NOAA Plans Supporting NextGen

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Discussion Points

- Aircraft as observation platforms
  - Water Vapor Sensors to complete the profiles
- Evolving to meet NextGen spatial and temporal forecast requirements
  - Next Generation Numerical Weather Prediction
  - Meteorologist “Over-the-Loop” processes
  - National Digital Forecast Database to include aviation elements
    - Legacy products generated from database (e.g. TAFs)
- Relevant, operations focused verification
  - Weather Impact Traffic Index
- Observing and Forecast Systems and Network Enabled Operations
  - System Open Architecture (AWIPS, ASOS etc)

Aircraft Based Observations

- NOAA has begun the acquisition of aircraft based water vapor sensors and data
- Planning on at least 1200 sensors on line by 2020, providing nearly 7000 atmospheric profiles per day
- Will enable an estimated 10% improvement in model guidance and forecast accuracy
  - Greatest effect on precipitation, convection, ceiling/visibility, icing and turbulence

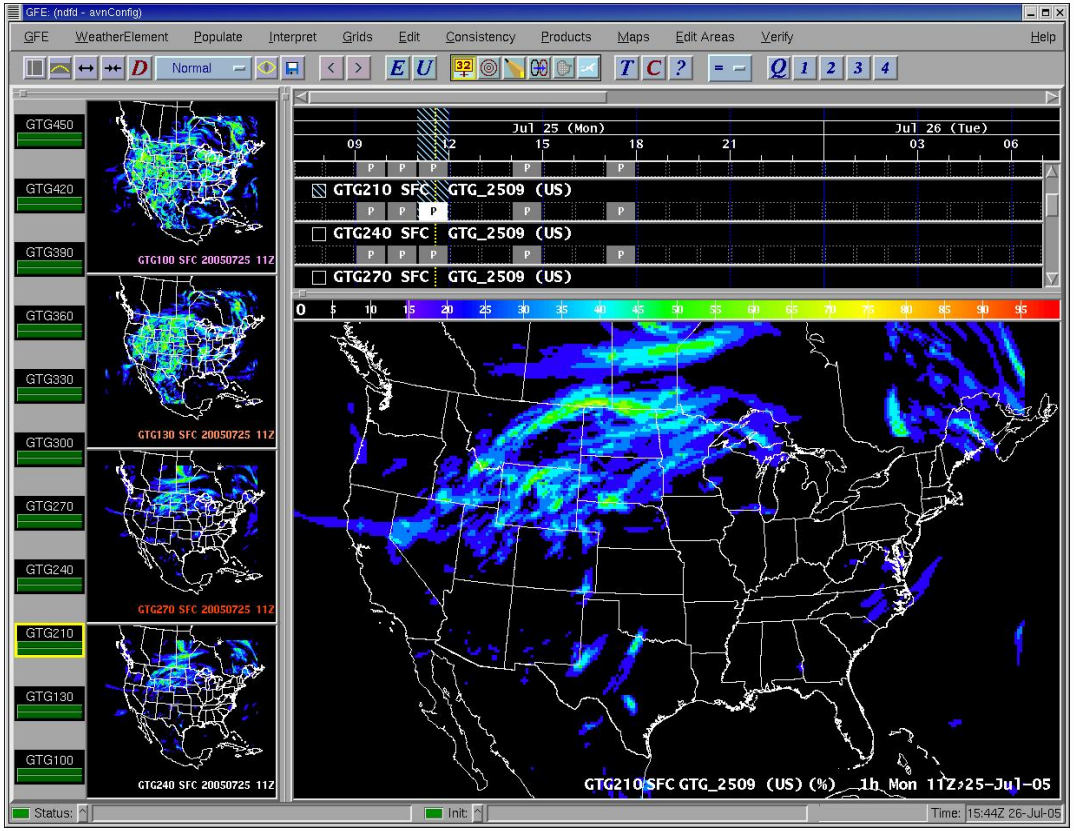
Numerical Weather Prediction (NWP)

- NOAA's Next Generation Numerical Weather Prediction (NWP) are being updated to provide better forecast guidance
  - High-Res, Rapid Refresh (HRRR) model in NCEP operations in FY12
  - Storm Scale nested models available for 2016 MOC
  - 4D data assimilation available 2016
  - Capabilities include advanced post processing and verification analyses

