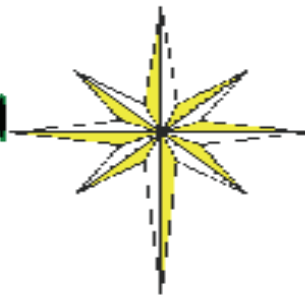


The NorStar Flyer



Return of the NorStar Flyer

It has been two years since we sent an edition of the NorStar Flyer to you our faithful NWS Cooperative Observers. During the past two years our office and indeed our agency have continued to evolve. We have become more involved with the Department of Homeland Security, have increased our attention to the prediction of long term climate and day to day forecast operations.

Despite all the technological advances the agency has made over the past two decades we are still very much in need of "people on the front lines of weather." That is the NWS cooperative weather observer. This task has become more important over the years as global climate change comes more to the forefront of everyday life.

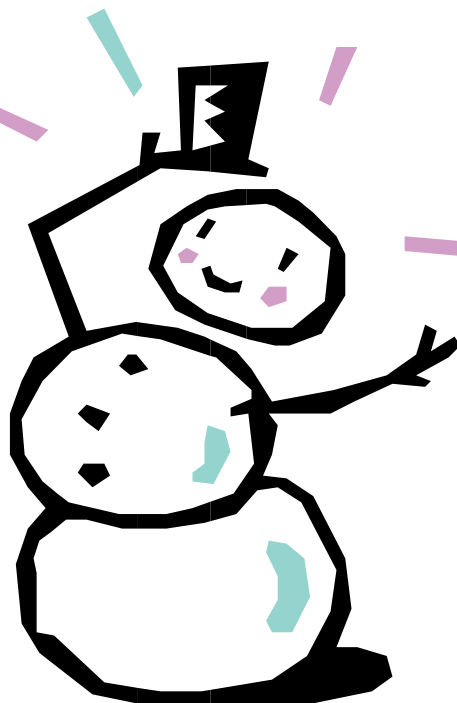
Cooperative Observer collects, is the base information that goes into determining the current state of the climate. That is why we are somewhat particular about how you

gather the information; why we need to be sure you are recording it in the way we need it, that it is being recorded daily (when possible), and accurately. Not only does the scientific community use the information you collect, but many others do as well; engineers, lawyers, utility companies, railroads, researchers of all disciplines, city planners—the list is quite expansive.

So, once again, we say THANK YOU for the information you collect. It is invaluable and benefits many people.

If there is anyway we can help you do the job you do so well, please let us know. We are here to serve you.

The NWS Grand Forks CPM team: Mark Ewens, Lynn Kennedy, Brad Hopkins and Bill Barrett



Winter Weather is just around the corner! What will this winter be like? See page 3

The information you, the

Special points of interest:

- *Technology continues to change the way we do business*
- *New recording rain gages trickle to the field*
- *A warm winter on tap?*
- *Low flood threat for the spring 2007?*
- *The Great Flood of 1997—ten years later*
- *Where we need observers*

Inside this issue:

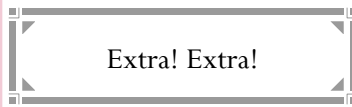
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New Recording Rain and snow gage in limited operations around the region.

The NWS operates approximately 1000 recording rain gages nationwide. The Fisher-Porter (F&P) gages are part of the Hourly Precipitation Network (HPN), and provide detailed information about rain and snow. The equipment

used is getting quite old, however, with the mechanical gages ranging in age from 30 to 40 years in age. In order to keep the HPN operational, the NWS has bought and deployed about 300 F&P Upgrades, or FPU. There are only

6 FPU gages in the Grand Forks area of responsibility. Orwell Dam, Frazee, Norris Camp, Breckenridge, Adams 7SSW and UND. More are planned for the future, with the aim to replace all the older F&P gages.



Measuring and reporting snow fall, depth and water content
Special for Fisher & Porter tape gages readers



Fisher / Porter raingage upgrades—a closer look

In October of 2000 the NWS officially recognized the need to replace the aging mechanical Fisher / Porter gages. To that end, the NWS contracted with Coastal Environmental Systems of Seattle Washington. CES has already been a proven contractor, providing the National Data Buoy Center in Pascagoula, Mississippi with high quality equipment.

CES produced approximately 300 Fisher / Porter Upgrades or FPU's. These units were sent to NWS offices nationwide, including the Grand Forks office. We tested the FPU in real world conditions from October 2001 until the summer of

2003. After various modifications were performed, the production versions of the FPU were shipped nationwide. However, due to the tight budget within the federal government, only the original 300 FPU's were deployed.

