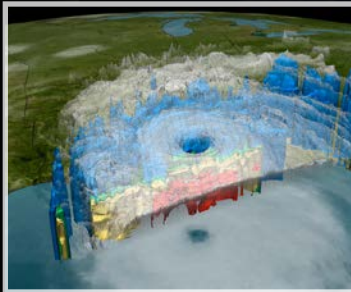
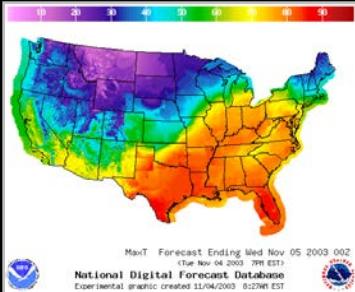
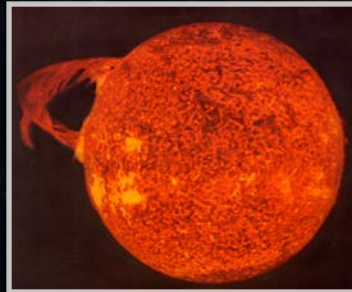
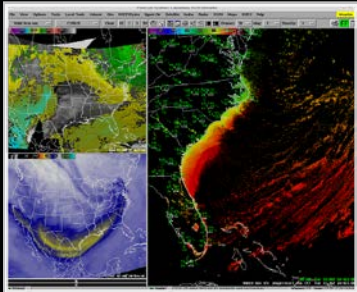


The National Centers for Environmental Prediction (NCEP): Enabling a Weather Ready Nation



Dr. William M. Lapenta

Director, National Centers for Environmental Prediction

NOAA/National Weather Service

Updated 26 April 2017



NWS Strategic Outcome: *A Weather- and Water-Ready Nation*



“Ready, Responsive, Resilient”

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

Better forecasts and warnings

Consistent products and services

Actionable environmental intelligence

Connecting forecasts to decisions

Involves the entire US Weather, Water and Climate Enterprise WORKING TOGETHER

We have 5000+ WRN Ambassadors



January 2016 IDSS Example:



Long Island Expressway comparison to 2013

2013 Snowstorm

2016 Snowstorm



The Past

**With NWS Impact-Based
Decision Support Services
(IDSS)**



What NCEP Delivers

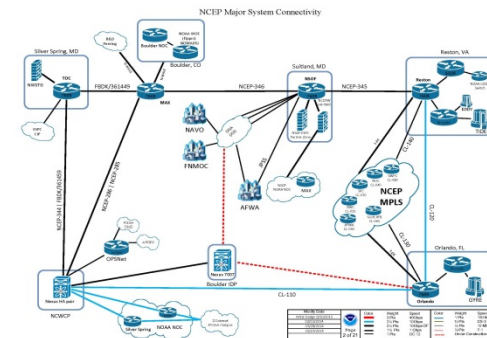
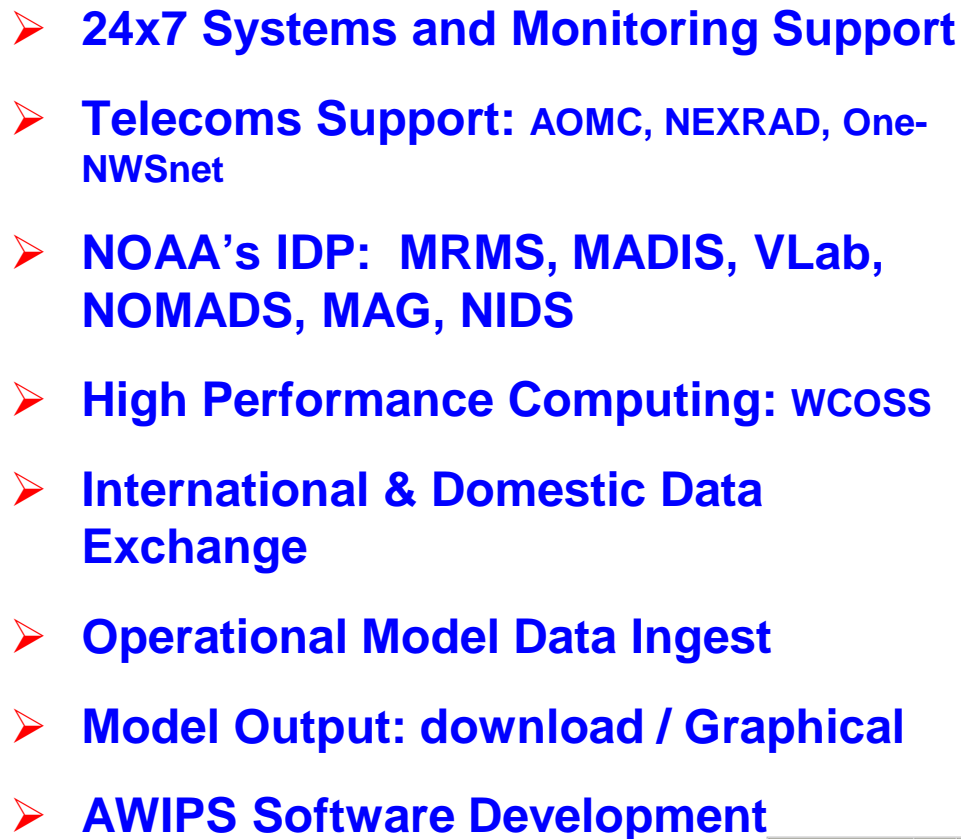


