



# NWS Hydrologic Products and Services: Now and Future



September 28th, 2010  
DRBC Flood Warning Users Forum

David Nicosia  
Warning Coordination Meteorologist  
NOAA's National Weather Service  
Binghamton, NY Forecast Office

607-770-9531 x223  
david.nicosia@noaa.gov



## NOAA's National Weather Service



# National Weather Service Mission



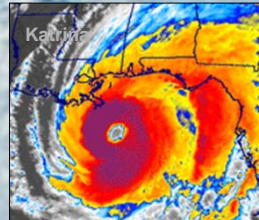
“To provide weather, water, and climate forecasts and warnings for the protection of life and property and the enhancement of the national economy.”



February 2007 – Lake Effect Snow in New York



April 2005 – Water from Lake Wallenpaupack

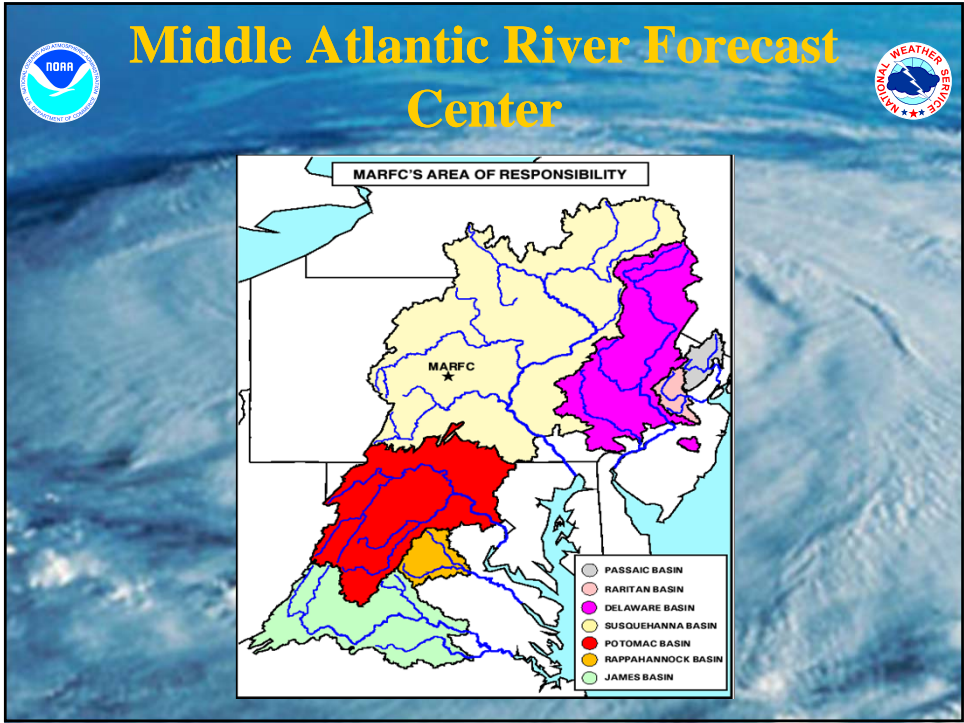


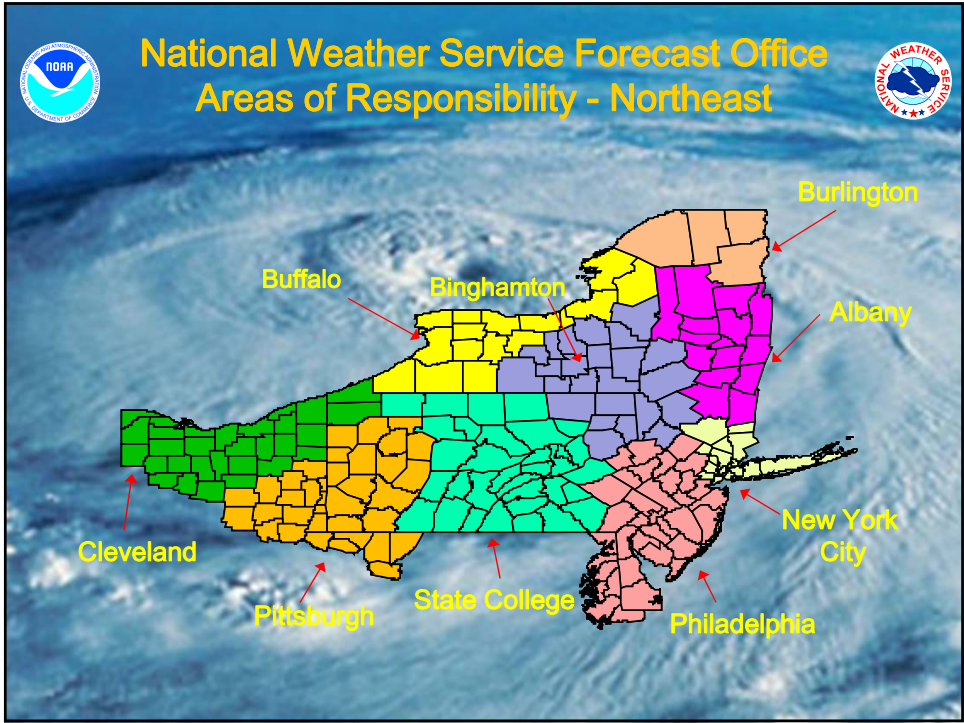
Katrina Storm Surge into Mississippi



# River Forecast Centers







## National Weather Service Binghamton




**Personnel**

- Senior Forecasters : 5
- General Forecasters: 6
- Hydrometeorological Technicians: 3
- Electronic Technicians: 2
- Hydrologist: 1
- Management: 5
- IT position: 1
- Administrative support: 1
- Total Personnel: 24








## The Present...



## Flood Warnings

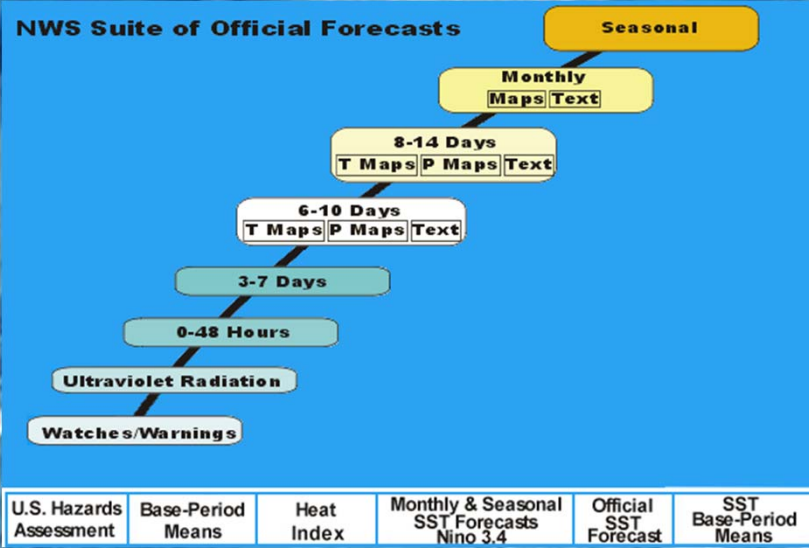


You may not have enough time to prepare once a flood warning is issued...

