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http://www.vos.noaa.gov/mwl.shtml

Marine Dissemination
http://www.nws.noaa.gov/om/marine/home.htm

U.S. Coast Guard Navigation Center
http://www.navcen.uscg.gov/marcomms/

See these Web pages for further links.

From the Editor

Paula Rychtar

Paula here and I have the "conn".

Welcome to my first issue of the Mariners Weather Log. I have some great ideas for our magazine and I do encourage input from all of you. First, I would like to give a loud and enthusiastic welcome aboard to our new Port Meteorological Officer, David Jones. Dave will be the new PMO for the New Orleans/Gulf Coast area; you can read his bio on Page 8. Dave will begin his responsibilities in March.

In this issue, we need to say farewell to one of our dear friends and a strong advocate of the U.S. VOS program, Dr. Bill Burnett. Dr. Bill Burnett has been selected as the new Technical Director of Commander, Naval Meteorology and Oceanography Command (CNMOC). This is a tremendous and well-deserved accomplishment for Bill, and I know that we are all very proud of him and happy for him. Bill's departure is a loss to NDBC, VOS as well as the Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM). It will be very difficult to replace him. You can read his farewell story on page 8.

I hope you enjoy our featured cover story, *Observer-based Whale Shark Research in the Northern Gulf of Mexico*. This project holds a special place for me as I have volunteered to participate in this project, twice. The excitement of the pending sighting and swimming with one of these magnificent creatures is just incredible. Sad to say, both times, after the long drive to South Louisiana to muster for the very early morning boat trip, it was cancelled…due to what else…weather!

VOS is an international program as most of you know. With that, I would like to introduce you to Julie Fletcher, the Manager of Marine Observations for the Meteorological Service of New Zealand. Julie provided us with a great article giving notice to a project and the accomplishments for one of her finest ships, the MV VOLENDAM. I hope you enjoy her article and if this article sparks an interest in participating in the drifting buoy program, her contact and website for further information is included.

Congratulations to all of our VOS Annual Award Winners for 2011…as well as the 5 year and 10 year pennant recipients. The full list of award winners is included in this issue. BRAVO ZULU!

In conclusion, this edition will be the last in print. The cost of printing the MWL has become a costly event and one that I cannot justify with the budget constraints and concerns so looming throughout our agency. So after this issue, you will be sent a notification that a beautiful digital high resolution edition of the Mariners Weather Log is awaiting you. This digital format will give you all the opportunity to print at your own leisure, if you so desire. It also provides a platform for more lengthy articles that I have had to turn down due to printing cost limitations. You will find the digital form of the MWL located:
http://www.vos.noaa.gov/mwl.shtml

~ Paula

On the cover:
Whale Shark
Photo Courtesy of Andy Murch,
Elasmodiver Shark and Ray Picture Database —
http://elasmodiver.com
Big Fish Photography Expeditions —
http://bigfishphotographyexpeditions.com

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Observer-based whale shark research in the northern Gulf of Mexico

By Jennifer McKinney of the Center for Fisheries Research and Development, University of Southern Mississippi Gulf Coast Research Laboratory in Ocean Springs, MS

Whale shark research in the northern Gulf of Mexico has greatly expanded over the last decade, spearheaded in 2003 by the University of Southern Mississippi Gulf Coast Research Laboratory's (GCRL) Whale Shark Sighting Survey (WSSS). Researchers at GCRL have used a variety of media (website, forum postings, Facebook, and news) in a vast effort to inform the public of the survey and data collection needs. Past participants have included recreational fishers and divers, charter fishing and diving operators, and members of the offshore petroleum industry.

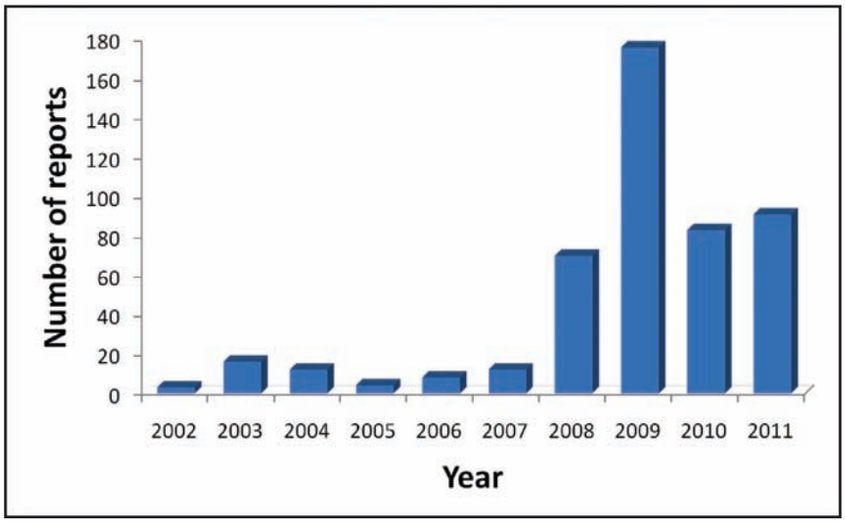

Figure 1. Annual reports submitted to the University of Southern Mississippi Gulf Coast Research Laboratory Whale Shark Sighting Survey (WSSS) from 2002 – 2011. Survey can be found online at www.usm.edu/gcrl/whaleshark.

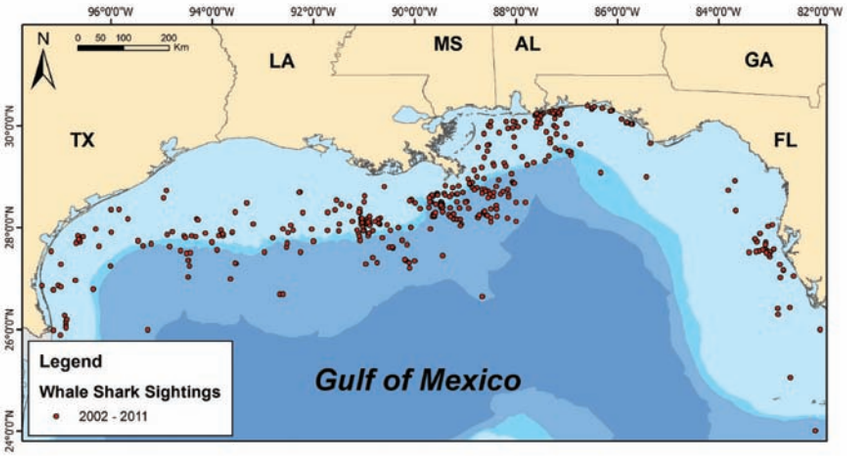

Figure 2. Distribution of whale shark sightings throughout the northern Gulf of Mexico from 2002 – 2011, submitted to the University of Southern Mississippi Gulf Coast Research Laboratory Whale Shark Sighting Survey (WSSS).

Whale sharks have been documented in the northern GOM since 1939 when Dr. Eugene Gudger reported on anecdotal information collected from commercial mariners who encountered these animals while they were en route between the Florida Strait and Texas port cities (Gudger, 1939). Since the 1930's, whale shark data has consisted primarily of isolated anecdotal reports or observations documented as an aside from field studies targeting other species such as marine mammals and sea turtles (Burks et. al. 2006) and seabirds (Hoffman et. al. 1981). After a chance encounter with whale sharks while on a research cruise, Jim Franks and Dr. Eric Hoffmayer initiated the GCRL WSSS in order to catalogue opportunistic sightings provided by anglers, mariners, divers and offshore industry personnel (Hoffmayer et al., 2005). Through the online survey, submitters provide information on their encounter, including date, time, location (preferably GPS coordinates), number of individuals, estimated length, observed behavior, associated species, and photographs. When underwater photographs of the left side of the shark are submitted (specifically the region behind the gills), they are entered into the Ecocean photo-identification global database which analyzes the spot pattern, much like a fingerprint, to determine if this shark has been previously sighted elsewhere in the world (www.whaleshark.org).

Between the years of 2002 – 2011, over 475 whale shark sightings have

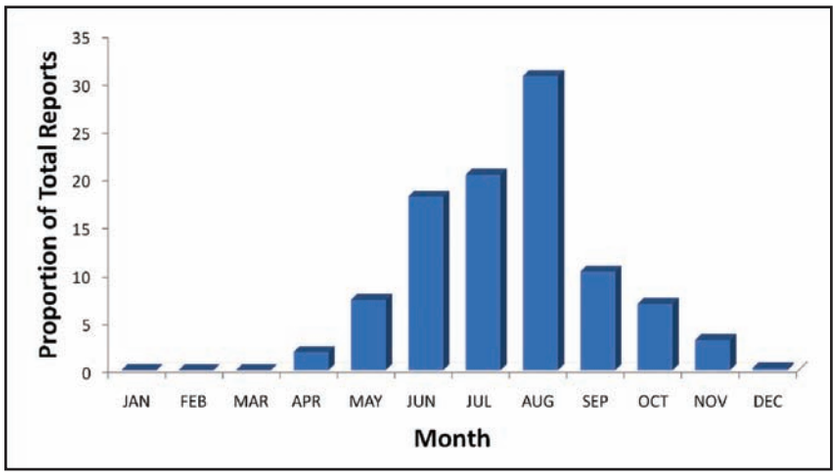

Figure 3. Whale shark sightings by month reported to the University of Southern Mississippi Gulf Coast Research Laboratory Whale Shark Sighting Survey (WSSS) from 2002 – 2011.

been reported to the GCRL WSSS. About a third of the reports were of multiple animals; 5 or more animals were reported a total of 63 times. The number of annual reports received has increased drastically since the onset of the survey (Figure 1), and present coverage spans from Brownsville, Texas to southern Florida (Figure 2). Reports are predominantly received during the summer months, with 70% of sightings occurring from June through August (Figure 3).

Whale sharks can reach lengths up to 50' and are easily distinguishable by their large size, broad head and unique spot pattern. They are often found feeding at the surface by swimming along with their large mouth open, consuming their small prey. Whale sharks feed primarily on plankton, but will also feed on schools of small fish, squid, or fish eggs. Whale sharks are solitary animals, but large groups (called aggregations) of these sharks may occur in highly productive areas. In the northern Gulf of Mexico, aggregations of over 100 individuals have been reported (Figure 4). One of the most interesting interactions of whale sharks is the association with big game fish, such as yellowfin, bluefin and skipjack tunas, tripletail, dolphin, and cobia, which appear to be feeding on the same food source (e.g. small baitfish).

Figure 4. Large aggregations of whale sharks have been documented in the northern Gulf of Mexico feeding at the surface on dense concentrations of fish eggs. Over 90 sharks can be counted in this photo.
Photo credit: Jennifer McKinney.

Studying whale sharks can be a difficult endeavor due to their pelagic habitat and highly migratory nature; the opportunities for scientific encounters are unpredictable, expensive, and weather dependent. Many of the sightings reported come from individuals outside of the scientific community. These individuals, who frequent areas where whale sharks occur, are a valuable resource to understanding the biology and ecology of this species in the northern Gulf of Mexico. In the fall of 2011, a series of whale shark reports off the coast of Louisiana prompted researchers at GCRL, NOAA and the Louisiana Department of Wildlife and Fisheries to mobilize a collaborative tagging expedition and successfully deployed 10 satellite tags on whale sharks (Figure 5). This is the largest number of whale sharks tagged at one time in the northern Gulf of Mexico to-date. Satellite tags provide the opportunity to learn a great deal more about these animals than just survey data alone, such as temperature and depth preferences, and estimated movement patterns for up to 12 months at a time. Often locating these animals is the greatest challenge to tagging expeditions, but with the help of timely reports, scientists can effectively focus their efforts.

If you encounter a whale shark in the northern Gulf of Mexico, please participate in the **ONLINE WHALE SHARK SIGHTINGS SURVEY.** You can help biologists learn more about the occurrence and distribution of whale sharks in the region. ⚓

Gulf Coast Research Laboratory biologists are extremely grateful for the sighting information provided thus far, and hope that the website will encourage submissions in the future!

Figure 5. A satellite tag trails behind a whale shark tagged in the northern Gulf of Mexico in 2011. This type of tag can send real-time locations when the animal surfaces. Photo Credit: Jesse Cancelmo.

Figure 6. Whale sharks are often seen in close proximity to petroleum platforms in the northern Gulf of Mexico, as seen in the water reflection. This animal was spotted by fisherman about 80 miles off the Texas Coast, who reported their encounter to the University of Southern Mississippi Gulf Coast Research Laboratory Whale Shark Sighting Survey. Photo Credit: Andy Sykes.

REFERENCES:

Burks, C. M., Driggers III, W. B., & Mullin, K. D. (2006). Observations of whale sharks, *Rhincodon typus*, in the northern Gulf of Mexico. *Fishery Bulletin, 104*, 579-584.

Gudger, E.W. (1939). The whale shark in the Caribbean Sea and the Gulf of Mexico. *The Scientific Monthly, 48,* 261-264.

Hoffman, W. T.H. Fritts, & R.P. Reynolds. (1981). Whale sharks associated with fish schools off south Texas. *Northeast Gulf Science*, 5(1), 55-57.

Hoffmayer, E.R., Franks, J.S., & Shelley, J.P. (2005). Recent observations of the whale shark (*Rhincodon typus*) in the north central Gulf of Mexico. *Gulf and Caribbean Research, 17,* 117-120.

To Report a Sighting:
Please complete the survey at
http://www.usm.edu/gcrl/whaleshark
or email: **whalesharksurvey@gmail.com**
Include:
Time and duration of encounter
Location (GPS coordinates)
Approximate size and number of individuals
Observed behavior
Associated species
If possible, photographs of the spot pattern behind left gills

Also, "Like" us on Facebook **www.facebook.com/whalesharkresearch**

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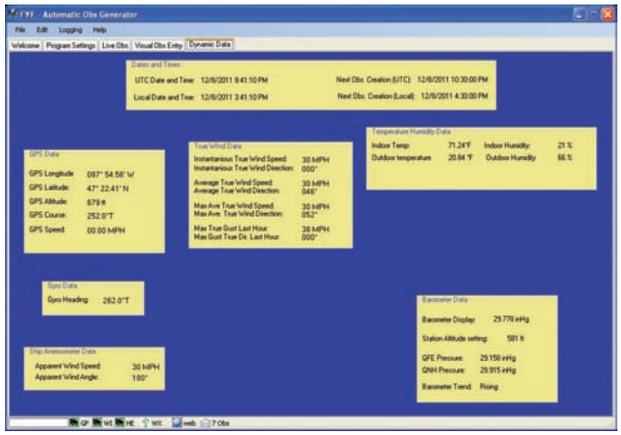
PMO Corner: Automated Weather Observations on the Great Lakes

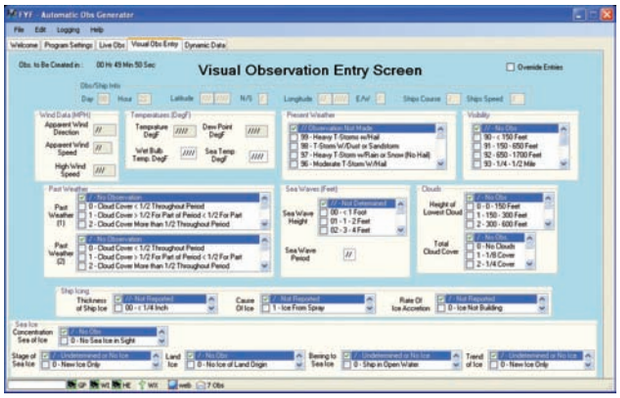
By.. PMO Ron Williams

On a recent trip across Lake Superior aboard the Central Marine Logistics Joseph L. Block , I was able to witness the workings of the FYF "For Your Forecast", an automated weather observation program that was written by Captain Mike Grzesiek.



Over the past few years, after seeing many errors in coding manual observations, Captain Grzesiek decided to make a change in the way they would send in VOS weather observations. As he had prior experience as a computer programmer, he decided he would be able to write a computer program to capture all the necessary weather elements needed to transmit a successful automated observation.

First off, he had to teach himself the computer code needed to tie into the ships navigation system from the ships computer. This was needed as he would pull the true wind data from the onboard R.M Young anemometer. After many hours and weeks of staying up late with endless coffee, he finally came up with a program to do the job. He purchased an inexpensive Honeywell weather system, and was then able to utilize the barometer, temperature, and dewpoint from the system to connect to his program and the onboard navigation display.



Due to the Great Lakes being on different heights for each of the Lakes, one of the largest hurdles the Captain ran into was how to calculate MSLP, as the ship transited each Lake. After three weeks of endless coding issues and much loss of sleep, he finally was able to have the program make the necessary height corrections as the ship would change elevation from each Lake. From here, Captain Grzesiek continued the tweak the program to the current version utilized today, which runs almost effortlessly aboard the Wilfred Sykes and Joseph L. Block.

While the system does a few bugs to work out, in regards to pressure readings and temperature, the system has been a large asset to National Weather Service Offices around the Great Lakes. With most months having a total of 700 plus observations, it provides us a "moving buoy" as the boats transit each of the Lakes, giving our forecasters the much needed weather data utilized to publish a marine weather forecast. ⚓

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US VOS Welcomes aboard its newest PMO to New Orleans, David Jones

Dave is currently with the U.S. Navy at the Naval Oceanographic Office, Fleet Survey Team at Stennis Space Center, Mississippi. He is a military hydrographer and leads a team to monitor marine instrumentation worldwide. As the Fleet Technical Liaison/Program Manager at the Space and Naval Warfare Systems Center in San Diego, he led the management of meteorological and oceanographic sensors across the globe. On the USS John F. Kennedy, Dave managed a division of 17 meteorologists and oceanographers in weather forecast and observation duties. He also supervised maintenance activities for ship environmental equipment. Dave was the training and IT systems manager while stationed in Europe providing weather observation and IT training to staff. He was the Automated Surface Observing System (ASOS) and Remote Automated Weather Stations (RAWS) manager providing maintenance and Quality Control.

Dave has extensive marine forecast ability and a decade of decision support experience. He is certified in Disaster Preparedness, a Microsoft Certified Systems Engineer, Cisco Certified Network Associate, Advanced Open Water Diver, and a Bachelors of Marine Science Degree from the University of Southern Mississippi.

Dave is a native Floridian and is an avid scuba diver and sport fisherman. He learned to dive while living in Hawaii, and has enjoyed diving all over the world in the course of his travels. His most memorable dives have been on sunken Navy ships, notably the USS Spiegel Grove in Key Largo and USS Oriskany in Pensacola. Dave also enjoys

camping in his spare time with his wife and daughter. He has several pets, including four parrots and two dogs.

Welcome aboard!

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Farewell to Bill Burnett

We must bid farewell and offer congratulations to Dr. Bill Burnett in this issue of the MWL. Bill has been such a strong advocate for the U.S. VOS program and it is with a heavy heart that we see him go off to his next adventure. Bill has accepted the challenging position of Deputy/Technical Director with the U.S. Navy's Naval Meteorology and Oceanography Command. Bills position as NDBC Branch Chief for Data Management and Communications concluded on January 13, 2012. As Branch Chief, Bill provided support, guidance and expertise for all who had the pleasure of working with him. Bill was the Chair of the Task Team for Table Driven Codes (TT-TDC); Co-Chair of the Task Team for Instrument Best Practices (TT-IBP), International Tsunameter Panel (ITP), OceanSITES Data Management Team and the JCOMM Data Buoy Cooperation Panel (DBCP) Science and Technical Workshop.

Fair Seas and following Winds, Bill…..

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2011 Award Recipients

Adventure Of The Seas
Alaska Mariner
Alaskan Explorer
American Century
Amsterdam
Antwerpen
APL China
APL Korea
APL Pearl
Arthur M. Anderson
Atlantic Frontier
Atlantic Grace
Aurora
Axel Spirit
Berge Nantong
Bernardo Quintana A.
Carnival Destiny
Celebrity Century
Celebrity Constellation
Celebrity Eclipse
Celebrity Equinox
Celebrity Infinity
Celebrity Millennium
Celebrity Silhouette
Celebrity Solstice
Celebrity Summit
Charleston Express
Discoverer Clear Leader
Discoverer Deep Seas
Disney Magic
Disney Wonder
El Yunque
Ever Refine
Front Katherine
George N
Grandeur Of The Seas
Grreen Dale
Gretchen H
GSF Grand Banks
Ha Sklenar 729
Henry Goodrich
Horizon Anchorage
Horizon Navigator
Horizon Producer
Horizon Reliance
Horizon Spirit
Horizon Trader
Independence Ii
Integrity
Jean Anne
Joseph L. Block
Maasdam
Maersk Georgia
Maersk Missouri
Maersk Ohio
Maersl Utah
Maersk Wyoming
Marcus G. Langseth
Maunawili
Melville
MidniGht Sun
Nieuw Amsterdam
Noordam
Norwegian Dawn
Norwegian Gem
Norwegian Jade
Norwegian Jewel
Norwegian Pearl
Norwegian Spirit
Norwegian Star
Norwegian Sun
Ocean Mariner
Oosterdam
Optimana
Oriental Queen
Overseas Boston
Overseas Joyce
Overseas Long Beach
Overseas Los Angeles
Patriot
Paul Gauguin
Philadelphia Express
Polar Endeavour
Polar Resolution
Posidana
Redoubt
Roger Blough
Roger Revelle
Saga Navigator
Sea Voyager
Sea-Land Eagle
Sea-Land Mercury
Sea-Land Racer
Sinuk
Splendour Of The Seas
St Louis Express
Star Fraser
Superstar Libra
Tustumena
UBC Saiki
UBC Santa Marta
United Spirit
Veendam
Virginian
Vigilant
Volendam
Washington Express
Westwood Rainier
Wilfred Sykes
Zaandam
Zuiderdam

5 YEAR PENANT RECIPIENTS
Disney Magic
GSF Grand Banks
Maersk Wyoming
Norwegian Sun
Oriental Queen
St Louis Express
Tustumena

10 YEAR PENANT RECIPIENTS
Horizon Producer

COMPANY AWARDS
Crowley Maritime Corp.
Tropical Shipping

Bravo Zulu to All !!!!

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Shipwreck: Dunav, Holmside, Prins Alexander

By Skip Gillam
Vinland, Ontario, Canada

Dunav

On any given day, there likely is a ship in trouble somewhere in the world. Despite all the modern navigational aids, up-to-date weather forecasts and improved safety standards, accidents still occur. I found it quite unusual that, on December 28, 1980, three ships, in three different parts of the world, all with Great Lakes/St. Lawrence Seaway connections, were all lost.

The PRINS ALEXANDER was the oldest of the three former Seaway traders in trouble that day. It had served the Oranje Lijn of Holland from 1947 to 1969. The ship had been built at Hardinxveld, Netherlands, and launched on December 12, 1946. It was completed on March 25, 1947, and soon began trading from Europe to the St. Lawrence and Saguenay River ports in Canada. At 352 feet, 5 inches in length, this vessel was too large to enter the Great Lakes until the St. Lawrence Seaway opened on April 25, 1959. PRINS ALEXANDER is shown down bound on Lake Huron off Port Huron, MI in a photo by Paul Michaels.

There were some problems in the early years with the rudder being lost on December 27, 1948, while about 105 miles south of Cape Race, Newfoundland. The tug GRENADIER brought the ship to Halifax under tow. Then, on June 9, 1963, there was a collision with the newly built laker SILVER ISLE in the St. Lawrence River near Prescott, ON and PRINS ALEXANDER received repairs at Kingston.

After close to 40 trips to the Great Lakes, PRINS ALEXANDER was sold in 1969 moving to Greek registry as PROSPERITY. It was resold and renamed IOANNIS in 1970, IOANNIS B. in 1974, APOSTOLOS B. in 1977 and POLIAGOS in 1980. At 33 years of age, its days were numbered and the hull was reported as sold for scrap. The vessel was en route from Piraeus, Greece, to Giza, United Arab Republic, with a cargo of cement when it struck a reef off Shadwan Island on December 28, 1980, and sank in the Red Sea.

