Meteorological Model Ensemble Forecast System (MMEFS)

(0 – 7 Day Potential River Levels)

Graphics Improvement

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Building a Weather-Ready Nation

Social Science Studies

socialscience.focusonfloods.org

Two Studies led by Nurture Nature Center:

- River flood forecast products (Easton, PA and Lambertville, NJ funded by NOAA OAR in 2012

- Coastal flood forecast products funded by NOAA Sea Grant/NJ Sea Grant Consortium in 2015

- Scenario based focus groups and surveys with flood-affected residents

THE NURTURE NATURE CENTER

NATIONAL WEATHER SERVICE

East Carolina UNIVERSITY

RMC RESEARCH

Jacques Cousteau
National Estuarine Research Reserve

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What did we learn?

- RIVER LEVELS matter

- COLOR and GRAPHIC DESIGN matter

- LEGENDS, TITLES, LABELING AND TEXT matter

- NWS BRIEFINGS matter

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UNCERTAINTY MESSAGES need to be carefully considered.

- Current ensemble forecast graphics were very **confusing**

- Some participants **did** want to receive uncertainty information

- Almost no participants could properly interpret the information from the current suite of Meteorological Model Ensemble River Forecasts (MMEFS) graphics

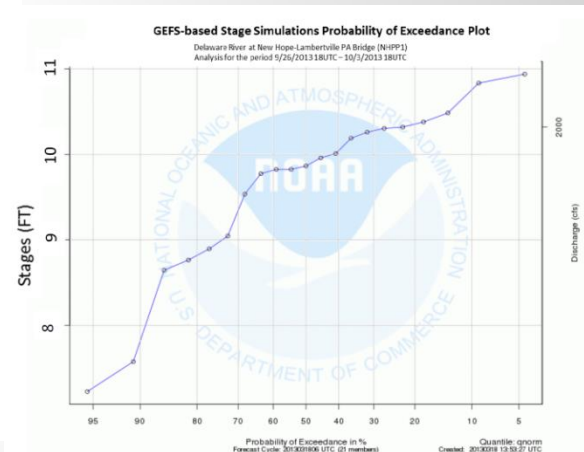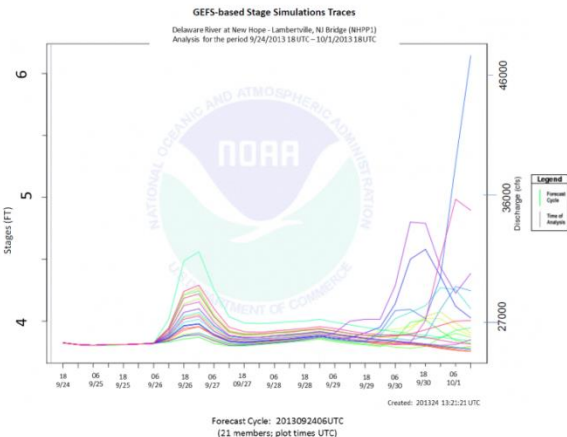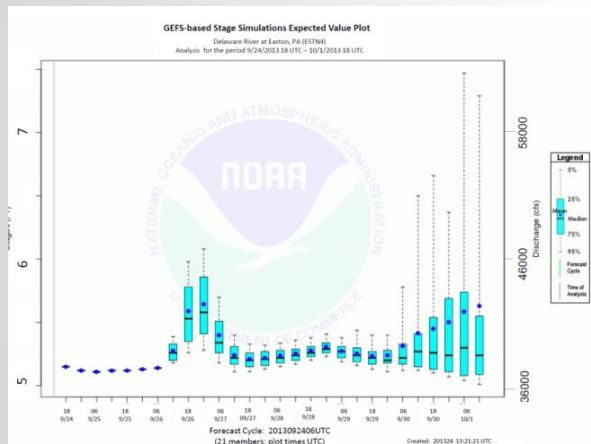# Using what we learned: MMEFS

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- <u>Quick Recognition</u>: 'What am I looking at, 'Why is this important', 'What is this trying to tell me'.
- <u>Pleasing</u> to the eye.
- <u>Carefully Use Text and Color</u> to help make the purpose and core message obvious
- <u>Simplify</u>-
  - Focus on primary message
  - Use non-technical language
  - Be willing to omit some details
  - Balance statistical rigor vs clarity
- <u>Test</u> mock-ups with a range of customers.