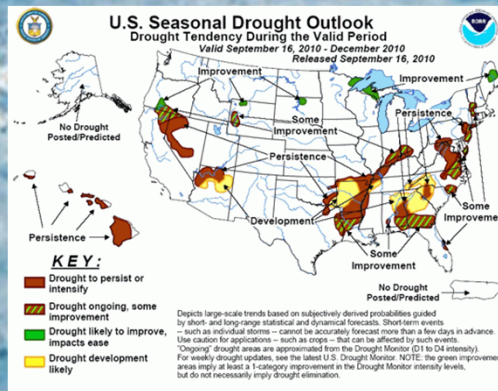
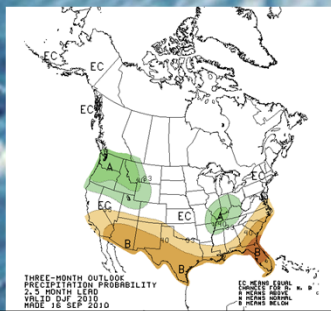
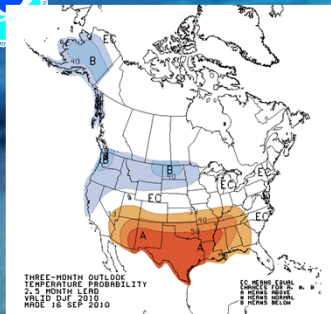


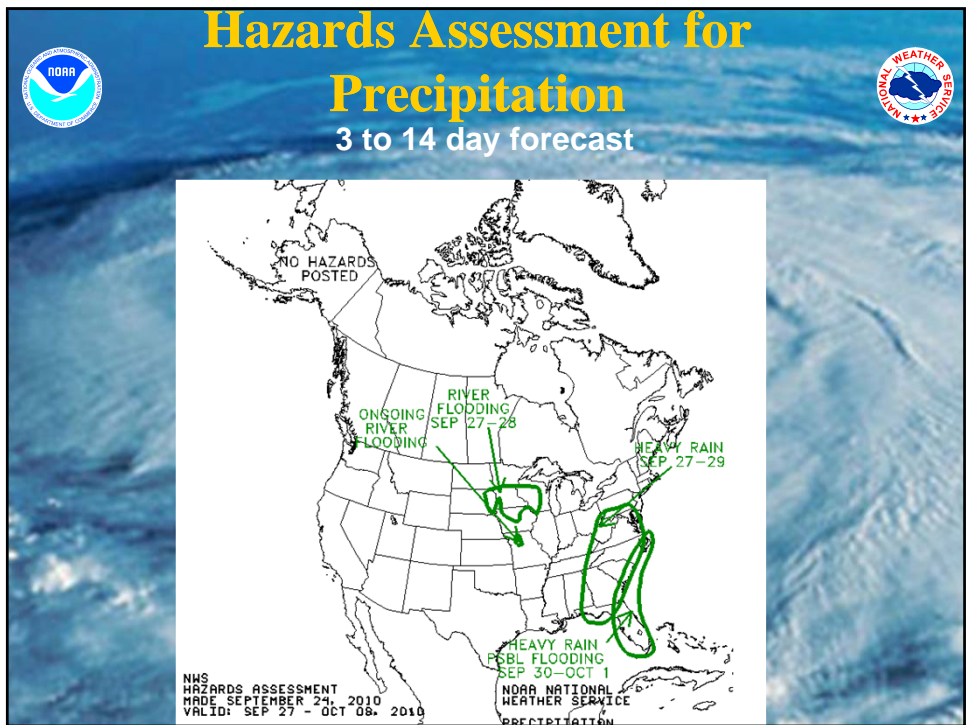


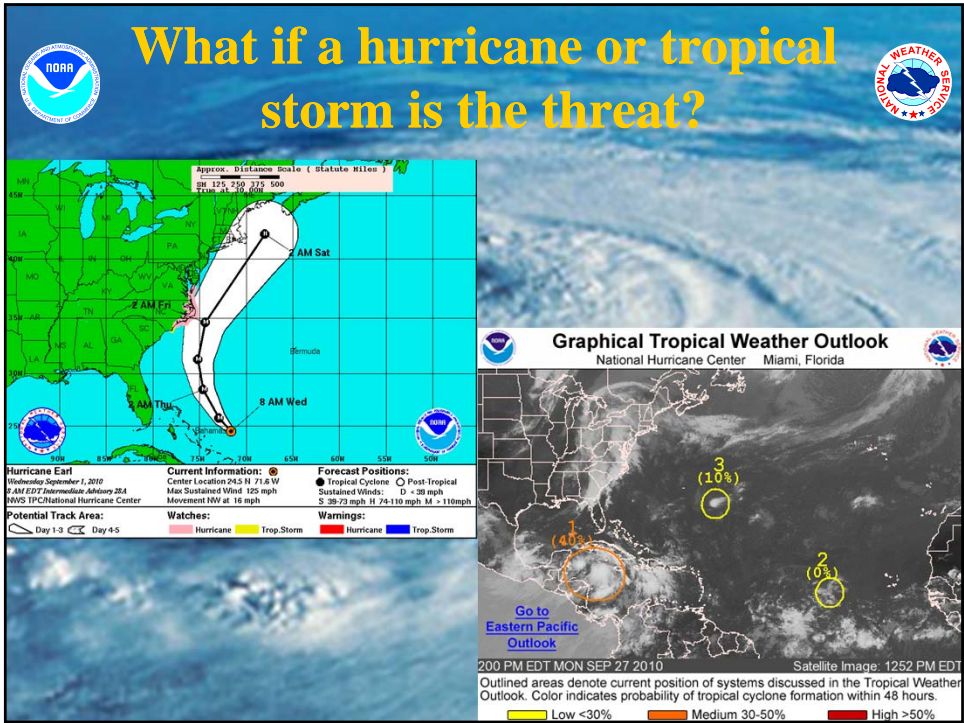
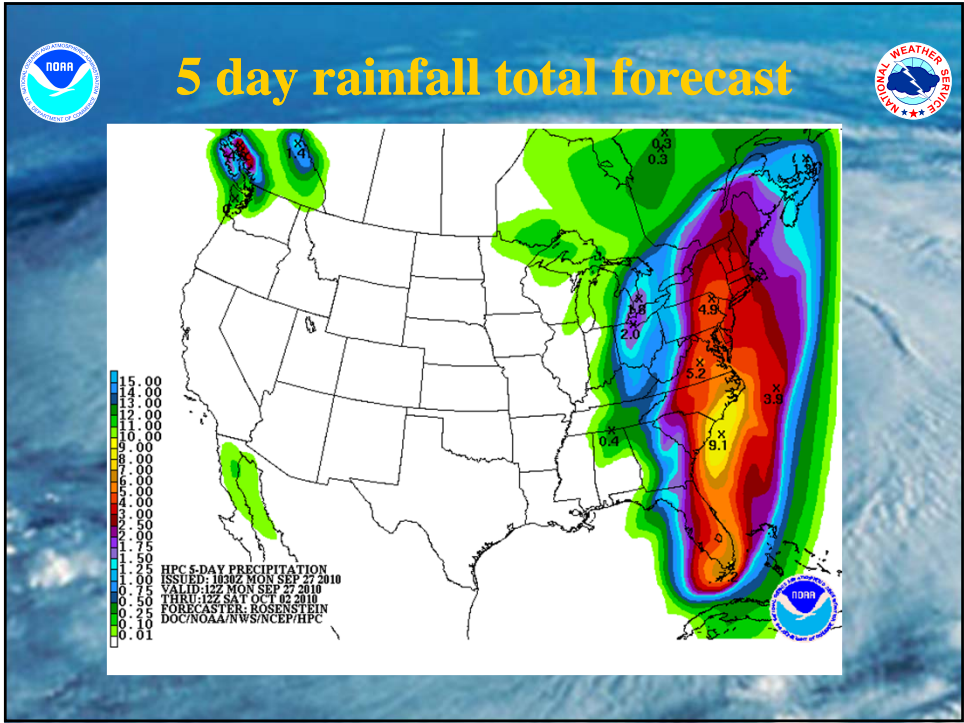
# NWS Suite of Products and Services



