

A Verification Service for the DTC

Jennifer Mahoney
Chief, ESRL/GSD/Forecast Verification Section
Affiliated with the Developmental Testbed Center

Outline

- Overarching assessment themes within DTC
- Why a Verification Service
- How will we provide a Verification Service
- Motivation and Paradigm shift
- Examples
- Plans

Goals

- Convey programmatic concepts and plans for the development of a Verification Service for DTC
- Sean Madine will present in depth concepts for creating the Verification Service (Thursday 10:45).

Overarching DTC Assessment Themes

- Assessments of WRF forecast quality with respect to operational application
- Effective collaboration among WRF user community, DTC analysts, and Operational Forecast Centers
- Assimilation of new observation datasets into verification techniques
- Development and testing of advanced verification techniques
- Effective communication of uncertainty in forecast performance metrics
- ***Assess forecast quality as it relates to improvements in forecast services to the public***

A Verification Service for the DTC

- Why:
 - WRF forecast assessed w.r.t improvements in forecast services to the public
 - Value of weather forecasts for U.S. agriculture is about \$1/acre.
 - U.S. electricity generation costs savings from weather forecasts are \$.061/mega-watt-hour.
 - U.S. households value forecasts at \$16-20/household per year.
 - 70% of all air traffic delays are related to weather; Reducing flight delays that are due to weather, would save airlines and flying public an estimated \$900 million over a 10-year period.
 - Foster collaboration between DTC user groups (e.g. WRF user community, DTC analysts, and Operational Centers)

A Verification Service for the DTC

- How:

- Develop of a Network-Enabled Verification Service (NEVS) that:

- Integrates user-specific decision and planning criteria into the forecast verification process, and
 - Provides an infrastructure for effective information sharing and collaboration among a variety verification users

