

Turkey River Basin Flood Seminar

Thursday, June 14th, 2012
Clermont, Iowa

Mike Welvaert, Service Hydrologist
National Weather Service, La Crosse, WI



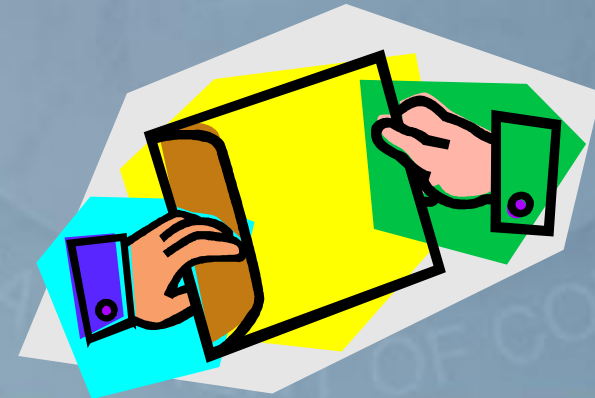
TURKEY RIVER BASIN FLOOD SEMINAR OVERVIEW

- An informational meeting to discuss river monitoring, flood forecasting, and water use in the Turkey Watershed.
- Why did we decide to host this seminar?



TURKEY RIVER BASIN FLOOD SEMINAR OVERVIEW

- There are several federal, state, and private groups that have responsibilities in the Turkey Watershed. We all collect data and information to support our own agendas.
- There are also local users that have their own information and ideas.
- The purpose of this seminar is to encourage an exchange of that information!



TODAY'S AGENDA

Turkey River Basin Overview and Recent Flooding Events

Mike Welvaert, National Weather Service, La Crosse, WI

USGS Operations in the Turkey River Basin and Cooperative Gaging Program

Jon Nania, US Geological Survey, Iowa City, IA

River Forecasting Procedures & Techniques for Northeast Iowa River Basins

Steve Buan/Mark Ziemer, National Weather Service, North Central River Forecast Center, Chanhassen, MN

Break



TODAY'S AGENDA

Iowa Stream Gauge Sensor Network

Witold Krajewski, Iowa Flood Center, University of Iowa, Iowa City, IA

Local Impacts and Actions from the Flooding

Randy Frank, Fayette County; Bruce Goetsch, Winneshiek County; Joel Biggs, Clayton County; Ken Raising, Chickasaw County; & Darrell Knecht, Howard County

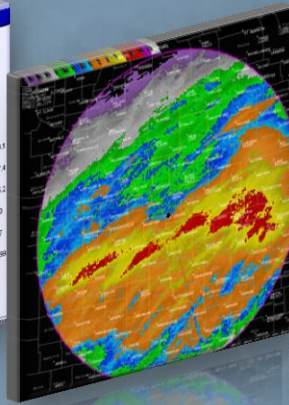
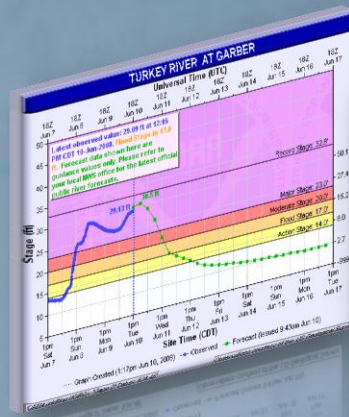
The State Role in Disaster Response

Joyce Flinn, Iowa Homeland Security Emergency Management, Des Moines, IA

Other local user groups in the Turkey Basin

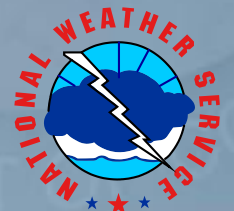
- Brad Crawford, Turkey River Watershed Project
- Scott Ralston/Chris Kahle, Iowa Department of Natural Resources
- Natural Resources Conservation Service
- Department of Transportation / County Highway Departments
- Canoe Rental Businesses / Campgrounds / Trout Fishing Groups / Others?





Turkey River Basin Flooding History and Overview

Mike Welvaert
 Service Hydrologist
 NOAA/NWS La Crosse
 June 14, 2012



Thanks to Todd Shea for his assistance in developing this presentation.

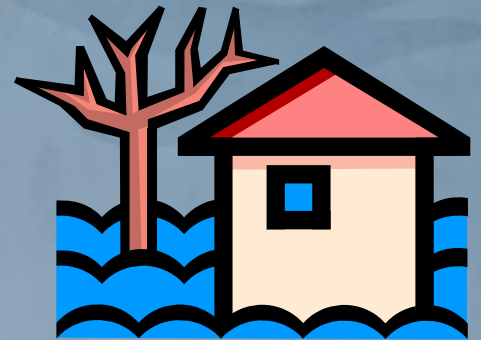
Outline

- History of Turkey Basin
- NWS Products/Services
- Overview of Recent Floods
 - 2008 / 2004 / 1999
- Heavy Rainfall!
- Observed Flooding
- Impacts on Public/Partners
- Outreach ideas
- Inundation Mapping



A Brief History of the Turkey Basin

- Turkey/Little Turkey headwaters in southern and eastern Howard County
- Volga headwaters in Fayette County
- Turkey River length about 130 miles
- Volga River length about 75 miles
- Drains nearly 1600 square miles
- Frequent Large Floods (2008, 2004, 1999, 1991, 1979)
- Significant sediment and debris causes problems with snags, jams, and erosion



A Brief History of the Turkey Basin

- Flooding in 1999 led to the loss of the towns of Elkport and Littleport.
- Flooding in 2008 led to a move of much of Garber to higher ground.
- Elkader and other communities also seriously impacted
- Many Recreational activities available



