



# Mariners Weather Log



Vol. 45, No. 3

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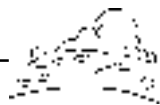


## Sizing Up the Iceberg

"Indestructible Icebergs"

See page 4





### Mariners Weather Log



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## From the Editorial Supervisor

### From the Editorial Supervisor

Hello, and Happy Holidays from the entire MWL family. The holiday period is normally a joyous and festive time for all. It is a time to savor the memories past and make new ones with your friends and loved ones. Yes, things have changed this year. No matter where we call home, I believe we all can share a tragic moment or two from this past year. Let us remember our World Trade Center's maritime family of American Bureau of Shipping (ABS), New York Shipping Association, PACRIM, Port Authority of New York & New Jersey, Rohde & Liesenfeld, Serko & Simon LLP, and Zim-American Shipping Company, and lift them up in our hearts this holiday season by remembering all the fond memories we have shared..

This issue has a lot of great stories for your reading pleasure. The *International Ice Patrol* graces our cover with a historical perspective of iceberg removal. Another article, first printed in SMITHSONIAN Magazine, tells of how flotsam can be used to study the ocean currents. The British METOFFICE has offered us a story on the EGOS buoy programme, and the Miami Herald has given permission to reprint their story of how the National Hurricane Center used our VOS Observations to help track Tropical Storm Allison.

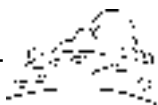
Once again, best wishes for a happy and safe holiday season, and I hope that Santa Claus, Crisingle, Father Christmas, Father Frost, Père Noël Joulupukki, Kris Kringle, Sabdiklos, Saint Nicolas, Sancte Claus, Sinter Klaas, or Weihnachtsmann brings you all that you hope for and more.

— **Luke**

### Some Important Web Page Addresses

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| NOAA                                  | <a href="http://www.noaa.gov">http://www.noaa.gov</a>                                               |
| National Weather Service              | <a href="http://www.nws.noaa.gov">http://www.nws.noaa.gov</a>                                       |
| National Data Buoy Center             | <a href="http://www.ndbc.noaa.gov">http://www.ndbc.noaa.gov</a>                                     |
| AMVER Program                         | <a href="http://www.amver.com">http://www.amver.com</a>                                             |
| VOS Program                           | <a href="http://www.vos.noaa.gov">http://www.vos.noaa.gov</a>                                       |
| SEAS Program                          | <a href="http://seas.nos.noaa.gov/seas/">http://seas.nos.noaa.gov/seas/</a>                         |
| Mariners Weather Log                  | <a href="http://www.nws.noaa.gov/om/mwl/mwl.htm">http://www.nws.noaa.gov/om/mwl/mwl.htm</a>         |
| Marine Dissemination                  | <a href="http://www.nws.noaa.gov/om/marine/home.htm">http://www.nws.noaa.gov/om/marine/home.htm</a> |
| U.S. Coast Guard<br>Navigation Center | <a href="http://www.navcen.uscg.gov/marcomms/">http://www.navcen.uscg.gov/marcomms/</a>             |

See these web pages for further links.

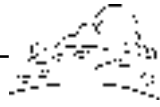


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## Indestructible Icebergs

*MST1 Duyane Alexander*

**A**pril 15, 2002 will mark the 90<sup>th</sup> anniversary of the loss of the ‘unsinkable’ RMS Titanic. The Titanic struck an iceberg late in the night on April 14, 1912 while crossing the Atlantic Ocean south of the Grand Banks of Newfoundland, and vanished under the waves within two and a half hours, taking the lives of over 1500 passengers and crew. This tragic event directly lead to the creation of the International Ice Patrol.

The crew, or “Ice Picks” of the International Ice Patrol, consists of 18 people: a civilian oceanographer and a computer specialist, four officers, one yeoman, and ten marine science technicians located in Groton, Connecticut, with an eleventh marine science technician remotely located at the National Ice Center in Suitland, Maryland. The Ice Picks work closely with

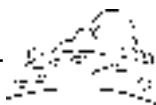
expert aviation technicians and air crew from Coast Guard Air Station Elizabeth City, North Carolina. The small crew of the International Ice Patrol is dedicated to serving the North Atlantic mariner and protecting seafarers of all nations from the dangers of icebergs. Since the U.S. Coast Guard began monitoring ice conditions in 1913, they have amassed an enviable safety record. There have been no reported losses of life or property for vessels that have heeded the Ice Patrol’s published warnings.

The International Ice Patrol is responsible for providing the Limit of All Known Ice (LAKI) which is specified under the Safety Of Life At Sea (SOLAS) agreement in Chapter V and states specifically “...the south-eastern, southern and south-west limits of the regions of icebergs in the vicinity of the

Grand Banks of Newfoundland shall be guarded for the purpose of informing passing ships of the extent of this dangerous region...” From the beginning of the International Ice Patrol until WWII, this service was provided by ships of the Revenue Cutter Service (now the United States Coast Guard). Aircraft provided the primary search method during and after the war, with surface vessels being used during unusually heavy iceberg years.

Since the start of the International Ice Patrol, one question has been asked more then any other. Why not just blow up the iceberg? The short answer is, we tried.

There have been many attempts over the years to reduce the threat posed by icebergs by destroying them and/or speeding up their melting. The theory is that smaller



## International Ice Patrol

pieces of ice will melt faster. The problem has been, and continues to be, making the smaller pieces of ice. Most of these experiments were spur-of-the-moment efforts.