# Seasonal Forecasts





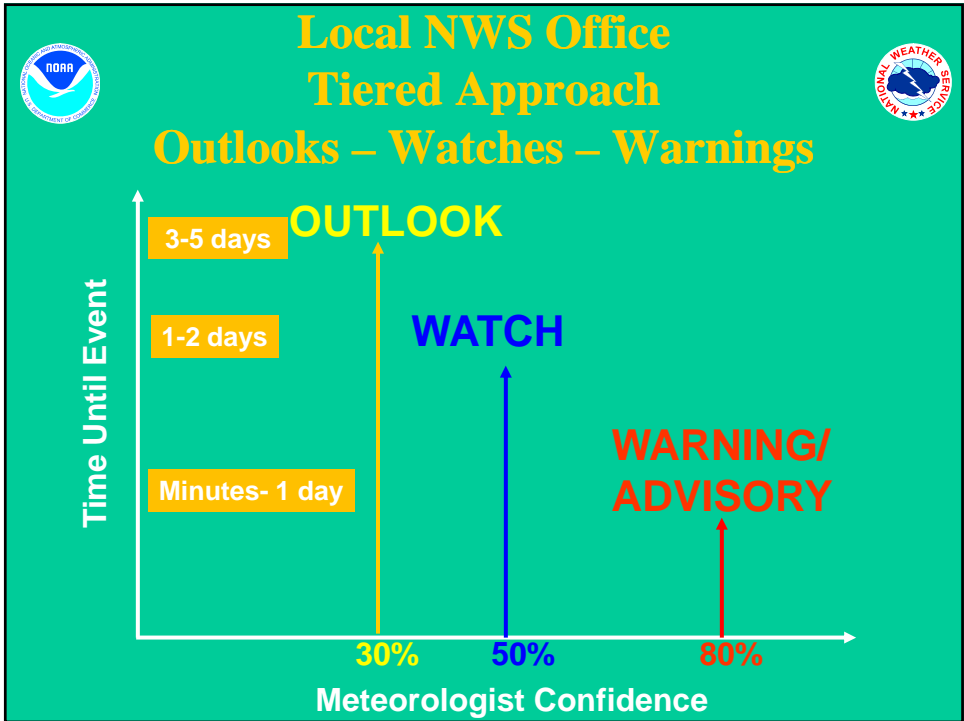


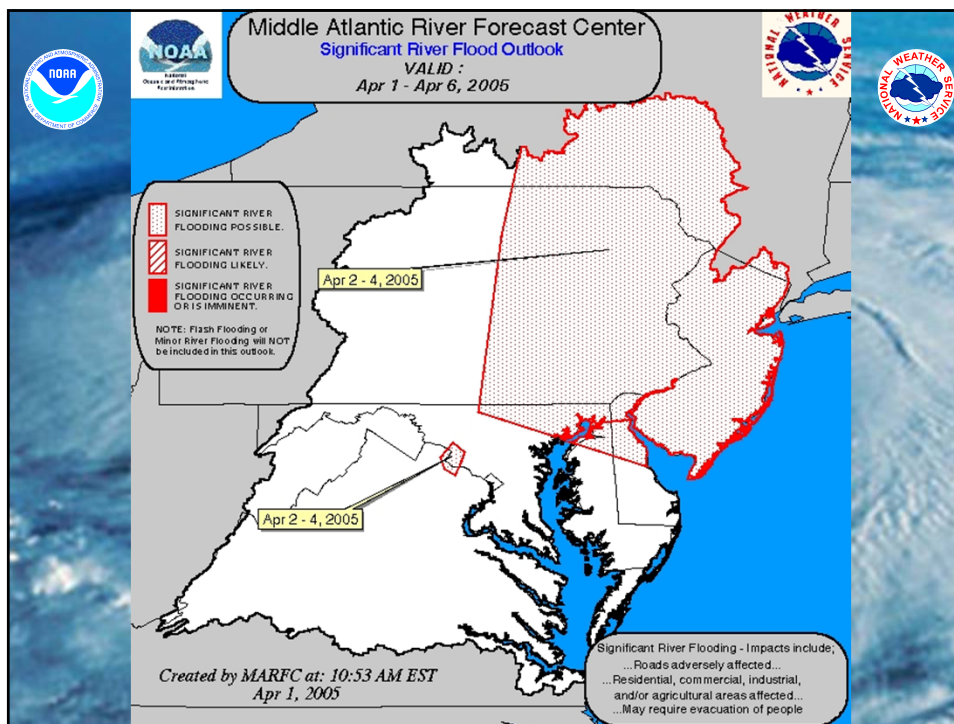


**Briefing package issued by WFO Binghamton**

National Weather Service Binghamton  
 Heavy Rain Potential  
 Briefing #1

Latest as of Monday 9/27/10 2 pm  
 For latest forecasts:  
 See <http://www.weather.gov/bgm>





**National Weather Service Forecast Office**  
**Binghamton, NY**

Home News Organization

Local forecast by "City, St" or Zip Code  
 City, St: [ ] [ ] Go

Current Hazards  
 Local Outlook  
 National Outlooks  
 Hurricanes  
 EM Page  
 eSpotter  
 Storm Reports  
 Current Conditions  
 Snow/Rain Reports  
 Rivers & Lakes  
 AHPS  
 Observations  
 Satellite  
 Text  
 Radar Imagery  
 Local  
 National  
 Forecasts  
 Activity Planner  
 Air Quality  
 Aviation  
 Fire  
 Hydrology  
 Marine  
 Models  
 Space Weather  
 RSS/XML/Mobile  
 Text  
 Climate  
 Local  
 National  
 More...  
 Weather Safety  
 Newsletter  
 NOAA Weather  
 Radio  
 NY-Alert  
 PA-Alert  
 Preparedness  
 Storm Ready

Top News of the Day - Past News  
 Rain/Snow Reports or Storm Reports

- Record Warm Spring and Summer... [Read More](#)
- Local Climate (Daily Weather Data) Help Page... [Read More](#)
- Eastern Region Flash Flood Conference Highlights... [Read More](#)
- Ways to submit storm reports... [Read More](#)
- SKYWARN Training: Schedule for New York or Pennsylvania

Click to view the Hazardous Weather Outlook Central NY and Northeast PA  
 Click on the map below for the latest forecast.

Read watches, warnings & advisories  
 Small Craft Advisory  
 Hazardous Weather Outlook  
 Short Term Forecast

Last map update: Mon, Sep. 27, 2010 at 12:02:30 pm EDT

A storm system over the Tennessee Valley will slowly lift north into southern Canada by Tuesday evening. As a result, a wet period is in store, with temperatures staying fairly mild for late September. Dry weather should return on Wednesday as high pressure builds over the region.  
[See Full Discussion](#)

Text Forecasts Hourly Weather Graph Quick Forecast Graphical Forecast Images

National Weather Service • Since 1870

**Flood Watches**

National Weather Service Forecast Office  
Blacksburg, VA

Home News

Página en Español

Local forecast by "City, St"

Current Hazards  
National Hazards  
Local Hazards  
Local Storm Reports  
Current Weather Event

Current Conditions  
Observations  
River & Lake Level  
Rivers & Lakes AHPs  
Air Quality  
Report Your  
Precipitation

Radar/Satellite  
Imagery  
RIDGE Radar  
Standard Radar  
Charlotte TDWR  
Nationwide Radar  
National Satellite  
Regional Satellite

Forecasts  
Activity Planner  
Aviation  
Fire Weather  
Forecast Discussion  
Graphical

Top News of the Day View All News Items

- Current Weather Event
- Skywarn Classes Scheduled (09/22/10)
- NWS Blacksburg Open House October 2nd (08/27/10)

Looking For An Update? Forecasts Below Refreshed Every 3 Hours

Roanoke Lynchburg Lewisburg, WV Blacksburg Boone, NC Others...

Quick Glimpse at the Weather and Local Hazards Blacksburg, VA

Click on the map below for the latest forecast.

