

Basin-scale Multiple Movable Nest HWRF Modeling System

Xuejin Zhang & Thiago Quirino
AOML/HRD

Collaborators:
AOML/HRD modeling group
NCEP/EMC HWRF Team

Basin-scale Model Configurations

	2012 HWRF Operational	Basin-scale Model (Stream 2)
Domain	27 KM: 77.76° X 77.76° 9 KM: 10.56° X 10.2° 3 KM: 6.12° X 5.42°	27 KM: 178.20° X 77.58° 9 KM: 10.56° X 10.2° 3 KM: 6.12° X 5.42°
Vortex Initialization	Modified Vortex Initialization at 3 KM, with 30x30° analysis domain and GSI	27KM: GFS 9-3 KM: No, Downscaled
Cycling	Yes (3 km vortex only)	No
Ocean Coupling	27-9 KM: Yes 3 KM: No, Downscaled	27-9-3 KM: No
Physics schemes		
Microphysics	<u>Modified Ferrier (High-Res)</u>	<u>Modified Ferrier (High-Res)</u>
Radiation	GFDL	GFDL
Surface	GFDL (High_res)	GFDL (High_res)
PBL Scheme	<u>2012 GFS (High_res)</u>	<u>2012 GFS (High_res)</u>
Convection	<u>SAS (High-Res), No CP (3 KM), Shallow Convection</u>	<u>SAS (High-Res), No CP (3 KM), Shallow Convection</u>
Land Surface	GFDL Slab	GFDL Slab
GWD	Yes(27km); No(9-3km)	No(27km); No(9-3km)

Basin-scale HWRF Configuration Test

	Number of Nest Domains	Wall Clock Time	CPUs
27 km	No	50 mins	196
27-9-3 km	2 (1 storm)	137 mins	196
27-9-3 km	4 (2 storms)	256 mins	196
27-9-3 km	6 (3 storms)	363 mins	196
27-9-3 km	8 (4 storms)	430 mins	196

Note: Not optimized yet.