To the west, the CABINDA, a Portuguese freighter, hit a jetty while inbound at Casablanca, Morocco, and foundered in the outer harbor. This was originally a British cargo carrier named HOLMSIDE. It had been launched at Aberdeen, Scotland, on May 21, 1959, and joined the Burnett Steamship Company for service between ports in the United Kingdom and those in Canada. The 396 foot long freighter made close to 40 visits through the St. Lawrence Seaway before it was sold in 1969.

It was damaged in a collision 60 miles east of Montreal on August 19, 1960, that sank BELLE ISLE II. Then, in December 1964, HOLMSIDE was damaged by ice in the Gulf of St. Lawrence and had some hull cracks when it arrived at Halifax on Christmas day. This vessel is shown in the Welland Canal in a photo by Ted Jones, courtesy of Barry Andersen.

Renamed CABINDA when sold to Portuguese interests in 1969, it operated on local routes around Western Europe. It was inbound, in ballast, from Lisbon, when it got caught by bad weather at Casablanca and nine members of the crew were lost.

The third ship, with Great Lakes connections, to be lost on December 28, 1980, was the Yugoslavian freighter DUNAV. The 585 foot, 5 inch long bulk carrier had been built at La Spezia, Italy, and launched on February 21, 1973. The hull was strengthened for the transportation of ore. It visited the Great Lakes, beginning in 1974, and is shown in the Welland Canal on September 20, 1977, from a photo by Tom Graham, courtesy of Barry Andersen.

DUNAV was en route from Hamilton, Ontario, to Tsingtao, China, via Los Angeles, when it ran into heavy weather on the Pacific. The Captain reported his ship was taking water in heavy seas off Central Japan, but that was the last report. DUNAV failed to arrive and apparently foundered, with all hands, soon after the last call. All 31 sailors on board were lost.

Three saltwater ships, all with Great Lakes connections, all lost the same day, and 40 sailors perished. ⚓

Holmside

Prins Alexander

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Mean Circulation Highlights and Climate Anomalies

September through December 2011

By Anthony Artusa, Meteorologist, Climate Operations Branch, Climate Prediction Center NCEP/NWS/NOAA

All anomalies reflect departures from the 1981-2010 base period.

September-October 2011

The 500-hPa circulation pattern over the Northern Hemisphere during September featured a zonal wave-4 anomaly pattern, with above average heights over the western North Pacific Ocean, westcentral Canada, Europe, and western Siberia. Below average heights were observed over the Gulf of Alaska, the eastern contiguous U.S., the far northern Atlantic, and southwestern Russia Figure 1. Over the Atlantic Ocean, the circulation reflected a strong positive phase (+1.8) of the East Atlantic (EA) teleconnection pattern. The sea-level pressure (SLP) pattern resembled the mid-tropospheric pattern, and highlights unusually strong Aleutian and Icelandic Lows Figure 2.

The mid-tropospheric circulation pattern during October 2011 again featured a zonal wave-4 anomaly pattern, with above average heights over the central North Pacific, east-central Canada (centered over Hudson Bay), Europe, and central Russia. Below average heights were observed over eastern Siberia, the Gulf of Alaska, and the eastern contiguous U.S., and the high latitudes of the North Atlantic Figure 3. The SLP map again largely mirrored the mid-tropospheric pattern, with the larger anomalies pole ward of 50N latitude Figure 4.

The Tropics

La Nina conditions strengthened during September and October 2011 as sea surface temperature (SST) anomalies were below -0.5C across much of the eastern and central equatorial Pacific Ocean. The latest monthly SST indices for the Nino 3.4 region were -0.7C (September) and -1.0C (October). The oceanic thermocline, measured by the depth of the 20C isotherm, was shallower than average across this same area, with subsurface temperatures reaching 1-3C below average in September, and 1-5C below average in October. Atmospheric convection was enhanced over the western equatorial Pacific, and suppressed near the Date Line and south of the Equator in September. In October, convection remained suppressed near the Date Line but was near average over Indonesia, which reflected the effect of the intraseasonal oscillation. Equatorial low level easterly trade wind anomalies and upper level westerly wind anomalies remained stronger than average over the central Pacific (September) and western Pacific (October). Collectively, the atmospheric and oceanic anomalies reflect a strengthening of La Nina conditions that developed during August.

The 2011 Atlantic hurricane season continued to be active, with Tropical Storm Lee making landfall along the Louisiana coast on September 4th. Lee then moved along a frontal boundary into the Ohio

Valley and eventually into the Northeast. The storm brought much needed precipitation to the drought stricken Gulf Coast (as much as 25-38 cm over a large area), and produced a second area of extremely heavy rainfall (25-50 cm) along the Mid-Atlantic and southern New England coasts (Reference 1). The rain over the Mid-Atlantic States fell over areas that had experienced a wet summer, including significant rains from Hurricane Irene less than two weeks before. This led to major flooding along the Susquehanna River, which in some areas broke high water records that were set nearly 40 years earlier in the aftermath of Hurricane Agnes (1972).

November-December 2011

The 500hPa circulation pattern during November 2011 featured above average heights over the central North Pacific, the northeastern CONUS, Europe, and eastern Asia. Below average heights were observed from eastern Siberia and Alaska to western Canada, the far northern Atlantic, and southwestern and central Russia (Figure 5). The sea level pressure and anomaly map (Figure 6) displays a similar pattern to that of the 500hPa circulation.

The month of December was characterized by above average heights over the temperate latitudes of the Northern Hemisphere, and below average heights over the North Polar Region (Figure 7). The SLP and anomaly field (Figure 8) largely mirrored the mid tropospheric circulation pattern.

An unusually strong autumn storm affected western Alaska on November 9-10 (Reference 2). After developing southeast of Japan on November 7th, it intensified as it moved across the northern Pacific towards the Bering Sea and western Alaska. The storm's central pressure dropped close to 50hPa in 24 hours, reaching a minimum pressure of 944hPa. Waves to 10.7 meters and wind of 87 kts were recorded offshore as the storm approached. Hurricane force winds and blizzard conditions affected coastal Alaska. Storm surges of up to 3 m affected communities along Alaska's west coast causing flooding, some structural damage and property loss. An ice zone connected to land had not yet developed to reduce

the impact of large waves buffeting the coast.

The Tropics

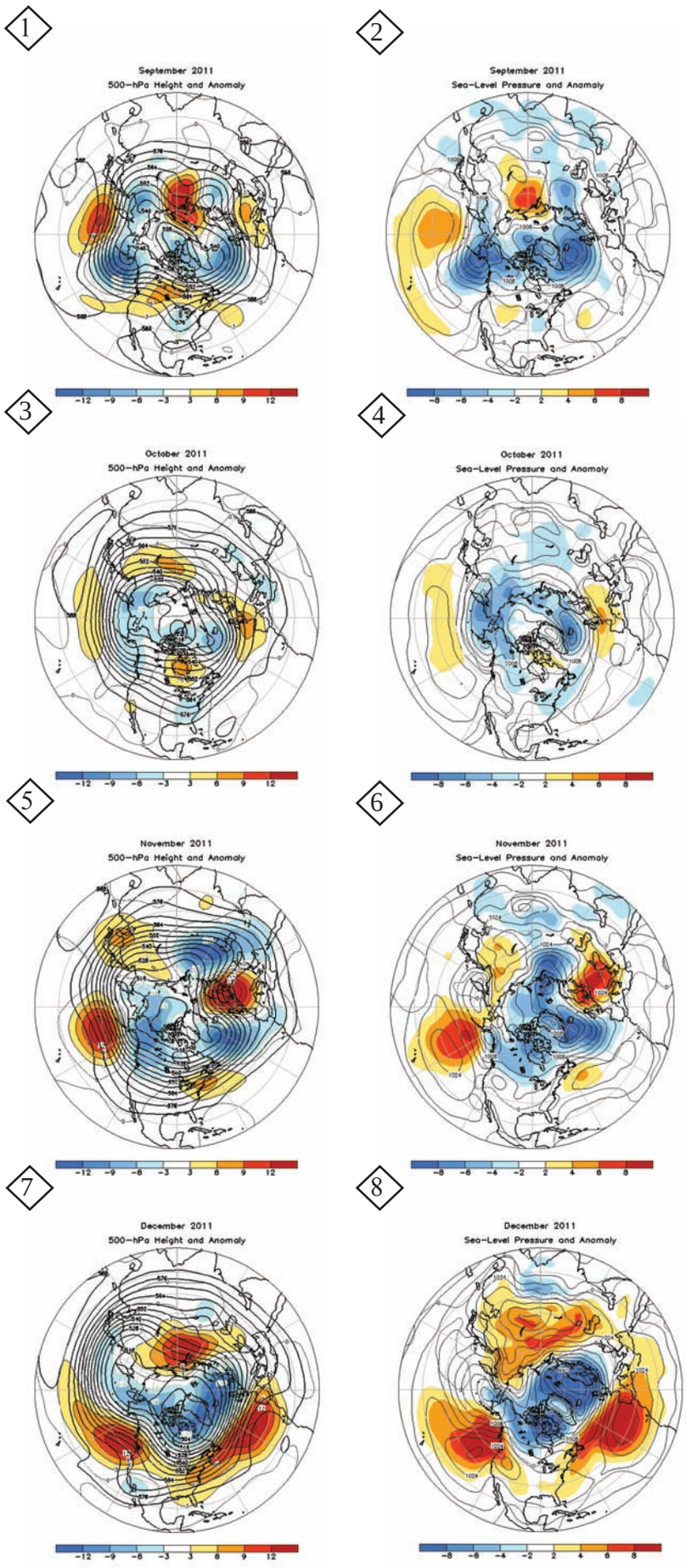
La Nina conditions continued during November and December, as SST anomalies were well below -0.5C across the eastern and central equatorial Pacific. The latest monthly Nino 3.4 indices were -1.1C (November) and -1.0C (December). The oceanic thermocline remained shallower than average across the east-central equatorial Pacific, and corresponding sub-surface temperatures ranged from 1-5C below-average. Deep cloudiness and thunderstorm activity near the equator was enhanced over Indonesia and northern Australia, and was suppressed near the Date Line. Equatorial low-level easterly trade winds remained stronger than average over the western and central Pacific. Collectively, these atmospheric and oceanic anomalies reflect a continuation of La Nina conditions. ⚓

References

1. http://www.ncdc.noaa.gov/sotc/national/2011/9

2. http://www.ncdc.noaa.gov/sotc/national/2011/11

Much of the information used in this article originates from the Climate Diagnostics Bulletin archive: (http://www.cpc.ncep.noaa.gov/products/CDB/CDB_Archive_html/CDB_archive.shtml)



Figures 1,3,5,7
Northern Hemisphere mean and anomalous 500-hPa geopotential height (CDAS/Reanalysis). Mean heights are denoted by solid contours drawn at an interval of 6 dam. Anomaly contour interval is indicated by shading. Anomalies are calculated as departures from the 1981-2010 base period monthly means.

Figures 2,4,6,8
Northern Hemisphere mean and anomalous sea level pressure (CDAS/Reanalysis). Mean values are denoted by solid contours drawn at an interval of 4 hPa. Anomaly contour interval is indicated by shading. Anomalies are calculated as departures from the 1981-2010 base period monthly means.

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NORTH AMERICAN ICE SERVICE ICEBERG INFORMATION AND SERVICES

The North American Ice Service (NAIS), a partnership comprised of the International Ice Patrol (IIP), the Canadian Ice Service (CIS), and the U.S. National Ice Center (NIC), provides year-round maritime safety information on iceberg and sea ice conditions in the vicinity of the Grand Banks of Newfoundland and the east coast of Labrador, Canada. The daily NAIS Iceberg Limit, valid at 0000Z, along with the daily Sea Ice Limit, valid for 100 EST the previous day, will be distributed as a NAVAREA IV warning in the format of a text Iceberg Bulletin and as a graphic Iceberg Chart in accordance with Table 1.

The purpose of the NAIS Iceberg Bulletin and Chart is to advise mariners of the estimated iceberg extent within the region. On the Chart, numbers within each grid sector inside the Iceberg Limit are intended to provide mariners an awareness of the relative density of icebergs. For more information on the Iceberg Bulletin and Iceberg Chart visit http://www.navcen.uscg.gov/iipCharts. NAIS reconnaissance is focused near the Grand Banks of Newfoundland and the east coast of Labrador, ice conditions south of Greenland are not monitored by NAIS. (For iceberg conditions south of Greenland visit the Danish Meteorological Institute's website at http://www.dmi.dk/dmi/en/gronland/iskort.htm.) While NAIS strives to be as accurate as possible in reporting the presence of icebergs to mariners, it is not possible to ensure that all icebergs are detected and reported. There is no substitute for due vigilance and prudent seamanship, especially when operating near sea ice and icebergs.

Reports of icebergs in the North Atlantic originate from various sources, including passing ships, reconnaissance flights, and spaceborne reconnaissance. Once position, time, size, and shape of icebergs sighted are received, the data is entered into a computer model that predicts iceberg drift and deterioration. As the time after sighting increases, so does the uncertainty in estimated positions. This uncertainty is taken into account when the Iceberg Limit is determined.

If an iceberg or radar target is detected and reported outside the published NAIS Iceberg Limit, a Notice to Shipping (NOTSHIP) will be sent by the Canadian Coast Guard Marine Communications and Traffic Service (MCTS) and an urgent NAVAREA IV message will be distributed on SafetyNET via the U.S. National Geospatial-Intelligence Agency (NGA) as the NAVAREA IV Coordinator. These warnings will remain in effect for 24 hours. Iceberg products will be revised shortly after notification between 1200Z and 0000Z or by 1400Z if reported between 0000Z and 1200Z.

Ships are encouraged to immediately report sightings of icebergs or stationary radar targets that may likely be icebergs to the nearest Canadian Coast Guard MCIS Station or through INMARSAT using Service Code 42, as there is no charge when using this code. See Table 2 for MCIS contact information. Vessels participating in a Voluntary Observing Ship (VOS) program should continue to report weather and sea surface temperature (STT) to their respective programs. Vessels interested in providing weather and SST reports to U.S. National Oceanic and Atmospheric Administration's VOS program can contact vos@noaa.gov or visit www.vos.noaa.gov for guidance.

When making iceberg reports, please include **SHIP NAME** and **CALL SIGN, ZULU TIME, SHIP POSITION** (latitude, longitude), (Specify either the geographic coordinates or range/bearing from ship's position), **ZULU TIME OF SIGHTING, METHOD OF DETECTION** (Visual, Radar, or Both), **LENGTH** (in meters), **SHAPE OF ICEBERG** (See Table 3), and **VESSEL CONTACT INFORMATION**.

International Ice Patrol in New London, CT

Phone:	(860) 271-2626
Toll free:	(877) 423-7287
Fax:	(860) 271-2773
Email:	iipcomms@uscg.mil
Web:	http//www.navcen.uscg.gov/IIP
Office hours:	1200Z – 0000Z

Canadian Ice Service in Ottawa, ON

Phone:	(877) 789-7733
Fax:	(560) 451-6010
Email:	cis-scg.client@ec.gc.ca
Web:	http//www.ice-glaces.ec.gc.ca
Office Hours:	0730 – 1730 EST

TABLE 1: NAIS BROADCASTS

Product Type	Transmission Means	Broadcast Station	Broadcast Time (UTC)	Frequencies (kHz) or Location
NAIS NAVAREA IV ICEBERG BULLETIN	SafetyNET Broadcasts as NAVAREA IV messages	AOR-W Satellite	1000, 2200	SafetyNET
			Urgent Broadcasts of targets outside limit sent upon receipt	
	NAVTEX Broadcast	Canadian CG Marine Communications and Traffic Service St. John's/VON	1820 (Winter) 2220 (Summer) (Changes with DST)	518 F1B
			Urgent Broadcasts of targets outside limit sent upon receipt	
	SITOR/NBDP Broadcast	USCG Communication Station Boston/NMF	0140-0230	6314, 8416.5, 12579 F1B
			1630-1720	08416.5, 12579, 16806.5 F1B
	Internet	International Ice Patrol Website	updated daily by 2200	http://www.navcen.uscg.gov/IIP
		Automated Email		https://radioaid.rdc.uscg.gov/mailman/listinfo/iceberg_bulletin
		National Geospatial-Intelligence Agency Website		http://msi.nga.mil/NGAPortal/MSI.portal
NAIS ICEBERG CHART	Radio Facsimile Broadcast	USCG Communication Station Boston/NMF	0438, 1039	4235, 6340.5, 9110 F3C
			1600, 2239	6340.5, 9110, 12750 F3C
		Offenbach, Germany via Pinneberg/DDK	0930, 2100	3855, 7880, 13882.5 F1C
		Canadian CG Marine Communications and Traffic Service Sydney/VCO	1741	6915.10 J3C
	Internet	International Ice Patrol Website	Updated daily by 2200	http://www.navcen.uscg.gov/IIP
		Automated Email		https://radioaid.rdc.uscg.gov/mailman/listinfo/iceberg_chart
		National Weather Service Website		http://weather.noaa.gov/pub/fax/PIEA88.gif
		Email On Demand*		ftpmail@ftpmail.nws.noaa.gov
FICN10	Radio Telephone	Canadian CG Marine Communications and Traffic Service St. Anthony/VCM	0107, 0907, 1907 & as required	2589 J3E
			continuous	VHF Channel 21B & 83B

*To prompt email on demand send an e-mail to ftpmail@ftpmail.nws.noaa.gov with any subject line. The body of the text should read as follows (please note the text is case sensitive and must be sent in plain text format):
open
cd fax
get PIEA88.gif ---or--- get PIEA88.TIF
quit
The e-mail server will then automatically send a GIF or TIF formatted image of the facsimile back to the sender's e-mail address.

TABLE 2: REPORT RECEIVING STATIONS

The following Canadian Coast Guard Marine Communications & Traffic Service (MCTS) Centers (Receiving Stations) monitor and transmit on VHF 16 & HF 2182 J3E:

Bold indicates the Coast Guard Radio call name.

St. Johns NL (VON) Email: ECAREGSNF@INNAV.GC.CA Phone: 709-772-2106	**St. Anthony** NL (VCM) Email: ECASNY@INNAV.GC.CA Phone: 709-454-3852
Labrador NL (VOK) Email: ECAGOY@INNAV.GC.CA Phone: 709-896-2252	**Placentia** NL (VCP) Email: ECAPLA@INNAV.GC.CA Phone: 709-227-2181
Port aux Basques NL (VOJ) Email: PAXTFC@INNAV.GC.CA Phone: 709-695-2167	**Sydney** NS (VCO) Email: CCGOPS@ELSMAIL.NET Phone: 902-564-7751
Dartmouth/**Halifax** NS (VCS) Email: CCGOPS@ELSMAIL.NET Phone: 902-426-9750	Saint John/**Fundy** NB (VAR) Email: CCGOPS@ELSMAIL.NET Phone: 506-636-4696

Visit http://www.vos.noaa.gov/vos_resource.shtml for instructions on sending INMARSAT 2-digit access code reports. For all iceberg reports use access code 42.

TABLE 3: ICEBERG SHAPES

Non-Tabular: This general shape category includes blocky, pinnacle, dry dock, wedged, dome, or any iceberg that does not meet characteristics of a tabular iceberg.

Tabular: Flat-topped, most show horizontal banding.

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NHC Offshore Marine Zone Changes:

Offshore Marine Zone Configurations Effective April 3, 2012

By Chris Fakes, Houston PMO
For more information on service change notice, please go to the NWS National Hurricane Center http://www.weather.gov/os/notif.htm

Background

In an ongoing effort to improve marine forecast services, the National Hurricane Center/Tropical Analysis and Forecast Branch (NHC/TAFB) in Miami, Florida will make changes to the Offshore Marine Zones. These changes will affect the Offshore Waters Forecasts (MIAOFFNT3 and MIAOFFNT4), as well as the NAVTEX and High Frequency Voice Broadcast (VOBRA) forecasts. Effective April 3, 2012, all offshore marine forecasts warnings will be based on the new zone configuration.

Figure 1. Existing Offshore Zone Configuration.

Impact on the Offshore Waters Forecasts

Current Zones
Four times per day, NHC/TAFB marine forecasters issue Offshore Waters marine forecasts for nine large zones covering the Gulf of Mexico, the Caribbean Sea, and portions of the Western Atlantic Ocean south 31° North. The configuration of the Offshore Waters Marine Zones is shown on the map below (Offshore Water Marine Zones are shown in blue, and Coastal Waters Marine Zones are shown in light tan).

There are usually several distinct weather regimes present in a marine zone. However, the large sizes of these zones occasionally make it difficult to describe the various nuances in the forecast without leading to lengthy and complex wording. Furthermore, the large zone size complicates how marine warnings are depicted on websites such as weather.gov. Marine warnings are currently displayed over the entire marine zone. This usually results in a graphical warning area on the web site that is much larger than what is intended and conflicts with how the warning is described in the forecast text. Smaller marine zones would alleviate this problem to an extent. Eventually, marine warnings will be depicted more precisely as polygons.

Proposed Zones
In an effort to improve how marine forecasts are communicated, marine forecasters at the NHC/TAFB have been gathering input from the marine community to reconfigure the Offshore Waters Marine Zones. The intent has been to design smaller marine zones that take into account local marine weather effects, as well as geographic features

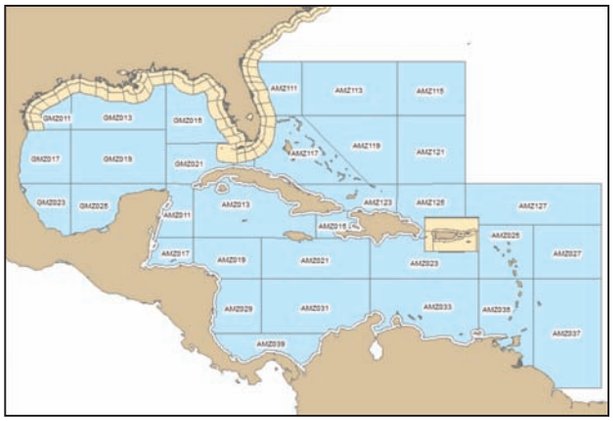

Figure 2. Proposed Offshore Zone configuration.

such as national boundaries or major latitude/longitude lines. An initial proposal of the configuration was presented in late 2009 and through 2010. The marine community not only overwhelmingly supported breaking the existing zones into smaller areas, but offered very insightful suggestions for modifying the boundaries of the proposed marine zones. This feedback has been incorporated into the present zone configuration proposal as shown in Figure 2. ⚓

Marine Zone Names and Universal Geographic Codes (UGC's)

Current Offshore Marine Zones

UGC	Offshore Marine Zone Name
AMZ080	SW N Atlantic S of 31N W of 65W including Bahamas
AMZ082	NW Caribbean N of 15N W of 75W
AMZ084	SW Caribbean S of 15N W of 75W
AMZ086	Caribbean E of 75W to the Windward and Leeward Islands
AMZ087	Tropical N Atlantic from 07N to 22N between 55W and 65W
GMZ080	NW Gulf N of 25N W of 90W including the Flower Garden Banks Marine Sanctuary
GMZ082	SW Gulf S of 25N W of 90W

Proposed Offshore Marine Zones

UGC	Offshore Marine Zone Name
AMZ011	Tropical N Atlantic from 15N to 19N between 55W and 60W
AMZ013	Caribbean N of 18N between 76W and 85W including the Cayman Basin
AMZ015	Caribbean approaches to the Windward Passage>
AMZ017	Gulf of Honduras
AMZ019	Caribbean from 15N to 18N between 80W and 85W
AMZ021	Caribbean from 15N to 18N between 72W and 80W
AMZ023	Caribbean N of 15N between 64W and 72W
AMZ025	Offshore Waters Leeward Islands
AMZ027	Tropical Atlantic from 15N to 19N between 55W and 60W
AMZ029	W Central Caribbean from 11N to 15N W of 80W
AMZ031	Caribbean from 11N to 15N between 72W and 80W including Colombia Basin
AMZ033	Caribbean S of 15N between 64W and 72W including Venezuela Basin
AMZ035	Offshore waters Windward Islands including Trinidad and Tobago
AMZ037	Tropical Atlantic from 07N to 15N between 55W and 60W
AMZ039	Southwest Caribbean S of 11N including approaches to the Panama Canal
AMZ111	Atlantic from 27N to 31N W of 77W
AMZ113	Atlantic from 27N to 31N between 70W and 77W
AMZ115	Atlantic from 27N to 31N between 65W and 70W
AMZ117	Bahamas N of 22N including the Cay Sal Bank
AMZ119	Atlantic from 22N to 27N E of Bahamas to 70W
AMZ121	Atlantic from 22N to 27N between 65W and 70W
AMZ123	Atlantic S of 22N W of 70W including approaches to the Windward Passage

Although not technically marine zones, the Synopsis paragraphs also have assigned UGC's. Current and proposed names and codes are shown below:

Current Synopses

UGC	Synopsis Name
AMZ089	Synopsis for the Caribbean and Tropical N Atlantic from 07N to 22N between 55W and 65W
AMZ088	Synopsis for the SW N Atlc including the Bahamas
GMZ089	Synopsis for the Gulf of Mexico

Proposed Synopses

UGC	Synopsis Name
AMZ001	Synopsis for the Caribbean and Tropical N Atlantic from 07N to 19N between 55W and 65W
AMZ101	Synopsis for the SW N Atlantic including the Bahamas
GMZ001	Synopsis for the Gulf of Mexico

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MV VOLENDAM Deploys Buoys

Julie Fletcher, Manager Marine Observations
Meteorological Service of New Zealand

2/O Rienus Hazelman and 2/O Folkert Visser deploying a MetOcean buoy at 42º S 153 º E on 4-Feb-2012

Holland America cruise ship MV VOLENDAM is a member of the US VOS. This ship maintains an excellent reporting programme often sending up to 500 observations (OBs) per month. In recent years the ship has spent the northern summers cruising in Canadian and Alaskan waters, and the southern summers in the South Pacific voyaging around Australia and New Zealand.