Last map update: Sun, Sep. 26, 2010 at 6:44:59 pm EDT

About the New Point and Click Map Changes  
Frequently Asked Questions About The Map and Colors

Choose from the options below for other ways to view your NWS forecast

Text Forecasts Digital Forecast Quick Forecast Graphical Forecast Images

**Flood Warnings**

National Weather Service Weather Forecast Office  
Twin Cities, MN

Home Site Map News Organization Search for:  NWS All NOAA

Local forecast by "City, St" or Zip Code

XML RSS Feeds

Current Hazards  
Watches/Warnings  
Outlooks  
Submit Report

Current Conditions  
Observations  
Radar  
Satellite  
Observed Precip

Forecasts  
Forecast Discussion  
Local Area  
Activity Planner  
Aviation Weather  
Fire Weather  
Marine Weather  
Severe Weather  
Winter Weather  
Hurricane Center

Hydrology  
Rivers & Lakes  
Climate  
Local  
National  
Drought  
More...

Weather Safety  
Preparedness

Top News of the Day

- Join the CoCoRaHS Precipitation Observing Team - Free Training Classes
- The Current Rainfall Event in a Historical Perspective

Watches & Warnings Observations Forecast Graphics Rivers & Lakes Climate Fire Weather

Click on the map below for the latest forecast.



Last map update: Sun, Sep. 26, 2010 at 5:51:49 pm CDT

Latest Conditions in Minneapolis, MN Choose Your Front Page City

Sep 26 4:53 pm 64°F (18°C) A Few Clouds

Select A City:

Weather Story Radar Satellite Weather Map

**Flood Warning**

**FLOOD STATEMENT**  
 NATIONAL WEATHER SERVICE TWIN CITIES/CHAMASSIN MN  
 1247 PM CDT MON SEP 27 2010

...THE FLOOD WARNING IS CANCELLED FOR THE FOLLOWING RIVERS IN WISCONSIN...

CHIPPENWA RIVER AT SAU CLAIRE AFFECTING SAU CLAIRE COUNTY

...THE FLOOD WARNING CONTINUES FOR THE FOLLOWING RIVERS IN MINNESOTA... WISCONSIN...

REDWOOD RIVER NEAR REDWOOD FALLS AFFECTING REDWOOD COUNTY  
 COTTONWOOD RIVER AT NEW ULM AFFECTING BLUE EARTH... BROWN AND NICOLLET COUNTIES  
 MINNESOTA RIVER AT HANAKATO AFFECTING BLUE EARTH AND NICOLLET COUNTIES  
 MINNESOTA RIVER AT SAVAGE AFFECTING DAKOTA... HENNEPIN AND SCOTT COUNTIES  
 CHIPPENWA RIVER AT DUDAND AFFECTING BUFFALO AND PEPIN COUNTIES

...THE FLOOD WARNING CONTINUES FOR THE FOLLOWING RIVERS IN MINNESOTA... WISCONSIN...

MINNESOTA RIVER AT NEW ULM AFFECTING BLUE EARTH... BROWN AND NICOLLET COUNTIES  
 MINNESOTA RIVER AT HENDERSON AFFECTING LE SUEUR... SCOTT AND SIBLEY COUNTIES  
 MINNESOTA RIVER NEAR JORDAN AFFECTING CARVER AND SCOTT COUNTIES  
 MINNESOTA RIVER AT SHAKOPEE AFFECTING CARVER... HENNEPIN AND SCOTT COUNTIES  
 SOUTH FORK CROW RIVER BELOW HAYES AFFECTING CARVER COUNTY  
 MISSISSIPPI RIVER AT ST PAUL AFFECTING DAKOTA... RAMSEY AND WASHINGTON COUNTIES  
 MISSISSIPPI RIVER NEAR HASTINGS L/D 2 AFFECTING DAKOTA... WASHINGTON AND PIERCE COUNTIES

...OVERVIEW...  
 A DRY NORTHWEST AIRFLOW WILL DOMINATE THE WEATHER OVER THE REGION THIS WEEK BRINGING DRY CONDITIONS WITH TEMPERATURES NEAR NORMAL.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

DO NOT DRIVE CARS THROUGH FLOODED AREAS. TURN AROUND... DON'T DROWN.  
 STAY TUNED TO NOAA WEATHER RADIO OR YOUR LOCAL RADIO OR TV STATION FOR THE LATEST INFORMATION CONCERNING THIS FLOOD EVENT.



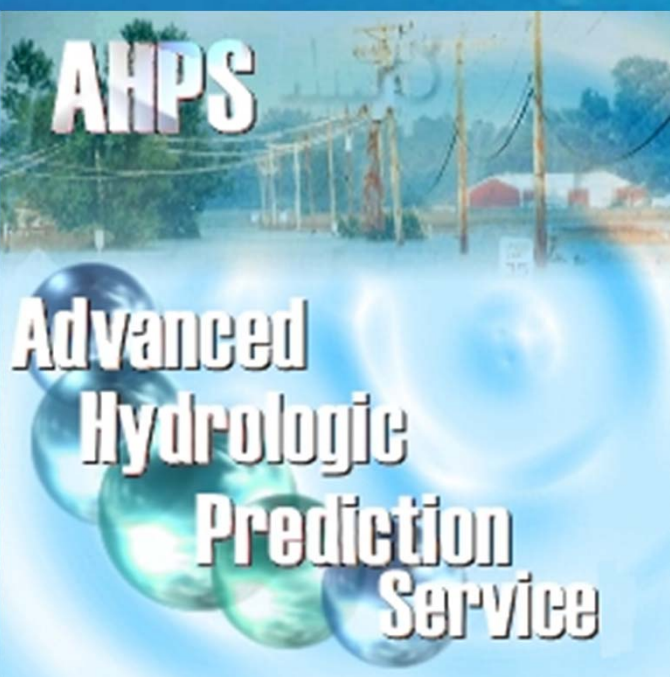
44

HNCO13-015-103-282347-  
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 /HUNTS.S.R.100924T0024Z.100926T1600Z.101002T0112Z.NR/  
 1247 PM CDT MON SEP 27 2010

THE FLOOD WARNING CONTINUES FOR THE COTTONWOOD RIVER AT NEW ULM.

- \* AT 12:00 PM MONDAY THE STAGE WAS 19.0 FEET.
- \* MAJOR FLOODING IS OCCURRING AND MAJOR FLOODING IS FORECAST.
- \* FLOOD STAGE IS 11.0 FEET.
- \* FORECAST... THE RIVER WILL CONTINUE TO FALL TO BELOW FLOOD STAGE BY FRIDAY EVENING.
- \* IMPACT... AT 19.0 FEET... FLOOD WATERS BEGIN TO IMPACT COTTONWOOD STREET WEST OF THE RIVER.
- \* IMPACT... AT 11.0 FEET... FLOOD WATERS BEGIN TO IMPACT LOW LYING AREAS... AND SOME ROADS ALONG THE RIVER.
- \* FLOOD HISTORY... THIS CREST COMPARES TO A PREVIOUS CREST OF 19.2 FEET ON APR 25 2001.

##

AHPS

Advanced  
Hydrologic  
Prediction  
Service



# River Forecasts and Warnings



Home News Organization

Guide to Hydrologic Information on the Web. To open PDF click here.

**ALERT!!** A Flood Warning and Flood Watch are in effect for portions of the area. View all valid statements/warnings or choose a specific point or river to get the details for that location.

