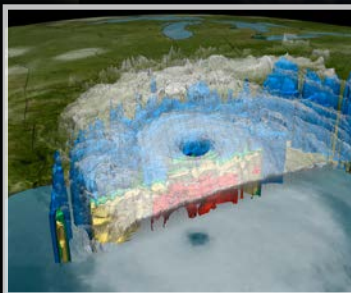
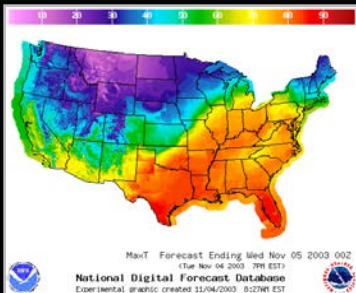
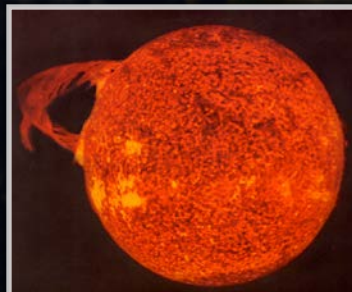
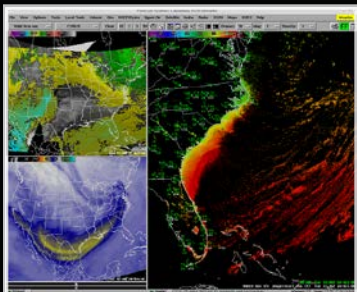


# National Centers for Environmental Prediction: COPC Spring Update



**Dr. William M. Lapenta**

Director, National Centers for Environmental Prediction

NOAA/National Weather Service

COPC meeting

3-4 May 2016

# NWS Organization

HQ Office

Field Office

Office of the Chief of Staff

*Paul Schlatter (A)*

International Affairs

*Courtney Dragoon*

Office of the  
Chief Learning Officer

*John Ogren (A)*

The Office of  
Assistant  
Administrator  
AA  
DAA

*Louis Uccellini* *Laura Furgione*

CFO/CAO

*John Potts*

Enterprise Risk Management  
& Internal Audit Office

*vacant*

Assistant CIO

*Richard Varn (A)*

Office of  
Organizational Excellence

*Kevin Werner*

Office of Planning &  
Programming for Service  
Delivery

*Kevin Cooley*

*AWC: Bob Maxson  
CPC: Dave DeWitt  
EMC: Hendrik Tolman  
NCO: Ben Kyger  
NHC: Rick Knabb  
OPC: Tom Cuff  
SPC: Russ Schneider  
SWPC: Tom Berger  
WPC: Dave Novak*

Office of Chief Operating  
Officer

*John Murphy*

*AR: Carven Scott (A)  
CR: Chris Strager  
ER: Jason Tuell  
PR: Ray Tanabe  
SR: Steven Cooper  
WR: Grant Cooper*

Office of  
Facilities

*Deirdre  
Jones*

Office of  
Observations

*Joe Pica*

Office of  
Central  
Processing

*Dave  
Michaud*

Office of  
Dissemination

*Luis  
Cano*

Office of  
Science &  
Technology  
Integration

*Ming  
Ji*

Analyze,  
Forecast, &  
Support  
Office

*Andy  
Stern*

National  
Centers for  
Env.  
Prediction

*Bill  
Lapenta*

Regional  
Offices

National  
Water  
Center

*Tom  
Graziano (A)*





# NWS Strategic Outcome: A Weather-Ready Nation

- Becoming a Weather-Ready Nation is about building community resiliency in the face of increasing vulnerability to extreme weather, water & climate events

## ***“Ready, Responsive, Resilient”***

- Requires NWS to:
  - Fully integrate our field structure to produce:
    - *Better forecasts and warnings*
    - *Consistent products and services*
    - *Actionable environmental intelligence*
- Address the “last mile” that connects forecast to critical national, state and location decisions
  - *Provide Impact-based Decision Support Services (IDSS)*
  - *Deliver through multiple and reliable dissemination pathways*
  - *Work with partners, including embedding NWS in Emergency Operations Centers and incorporating Social Sciences, to gain the public’s needed response*