Meeting Forecast Requirements of the 4D-Cube and Examples of Meteorologist "Over the Loop"

- Interactive Calibration in 4-D (IC4D)
  - Test-bed at Alaska Aviation Weather Unit
- Localized Aviation MOS (Model Output Statistics) Program
- Auto-Nowcaster (NCAR and Fort Worth WFO)
- Aviation Forecaster Preparation System
  - Legacy (TAF) products automatically generated

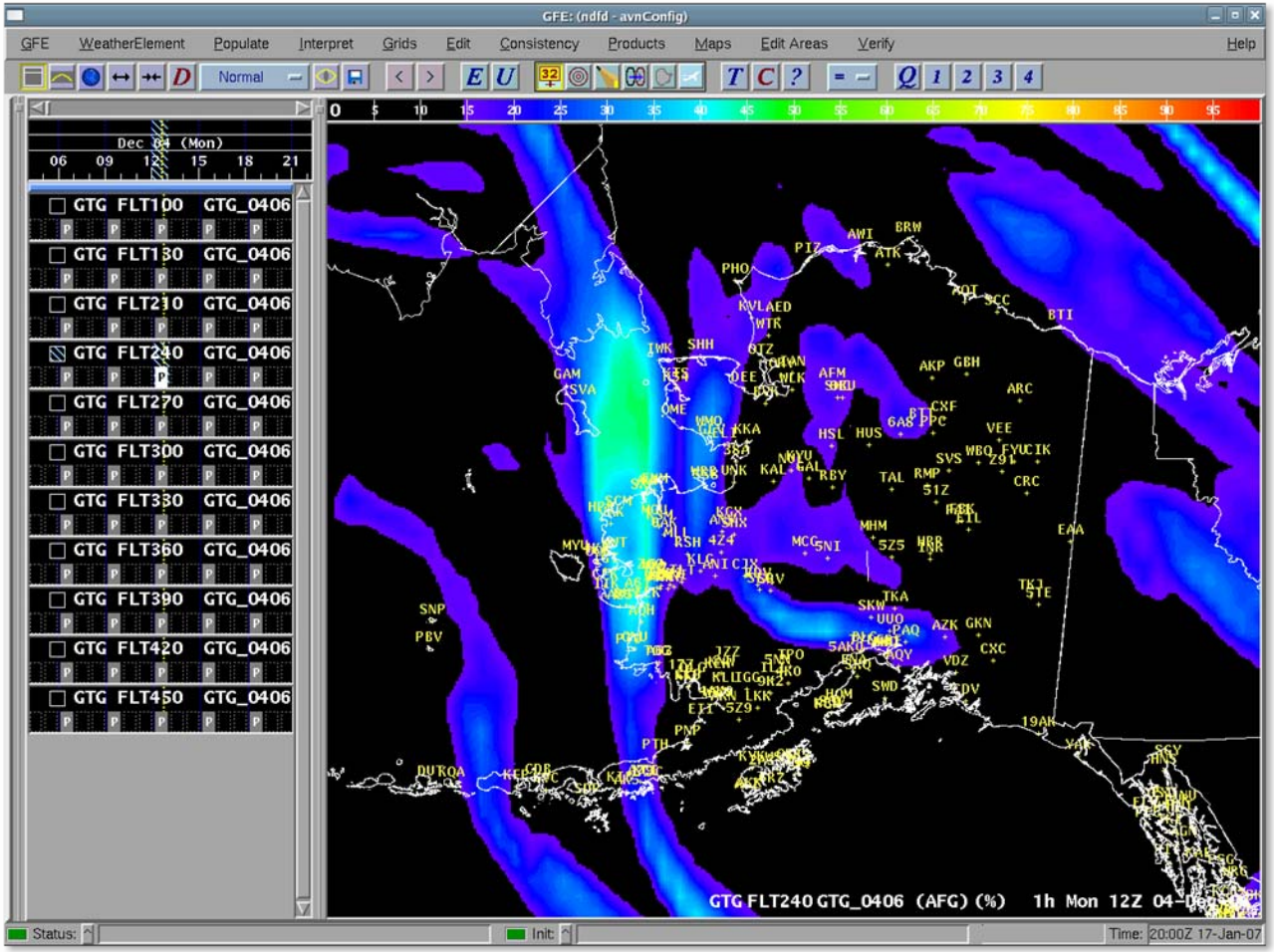
IC4D



- **FAA Aviation weather research program has developed 4- (x, y, z, t) gridded guidance for parameters such as turbulence and icing.**

