NCEP Quarterly Newsletter - December 2012

Print

Weather and Climate Operational Supercomputing

The two WCOSS supercomputers, Tide and Gyre, successfully completed their acceptance tests. Tide, located in Reston Va., was officially accepted on November 29, 2012. Gyre, located in Orlando Fl., was officially accepted on January 4, 2013. Both systems met or exceeded the acceptance test benchmarks without any major hardware or software failures during their respective tests. Each system is an IBM iDataPlex consisting of 628 compute nodes which provide a peak system performance of 208 TeraFlops. Tide and Gyre each have approximately 2.5 Petabytes of disk storage.

With the conclusion of acceptance, NOAA developers can complete transition of the National Centers for Environmental Prediction (NCEP) production model suite from the legacy NCEP Central Computing System (CCS) to the new WCOSS. Many NCEP Centers, including the Environmental Modeling Center, NCEP's Central Operations, Climate Prediction Center, National Hurricane Center, and Space Weather Prediction Center, along with other NOAA organizations including the Meteorological Development Laboratory, National Ocean Service, and the Air Resources Laboratory are involved in this transition. The migration of data assimilation software, numerical weather prediction models, and product generation software is expected to be completed by May 2013.

Parallel work occurring at the same time as the transition of software from the current PowerPC architecture to the iDataPlex Intel architecture includes implementation of high-speed wide area network connections at both sites, system optimization, model suite scheduling work to establish product delivery times in line with current operations, and preparation for product validation. The product validation phase will include an opportunity for external users to compare products from the operational Central Computing System and the pre-operational WCOSS system while the systems are running in parallel.

Gyre, located in Orlando, FL

Tide, located in Reston, VA

2012 NCEP Operational Hurricane Guidance

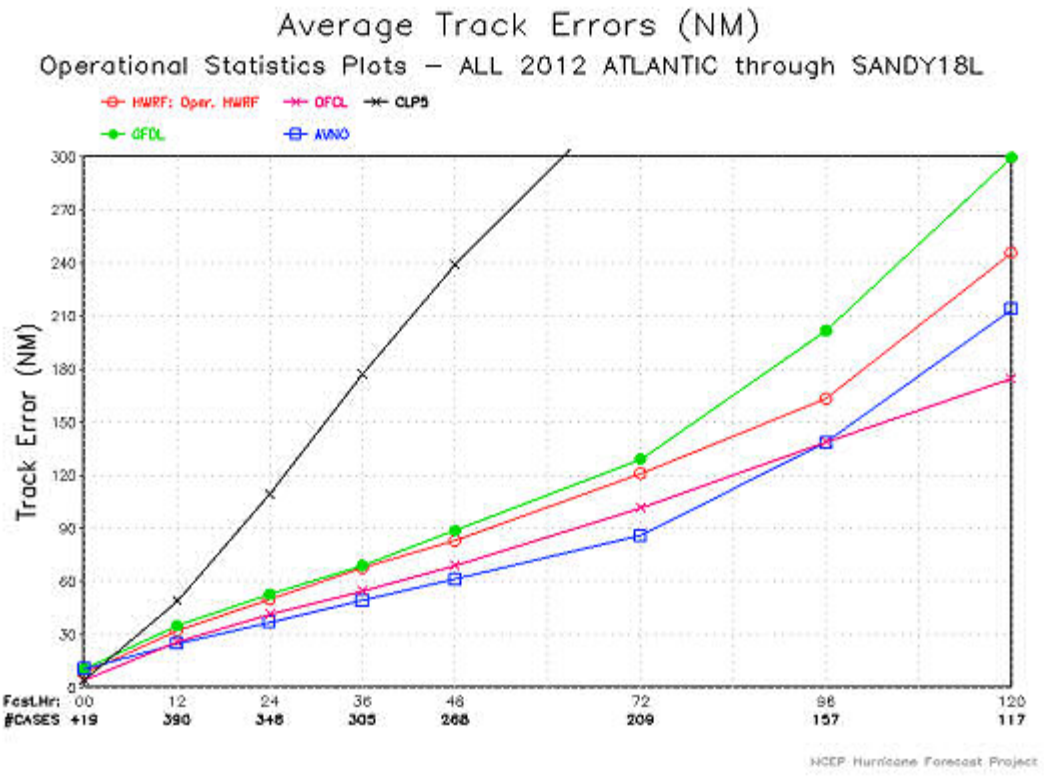
Deterministic numerical guidance from NCEP's operational Global Forecast System (GFS) and two specialized atmosphere-ocean coupled regional models, the Geophysical Fluid Dynamics Laboratory (GFDL) hurricane model and the Hurricane Weather Research and Forecast (HWRF) modeling system, are the primary contributors for operational hurricane forecasts issued by the National Hurricane Center (NHC) for the North Atlantic and North Eastern Pacific basins. Significant model upgrades were implemented before the hurricane season for all three modeling systems. Changes to the operational GFS model include implementation of EnKF/3DVAR based hybrid data assimilation system (http://www.nws.noaa.gov

/os/notification/tin11-07gfs_update_aab.htm). Implementation of the GFDL hurricane model upgrades include several bug fixes and improved model physics (http://www.nws.noaa.gov/os/notification/tin11-11gfdl.htm). Upgrades for the HWRF modeling system (http://www.nws.noaa.gov/os/notification/tin11-09hwrf.htm) consisted of implementation of a very high resolution storm-following nested grid operating at 3km resolution and several enhancements to the model physics, vortex initialization and post-processing. Performance of these three models for 2012 hurricane season is evaluated in terms of track and intensity forecasts.