“Provision of Services from the Sun to the Sea”

- Seasonal Outlooks (CPC)
- El Nino – La Nina Forecast (CPC)
- Weather Forecasts to Day 7 (WPC)
- Extreme Events (Hurricanes, Severe Weather, Snowstorms, Fire Weather) (NHC, WPC, SPC)
- High Seas Forecasts and Warnings (
- Aviation Forecasts and Warnings (AWC)
- Solar Monitoring, Warnings and Forecasts (SWPC)



- Model Development, Implementation and Applications for Global and Regional Weather, Climate, Oceans and Space Weather (EMC)
- Super Computer, Workstation and Network Operations (NCO)

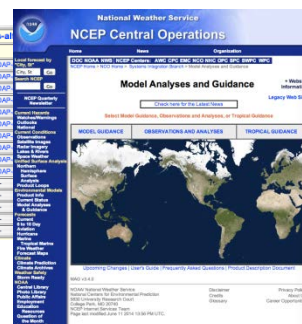
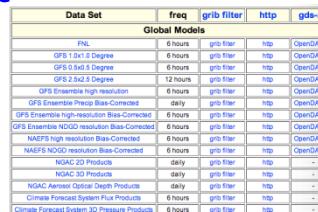


Subscriber/Site Status as of Wed Jun 3 17:14:58 UTC 2015

Receivers - Last confirmation of successful transmission to receiver

Session	Topic	Date	Time	Location
Session 1: Introduction to the course	Introduction to the course	01 Jan 2025	10:00-11:00	Online
Session 2: The history of the world	The history of the world	02 Jan 2025	10:00-11:00	Online
Session 3: The geography of the world	The geography of the world	03 Jan 2025	10:00-11:00	Online
Session 4: The climate of the world	The climate of the world	04 Jan 2025	10:00-11:00	Online
Session 5: The environment of the world	The environment of the world	05 Jan 2025	10:00-11:00	Online
Session 6: The human impact on the world	The human impact on the world	06 Jan 2025	10:00-11:00	Online
Session 7: The future of the world	The future of the world	07 Jan 2025	10:00-11:00	Online
Session 8: The world in the 21st century	The world in the 21st century	08 Jan 2025	10:00-11:00	Online
Session 9: The world in the 22nd century	The world in the 22nd century	09 Jan 2025	10:00-11:00	Online
Session 10: The world in the 23rd century	The world in the 23rd century	10 Jan 2025	10:00-11:00	Online

Radar Sites - Last receipt of data:

[illegible]



Integrated Dissemination Program (IDP)

