

Probabilistic Forecast Updates

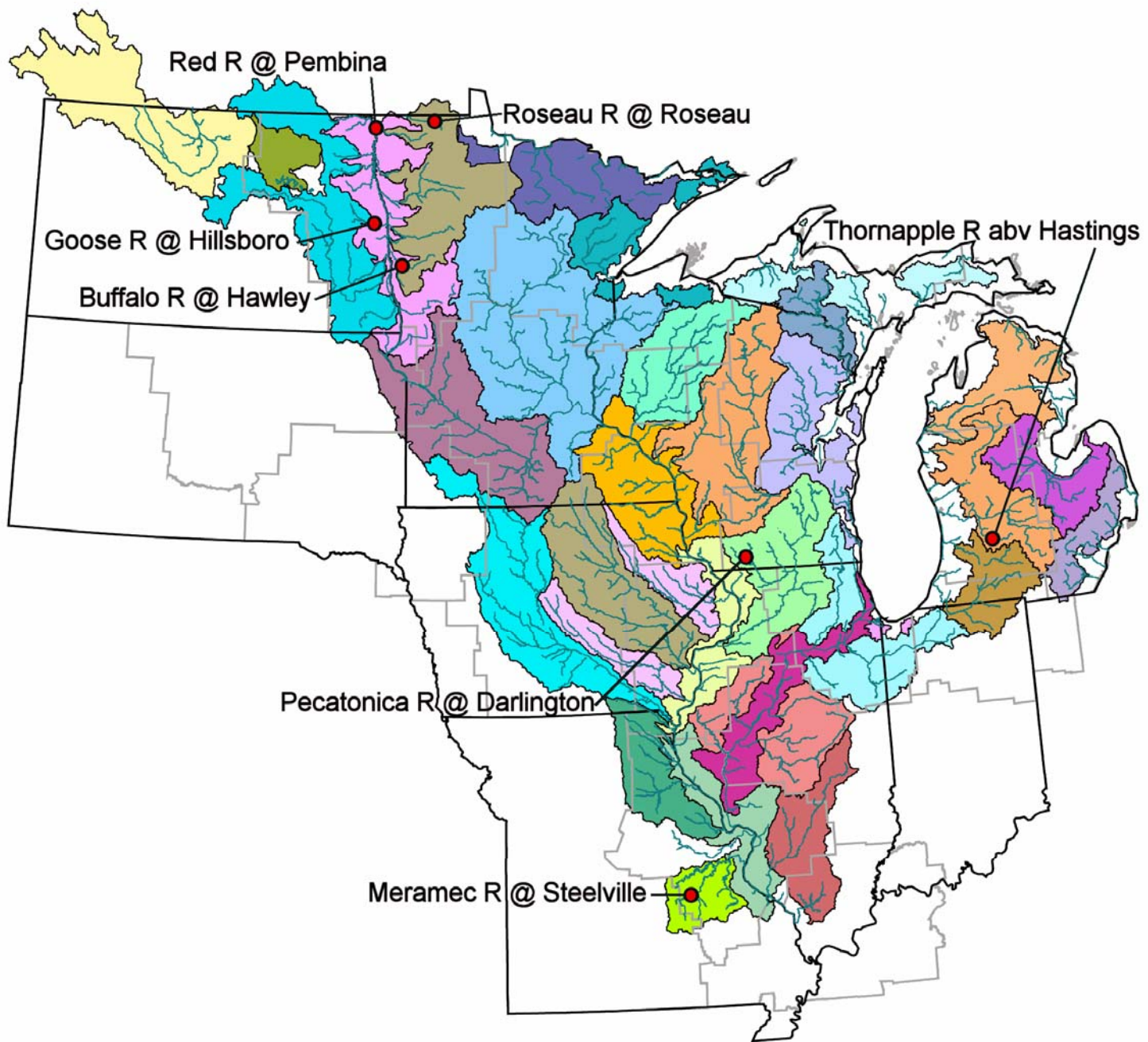
Sensitivity analysis

DOH/RDM Workshop

June 2004

Analysis procedure

- Based on actual conditions on April 19, 2004 (moderately wet to very wet)
- Additional runs made with 2" and 4" additional rainfall (24 hr applied on 4/19)
- In all cases 4" rainfall has ~5% or lower probability of occurrence based on our climate period (1951 – 1999)

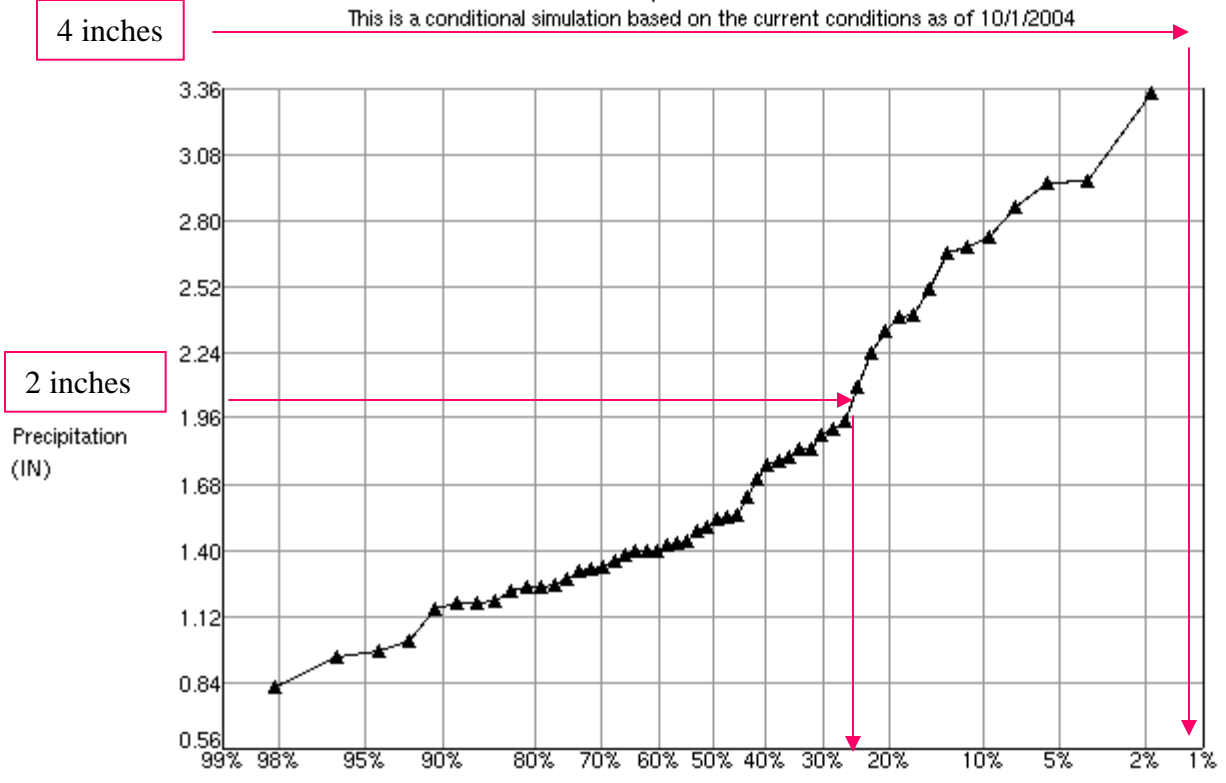


Case #1

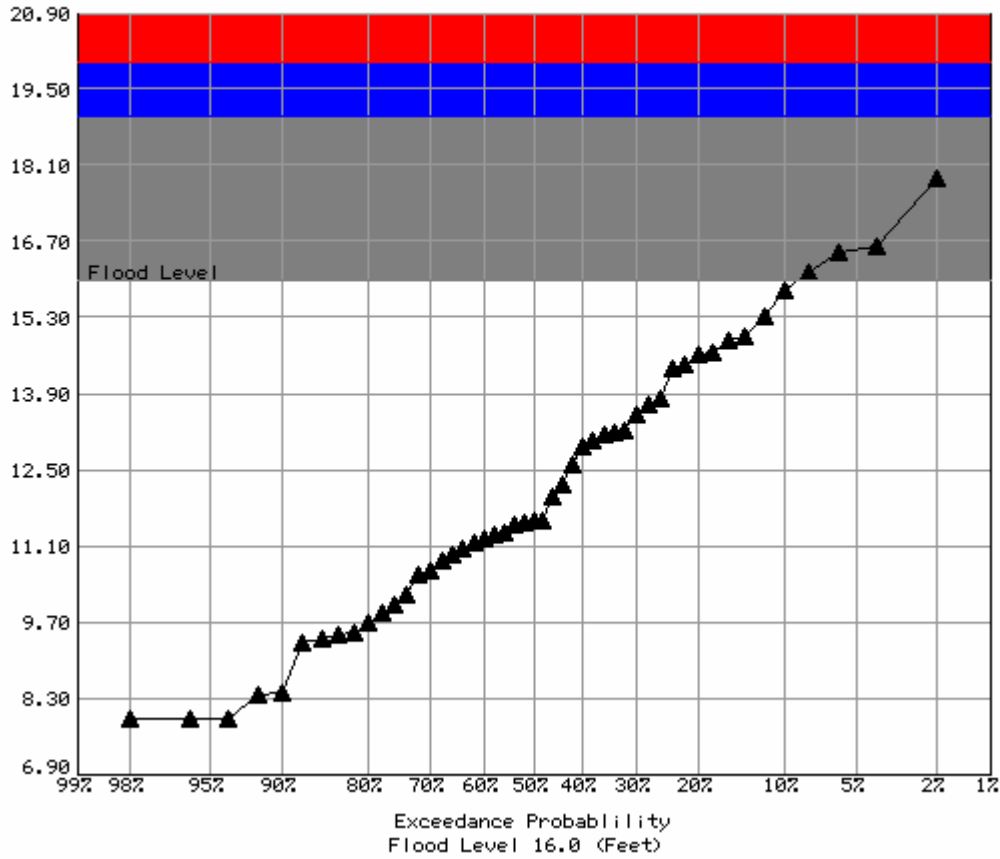
Roseau River @ Roseau, MN

484 sq mi

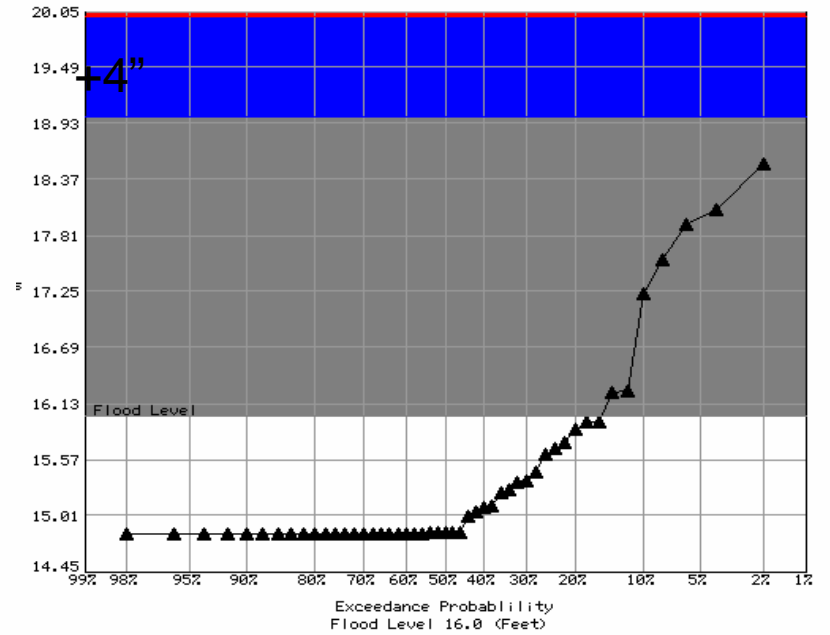
Chances of Exceeding 24 Hour Precip on the ROSEAU R ROSEAU
Latitude: 0.0 Longitude: 0.0
Forecast for the period 10/1/2004 - 9/30/2005
This is a conditional simulation based on the current conditions as of 10/1/2004