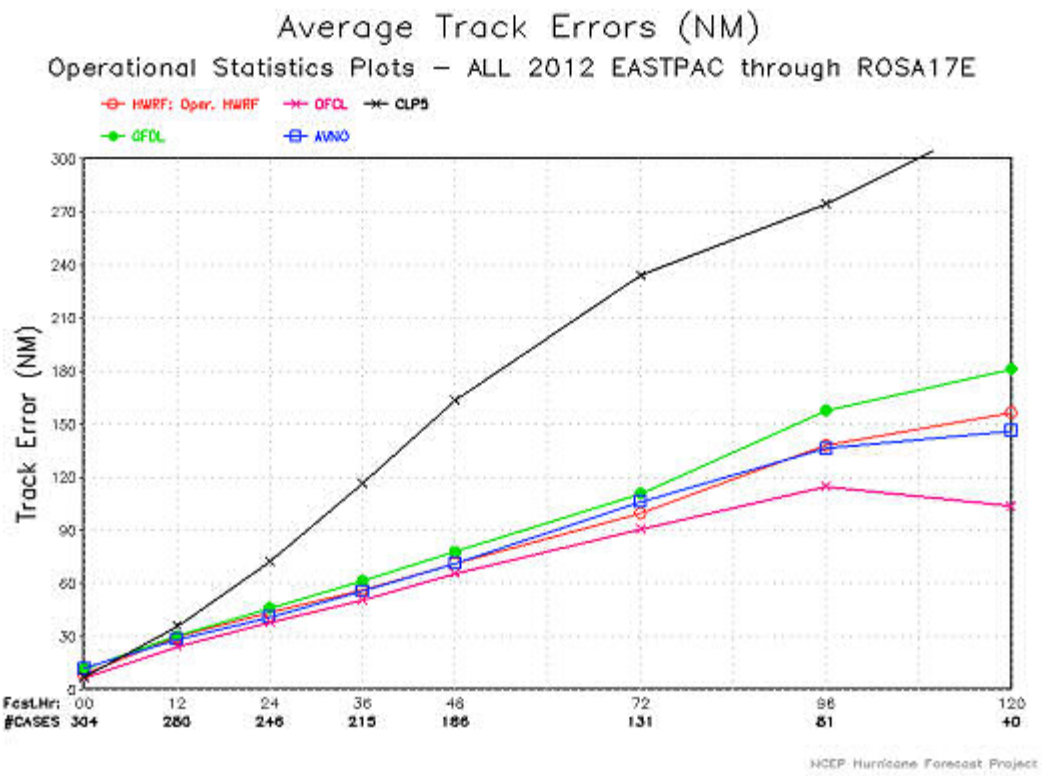
Figure 1 shows the track errors (in nm) from GFS (blue), GFDL (green) and HWRF (red) in comparison to official forecasts from NHC (pink) for the North Atlantic (Fig. 1a) and North Eastern Pacific (Fig. 1b) basins. Track forecast guidance for the 2012 Atlantic hurricane season from operational GFS is found superior to other deterministic models as well as NHC official forecasts through 96-hr forecast period. For the Eastern Pacific basin, track errors from GFS and HWRF models were comparable at all forecast intervals.

Evaluation of intensity forecast errors (in knots) from GFS and regional hurricane models (HWRF and GFDL) for 2012 hurricane season is presented in Fig. 2 (a, b) for the North Atlantic and North Eastern Pacific basins. Verification of intensity errors includes forecasts from statistical dynamical models (DSHP and LGEM) which are considered superior to dynamical models. From intensity forecast perspective, none of the model guidance has shown any useful skill for the 2012 Atlantic hurricane season compared to climatology based statistical hurricane intensity forecast model (SHIFOR5, denoted as SHF5 in Fig. 2). Intensity forecasts for the Eastern Pacific basin were found to be more skillful compared to the climatology, and the NHC official forecasts had the lowest errors for this basin.

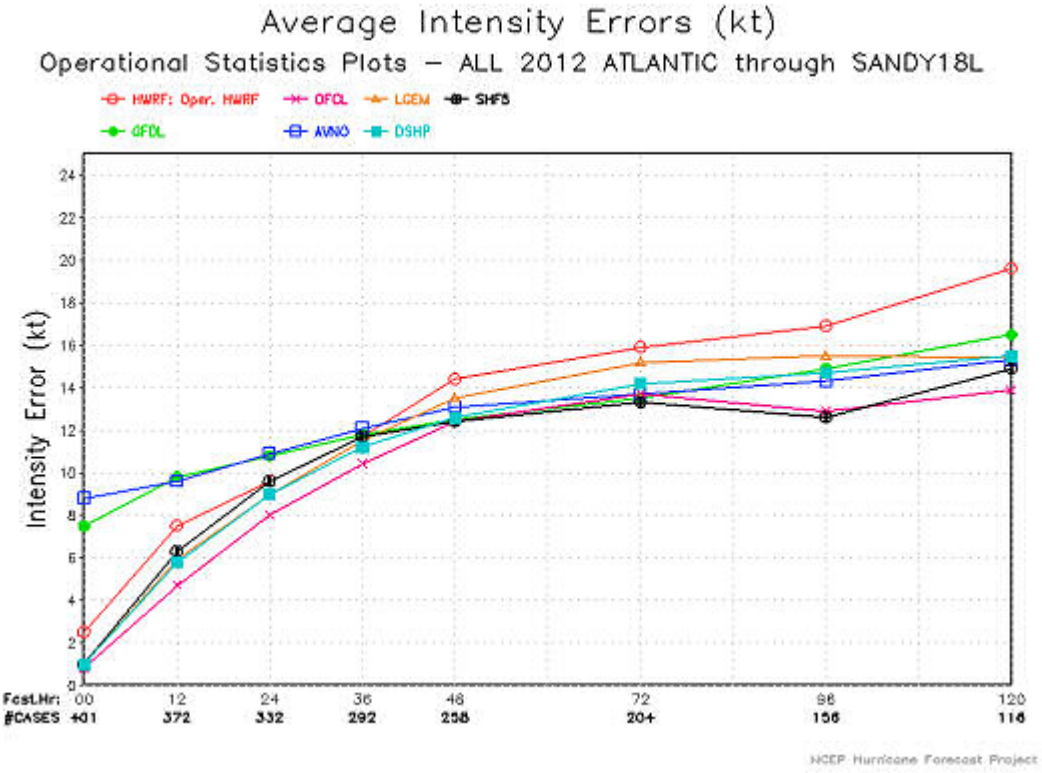
These verification statistics are based on working best track data provided by NHC, and are subjected to change when final best track data are made available.



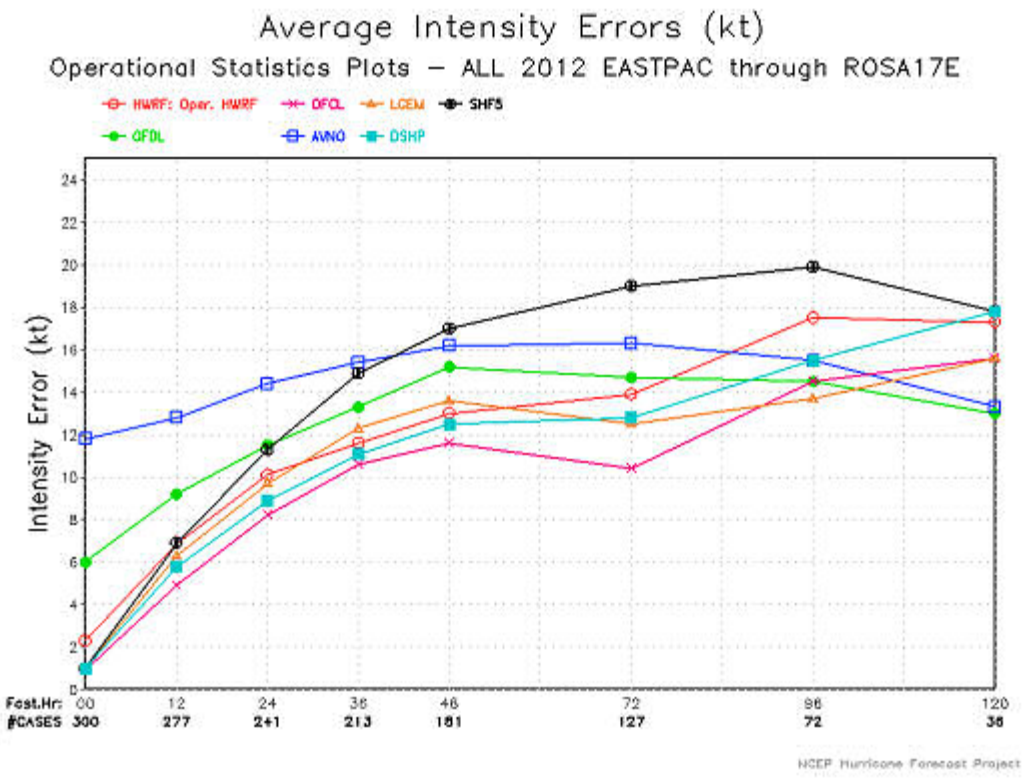
Average track errors for all 2012 Atlantic storms from NCEP deterministic models GFS (AVNO) in blue, GFDL in green and HWRF in red, compared to NHC Official (OFCL) forecasts in pink. Black line corresponds to errors from climatology and persistence (CLP5) based forecasts.



