



Verification at NWS River Forecast Centers

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Verification at NWS RFCs

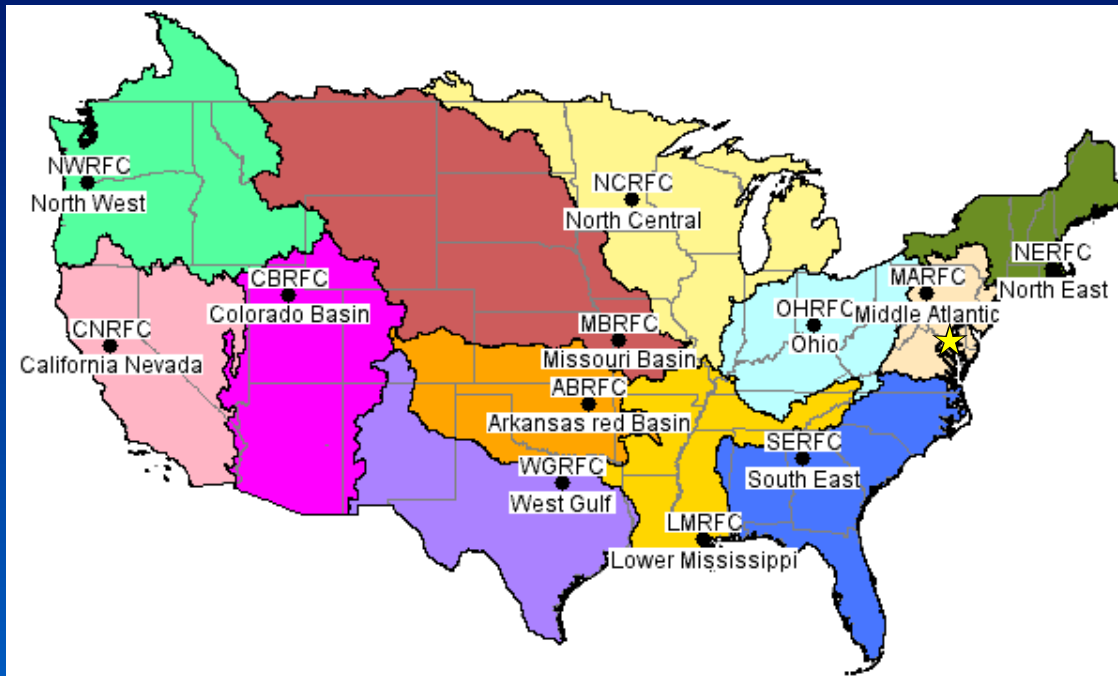
Background

The mission of the NWS Hydrologic Services Program is to save lives, reduce property damage, and contribute to the optimum use of the nation's water resources (NWS webpage, 2002)

- The NWS meets its hydrologic forecast responsibilities using:
 - < 13 River Forecast Centers (RFCs)
 - < 122 Weather Forecast Offices (WFOs)
 - < Office of Hydrologic Development (OHD)

Verification at NWS RFCs

Background



Verification at NWS RFCs

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- The RFCs initiate nearly all river forecasts
 - < Combine model guidance and hydrologic expertise to create forecasts of river height at a point
 - < Pass forecasts along to the WFO that has hydrologic responsibility for that area
- WFO issues public statements
- Final Product Consists of:
 - < **Numbers generated at RFC**
 - < Text description added at WFO

Verification at NWS RFCs

Background

FLOOD STATEMENT
NATIONAL WEATHER SERVICE ALBANY NY
1057 AM EDT THU JUN 06 2002

LOCATION	FORECAST					
	2 PM THU	8PM THU	2AM FRI	8AM FRI	2PM FRI	8PM FRI
HOOSIC RIVER EAGLE BRIDGE	9.7	8.0	7.4	7.0	6.6	6.2

MINOR FLOODING ALONG THE HOOSIC RIVER SHOULD END THIS AFTERNOON.

AT 10 AM THE HOOSIC RIVER WAS CRESTING AT EAGLE BRIDGE IN NORTHERN RENSSELAER COUNTY. IT WAS JUST UNDER 10 FEET.

THE RIVER WAS JUST HIGH ENOUGH TO OVERFLOW ONTO RIVER ROAD NEXT TO THE COVERED BRIDGE.

Verification at NWS RFCs

History

- Initial national river forecast verification system implemented in April 2001
- Current NWS national verification software supported by OHD measures forecast skill based on statistical error and bias
 - < Mean Error
 - < Mean Absolute Error
 - < RMS Error