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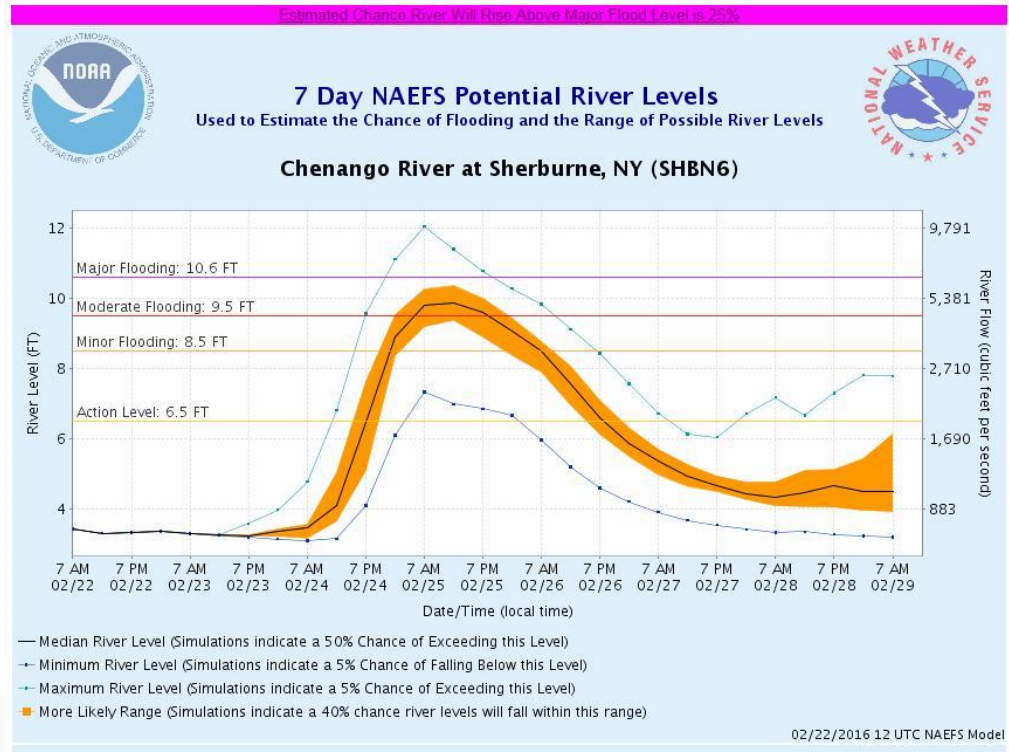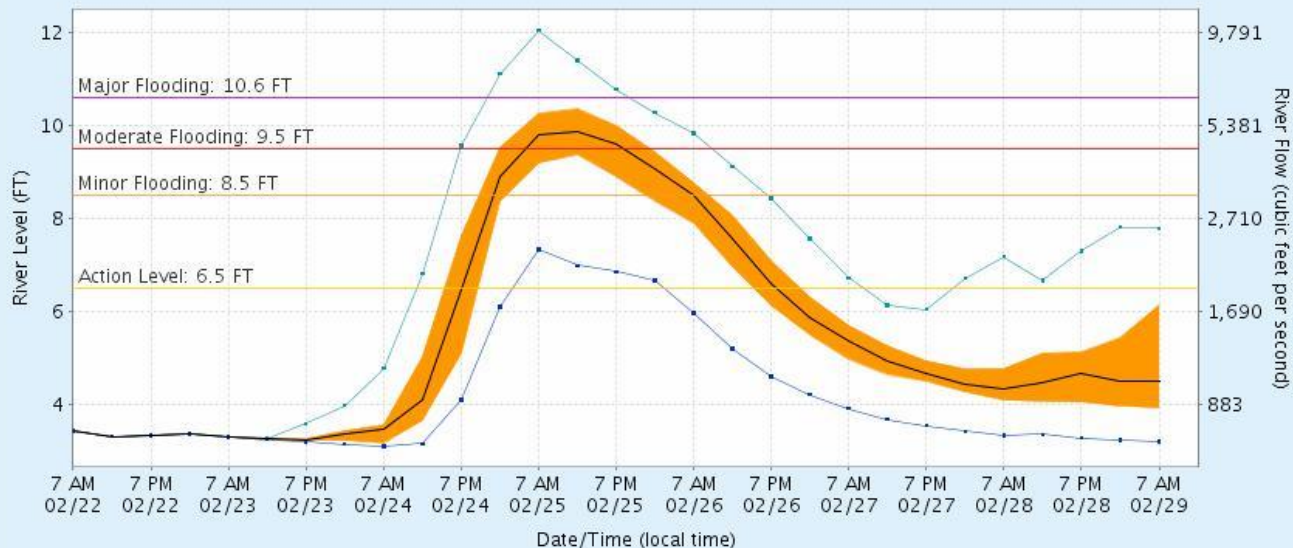

