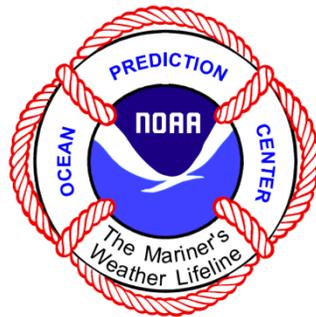


Ocean Prediction Center

2011 Annual Accomplishments



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1. Introduction

The Ocean Prediction Center (OPC) had ambitious plans for 2011, most notably to work towards the implementation of a new suite of ocean forecasting and coastal service products. As the Pacific was mired by epic natural disasters, the OPC was poised to do its part on behalf of the United States, and was integral in the National Oceanic and Atmospheric Administration's (NOAA) extended helping hand internationally to the west. Meanwhile, significant relationships on the North American continent became the strongest in years, thanks in part to the OPC's leadership and participation in myriad programs, both old and new. New ties have been forged with the OPC's sister offices, the National Hurricane Center (NHC), and the Honolulu Weather Forecast Office (HFO), as well as with our Arctic partners in the Alaska Region (AR) of the National Weather Service (NWS).

The OPC continued its outreach program with gusto in 2011, and took a special interest in re-kindling existing relationships within the NWS in geographically disparate regions. Pamphlets, handouts, and posters distributed to both coasts allowed the OPC to reach more users than in previous years. The office was more completely represented at regional and local maritime outreach events, and the plunge into social media has only strengthened the ability for the Maryland-based office to reach people around the world.

New development personnel hired in 2011 served as a catalyst in the development branch of the OPC, which has put the office many steps closer to the implementation of a gridded product generation infrastructure in the large ocean domains OPC administers. An experimental version is expected to begin in 2012.

2. Major Accomplishments

Tōhoku Tsunami Response Support

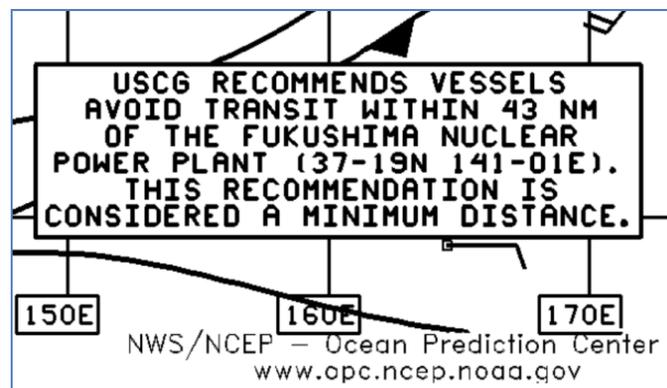
On 11 March 2011, a megathrust earthquake occurred off the coast of Japan, setting into motion a remarkable tsunami that devastated the Japanese coast. The tsunami spawned by the 9.0 earthquake caused considerable damage to the Fukushima-Daiichi nuclear power plant in Sendai, Japan.

Immediately following the earthquake and tsunami, the OPC initiated coordination with the U.S. Coast Guard (USCG), National Geospatial Intelligence Agency (NGIA) and the U.S. Maritime Administration regarding the establishment of methods aimed to keep mariners informed of the situation. In absence of an official U.S. government advisory during the first three days following the earthquake, OPC placed a navigation restriction advisory from the Government of Japan on OPC's regular radiofax charts for Pacific high seas and disseminated it to mariners. The Government of Japan's advisory established a restricted area of 50 km from the crippled nuclear power plant. OPC subsequently replaced the Japanese advisory with a special U.S. Maritime Administration navigational advisory when it became available, which established a

larger restricted area of 80 km from the Fukushima-Daiichi nuclear power plant. The U.S. Government advisory was transmitted via OPC's high frequency radiofax charts to ships heading to the U.S. from the western Pacific Ocean where the USCG broadcast via the Global Maritime Distress Safety System (GMDSS) cannot reach under the international system. Ships traveled within the areas of 80km radius of the Fukushima plant would be subjected to additional inspection for contamination upon arrival of the U.S. shore.

