

Ocean Prediction Center 2005 Accomplishments

1. Introduction

An important achievement this year was the integration of sea-level pressure objectively obtained from scatterometer winds into Ocean Prediction Center (OPC) operations. The operational use of this program has had a very positive impact on the Unified Surface Analysis in that we can more accurately place major weather systems, thereby providing users with a better picture of the surface features over the oceans.

This was also a banner year for outreach. The OPC devoted over 56 staff-days to this important Center function. Several thousand mariners were informed first hand of OPC products and operations and on how to use the products most effectively to ensure safety at sea. OPC continues towards its goal of being widely used by the marine public. This is evidenced by the fact that OPC website saw a rapid rise in use during 2005. The site achieved a 155% increase in hits from 2004.

Two OPC staff members received important awards this year. Dave Feit, Chief of OPC's Ocean Forecast Branch, and Curt Janota, OPC Development Meteorologist, received the NOAA Administrator's Award as part of a team that developed the NWS Unified Surface Analysis. Curt was also awarded the national-level NWS Isaac Cline Award for providing exceptional information technology support to OPC.

2. Major Accomplishments

New Forecast Chart

On March 29, the Ocean Prediction Center added a new chart to its already large suite of graphic products. The chart is a 24-h, 500-mb height forecast graphic covering the Pacific Ocean north of about 20 deg N. With the production of this chart both the Atlantic and Pacific Oceans have a complete set of graphical products extending from 24 to 96 h. The suite of OPC charts includes sea state forecasts, surface feature forecasts, and upper air forecasts. The new chart is available on the OPC web page.

Personal Digital Assistant Access to OPC Web Site

On April 29, OPC implemented a capability enabling the downloading of OPC text products using Personal Digital Assistants (PDAs) and cell phones from the OPC web site. A description of the capability and how to use it are provided on the OPC web page. The following products are available for mobile downloading:

- Atlantic and Pacific Marine Weather Discussions
- Atlantic and Pacific Offshore Forecasts
- Atlantic and Pacific NAVTEX Forecasts
- Atlantic and Pacific High Seas Forecasts/

Other products are planned including graphics.

Sea Level Pressure Derived from Scatterometer Winds

On June 14 OPC began the operational use of the University of Washington Planetary Boundary Layer (UW PBL) Model. The advancement was the result of a collaborative effort between Joan Von Ahn (contract research meteorologist for the Office of Research and Applications of NOAA's National Environmental Satellite, Data, and Information Service (NESDIS)), Joe Sienkiewicz (OPC's Science and Operations Officer), and Dr. Jerome Patoux of the University of Washington. The UW PBL Model uses high-resolution QuikSCAT winds as input to derive a sea-level pressure gradient through the inverse retrieval process. The sea-level pressure field is then determined by combining the gradient real-time observations from ships and drifting and fixed buoys. This method produces pressure gradients that are consistent with the QuikSCAT-derived wind field. A study by Von Ahn presented at the AMS Weather Analysis and Forecasting Conference showed that the retrieved pressures for significant ocean cyclones tend to be deeper than either numerical model analyses and forecasts and OPC-generated manual surface analyses. This effort is a significant step towards enhancing the OPC surface analyses.

3. Emergency Response

On January 26, the ship *M/V Explorer*, a 591-foot cruise ship enroute from Vancouver, British Columbia, to Japan and carrying 990 people, was disabled in the north Pacific (about 650 nm south of Adak, AK) after a large wave broke bridge windows damaging bridge controls. The ship lost all power for some time but was able to restore partial power to give steerage into the waves to keep from extreme rolling. Initial weather support was provided by the National Weather Service's Weather Forecast Office (WFO) in Anchorage. Subsequently, the OPC was asked to take over and worked with the USCG District 11, Alameda, CA. The OPC provided detailed weather forecasts for the incident area directly to the Coast Guard and provided them with additional weather information through the OPC web site. OPC forecasts had a hurricane force warning for winds of 50 to 65 kt and seas of 22 to 37 ft in effect at the time of the incident. Subsequently, *M/V Explorer* was able to get underway, rerouting to Hawaii for repairs. The ship arrived in Honolulu on January 31 without further incident.

4. Conference Participation

OPC staff attended a number of important conferences, both national and international, sponsored by such organizations as the American Meteorological Society (AMS) and the World Meteorological Organization (WMO), among others.

