Maintaining a Local Data Integration System in Support of Weather Forecast Operations

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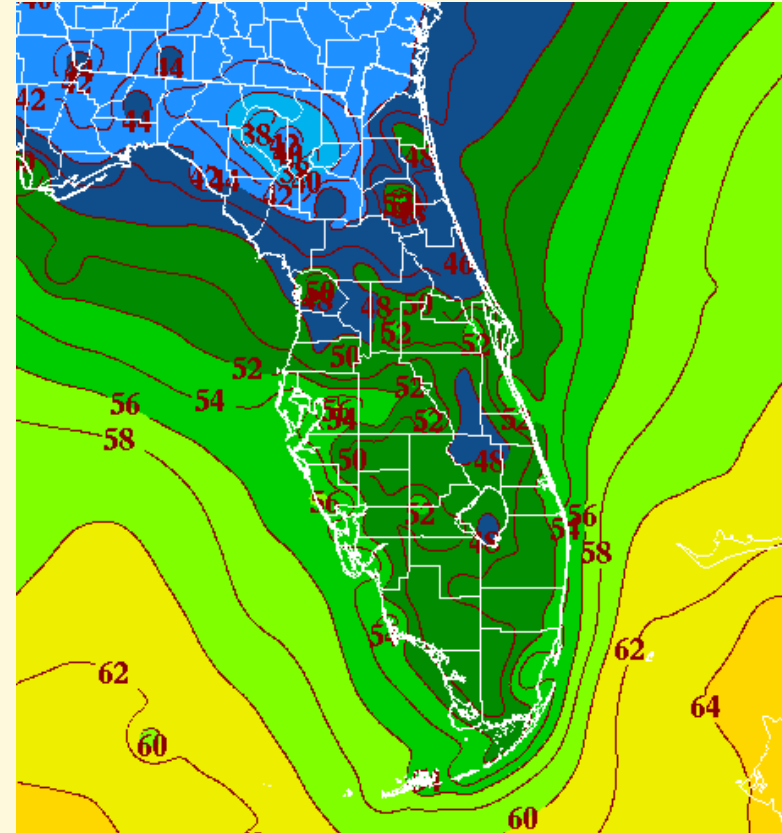**Peter F. Blottman and David W. Sharp**

NOAA/NWS, Melbourne, Florida

Brian Hoeth

NOAA/NWS Spaceflight Meteorology Group, Houston, Texas

Project Objectives

- Update local data integration system (LDIS) at NWS
  - LDIS developed by AMU in 1998
  - Provides 3-D analyses every 15 min across Florida
  - Advanced Regional Prediction System (ARPS) Data Analysis System (ADAS)

- Goals:
  - Update LDIS with latest ADAS
  - Incorporate new observation types
  - Make adjustments to scripts that govern system
  - Update existing ADAS GUI using the newest scripts

Sample ADAS temperature analysis from NWS MLB

LDIS Configuration

- A series of scripts run the complete system
- Each script accesses a user-configurable file
- Input parameters: domain information, model integration time, directory structure, etc.
- Scripts consist of 3 steps:
  - Preprocessing
 - Main model integration
  - Post-processing

LDIS Configuration

- Preprocessing
  - Prepares 2-D terrain and surface characteristics data sets
    - Four raw terrain data sets to create the 2-D fields:
      - 1°x1° (~110 km)   5'x5'(~10km)
      - 30"x30" (~1km)   3"x3" (~1/10 km)
  - Interpolates the external forecast grids to ARPS model grid
    - Large scale model for first-guess field for model initialization
  - Prepares the objective analysis for model initialization
    - Interpolates observations onto ARPS grid, combines observed information with background field
  - Quality control data – 2 methods:
    - Compare obs with neighboring data, background fields
   - Manually exclude data at specified surface stations