OPC also provided weather analysis and forecasts for the Western Pacific Ocean area (including Japanese waters) twice daily to support daily briefings by NOAA leadership that supported high level interagency response efforts. In response to the unfolding disaster, the U.S. Navy Oceanographic Office (NAVO) quickly configured a nested, high resolution regional and local ocean model system for the surrounding ocean area of the troubled nuclear power plant to facilitate the tracking of radioactive materials leaked into the ocean. OPC immediately set up a method, according to a prior arrangement with the Navy, to disseminate the specialized real-time Navy model data to NOAA, Defense Threat Response Agency, USCG, and the research community for tracking the leaked radioactive materials in the ocean. The product also was of great assistance to NOAA's National Ocean Service Marine Debris Program, which tracks the large masses that were washed into the sea when the water receded, such as derelict ships, homes, and other hazards to navigation and the ocean ecosystem.

In addition, OPC's Ocean Forecast Branch Chief, Mr. Anthony Siebers, was called upon by NOAA leadership to co-lead the NOAA Tsunami Coordination Team along with Commander Scott Sirois of the NOAA Commissioned Corps, operating from NOAA Headquarters at the Department of Commerce in Washington DC. Mr. Siebers and CDR Sirois coordinated with NOAA line offices and NOAA leadership to prepare reports twice daily, seven days a week for 59 consecutive days. The reports summarized conditions near the Fukushima Nuclear Power Plant and NOAA activities for the tsunami response. The reports provided the essential information for NOAA leadership to brief White House staff, and assisted in coordination with the U.S. government-wide response efforts through the interagency response coordination team.



OPC notification box that was placed on the Pacific surface analysis chart.

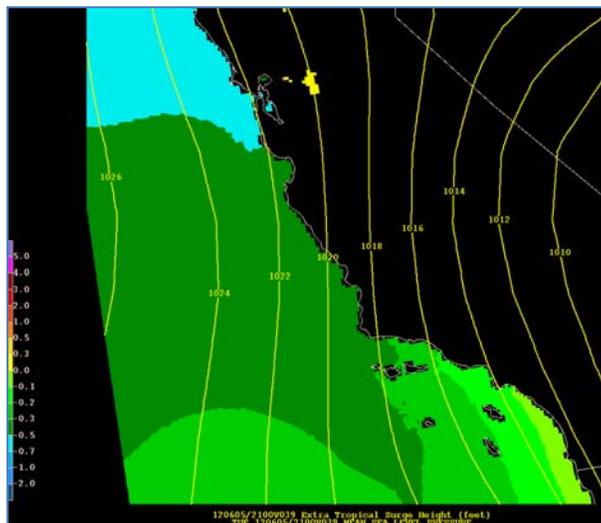
Digital Services, Advanced Weather Interactive Processing System (AWIPS) 2

Significant progress was made in 2011 on the planned implementation of a new suite of digital products. Some of the most significant accomplishments on this project include the migration of code used in AWIPS 1 to the NWS new product viewing and generation software, AWIPS 2. The AWIPS 2 project, although heavily focused on improving issues at the local weather forecast office level, is also integral to the national centers. The OPC had to work hard to ensure that the challenges associated with adapting these new improvements to its operations would be supported properly, as well as complimentary to the gridded products suite currently in development. As a precursory step for this implementation, significant preparatory work was conducted for “shadow shifts” where OPC’s forecasters could learn how to conduct operations within the new computing framework. The shifts are planned for 2012.

Significant Products and Services Enhancements

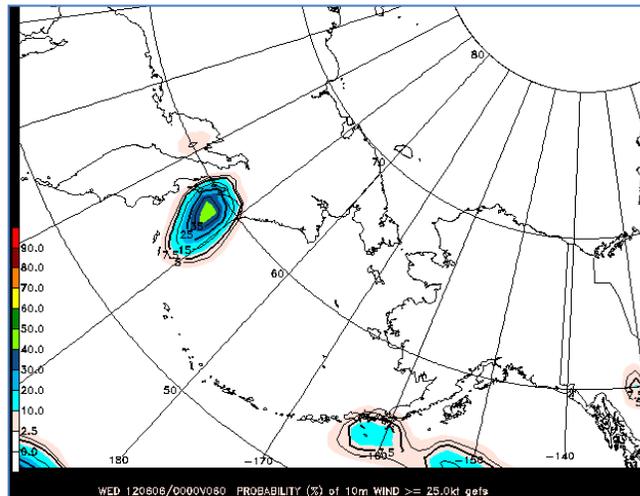
The OPC adopted a new format in which to provide charts and other graphical products in 2011: Geographic Information Systems (GIS). Sophisticated users can now view myriad forecasts in a layered format in GIS programs such as Google Earth using the .kml file format. Other NOAA and NWS offices issue products in this format. When combined with them, users can view OPC products overlaid with observational and other scientific data in a fully customizable interface.