Same as Fig. 1a except for North Eastern Pacific basin.



Average intensity errors (kts) for all 2012 Atlantic storms from NCEP deterministic models GFS (AVNO) in blue, GFDL in green and HWRF in red, compared to NHC Official (OFCL) forecasts in pink. Black line corresponds to errors from climatology based statistical model (SHF5).



Same as Fig. 2a except for North Eastern Pacific basin.

Service Center Activities

QMS Certification for AWC

On December 28, 2012, the National Centers for Environmental Prediction (NCEP) Aviation Weather Center (AWC) was certified as conforming to the International Organization of Standards (ISO) 9001:2008 standard for Quality Management Systems (QMS). The AWC proudly delivers consistent, timely and accurate weather information for the world based on needs of the United Nations. International Civil Aviation Organization (ICAO) and Federal Aviation Administration (FAA). This is accomplished by a team of highly skilled people dedicated to working with customers and partners to enhance safe and efficient flight, through a quality management system based on a philosophy of continuous improvement. ICAO recommends that states producing aviation weather information adhere to the "principles" of the ISO 9001:2008 standard. The AWC exceeded the ICAO recommendation by earning a full certification. This certification culminates a two-year effort in which the AWC developed and implemented a management system adhering to all requirements of the ISO standard. This international recognition demonstrates AWC's commitment to meeting and exceeding customer requirements and to the collaborative development, production, and delivery of weather information for the world airspace system.

ISO is the world's largest developer of voluntary International Standards. International Standards give state of the art specifications for products, services and good practice, helping to make government and industry more efficient and effective. ISO International Standards ensure that products and services are safe, reliable and of good quality. Founded in 1947, the ISO has developed and published more than 19,000 international standards covering almost all aspects of technology and business. The ISO 9001:2008 standard sets out the criteria for a QMS. Using ISO 9001:2008 helps companies and organizations ensure customers receive consistent, good quality products and services by providing guidance and tools for ensuring these products and services meet customers' requirements and are continually improved. Over one million companies and organizations in over 170 countries use the ISO 9001:2008 quality management principles that include strong customer focus, top management commitment, process approach, and continual improvement. The standards provide guidance

and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved. ISO 9001:2008 is implemented by over one million companies and organizations in over 170 countries.

NSF ISO 9001 Logo

AWC Provides Enhanced Support During Peak Aviation Travel Period

The AWC National Aviation Meteorologists (NAMs) at the Federal Aviation Administration (FAA) Air Traffic Control System Command Center (ATCSCC) provided enhanced decision support to the FAA during the holiday peak travel periods around Thanksgiving and Christmas.

New decision support briefing tools were developed to provide an overview of potentially high-impact aviation weather in the National Airspace System (NAS). A graphical "stop-light" chart, similar to what was issued last holiday season, was emailed daily to senior FAA officials. This forecast for 16 major air terminals (including the popular vacation cities of San Juan, PR and St. Thomas, USVI) were included. The purpose was to keep the FAA ATCSCC National Operations Managers (NOMs), Management, and the FAA Director's staff up-to-date on the potential for aviation impacts at major hubs during the peak holiday travel period.

Additionally, the NAMs produced a Day 2-4 NAS-wide graphical aviation impact outlook giving an overview of potential aviation hazards such as thunderstorms, strong winds, wintery precipitation and low ceilings and visibility. This enabled the FAA to strategically plan for any operational adjustments needed to handle the aviation weather hazards and ensure public safety.

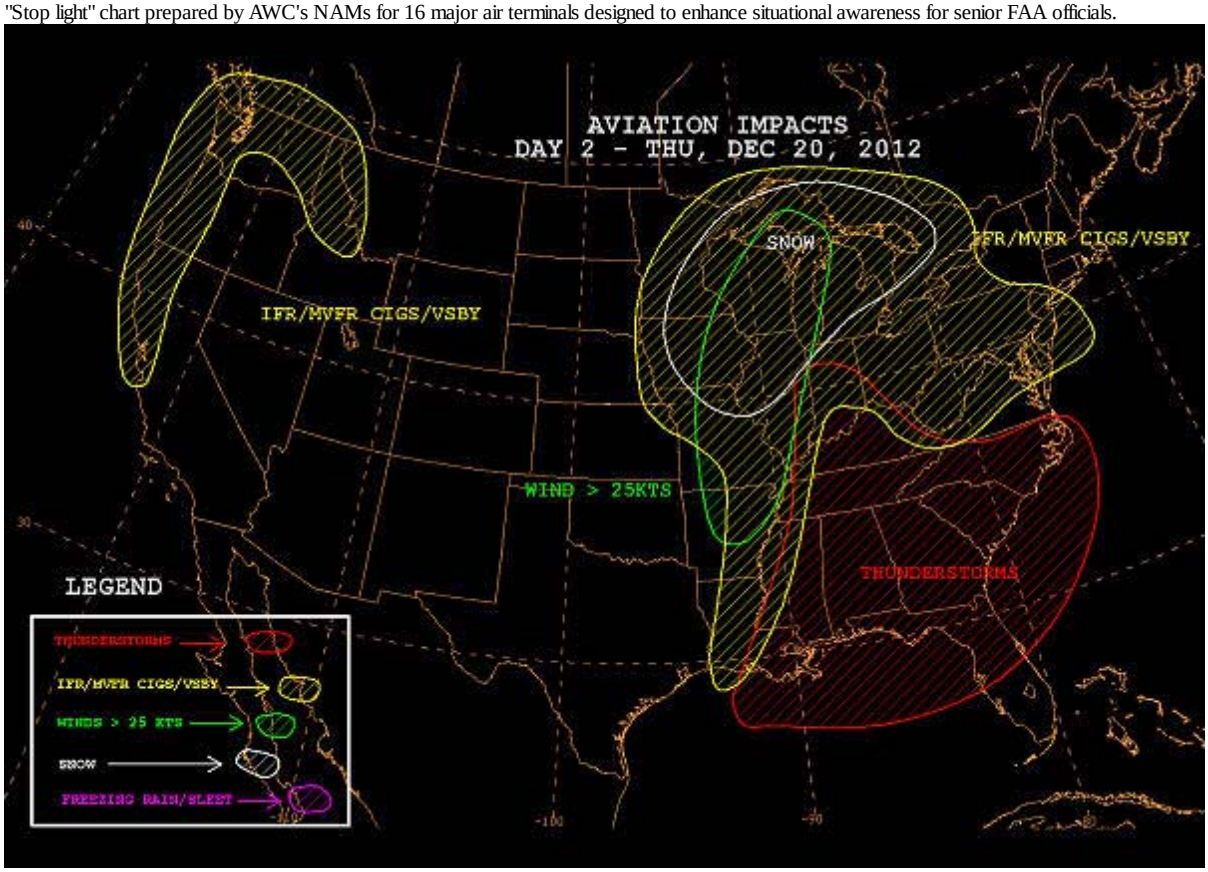
In full support of the National Weather Service (NWS) Weather-Ready Nation initiative, these products were coordinated using the full suite of NWS data from the National Centers for Environmental Prediction, Central Weather Service Units and Weather Forecast Offices, and received high praise from FAA Senior staff for providing life-saving decision support services.