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LDIS Configuration

- ## Main model integration

  - Runs the model and creates forecast

  - Option of using ARPS or WRF model

- ## Post-processing

  - Outputs desired products

  - Interpolates native model levels to height or pressure vertical coordinates

0-hr 2m temp (K) WRF-ADAS

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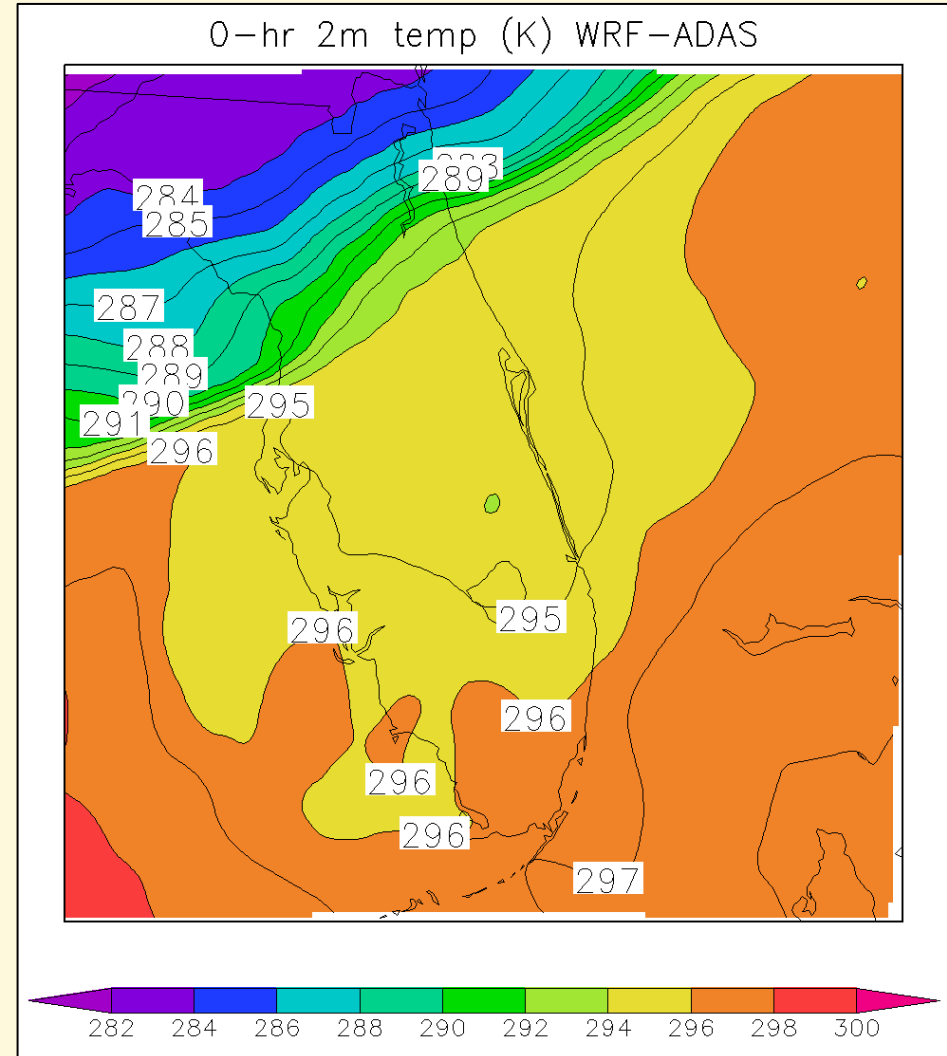
Real-Time Data Ingest

- LDIS configuration ingests:
  - Level II WSR-88D data from 6 Florida radars
  - GOES visible and infrared satellite imagery
  - KSC/CCAFS wind tower network data
  - Florida surface and upper air observations from MADIS