Verification at NWS RFCs

RFC Tools for Verifying Forecasts

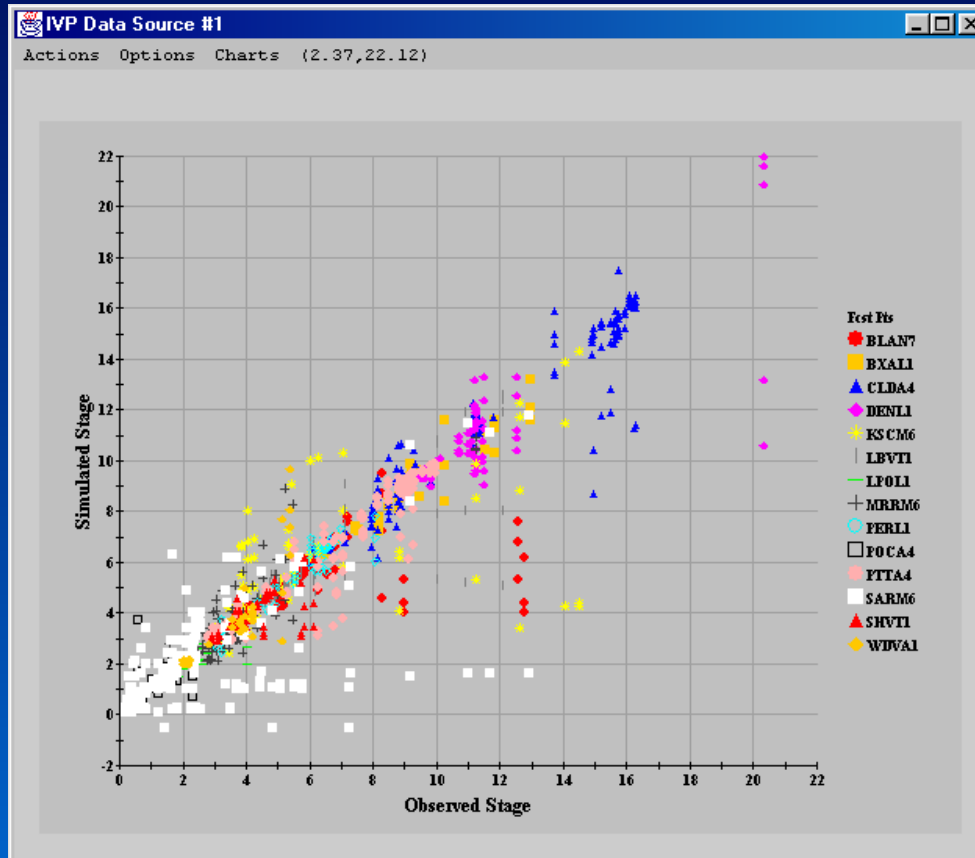
- **VERIFY** - a program to query and extract data
 - < Extracts hydrologic forecasts and gauge observations from the operational relational database
 - < Pairs observation and forecasts using specified criteria
 - < Calculates summary statistics for extracted pairs
- **IVP** - a "back-end" GUI for the VERIFY program
 - < Displays pairs of observations and forecasts
 - < Divides sample set into categories for more thorough verification analysis
 - < Computes measures for user-defined categories

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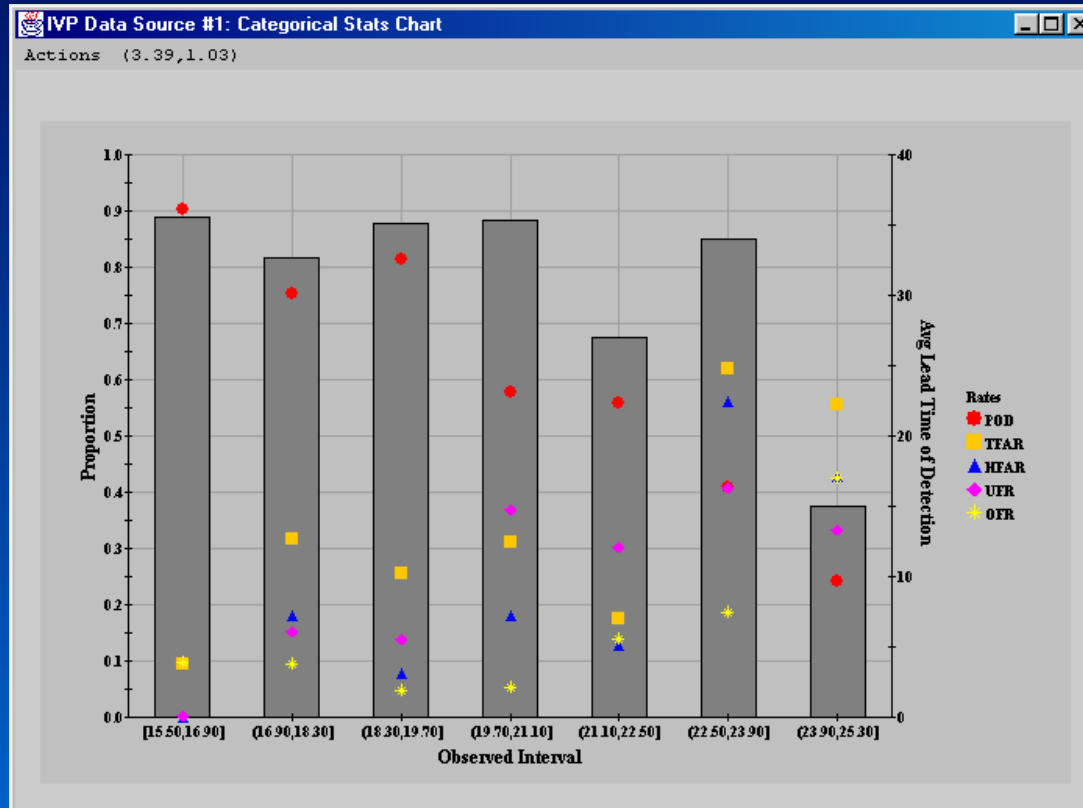
RFC Tools for Verifying Forecasts

