79

Format Usefulness River/Stream Observations

- Text: 80
- Graphics: 84
- A combination of text/graphics: 86
- Digital: 73
- NOAA Weather Radio All Hazards: 77



Research Summary continued

High Satisfaction Driver Segmentation

Figure 9: Flood Information and Routine River Forecasts/Observed Conditions Scores by Region

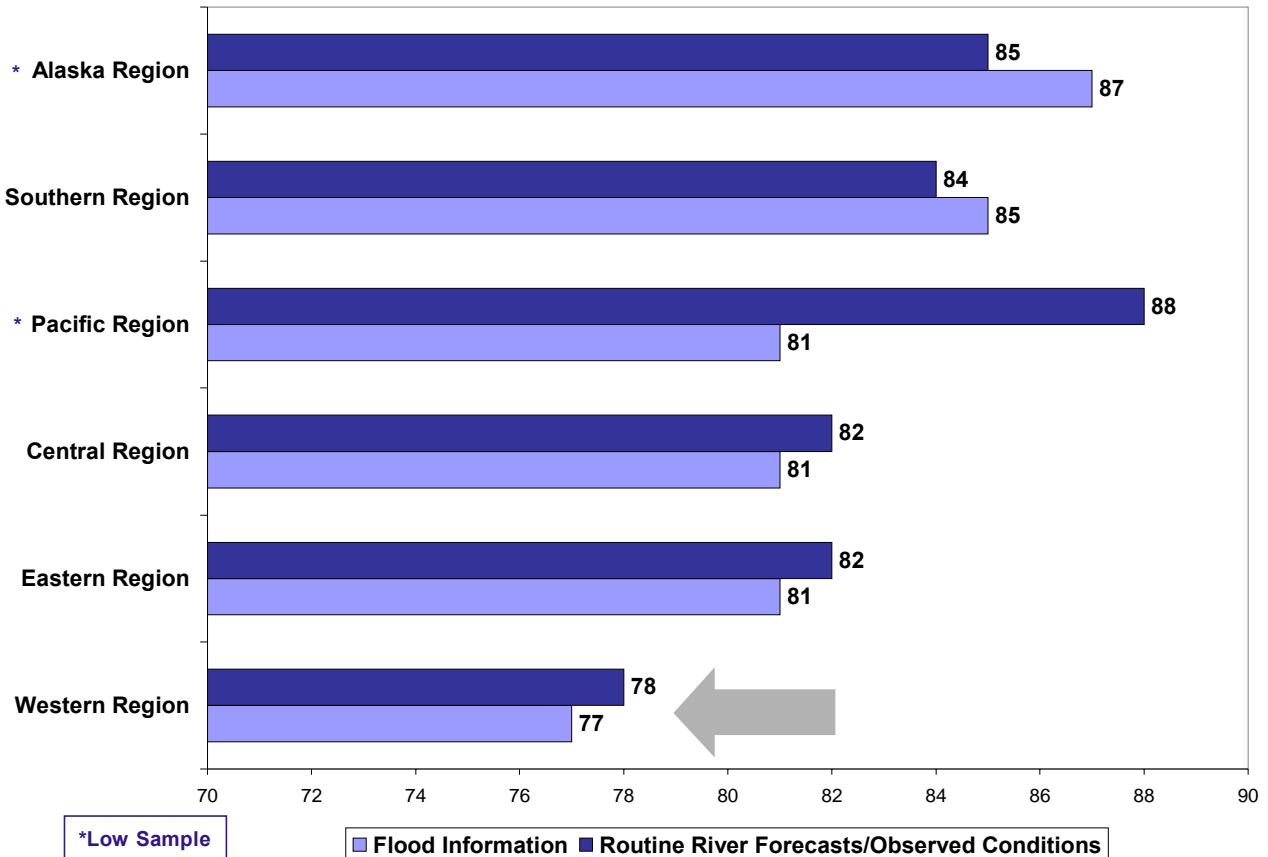


Figure 9 compares scores for the top two drivers of satisfaction (Flood Information and Routine River Forecasts/Observed Conditions) by region. While all regions score well in these areas, the Western Region scores slightly lower. In looking for opportunities to fine-tune scores for these drivers of satisfaction, the Western Region could lend insight.

Figure 10 shown on the next page views the scores by Primary Use of information. Again, the caveat is that for some of these groups, the sample size is low. Nevertheless, Consulting and Agriculture 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, Figure 9 provides customer commentary that lends further support that the NWS Hydrologic information successfully suits a broad range of customer needs.



Research Summary continued

Figure 10: Flood Information and Routine River Forecasts/Observed Conditions Scores by Primary Use

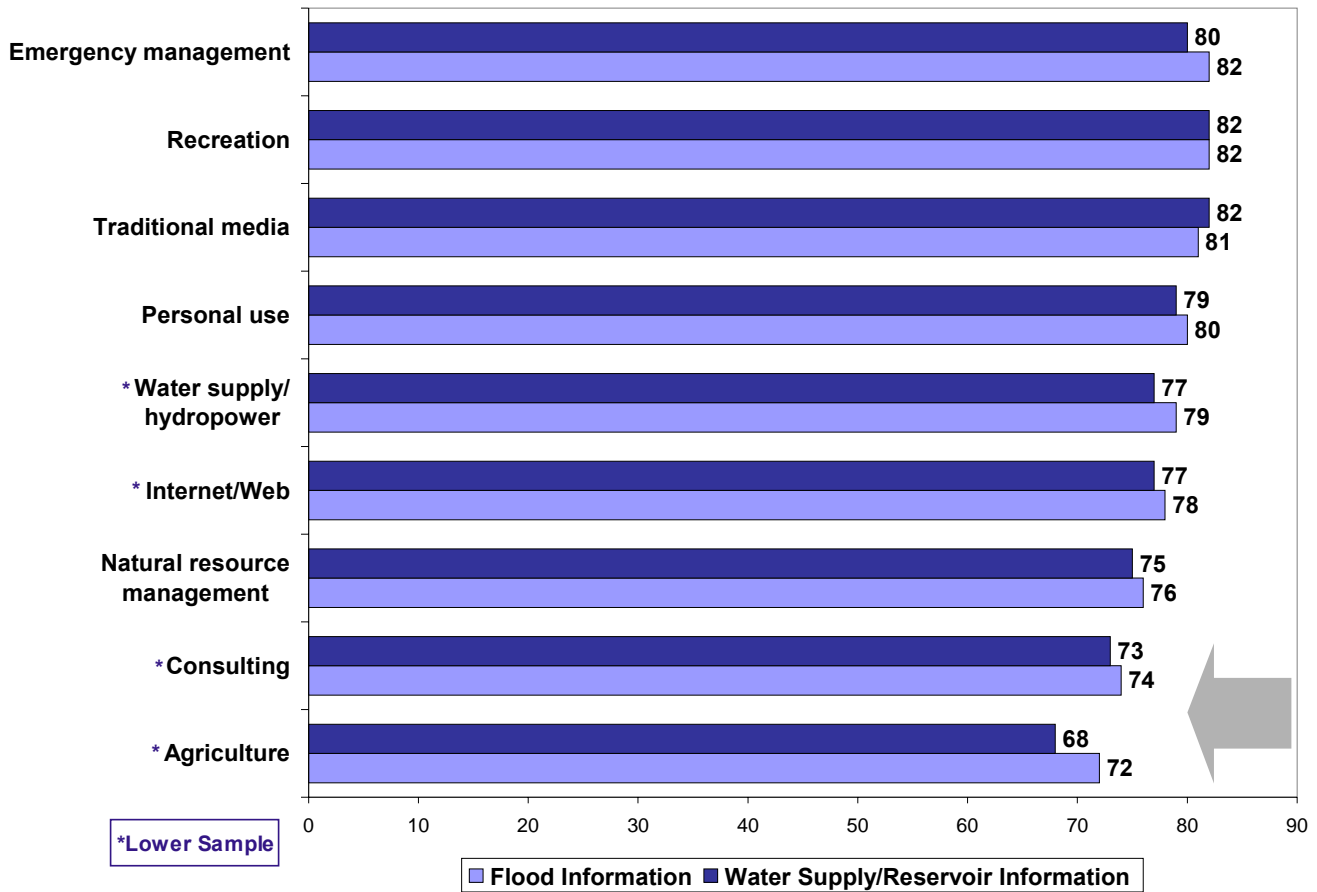


Figure 11: Customer Verbatim Commentary

As an emergency manager, I could not do my job without their help.

As a hydrologic engineer, the products and services provided by the NWS are invaluable to me.

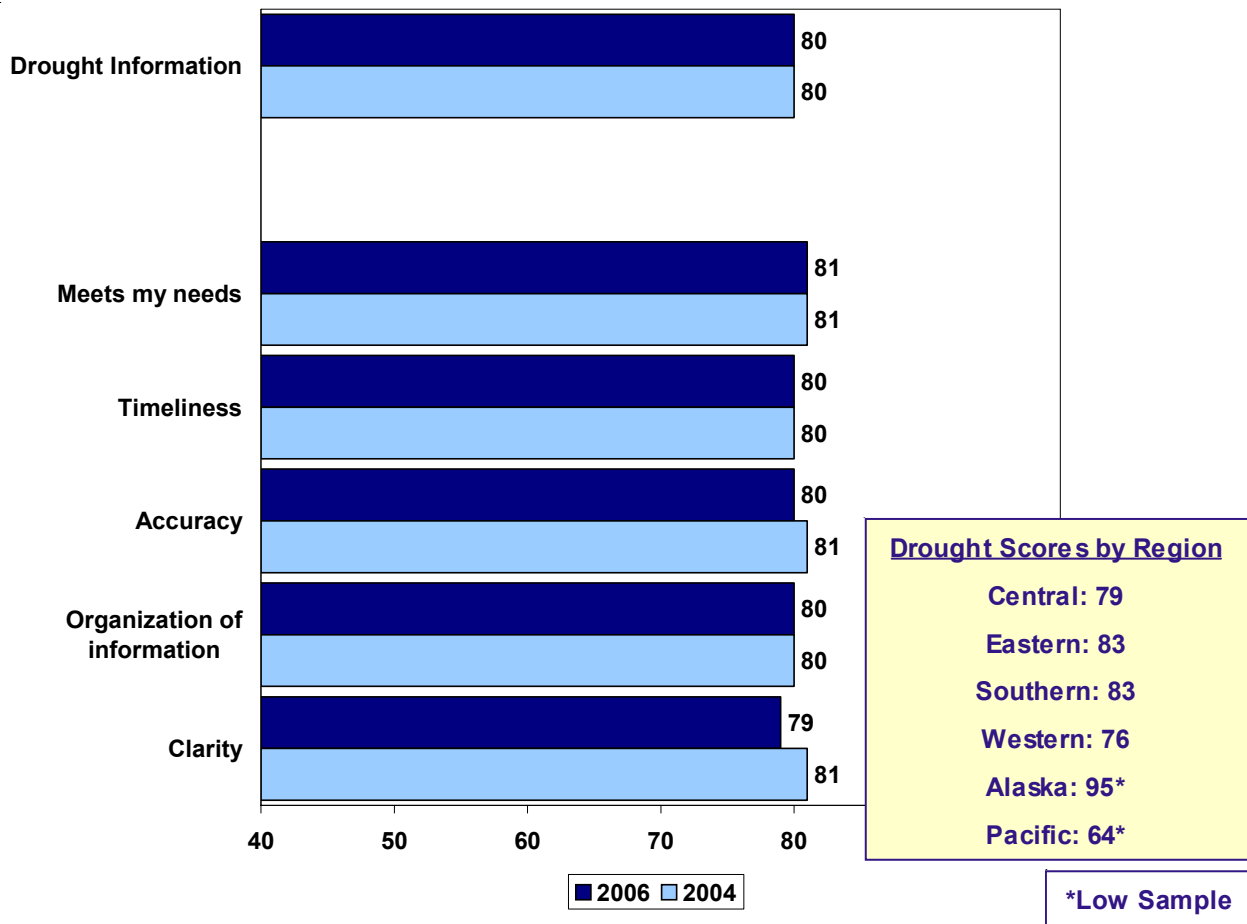
As a teacher, I use the information on these pages when I am in various units or when weather conditions are such that I show my students.



Research Summary continued

Drought Information

Figure 12: Drought Information component and attribute scores 2004 vs. 2006



Drought Information scores as well as it did in 2004, at a strong score of 80. What is of interest to note, is that the Western region rates Drought Information comparably lower (Figure 12) at a 76. While Drought Information is a low impact area overall, it is a higher impact item for the Western region. The National Weather Service may choose to seek opportunities to better provide this information to the Western region.



Research Summary continued

Web Products

Figure 13 Frequency of Visiting NWS Web Pages

16. How frequently do you visit the NWS web pages providing hydrologic information? (n=1616)

Several times per day: 19%

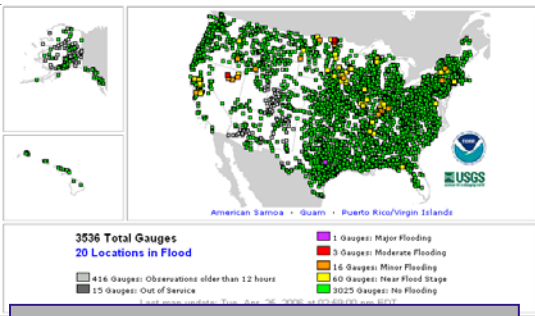
Once per day: 28%

Once per week: 23%

Once per month: 18%

Not familiar with this information: 7%

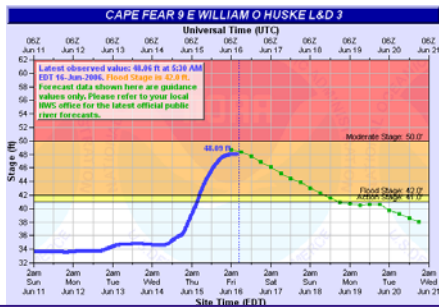
I am familiar with this information but do not use: 6%



River Conditions Country-wide

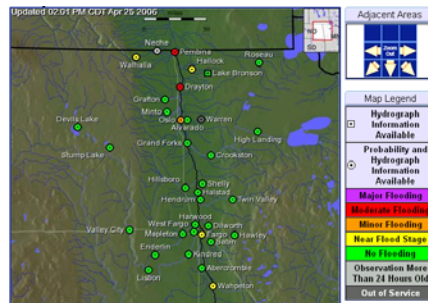
Average: 71
68: Visual Appeal
72: Ease of Understanding
73: Tells me what I need to know

Figure 13 shows how frequently survey respondents visit NWS web pages providing hydrologic information. The majority visits at least once per week. Respondents were then asked to rate the three graphics on this page. As can be seen, the Country-wide river conditions scores lower than the other two. When looking at the scores broken out by scope of responsibility, they range from personal (69) to National (73). The intended audience (National) did not rate this product much higher than the others. Additional research is necessary to understand how better to fit the needs of the users for which this product is intended.



Hydrograph – Cape Fear River

Average: 85
84: Visual Appeal
84: Ease of Understanding
86: Tells me what I need to know



River Conditions – Grand Forks, ND

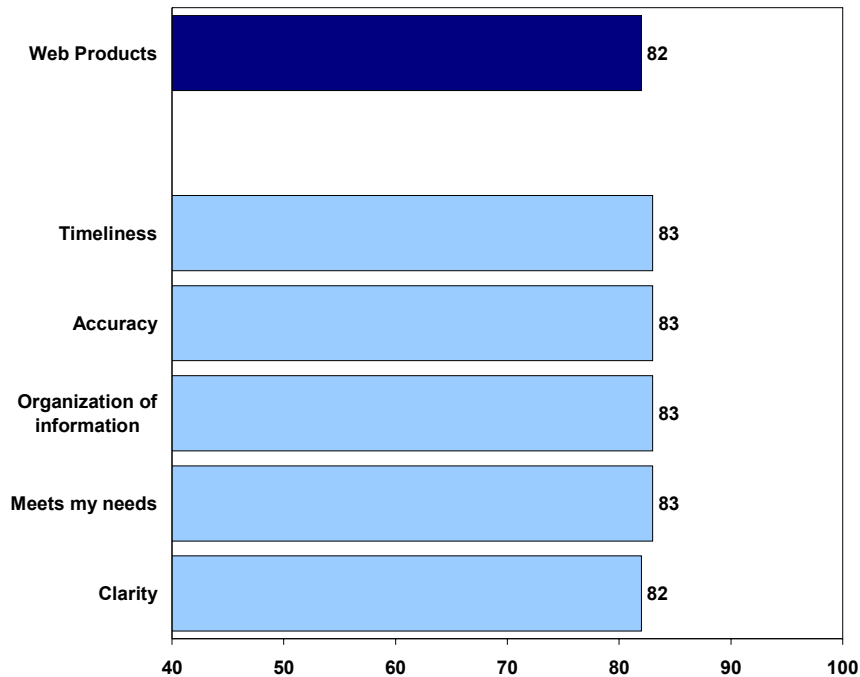
Average: 86
85: Visual Appeal
87: Ease of Understanding
85: Tells me what I need to know



Research Summary continued

Web Products

Figure 14: Web Products component and attribute score

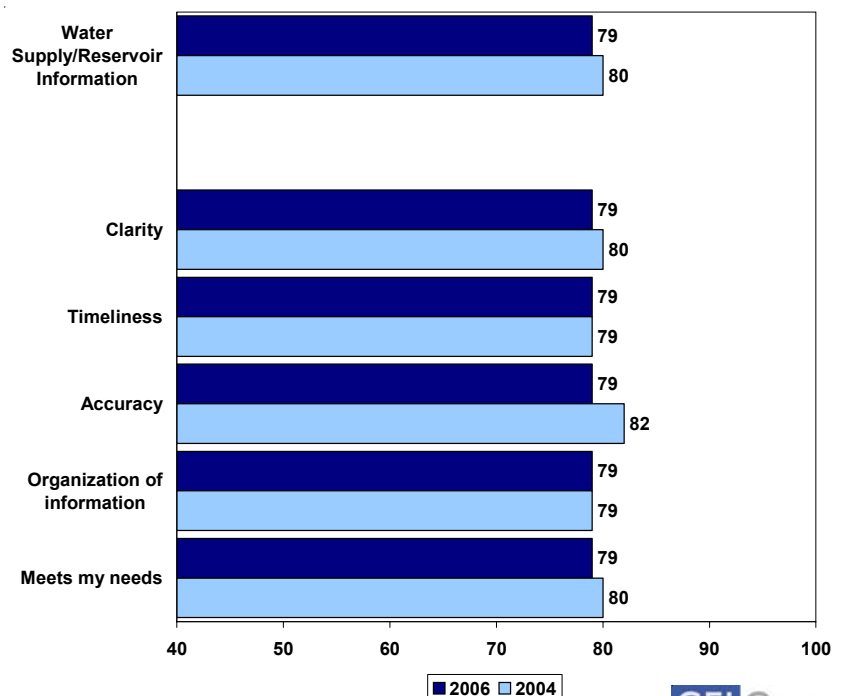


The NWS exhibits a strong web presence for hydrologic information, as shown by the scores in Figure 14. This is a moderate impact area (0.9), so it is important to maintain the current levels of support.

Water Supply/Reservoir Information

Figure 15: Water Supply/Reservoir Information component and attribute score 2006 vs. 2004

Water Supply/Reservoir Information is a relatively lower impact area (0.5) and currently the NWS performs well. Maintaining current support levels is the only action suggested at this time.



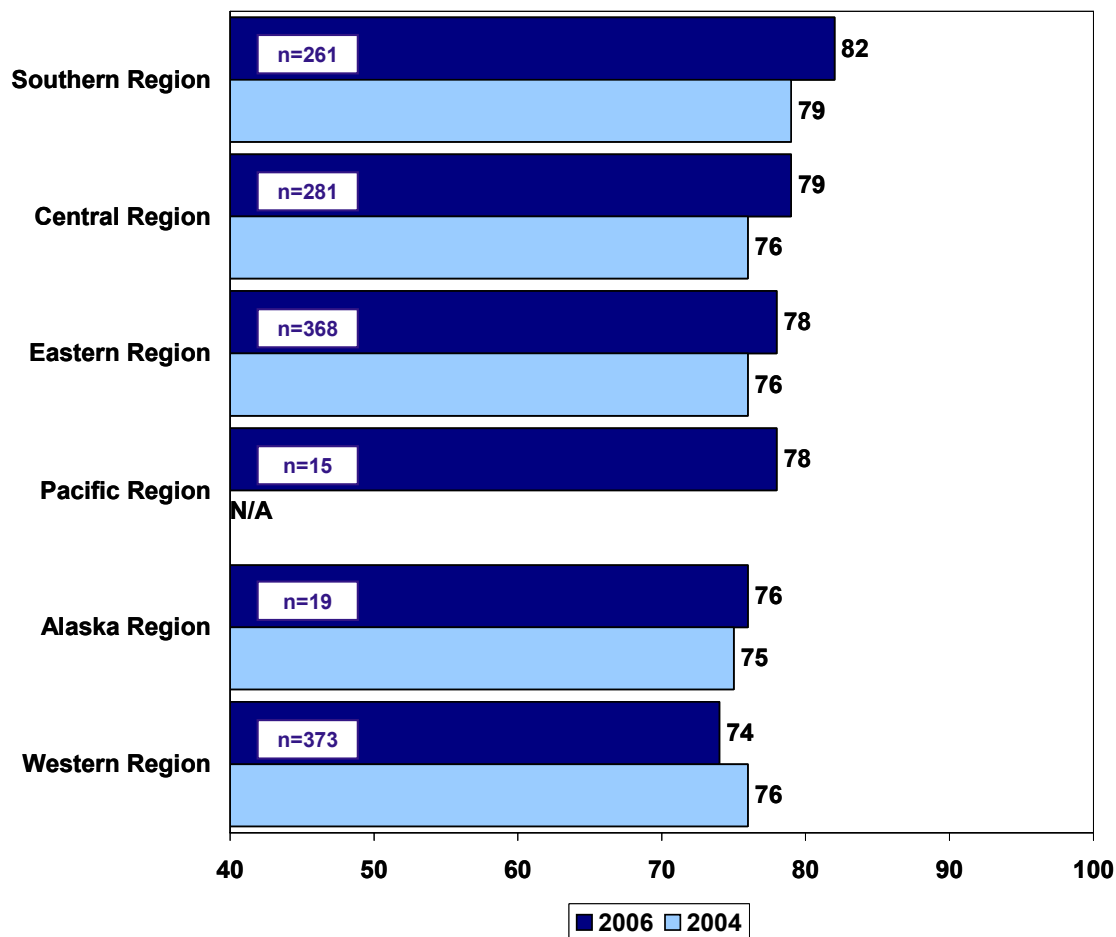


Research Summary continued

Segment Analysis

Region

Figure 16: CSI Scores by Region 2006 vs. 2004



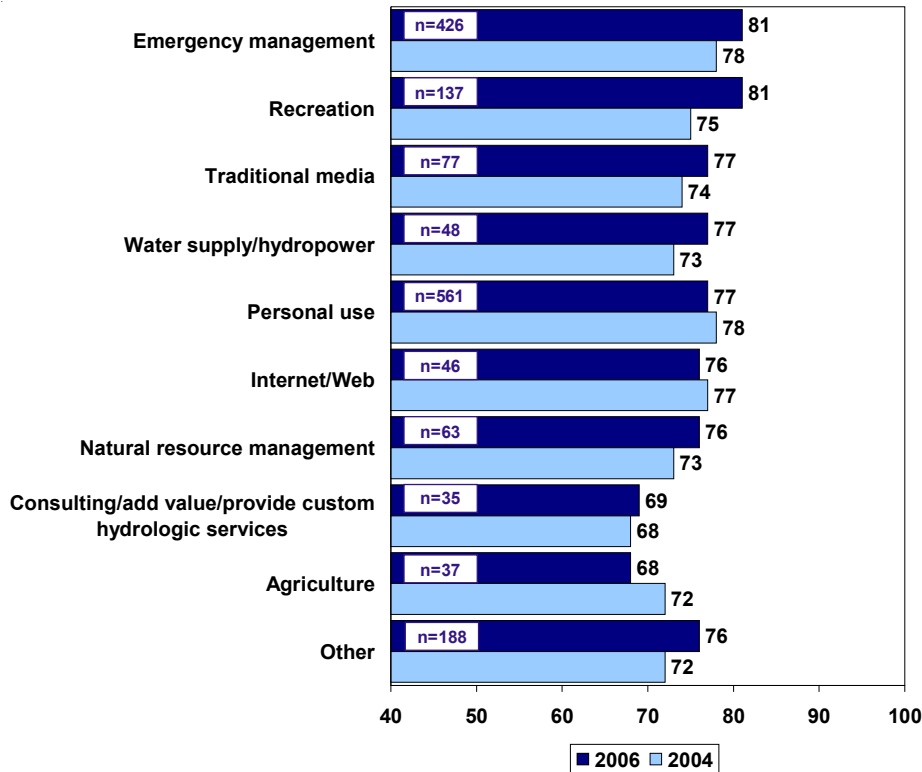
Region customer satisfaction scores range from 74 to 82, and show improvement over 2004 for the most part. Note the low samples for the Pacific and Alaska region. The Southern region scores better than the others, with the Western region scoring on the lower end. While a 74 is still a good score, the Western region may want to reach out to its customers to pinpoint any opportunities to improve service.