	ISSUED 1200Z 12/18/12 NEXT UPDATE 1600Z 12/20/12		PLEASE SEE LATEST TAF FOR SPECIFIC TERMINAL DETAIL AND UPDATES						
STATION	12/19 WED	12/20 THU	12/21 FRI	12/22 SAT	12/23 SUN	12/24 MON	12/25 TUE	12/26 WED	STATION
BOS	MVFR CIGS/VSBY/RA		IFR/MVFR CIGS/VSBY/RA	MVFR CIGS/SNW 10-20KTS	MVFR 10-20KTS	MVFR 10-20KTS			BOS
NYC/EWR/LGA	MVFR 10-20KTS		MVFR 15-25KTS	MVFR CIGS/SNW 10-20KTS	MVFR 10-20KTS	MVFR 10-20KTS			NYC/EWR/LGA
PHL	MVFR 10-20KTS	MVFR CIGS/RA/-SHSN	MVFR 15-25KTS	MVFR 10-20KTS	MVFR 10-20KTS				PHL
DCA/BWI/IAD	MVFR 10-20KTS	MVFR CIGS/RA/-SHSN	MVFR 10-20KTS	MVFR 10-20KTS					DCA/BWI/IAD
CLT		MVFR CIGS/SHRA/TS	MVFR 10-20KTS						CLT
ATL		MVFR CIGS/SHRA/TS	MVFR 10-20KTS					SHRA	ATL
MIA/FLL			MVFR 10-20KTS						MIA/FLL
IAH	MVFR CIGS/SHRA/TS	MVFR 15-25KTS				SHRA/TS	SHRA/TS		IAH
DFW	MVFR CIGS/SHRA 10-20KTS	MVFR 15-25KTS					SHRA		DFW
ORD	MVFR CIGS	IFR/CIGS/VSBY/RA/FZRA/SN						SN	ORD
MSP	MVFR CIGS	MVFR 10-20KTS							MSP
DEN	IFR CIGS/VSBY/SN						SN	SN	DEN
SEA	MVFR CIGS/RA/-SN	MVFR CIGS/RA	MVFR CIGS/RA	MVFR CIGS/RA	MVFR CIGS/RA	MVFR CIGS/RA			SEA
SFO		MVFR CIGS/RA	MVFR CIGS/RA	MVFR CIGS/CHC RA	MVFR CIGS/RA		MVFR CIGS	MVFR CIGS	SFO
SJU	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	SJU
HNL	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	CHC SHRA	HNL

SEE LATEST TAFS FOR SPECIFIC TERMINAL DETAILS & UPDATES — NEXT UPDATE: THURSDAY MORNING

HAZARD KEY				
Hazard	Green	Yellow	Red	Magenta
Wind Speed (kt)	>11	11 to 23	>23	
Wind Gusts (kt)	<18	18 to 30	>30	
Visibility (SM)	>5	3.01 to 5	1.01 to 3	<1
Ceiling (ft)	>3000	1000 to 3000	500 to 1000	<500
Weather	No WX	Light precip	Mod precip	Heavy Precip
FLT Category	VFR	MVFR	IFR	LIFR/V LIFR

"Stop light" chart prepared by AWC's NAMs for 16 major air terminals designed to enhance situational awareness for senior FAA officials.



Aviation Impacts chart showing weather that would affect National Air Space for days 2-4 allows for FAA strategic operational adjustments.

New CPC Week-2 Web Display

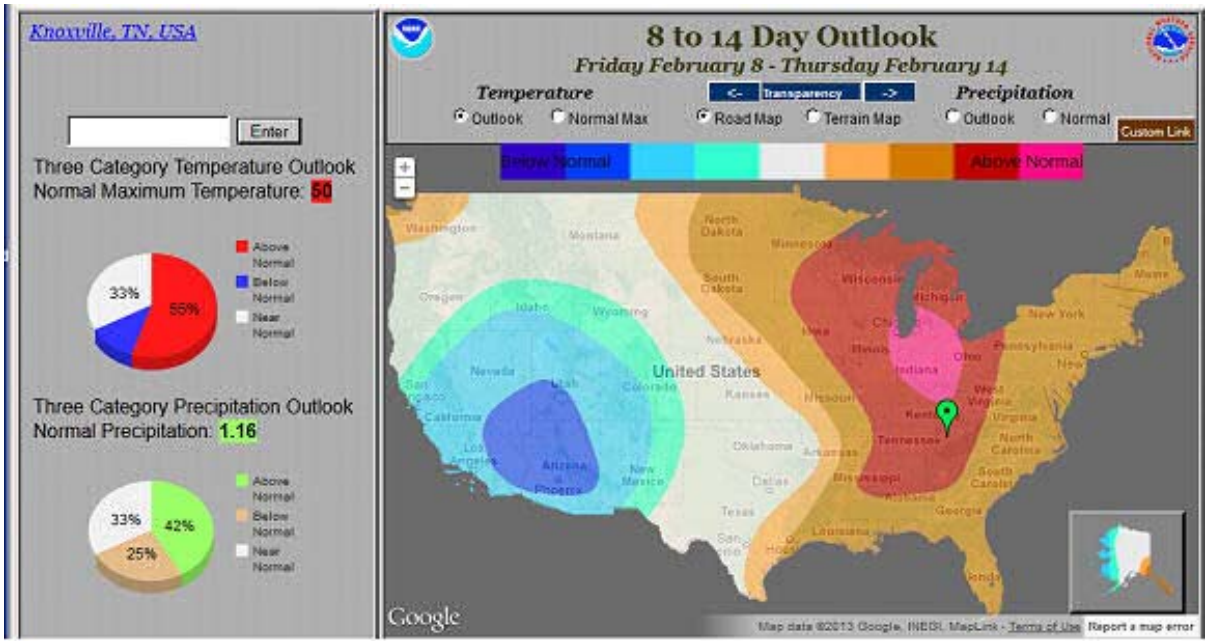
The Climate Prediction Center (CPC) partnered with the Pendleton, Oregon Weather Forecast Office (WFO) to implement an interactive web tool on the CPC web page that allows users to see and understand the full spectrum of CPC's extended range forecasts. The tool was developed at the Pendleton, Oregon WFO and transitioned into operations at CPC. A simple point and click "mouse over" interface allows the user to quickly see and understand that there are probabilities for 3 forecast categories (above-, near-, and below average temperature or precipitation) associated with each point on the map. The interface also provides additional information to the user, such as climate normals, as briefly described below.