In addition to their regular OBs programme which includes reports on the NZ coast, MV VOLENDAM has also assisted MetService NZ with the deployment of a number of meteorological drifting buoys in the Tasman Sea. Reports from buoys supplement the observations received from ships, and whilst ships quickly voyage through an area, buoys drift only slowly and continuously transmit hourly air pressure and sea surface temperature data via satellite. Data on ocean currents is derived from the drift of a buoy. MV VOLENDAM first deployed buoys in November 2008, and each subsequent summer the ship has offered the opportunity to deploy buoys on their Tasman Sea crossings. In early February 2012, the ship deployed 4 buoys on their voyage from Burnie (Tasmania) to Milford South (NZ).

In total, MV VOLENDAM has deployed eleven buoys in the Tasman

Sea over the last four summers. This ship has keenly supported the buoy programme and has actively sought buoys for deployment. The Masters, Captains Pieter Visser and Peter Bos, the officers and crew have all been helpful in loading and deploying these buoys. This is an extra job in an already busy work schedule, but the officers are keen to assist because they understand that buoy data and their met OBs helps forecasters to prepare more accurate forecasts for mariners.

Prior to arrival at the pre-arranged buoy deployment locations, the Master said that he made an announcement to advise the passengers that a buoy deployment was imminent. He also provided a brief explanation about the buoy programme and why deployments are necessary. This information demonstrates to the passengers that cruise ships are involved in scientific programmes.

Typically a buoy consists of a surface float and a drogue in one parcel weighing about 22kg. Before deployment the plastic wrapping is removed and the buoy is activated by removal of a magnet. The buoy is then deployed from the lowest stern deck.
Sadly the cruise schedule for MV VOLENDAM is changing next year and this ship will not be returning to NZ waters. MetService is hopeful that the replacement ship will be willing to provide future deployment opportunities. ⚓

3/O Adam Wilson and cadet Charles Pagler getting ready to deploy a buoy on 4-Feb-2012

For more information about the global buoy programme, visit:
http://www.jcommops.org/dbcp/
http://www.aoml.noaa.gov/phod/dac/index.php

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Gust Factor during Tropical Cyclones

Professor S. A. Hsu, Coastal Studies Institute, Louisiana State University
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Abstract: In 2011 during Tropical Storm Lee, for the first time, we had 21 overwater stations measuring both sustained wind speed and gust. The anemometer height ranged from 5 m (16 ft) to 160 m (525 ft) and sustained wind speed from 25 to 51 knots. Analyses of these measurements show that the average gust factor (GF=gust/sustained wind speed) is 1.27. Since this value does not vary significantly with both height and sustained wind speed, it further supports the so-called 30 % overwater GF rule for operational applications.

1. Introduction

According to Geer (1996), a gust is a sudden brief increase in the wind speed, typically of less than 20-second duration. The gust factor (GF) = gust/sustained wind speed, for example, a 5 second gust within a 2 minute period. GF is important for search and rescue mission, wind energy assessment and wind loading on offshore structures. The purpose of this study is to provide the operational community with the answers to the following questions, particularly during tropical cyclones: What is the average value of overwater GF? Does GF vary with height and sustained wind speed? Does GF vary from one side of the storm track to the other? And, can we apply the GF knowledge gained onshore for offshore application? Due to insufficient data prior to Tropical Storm Lee in 2011, these questions could not be answered satisfactory.

2. Analyses and Results

During Tropical Storm Lee in 2011, we had 21 overwater stations measuring both sustained wind speed and gust as shown in Table 1 (see Brown, 2011 in www.nhc.noaa.gov). These stations were located in the northern Gulf of Mexico on both sides of the storm track (see www.ndbc.noaa.gov). The anemometer height ranged from 5 m (16 ft) to 160 m (525 ft) and sustained wind speed from 25 to 51 knots. The variation of GF with height is provided in Fig.1, which illustrates that the GF does not change systematically with height as compare to that over land as shown in Fig. 2 (based on the datasets provided in Merceret, 2009). Variations of the GF with sustained wind speed for offshore and onshore are shown in Figs. 3 and 4, respectively, illustrating that the variation of GF on the sustained wind speed is rather weak for offshore than onshore. Some physical reasons are provided as follows:

According to Hsu and Blanchard (2004), for overwater turbulence intensity applications,

$$GF = 1 + 5\, U^*/U10 \quad (1)$$

Where U* is the friction velocity and U10 is the sustained wind speed at 10 m. Furthermore, according to Hsu (2004), under hurricane conditions,

$$U^*/U10 = 0.054 \quad (2)$$

Substituting Equation (2) into (1), we get

$$GF = 1.270 \quad (3)$$

This value is in excellent agreement with that of 1.273 as provided in Table 1. Note that, since the standard deviation (s.d.) for the GF is 0.11 and the coefficient of variation (cov =s.d./mean) is 8.6% (which is within the 10 % error margin for the field accuracy in wind speed measurements, see www.ndbc.noaa.gov), we can say that the overwater GF does not vary with height for operational use. Furthermore, based on Equation (3) and Table 1, GF is very close to the commonly referred 30% rule for offshore applications.

3. Conclusions

On the basis of foregoing analyses, it can be concluded that the average overwater gust factor value is approximately 1.3 or the gust is about 30 % higher than the sustained wind speed. Since this value does not vary with height, sustained wind speed, and on both sides of the storm track, this 30 % rule for the overwater gust factor is recommended for operational use. ⚓

References

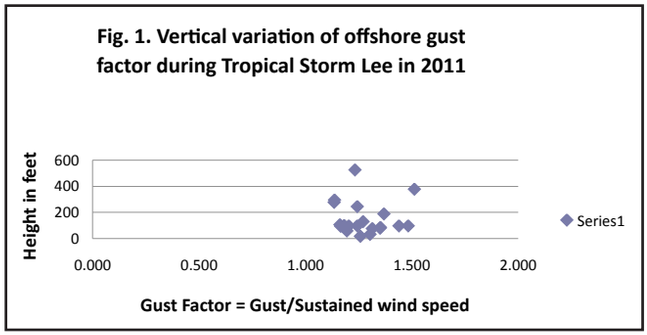
Brown, D. P., 2011: Tropical Cyclone Report, Tropical Storm Lee (AL132011), 2-5 September 2011 (see www.nhc.noaa.gov).

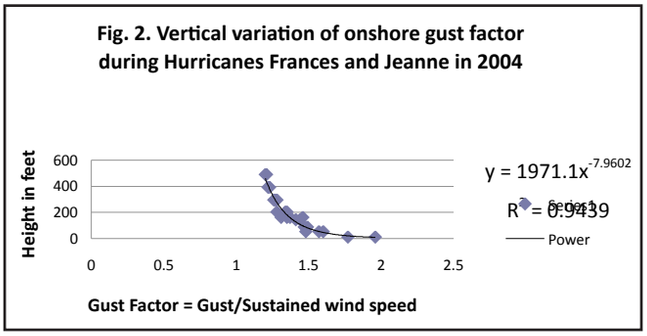
Geer, I. W., Editor, 1996: Glossary of Weather and Climate. American Meteorological Society, Boston, MA.

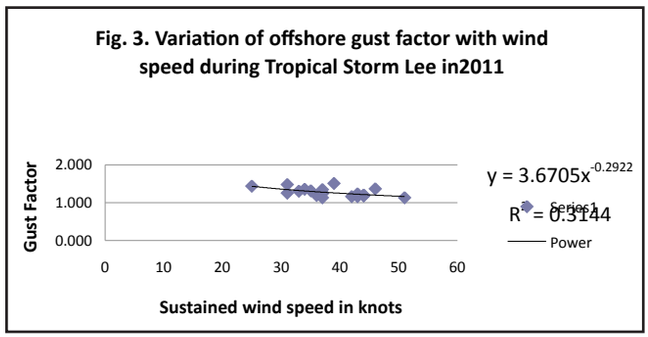
Hsu, S. A., 2004: A wind-wave interaction explanation for Jelesnianski's open-ocean storm surge estimation using Hurricane Georges' (1998) measurements. National Weather Digest, 28, 25-31.

Hsu, S. A., and B. W. Blanchard, 2004: Estimating overwater turbulence intensity from routine gust factor measurements. Journal of Applied Meteorology, 43, 1911-1916.

Merceret, F. J., 2009: Two empirical models for gust factors near land-falling hurricanes. National Weather Digest, 33, 27-35.







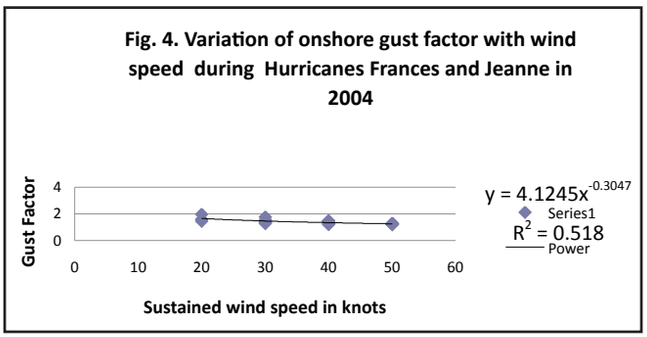


Table 1. Measurements of maximum sustained wind speed and gust during Tropical Storm Lee in 2011 (Data source:Brown's Tropical Cyclone Report, National Hurricane Center).

Offshore Station	Anemometer height, m	Max sustained wind speed, kts	Gust, kts	Gust factor	Anemometer height, ft
Buoy 42067	5	31	39	1.258	16
Buoy 42040	10	33	43	1.303	33
KHQI	18	36	43	1.194	59
MRSL1	23	35	46	1.314	75
PSTL1	24	37	50	1.351	79
KVBS	26	44	52	1.182	85
KVNP	26	34	46	1.353	85
KEHC	29	42	49	1.167	95
KCMB	30	44	53	1.205	98
KSPR	30	31	46	1.484	98
KCRH	30	37	46	1.243	98
KXPY	30	25	36	1.440	98
BURL1	30.5	44	52	1.182	100
KMYT	32	43	50	1.163	105
SPLL1	40	37	47	1.270	131
LOPL1	58	46	63	1.370	190
KSPR	75	37	46	1.243	246
KMIS	85	37	42	1.135	279
KMDJ	90	51	58	1.137	295
KVKY	115	39	59	1.513	377
KVOA	160	43	53	1.233	525
			mean	1.273	
			S.D.	0.11	
			COV	8.6%	

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Tropical Atlantic and Tropical East Pacific Areas
September through December 2011

Michael Formosa / Scott Stripling
Tropical Analysis and Forecast Branch,
National Hurricane Center, Miami, Florida
NOAA National Center for Environmental Prediction

The National Hurricane Center's (NHC) Tropical Analysis and Forecast Branch (TAFB) issued 20 non-tropical cyclone warnings in their Atlantic High Seas Area of Responsibility (AOR), which is the Atlantic west of 35W extending from 07N to 31N, including the Gulf of Mexico and Caribbean Sea, summarized in ***Table 1***, and 16 warnings in their Pacific High Seas AOR, ***Table 2***, during the period from 1 September to 31 December 2011. Weak to moderate La Nina conditions returned across the Tropical Pacific Ocean by August and September of 2011, and contributed to a slightly below normal East Pacific Hurricane Season, while the Atlantic Hurricane Season, in terms of number of named storms, was very active. La Nina conditions persisted through the end of December, and continued to influence weather patterns across both the Eastern Pacific and Atlantic Basins. For a summary of the 2011 seasonal tropical cyclone activity, see the NHC web site at: http://www.nhc.noaa.gov/pastall.shtml

No non-tropical cyclone warnings were issued during September, with marine conditions during the month generally dominated by light to moderate tradewinds, tropical cyclones, and interactions between tropical and mid latitude systems, typical for this peak month of the Atlantic Hurricane Season. Tradewinds across much of the Caribbean freshened significantly during the second half of September as a monsoonal (cyclonic) circulation became well established across the far eastern tropical Pacific, central America, and the adjacent western Caribbean, while high pressure across the western Atlantic shifted south of 35N. September also proved to be a relatively active month for tropical cyclone formation, with six (6) named systems affecting the basin during the month, requiring numerous tropical cyclone related warnings.

The first cold front of the season sank southward across the central and northeastern Gulf of Mexico on Sep 30. This front moved southeast across the southwest North Atlantic and southward across the Gulf of Mexico, and became stationary from the northern Yucatan Peninsula across north central Bahamas to just west of Bermuda by Oct 3, where it stalled. A reinforcing front moved off of the east coast of the U.S. and into the southwest North Atlantic on Oct 3 and 4 , forcing the initial front southeastward through Bermuda. On Oct 5 and 6, high pressure building behind the reinforcing front combined with a slow northward drift of the frontal zone stretching across the Straits of Florida and Central Bahamas, to tighten the pressure gradient north of this boundary, **(*Figure 1)***, and produce a broad fetch of northeast winds 20-25 kts from near 70W into the Bahamas and the entire Florida coastline. Low level winds continued to veer more easterly on both sides of the frontal zone on Oct 6 and 7, with the old front transitioning to a shearline, while the pressure gradient north of this shearline increased further. Several vessels began to report gale force winds by the morning of Oct 6, in the numerous squalls occurring on both sides of the shearline. These included the cruise ships **Zuiderdam** (PBIG) approaching the Yucatan Channel from the southeast, the **Celebrity Millennium** (9HJF9) crossing through the Yucatan Channel, the **Carnival Ecstasy** (H3GR) just north of the shearline in the southeast Gulf of Mexico, and the tanker **Iver Experience** (PECF) transiting the Straits of Florida. A broad upper level trough spanning much of this region and the eastern U.S. sharpened to a narrow and more energetic trough by Oct 7, extending from the northeast Gulf of Mexico up the eastern seaboard, and acted to significantly intensify the numerous squalls and thunderstorms moving quickly westward along and north of the shearline. Gale force wind gusts in squalls and thunderstorms were reported on Oct 7, from the northern Bahamas and adjacent Atlantic waters, as reported by the **Norwegian Sky** (C6PZ8), to as far north as Satellite Beach, along the central Florida coast. The shearline continued to drift slowly northward on Oct 8 and 9, now with widespread gales and the first non-tropical cyclone warning of the September to December period, and expansive easterly fetch of 25-35 kts extending from near 65W to the Bahamas and Florida coast, across the Florida peninsula, and through the entire Gulf of Mexico north of 25N **(*Figure 2*)**.

Cyclonic turning within this sharp upper trough worked downward into the middle and lower levels of the atmosphere on Oct 8 and 9, and interacted with the shearline and gales occurring to its north to generate a surface low pressure center across the northwest Bahamas waters that produced fresh gales and severe thunderstorms as it moved northwestward across the central Florida coast on Oct 9, and over interior north Florida on Oct 10. This event produced widespread impacts, with a very broad area of gales and high seas occurring across the southwest North Atlantic, where seas built to 18

Atlantic Ocean including the Caribbean Sea and the Gulf of Mexico

Onset	Region	Peak Wind Speed	Duration	Forcing
1200 UTC 08 Oct	SW N Atlantic	35 kts	48 hr	N of Frontal Trough
0000 UTC 09 Oct	Gulf of Mexico	35 kts	18 hr	N of Frontal Trough
0600 UTC 16 Oct	Gulf of Mexico	40 kts	54 hr	N of Low
0000 UTC 19 Oct	SW N Atlantic	40 kts	30 hr	E of Cold Front
0000 UTC 19 Oct	Gulf of Mexico	35 kts	12 hr	N of Cold Front
1200 UTC 03 Nov	Gulf of Mexico	40 kts	18 hr	N of Cold Front
1200 UTC 05 Nov	SW N Atlantic	45 kts	72 hr	NW of Cold Front
0600 UTC 10 Nov	Gulf of Mexico	40 kts	36 hr	NW of Cold Front
1200 UTC 21 Nov	Central Atlantic	40 kts	48 hr	NW of Low and E of Trough
0000 UTC 27 Nov	Gulf of Mexico	45 kts	36 hr	W of Cold Front
1200 UTC 30 Nov	Central Atlantic	40 kts	30 hr	NE and E of Low
0600 UTC 05 Dec	SW N Atlantic	35 kts	12 hr	W of Trough
1200 UTC 07 Dec	Gulf of Mexico	35 kts	12 hr	W of Cold Front
0600 UTC 10 Dec	Central/SW N Atlantic	35 kts	60 hr	N of Trough
0000 UTC 14 Dec	Central/SW N Atlantic	35 kts	48 hr	E of Cold Front
1200 UTC 16 Dec	Central Atlantic	40 kts	42 hr	E of Trough
0000 UTC 19 Dec	SW N Atlantic	35 kts	30 hr	W of Cold Front
1200 UTC 21 Dec	Caribbean	35 kts	54 hr	Enhanced Pres Gradient
0600 UTC 25 Dec	Gulf of Mexico	35 kts	18 hr	W of Cold Front
0000 UTC 27 Dec	SW N Atlantic	40 kts	30 hr	Either Side of Cold Front

Table 1. Non-tropical Cyclone Warnings issued for the Atlantic Basin between 01 Sept and 31 Dec 2011.

ft, and minimal gales across much of the northern Gulf of Mexico, where seas built to 15 ft. High surf and significant coastal erosion occurred along the entire east coast of Florida.

Prolonged strong onshore flow and high surf raised water levels along the Florida east coast, making for treacherous conditions for port entrances and departures. According to *Jacksonville PMO Rob Niemeyer*, at Port Canaveral on Oct 9, the cruise ship **Freedom of the Seas** (C6UZ7), departed in the afternoon. The ship reported 13 passengers injured with cuts, bruises, and scrapes and that conditions were worse than expected. Based on the conditions reported by the Pilot and Ships Captain, the decision was made by the Pilot to suspend all other departures. Upon hearing of the reports, the cruise ships **Disney Dream** (C6YR6) and **Carnival Sensation** (C6FM8) decided to delay their departures until the conditions improved the following day. Rob also reported that the **Carnival Fascination** (C6FM9) was delayed in returning to Jacksonville on Oct 10 due to the elevated tides experienced and insufficient clearance to transit beneath the Dames Point Bridge.

Another interaction between a tropical and mid latitude system occurred one week later and led to a second gale event across the Gulf of Mexico, which began on Oct 16 and lasted 54 hours. A broad cyclonic circulation associated with the eastern Pacific Monsoon became well established across portions of Central America and into the Yucatan Peninsula, roughly between 80W and 95W, the days immediately following the previous widespread gale event. A new cold front moved southeastward into the Gulf of Mexico on Oct 13 and became nearly stationary from the southwest Gulf of Mexico to southern Florida by the evening of Oct 14. Widespread showers and thunderstorms entrained in the broad monsoonal low encompassed most of southeastern

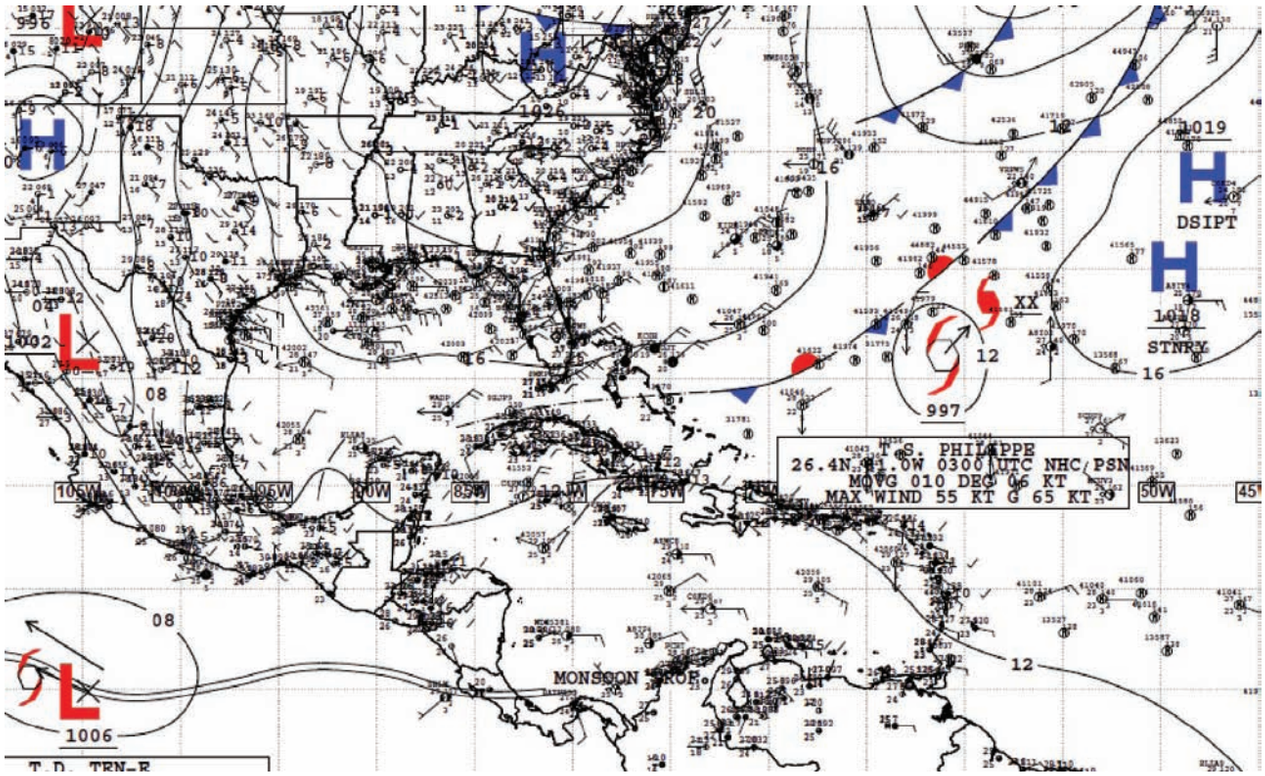

Figure 1. Unified surface analysis for 0000 UTC 06 Oct 2011.