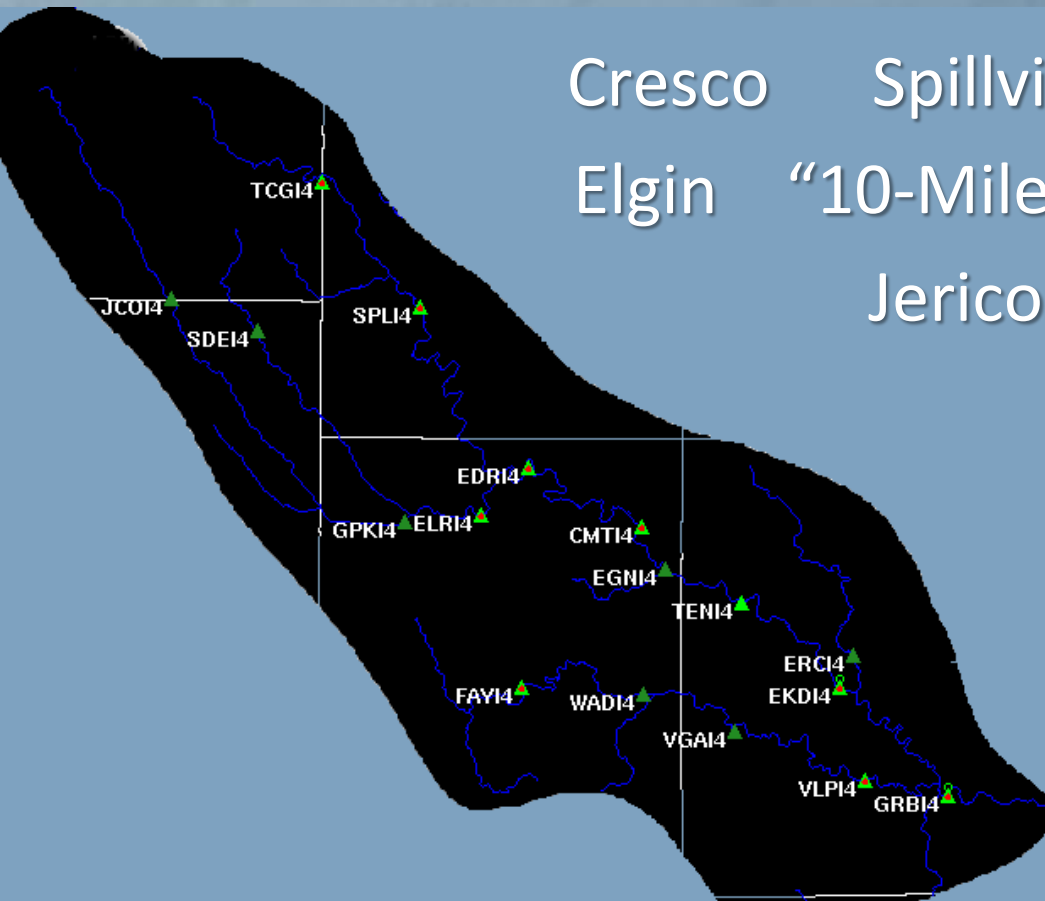
A Brief History of the Turkey Basin

- Changing Land-Use issues over the years
 - Land use practices and hilly terrain leading to more runoff into the river
 - Erosion and sedimentation have changed the channel characteristics significantly
 - Older bridges have been washed out or replaced, which once may have served as a debris catch



River Monitoring

- There are several river monitoring locations:



Cresco Spillville El Dorado Clermont
Elgin “10-Mile Bridge” Elkader Garber
Jerico Saude Gouldsburg Park
Near West Union Fayette
Wadena Volga
Littleport

River Monitoring

Types of river gages:

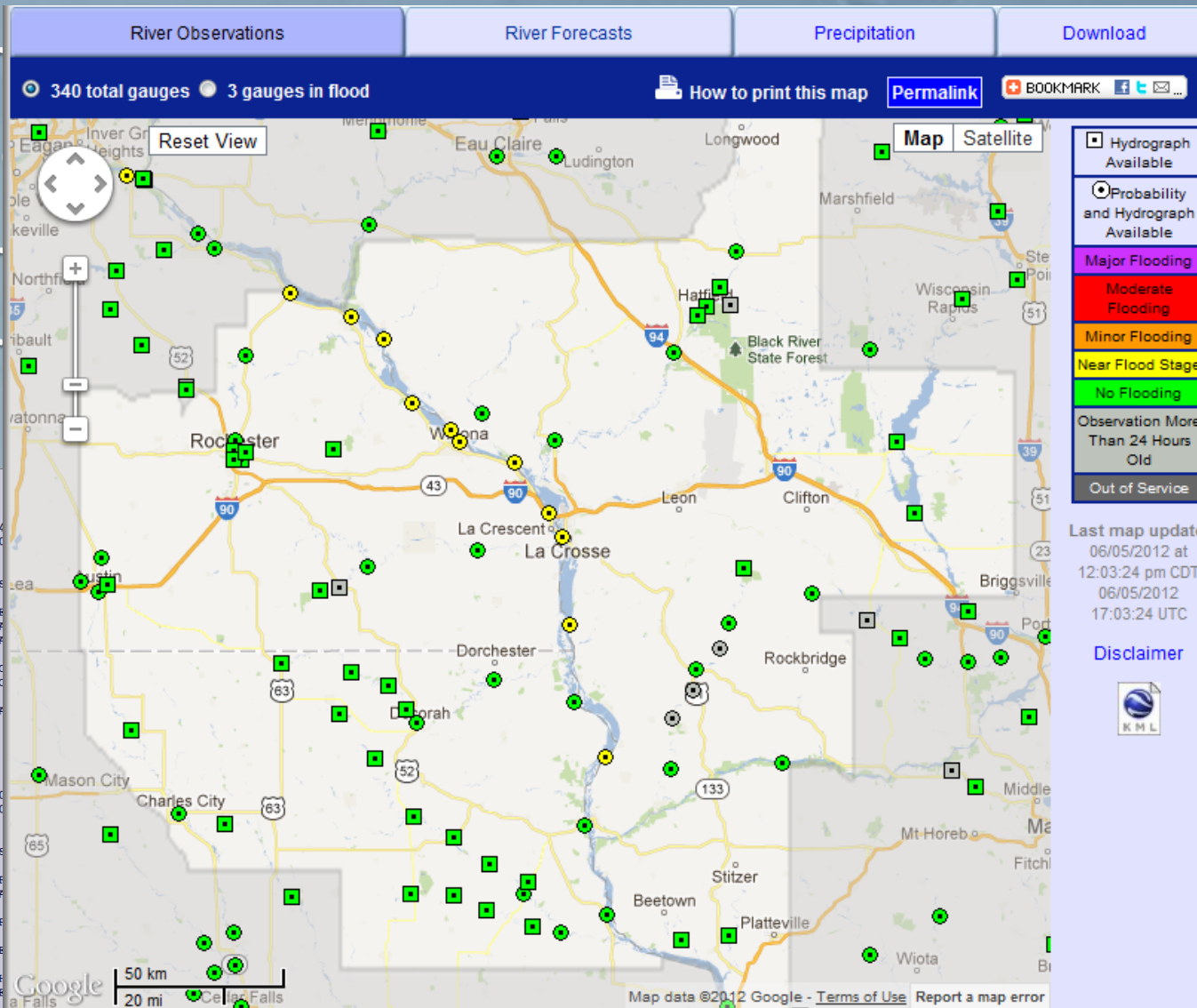
- Automated (USGS)



- Automated (Iowa Flood Center)

River Forecasts

- The
- The



and
osse

IAC043-240110-
/O.EXT.KARK.FL.W.0034.100724
/EKD14.2.ER.100724T0318Z.100
822 AM CDT FRI JUL 23 2010

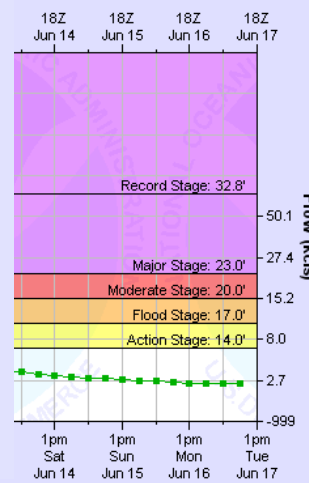
...FORECAST FLOODING INCREASES
THE FLOOD WARNING CONTINUES
THE TURKEY RIVER AT ELKADE
* FROM THIS EVENING TO MONDAY
* AT 7:45 AM FRIDAY THE STAGE
* FLOOD STAGE IS 12.0 FEET.
* MODERATE FLOODING IS FORECAST
* FORECAST...RISE ABOVE FLOOD
RISE TO NEAR 16.0 FEET BY SUNDAY