Local weather forecast by "City, ST"

City, ST  Go

Weather Forecast Office Twin Cities/Chanhassen, MN

River Observations River Forecasts Within 48 Hours Precipitation Download

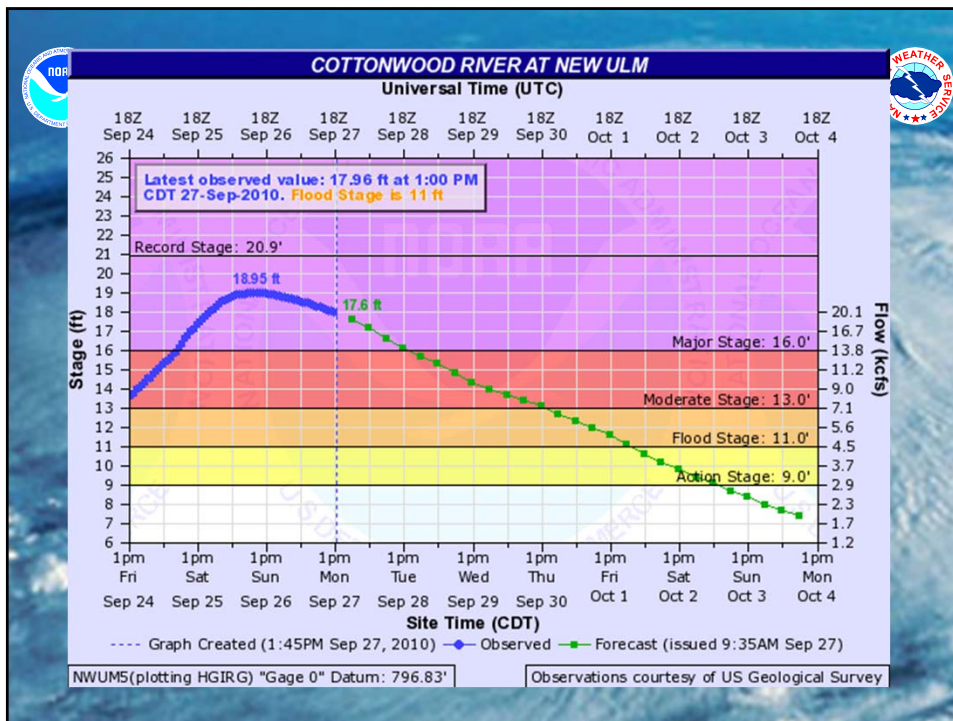
09/26/2010 05:46 PM CDT

Map Legend

- Hydrograph Available
- Probability and Hydrograph Available
- Major Flooding
- Moderate Flooding
- Minor Flooding
- Near Flood Stage
- No Flooding
- Observation More Than 24 Hours Old
- Out of Service

104 Total Gauges 22 Locations in Flood

FLOODSMART.GOV





# Getting the Word Out



# NOAA Weather Radio



National Oceanic and Atmospheric Administration's  
**National Weather Service**

Local forecast by "City, ST"

Sign-up for Email Alerts  
 RSS Feeds  
 Warnings  
 Current  
 By State/County...  
 UV Alerts  
 Observations  
 Radar  
 Satellite  
 Snow Cover  
 Surface Weather...  
 Observed Precip  
 Forecasts  
 Local  
 Graphical  
 Aviation  
 Marine  
 Hurricanes  
 Severe Weather  
 Fire Weather  
 Text Bulletins  
 By State  
 By Message Type  
 National  
 Forecast Models  
 Numerical Models  
 Statistical Models...  
 MDS Prod  
 GFS-LAMP Prod  
 Climate  
 Past Weather  
 Predictions  
 Weather Safety  
 Weather Radio  
 Hazard Assmt...  
 StormReady /  
 TsunamiReady  
 Skywarn™  
 Education/Outreach  
 Information Center  
 Tsunamis  
 Publications...  
 Contact Us  
 FAQ  
 Comments...  
 Submit comments on the draft NWS Strategic Plan

Site Map News Organization

... Fourth Warmest U.S. Summer on Record ...  
 The contiguous United States had its fourth-warmest summer (June-August) on record, according to the latest NOAA State of the Climate report. The report also showed the August average temperature was 75.0 degrees F, which is 2.2 degrees F above the long-term (1901-2000) average. Details...

Warnings & Forecasts Graphical Forecasts National Maps Radar Water Air Quality Satellite Climate

Warnings By State  Click Below To Zoom In. Tabs At A Glance

Created: 09/27/10 at: 19:06 UTC

American Samoa · Guam · Puerto Rico/Virgin Islands

Flash Flood Warning  
 Special Marine Warning  
 High Wind Warning  
 Tornado Warning  
 Flash Flood Watch  
 Severe Weather Statement  
 Flood Warning

Gale Warning  
 Red Flag Warning  
 Flood Advisory  
 Coastal Flood Advisory  
 High Surf Advisory  
 Small Craft Advisory  
 Coastal Flood Watch

Flood Watch  
 High Wind Watch  
 Special Weather Statement  
 Marine Weather Statement  
 Hazardous Weather Outlook  
 Hydrologic Outlook  
 Short Term Forecast

High Res | Map FAQ | Map Comments | What is UTC?

Warnings	Forecasts	Climate	Information Center	Administrative
Current	Local	Past Weather	Tsunamis	Headquarters
State/County	Graphical	Predictions	Publications	For MWS
RSS/XML	Aviation	Heating/Cooling Days	Proper Sting for	Employees
UV Alerts	Marine	Monthly Temps	Weather Instruments	Mission Statement
	River/Stream	Records	Damage/Fatality/Injury	Strategic Plan
	Hurricanes	Long Range Forecasts	Statistics	Headline Archive
Radar	Severe Weather	Astronomical Data	Admin msp/charts	International
Satellite	Fire Weather		Brochures	Legislative Affairs
Snow Cover	Sun/Moon	Education/Outreach	Digital Forecast Info	National Centers
Marine	Forecast Models	NOAA Economics	GIS Products	Local Offices
River/Stream	Numerical Models	NOAA Education	MM Products	Products and Services
Surface Weather	Statistical Models	General Public		
Observed Precip	MDS Prod	Teachers	Weather Safety	Contact Us
	GFS-LAMP Prod	Students	Weather Radio	FAQ
Text Bulletins	Current Forecast	Play Time for Kids	Hazard Assmt	Comments
By State		Audio/Video	StormReady	

<http://weather.gov>

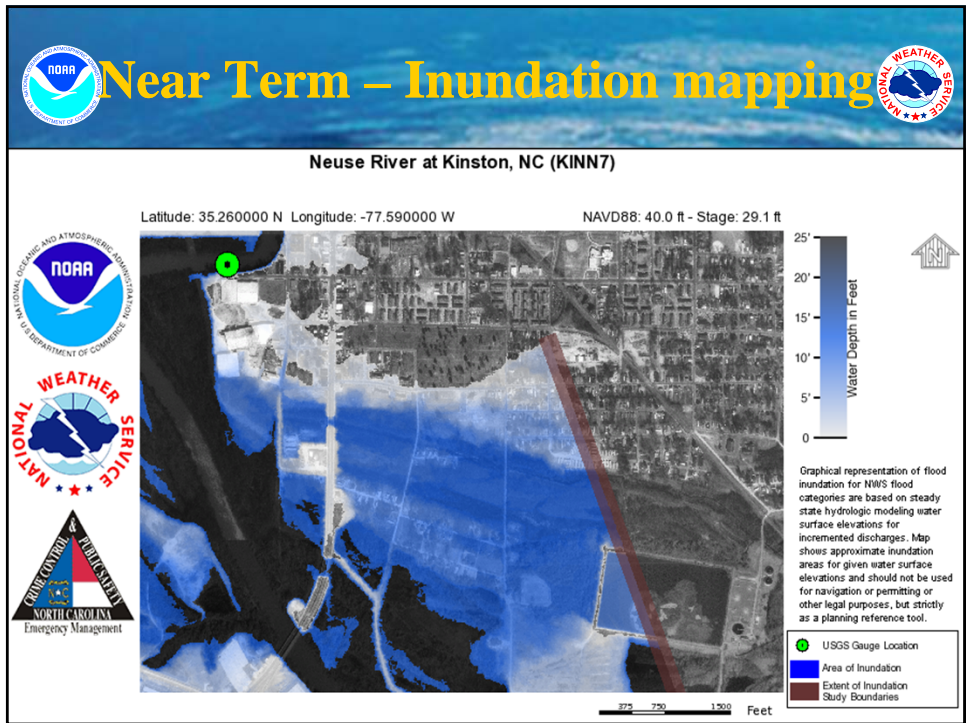
<http://inws.wrh.noaa.gov/>

**iNWS - Interactive NWS**  
 National Weather Service Mobile Decision Support Services (MDSS)

**iNWS MOBILE ALERTING**  
 Receive customized text message and e-mail alerts for National Weather Service products that you care about.