At this time, the NWS hopes to resume production of the FPU sometime in the next few years. This will be dependant on many things, with the over-all federal budget the

primary driving force. However, the NWS has renewed its dedication to studying the climate, both locally and globally. To that end the FPU's provide significantly increased resolution to precipitation, both in actual measuring and time sampling ability. If you are an observer with an older style F&P gage, we will continue to work with you to ensure the gages work throughout the year. We ask you to check the gages regularly and call us with any problems noted.



The inside of the old mechanical Fisher / Porter gage

Flood Forecasting and frost depth.

During the late summer and fall of 2006, technicians from the Grand Forks NWS installed 10 'frost probes' at select locations in and around the Red River Valley. These simple PVC plastic and tygon tube gages are designed to help us forecast spring flooding.

Why is frost depth important? There are 6 factors which go into a spring snowmelt flood including

Frost depth is one of the most significant pieces of the spring flood puzzle.

the precipitation during the fall, how much snow falls during the winter and how fast it melts and runs off. However, how fast it runs off is directly tied to how deep the frost is. Until the installation of the frost probes, we did not know how deep the frost is other than isolated reports from construction crews.

Frost depth is one of the most significant pieces to

the spring flood puzzle. With the new frost probe network, we hope to produce more accurate forecasts of river flooding, with greater accuracy and with longer lead times.

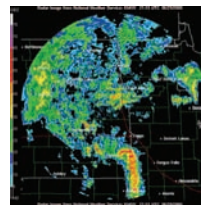
In North Dakota frost probes have been installed near Edmore, Pembina, Valley City, Forman and Grand Forks. In Minnesota probes are in the ground near Campbell, Fergus Falls, Halstad, Thief River Falls and Camp Norris.

Technology and weather

During the Second World War, a revolutionary tool was developed that helped turn the tide to victory. This tool has grown over the years and is used in many non-military applications, world wide and under many scientific disciplines. RADAR, which stands for **RA**dio **D**etection **A**nd **R**anging, has matured from it's early days as an aircraft detection tool. In the NWS, the Doppler RADAR, or WSR-88D has allowed us to more accurately predict

severe thunderstorms, tornadoes and flash floods. In the 1960s there were virtually no warnings for any of the above weather events. Today, we can warn folks about impending severe weather up to one hour before the bad weather hits.

Weather satellites are another tool we rely on. The new genera-



RADAR is one of the most important tools we use.

tion satellites can see cloud features as small as a section of land. This details allows us to more accurately trace and predict weather systems as they develop. While still not perfect, today's weather forecasts are much better than even just 20 years ago.

And the best is yet to come!



A Warm Winter on the Way?

What does the winter of 2006 and 2007 hold? El Niño conditions continue to develop in the equatorial pacific. Moderate El Nino conditions are forecast to prevail through the winter season. At this time...it appears that this El Nino could be as strong as the 2002/2003 event.

Therefore...the Climate Prediction Center...CPC...says there is a greater than 60 percent chance temperatures will be normal to above normal this winter for eastern North Dakota and northwestern Minnesota. Precipitation for the northern plains will feature normal climatic variability. During El Nino winters...temperatures

are consistently 3 to 5 degrees above the long term average. December and January typically feature the greatest departure from normal...with February often exhibiting more normal temperature patterns. Precipitation tends to be 85 to 95 percent of average in an El Nino winter. As a result...winter snowfall is 5 to 15 inches less than average.

Remember that this outlook represents average conditions during the December through February winter season. Periodic cold arctic outbreaks are

still likely...but they are typically short lived. Also remember that while snow storms tend to be less frequent during El Nino winters...they still can occur.

The NWS is your official source for Weather...water...and climate information.

We continually monitor precipitation data...river levels...and many other types of weather and climate information. Forecasts can be found at



Snowfalls are likely to much less than normal this winter if predictions are correct

WWW.CRH.NOAA.GOV/FGF

The Great Flood of 1997—one decade later

It is difficult to believe that 10 years have passed since the devastating floods of 1997. Everyone who lived through that winter of 1996/97 will remember the seemingly endless parade of blizzards, the howling winds and frequent road closures.

Everyone who lived through that winter of 1996/97 will remember the seemingly endless parade of blizzards.

suddenly as temperatures soared into the 50s and the 100+ inches of winter snow melted in a matter of days. The devastation, especially to the communities of Ada, Breckenridge, Warren, East Grand Forks and Grand Forks will be in

the minds of those who lived through it forever.

The NWS in Grand Forks was just 1 year old at the time of the flood. Everyone was affected, with some employees losing most everything they owned. Yet because of that flood, we have learned so much about river forecasting and have prepared for another '97 event. The major flooding in the spring of 2006 showed that many of the changes cities have made worked.