Long-Term Sustainable Solution

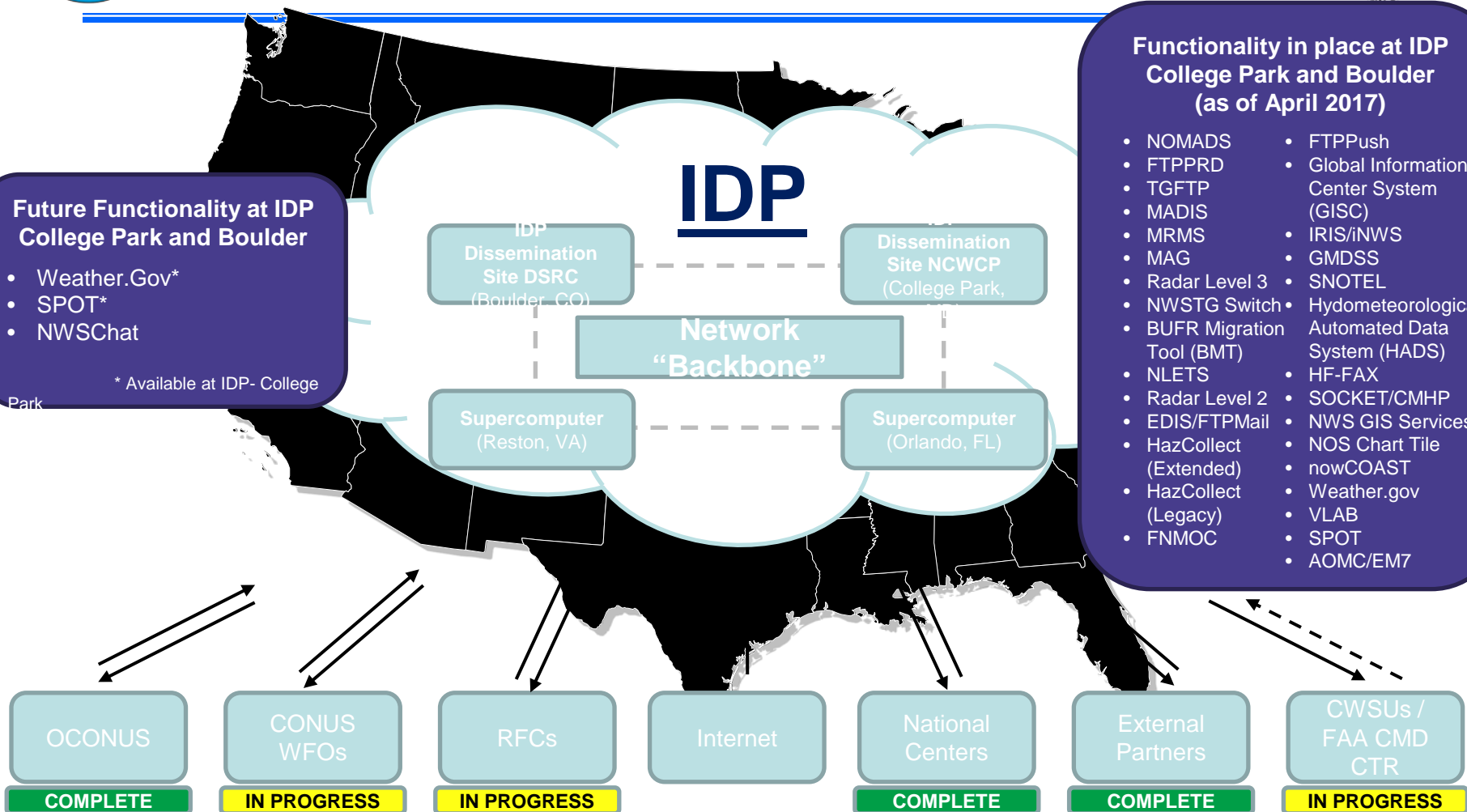


Future Functionality at IDP College Park and Boulder

- Weather.Gov*
- SPOT*
- NWSSchat

* Available at IDP- College

Park



Functionality in place at IDP College Park and Boulder (as of April 2017)

- NOMADS
- FTPPRD
- TGFTP
- MADIS
- MRMS
- MAG
- Radar Level 3
- NWSTG Switch
- BUFR Migration Tool (BMT)
- NLETS
- Radar Level 2
- EDIS/FTP Mail
- HazCollect (Extended)
- HazCollect (Legacy)
- FNMOC
- FTTPush
- Global Information Center System (GISC)
- IRIS/iNWS
- GMDSS
- SNOTEL
- Hydrometeorological Automated Data System (HADS)
- HF-FAX
- SOCKET/CMHP
- NWS GIS Services
- NOS Chart Tile
- nowCOAST
- Weather.gov
- VLAB
- SPOT
- AOMC/EM7