National

OPC Director Jim Hoke attended the 85th Annual Meeting of the AMS, which was held January 9-13, in San Diego, California. In addition to presenting the paper "Is There a Role for a National Center in Operational, Coastal Atmospheric and Ocean Prediction?" in the

Symposium on Living in the Coastal Zone, he also served as the chair of the session “Measuring the Challenges of Living in the Coastal Zone”. During the week-long meeting Hoke joined colleagues in staffing the National Oceanic Atmospheric Administration (NOAA) Booth, which was in the showcase location of the Exhibit Hall. Among other activities he visited the San Diego Supercomputer Center in La Jolla with John Ward and Brent Gordon of National Centers for Environmental Prediction (NCEP) Central Operations (NCO) to get a first-hand sense for the supercomputing architecture and capabilities of the not-too-distant future

Joe Sienkiewicz was one of seven NOAA employees to attend the AMS Summer Science Policy Colloquium at the Washington Courtyard Hotel in downtown Washington, DC, June 6-14. Participants of the colloquium were atmospheric and ocean scientists from national laboratories, academia, and the public and private sectors.

Sienkiewicz and Joan Von Ahn represented the OPC at the joint AMS Conferences on Weather Analysis and Forecasting and Numerical Weather Prediction. Sienkiewicz in a talk entitled “Hurricane Force Extratropical Cyclones” summarized the results from the OPC four-year effort to study the characteristics of extratropical cyclones using QuikSCAT winds. The goals of this work are to understand and improve forecasts for extreme cyclones.

Joe attended the OCEANS 2005 Conference in Washington, DC, September 20 – 24. Joe participated in a session on remote sensing and gave a talk entitled “The Application of QuikSCAT Winds in the OPC”.

International

Joe Sienkiewicz was invited by the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) and Meteo France to attend the 2nd Ocean Sea Ice Satellite Applications Facility (OSI-SAF) Workshop, March 14-17. The workshop was held in the Brittany coastal town of Perros-Guirec, France. EUMETSAT is preparing to launch a series of scatterometers to help determine ocean vector winds over the world’s oceans. The first of these operational instruments is scheduled to be launched in April 2006. Sienkiewicz spoke about NOAA/NWS experiences in operational forecasting with QuikSCAT winds.

Dave Feit participated in the Joint International Ocean Commission / World Meteorological Organization Commission for Oceanography and Marine Meteorology (JCOMM) conference as a member of the U.S. delegation. The meeting was held in Halifax, NS, from September 19-27 and was attended by delegations from 41 countries. The commission addressed issues relating to both oceanography and marine meteorology. A number of important decisions were adopted relating to requirements for collecting ocean data and transmitting them in a timely fashion. JCOMM also established an expert team to address issues related to both marine pollution events and support to sea-air rescue missions. It made a point of emphasizing that the provision of marine meteorological information in graphical form remains a priority activity.

5. Training at Government Facilities

U.S. Naval Academy

Lee Chesneau, OPC Marine Forecaster, conducted a 2-hour presentation at the United States Naval Academy (USNA) February 10 to Naval Officers and staff. He discussed maritime safety and OPC's warning-related products and services.

Joe Sienkiewicz and Lee Chesneau participated in the annual Safety at Sea Seminar hosted by the USNA Sailing Squadron, Annapolis, MD, April 2-3. The two-day seminar was held at the USNA. The seminar was attended by approximately 1100 people on Saturday (300 civilian sailors and 800 Naval Academy midshipmen) and 200 sailors on Sunday. Both talks were enthusiastically received. In addition, Sienkiewicz and Chesneau staffed an OPC display booth where they spoke to many sailors about OPC forecast products, communications issues, meteorology, and oceanography.

Maritime Academies

On April 13, Joe Sienkiewicz and Jim Hoke were guest lecturers at the United States Merchant Marine Academy (USMMA) in Kings Point, NY, and the State University of New York (SUNY) Maritime College, Bronx, NY. Joe and Jim spoke to three classes of freshmen at the USMMA (approximately 80 cadets) and one class of sophomores (76 cadets) at SUNY Maritime. They introduced cadets to the OPC mission and product suite and discussed the importance of weather at sea through a variety of images and video clips.

National Weather Service

Joe Sienkiewicz visited the NWS Weather Forecast Office in Gray, ME, on November 2. He gave an overview of OPC operations and discussed some of the efforts to transfer research to operations being conducted by OPC. His talk concerned the common forecast challenges faced by both OPC and WFO Gray in the Gulf of Maine.