Estimated Chance River Will Rise Above Major Flood Level is 25%

7 Day NAEFS Potential River Levels
Used to Estimate the Chance of Flooding and the Range of Possible River Levels

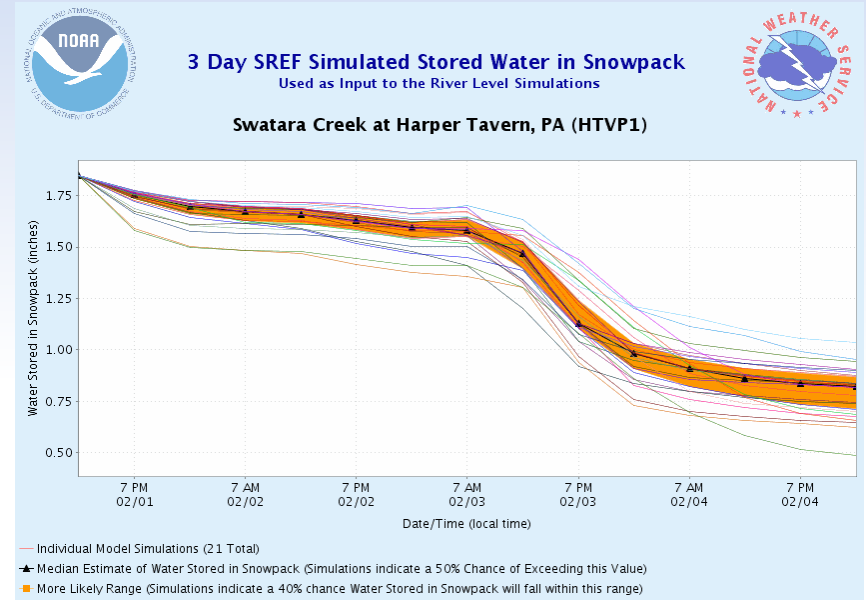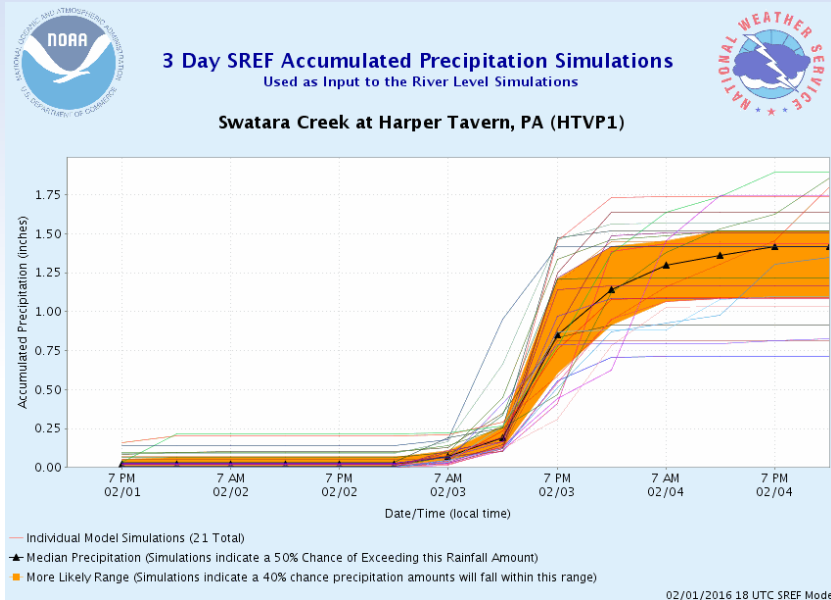**Chenango River at Sherburne, NY (SHBN6)**

