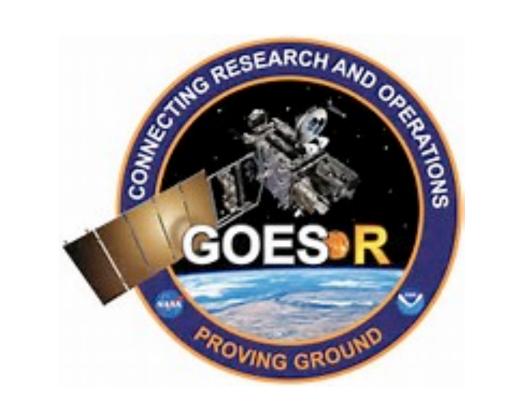


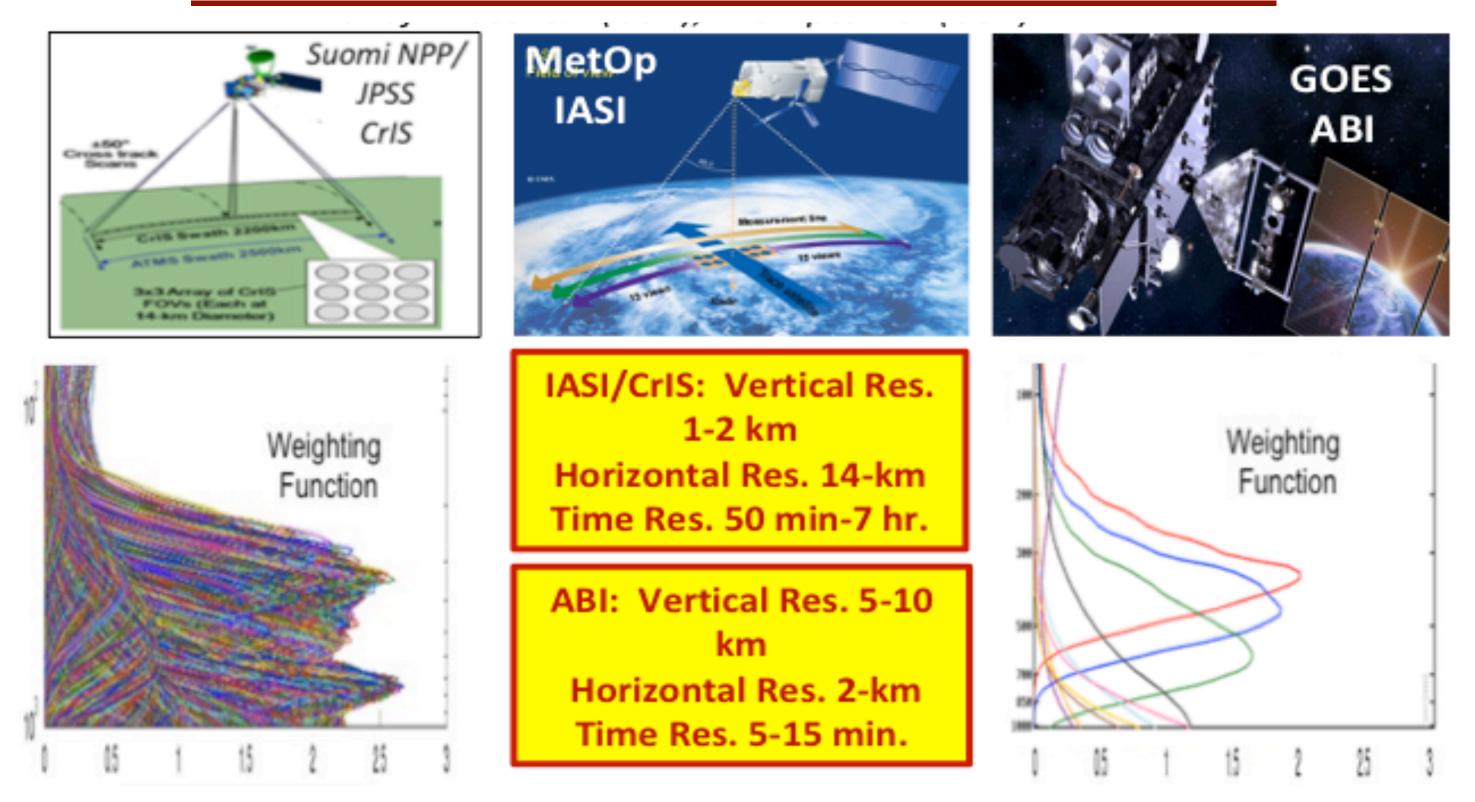
Hazardous Weather Forecasting Using High Resolution Leo/Geo Soundings