Research Summary continued

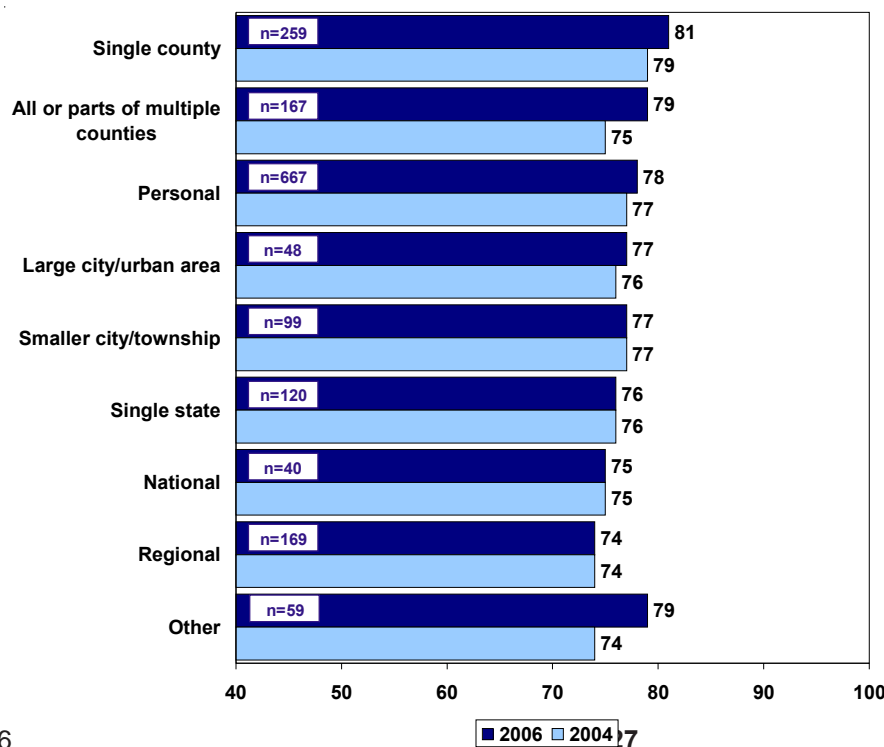
Primary Use Or Commercial Sector

Figure 17: CSI Scores by Primary Use or Commercial Sector 2006 vs. 2004



Many user groups show improvement over 2004, including Emergency Management, the largest responding population. Agriculture and Consulting score on the lower end. Should the NWS resolve to determine how to better provide information by reaching out to specific groups, the opportunity exists within Consulting and Agriculture

Figure 18: CSI Scores by Primary Scope of Responsibility 2006 vs. 2004



CSI scores by primary scope of responsibility are provided in Figure 18.



Research Summary continued

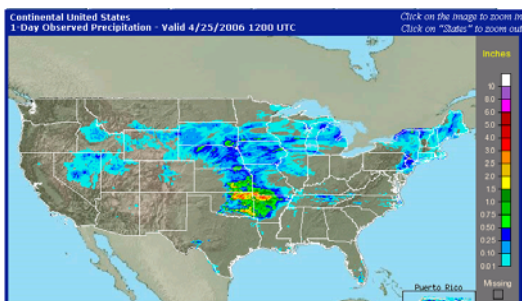
Additional Findings

Graphics

The NWS survey also gathered information on additional graphics, including High-resolution Precipitation Estimates and High-resolution Water Contained in Snow (shown below). Thirty-one percent indicate a lack of familiarity with the latter, perhaps accounting for the lower (although still very good) score. CFI suggests that the NWS raise awareness with the appropriate groups regarding its availability. Additional graphic information is available beginning on page 35.

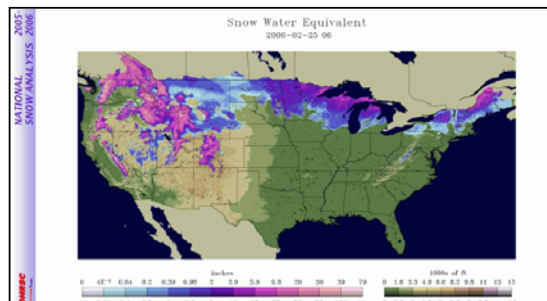
Figure 19: High-resolution Graphic Data

Frequency of using high-resolution precipitation estimate graph n=1613	
Several times per day	18%
Once per day	28%
Once per week	20%
Once per month	13%
Not familiar with this information	12%
I am familiar with this information but do not use	10%
Frequency of using high-resolution snow water equivalent graph n=1613	
Several times per day	3%
Once per day	8%
Once per week	13%
Once per month	17%
Not familiar with this information	31%
I am familiar with this information but do not use	28%



High-resolution Precipitation Estimates

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



High-resolution Estimates Water Contained in Snow

Average: 80
81: Visual Appeal
80: Ease of Understanding
80: Tells me what I need to know

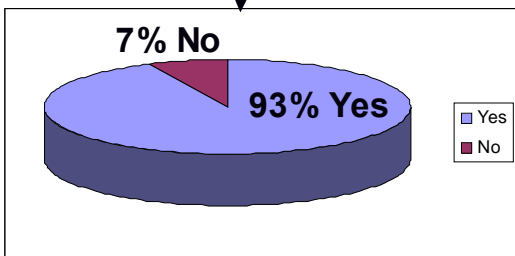
Research Summary continued

Survey Part II: Flood Risk and Inundation

After the core model questions, respondents were given the option to complete three additional survey segments. Some of the information collected for Flood Risk and Inundation is included below. Digital Services and Uncertainly infromation is located on the next two pages.

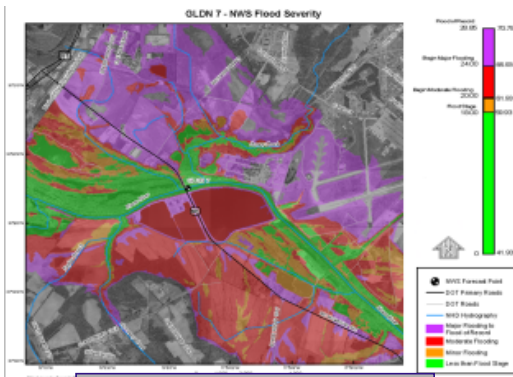
Figure 20: Flood Risk and Inundation Data

34. Are you familiar with the way these terms (minor, moderate, major flooding) are used by the NWS in their flood warnings for your area ? (n=691)



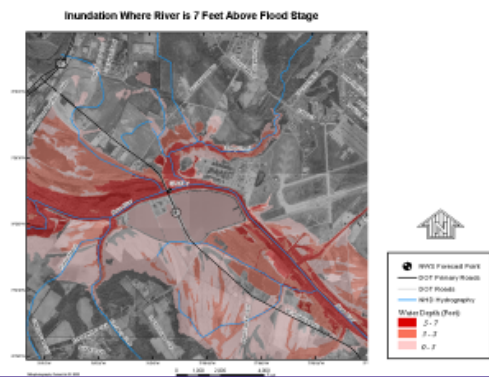
35. Rate the usefulness of these flood severity categories in interpreting the impact of river flooding. (n=686)

87



Flood Severity Categories

Average: 84
85: Visual Appeal
83: Ease of Understanding
85: Tells me what I need to know



Depth of Flood Waters for a Given River Level

Average: 84
83: Visual Appeal
85: Ease of Understanding
85: Tells me what I need to know



Research Summary continued

Survey Part III: Digital Services (Internet/Web)

Figure 21: Digital Services Data

Usefulness of receiving graphical information that includes the following features:	
Ability to overlay different information n=392	93
Ability to specify areal extent n=397	92
Ability to overlay different background information n=396	92
Ability to specify time range shown n=394	91
Graphics with pre-determined content, spatial extent and time period n=387	86
Usefulness of the following digital formats:	
Information formatted geospatially for use with Geographic Information Systems n=333	85
Numerical information using standards-based formats n=309	81
Metadata information n=278	80
RSS n=239	79
Other n=64	77
WAP n=227	76
Usefulness of the following geospatial formats:	
Shapefile n=260	86
40) GeoPDF n=193	82
Other n=38	79
Open Geospatial Consortium standards n=159	78
Worldfile n=178	76
KML/KMZ format n=152	74
Usefulness of the following options in making information more accessible on the Internet:	
Web-based data service (including selective extraction) n=335	90
GIS map service n=314	86
GIS feature service n=293	86
"Bulk transfer," e.g., ftp n=307	79
Other n=30	69



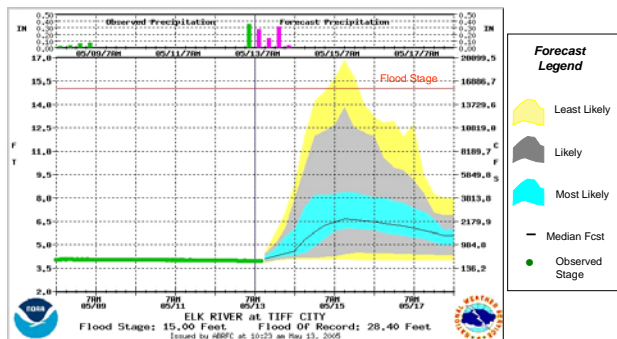
Research Summary continued

Survey Part IV: Uncertainty and Probability

Some of the Uncertainty and Probability data gathered is included in Figure 22. Results echoed information received in focus group studies that were conducted in 2006. Respondents rate the usefulness of providing river forecasts and uncertainty information in the short-term very high. The NWS should consider focusing efforts here. Notably, the probability graphic scores considerably lower than the uncertainty graphic. As has been the case in the past, it is necessary to continue to focus on providing information in the most user-friendly way possible.

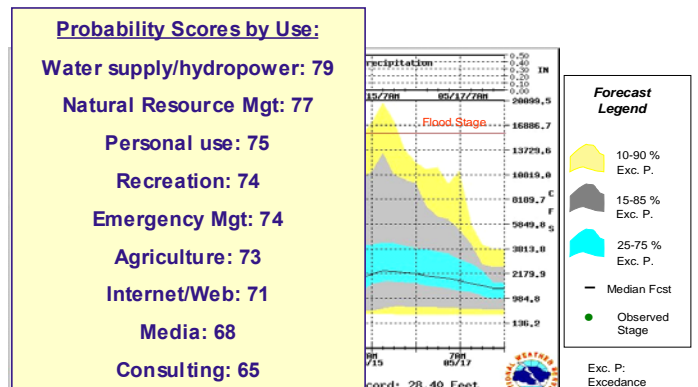
Figure 22 Uncertainty and Probability Data

	Aggregate	Water supply / hydropower	Agriculture	Natural Resource Management
How useful would it be to have forecasts include uncertainty information				
How useful would it be to have forecasts include uncertainty information	89	83	91	90
How useful would it be to have forecasts include probability information				
How useful would it be to have forecasts include probability information	83	80	83	87
Usefulness of providing river forecasts and uncertainty information for the following time scales:				
Short-term (0-5 days)	92	86	93	93
Monthly (30 days)	68	82	61	57
Seasonal (90 days)	58	79	41	44
Likelihood of using probabilistic streamflow forecast product generator				
Likelihood of using probabilistic streamflow forecast product generator n=379	78	87	77	81



Forecast Uncertainty

Average: 80
80: Visual Appeal
80: Ease of Understanding
81: Tells me what I need to know



Probability Scores by Use:
Water supply/hydropower: 79
Natural Resource Mgt: 77
Personal use: 75
Recreation: 74
Emergency Mgt: 74
Agriculture: 73
Internet/Web: 71
Media: 68
Consulting: 65

Forecast Uncertainty in terms of Probability

Average: 75
78: Visual Appeal
71: Ease of Understanding
75: Tells me what I need to know



Research Summary continued

Conclusions & Recommendations

The performance of the National Weather Service Hydrologic Services Program remains strong in its second year of measurement. With a customer satisfaction score of 78, the NWS performs among the highest of federal government agencies. As was realized in the first study, the NWS is appreciated for the lengths they go to to provide the crucial, sometimes life-saving information to its customers; “They always go the extra mile to provide service.”

Recommendations

While scores remain high, there always exists opportunities for continued improvement. Consistent with the findings of the previous study and focus group research, the NWS needs to continue product development with specific users in mind. A “one size fits all” approach will not lead to high degrees of satisfaction. NWS should continue to explore the needs of its key constituents as it makes improvements in products and services. Emergency Managers, partners and the general public will have very different needs.

The following are target areas for improvement:

Internal Resource Assessment

Perceptions of the Hydrologic Services Program continue to be mostly driven by Flood and River Information. These are the highest impact items. It is recommended that improvement efforts be focused here first. Ensure that resources are aligned internally to reflect this priority.

Targeting User Groups and Geographic Areas

The Western region scores a bit lower than the others, though still well, as they relate to the higher impact areas, as do the agriculture and consulting respondents. Reach out to these users to understand how, if at all, their needs could be better met. Drought Information scores very well overall, but scores lower in the Western region, where it is a higher impact area of information. Again, is there a way that this group could better benefit from this information?

Graphics Simplification

Continue to simplify graphics where possible, particularly those related to probability information. Respondents indicate their preference for a mix of text and graphics, so ensure that both are incorporated when developing products.



Research Summary continued

Communication

Communicate new products and service offerings as appropriate. Currently, the NWS does very well in communicating with their customers. Respondents rate the value of their personal communication with NWS staff to discuss hydrologic forecasts a 92. This is an exemplary score and shows the value the NWS has to offer with regard to communication. Leverage this strength when introducing new products to users. One quote suggests that product awareness could be increased: “many of the new products I don’t know about until I randomly find them on the website”. Target specific user groups with communications as new products become available. Remind them of current products that are available as well. NWS products oftentimes have a lot of functionality; ensure that users are aware of a product’s full capability.



Score Detail & Segmentation



2006 Aggregate Modeled Scores and Impacts

	2004 Scores	2006 Scores	Significant Difference	2006 Impacts
Flood Information n=1438	--	80		2.2
Clarity	81	81		
Timeliness	81	81		
Accuracy	80	79	✓	
Organization of information	80	80		
Meets my needs	82	82		
Water Supply/Reservoir Information n=841	--	79		0.5
Clarity	80	79		
Timeliness	79	79		
Accuracy	82	79	✓	
Organization of information	79	79		
Meets my needs	80	79		
Drought Information n=894	--	80		0.2
Clarity	81	79		
Timeliness	80	80		
Accuracy	81	80		
Organization of information	80	80		
Meets my needs	81	81		
Routine River Forecasts/Observed Conditions n=1115	--	81		1.1
Clarity	82	82		
Timeliness	80	81	✓	
Accuracy	79	81	✓	
Organization of information	80	81		
Meets my needs	81	81		
Web Products n=1500	--	82		0.9
Clarity	--	82		
Timeliness	--	83		
Accuracy	--	83		
Organization of information	--	83		
Meets my needs	--	83		
Customer Satisfaction Index n=1586	77	78		
Overall satisfaction with the NWS Hydrologic Services Program	82	82		
How well NWS Hydrologic Services Program meets your expectations	74	75	✓	
How NWS Hydrologic Services Program compares to an 'ideal' hydrologic services program	74	75	✓	
Likelihood to Take Action n=1598	87	88	✓	2.7
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	87	88	✓	
Confidence in NWS n=1595	86	85		3.6
How confident are you that the NWS Hydrologic Services Program will do a good job	86	85		
Sample Size	2352	1668		



2006 Aggregate Non-modeled Responses

	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent n=1624		
Emergency management		26%
Traditional media		5%
Internet/Web		3%
Water supply/hydropower		3%
Agriculture		2%
Shipping		0%
Natural resource management		4%
Consulting/add value/provide custom hydrologic services		2%
Recreation		8%
Personal use		35%
Other		12%
Primary scope of your responsibility n=1628		
National		2%
Regional		10%
Single state		7%
All or parts of multiple counties		10%
Single county		16%
Large city/urban area		3%
Smaller city/township		6%
Personal		41%
Other		4%
Method for receiving National Weather Service hydrologic information* n=1668		
NWS Web pages		91%
Non-NWS Web pages		22%
Phone		13%
NOAA Weather Radio		42%
NOAA Weather Wire		4%
Family of Services (FOS)		2%
Emergency Managers Weather Information Network (EMWIN)		11%
Local or cable TV		39%
Commercial Radio		18%
Satellite radio		3%
Newspaper		15%
Private Vendor		6%
Other		9%
Frequency of using Flood Warnings, Flood Watches and Flood Statements n=1573		
Several times per day		23%
Once per day		22%
Once per week		19%
Once per month		28%
Do not use		5%
Not familiar with this information		2%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information n=1511		
Several times per day		6%
Once per day		11%
Once per week		18%
Once per month		27%
Do not use		26%
Not familiar with this information		12%
Frequency of using Hydrologic Outlooks providing drought information n=1499		
Several times per day		4%
Once per day		10%
Once per week		20%
Once per month		32%
Do not use		25%
Not familiar with this information		9%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions n=1500		
Several times per day		9%
Once per day		18%
Once per week		24%
Once per month		27%
Do not use		15%
Not familiar with this information		7%
Frequency of using other information n=629		
Several times per day		13%
Once per day		14%
Once per week		10%
Once per month		8%
Do not use		27%
Not familiar with this information		28%
Frequency of visiting web pages providing a suite of hydrologic information n=1616		
Several times per day		19%
Once per day		28%
Once per week		23%
Once per month		18%
Not familiar with this information		7%
I am familiar with this information but do not use		6%
River Conditions Map (Country-wide)		
Visual appeal n=1508	68	
Ease of understanding n=1497	72	
Tells me what I need to know about river conditions throughout the country n=1468	73	



2006 Aggregate Non-modeled Scores- Continued

	Scores	Percent of Respondents
River Conditions Map (Grand Forks, ND)		
Visual appeal n=1512	85	
Ease of understanding n=1504	87	
Tells me what I need to know about river conditions in Grand Forks, ND n=1491	85	
Hydrograph of Cape Fear River, NC water level		
Visual appeal n=1489	84	
Ease of understanding n=1483	84	
Tells me what I need to know about forecast levels n=1470	86	
Frequency of using high-resolution precipitation estimate graph n=1613		
Several times per day		18%
Once per day		28%
Once per week		20%
Once per month		13%
Not familiar with this information		12%
I am familiar with this information but do not use		10%
Map of high-resolution precipitation estimates		
Visual appeal n=1418	86	
Ease of understanding n=1415	86	
Tells me what I need to know about precipitation estimates n=1398	85	
Frequency of using high-resolution snow water equivalent graph n=1613		
Several times per day		3%
Once per day		8%
Once per week		13%
Once per month		17%
Not familiar with this information		31%
I am familiar with this information but do not use		28%
Map of water in snow high-resolution estimates		
Visual appeal n=1059	81	
Ease of understanding n=1051	80	
Tells me what I need to know about water contained in snow n=1005	80	
Use precipitation frequency estimates n=1608		
Yes		37%
No		63%
Familiar with Precipitation Frequency Data Server web page n=583		
Yes		51%
No		49%
Precipitation Frequency Data Server Map		
Usefulness of having updated precipitation frequency estimates n=527	82	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:		
Text n=1547	85	
Graphics n=1527	85	
A combination of text and graphics n=1547	89	
NOAA Weather Radio All Hazards n=1433	86	
Usefulness of receiving river forecasts in the following formats:		
Text n=1501	80	
Graphics n=1492	83	
A combination of text and graphics n=1488	86	
Digital n=1267	73	
NOAA Weather Radio All Hazards n=1344	79	
Usefulness of receiving river/stream observations in the following formats:		
Text n=1480	80	
Graphics n=1473	84	
A combination of text and graphics n=1463	86	
Digital n=1252	73	
NOAA Weather Radio All Hazards n=1342	77	
Ever had personal communication with NWS staff to discuss hydrologic forecasts n=1618		
Yes		39%
No		61%
Value of your personal communication with NWS staff to discuss hydrologic forecasts		
Value of your personal communication with NWS staff to discuss hydrologic forecasts n=627	92	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year n=631		
1-3 times a year		44%
4-6 times a year		23%
7-12 times a year		13%
More than 12 times a year		20%
Purpose of personal communication with NWS staff* n=1668		
Explanation or interpretation of available forecast products		19%
Gain an understanding of forecaster confidence in forecast products		18%
Synthesize available forecast products and information for your specific needs		16%
Get more information from forecaster than available in existing products		24%
Provided feedback on the following categories*: n=1668		
Flood Risks		42%
Digital Services		25%
Uncertainty & Probability		24%
I do not wish to continue		41%
Familiar with the way these terms are used by the National Weather Service n=691		
Yes		93%
No		7%
Usefulness of these flood severity categories in interpreting the impact of river flooding		
Usefulness of these flood severity categories in interpreting the impact of river flooding n=686	87	
Flood Severity Map		
Visual appeal n=686	85	
Ease of understanding n=684	83	
Tells me what I need to know about flooding n=680	85	



2006 Aggregate Non-modeled Scores- Continued

	Scores	Percent of Respondents
Flood Depth Map		
Visual appeal n=685	83	
Ease of understanding n=689	85	
Tells me what I need to know about the depth of the water n=680	85	
Usefulness of receiving graphical information that includes the following features:		
Graphics with pre-determined content, spatial extent and time period n=387	86	
Ability to specify time range shown n=394	91	
Ability to specify areal extent n=397	92	
Ability to overlay different background information n=396	92	
Ability to overlay different information n=392	93	
Usefulness of the following digital formats:		
Numerical information using standards-based formats n=309	81	
Information formatted geospatially for use with Geographic Information Systems n=333	85	
RSS n=239	79	
WAP n=227	76	
Metadata information n=278	80	
Other n=64	77	
Usefulness of the following geospatial formats:		
Shapefile n=260	86	
Worldfile n=178	76	
KML/KMZ format n=152	74	
40) GeoPDF n=193	82	
Open Geospatial Consortium standards n=159	78	
Other n=38	79	
Usefulness of the following options in making information more accessible on the Internet:		
Bulk transfer, e.g., ftp n=307	79	
Web-based data service (including selective extraction) n=335	90	
GIS map service n=314	86	
GIS feature service n=293	86	
Other n=30	69	
How useful would it be to have forecasts include uncertainty information		
How useful would it be to have forecasts include uncertainty information n=387	89	
How useful would it be to have forecasts include probability information		
How useful would it be to have forecasts include probability information n=391	83	
Usefulness of providing river forecasts and uncertainty information for the following time scales:		
Short-term (0-5 days) n=391	92	
Monthly (30 days) n=374	68	
Seasonal (90 days) n=374	58	
Map of Observed and Forecast River Levels		
Visual appeal n=395	80	
Ease of understanding n=396	80	
Tells me what I need to know about river stages during a 5-day forecast period n=389	81	
Map of Observed and Forecast River Levels (exceedance probability)		
Visual appeal n=396	78	
Ease of understanding n=395	71	
Tells me what I need to know about river stages during a 5-day forecast period n=388	75	
Likelihood of using probabilistic streamflow forecast product generator		
Likelihood of using probabilistic streamflow forecast product generator n=379	78	
Sample Size	1668	



Score Summaries - Region Scores and Impacts

NWS Scores/Impacts	Central Region	Total Impact	Eastern Region	Total Impact	Southern Region	Total Impact	Western Region	Total Impact	Alaska Region	Total Impact	Pacific Region	Total Impact
Flood Information	81	2.9	81	1.9	85	2.3	77	1.3	87	2.2	81	2.2
Clarity	80		83		84		78		90		83	
Timeliness	83		80		85		78		80		83	
Accuracy	79		78		85		74		84		74	
Organization of information	80		81		84		75		89		86	
Meets my needs	83		82		86		79		88		85	
Water Supply/Reservoir Information	76	0.3	81	0.1	83	0.0	76	0.9	82	0.5	76	0.5
Clarity	74		81		83		76		81		75	
Timeliness	76		80		83		76		74		75	
Accuracy	75		81		84		75		83		83	
Organization of information	75		82		83		76		86		78	
Meets my needs	77		81		83		76		81		69	
Drought Information	79	0.3	83	0.7	83	0.0	76	0.8	95	0.2	64	0.2
Clarity	78		83		82		76		97		64	
Timeliness	79		82		84		76		94		71	
Accuracy	78		83		84		74		93		60	
Organization of information	79		84		82		76		94		67	
Meets my needs	80		84		84		77		92		58	
Routine River Forecasts/Observed Conditions	82	0.0	82	1.6	84	1.8	78	1.0	85	1.1	88	1.1
Clarity	82		83		85		79		91		89	
Timeliness	83		82		84		78		79		78	
Accuracy	81		80		83		78		86		89	
Organization of information	81		83		83		78		86		86	
Meets my needs	83		82		84		78		84		85	
Web Products	82	1.5	83	0.6	85	0.4	79	0.5	84	0.9	81	0.9
Clarity	81		84		85		79		88		80	
Timeliness	84		83		86		81		80		80	
Accuracy	83		83		86		80		83		80	
Organization of information	81		85		85		79		84		81	
Meets my needs	83		85		86		80		85		81	
Customer Satisfaction Index	79	7.8	78	8.2	82	7.4	74	8.2	76	7.8	78	8.1
Overall satisfaction with the NWS Hydrologic Services Program	83		82		86		79		82		81	
How well NWS Hydrologic Services Program meets your expectations	77		75		80		71		75		76	
How well NWS Hydrologic Services Program compares to an 'ideal' hydrologic services program												
Likelihood to Take Action	77		74		80		71		71		76	
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	89	2.5	90	1.9	91	2.2	86	3.1	89	2.7	87	2.7
Confidence in NWS	89		90		91		86		89		87	
How confident are you that the NWS Hydrologic Services Program will do a good	85	3.5	86	3.6	89	2.7	82	3.6	89	3.6	83	3.6
Sample Size	281		368		261		373		19		15	