- **"Meteorologist-over-the-loop" concept will allow forecasters to make adjustments to the automated guidance when needed**

IC4D at AAWU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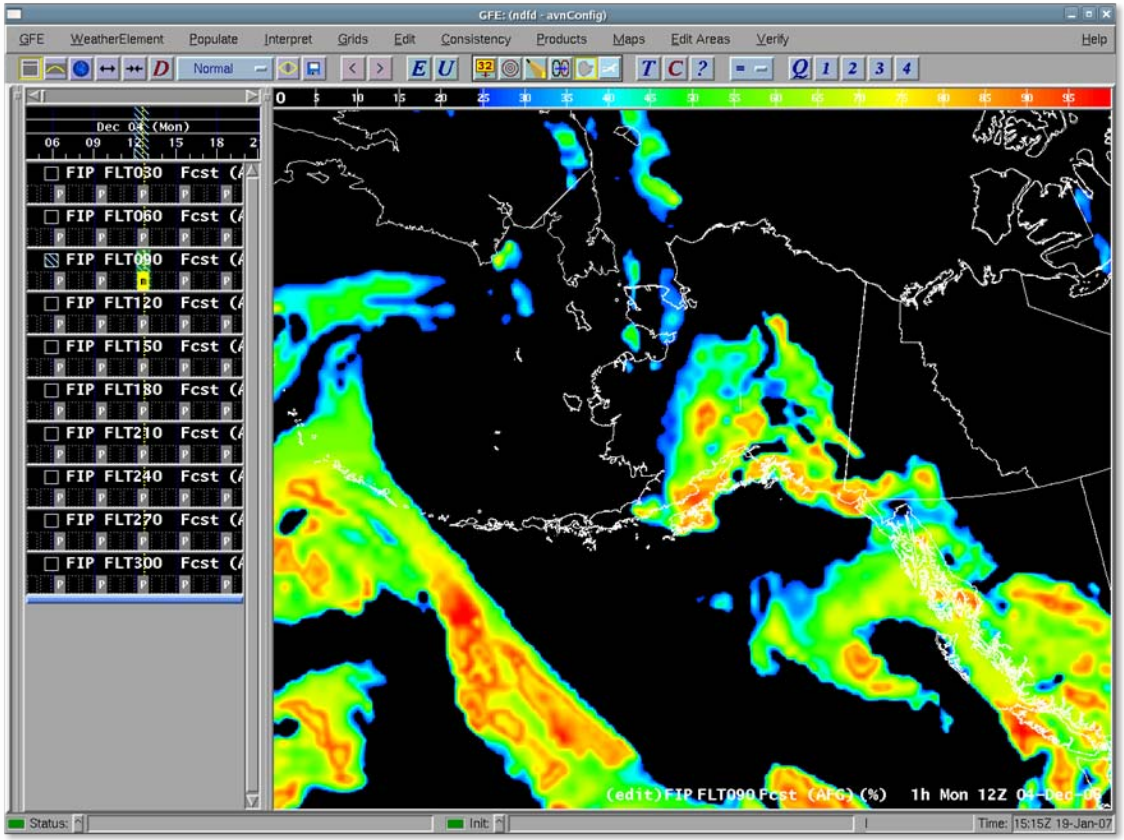