On June 30, Dave Feit, represented the OPC at a marine users meeting in Charleston, SC. The WFO Charleston hosted the meeting. Participants included leaders of South Carolina recreational boating and fishing organizations, as well as representatives from NWS Headquarters, Eastern Region Headquarters, WFO Wilmington, NC, WFO Charleston, SC, and the National Data Buoy Center. Dave made a presentation on OPC's products and services.

Lee Chesneau represented the OPC at the first Marine Users Committee meeting, sponsored by the WFO Sterling, Virginia, on December 2. Lee discussed the offshore and high seas text forecast and warning products from OPC as well as how to access the many OPC graphic products both while at sea and when ashore.

6. Other Outreach

OPC is dedicated to ensuring that mariners have a full understanding of and are able to interpret our products and services. In this regard, OPC routinely, when resources are available, conducts outreach at diverse venues ranging from boat shows to boating

organizations to other professional organizations.

Boat Shows

Lee Chesneau gave four presentations in the Seattle Boat Show seminar program at Seattle, WA, on January 14 – 17. OPC warning products and services were discussed. Mr. Chesneau also represented the OPC while assisting the Seattle WFO in staffing its booth.

Jim Hoke teamed up with the staffs of the Mt. Holly and Upton WFOs at the Atlantic City Powerboat Show, which ran from February 2-6. The annual boat show, one of the biggest in the country, brought hundreds of people by the NOAA booth during the event. Especially noteworthy were the number of comments by customers regarding the high-quality of NWS weather forecasts and the indispensable nature of NOAA Weather Radio and the NOAA website in providing the latest forecasts.

Lee Chesneau represented the OPC at Strictly Sail Expo held at the Pennsylvania Convention Center, January 20-23. The event promoters provided a booth for the OPC. Two forecasters from WFO Mount Holy, NJ, also participated in handing out material and answering questions from attendees. Lee also gave three presentations to some 500 mariners who braved a major east coast snowstorm to attend. He discussed OPC's safety warning analyses products and forecast services over the three days of presentations.

Seminars and Workshops for Sailing and Boating Organizations

Lee Chesneau conducted a 2-day marine weather workshop for the Single Aboard Yacht Club of Annapolis, MD, held in the OPC facilities January 29 and 30. There were 15 mariners in attendance for the weekend event. In addition to detailed exposure of OPC safety warning analyses and forecasts, the attendees were given a tour of OPC operations.

On March 5 in Annapolis, MD, Paul Vukits, OPC Senior Marine Forecaster, provided marine weather safety information at the annual Singles on Sailboats, Inc., "Spring Training". A total of 300 attendees from across the nation participated in four 90-minute sessions of nine classes taught simultaneously.

On March 12-13, Lee Chesneau participated in a weekend offshore cruising seminar sponsored by West Marine and conducted by Mahina Expeditions, in Seattle, WA. There were 85 recreational offshore sailors in attendance. He discussed OPC's warnings, analyses, and forecast products and services along with an explanation on how to retrieve them through the National Weather Service FTP-mail system.

Hugh McRandal, OPC Marine Forecaster, attended a workshop organized by the New Jersey Marine Sciences Consortium and the New Jersey Sea Grant Extension Program in Egg Harbor Township, NJ, on March 16. The workshop, which attracted about 45 owners of charter and party boats, dealt with the business, equipment, safety, and fisheries management that concern small charter and party boat operators. Great interest was shown in OPC's products and services.

Lee Chesneau gave a presentation on OPC warning and forecast products to 65

mariners attending Mahina Expeditions weekend seminar March 19-20 in San Francisco, CA. He provided handout material on the OPC web site as well.