- Median River Level (Simulations indicate a 50% Chance of Exceeding this Level)
- Minimum River Level (Simulations indicate a 5% Chance of Falling Below this Level)
- Maximum River Level (Simulations indicate a 5% Chance of Exceeding this Level)
- More Likely Range (Simulations indicate a 40% chance river levels will fall within this range)

02/22/2016 12 UTC NAEFS Model

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CHENANGO RIVER AT SHERBURNE

Additional Graphics

- Precipitation Simulations
- Accumulated Precipitation Simulations
- River Level Simulations (expanded)
- Simulated Water Stored in Snowpack
- Temperature Simulations

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Direct Navigation: www.weather.gov/erh/mmefs

Product Description Document

MARFC Status & News

aflet | Esri — Source: Esri, DeLorme, 2012

Make a link to this map view

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KML data useful for ingest into your software or situational displays

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Acknowledgements:

Social Science Study Participants
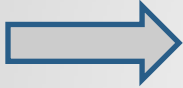
→ Nurture Nature Center, Easton, PA
East Carolina University
RMC Research, Inc
Jacques Cousteau National Estuarine Research Reserve
WFO Binghamton, NY
WFO Mount Holly, PA
Middle Atlantic RFC

MMEFS Graphics Improvement Team

→ Middle Atlantic RFC
Northeast RFC
Ohio RFC
Southeast RFC
Eastern Region Headquarters
WFO Taunton, MA

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- Ensemble forecasts for time periods from days to weeks to months

- Currently being used by NYC DEP to support their reservoir operations

- Under evaluation to validate model performance

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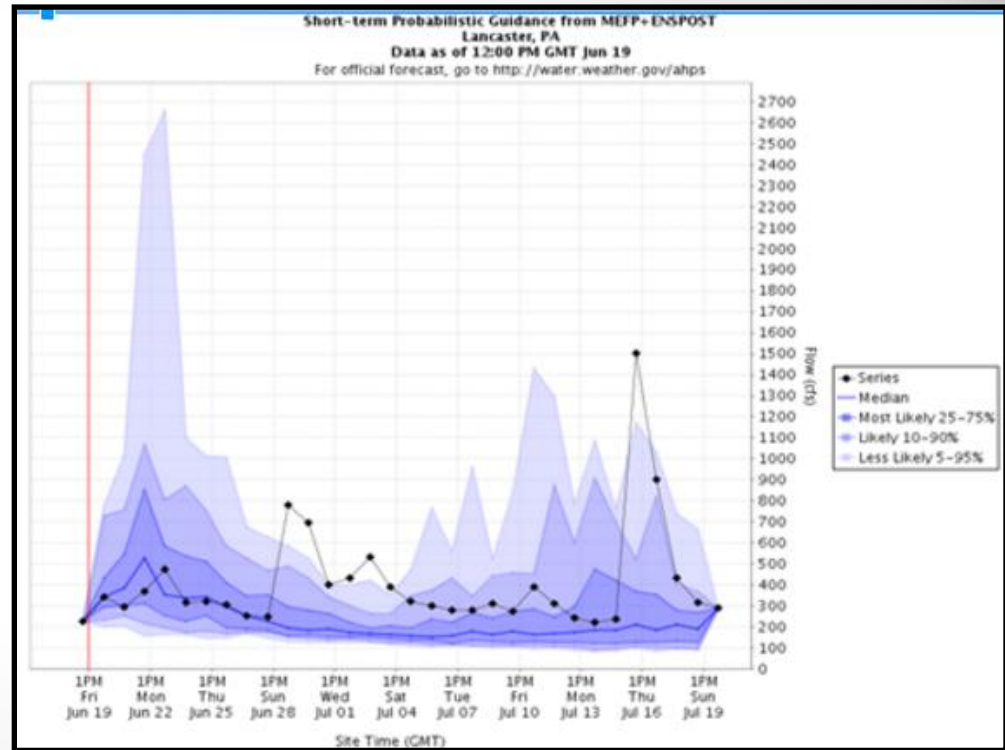

