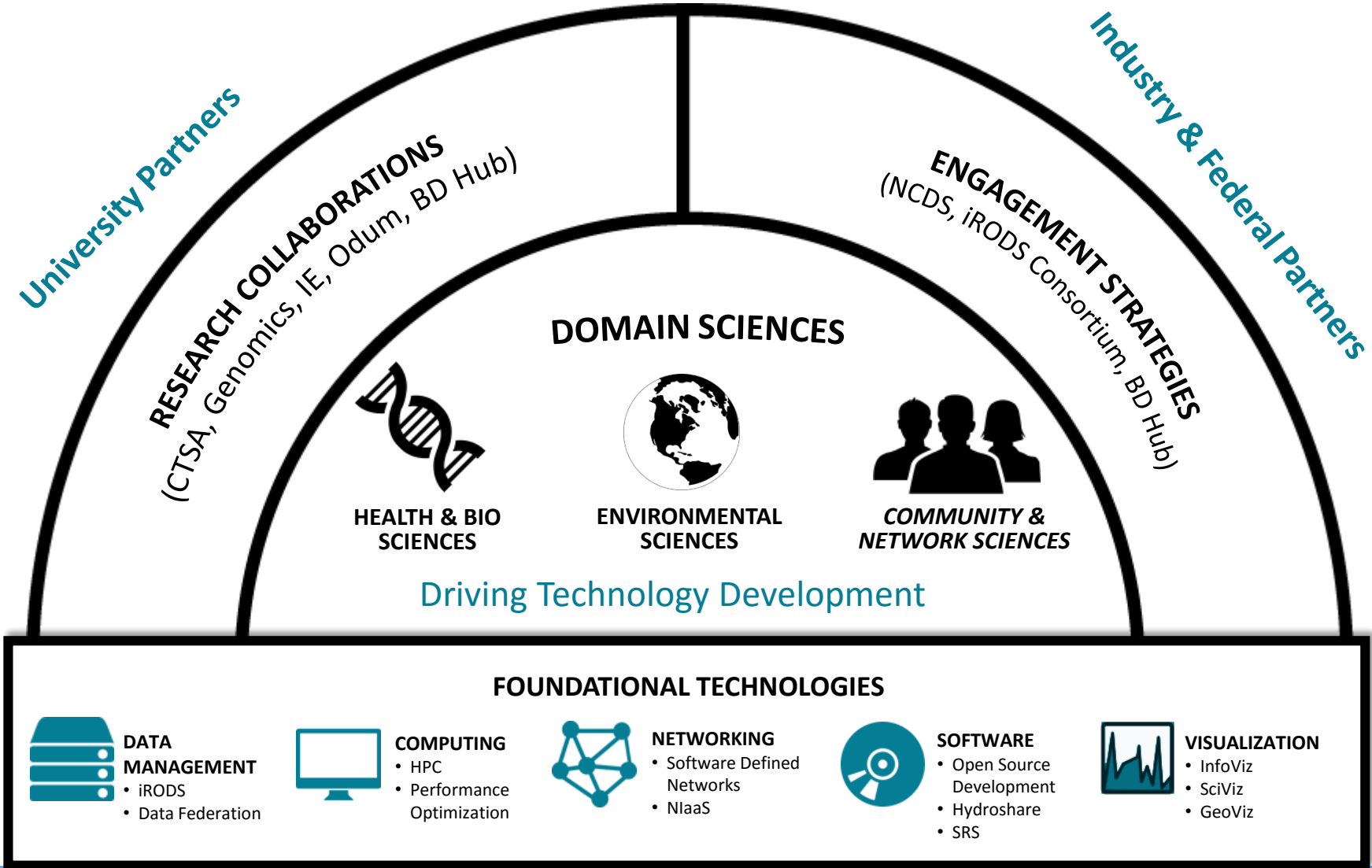


# SECOORA

Stan Ahalt, Ph.D.