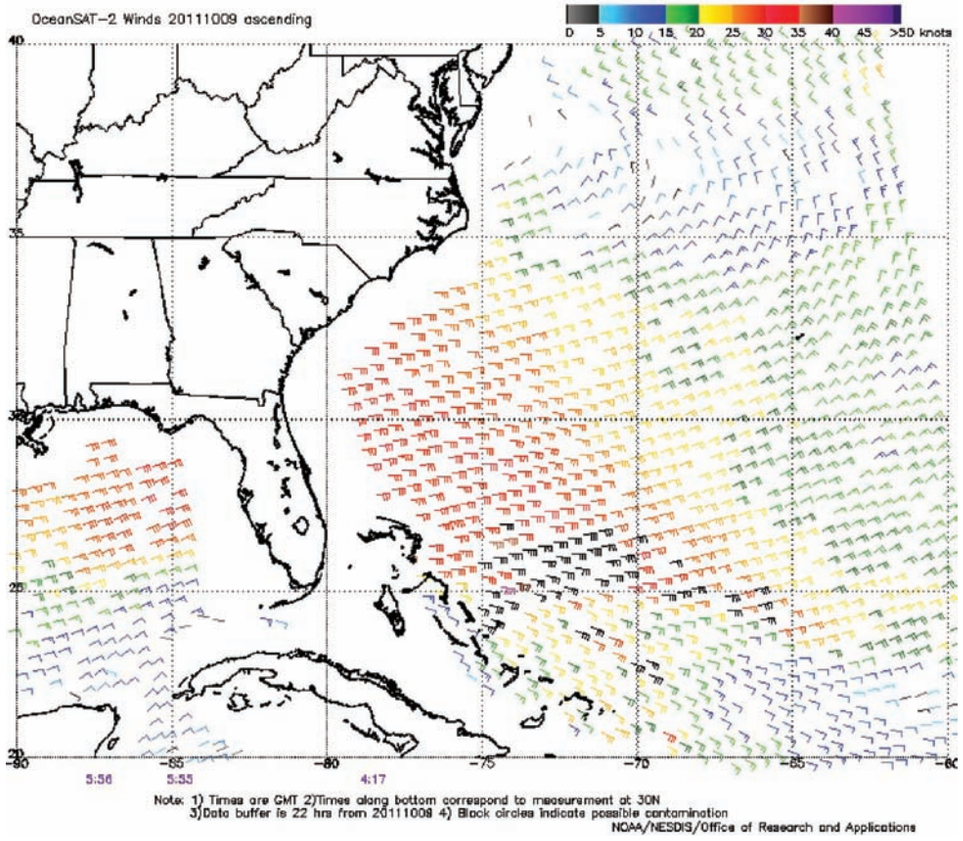

Figure 2. NOAA image of W Atlantic and eastern Gulf of Mexico showing OceanSAT-2 wind vectors from 09 Oct 0417 and 0556 UTC passes. Color coded wind speed scale appears at upper right. Black vectors indicate thunderstorm contamination.

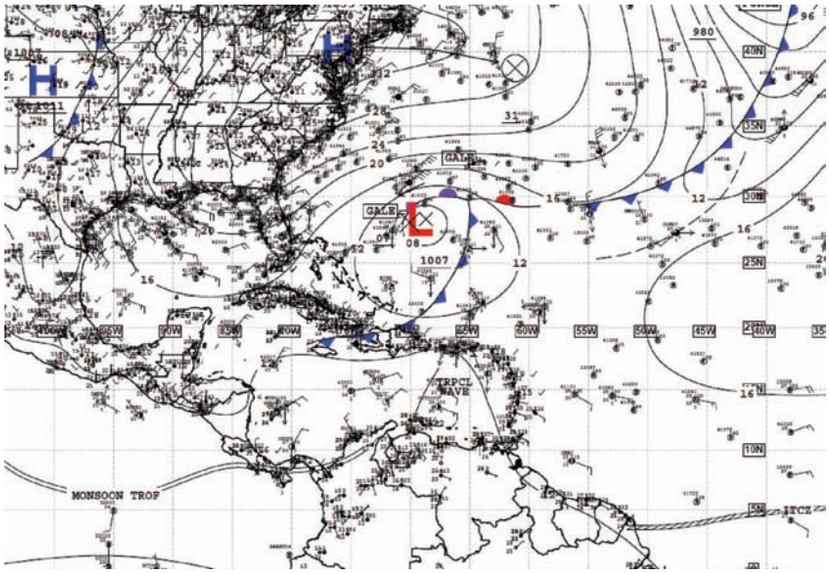

Figure 3. Unified surface analysis for 1200 UTC 06 Nov 2011.

Mexico and Central America on Oct 15, with a 1006 hPa surface low analyzed just offshore of the coast of Belize by 1800 UTC that day. Global weather models suggested the possibility that this low could drift northwest during the coming days and further organize into a tropical cyclone off of the north coast of the Yucatan Peninsula. However, tropical cyclone development did not occur, as the low remained too close to the Yucatan Peninsula. High pressure behind the cold front moved into the southeastern U.S. and aligned the weakening frontal zone more east to west on Oct 16. This positioning of the high and frontal zone combined with lowering pressure to 1004 hPa across the northern Yucatan Peninsula, to increase the pressure gradient and initiate gales across the southeast Gulf of Mexico, between the frontal zone and the tropical low center. Several vessels transiting this area reported gales on Oct 16, including the **Celebrity Millennium** (9HJF9) passing north of the Yucatan Channel through the Straits of Florida, the **Zuiderdam** (PBIG) while in the Yucatan Channel, as well as the **Iver Experience** (PECF) also moving through the Straits of Florida. The low drifted northwestward along the northern fringes of the Yucatan Peninsula and allowed for interaction with the frontal zone, inducing a more elongated north to south cyclonic circulation by Oct 18, and an appearance in satellite imagery more typical of sub-tropical cyclones. This shifted the area of gales northward to 28N, before the whole system was forced off to the northeast late on Oct 18 and into Oct 19 by a new cold front shifting southeast into the Gulf. This new front was responsible for the next gale event, which commenced at 00 UTC Oct 19 and lasted only 12 hours. As the cold front moved into the northeastern Gulf of Mexico, southerly gales developed ahead of the front, occurring across the waters offshore of northeast Florida, and shifted eastward by Oct 20 as the front moved off the Florida coast and into the Atlantic.

The next significant gale event across the southwest North Atlantic did not occur until1200 UTC Nov 5, when low pressure deepened to 1001 hPa along a slow moving cold front that extended from just northwest of Bermuda through the central Bahamas. The pressure gradient between high pressure well behind the front and this deep layered low center produced a zone of fresh northeasterly gales extending from well offshore of Cape Hatteras, NC into northwestern portions of the forecast area. The low drifted eastward to near 28N69W by Nov 6, became occluded, and began to separate from the front ***(Figure 3)***. This gale center remained relatively stationary for the next 36 hours, while showers and thunderstorms surrounding the system gradually became more symmetrical. By 0600 UTC Nov 8, the satellite signature of this low pressure center appeared as a classical sub-tropical cyclone, and the low was upgraded to sub-tropical storm Sean. Gale warnings were then replaced with tropical storm warnings. For a summary of the life cycle of Sean, see the NHC website at: http://www.nhc.noaa.gov/data/tcr/AL192011_Sean.pdf This event also generated very high seas across a large expanse of the SW N Atlantic, with peak seas to 22 ft, and generated large northeast swells that pounded the Bahamas and Florida coastlines. This was the longest lived non-tropical cyclone warning event for the period, lasting 72 hours before transitioning to tropical storm warnings.

A middle level trough persisted across the central Atlantic throughout much of November and contributed to the formation of a gale center across the central Atlantic on 1200 UTC Nov 21. Gales prevailed across the northwest quadrant of this low as it merged with a cold frontal boundary to the north and shifted northeastward and out of the area within 48 hours. Days later, a gale center developed in similar fashion farther to the west, along about 60W, commencing at 1200 UTC Nov 30, and

lifted northward and out of the area within 30 hours.

Six warning events occurred across the southwest North Atlantic in December, all but one associated with cold fronts and frontal troughs. The lone event not associated with a frontal system was a long lived, 60 hour event commencing on 0600 UTC Dec 10. The persistent middle level trough lingering across the central Atlantic throughout much of December produced a broad surface trough along 55W by Dec 10. A cold front draped across top of this inverted trough produced easterly gales to the north of the inverted trough, as verified by the freighter **Buzzard Bay** (A8JH8). The inverted trough then drifted westward and amplified over the next 2 days, finally allowing the pressure gradient to relax by 1800 UTC Dec 12.

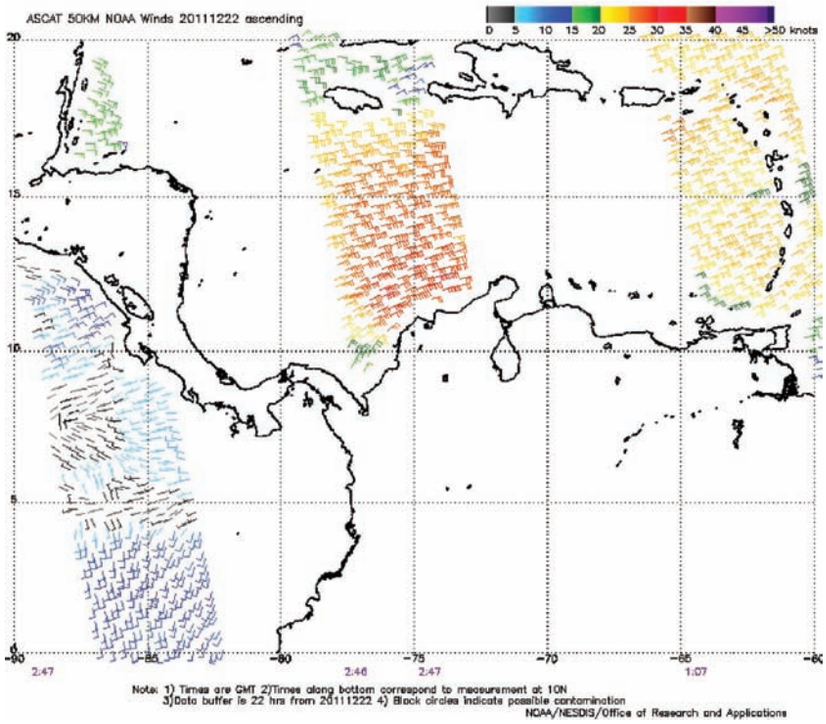

Figure 4. NOAA image of Caribbean, showing ASCAT wind vectors from 22 Dec 0107 and 0247 UTC passes. Darkest red flags indicate 30-35 kts.

Gulf of Mexico Warnings

The five remaining non-tropical warnings issued across the Gulf of Mexico occurred during the months of November and December, all pressure gradient induced behind cold fronts. The strongest of these gale events, beginning Nov 27, produced strong northerly gales to 45 kts across SW portions of the Gulf of Mexico, through the central Bay of Campeche and Chivelas pass, and exited into the eastern Pacific across the Gulf of Tehuantepec, where storm force winds occurred. See Tropical Eastern Pacific section fro more details of the events effect in that region. The cruise ship **Carnival Triumph** (C6FN5) reported gales behind the front, across the northwestern Gulf of Mexico on Nov 27, while the **Norwegian Star** (C6FR3) also reported gales across the northwest Gulf on Nov 27, and then again across the southwestern Gulf on Nov 28.

Caribbean Warnings

There was only one non-tropical cyclone warning event across the Caribbean during this period, which commenced on 1200 UTC Dec 21, across the climatologically prevalent area of strongest tradewinds found south of 14N to the coasts of Colombia and northwestern Venezuela. As is typical of these events, strong tradewinds across this area were enhanced to gale force by a strong pressure gradient between semi-permanent low pressure across the Colombian Basin and strong high pressure building across the sub-tropics. In this case, a very strong Atlantic high pressure ridge centered just southeast of Bermuda induced a prolonged 54 hour period of gales. ***Figure 4*** shows a NOAA image of ASCAT wind vectors from 0247 UTC Dec 22, where darkest red wind flags indicate gale force winds, generally south of 13N to just offshore of the coast of Colombia. Gales were reported during this time by the **Crown Princess** (ZCDM6) and the **Emerald Princess** (ZCDP8) across the southern Caribbean. Gales prevailed during this period from 11N to 15N, and also occurred during the afternoon and evening hours of Dec 21, where frequent squalls prevailed from 15N to 18N south of Hispaniola, associated with a dying frontal zone stretched across the central Caribbean.

Eastern North Pacific Ocean South of 30N and East of 140W

The fall and winter months are an active time for gale and storm events in this portion of the Eastern Pacific. The majority of the events usually occur in the Gulf of Tehuantepec.

Onset	Region	Peak Wind Speed	GALE/STORM Duration
1800 UTC 19 Oct	Gulf of Tehuantepec	40 kts	48 hr
0600 UTC 25 Oct	Gulf of Tehuantepec	35 kts	12 hr
0600 UTC 29 Oct	Gulf of Tehuantepec	35 kts	90 hr
1200 UTC 02 Nov	Gulf of California	35 kts	12 hr
1200 UTC 10 Nov	Gulf of Tehuantepec	45 kts	42 hr
1800 UTC 12 Nov	Baja California	35 kts	12 hr
0000 UTC 18 Nov	Gulf of Tehuantepec	40 kts	12 hr
0600 UTC 24 Nov	Gulf of Tehuantepec	35 kts	18 hr
1800 UTC 27 Nov	Gulf of Tehuantepec	50 kts	102 hr / 12 hr
1200 UTC 07 Dec	Gulf of Tehuantepec	45 kts	42 hr
1200 UYTC 10 Dec	Gulf of Tehuantepec	40 kts	18 hr
0000 UTC 18 Dec	Gulf of Tehuantepec	45 kts	36 hr
0600 UTC 23 Dec	Gulf of California	35 kts	36 hr
0600 UTC 24 Dec	Gulf of Tehuantepec	35 kts	06 hr
0000 UTC 26 Dec	Gulf of Tehuantepec	40 kts	42 hr
0600 UTC 28 Dec	Gulf of Tehuantepec	35 kts	12 hr

Table 2. Non-tropical Cyclone Warnings issued for the Northeast Pacific Basin between 01 Sep and 31 Dec 2011.

Time/Date	Ship	Location	Wind Speed	Seas
1400 UTC 21 Oct	Coral Princess (ZCDF4)	15.6N 95.4W	38 kts	6 ft
0800 UTC 18 Nov	Coral Princess (ZCDF4)	15.3N 95.3W	40 kts	6 ft
0300 UTC 25 Nov	Cap Palmerston (A8MW6)	14.8N 95.0W	35 kts	9 ft
1200 UTC 07 Dec	Hansa Visby (ELWR5)	14.5N 95.2W	35 kts	6 ft
1300 UTC 24 Dec	Coral Princess (ZCDF4)	15.6N 95.4W	38 kts	6 ft

Table 3. Ship reports that verified gale events over the Gulf of Tehuantepec between 01 Sep 2011 and 31 Dec 2011.

The 2011 season produced 13 Gulf of Tehuantepec, 2 Gulf of California, and 1 Baja California gale force or greater wind events. ***Table 2*** provides additional details on these events.

Ship reports are a vital source of data in verifying gale and storm events. A few choice ship reports that directly verified some of this season's gales are enumerated in ***Table 3.***

The Gulf of Tehuantepec gap wind events are usually driven by mid-latitude cold frontal passages through the Chivela Pass, a narrow valley within the Isthmus of Tehuantepec. The post cold frontal northerly winds over the southwest Gulf of Mexico surge through the Chivela Pass and result in gap wind events through the pass delivering stronger winds into the Gulf of Tehuantepec. The events are of various duration with the longer events associated with reinforcing secondary cold fronts in the Gulf of Mexico.

A gale event in the Gulf of Mexico, which occurred behind a cold front on Nov 10, 2011 produced, one of the strongest gale events in the Gulf of Tehuantepec for the September to December period **(*Figure 5*).** A European Advanced Scatterometer (ASCAT) and an Indian Oceansat-2 Scatterometer (OSCAT) pass captured the event. The passes were within two hours of each other with maximum winds of 35 kts retrieved **(*Figure 6*)**. The OSCAT imagery was not operationally available to forecasters in the Tropical Analysis and Forecast Branch (TAFB)

on Nov 10, 2011. It was retrieved later to further verify the gale event. Since then, the OSCAT wind retrievals have undergone some calibration and imagery has been made routinely available to TAFB forecasters with a four and half hour retrieval delay. The swath is 1800 km wide and is displayed with a 25 km resolution. It is good to note that all scatterometer imagery in the Gulf of Tehuantepec depicting gales and storms have no heavy precipitation complications thus the wind vectors are very reliable.

Another pair of ASCAT and OSCAT imagery is shown in ***Figure 7*** depicts the long duration gale/storm event that commenced on Nov 29, 2011. The scatterometer passes were two and a

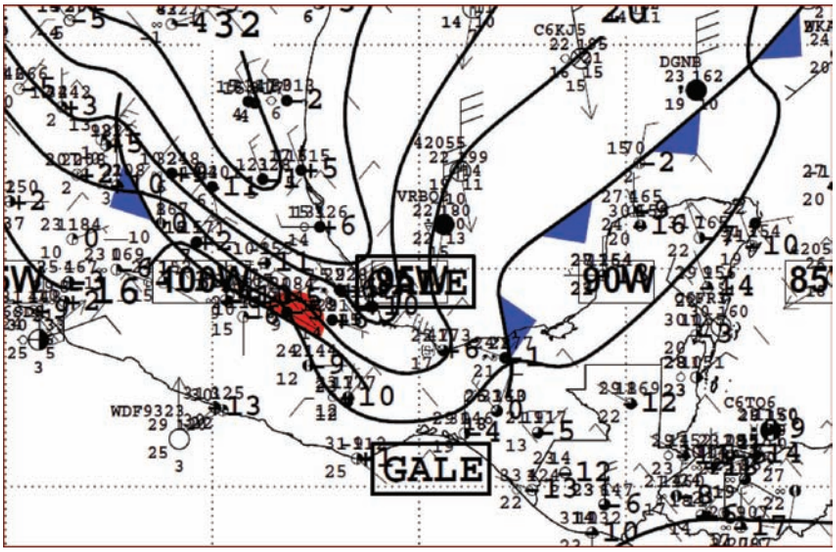

Figure 5. National Weather Service Unified Surface Analysis (USA) map valid 1800 UTC 10 November 2011.

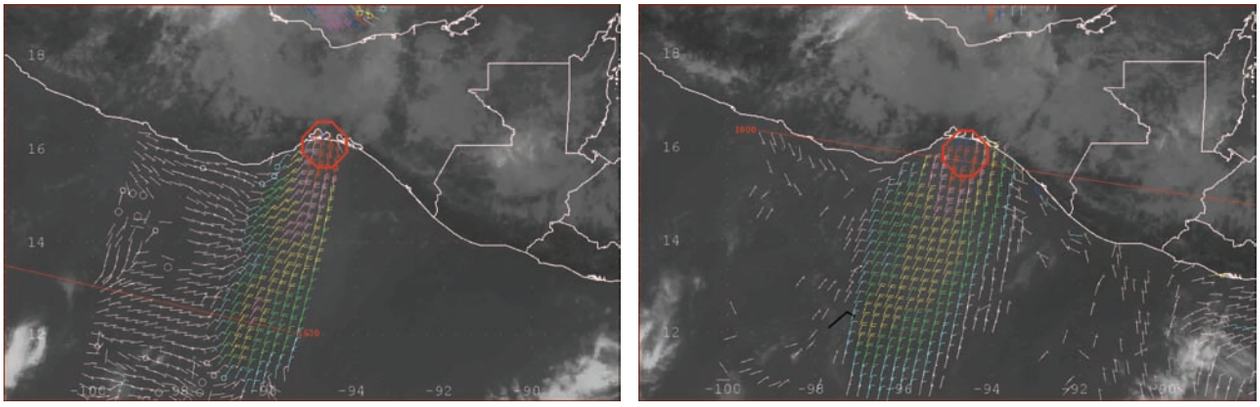

Figure 6. Gulf of Tehuantepec gap winds. 1629 UTC 10 November 2011 ASCAT images indicating 35 kts winds (top) and an 1809 UTC 10 November 2011 OSCAT image indicating 36 kts winds (bottom).

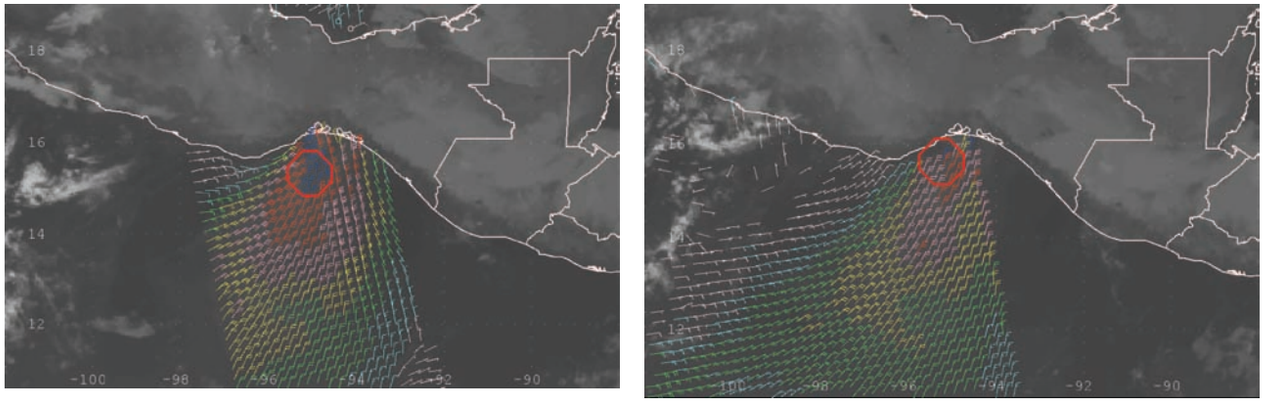

Figure 7. Gulf of Tehuantepec gap winds. 0405 UTC 29 November 2011 ASCAT image indicating 39 kts winds (top) and an 0641 UTC 29 November 2011 OSCAT image indicating 39 kts winds (bottom).

half hours apart. The passes retrieved maximum winds of 39 kts and were direct hits, covering significant areas of the northeast Pacific Ocean south of the Gulf of Tehuantepec.