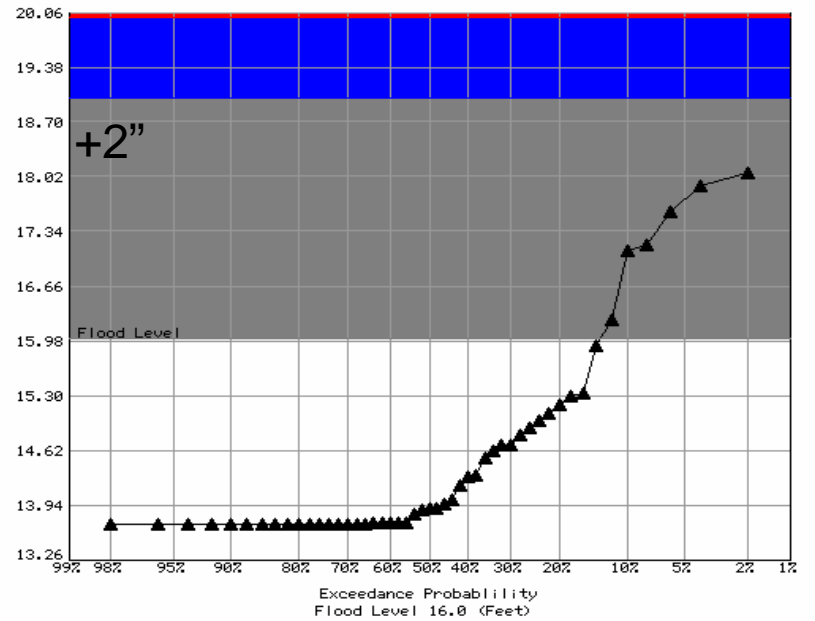
Chances of Exceeding River Levels on the ROSEAU R at ROSEAU MN
 Latitude: 48.6 Longitude: 95.5
 Forecast for the period 4/24/2004 - 8/3/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



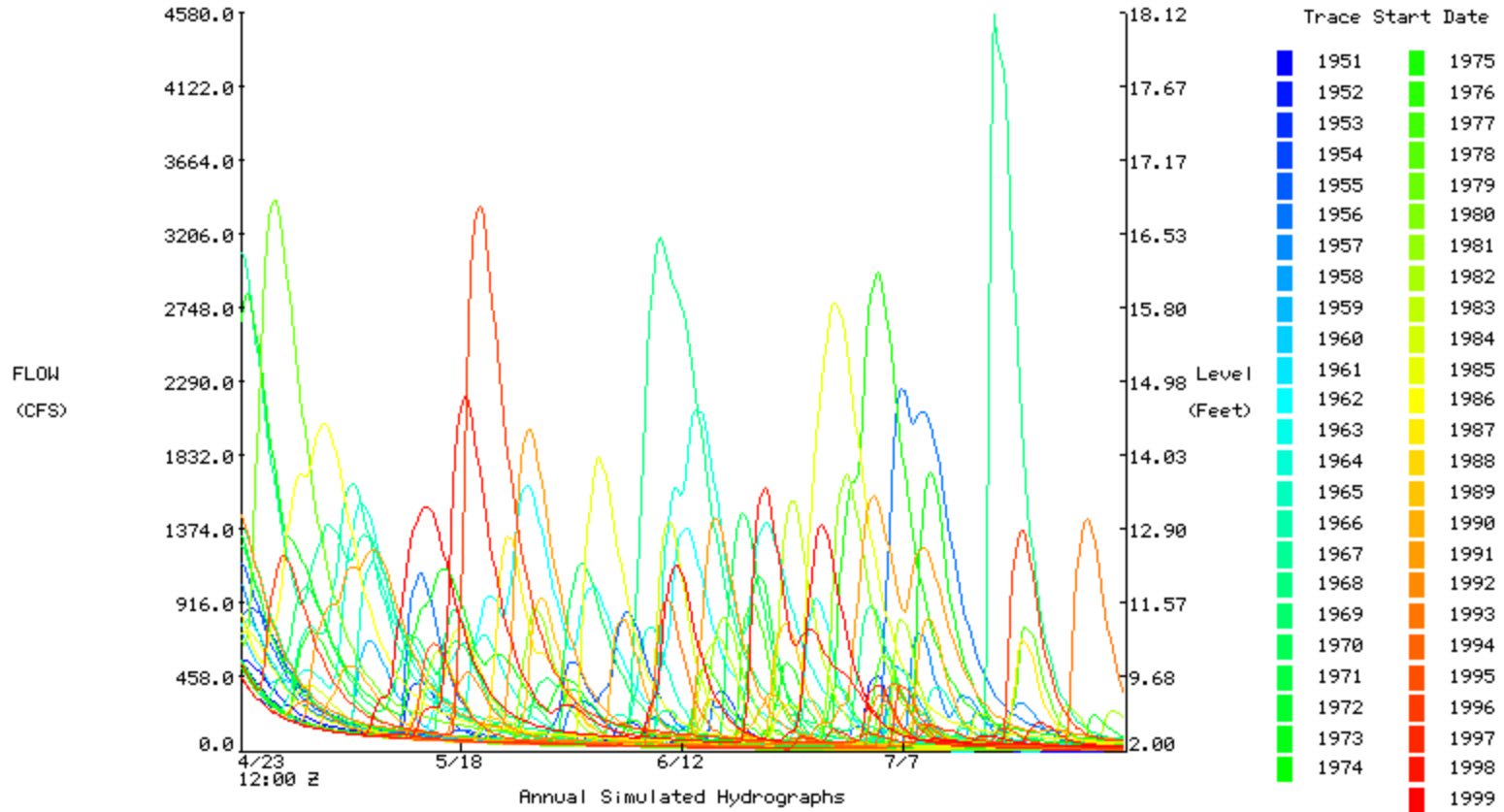
Chances of Exceeding River Levels on the ROSEAU R at ROSEAU MN
 Latitude: 48.6 Longitude: 95.5
 Forecast for the period 4/24/2004 - 8/3/2004
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Chances of Exceeding River Levels on the ROSEAU R at ROSEAU MN
 Latitude: 48.6 Longitude: 95.5
 Forecast for the period 4/24/2004 - 8/3/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



ESP Trace Ensemble of ROSEAU R at ROSEAU MN
 Latitude: 48.6 Longitude: 95.5
 Forecast for the period 4/23/2004 12h - 8/1/2004 6h
 This is a conditional simulation based on the current conditions as of 4/18/2004

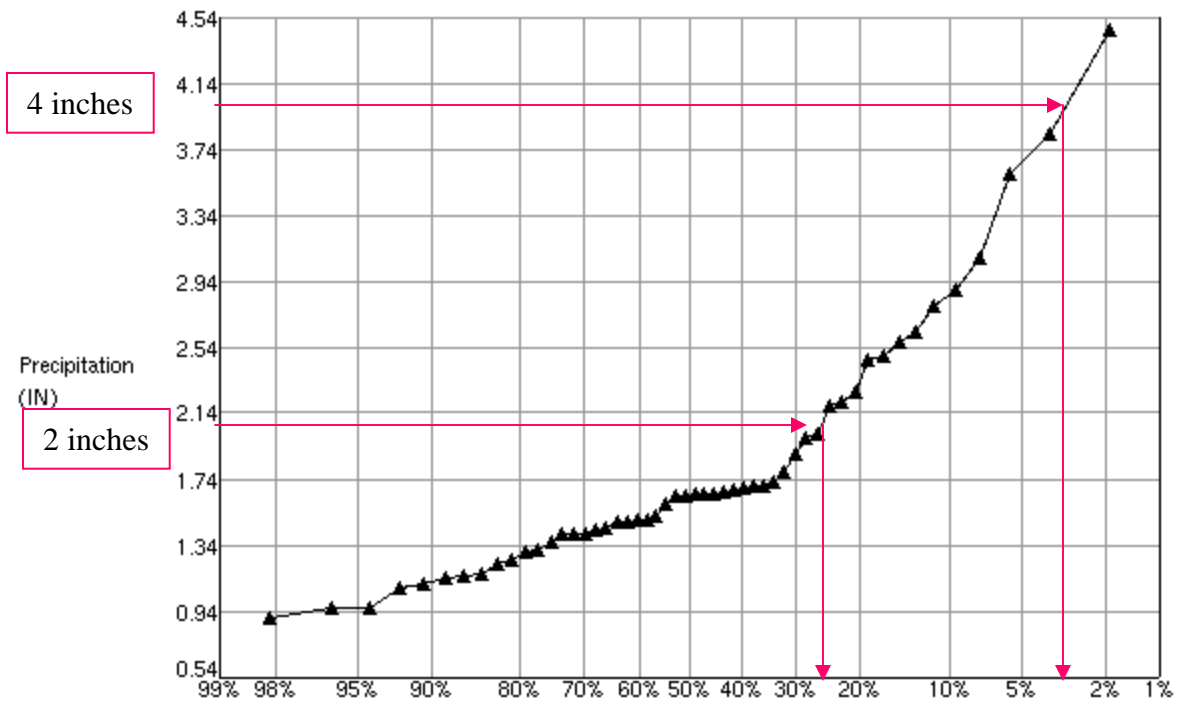


Case #2

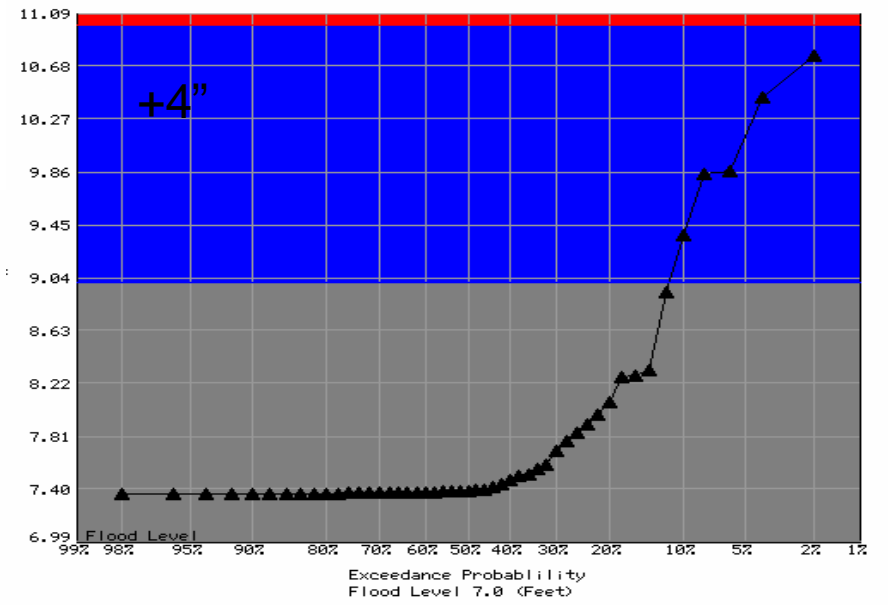
Buffalo River @ Hawley, MN

325 sq mi

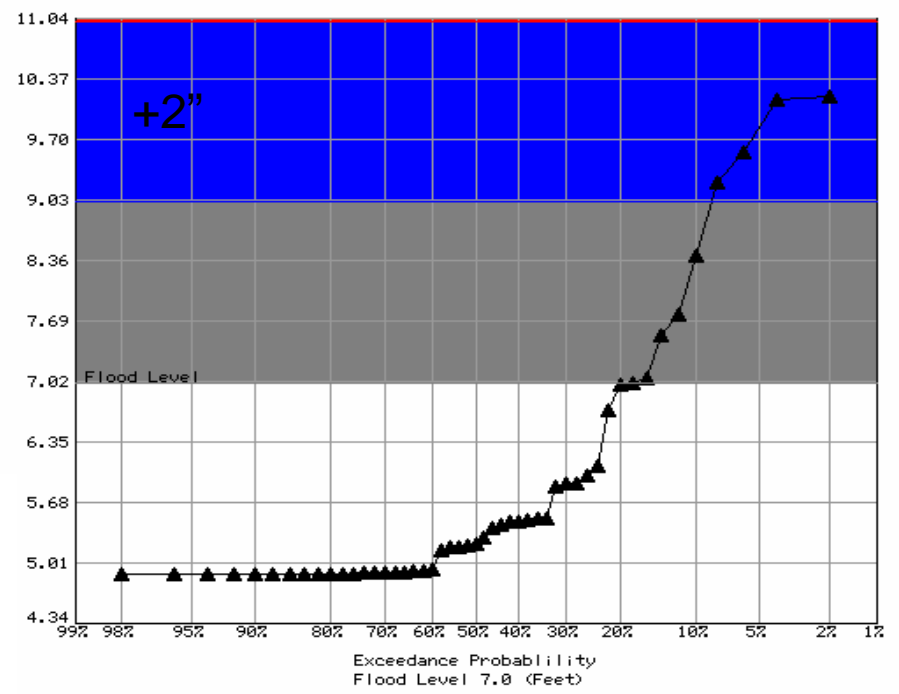
Chances of Exceeding 24 Hour Precip on the BUFFALO R NR HAWLEY
Latitude: 0.0 Longitude: 0.0
Forecast for the period 10/1/2004 - 9/30/2005
This is a conditional simulation based on the current conditions as of 10/1/2004



