Meteorological Modeling for Traffic Management
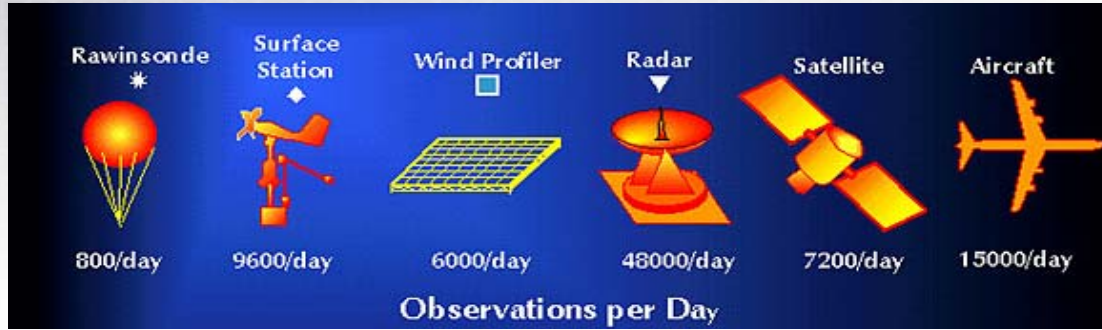
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Aerospace Sciences and Engineering Division

10 November 2005

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Weather Impacts on Air Traffic Management

- Air transportation is growing rapidly making management of limited airspace critical
- Majority of delays in air traffic within the NAS are due to adverse weather
  - Adverse weather often affects airspace and limits traffic to terminals
  - Limited planning of the interface between en-route and terminals compounds problem
- Improved weather forecast are required
  - National models lack sufficient temporal and spatial resolution to address traffic management needs
  - High resolution 4-D regional model is better solution
  - Presentation of forecast information to TM is as important as better forecasts
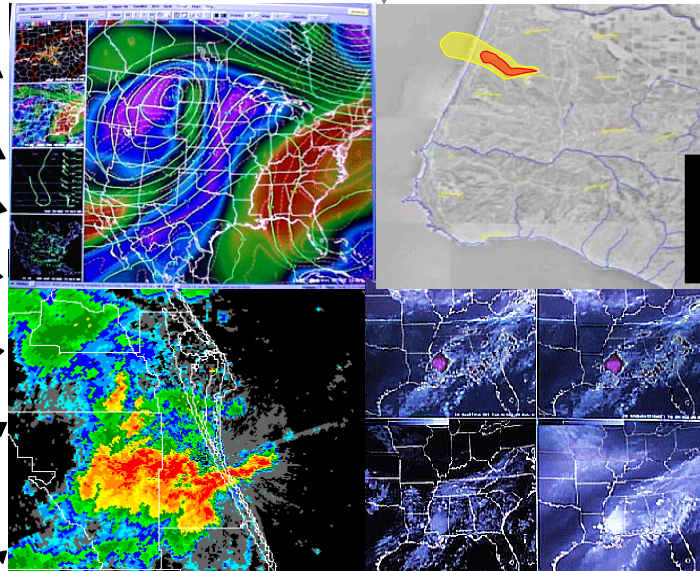
ENSCO Data Assimilation & Modeling

Observations per Day: Rawinsonde 800/day, Surface Station 9600/day, Wind Profiler 6000/day, Radar 48000/day, Satellite 7200/day, Aircraft 15000/day

LOCAL DATA SETS

Decision Products

Data fusion
Forecast and safety modeling systems

Launch Support

Emergency Response

Aviation Support

Severe Weather Response

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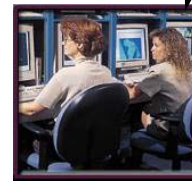
METWISE Predict Overview