Two Gulf of California gale events occurred during the September to December 2011 time frame. The second event commenced on Dec 23, 2011. A tight surface pressure gradient over the Gulf of California produced gale force northerly winds over the entire gulf **(*Figure 8*)**. An ASCAT pass at 1638 UTC 23 December 2011 captured an area of northwesterly winds of 30 to 35 kts over the Gulf of California **(*Figure 9*).**

A gale event just off the west coast of Baja California occurred on Nov 12, 2011. An extra tropical gale center moved into the area from the northwest and drifted off Baja California near 30N120W **(*Figure 10*).** An earlier 0500 UTC ASCAT pass indicated an area of northwest winds of 30 to 35 kts within the southern semicircle of the gale center **(*Figure 11*).** ⚓

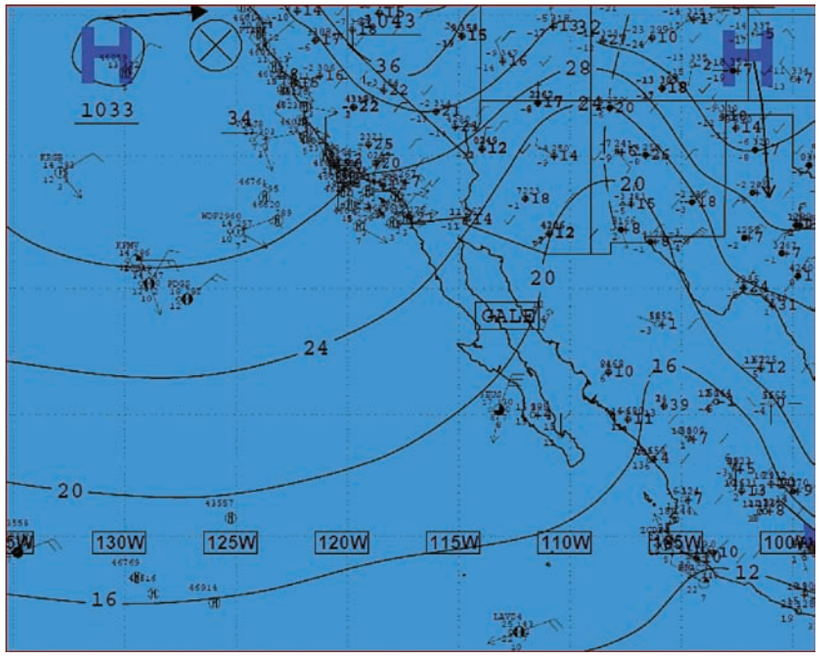

Figure 8. National Weather Service USA map valid 0600 UTC 23 December 2011.

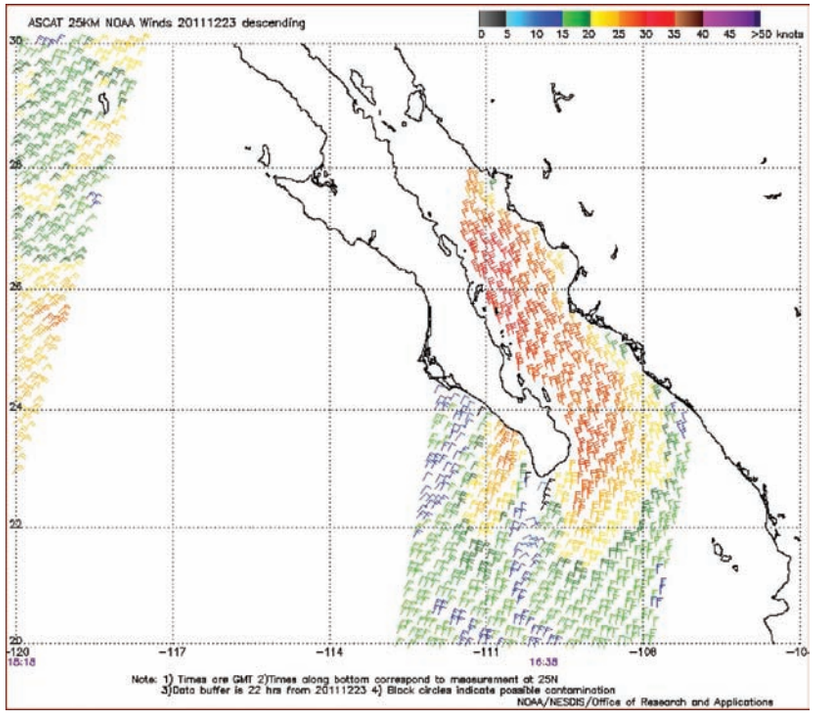

Figure 9. 25 km ASCAT scatterometer pass valid 1638 UTC 23 December 2011. The pass depicted a substantial area of 30 to 35 kt winds in the west-central portion of the Gulf of California.

References

Storm Data Report, Oct 2011, NWS Jacksonville

Storm Data Report, Oct 2011, NWS Melbourne

Avilla, L.A., 2012. Tropical Cyclone Report: Tropical Storm Sean. National Hurricane Center. http://www.nhc.noaa.gov/data/tcr/AL192011_Sean.pdf.

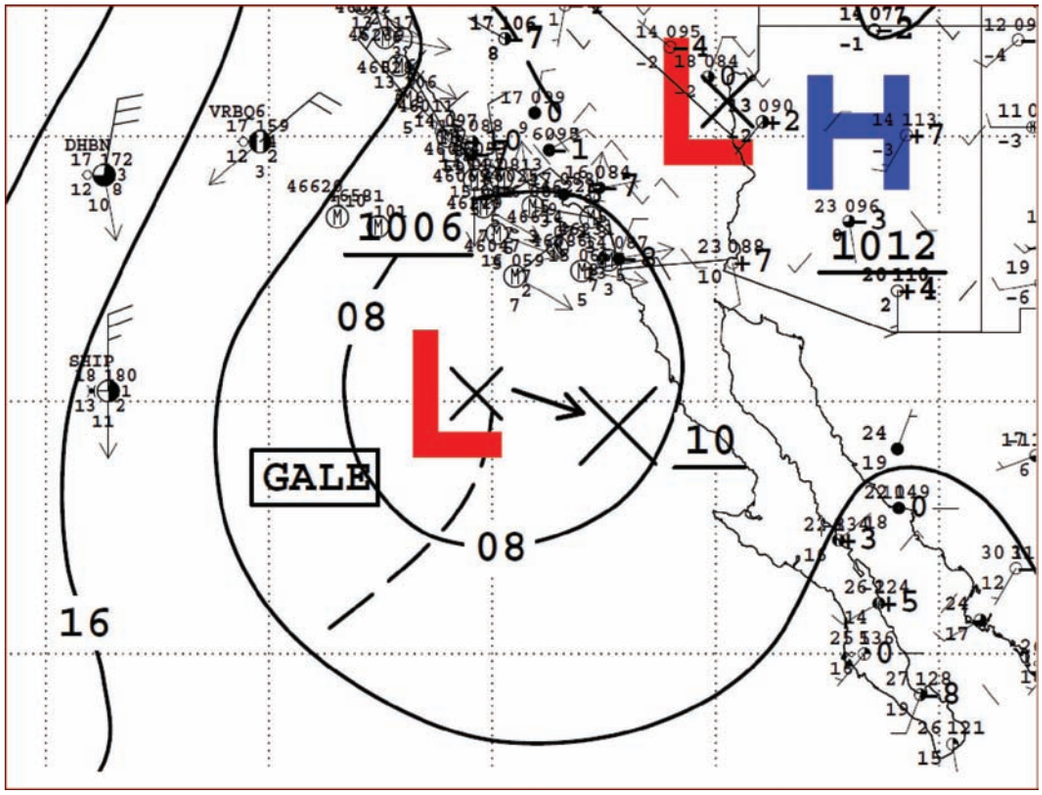

Figure 10. National Weather Service USA map valid 1800 UTC 12 November 2011.

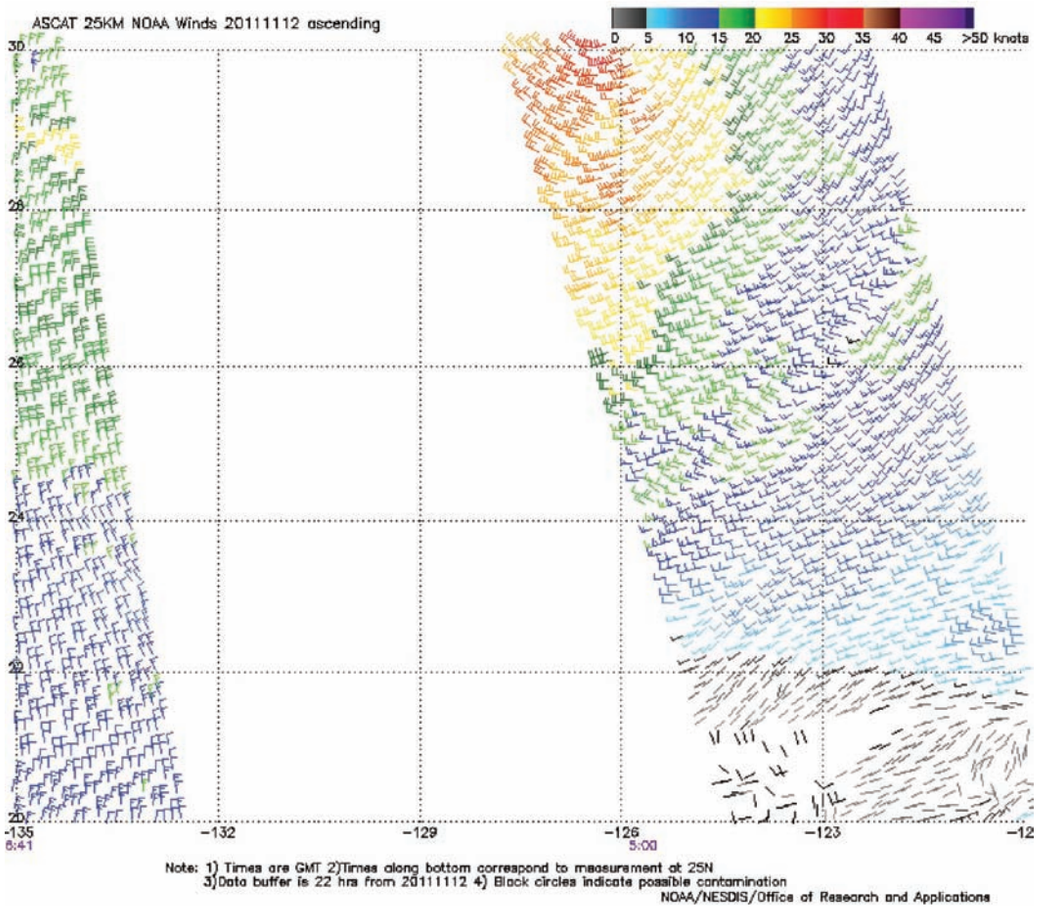

Figure 11. 25 km ASCAT scatterometer pass valid 0500 UTC 12 November 2011.

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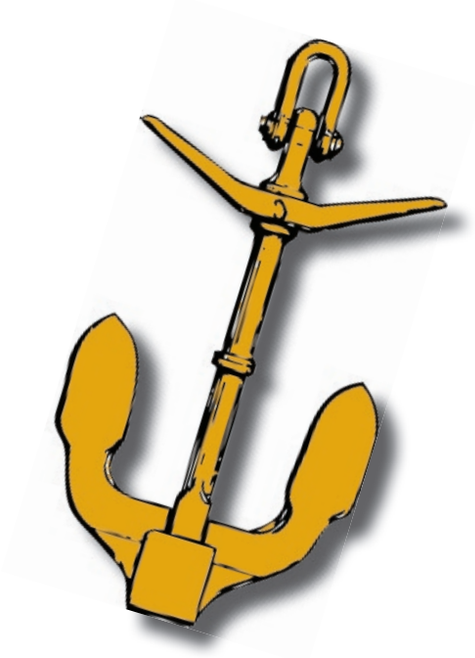
VOS Program Awards

For the 5th consecutive year, the vessel Philadelphia Express received the annual VOS Award (2010) for outstanding support to the Marine Observing Program. In 2010 the crew provided an outstanding 1358 quality marine observations. They also received the 5 Year Pennant for winning 5 consecutive annual VOS performance awards from 2006 to 2010. During that period the crew of the Philadelphia Express transmitted over 7000 marine observations. NOAA congratulates the crew for their consistent dedication to the marine observing program over the past 5 years. Well Done!!

Left to Right: Dk Cadet Eric Isaksen, 3/M Ryan Guthrie (holding the plaque), Capt. Dave Sulin, 2/M Brandon Teal, C/M Chris Hendrickson. All displaying the 5 year Flag Award.

Other valuable observers participating over the 2010 reporting year were Capt. Scott Putty, C/M Chuck Rau, 2/M Mark Meyer, 2/M Brendan Smith, 2/M Charlie Orr, 3/M Jeremy Cunningham, 3/M Andrew Longnecker, and Cadets Ian Nisley, Kevin Miele, Fred Wheeler, and Kevin Fink.

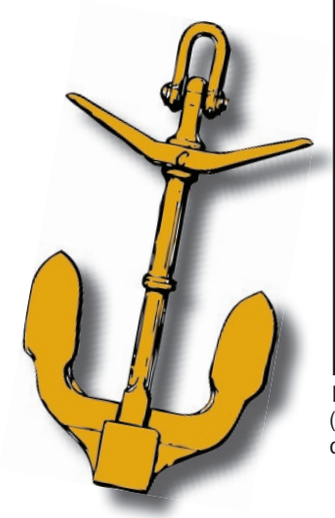


Horizon Lines Senior Superintendent Wally Becker accepts 2010 VOS Annual Award on behalf of Capt John Loftus and the crew of M/V HORIZON TRADER.

VOS Program Awards

Horizon Challenger was presented the 2010 VOS Award for outstanding performance in Marine Observation Reporting. The crew provided over 1066 quality marine observations in 2010. This is the sixth annual award since 2003. Horizon Challenger's best meteorologist is Hector Rodriquez. Congratulation!

For the second consecutive year the Sealand Racer was presented the annual VOS Award (2010) for outstanding performance in marine observations. The crew provided over 1844 quality observations in 2010 and was in the VOS Top 50 reporters. The National Weather Service and NOAA extend a special thanks to the Masters and Mates of the Sealand Racer. Thanks for the dedicate work. Pictured left to right, Chief Mate Steve Watt, 2nd Mate Roy Valentine, Captain J. Pratt, 3rd Mate Robert Neumyer and Cadet Jeffery Mark



For the second consecutive year the Sealand Eagle was presented the annual VOS Award (2010) for outstanding performance in marine observations. The crew provided over 1061 quality observations. Picture (left to right) are: NYM Deck Cadet Fulgencio Anavitate, 3/m Trevor Battles, C/m Mike LaMaina, KP Deck Cadet Harl Romine, 2/m Erik Stark.

Not pictured but deserving credit for 2010 reporting are: C/m John Kelly, 2/m Brent McClaine, 2/m Cisco Medal, 3/m Chris Kalinowski, 3/m Roy Valentine, KP D/c Aaron Madler, NYM D/c Nick Terek

VOS Program Awards

For the second consecutive year the Sealand Eagle was presented the annual VOS Award (2010) for outstanding performance in marine observations. The crew provided over 1084 quality observations. Accepting the award is from left to right: 3/M Ian Falkenberg, 2/M Joe Ward, C/M Dan Martin and Cadet Sam Heard

The Charleston Express was presented the annual VOS Award (2010) for outstanding performance in marine observations. The crew provided over 1053 quality observations. The National Weather Service and NOAA extend a special thanks to the Masters and Mates of the Charleston Express. Well done. Pictured (left to right) are: Second Mate Richard Burkle, Chief Mate Bill O'Connor, Captain Peter Curtis, Third Mate Aaron Voorhees, Great Lakes Deck Cadet Matthew Lang, Kings Point Cadet Blake Krell. Not pictured Captain John Farmer, Chief Mate Brendan Smith.

For the fourth consecutive year, the vessel St Louis Express received the annual VOS Award (2010) for outstanding support to the Marine Observing Program. The crew of the St Louis Express provided an outstanding 4270 quality marine observations in 2010. NOAA congratulates the crew for a job well done. Accepting the award from left to right is C/Mate Stephen Jones and Captain Robert Strobel. Not Pictured but deserve special recognition are:

Captain: W. L. Miles
C/Mates: M.B O'Brien, P. Curtis, P. Grate
2nd Mates: R. Newton, A. Roland, S. Halley, S. Roberto
3rd Mates: C. Moore, M. Bokorney, K. Kesse, M. Lynch, F. Pipitone
Deck Cadets: C. Nate, M. Hearn, M. Bardoutsos, R. Hadley, S. Green

Captain Strobel expressed his Thanks to all of them for their efforts in sending voluntary marine weather observations.

VOS Program Awards

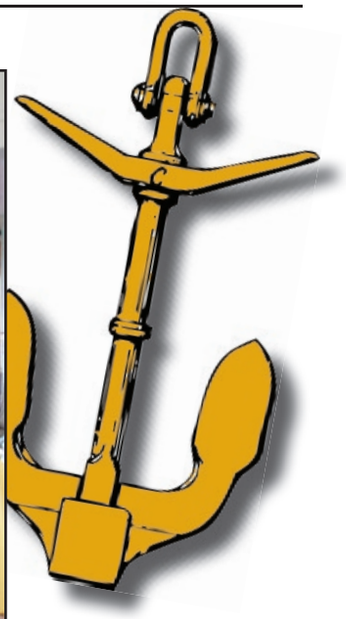
2010 VOS Observation Award winner to the Wilfred Sykes. Pictured is Captain Mike Grzesiek.

2010 VOS Observation award winner the Arthur M. Anderson. Pictured is 1stMate Kenneth M. Clemons.

VOS Program Awards

2010 Observation Award to the M/V Maumee.

From left to right are crew that sailed on the Maumee on her 82nd and final season, Shawn Pavlovich (Bosun), Christopher Edyvean (First Officer), Mark Stanger (Master), Jay Love (Able-Seaman). Not pictured are Deck Officers David Richmond, David Gruber, Eric Johnson & GLMA Deck Cadet Danny Hecko, who all contributed throughout the 2010 season.



2010 VOS Observation Award to the American Century. Pictured is 1stMate Ken Suedek, 2ndMate Gary Thompson, 3rdMate Steve Peterson and Capt. Bruce Dunlap.

VOS Program Awards

2010 VOS Observation Award to the Manitowoc. Pictured on the left is 1stMate Anthony Szymanski and to his right is Capt. Jeff Letzkus.

Captain Tim English accepts the 2011 VOS Annual Award from the NY/NJ PMO on behalf of the crew of APL PEARL. Thanks to all members of the crew for submitting over 800, high quality observations, in 2010.

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National Weather Service VOS Program New Recruits:

July 1 through October 31, 2011

SHIP NAME	CALL SIGN
Algolake	VCPX
American Courage	WDD2879
Brotonne Bridge	VRHO2
Capt. Henry Jackman	VCTV
Carnival Magic	3ETA8
Eagle Tacoma	S6NK2
Maersk Wismar	3EXK5
Major Bernard F. Fisher	KBGK
Mustafa Dayi	TCZF2
Pacific Santa Ana	A8WI3
Trailblazer	WDE6541
Tropic Express	HO7723

12 NEW RECRUITS! WAY TO GO!!!

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VOS Cooperative Ship Report:

January through December 2011

Ship Name	Call Sign	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Achievement	WDF2728	0	0	0	0	47	29	56	67	112	20	170	60	561
Adrian Maersk	OXLD2	0	0	0	0	0	0	0	0	0	19	10	4	33
Advantage	WPPO	4	0	9	13	8	37	13	9	1	1	0	0	95
Adventure Of The Seas	C6SA3	156	244	380	334	396	290	324	299	370	350	299	76	3518
Adventurer	WBN3015	1	20	2	16	3	19	8	10	0	0	0	10	89
Al Huwaila	C6VG2	24	17	11	5	1	0	0	0	9	0	0	0	67
Al Khuwair	C6VM6	0	20	37	12	16	6	0	24	8	0	36	13	172
Al Marrouna	C6VF5	53	60	46	52	52	38	74	79	1	0	38	71	564
Alaska Mariner	WSM5364	9	33	7	34	25	85	117	153	69	93	11	22	658
Alaska Titan	WDE4789	12	0	0	0	0	0	0	0	0	11	3	8	34
Alaskan Explorer	WDB9918	87	77	32	26	88	124	136	86	212	126	73	76	1143
Alaskan Frontier	WDB7815	40	17	34	45	0	68	65	48	38	47	28	20	450
Alaskan Legend	WDD2074	23	60	116	101	0	36	0	0	25	12	39	60	472
Alaskan Navigator	WDC6644	13	40	55	49	7	0	64	163	135	6	7	7	546
Albemarle Island	C6LU3	50	32	34	33	50	35	37	24	52	57	32	33	469
Alert	WCZ7335	2	24	20	42	21	4	4	3	3	4	19	3	149
Algolake	VCPX	0	0	0	0	3	0	1	0	0	0	13	27	44
Algoma Discovery	CFK9796	0	0	0	0	0	13	28	3	21	26	0	7	98
Algoma Guardian	CFK9698	0	0	0	7	11	9	39	22	3	14	13	9	127
Algoma Navigator	VGMV	0	0	0	0	0	0	6	3	0	13	16	3	41
Algoma Progress	VDRV	17	0	1	34	28	10	5	23	31	20	40	11	220
Algoma Spirit	CFN4309	0	8	50	8	5	15	6	14	14	5	37	35	197
Algorail	VYNG	0	0	0	0	1	108	19	59	0	0	46	38	271
Algosoo	VGJD	0	0	0	0	0	0	16	21	0	0	16	11	64
Algoway	VDFP	0	0	0	1	38	38	11	46	46	5	16	2	203
Alkin Kalkavan	TCOL6	0	0	0	0	0	0	1	0	0	0	0	0	1
Alliance Beaumont	WKDY	30	25	0	0	27	59	51	31	36	47	46	48	400

Ship Name	Call Sign	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Alliance Charleston	WRAH	29	24	29	55	62	33	60	44	35	50	95	92	608
Alliance St Louis	WGAE	12	21	5	27	19	39	10	25	36	19	18	0	231
Allure Of The Seas	C6XS8	7	15	1	2	0	0	2	6	33	21	63	32	182
Alpena	WAV4647	0	0	3	11	2	10	16	12	2	0	33	1	90
Altair Voyager	C6OK	3	0	2	18	41	5	48	5	6	22	14	22	186
American Century	WDD2876	55	0	78	299	306	309	352	296	265	435	439	353	3187
American Courage	WDD2879	0	0	0	0	5	7	0	0	0	0	7	7	26
American Integrity	WDD2875	42	0	13	79	57	25	10	16	22	10	18	29	321
American Mariner	WQZ7791	0	0	6	38	25	22	31	24	20	16	27	24	233
American Spirit	WCX2417	16	0	7	39	56	76	46	23	57	53	52	46	471
American Tern	WAHF	4	18	13	27	45	16	6	0	0	10	57	4	200
Amsterdam	PBAD	55	34	42	31	81	165	129	108	84	147	177	171	1224
Andromeda Voyager	C6FZ6	9	45	20	59	25	10	45	36	14	53	48	23	387
Antonis I. Angelicoussis	C6FP5	72	74	26	23	65	72	40	84	54	3	54	31	598
Antwerpen	VRBK6	64	53	111	67	69	74	64	88	136	55	35	39	855
APL Agate	WDE8265	55	41	41	43	28	48	59	54	4	51	21	38	483
APL Belgium	9VKQ3	73	23	8	53	25	14	17	4	0	0	0	0	217
APL China	WDB3161	70	90	65	61	48	31	46	60	50	60	41	83	705
APL Coral	WDF6832	6	5	0	3	16	7	0	51	26	64	36	50	264
APL Cyprine	WDE8293	1	14	3	13	9	16	29	18	0	0	35	24	162
APL England	9VDD2	76	8	23	28	57	51	82	81	57	95	63	59	680
APL Garnet	9VVN	6	11	15	11	23	0	15	18	34	8	38	24	203
APL Japan	WDE8288	45	41	24	30	34	50	70	51	74	49	42	56	566
APL Kennedy	9VAY4	40	20	29	3	0	0	37	49	55	43	22	7	305
APL Korea	WCX8883	30	145	217	279	37	28	260	335	216	110	171	225	2053
APL Paradise	3ECJ7	0	0	0	0	0	0	0	0	0	54	42	29	125
APL Pearl	WDE8264	200	58	67	90	117	79	28	110	91	65	50	111	1066
APL Philippines	WCX8884	34	19	44	39	18	22	46	56	33	35	44	45	435

