Local Analysis and Prediction System (LAPS) Technology Transfer
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Introduction
- Used for data assimilation, nowcasting, and model initialization/post-processing
- Wide variety (~150) of group and individual users
- Federal and state agencies (e.g., National Weather Service, United States Air Force (USAF), and the California Department of Water Resources)
- Private Sector
- Academia (e.g., University of Hawaii)
- International (e.g., Taiwan Central Weather Bureau, FMI)
- Meets NOAA Weather and Water Goals (observation integration, hazard prediction, external collaboration, technology transfer, decision support, resource management)

Environmental Support for Space Launch Operations
- Collaborators: Lockheed-Martin, USAF
- LAPS/MM5 system installed at both U.S. space launch ranges (Cape Canaveral AFS, FL and Vandenberg AFB, CA)
- First operational modeling system in U.S. government running on an affordable Linux cluster – fully integrated with the AWIPS system
- Prototype for the Weather Forecast Office

Fire Weather Analysis and Prediction
- Used by national and regional wildfire managers.
- Demonstrated real-time fire weather products for one of the five regional centers - Fire Consortium for Advanced Modeling of Meteorology and Smoke (FCAMMS).
- Collaborators: USDA Forest Service, Rocky Mountain Research Station
- LAPS is used to initialize and update short-term gridded forecasts
- Converts mesoscale analysis to high-resolution local scale models run at WFOs (e.g., MIA, SAC)

LAPS Attributes
- Blends a wide variety of global, national data sets and local data sets (e.g., METARs and mesonets)
- Utilizes large-scale numerical weather prediction models as backgrounds
- LAPS analyses are used to initialize mesoscale forecast models (e.g., MM5, RAMS, WRF)
- Adjusted horizontal, vertical, and temporal resolution
- Highly portable and runs on inexpensive hardware: desktop to laptop

Fire Impact Diagnostic Fields
- Ventilation Index and PBL Winds
- PBL Height
- Haines Index (Low, Mid, High)
- Fosberg Fire Weather Index
- LAPS Fire Weather Potential Index
- Tabular User-Defined Point Forecasts
- Standard Surface and Upper-Air Fields
- LAPS MM5 domains (10, 3, 1 km)
- Resolve terrain-driven flow missing from large-scale model
- Reliable, inexpensive, high-performance computing solutions for local forecast offices using Linux clusters

Collaborators
- NOAA/Earth System Research Laboratory
- USDA Forest Service
- Rocky Mountain Research Station
- Fire and Environmental Research Applications Team
- Northwest Regional Modeling Consortium

National Weather Service
- LAPS has been part of the NWS operational AWIPS since the late 1980s
- Forecasters use LAPS to help identify:
  - convergence zones
  - severe weather parameters
  - changes in instability using point soundings
  - conditions that support precipitation banding (presence of CSI, etc.) - heavy precipitation
- First operational modeling system in U.S. government running on an affordable Linux cluster - fully integrated with the AWIPS system
- Prototype for the Weather Forecast Office
- Initializes high-resolution local scale models run at WFOs (e.g., MIA, SAC)

Upland Moisture Flux LAPS/WRF forecast identifies heavy precipitation potential for California water resource management

Non-Supercell Tornado environment parameter prediction (developed at LaCrosse, Wisconsin WFO)

- LAPS is used to initialize and update short-term gridded forecasts
- Converts mesoscale analysis to high-resolution local scale models run at WFOs (e.g., MIA, SAC)
- AWIPS-II workstation plan includes LAPS

"Forecasters at my office integrate LAPS analyses and surface observations with radar data for a combined radar-environmental analysis."

- Ray Wolf, WFO SOO - Davenport, Iowa

He also noted that LAPS is commonly used to examine convective parameters such as CAPE and CIN.