



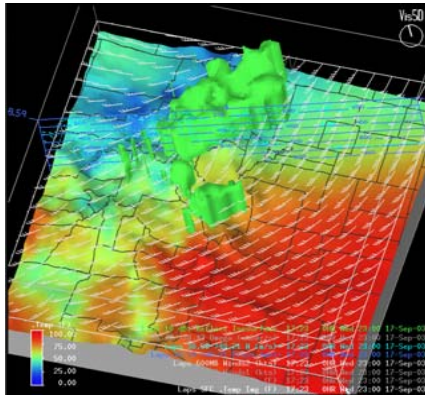
Local Analysis and Prediction System (LAPS) Technology Transfer

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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)



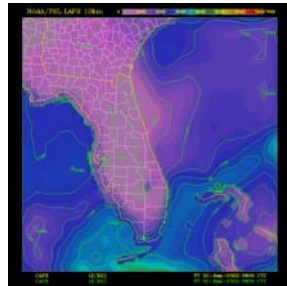
LAPS Analyses for 10km domain centered in Colorado

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)
- Adjustable horizontal, vertical, and temporal resolution
- Highly portable and runs on inexpensive hardware: desk top to laptop

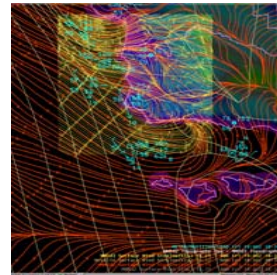
Environmental Support for Space Launch Operations

- 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



Convective Available Potential Energy (CAPE) helps thunderstorm forecasts at Cape Canaveral.

- Local observations include ASOS, wide-band WSR-88D reflectivity/radial velocity, meteorology towers, RTAMPS balloons, SODAR, wind and RASS profilers.
- Combined with national data sets such as GOES imagery, narrowband WSR-88D, METARs, and ACARS to make a complete data assimilation system.



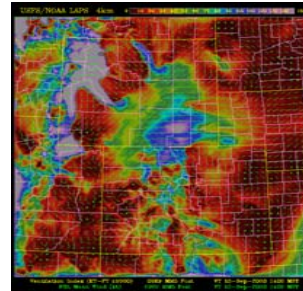
Triple nested MM5 domains (10, 3, 1 km) resolve terrain-driven flow missing from large-scale model. Compare with NCEP Eta streamlines (tan).

Reliable, inexpensive, high-performance computing solutions for local forecast offices using Linux clusters



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 Consortia for Advanced Modeling of Meteorology and Smoke (FCAMMS).



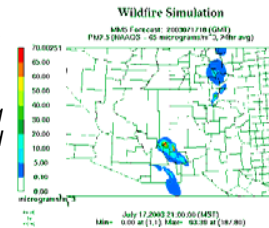
High-resolution (4km grid) forecast of Ventilation Index and PBL winds identify dense smoke hazards.

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

Dry Lake WFO
Gila NF
June 2003

BlueSky smoke dispersion model hazard prediction using LAPS-initialized MM5 forecast for the SW US.

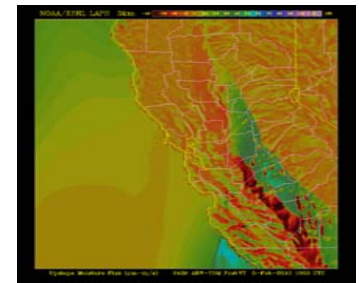


Collaborators

- 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

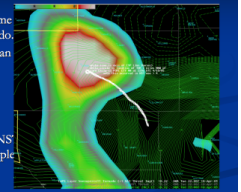
- LAPS has been part of the NWS operational AWIPS since the late 1980s
- Forecasters use LAPS to help identify:
 - convergence zones
 - severe weather parameters
 - changes in instability using point soundings
 - conditions that support precipitation banding (presence of CSI, etc) - heavy precipitation



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

19 April 2005: NST Parameter

- 38 minute lead time on an NST tornado.
- WELL North of an occluding low.
- NST >= 1 then NS possible (red, purple)



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

- LAPS is used to initialize and update short-term gridded forecasts
 - Initializes 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.