

DOI Modernization and Zero Trust Update

Tim Quinn
Associate CIO

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What are we trying to achieve?

- Strategic Science
 - 21st Century IT to Support 21st Century Science
 - Process Science – Data Sciences – Expert Modeling
 - Build capacity to do integrated science and solve problems
- Internet of Actions
 - What actions are going to happen verses reporting on what happened
 - Information derived actions
 - Near real time
- Earth System Characterization
 - Intelligence driven by data
 - Opportunities, Threats, Exploits, Mitigation and Resources

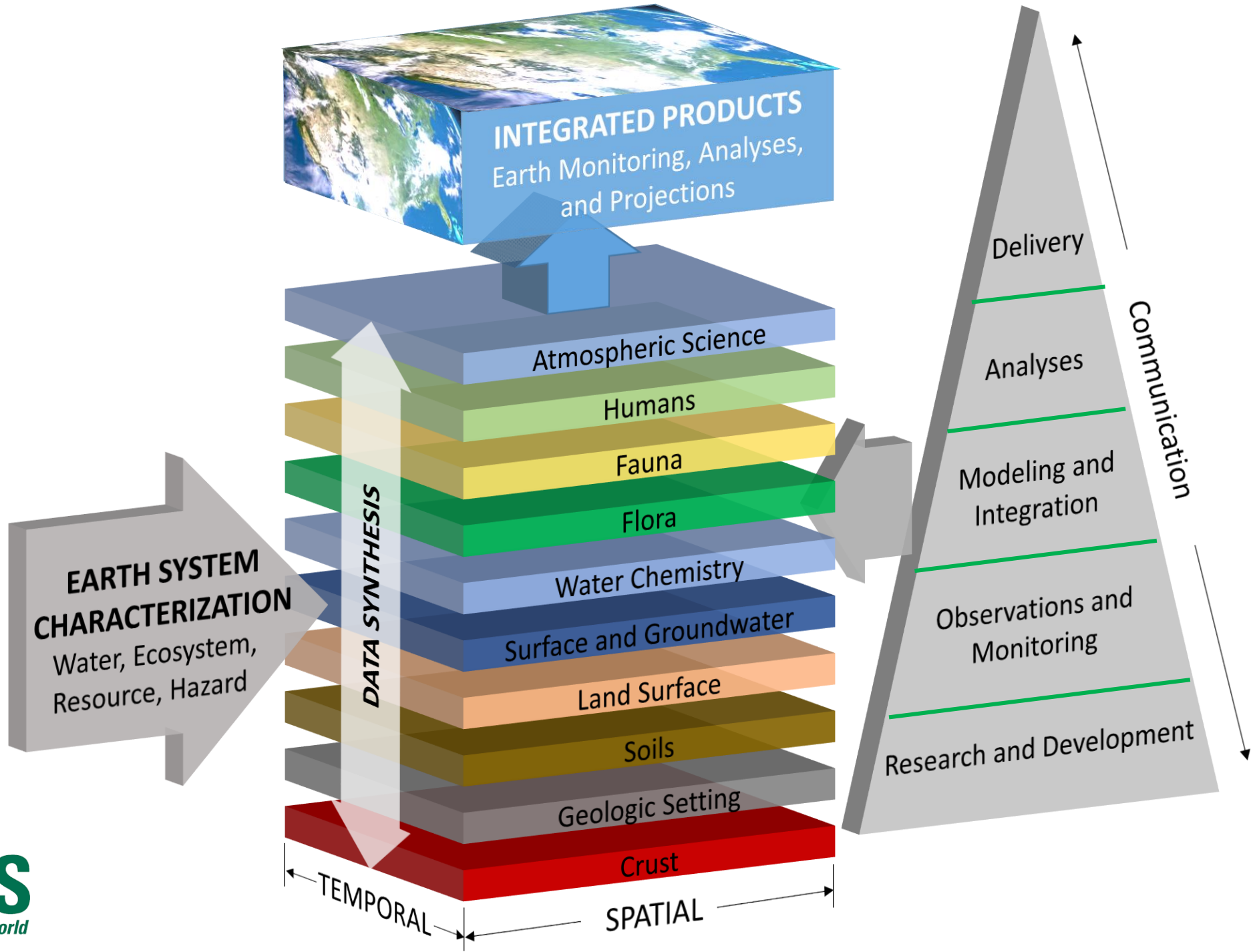
- **Big Science Capacity**
- **Integrated Science**