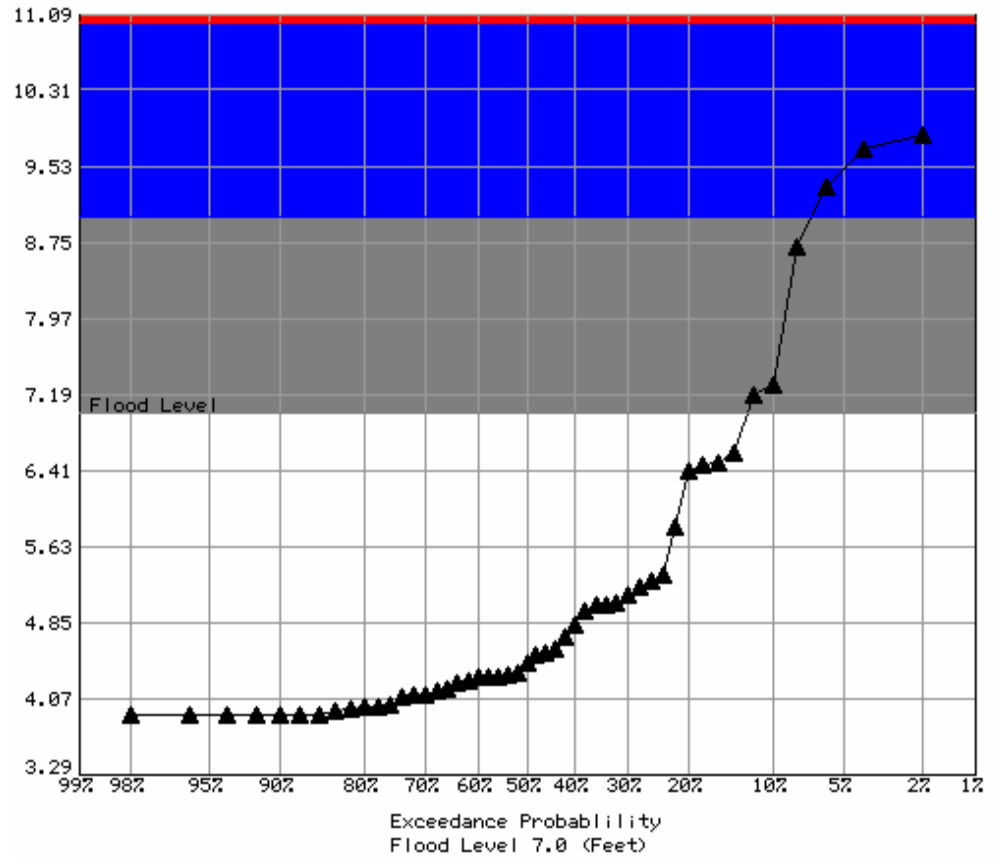
Chances of Exceeding River Levels on the BUFFALO R at HAWLEY MN
 Latitude: 47.0 Longitude: 96.1
 Forecast for the period 4/24/2004 - 8/3/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Chances of Exceeding River Levels on the BUFFALO R at HAWLEY MN
 Latitude: 47.0 Longitude: 96.1
 Forecast for the period 4/24/2004 - 8/3/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Chances of Exceeding River Levels on the BUFFALO R at HAWLEY MN
 Latitude: 47.0 Longitude: 96.1
 Forecast for the period 4/24/2004 - 8/3/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004

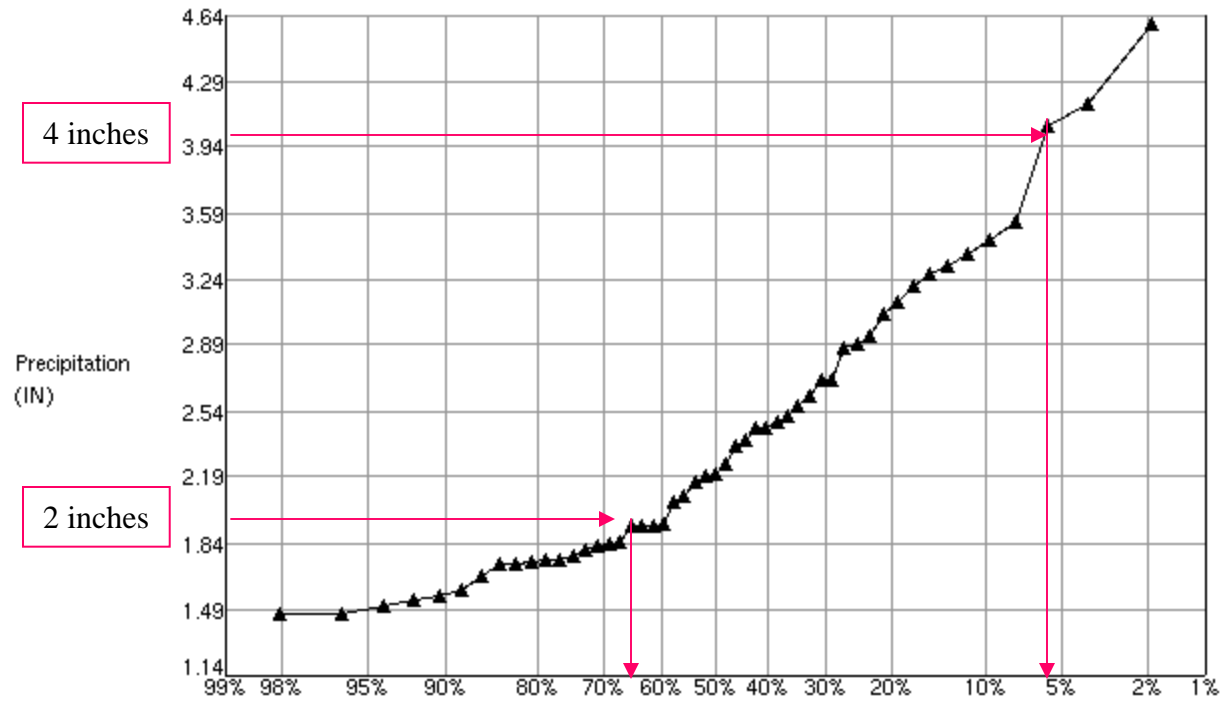


Case #3

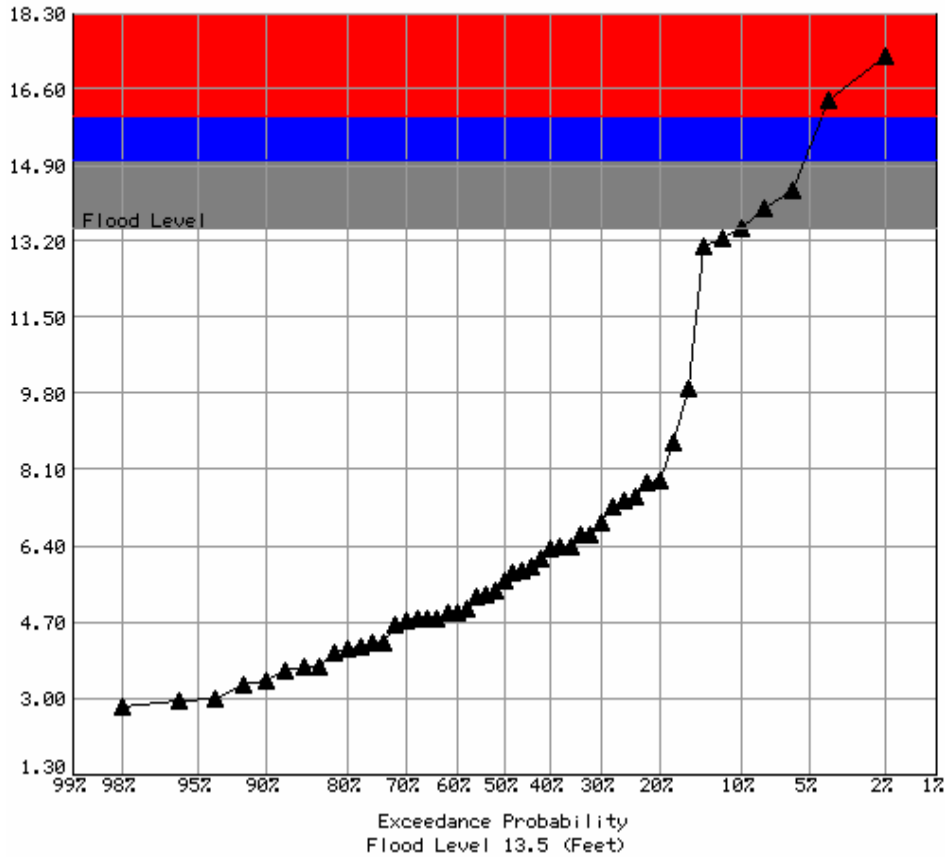
Pecatonica River @ Darlington, WI

273 sq mi

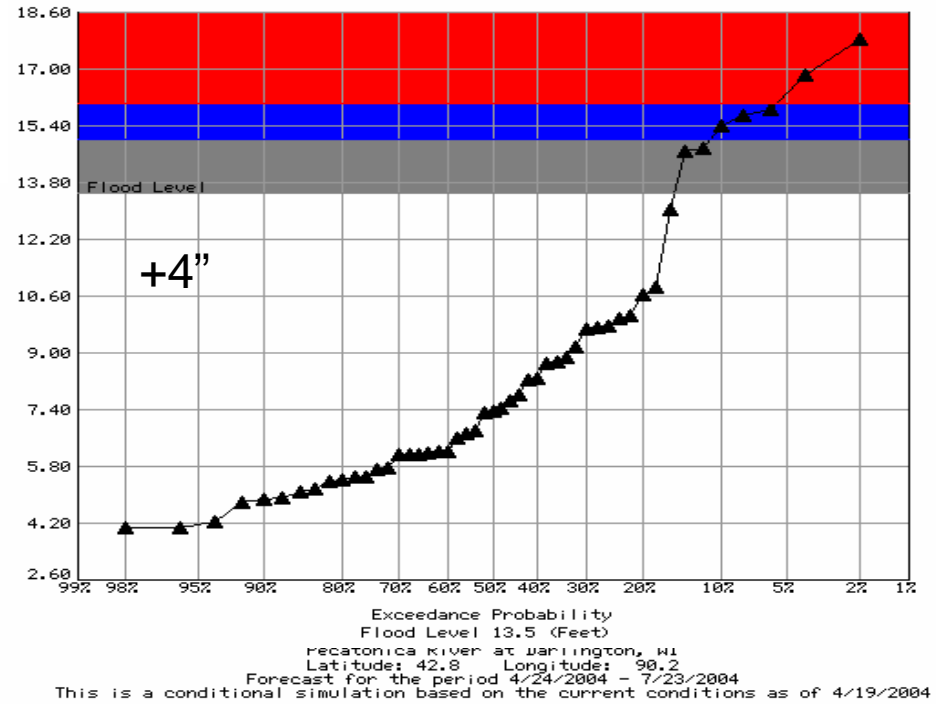
Chances of Exceeding 24 Hour Precip on the PECATONICA R DARLING
Latitude: 0.0 Longitude: 0.0
Forecast for the period 10/1/2004 - 9/30/2005
This is a conditional simulation based on the current conditions as of 10/1/2004