- Proven model developed to forecast convection
  - Focused on explicit convection and supercell prediction
  - Can operate on local to hemispheric scales
  - Designed for optimization on parallel computing
  - Well-documented
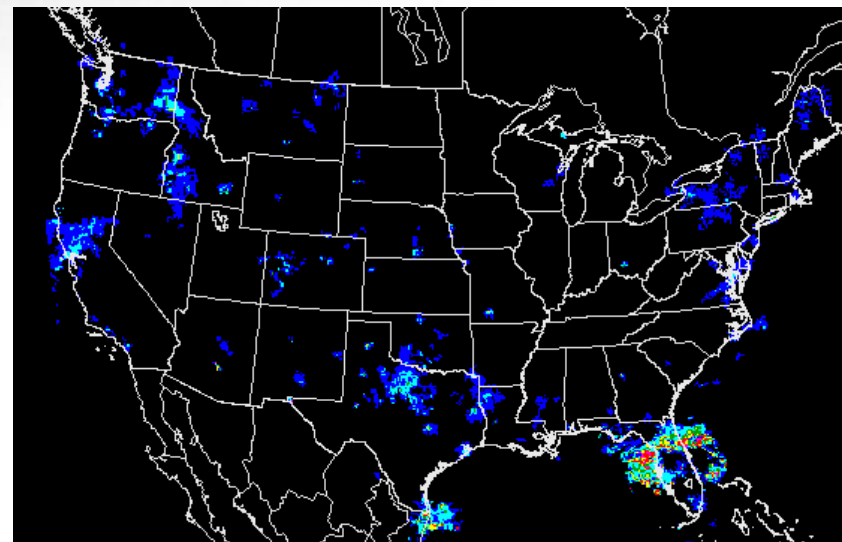 - International applications

ENSCO Model Configuration

- Current (METWISE Predict)
  - Model runs 8 times per day (every 3 hours)
  - Forecast covers from 30 minutes to 9 hours
  - Forecasts provided in 30-minute increments
  - 12 km grid spacing over CONUS
- Added Value beyond current national models
  - Higher temporal and spatial resolution (vs. 20 km x 1 hr.)
  - Visualization, Time Animation, & Prognostic products not currently available with national models
  - Higher resolution regional forecasts can be produced (4km x 15 minutes)
- Future
  - Longer forecast periods are possible
  - Migration towards community model (WRF)
    - ENSCO continuously evaluates newest technology

4 May 05 – 15Z ARPS Model
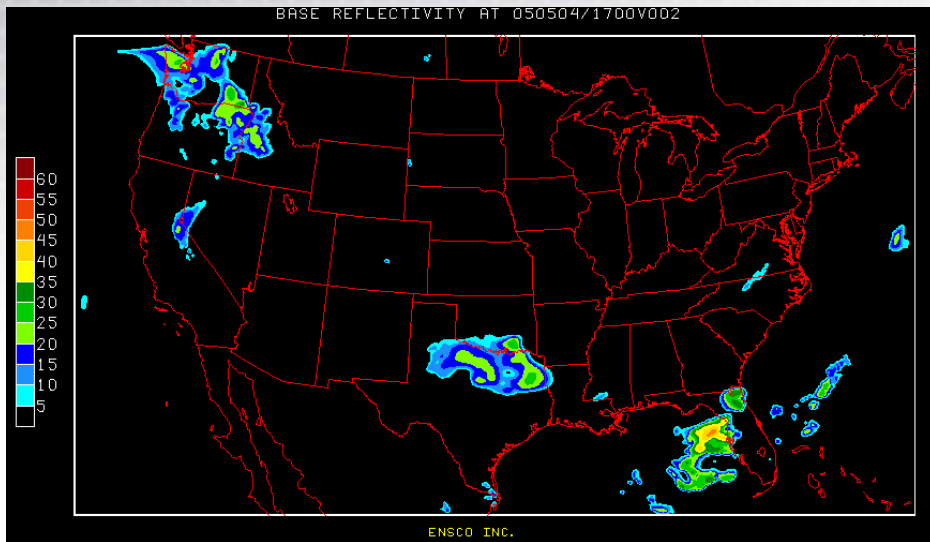
ENSCO ARPS Initialization 15Z
Valid 17Z- 21Z (30-min intervals)

ENSCO MetWise National Radar
Valid 17Z- 21Z (30-min intervals)

CCFP Issued 15Z
Valid 17Z

CCFP Issued 15Z
Valid 19Z

CCFP Issued 15Z
Valid 21Z

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