SS
IAC043-240110-
/O.EXT.KARK.FL.W.0035.000000
/GRB14.3.ER.100723T0544Z.100
822 AM CDT FRI JUL 23 2010

...FORECAST FLOODING INCREASES
THE FLOOD WARNING CONTINUES
THE TURKEY RIVER AT GARBER
* AT 7:15 AM FRIDAY THE STAGE
* FLOOD STAGE IS 17.0 FEET.
* MODERATE FLOODING IS OCCURRING
* FORECAST...THE RIVER WILL
SATURDAY MORNING. THE RIVER
MORNING.
* IMPACT...AT 26.0 FEET...THE
UPSTREAM OF GARBER IS THREE

Last map update:
06/05/2012 at
12:03:24 pm CDT
06/05/2012
17:03:24 UTC

RBBER



Disclaimer
KML

Site Time (CDT)

--- Graph Created (1:17pm Jun 10, 2008) --- Observed --- Forecast (issued 9:43am Jun 10)



Flooding Statements/Warnings

- The NWS also issues Flood Advisories and Flood/Flash Flood Warnings for larger areas.
 - Parts of counties
 - Smaller creeks and streams
 - Urban areas
- Flash Flood Warning
- Flood Warning
- Urban and Small Stream Flood Advisory



www.weather.gov/lacrosse

National Weather Service Weather Forecast Office

La Crosse, WI

Home Site Map News Organization

Local forecast by
"City, St" or Zip Code
 City, St

Current Hazards
Watches / Warnings
Outlooks
U.S. Hazards
Hurricane Info
Area Storm Reports
eSpotter

Current Conditions
Observations
Satellite Images
Rivers & Lakes AHPS
Precip Estimate
Snow Cover
River Stages
Local Plots
Winter Monitor

Radar Imagery
Local Radar
Nationwide
Local Radar (Faster)

Forecasts
Activity Planner
Local Area
Aviation
Fire Weather
Graphical
Interactive
Discussions

Top News of the Day

- [Tornado Threat Across Parts Of The Area Tonight](#)
- [Heavy Rain Tonight...Flash Flooding Possible](#)
- [Severe Weather on Friday, April 24th](#)
- [Record Warmth on Friday, April 24th](#)

Watches & Warnings Observations Forecast Graphics Rivers & Lakes Climate Outlooks

Click on the map below for the latest forecast.

Read watches, warnings & advisories

Zoom Out

- [Tornado Warning](#)
- [Flash Flood Warning](#)
- [Tornado Watch](#)
- [Flash Flood Watch](#)
- [Severe Weather Statement](#)
- [Flood Warning](#)
- [Flood Advisory](#)
- [Flood Watch](#)
- [Special Weather Statement](#)
- [Hazardous Weather Outlook](#)
- [Short Term Forecast](#)

Last map update: Sun, Apr. 26, 2009 at 6:20:10 pm CDT

Latest Conditions in La Crosse, WI Choose Your Front Page City

Apr 26 5:52 pm 54°F

Select A City:

[Click here to begin](#)



NWS - National Mosai...

NWS La Crosse, WI - ...

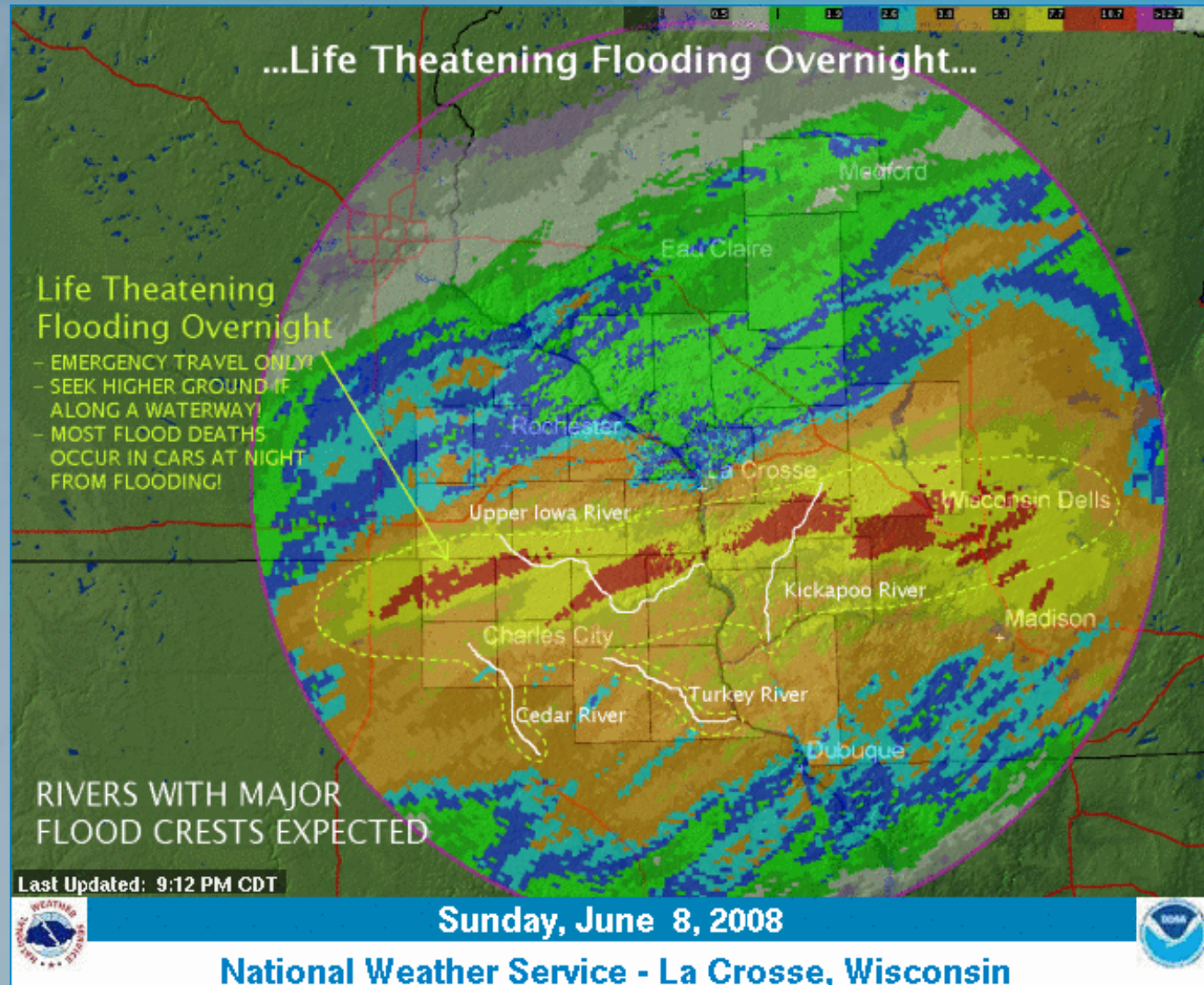
Weather Service
La Crosse, WI

June 7-8, 2008 Flooding

Several rounds of heavy thunderstorms have impacted the region. Rivers, creeks and streams will see flooding overnight. 7-9 inches of rain has fallen in the area depicted on the map as **LIFE THREATENING FLOODING**.