The tool consists of a large panel on the right, and a smaller text panel on the left. The large panel shows a color-shaded map of the operational probability forecast. Buttons above the panel allow toggling between the "Outlook" and the "Normal Max", for temperature, and "Outlook" and "Normal Total", for precipitation. One can also toggle between "Road Map" and "Terrain Map" backgrounds for the forecast. The visibility of these features can be controlled by a "Transparency" option.

Moving the screen cursor over the forecast map causes a small window to appear, giving text which lists 1) the latitude and longitude, 2) the probability of near-, below- and above-normal, and 3) the normal maximum temperature, or the normal precipitation, for the region where the cursor is located.

A panel to the left of the map shows pie charts of the 3 forecast categories for both temperature and precipitation for a location specified by the user by either 1) left-clicking the mouse for a desired location on the map, or 2) by typing the name of a geographical location.

The web tool is located here: http://www.cpc.ncep.noaa.gov/products/people/sbaxter/pdt/814day/



Web Tool for displaying CPC's 8-14 Day Temperature and Precipitation Outlooks.

HPC Medium Range Enhancements

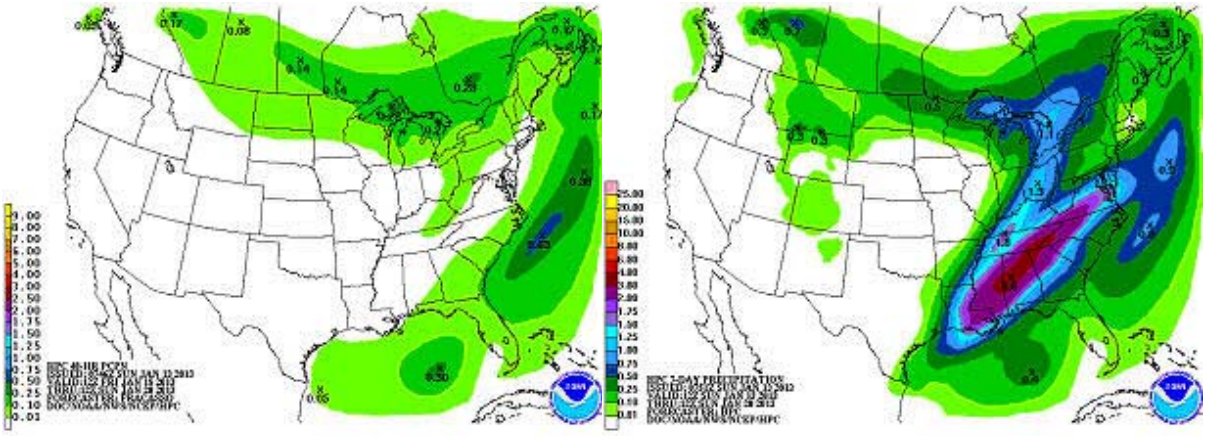
In an effort to better serve NWS offices and other HPC partners and customers, HPC has made several enhancements to its medium range (day three through seven timeframe) services.

For years, HPC has provided a daytime package of medium range information, including graphical forecasts and an associated high resolution set of sensible weather grids and discussions. Forecasters routinely synthesize information from over 100 different model solutions to highlight medium-range model differences, provide weather solution preferences, and highlight any significant weather expected to impact the conterminous United States (CONUS) during the medium range time frame.

To complement the daytime package, a nighttime issuance of medium range guidance was introduced on Dec 18, 2012. NWS offices and the public now have around-the-clock guidance from HPC with two complete packages of HPC medium range guidance (grids, graphics, and discussions) for the CONUS. This will allow HPC customers more flexibility in using these products which will never be more than 12 hours old.

Additionally, for the past couple of cool seasons, HPC has produced day six and seven Quantitative Precipitations Forecasts (QPFs) for the Western U.S field offices. Central and Eastern Region field offices have also expressed interest in extending the time range of HPC QPFs. In response to these requests, on December 18, 2012, HPC began producing twice daily QPFs for days six and seven year-round for the entire contiguous U.S. (Fig. 1). These products will result in a complete set of sensible weather parameters available to HPC partners and customers out to seven days.

These medium range service enhancements were made possible by new tools developed by HPC development staff. The new tools have streamlined the forecast process. Insights and suggestions from medium range forecasters also identified crucial ways to modify the workflow to match user requirements.



Example of the new experimental Day 6/7. Days 1-7 total precipitation forecasts.

HPC Sandy Activities

As part of the life-saving work of the National Weather Service (NWS) during Sandy, the Hydrometeorological Prediction Center (HPC) participated in a range of unique activities to ensure that customers and the public were adequately prepared for the hazards posed by Sandy, as it traveled up the U.S. East Coast from the Caribbean, finally making landfall in SE New Jersey, from October 22-29, 2012.

During the early stages of Sandy, HPC's Medium Range forecasters used ensemble model forecasts to alert the U.S. East Coast of a potentially hazardous storm more than a week in advance. In addition, the HPC International Desks alerted several Caribbean nations of potential impacts.

As Sandy approached the U.S. coast, HPC coordinated closely with NOAA partners, including other NCEP centers and the local forecast offices. HPC also provided daily briefings to NOAA and NWS leadership, granted interviews to national media partners, and hosted government officials (Figure 1) who had a keen interest in Sandy. Throughout the lifetime of the storm, HPC quickly adapted its homepage to highlight whatever was requested to maintain a common message for NWS, especially regarding the public advisory, the latest rainfall forecasts, and the flooding potential forecasts from the Middle Atlantic River Forecast Center.

Immediately after Sandy made landfall, HPC began issuing the public forecasts for the remaining hazards, including strong inland winds and heavy rainfall over a very large portion of the Northeast U.S. This was the first time HPC assumed responsibility from NHC for a system this strong. One of the primary hazards that was included in the forecast (and is not often associated with storms of tropical origin) was heavy snowfall in the

Appalachians!