Ship Name	Call Sign	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
APL Sardonyx	9VVU	55	42	59	58	46	80	26	23	19	71	69	48	596
APL Scotland	9VDD3	30	41	2	25	31	50	42	45	77	38	52	16	449
APL Singapore	WCX8812	38	44	35	21	25	16	42	40	42	69	66	75	513
APL Tennessee	9HA2064	40	30	27	27	0	0	0	0	38	22	15	82	281
APL Texas	VRFH2	0	11	54	14	42	5	13	18	4	2	0	9	172
APL Thailand	WCX8882	49	48	34	39	12	42	72	62	33	23	61	58	533
APL Tourmoline	9VVP	0	0	0	0	0	21	24	25	18	29	39	27	183
APL Washington	VRFD6	0	0	0	0	0	13	20	12	4	0	0	6	55
Aquarius Voyager	C6UC3	4	18	8	47	8	10	3	44	50	1	11	42	246
Aquavictory	A8VA2	0	0	0	0	0	19	10	2	3	0	0	0	34
Arctic Bear	WBP3396	0	0	0	10	2	1	0	0	1	5	1	0	20
Arctic Ocean	C6T2062	3	41	23	51	42	32	46	46	34	0	0	0	318
Arcturus Voyager	C6YA7	1	0	26	11	93	64	60	58	57	31	62	85	548
Aries Voyager	C6UK7	57	76	69	51	33	12	50	2	4	17	29	31	431
Arthur M. Anderson	WE4805	156	0	32	200	147	84	295	276	247	220	182	227	2066
Atlantic Breeze	VRDC6	20	32	16	24	15	14	21	1	0	0	0	0	143
Atlantic Cartier	SCKB	38	22	28	18	15	24	14	8	24	24	18	33	266
Atlantic Explorer (AWS)	WDC9417	0	0	0	0	1	0	0	0	0	0	0	0	1
Atlantic Explorer (AWS)	NWS0021	0	116	388	194	181	410	404	237	153	620	300	238	3241
Atlantic Frontier	VRDJ7	0	0	0	6	1	0	184	186	186	179	77	44	863
Atlantic Gemini	VRDO9	0	219	36	0	0	0	0	0	0	0	0	23	278
Atlantic Grace	VRDT7	17	47	463	363	136	44	23	28	1	0	0	0	1122
Atlantic Lily	VREF6	0	0	10	22	37	38	9	25	13	2	0	0	156
Atlantic Ocean	C6T2064	20	0	31	31	20	21	16	32	27	39	8	47	292
Atlantic Rose	VREF7	0	0	0	0	0	0	0	0	35	17	52	49	153
Atlantis (Aws)	NWS0020	0	0	262	153	733	710	740	740	717	703	717	743	6218
Attentive	WCZ7337	0	9	18	74	0	0	15	1	14	6	12	0	149
Aurora	WYM9567	160	286	273	314	340	635	302	680	370	0	0	0	3360
Aware	WCZ7336	0	0	33	0	0	0	1	0	0	4	0	0	38

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Axel Spirit	C6FY5	57	80	86	80	86	76	72	58	14	34	82	59	784
Azamara Journey	9HOB8	39	142	83	44	4	3	1	106	54	24	6	4	510
Azamara Quest	9HOM8	36	37	51	24	51	31	7	29	29	1	2	0	298
Badger	WBD4889	0	0	0	0	0	13	13	19	1	2	0	0	48
Baltic Bear	V7QN4	0	0	0	0	52	45	40	11	0	0	0	0	148
Baltic Cove	A8VG9	0	0	1	11	6	1	0	0	4	11	0	0	34
Baltic Wind	A8SU8	0	1	0	0	0	6	13	8	3	0	0	0	31
Baltic Wolf	V7QX8	0	0	64	11	0	20	62	70	29	115	21	0	392
Barbara Andrie	WTC9407	1	0	2	10	5	21	31	36	31	22	10	33	202
Barbara Foss	WYL4318	7	0	14	8	2	0	0	0	0	3	6	25	65
Barrington Island	C6QK	38	52	51	35	50	59	29	50	26	40	27	27	484
Bell M. Shimada	WTED	0	0	0	0	0	0	83	280	36	0	0	0	399
Bell M. Shimada (AWS)	NWS0025	0	0	227	331	185	240	250	0	0	0	0	0	1233
Berge Nantong	VRBU6	182	493	156	105	60	47	23	11	6	48	39	12	1182
Berge Ningbo	VRBQ2	2	0	1	0	41	79	76	2	0	52	1	0	254
Berlian Ekuator	HPYK	30	5	23	17	0	0	0	0	0	0	0	0	75
Bernardo Quintana A.	C6KJ5	67	61	68	72	54	62	57	45	44	56	38	56	680
Berra K	TCTH9	0	0	0	0	0	0	15	15	9	7	0	0	46
Bluefin	WDC7379	0	0	0	0	2	58	64	63	42	0	0	0	229
Brilliance Of The Seas	C6SJ5	0	0	0	1	0	0	0	0	1	0	0	0	2
Brotonne Bridge	VRHO2	0	0	0	0	0	0	0	0	0	0	0	45	45
Buccaneer	WYW5588	0	0	1	5	11	0	0	0	0	2	0	0	19
Buffalo	WXS6134	12	0	0	0	0	0	1	0	0	17	8	30	68
Bulk Mexico	A8VL8	0	0	0	0	0	0	18	53	57	53	85	109	375
Bulwark	WBN4113	16	4	20	18	60	59	19	16	16	45	12	0	285
Burns Harbor	WDC6027	28	0	0	36	49	47	57	7	8	56	65	53	406
California Voyager	WDE5381	42	2	6	31	55	13	23	38	2	37	28	43	320
Calumet	WDE3568	0	0	0	0	2	8	0	0	4	3	69	12	98

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Camai	KF003	0	0	0	0	6	0	2	7	1	1	0	0	17
Camellia	VRCP9	0	0	0	0	0	0	0	0	22	0	24	35	81
Capricorn Voyager	C6UZ5	29	9	15	11	1	15	25	37	34	41	25	16	258
Capt. Henry Jackman	VCTV	0	0	0	5	4	2	0	0	1	0	0	0	12
Carnival Conquest	3FPQ9	23	14	13	11	9	59	63	55	44	15	27	21	354
Carnival Destiny	C6FN4	38	29	23	53	57	125	137	73	13	53	73	61	735
Carnival Dream	3ETA7	30	49	35	8	7	30	32	33	11	27	9	6	277
Carnival Ecstasy	H3GR	15	5	0	12	24	18	0	8	1	4	18	10	115
Carnival Fantasy	H3GS	11	6	12	12	3	30	86	66	55	24	47	60	412
Carnival Fascination	C6FM9	2	0	3	6	83	39	61	37	8	16	14	9	278
Carnival Freedom	3EBL5	23	5	7	16	67	46	18	21	56	6	35	36	336
Carnival Glory	3FPS9	49	40	39	48	8	8	9	28	7	0	28	11	275
Carnival Imagination	C6FN2	33	43	40	49	3	34	14	1	3	9	34	55	318
Carnival Inspiration	C6FM5	74	46	15	3	26	16	67	53	30	34	17	36	417
Carnival Legend	H3VT	0	0	0	0	5	3	0	22	8	0	0	2	40
Carnival Liberty	HPYE	26	21	46	51	35	53	84	42	26	8	3	29	424
Carnival Magic	3ETA8	0	0	0	0	0	0	0	0	0	0	28	48	76
Carnival Miracle	H3VS	4	57	49	52	48	42	23	0	6	41	1	14	337
Carnival Paradise	3FOB5	11	6	26	28	31	36	27	1	0	0	0	0	166
Carnival Pride	H3VU	0	0	0	4	23	22	19	21	0	0	0	0	89
Carnival Sensation	C6FM8	25	43	10	1	0	0	7	0	33	37	32	46	234
Carnival Spirit	3FPR9	51	41	23	5	11	9	30	28	25	10	14	61	308
Carnival Splendor	3EUS	0	9	35	41	35	42	36	9	15	188	13	28	451
Carnival Triumph	C6FN5	0	19	31	17	19	18	21	31	72	22	14	11	275
Carnival Valor	H3VR	41	4	43	13	6	4	4	14	92	83	38	26	368
Carnival Victory	3FFL8	22	24	18	8	19	59	55	28	27	16	11	13	300
Caroline Maersk	OZWA2	0	0	37	42	39	41	51	12	14	11	9	0	256
Cason J. Callaway	WE4879	3	0	32	56	21	22	6	7	26	18	47	45	283
Castor Voyager	C6UZ6	0	66	20	62	64	23	36	55	30	84	43	37	520

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Celebrity Century	9HJI9	142	93	54	115	30	152	225	198	126	46	57	47	1285
Celebrity Constellation	9HJB9	417	530	351	319	312	305	269	297	299	274	290	333	3996
Celebrity Eclipse	9HXC9	649	636	692	629	659	628	534	384	467	496	459	588	6821
Celebrity Equinox	9HXD9	319	267	573	580	536	466	341	343	394	454	390	212	4875
Celebrity Infinity	9HJD9	27	45	147	75	85	84	39	128	95	71	47	139	982
Celebrity Mercury	9HJG9	0	388	0	0	0	0	0	0	0	0	0	0	388
Celebrity Millennium	9HJF9	194	296	287	186	227	246	225	236	195	151	157	114	2514
Celebrity Silhouette	9HA2583	0	0	0	0	0	0	189	501	503	409	399	407	2408
Celebrity Solstice	9HRJ9	546	526	353	427	388	296	170	254	134	194	161	142	3591
Celebrity Summit	9HJC9	85	90	235	192	264	242	155	107	107	137	134	118	1866
Centurion	WBN3022	9	11	6	0	3	0	13	29	12	0	0	0	83
Chamai	WDD5880	0	0	0	0	0	0	10	2	0	0	0	0	12
Charles Island	C6JT	48	16	14	21	19	4	31	22	15	28	30	27	275
Charleston Express	WDD6126	91	96	119	131	101	96	121	135	115	192	151	180	1528
Chemical Pioneer	KAFO	0	44	25	22	11	13	33	14	2	7	4	0	175
Chenega	WDC3997	0	0	0	0	0	0	0	0	7	2	0	0	9
CMB Biwa	ONED	6	3	0	0	0	0	0	0	0	0	0	6	15
Commitment	WDE3894	8	14	0	5	46	26	29	0	9	10	2	2	151
Corwith Cramer	WTF3319	0	7	25	0	17	21	1	0	0	0	0	0	71
Costa Allegra	ICRA	17	8	4	0	0	0	0	0	0	0	0	157	186
Costa Atlantica	IBLQ	1	3	14	0	0	0	0	0	0	0	0	0	18
Costa Fortuna	IBNY	111	172	134	21	0	0	0	0	0	0	0	0	438
Costa Luminosa	ICGU	0	3	1	0	0	0	0	0	0	0	151	414	569
Costa Marina	IBNC	0	15	90	40	53	157	151	143	137	120	39	0	945
Costa Mediterranea	IBCF	0	3	22	53	1	0	0	0	0	0	0	0	79
Costa Romantica	IBCR	0	39	61	55	30	3	0	0	0	0	0	0	188
Courage	WDE3893	11	2	5	7	15	1	11	0	0	0	0	0	52
Courage	WDC6907	4	1	22	16	4	0	3	2	0	1	18	22	93

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Crystal Marine	9VIC4	11	6	0	4	15	20	19	14	0	0	0	1	90
Darya Shanthi	VRXB2	2	57	66	114	19	18	1	0	0	0	0	0	277
Deepwater Millennium	V7HD2	29	23	33	39	27	28	35	29	43	17	42	1	346
Defender	WBN3016	1	0	0	40	11	29	65	23	2	1	20	16	208
Delaware II	KNBD	156	370	0	0	204	389	229	212	222	116	208	36	2142
Delaware II (AWS)	NWS0012	195	408	0	0	465	0	382	285	0	0	0	0	1735
Deliverance	WDE2632	1	0	0	7	37	26	44	9	2	1	0	1	128
Dependable	V7DI6	0	0	0	0	4	60	114	77	36	0	0	0	291
Diane H	WUR7250	0	0	0	4	7	8	12	1	11	15	0	0	58
Discoverer Clear Leader	V7MO2	103	93	76	67	86	67	69	61	78	54	61	114	929
Discoverer Deep Seas	V7HC6	200	150	148	179	179	200	185	203	174	137	89	133	1977
Discoverer Inspiration	V7MO3	0	0	0	0	0	0	0	0	1	0	22	24	47
Discoverer Spirit	V7HC8	78	48	28	17	13	0	16	0	0	40	18	21	279
Disney Dream	C6YR6	0	0	0	32	48	2	0	0	0	0	0	0	82
Disney Magic	C6PT7	19	31	58	52	1	46	49	10	0	7	2	0	275
Disney Wonder	C6QM8	54	58	92	31	165	133	176	89	74	21	20	0	913
Dominator	WBZ4106	0	18	31	4	0	15	22	23	6	1	0	0	120
Drew Foss	WYL5718	12	7	8	15	4	0	0	0	0	0	0	0	46
Duncan Island	C6JS	50	44	50	32	53	43	48	38	61	56	55	52	582
Eagle Albany	S6TD	0	0	145	216	127	155	49	0	0	0	0	0	692
Eagle Phoenix	9VKH2	0	2	0	0	0	0	0	0	0	0	0	0	2
Eagle Toledo	S6NK3	24	21	17	9	26	34	27	5	0	0	0	0	163
Eagle Torrance	9VMG5	17	19	19	5	4	0	0	5	10	0	0	0	79
Ecem Kalkavan	V7JT6	0	0	0	0	0	9	8	1	0	0	0	0	18
Edgar B. Speer	WQZ9670	0	0	12	103	75	44	42	16	36	13	52	46	439
Edwin H. Gott	WXQ4511	0	0	0	4	38	46	110	14	38	58	40	33	381
El Morro	KCGH	6	9	18	36	31	33	24	43	33	30	20	22	305
El Yunque	WGJT	51	47	39	9	63	72	68	47	55	72	34	32	589
Elversele	ONCT	0	0	0	0	57	77	33	1	0	0	0	19	187

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Empire State	KKFW	0	0	0	0	105	136	134	30	0	0	0	0	405
Enchantment Of The Seas	C6FZ7	0	33	27	17	5	1	0	0	0	0	14	0	97
Endeavor	WCE5063	617	671	715	692	598	720	741	741	716	742	714	742	8409
Endurance	WDF7523	42	14	14	9	44	40	70	40	22	10	24	25	354
Endurance	WDE9586	62	31	125	51	61	10	28	158	87	62	64	81	820
Ensign	WBN3012	4	0	0	9	17	20	14	20	0	0	0	0	84
Eot Spar	WDE9193	41	34	44	34	45	45	56	18	18	35	32	29	431
Erkan K	V7ND9	0	0	6	34	20	5	0	0	10	3	14	0	92
Ernest N	A8PQ6	14	0	0	46	23	14	6	0	17	18	7	76	221
Eships Dana	ZDJT6	0	0	10	24	47	61	36	26	16	7	7	0	234
Eskden	DYLD	0	0	0	8	27	46	45	47	0	0	0	0	173
Eurodam	PHOS	11	10	23	51	29	15	11	3	26	90	41	30	340
Eurus Lima	A8MH9	0	0	0	18	27	13	6	2	0	0	0	0	66
Eurus Lisbon	A8MI2	4	7	15	12	7	11	10	16	13	15	40	0	150
Ever Dainty	9V7951	23	8	18	12	17	11	2	1	0	1	0	9	102
Ever Develop	3FLF8	0	26	22	17	0	12	6	14	12	2	0	0	111
Ever Diadem	9V7955	13	1	12	0	4	25	0	0	0	0	13	25	93
Ever Diamond	3FQS8	0	0	0	0	0	33	51	50	59	64	65	79	401
Ever Excel	VSXV3	15	53	38	61	56	58	48	61	56	62	0	0	508
Ever Radiant	3FFR4	11	12	9	7	1	0	0	0	0	2	6	8	56
Ever Refine	3FSB4	62	69	31	66	12	9	18	40	92	86	99	121	705
Ever Result	3FSA4	2	1	0	0	2	6	21	17	20	21	10	5	105
Ever Reward	3FYB3	3	0	2	24	5	0	0	0	0	20	1	13	68
Ever Salute	3ENU5	33	10	8	7	0	0	0	0	0	0	0	0	58
Ever Steady	3EHT6	157	37	0	0	5	22	0	0	0	0	0	0	221
Ever Summit	3EKU3	0	0	0	0	0	7	3	0	0	0	0	13	23
Ever Ulysses	9V7962	0	0	0	3	0	1	3	0	0	14	0	4	25
Ever Unific	9V7961	0	0	0	0	69	11	0	9	21	0	0	0	110

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Ever Uranus	3FCA9	2	0	0	0	0	0	0	0	0	15	19	10	46
Ever Useful	3FCC9	0	0	0	0	0	28	14	0	8	17	0	0	67
Everest Spirit	C6FY8	40	97	102	45	43	38	90	72	47	2	71	62	709
Evergreen State	WDE4430	29	22	15	12	6	7	16	5	12	12	9	16	161
Excalibur	ONCE	52	82	108	90	67	63	96	79	73	82	64	84	940
Excel	ONAI	0	0	0	90	86	90	81	4	64	78	90	72	655
Excelerate	ONDY	0	0	0	52	31	61	66	101	90	80	73	111	665
Explorer	WBN7618	1	0	0	0	0	0	0	4	0	0	1	35	41
Explorer	ONFE	92	73	86	74	76	67	3	0	0	57	80	100	708
Explorer Of The Seas	C6SE4	30	32	56	28	27	23	33	34	16	28	39	23	369
Fairchem Friesian	V7PU7	0	14	9	14	33	0	0	0	0	0	0	0	70
Fairchem Mustang	HPOW	9	18	5	7	10	0	1	1	33	30	19	0	133
Fairchem Stallion	H3WD	0	0	0	0	0	0	33	20	1	30	30	44	158
Fairweather	WDB5604	1	0	0	0	2	14	28	4	18	0	0	0	67
Fairweather (AWS)	WTEB	0	0	0	0	0	578	643	742	556	328	0	0	2847
Falcon Confidence	D5AP3	21	0	44	56	76	0	0	0	0	0	0	0	197
Federal Asahi	VRWG3	10	18	0	0	0	0	0	0	0	45	2	24	99
Federal Mackinac	V7RI8	32	1	2	6	3	1	0	0	0	0	0	0	45
Federal Saguenay	8PNQ	0	0	0	30	236	23	57	149	113	3	5	2	618
Federal Schelde	8POF	0	0	0	0	0	0	0	0	0	6	2	1	9
Federal Venture	VRXL7	17	7	10	33	17	38	66	25	42	40	24	47	366
Flanders Loyalty	ONEV	26	20	13	1	44	43	32	2	0	0	0	0	181
Florida Voyager	WDF4764	0	1	5	20	28	43	28	58	42	39	20	31	315
FMG Cloudbreak	ONFW	36	45	54	39	15	22	17	17	21	41	28	54	389
FMG Matilda	ONFN	0	0	0	0	21	28	46	44	20	23	10	22	214
Freedom	WDB5483	12	3	2	1	17	0	0	0	0	0	0	0	35
Freedom Of The Seas	C6UZ7	0	0	15	0	0	0	0	0	0	0	0	15	30
Freja Dania	A8LC2	0	0	2	22	28	29	15	23	12	7	15	9	162
Fritzi N	A8PQ4	0	13	65	6	0	13	26	44	79	83	126	83	538

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Front Kathrine	V7QX2	17	61	55	42	36	5	48	112	112	112	102	35	737
Furth	V7MP5	1	14	31	40	18	12	1	13	5	24	0	0	159
G. L. Ostrander	WCV7620	0	0	0	19	27	20	18	51	40	55	48	26	304
Garden City River	S6AJ8	0	0	0	0	0	0	0	0	0	7	33	25	65
Gauntlet	WBN6511	43	21	26	8	11	28	24	0	0	0	6	0	167
Gemini Voyager	C6FE5	25	0	0	0	0	0	0	22	24	11	0	26	108
Genco Augustus	VRDD2	61	69	87	82	114	64	0	0	0	0	0	0	477
Genco Claudius	V7SY6	25	21	17	14	1	14	49	85	38	8	30	63	365
Genco Constantine	VRDR8	90	27	67	64	63	25	70	43	67	4	0	41	561
Genco Hadrian	V7QN8	0	0	0	0	0	0	4	64	92	86	95	41	382
Genco Raptor	V7NB8	0	0	0	0	0	20	2	16	1	7	0	0	46
Genco Thunder	V7LZ4	30	14	4	0	0	0	0	0	0	0	11	18	77
Genco Tiberius	VRDD3	0	0	0	4	21	23	21	13	22	16	21	13	154
Genco Titus	VRDI7	45	64	68	2	0	10	4	3	10	17	0	0	223
George N	A8PQ5	0	144	184	401	0	27	60	51	18	3	36	11	935
Geysir	WCZ5528	6	31	75	70	26	0	0	0	0	0	0	0	208
Global Sentinel	V7KR4	0	0	0	0	0	0	0	4	4	18	15	0	41
Golden Bear	NMRY	0	0	0	0	16	64	62	54	0	0	0	0	196
Golden State	WHDV	7	5	6	1	0	0	6	10	3	10	0	0	48
Gordon C. Leitch	VCKM	0	0	0	0	0	17	9	15	7	1	1	0	50
Gordon Gunter (AWS)	NWS0014	0	0	217	569	212	0	0	0	0	0	0	0	998
Gordon Gunter (AWS)	WTEO	0	0	0	0	278	319	446	212	580	521	298	0	2654
Grandeur Of The Seas	C6SE3	87	98	111	52	53	57	68	38	44	47	71	59	785
Great Republic	WDF7994	0	0	0	0	0	60	81	40	73	83	46	157	540
Green Bay	WDD9433	29	10	0	0	94	40	57	55	23	5	0	4	317
Green Dale	WCZ5238	59	46	40	47	66	55	24	26	7	0	35	79	484
Green Ridge	WZZF	83	59	11	34	37	26	54	9	21	0	1	24	359
Gretchen H	WDC9138	0	0	27	19	25	21	24	39	40	1	10	5	211