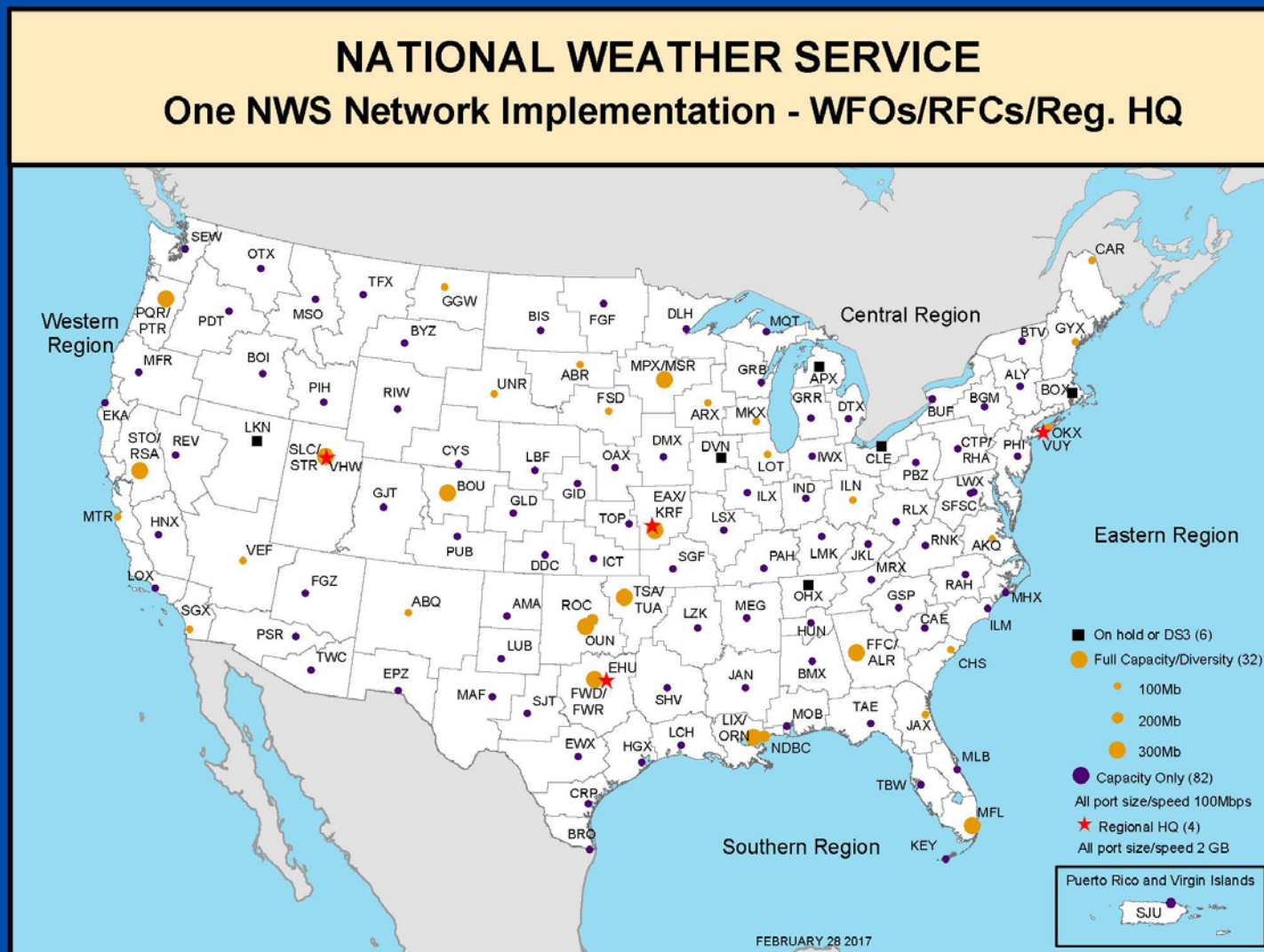
"OneNWS" Network

The future OneNWS network will consolidate all operational networks (OPSnet, Regional, etc.) as a single managed network under NCEP Central Operations (NCO).