**Sizing up the Iceberg**

The first documented International Ice Patrol attempt to destroy an iceberg occurred on March 26<sup>th</sup>, 1913 when the U.S. Revenue Cutter Miami used her deck gun on an iceberg she was shadowing (following). The description in the official trip report is "A 6-pound shot was fired against the vertical wall of the berg and had no other effect than to shake down a barrellful of snowlike dust." Undeterred by this initial failure, the Cutter Miami again used her 6-pounder deck gun on an iceberg on May 26, 1914. This time she fired twelve rounds and found the results to be "...just as effective as if we had stormed the Rock of Gibraltar." In June 1915, the U.S. Revenue Cutter Seneca reported "One of its faces presented a good target, and I caused seven common shell, without bursting charge, to be fired into it from our 6-pounder guns. The ice was so rotten that the projectiles entered

the ice and stuck there, plainly showing their bases in the holes they made." There are many more reports of a similar nature detailing the use of everything from 20mm cannon to the standard 5-inch gun on the larger cutters. In each case it was found that aside from making a bit of crushed ice, the gunfire had no noticeable effect on icebergs.



**Ready, Aim, Fire!**

One of the collateral duties assigned to the vessels of the International Ice Patrol was the destruction of derelict vessels, which were usually wooden sailing ships that had been abandoned and might drift for months on the ocean currents, thereby posing a hazard to safe navigation. The ships used guns, mines (an explosive device designed specifically to be attached to the hull of the vessel), and other explosives such as TNT to destroy derelict vessels. Experiments using these items were conducted to see how effective they would be in speeding up the destruction and melting of icebergs.

Captains of the vessels would decide to mine the icebergs by letting the explosives drift next to the iceberg, attaching the explosive to them, placing the mine on the iceberg, or trying to jam the explosives into a hole in the surface. In each case, very little damage was done to the iceberg.

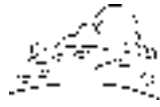
In the 1920's, Professor Howard T. Barnes of McGill University located in Montreal conducted

experiments on river ice dams using thermite (an incendiary material that produces molten iron at 4000°F) to remove the blockages. In 1926, experiments using thermite were conducted on icebergs with very promising results; however, the findings were not followed up on for many years. In 1959, the research using

thermite on icebergs was revisited, and experiments using aerial delivery were conducted using surplus WWII incendiary bombs. The bombs would burst on the surface and spread the material over the iceberg, having little overall effect. However, results were reviewed and scientists still



**Drilling**



## International Ice Patrol

felt thermite had merit for further exploration.

Ice Patrol conducted further experiments using Thermite in 1960 that were more carefully designed and executed, but this time on grounded icebergs near Newfoundland. This required that an iceberg be boarded, holes bored into the iceberg, placement of thermite in the holes, and then detonation. These were very dangerous operations on an unstable iceberg that could roll over at any time with little or no warning. Three different Thermite charges of 196 lbs, 364 lbs, and 560 lbs of Thermite were detonated on two separate icebergs.

The first charge of 196 lbs was detonated and produced steam and molten metal that was scattered over a distance of 100 yards, but did little more than produce several



**Thermite Explosion**

small growlers (very small icebergs) and a small crater. Another iceberg was boarded, and the second charge of 364 lbs was set and detonated. The results were the same. The final charge of 560 lbs was then set at the base of a large pinnacle on the iceberg. In

the International Ice Patrol Bulletin for 1960 it states "... a magnificent display took place as smoke and molten iron was hurled hundreds of feet into the air, but the berg remained virtually unchanged. This concluded the thermite tests."



**Carbon Black Painting on Icebergs**

Another experiment involved the use of carbon black painted on an iceberg. The theory was that the carbon black would absorb heat from the sun and speed the melting of the iceberg. The carbon had to be spread by hand, which required boarding an iceberg with all the inherent dangers. This experiment met partial success because as the iceberg melted, the water run off would wash away the carbon black, which would stop the melting. Additionally as the center of gravity changed, the iceberg would tend to roll, exposing a fresh clean face to the world, thus requiring another application of carbon black.

Experiments having aircraft drop 1000 lb general purpose and semi-armor-piercing bombs on icebergs were also conducted. Of the twenty bombs dropped, eighteen struck the iceberg. Of those

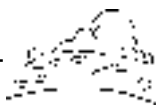
eighteen, three failed to explode, and three detonated underwater. Aside from producing some brash ice, the iceberg was unharmed. Experiments using explosives have been conducted as recently as the 1980's.

Research has also been conducted concerning the use of wires heated by electricity to cut through the iceberg; however, it was found that the electric motors would burn out on the generators before significant progress could be made.



**Bombing Experiments Prove Unsuccessful**

The International Ice Patrol long ago abandoned its iceberg destruction research. The information presented is to give you an appreciation and a respect for the strength and power of icebergs. Even today, modern, radar equipped ships do strike icebergs. Three ships struck icebergs as recently as 1993. For all of our attempts to melt, destroy, or remove them, the safest and surest method has been found to simply report the positions of the icebergs



and allow nature to work its magic.

If you would like further information on the attempts to destroy icebergs, please contact the International Ice Patrol or visit our web page.

### How to Report Icebergs

The Ice Patrol encourages commercial vessels to immediately report ice sightings to COMINTICEPAT GROTON CT through INMARSAT-A or C, using Code 42 to U. S. Coast Guard Communication stations or to Canadian Coast Guard marine radio stations. Regular weather and sea surface temperature reports provide valuable information even when no ice is sighted. Sightings may be reported on guarded frequencies as listed in the annual Announcement of Services.