Information Management and Technology

Component Architecture Service Stacks

	Where we were	Where we are	Where we are going	I n f o r m a t i o n A s s u r a n c e
Sensor Network	Multiple Network Types All over the Landscape	Sensor to Cloud IoT Tech in Cloud Next Gen Sensors	Intelligent Sensor Networks UAV Other autonomous	
Network	14 Networks	Private MPLS TIC 2.0	Gbig Pipes SDN Zero Trust Architecture	
Cloud		Managed Services 100 + Migrated Sand Box	Self Service "Gravity" Tool Rich	
Data Center	Distributed	Data Center Optimization	Secure Enclaves/ Core Data Centers	
High Performance Computing	Servers & Desktops	Yeti (SGI + Cray) (Research HPC) HT Condor	Modeling Sandbox HPC Operational HPC	
Storage	Distributed	Cloud Storage Backup Cloud Storage Gateway HPC Storage	Data Lakes	
Analysis Tools	Synthesis Data Visualization GIS	Cloud Bioinformatics Cloud Tableau Online	AI/ML Computational Notebook Decision Support	
Data Management		Trusted Digital Repositories Science Data Catalog/Metadata Data Lifecycle Management	Cross Boundary	

Information and Technology Dependent Science Mission Area Advances



USGS Water Mission – Big Data Big Analytics

National Water Information System Modernization

Moved / moving multiple components to Cloud

Next Generation Water Observing System

Delaware River Pilot enhancements (high resolution)

Integrated Water Resources Availability Assessments

Evaluate current & long term water supply and demand

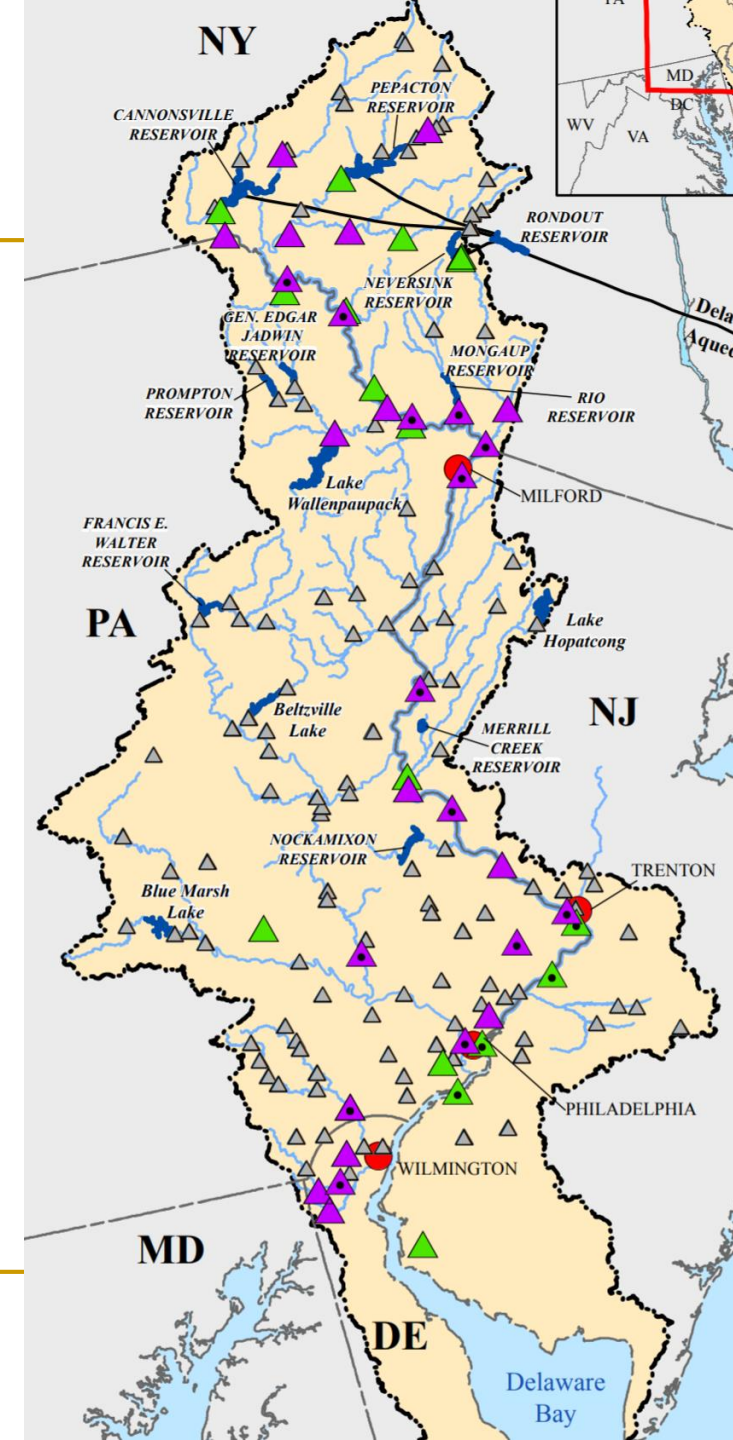
Provide seasonal to decadal forecasts of availability