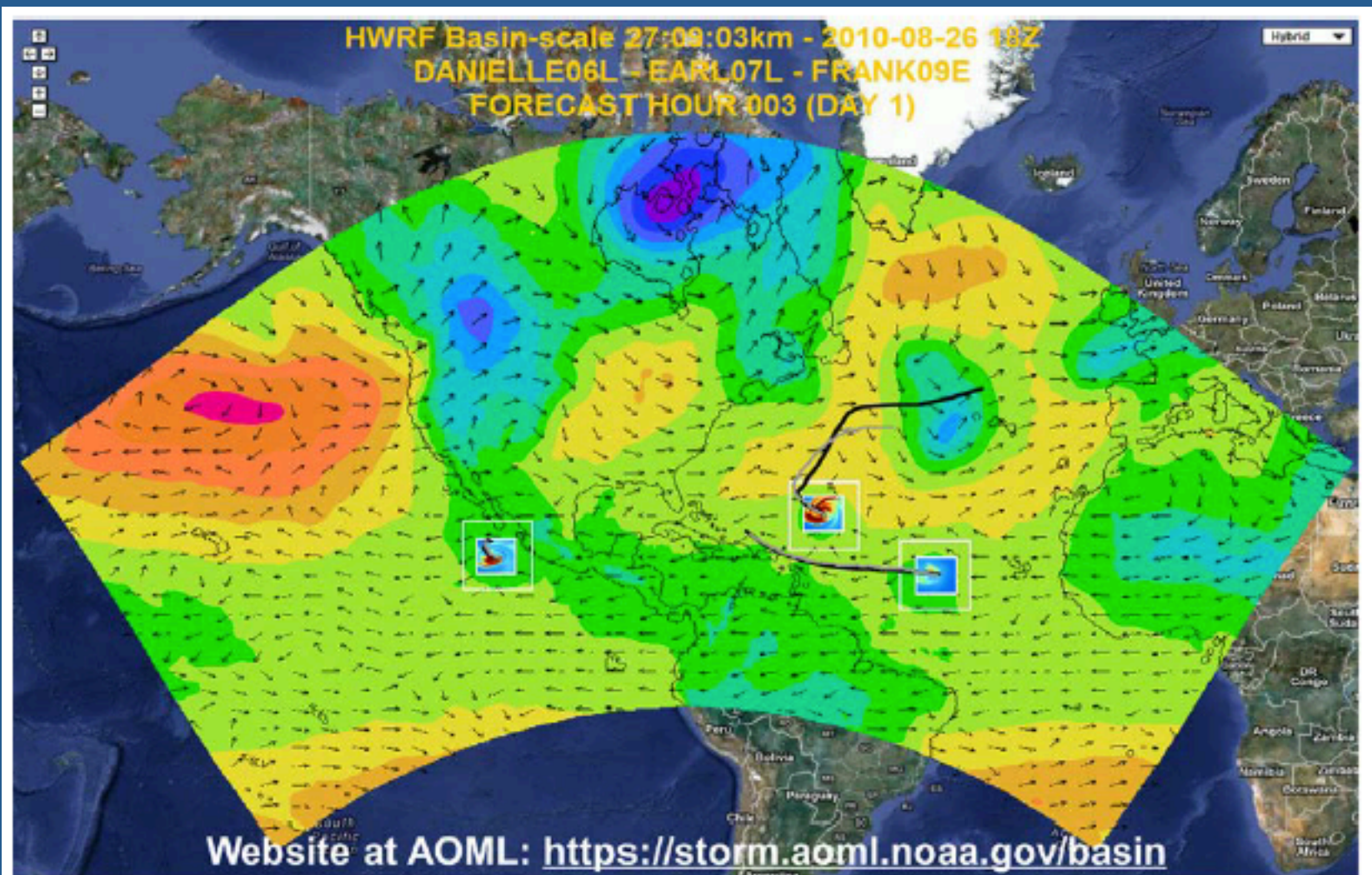


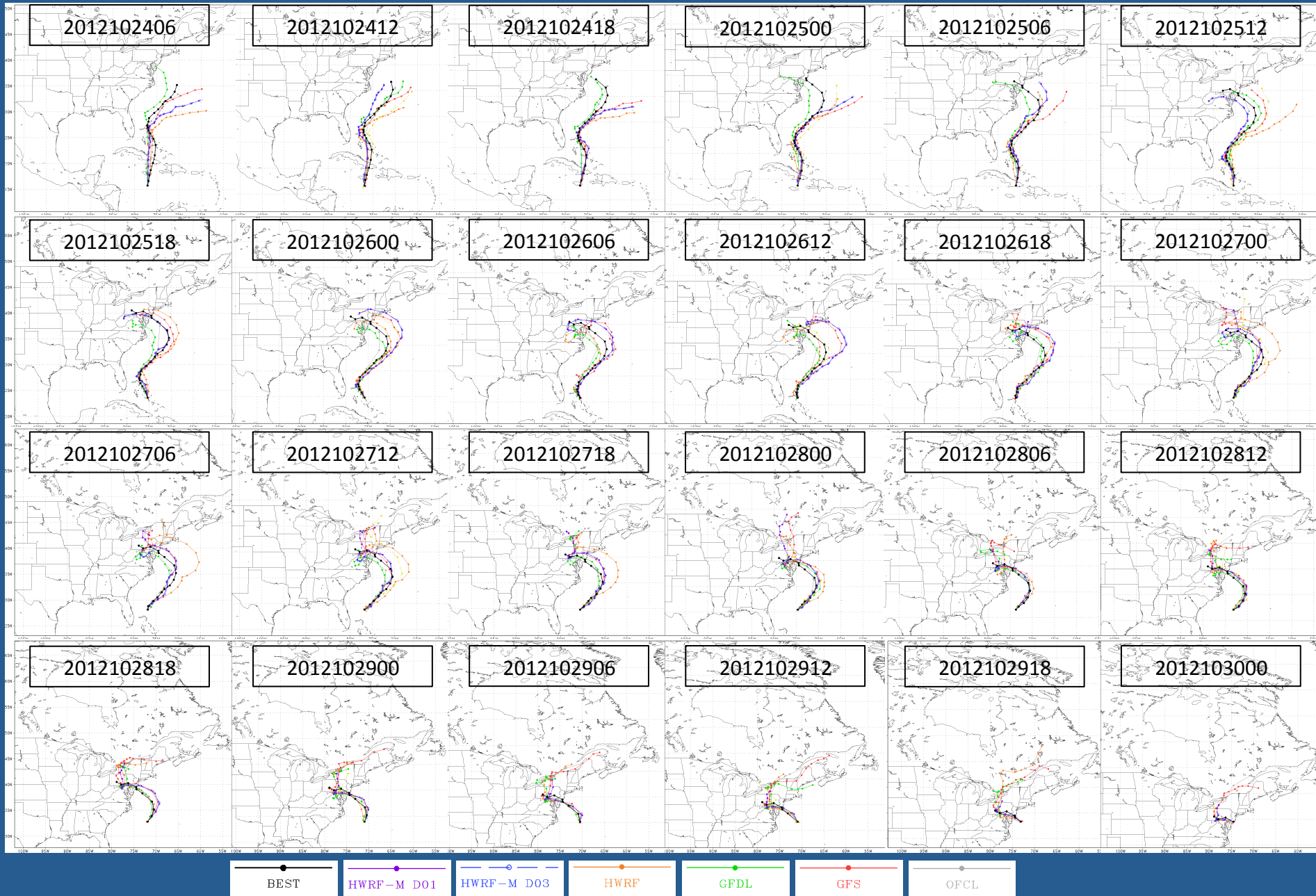
Figure 1. Basin-scale domain

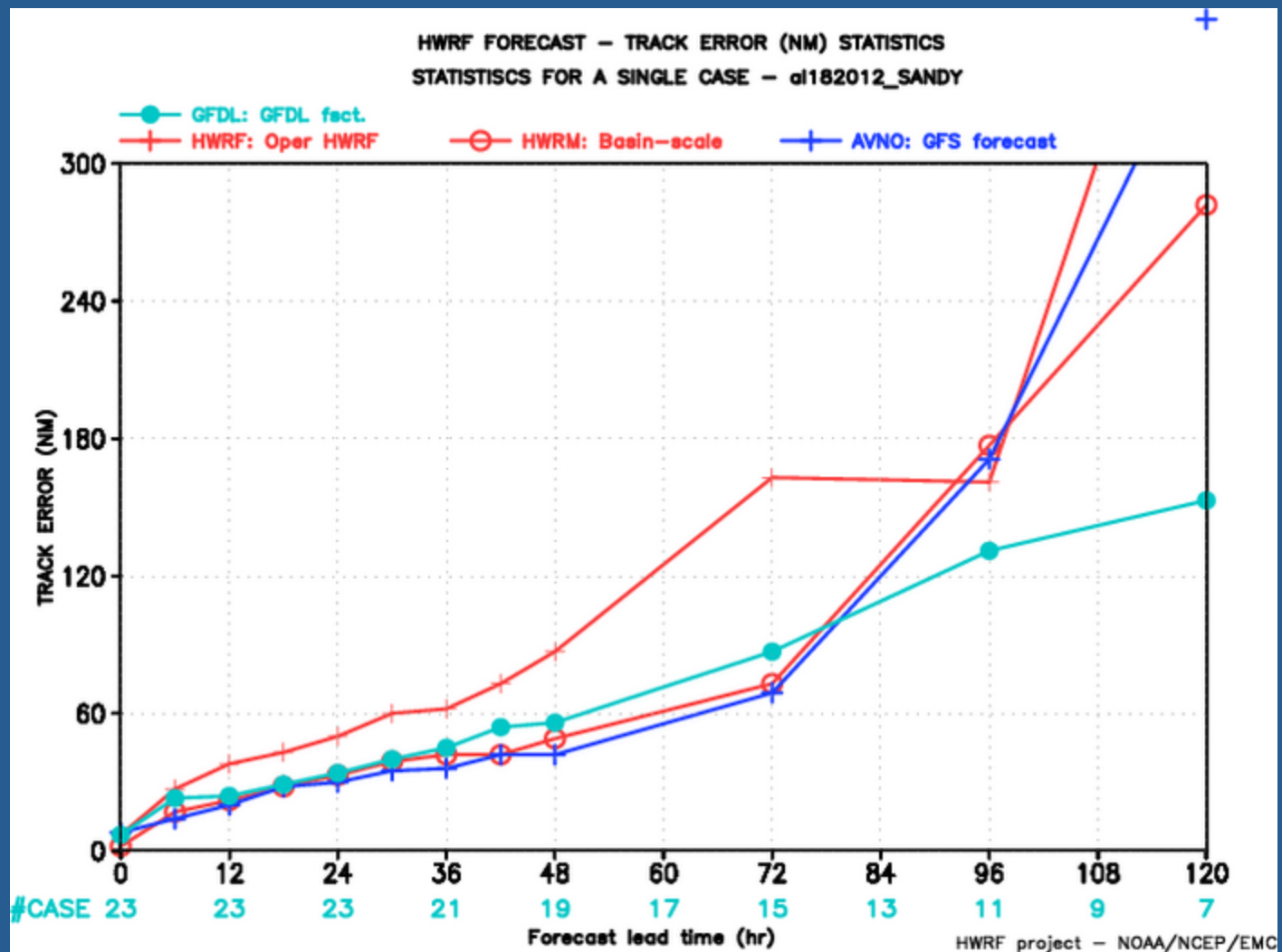
Retrospective & Real-time Forecasts

- 140 cycles start from 18Z 21 August 2012 by 11/5
- 24 cycles Sandy real-time from 06Z 24 October 2012
- Web products:
 - 3 categories (27km environment; 3km moving nest; multi-model)
 - 20 products

<https://storm.aoml.noaa.gov/basin>

Hurricane Sandy Track Forecasts





HWRP FORECAST — INTENSITY VMAX ERROR (KT) STATISTICS

STATISTICS FOR A SINGLE CASE — 0182012_SANDY