Non-modeled - Region

	Central Region		Eastern Region		Southern Region		Western Region		Alaska Region		Pacific Region	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service in the commercial sector that you represent		26%		25%		44%		21%		6%		27%
Traditional media		6%		3%		8%		2%		8%		7%
Internet/Web		3%		3%		2%		3%		6%		0%
Water supply/hydropower		3%		3%		3%		4%		0%		0%
Agriculture		0%		0%		1%		1%		0%		0%
Shipping		3%		4%		3%		6%		6%		0%
Natural resource management		2%		3%		1%		2%		6%		0%
Consulting/field value/provide custom hydrologic services		9%		8%		5%		28%		0%		0%
Recreation		34%		38%		21%		37%		39%		53%
Personal Use		11%		13%		11%		12%		6%		13%
Other												
Primary scope of your responsibility												
National		2%		3%		2%		2%		0%		0%
Regional		8%		13%		8%		11%		0%		0%
Single state		6%		7%		7%		8%		21%		13%
All or parts of multiple counties		13%		8%		13%		16%		0%		0%
Single county		20%		13%		21%		12%		0%		20%
Large city/urban area		2%		1%		7%		3%		0%		0%
Smaller city/township		6%		7%		11%		3%		5%		7%
Personal		40%		45%		27%		42%		63%		53%
Other		3%		4%		3%		4%		11%		7%
Method for receiving National Weather Service hydrologic information*												
NWS Web pages		95%		94%		91%		95%		84%		87%
Non-NWS Web pages		21%		22%		25%		24%		26%		27%
Phone		15%		11%		19%		14%		11%		20%
NOMAA Weather Radio		49%		43%		51%		33%		11%		33%
NOMAA Weather Wire		4%		5%		7%		3%		0%		7%
Family of Services (FOS)		1%		1%		3%		1%		0%		13%
Emergency Managers Weather Information Network (EMWIN)		16%		11%		17%		8%		5%		13%
Local or cable TV		43%		41%		47%		31%		26%		33%
Commercial Radio		21%		16%		22%		16%		11%		20%
Satellite radio		2%		4%		4%		4%		0%		0%
Newspaper		16%		13%		18%		16%		11%		7%
Private Vendor		7%		6%		10%		5%		0%		7%
Other		7%		10%		12%		8%		11%		13%
Frequency of using Flood Warnings, Flood Watches and Flood Statements												
Several times per day		15%		23%		21%		26%		26%		53%
Once per day		19%		22%		19%		24%		16%		33%
Once per week		20%		21%		19%		21%		21%		7%
Once per month		34%		28%		33%		26%		21%		7%
Do not use		7%		5%		6%		3%		16%		0%
Not familiar with this information		4%		1%		2%		1%		5%		0%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information												
Several times per day		4%		6%		6%		7%		0%		27%
Once per day		9%		13%		14%		9%		12%		0%
Once per week		15%		21%		21%		18%		13%		7%
Once per month		22%		20%		24%		33%		18%		20%
Do not use		26%		27%		23%		27%		35%		27%
Not familiar with this information		14%		12%		14%		6%		24%		20%
Frequency of using Hydrologic Outlooks providing drought information												
Several times per day		5%		5%		3%		3%		0%		7%
Once per day		9%		8%		8%		8%		0%		0%
Once per week		21%		21%		23%		18%		6%		14%
Once per month		36%		24%		31%		40%		19%		14%
Do not use		21%		30%		17%		27%		56%		43%
Not familiar with this information		9%		12%		11%		4%		19%		21%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions												
Several times per day		8%		11%		7%		9%		11%		15%
Once per day		12%		22%		12%		17%		28%		15%
Once per week		26%		23%		29%		23%		8%		20%
Once per month		31%		25%		29%		29%		11%		15%
Do not use		16%		12%		14%		17%		31%		31%
Not familiar with this information		8%		7%		9%		4%		11%		15%
Frequency of using other information												
Several times per day		9%		8%		9%		23%		10%		20%
Once per day		11%		16%		10%		16%		0%		20%
Once per week		10%		10%		12%		8%		20%		40%
Once per month		5%		8%		7%		10%		10%		0%
Do not use		28%		33%		32%		18%		30%		20%



Non-modeled - Region Continued

	Central Region		Eastern Region		Southern Region		Western Region		Alaska Region		Pacific Region	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Frequency of visiting web pages providing a suite of hydrologic information												
Several times per day		15%		21%		17%		17%		26%		20%
Once per day		23%		27%		23%		23%		28%		47%
Once per week		21%		25%		23%		25%		32%		7%
Once per month		5%		7%		20%		19%		11%		7%
Not familiar with this information		8%		7%		8%		7%		5%		0%
I am familiar with this information but do not use		6%		4%		7%		5%		0%		20%
River Conditions Map (Country-wide)												
Visual appeal	65		70		73		64		80		71	
Ease of understanding	70		73		74		70		81		78	
Tells me what I need to know about river conditions throughout the country	71		75		75		68		84		73	
River Conditions Map (Grand Forks, ND)												
Visual appeal	85		87		88		81		90		82	
Ease of understanding	87		89		88		84		90		83	
Tells me what I need to know about river conditions in Grand Forks, ND	84		87		87		82		85		83	
Hydrograph of Cape Fear River, NC water level												
Visual appeal	83		86		86		81		91		87	
Ease of understanding	83		87		85		81		81		86	
Tells me what I need to know about forecast levels	85		88		88		83		88		88	
Frequency of using high-resolution precipitation estimate graph												
Several times per day		14%		18%		23%		15%		11%		7%
Once per day		34%		26%		27%		27%		11%		33%
Once per week		24%		17%		18%		22%		11%		0%
Once per month		10%		13%		10%		14%		37%		7%
Not familiar with this information		9%		14%		10%		14%		16%		7%
I am familiar with this information but do not use		8%		12%		8%		8%		16%		47%
Map of high-resolution precipitation estimates												
Visual appeal	86		87		89		83		79		81	
Ease of understanding	87		88		89		83		78		85	
Tells me what I need to know about precipitation estimates	85		86		88		81		79		69	
Frequency of using high-resolution snow water equivalent graph												
Several times per day		4%		4%		2%		2%		5%		0%
Once per day		54%		41%		6%		6%		1%		1%
Once per week		14%		13%		8%		12%		11%		0%
Once per month		23%		15%		12%		16%		5%		7%
Not familiar with this information		27%		36%		31%		28%		13%		2%
I am familiar with this information but do not use		23%		22%		42%		23%		26%		67%
Map of water in snow high-resolution estimates												
Visual appeal	81		84		84		79		68		83	
Ease of understanding	80		84		81		78		70		83	
Tells me what I need to know about water contained in snow	80		84		83		76		74		64	
Use precipitation frequency estimates												
Yes		31%		34%		47%		37%		26%		55%
No		69%		65%		53%		63%		74%		47%
Familiar with Precipitation Frequency Data Server web page												
Yes		54%		55%		47%		49%		60%		38%
No		46%		45%		53%		51%		40%		63%
Precipitation Frequency Data Server Map												
Usefulness of having updated precipitation frequency estimates	81		85		85		78		69		83	
Usefulness of receiving flash flood/warnings and watches in the following formats:												
Text	64		88		89		82		83		90	
Graphics	85		88		90		82		90		83	
NOAA Weather Radio All Hazards	89		91		91		87		89		89	
Usefulness of receiving river forecasts in the following formats:												
Text	79		82		84		77		81		91	
Graphics	82		86		87		81		90		91	
A combination of text and graphics	86		89		88		85		91		92	
Digital	73		74		72		78		81		78	
NOAA Weather Radio All Hazards	82		79		85		74		72		83	
Usefulness of receiving livestream observations in the following formats:												
Text	78		81		85		76		82		91	
Graphics	83		87		88		82		89		84	
A combination of text and graphics	83		89		91		85		90		90	
Digital	73		75		78		72		78		78	
NOAA Weather Radio All Hazards	80		78		85		71		81		91	
Ever had personal communication with NWS staff to discuss hydrologic forecasts												
Yes		36%		34%		51%		40%		32%		47%
No		64%		65%		49%		60%		68%		53%
Value of your personal communication with NWS staff to discuss hydrologic forecasts												
Value of your personal communication with NWS staff to discuss hydrologic forecasts	94		94		93		91		76		95	
Value of your personal communication with NWS staff to discuss hydrologic forecasts during a typical year												
1-3 times a year		47%		40%		44%		47%		100%		14%
4-6 times a year		27%		25%		21%		19%		0%		43%
7-12 times a year		10%		11%		10%		18%		0%		0%
More than 12 times a year		16%		24%		20%		17%		0%		43%



Non-modeled - Region - Continued

	Central Region		Eastern Region		Southern Region		Western Region		Alaska Region		Pacific Region	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Purpose of personal communication with NWS staff:												
Explanation of interpretation of available forecast products		18%		18%		21%		23%		11%		27%
Get more information from forecaster than available in existing products		14%		17%		26%		4%		1%		20%
Get more information from forecaster than available in existing products		15%		16%		21%		15%		5%		24%
Get more information from forecaster than available in existing products		22%		21%		33%		27%		16%		13%
Provided feedback on the following categories:												
Flood Risks		43%		55%		45%		33%		32%		47%
Digital Services		27%		27%		28%		23%		20%		47%
Uncertainty & Probability		26%		26%		27%		26%		11%		13%
I do not wish to continue		42%		31%		43%		48%		55%		47%
Familiar with the way these terms are used by the National Weather Service												
Yes		94%		95%		93%		88%		83%		71%
No		6%		5%		7%		12%		17%		29%
Usefulness of these flood severity categories in interpreting the impact of river flooding												
Usefulness of these flood severity categories in interpreting the impact of river flooding	85		87		89		84		78		87	
Flood Severity Map												
Visual appeal	83		86		90		84		87		90	
Ease of understanding	79		85		89		81		80		89	
Tells me what I need to know about flooding	82		86		89		82		82		86	
Flood Depth Map												
Visual appeal	80		84		89		83		84		83	
Ease of understanding	81		86		89		84		87		87	
Tells me what I need to know about the depth of the water	82		86		90		83		89		89	
Usefulness of receiving graphical information that includes the following features:												
Graphics with pre-determined content, spatial extent and time period	82		87		88		86		78		89	
Ability to specify time range shown	88		91		94		91		94		96	
Ability to specify areal extent	89		92		95		91		100		96	
Ability to overlay different background information	92		94		98		94		78		95	
Ability to overlay different information	91		93		95		91		94		95	
Usefulness of the following digital formats:												
Numerical information using standards-based formats	77		82		83		81		67		94	
Information formatted specifically for use with Geographic Information Systems	83		86		90		82		89		89	
Map	71		72		74		69		84		84	
Map	72		72		74		69		84		84	
Metadata information	82		79		86		75		67		88	
Other (please specify)	79		64		83		83		100		100	
Usefulness of the following geospatial formats:												
Shapefile	82		87		91		83		78		94	
Worldfile	77		75		81		76		--		89	
KML/KMZ format	78		70		76		75		--		94	
401 GeoPDF	82		83		88		80		--		89	
Open Geospatial Consortium standards	77		80		82		77		--		94	
Other (please specify)	78		79		92		97		100		--	
Are the following options in making information more accessible on the internet:												
Bulk transfer, e.g. ftp	73		77		83		78		100		70	
Web-based data service (including selective extraction)	91		92		92		86		100		89	
GIS map service	86		89		94		80		56		85	
GIS feature service	86		88		90		80		56		84	
Other (please specify)	62		62		100		100		--		--	
How useful would it be to have forecasts include uncertainty information												
How useful would it be to have forecasts include uncertainty information	88		90		92		88		94		100	
How useful would it be to have forecasts include probability information												
How useful would it be to have forecasts include probability information	80		83		88		82		78		100	
Usefulness of providing river forecast and uncertainty information for the following time scales:												
Short-term (0-5 days)	90		93		96		91		94		100	
Monthly (30 days)	66		64		76		66		50		78	
Seasonal (90 days)	53		54		65		56		44		78	
Map of Observed and Forecast River Levels												
Visual appeal	76		76		86		78		94		83	
Ease of understanding	74		80		84		84		94		79	
Tells me what I need to know about river stages during a 5-day forecast period	75		82		80		80		94		72	
Map of Observed and Forecast River Levels (exceedance probability)												
Visual appeal	74		76		85		76		84		83	
Ease of understanding	67		71		78		70		78		72	
Tells me what I need to know about river stages during a 5-day forecast period	69		77		83		71		83		72	
Likelihood of using probabilistic streamflow forecast product generator												
Likelihood of using probabilistic streamflow forecast product generator	77		79		85		76		83		83	
Sample Size	281	368	261	373	19	15						



Score Summaries - By Primary Use

NWS Scores	Emergency management	Traditional media	Internet/Web	Water supply/hydropower	Agriculture	Natural resource management	Consulting/add custom hydrologic services	Recreation	Personal use	Other
Flood Information	82	81	78	79	72	76	74	82	80	81
Clarity	83	79	78	80	74	76	77	83	81	82
Timeliness	83	82	79	79	75	77	75	83	80	81
Accuracy	81	83	77	75	71	73	72	79	78	78
Organization of information	82	80	80	79	73	76	73	82	79	81
Meets my needs	84	80	80	83	72	78	71	85	82	82
Water Supply/Reservoir Information	80	82	77	77	68	75	73	82	79	79
Clarity	80	80	78	78	67	74	77	83	79	78
Timeliness	80	83	78	75	65	74	75	81	79	80
Accuracy	81	77	78	77	71	74	73	79	79	78
Organization of information	81	83	78	76	70	76	72	83	79	79
Meets my needs	80	81	75	77	62	75	70	84	80	79
Drought Information	82	79	78	75	72	74	69	82	80	80
Clarity	81	78	79	73	73	75	72	79	80	80
Timeliness	82	82	77	76	72	74	70	80	80	81
Accuracy	81	84	76	76	71	74	69	81	81	78
Organization of information	82	80	81	75	71	72	69	84	80	81
Meets my needs	83	78	79	75	70	73	66	85	82	81
Routine River Forecasts/Observed Conditions	82	81	77	81	75	78	75	85	81	82
Clarity	83	80	79	82	78	80	78	85	82	83
Timeliness	83	83	77	83	75	79	75	84	81	81
Accuracy	81	84	76	77	76	77	75	84	81	80
Organization of information	82	81	77	81	75	77	73	85	81	83
Meets my needs	82	80	78	79	72	78	74	86	82	82
Web Products	83	83	81	78	77	80	77	85	83	81
Clarity	83	82	81	78	78	81	77	85	82	81
Timeliness	83	86	82	80	78	81	80	84	83	83
Accuracy	83	85	81	78	78	78	75	85	84	81
Organization of information	84	82	82	78	79	82	78	84	83	82
Meets my needs	84	82	82	78	72	81	75	87	84	80
Customer Satisfaction Index	81	77	76	77	68	76	69	81	77	76
Overall satisfaction with the NWS Hydrologic Services Program	85	81	80	79	74	80	74	85	81	81
How well NWS Hydrologic Services Program meets your expectations	79	75	75	76	65	71	66	78	74	73
How NWS Hydrologic Services Program compares to an 'ideal' hydrologic services program	79	77	72	75	65	74	63	78	74	71
Likelihood to Take Action	91	92	80	83	85	86	80	90	87	86
Likelihood to take action based on the hydrologic information you receive from the National Weather Service	91	92	80	83	85	86	80	90	87	86
Confidence in NWS	88	87	80	80	76	83	75	87	85	82
How confident are you that the NWS Hydrologic Services Program will do a good job	88	87	80	80	76	83	75	87	85	82
Sample Size	426	77	46	48	37	63	35	137	561	188



Non-modeled - By Primary Use

	Emergency management		Traditional media		Internet/Web		Water supply/hydropower		Agriculture	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent										
Emergency management		100%		0%		0%		0%		0%
Traditional media		0%		100%		0%		0%		0%
Internet/Web		0%		0%		100%		0%		0%
Water supply/hydropower		0%		0%		0%		100%		0%
Agriculture		0%		0%		0%		0%		100%
Shipping		0%		0%		0%		0%		0%
Natural resource management		0%		0%		0%		0%		0%
Consulting/advise value/provide custom hydrologic services		0%		0%		0%		0%		0%
Recreation		0%		0%		0%		0%		0%
Personal use		0%		0%		0%		0%		0%
Other		0%		0%		0%		0%		0%
Primary scope of your responsibility										
National		3%		4%		4%		4%		5%
Regional		7%		22%		7%		42%		0%
Single state		9%		12%		4%		13%		3%
All or parts of multiple counties		10%		38%		15%		17%		19%
Single county		47%		5%		4%		2%		19%
Large city/urban area		5%		11%		7%		6%		0%
Smaller city/township		14%		1%		9%		8%		0%
Personal		1%		5%		46%		8%		54%
Other		3%		1%		4%		0%		0%
Method for receiving National Weather Service hydrologic information*										
NWS Web pages		92%		92%		93%		92%		95%
Non-NWS Web pages		26%		19%		17%		17%		19%
Phone		34%		18%		18%		29%		3%
NOAA Weather Radio		62%		27%		30%		29%		38%
NOAA Weather Wire		10%		14%		4%		2%		0%
Family of Services (FOS)		2%		5%		2%		4%		5%
Emergency Managers Weather Information Network (EMWIN)		31%		8%		2%		10%		5%
Local or cable TV		55%		14%		41%		29%		41%
Commercial Radio		27%		0%		13%		13%		14%
Satellite radio		4%		3%		0%		2%		5%
Newspaper		18%		8%		15%		15%		16%
Private Vendor		11%		30%		2%		2%		5%
Other		15%		3%		0%		13%		8%
Frequency of using Flood Warnings, Flood Watches and Flood Statements										
Several times per day		27%		41%		18%		30%		31%
Once per day		19%		12%		16%		23%		14%
Once per week		20%		13%		30%		9%		20%
Once per month		30%		28%		30%		27%		29%
Do not use		3%		3%		7%		7%		6%
Not familiar with this information		1%		3%		0%		5%		0%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information										
Several times per day		7%		8%		5%		20%		9%
Once per day		9%		11%		7%		17%		14%
Once per week		17%		23%		26%		26%		26%
Once per month		28%		24%		29%		28%		20%
Do not use		27%		22%		21%		7%		20%
Not familiar with this information		11%		12%		12%		2%		11%
Frequency of using Hydrologic Outlooks providing drought information										
Several times per day		4%		5%		2%		7%		3%
Once per day		11%		5%		12%		14%		14%
Once per week		18%		32%		24%		23%		37%
Once per month		33%		38%		38%		39%		31%
Do not use		25%		14%		21%		11%		11%
Not familiar with this information		8%		7%		2%		7%		3%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions										
Several times per day		10%		11%		3%		20%		15%
Once per day		16%		18%		15%		20%		15%
Once per week		25%		23%		28%		30%		21%
Once per month		30%		26%		30%		16%		39%
Do not use		14%		15%		23%		11%		9%
Not familiar with this information		5%		8%		3%		2%		0%
Frequency of using other information										
Several times per day		19%		11%		6%		11%		33%
Once per day		14%		7%		6%		13%		13%
Once per week		11%		7%		6%		19%		7%
Once per month		12%		4%		6%		18%		0%
Do not use		21%		22%		53%		19%		27%
Not familiar with this information		24%		48%		24%		19%		20%
Frequency of visiting web pages providing a suite of hydrologic information										
Several times per day		16%		19%		26%		27%		23%
Once per day		25%		23%		20%		21%		34%
Once per week		24%		29%		30%		25%		23%
Once per month		22%		21%		17%		19%		6%
Not familiar with this information		6%		5%		2%		6%		6%
I am familiar with this information but do not use		7%		3%		4%		6%		9%
River Conditions Map (Country-wide)										
Visual appeal		69		66		73		67		62
Ease of understanding		70		69		72		71		70
Tells me what I need to know about river conditions throughout the country		72		73		71		71		68
River Conditions Map (Grand Forks, ND)										
Visual appeal		86		85		84		81		80
Ease of understanding		87		87		85		83		85
Tells me what I need to know about river conditions in Grand Forks, ND		86		85		83		81		80
Hydrograph of Cape Fear River, NC water level										
Visual appeal		85		81		79		83		83
Ease of understanding		85		83		79		84		82
Tells me what I need to know about forecast levels		86		86		80		85		87
Frequency of using high-resolution precipitation estimate graph										
Several times per day		20%		27%		26%		17%		11%
Once per day		30%		26%		26%		21%		40%
Once per week		18%		17%		24%		21%		31%
Once per month		11%		14%		15%		23%		3%
Not familiar with this information		10%		6%		4%		6%		6%
I am familiar with this information but do not use		10%		9%		4%		13%		9%
Map of high-resolution precipitation estimates										
Visual appeal		86		88		87		82		81
Ease of understanding		87		88		86		82		83
Tells me what I need to know about precipitation estimates		85		87		86		78		75



Non-modeled - By Primary Use - Continued

	Natural resource management		Consulting/add value/ provide custom hydrologic services		Recreation		Personal use		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent										
Emergency management		0%		0%		0%		0%		0%
Traditional media		0%		0%		0%		0%		0%
Internet/Web		0%		0%		0%		0%		0%
Water supply/hydropower		0%		0%		0%		0%		0%
Agriculture		0%		0%		0%		0%		0%
Shipping		0%		0%		0%		0%		0%
Natural resource management		100%		0%		0%		0%		0%
Consulting/add value/provide custom hydrologic services		0%		100%		0%		0%		0%
Recreation		0%		0%		100%		0%		0%
Personal use		0%		0%		0%		100%		0%
Other		0%		0%		0%		0%		100%
Primary scope of your responsibility										
National		0%		3%		1%		0%		6%
Regional		14%		49%		5%		3%		23%
Single state		25%		20%		7%		2%		10%
All or parts of multiple counties		29%		6%		4%		2%		17%
Single county		14%		0%		3%		3%		7%
Large city/turban area		2%		11%		0%		1%		2%
Smaller city/township		3%		0%		3%		1%		10%
Personal		3%		0%		74%		86%		13%
Other		10%		11%		1%		1%		12%
Method for receiving National Weather Service hydrologic information*										
NWS Web pages		95%		100%		91%		94%		92%
Non-NWS Web pages		29%		46%		21%		17%		33%
Phone		6%		7%		7%		1%		13%
NOAA Weather Radio		38%		29%		30%		39%		39%
NOAA Weather Wire		2%		6%		4%		0%		5%
Family of Services (FOS)		3%		3%		1%		0%		3%
Emergency Managers Weather Information Network (EMWIN)		5%		9%		2%		3%		10%
Local or cable TV		30%		40%		29%		38%		40%
Commercial Radio		21%		20%		14%		15%		14%
Satellite radio		2%		0%		4%		3%		4%
Newspaper		19%		11%		13%		15%		14%
Private Vendor		3%		9%		1%		2%		7%
Other		5%		4%		4%		4%		20%
Frequency of using Flood Warnings, Flood Watches and Flood Statements										
Several times per day		22%		13%		10%		21%		24%
Once per day		18%		25%		25%		27%		19%
Once per week		28%		22%		23%		17%		19%
Once per month		28%		38%		28%		28%		27%
Do not use		0%		3%		0%		6%		9%
Not familiar with this information		3%		0%		6%		2%		2%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information										
Several times per day		5%		3%		5%		4%		9%
Once per day		9%		16%		14%		10%		10%
Once per week		27%		22%		18%		16%		16%
Once per month		38%		38%		21%		26%		27%
Do not use		17%		22%		31%		27%		27%
Not familiar with this information		5%		0%		11%		16%		11%
Frequency of using Hydrologic Outlooks providing drought information										
Several times per day		2%		0%		5%		3%		6%
Once per day		7%		13%		8%		10%		6%
Once per week		30%		22%		18%		18%		20%
Once per month		35%		28%		29%		32%		29%
Do not use		22%		38%		30%		26%		29%
Not familiar with this information		5%		0%		11%		12%		10%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions										
Several times per day		13%		3%		4%		6%		16%
Once per day		25%		24%		30%		16%		17%
Once per week		33%		24%		25%		22%		23%
Once per month		20%		44%		21%		27%		27%
Do not use		7%		3%		13%		3%		12%
Not familiar with this information		2%		3%		7%		10%		5%
Frequency of using other information										
Several times per day		24%		6%		7%		7%		22%
Once per day		24%		6%		16%		14%		16%
Once per week		24%		19%		13%		5%		14%
Once per month		12%		25%		5%		5%		8%
Do not use		6%		19%		23%		35%		24%
Not familiar with this information		12%		25%		36%		34%		16%
Frequency of visiting web pages providing a suite of hydrologic information										
Several times per day		24%		23%		16%		17%		24%
Once per day		25%		17%		29%		30%		33%
Once per week		24%		34%		34%		20%		17%
Once per month		17%		20%		12%		18%		14%
Not familiar with this information		5%		3%		7%		6%		7%
I am familiar with this information but do not use		5%		3%		1%		6%		5%
River Conditions Map (Country-wide)										
Visual appeal	61		64		69		68		67	
Ease of understanding	70		72		76		72		73	
Tells me what I need to know about river conditions throughout the country	69		67		77		73		73	
River Conditions Map (Grand Forks, ND)										
Visual appeal	81		80		86		86		84	
Ease of understanding	84		83		89		88		86	
Tells me what I need to know about river conditions in Grand Forks, ND	78		78		87		87		83	
Hydrograph of Cape Fear River, NC water level										
Visual appeal	81		86		86		84		84	
Ease of understanding	85		85		86		84		83	
Tells me what I need to know about forecast levels	86		82		87		86		84	
Frequency of using high-resolution precipitation estimate graph										
Several times per day		17%		17%		15%		14%		18%
Once per day		25%		26%		29%		26%		29%
Once per week		22%		23%		20%		21%		20%
Once per month		10%		17%		10%		13%		13%
Do not use		16%		9%		15%		16%		10%
I am familiar with this information but do not use		10%		9%		11%		10%		10%
Map of high-resolution precipitation estimates										
Visual appeal	81		82		89		86		86	
Ease of understanding	80		81		88		87		86	
Tells me what I need to know about precipitation estimates	78		76		90		86		84	