**Welcome.**

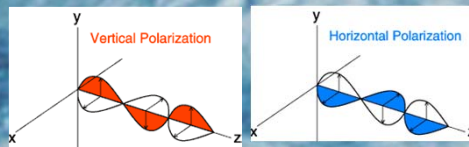
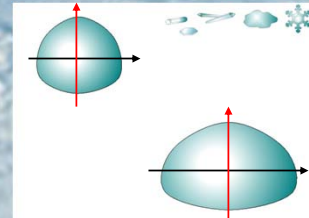
InteractiveNWS (iNWS) is the home of new mobile and desktop innovations of the National Weather Service. This application suite allows NWS partners to receive National Weather Service products in new and innovative ways, such as text messaging and mobile-enabled webpages. iNWS strives to fulfill our mission of protecting life and property by using new technology to reach out to our customers.







# Dual-polarization Radar

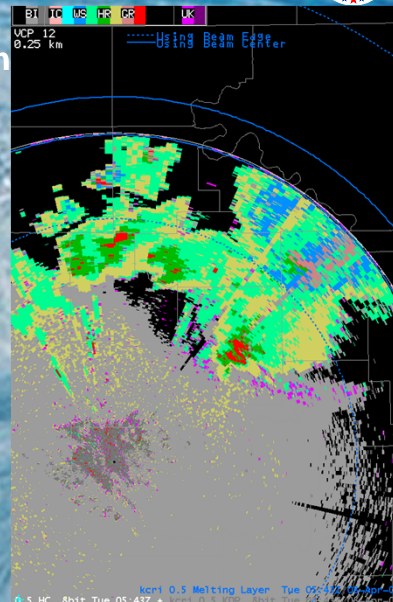


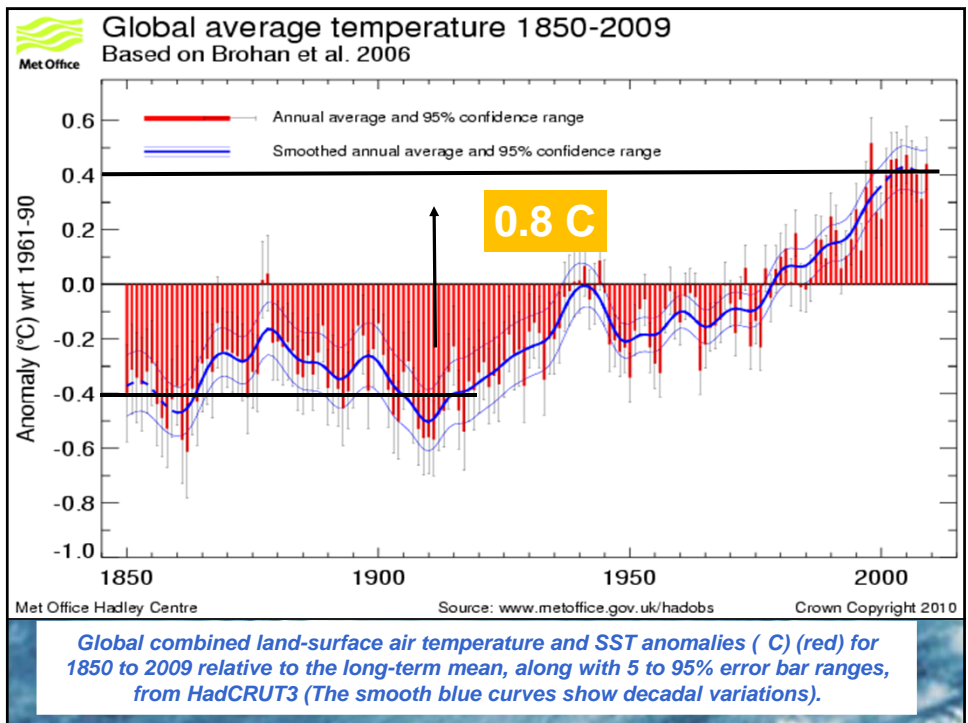
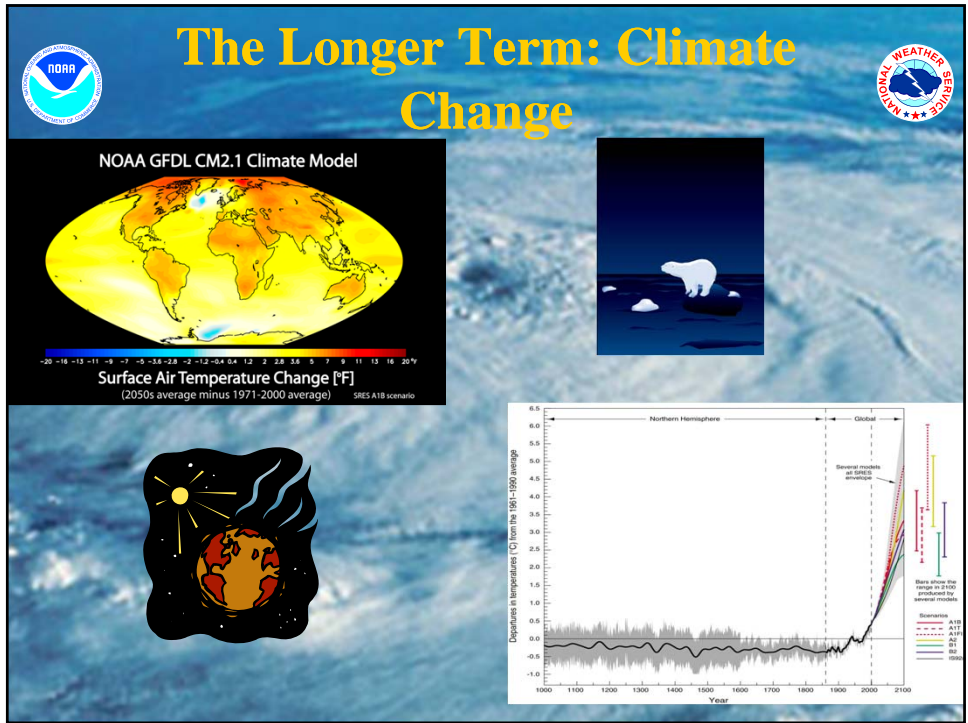
# Benefits