Sandy will undoubtedly leave a lasting impression on many residents in the Northeast U.S., and HPC aims to translate any lessons-learned from Sandy into improved life- and property-saving services during future hazardous weather events.

Figure 1: (left to right, foreground) U.S. Senator (MD) Barbara Mikulski, NOAA Administrator Jane Lubchenco, and HPC Director Jim Hoke discuss the forecast track of Sandy with HPC forecaster Sean Ryan (seated). Photo courtesy Ed Danaher (HPC).

NHC Media Outreach for Sandy

Five days in advance, the NHC forecast track of Hurricane Sandy was forecast to aim at the Northeast U.S. So for the second time in 2012, the NHC media pool was opened to get the message out regarding an approaching hurricane. More than 25 live on-camera television interviews were provided to national and local outlets during the event, along with more than 150 phone interviews to radio and print outlets.

Live top-of-the-hour updates were made available on the Internet and as an audio-podcast. NHC continued to make use of social media, with a tweet sent at the issuance of every new advisory. NHC's Facebook page was updated 65 times during Hurricane Sandy, gaining more than 18,000 new "likes" and surpassing the 200,000 mark on its page. Its audience reach during Sandy was 1.9 million views.

NHC Hurricane Specialist Todd Kimberlain provides a Spanish-language interview regarding Hurricane Sandy.

NHC Visiting Scientist Program

During the peak of the 2012 hurricane season, the National Hurricane Center hosted its annual Visiting Scientist Program. Once again, it was a big success.

The participating scientists included three university professors, a graduate student, one government laboratory researcher, two National Weather Service Forecast Office meteorologists, three National Weather Service national center meteorologists/oceanographers, and a private sector meteorologist.

Each had the opportunity to be at NHC during actual tropical storm and hurricane events, spending up to three days with the hurricane specialists and one day with the marine forecasters in NHC's Tropical Analysis and Forecast Branch. By shadowing these forecasters, each learned the analysis and prediction methodologies, technologies employed, observations and models used, time constraints, and ways that forecasts are communicated.

Dave Nolan, Ph.D. (left), of the University of Miami, shadows John Pavone of NHC's CARCAH unit, discussing data being received from Hurricane Hunter aircraft.

NHC Hosts NOAA Hurricane Meeting

The NOAA Hurricane Meeting took place at the National Hurricane Center (NHC) at the end of the 2012 hurricane season. This annual gathering by NOAA conducts a review of operations and considers options to enhance its products and services.

This meeting made two proposals to the National Weather Service (NWS) that, if adopted, would result in some changes to NWS products and warnings. The first proposal originates from the unique situation posed by Hurricane Sandy; it would give NHC the option to continue issuing formal advisories on post-tropical cyclones as long as those systems pose a significant threat to life and property, and it would give the NWS the option to keep hurricane and tropical storm watches and warnings in place for those systems.

The second proposal would set a target date of 2015 for NOAA to implement explicit Storm Surge Watches and Warnings, a goal NOAA has been working toward for several years. The NWS Office of Climate, Weather, and Water Services (OCWWS) will review these two proposals in conjunction with a Hurricane Sandy service assessment. The NWS looks forward to continued engagement with its partners and users about these proposals.

National Hurricane Center Storm Surge Team Leader (seated at right) discusses the storm surge risk with NWS WFOs during a coordination conference call as Sandy approaches the Northeast U.S. coastline.

OPC Ecological Forecasting Workshop

The first NOAA Ecological Forecasting (EF) Roadmap Meeting was held at the NOAA Center for Weather and Climate Prediction (NCWCP) 22-23 Oct. 2012. Approximately 90 NOAA employees participated in the meeting on site and remotely. Ming Ji (OPC) and Capt. Barry Choy (OD) were members of the organizing group for the meeting and hosted the meeting at the NCWCP. The meeting was focused on beginning implementation of the Roadmap, with participation from subject matter experts on three initial focus area: 1) Harmful algal blooms (HAB); 2) Hypoxia; and 3) Pathogens. In addition, there was a cross-cutting theme focused on infrastructures (observing, physical modeling, computing, and service delivery) to enable integrated NOAA ecological forecast services.

The primary meeting objective was to agree to a short-term NOAA Ecological Forecasting Services action plan to bring mature ecological research into operations in order to produce a suite of NOAA ecosystem forecast services. During the conference, four technical teams (HABs, Hypoxia, Pathogens and Infrastructure) held breakout meetings, and identified initial challenges and next steps in embracing the vision of a coordinated NOAA ecological forecasting services capability. The meeting was a first step in minimizing stove-piped activities to embrace the new paradigm of "build once, use many times," a vision delivered during the opening plenary of the Ecological Forecasting Meeting.

This meeting had three primary outcomes:

- Guidance on Roadmap direction has been received by NOAA leadership from all Line Offices. Input on technical teams was provided by subject matter experts in all Line Offices.
- Four technical teams (HAB, Hypoxia, Pathogens, and Infrastructure) were established as part of the Roadmap governance structure, and leadership of the teams has been confirmed.
- Initial action plans are being developed for each technical team, outlining current status, challenges, gaps, and next steps. These are being combined into a Roadmap action plan, currently in a very early draft.

The Ocean Prediction Center's role is to enable ecological forecast services. The idea is to use NWS expertise

and infrastructure to help with ecological product production and dissemination. OPC does not have biological expertise, but is experienced with the 24 hour/7 day a week demands required for operational product monitoring and generation. One example of using NWS resources to enable NOAA ecological forecasts is the Chesapeake Bay seas nettle project (Figure 1).

The website for this product is located here: http://www.opc.ncep.noaa.gov/Loops/SeaNettles/prob/SeaNettles.shtml