Non-Modeled - By Primary Use - Continued

	Emergency management		Traditional media		Internet/Web		Water supply/hydropower		Agriculture	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Frequency of using high-resolution snow water equivalent graph										
Several times per day		4%		6%		4%		4%		3%
Once per day		9%		8%		13%		13%		14%
Once per week		14%		19%		13%		17%		14%
Once per month		15%		12%		15%		23%		14%
Not familiar with this information		30%		18%		28%		19%		17%
I am familiar with this information but do not use		29%		36%		26%		25%		37%
Map of water in snow high-resolution estimates										
Visual appeal	82		83		83		79		71	
Ease of understanding	81		84		79		77		69	
Tells me what I need to know about water contained in snow	81		84		76		73		68	
Use precipitation frequency estimates										
Yes		40%		37%		39%		58%		40%
No		60%		63%		61%		42%		60%
Familiar with Precipitation Frequency Data Server web page										
Yes		54%		54%		56%		52%		29%
No		46%		46%		44%		48%		71%
Precipitation Frequency Data Server Map										
Usefulness of having updated precipitation frequency estimates	83		79		78		69		85	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:										
Text	89		93		86		81		79	
Graphics	87		84		87		82		79	
A combination of text and graphics	90		89		90		85		86	
NOAA Weather Radio All Hazards	89		81		83		75		83	
Usefulness of receiving river forecasts in the following formats:										
Text	84		85		79		81		71	
Graphics	84		85		82		84		77	
A combination of text and graphics	86		87		85		86		81	
Digital	79		67		77		77		69	
NOAA Weather Radio All Hazards	81		74		80		69		74	
Usefulness of receiving river/stream observations in the following formats:										
Text	84		86		81		76		75	
Graphics	85		87		87		85		81	
A combination of text and graphics	88		89		87		86		82	
Digital	79		66		81		77		72	
NOAA Weather Radio All Hazards	82		69		76		66		73	
Ever had personal communication with NWS staff to discuss hydrologic forecasts										
Yes		72%		69%		20%		68%		31%
No		28%		31%		80%		32%		69%
Value of your personal communication with NWS staff to discuss hydrologic forecasts										
Value of your personal communication with NWS staff to discuss hydrologic forecasts	95		90		91		90		94	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year										
1-3 times a year		34%		42%		38%		31%		82%
4-6 times a year		29%		25%		13%		9%		9%
7-12 times a year		15%		13%		50%		6%		0%
More than 12 times a year		21%		21%		0%		53%		9%
Purpose of personal communication with NWS staff										
Explanation or interpretation of available forecast products		41%		36%		9%		31%		8%
Gain an understanding of forecaster confidence in forecast products		35%		34%		7%		40%		5%
Synthesize available forecast products and information for your specific needs		34%		35%		0%		35%		5%
Get more information from forecasts than available in existing products		46%		45%		7%		44%		22%
Provided feedback on the following categories:										
Flood Risks		52%		34%		33%		48%		32%
Digital Services		25%		19%		37%		42%		16%
Uncertainty & Probability		30%		17%		33%		35%		24%
I do not wish to continue		37%		49%		37%		35%		49%
Familiar with the way these terms are used by the National Weather Service										
Yes		95%		88%		93%		100%		92%
No		5%		12%		7%		0%		8%
Usefulness of these flood severity categories in interpreting the impact of river flooding										
Usefulness of these flood severity categories in interpreting the impact of river flooding	88		92		88		83		69	
Flood Severity Map										
Visual appeal	87		81		88		85		82	
Ease of understanding	86		79		81		82		79	
Tells me what I need to know about flooding	87		81		79		82		81	
Flood Depth Map										
Visual appeal	85		82		87		83		77	
Ease of understanding	86		82		84		84		80	
Tells me what I need to know about the depth of the water	86		82		77		89		79	
Usefulness of receiving graphical information that includes the following features:										
Graphics with pre-determined content, spatial extent and time period	90		85		80		77		89	
Ability to specify time range shown	92		87		90		87		96	
Ability to specify areal extent	93		91		93		85		96	
Ability to overlay different background information	93		96		92		84		96	
Ability to overlay different information	93		87		94		86		96	
Usefulness of the following digital formats:										
Numerical information using standards-based formats	82		89		87		76		83	
Information formatted geospatially for use with Geographic Information Systems	87		86		83		80		85	
RSS	85		78		81		62		74	
WAP	83		82		72		58		67	
Metadata information	83		77		79		74		71	
Other (please specify)	77		83		47		58		100	
Usefulness of the following geospatial formats:										
Shapefile	87		93		87		76		92	
Worldfile	85		87		86		61		100	
XML/KML2 format	70		86		84		54		100	
40) GeoPDF	85		71		88		68		94	
Open Geospatial Consortium standards	79		93		84		68		94	
Other (please specify)	84		44		93		22		100	
Usefulness of the following options in making information more accessible on the Internet:										
"Bulk transfer," e.g., ftp	83		77		87		74		87	
Web-based data service (including selective extraction)	90		87		84		83		93	
GIS map service	90		87		84		84		98	
GIS feature service	91		89		85		83		93	
Other (please specify)	75		100		50		--		--	
How useful would it be to have forecasts include uncertainty information	89		93		78		83		91	
How useful would it be to have forecasts include probability information	84		89		84		80		83	
Usefulness of providing river forecasts and uncertainty information for the following time scales:										
Short-term (0-5 days)	91		94		84		86		93	
Monthly (30 days)	71		64		74		82		61	
Seasonal (90 days)	84		58		71		79		41	
Map of Observed and Forecast River Levels										
Visual appeal	80		79		83		82		88	
Ease of understanding	80		80		70		81		83	
Tells me what I need to know about river stages during a 5-day forecast period	82		83		70		78		78	
Map of Observed and Forecast River Levels (exceedance probability)										
Visual appeal	76		72		78		80		78	
Ease of understanding	72		61		67		79		72	
Tells me what I need to know about river stages during a 5-day forecast period	78		67		68		78		68	
Likelihood of using probabilistic streamflow forecast product generator										
Likelihood of using probabilistic streamflow forecast product generator	75		70		78		87		78	
Sample Size		426		77		46		48		37



Non-Modeled - By Primary Use - Continued

	Natural resource management		Consulting/add value/ provide custom hydrologic services		Recreation		Personal use		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Frequency of using high-resolution snow water equivalent graph										
Several times per day		0%		0%		3%		3%		4%
Once per day		5%		3%		7%		8%		7%
Once per week		19%		17%		9%		10%		13%
Once per month		14%		23%		19%		19%		17%
Not familiar with this information		37%		20%		34%		34%		33%
I am familiar with this information but do not use		25%		37%		28%		26%		25%
Map of water in snow high-resolution estimates										
Visual appeal	78		72		85		82		82	
Ease of understanding	77		68		83		81		81	
Tells me what I need to know about water contained in snow	77		64		85		81		79	
Use precipitation frequency estimates										
Yes		40%		80%		25%		29%		47%
No		60%		20%		75%		71%		53%
Familiar with Precipitation Frequency Data Server web page										
Yes		40%		50%		42%		55%		47%
No		60%		50%		58%		45%		53%
Precipitation Frequency Data Server Map										
Usefulness of having updated precipitation frequency estimates	84		90		75		79		89	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:										
Text	82		79		81		85		82	
Graphics	81		85		84		86		85	
A combination of text and graphics	87		89		88		90		89	
NOAA Weather Radio All Hazards	84		77		85		86		85	
Usefulness of receiving river forecasts in the following formats:										
Text	75		74		76		79		79	
Graphics	82		82		84		83		84	
A combination of text and graphics	88		88		87		86		87	
Digital	78		82		69		69		74	
NOAA Weather Radio All Hazards	76		67		79		80		78	
Usefulness of receiving river/stream observations in the following formats:										
Text	75		72		79		78		78	
Graphics	83		84		85		83		85	
A combination of text and graphics	87		89		88		88		86	
Digital	80		81		69		67		77	
NOAA Weather Radio All Hazards	73		66		77		78		76	
Ever had personal communication with NWS staff to discuss hydrologic forecasts										
Yes		37%		49%		16%		14%		46%
No		63%		51%		84%		86%		54%
Value of your personal communication with NWS staff to discuss hydrologic forecasts										
Value of your personal communication with NWS staff to discuss hydrologic forecasts	93		90		97		86		91	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year										
1-3 times a year		43%		59%		70%		71%		45%
4-6 times a year		22%		18%		10%		17%		21%
7-12 times a year		26%		6%		10%		4%		12%
More than 12 times a year		9%		18%		10%		8%		22%
Purpose of personal communication with NWS staff										
Explanation or interpretation of available forecast products		10%		23%		8%		5%		21%
Gain an understanding of forecaster confidence in forecast products		10%		37%		4%		6%		21%
Synthesize available forecast products and information for your specific needs		22%		20%		4%		3%		16%
Get more information from forecaster than available in existing products		21%		29%		7%		9%		34%
Provided feedback on the following categories*:										
Flood Risks		44%		54%		33%		38%		49%
Digital Services		33%		40%		18%		22%		31%
Uncertainty & Probability		32%		49%		16%		24%		29%
I do not wish to continue		38%		23%		53%		46%		37%
Familiar with the way these terms are used by the National Weather Service										
Yes		89%		95%		82%		94%		89%
No		11%		5%		18%		6%		11%
Usefulness of these flood severity categories in interpreting the impact of river flooding										
Usefulness of these flood severity categories in interpreting the impact of river flooding	81		81		83		86		88	
Flood Severity Map										
Visual appeal	83		82		78		85		87	
Ease of understanding	80		80		76		84		86	
Tells me what I need to know about flooding	79		77		78		86		85	
Flood Depth Map										
Visual appeal	82		86		76		81		85	
Ease of understanding	83		86		80		84		85	
Tells me what I need to know about the depth of the water	82		82		86		82		84	
Usefulness of receiving graphical information that includes the following features:										
Graphics with pre-determined content, spatial extent and time period	81		84		84		85		87	
Ability to specify time range shown	92		96		88		90		93	
Ability to specify areal extent	94		93		90		91		95	
Ability to overlay different background information	90		89		94		90		96	
Ability to overlay different information	94		94		93		92		96	
Usefulness of the following digital formats:										
Numerical information using standards-based formats	86		81		74		78		84	
Information formatted geospatially for use with Geographic Information Systems	89		86		90		79		89	
BSS	69		73		78		80		76	
WAP	81		59		70		74		79	
Metadata information	82		81		75		75		87	
Other (please specify)	--		83		74		77		89	
Usefulness of the following geospatial formats:										
Shapefile	86		80		84		78		94	
Worldfile	76		86		75		75		79	
KML/KMZ format	76		78		68		75		82	
40 GeoPDF	83		84		78		79		91	
Open Geospatial Consortium standards	78		87		68		76		84	
Other (please specify)	--		100		100		69		90	
Usefulness of the following options in making information more accessible on the internet:										
Bulk transfer, e.g. ftp	76		84		75		73		85	
Web-based data service (including selective extraction)	90		91		85		87		93	
GIS map service	88		78		80		78		90	
GIS feature service	85		83		86		78		91	
Other (please specify)	--		--		44		61		88	
How useful would it be to have forecasts include uncertainty information										
How useful would it be to have forecasts include uncertainty information	90		92		83		88		94	
How useful would it be to have forecasts include probability information										
How useful would it be to have forecasts include probability information	87		83		78		82		85	
Usefulness of providing river forecasts and uncertainty information for the following time scales:										
Short-term (0-5 days)	93		90		92		93		94	
Monthly (30 days)	57		63		74		67		66	
Seasonal (90 days)	54		56		64		54		54	
Map of Observed and Forecast River Levels										
Visual appeal	84		72		75		78		84	
Ease of understanding	81		76		80		79		83	
Tells me what I need to know about river stages during a 5-day forecast period	83		75		83		81		82	
Map of Observed and Forecast River Levels (exceedance probability)										
Visual appeal	83		70		77		78		81	
Ease of understanding	76		61		69		71		77	
Tells me what I need to know about river stages during a 5-day forecast period	78		63		77		75		78	
Likelihood of using probabilistic streamflow forecast product generator										
Likelihood of using probabilistic streamflow forecast product generator	81		78		79		77		82	
Sample Size	63		35		137		561		188	



Score Summaries - By Primary Scope of Responsibility

NWS Scores	National	Regional	Single state	All or parts of multiple counties	Single county	Large city/urban area	Smaller city/township	Personal	Other
Flood Information	78	77	80	81	82	82	79	81	81
Clarity	79	78	77	82	82	82	79	81	86
Timeliness	77	73	82	81	82	84	78	81	80
Accuracy	79	79	79	80	79	78	76	80	78
Organization of information	77	76	79	80	82	83	81	80	81
Meets my needs	80	78	82	82	84	84	81	83	79
Water Supply/Reservoir Information	78	75	77	81	79	78	78	80	84
Clarity	78	76	76	80	79	83	77	79	84
Timeliness	78	76	77	80	79	81	77	79	84
Accuracy	80	73	75	84	79	82	80	80	81
Organization of information	76	75	78	81	79	82	79	80	84
Meets my needs	80	75	78	80	79	77	78	81	83
Drought Information n=25	78	74	77	80	83	79	78	81	79
Clarity	76	74	77	80	82	79	78	80	81
Timeliness	77	75	77	80	83	79	78	81	83
Accuracy	80	73	75	81	82	79	77	82	78
Organization of information	78	75	77	81	81	79	77	81	77
Meets my needs	79	75	79	79	83	80	80	83	80
Routine River Forecasts/Observed Conditions	81	78	79	83	83	78	79	83	83
Clarity	81	79	79	83	84	77	79	83	86
Timeliness	82	80	79	82	84	80	79	82	82
Accuracy	83	75	78	81	82	80	77	82	83
Organization of information	80	78	80	82	83	77	81	82	82
Meets my needs	79	78	83	80	83	77	79	83	82
Web Products	81	78	81	84	83	82	79	84	82
Clarity	81	79	82	83	83	82	80	83	81
Timeliness	81	80	83	85	82	81	80	85	82
Accuracy	83	75	79	84	83	81	81	85	83
Organization of information	80	77	82	85	83	82	79	84	84
Meets my needs	81	76	81	82	84	83	81	85	85
Customer Satisfaction Index	75	74	76	79	81	77	77	78	79
Overall satisfaction with the NWS Hydrologic Services Program	79	78	79	84	84	81	82	82	82
How well NWS Hydrologic Services Program meets your expectations	69	71	74	77	79	74	74	75	76
How NWS Hydrologic Services Program compares to an 'ideal' hydrologic services program	76	70	74	76	79	74	74	75	76
Likelihood to Take Action	86	85	86	90	90	85	87	88	88
Likelihood to take action based on the hydrologic information you receive	86	85	86	90	90	85	87	88	88
Confidence in NWS	85	81	84	85	87	85	84	85	85
How confident are you that the NWS Hydrologic Services Program will do a good job	85	81	84	85	87	85	84	85	85
Sample Size	40	169	120	167	259	48	99	667	59



Non-modeled - By Primary Scope of Responsibility

	National		Regional		Single state	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent						
Emergency management		31%		19%		33%
Traditional media		8%		10%		8%
Internet/Web		5%		2%		2%
Water supply/hydropower		5%		12%		5%
Agriculture		5%				1%
Shipping		3%		1%		1%
Natural resource management		0%		5%		13%
Consulting/add value/provide custom hydrologic services		3%		10%		6%
Recreation		5%		4%		8%
Personal use		5%		11%		8%
Other		31%		26%		16%
Primary scope of your responsibility						
National		100%		0%		0%
Regional		0%		100%		0%
Single state		0%		0%		100%
All or parts of multiple counties		0%		0%		0%
Single county		0%		0%		0%
Large city/urban area		0%		0%		0%
Smaller city/township		0%		0%		0%
Personal		0%		0%		0%
Other		0%		0%		0%
Method for receiving National Weather Service hydrologic information*						
NWS Web pages		95%		93%		91%
Non-NWS Web pages		33%		25%		37%
Phone		10%		18%		19%
NOAA Weather Radio		30%		34%		35%
NOAA Weather Wire		13%		3%		13%
Family of Services (FOS)		10%		4%		5%
Emergency Managers Weather Information Network (EMWIN)		10%		8%		16%
Local or cable TV		33%		35%		45%
Commercial Radio		13%		16%		19%
Satellite radio		8%		5%		4%
Newspaper		20%		11%		18%
Private Vendor		20%		9%		10%
Other		8%		13%		14%
Frequency of using Flood Warnings, Flood Watches and Flood Statements						
Several times per day		44%		26%		25%
Once per day		12%		22%		25%
Once per week		15%		13%		22%
Once per month		18%		31%		23%
Do not use		12%		2%		2%
Not familiar with this information		0%		1%		3%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information						
Several times per day		17%		10%		11%
Once per day		6%		16%		12%
Once per week		20%		19%		18%
Once per month		26%		31%		33%
Do not use		29%		17%		11%
Not familiar with this information		3%		7%		15%
Frequency of using Hydrologic Outlooks providing drought information						
Several times per day		12%		4%		7%
Once per day		12%		13%		8%
Once per week		18%		22%		17%
Once per month		33%		37%		35%
Do not use		21%		17%		24%
Not familiar with this information		3%		7%		10%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions						
Several times per day		17%		15%		12%
Once per day		17%		25%		19%
Once per week		23%		22%		26%
Once per month		26%		28%		28%
Do not use		17%		8%		7%
Not familiar with this information		0%		3%		8%
Frequency of using other information						
Several times per day		33%		15%		19%
Once per day		17%		17%		12%
Once per week		17%		13%		12%
Once per month		6%		15%		12%
Do not use		11%		18%		24%
Not familiar with this information		17%		22%		21%
Frequency of visiting web pages providing a suite of hydrologic information						
Several times per day		26%		27%		20%
Once per day		23%		23%		26%
Once per week		21%		22%		28%
Once per month		16%		15%		15%
Not familiar with this information		5%		5%		6%
I am familiar with this information but do not use		3%		4%		6%
River Conditions Map (Country-wide)						
Visual appeal	69		67		66	
Ease of understanding	72		73		69	
Tells me what I need to know about river conditions throughout the country	77		68		70	
River Conditions Map (Grand Forks, ND)						
Visual appeal	83		81		84	
Ease of understanding	86		84		85	
Tells me what I need to know about river conditions in Grand Forks, ND	81		78		83	
Hydrograph of Cape Fear River, NC water level						
Visual appeal	83		82		84	
Ease of understanding	82		82		84	
Tells me what I need to know about forecast levels	84		81		85	



Non-modeled - By Primary Scope of Responsibility - Continued

	All or parts of multiple counties		Single county		Large city/urban area	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent						
Emergency management		27%		78%		44%
Traditional media		17%		2%		17%
Internet/Web		4%		1%		6%
Water supply/hydropower		5%		0%		6%
Agriculture		4%		3%		0%
Shipping		1%		0%		0%
Natural resource management		11%		3%		2%
Consulting/add value/provide custom hydrologic services		1%		0%		8%
Recreation		4%		2%		0%
Personal use		8%		7%		8%
Other		19%		5%		8%
Primary scope of your responsibility						
National		0%		0%		0%
Regional		0%		0%		0%
Single state		0%		0%		0%
All or parts of multiple counties		100%		0%		0%
Single county		0%		100%		0%
Large city/urban area		0%		0%		100%
Smaller city/township		0%		0%		0%
Personal		0%		0%		0%
Other		0%		0%		0%
Method for receiving National Weather Service hydrologic information*						
NWS Web pages		93%		92%		92%
Non-NWS Web pages		25%		22%		27%
Phone		18%		31%		29%
NOAA Weather Radio		45%		62%		46%
NOAA Weather Wire		4%		7%		13%
Family of Services (FOS)		4%		1%		6%
Emergency Managers Weather Information Network (EMWIN)		19%		26%		21%
Local or cable TV		34%		51%		38%
Commercial Radio		16%		24%		25%
Satellite radio		3%		2%		4%
Newspaper		14%		18%		17%
Private Vendor		13%		8%		15%
Other		7%		12%		15%
Frequency of using Flood Warnings, Flood Watches and Flood Statements						
Several times per day		25%		24%		32%
Once per day		25%		18%		19%
Once per week		21%		20%		13%
Once per month		22%		32%		30%
Do not use		6%		4%		4%
Not familiar with this information		1%		3%		2%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information						
Several times per day		8%		6%		7%
Once per day		12%		8%		7%
Once per week		23%		19%		24%
Once per month		29%		29%		33%
Do not use		20%		27%		20%
Not familiar with this information		8%		12%		9%
Frequency of using Hydrologic Outlooks providing drought information						
Several times per day		5%		1%		5%
Once per day		12%		11%		7%
Once per week		25%		19%		19%
Once per month		33%		32%		42%
Do not use		19%		27%		21%
Not familiar with this information		5%		10%		7%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions						
Several times per day		10%		8%		14%
Once per day		22%		14%		14%
Once per week		25%		25%		27%
Once per month		29%		30%		20%
Do not use		12%		15%		18%
Not familiar with this information		1%		7%		7%
Frequency of using other information						
Several times per day		20%		13%		25%
Once per day		17%		11%		0%
Once per week		11%		8%		6%
Once per month		6%		12%		0%
Do not use		18%		31%		31%
Not familiar with this information		29%		25%		38%
Frequency of visiting web pages providing a suite of hydrologic information						
Several times per day		20%		16%		21%
Once per day		33%		23%		19%
Once per week		20%		26%		21%
Once per month		16%		23%		25%
Not familiar with this information		5%		6%		6%
I am familiar with this information but do not use		5%		6%		8%
River Conditions Map (Country-wide)						
Visual appeal	69		69		64	
Ease of understanding	73		71		70	
Tells me what I need to know about river conditions throughout the country	73		73		73	
River Conditions Map (Grand Forks, ND)						
Visual appeal	85		85		83	
Ease of understanding	87		86		84	
Tells me what I need to know about river conditions in Grand Forks, ND	85		85		84	
Hydrograph of Cape Fear River, NC water level						
Visual appeal	84		84		84	
Ease of understanding	85		84		83	
Tells me what I need to know about forecast levels	87		86		85	