Short-term Probabilistic Guidance from MEFP+ENSPOST
Lancaster, PA
Data as of 12:00 PM GMT Jun 19
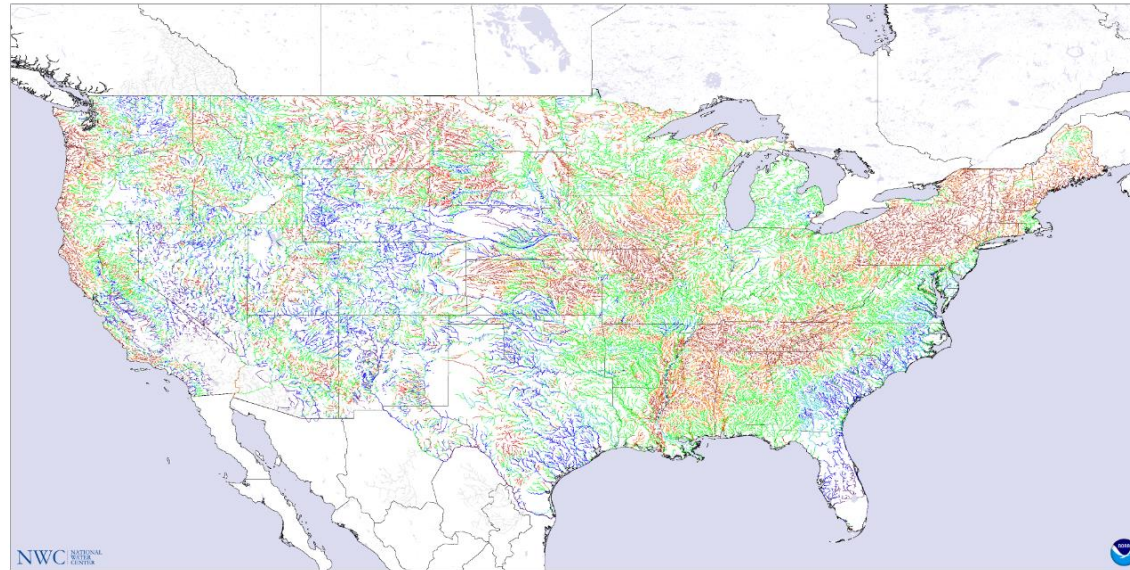For official forecast, go to http://water.weather.gov/ahps

National Water Model

National Water Model Streamflow Anomaly (Experimental)
Forecast valid for 2016-05-29 03:00:00 UTC
Model initialized at 2016-05-19 06:00:00 UTC

| No anomaly data | Low flow | Much below normal flow | Below normal flow | Normal flow | Above normal flow | Much above normal flow | High flow |

- National Water Center in Tuscaloosa beginning to spin up operations
- National Water Model currently in 30 day test period before beginning "operations" in June
- Several years of development and validation expected
- Producing several TB of data / day

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Please let us know:

- How you use MMEFS
- Specific cases when it was helpful
- Problems and Issues
- Recommended improvements

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