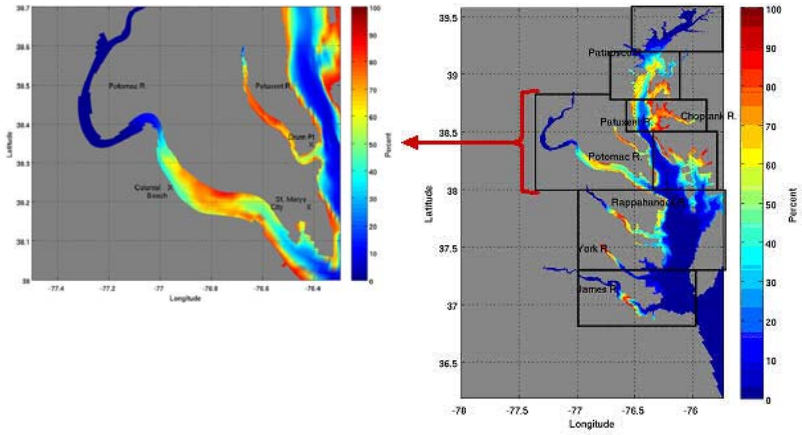
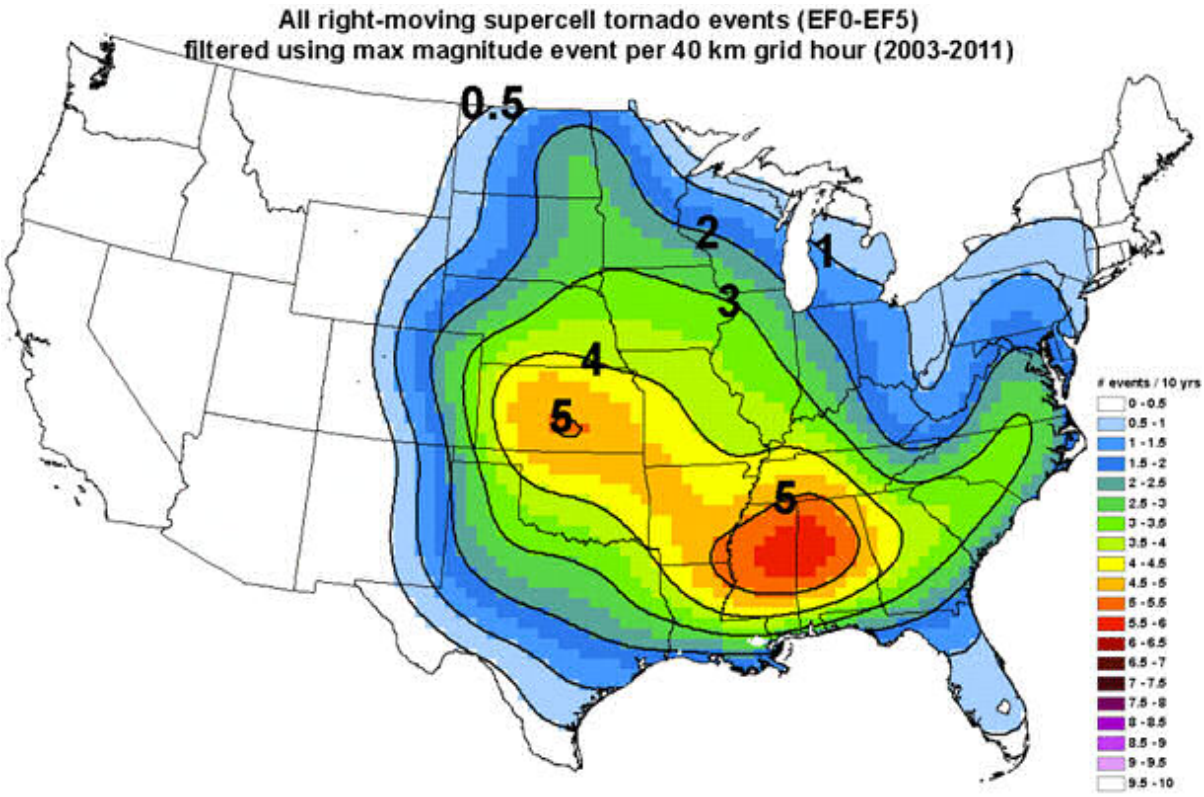


Figure 1. Probability (%) of Encountering Sea Nettles (Chrysaora quinquecirrha) in the Chesapeake Bay based on the Chesapeake Bay Operational Forecast System (CBOFS) valid July 1, 2012 at 00 UTC. Each box can be animated through the 48 hour forecast to zoom in on a smaller area.

SPC Tornado Environment Webpage

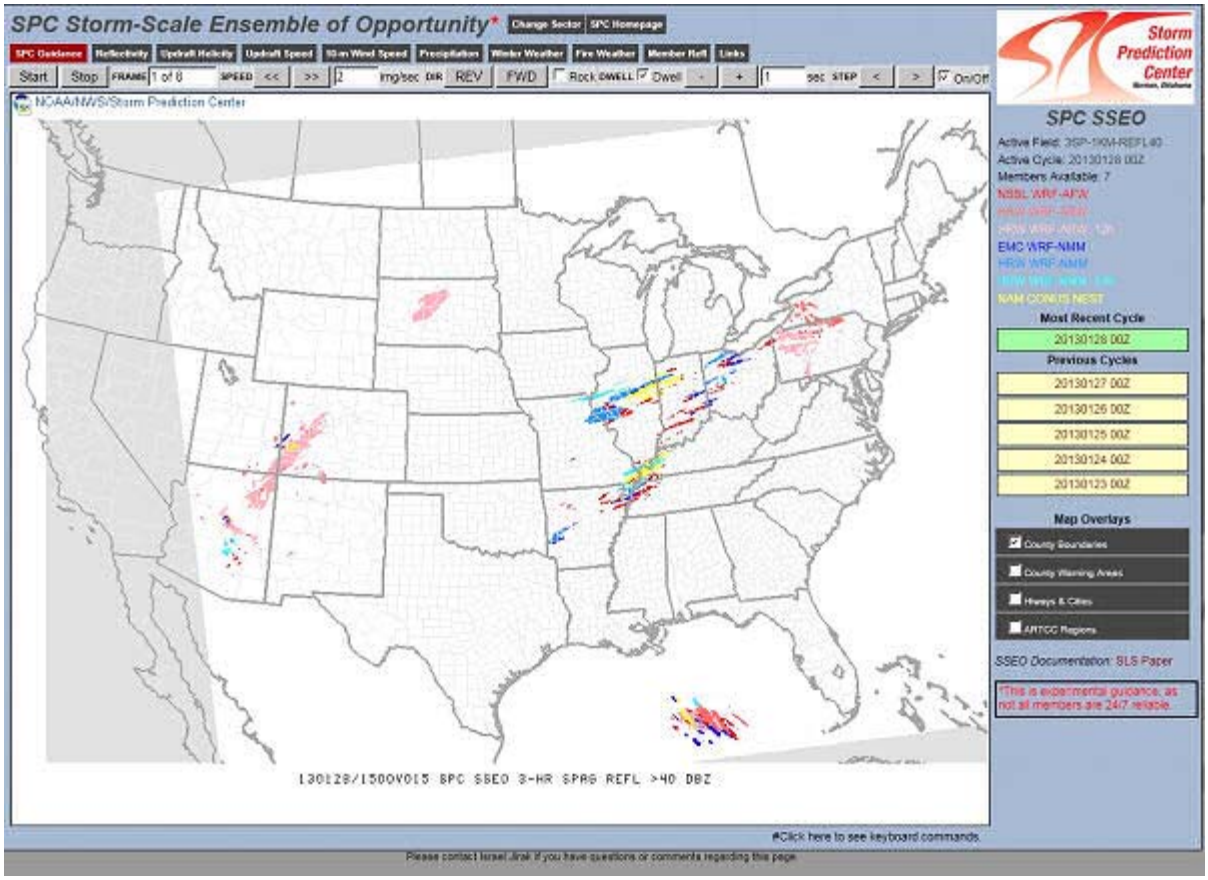
A tornado environment dynamic webpage browser for the contiguous United States is now available. A tornado environment--convective mode sample spanning the 2003-2011 period displays statistical information of supercell-related convective parameters accompanied by smoothed tornadic convective mode climatology images. Through a collaborative effort between Storm Prediction Center (SPC) forecasters, SPC techniques development meteorologists, a National Severe Storms Laboratory scientist, and a graduate student with the University of Oklahoma, this specific work is an example of a Research-to-Operations (R2O) web-based tool. This tool has multiple applications that can serve to enhance severe storm training material, provide a climatological reference to forecasters in a real-time situational awareness warning situation (via decision support), and, in a post-mortem setting, act as an outreach mechanism to the severe storms community.