IDP GRP OneNWS Network Implementation

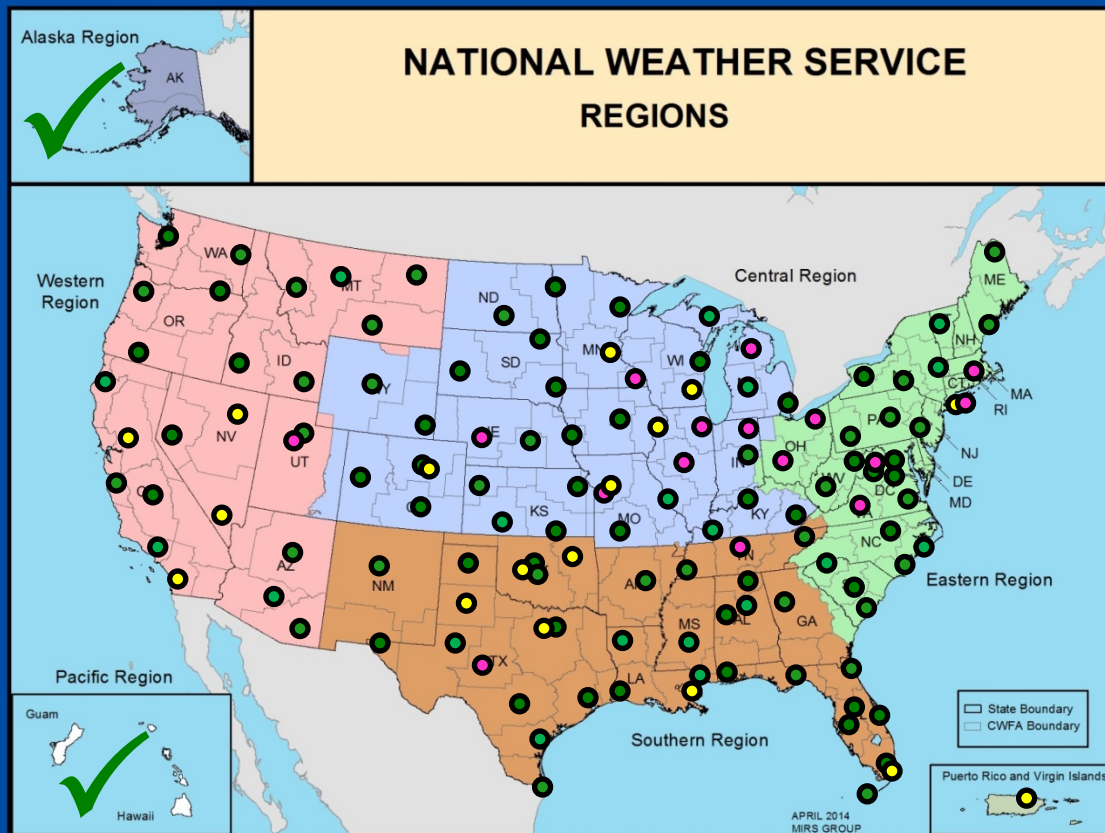
FY16 – FY18 – Planned CONUS Network Upgrades





IDP GRP OneNWS Network Implementation

FY16 – FY18 – Status as of 4/21/2017



CONUS Upgrades

- ✓ IDP College Park
- ✓ IDP Boulder
- ✓ Storm Prediction Center
- ✓ National Hurricane Center
- ✓ WCOSS Orlando to Boulder
- ✓ National Water Center
- ✓ NSOF
- ✓ Fairmont CBU (NESDIS backup for NSOF)
- ✓ **10 WFOs upgraded in FY16**
- **81 WFOs upgraded in FY17 as of 04/21/2017**

OCONUS FY16

- ✓ Upgrade capacity & diversity in Alaska Region
- ✓ Upgrade capacity & diversity in Pacific Region
- ✓ Disconnect legacy circuits

CONUS FY17 Plan

- Upgrade as many sites as possible with capacity and some with diversity based on budget and mission priority
- Upgrade 21 FAA CWSU sites and FAA ATCSCC **pending signed IA from FAA**
- Disconnect legacy circuits in FY18