Integrated Modeling and Prediction

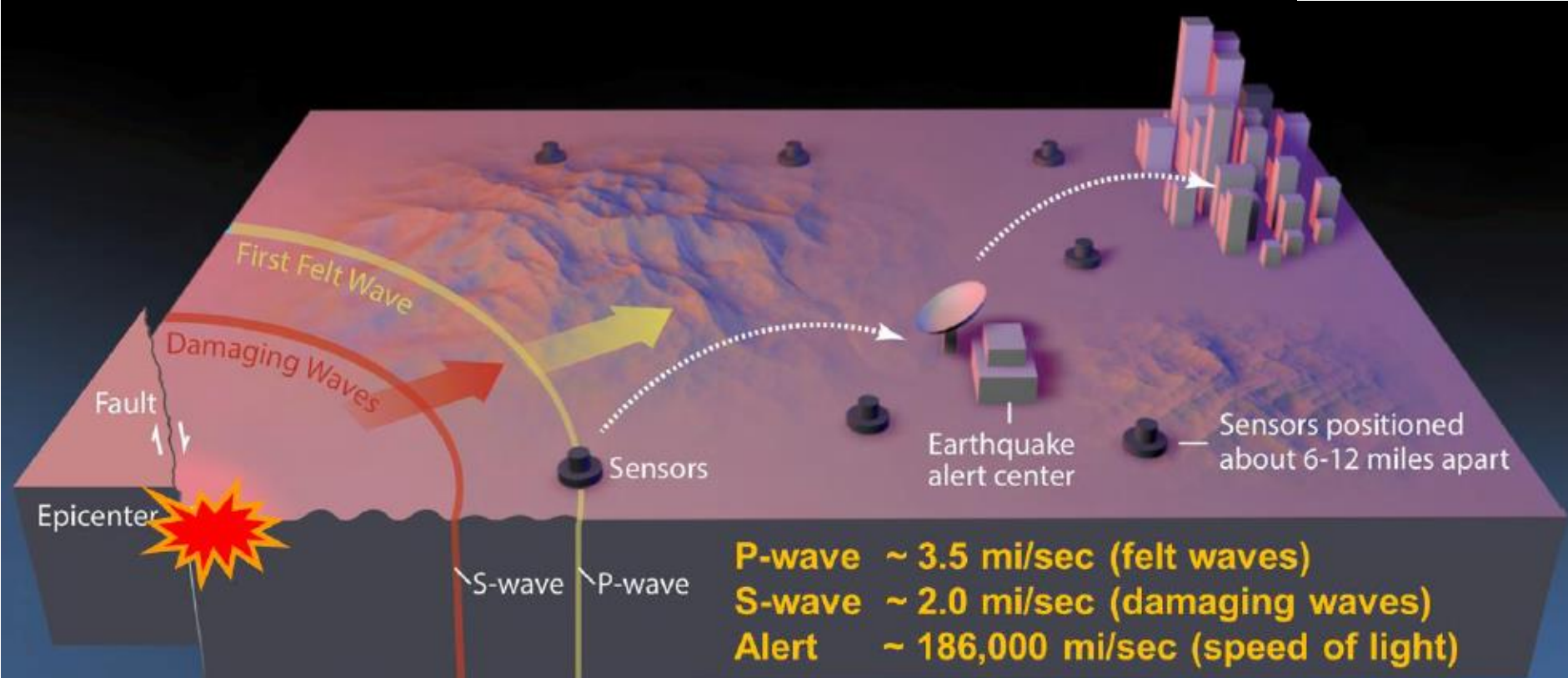
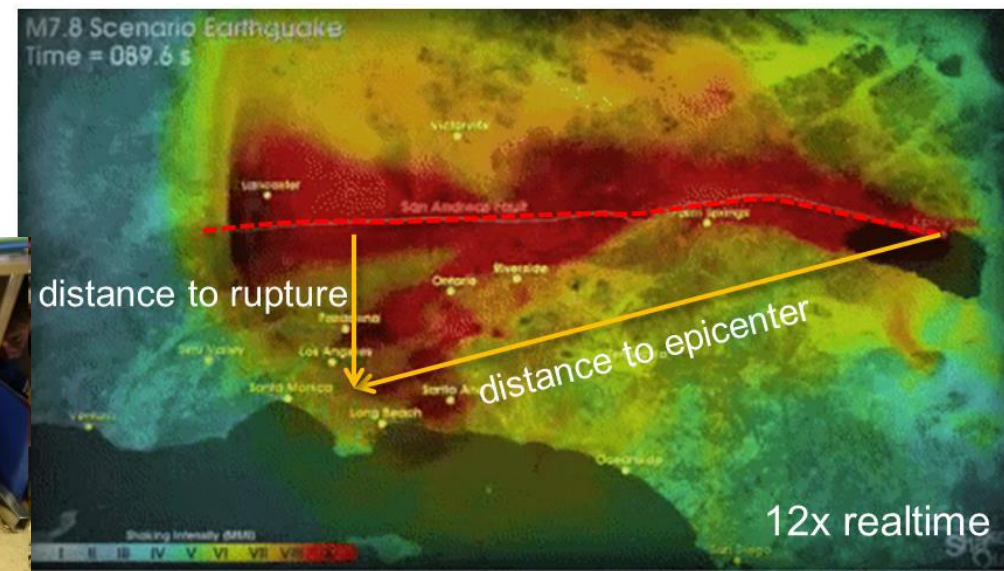
Short-term: focus on NWM and a collaboration with NWS