MAJOR RIVER FLOODS:
Kickapoo, Upper Iowa, Turkey, and Cedar rivers.

DO NOT TRAVEL. ENSURE YOU ARE ON HIGH GROUND AND EVACUATE TO DESIGNATED AREAS AWAY FROM WATERWAYS IN THE LIFE THREATENING AREA. MANY MUDSLIDES HAVE ALSO OCCURRED.



June 7-8, 2008 Flooding

- Two elements
 - Flash Flooding / River Flooding
- Communities flooded
 - Hundreds of homes damaged
 - Numerous businesses
 - Infrastructure destroyed
 - Dozens of mudslides
 - Many highways closed
- \$100 Million in damages

Bridge destroyed on County Road W42
between Clermont and Eldorado, IA
from June 8, 2008 flooding



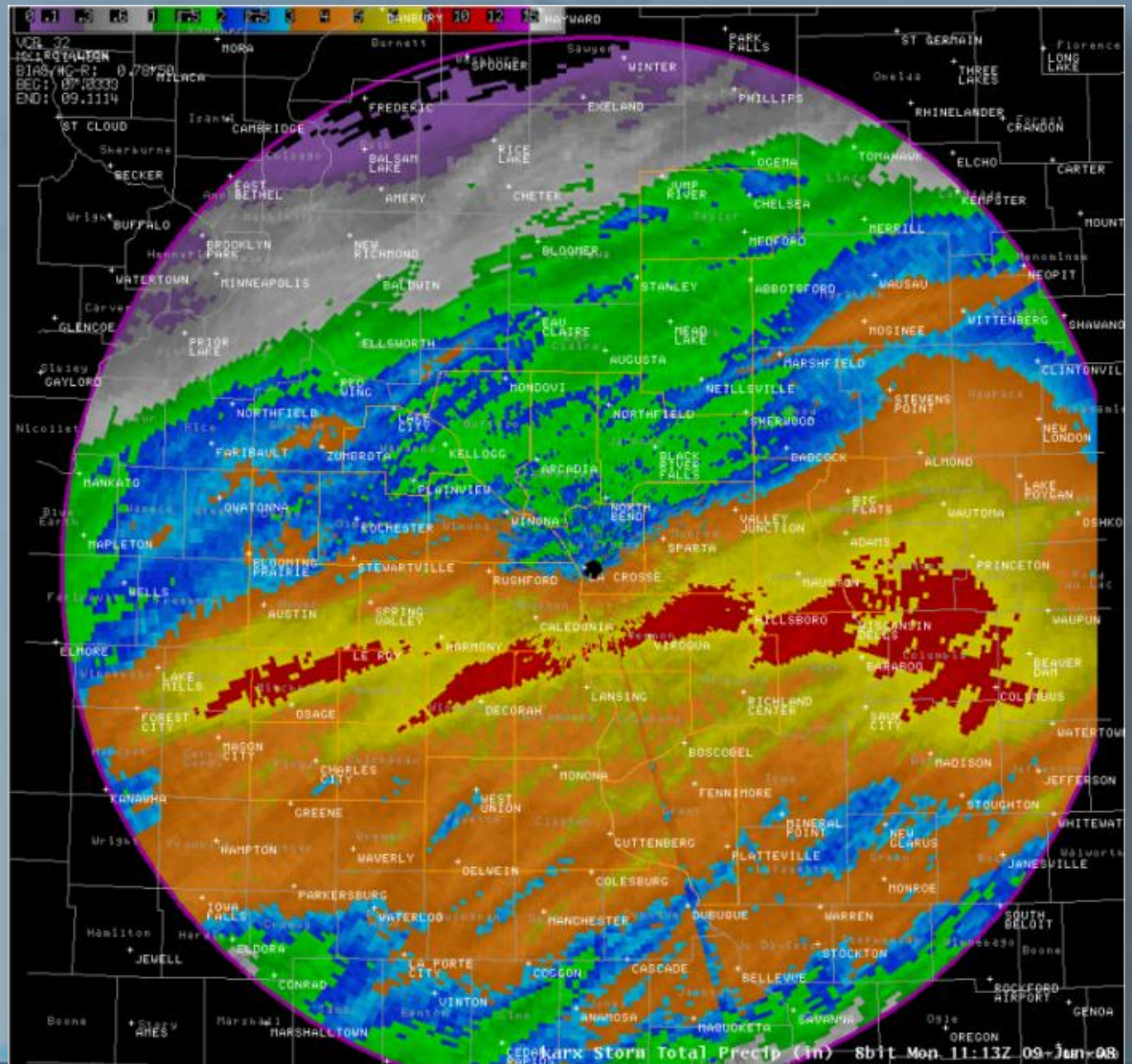
Damage to Great River Road
between Clermont and Eldorado, IA
from June 8, 2008 flooding

June 7-8, 2008

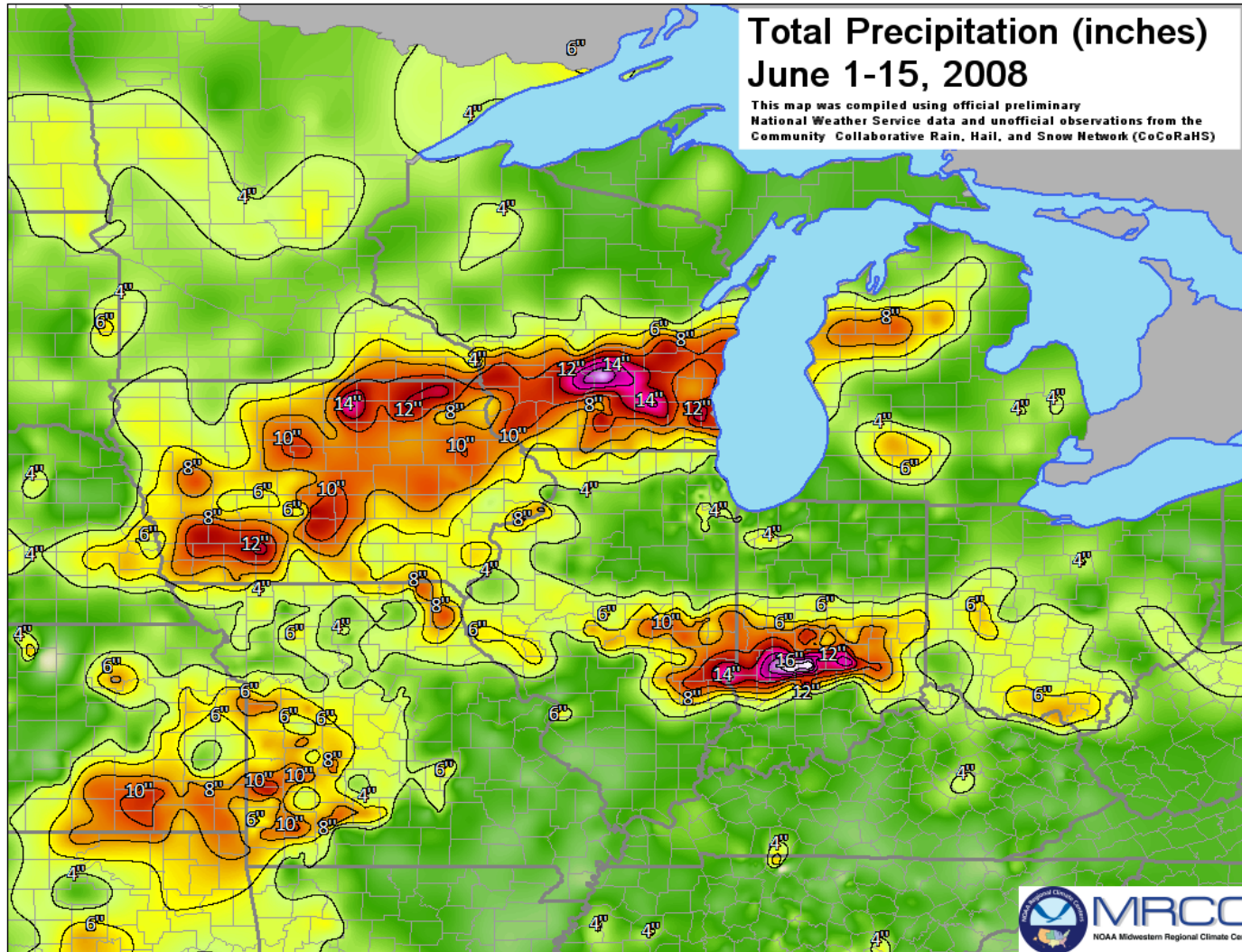
Radar Estimated Amounts
June 7th through the
night of the 8th.