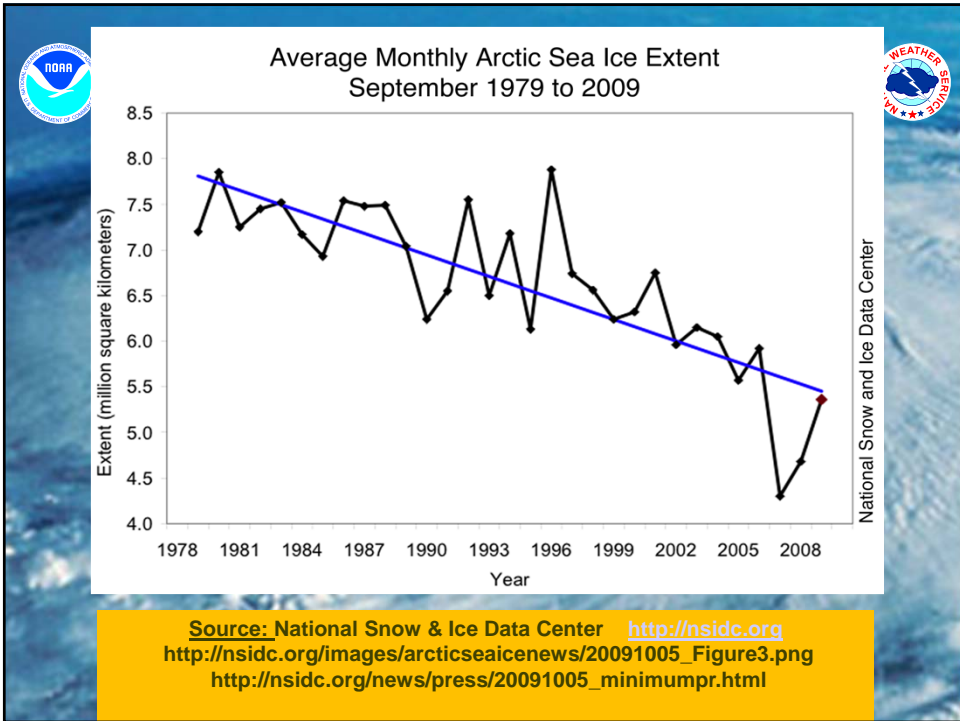
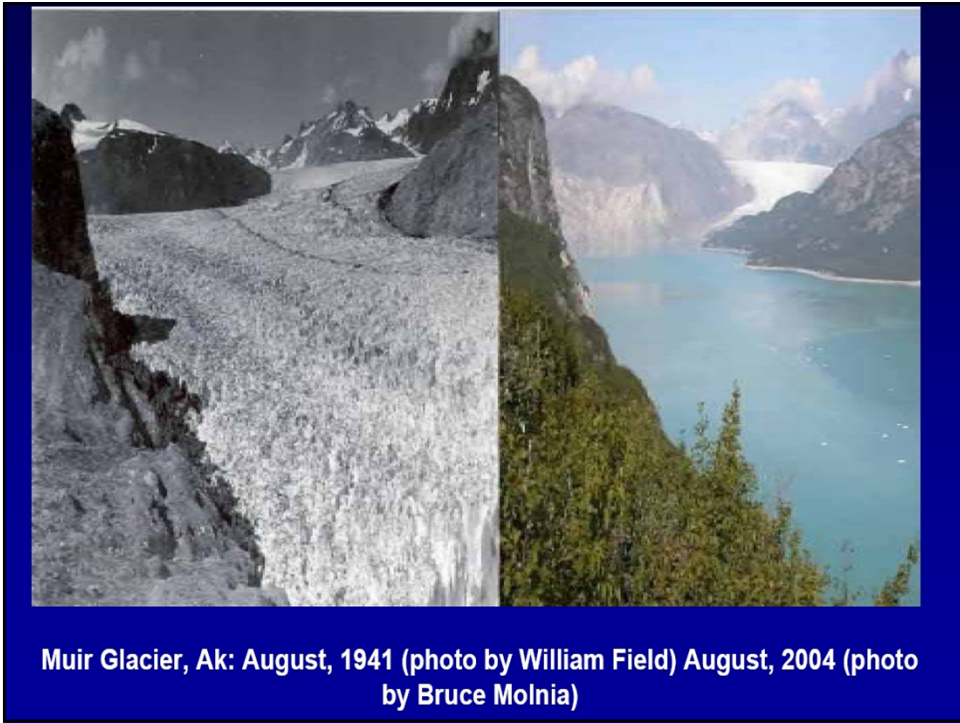


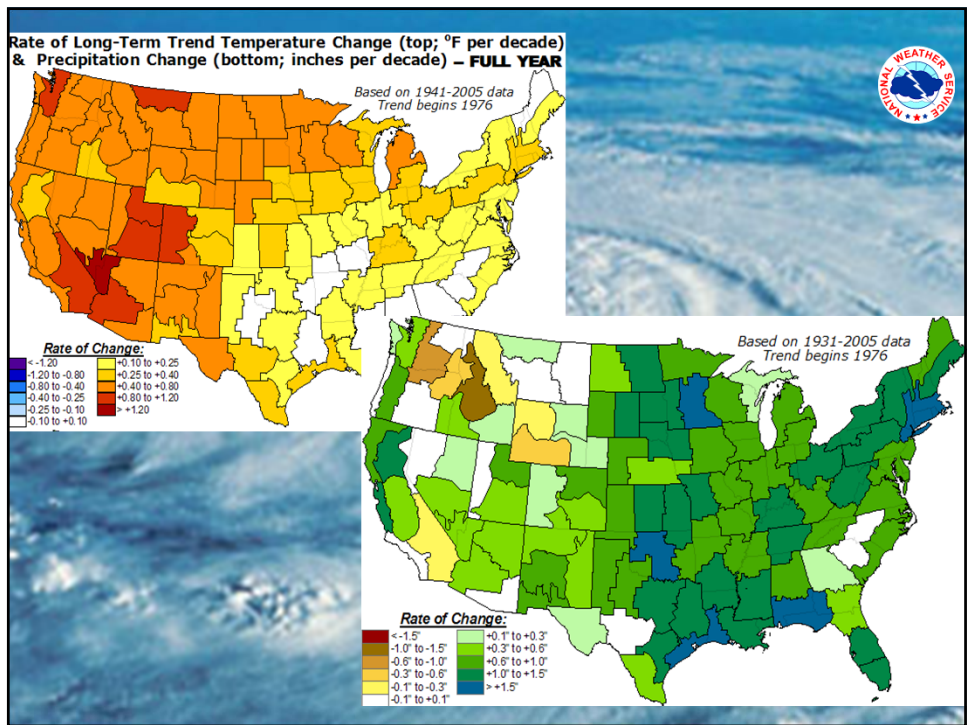
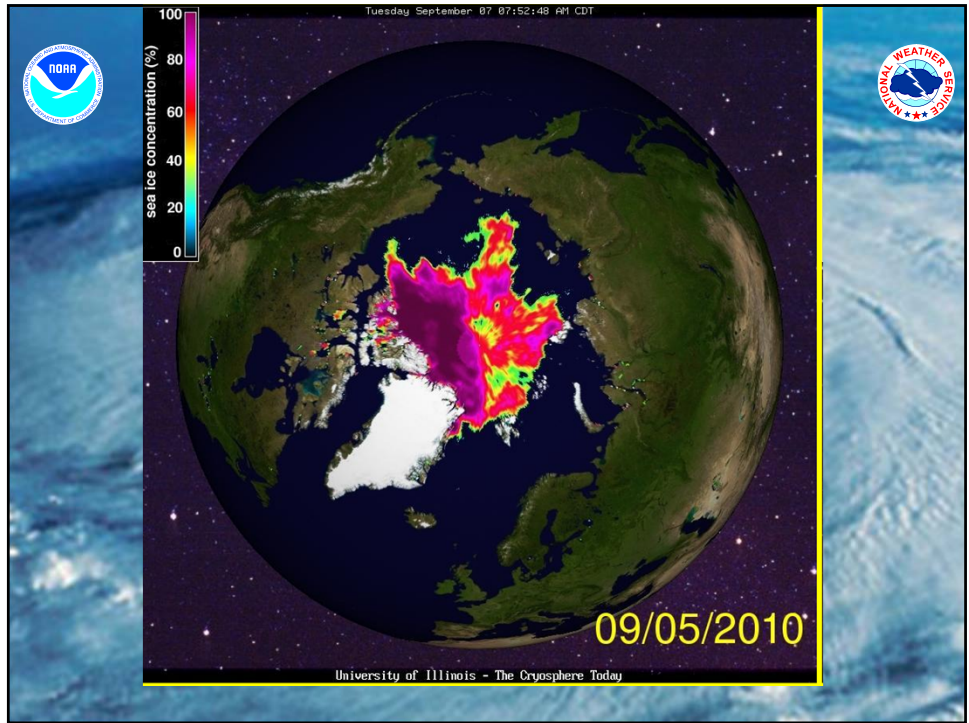
- Better able to distinguish between rain, hail, sleet, and snow.
- Improved data quality.
- Significant improvements in precipitation estimates.