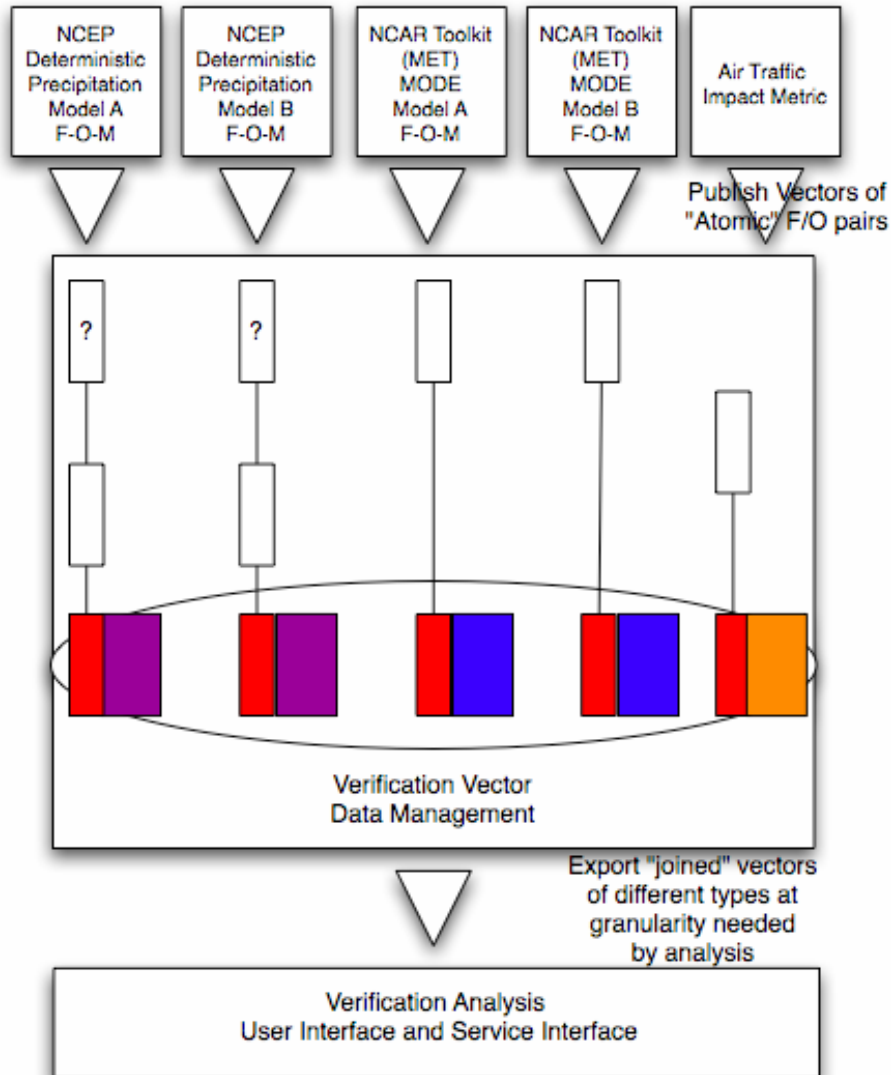
The Motivation for NEVS

- Integral part of the automated Next Generation Air Transportation System
- Used to evaluate forecast performance as related to improvements in NOAA's weather services to the public
- Leverage development of NEVS for the DTC

NEVS – Paradigm Shift

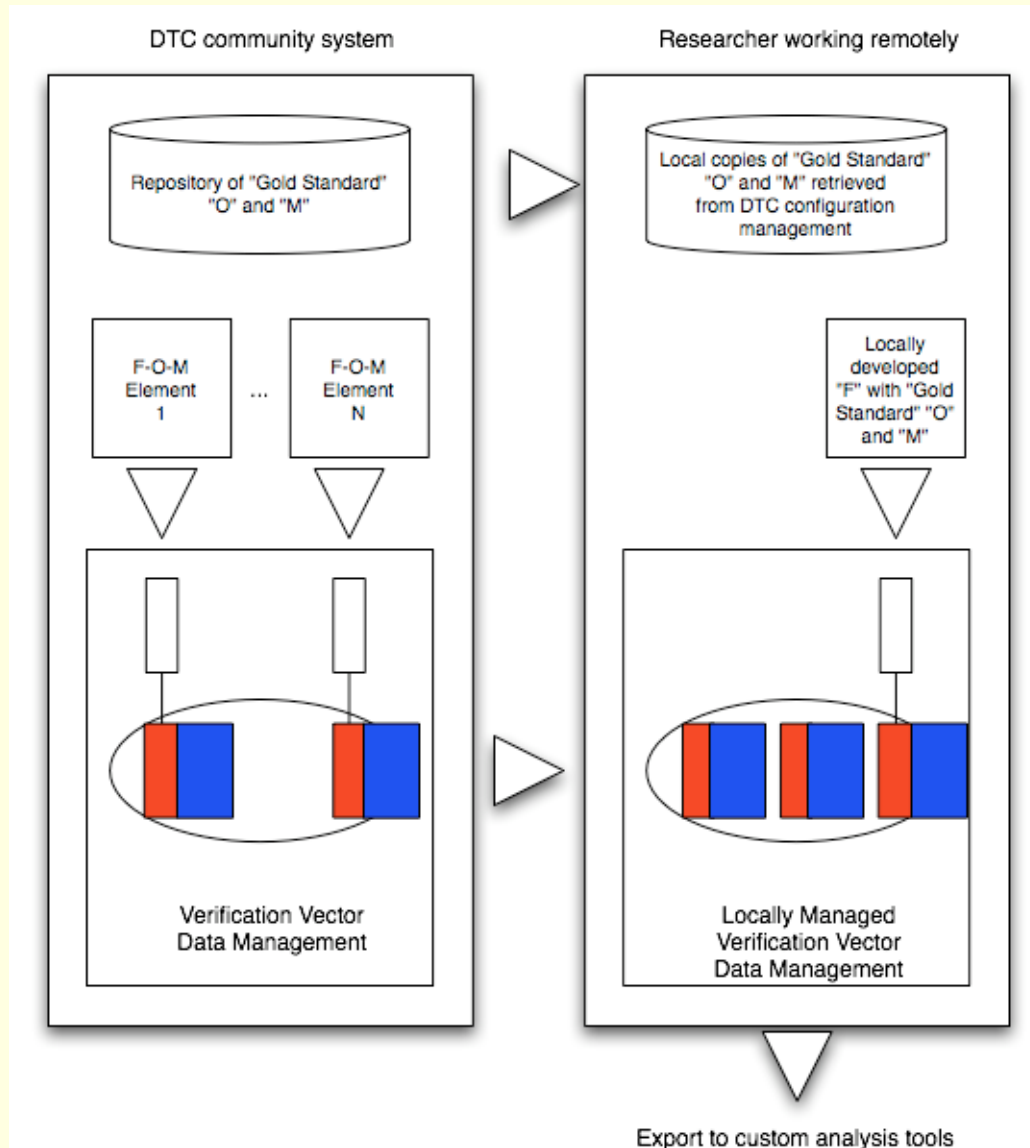
- Conceptual
 - User decision criteria fundamental to the forecast verification process
- Engineering
 - Distributed service (not a ‘system’)
 - Uses a web-based network for data distribution and access
 - Sophisticated database management structure for integrating disparate datasets