Copies of the annual Announcement of Services are available through several methods:

1. World Wide Web:  
[www.uscg.mil/lantarea/iip/data/ann\\_ser.html](http://www.uscg.mil/lantarea/iip/data/ann_ser.html)

2. E-mail request to:  
[iipcomms@rdc.uscg.mil](mailto:iipcomms@rdc.uscg.mil)

3. Mail request to:  
Commander,  
International Ice Patrol  
1082 Shennecossett Road  
Groton, CT 06340-6095

Attention: Ice Information Officer

4. Phone request to: (860)-441-2626

### What to Include in an Ice Report

When reporting icebergs, certain information should be included:

- Ship's name & call sign
- Date/Time (UTC) ice was sighted
- Iceberg position (latitude, longitude)
- Method of observation (radar, visual, both)
- Number of icebergs
- Size and shape (Tables 1 & 2)

Ice data is constantly analyzed at the International Ice Patrol operations center in Groton, Connecticut and added to a computer model. This model incorporates environmental factors such as winds, waves, currents, and sea surface temperatures with iceberg reports to predict drift and deterioration. The processed information from the model is used to estimate the Limit of All Known Ice every twelve hours. The LAKI, sea ice limit, and an area of many bergs are broadcast in two daily text bulletins and a graphic fax chart. The broadcast times and frequencies are available in the annual Announcement of

Services. They are also posted daily in the Products section of the IIP web page at:

[www.uscg.mil/lantarea/iip/home.html](http://www.uscg.mil/lantarea/iip/home.html)

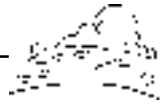
The International Ice Patrol is grateful to all mariners who have contributed to this endeavor and hopes to have your support in the future. Should you have any questions or comments, please contact the International Ice Patrol by e-mail through the World Wide Web or call: (860)-441-2626.

| SIZE            | HEIGHT  |       | LENGTH  |         |
|-----------------|---------|-------|---------|---------|
|                 | (ft)    | (m)   | (ft)    | (m)     |
| Growler         | <17     | <5    | <50     | <15     |
| Small Berg      | 17-50   | 5-15  | 50-200  | 15-60   |
| Medium Berg     | 51-150  | 16-45 | 201-400 | 61-122  |
| Large Berg      | 151-240 | 46-75 | 401-670 | 123-213 |
| Very Large Berg | >240    | >75   | >670    | >213    |

Table 1 Sizing Guidelines

| SHAPE       | DESCRIPTION                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Non-Tabular | This category covers all icebergs that are not tabular-shaped as described below. This includes icebergs that are dome shaped, sloping, blocky, and pinnacle. |
| Tabular     | Flat topped iceberg with length-height ration greater than 5:1                                                                                                |

Table 2 Shape Guidelines



## MESSAGE IN A BOTTLE - By studying objects cast up on our shores, researcher Curtis Ebbesmeyer traces the flow of ocean currents

Kevin Krajick  
Photographs Rick Rickman  
Reprinted with permission

*This article originally printed in The Smithsonian, July 2001*

If Curtis Ebbesmeyer had just one word for budding oceanographers, it would probably be: plastics. If he had more than one, he might add: roll-on antiperspirant balls, toxic-waste containers, computer monitors, lightbulbs, armadas of toys and sporting goods, toilet seats, bales of rubber and marijuana, explosive devices, surfboards, coconuts, aircraft, the occasional human body, and a surprising number of genuine messages in bottles. The seas are wonderfully, horribly full of floating things. Sooner or later, many of them wash up on the beach; and on the way, some make epic continent-to-continent journeys, thus forming new data points regarding the complex doings of long-distance ocean current systems—the subject of Ebbesmeyer's work.

Scientists study currents ever more intensely: they affect not only transportation but weather, biology, evolution and climate change. Most oceanographers use satellites and high-tech buoys for tracking them; Ebbesmeyer, a self-described “filter feeder on floating objects,” stubbornly does it the old-fashioned way—by studying movements of random junk. Part reporter and historian, part water

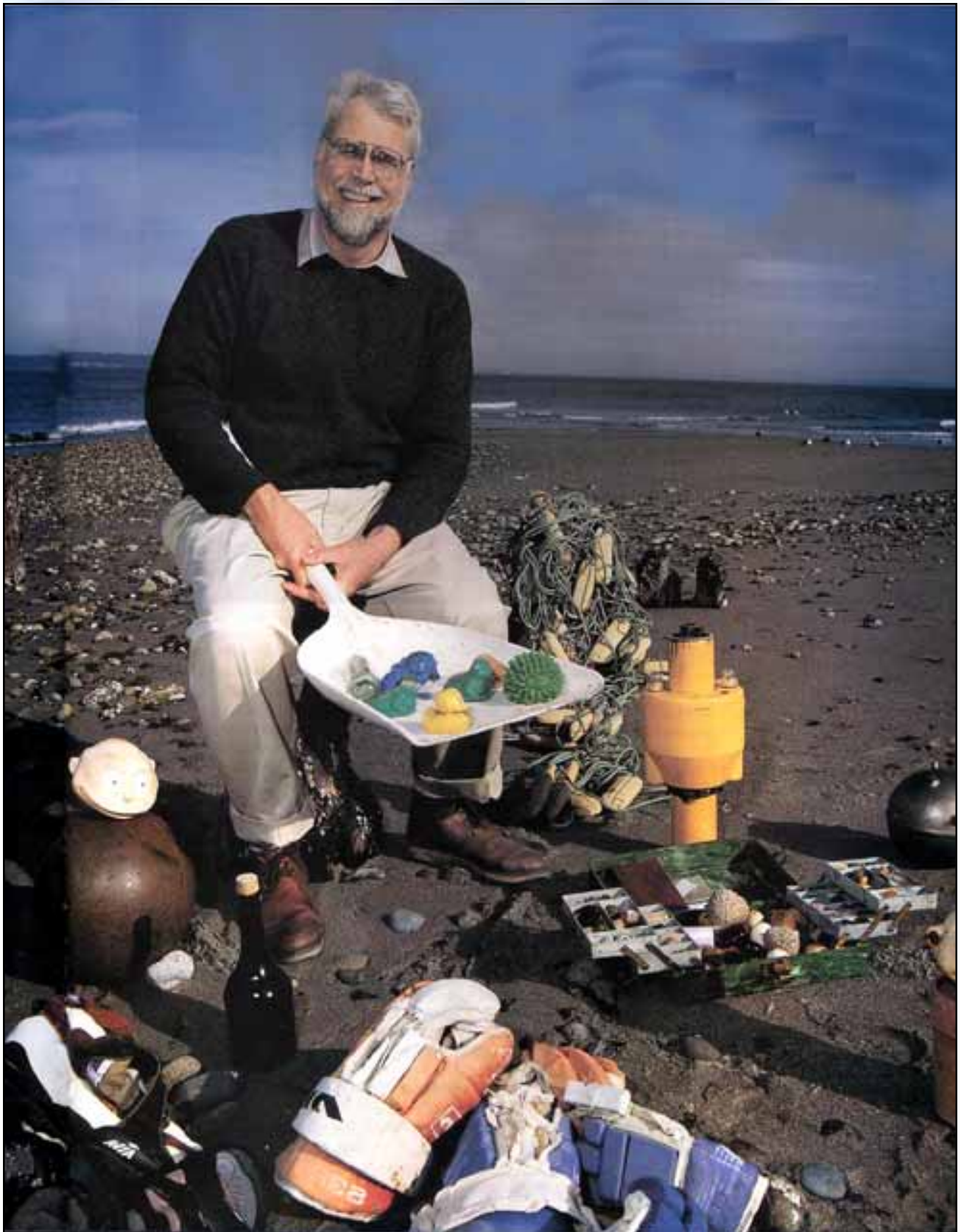
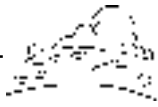
physicist, he has sources everywhere, including his own vast, ragtag worldwide army of beachcombers. “The literature of things that float from here to there is so scattered it makes no sense until you compress it,” he says. “Then it begins to take on a glow, like radium.”