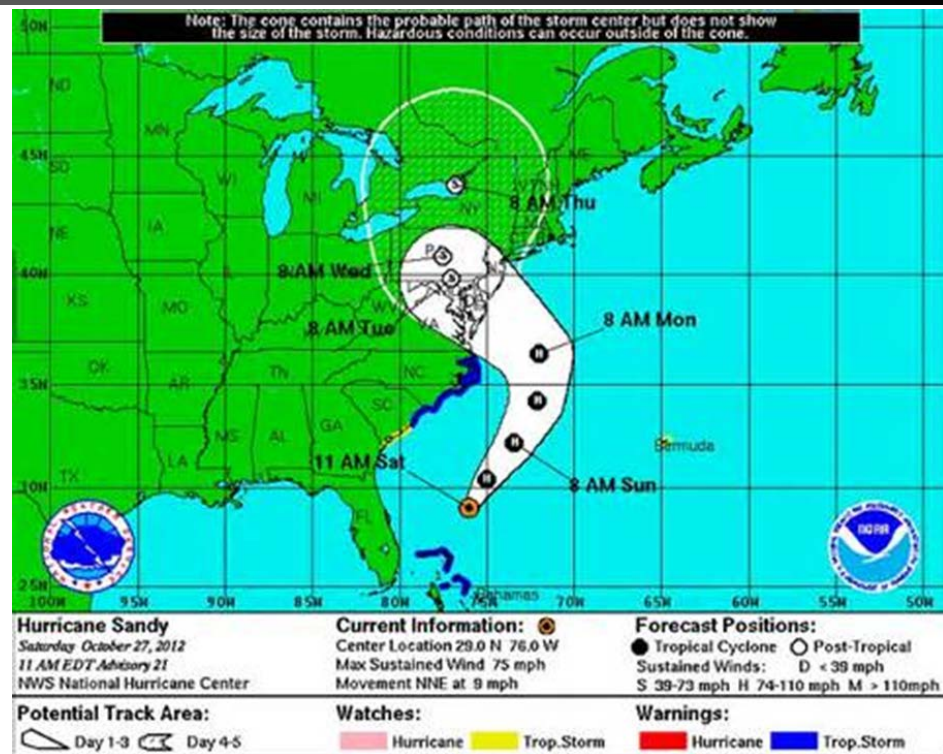


***Involves entire US Weather, Water and Climate Enterprise WORKING TOGETHER  
to achieve far-reaching national preparedness for weather events***



# Tom Geyer (White House Military Office): “The \$\$ Chart”

- What's happening?
- What's the impact?
- What are the proposed courses of action?
- What are the risks?



COMMUNICATION with decision makers: “we don’t want a map discussion”

Impact-based Decision Support Services (IDSS): going the last mile!



# The Job Doesn't End with Forecasts and Warnings

## **“What is a Good Forecast? An Essay on the Nature of Goodness in Weather Forecasting”**

*by Allan H. Murphy; Weather and Forecasting (June 1993)*

*“First, it should be understood that forecasts possess no intrinsic value. They acquire value through their ability to influence the decisions made by users of the forecasts.”*



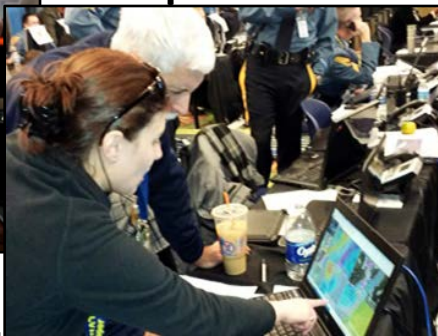


# Realizing Intrinsic Value

*Intrinsic Value is realized through providing  
Impact-Based Decision Support Services (IDSS)*

Generating forecasts and warnings + Connecting those forecasts/warnings with impacts = **IDSS**

Practice, practice,  
practice!



Develop  
relationships/  
know partner  
needs



Embed



Trust



The best  
hydrometeorological  
forecasting in the  
world

“Ready, Responsive, Resilient”



# Connecting All the Pieces

## January 2016 Blizzard Timeline

Jan 17 & 18

Medium Range products highlight snowstorm threat

Jan 19

Medium Range products highlight snowstorm threat

2 pm:  
NWS Collaboration call focused on messaging and strategy

Several national media interviews

Jan 20

8:30 am: NWS briefs FEMA HQ

Numerous national media interviews

**Blizzard Watches Issued**

Jan 21

8:30 am: NWS briefs FEMA HQ  
Coordination with state and local governments

1 pm: National Press Briefing



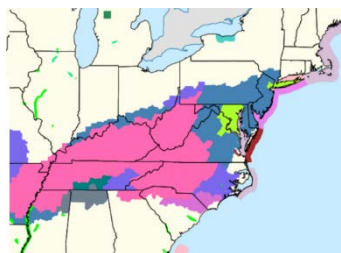
Jan 22

Collaboration to raise snowfall in NYC area

**Schools and Government Close**

**Flights Canceled**

**Roads Closed**



### State of Emergency Declared:

- North Carolina
- Virginia
- West Virginia
- District of Columbia
- Maryland
- Pennsylvania
- New Jersey
- New York