How Does NEVS Fit in the DTC



- NCEP output used as basic input
- NCAR's MET enhances basic input
- GSD manages and integrates FOM and non-wx vectors
- Analysis requires stratification and granularity control

How Does NEVS Fit in the DTC

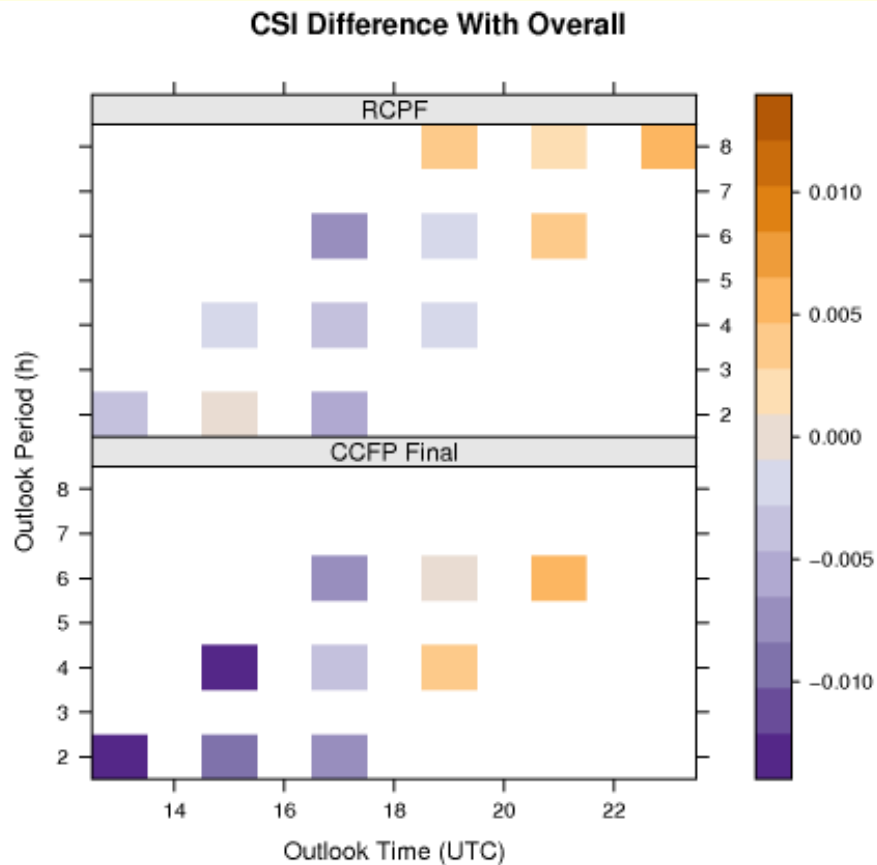


NEVS - Will Support:

- Integration of user-decision and planning criteria into the verification process
- Provide an infrastructure for collaboration between WRF user groups
- Allow for information sharing between MET and other verification 'systems'
- Maintain the historical approach to forecast verification
- Integration of new observation datasets and verification techniques

Verification Information When it Matters

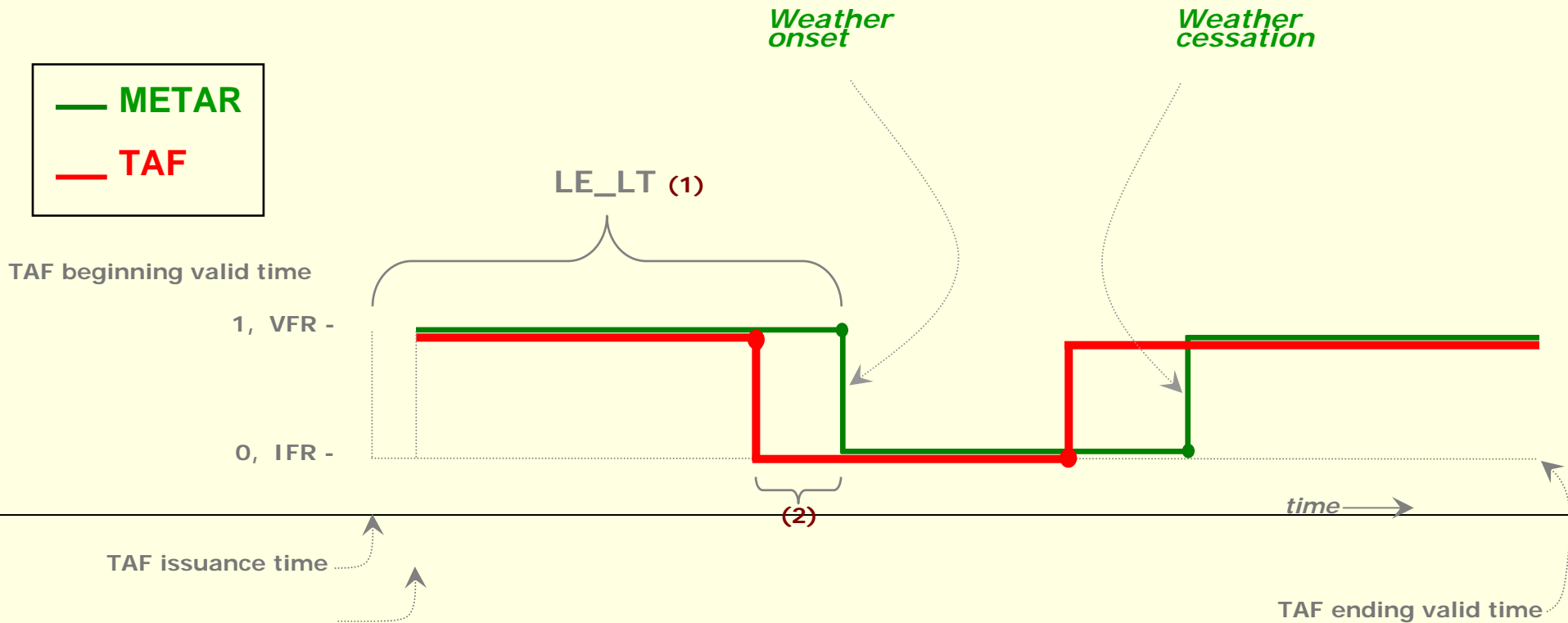
Problem: Forecast Skill when Traffic Impact due to Convection is Large



- Difference in CSI values for high impact convective weather days w.r.t all days
- Improvement in forecast skill for strategic planning periods when convective weather is a problem for air traffic flow

Verification Information When it Matters

Problem: Accuracy of the forecast onset for poor ceiling and visibility conditions at an airport



Plans

- NEVS prototype available this summer for convective forecast evaluation
 - Include the MET object-based techniques
- Assemble team to develop functional requirements for DTC NEVS
- Begin prototype to support future DTC tests