Non-modeled - By Primary Scope of Responsibility - Continued

	Smaller city/township		Personal		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent						
Emergency management		60%		1%		24%
Traditional media		1%		1%		2%
Internet/Web		4%		3%		3%
Water supply/hydropower		4%		1%		0%
Agriculture		0%		3%		0%
Shipping		0%		0%		0%
Natural resource management		2%		0%		10%
Consulting/add value/provide custom hydrologic services		0%		0%		7%
Recreation		4%		15%		3%
Personal use		6%		72%		14%
Other		18%		4%		37%
Primary scope of your responsibility						
National		0%		0%		0%
Regional		0%		0%		0%
Single state		0%		0%		0%
All or parts of multiple counties		0%		0%		0%
Single county		0%		0%		0%
Large city/urban area		0%		0%		0%
Smaller city/township		100%		0%		0%
Personal		0%		100%		0%
Other		0%		0%		100%
Method for receiving National Weather Service hydrologic information*						
NWS Web pages		96%		93%		92%
Non-NWS Web pages		25%		18%		24%
Phone		18%		2%		15%
NOAA Weather Radio		52%		37%		47%
NOAA Weather Wire		9%		1%		5%
Family of Services (FOS)		0%		0%		2%
Emergency Managers Weather Information Network (EMWIN)		20%		2%		14%
Local or cable TV		53%		36%		47%
Commercial Radio		28%		15%		15%
Satellite radio		3%		3%		3%
Newspaper		16%		16%		10%
Private Vendor		6%		2%		8%
Other		15%		4%		19%
Frequency of using Flood Warnings, Flood Watches and Flood Statements						
Several times per day		26%		18%		40%
Once per day		13%		25%		9%
Once per week		17%		19%		11%
Once per month		35%		29%		33%
Do not use		6%		7%		5%
Not familiar with this information		3%		3%		2%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information						
Several times per day		7%		3%		14%
Once per day		7%		11%		5%
Once per week		15%		17%		13%
Once per month		23%		24%		27%
Do not use		37%		29%		36%
Not familiar with this information		10%		16%		5%
Frequency of using Hydrologic Outlooks providing drought information						
Several times per day		5%		3%		11%
Once per day		8%		8%		6%
Once per week		21%		19%		21%
Once per month		29%		30%		30%
Do not use		28%		28%		26%
Not familiar with this information		7%		11%		6%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions						
Several times per day		7%		6%		15%
Once per day		16%		17%		15%
Once per week		19%		24%		17%
Once per month		32%		26%		33%
Do not use		19%		18%		13%
Not familiar with this information		7%		9%		6%
Frequency of using other information						
Several times per day		9%		7%		23%
Once per day		18%		14%		16%
Once per week		6%		8%		13%
Once per month		9%		6%		10%
Do not use		24%		33%		16%
Not familiar with this information		33%		31%		23%
Frequency of visiting web pages providing a suite of hydrologic information						
Several times per day		12%		17%		24%
Once per day		24%		30%		22%
Once per week		23%		23%		22%
Once per month		28%		16%		14%
Not familiar with this information		9%		7%		10%
I am familiar with this information but do not use		3%		6%		7%
River Conditions Map (Country-wide)						
Visual appeal	62		69		69	
Ease of understanding	66		73		72	
Tells me what I need to know about river conditions throughout the country	69		75		71	
River Conditions Map (Grand Forks, ND)						
Visual appeal	83		87		86	
Ease of understanding	86		88		88	
Tells me what I need to know about river conditions in Grand Forks, ND	83		88		83	
Hydrograph of Cape Fear River, NC water level						
Visual appeal	81		85		81	
Ease of understanding	82		86		83	
Tells me what I need to know about forecast levels	83		87		85	



Non-modeled - By Primary Scope of Responsibility - Continued

	National		Regional		Single state	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Frequency of using high-resolution precipitation estimate graph						
Several times per day		32%		19%		18%
Once per day		29%		34%		31%
Once per week		18%		26%		18%
Once per month		3%		10%		14%
Not familiar with this information		5%		4%		8%
I am familiar with this information but do not use		13%		8%		10%
Map of high-resolution precipitation estimates						
Visual appeal	85		85		83	
Ease of understanding	88		85		83	
Tells me what I need to know about precipitation estimates	86		82		82	
Frequency of using high-resolution snow water equivalent graph						
Several times per day		5%		5%		0%
Once per day		8%		10%		7%
Once per week		21%		22%		18%
Once per month		26%		18%		17%
Not familiar with this information		16%		22%		20%
I am familiar with this information but do not use		24%		24%		29%
Map of water in snow high-resolution estimates						
Visual appeal	82		79		79	
Ease of understanding	76		79		78	
Tells me what I need to know about water contained in snow	80		75		77	
Use precipitation frequency estimates						
Yes		47%		61%		41%
No		53%		39%		59%
Familiar with Precipitation Frequency Data Server web page						
Yes		50%		56%		48%
No		50%		44%		52%
Precipitation Frequency Data Server Map						
Usefulness of having updated precipitation frequency estimates	84		87		82	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:						
Text	78		83		82	
Graphics	81		83		85	
A combination of text and graphics	86		87		89	
NOAA Weather Radio All Hazards	82		77		85	
Usefulness of receiving river forecasts in the following formats:						
Text	74		79		79	
Graphics	81		83		84	
A combination of text and graphics	80		87		88	
Digital	72		79		77	
NOAA Weather Radio All Hazards	76		69		80	
Usefulness of receiving river/stream observations in the following formats:						
Text	74		79		78	
Graphics	85		84		83	
A combination of text and graphics	85		86		87	
Digital	72		80		76	
NOAA Weather Radio All Hazards	67		65		76	
Ever had personal communication with NWS staff to discuss hydrologic forecasts						
Yes		26%		58%		56%
No		74%		42%		44%
Value of your personal communication with NWS staff to discuss hydrologic forecasts						
Value of your personal communication with NWS staff to discuss hydrologic forecasts	91		90		94	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year						
1-3 times a year		78%		30%		38%
4-6 times a year		11%		21%		20%
7-12 times a year		0%		22%		12%
More than 12 times a year		11%		28%		30%
Purpose of personal communication with NWS staff*						
Explanation or interpretation of available forecast products		10%		31%		32%
Gain an understanding of forecaster confidence in forecast products		10%		33%		29%
Synthesize available forecast products and information for your specific needs		10%		25%		29%
Get more information from forecaster than available in existing products		15%		37%		37%
Provided feedback on the following categories:						
Flood Risks		38%		46%		43%
Digital Services		40%		32%		24%
Uncertainty & Probability		28%		34%		24%
I do not wish to continue		43%		34%		47%
Familiar with the way these terms are used by the National Weather Service						
Yes		87%		92%		92%
No		13%		8%		8%
Usefulness of these flood severity categories in interpreting the impact of river flooding						
Usefulness of these flood severity categories in interpreting the impact of river flooding	85		85		84	
Flood Severity Map						
Visual appeal	84		83		83	
Ease of understanding	77		80		81	
Tells me what I need to know about flooding	80		80		82	



Non-modeled - By Primary Scope of Responsibility - Continued

	All or parts of multiple counties		Single county		Large city/urban area	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Frequency of using high-resolution precipitation estimate graph						
Several times per day		20%		19%		21%
Once per day		28%		27%		29%
Once per week		20%		17%		19%
Once per month		13%		14%		13%
Not familiar with this information		11%		11%		15%
I am familiar with this information but do not use		8%		11%		4%
Map of high-resolution precipitation estimates						
Visual appeal	86		86		86	
Ease of understanding	87		86		85	
Tells me what I need to know about precipitation estimates	84		84		83	
Frequency of using high-resolution snow water equivalent graph						
Several times per day		2%		4%		8%
Once per day		11%		11%		8%
Once per week		15%		12%		8%
Once per month		16%		13%		10%
Not familiar with this information		28%		31%		38%
I am familiar with this information but do not use		28%		29%		27%
Map of water in snow high-resolution estimates						
Visual appeal	82		82		86	
Ease of understanding	82		80		82	
Tells me what I need to know about water contained in snow	81		81		84	
Use precipitation frequency estimates						
Yes		41%		39%		42%
No		59%		61%		58%
Familiar with Precipitation Frequency Data Server web page						
Yes		45%		54%		40%
No		55%		46%		60%
Precipitation Frequency Data Server Map						
Usefulness of having updated precipitation frequency estimates	79		82		84	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:						
Text	86		88		88	
Graphics	84		85		88	
A combination of text and graphics	89		89		93	
NOAA Weather Radio All Hazards	87		90		80	
Usefulness of receiving river forecasts in the following formats:						
Text	80		83		83	
Graphics	83		83		87	
A combination of text and graphics	87		86		90	
Digital	73		77		70	
NOAA Weather Radio All Hazards	80		83		70	
Usefulness of receiving river/stream observations in the following formats:						
Text	80		83		83	
Graphics	85		85		88	
A combination of text and graphics	87		87		90	
Digital	73		78		74	
NOAA Weather Radio All Hazards	78		83		70	
Ever had personal communication with NWS staff to discuss hydrologic forecasts						
Yes		53%		71%		60%
No		47%		29%		40%
Value of your personal communication with NWS staff to discuss hydrologic forecasts						
Value of your personal communication with NWS staff to discuss hydrologic forecasts	93		96		96	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year						
1-3 times a year		37%		38%		41%
4-6 times a year		29%		30%		17%
7-12 times a year		11%		13%		17%
More than 12 times a year		22%		19%		24%
Purpose of personal communication with NWS staff*						
Explanation or interpretation of available forecast products		22%		40%		38%
Gain an understanding of forecaster confidence in forecast products		23%		31%		46%
Synthesize available forecast products and information for your specific needs		22%		32%		38%
Get more information from forecaster than available in existing products		36%		46%		33%
Provided feedback on the following categories*:						
Flood Risks		47%		49%		54%
Digital Services		26%		23%		29%
Uncertainty & Probability		23%		18%		33%
I do not wish to continue		41%		40%		35%
Familiar with the way these terms are used by the National Weather Service						
Yes		94%		89%		92%
No		6%		11%		8%
Usefulness of these flood severity categories in interpreting the impact of river flooding						
Usefulness of these flood severity categories in interpreting the impact of river flooding	87		89		80	
Flood Severity Map						
Visual appeal	87		87		88	
Ease of understanding	82		86		85	
Tells me what I need to know about flooding	84		86		85	



Non-modeled - By Primary Scope of Responsibility - Continued

	Smaller city/township		Personal		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Frequency of using high-resolution precipitation estimate graph						
Several times per day		15%		14%		31%
Once per day		34%		25%		22%
Once per week		20%		21%		12%
Once per month		12%		13%		10%
Not familiar with this information		9%		16%		10%
I am familiar with this information but do not use		9%		11%		14%
Map of high-resolution precipitation estimates						
Visual appeal	82		87		88	
Ease of understanding	83		87		90	
Tells me what I need to know about precipitation estimates	81		87		85	
Frequency of using high-resolution snow water equivalent graph						
Several times per day		2%		3%		9%
Once per day		7%		8%		3%
Once per week		9%		9%		14%
Once per month		19%		19%		10%
Not familiar with this information		36%		34%		28%
I am familiar with this information but do not use		27%		28%		36%
Map of water in snow high-resolution estimates						
Visual appeal	76		82		83	
Ease of understanding	76		81		83	
Tells me what I need to know about water contained in snow	76		82		81	
Use precipitation frequency estimates						
Yes		38%		27%		40%
No		62%		73%		60%
Familiar with Precipitation Frequency Data Server web page						
Yes		49%		51%		48%
No		51%		49%		52%
Precipitation Frequency Data Server Map						
Usefulness of having updated precipitation frequency estimates	79		78		87	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:						
Text	89		84		88	
Graphics	87		86		88	
A combination of text and graphics	90		90		92	
NOAA Weather Radio All Hazards	87		87		90	
Usefulness of receiving river forecasts in the following formats:						
Text	81		79		78	
Graphics	84		83		81	
A combination of text and graphics	86		86		87	
Digital	73		70		72	
NOAA Weather Radio All Hazards	79		80		84	
Usefulness of receiving river/stream observations in the following formats:						
Text	80		79		78	
Graphics	83		84		85	
A combination of text and graphics	86		86		85	
Digital	73		69		74	
NOAA Weather Radio All Hazards	79		78		85	
Ever had personal communication with NWS staff to discuss hydrologic forecasts						
Yes		40%		14%		49%
No		60%		86%		51%
Value of your personal communication with NWS staff to discuss hydrologic forecasts						
Value of your personal communication with NWS staff to discuss hydrologic forecasts	90		89		85	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year						
1-3 times a year		54%		72%		48%
4-6 times a year		28%		11%		28%
7-12 times a year		13%		7%		7%
More than 12 times a year		5%		10%		17%
Purpose of personal communication with NWS staff*						
Explanation or interpretation of available forecast products		15%		6%		20%
Gain an understanding of forecaster confidence in forecast products		17%		5%		20%
Synthesize available forecast products and information for your specific needs		19%		3%		17%
Get more information from forecaster than available in existing products		23%		9%		32%
Provided feedback on the following categories*:						
Flood Risks		49%		37%		47%
Digital Services		30%		21%		34%
Uncertainty & Probability		21%		24%		34%
I do not wish to continue		40%		46%		37%
Familiar with the way these terms are used by the National Weather Service						
Yes		92%		94%		96%
No		8%		6%		4%
Usefulness of these flood severity categories in interpreting the impact of river flooding						
Usefulness of these flood severity categories in interpreting the impact of river flooding	83		88		86	
Flood Severity Map						
Visual appeal	84		85		82	
Ease of understanding	83		84		84	
Tells me what I need to know about flooding	86		86		84	



Non-modeled - By Primary Scope of Responsibility - Continued

	National		Regional		Single state	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Flood Depth Map						
Visual appeal	79		83		79	
Ease of understanding	84		83		81	
Tells me what I need to know about the depth of the water	85		83		83	
Usefulness of receiving graphical information that includes the following features:						
Graphics with pre-determined content, spatial extent and time period	81		84		87	
Ability to specify time range shown	92		92		92	
Ability to specify areal extent	90		93		93	
Ability to overlay different background information	89		91		95	
Ability to overlay different information	91		93		93	
Usefulness of the following digital formats:						
Numerical information using standards-based formats	85		85		83	
Information formatted geospatially for use with Geographic Information Systems	90		87		88	
RSS	82		69		84	
WAP	86		67		73	
Metadata information	86		85		83	
Other (please specify)	93		61		63	
Usefulness of the following geospatial formats:						
Shapefile	89		92		88	
Worldfile	71		80		70	
KML/KMZ format	80		76		66	
40) GeoPDF	81		82		86	
Open Geospatial Consortium standards	76		84		79	
Other (please specify)	100		89		69	
Usefulness of the following options in making information more accessible on the Internet:						
"Bulk transfer," e.g., ftp	83		82		86	
Web-based data service (including selective extraction)	94		89		93	
GIS map service	87		83		91	
GIS feature service	89		83		91	
Other (please specify)	69		50		100	
How useful would it be to have forecasts include uncertainty information						
How useful would it be to have forecasts include uncertainty information	91		90		88	
How useful would it be to have forecasts include probability information						
How useful would it be to have forecasts include probability information	89		84		81	
Usefulness of providing river forecasts and uncertainty information for the following time scales:						
Short-term (0-5 days)	83		89		92	
Monthly (30 days)	86		70		64	
Seasonal (90 days)	81		63		52	
Map of Observed and Forecast River Levels						
Visual appeal	71		78		82	
Ease of understanding	72		79		80	
Tells me what I need to know about river stages during a 5-day forecast period	75		75		82	
Map of Observed and Forecast River Levels (exceedance probability)						
Visual appeal	75		77		77	
Ease of understanding	73		72		73	
Tells me what I need to know about river stages during a 5-day forecast period	72		72		75	
Likelihood of using probabilistic streamflow forecast product generator						
Likelihood of using probabilistic streamflow forecast product generator	84		78		78	
Sample Size		40		169		120



Non-modeled - By Primary Scope of Responsibility - Continued

	All or parts of multiple counties		Single county		Large city/urban area	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Flood Depth Map						
Visual appeal	87		84		87	
Ease of understanding	85		86		87	
Tells me what I need to know about the depth of the water	83		86		87	
Usefulness of receiving graphical information that includes the following features:						
Graphics with pre-determined content, spatial extent and time period	87		89		83	
Ability to specify time range shown	89		89		99	
Ability to specify areal extent	93		91		97	
Ability to overlay different background information	92		91		92	
Ability to overlay different information	92		91		94	
Usefulness of the following digital formats:						
Numerical information using standards-based formats	85		82		90	
Information formatted geospatially for use with Geographic Information Systems	88		85		91	
RSS	86		85		79	
WAP	81		82		82	
Metadata information	82		82		76	
Other (please specify)	67		87		100	
Usefulness of the following geospatial formats:						
Shapefile	90		85		90	
Worldfile	83		72		92	
KML/KMZ format	86		64		89	
40) GeoPDF	83		82		80	
Open Geospatial Consortium standards	85		76		92	
Other (please specify)	65		83		--	
Usefulness of the following options in making information more accessible on the Internet:						
"Bulk transfer," e.g., ftp	79		75		82	
Web-based data service (including selective extraction)	90		88		92	
GIS map service	88		88		87	
GIS feature service	88		89		86	
Other (please specify)	33		100		100	
How useful would it be to have forecasts include uncertainty information						
How useful would it be to have forecasts include uncertainty information	93		90		89	
How useful would it be to have forecasts include probability information						
How useful would it be to have forecasts include probability information	85		88		79	
Usefulness of providing river forecasts and uncertainty information for the following time scales:						
Short-term (0-5 days)	92		92		90	
Monthly (30 days)	68		67		63	
Seasonal (90 days)	53		59		59	
Map of Observed and Forecast River Levels						
Visual appeal	81		80		86	
Ease of understanding	83		81		83	
Tells me what I need to know about river stages during a 5-day forecast period	83		85		81	
Map of Observed and Forecast River Levels (exceedance probability)						
Visual appeal	77		77		82	
Ease of understanding	72		71		72	
Tells me what I need to know about river stages during a 5-day forecast period	76		79		75	
Likelihood of using probabilistic streamflow forecast product generator						
Likelihood of using probabilistic streamflow forecast product generator	79		82		92	
Sample Size	167		259		48	



Non-modeled - By Primary Scope of Responsibility - Continued

	Smaller city/township		Personal		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Flood Depth Map						
Visual appeal	85		81		76	
Ease of understanding	86		85		81	
Tells me what I need to know about the depth of the water	85		87		77	
Usefulness of receiving graphical information that includes the following features:						
Graphics with pre-determined content, spatial extent and time period	90		85		81	
Ability to specify time range shown	92		91		90	
Ability to specify areal extent	92		92		92	
Ability to overlay different background information	92		91		93	
Ability to overlay different information	93		93		94	
Usefulness of the following digital formats:						
Numerical information using standards-based formats	76		77		81	
Information formatted geospatially for use with Geographic Information Systems	87		79		91	
RSS	81		76		94	
WAP	80		73		86	
Metadata information	75		75		83	
Other (please specify)	64		75		94	
Usefulness of the following geospatial formats:						
Shapefile	87		76		95	
Worldfile	79		74		93	
KML/KMZ format	72		73		82	
40) GeoPDF	85		80		98	
Open Geospatial Consortium standards	79		73		94	
Other (please specify)	96		72		100	
Usefulness of the following options in making information more accessible on the Internet:						
"Bulk transfer," e.g., ftp	84		74		93	
Web-based data service (including selective extraction)	93		88		96	
GIS map service	95		81		92	
GIS feature service	94		80		94	
Other (please specify)	44		63		100	
How useful would it be to have forecasts include uncertainty information						
How useful would it be to have forecasts include uncertainty information	83		87		94	
How useful would it be to have forecasts include probability information						
How useful would it be to have forecasts include probability information	81		81		87	
Usefulness of providing river forecasts and uncertainty information for the following time scales:						
Short-term (0-5 days)	90		93		99	
Monthly (30 days)	73		67		65	
Seasonal (90 days)	67		55		63	
Map of Observed and Forecast River Levels						
Visual appeal	78		78		86	
Ease of understanding	76		78		88	
Tells me what I need to know about river stages during a 5-day forecast period	79		80		91	
Map of Observed and Forecast River Levels (exceedance probability)						
Visual appeal	75		77		86	
Ease of understanding	65		70		85	
Tells me what I need to know about river stages during a 5-day forecast period	69		74		88	
Likelihood of using probabilistic streamflow forecast product generator						
Likelihood of using probabilistic streamflow forecast product generator	77		77		67	
Sample Size		99		667		59



Score Summary - Means of Receiving Hydrologic Information

NWS Scores	National Weather Service Web pages	Non-National Weather Service Web pages	Phone	NOAA Weather Radio	NOAA Weather W/ire	Family of Services (FOS)	Emergency Managers Weather Information Network (EMWIN)	Local or cable TV	Commercial Radio	Satellite radio	Newspaper	Private Vendor	Other
Clarity	80	79	84	83	83	77	82	81	82	81	82	79	82
Timeliness	81	79	85	84	84	75	82	82	83	81	83	80	81
Accuracy	81	80	84	83	83	78	82	82	82	81	83	79	83
Organization of information	78	77	82	81	83	74	80	81	80	78	81	77	81
Meets my needs	82	80	85	82	82	80	84	83	84	84	83	79	83
Water Supply/Reservoir Information	79	77	83	81	84	77	79	80	80	74	81	78	79
Clarity	79	77	83	81	83	76	78	79	81	75	81	77	79
Timeliness	79	77	83	81	83	78	79	80	82	76	81	77	79
Accuracy	79	76	82	81	83	76	79	80	80	76	81	76	79
Organization of information	79	79	82	81	83	79	79	80	80	77	81	76	79
Meets my needs	78	79	83	81	83	79	78	80	80	75	81	76	80
Drought Information	80	77	83	82	84	80	79	80	80	73	81	83	86
Clarity	79	76	82	82	84	75	80	79	79	74	80	76	79
Timeliness	80	77	83	82	84	80	80	80	82	72	81	82	81
Accuracy	80	77	83	82	84	79	80	80	79	75	81	82	80
Organization of information	80	78	83	82	83	81	81	80	80	73	81	82	80
Meets my needs	81	78	84	83	83	83	81	81	81	76	82	83	80
Routine River Forecasts/Observed Conditions	81	79	86	84	86	77	82	82	83	79	83	84	82
Clarity	82	80	87	84	85	78	82	83	84	78	82	85	84
Timeliness	82	80	86	84	87	79	82	83	84	81	84	85	81
Accuracy	81	79	84	83	83	76	82	81	83	79	83	82	81
Organization of information	81	79	87	84	86	78	81	82	83	77	83	83	84
Meets my needs	81	79	85	84	85	75	82	83	84	78	82	84	82
Web Products	83	80	84	84	86	81	84	83	82	79	83	81	83
Clarity	82	80	85	84	85	81	83	82	82	78	82	80	84
Timeliness	83	80	85	85	87	78	84	85	82	78	82	80	84
Accuracy	83	80	85	85	87	78	84	85	83	80	83	82	85
Organization of information	83	80	83	84	86	79	83	83	82	80	83	79	83
Meets my needs	83	80	85	84	86	82	82	83	82	76	83	81	84
Customer Satisfaction Index	78	76	83	84	82	74	80	78	82	79	79	81	84
Overall satisfaction with the NWS Hydrologic Services Program	82	81	87	85	85	74	80	83	83	81	83	81	84
How well NWS Hydrologic Services Program meets your hydrologic services program	75	73	81	78	79	69	78	77	76	75	76	74	76
Likelihood to take action	75	73	81	78	80	69	77	76	77	76	78	74	74
Likelihood to take action based on the hydrologic information you receive	88	87	92	91	93	81	91	90	90	91	90	89	87
Confidence in NWS	88	87	92	91	93	81	91	90	90	91	90	89	87
How confident are you that the NWS Hydrologic Services Program will do a good job	85	83	88	87	87	75	86	86	87	85	86	84	87
Sample Size	1516	371	223	693	73	31	190	653	282	53	253	108	148



Non-modeled - Means of Receiving Hydrologic Information

	National Weather Service Web pages		Non-National Weather Service Web pages		Phone		NOAA Weather Radio	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent								
Emergency management		26%		30%		64%		38%
Traditional media		5%		4%		6%		3%
Internet/Web		3%		2%		2%		2%
Water supply/hydropower		3%		2%		6%		2%
Agriculture		2%		2%		0%		2%
Shipping		0%		0%		0%		0%
Natural resource management		4%		5%		2%		3%
Consulting/add value/provide custom hydrologic services		2%		4%		1%		1%
Recreation		8%		8%		4%		6%
Personal use		35%		25%		4%		32%
Other		11%		17%		11%		11%
Primary scope of your responsibility								
National		3%		4%		2%		2%
Regional		10%		12%		14%		8%
Single state		7%		10%		10%		8%
All or parts of multiple counties		10%		11%		13%		11%
Single county		16%		15%		36%		23%
Large city/urban area		3%		4%		6%		3%
Smaller city/township		6%		7%		8%		7%
Personal		41%		33%		6%		35%
Other		4%		4%		4%		4%
Method for receiving National Weather Service hydrologic information*								
NWS Web pages		100%		97%		96%		94%
Non-NWS Web pages		24%		100%		33%		27%
Phone		14%		20%		100%		21%
NOAA Weather Radio		43%		51%		65%		100%
NOAA Weather Wire		4%		5%		12%		6%
Family of Services (FOS)		2%		4%		5%		2%
Emergency Managers Weather Information Network (EMWIN)		12%		17%		28%		19%
Local or cable TV		41%		60%		60%		60%
Commercial Radio		19%		25%		34%		28%
Satellite radio		3%		8%		4%		4%
Newspaper		16%		28%		24%		21%
Private Vendor		6%		13%		15%		8%
Other		8%		13%		17%		11%
Frequency of using Flood Warnings, Flood Watches and Flood Statements								
Several times per day		24%		28%		31%		25%
Once per day		22%		19%		25%		22%
Once per week		19%		21%		14%		20%
Once per month		28%		25%		25%		28%
Do not use		5%		5%		3%		4%
Not familiar with this information		2%		2%		1%		1%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information								
Several times per day		6%		8%		10%		7%
Once per day		11%		9%		11%		10%
Once per week		19%		21%		22%		18%
Once per month		28%		30%		26%		27%
Do not use		25%		22%		25%		27%
Not familiar with this information		11%		11%		6%		10%
Frequency of using Hydrologic Outlooks providing drought information								
Several times per day		4%		4%		5%		5%
Once per day		10%		10%		14%		11%
Once per week		21%		19%		21%		21%
Once per month		33%		35%		36%		33%
Do not use		24%		25%		21%		22%
Not familiar with this information		8%		7%		4%		8%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions								
Several times per day		9%		11%		16%		9%
Once per day		18%		19%		24%		16%
Once per week		24%		25%		18%		25%
Once per month		28%		25%		27%		29%
Do not use		15%		13%		13%		15%
Not familiar with this information		6%		7%		3%		6%
Frequency of using other information								
Several times per day		14%		18%		19%		15%
Once per day		15%		13%		21%		11%
Once per week		9%		12%		9%		8%
Once per month		8%		10%		10%		8%
Do not use		27%		21%		16%		30%
Not familiar with this information		28%		26%		25%		26%
Frequency of visiting web pages providing a suite of hydrologic information								
Several times per day		19%		21%		20%		20%
Once per day		29%		26%		33%		27%
Once per week		24%		26%		23%		23%
Once per month		18%		17%		16%		18%
Do not use		5%		6%		5%		6%
Not familiar with this information		5%		4%		3%		5%
River Conditions Map (Country-wide)								
Visual appeal	68		66		72		71	
Ease of understanding	72		69		75		74	
Tells me what I need to know about river conditions throughout the country	73		69		75		74	
River Conditions Map (Grand Forks, ND)								
Visual appeal	85		83		87		86	
Ease of understanding	87		85		89		88	
Tells me what I need to know about river conditions in Grand Forks, ND	85		81		86		86	
Hydrograph of Cape Fear River, NC water level								
Visual appeal	84		82		87		85	
Ease of understanding	84		83		86		85	
Tells me what I need to know about forecast levels	86		84		87		88	
Frequency of using high-resolution precipitation estimate graph								
Several times per day		18%		17%		22%		19%
Once per day		28%		30%		32%		31%
Once per week		21%		22%		17%		21%
Once per month		12%		11%		12%		13%
Do not use		12%		10%		7%		9%
Not familiar with this information		9%		9%		10%		8%



