



The 2012-2013 Hydrometeorology Testbed Numerical Weather Prediction Suite

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INTRODUCTION

The Hydrometeorology Testbed (HMT) aims at improving the understanding and forecasting of extreme precipitation events.

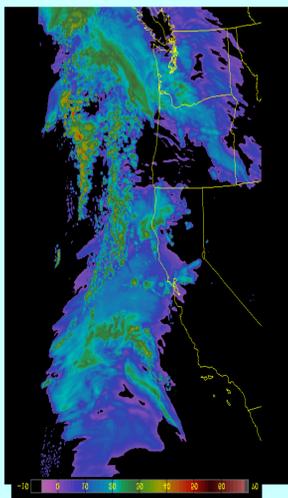
HMT-West has two NWP components in the winter 2012-2013 (high-resolution deterministic and North American ensemble) using WRF-ARW with RRTM shortwave and Dudhia longwave radiation, and thermal diffusion land surface scheme.

These experimental models are used to test new techniques in NWP for future transition to operations.

HIGH-RESOLUTION DETERMINISTIC

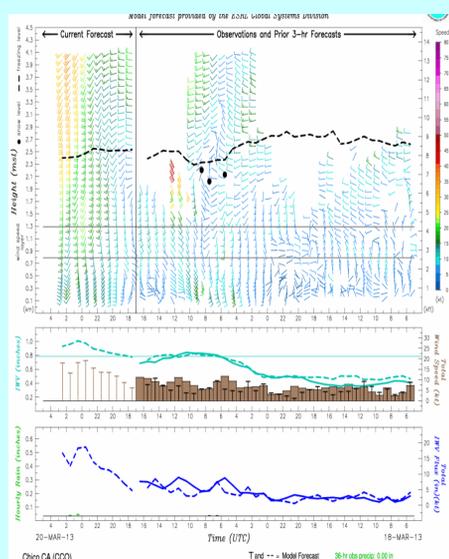
MODEL CONFIGURATION

- 3-km grid spacing over west coast
- Forecast length 12 h
- Initialization: NAM + Local Analysis and Prediction System
- Boundary Conditions: NAM
- Microphysics: Thompson scheme



Five-hour forecast of composite radar reflectivity (dBZ) for model run initialized on March 19, 08 UTC

The primary application for this component is providing input for the HMT Flux Tool.

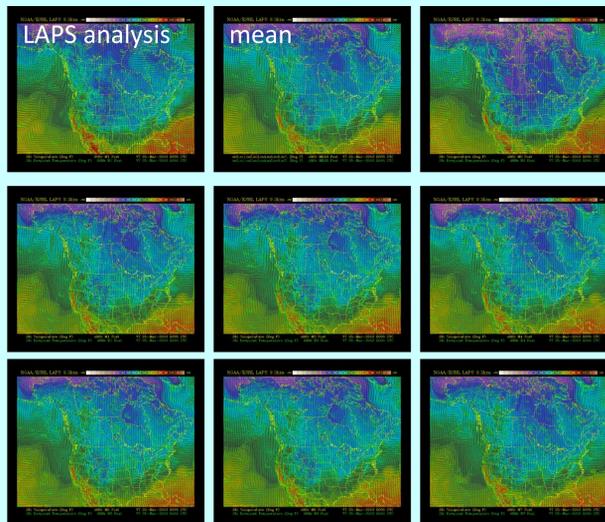


Time series of observed (right of vertical line) and forecast wind and moisture. The flux tool is used for precipitation forecasting at California forecast offices. It also offers an opportunity for forecast validation.

LAPS – LOCAL ANALYSIS AND PREDICTION SYSTEM

- Blends a variety of in-situ and remotely sensed data
- Has hot start capability to add clouds and vertical motion at initial time
- Has 150 users worldwide
- Can be used in traditional (Barnes) or multi-scale variational option

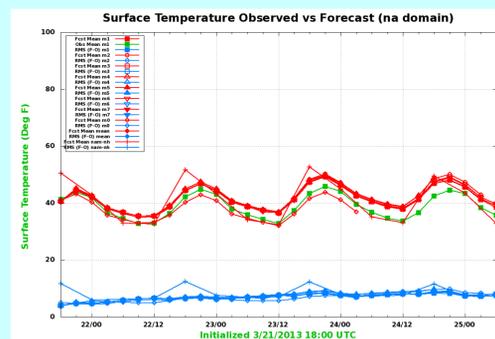
ExREF – Experimental Regional Ensemble System



Surface temperature, dewpoint, and winds analysis and 4-8-h forecasts (mean and members)

The ensemble uses a variety of initial and boundary conditions to represent uncertainty in the large scale fields. Microphysics diversity is also used as QPF is very sensitive to this parameterization.

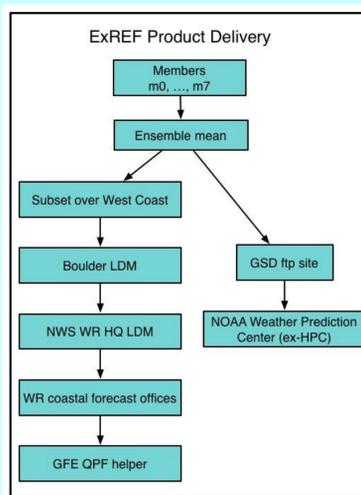
North American average of T_{sfc} forecast and RMSE for run initialized 3/21, 18 UTC. Observed T in green.



MODEL CONFIGURATION

- 9-km grid spacing over North America
- Forecast length 84 h
- Initialization: GFS and LAPS
- Boundary Conditions: GEFS
- Microphysics: Thompson, Ferrier, WSM6

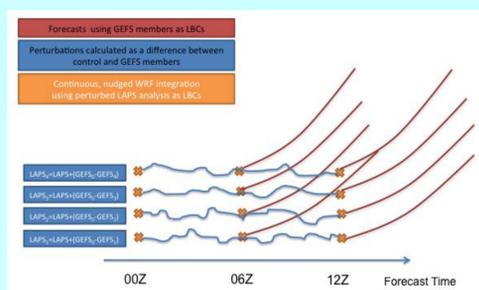
	IC	BC	MP
m0	GFS	GFS	Thomp
m1	LAPS _T	GFS	Thomp
m2	LAPS _T	GEFS ₁	Ferrier
m3	LAPS _T	GEFS ₂	WSM6
m4	LAPS _T	GEFS ₃	Thomp
m5	LAPS _T	GEFS ₄	Ferrier
m6	LAPS _T	GEFS ₅	WSM6
m7	LAPS _V	GFS	Thomp



The ensemble mean is sent to NOAA WPC where it will be used for the Flash Flood experiment.

A subset of the mean is sent using the Local Data Manager (LDM) protocol to the NWS Western Region HQ, and distributed to field offices for use in the Graphic Forecast Editor.

GOING FORWARD



Initial conditions will be enhanced with the use of dynamic downscaling, a technique to combine the uncertainty represented by the difference between members of the GFS ensemble with local data assimilation.

These innovations will be tested by the Developmental Testbed Center for possible transition to the operational Short Range Ensemble Forecasting (SREF) system.

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<http://hmt.noaa.gov> or <http://laps.noaa.gov/hmt/hmt.html>