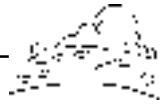
His contributions to the literature range from the seminal to the semi-wacky, but we know one thing: he is probably the only scientist to have posed for *People* magazine mostly naked (grayed in the chest hairs, but looking good) in the pool with a floating bathtub ducky, a souvenir of one of his greatest research triumphs. Colleagues with fancier instruments and stiffer attitudes may sneer, but deep down they must suspect the truth: he has more fun than they do. Along the way, he has learned that ocean surface currents can be chaotically changeable; if two bathtub toys are dumped, say, in the middle of the Pacific at the same moment in the same spot, one may wash up in Hawaii while the other might end up frozen in an Arctic ice floe.

I accidentally entered the world of long-distance floatables on a Canadian Coast Guard icebreaker

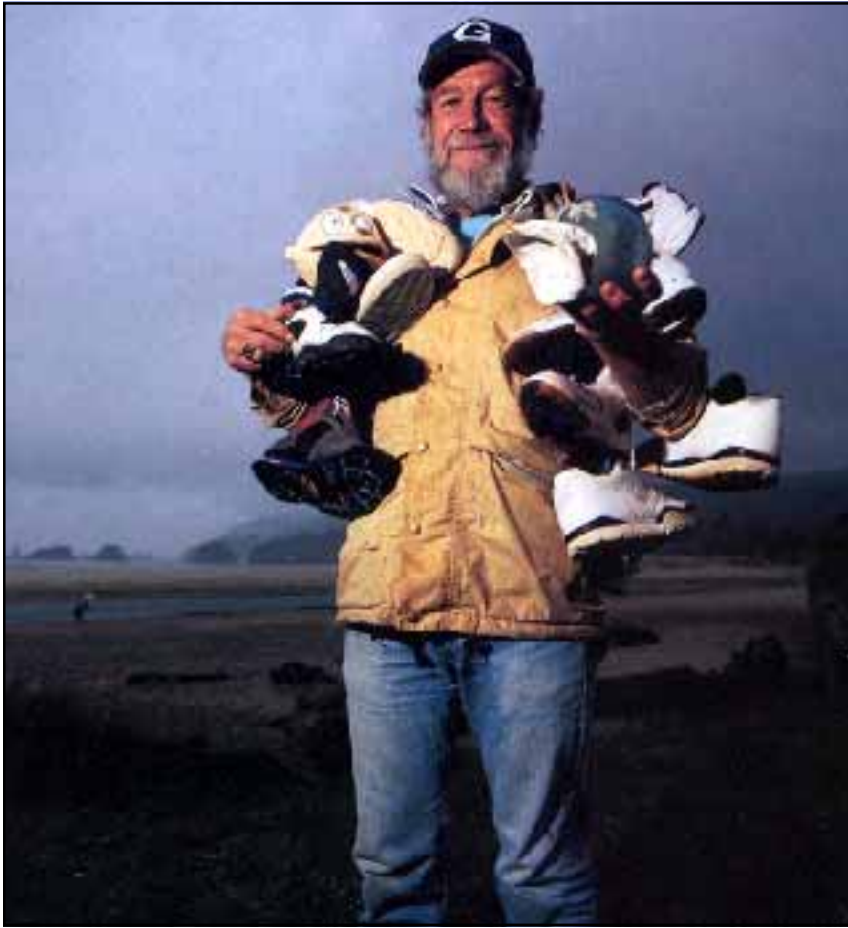
traversing the Northwest Passage—that frozen labyrinth of islands where Arctic ice floes slowly drain toward the Atlantic. In this treeless region, I was watching off the bow one day for polar bears and instead spied dead ahead a weathered tree fragment in the ice. Eddy Carmack, an onboard oceanographer specializing in water movements such as eddies, assured me this was normal. “Trees fall off banks of north-flowing Siberian and Canadian rivers,” he said. “Then they move into the sea ice. They may go around clockwise with the Transarctic Drift”—a great gyre circling the Arctic Ocean—“for 30 years. Eventually, the tree gets spit out near Greenland. If it's not too waterlogged, maybe then it circles the Atlantic for a while. Maybe it lands in England or North Carolina, then somebody puts it on the mantel. There's a lot of odd stuff like that.” Carmack jotted down the Seattle phone number of Curt Ebbesmeyer—the man he said knew the most about such odd stuff.