Non-modeled - Means of Receiving Hydrologic Information - Continued

	NOAA Weather Wire		Family of Services (FOS)		Emergency Managers Weather Information Network (EMWIN)		Local or cable TV	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent								
Emergency management		56%		26%		70%		36%
Traditional media		15%		13%		3%		2%
Internet/Web		3%		3%		1%		3%
Water supply/hydropower		1%		6%		3%		2%
Agriculture		0%		6%		1%		2%
Shipping		0%		3%		1%		0%
Natural resource management		1%		6%		2%		3%
Consulting/add value/provide custom hydrologic services		3%		3%		2%		2%
Recreation		7%		6%		2%		6%
Personal use		1%		6%		8%		32%
Other		12%		19%		9%		12%
Primary scope of your responsibility								
National		7%		13%		2%		2%
Regional		7%		19%		7%		9%
Single state		22%		19%		10%		8%
All or parts of multiple counties		10%		19%		16%		9%
Single county		24%		10%		36%		20%
Large city/urban area		8%		10%		4%		3%
Smaller city/township		13%		0%		11%		8%
Personal		6%		6%		8%		37%
Other		4%		3%		4%		4%
Method for receiving National Weather Service hydrologic information*								
NWS Web pages		86%		81%		95%		95%
Non-NWS Web pages		36%		45%		33%		34%
Phone		37%		39%		33%		21%
NOAA Weather Radio		62%		55%		70%		64%
NOAA Weather Wire		100%		35%		16%		6%
Family of Services (FOS)		15%		100%		4%		2%
Emergency Managers Weather Information Network (EMWIN)		41%		26%		100%		17%
Local or cable TV		53%		35%		58%		100%
Commercial Radio		26%		16%		31%		40%
Satellite radio		8%		10%		8%		6%
Newspaper		22%		19%		27%		33%
Private Vendor		22%		32%		18%		8%
Other		16%		16%		13%		9%
Frequency of using Flood Warnings, Flood Watches and Flood Statements								
Several times per day		35%		45%		36%		24%
Once per day		25%		10%		20%		21%
Once per week		11%		24%		18%		20%
Once per month		25%		17%		24%		28%
Do not use		1%		3%		1%		5%
Not familiar with this information		1%		0%		1%		2%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information								
Several times per day		17%		32%		14%		7%
Once per day		13%		7%		16%		9%
Once per week		21%		25%		20%		18%
Once per month		16%		21%		27%		28%
Do not use		26%		7%		17%		27%
Not familiar with this information		7%		7%		7%		11%
Frequency of using Hydrologic Outlooks providing drought information								
Several times per day		13%		15%		7%		4%
Once per day		7%		19%		19%		9%
Once per week		25%		30%		23%		20%
Once per month		32%		30%		33%		34%
Do not use		22%		4%		14%		24%
Not familiar with this information		1%		7%		4%		8%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions								
Several times per day		19%		31%		16%		9%
Once per day		20%		14%		20%		15%
Once per week		23%		28%		28%		24%
Once per month		26%		14%		24%		30%
Do not use		9%		3%		10%		16%
Not familiar with this information		3%		10%		2%		6%
Frequency of using other information								
Several times per day		13%		40%		18%		12%
Once per day		13%		20%		9%		15%
Once per week		13%		0%		10%		9%
Once per month		13%		0%		15%		9%
Do not use		13%		10%		21%		31%
Not familiar with this information		38%		30%		27%		24%
Frequency of visiting web pages providing a suite of hydrologic information								
Several times per day		28%		42%		24%		20%
Once per day		22%		23%		32%		26%
Once per week		24%		16%		23%		25%
Once per month		22%		10%		16%		16%
Do not use		0%		0%		3%		7%
I am familiar with this information but do not use		4%		10%		4%		6%
River Conditions Map (Country-wide)								
Visual appeal	76		69		69		68	
Ease of understanding	74		75		73		71	
Tells me what I need to know about river conditions throughout the country	77		72		74		73	
River Conditions Map (Grand Forks, ND)								
Visual appeal	88		81		87		86	
Ease of understanding	91		86		89		87	
Tells me what I need to know about river conditions in Grand Forks, ND	89		78		87		86	
Hydrograph of Cape Fear River, NC water level								
Visual appeal	84		78		86		84	
Ease of understanding	84		81		86		83	
Tells me what I need to know about forecast levels	86		81		87		85	
Frequency of using high-resolution precipitation estimate graph								
Several times per day		18%		35%		22%		18%
Once per day		31%		29%		36%		29%
Once per week		19%		13%		16%		22%
Once per month		8%		0%		9%		14%
Do not use		10%		10%		7%		9%
I am familiar with this information but do not use		14%		13%		9%		9%



Non-modeled - Means of Receiving Hydrologic Information - Continued

	Commercial Radio		Satellite radio		Newspaper		Private Vendor		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Primary use of hydrologic information provided by the National Weather Service or the commercial sector that you represent										
Emergency management		38%		28%		31%		44%		44%
Traditional media		2%		4%		2%		21%		21%
Internet/Web		2%		0%		3%		1%		0%
Water supply/hydropower		3%		2%		3%		1%		4%
Agriculture		2%		4%		2%		2%		2%
Shipping		0%		0%		1%		1%		0%
Natural resource management		4%		2%		5%		2%		2%
Consulting/add value/provide custom hydrologic services		2%		0%		2%		3%		2%
Recreation		7%		9%		7%		2%		3%
Personal use		29%		36%		34%		10%		16%
Other		0%		15%		11%		13%		25%
Primary scope of your responsibility										
National		2%		6%		3%		7%		2%
Regional		9%		15%		7%		15%		15%
Single state		0%		9%		9%		11%		12%
All or parts of multiple counties		9%		9%		10%		13%		8%
Single county		22%		9%		18%		19%		20%
Large city/urban area		4%		4%		3%		6%		5%
Smaller city/township		10%		6%		6%		6%		10%
Personal		34%		38%		41%		12%		20%
Other		3%		4%		2%		5%		7%
Method for receiving National Weather Service hydrologic information*										
NWS Web pages		97%		96%		96%		90%		80%
Non-NWS Web pages		32%		53%		41%		44%		33%
Phone		26%		19%		21%		31%		26%
NOAA Weather Radio		67%		58%		57%		53%		51%
NOAA Weather Wire		7%		11%		6%		15%		9%
Family of Services (FOS)		2%		2%		2%		9%		3%
Emergency Managers Weather Information Network (EMWIN)		20%		30%		20%		31%		16%
Local or cable TV		88%		72%		84%		49%		41%
Commercial Radio		100%		43%		57%		31%		19%
Satellite radio		8%		100%		9%		11%		5%
Newspaper		48%		45%		100%		26%		14%
Private Vendor		11%		23%		11%		100%		7%
Other		10%		13%		8%		10%		100%
Frequency of using Flood Warnings, Flood Watches and Flood Statements										
Several times per day		24%		35%		25%		45%		30%
Once per day		32%		15%		16%		13%		13%
Once per week		19%		17%		21%		14%		13%
Once per month		29%		23%		30%		23%		35%
Do not use		4%		8%		6%		5%		8%
Not familiar with this information		2%		2%		2%		0%		3%
Frequency of using Hydrologic Outlooks providing information on water supply and/or reservoir information										
Several times per day		8%		13%		6%		13%		9%
Once per day		10%		10%		8%		10%		9%
Once per week		17%		19%		18%		16%		14%
Once per month		29%		27%		31%		25%		25%
Do not use		26%		19%		23%		24%		29%
Not familiar with this information		13%		12%		13%		11%		13%
Frequency of using Hydrologic Outlooks providing drought information										
Several times per day		3%		10%		5%		7%		6%
Once per day		11%		8%		8%		10%		6%
Once per week		20%		19%		19%		16%		14%
Once per month		32%		27%		37%		41%		25%
Do not use		25%		25%		21%		20%		36%
Not familiar with this information		8%		10%		7%		7%		13%
Frequency of using Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions										
Several times per day		8%		14%		9%		16%		14%
Once per day		18%		14%		14%		22%		13%
Once per week		22%		22%		25%		14%		19%
Once per month		30%		24%		29%		27%		26%
Do not use		16%		18%		15%		6%		21%
Not familiar with this information		6%		6%		7%		6%		6%
Frequency of using other information										
Several times per day		14%		18%		12%		22%		18%
Once per day		15%		18%		13%		16%		14%
Once per week		6%		5%		14%		0%		18%
Once per month		12%		5%		13%		9%		15%
Do not use		29%		32%		25%		16%		18%
Not familiar with this information		24%		23%		24%		38%		15%
Frequency of visiting web pages providing a suite of hydrologic information										
Several times per day		19%		31%		23%		23%		23%
Once per day		25%		31%		23%		21%		17%
Once per week		24%		25%		23%		24%		22%
Once per month		19%		8%		17%		20%		18%
Not familiar with this information		7%		2%		8%		8%		10%
I am familiar with this information but do not use		2%		4%		6%		6%		10%
River Conditions Map (Country-wide)										
Visual appeal	68		69		68		67		70	
Ease of understanding	70		67		71		70		74	
Tells me what I need to know about river conditions throughout the country	71		71		72		71		73	
River Conditions Map (Grand Forks, ND)										
Visual appeal	85		82		86		83		87	
Ease of understanding	87		84		87		86		89	
Tells me what I need to know about river conditions in Grand Forks, ND	85		83		86		84		84	
Hydrograph of Cape Fear River, NC water level										
Visual appeal	82		76		83		81		88	
Ease of understanding	82		76		82		82		88	
Tells me what I need to know about forecast levels	84		79		85		83		89	
Frequency of using high-resolution precipitation estimate graph										
Several times per day		20%		29%		19%		26%		13%
Once per day		30%		25%		26%		22%		26%
Once per week		19%		10%		21%		21%		19%
Once per month		37%		12%		18%		9%		13%
Not familiar with this information		9%		17%		9%		11%		12%
I am familiar with this information but do not use		6%		8%		8%		10%		18%



Non-modeled - Means of Receiving Hydrologic Information - Continued

	National Weather Service Web pages		Non-National Weather Service Web pages		Phone		NOAA Weather Radio	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Map of high-resolution precipitation estimates								
Visual appeal	86		84		87		87	
Ease of understanding	86		84		88		88	
Tells me what I need to know about precipitation estimates	85		84		86		87	
Frequency of using high-resolution snow water equivalent graph								
Several times per day		3%		2%		4%		4%
Once per day		9%		7%		10%		11%
Once per week		13%		14%		17%		14%
Once per month		17%		21%		13%		17%
Not familiar with this information		30%		30%		27%		27%
I am familiar with this information but do not use		27%		26%		29%		27%
Map of water in snow high-resolution estimates								
Visual appeal	82		79		84		84	
Ease of understanding	80		78		82		83	
Tells me what I need to know about water contained in snow	80		78		80		83	
Use precipitation frequency estimates								
Yes		37%		43%		48%		38%
No		63%		57%		52%		62%
Familiar with Precipitation Frequency Data Server web page								
Yes		51%		48%		54%		55%
No		49%		52%		46%		45%
Precipitation Frequency Data Server Map								
Usefulness of having updated precipitation frequency estimates	83		84		82		81	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:								
Text	85		86		80		88	
Graphics	85		86		88		87	
A combination of text and graphics	90		91		92		91	
NOAA Weather Radio All Hazards	86		85		89		93	
Usefulness of receiving river forecasts in the following formats:								
Text	80		79		86		83	
Graphics	84		83		87		84	
A combination of text and graphics	87		87		90		87	
Digital	73		75		81		74	
NOAA Weather Radio All Hazards	79		78		82		85	
Usefulness of receiving river/stream observations in the following formats:								
Text	80		78		85		82	
Graphics	84		84		88		85	
A combination of text and graphics	87		87		90		88	
Digital	73		76		81		75	
NOAA Weather Radio All Hazards	77		76		81		85	
Ever had personal communication with NWS staff to discuss hydrologic forecasts								
Yes		40%		48%		86%		47%
No		60%		52%		14%		53%
hydrologic forecasts								
Value of your personal communication with NWS staff to discuss hydrologic forecasts	93		93		96		95	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year								
1-3 times a year		43%		39%		24%		44%
4-8 times a year		23%		24%		25%		22%
9-12 times a year		13%		15%		18%		15%
More than 12 times a year		20%		23%		33%		29%
Purpose of personal communication with NWS staff*								
Explanation or interpretation of available forecast products		20%		27%		53%		25%
Gain an understanding of forecaster confidence in forecast products		19%		27%		48%		23%
Synthesize available forecast products and information for your specific needs		17%		24%		48%		21%
Get more information from forecaster than available in existing products		26%		33%		64%		30%
Provided feedback on the following categories*:								
Flood Risks		43%		47%		53%		47%
Digital Services		25%		30%		30%		27%
Uncertainty & Probability		25%		30%		26%		27%
I do not wish to continue		42%		39%		35%		39%
Familiar with the way these terms are used by the National Weather Service								
Yes		94%		93%		95%		95%
No		6%		7%		5%		5%
Usefulness of these flood severity categories in interpreting the impact of river flooding								
Usefulness of these flood severity categories in interpreting the impact of river flooding	86		83		90		88	
Flood Severity Map								
Visual appeal	85		83		87		87	
Ease of understanding	83		82		86		86	
Tells me what I need to know about flooding	84		83		85		87	
Flood Depth Map								
Visual appeal	83		82		84		85	
Ease of understanding	85		84		86		87	
Tells me what I need to know about the depth of the water	85		83		86		87	
Usefulness of receiving graphical information that includes the following features:								
Graphics with pre-determined content, spatial extent and time period	86		86		88		86	
Ability to specify time range shown	92		90		94		89	
Ability to specify area extent	92		92		92		91	
Ability to overlay different background information	92		93		92		91	
Ability to overlay different information	93		94		92		92	
Usefulness of the following digital formats:								
Numerical information using standard-based formats	82		83		82		82	
Information formatted geospatially for use with Geographic Information Systems	85		85		89		86	
RSS	79		83		82		82	
WAP	76		79		81		81	
Metadata information	80		85		81		82	
Other (please specify)	78		84		83		87	
Usefulness of the following geospatial formats:								
Shapefile	86		87		91		87	
Worldfile	77		76		74		76	
KML/KMZ format	75		71		73		77	
GDAL/GSIF	83		85		86		83	
Open Geospatial Consortium standards	80		79		79		80	
Other (please specify)	82		76		76		87	
Usefulness of the following options in making information more accessible on the Internet:								
*Bulk transfer, e.g., ftp	80		81		82		80	
Web-based data service (including selective extraction)	90		91		90		91	
GIS map service	86		86		89		88	
GIS feature service	86		87		91		88	
Other (please specify)	72		74		86		81	
How useful would it be to have forecasts include uncertainty information								
How useful would it be to have forecasts include uncertainty information	89		90		92		89	
How useful would it be to have forecasts include probability information								
How useful would it be to have forecasts include probability information	83		85		88		85	
Usefulness of providing river forecasts and uncertainty information for the following time scales:								
Short-term (0-5 days)	92		94		94		93	
Monthly (30 days)	88		70		74		69	
Seasonal (90 days)	88		69		69		69	
Map of Observed and Forecast River Levels								
Visual appeal	79		77		83		81	
Ease of understanding	80		77		85		81	
Tells me what I need to know about river stages during a 5-day forecast period	81		78		82		82	
Map of Observed and Forecast River Levels (exceedance probability)								
Visual appeal	77		76		79		79	
Ease of understanding	71		71		71		73	
Tells me what I need to know about river stages during a 5-day forecast period	74		74		76		77	
Likelihood of using probabilistic streamflow forecast product generator								
Likelihood of using probabilistic streamflow forecast product generator	79		84		87		78	
Sample Size	1516		371		223		693	



Non-modeled - Means of Receiving Hydrologic Information - Continued

	NOAA Weather Wire		Family of Services (FOS)		Emergency Managers Weather Information Network (EMWIN)		Local or cable TV		Commercial Radio	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Map of high-resolution precipitation estimates										
Visual appeal	89		80		87		86		86	
Ease of understanding	88		83		87		86		86	
Tells me what I need to know about precipitation estimates	87		81		86		85		84	
Frequency of using high-resolution snow water equivalent graph										
Several times per day		1%		6%		4%		4%		4%
Once per day		13%		29%		15%		15%		10%
Once per week		19%		3%		19%		12%		13%
Once per month		21%		13%		16%		16%		17%
Not familiar with this information		14%		6%		20%		29%		29%
I am familiar with this information but do not use		39%		42%		27%		28%		25%
Map of water in snow high-resolution estimates										
Visual appeal	84		78		83		82		82	
Ease of understanding	83		76		82		80		80	
Tells me what I need to know about water contained in snow	84		75		82		81		81	
Use precipitation frequency estimates										
Yes		44%		74%		42%		40%		40%
No		56%		26%		58%		60%		60%
Familiar with Precipitation Frequency Data Server web page										
Yes		61%		68%		49%		47%		48%
No		39%		32%		51%		53%		52%
Precipitation Frequency Data Server Map										
Usefulness of having updated precipitation frequency estimates	84		79		82		82		81	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:										
Text	91		85		89		88		88	
Graphics	89		78		87		88		89	
A combination of text and graphics	94		83		91		92		93	
NOAA Weather Radio All Hazards	92		77		90		90		91	
Usefulness of receiving river forecasts in the following formats:										
Text	84		83		84		82		83	
Graphics	85		82		85		84		84	
A combination of text and graphics	96		83		88		87		88	
Digital	74		76		81		76		76	
NOAA Weather Radio All Hazards	84		76		84		82		83	
Usefulness of receiving river/stream observations in the following formats:										
Text	83		82		82		81		81	
Graphics	87		80		84		85		85	
A combination of text and graphics	90		83		88		87		88	
Digital	78		77		80		75		76	
NOAA Weather Radio All Hazards	83		72		83		81		83	
Ever had personal communication with NWS staff to discuss hydrologic forecasts										
Yes		62%		55%		69%		45%		46%
No		38%		45%		31%		55%		54%
hydrologic forecasts										
Value of your personal communication with NWS staff to discuss hydrologic forecasts	96		84		93		94		96	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year										
1-3 times a year		41%		18%		33%		40%		41%
4-6 times a year		16%		18%		23%		27%		24%
7-12 times a year		18%		24%		17%		14%		17%
More than 12 times a year		25%		41%		27%		19%		17%
Purpose of personal communication with NWS staff										
Excitation or interpretation of available forecast products		36%		26%		42%		24%		28%
Gain an understanding of forecaster confidence in forecast products		33%		35%		37%		24%		23%
Synthesize available forecast products and information for your specific needs		33%		26%		40%		21%		22%
Get more information from forecaster than available in existing products		34%		46%		49%		30%		30%
Provided feedback on the following categories:										
Flood Risks		48%		58%		49%		45%		46%
Digital Services		25%		42%		32%		28%		31%
Uncertainty & Probability		29%		23%		31%		29%		30%
I do not wish to continue		38%		26%		36%		40%		40%
Familiar with the way these terms are used by the National Weather Service										
Yes		100%		83%		99%		94%		92%
No		0%		17%		1%		6%		8%
Usefulness of these flood severity categories in interpreting the impact of river flooding										
Usefulness of these flood severity categories in interpreting the impact of river flooding	94		91		88		88		87	
Flood Severity Map										
Visual appeal	91		80		88		86		86	
Ease of understanding	89		74		85		83		83	
Tells me what I need to know about flooding	87		71		88		85		84	
Flood Depth Map										
Visual appeal	89		80		86		83		84	
Ease of understanding	88		77		85		85		86	
Tells me what I need to know about the depth of the water	88		77		88		85		85	
Usefulness of receiving graphical information that includes the following features:										
Graphics with pre-determined content, spatial extent and time period	86		79		90		86		88	
Ability to specify time range shown	90		86		91		91		91	
Ability to specify areal extent	91		85		91		92		93	
Ability to overlay different background information	87		84		92		92		94	
Ability to overlay different information	88		85		93		93		93	
Usefulness of the following digital formats:										
Numerical information using standards-based formats	85		82		80		80		83	
Information formatted geospatially for use with Geographic Information Systems	88		89		85		86		88	
RSS	83		82		85		81		84	
WAP	81		75		79		78		81	
Metadata information	80		83		79		82		85	
Other (please specify)	78		93		78		78		75	
Usefulness of the following geospatial formats:										
Shapefile	87		88		83		85		89	
Wordfile	68		65		73		75		82	
KML/KMZ format	74		53		70		74		77	
401 GeoPDF	84		71		81		84		87	
Open Geospatial Consortium standards	79		70		74		77		82	
Other (please specify)	87		94		79		71		76	
Usefulness of the following options in making information more accessible on the Internet:										
Bulk transfer (e.g., ftp)	87		84		82		80		84	
Web-based data service (including selective extraction)	87		85		92		90		93	
GIS map service	93		80		92		86		92	
GIS feature service	93		80		91		87		93	
Other (please specify)	86		61		81		71		70	
How useful would it be to have forecasts include uncertainty information										
How useful would it be to have forecasts include uncertainty information	93		84		87		88		89	
How useful would it be to have forecasts include probability information										
How useful would it be to have forecasts include probability information	90		71		82		85		86	
Usefulness of providing river forecasts and uncertainty information for the following time scales:										
Short-term (0-5 days)	94		87		91		92		92	
Monthly (30 days)	82		62		73		68		68	
Seasonal (90 days)	76		60		66		57		62	
Map of Observed and Forecast River Levels										
Visual appeal	89		76		80		78		78	
Ease of understanding	85		76		80		78		78	
Tells me what I need to know about river stages during a 5-day forecast period	86		78		80		79		80	
Map of Observed and Forecast River Levels (exceedance probability)										
Visual appeal	88		78		76		76		76	
Ease of understanding	83		79		71		74		71	
Tells me what I need to know about river stages during a 5-day forecast period	82		73		69		74		75	
Likelihood of using probabilistic streamflow forecast product generator										
Likelihood of using probabilistic streamflow forecast product generator	85		76		78		80		78	
Sample Size	73		31		190		653		292	