We will continue to work to make lives safer, as this is our home too.

Then the spring that would not end did so

Ten years later—the spring flood of 2007

Moderate to extreme drought conditions developed during the summer of 2006, with dry conditions continuing into the early winter season. This is a significant change from the recent 13 years when predominantly wet summer seasons prevailed. As a result, some conditions the NWS look at to estimate spring flooding potential are currently favorable for minimizing that potential. Existing Conditions must be considered

when determining the magnitude of a spring flood. The main conditions include: The freeze/melt cycle; Early spring rains which increase melting of the snow pack or late spring snow storms adding to the existing snow pack. The actual snow pack depth and water equiva-



Will the dry weather mean less of a flood threat next spring?

lency; frost depth; soil moisture content and river base flows and ice conditions.

At this time conditions favor only minor flooding next spring. However, we all know that conditions can change quickly, so stay tuned for later forecasts!



NWS and Coop program changes

The National Weather Service was instituted by the Organic Act of 1916 and originally was under the U.S. Army Signal Corps. Later the "Weather Bureau" was moved to the Department of Interior then finally the Department of Commerce. In 1969 our name was officially changed to National Weather Service. Our number one job is protection of life and property through the issuance of weather watches and warnings. We are the stewards of the data you, the Cooperative Weather Observer generate.

The current plans within the NWS are for streamlining the agency from top to bot-

tom. This is driven primarily by the shrinking budget, and new technologies. What those changes are and how they will affect the way we interact with you are unclear at the present time.

The most likely changes to the NWS cooperative weather program will be fewer manual, and more



The Standard Rain Gage—one part of the coop network puzzle

automated stations. One such station is near Holt Minnesota, at the Lake Agassiz Wildlife Refuge. An automated station called a "Climate Reference Network" station was installed in 2001 and is now fully operational. Another change is the Fisher / Porter Upgrade unites (see story on page 2) More changes are planned, including installing wind equipment at some cooperative stations, and even moving equipment to better locations. As we learn more, we will pass the information on to you. In the mean time, we will strive to be your "No Surprise" Weather Service.

IV-ROCS fully operational

In 2004 the NWS replaced the older ROSA system with **IV-ROCS**. (Interactive Voice - Remote Observation Collection System) While many folks use a telephone or a computer based program to send us daily temperature and precipitation data, IV-ROCS, allows weather observers to call in and send us the daily observation by using the key pad. You simply will dial a designated toll free phone number, and IV-

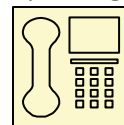
"IV-ROCS, or Interactive Voice - Remote Observation Collection System, allows weather observers to call in and send us the daily observation"

ROCS voice will direct you through the data entry process. IV-ROCS is the replacement for the ROSA reporting system.

The system is fairly simple to use, and a Cooperative Program Manager will be happy to visit with you to demonstrate how to use the system.

If you used the older ROSA system with a

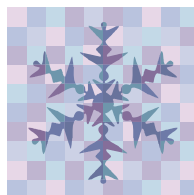
touch tone telephone, the new IV-ROCS system is very similar to that. **First**, you dial the 800 number provided. **Second** Identify yourself. Enter your 6 digit station number, beginning with '32' in you're in North Dakota or '21' if you're in Minnesota. The program will verify your station by reading back the information. **Third** Enter your data. Using the telephone key pad you will enter your information. The IV-ROCS voice will ask you for your data. You will only be



asked to provide data that your station is equipped to provide. Observation elements IV-ROCS is capable of recording are: precipitation (including snow), temperature, evaporation, soil temperature and river stage. This will not affect those using the internet based WXCODER (see companion story next page)

If you used to use the ROSA system, IV-ROCS is for you! If you are interested, the NWS will supply you with all the information, and set up a date and time to give you on-hands training!

Your 4 Seasons Weather Service is here to Serve You!





Getting the weather to us—Weather Coder

Cooperative observer data has traditionally been collected and transmitted to the National Weather Service by telephone. While the method has been effective, it not only requires significant time but also fails to take advantage of more sophisticated methods of data entry and transmission generally available through use of the Internet.

In 1999 WFO Chicago took a significant step in opening the use of the Internet to cooperative observers across the central United States. The result of the effort was the introduction of an Internet-enabled data entry system called WxCoder (Web

WxCoder II provides substantial improvements in data entry. The entry form is clean and concise. Through the use of the WxCoder database and dynamic content technology, data entry now occurs through a one-page, customized form – no need for the observer to muddle through pages of non-pertinent entry blanks. Persistent, site-

Xmitted Cooperative Observer Data Encoded Report). Though an advancement, WxCoder only made the first step. Entry forms were cumbersome, error feedback was confusing, and data retrieval was non-existent.