Ebbesmeyer got started in the mid-1960s with Mobil Oil as a roustabout, then, after attending the University of Washington, an oceanographer. A lot of Mobil's oil





## Message in a Bottle



**Peripatetic beachcomber Steve McLeod, displaying a glass fishing float and other finds, has served as a roving data collector for Ebbesmeyer**

was under the frigid Grand Banks off Newfoundland; Ebbesmeyer was told to figure out how to tow approaching icebergs—the largest floating objects in the world—away from drilling platforms. In 1974 he joined Evans—Hamilton, Inc., a small oceanographic consulting firm specializing in measuring and understanding ocean currents. His projects have included placing sewage outfalls to minimize impact on shore (“Did you know 10 percent of sewage floats even after secondary treatment?”) and tracking oil slicks (of his work on the Exxon *Valdez* spill: “Did you know oranges are good experimental surrogates? For some

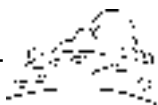
reason, if you dump thousands in seawater, they’ll distribute themselves exactly like spilled oil”).

Each ocean, carrying the long-distance floatables studied by Ebbesmeyer, hosts one or more huge gyres shaped by prevailing winds, Earth’s rotation and bordering landmasses. The Gulf Stream, skirting the U.S. East Coast, is part of a clockwise pattern of surface currents that carries Caribbean debris past Nantucket, toward Iceland, to the coasts of Norway and Britain, around the calm center of the Sargasso Sea, and back again. In the Pacific, the Kuroshio, or Japanese, Current

arcs clockwise away from Japan and becomes the North Pacific Drift, then turns south 200 to 500 miles off Washington or Oregon, where it is called the California Current. Off Baja California, it turns back out, passing Hawaii, heading for the Philippines and China, and back to Japan. An object may take six years to complete the roughly 14,000-mile circuit.

Unless sidetracked in any of countless ways. Storms drive floaters off track, especially ones with windage—exposed surface area making a sail—into counter-currents or competing gyres, like the North Pacific’s counterclockwise Alaska Current, which can snag something from the Pacific Northwest and send it toward Siberia, or filter it through the teeth of the Aleutians to be sucked through the Bering Strait and into the swirling belly of the Arctic. Alternatively, junk may hang out for years if it drifts into the eyes of the great oceanic gyres. Also, strong winds can cause water masses to upwell or downwell powerfully, which is reflected both in surface movements and in huge worldwide submarine currents that flow their own separate ways—a whole other story.

It is also becoming apparent that major surface current systems, once thought stable as rocks, are capable of huge, sudden shifts. In the prehistoric past, these could have been the result—or cause—of drastic climate change; many scientists think that cycle could recur, with dire results. Oceanic distributions of nutrients depend on currents; hitchhiking on currents is



integral to the life cycles of everything from eels to sharks. There's also evidence that even large terrestrial animals may spread and evolve by the unlikely mechanism of "rafting" on ocean debris.

It seems unlikely also that any small human-made object can survive a long voyage, make it to a beach and stay long enough for someone to come along at just the right moment to discover it. But objects do. Boy, do they.

In 1959, the Guinness brewing company of Dublin dumped 150,000 of its bottles into the Atlantic and Caribbean, each containing a scroll bearing greetings from "King Neptune" extolling Guinness and providing instructions for converting the bottle into a lamp. They were so well sealed with cork, wax and lead tape, Guinness predicted they would go 500 years. According to one of Ebbesmeyer's sources, about 80 bottles made it to Coats Island in Canada's Hudson Bay, to be spotted by Inuit hunters. The mystified Inuit used the bottles for target practice, but then saw the scrolls and buried the rest in an unmarked grave.

Ebbesmeyer loves such arcana, but must admit that his first love is garbage. There is so much of it. And most is plastic. The buoyant, indestructible stuff has exploded since the 1950s and '60s; before that most marine garbage was organic, so it eventually rotted or sank. The bulk may come from land, dumped offshore or floated out rivers, but ships contribute much. Lost synthetic fishing gear

alone—nets, traps, buoys, lines, packing material—may run 150,000 tons a year. More is washed or thrown off merchant and pleasure vessels, despite a 1987 international convention supposedly curbing marine dumping. As many as 1,000 or more boxcar-size shipping containers—perhaps the most fruitful sources of intriguing objects—fall off ships annually, releasing fleets of floatable goods.