W. Smith Sr. 1,2, Q. Zhang², E. Weisz¹, A. DiNorscia², S. Lindstrom¹ ¹U. of Wisconsin (USA), ²Hampton U. (USA)



A system has been set up to produce in near real-time nowcasting and forecast model input data from combined Direct Broadcast Satellite (DBS) Polar Hyperspectral (PHS) CrIS/IASI and GOES ABI (PHSnABI) Data. The data is made available to potential users via the internet and through the NWS AWIPS. Studies are being performed to demonstrate severe and precipitation forecast improvements using these data. The PHSnABI observation and forecast products will be provided to weather forecasters for evaluation during the NOAA spring 2020 Hazardous Weather Testbed (HWT).

PHS and ABI Characteristics



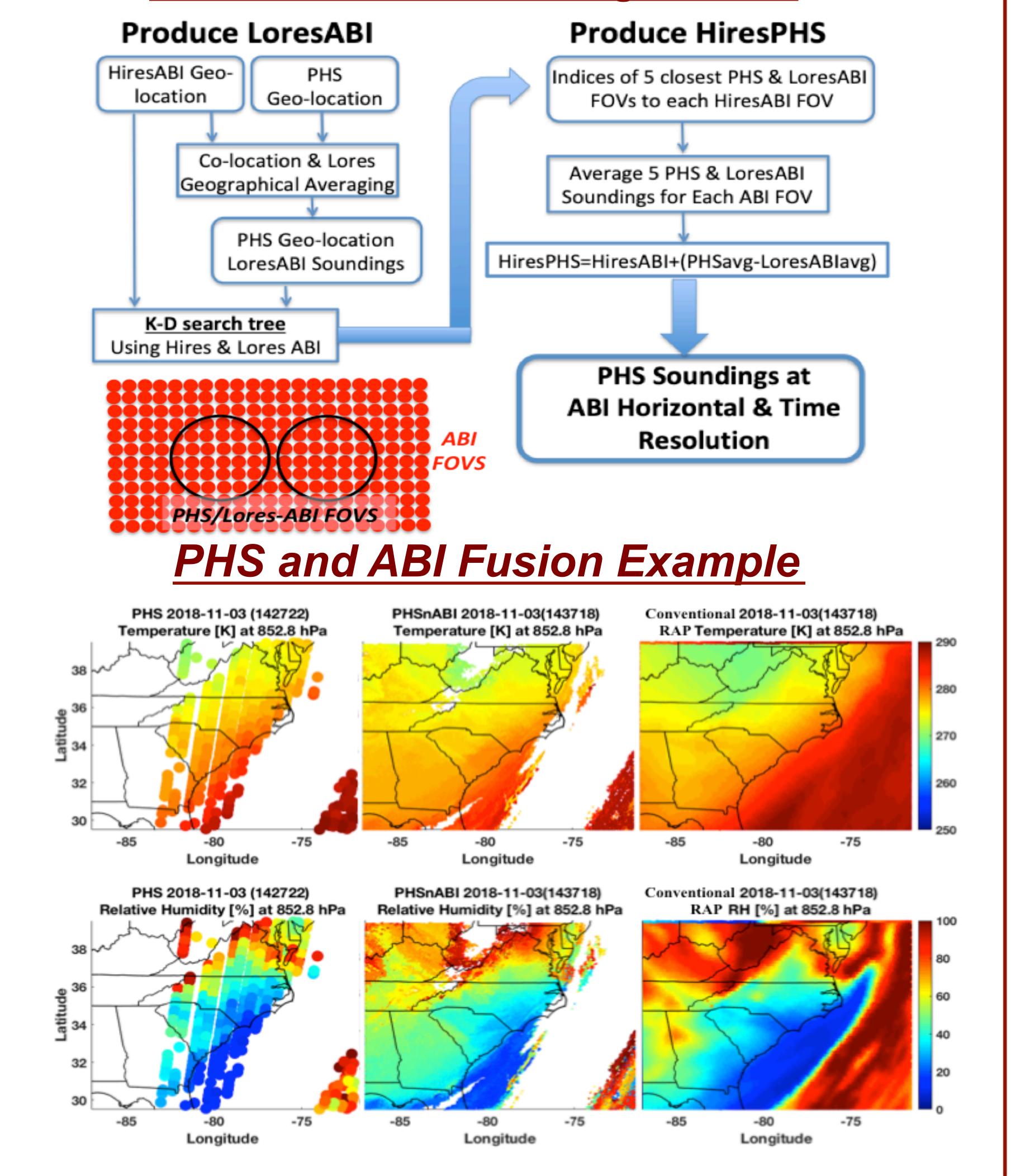
Sounding Retrieval Process

Dual Regression + De-Alias (DRDA)*

- Alias = Forecast Retrieval Forecast Profile
- DRDA Retrieval = DR Retrieval Alias

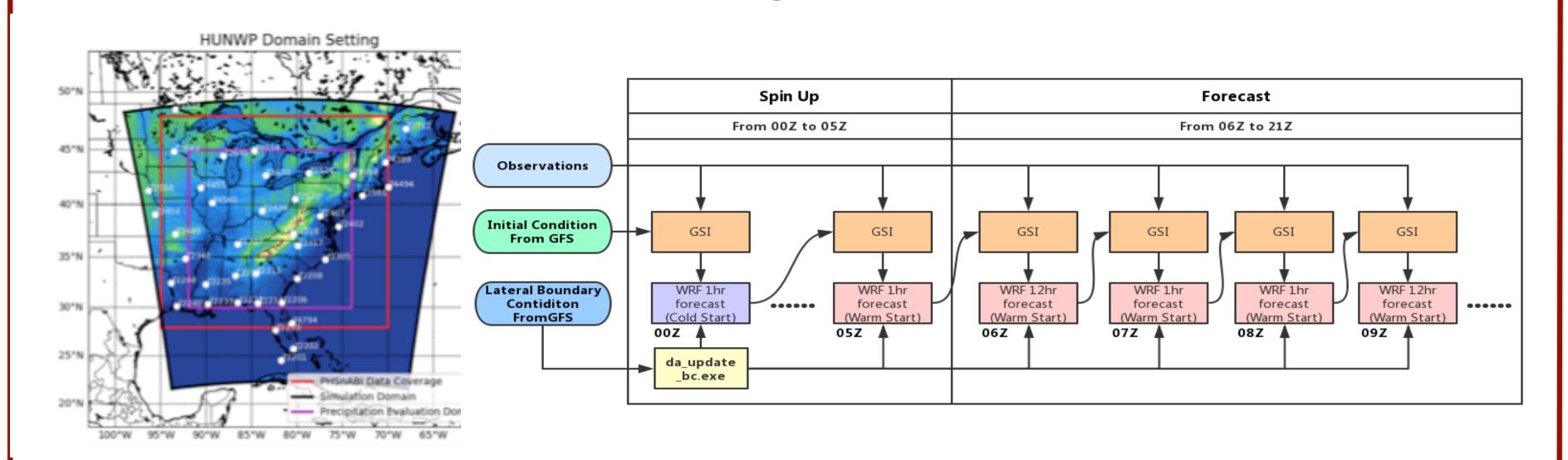
* Smith, W. L., and E. Weisz, 2017: Dual Regression Approach for High Spatial Resolution Infrared Soundings, in Comprehensive Remote Sensing, M. Goldberg, Editor, Elsevier Ltd, Langford Lane Oxford, OX5 1GB UK.