Geographical distribution of supercell tornado events from 2003-2011 displayed as count per decade.

SPC Stormscale Ensemble of Opportunity

The Storm Prediction Center (SPC) has developed the Storm-Scale Ensemble of Opportunity (SSEO) in which deterministic convection-allowing models are processed as an ensemble in an effort to efficiently summarize the increasing volume of high-resolution data. While a formal storm-scale ensemble may not be possible within NCEP for several years, this approach provides a practical alternative using data already available to SPC. The SSEO includes storm-attribute hourly maximum fields for severe convective weather forecasting, as well as a small number of other fields for fire- and winter-weather forecasting. Several SSEO graphics have been made available on a newly developed SPC web site (http://www.spc.noaa.gov/exper/sseo). Currently, seven models contribute to supplying this experimental guidance. They are listed on the aforementioned web site.



SPC Storm-Scale Ensemble of Opportunity web site.

SWPC Visits Korean Space Weather Center

On October 11-15, 2012, Bill Murtagh, Terry Onsager, Bob Rutledge and George Millward from the Space Weather Prediction Center (SWPC) attended an international conference and held side meetings at the Korea Space Weather Center (KSWC) on Jeju Island, South Korea. KSWC is a key member of the international real-time solar wind data network, providing tracking coverage for the Advanced Composition Explorer, and SWPC and KSWC have had multiple personnel exchanges in recent years. KSWC is a new member of the International Space Environment Service and a participant on the WMO Inter-Programme Coordination Team on Space Weather. The conference was attended by representatives from Australia, Japan, and numerous agencies within Korea.

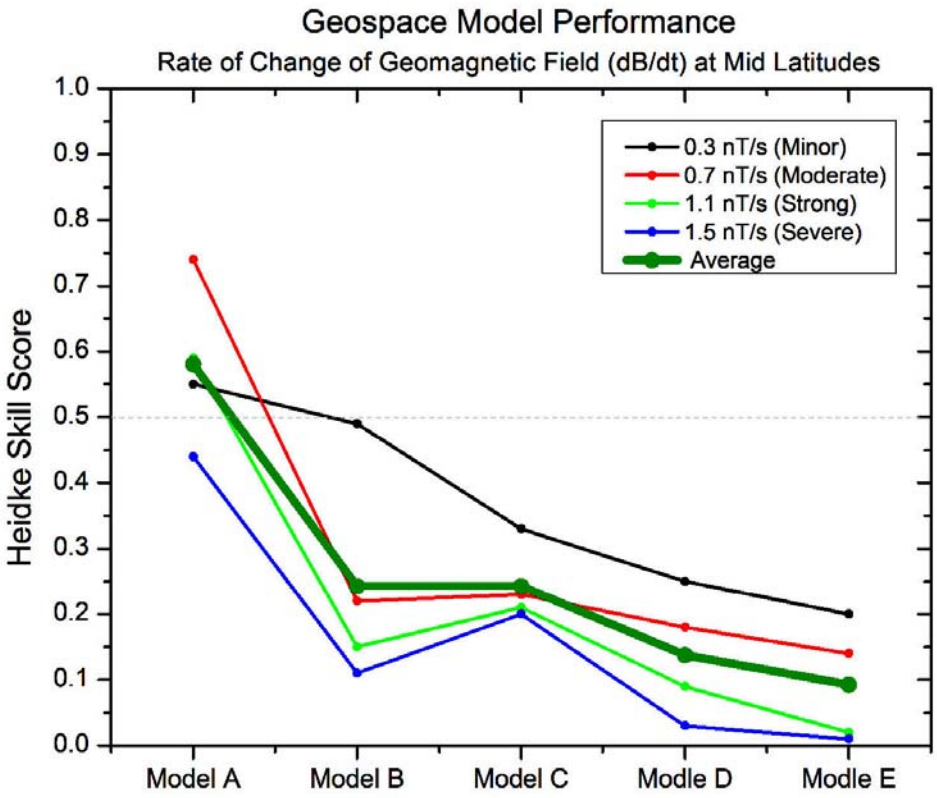
During the visit, substantial progress was made by installing the operational NOAA model for solar wind disturbances (Enlil) on KSWC's computer systems, providing training on the use of the model for geomagnetic storm prediction, and identifying specific actions to integrate our space weather efforts. In addition, Terry Onsager received an Appreciation Award from the Director General of the National Radio Research Agency in recognition of our efforts to strengthen the collaborative ties between our organizations.

The Korean Space Weather Center (right) and ACE satellite tracking antenna (left), both seen through a volcanic rock wall and nestled among the cabbage fields of Jeju Island, S. Korea.

SWPC NASA Geospace Model Assessment

On 1 December 2012, the NASA Community Coordinated Modeling Center (CCMC) delivered to NOAA its first report on the Geospace Model Evaluation. With participation and guidance from NOAA, NSF, and the research community, NASA CCMC tested five magnetosphere or geospace models to provide quantitative comparisons of these models for a specific set of metrics and events. This model assessment was motivated by requests from the electric power industry for regional products instead of the global indices of geomagnetic activity that the Space Weather Prediction Center (SWPC) currently provides. It is well known and documented that a single index, such as the planetary Kp index, does not adequately capture the local impacts of a geomagnetic storm. A Kp value of seven (on a scale of 1 - 9) can produce dramatic impacts in the north-east US for one storm, or minimal impacts for another. Regional information is critical to the power industry in responding to geomagnetic storms.

One of the metrics of the geospace model performance was the ability to forecast the time-rate-of-change in magnetic field (dB/dt) at mid-latitudes. This quantity is directly related to the amount of current induced on electric power lines. The figure shows the Heidke Skill Score for the five models for four different levels of dB/dt. It is clear that Model-A outperforms the other four models for all levels of dB/dt. A second report evaluating each model's ability to forecast regional information is expected in mid-2013. The two reports will provide the Space Weather Prediction Center with the information it needs to decide which geospace model, if any, meets its requirements and the requirements of the customers thereby justifying the resources needed to transition a model into operations.



The Heidke Skill Score for five geospace models forecasting the fluctuations in the geomagnetic field at mid latitudes. Any score above zero is better than chance. One is a perfect score.

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