The NWS Meteorological Development Laboratory (MDL) partnered with the OPC to outline requirements and implement an expanded domain for their extratropical storm surge model (ETSS) along the Pacific Coast. The previous domain did not provide any guidance for California’s coastline South of Point Conception. The new domain, which extends south to the Mexican border, will provide OPC and local Weather Forecast Office (WFO) forecasters valuable storm surge guidance information for the coast along the major metropolitan areas of Los Angeles and San Diego should they be threatened in the future.



ET-Surge model for new Southern California domain

Pioneered in 2010 on the OPC's joint Alaska Region Arctic weather support page, probabilistic wind warning graphics from ensemble computer models proved very useful as a planning tool. Due to the overwhelming success and positive feedback from public vessels in the Arctic, the OPC has implemented the same probabilistic wind warning graphic for the North Atlantic and North Pacific basins as well, available on OPC's website. The graphics can be set to different wind thresholds, such as gale and storm force, and can give mariners another tool to use as a risk-assessment resource when planning operations or transits.



GEFS wind probability in a US-Arctic domain

Continuing its partnership with the USN's Oceanographic Office, the OPC began acting as the public dissemination point for the global Real Time Ocean Forecast System (RTOFS), run from the United States Navy (USN) Global HYbrid Coordinate Ocean Model (HYCOM). The output, which is accessible from the OPC's website, is a sophisticated ocean model that provides ocean current and sea surface temperature forecasts.

Since NASA's Quick Scatterometer (QuikSCAT) ceased operating in November of 2009, the OPC's Mr. Joseph Sienkiewicz, along with his colleagues in NOAA's National Environmental Satellite and Data Information Service (NESDIS) have been seeking out other data opportunities to mitigate the loss of that instrument's data. Through negotiations with the government of India, NOAA and subsequently OPC have been granted access to data from the Oceansat-2 Scatterometer (OSCAT) instrument, which is another type of scatterometer. The data from OSCAT is being used operationally at the OPC to estimate wind speeds over the open ocean, which helps determine positions of pressure systems and fronts, and in the assessment of storm strength for warning issuance and forecast verification.

3. Contribution to NOAA, National and International Programs

Ocean Surface Vector Winds Science Team

Mr. Sienkiewicz attended the International Ocean Vector Winds Science Team meeting in Annapolis, Maryland in May. Participants were from around the U.S., as well as Europe. At the meeting, the team discussed the future of U.S. scatterometry, and the developing partnerships with other nations, such as an opportunity with the Japanese. While those projects are worked, the U.S. will continue to collaborate with China and India on their ocean vector wind data sharing arrangements.

European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)/European Space Agency (ESA) Scatterometer Science Conference

Mr. Sienkiewicz attended the EUMETSAT conference in April, which was hosted in the Central Station facility in Darmstadt, Germany. Communities represented included those interested in ocean winds, land surface and soil moisture, and sea ice. Participants were from Europe, China, Japan, India, Canada, and the United States. Numerous presentations were made on the scientific uses of scatterometry data, and plans for future projects and collaborations. Of note, Mr. Sienkiewicz presented a technique that was developed at the National Centers for Environmental Prediction (NCEP) to determine wave generation potential by determining the wind component aligned with great circle rays. He demonstrated the technique for a significant wave inundation event in New Guinea in Dec 2008 by comparing both QuikSCAT and GFS wind components, and also showed results using Advanced Scatterometer (ASCAT), OSCAT, Global Forecast System (GFS), and European Center for Medium-Range Weather Forecasts (ECMWF) wind fields to assess the wave threat to the west coast of Europe for two extreme ocean storms of February 2011. This method can be used to assess the accuracy of numerical weather prediction (NWP) wind fields and assess a potential threat by comparing remotely sensed winds to model fields.