PHS and ABI Sounding Fusion



Assimilating PHSnABI

NOAA RAP-like configured 9-Km WRF Model

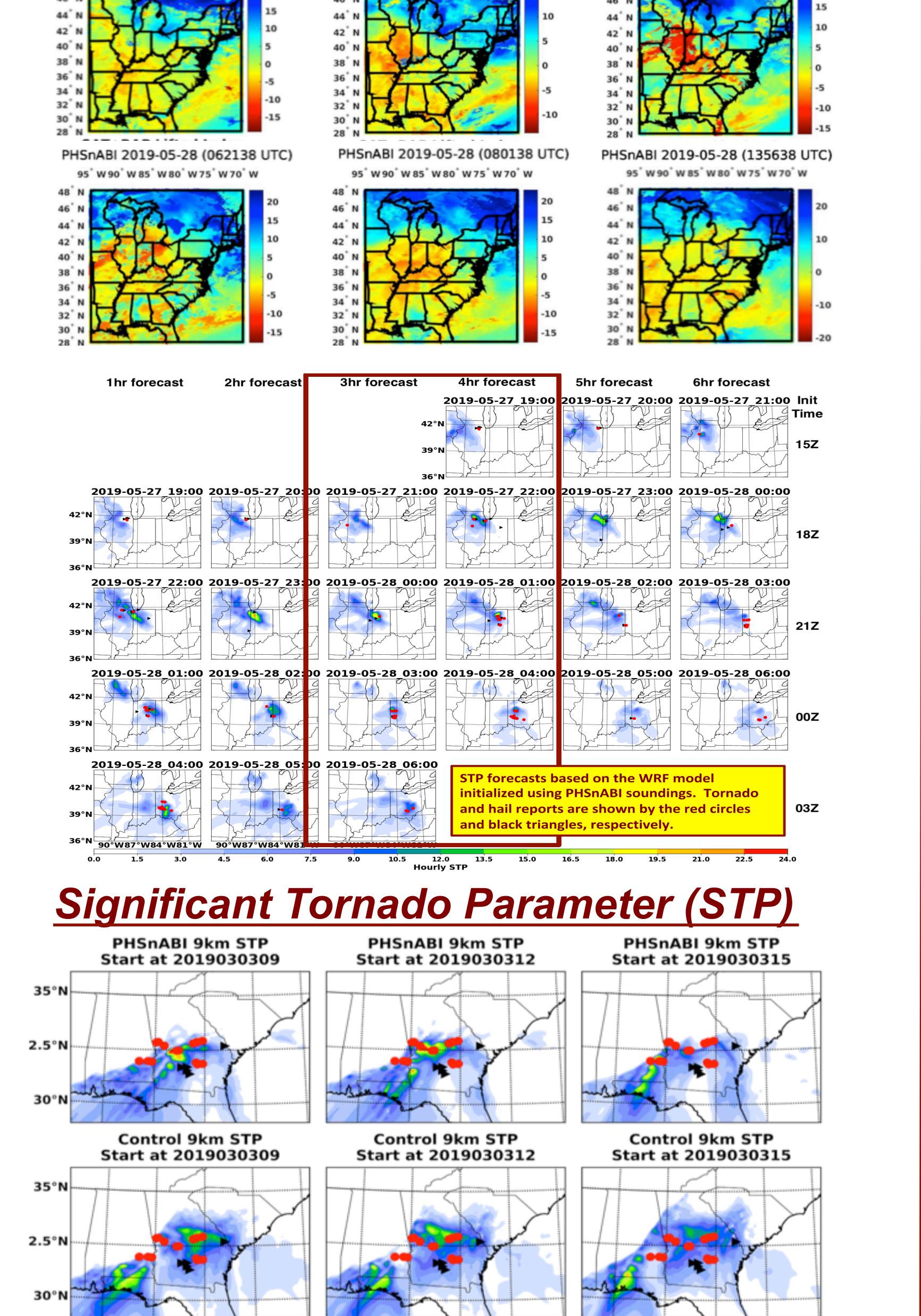


May 27/28 2019 Lifted Index & STP

95° W 90° W 85° W 80° W 75° W 70° W

PHSnABI 2019-05-28 (011138 UTC)