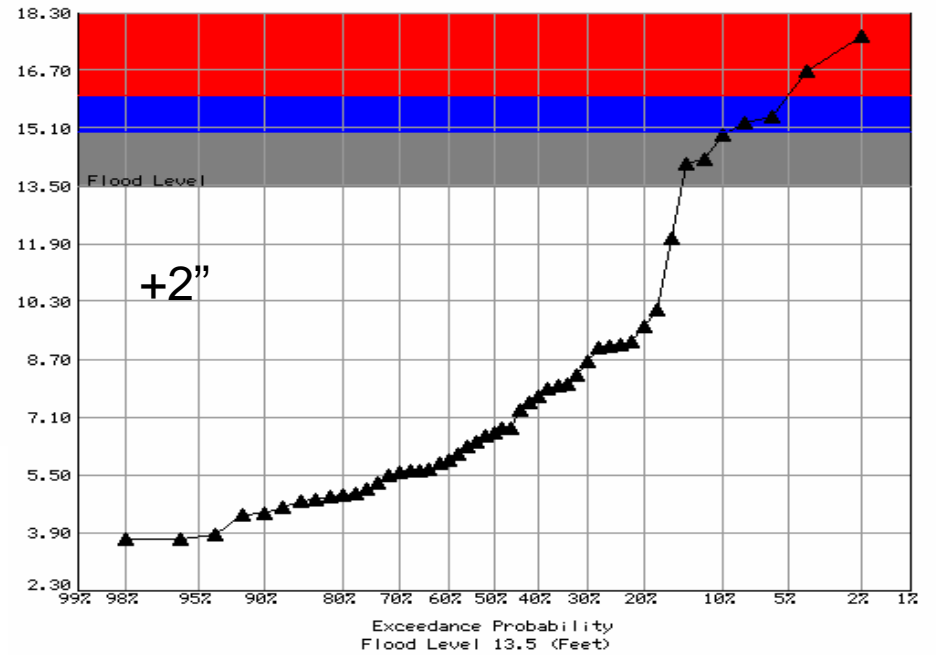
Pecatonica River at Darlington, WI
 Latitude: 42.8 Longitude: 90.2
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Pecatonica River at Darlington, WI
 Latitude: 42.8 Longitude: 90.2
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Pecatonica River at Darlington, WI
 Latitude: 42.8 Longitude: 90.2
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Case #4

Thornapple River abv Hastings,
MI

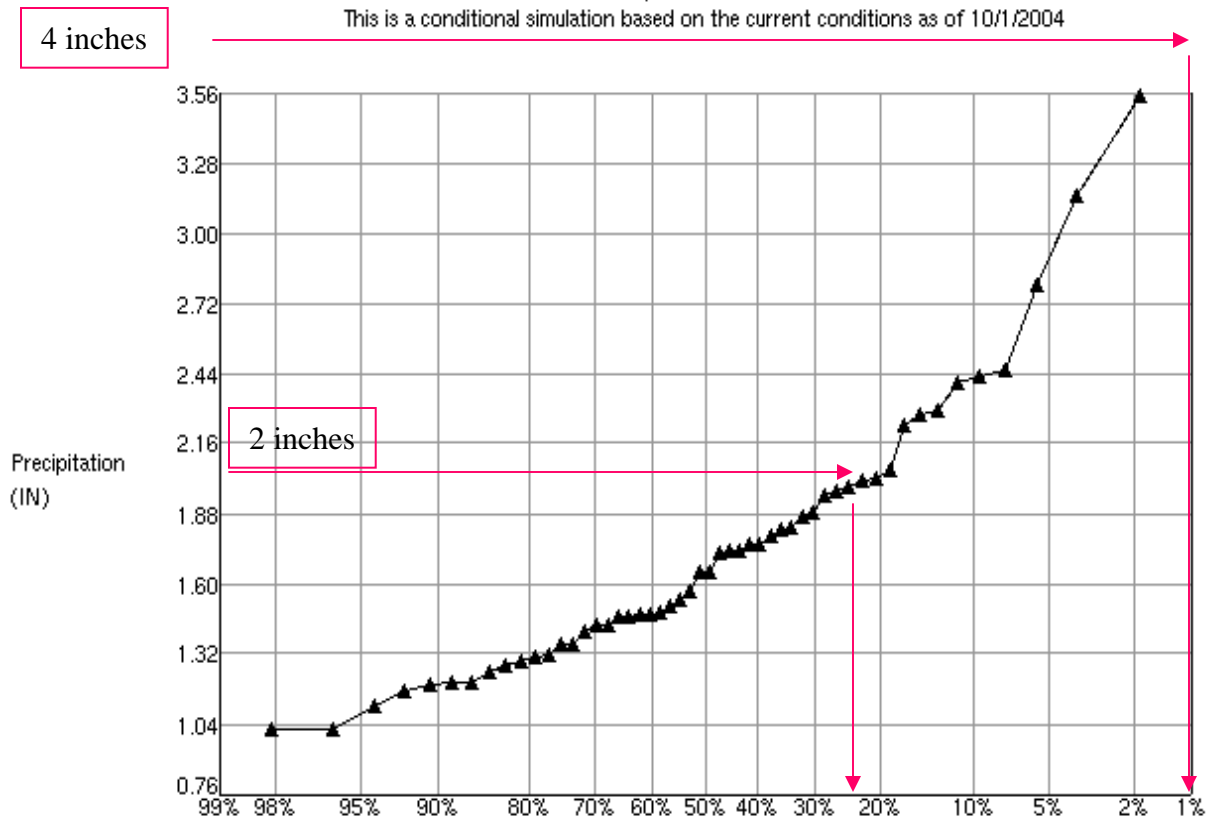
443 sq mi

Chances of Exceeding 24 Hour Precip on the THORNAPPLE R HASTING

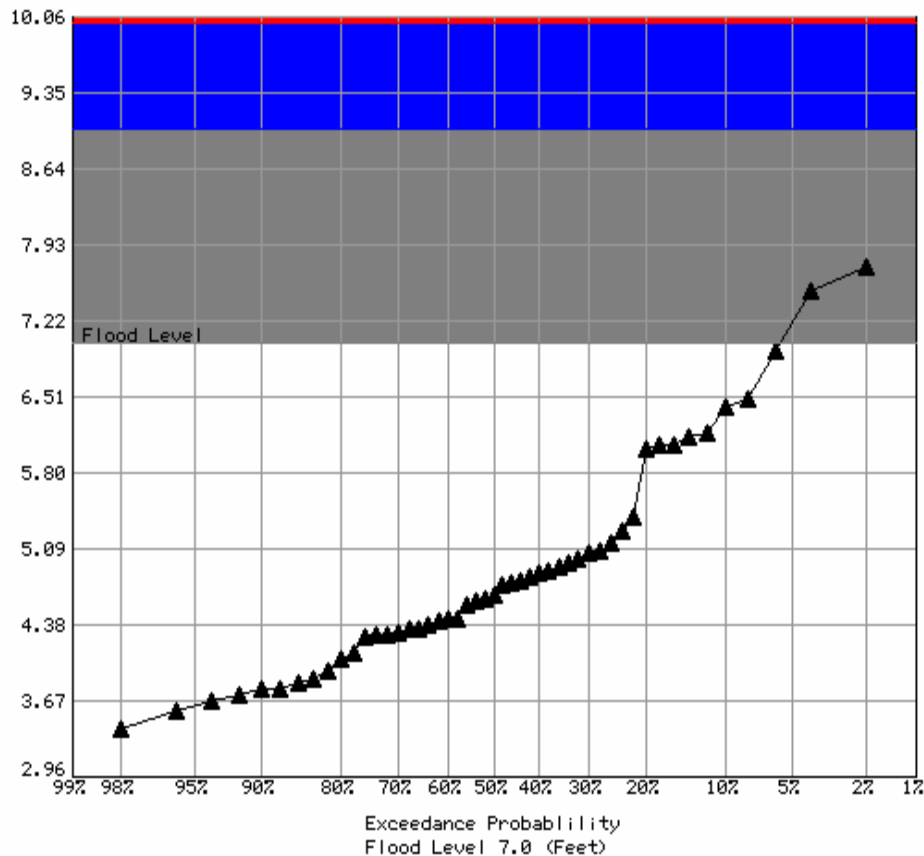
Latitude: 0.0 Longitude: 0.0

Forecast for the period 10/1/2004 - 9/30/2005

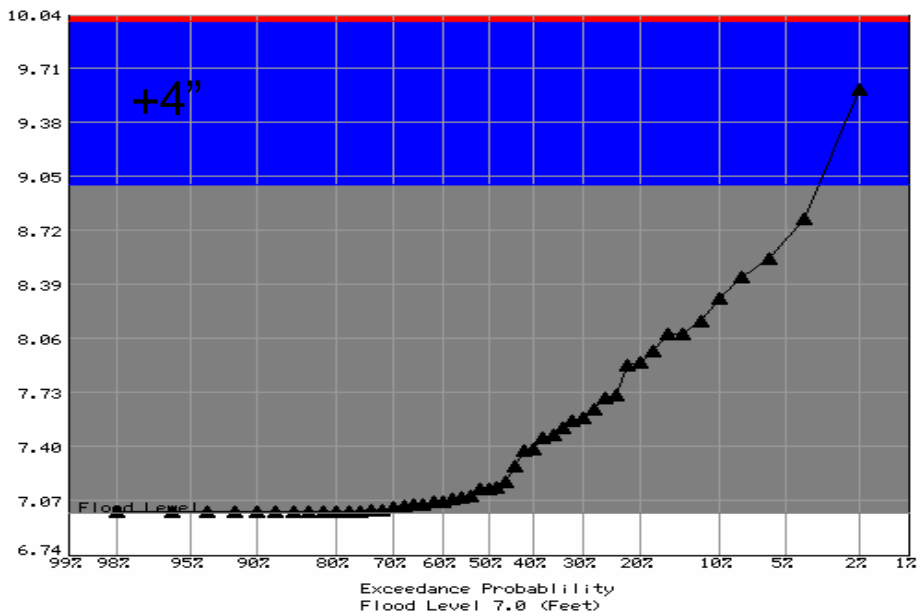
This is a conditional simulation based on the current conditions as of 10/1/2004



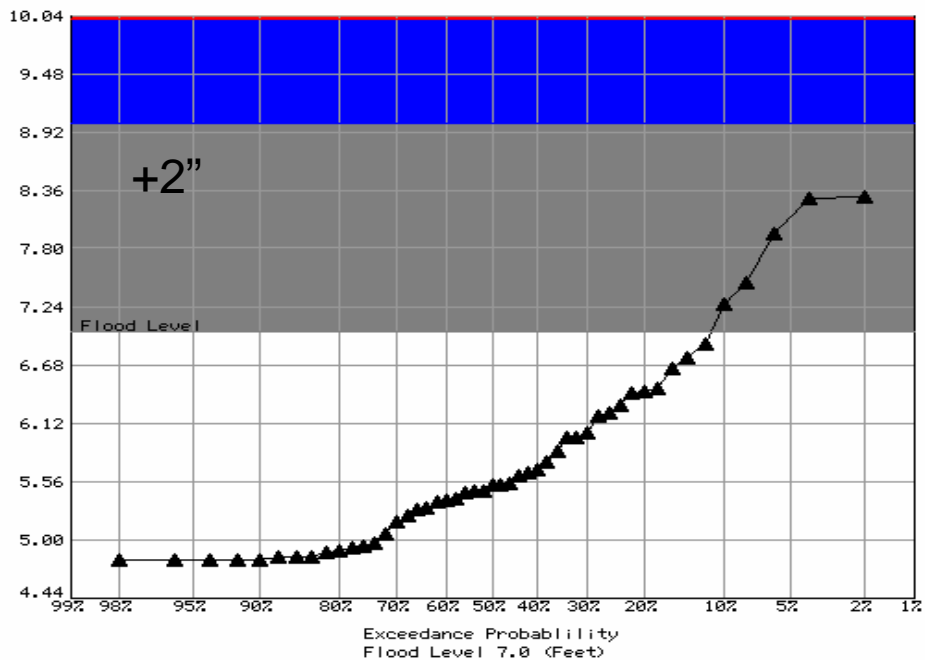
Thornapple River above Hastings, MI
 Latitude: 42.6 Longitude: 85.1
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Thornapple River above Hastings, MI
 Latitude: 42.6 Longitude: 85.1
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Thornapple River above Hastings, MI
 Latitude: 42.6 Longitude: 85.1
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004