- Yellow is 6-8 inches
- Red is 8-10 inches

Dorchester	7.30"
Edgewood	7.28"
Bluffton	7.23"
Kendallville	7.00"
Decorah	6.60"
Elma	6.25"
Ion	6.14"

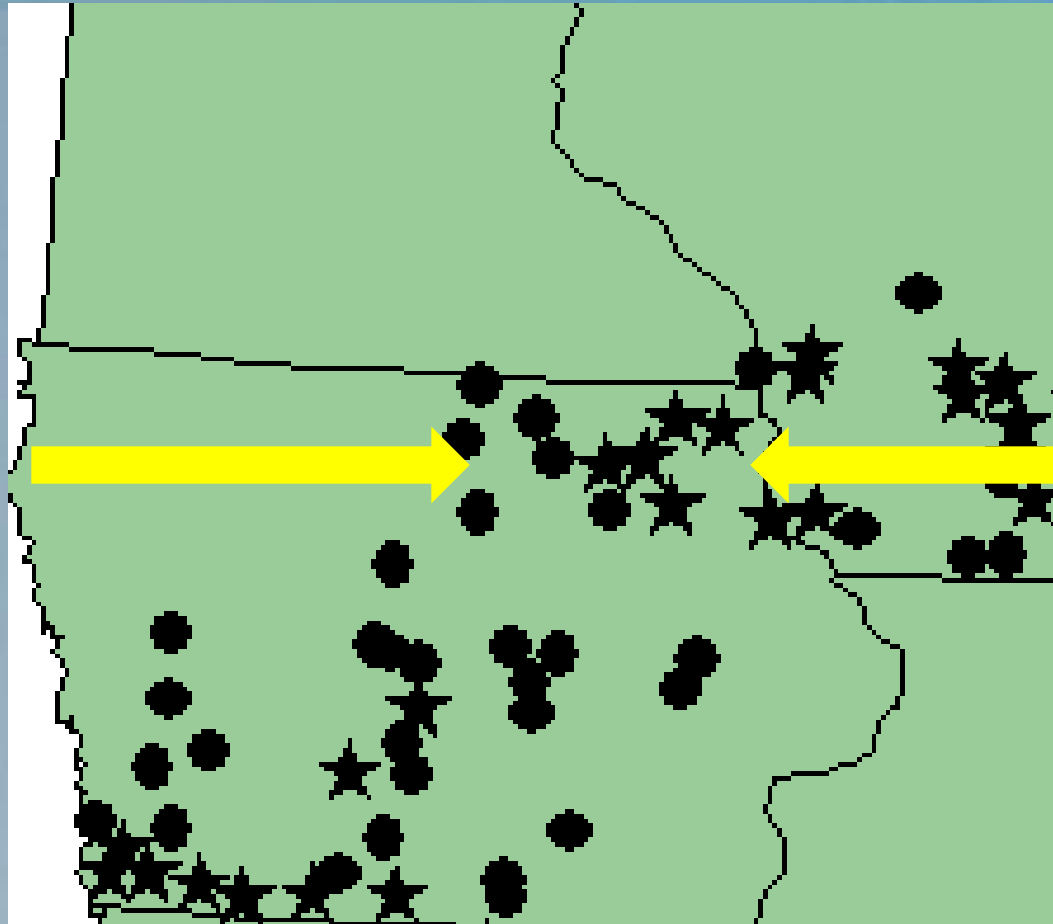


June 1-15, 2008 Rainfall



Rainfall Records

Seven sites with records ranked from 2-5

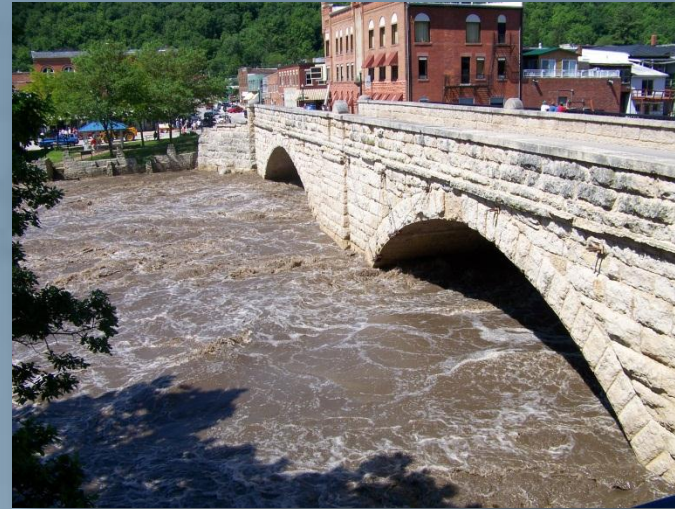


Six new rainfall records

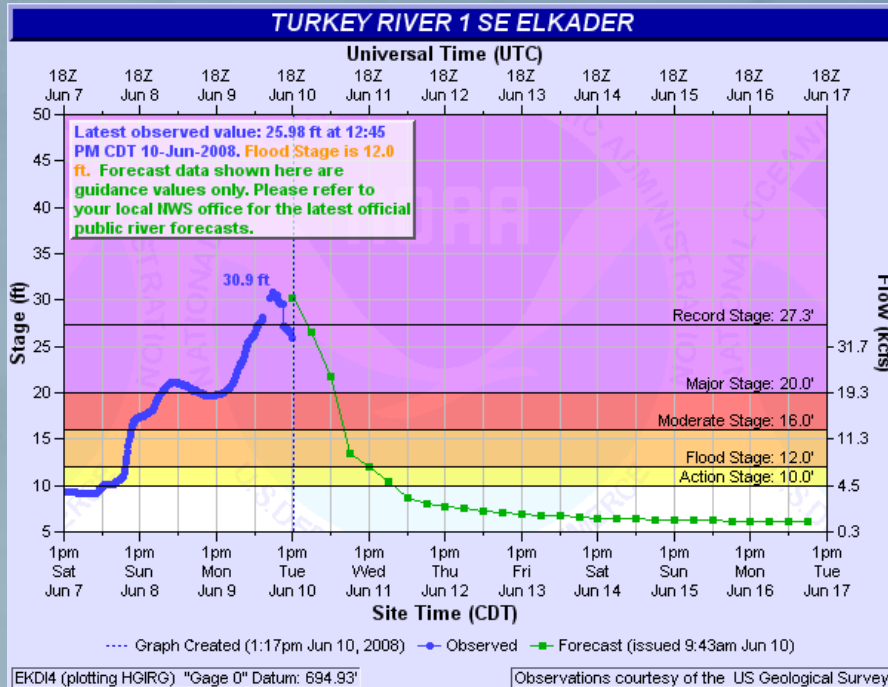
National Weather Service Cooperative Observer Network precipitation stations having a Top 5 precipitation total for June 2008. The locations with stars tied or exceed previous records, while the locations with dots are ranked second to fifth wettest. All stations reported at least 75% of the time, had 30 years or more of records, and were compared to all station data since 1895.

Extensive Flooding

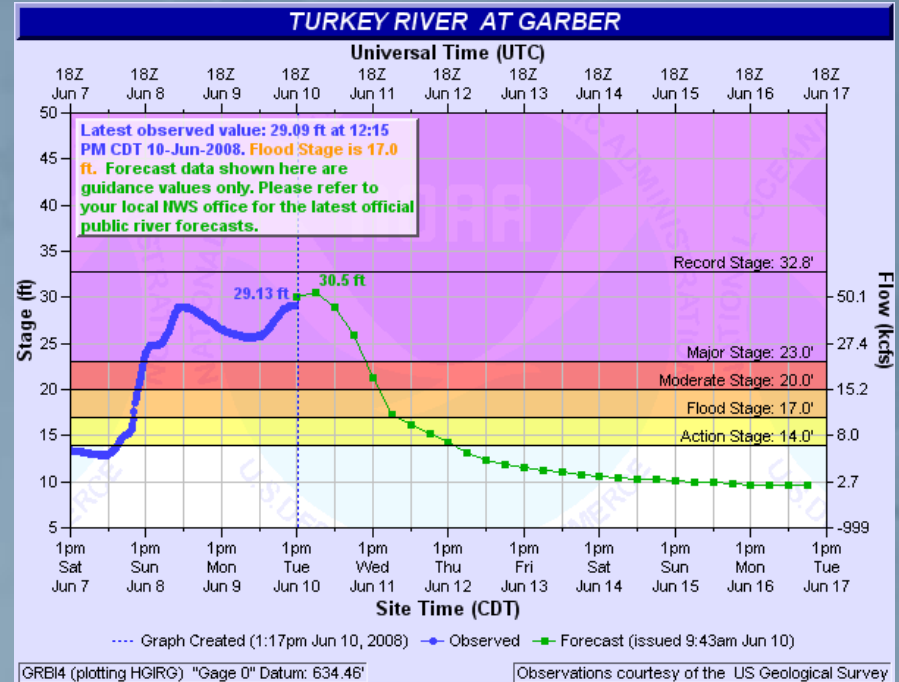
Bridge destroyed on County Road W42
between Clermont and Eldorado, IA
from June 8, 2008 flooding



Extensive Flooding



- Hydrograph for Elkader from June 2008



- Hydrograph for Garber from June 2008

It has happened before

2004:

1999:



Partner Impacts

- Some planned for event
- Workload dramatically increased
 - Large number of 911 calls
- Civil Emergency Decisions (evacuations)
- Hazards begin to compound themselves
 - Increases workload even more
- Longer term disaster
 - Days, weeks, months with no breaks
 - Relocation / Buyouts of structures
 - Rebuilding road and other infrastructure



Challenges

- Amount of rain (how to predict the “big one”)
- Recognizing scope of event
- How do we convey *higher impact* event?
- Weekend (summer) activities
- Weekend staffing
- Nighttime (darkness)
- Communication
- Simply getting around
- Exchange of information



Outreach Ideas

- Flood Safety Education
- Help people to recognize dangers around them
 - Look for the signs; realize this is different than before
- Signage in most dangerous areas
- Flash Flood Awareness projects