Ecological Forecasting Workshop

Several OPC senior staff participated in a NOAA sponsored Ecological Forecasting Workshop in Annapolis, Maryland. The group looked at the development of future ecological forecasts, and recommended dissolved oxygen (DO) as the parameter to focus on because it is the underpinning for many other ecological forecasts. A subsequent NWS-National Ocean Service (NOS) meeting reviewed the ecological forecasting workshop findings and recent model implementations, developed priorities for ecological forecasts, and discussed other areas where collaborations between NWS and NOS will lead to better services for the public.

NWS Marine Synergy Team

The Synergy Team, which is a medium for the three high seas forecast issuing partner marine offices (OPC, NHC, Honolulu WFO), is composed of management and NWSEO representation

from each office along with Mr. Bill Hopkins, the National Weather Service Employees Organization (NWSEO) Executive Vice President. In 2011, Honolulu was added to the group, and the initial meeting with them present was held there. In attendance at the inaugural meeting were: OPC Forecast Branch Chief Mr. Tony Siebers and lead forecaster Mr. Scott Prorise, NHC Tropical Analysis & Forecast Branch (TAFB) Chief Mr. Hugh Cobb, NHC lead forecaster Mr. Martin Nelson, Mr. Bob Ballard and Mr. Pete Donaldson from the HFO, and Mr. Bill Hopkins from NWSEO. A number of topics were discussed, including the drafting of an operations strategy plan regarding the transition to AWIPS 2, back-up capabilities, and implementation of gridded forecasts for the offshore and high seas areas. The synergy team is scheduled to meet again in mid-2012.

GOES-R Proving Ground

The OPC, jointly with the HPC and the NESDIS Satellite Analysis Branch (SAB), hired a contract meteorologist, Mr. Michael Folmer in 2011. Mr. Folmer's tasks include bringing in GOES-R simulated data sets and products for evaluation, facilitating or conducting the evaluations, and engaging and educating the OPC, HPC, and SAB on the operational utility of specific products. OPC identified four focus areas, offshore convection, rapid cyclogenesis, visibility, and oceanographic products. The GOES-R (Geostationary Operational Environmental Satellite – R Series) launch is scheduled for 2015.

4. Outreach

OPC's outreach program was very active in 2011 as representatives attended events nationwide in an effort to educate mariners and partners on OPC's products and services.

Facebook

On June 2, the OPC joined the world of social media by officially launching its Facebook page. The NWS is using Facebook as a supplemental channel to experimentally disseminate environmental information and promote weather awareness activities, including outreach and educational efforts. The OPC hopes to continue using Facebook for these purposes, as well as a polling place for feedback on potential service and product changes.

Visit us at: <http://www.facebook.com/OceanPredictionCenter>.

Connecticut Maritime Association Shipping Conference

Mr. Joe Sienkiewicz attended the Connecticut Maritime Association Shipping 2011 Conference in Stamford, CT. He, along with the New York Port Meteorological Officer, staffed a NOAA booth which focused on NOS charting, the NWS Volunteer Observing Ship Program (VOS) and OPC products and services. Conference attendees included shipping companies, USCG,

private weather routing service providers, maritime unions, maritime training schools, communication companies and experts, marine insurance and other support services to the shipping industry.

Safety at Sea Seminar

Mr. Sienkiewicz and lead forecaster Mr. Paul Vukits also attended the 32nd annual Safety At Sea Seminar hosted by the U.S. Naval Academy Sailing Squadron and Maryland Marine Trades Association in March. Paul and Joe presented four separate seminars as well as staffed an OPC booth and handed out literature about OPC's products and services. Some 350 sailors attended the two day seminar series. Many participants went out of their way to acknowledge the usefulness of OPC's products and stated that they were extremely appreciative of NOAA and NWS services.

Boat Shows

Throughout the year, OPC forecasters and management attended a number of other events during 2011, including the Atlantic City, Annapolis, and New York City Boat Shows.