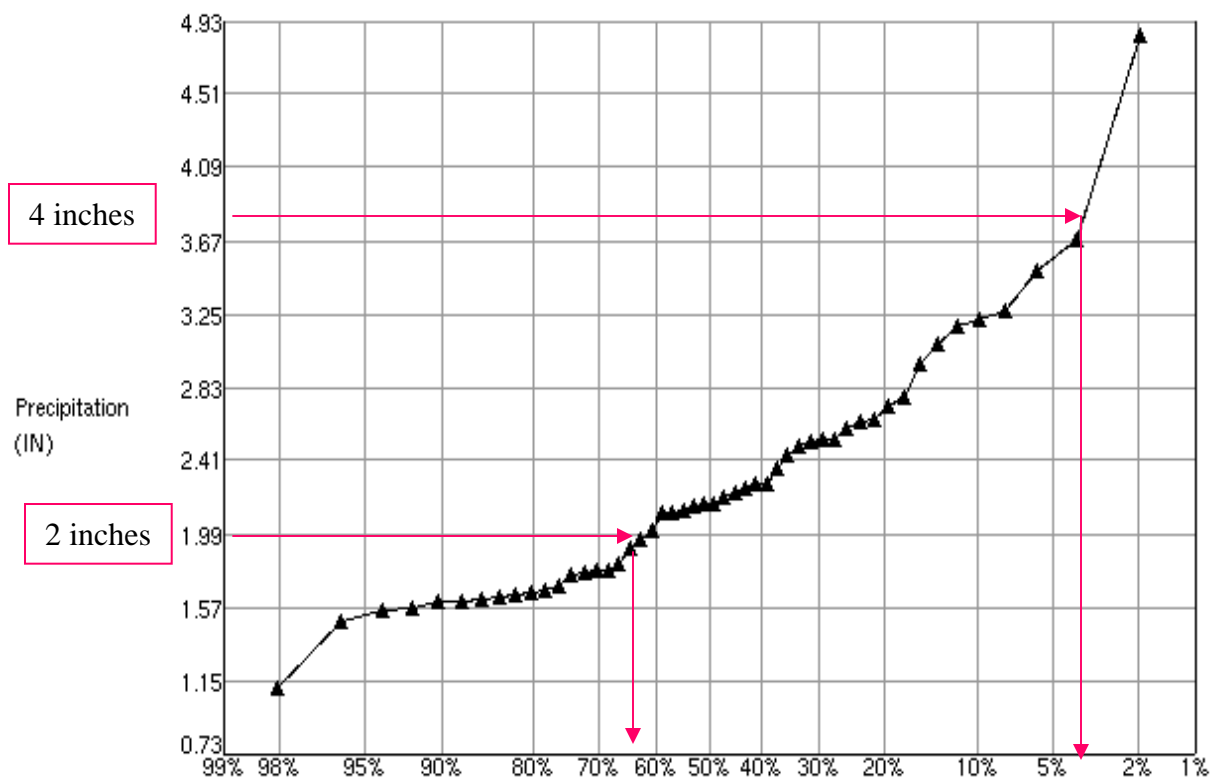


Case #5

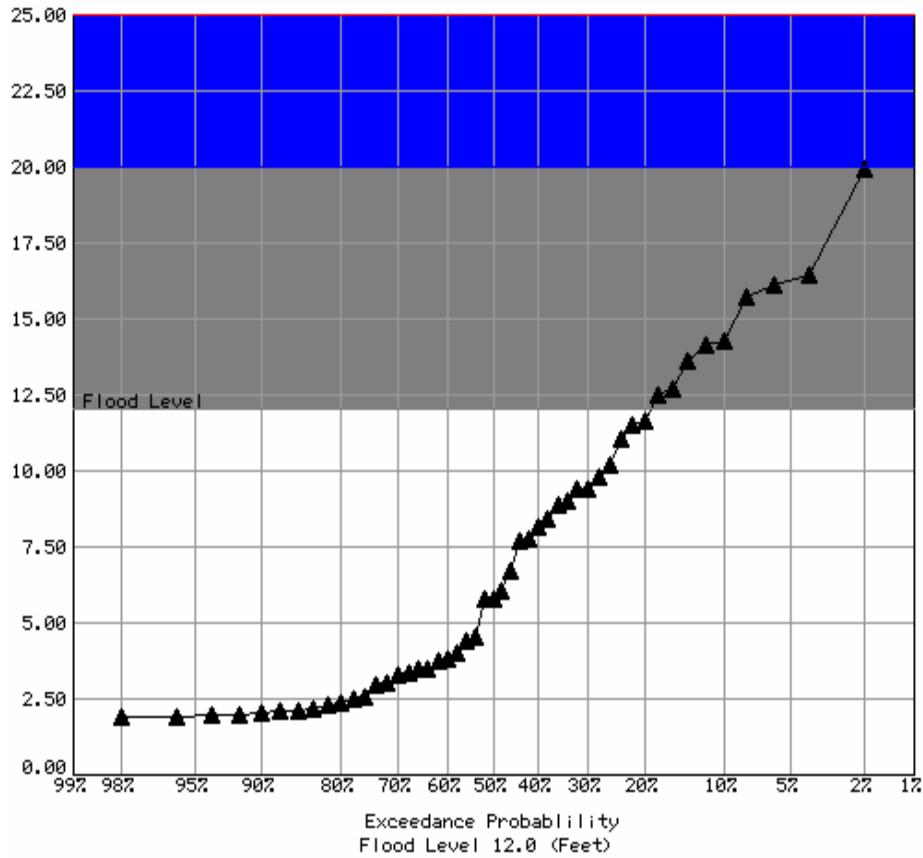
Meramec River @ Steelville, MO

781 sq mi

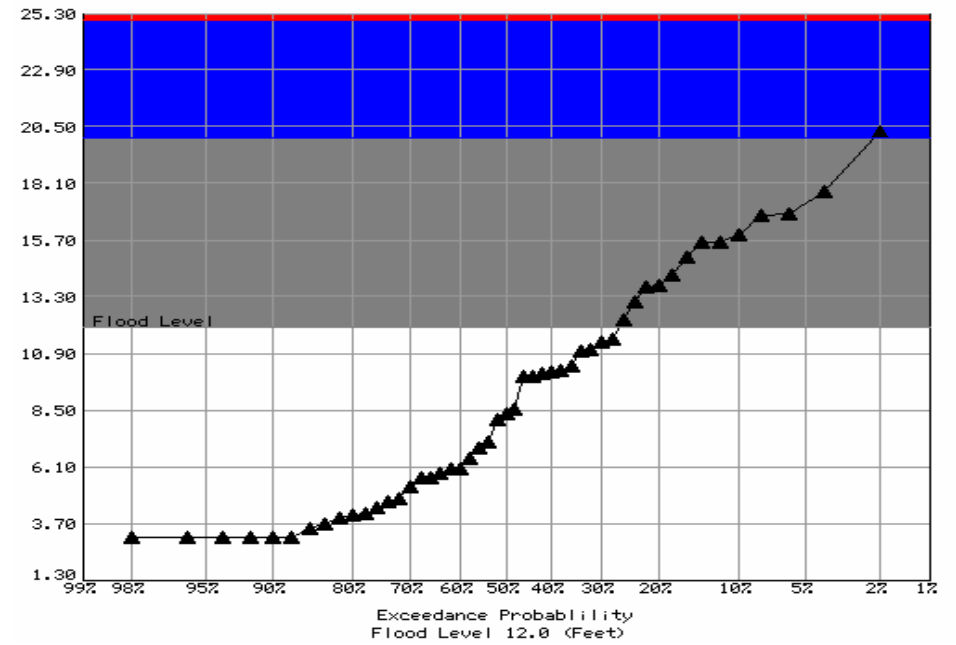
Chances of Exceeding 24 Hour Precip on the MERAMEC R NR STEELVILLE
Latitude: 0.0 Longitude: 0.0
Forecast for the period 10/1/2004 - 9/30/2005
This is a conditional simulation based on the current conditions as of 10/1/2004



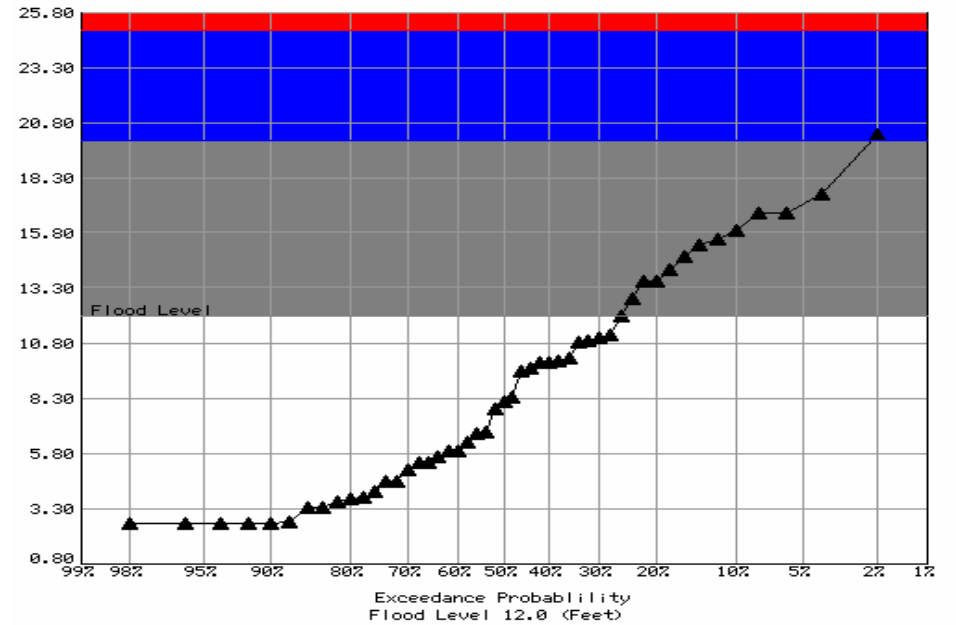
Chances of Exceeding River Levels on the MERAMEC R at STEELVILLE MO
 Latitude: 37.8 Longitude: 91.5
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Chances of Exceeding River Levels on the MERAMEC R at STEELVILLE MO
 Latitude: 37.8 Longitude: 91.5
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Chances of Exceeding River Levels on the MERAMEC R at STEELVILLE MO
 Latitude: 37.8 Longitude: 91.5
 Forecast for the period 4/24/2004 - 7/23/2004
 This is a conditional simulation based on the current conditions as of 4/19/2004