October and November were particularly busy months for OPC outreach. Lee gave an overview presentation on the OPC to 100 attendees at the Trawlerfest in Solomon's, MD, on October 1. He made a similar presentation on October 7 at a Cruising World Magazine sponsored seminar, in Annapolis, MD, attended by 400 Annapolis Boat Show patrons. On the morning of October 8, Lee presented the OPC overview to 200 attendees at the Krogen Cruisers Rally in Solomon's, MD, and later that afternoon to 250 Seven Seas Cruising Association (SSCA) members at their Port Annapolis, MD, meeting. On October 10 and 11, he conducted a 2-day marine weather workshop to offshore cruisers also in Port Annapolis and sponsored by SSCA. On October 15, he gave an OPC presentation to 100 attendees at the Trawlerport seminar series in Annapolis, MD. Lee represented the OPC at the SSCA meeting in Melbourne, FL, November 11– 13. In addition to his 90-minute seminar attended by over 600 offshore recreational mariners, OPC was given booth space during the 3-day meeting for answering questions from the show's attendees. Also present was Dennis Decker, Warning Coordination Meteorologist of the WFO Melbourne. Chesneau assisted in staffing the booth and provided a tour of the Melbourne WFO to interested meeting attendees. He also conducted a two-day marine workshop for the SSCA in Vero Beach, FL, on November 15 and 16. There were 25 recreational mariners in attendance. Lee participated in the annual Pacific Marine Expo in Seattle, WA, on November 17 –19, attended by many fishermen. He gave a 90-minute presentation on OPC products and services. The booth was jointly staffed with WFO meteorologists from Seattle, Anchorage, and Juneau. There were several thousand mariners in attendance at the show.

Professional Mariner Organizations

Lee Chesneau represented the OPC at the Basic Meteorology seminar of the Pacific Maritime Institute (PMI) in Seattle WA, an affiliate of the Maritime Institute of Technology and Graduate Studies (MITAGS) in Baltimore, MD, on February 28 - March 5. There were 16 mariners in attendance. NOAA Corps mariners based on ships out of Norfolk, VA, and the local Seattle area were participants.

On October 22, in Annapolis, MD, he conducted a day-long seminar to the Chesapeake Captains Sailing Association of Alexandria, VA. There were 40 licensed skippers in attendance at the seminar. Lee discussed OPC warning products and services. He joined forces with James Robinson of the Sterling, VA, WFO, who discussed local forecast issues of the Chesapeake Bay.

Chesneau conducted two Advanced Marine Meteorology seminars at MITAGS in Linthicum Heights, MD. The seminars were held October 17 - 21 and October 31 - November 4. There were 15 professional mariners in attendance for each session. OPC warning products and services were extensively covered along with their use as safety decision making tools.

He also conducted a day-long seminar for Senior Chief Mates and Master Mariners for Maersk Lines, Limited, in Portsmouth VA, on November 1 and 2 at their Safety Boot Camp.

Academic Organizations

Joe Sienkiewicz was an invited speaker at the NOAA Ocean Service / University of New Hampshire Joint Hydrographic Center on November 3. He lectured on marine weather and OPC products to ocean engineering students taking seamanship. Approximately 15 students participated in the class.

7. Special Activities

Joe Sienkiewicz and Joan Von Ahn attended the Satellite Measurements of Ocean Vector Winds Workshop held at Florida International University, Miami, FL, from February 8-10. The workshop was co-hosted by the NOAA Cooperative Institute for Oceanographic Studies at Oregon State University and the Tropical Prediction Center (TPC). Those participating included scientists from the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL), academic institutions, the European research and operational oceanographic and meteorological communities, and operational NOAA forecast centers such as the OPC, TPC, and local forecast offices. The purpose of the meeting was to bring together operational users and researchers of ocean vector winds to define present capabilities and to discuss future needs. Joe gave an overview of the operational use of QuikSCAT winds at the OPC.

Joe Sienkiewicz and Joan Von Ahn met with members of the University of Washington Planetary Boundary Layer (UW PBL) Group and Mark Bourassa of the Florida State University on March 21 to discuss plans to run the UW PBL Model at the OPC. The UW PBL Model is used in near real time to retrieve sea-level pressure from QuikSCAT scatterometer winds through the inversion process. The retrieved pressure fields are then used as guidance by OPC forecasters producing the oceanic portion of the NWS Unified Surface Analysis. This provides forecasters with a dynamically consistent pressure analysis for significantly improving OPC-generated ocean analyses.

Sienkiewicz and Von Ahn attended an Ocean Vector Winds Science Team (OVWST) Meeting in Seattle, WA, on March 22-24. Approximately 75 scientists from North America, Europe, and Asia interested in ocean vector wind retrievals and applications were in attendance. Von Ahn discussed the impacts of QuikSCAT winds on OPC operations and gave several examples of changes made by OPC forecasters to surface analyses and wind warnings. Sienkiewicz spoke about QuikSCAT winds across sea surface temperature (SST) gradients of the Gulf Stream.