95 W 90 W 85 W 80 W 75 W 70 W

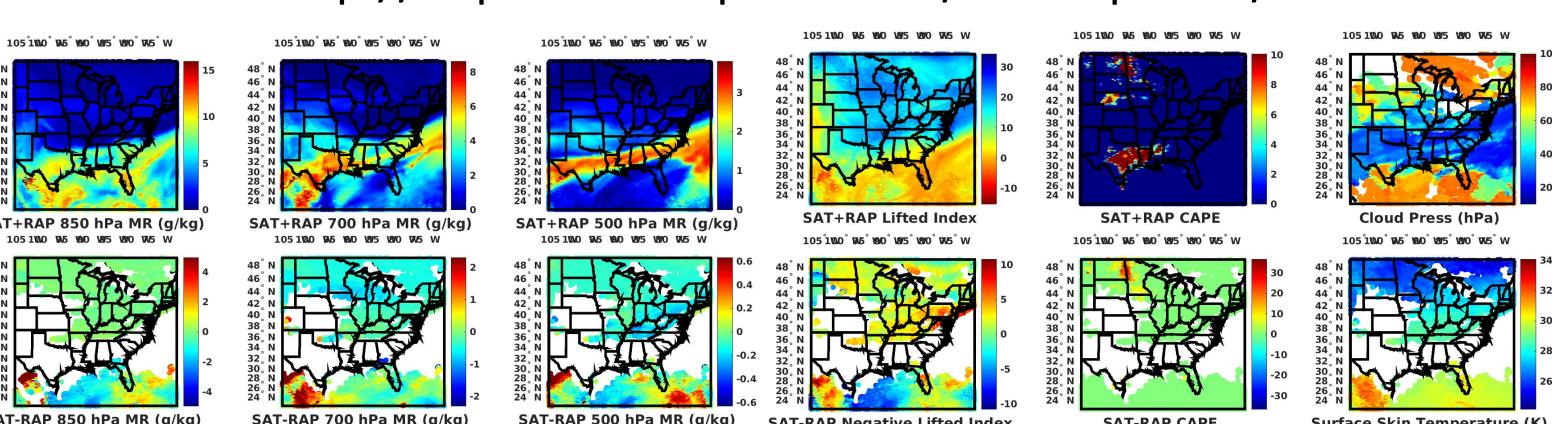


6.0 7.5 9.0 10.5 12.0 13.5 15.0 16.5 18.0 19.5 21.0 22.5 24.0

STP Index at 2019-03-03 21UTC

Nowcast Website (194116 UTC)