Some Real Examples

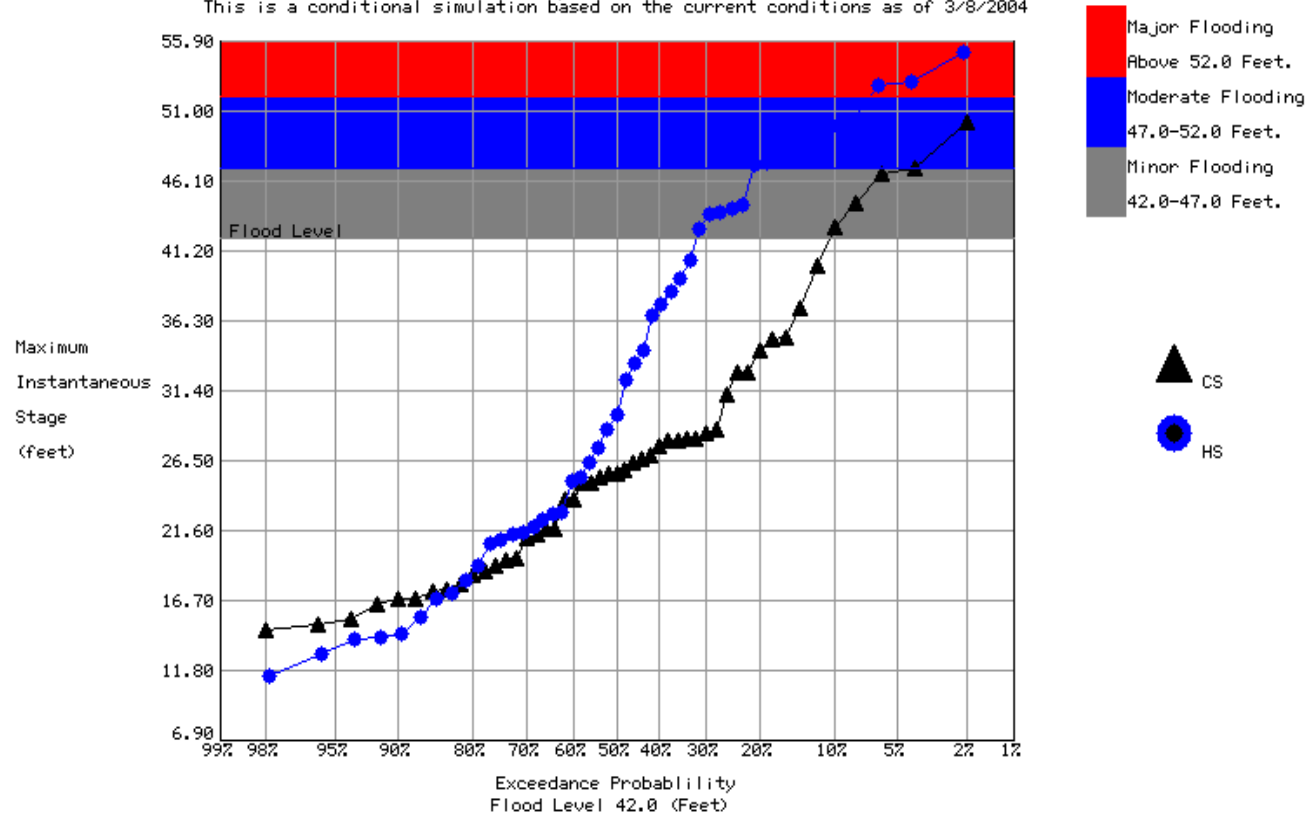
Red River

March/April 2004

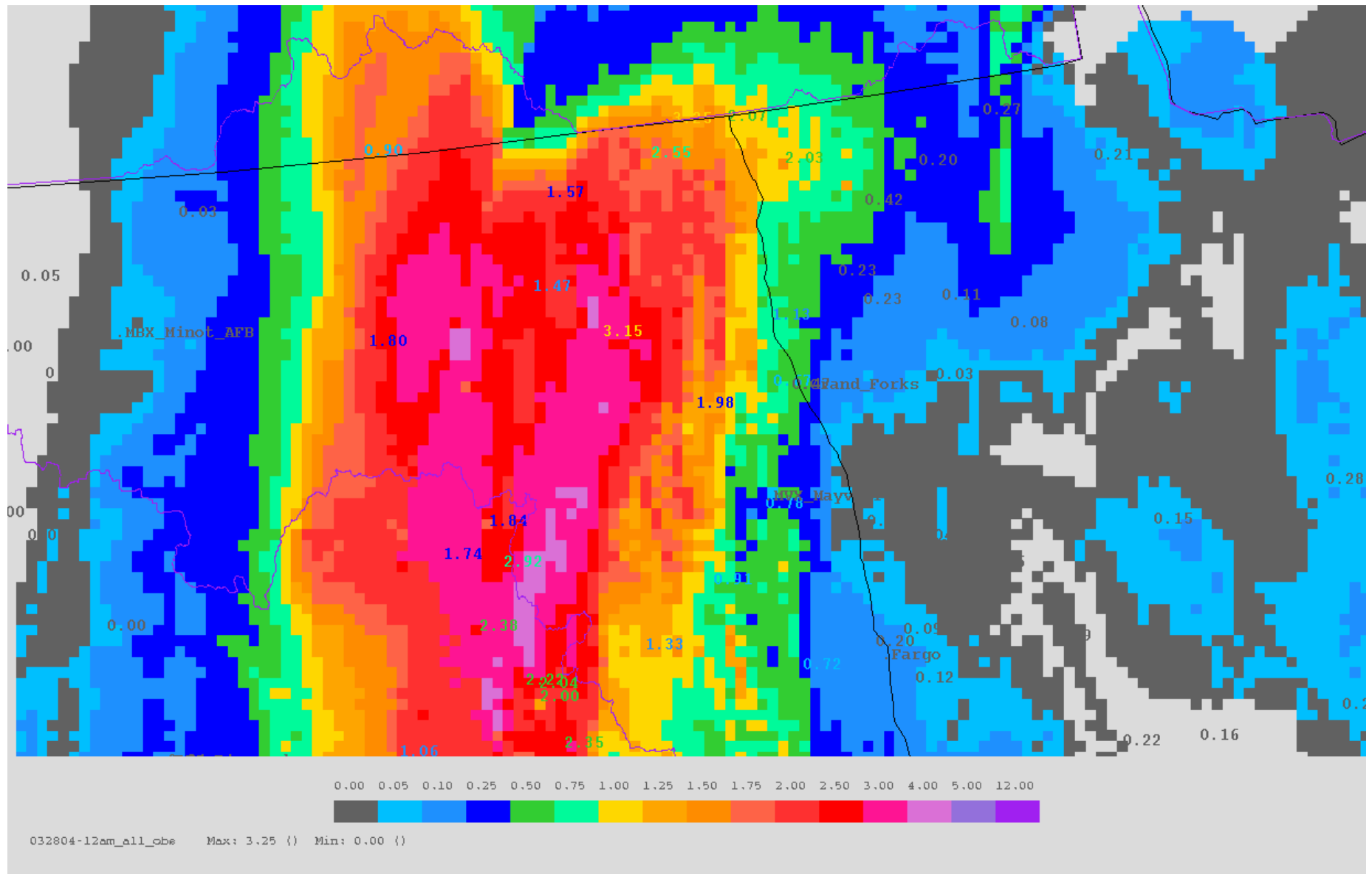
Red River @ Pembina, ND

- 40,200 square miles
- 2-4 inches of rain over wide area (began as snow but mostly rain)
- Snow on ground, but below normal SWE
- Frozen ground

Chances of Exceeding River Levels on the RED R at PEMBINA ND
 Latitude: 48.8 Longitude: 97.5
 Forecast for the period 3/13/2004 - 6/21/2004
 This is a conditional simulation based on the current conditions as of 3/8/2004

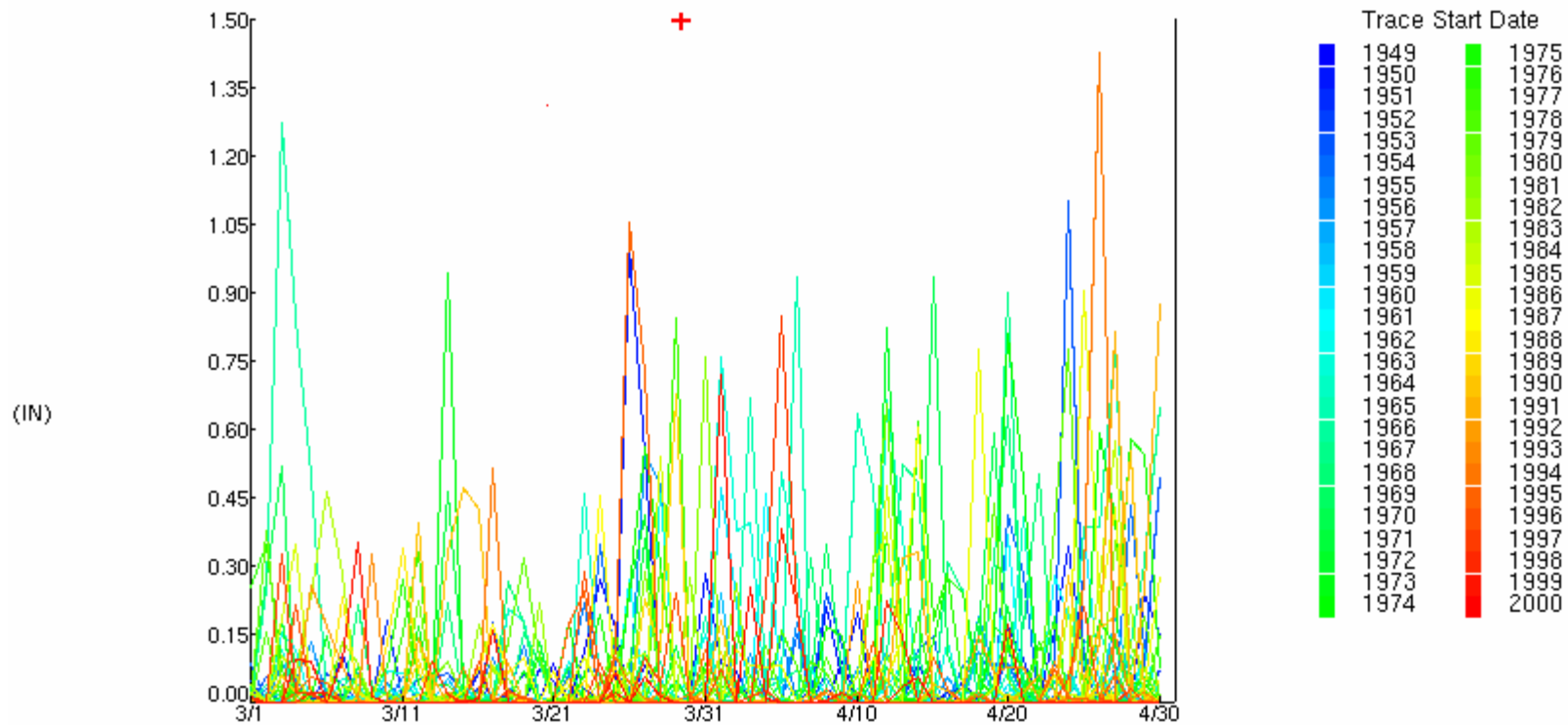


March 8th Probabilistic Outlook for the Red River at Pembina, ND.