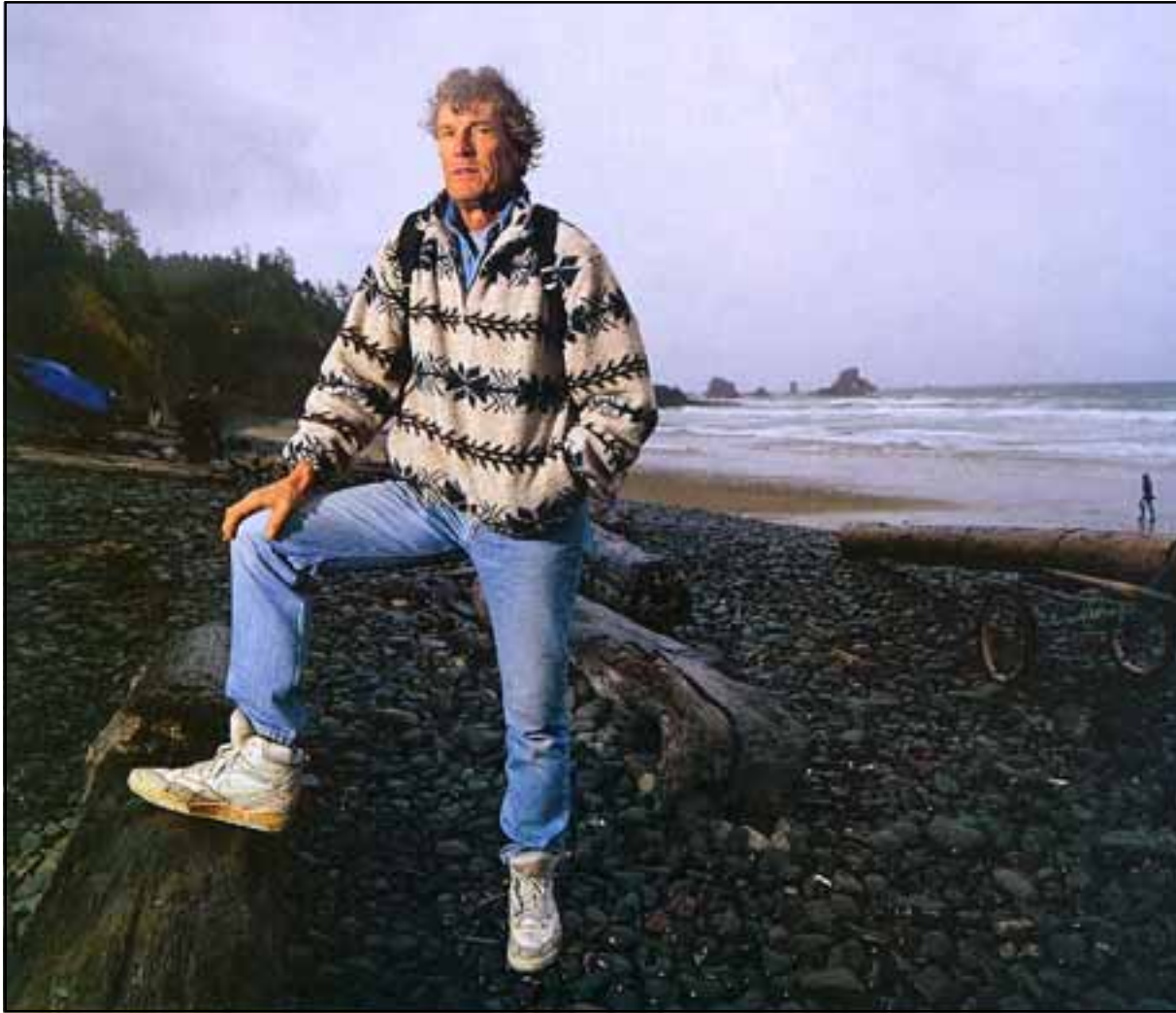
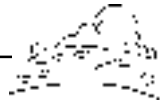
The results are horrifying. In some years tens of thousands of seals and hundreds of thousands of seabirds may die entangled in lost fishing gear. Turtles, whales, fish and at least 100 seabird species mistake plastics for floating food: autopsied animals are often crammed with cigarette lighters, plastic bags, tampon applicators, toy soldiers. Old plastics break up under ultraviolet radiation and waves, but never die; they turn into "nurdles"—colorful, anonymous fingernail—to BB-size bits. The ocean keeps trying to cleanse itself of them like a cold sufferer spitting phlegm. After a recent count, the Southern California Coastal Water Research Project estimated there were more than one million per mile along Orange County beaches. "To my horror and fascination, plastic trash just keeps going," says Ebbesmeyer. "It is both sinister and useful."

Others have long put floatables to work for science. Eighteenth- and nineteenth-century explorers figured out the outlines of major currents simply by watching where objects traveled, including their own vessels. Today, scientific institutions are deploying the latest

### Bathtub Toy's Drift



In 1992 a container ship spilled 29,000 bath toys into the Northern Pacific (star, top). After 400 were found (arrow, middle), oceanographer James Ingraham used a computer model to track the objects' route and extrapolate where the remainder would go. Monor currents would push these floatables along myriad paths, indicated here by individual colored lines. The center chart projects the toy's travels through 1995; the bottom, through the end of last year.



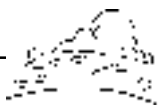
**On Oregon's Indian Beach, collector Barry Tweed sports Nikes from the 1990 spill that became a subject of scientific inquiry**

tracking devices: a planned fleet of 3,000-some PALACE floats, or Profiling Autonomous Lagrangian Circulation Explorers. These drifters automatically sample salinity and temperature—also measures of water movements—and dive on programmed schedules as deep as a mile to catch various current layers, surfacing occasionally like U-boats to transmit data to satellites. But instruments like these cost thousands of dollars apiece and are, by necessity, deployed in limited numbers.

Which brings us back to floating junk—and to Curt Ebbesmeyer. For years he labored at his consulting firm in Seattle but never quite managed to grow up; endlessly curious, Ebbesmeyer did extracurricular thinking on everything from migratory shad to the origin of life. He and a group of colleagues were the first to point out that a single, sudden 1976 Pacific climate/circulation swing had affected dozens of seemingly unconnected phenomenon, including West Coast water-oxygen contents, Arctic sea-ice extents,

Andean glacial dynamics; life cycles of corals, crabs, oysters, salmon. He collected this data from existing studies, like so much beachcombed drift; the resulting publication became a key paper on climate change.