LEGEND:

- Completed Upgrades (91 CONUS NWS Offices)
- Upgrades planned in FY17Q3 (17 NWS Offices)
- Upgrades planned in FY17Q4 (16 NWS Offices)



Current Status of Supercomputer Upgrades



- Orlando, FL – Gyre/Surge

Today:

IBM/Cray XC40 integrated platform:

3,748 compute nodes per site

2.89 PFLOPS/s peak per site

8.5 PB usable storage per site

40 GB/sec max bandwidth

Coming in January 2018:

DELL will be fully integrated with current IBM/Cray platform and adds:

1,212 compute nodes per site

1.4 PFLOPS/s peak per site

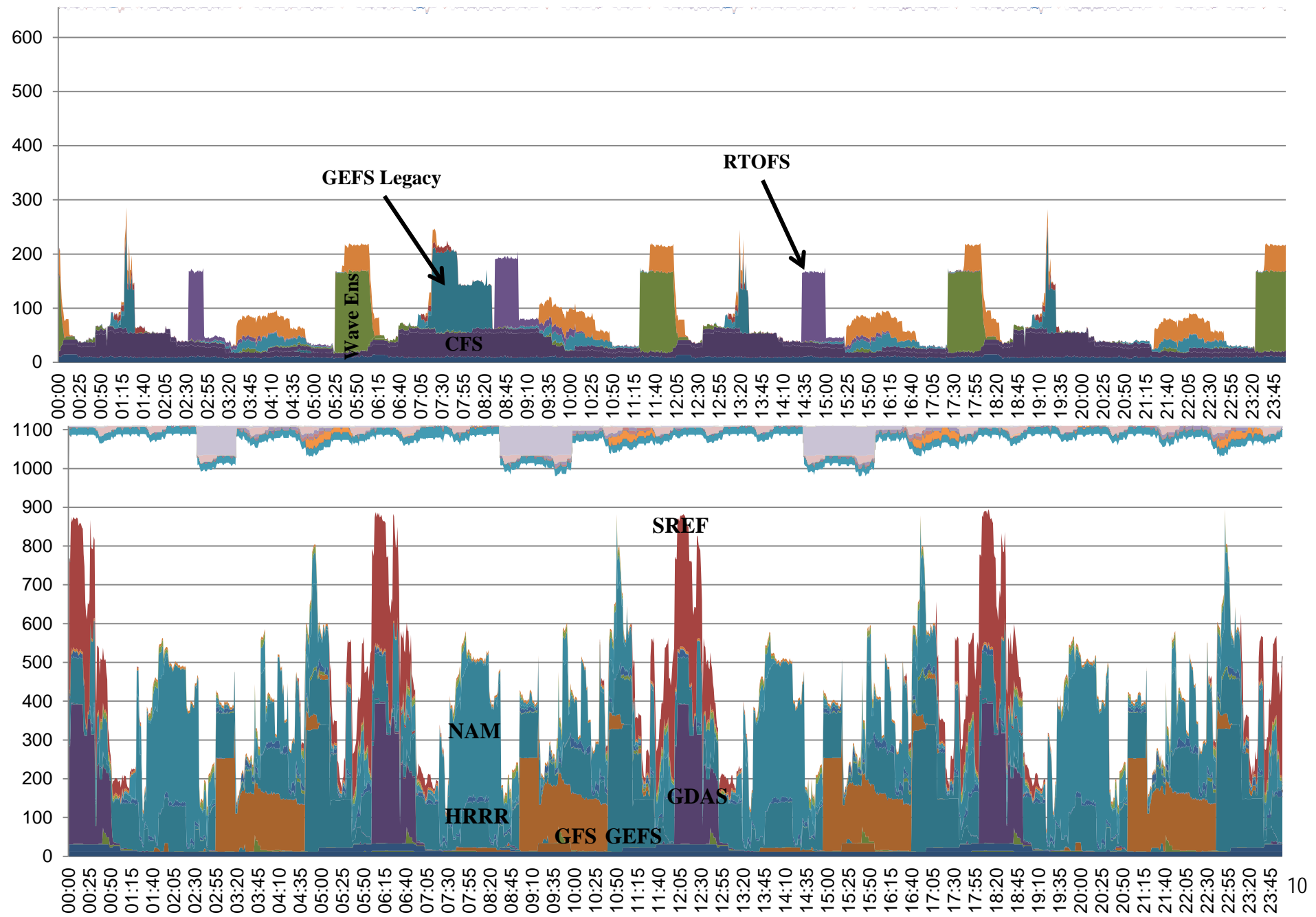
5.47 PB usable storage per site

162 GB/sec max bandwidth

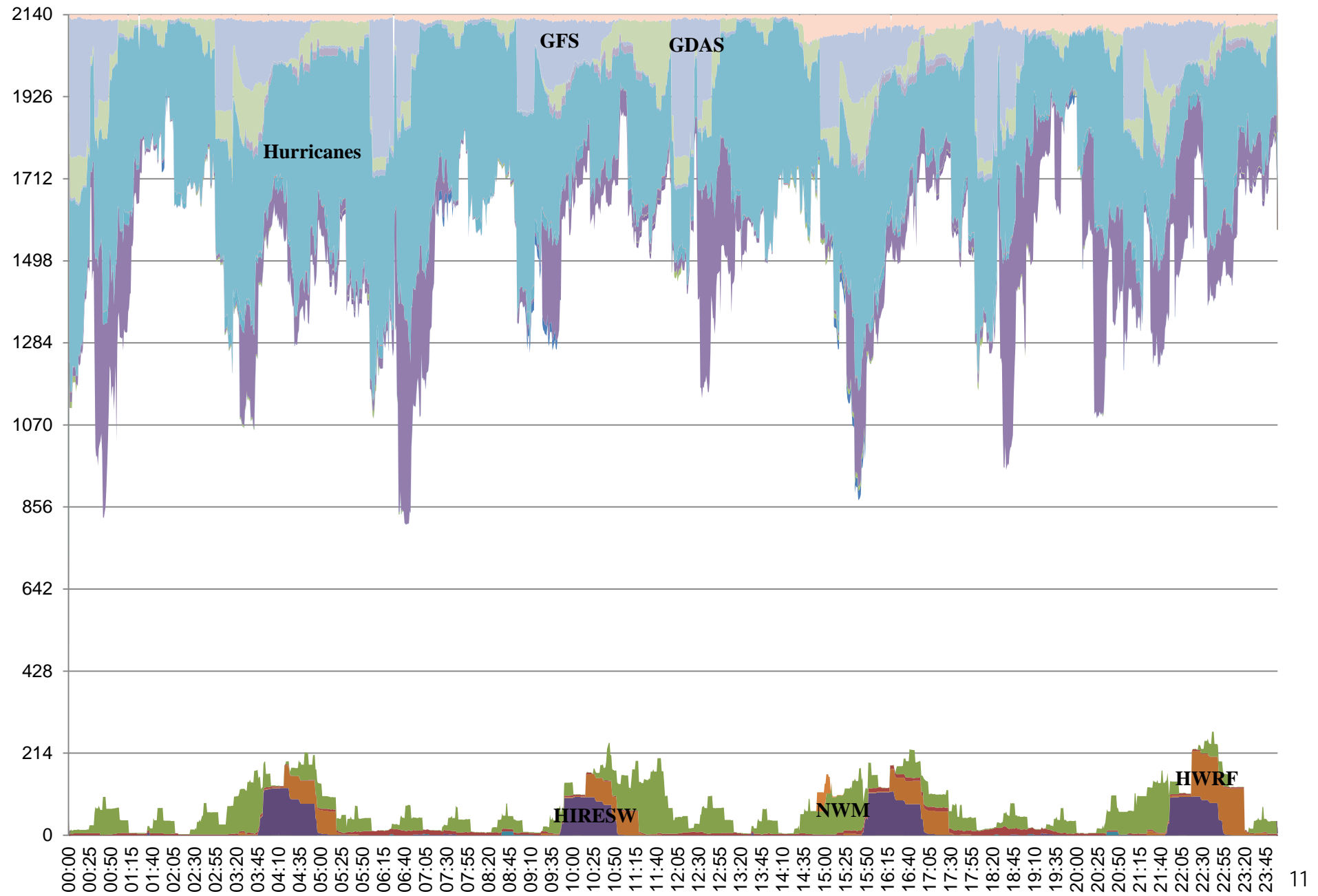


- Reston, VA – Tide/Luna

Production Machines 4/24/2017



Production Machines 4/24/2017





Current Status and Pending Model Upgrades

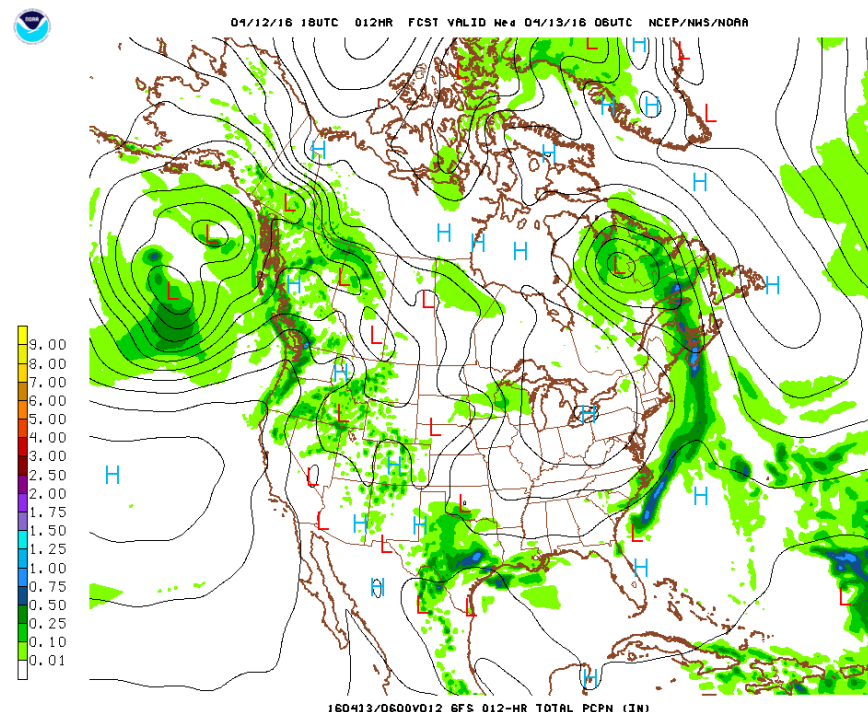