IC4D at AAWU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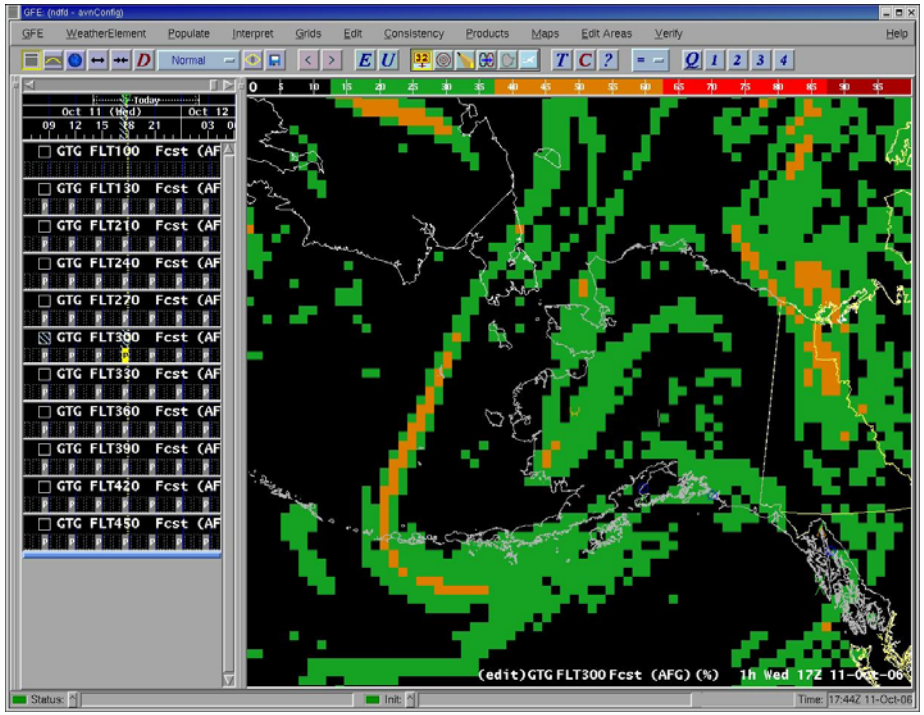
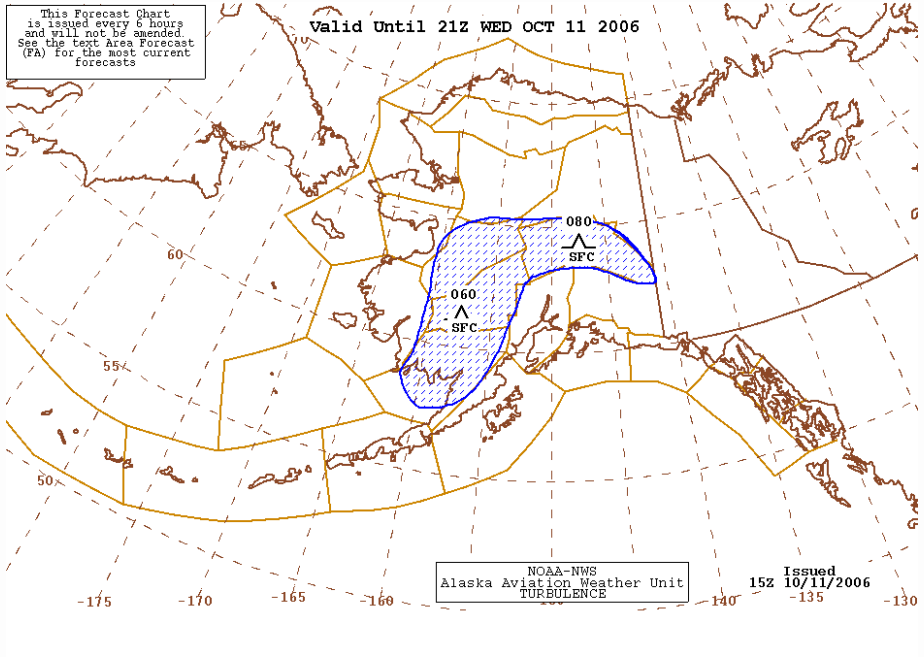
Potential Products from 4-D Cube