Field science was about to take over Ebbesmeyer's life, beginning one day in May 1991, when his mother, Genevieve, was serving lunch and reading from the paper. Factory-fresh Nike sneakers and hiking boots were washing up on Oregon beaches—so many that



## Message in a Bottle

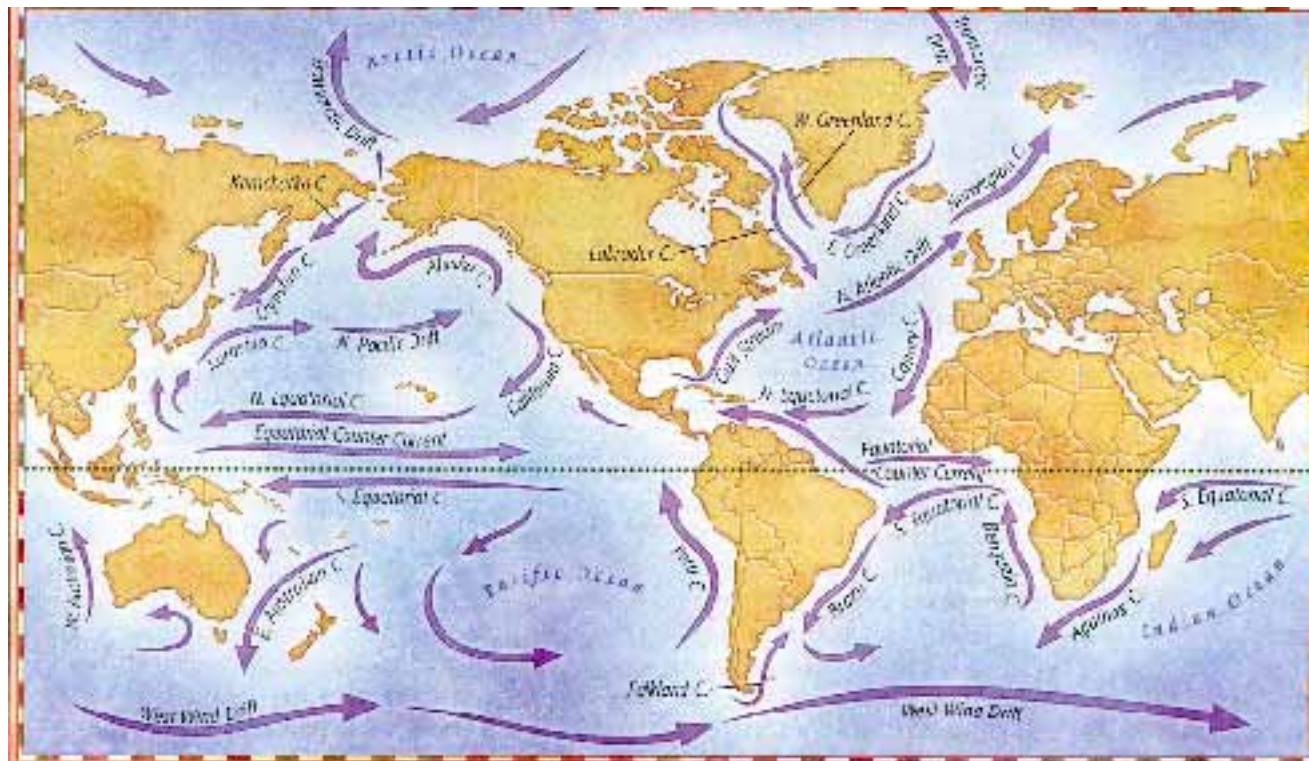
beachcombers were holding swap meets to match lefts with rights of correct sizes for selling or for wearing. No one knew the source. “Curt, isn’t that your business to figure out things like that?” inquired Genevieve. Some hours later the phone rang at a home in coastal Rockaway Beach, Oregon, where a swap meet was in progress. It was Curt Ebbesmeyer.

Thus began a brilliant new incarnation for the oceanographer—and for beachcomber/artist Steve McLeod, mightiest Nike hunter of them all. Converging currents and winds make the Pacific Northwest one of the world’s most productive beachcombing regions, and thus host to a long-time secret society of serious beachcombers. The big prizes: old glass fishing-net floats,

handblown in Japan and ranging from golf-ball-size and smaller to bigger than a medicine ball. The rarest are worth at least \$3,000; there are also crab pots, ship parts and many other resalable objects. Pros monitor 24-hour weather radio for two or three days of winds from the south to move debris in from the main oceanic gyre, hobnobbing with fishing captains for intelligence on off-shore sightings. Storms, of course, are prime time. Combers wait for high tide—even if it’s at 3 A.M.—then climb down crumbly cliffs to dot beaches with lanterns, flashlights, floodlights and headlights; pickup trucks rove surf lines on accessible stretches.