Radar Data

Wind Tower Data

MADIS Surface Data

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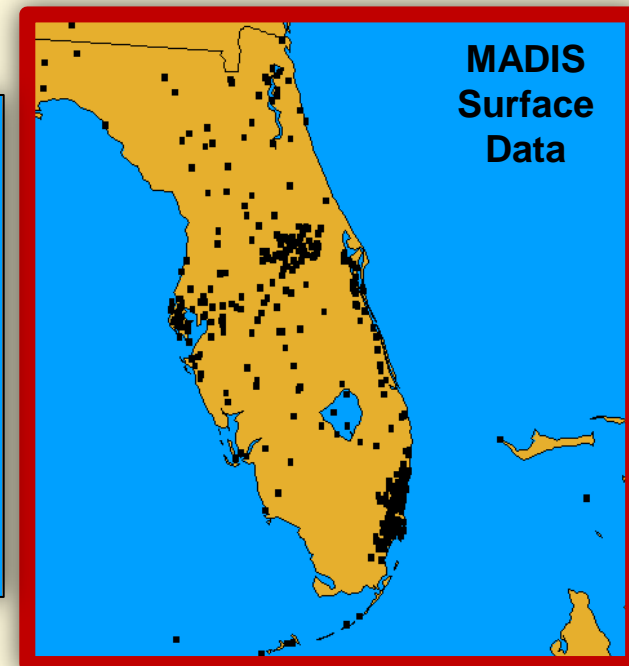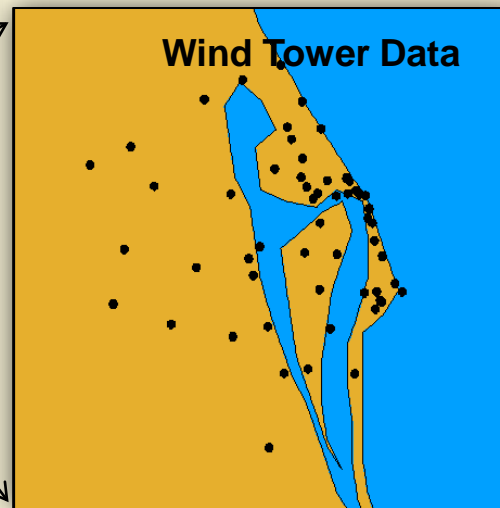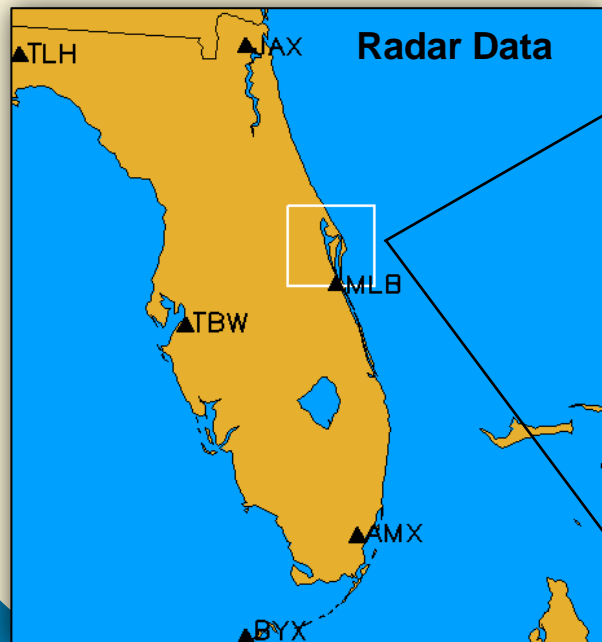
ADAS GUI