5. Special Activities

Arctic Support

Continuing a project with the Alaska Region of the NWS, the OPC populated a special Arctic Ocean support page with charts, sea surface temperature (SST) and ocean current forecasts through the summer of 2011. Mainly in support of the NOAA vessels and U.S. Coast Guard Cutter *Healy*, which operate in the Arctic during the summer, the OPC is also forging ahead with its partners to continually populate the site with more Arctic data. In 2011, an agreement was made with Environment Canada regarding information sharing in the Beaufort and Chukchi Seas. The OPC provides its seasonal charts to the Canadians, and they provide further computer model guidance for the same region, including a blizzard potential. Be sure to check-out the site at: arctic.arh.noaa.gov.

Antarctic Support

From early January through March 2011, the OPC once again provided special weather support for the Antarctic Living Marine Research (AMLR) program field campaign. The field campaign was conducted by the Antarctic Research Division of NOAA National Marine Fisheries Service (NMFS) off of the Antarctic Peninsula aboard a chartered research vessel. OPC tailored products for the area of the field campaign. Throughout the three-month long special support, OPC forecasters also continued to gain experience forecasting for Southern Hemisphere employing their meteorological expertise. The AMLR program has been ongoing for 26 years.

International Collaboration

A joint NWS – Meteorological Services of Canada project evaluating the algorithms used to predict the freezing rate of sea spray kicked off in the summer of 2011. The work, spearheaded by OPC's summer intern from the USCG Academy, hinges on participation by operational forecasters from both sides of the border. The forecasters will use both the US and Canada operational algorithms, each populated by different computer models, in an operational environment. The catalogued strengths and weaknesses of both algorithms will allow for the development of a new North American freezing spray algorithm that will be used by both countries' meteorological services, and will open the door to future collaboration with other Arctic nations.

The freezing spray project is the first of many fruits that came from a week-long Pacific marine weather workshop at NOAA's Western Regional Center in Seattle, Wash. Members from NWS Western, Pacific, and Alaska Regions, NWS Headquarters, and Meteorological Services of Canada attended. OPC's LT Matt Glazewski, who was also an organizer, participated on behalf of the office. A number of potential collaborative projects were discussed at the workshop, many of which are going to be included into a bi-lateral agreement between the two agencies.



Participants in the first Pacific joint NWS-MSM workshop in April at NOAA's Western Regional Center in Seattle, WA

OPC's director, Dr. Ming Ji, continues to be heavily involved with the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), serving as the JCOMM Services and Forecast Systems Program Area (SFSPA) Coordinator. During 2011, he attended several meetings to plan for the 4th quadrennial intergovernmental session of the JCOMM (May 2012). The planning is primarily focused on identifying requirements and setting priorities for the next intercessional period (2012-2017) work plan. The meetings were:

- The 9th session of the JCOMM Management Committee (Sept. 2011, Geneva): The JCOMM leadership team to identify strategic direction and priorities for the 2012-2017 intercessional period and plan for the 4th session of the JCOMM;
- The 6th session of the JCOMM Service Coordination Group (Nov., 2011, Seoul): Development of the JCOMM Service and Forecast Systems Program area priority activities and intercessional work plan for approval at JCOMM-4;
- The 3rd session of the GODAE ocean view science team (Nov. 2011, Paris): Coordinate with the ocean prediction modeling R&D community on the development of operational ocean “plume” modeling capability for tracking oceanic discharge of radioactive hazards to support marine environmental pollution emergency response, for future events such as the Gulf of Mexico oil spill or the Fukushima nuclear accident.

6. Awards

NOAA Administrator’s Award

As part of a ten-person group award, OPC’s Lieutenant Matt Glazewski received the 2011 NOAA Administrator’s award, which was presented in October at NOAA Headquarters in Silver Spring, MD, by the NOAA Administrator Dr. Jane Lubchenco. The citation was “For the development of a clear, concise and compelling Arctic Vision and Strategy that aligns and articulates NOAA priorities in the fragile Arctic region.” LT Glazewski worked with counterparts throughout NOAA to ensure that the marine weather portion of the vision and strategy was written completely and was the best representation of the goals within the program.