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GSF Development Driller I	YJSW5	62	70	66	63	45	31	27	27	15	31	27	10	474
GSF Grand Banks	YJUF7	131	124	128	111	118	109	113	113	108	110	137	47	1349
Guardian	WBO2511	14	9	36	16	14	30	7	45	24	0	3	16	214
Gulf Reliance	WDD2703	10	34	5	14	0	0	0	0	0	0	0	0	63
Gulf Titan	WDA5598	8	17	9	1	8	4	4	3	4	8	18	10	94
H A Sklenar	C6CL6	99	63	84	64	71	61	62	35	79	35	35	41	729
H. Lee White	WZD2465	3	0	0	3	40	40	36	9	11	35	23	25	225
Healy	NEPP	0	0	0	0	0	87	89	77	140	95	40	3	531
Healy (AWS)	NWS0003	0	0	0	0	11	708	742	717	714	740	695	727	5054
Henry B. Bigelow (AWS)	WTDF	0	6	262	299	196	444	356	12	216	452	212	0	2455
Henry Goodrich	YJQN7	125	127	127	110	114	111	111	114	103	106	86	0	1234
Herbert C. Jackson	WL3972	11	0	1	25	51	58	34	22	41	20	22	76	361
Hi'ialakai	WTEY	0	0	68	66	14	0	0	0	0	0	0	0	148
Hi'ialakai (AWS)	NWS0010	0	0	402	489	543	0	373	313	0	0	0	0	2120
Hoegh Oslo	LAEK7	7	0	11	32	14	0	0	0	52	0	0	0	116
Hon. James L. Oberstar	WL3108	0	0	1	25	12	5	32	24	49	53	62	77	340
Honor	WDC6923	69	37	15	33	13	1	10	29	14	44	28	15	308
Hood Island	C6LU4	64	60	76	71	60	30	24	43	38	21	19	33	539
Horizon Anchorage	KGTX	146	185	189	169	136	179	199	176	202	161	102	108	1952
Horizon Challenger	WZJC	83	56	67	84	81	48	54	137	89	103	148	136	1086
Horizon Consumer	WCHF	38	39	40	46	14	81	7	0	0	0	31	0	296
Horizon Eagle	WDD6039	7	95	121	72	78	76	73	83	77	85	42	3	812
Horizon Enterprise	KRGB	69	64	71	75	66	53	37	69	39	21	27	75	666
Horizon Falcon	WDD6040	80	74	77	77	69	61	67	94	87	61	12	0	759
Horizon Hawk	WDD6033	32	31	42	90	57	54	54	73	59	56	18	0	566
Horizon Hunter	WDD6038	44	54	67	49	57	53	82	73	70	77	9	0	635
Horizon Kodiak	KGTZ	58	52	47	46	44	41	34	51	45	45	34	56	553
Horizon Navigator	WPGK	71	121	150	156	171	171	158	160	105	152	122	119	1656
Horizon Pacific	WSRL	72	62	39	17	47	35	40	29	22	46	62	78	549

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Horizon Producer	WJBJ	107	87	132	147	172	234	184	246	160	199	135	160	1963
Horizon Reliance	WFLH	48	32	69	63	76	68	42	71	78	82	64	73	766
Horizon Spirit	WFLG	88	80	83	83	82	72	76	84	80	79	79	77	963
Horizon Tacoma	KGTY	32	3	49	48	46	52	50	46	57	61	65	74	583
Horizon Tiger	WDD6042	93	62	45	76	41	2	25	150	52	52	17	0	615
Horizon Trader	KIRH	62	62	85	85	88	89	86	86	94	82	77	46	942
Hosanger	9VAW8	0	0	0	0	0	0	0	0	0	0	43	126	169
Houston	KCDK	25	21	8	2	30	20	9	10	0	2	4	4	135
Hugo N	A8TD2	0	0	0	0	0	0	51	54	18	0	0	0	123
Independence II	WGAX	120	124	71	121	108	135	55	58	105	115	100	54	1166
Independence Of The Seas	C6WW4	0	32	34	39	33	33	32	45	41	13	33	34	369
Indian Ocean	C6T2063	30	31	32	27	30	31	42	54	26	27	30	19	379
Indiana Harbor	WXN3191	28	0	0	75	75	71	73	30	29	43	30	29	483
Integrity	WDC6925	59	40	30	50	61	51	56	58	52	70	21	35	583
Invader	WBO3337	2	25	5	6	17	50	119	46	31	86	116	19	522
James L. Kuber	WDF7020	0	0	0	0	0	0	0	0	0	113	108	140	361
James R. Barker	WYP8657	9	0	37	124	76	114	99	91	82	90	83	96	901
Jean Anne	WDC3786	122	63	35	59	91	81	76	31	58	93	85	72	866
Jenny N	A8PQ7	0	0	0	0	0	0	0	0	7	123	32	0	162
Jewel Of The Seas	C6FW9	0	36	44	14	6	4	0	0	0	0	0	0	104
John B. Aird	VCYP	0	0	0	1	24	17	5	9	10	15	0	4	85
John G. Munson	WE3806	20	0	0	70	80	16	18	25	27	15	61	37	369
John J. Boland	WZE4539	0	0	0	0	0	0	5	0	0	3	3	0	11
Joides Resolution	D5BC	6	1	0	0	0	0	0	0	0	0	0	0	7
Joseph L. Block	WXY6216	64	0	485	715	580	42	572	677	618	742	719	744	5958
Justine Foss	WYL4978	0	0	0	0	0	0	1	6	0	0	19	0	26
Ka'imimoana	WTEU	35	67	73	58	27	0	26	67	13	3	0	0	369
Ka'imimoana (AWS)	NWS0009	317	533	593	479	254	0	264	619	234	722	605	188	4808

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Karen Andrie	WBS5272	193	15	15	241	231	183	111	272	103	95	160	207	1826
Karoline N	A8PQ8	1	160	50	60	54	0	0	4	0	64	20	0	413
Kasif Kalkavan	V7IX7	33	63	92	47	52	0	0	0	0	0	0	0	287
Kaveri Spirit	C6WK2	0	0	0	0	0	0	0	13	24	22	14	3	76
Kaye E. Barker	WCF3012	7	0	9	38	43	59	52	75	44	44	61	42	474
Kennicott	WCY2920	8	0	0	4	0	2	21	43	24	1	0	1	104
Keswick	C6XE5	10	1	0	6	11	9	14	3	7	2	7	2	72
Kilo Moana	WDA7827	14	27	37	20	58	49	26	42	50	69	14	19	425
Kiyi	KAO107	0	0	0	0	26	20	5	2	3	1	0	0	57
Knorr (AWS)	NWS0029	117	173	744	720	734	720	723	741	240	738	720	744	7114
Kodiak	KQXZ	0	0	1	28	54	0	5	8	0	10	5	9	120
Kota Halus	9V8258	32	26	0	0	0	0	0	0	0	0	0	0	58
Kota Harum	9VFF8	0	0	0	0	40	55	63	0	0	0	0	0	158
Kota Jati	VRWJ7	41	44	22	26	33	5	15	37	18	1	14	2	258
Kota Jaya	VRWM2	19	33	27	33	24	14	6	12	12	15	18	7	220
Laurence M. Gould (AWS)	WCX7445	593	536	700	669	497	710	266	468	329	704	296	673	6441
Lavender Passage	3FJY6	0	7	22	10	0	0	0	0	0	0	0	0	39
Lee A. Tregurtha	WUR8857	0	0	1	2	14	33	16	7	12	1	69	26	181
Legacy	WDF7311	0	0	0	0	0	0	38	12	0	0	0	0	50
Leslie Lee	WYC7933	1	0	0	0	0	0	0	0	0	0	0	0	1
Liberty Eagle	WHIA	32	32	3	46	30	74	32	27	0	47	28	46	397
Liberty Glory	WADP	26	17	22	20	41	3	34	2	2	22	4	2	195
Liberty Grace	WADN	62	50	11	43	0	46	61	2	0	2	31	23	331
Liberty Of The Seas	C6VQ8	2	37	15	4	0	9	18	16	5	0	4	0	110
Liberty Spirit	WCPU	26	22	16	54	61	85	45	27	0	23	16	16	391
Liberty Sun	WCOB	57	18	20	110	16	4	43	68	4	35	14	37	426
Lion City River	9VJC5	0	0	0	0	0	0	21	19	1	3	1	0	45
Livorno Express	ZCDV9	0	0	0	0	0	0	20	42	15	15	8	11	111
LNG Abuja	C6W2032	0	0	0	0	0	0	1	0	0	6	7	37	51

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LNG Edo	C6W2033	7	19	25	31	3	2	10	10	0	0	0	0	107
LNG Gemini	V7BW9	21	0	11	35	53	70	53	125	121	7	0	0	496
LNG Jupiter	C6XQ5	0	0	0	0	0	0	0	0	17	108	41	0	166
LNG Leo	V7BX2	32	0	0	0	0	0	17	0	0	47	66	0	162
Lois H	WTD4576	0	0	0	4	0	0	6	0	0	0	39	28	77
Lowlands Brilliance	ONDC	0	0	0	0	0	21	42	39	29	29	11	4	175
Lowlands Orchid	ONFP	55	46	21	12	66	45	26	35	29	25	65	97	522
Lyla	V7QK3	0	0	0	0	0	0	27	15	29	24	33	0	128
Maasdam	PFRO	184	110	44	32	129	204	249	204	148	238	232	136	1910
Madrid Spirit	ECFM	2	14	54	18	0	0	0	17	13	0	0	0	118
Maersk Carolina	WBDS	39	32	39	36	35	41	40	30	35	31	30	42	430
Maersk Danang	A8PS5	0	0	47	45	31	47	30	34	16	15	0	0	265
Maersk Drummond	A8JF3	3	0	36	7	26	28	0	50	10	20	9	10	199
Maersk Georgia	WAHP	94	60	34	24	74	68	59	26	41	73	91	48	692
Maersk Idaho	WKPM	22	30	15	50	66	24	57	38	28	42	29	0	401
Maersk Iowa	KABL	49	16	65	65	54	41	36	29	43	77	52	75	602
Maersk Kentucky	WKPY	33	18	31	9	23	29	39	4	4	34	51	38	313
Maersk Merritt	VRCH6	11	7	1	0	0	0	0	0	0	0	0	0	19
Maersk Missouri	WAHV	66	18	42	68	54	30	45	60	61	40	26	73	583
Maersk Montana	WCDP	40	52	57	55	17	52	50	30	31	43	10	24	461
Maersk Ohio	KABP	98	92	30	83	87	81	65	43	124	100	99	64	966
Maersk Peary	WHKM	0	0	0	0	0	0	0	0	0	55	42	56	153
Maersk Sheerness	DDJQ2	0	0	0	0	0	1	0	1	17	22	18	0	59
Maersk Tangier	A8NH3	9	4	0	0	0	0	0	0	0	0	0	0	13
Maersk Utah	WKAB	73	66	86	26	69	78	84	84	71	102	85	102	926
Maersk Virginia	WAHK	0	38	48	31	14	43	35	46	4	50	56	33	398
Maersk Wakayama	3FCC4	0	0	0	0	0	0	0	0	0	2	14	3	19
Maersk Westport	VRFO4	0	0	0	1	1	0	4	21	2	0	0	0	29

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Maersk Wind	S6TY	0	0	0	0	0	8	9	0	0	0	0	0	17
Maersk Winnipeg	VRGI7	0	0	0	4	0	4	7	52	15	25	3	0	110
Maersk Wisconsin	WKPN	39	31	20	21	36	39	57	66	27	46	5	59	446
Maersk Wyoming	WKPF	50	90	64	72	75	51	64	55	59	57	62	56	755
Mahimahi	WHRN	32	19	12	22	18	19	32	38	30	13	23	33	291
Maia H	WYX2079	0	0	18	5	0	0	42	14	6	0	4	20	109
Majesty Of The Seas	C6FZ8	0	5	6	14	0	0	0	0	0	0	0	10	35
Major Bernard F. Fisher	KBGK	0	0	0	0	0	0	0	0	0	2	2	0	4
Malolo	WYH6327	3	3	0	0	30	67	25	16	0	0	0	1	145
Manfred Nystrom	WCN3590	0	0	0	0	0	0	52	2	0	0	0	0	54
Manistee	WDB6831	5	0	0	5	3	44	18	34	25	29	65	17	245
Manitowoc	WDE3569	113	0	21	145	123	129	161	72	113	170	178	135	1360
Manoa	KDBG	61	42	47	46	32	33	20	11	30	42	15	3	382
Manukai	WRGD	12	25	13	14	20	30	35	42	35	43	2	12	283
Manulani	WECH	56	62	20	38	59	33	47	28	1	53	21	41	459
Maple 2	C6TF8	19	11	19	1	0	6	19	12	5	7	4	5	108
Marchen Maersk	OUIY2	22	66	0	0	70	1	0	36	1	0	18	16	230
Marcus G. Langseth	WDC6698	0	0	13	37	40	33	350	712	714	700	408	742	3749
Maren Maersk	OUJI2	0	1	0	0	0	0	0	29	29	0	16	35	110
Margrethe Maersk	OZBY2	0	0	0	0	0	34	7	0	37	31	0	42	151
Marine Express	3FHX2	3	11	5	4	1	7	1	0	0	2	5	27	66
Mariner Of The Seas	C6FV9	26	34	23	0	3	24	2	11	9	2	9	19	162
Marit Maersk	OUJN2	60	0	0	64	1	0	22	10	0	27	9	0	193
Mary Ann Hudson	KSDF	35	54	28	1	0	0	0	56	53	42	31	30	330
Matanuska	WN4201	6	1	0	0	0	0	0	0	0	0	0	0	7
Maui	WSLH	0	39	42	35	37	42	48	19	25	38	25	42	392
Maunalei	KFMV	22	36	0	20	21	14	47	32	26	42	19	25	304
Maunawili	WGEB	59	52	51	65	61	40	71	63	68	54	49	58	691
Mcarthur II (AWS)	WTEJ	0	0	78	49	89	102	132	80	206	463	0	0	1199

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Mcarthur II (AWS)	NWS0006	0	0	289	280	163	0	244	244	21	0	0	0	1241
Mein Schiff	9HJH9	34	29	50	30	12	4	0	0	0	0	0	0	159
Melville	WECB	66	61	87	74	81	332	433	224	33	62	34	0	1487
Mesabi Miner	WYQ4356	3	0	13	42	37	54	56	64	61	69	47	59	505
Midnight Sun	WAHG	44	24	58	122	48	70	135	50	39	48	66	34	738
Mike O'Leary	WDC3665	0	0	0	0	0	41	0	0	0	0	0	0	41
Mill House	9VAK9	0	0	0	5	26	45	45	31	4	0	0	0	156
Mill Reef	9VAK8	21	0	1	0	21	27	26	20	1	0	19	18	154
Mindanao	S6SR	0	47	73	72	53	28	0	0	0	0	33	88	394
Mineral Beijing	ONAR	56	22	37	14	10	11	13	12	12	9	22	20	238
Mineral Belgium	ONCF	18	0	51	34	15	29	50	12	16	21	6	0	252
Mineral Ningbo	ONGA	0	0	0	3	19	39	6	0	0	0	0	0	67
Mineral Noble	ONAN	19	41	34	7	5	18	9	29	25	43	24	58	312
Mineral Tianjin	ONBF	22	12	0	0	0	3	11	8	4	0	0	0	60
Miss Roxanne	WCX4992	0	0	0	0	1	6	0	0	2	0	0	0	9
Mokihana	WNRD	30	49	60	37	43	40	36	41	13	3	0	0	352
Monarch Of The Seas	C6FZ9	33	22	8	8	23	43	30	23	42	152	31	43	458
Monitor	WCX9104	4	0	18	16	21	8	14	46	24	0	1	0	152
Montrealais	VDWC	0	0	0	0	0	2	2	1	0	0	10	0	15
Morning Glory VIII	A8AT8	0	0	0	0	0	0	0	0	0	46	18	12	76
Morning Haruka	A8GK7	0	0	0	0	68	122	48	29	19	28	21	7	342
Murat K	V7NE2	0	0	0	0	0	0	0	17	36	0	0	0	53
Nachik	WDE7904	0	0	0	0	2	8	9	0	2	5	3	0	29
Nancy Foster (AWS)	WTER	0	0	205	603	474	257	189	561	532	181	0	0	3002
Nanuq	WCY8498	2	1	0	0	0	0	0	0	0	0	0	0	3
Nathaniel B. Palmer (AWS)	WBP3210	404	522	699	663	616	720	727	517	447	737	341	337	6730
Naval Academy Yp 686	YP686	0	0	0	0	0	0	0	10	0	0	0	0	10
Navigator	WBO3345	0	0	0	0	0	0	0	0	0	0	0	24	24

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Navigator Of The Seas	C6FU4	36	9	7	12	20	2	8	23	3	38	22	11	191
Neptune Voyager	C6FU7	23	6	19	3	4	21	25	7	0	0	3	0	111
New Horizon	WKWB	21	10	0	0	17	53	51	21	13	9	7	38	240
Nieuw Amsterdam	PBWQ	61	148	84	29	2	144	103	90	144	163	142	118	1228
Noble Star	KRPP	31	74	49	42	5	0	59	50	5	0	6	11	332
Noordam	PHET	116	173	156	102	45	64	136	94	163	125	296	252	1722
North Star	KIYI	27	21	36	55	28	28	15	20	44	63	35	22	394
Northern Jupiter	A8TA5	0	0	0	0	0	0	0	0	8	0	5	0	13
Northwest Swan	ZCDJ9	63	42	63	57	54	0	58	96	83	53	51	62	682
Norwegian Dawn	C6FT7	81	32	99	23	33	198	37	21	25	133	150	152	984
Norwegian Epic	C6XP7	33	29	22	43	66	16	8	14	27	39	59	54	410
Norwegian Gem	C6VG8	45	44	1	167	138	162	102	52	18	33	52	226	1040
Norwegian Jade	C6WK7	50	37	146	162	155	97	113	166	164	161	70	147	1468
Norwegian Jewel	C6TX6	62	36	45	57	34	56	77	61	56	33	20	3	540
Norwegian Pearl	C6VG7	34	49	68	87	7	50	20	0	57	110	563	616	1661
Norwegian Sky	C6PZ8	16	9	5	52	21	10	40	59	97	63	17	106	495
Norwegian Spirit	C6TQ6	68	37	117	175	204	155	240	235	168	129	236	202	1966
Norwegian Star	C6FR3	184	157	174	100	61	98	45	135	304	225	213	82	1778
Norwegian Sun	C6RN3	90	120	212	116	44	31	13	18	42	97	89	107	979
NYK Delphinus	3ENU7	0	25	45	0	0	0	0	0	0	0	0	0	70
NYK Demeter	3ENV5	11	6	22	18	27	9	50	23	27	21	11	18	243
NYK Diana	3EOS4	0	0	0	0	0	0	0	0	0	0	1	31	32
NYK Futago	9V8739	0	0	0	0	0	0	36	32	13	7	26	22	136
NYK Rumina	9V7645	0	0	0	0	0	0	0	0	0	45	73	80	198
Oasis Of The Seas	C6XS7	20	17	26	19	29	8	1	0	0	1	0	0	121
Ocean Charger	WDE9698	52	9	0	0	6	5	2	1	0	0	0	0	75
Ocean Crescent	WDF4929	1	0	19	49	56	41	17	31	37	45	15	0	311
Ocean Freedom	WDF9323	0	0	0	0	0	0	0	0	0	13	43	61	117
Ocean Harvester	WBO5471	11	5	6	12	2	0	0	0	5	1	1	0	43

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Ocean Mariner	WCF3990	0	0	0	29	19	1	0	20	26	99	46	1	241
Ocean President	VRAD4	3	11	21	0	0	0	0	0	2	0	0	0	37
Ocean Reliance	WADY	0	0	0	0	0	2	109	73	1	1	0	0	186
Ocean Titan	WDB9647	0	0	3	3	0	2	6	0	0	2	1	1	18
Oceanus (AWS)	NWS0028	744	670	740	670	632	720	740	740	656	743	382	0	7437
Okeanos Explorer (AWS)	NWS0016	0	0	362	217	0	0	0	0	0	0	0	0	579
Okeanos Explorer (AWS)	WTDH	0	0	54	30	0	455	444	583	544	0	0	0	2110
Oleander	V7SX3	19	0	0	17	19	15	18	14	2	0	1	0	105
Olive L. Moore	WDF7019	0	0	0	58	56	57	121	74	62	105	70	93	696
Oocl America	VRWE8	2	3	5	1	6	0	0	0	1	4	14	5	41
Oocl Busan	VRDN3	25	7	26	13	22	16	16	18	21	3	9	28	204
Oocl Nagoya	VRFX8	24	11	9	23	41	39	59	59	46	47	50	34	442
Oocl Norfolk	VREX4	1	1	13	23	41	44	37	30	28	23	22	14	277
Oosterdam	PBKH	73	55	96	87	73	64	49	30	44	67	82	122	842
Optimana	9VAR2	73	51	146	175	152	43	39	78	48	0	44	0	849
Orange Sky	ELZU2	0	0	0	0	0	19	13	32	31	18	12	9	134
Orange Star	A8WP6	0	0	0	0	10	6	4	13	27	8	12	24	104
Orange Sun	A8HY8	9	7	22	7	16	38	49	53	42	46	25	5	319
Oregon II (AWS)	WTDO	0	0	0	0	0	224	471	476	452	410	135	0	2168
Oregon Voyager	WDF2960	35	12	12	23	17	0	0	0	45	38	17	24	223
Oriental Queen	VRAC9	191	42	26	29	40	73	92	73	37	18	28	20	669
Orion Voyager	C6MC5	24	21	35	51	0	46	0	16	0	5	4	7	209
Oscar Dyson	WTEP	0	0	0	0	150	170	130	73	120	178	0	0	821
Oscar Dyson (AWS)	NWS0001	0	0	0	0	516	612	648	714	690	678	0	0	3858
Oscar Elton Sette	WTEE	0	15	139	125	0	2	69	142	87	55	86	0	720
Oscar Elton Sette (AWS)	NWS0015	0	102	592	455	0	0	152	270	0	150	299	0	2020
Ouro Do Brasil	ELPP9	20	37	16	30	38	28	26	25	18	14	11	0	263
Overseas Alcesmar	V7HP2	35	3	53	67	114	47	67	9	0	0	0	0	395

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Overseas Anacortes	KCHV	26	13	11	20	14	8	26	18	11	6	0	5	158
Overseas Andromar	V7HP4	7	2	4	4	0	14	56	55	31	27	22	27	249
Overseas Ariadmar	V7HP6	6	6	14	20	20	19	19	16	14	14	12	10	170
Overseas Boston	WJBU	82	107	141	132	70	85	65	65	70	93	82	83	1075
Overseas Cascade	WOAG	0	6	8	0	0	0	0	0	0	0	0	0	14
Overseas Houston	WWAA	4	1	3	0	13	8	19	16	10	6	6	5	91
Overseas Joyce	V7NV4	40	25	65	35	94	46	47	36	41	50	87	105	671
Overseas Long Beach	WAAT	72	183	257	59	27	59	94	87	52	36	0	20	946
Overseas Los Angeles	WABS	227	191	58	148	125	237	285	150	91	88	201	336	2137
Overseas Luxmar	WDC7070	14	0	32	18	11	10	3	17	11	7	15	2	140
Overseas Maremar	WDC6975	0	21	11	5	19	16	1	13	21	15	2	16	140
Overseas Martinez	WPAJ	0	23	2	18	6	21	32	23	5	11	8	7	156
Overseas Nikiski	WDBH	13	16	20	29	35	22	17	6	6	3	3	8	178
Overseas Rimar	V7HQ3	21	16	15	13	20	22	0	0	0	0	0	0	107
Overseas Tampa	WOTA	0	0	0	0	5	6	0	5	16	27	13	4	76
Overseas Texas City	WHED	0	6	2	5	0	12	10	0	0	0	5	1	41
Pacific Celebes	VRZN9	1	9	25	13	40	37	20	54	22	26	20	2	269
Pacific Flores	VRZN8	0	18	18	25	0	0	0	0	0	0	0	37	98
Pacific Freedom	WDD9283	0	0	0	0	14	0	0	10	0	0	0	0	24
Pacific Java	VRZN7	42	31	16	49	31	53	64	37	25	30	7	46	431
Pacific Makassar	VRZO2	37	57	73	31	83	47	56	94	24	47	0	0	549
Pacific Mistral	A8WI2	0	0	0	0	0	30	15	59	0	0	0	0	104
Pacific Star	WCW7740	0	0	0	0	1	0	0	0	0	0	1	0	2
Pacific Wolf	WDD9286	2	0	0	1	0	4	1	1	1	0	1	2	13
Pandalus	WAV7611	0	0	0	0	0	12	21	4	9	0	0	0	46
Patriarch	WBN3014	16	4	43	26	0	0	34	1	0	1	5	19	149
Patriot	WQVY	41	37	39	27	35	57	36	30	60	68	61	52	543
Paul Gauguin	C6TH9	93	63	41	59	80	126	150	294	55	52	300	255	1568
Paul R. Tregurtha	WYR4481	26	0	17	76	89	87	46	77	104	54	63	74	713