WxCoder II is a major and substantial enhancement to previous methods of data entry for observers. While addressing the shortcomings of its predecessors, WxCoder II breaks new ground with the introduction of a multi-function database. By combining the power of relational database technology with the Internet,

specific data is automatically presented on the form; no need for repetitious, daily entry.

For the NWS, the introduction of the WxCoder database is a major enhancement to coop observer data collection, processing, analysis, and presentation. The collected data no longer serves one purpose. It is available for multiple

WxCoder II provides information services that neither can deliver alone. Major improvements are provided for both the observer and the NWS; significant new features for both are added.

For the coop observer,



Winter weather across the plains can be as dangerous as it is beautiful.

uses – automatically generating summaries and reports, direct forwarding to NCDC.

If you are not current using it, and are interested in using WxCoder, you need a personal computer (or MAC) and an internet connection. Call the NWS for details!

“WxCoder II provides substantial improvements in data entry. The entry form is **clean and concise.**”

Postal Rates to increase in 2007

The NWS has learned from the United States Postal Service that postal rates will be increasing in the late spring or early summer, 2007. How much the rate increase will be is unclear at this time. However the Postal Service has traditionally increase rates in 1 or 2 cent increments. Most of you should have 39 cent pre-metered envelopes. If you have envelopes with a different postage, please call us and let us know so that we can mail you

the appropriate amount of 1 cent stamps to make up the difference.

We plan on making a couple of “mass mailings” of envelopes and packages. One will be this winter, and the other during the spring of 2007. The first will be with the current 39 cent



Classic plains to prairie farm during the last century.

postage and the second will be with the updated postage. If there is a need, we will send additional 1 cent stamps to make up any left over postal costs. Remember, you should never have to use your own money to mail weather information to the NWS. If you are ever in need of any supplies, please contact us as soon as practical!

There are a few attachments to the NorStar Flyer Newsletter. They include a guide to measuring snow fall, snow depth and the water content of snow on the ground. For those who use the Fisher / Porter rain gage, there are some reminders of how to remove the paper tape or use the electronic key (where applicable) and how to fill the Daily Weather Report form, WS-B91. Please call us with any questions!

NWS Grand Forks ND

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The National Weather Service is a federal agency, operating under the Department of Commerce, National Oceanic and Atmospheric Administration. By law, we are tasked with the protection of life and property through the issuance of timely watches and warnings.

Our Mission Statement:

"The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community. "

Working Together To Save Lives
The Cooperative Observer—On Weathers Front Line

Where we need observers reporting to us daily!

The NWS operates the cooperative program, which utilizes observations from approximately 10,500 observers nation wide. While this is a large number of volunteers, there are 'holes' in our daily coverage. Most of our observers report to us on a monthly basis by sending in the Weather Service forms provided. We have a handful of observers who report to us more frequently, using either an internet based program or a telephone—voice prompt system. There are also a few who call our 800 line to report their precipitation to us.

To that end we would like to encourage observers in the following areas to consider using either WxCoder or IV-ROCS to send us their daily (or near daily) reports: *The upper Devils Lake basin, lower and middle Sheyenne River basin, the middle Red River Valley and the forested areas of northwest Minnesota.*

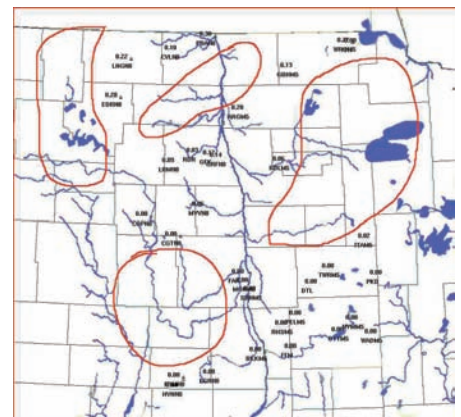
If you would be willing to help us, we can

supply you with the particulars on how WxCoder and IV-ROCS work. WxCoder is an internet based system, so you need a personal computer or MAC and access to the internet. IV-ROCS requires only a touch tone phone and a bit of patience.

If you are currently using either system, or calling us, thank you very much. Your daily reports help us verify our forecasts and keep track of soil moisture for better flood forecasting.

If you are currently sending in a monthly form and not calling, we ask you to consider using one of the above methods, if possible. We will supply you with instructions and, if necessary, on hands training.

In either case, we cannot express our appreciation enough. The data you provide is invaluable, and we simply could not do our job as well without your help.



The lines represent areas where we need observers to report on a daily basis