George Bancroft, OPC Marine Forecaster, assisted the National Marine Fisheries Service in gathering expendable bathythermograph (XBT) observations along with seawater and plankton samples aboard *M/V Oleander*. The trip took place March 11-17 beginning at Port Elizabeth, NJ, with a round trip to Bermuda. The voyage provided an opportunity for Bancroft to observe how the crew uses OPC products, take and record observations, note any feedback, and to experience the effects of weather on ship operations and life at sea.

On April 14 staff from the NCEP Marine Modeling and Applications Branch and the OPC Ocean Applications Branch met with members from the USCG Search and Rescue (SAR) community. The USCG is upgrading the software used in SAR planning and is interested in making NWS products available to USCG units to minimize search areas.

At the invitation of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Integrated Program Office and the Cooperative Program for Operational Meteorology, Education, and Training (COMET), Joe Sienkiewicz attended the NPOESS Satellite User Training-Planning Workshop on May 23-25 at the COMET facilities in Boulder, CO. Sienkiewicz described the successful use of QuikSCAT within the OPC as an example of how to make a new data set available to the operational environment.

On November 3, Joe Sienkiewicz met with members of the new NOAA – University of New Hampshire Joint Center on Ocean Observing Technology. This new joint center is initially focusing on running an atmospheric forecast model at the regional scale for the Gulf of Maine waters and adjoining land areas.

Joe Sienkiewicz and Bob Daniels (IMSG contract oceanographer) attended the Hybrid Coordinate Ocean Model (HYCOM) Consortium Meeting at the University of Miami Rosenstiel School of Marine and Atmospheric Sciences (RSMAS) on December 6-8 in Miami, FL. In attendance were ocean modelers and oceanographers from a variety of civilian government, military, university, and private groups interested in the improvement of ocean modeling on the global, ocean basin, and coastal scales. Daniels presented results from an evaluation of the HYCOM-based NCEP Real Time Ocean Forecast System – Atlantic (RTOFS-Atlantic). The RTOFS-Atlantic has become part of the operational suite of models at NCEP. The evaluation suggests that the model is quite stable over time but has difficulty accurately placing the Gulf Stream off of Cape Hatteras.

8. Media

There were an exceptional number of media contacts during the year. These included both television and print media.

On February 4, Joe Sienkiewicz was interviewed by Mish Michaels of WBZ-TV Boston concerning hurricane force ocean storms. The 2005 January Blizzard that impacted the Northeast qualified as a hurricane force storm with winds 64 knots and higher. The OPC through summer interns and contract staff has studied hurricane force cyclones for the past four winter seasons using winds from the QuikSCAT scatterometer. Sienkiewicz answered questions concerning where these storms occur, how they compare to hurricanes, and discussed the potential hazards they pose to mariners and coastal areas. The piece aired the week of February 7.

OPC was the focus for media inquiries as a result of the incident involving an extreme wave that damaged the cruise vessel *Norwegian Dawn* off the coast of South Carolina on April 16. During the week following the incident, Dave Feit fielded numerous requests for interviews from such news organizations as ABC World News Tonight, ABC Good Morning America, WNBC News, the Associated Press, the New York Times, the New York Sun, the New York Post, and The Post & Courier in Charleston, SC, among others. Feit described the role of the OPC in providing marine weather forecasts and warnings and gave some background regarding the state of forecasting such extreme wave conditions. In addition, he provided information to the National Transportation Safety Board and the USCG for their investigations.

On May 25, Dave Feit was interviewed and taped by WABC-TV News, New York, for a special segment about marine weather. Dave explained the forecast processes for both the marine atmosphere and ocean waves. He also fielded questions regarding the processes behind the formation of extreme or freak waves and talked about the future possibility of forecasting such events. The segment was aired on June 11 during the evening news.

The National Geographic produced a one-hour television piece concerning the 1991 Halloween Storm (named in a popular book and movie as the Perfect Storm). A portion of the documentary describes the meteorology associated with the storm. On August 18 a film crew visited the OPC. Joe Sienkiewicz was interviewed for the documentary, OPC map discussion was filmed, and background footage was taken in the OPC operations area. Sienkiewicz described what it was like to forecast the Halloween Storm. He also talked about the evolution of the storm and discussed how observing systems, forecasting tools including numerical guidance, and interactive workstations have changed ocean forecasting since 1991.