Non-modeled - Means of Receiving Hydrologic Information - Continued

	Satellite radio		Newspaper		Private Vendor		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Map of high-resolution precipitation estimates								
Visual appeal	83		86		84		87	
Ease of understanding	85		86		84		88	
Tells me what I need to know about precipitation estimates	83		86		82		86	
Frequency of using high-resolution snow water equivalent graph								
Several times per day		6%		3%		3%		2%
Once per day		15%		15%		14%		6%
Once per week		13%		13%		17%		11%
Once per month		21%		20%		6%		13%
Not familiar with this information		25%		30%		25%		35%
I am familiar with this information but do not use		19%		25%		35%		34%
Map of water in snow high-resolution estimates								
Visual appeal	81		82		79		82	
Ease of understanding	79		80		80		79	
Tells me what I need to know about water contained in snow	81		81		80		79	
Use precipitation frequency estimates								
Yes		44%		42%		47%		41%
No		56%		58%		53%		59%
Familiar with Precipitation Frequency Data Server web page								
Yes		41%		43%		46%		45%
No		59%		57%		54%		55%
Precipitation Frequency Data Server Map								
Usefulness of having updated precipitation frequency estimates	85		85		81		82	
Usefulness of receiving flash flood/flood warnings and watches in the following formats:								
Text	83		87		89		86	
Graphics	83		89		83		85	
A combination of text and graphics	86		92		87		90	
NOAA Weather Radio All Hazards	84		88		84		83	
Usefulness of receiving river forecasts in the following formats:								
Text	79		81		83		80	
Graphics	80		85		83		81	
A combination of text and graphics	81		87		85		85	
Digital	74		76		72		73	
NOAA Weather Radio All Hazards	78		80		76		74	
Usefulness of receiving river/stream observations in the following formats:								
Text	76		80		81		79	
Graphics	79		85		85		81	
A combination of text and graphics	80		87		85		84	
Digital	75		75		74		75	
NOAA Weather Radio All Hazards	77		79		74		76	
Ever had personal communication with NWS staff to discuss hydrologic forecasts								
Yes		32%		43%		69%		56%
No		68%		57%		31%		44%
Hydrologic forecasts								
Value of your personal communication with NWS staff to discuss hydrologic forecasts	86		95		92		93	
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year								
1-3 times a year		63%		42%		32%		43%
4-6 times a year		6%		26%		19%		24%
7-12 times a year		24%		16%		23%		9%
More than 12 times a year		18%		16%		26%		24%
Purpose of personal communication with NWS staff*								
Explanation or interpretation of available forecast products		19%		25%		43%		30%
Gain an understanding of forecaster confidence in forecast products		23%		22%		41%		32%
Obtain more available forecast products and information for your specific needs		19%		19%		34%		26%
Get more information from forecaster than available in existing products		17%		30%		51%		38%
Provided feedback on the following categories*:								
Flood Risks		40%		47%		44%		53%
Digital Services		42%		29%		32%		35%
Uncertainty & Probability		32%		31%		26%		34%
I do not wish to continue		42%		42%		45%		34%
Familiar with the way these terms are used by the National Weather Service								
Yes		100%		91%		96%		92%
No		0%		9%		4%		8%
Usefulness of these flood severity categories in interpreting the impact of river flooding								
Usefulness of these flood severity categories in interpreting the impact of river flooding	83		85		84		88	
Flood Severity Map								
Visual appeal	81		85		86		89	
Ease of understanding	81		83		81		88	
Tells me what I need to know about flooding	82		83		83		87	
Flood Depth Map								
Visual appeal	79		82		85		83	
Ease of understanding	84		83		83		86	
Tells me what I need to know about the depth of the water	83		82		84		85	
Usefulness of receiving graphical information that includes the following features:								
Graphics with pre-determined content, spatial extent and time period	87		87		85		86	
Ability to specify time range shown	90		90		86		91	
Ability to specify area extent	90		91		90		94	
Ability to overlay different background information	88		92		91		93	
Ability to overlay different information	90		91		91		94	
Usefulness of the following digital formats:								
Numerical information using standards-based formats	85		84		83		83	
Information formatted geospatially for use with Geographic Information Systems	91		85		92		91	
RSS	84		81		82		75	
WAP	81		80		83		75	
Metadata information	83		83		84		86	
Other (please specify)	83		72		78		79	
Usefulness of the following geospatial formats:								
Shapefile	91		83		94		90	
Worldfile	83		75		83		71	
KML/KMZ format	83		72		80		66	
401 GeopDF	88		83		85		82	
Open Geospatial Consortium standards	85		74		87		79	
Other (please specify)	100		61		100		72	
Usefulness of the following options in making information more accessible on the Internet:								
Bulk transfer, e.g. ftp	93		81		82		86	
Web-based data service (including selective extraction)	95		88		92		90	
GIS map services	92		88		90		89	
GIS feature services	92		88		89		89	
Other (please specify)	86		72		91		80	
How useful would it be to have forecasts include uncertainty information								
How useful would it be to have forecasts include uncertainty information	85		88		85		93	
How useful would it be to have forecasts include probability information								
How useful would it be to have forecasts include probability information	82		84		77		87	
Usefulness of providing river forecasts and uncertainty information for the following time scales:								
Short-term (0-5 days)	87		92		88		91	
Monthly (30 days)	70		73		53		70	
Seasonal (90 days)	70		62		47		58	
Map of Observed and Forecast River Levels								
Visual appeal	72		80		77		80	
Ease of understanding	74		80		77		81	
Tells me what I need to know about river stages during a 5-day forecast period	71		81		75		80	
Map of Observed and Forecast River Levels (exceedance probability)								
Visual appeal	66		77		74		78	
Ease of understanding	65		72		63		72	
Tells me what I need to know about river stages during a 5-day forecast period	60		72		65		74	
Likelihood of using probabilistic streamflow forecast product generator								
Likelihood of using probabilistic streamflow forecast product generator	81		80		80		74	
Sample Size		53		253		108		148



Non-modeled - Means of Receiving Hydrologic Information - Continued

	Satellite radio		Newspaper		Private Vendor		Other	
	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents	Scores	Percent of Respondents
Map of high-resolution precipitation estimates								
Visual appeal	83		86		84		87	
Ease of understanding	85		86		84		88	
Tells me what I need to know about precipitation estimates	83		86		82		86	
Frequency of using high-resolution snow water equivalent graph								
Several times per day		6%		3%		3%		2%
Once per day		15%		15%		14%		6%
Once per week		13%		13%		11%		11%
Once per month		21%		20%		6%		13%
Not familiar with this information		25%		30%		25%		35%
I am familiar with this information but do not use		19%		25%		35%		34%
Map of water in snow high-resolution estimates								
Visual appeal	81		82		79		82	
Ease of understanding	79		80		80		79	
Tells me what I need to know about water contained in snow	81		81		80		78	
Use precipitation frequency estimates								
Yes		44%		42%		47%		41%
No		56%		58%		53%		59%
Familiar with Precipitation Frequency Data Server web page								
Yes		41%		43%		46%		45%
No		59%		57%		54%		55%
Precipitation Frequency Data Server Map								
Usefulness of having updated precipitation frequency estimates	85		85		81		82	
Usefulness of receiving flash flood/warnings and watches in the following formats:								
Text	83		87		89		86	
Graphics	83		89		83		85	
A combination of text and graphics	86		92		87		90	
NOAA Weather Radio All Hazards	84		88		84		83	
Usefulness of receiving river forecasts in the following formats:								
Text	79		81		83		80	
Graphics	80		85		83		81	
A combination of text and graphics	81		87		85		85	
Digital	74		76		72		73	
NOAA Weather Radio All Hazards	78		80		76		74	
Usefulness of receiving river/stream observations in the following formats:								
Text	76		80		81		79	
Graphics	79		85		85		81	
A combination of text and graphics	80		87		85		84	
Digital	75		75		74		75	
NOAA Weather Radio All Hazards	77		79		74		75	
Ever had personal communication with NWS staff to discuss hydrologic forecasts								
Yes		37%		43%		69%		56%
No		68%		57%		31%		44%
Usefulness of your personal communication with NWS staff to discuss hydrologic forecasts								
Frequency of personal communication with NWS staff to discuss hydrologic forecasts during a typical year	86		95		92		93	
1-3 times a year		53%		42%		32%		43%
4-6 times a year		6%		29%		16%		24%
7-12 times a year		24%		15%		23%		9%
More than 12 times a year		18%		16%		26%		24%
Purpose of personal communication with NWS staff								
Explanation or interpretation of available forecast products		19%		25%		43%		30%
Gain an understanding of forecaster confidence in forecast products		23%		22%		41%		32%
Synthesize available forecast products and information for your specific needs		19%		19%		34%		26%
Get more information from forecaster than available in existing products		17%		30%		51%		38%
Provided feedback on the following categories:								
Flood Risks		40%		47%		44%		53%
Digital Services		42%		29%		32%		35%
Uncertainty & Probability		32%		31%		29%		34%
I do not wish to continue		42%		42%		45%		34%
Familiar with the way these terms are used by the National Weather Service								
Yes		100%		91%		98%		92%
No		0%		9%		4%		8%
Usefulness of these flood severity categories in interpreting the impact of river flooding								
Usefulness of these flood severity categories in interpreting the impact of river flooding	83		85		84		88	
Flood Severity Map								
Visual appeal	81		85		86		89	
Ease of understanding	81		83		81		88	
Tells me what I need to know about flooding	82		84		83		87	
Flood Depth Map								
Visual appeal	79		82		85		83	
Ease of understanding	84		83		83		86	
Tells me what I need to know about the depth of the water	83		82		84		85	
Usefulness of receiving graphical information that includes the following features:								
Graphics with pre-determined content, spatial extent and time period	87		87		85		86	
Ability to specify time range shown	90		90		86		91	
Ability to specify areal extent	90		91		90		94	
Ability to query different background information	88		92		91		93	
Ability to overlay different information	90		91		91		94	
Usefulness of the following digital formats:								
Numerical information using standards-based formats	85		84		83		83	
Information formatted geospatially for use with Geographic Information Systems	91		85		92		91	
RSS	84		81		82		75	
WAP	81		80		83		75	
Metadata information	83		83		84		86	
Other (please specify)	83		72		78		79	
Usefulness of the following geospatial formats:								
Shapefile	91		83		94		90	
Worldfile	83		75		83		71	
KML/KMZ format	83		72		80		66	
40) GeoPDF	88		83		85		82	
Open Geospatial Consortium standards	85		74		87		78	
Other (please specify)	100		61		100		72	
Usefulness of the following options in making information more accessible on the Internet:								
Bulk transfer, e.g., ftp	93		81		82		86	
Web-based data service (including selective extraction)	95		88		92		91	
GIS map service	92		88		90		89	
GIS feature service	92		88		89		89	
Other (please specify)	86		72		91		50	
How useful would it be to have forecasts include uncertainty information								
How useful would it be to have forecasts include uncertainty information	85		88		85		93	
How useful would it be to have forecasts include probability information								
How useful would it be to have forecasts include probability information	82		84		77		87	
Usefulness of providing river forecasts and uncertainty information for the following time scales:								
Short-term (0-5 days)	87		92		88		91	
Monthly (30 days)	70		73		53		70	
Seasonal (90 days)	70		62		47		58	
Map of Observed and Forecast River Levels								
Visual appeal	72		80		77		80	
Ease of understanding	74		80		77		81	
Tells me what I need to know about river stages during a 5-day forecast period	71		81		75		80	
Map of Observed and Forecast River Levels (exceedance probability)								
Visual appeal	66		77		74		78	
Ease of understanding	65		72		63		74	
Tells me what I need to know about river stages during a 5-day forecast period	60		72		65		74	
Likelihood of using probabilistic streamflow forecast product generator								
Likelihood of using probabilistic streamflow forecast product generator	81		80		80		74	
Sample Size	53		253		108		148	



Questionnaire



Questionnaire

NWS Hydrologic Services Program Customer Satisfaction Survey 2006

Introduction

The National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS) is deeply committed to serving the needs of all of its customers. To help in determining how to continually improve services, the NWS is undertaking research on how satisfied users are with the National Weather Service Hydrologic Services Program, 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 weather products and services for you and others like you.

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 15 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 or what commercial sector do you represent?
 - a. Emergency management
 - b. "Traditional" media (radio, TV, print)
 - c. Internet/Web
 - d. Water supply/hydropower
 - e. Agriculture
 - f. Shipping (e.g., barge)
 - g. Natural resource management
 - h. Consulting/add value/provide custom hydrologic services
 - i. Recreation
 - j. Personal use
 - k. Other (**please specify**)



Questionnaire

- 3) What is the primary scope of your responsibility?
- National
 - Regional (all or parts of multiple states)
 - Single state
 - All or parts of multiple counties
 - Single county
 - Large city/urban area (population greater than 100,000)
 - Smaller city/township (population less than 100,000)
 - Personal
 - Other (**please specify**)
- 4) By what means do you receive National Weather Service hydrologic information? (**Select all that apply**)
- National Weather Service Web pages
 - Non-National Weather Service Web pages
 - Phone
 - NOAA Weather Radio
 - NOAA Weather Wire
 - Family of Services (FOS)
 - Emergency Managers Weather Information Network (EMWIN)
 - Local or cable TV
 - Commercial Radio
 - Satellite radio
 - Newspaper
 - Private Vendor
 - Other (**please specify**)

General Satisfaction with the National Weather Service Hydrology Program

5) During the last 12 months, please indicate the frequency with which you have used the following hydrologic information provided in *text format* by the National Weather Service. If you are not familiar with the information from a given category, please select that option.

Note: All will be hyperlinked to examples of products for respondent reference.

	Several times per day	Once per day	Once per week	Once per month	Do not use	Not familiar with this information
a. Flood Warnings, Flood Watches and Flood Statements						
b. Hydrologic Outlooks providing information on water supply and/or reservoir						



Questionnaire

providing information on water supply and/or reservoir information						
c. Hydrologic Outlooks providing drought information						
d. Hydrologic Statements and Hydrologic Summaries providing routine river forecasts and observed conditions						
e. Other information (please specify)						

6) **(If 5a usage indicated)** 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

7) **(If 5b usage indicated)** Think about the NWS' Hydrologic Outlooks providing information on **water supply** and/or **reservoir information**. On a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the quality of the water supply/reservoir information on the following:

- a. Clarity
- b. Timeliness
- c. Accuracy
- d. Organization of information
- e. Meets my needs

8) **(If 5c usage indicated)** Think about the 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



Questionnaire

9) **(If 5d usage indicated)** Please think about the 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

Customer Satisfaction Index

Now, please think about your overall satisfaction with the NWS Hydrologic Services Program.

11) 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?

12) 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?

13) 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

14) 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 hydrologic information you receive from the National Weather Service?

15) 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, watches and warnings in the future?

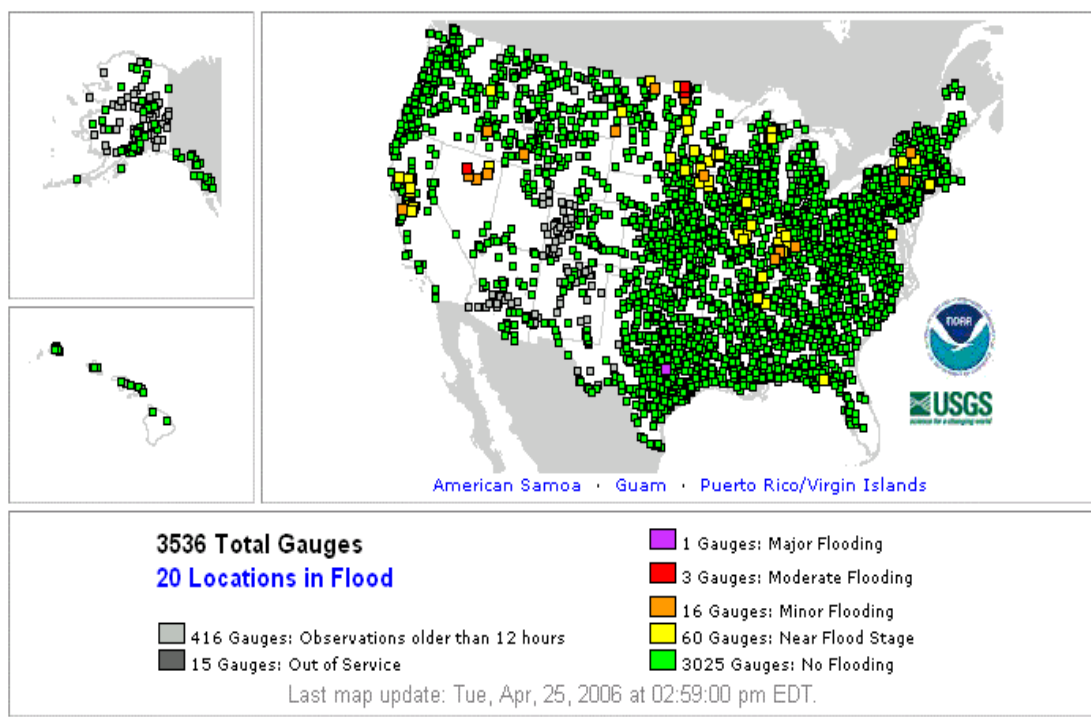


Questionnaire

Products

16) The National Weather Service provides a suite of hydrologic information on the Internet, primarily in graphical format as part of its Advanced Hydrologic Prediction Services. 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. Not familiar with this information
- f. I am familiar with this information but do not use (**skip to Q21A**)

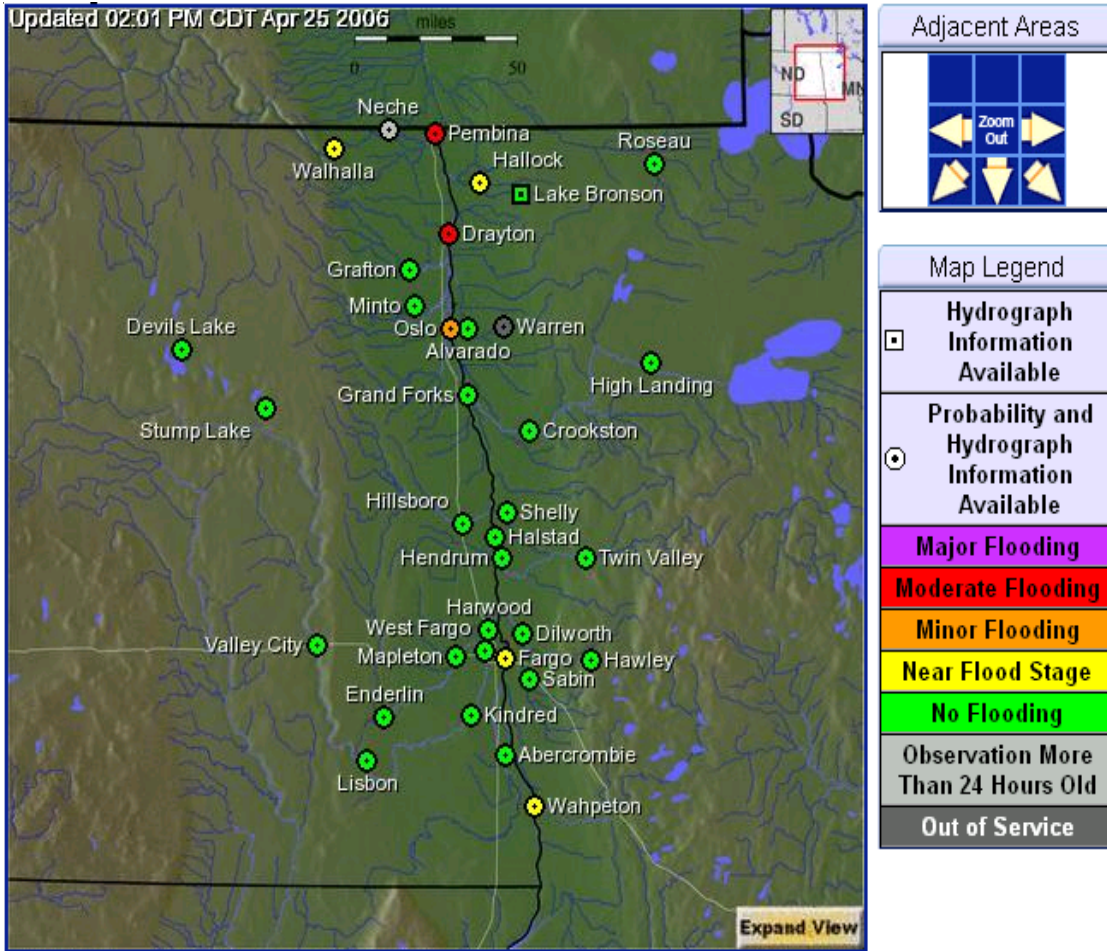


17) The map above shows a color-coded status of river conditions throughout the country. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the map on the following:

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



Questionnaire



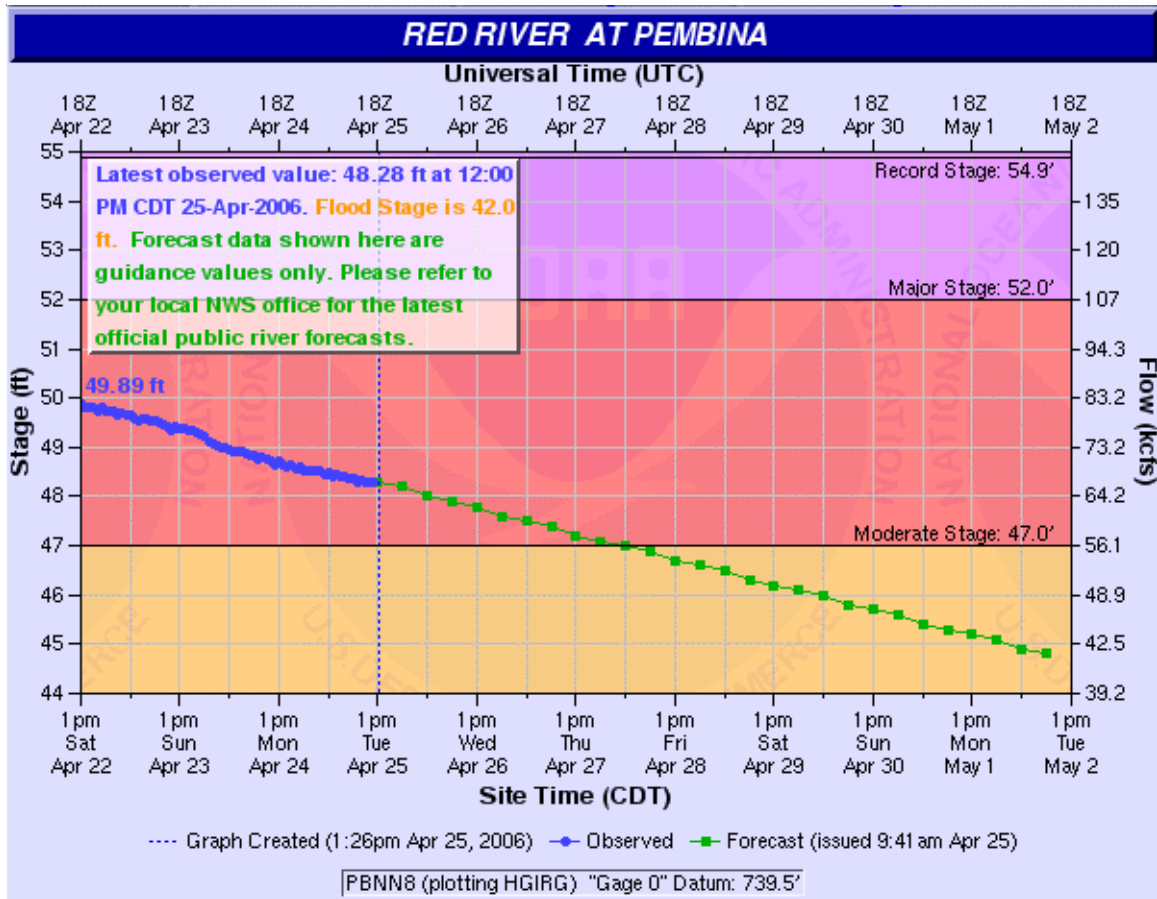
18) The map above shows a color-coded status of river conditions for the area served by the National Weather Service Office in Grand Forks, ND. (A similar map is available for each of the over 100 National Weather Service Offices covering the whole country.)

Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the map on the following:

- Visual appeal
- Ease of understanding
- Tells me what I need to know about river conditions in Grand Forks, ND



Questionnaire



19) The graph above shows how the level of the William O. Huske Lock & Dam on the Cape Fear River, NC varied in the past, as well as forecast levels. This graph is known as a hydrograph. (Similar hydrographs are available for each location identified on the previous map.) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the graph on the following:

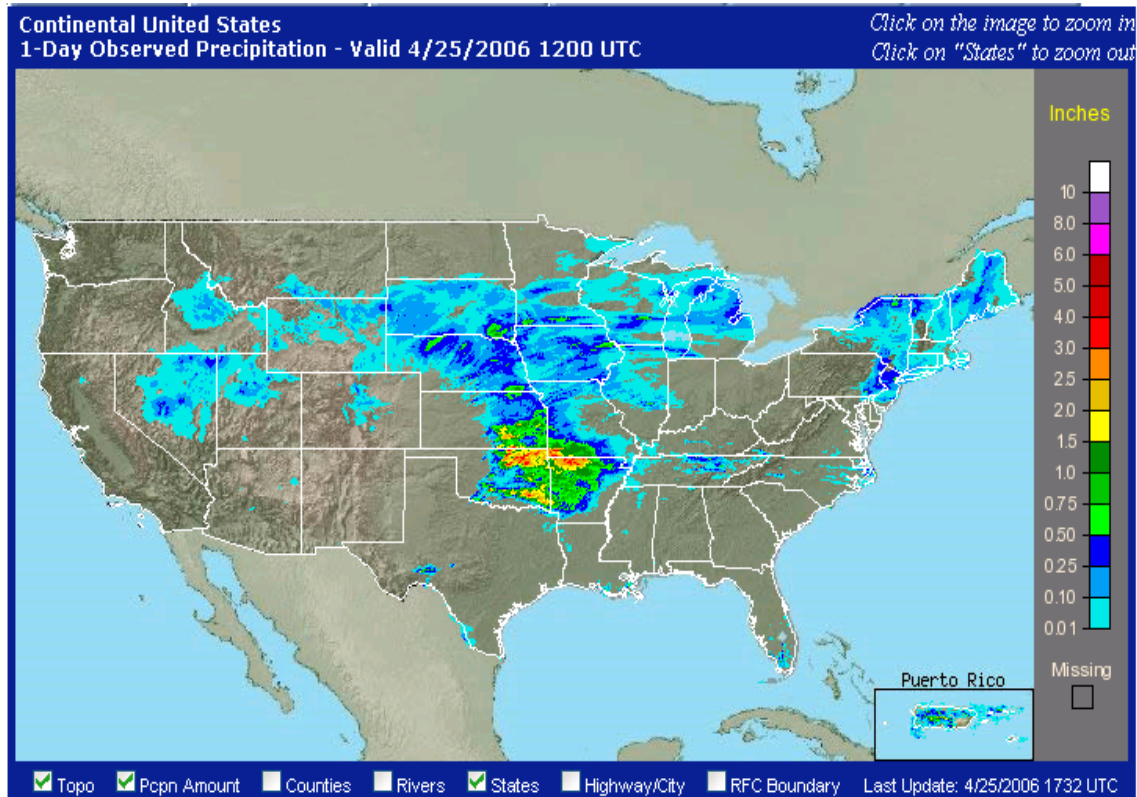
- Visual appeal
- Ease of understanding
- Tells me what I need to know about forecast levels

20) Considering the National Weather Service's Hydrologic Web pages, as represented by the previous three graphics, on a 10-point scale, where 1 means Poor and 10 means Excellent, please rate the following:

- Clarity
- Timeliness
- Accuracy
- Organization of information
- Meets my needs



Questionnaire



21a) The graph above shows a how high-resolution precipitation estimates for the contiguous 48 states and Puerto Rico. How often do you use this type of product?