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Peace Voyage	VRHO5	0	0	2	21	25	20	4	14	0	0	0	0	86
Pelican State	WDE4433	10	18	10	11	9	7	9	3	5	9	10	0	101
Perseverance	WDE5328	0	0	0	0	0	0	7	10	9	17	21	26	90
Philadelphia Express	WDC6736	71	142	120	131	93	122	107	111	149	149	94	306	1595
Philip R. Clarke	WE3592	42	0	18	36	5	20	53	17	31	72	4	145	443
Phoenix Alpha	VRZT8	11	1	0	0	12	1	0	0	2	15	7	10	59
Phoenix Beta	VRZT9	0	27	49	8	2	7	28	28	42	77	37	44	349
Phoenix Light	HPHV	0	0	1	0	20	36	66	68	59	7	28	35	320
Phoenix Voyager	C6QE3	3	21	33	32	2	13	17	8	4	3	14	45	195
Pilot	WBN3011	0	0	0	5	2	0	0	3	14	0	0	0	24
Pisces (AWS)	WTDL	0	0	41	35	399	459	300	411	516	397	326	0	2884
Polar Adventure	WAZV	72	35	20	51	41	39	50	46	61	33	55	59	562
Polar Cloud	WDF5296	20	0	44	0	0	0	0	0	0	0	0	1	65
Polar Discovery	WACW	116	82	0	0	0	0	67	41	28	40	67	56	497
Polar Endeavour	WCAJ	21	20	70	78	84	29	50	97	83	66	26	91	715
Polar Enterprise	WRTF	24	22	21	17	76	72	5	0	0	0	4	18	259
Polar Ranger	WDC8652	0	0	0	0	2	0	3	0	2	0	0	0	7
Polar Resolution	WDJK	139	100	210	209	88	180	290	213	214	313	288	297	2541
Polar Spirit	C6WL6	27	46	23	4	2	28	12	11	0	0	0	0	153
Polar Storm	WDE8347	0	0	0	0	7	0	0	1	8	0	0	0	16
Polar Viking	WDD6494	0	7	16	0	2	1	0	0	0	0	0	0	26
Polar Wind	WDE6058	0	0	0	0	0	0	4	0	0	0	0	0	4
Posidana	9VBM6	30	109	183	370	254	69	194	200	104	6	8	44	1571
Premium Do Brasil	A8BL4	28	32	34	15	33	16	21	0	0	0	0	0	179
President Adams	WRYW	36	35	21	12	41	43	66	34	47	37	37	25	434
President Jackson	WRYC	63	25	39	33	0	0	0	0	68	81	34	48	391
President Polk	WRYD	13	19	17	13	31	0	31	58	52	74	67	70	445
President Truman	WNDP	45	24	30	45	28	25	2	11	49	40	35	1	335

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Presque Isle	WZE4928	0	0	10	110	84	20	51	38	63	38	62	21	497
Prestige New York	KDUE	37	32	36	30	48	9	30	33	39	72	16	3	385
Pride Of America	WNBE	42	19	19	5	14	12	51	18	18	106	152	111	567
Pride Of Baltimore II	WUW2120	0	0	0	5	22	41	26	35	28	7	0	0	164
Prinsendam	PBGH	0	33	39	37	91	5	9	17	19	35	36	12	333
Progress Ace	HPQI	0	0	0	0	0	0	0	0	0	1	2	4	7
Prosperous	VRIA3	0	0	0	0	0	8	59	0	0	1	0	0	68
Pt. Barrow	WBM5088	0	0	0	0	0	0	0	0	9	0	12	0	21
Pt. Thompson	WBM5092	0	0	0	0	0	0	0	0	15	0	1	0	16
Quebecois	CYGR	0	0	0	5	30	23	32	25	1	3	12	0	131
R. J. Pfeiffer	WRJP	0	3	2	0	0	0	0	0	0	0	0	0	5
R. M. Thorstenson	KGCJ	1	0	3	3	0	0	1	0	0	0	0	0	8
Radiance Of The Seas	C6SE7	20	99	93	95	62	20	74	50	25	5	13	49	605
Rainier	WTEF	0	0	0	0	0	0	71	99	131	142	0	0	443
Rebecca Lynn	WCW7977	0	0	3	22	18	12	8	8	11	2	8	1	93
Redoubt	WDD2451	0	0	0	10	28	0	19	52	28	14	32	18	201
Regulus Voyager	C6FE6	23	8	31	21	0	0	0	0	0	0	18	68	169
Resolve	WCZ5535	25	29	12	17	24	34	13	48	37	4	14	46	303
Rhapsody Of The Seas	C6UA2	11	31	33	7	0	32	52	15	46	31	45	40	343
Robert C. Seamans	WDA4486	0	0	9	23	26	28	23	0	0	0	0	0	109
Robert S. Pierson	CFN4934	0	0	0	0	7	15	4	0	10	1	3	4	44
Roger Blough	WZP8164	1	0	36	177	313	173	32	146	260	355	446	234	2173
Roger Revelle	KAOU	0	2	11	33	67	595	736	724	717	743	716	744	5088
Ronald H. Brown (AWS)	WTEC	0	0	0	0	0	22	218	163	0	37	16	10	466
Ronald N	A8PQ3	10	3	8	23	8	234	160	174	9	36	3	2	670
Ryndam	PHFV	14	45	31	95	56	33	40	14	23	34	35	96	516
S/R American Progress	KAWM	80	80	54	51	51	72	43	30	0	0	17	20	498
Safmarine Makutu	MRWF2	0	0	0	37	45	27	30	15	25	20	18	23	240
Saga Adventure	VRBL4	0	0	0	0	0	29	81	90	69	102	19	21	411

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Saga Andorinha	MYNJ6	4	0	0	0	0	0	0	0	22	71	54	51	202
Saga Monal	VRZQ9	0	0	53	63	39	86	33	116	0	0	17	18	425
Saga Navigator	VRDA4	3	9	20	86	142	124	5	201	416	482	440	105	2033
Saga Viking	VRXO6	4	12	0	0	0	4	22	13	17	17	7	14	110
Saipem 7000	C6NO5	0	0	0	0	19	82	17	7	0	0	0	0	125
Sam Laud	WZC7602	0	0	0	0	0	0	6	2	0	0	16	1	25
Samuel De Champlain	WDC8307	44	0	12	37	29	6	5	23	19	27	1	6	209
Sandra Foss	WYL4908	0	0	3	0	0	16	0	0	0	22	7	0	48
Saudi Abha	HZRX	0	3	17	0	3	0	0	83	52	33	34	68	293
Saudi Diriyah	HZZB	20	0	45	17	11	0	33	20	0	34	20	32	232
Saudi Hofuf	HZZC	1	8	7	0	0	5	4	0	7	7	2	2	43
Saudi Tabuk	HZZD	57	64	0	35	30	5	6	43	18	0	38	14	310
Sea Breeze	WBN3019	58	0	0	0	7	0	1	0	0	0	1	0	67
Sea Hawk	WDD9287	0	0	0	0	0	1	25	0	6	1	0	0	33
Sea Horse	WBN4382	10	10	2	6	0	0	0	0	0	0	0	0	28
Sea Prince	WYT8569	3	48	38	26	5	0	0	3	2	1	0	0	126
Sea Victory	WCY6777	0	0	0	0	0	0	0	0	1	0	0	0	1
Sea Voyager	WCX9106	399	94	0	43	93	120	132	202	69	107	126	86	1471
Seabourn Spirit	C6FR4	0	0	0	0	0	0	0	0	0	0	44	79	123
Seabulk Arctic	WCY7054	34	24	16	19	38	21	27	9	24	28	26	12	278
Seabulk Trader	KNJK	37	48	38	15	25	20	44	48	27	20	25	39	386
Sea-Land Champion	WKAU	11	31	44	47	37	62	58	47	46	54	33	57	527
Sea-Land Charger	WDB9948	33	38	52	30	25	40	43	24	13	5	3	27	333
Sea-Land Comet	WDB9950	112	59	24	39	36	54	61	35	48	30	10	22	530
Sea-Land Eagle	WKAE	152	193	166	103	86	143	153	94	109	111	163	174	1647
Sea-Land Intrepid	WDB9949	55	9	17	23	30	21	13	16	33	47	49	50	363
Sea-Land Lightning	WDB9986	73	65	36	23	35	6	0	6	12	7	6	36	305
Sea-Land Mercury	WKAW	75	18	57	70	117	94	119	130	114	137	88	103	1122

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Sea-Land Meteor	WDB9951	29	3	47	24	6	29	34	63	51	48	36	15	385
Sea-Land Racer	WKAP	175	107	112	128	96	118	139	110	134	174	36	91	1420
Sedef Kalkavan	V7LU5	0	0	5	15	0	0	0	0	0	0	0	0	20
Senang Spirit	C6ME8	9	3	9	113	8	0	0	0	0	0	0	0	142
Seneca	WBN8469	0	0	0	0	36	13	11	64	28	0	0	0	152
Sentinel	WBN6510	0	0	15	25	8	0	8	33	12	1	2	16	120
Sentry	WBN3013	0	26	0	0	6	47	6	4	0	0	0	0	89
Serenade Of The Seas	C6FV8	26	13	23	25	3	17	43	15	10	14	14	31	234
Serenata	3EEE2	26	5	18	23	28	7	31	21	9	4	3	6	181
Sesok	WDE7899	0	0	0	0	0	0	3	0	0	0	0	0	3
Seven Seas Mariner	C6VV8	37	24	1	9	24	16	9	23	13	0	43	78	277
Seven Seas Navigator	ZCDT7	19	24	19	11	9	6	0	34	18	3	1	1	145
Seven Seas Voyager	C6SW3	24	22	0	18	72	8	18	2	7	5	0	39	215
Sheila Mcdevitt	WDE2542	29	72	14	57	53	1	0	0	0	1	1	0	228
Sidney Foss	WYL5445	0	22	11	0	0	9	0	0	0	7	0	1	50
Sierra	WSNB	11	26	23	13	4	23	17	7	0	14	13	12	163
Siku	WCQ6174	0	0	0	1	2	20	24	0	2	15	17	5	86
Sinuk	WCQ8110	0	0	0	45	135	114	21	97	59	0	0	0	471
Siranger	9VAH	0	0	0	0	0	18	25	20	10	17	0	18	108
Sol Do Brasil	ELQQ4	16	37	27	58	57	21	44	15	9	12	4	29	329
Splendour Of The Seas	C6TZ9	99	108	205	202	129	141	261	498	438	222	13	205	2521
St Louis Express	WDD3825	405	340	371	447	235	444	461	490	459	479	373	422	4926
St Nicholas	WDB8066	0	0	0	0	0	0	0	8	0	0	0	0	8
St. Clair	WZA4027	46	0	0	0	0	0	0	0	0	40	37	1	124
Stacey Foss	WYL4909	9	0	0	0	0	0	7	0	1	4	0	0	21
Stalwart	WBN6512	36	50	55	42	27	64	68	1	40	26	29	11	449
Star Alabama	LAVU4	31	23	45	11	0	19	4	35	15	14	13	2	212
Star America	LAVV4	6	6	31	17	30	10	10	0	11	0	0	0	121
Star Atlantic	LAYG5	43	23	13	0	9	9	27	20	32	43	34	22	275
Star Derby	LAXS2	48	13	50	42	32	36	35	29	47	25	27	11	395

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Star Dieppe	LEQZ3	9	27	16	19	18	24	24	29	5	30	35	37	273
Star Eagle	LAWO2	20	25	36	39	42	62	111	56	32	0	22	18	463
Star Evviva	LAHE2	2	14	0	10	0	6	20	47	10	30	16	7	162
Star Florida	LAVW4	18	31	29	44	22	28	23	21	0	0	11	28	255
Star Fraser	LAVY4	325	139	367	244	261	69	18	8	46	25	23	1	1526
Star Fuji	LAVX4	13	18	20	8	9	8	24	25	26	22	24	27	224
Star Gran	LADR4	30	22	4	22	0	0	0	34	31	0	16	72	231
Star Grip	LADQ4	36	15	53	4	63	51	47	70	28	38	3	25	433
Star Hansa	LAXP4	0	1	0	25	5	1	0	0	0	31	4	19	86
Star Harmonia	LAGB5	11	2	0	0	0	0	2	2	0	0	0	14	31
Star Herdla	LAVD4	77	8	69	7	17	29	22	0	0	15	7	28	279
Star Hidra	LAVN4	22	27	5	35	33	0	4	3	7	0	0	22	158
Star Isfjord	LAOX5	1	36	17	8	41	46	29	0	44	21	14	51	308
Star Ismene	LANT5	8	2	2	37	8	68	9	16	10	0	0	0	160
Star Istind	LAMP5	0	0	0	0	0	0	0	55	41	34	31	0	161
Star Japan	LAZV5	19	15	14	18	0	29	34	4	0	45	14	29	221
Star Java	LAJS6	54	48	38	42	15	20	1	18	20	34	0	25	315
Star Juventas	LAZU5	0	18	15	2	1	0	20	31	40	0	47	0	174
Star Kilimanjaro	LAIG7	38	33	62	10	23	31	42	21	28	45	16	50	399
Star Kinn	LAJF7	1	0	0	18	0	3	28	13	27	0	7	0	97
Star Kvarven	LAJK7	6	9	16	28	46	10	1	39	31	4	10	24	224
State Of Maine	WCAH	0	0	0	0	53	40	0	0	0	0	0	0	93
Statendam	PHSG	31	18	12	65	69	92	66	17	38	27	46	137	618
Stellar Voyager	C6FV4	3	0	0	30	54	76	9	5	18	1	28	19	243
Stewart J. Cort	WDC6055	6	0	7	43	46	38	55	13	41	45	38	43	375
Stikine	WDC8583	0	0	0	0	0	11	26	19	17	15	8	11	107
Stimson	KF002	15	1	6	0	3	2	2	0	0	14	0	0	43
Sunshine State	WDE4432	10	0	1	1	15	12	8	0	2	11	10	11	81

Ship Name	Call Sign	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Superstar Aquarius	C6LG6	29	19	0	0	0	0	0	0	0	0	0	0	48
Superstar Libra	C6DM2	106	97	118	119	116	116	106	121	120	120	105	105	1349
Sylvie	VRCQ2	0	0	0	0	0	0	0	0	20	38	13	17	88
Talisman	LAOW5	0	17	23	0	0	32	25	0	6	23	51	46	223
Tamesis	LAOL5	0	27	0	14	10	23	14	4	11	28	0	0	131
Tan'erliq	WCY8497	0	0	0	0	3	0	0	0	0	1	0	0	4
Tangguh Hiri	C6XC2	0	0	0	9	31	16	37	77	72	43	45	113	443
Tarang	ELSR7	0	0	8	0	19	7	45	51	15	0	0	0	145
Thomas G. Thompson	KTDQ	0	0	0	1	22	0	27	14	26	0	1	0	91
Thomas Jefferson	WTEA	0	0	0	331	439	305	0	0	0	0	0	0	1075
Thrasher	V7TE3	2	4	0	0	0	0	60	16	1	0	0	0	83
Tim S. Dool	VGPY	0	0	0	5	6	8	4	7	11	5	2	1	49
Tina Litrico	KCKB	22	5	0	15	0	20	2	0	0	0	0	0	64
Tonsberg	9HA2066	0	0	0	0	0	0	0	0	19	28	25	47	119
Trailblazer	WDE6541	1	17	4	0	0	0	0	0	0	1	10	0	33
Tridonawati	ELNY2	0	0	0	0	0	70	98	63	34	2	8	24	299
Triumph	WDC9555	0	0	0	0	0	0	0	0	1	2	0	0	3
Tropic Carib	J8PE3	10	10	22	24	11	0	0	36	28	20	9	0	170
Tropic Dawn	J8PR3	9	4	13	11	7	1	1	8	29	14	15	18	130
Tropic Express	HO7723	0	0	0	0	0	0	5	25	8	2	18	22	80
Tropic Jade	J8NY	33	32	36	40	36	29	8	11	17	13	11	22	288
Tropic Lure	J8PD	24	21	23	19	22	19	26	9	47	24	20	22	276
Tropic Night	J8NX	1	4	0	0	0	46	45	42	11	14	4	20	187
Tropic Opal	J8NW	36	33	23	61	43	43	44	15	35	39	34	69	475
Tropic Palm	J8PB	8	9	13	11	11	13	15	14	9	8	9	15	135
Tropic Sun	J8AZ2	0	24	25	22	8	10	12	12	6	0	0	16	135
Tropic Tide	J8AZ3	28	0	31	39	38	63	90	31	34	35	25	32	446
Tropic Unity	J8PE4	0	0	0	11	61	64	66	69	59	47	41	37	455
TS Kennedy	KVMU	102	66	0	0	0	0	0	0	0	0	0	0	168
Tug Dorothy Ann	WDE8761	1	0	0	0	0	95	48	31	65	62	47	14	363

Ship Name	Call Sign	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Tug Spartan	WDF5483	0	0	0	0	1	20	124	288	267	311	120	69	1200
Tustumena	WNGW	94	128	247	160	158	198	179	187	221	137	117	193	2019
Tyco Decisive	V7DI7	19	51	44	55	0	0	0	0	0	0	0	100	269
Tyco Durable	V7DI8	2	1	43	61	56	75	0	0	0	54	10	69	371
Tyco Responder	V7CY9	67	2	0	0	0	0	0	0	0	0	3	6	78
Tycom Reliance	V7CZ2	8	5	42	0	1	0	0	0	0	0	0	0	56
UBC Saiki	P3GY9	66	45	10	59	34	29	70	18	32	51	0	43	457
UBC Santa Marta	5BDK2	107	46	76	75	123	103	138	55	114	50	61	131	1079
Umang	A8PF6	34	18	1	2	0	1	2	0	0	0	0	34	92
Unique Brilliance	VRXK4	0	0	0	0	59	26	33	17	20	0	0	0	155
Unique Carrier	VRCV5	12	77	2	3	2	0	0	1	0	0	0	0	97
Unique Explorer	VRGT8	0	0	13	0	0	5	24	14	20	17	2	0	95
Unique Sunshine	VRWV4	0	0	0	0	0	14	25	2	34	10	22	24	131
United Spirit	ELYB2	121	88	116	78	137	41	100	63	74	9	0	0	827
Valdez Star	WCO7674	74	80	30	0	0	20	13	0	0	0	0	0	217
Veendam	PHEO	42	53	66	37	81	16	24	85	54	200	201	127	986
Vega Voyager	C6FV3	51	33	16	14	38	40	20	20	13	13	34	50	342
Vigilant	WDE2719	40	62	47	49	34	28	41	55	39	55	81	53	584
Viking Star	WDE6434	4	0	0	0	3	0	0	0	1	0	0	7	15
Virginian	KSPH	58	63	76	90	80	60	85	95	67	77	47	0	798
Vision Of The Seas	C6SE8	27	11	9	17	2	7	8	4	19	22	6	14	146
Volendam	PCHM	480	502	385	248	405	518	495	380	368	219	352	504	4856
Voyager Of The Seas	C6SE5	83	56	27	16	7	55	30	42	32	26	14	69	457
Washington Express	WDD3826	79	108	56	66	73	128	101	49	61	144	95	51	1011
West Sirius	3EMK6	0	0	0	0	0	0	21	52	48	17	24	37	199
Westerdam	PINX	93	39	42	74	29	0	31	28	13	43	26	53	471
Western Ranger	WBN3008	0	0	0	0	0	0	0	15	0	0	0	0	15
Westwood Columbia	C6SI4	46	35	32	34	40	45	20	46	27	29	23	21	398

Ship Name	Call Sign	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Westwood Olympia	C6UB2	56	19	38	22	35	28	26	29	37	28	0	36	354
Westwood Rainier	C6SI3	44	37	34	45	42	30	65	39	28	43	29	25	461
Wilfred Sykes	WC5932	578	0	102	718	738	718	743	656	666	733	707	744	7103
Wolstad	KF001	5	0	14	16	17	25	25	6	0	0	2	0	110
World Spirit	ELWG7	0	28	17	47	23	37	18	35	22	10	5	9	251
Xpedition	HC2083	19	0	27	40	0	6	33	39	39	43	28	0	274
Ym Antwerp	VRET5	31	27	16	17	39	38	31	1	77	101	47	105	530
Ym Busan	VREX8	42	77	48	57	48	24	23	51	36	11	17	26	460
Yorktown Express	WDD6127	17	42	30	45	34	20	24	19	19	28	25	36	339
Yuhsan	H9TE	4	9	7	16	12	0	0	0	0	0	0	0	48
Yuyo Spirits	3FNF4	0	0	0	0	0	19	28	17	4	24	1	26	119
Zaandam	PDAN	106	120	56	41	7	119	116	175	61	3	73	25	902
Zim Los Angeles	A8SI3	31	27	29	46	24	32	44	17	43	8	27	53	381
Zim Ningbo	A8SI5	17	24	37	12	28	1	0	0	4	11	10	5	149
Zim Shanghai	VRGA6	14	8	4	0	6	5	0	0	16	10	19	22	104
Zim Shenzhen	VQUQ4	79	71	44	40	48	47	37	17	0	0	0	0	383
Zuiderdam	PBIG	53	70	35	222	165	176	198	89	199	329	266	273	2075

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NOAA WEATHER RADIO NETWORK

(1) 162.550 mHz
(2) 162.400 mHz
(3) 162.475 mHz
(4) 162.425 mHz
(5) 162.450 mHz
(6) 162.500 mHz
(7) 162.525 mHz

Channel numbers, e.g. (WX1, WX2) etc. have no special significance but are often designated this way in consumer equipment. Other channel numbering schemes are also prevalent.

The NOAA Weather Radio network provides voice broadcasts of local and coastal marine forecasts on a continuous cycle. The forecasts are produced by local National Weather Service Forecast Offices.

Coastal stations also broadcast predicted tides and real time observations from buoys and coastal meteorological stations operated by NOAA's National Data Buoy Center. Based on user demand, and where feasible, Offshore and Open Lake forecasts are broadcast as well.

The NOAA Weather Radio network provides near continuous coverage of the coastal U.S, Great Lakes, Hawaii, and populated Alaska coastline. Typical coverage is 25 nautical miles offshore, but may extend much further in certain areas.

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Important message for the Subscribers to the Mariners Weather Log

In order to expand our reader audience and provide our readers with a contemporary digital format that has numerous options for future publications, hard copy printing and mailing of the Mariners Weather Log will be discontinued after this edition (April 2012); paid subscribers to the Mariners Weather Log will be prorated and reimbursed. As the editor of this magazine, I do apologize for any inconveniences due to this change in format. If you have further concerns or questions please contact me directly by phone (228) 688-1457 or email, paula.rychtar@noaa.gov.

Please be assured that this magazine will not falter in its' content and quality. This change is a positive move towards better utilizing our vastly improved methods of communications over land and sea. Under the new format, the *Voluntary Observing Ship Program* management team will be able to lift the program to a higher level of awareness and accessibility. The digital format gives notice in the many ways that VOS has become intricately networked with scientists, biologists, worldwide environmental impact concerns/ studies, climatology, metadata quality and actively engages in the stewardship of our world. I hope my invitation for related articles and photographs is taken seriously, as this new platform will reach far and wide.

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This amazing photograph of a Maui sunrise was taken by Patrick Bell, 1st Officer Navigation on Norwegian Cruise Lines, *Pride of America.*

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