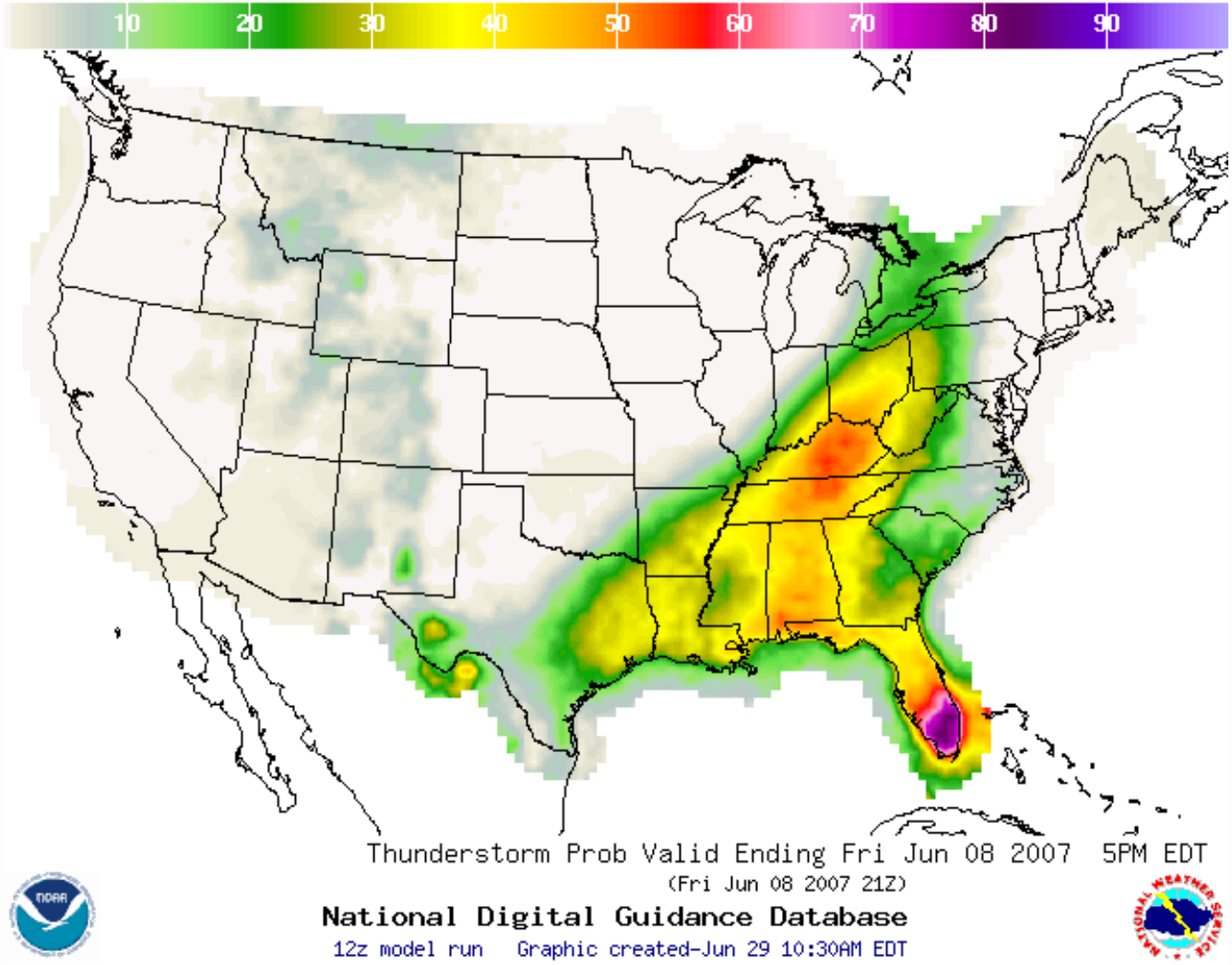
- **Graphical forecast products could be derived from forecaster-adjusted grids**



Localized Aviation MOS Program

- LAMP statistically relates sensible weather to output from MOS along with the most recent observations
- Acts as a rapid refresh update to MOS
- LAMP acts as a sophisticated interpolation between the observations and the MOS forecast
- LAMP guidance
  - Provides guidance of aviation elements: ceiling height, sky cover, visibility, and obstruction to vision
  - Probability/Best Category Y/N of a thunderstorm occurrence in a 2-hour period in a 20-km gridbox
  - Goes out 25 hours in 1 hour projections
  - Station Guidance: All elements, ~1600 stations, CONUS, Alaska, Hawaii, Puerto Rico
  - Will run 24 times a day (every hour) by end of CY08

Gridded MOS Thunderstorm Products



Terminal Forecast Error: Potential Impact

Next Generation Air Transportation System
Joint Planning and Development Office

Example of a terminal Wx overforecast
Dec 16, 2007