Director, RENCi

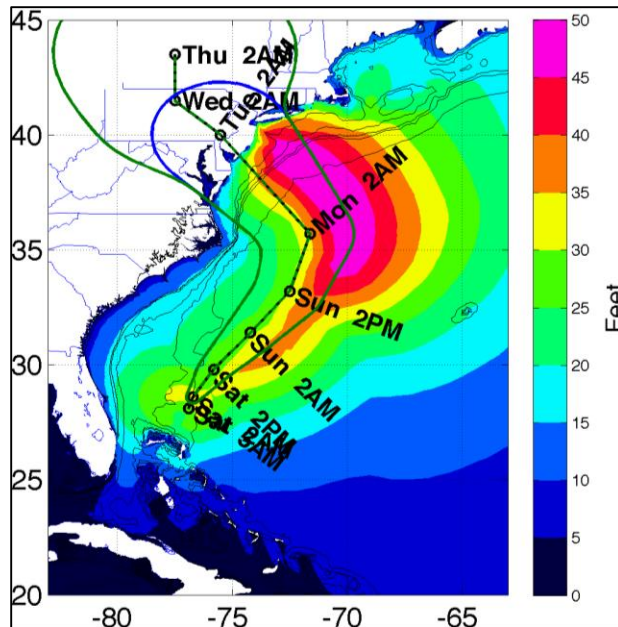
May 19<sup>th</sup>, 2016



# Real-time predictions of coastal hazards

## ADCIRC: Storm Forecasting

**Hurricane Sandy '12**  
Forecast trajectory and wave heights



<http://adcirc.org/>

### Real-time predictions of coastal hazards

Compute/disseminate coastal flood levels

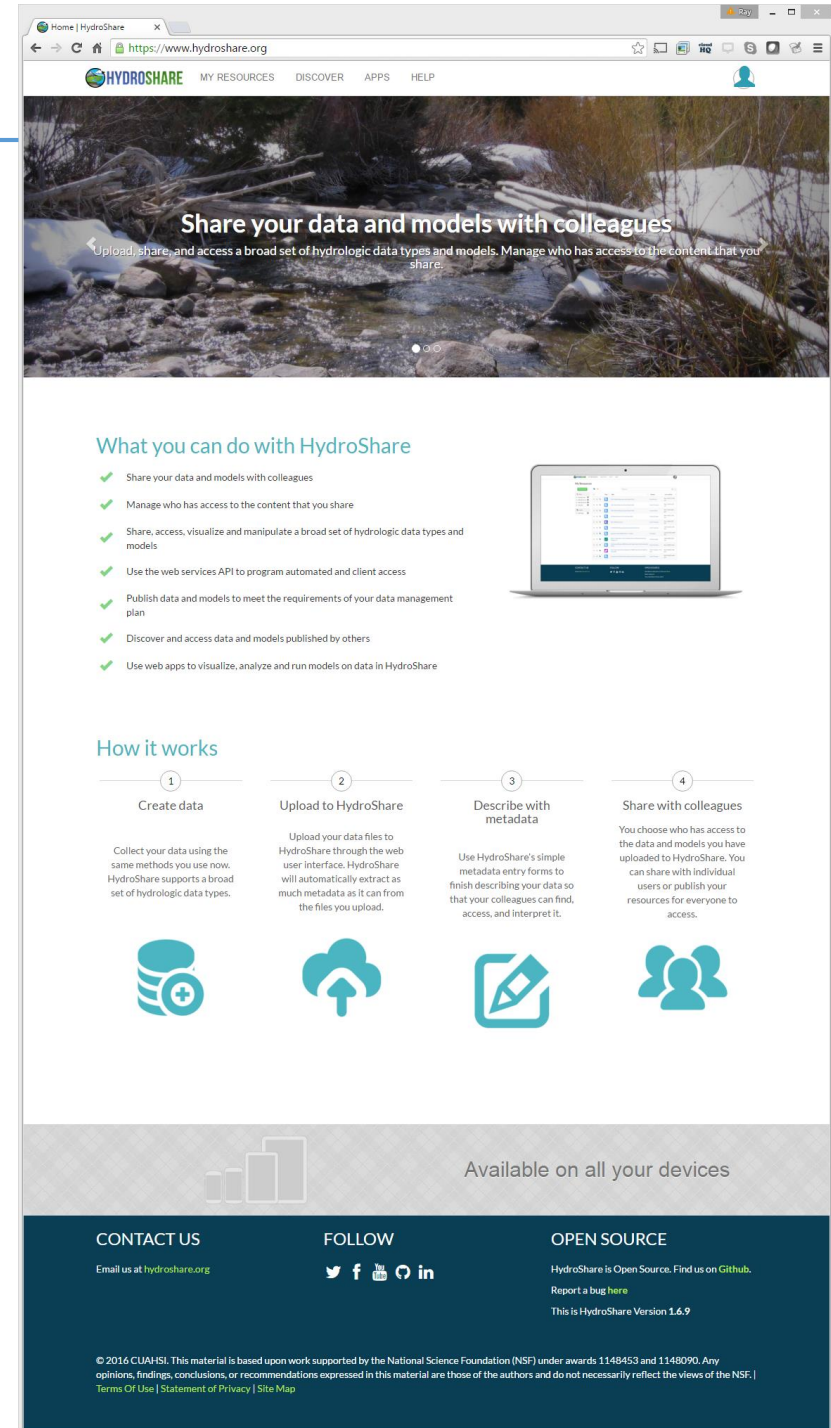
US Coast Guard moved Chesapeake Bay assets because of this, during Irene (2011)

*RENCI has enhanced/organized the community that develops and applies the ADCIRC model*

*RENCI also coordinates computations, provides data distribution infrastructure, and conducts research into operational systems (scheduling, cloud computing) using ADCIRC*

# www.HydroShare.org

- Provide cyberinfrastructure for hydrologic research to solve problems of size and scope not otherwise solvable using desktop computing through:
  - Software as a Service
  - Data as a Service
  - Models as a Service
  - Visualization and Analysis Services
- Enable more rapid advances in hydrologic understanding through collaborative data sharing, analysis and modeling
- RENCi is cyberinfrastructure lead for this \$4.5M NSF proposal
  - Leads development among the 10 participating organizations across the U.S.
    - Including UNC Institute for the Environment



# The National Water Model (NWM)

The initial operational WRF-Hydro configuration will feature

1. hourly analysis runs,
2. short-and medium-range deterministic forecasts out to one day and ten day horizons and
3. long-range ensemble forecasts out to 30 days.