Significant rainfall event March 28th – 24 hr total

Calib. Trace Ensemble
Latitude: 0.0 Longitude: 0.0
Forecast for the period 3/1/2005 6h - 4/30/2005 6h
This is a conditional simulation based on the current conditions as of 10/1/2004

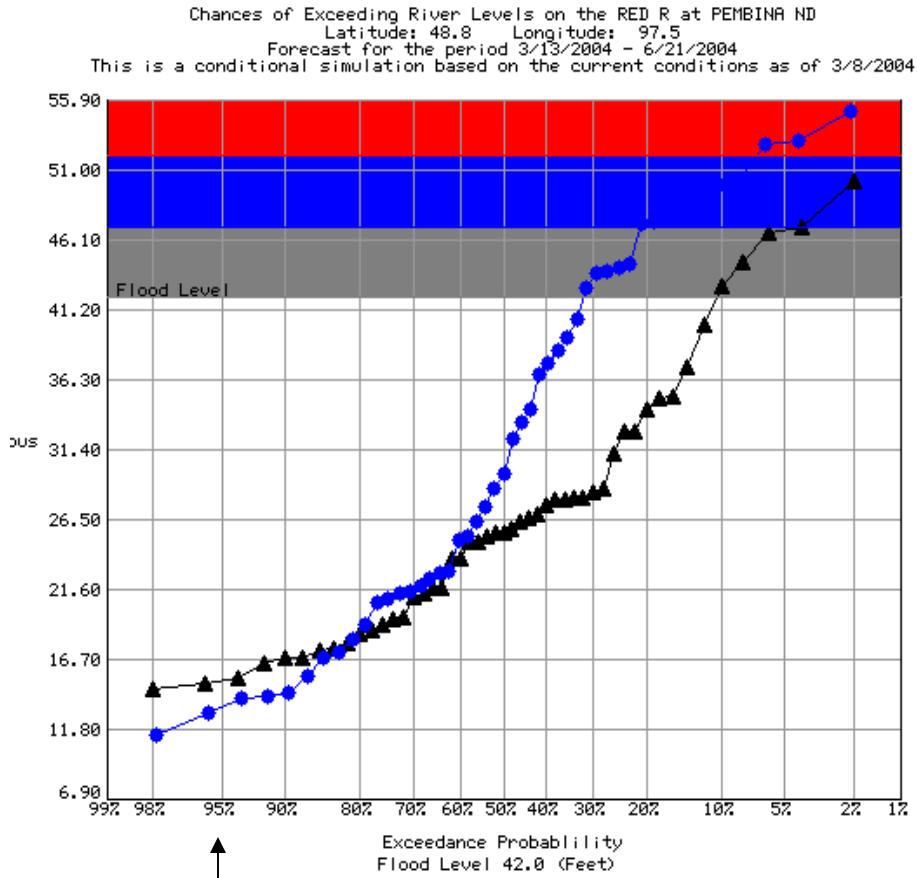


Historical MAP values

To update or not update?

- WFO called requesting update to AHPS product suite (exceedence probabilities)
- Widespread flooding underway with major flooding on several tributaries
- Next scheduled AHPS release
 - April 19 - 25

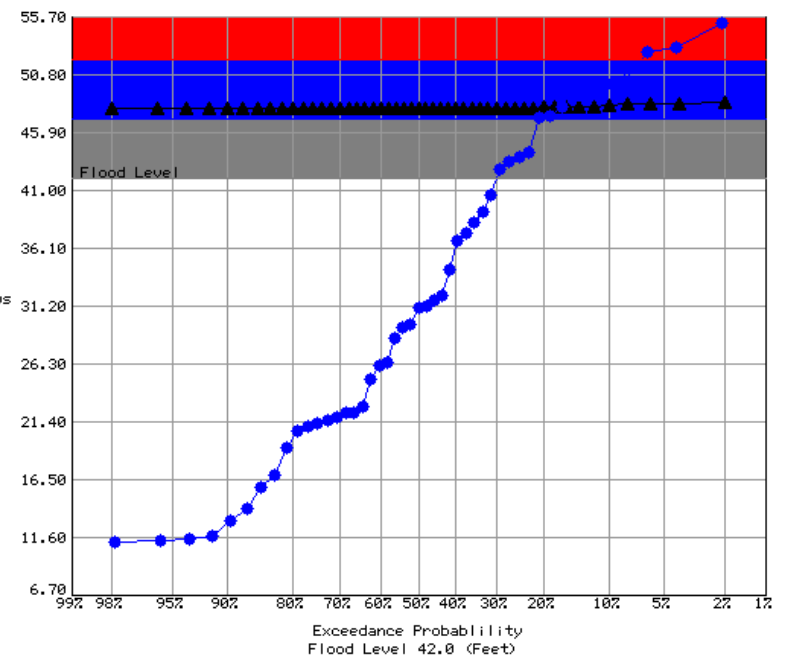
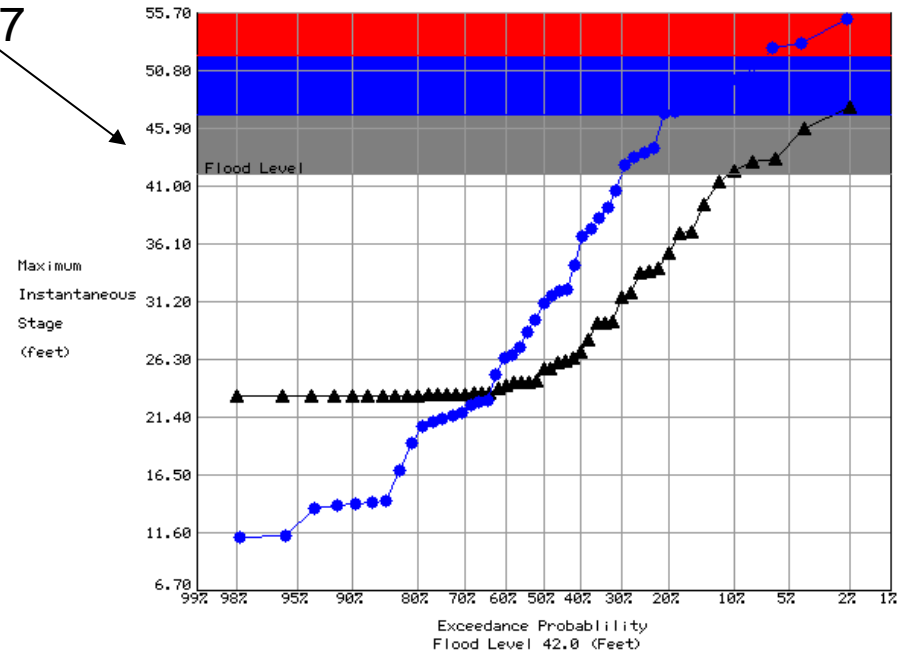
March 27



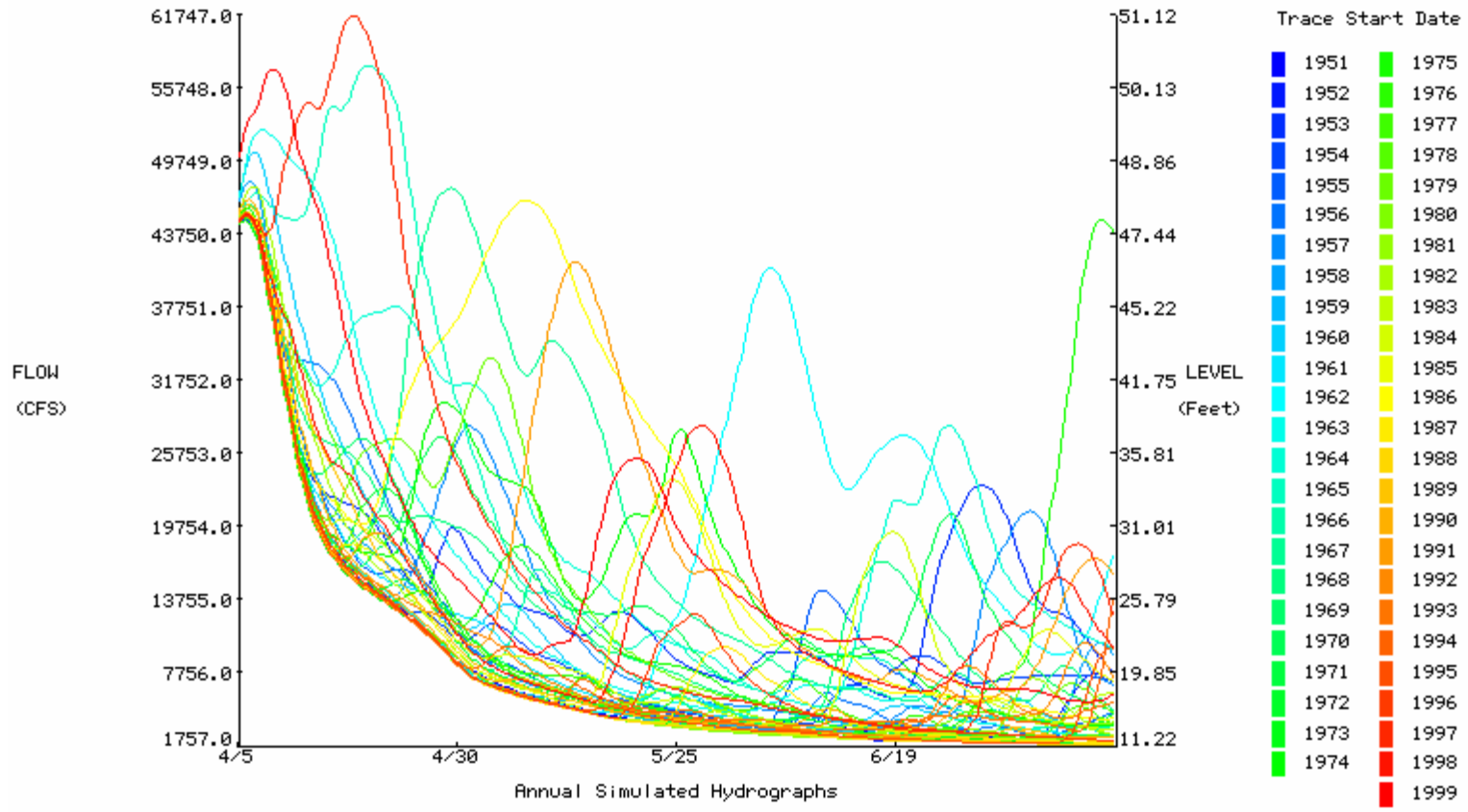
March 8

April 1

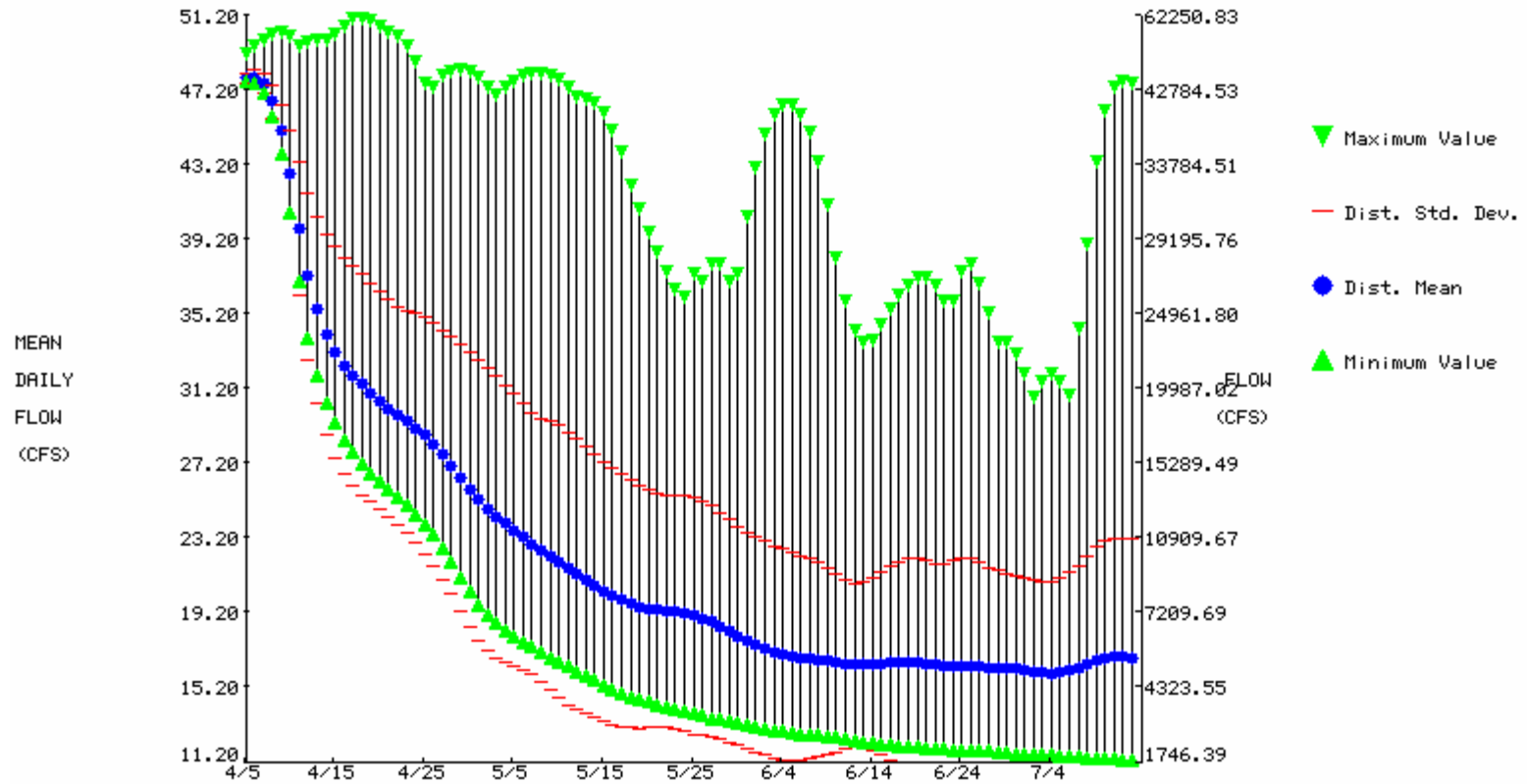
Chances of Exceeding River Levels on the RED R at PEMBINA ND
 Latitude: 48.8 Longitude: 97.5
 Forecast for the period 3/31/2004 - 7/1/2004
 This is a conditional simulation based on the current conditions as of 3/26/2004