Mid-term: focus on hyper resolution & operational prediction

Long-term: incorporation of cutting-edge process-based research into an ecosystem of model modules that can be run in varying configurations



Shake Alert – Earthquake Early Warning

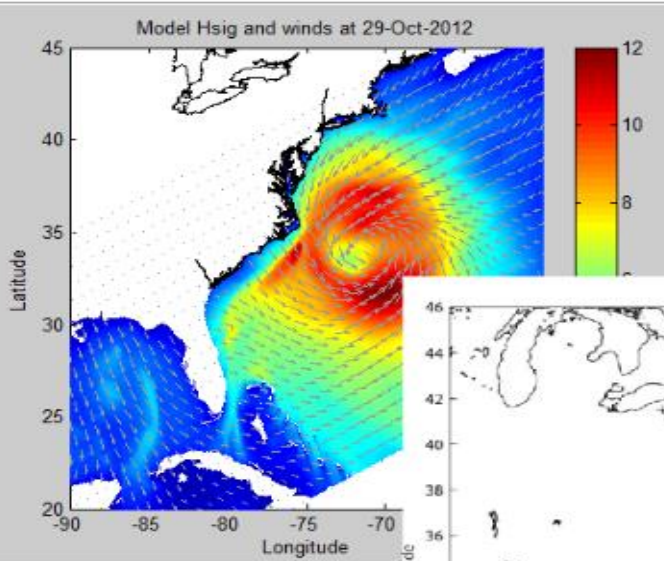


Near Real Time eDNA

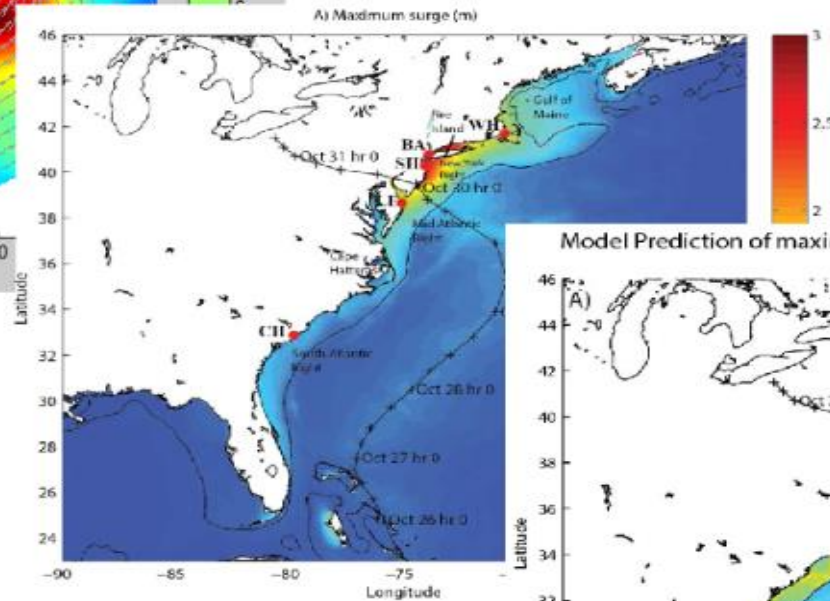


Hurricane Sandy

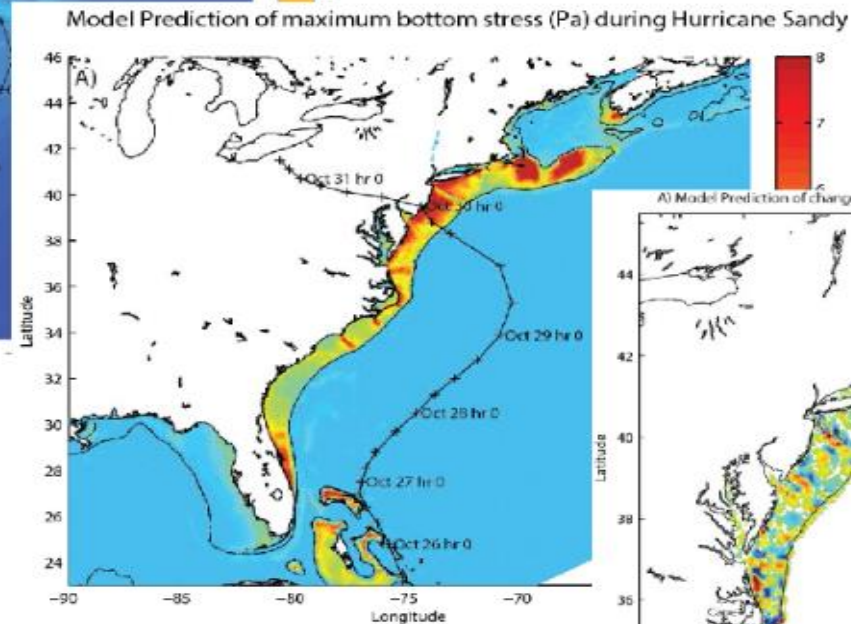
Coupled ocean-wave-sediment modeling system simulation of waves, water levels, bottom stress, and seafloor elevation changes during Hurricane Sandy.



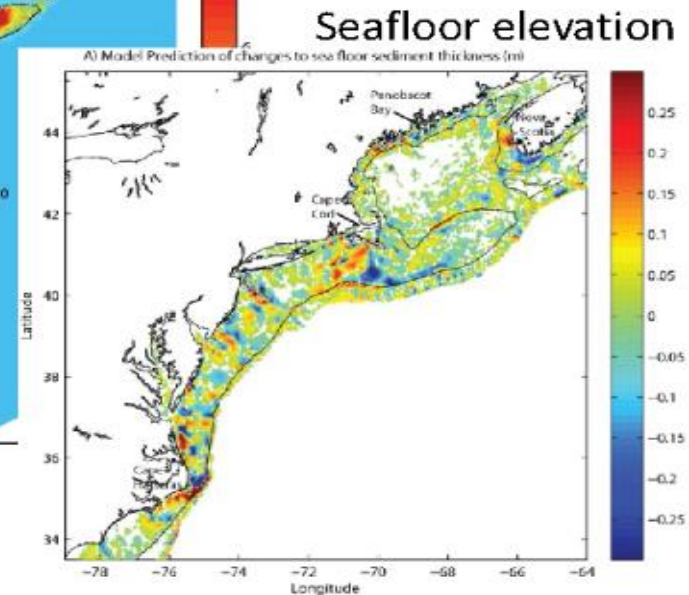
Wave heights



Water levels



Bottom stress



Seafloor elevation

Zero Trust ~~Network~~ Architecture (ZTNA) Update

- **At Federal Networks 2018 DOI announced we are commencing with efforts on ZTN**
- **DOI CIO led discussions at FCIO working group level with other Federal agencies**
- **Discussions with NIST began in earnest during October 2018**
- **NIST proposed federal statement of work in late calendar 2018/early 2019**

Zero Trust Architecture Update

In collaboration with the Federal CIO Council, USG and industry collaborators, NIST will execute the following:

- Coordinate with the FCIOC Zero Trust Architecture Project Steering Group
- Lead effort to define a reference ZTA for USG IT systems
- Lead ZTA technology evaluation with initial focus on the emerging SD-WAN technologies
- Lead efforts to add ZTA requirements into emerging industry standards



Lead efforts to define and execute a federal ZTA demonstration project

ZTA

- The actual technical effort for the demonstration project will occur in FY2020.
- The development and publication of a draft NIST 1800-series Special Publication / Practice guide within 24 months from now.
- So how can I participate? STAY TUNED from more from FCIOC and NIST.