One day of NWM hourly forecast data:  
raw

- 554 GB per day
- ~7000 .gz files

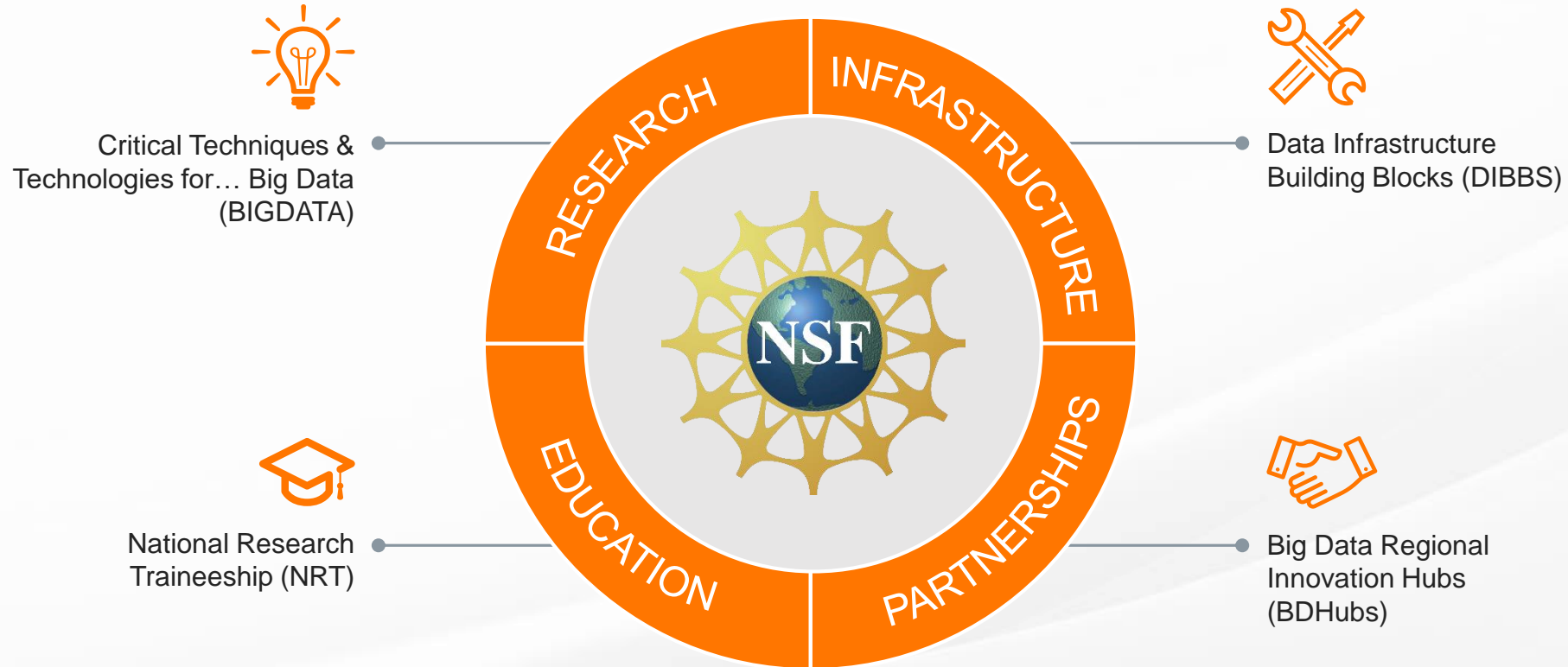
One day of NWM hourly forecast  
data: processed

- 3.8 TB per day
- Decompress and Process ~7000 files per day

# How RENCI contributes to the NWM

- Mirroring the hourly data as an internal service.
- Post-processing the raw data to generate georeferenced netCDF files for researchers to use.
  - land - land model grid ('coarse grid')
  - terrain - terrain routing grid ('fine grid')
  - channel - channel routing locations
  - reservoir - lake/reservoir locations
  - fe - land model grid ('coarse grid')
- Processed files are stored via a network file mount for direct application consumption as well as registered in an iRODS grid for widespread distribution via federation, desktop applications or iCommands.
- Retain a historical data store for a yet to be determined amount of time.

# NSF Big Data Portfolio of Programs



GOAL: To stimulate regional and grassroots **partnerships involving public and private organizations** of all types in order to establish a national Big Data innovation ecosystem

# South Big Data Hub @ RENCi

GOAL: To stimulate regional and grassroots **partnerships involving public and private organizations** of all types to establish a national Big Data innovation ecosystem.