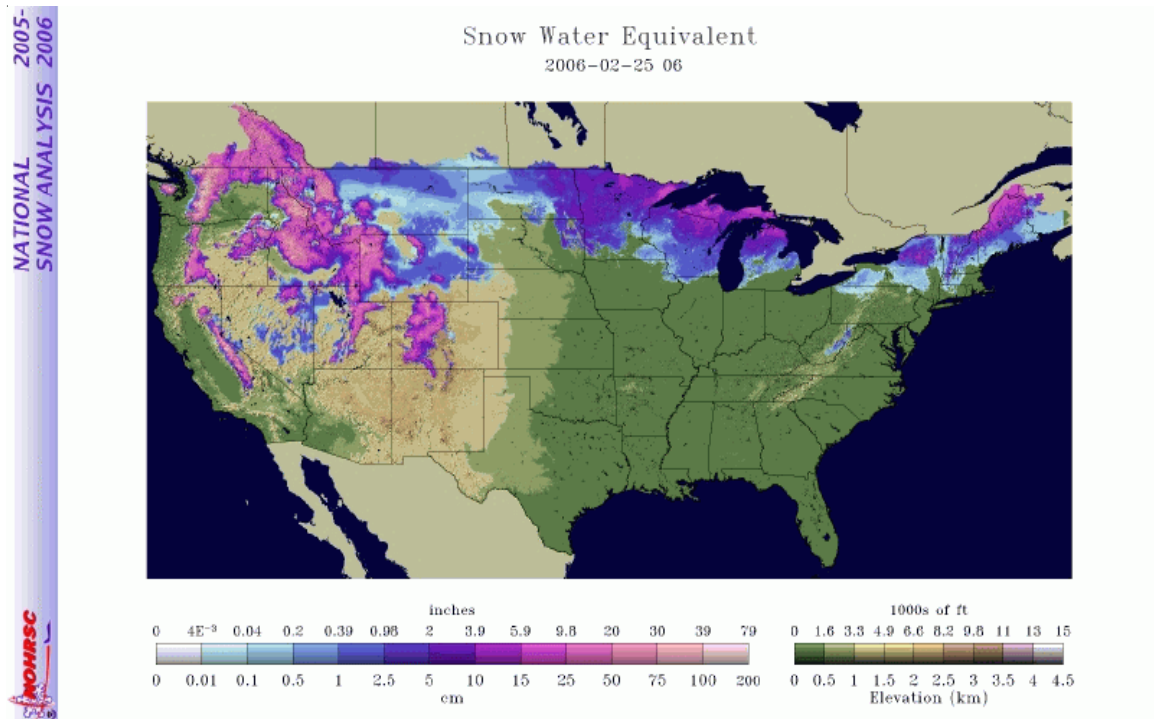
- Several times per day
- Once per day
- Once per month
- Not familiar with this information
- I am familiar with this information but do not use (**skip to Q22A**)

21b) Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the above graph on the following:

- Visual appeal
- Ease of understanding
- Tells me what I need to know about precipitation estimates



Questionnaire



22a) The graph above shows high-resolution estimates of the water contained in snow for the contiguous 48 states. How often do you use this type of product?

- a. Several times per day
- b. Once per day
- c. Once per month
- e. Not familiar with this information
- f. I am familiar with this information but do not use (**skip to Q23**)

22b) 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 water contained in snow

23) Precipitation frequency estimates are typically used for hydro meteorological design applications among other uses. Do you use precipitation frequency estimates?

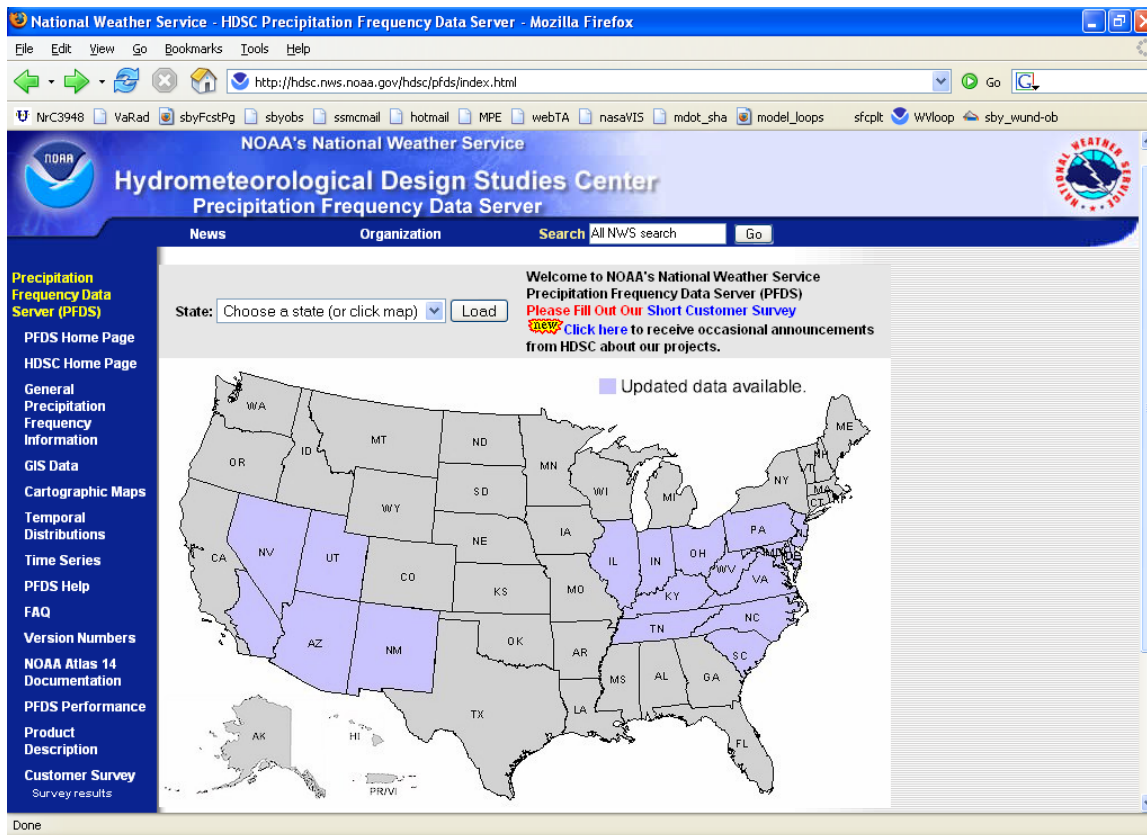
- a. Yes
- b. No (**skip to 26**)

24) 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



Questionnaire



25) The map above shows the Precipitation Frequency Data Server, which provides 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?

26) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of receiving **flash flood/flood warnings and watches** in the following formats.

- a. Text
- b. Graphics
- c. A combination of text and graphics
- d. NOAA Weather Radio All Hazards

27) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of receiving **river forecasts** in the following formats.

- a. Text
- b. Graphics
- c. A combination of text and graphics



Questionnaire

- d. Digital (numerical information that can be downloaded)
- e. NOAA Weather Radio All Hazards

28) Using a 1 to 10 point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of receiving **river/stream observations** in the following formats.

- a. Text
- b. Graphics
- c. A combination of text and graphics
- d. Digital (numerical information that can be downloaded)
- e. NOAA Weather Radio All Hazards

29) Have you ever had personal communication with NWS staff to discuss hydrologic forecasts?

- a. Yes
- b. No (**skip to 32b**)

30) On a 10-point scale where 1 means Poor and 10 means Excellent please rate the value of your personal communication with NWS staff to discuss hydrologic forecasts.

31) During a typical year, how many times do you have personal communication with NWS staff to discuss hydrologic forecasts?

- a. 1-3 times a year
- b. 4-6 times a year
- c. 7-12 times a year
- d. More than 12 times a year

32a) Please select the purpose of your personal communications with NWS staff (**select all that apply**)

- a. Explanation or interpretation of available forecast products
- b. Gain an understanding of forecaster confidence in forecast products
- c. Synthesize available forecast products and information for your specific needs
- d. Get more information from forecaster than available in existing products

32b) If you have any additional comments you would like to provide to the NWS at this time, please do so below.

33) This is the end of part one of the survey. If you have the time, the National Weather Service would like to get some additional feedback from you on the below categories so that we may continue to provide the most useful information possible. Each category of questions should take about 8 minutes to complete. If you wish to continue, please select



Questionnaire

any or all of the following areas for which you use hydrologic information (**select all that apply**). Thank you in advance for your thoughtful feedback!

- a. Flood Risks (**go to Flood Risk and Flood Inundation**)
- b. Digital Services (**go to Digital Services (Internet/Web)**)
- c. Uncertainty & Probability (**go to Uncertainty and Probability**)

SURVEY PART II

Flood Risk and Flood Inundation

The National Weather Service characterizes flood severity to more effectively communicate the impact of flooding. It uses the following categories:

Minor Flooding - minimal or no property damage, but possibly some public threat.

Moderate Flooding - some inundation of structures and roads near stream. Some evacuations of people and/or transfer of property to higher elevations.

Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.

34) Are you familiar with the way these terms are used by the National Weather Service in their flood warnings for your area?

- a. Yes
- b. No

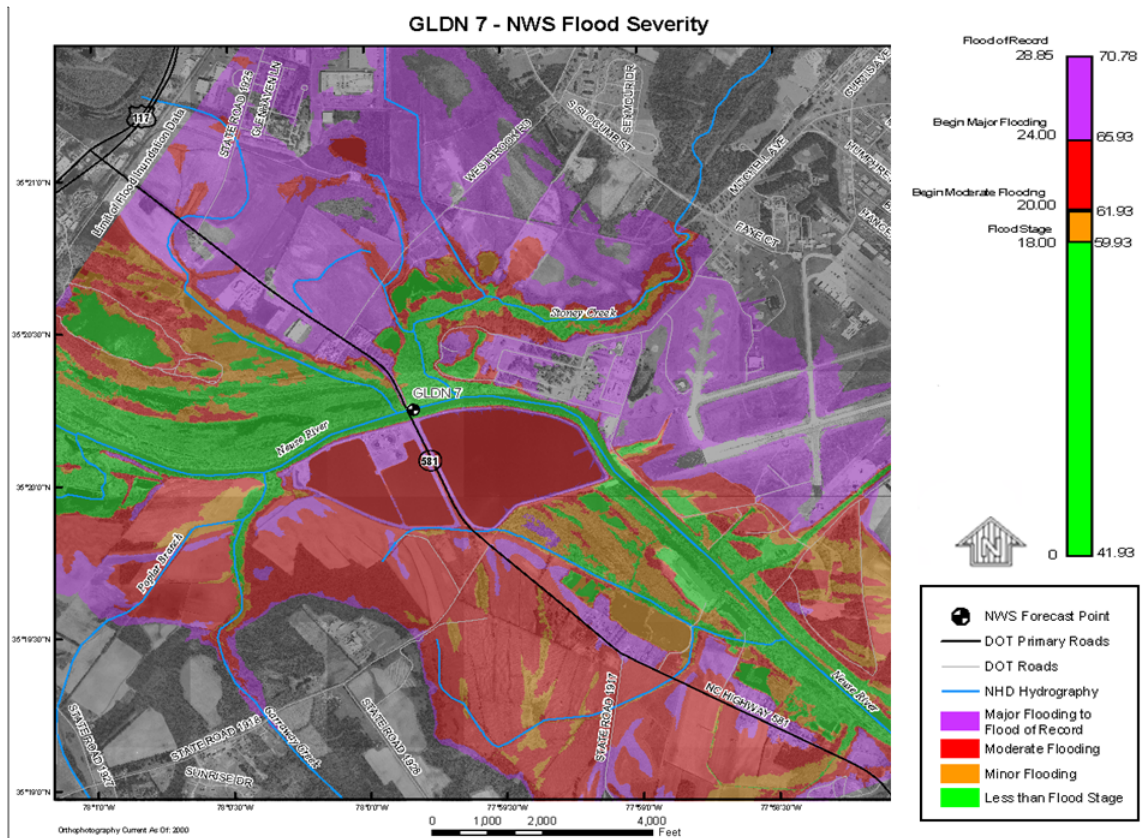
35) Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of these flood severity categories in interpreting the impact of river flooding.

36) (**If Q35 <=5**) What could the National Weather Service do to make these flood severity categories more useful?

The National Weather Service can combine the flood severity categories (previously defined) with satellite imagery to portray the area impacted by each flood category in map form.



Questionnaire



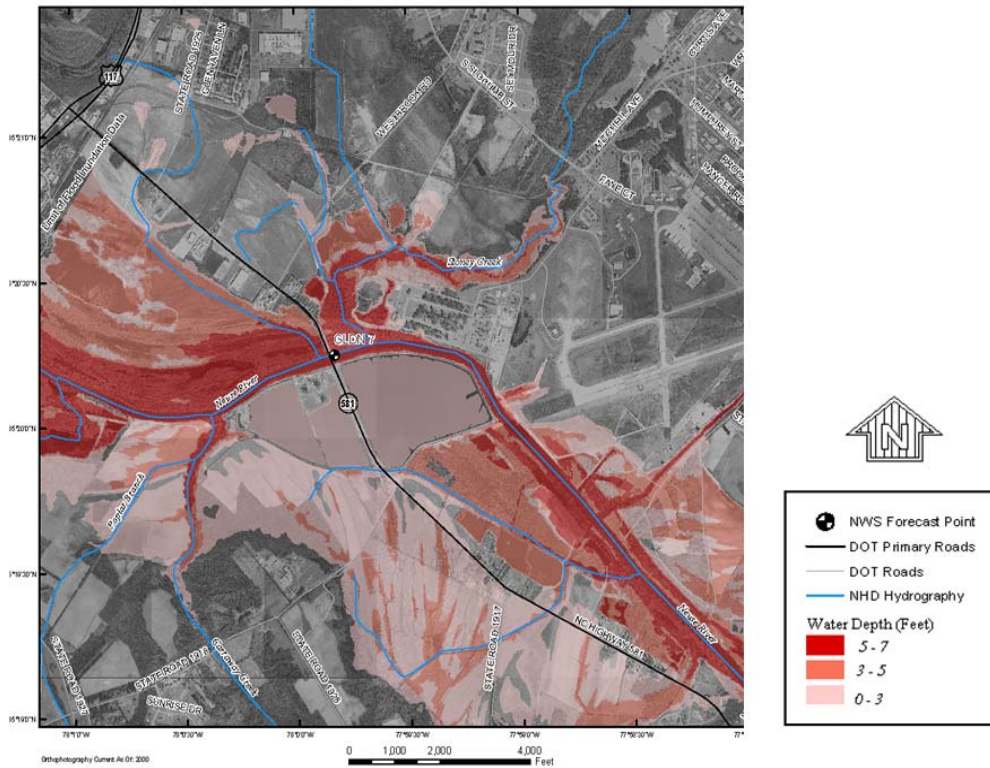
37) The map above shows the area covered by floodwaters for each of the flood severity categories. Using a 10 point scale where 1 means Poor and 10 means Excellent, please rate the flood severity map on the following:

- Visual appeal
- Ease of understanding
- Tells me what I need to know about flooding



Questionnaire

Inundation Where River is 7 Feet Above Flood Stage



38) The map above shows the general depth of floodwaters for a given river level. Using a 10-point scale where 1 means Poor and 10 means Excellent, please rate the flood depth map on the following:

- Visual appeal
- Ease of understanding
- Tells me what I need to know about the depth of the water

If you have any additional comments you would like to provide the NWS regarding Flood Risk and Flood Inundation, please do so below.



Questionnaire

SURVEY PART III

Digital Services (Internet/Web)

The National Weather Service is considering providing information on the Internet (e.g., graphics, numerical information, including river observations, forecasts, uncertainty information) using additional access modes and formats, focused primarily on making automated data processing more efficient.

Visual

39) The National Weather Service is increasingly depicting information in graphical form on the Internet. Using a 1 to 10 point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of receiving graphical information that includes the following features:

- a. Graphics with pre-determined content, spatial extent and time period
- b. Ability to specify time range shown (e.g., 1 day rainfall total, 1 month rainfall total)
- c. Ability to specify areal extent (e.g., state, county, river basin)
- d. Ability to overlay different background information (e.g., political boundaries, roads, rivers)
- e. Ability to overlay different information (e.g., radar precipitation estimates and observations from rain gauges)

Digital

40) Digital information can be provided for a number of different purposes. 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. Numerical information using standards-based formats (e.g., XML, NetCDF)
- b. Information formatted geospatially for use with Geographic Information Systems (e.g. shapefiles)
- c. RSS (Real Simple Syndication)
- d. WAP (Wireless Application Protocol)
- e. Metadata information



Questionnaire

Geospatial Formats

41) Considering information in geospatial 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. Shapefile
- b. Worldfile
- c. KML/KMZ format
- d. 40) GeoPDF
- e. Open Geospatial Consortium standards

Delivery Modes

42a) There are a number of ways to provide access to digital information. 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 options to make information accessible on the Internet (**Include option 11="Not familiar with this format"**):

- a. "Bulk transfer," e.g., ftp
- b. Web-based data service (including selective extraction)
- c. GIS map service
- d. GIS feature service

42b) If you have any additional comments you would like to provide the NWS regarding Digital Services, please do so below.

SURVEY PART IV

Uncertainty and Probability

43) Forecasts of river levels involve a degree of uncertainty. To reflect this, forecasts can be provided as a range of possible values (e.g., the river will crest between 11 and 12 feet above flood stage). Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate how useful it would be to have forecasts include uncertainty information.

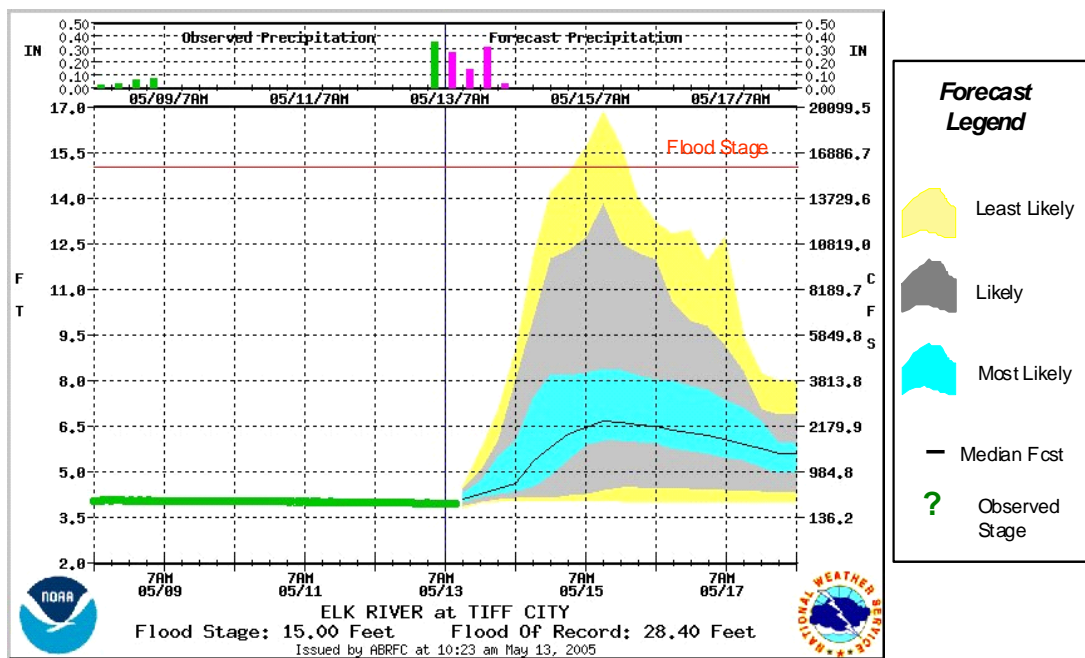
44) Uncertainty can also be expressed in terms of probabilities (i.e., there is a 70% chance the river will exceed flood stage). Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate how useful it would be to have forecasts include probability information.



Questionnaire

45) Forecast uncertainty typically increases with the length of the forecast. Using a 10-point scale where 1 means Not at all Useful and 10 means Very Useful, please rate the usefulness of providing river forecasts and uncertainty information for the following time scales.

- Short-term (0-5 days)
- Monthly (30 days)
- Seasonal (90 days)

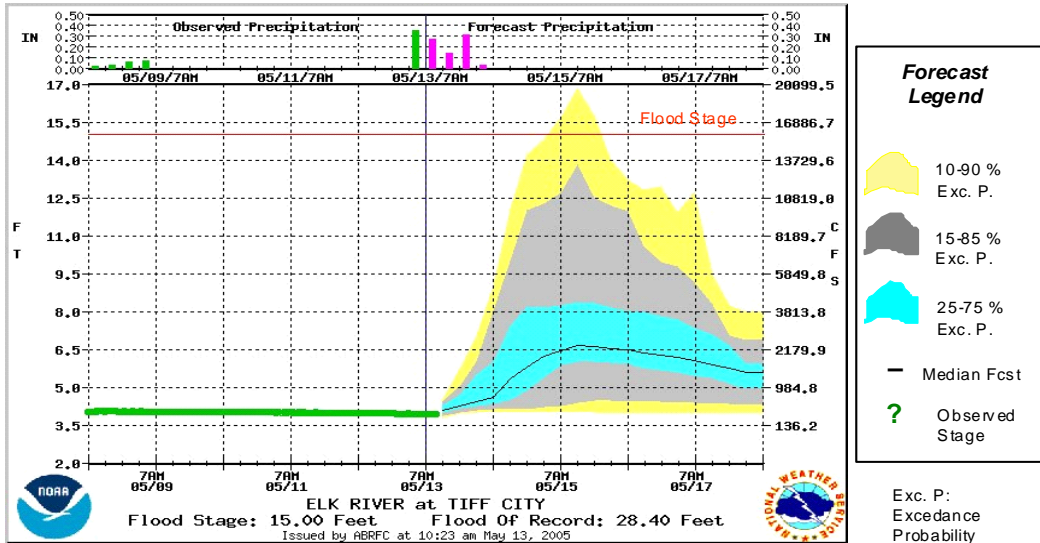


46) Considering the graphic above which provides information about observed and forecast river levels, including forecast uncertainty, use a 10-point scale where 1 means Poor and 10 means Excellent, to rate the following:

- Visual appeal
- Ease of understanding
- Tells me what I need to now about river stages during a 5-day forecast period



Questionnaire



47) Considering the graphic above which provides information about observed and forecast river levels, including specification of forecast uncertainty in terms of probability (note change in legend), use a 10-point scale where 1 means Poor and 10 means Excellent, to rate the following:

- a. Visual appeal
- b. Ease of understanding
- c. Tells me what I need to know about river stages during a 5-day forecast period

48) NWS is considering providing the capability for customers to generate their own probabilistic streamflow forecast graphics and tables. This capability would allow customers to control the forecast location, forecast variable (mean, minimum, maximum, volume), forecast interval (day, week, month, entire period), forecast time horizon and output product type (graphics or tables) such that the customer can generate customized probabilistic streamflow forecast graphics or tables. Using a 10-point scale where 1 means Not at all Likely and 10 means Very Likely, how likely are you to use this probabilistic streamflow forecast product generator? **(Include option 11="Not familiar with this format")**



Questionnaire

49) If you have any additional comments you would like to provide the NWS regarding Uncertainty or Probability, please do so below.

Thank you for your time. The National Weather Service appreciates your input and will use this feedback to better serve its customers.