http://dbps.cas.hamptonu.edu/development/



Severe Weather Research Center

8-km Numerical Weather Prediction System

The goal of Severe Weather Research Center 8-km Numerical Weather

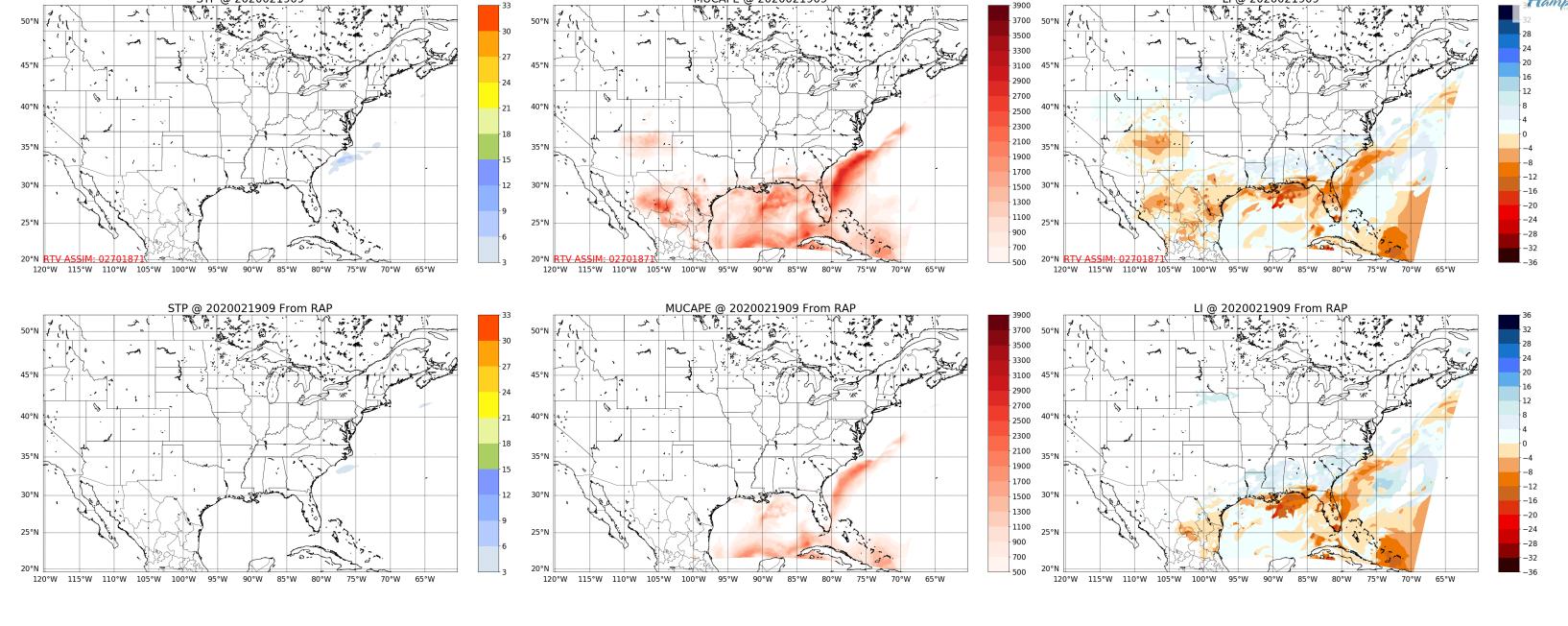
Prediction System is to provide meteorological satellite enhanced high resolution nowcasts and short-term numerical forecasts for the purpose of warning the US population of impending High Impact Weather (e.g. tornados, hail, flash floods,

tropical storms, and hurricanes). "Nowcast" products are produced from near realtime satellite soundings produced by the fusion of direct broadcast operational Polar (IASI and CrIS) Hyper-spectral Sounding (PHS) and geostationary Advanced Baseline Imager (ABI) multi-spectral sounding radiance data (PHSnABI). Numerical Weather Prediction (NWP) products are produced by the hourly assimilation of PHSnABI soundings with operational conventional weather observations into the Weather Research and Forecasting (WRF) model configured with the same physics and forecast initialization procedures used in the NOAA Rapid Refresh Prediction (RAP) NWP model. The nowcasting products which take advantage of PHSnABI soundings assimilation provide hourly Significant Tornado Parameter (STP), Most Unstable CAPE (MUCAPE), Lifted Index (LI), Accumulated Precipitation for the Central and Eastern US regions. Short-term forecast products including hourly STP, LI, MUCAPE, accumulated precipitation and 6-minutes-interval composite radar reflectivity

forecasts are generated using the same background that provides nowcast products.



Initial Condition 2020/02/19 (9 UTC)



1 to 6-hour Precipitation Forecast 2020/02/19 16 - 21 UTC