- IVP computes several measures for each category
 - , Root Mean Square Error
 - , Mean Absolute Error
 - , Mean Error
 - , Maximum Error
 - , Probability Quantiles
 - , Probability of Detection
 - , Under Forecast Rate
 - , Over Forecast Rate
 - , Average Lead-Time of Detection
 - , False Alarm Rate
 - , Hydrologic False Alarm Rate

IVP Scatter Plot



IVP Categorical Stats Chart



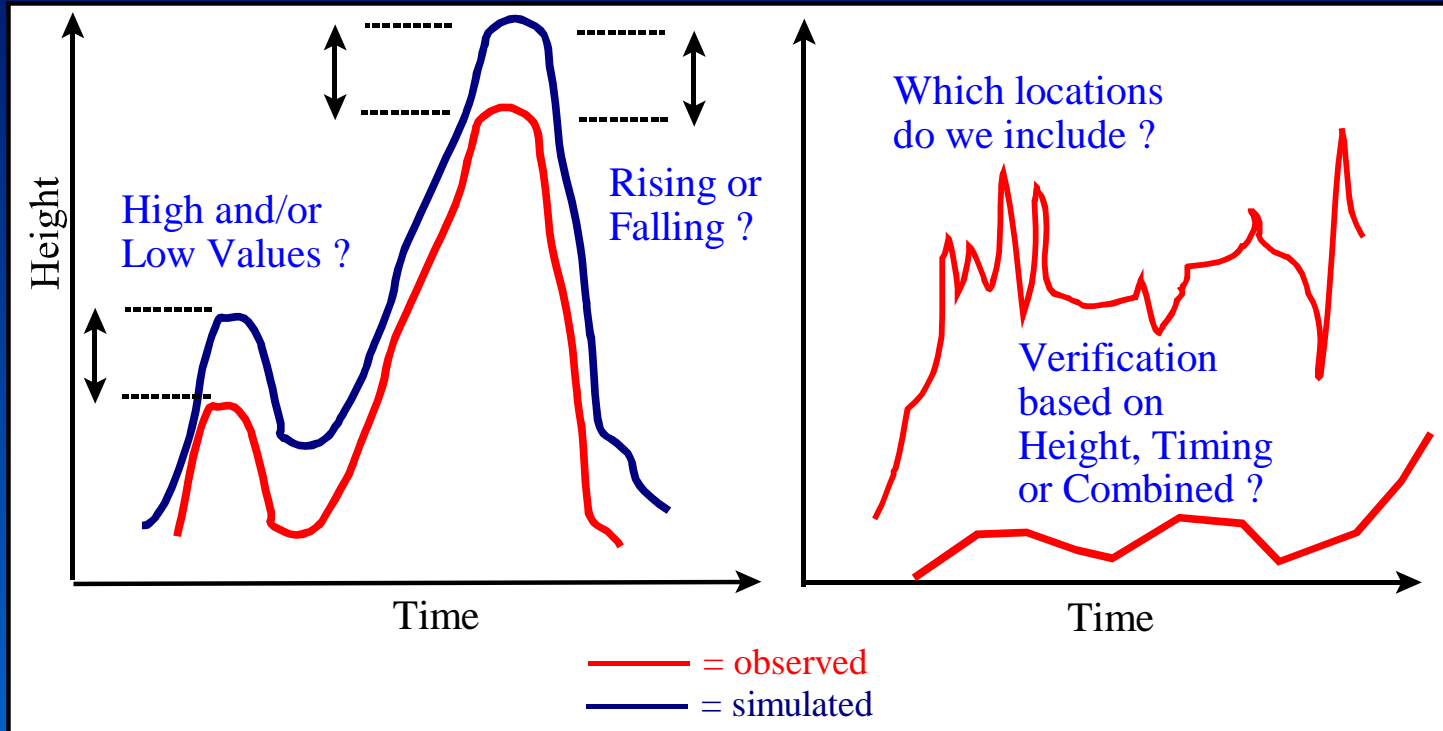
Verification at NWS RFCs

Issues

- **Data**
 - < Not enough data for most RFCs (April 2001 to Present)
- **Measures**
 - < Which are most informative?
 - < Under which conditions?
- **Software**
 - < Need meaningful and easy to understand charts
 - < Must reduce time/system resources

Verification at NWS RFCs

Hydrologic Issues



Verification at NWS RFCs

Future Work

- Hydrology specific measures
- Investigate Strengths/Weaknesses of measures
 - < Effects of user-defined parameters
- Verify Probabilistic River Forecasts
 - < “A Method for Evaluation of Ensemble Streamflow Predictions” (Franz et al.)