- Needs user-friendly GUI to easily interact with ADAS
- Allows forecasters to manage data ingest without prior ADAS experience
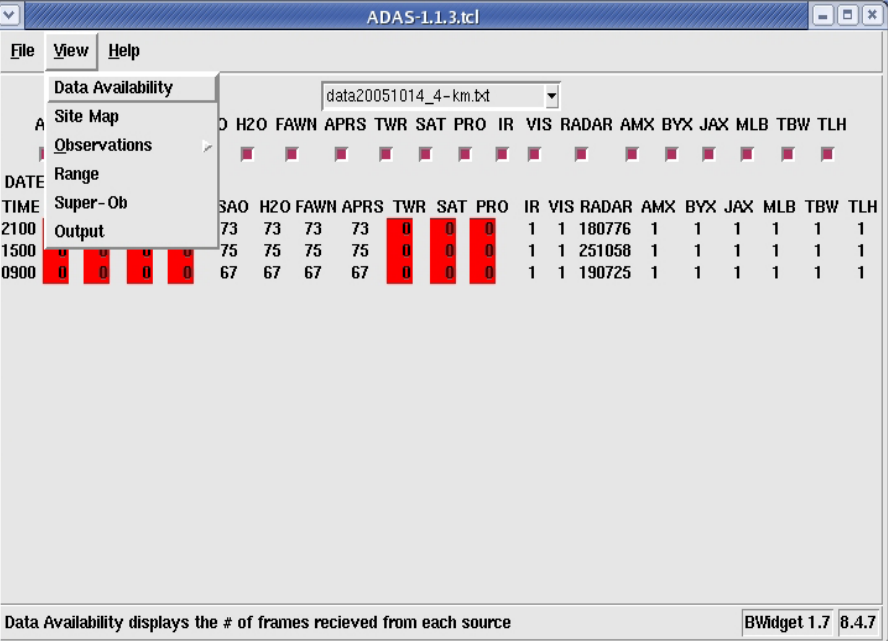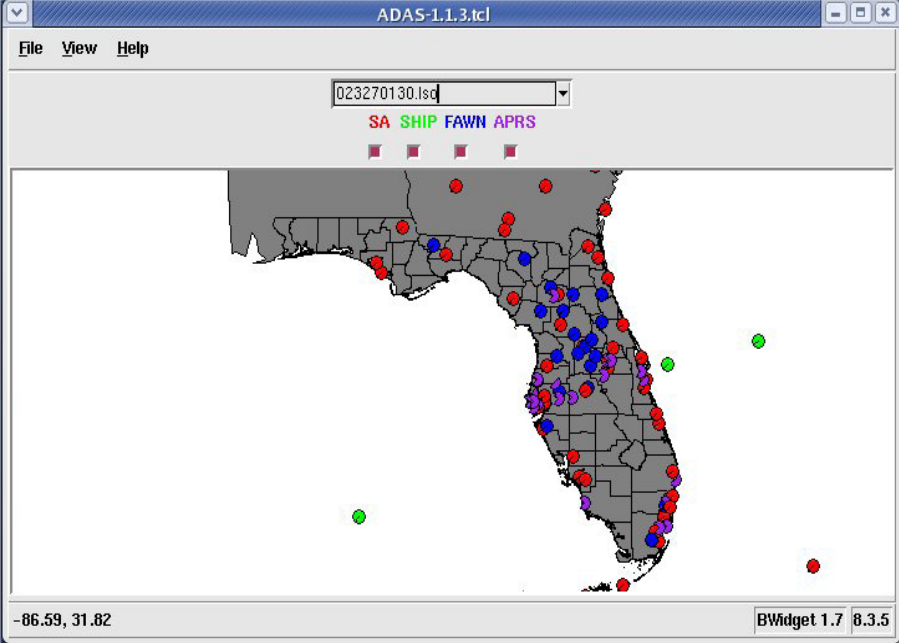
- GUI created using Tool Command Language (TCL) and its associated GUI toolkit, TK
- Developed in 2004

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Conclusions

- Improved existing LDIS by:
  - Updating LDIS with latest version ADAS
  - Incorporating all data available from MADIS
  - Making adjustments to scripts that run system
  - Updating existing ADAS GUI
- Helps enhance synoptic and mesoscale features in initial conditions of a model run

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