ESP Trace Ensemble of RED R at PEMBINA ND
 Latitude: 48.8 Longitude: 97.5
 Forecast for the period 4/5/2004 12h - 7/14/2004 6h
 This is a conditional simulation based on the current conditions as of 3/31/2004



ESP Expected Value of RED R at PEMBINA ND
 Latitude: 48.8 Longitude: 97.5
 Forecast for the period 4/5/2004 12h - 7/13/2004 12h
 This is a conditional simulation based on the current conditions as of 3/31/2004

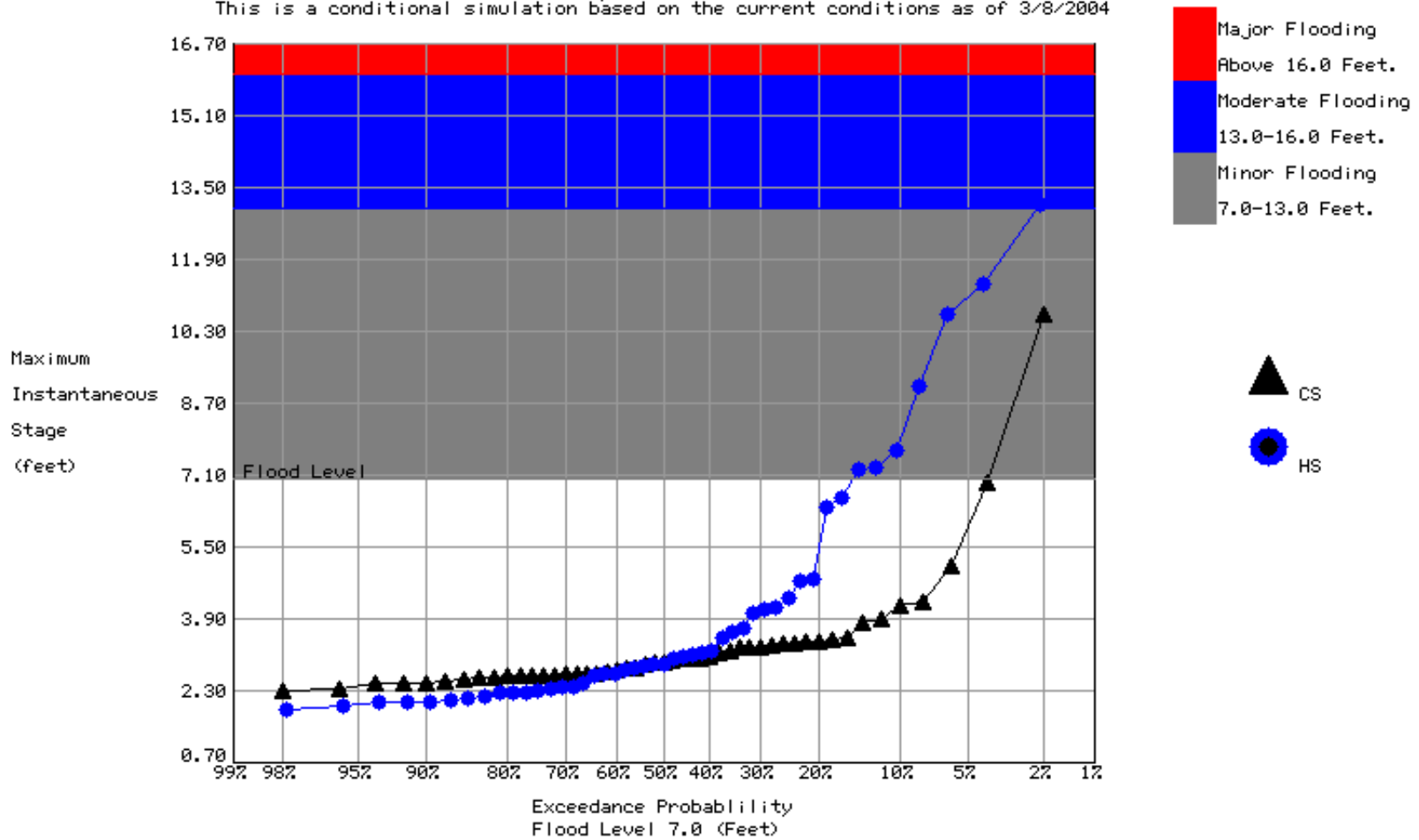


April 1st Expected Value graphic

Goose River @ Hillsboro, ND

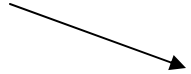
- 1203 square miles
- Quick responding tributary
- Experienced major flooding
- Location of some of the heaviest rainfall on March 28th

Chances of Exceeding River Levels on the GOOSE R at HILLSBORO ND
 Latitude: 47.5 Longitude: 97.4
 Forecast for the period 3/13/2004 - 6/21/2004
 This is a conditional simulation based on the current conditions as of 3/8/2004

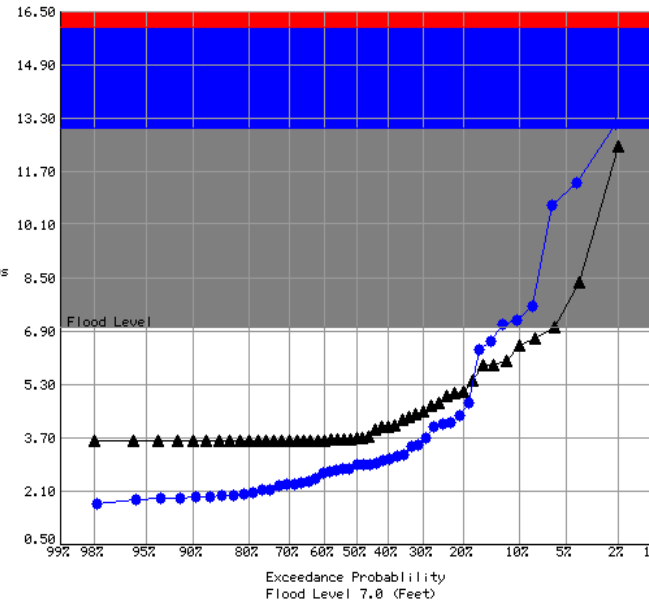


March 8th Outlook for the Goose River at Hillsboro, ND.

March 27



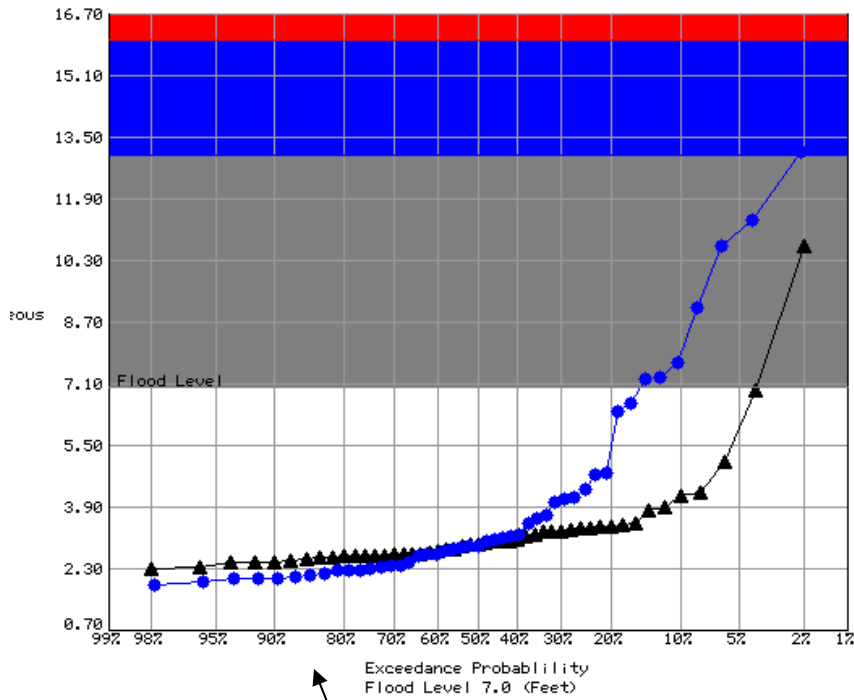
Chances of Exceeding River Levels on the GOOSE R at HILLSBORO ND
 Latitude: 47.5 Longitude: 97.4
 Forecast for the period 4/1/2004 - 6/30/2004
 This is a conditional simulation based on the current conditions as of 3/27/2004



- Major Flooding
Above 16.0 Feet.
- Moderate Flooding
13.0-16.0 Feet.
- Minor Flooding
7.0-13.0 Feet.

▲ CS
● HS

Chances of Exceeding River Levels on the GOOSE R at HILLSBORO ND
 Latitude: 47.5 Longitude: 97.4
 Forecast for the period 3/13/2004 - 6/21/2004
 This is a conditional simulation based on the current conditions as of 3/8/2004

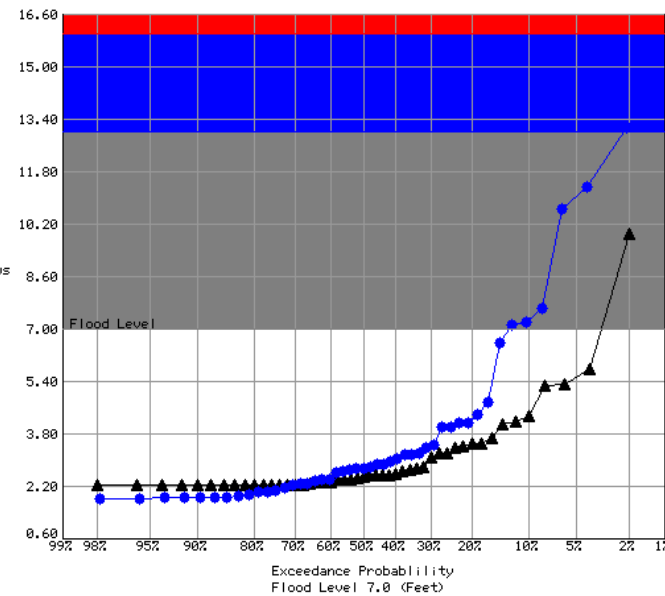


March 8



Chances of Exceeding River Levels on the GOOSE R at HILLSBORO ND
 Latitude: 47.5 Longitude: 97.4
 Forecast for the period 4/6/2004 - 7/5/2004
 This is a conditional simulation based on the current conditions as of 4/1/2004

▲ CS



- Major Flooding
Above 16.0 Feet.
- Moderate Flooding
13.0-16.0 Feet.
- Minor Flooding
7.0-13.0 Feet.

▲ CS
● HS

April 1