# Connecting All the Pieces

## Long Island Expressway

2013 Snowstorm



The Past

2016 Snowstorm



With Decision Support







# Current Status of Supercomputer Upgrades



## Primary

- Reston, VA – Tide/Luna
- Orlando, FL – Gyre/Surge

IBM/Cray XC40 integrated platform

3,748 compute nodes per system

2.89 PFLOPS/s peak per system

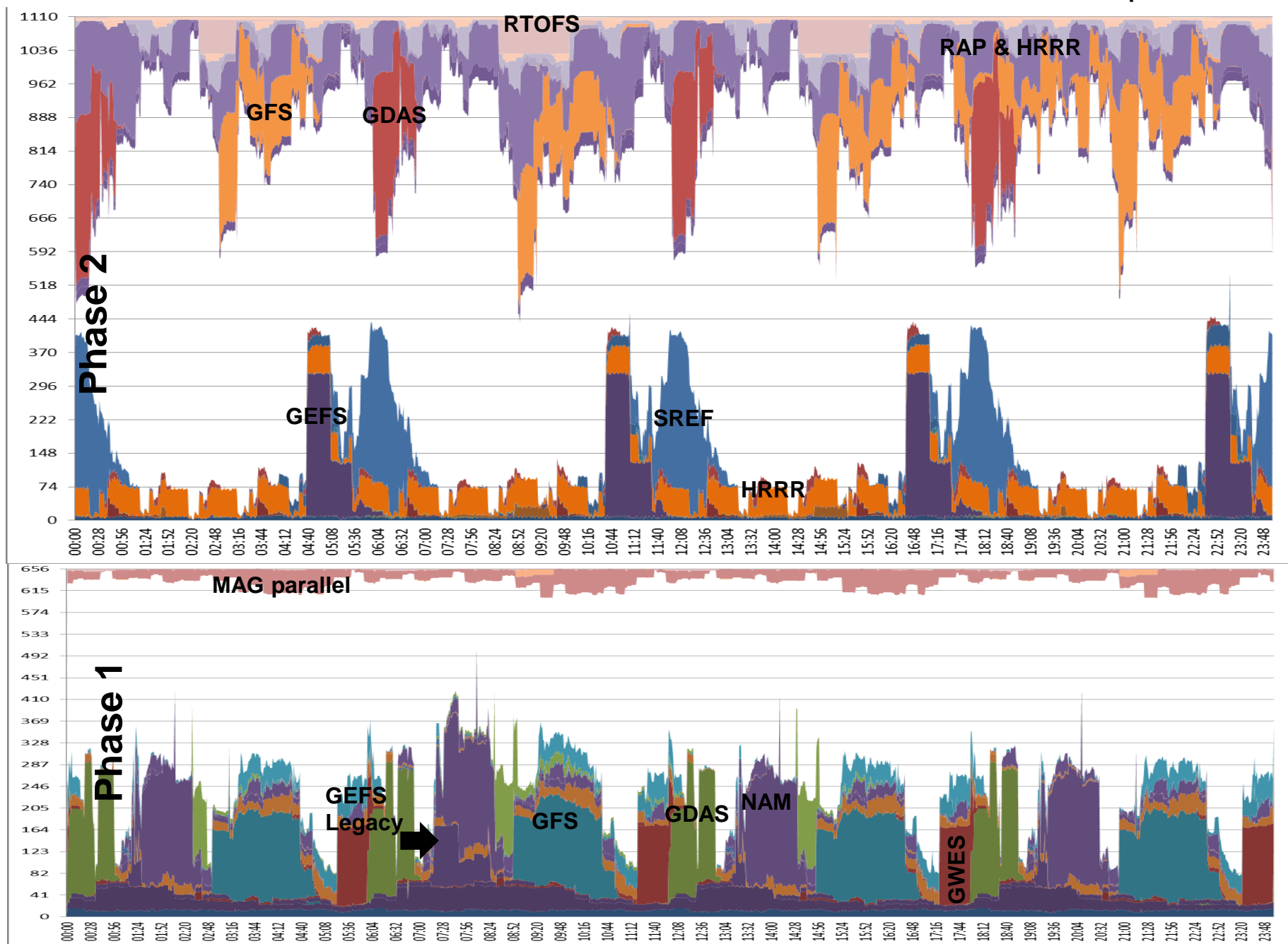
3.5 PB useable storage

40 GB/sec bandwidth



# Production Machine 4/4/2016

Geospace – 6 nodes





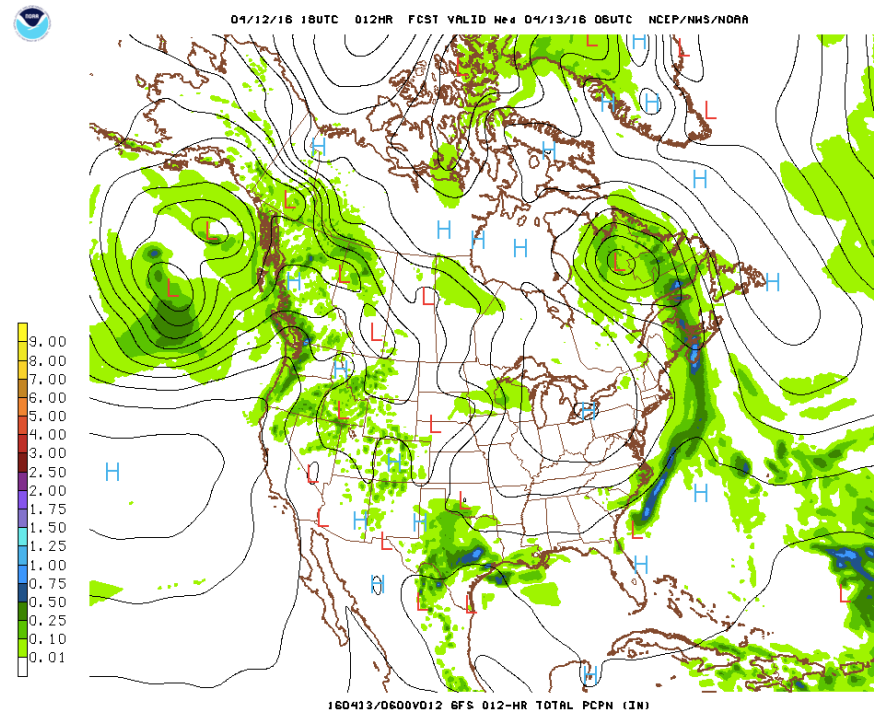


# Current Status and Pending Model Upgrades



## Key Atmospheric Model Upgrades Supporting Water Program:

- **December 2015**
  - GEFS Upgrade – Increased horizontal and vertical resolution and introduced new 0.5 degree GRIB2 output - December 2
- **January 2016**
  - National Blend of Models
- **March 2016**
  - HIRSW on Cray XC40!
  - NAEFS Upgrade
- **May 2016**
  - GFS Target Upgrade
- **June 2016**
  - HWRF Target Upgrade (on Cray)
  - PSURGE (on Cray)
  - National Water Model (on Cray)





# Interactions with Air Force

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- **Implemented 557<sup>th</sup> Ensemble to place on NOMADS**
- **AWC and SPC continue to rely on 15<sup>th</sup> Oper. Weather Squadron for short-term back-up (quarterly exercises) and on 557<sup>th</sup> WW for long-term COOP**
  - **MOA renewal in progress**
- **557<sup>th</sup> WW has provided access to weather products for AWC forecasters**
- **Space Weather Prediction Center**
  - **The relationship between SWPC and the 557th WW continue to be very strong and productive**
  - **Appreciation for the continued support provided by the 557th WW liaison (Capt Domm) located at SWPC in Boulder.**
  - **Request renewed focus to update the longstanding MOU between the two organizations.**



# Interactions with Navy



- **NCO receives NCODA analyses to initialize RTOFS**