Key Model Upgrades Supporting Water Program:

- **July 2017**
 - Global Forecast System
 - Global Real-Time Ocean Forecast System
 - National Blend of Models
 - Hurricane WRF

- **September 2017**
 - Hi-Resolution Window
 - Real-Time Mesoscale Analysis
 - Global Wave Deterministic
 - Global Wave Ensemble
 - Nearshore Wave Prediction System
 - NAEFS

- **October 2017**
 - National Water Model





Interactions with Air Force

- **AWC and SPC continue to rely on 15th Oper. Weather Squadron for short-term back-up (quarterly exercises) and on 557th WW for long-term COOP**
 - **MOA renewal in progress – Target June**
- **557th 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 long standing MOU between the two organizations.**
 - **Beginning conversations on the interest in obtaining SPADES (Satellite Product Analysis and Distribution System) and GONG (Global Operations Network Group) data through NCO IDP.**



Interactions with Navy



- **NCO receives NCODA analyses to initialize RTOFS**
 - As part of the Navy-NOAA MOA, NCEP received NCODA source codes from NRL and is targeting late FY18 for operational implementation.
 - Overall communication between NCEP and NAVOCEANO has been positive.
- **Status on RTFOS model upgrade**
 - Around July, 2017, NCEP will upgrade to RTOFS v1.1 and GOFS V3.1 with the newly upgrade NAVO Hycom
- **Status on NAEFS model**
 - NAEFS remains a two ensemble model (NCEP + CMC)
 - FNMOC Ens. model including bias-corrected output provided via NOMADS & FTPPRD
- **NCEP continues to run the HWRF across all ocean basins**
 - This season the GFDL model will be replaced with HMON (Hurricanes in a Multi-scale Ocean-coupled Non-hydrostatic)
 - By next hurricane season JTWC will be able to initialize HMON storm runs