The August 2005 *Bulletin of the American Meteorological Society* (AMS) had a focus on global sea surface temperature and its use in weather forecasting. On the cover was a colored global sea surface temperature analysis with a mid Atlantic offshore weather forecast produced by the OPC ghosted over the continental areas. The forecast highlights intense conditions over the Gulf Stream.

From August 22 – 31, the OPC staff was heavily involved in NOAA's extensive forecast and outreach activities before and during the landfalls of Hurricane Katrina, first in southeastern Florida and then along the central Gulf Coast. The OPC issued numerous products warning of the impacts of the storm to interests in the U.S. and adjacent waters affected by the devastating storm.

The Conference Notebook section of the September issue of the *Bulletin of the AMS* contained a short article highlighting the work by OPC in investigating extratropical cyclones with hurricane force winds. The paper entitled "Hurricane Force Extratropical Cyclones" was given at the AMS 21st Conference on Weather Analysis and Forecasting in August in Washington, DC, by Joe Sienkiewicz. Co-authors are Joan Von Ahn and Greg McFadden (SAIC contractor).

To celebrate the 300th birthday of Benjamin Franklin, the Philadelphia Inquirer released a series of articles about the Gulf Stream on December 18-20. Franklin is credited with both discovering and naming the Gulf Stream. Joe Sienkiewicz was interviewed concerning the role of the Gulf Stream on ocean storm development. Fred Sanders and John Gyakum quote Sienkiewicz in the second article referencing the seminal works on meteorological bomb. He answered several questions from USA Today regarding the impact of the Gulf Stream on weather.

9. Special Visitors

The OPC hosted visits of professional mariners from the Maritime Institute of Technology and Graduate Studies (MITAGS) in Linthicum Heights, MD, on February 2, March 1, June 8, October 20, and November 2. The visits were connected with their training on heavy weather avoidance, part of which is provided by OPC. Attendees included masters and mates, as well

as staff from the Woods Hole Oceanographic Institute. They were given a tour of the OPC, where they saw first hand the importance of their ship observations in the forecast process.

Other special visitors during the year included SSCA Executive Board members Richard and Beth Blackford and Nancy and Berger Zapft on October 13 and Steve Bowden of SeaTech Systems and Jonathon Sebly of Xerso Marine Weather Systems. Selby made a presentation to OPC in which he described how he integrates and provides OPC products as a service to his customer base.

10. Awards

On May 13 Dave Feit and Curt Janota received the NOAA Administrator's Award as part of a team that developed the NWS Unified Surface Analysis. This product suite provides a seamless and consistent weather depiction that is of great use to commerce and transportation and is an aid to ensuring the safety of life at sea.

On June 16, Curt Janota was awarded the national-level NWS Isaac Cline Award for providing exceptional information technology support to OPC. This award is named after Isaac Cline, who played a key role in warning the residents of Galveston, TX, about an impending hurricane in 1900. His actions were instrumental in saving many lives.

11. OPC Staff as of December 31, 2005

Administration

James Hoke, Director
Kevin McCarthy, Deputy Director
Crystal Rickett, Administrative Officer
Jeanette Rolan, Secretary

Ocean Forecast Branch

David Feit, Branch Chief
Senior Marine Forecasters: Robert Oszajca, Scott Prorise, Edward Schoenberg,
Douglas Scovil, Paul Vukits
Marine Forecasters: Frances Achorn, Kevin Achorn, George Bancroft, Lee Chesneau,
Ross Van Til, James Clark, Joe Cope, Joseph Czarniecki, James Kells, David Kosier,
Hugh McRandal, David Mills, James Nolt, Michael Rowland, Todd Shaw

Ocean Applications Branch

Joseph Sienkiewicz, Acting Branch Chief/Science and Operations Officer
Curt Janota, Meteorologist Developer

Personnel Changes in 2005

None



Lead Marine Forecaster Paul Vukits preparing the afternoon Atlantic regional forecast package.



Marine Forecaster Lee Chesneau providing information on OPC products and services at the Seattle Boat Show, Seattle, WA, on January 15.



OPC Marine Forecaster Lee Chesneau, right, with Ted Buehner from WFO Seattle and Kimberly Vaughn from WFO Juneau staffing the NOAA booth at the Pacific Marine Expo, Seattle, WA, on November 17-19.