  - As part of the Navy-NOAA MOA, NCEP received NCODA source codes from NRL around a year ago. However, the code was provided with little guidance and test cases.
  - NCEP is targeting late FY17/early FY18 for operational implementation
  - Overall communication between NCEP and NAVOCEANO has been positive.
- **Status on NAEFS model:**
  - NAEFS remains a two ensemble model (NCEP + CMC)
  - FNMOC Ens. model including bias-corrected output provided via NOMADS & FTPPRD
- **Status on NCEP/FNMOC Combined Wave Ensemble**
  - NCEP did not receive notification of the delayed output associated with the model upgrade last Spring. Output ~ 2 hours from previous model version
  - To account for the delays, NCEP has delayed our version by two hours
  - Even with the two-hour adjustment on the NCEP side, 50% of the time, individuals model files are missing resulting in a “NCEP-only” wave ensemble model





# NWS Operational Workforce Analysis (OWA)

## Phase 1 Summary

OWA External  
Survey sent to  
**EMs**  
(Summer 2015)

Analysis of surveys  
and interviews  
(Fall 2015)

OWA identified the need for  
service consistency and role clarity  
for both internal operations and  
external IDSS  
(Winter 2015)

**OWA Operating Model Workstream will focus on Impact-Based Decision Support Services (IDSS):**

NWS employees embrace IDSS, and EMs use IDSS with high customer satisfaction

However, there are a number of definitions of IDSS, including in terms of what IDSS products are provided, how IDSS is delivered, when IDSS is delivered and to whom IDSS is being delivered

*"We have to know what the NWS can do for us, but **we also have to know what they can't do, or we'll ask them to do everything**, and, God help them, they'll try and give it to us"*



*"I trust my partners at NWS and **I know them** – the tone of their voice, the way they report out to us. And they know me."*





# QUESTIONS ?

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