Deployment 2011-2012







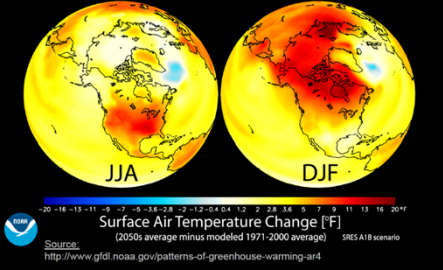




# It will be a warmer & wetter world



Climate Change Responses Are Not Geographically Uniform  
NOAA GFDL CM2.1 Climate Model



### Mean Decadal Change in the 99th Percentile of Daily Accumulations: 1948-2007

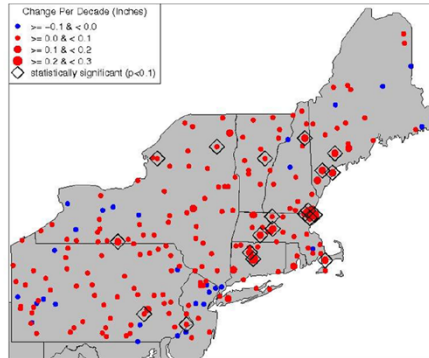
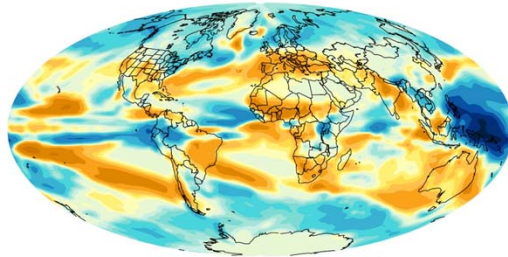


Figure 8. Trends in the 99th percentile of daily accumulations per decade from 1948-2007. Increasing trends are shown in red, decreasing in blue. Trends were calculated from ten 51-year window time series. Statistically significant trends are indicated by black diamonds.

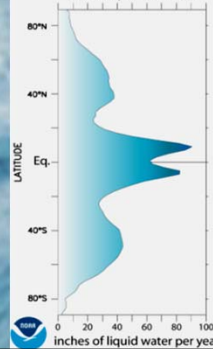
### CHANGE IN PRECIPITATION BY END OF 21st CENTURY inches of liquid water per year



as projected by NOAA/GFDL CM2.1

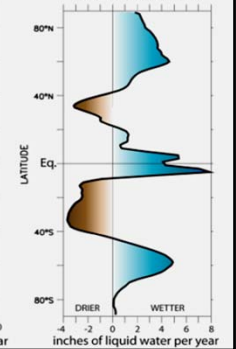
### LONGITUDINALLY AVERAGED 1950-2000 PRECIPITATION

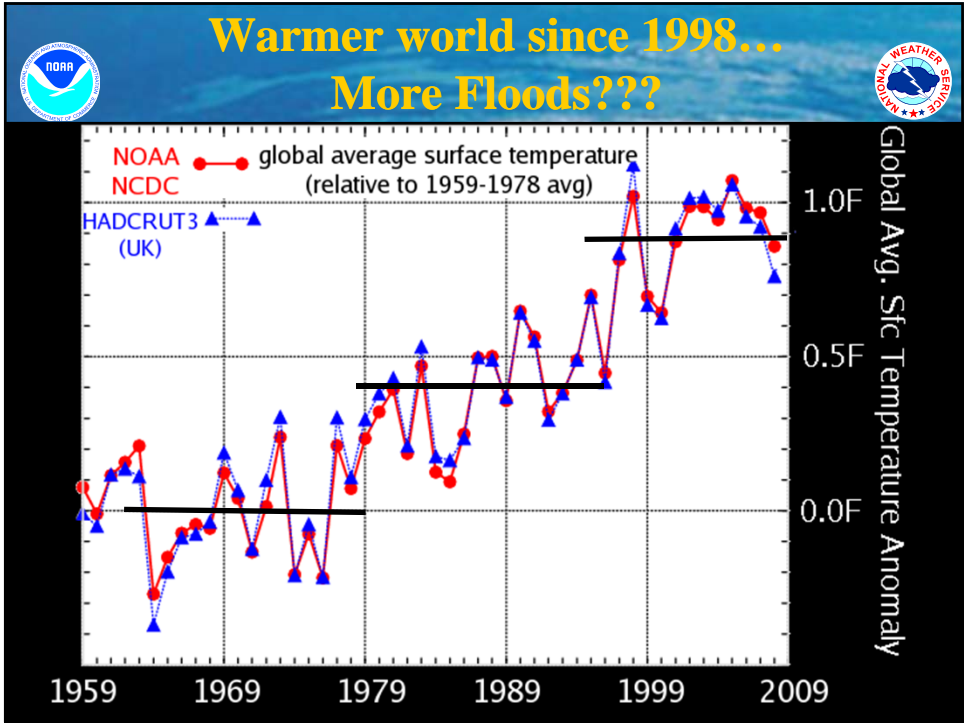
as modeled by NOAA/GFDL CM2.1



### LONGITUDINALLY AVERAGED 21st Cy PRECIPITATION CHANGE

as projected by NOAA/GFDL CM2.1







# NWS Strategic Plan for 2020



## Enhanced Climate Services



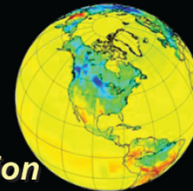
Enhance climate services to help communities, businesses, and governments understand and adapt to climate-related risks



## Where We're Headed



### Climate Services



- *Climate information demands increasing*
  - *High quality observations*
  - *Improved seasonal to inter-annual prediction*
  - *Downscaled products and services to regional and local levels*
- *Entire Weather and Climate Enterprise must work together to meet these challenges*
  - *NWS committed to doing our part*

- **Improve Preparation for and Response to Heat Waves, Drought, Coastal Inundation, and Other Phenomena**
- **Relevant and Reliable Climate Data Will Stimulate Private Development of Technologies and Applications**



# NWS Strategic Plan for 2020



## Weather Decision Services

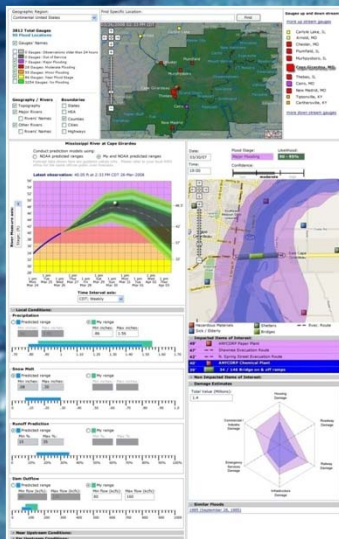


Improve weather decision services for events that threaten safety, health, the environment, economic productivity, or homeland security [Learn More >>](#)

- But now, its not just good enough to make a better weather forecasts.
- Insure appropriate level of information is getting to decision makers.
- Better insight into how people react and respond to warnings.
- Focus on user-defined impact based-warnings.



# NWS Decision Support Services- Painting a Complete Picture Quickly



## New Decision Tools created by a team of Social Scientists with Emergency Managers

- Visualizations of inundation “impact” for various flooding scenarios
- Visualization of uncertainty model inputs for more clear understanding predictions
- Allow for local knowledge to be incorporated into impacts (inundation and costs)
- *Fusion/organization of information* for clear understanding of relationship to one another and enhanced orientation.





# NWS Strategic Plan for 2020



## Integrated Water Services



Deliver a broad suite of improved water services to support management of Nation's water supply

[Learn More >>](#)



## Where We're Headed



### Water Resource Services

- Provide high-resolution water quantity, quality, and soil moisture forecasts
  - Emergency and resource managers mitigate losses for conditions ranging from droughts to floods



- Enables NOAA to meet our Nation's growing needs for water forecasts
- Provides forecasts for consumption resources
- Provides important resource protection capabilities



# Questions?