**Turn Around
Don't Drown**

tadd.weather.gov



Outreach Ideas

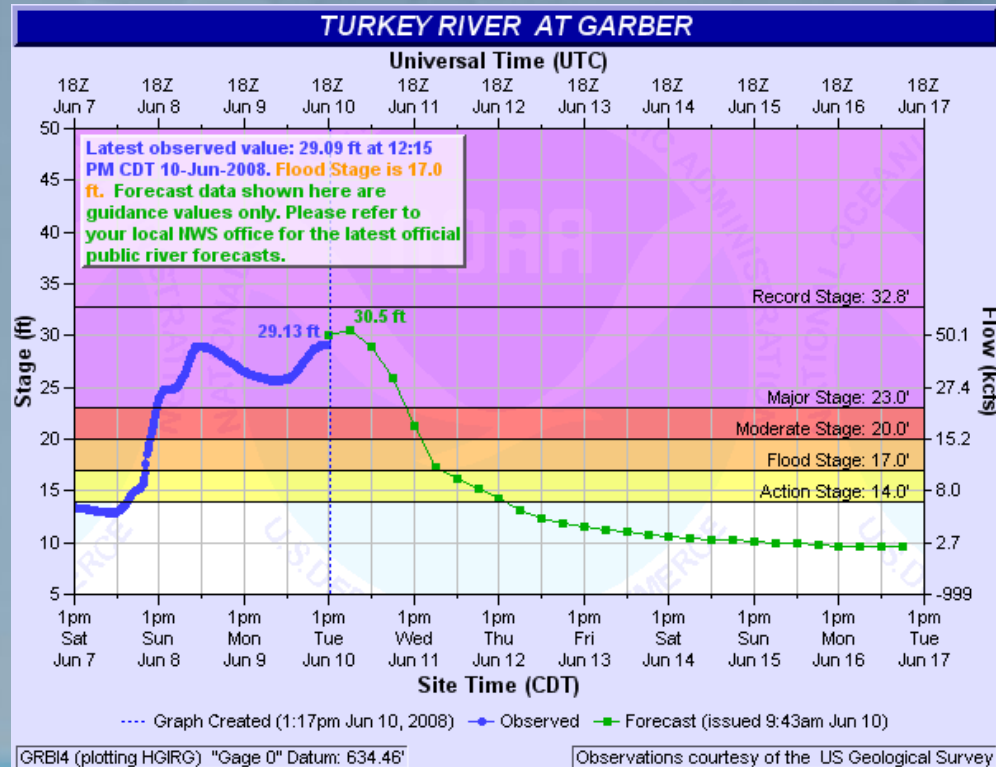
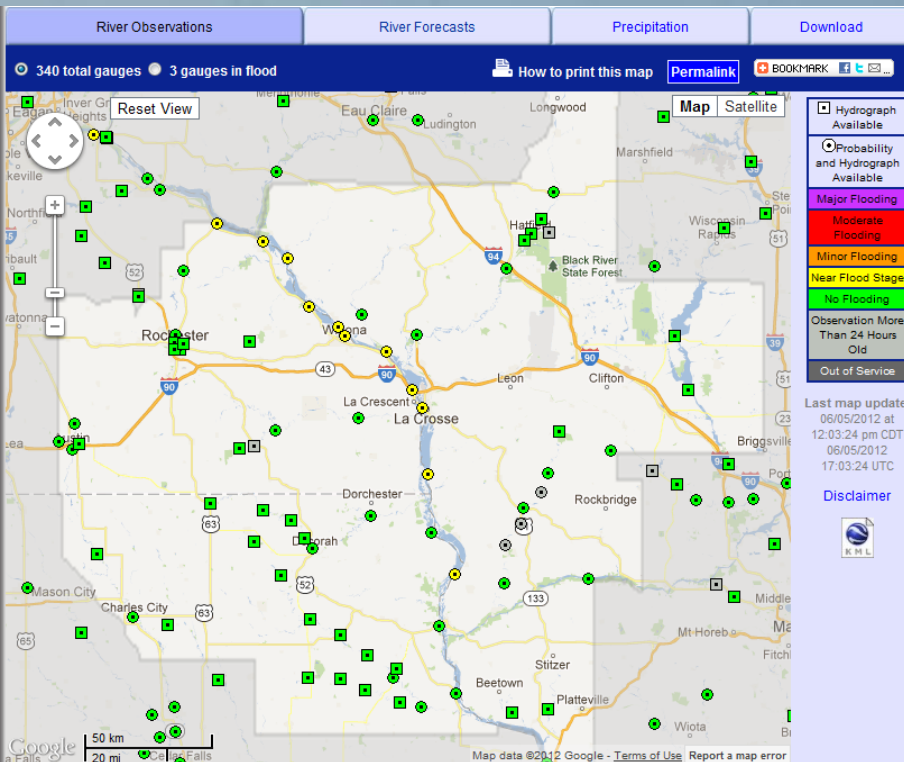
- High Water Mark Signs
- Recognize that flooding can and has happened
- Obtain Flood Insurance

www.floodsmart.gov



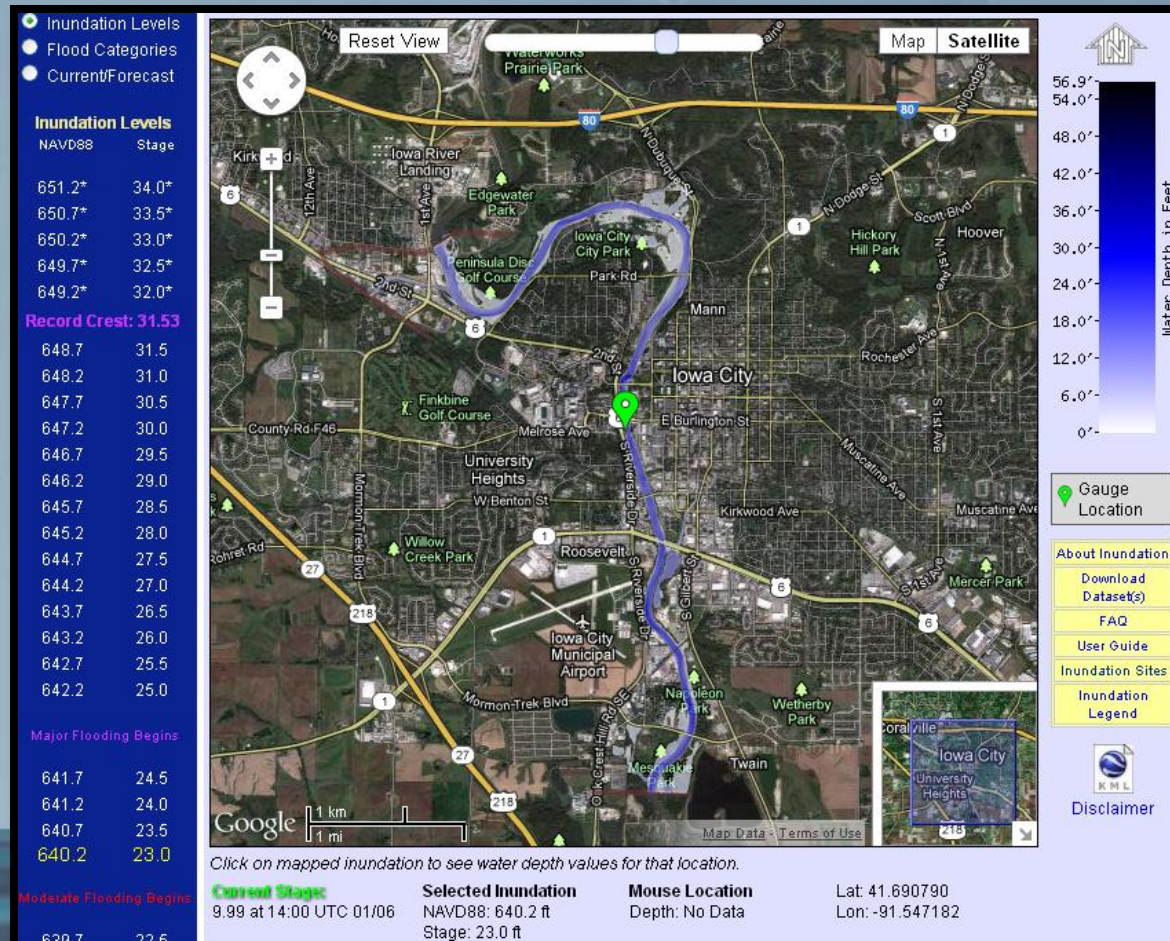
Inundation Mapping

- New service being deployed across the U.S.
- Our current maps look like this:

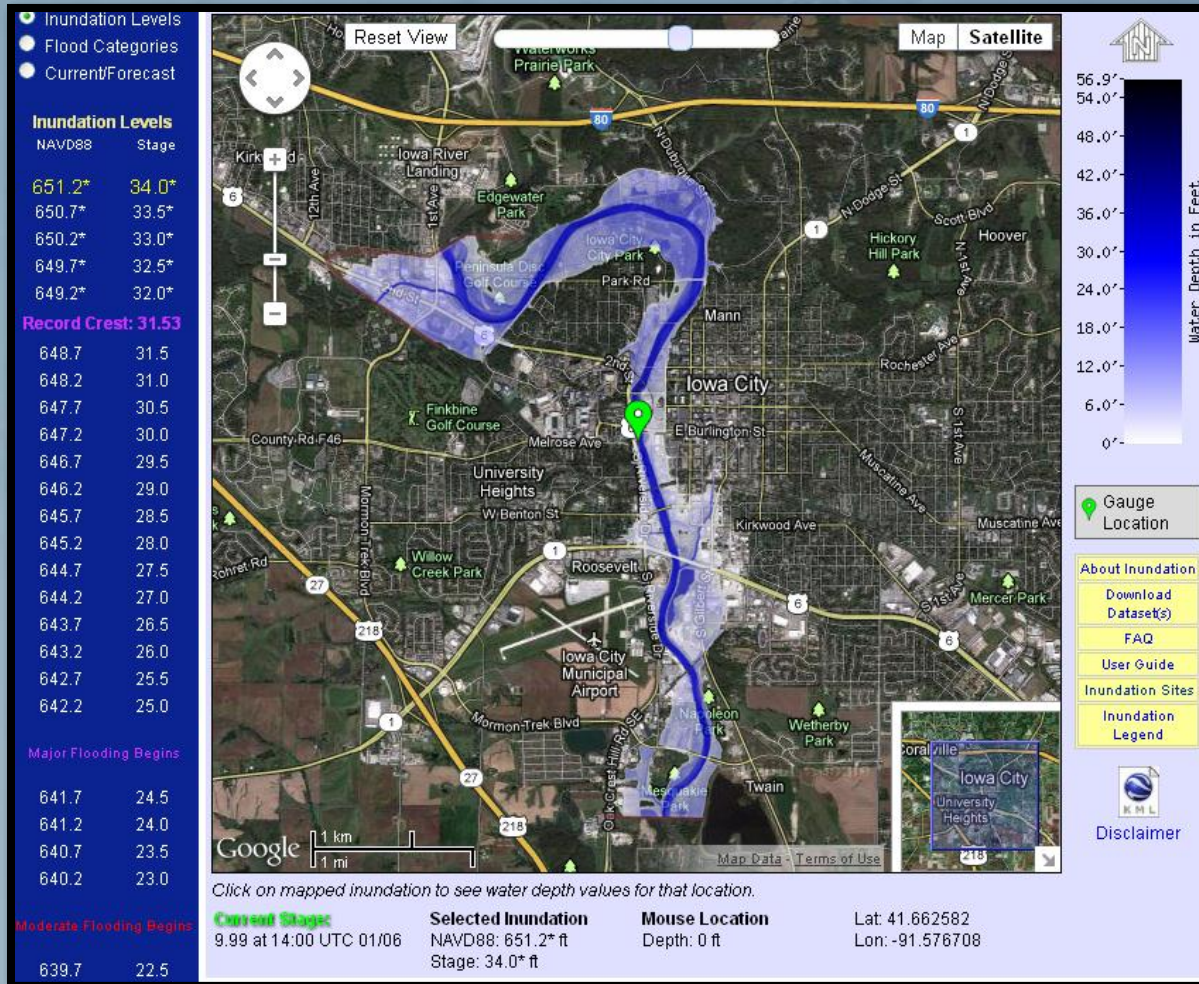


Inundation Mapping

- But our new inundation mapping shows much more information for planning purposes



Inundation Mapping



Inundation Mapping

Data Type

- Inundation Levels
- Flood Categories
- Current/Forecast

Inundation Levels

NAVD88	Stage
651.2*	34.0*
650.7*	33.5*
650.2*	33.0*
649.7*	32.5*
649.2*	32.0*
Record Crest: 31.53	
648.7	31.5
648.2	31.0
647.7	30.5
647.2	30.0
646.7	29.5
646.2	29.0
645.7	28.5
645.2	28.0
644.7	27.5
644.2	27.0
643.7	26.5
643.2	26.0
642.7	25.5
642.2	25.0
Major Flooding Begins	
641.7	24.5
641.2	24.0
640.7	23.5
640.2	23.0
Moderate Flooding Begins	

Print this map Find your location by address or ZIP code:

Reset View Map Satellite

Marker Info:

Depth: 11.8 - 12.3 ft

Lat: 41.876694
Lon: -91.545519

Nearest geolocated address:

845 Normandy Dr
Iowa City, IA 52245, USA

[Remove this marker.](#)

Water Depth in Feet

56.9'
54.0'
48.0'
42.0'
36.0'
30.0'
24.0'
18.0'
12.0'
6.0'
0'

About Inundation

[Download Dataset\(s\)](#)

[FAQ](#)

[User Guide](#)

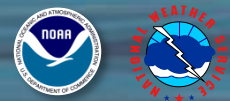
[Inundation Sites](#)

[Inundation Legend](#)

[Disclaimer](#)

Click on mapped inundation to see water depth values for that location.

Current Stage:	Selected Inundation	Mouse Location	Lat: 41.886918
9.99 at 14:00 UTC 01/06	NAVD88: 651.2* ft	Depth: No Data	Lon: -91.556130



Inundation Mapping

The screenshot shows the Google Earth Pro interface with the following components:

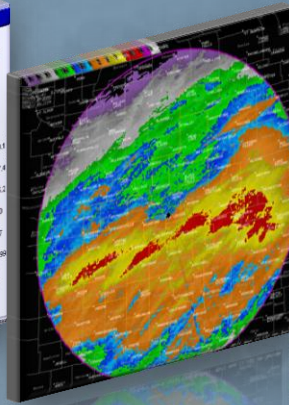
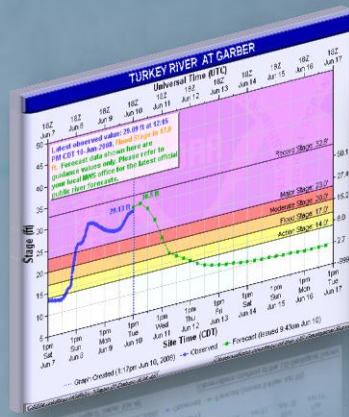
- Search Panel:** Includes "Fly To" buttons for "Find Businesses" and "Directions", and a search input field.
- Places Panel:** Lists "Iowa City, IA Inundation Flood Category Overlay" with sub-items for Major, Minor, Moderate, and Near categories.
- Layers Panel:** Shows various map layers such as "Primary Database", "Earth Pro (US)", "Borders and Labels", "Places", "Photos", "Roads", "3D Buildings", "Ocean", "Weather", "Gallery", "Global Awareness", "More", and "Terrain".
- Map:** Displays an aerial view of Iowa City, IA, with a purple shaded area representing the Major Flood Stage inundation. Key streets labeled include "2nd St", "S Riverside Dr", and "N Dodge St".
- Legend:** A "Flood Categories" legend is visible at the bottom left of the map area, showing "Major Flood Stage" with a purple swatch and a value of "25 ft".
- Metadata:** The bottom status bar shows "Imagery Date: 10/4/2010", "1990", "lat 41.649816° lon -91.542330° elev 652 ft", and "Eye alt 30026 ft".



Inundation Mapping

- This could be done in Elkader!!
- Iowa Flood Center has already done most of the work
- NWS can implement this for Elkader (and Chalres City) based on the IFC's work
- Need to find \$4,000 to fund the conversion





Turkey River Basin Flooding History and Overview

Let the Exchange of Information Begin!

Thank YOU for being here!