Isaac Cline Awards

The following individuals were awarded the 2011 Isaac Cline Regional Award for Meteorology “for outstanding advancements in developing gridded marine weather services at two National Centers.” From the OPC: Frances Achorn, Christopher Juckins, David Mills, Robert Banks, James Clark, Hugh McRandal, Todd Shaw, Paul Vukits, Kevin Achorn, Frank Musonda, and David Kosier. From the NHC: Jeff Lewitsky, Eric Christensen, Jessica Schauer, Ariel Cohen, Chris Lauer and John Sullivan.

The following individuals were awarded the local Isaac Cline Award “for providing the immediate Ocean Prediction Center support to the U.S. government in the aftermath of the Japanese earthquake and tsunami: Paul Vukits, Robert Oszajca, and Frances Achorn. They were recognized for providing an immediate initial response to the NOAA leadership request for OPC to support the U.S. Government efforts to respond to the aftermath of the Japan Earthquake and Tsunami in March 2011.

7. Staff

OPC Staff

A number of staff changes occurred at the OPC during 2011. Most notably, Mr. Anthony Siebers was hired as OPC's new Ocean Forecast Branch Chief, a position previously held by Mr. David Feit, who retired from Federal service at the end of September 2010.

OPC and HPC said goodbye to our secretary, Ms. DeVerah Petersen, who accepted a contract position in NCEP Central Operations.

OPC and HPC also welcomed back to Ms. Crystal Rickett, Administrative Officer. Ms. Rickett departed the OPC and HPC in 2010 to take a position with the Climate Prediction Center of NCEP, but has since returned to her previous position.

The OAB bade farewell to its meteorologist trainee, Mr. Richard Lam, who accepted a position at the Juneau, AK WFO in August.

The OAB also welcomed Mr. Christopher Juckins, who joined the Ocean Applications Branch in January. Mr. Juckins brings a powerful skill set from the Hurricane Center, where he previously worked in the development branch.

In May, the OPC, in partnership with our neighbor offices, the Hydrometeorological Prediction Center (HPC) and the NESDIS Satellite Analysis Branch (SAB), welcomed Dr. Michael Folmer aboard as a contract meteorologist. Dr. Folmer is working exclusively on the GOES-R satellite proving ground, and his task is to bring in GOES-R simulated data sets and products for evaluation, facilitate or conduct the evaluations, and engage and educate all of us on the operational utility of specific products. OPC identified four focus areas: offshore convection, rapid cyclogenesis, visibility, and oceanographic products.

Summer Internship

Cadet 1st Class Christa Funk joined the OPC as a summer intern from the U.S. Coast Guard Academy, where she is a marine environmental science major. 1/C Funk began the work on a cross-border project with Environment Canada focused on evaluating the freezing spray algorithms used operationally by both the NWS and the Meteorological Services of Canada. 1/C Funk was a critical link throughout the fall semester at the academy, where she continued to work on the project as part of an independent studies class.



USCG Cadet 1st Class Christa Funk speaks with USCG Commandant Admiral Robert Papp

Additionally, Mr. Benjamin Albright, who interned at the OPC in 2010 and is a graduate student at Howard University, continues to work on research projects with OPC's Mr. Joseph Sienkiewicz.

OPC Staff as of 31 December 2011

Administration

Director: Dr. Ming Ji

Deputy Director: Kevin McCarthy

Secretary: Vacant

Administrative Officer: Crystal Rickett

Ocean Forecast Branch

Chief: Anthony Siebers

Senior Marine Forecasters: Robert Oszajca, Scott Prorise, James Clark, Douglas Scovil, Paul Vukits, Edward Schoenberg (part time)

Marine Forecasters: Kevin Achorn, George Bancroft, Robert Banks, Kathy Bell, Timothy Collins, Timothy Holley, James Kells, David Kosier, Paul Lee, Hugh McRandal, David Mills, Frank Musonda, James Nolt, Michael Rowland, Todd Shaw

Ocean Applications Branch

Chief: Joseph Sienkiewicz

Technical Operations Coordination Meteorologist: LT Matt Glazewski, NOAA Corps

Meteorologist Developer: Frances Achorn

Meteorologist Developer: Christopher Juckins

Meteorologist Trainee: Vacant