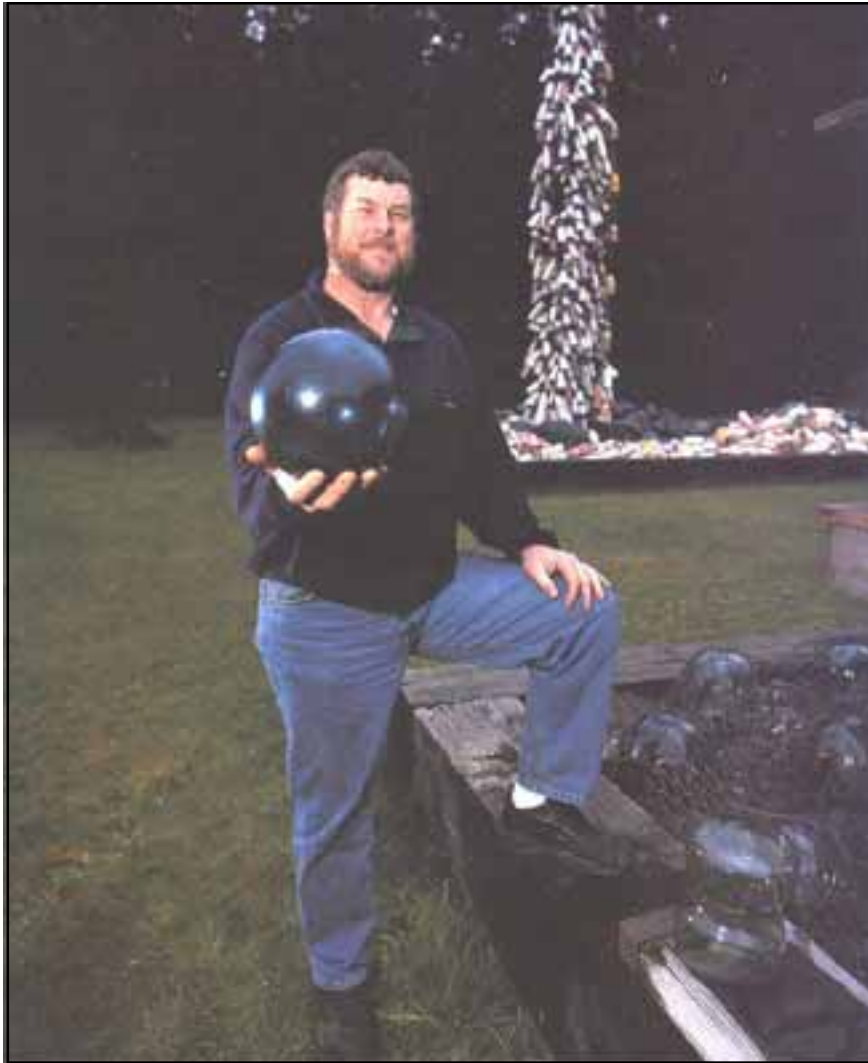
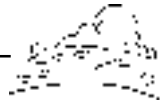
No one knows who found the first Nikes, but McLeod collected his

initial batch of about 20 along and near Crescent Beach, a wild stretch of sand flanked by cliffs near his home in Cannon Beach, Oregon. The 56-year-old ex-coast guardsman had long ago dropped out of the “consumerist economy” to pick chanterelles in the woods and sell salvaged fishing floats; he saw an opportunity here. His size nine hiking boots were worn out, and here was an expensive new size nine Nike—albeit only a left, encrusted with barnacles. Combers are generally secretive, but this time they needed each other. One woman mentioned the Nikes to a local television reporter and the news spread. People put the shoes in washers with bleach. Ensuing swap meets featured mounds of Nikes. Soon McLeod had new



Each of the oceans is home to one or more huge gyres, formed by the major surface current systems. These currents, shown above in their average locations and directions, are driven primarily by prevailing winds and Earth’s rotation.

Image courtesy of Karen Minot



**John Anderson has recovered an array of glass fishing floats (he holds his favorite; his rarest is by his foot), along with countless foam buoys that cover a 40-foot post in his yard.**

boots on both feet, plus a stock of extras that eventually netted him about \$1,300, at around \$20 a pair.

Things really got going with the appearance of “Dr. Curt,” as they called him. For him, this was not about the money. It took half a dozen phone calls to find McLeod, and a dozen or so more brought him to Nike’s transportation manager. The man told him—as Ebbsmeyer suspected—that Nike had lost a load of shoes in a

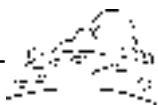
shipping accident; the courts were ironing it out. “They’re washing up now. Do you want them back?” asked Ebbsmeyer. He was told, not surprisingly, that he and the beachcombers could keep them. Here, thought Ebbsmeyer, is the best drift experiment anyone could dream of.

Phoning shipping lawyers, he got court papers with baseline data: the ship was the *Hansa Carrier*, en route from Korea, hit by a

storm on May 27, 1990, at 48 degrees north, 161 degrees west. Twenty-one containers were swept off deck; five held 80,000 Nikes. Each Nike tongue had a telltale serial number, distinguishing the shipwrecked ones from those of, say, random drowning victims or forgetful beachgoers. (Ultimately, those serial numbers led Ebbsmeyer to deduce that only four of the five containers had likely opened—spilling 61,280 shoes into the sea.)

Ebbsmeyer visited the beachcombers repeatedly, and fit right in. “A kindred spirit with a PhD!” thought McLeod. He was foot-loose, so Ebbsmeyer deputized him to document where more Nikes turned up. On the Oregon coast, McLeod met with a diner waitress who directed him to her brother-in-law, who had a garageful. In another town, he looked both ways, then dove head first into a Dumpster for Nikes discarded by a beach cleanup crew. Crossing over into British Columbia, he eventually reached the wild Queen Charlotte Islands, near Alaska. He joined a sea-kayaking trip in the southern islands and, farther north, met beachcombers who had recovered Nikes. Meanwhile, Ebbsmeyer collected more reports from his expanding beachcomber network. After a year or so, they had compiled reliable details on 1,600 wash ups, a 2.6 percent recovery rate—very respectable.

Ebbsmeyer’s old buddy, Jim Ingraham of the U.S. National Oceanic and Atmospheric Administration, had worked for years to



extrapolate a computer model of changing Pacific surface currents from Navy weather data, but so far it was only theoretical; here was a real-life test. They plugged in spill coordinates with beaching coordinates and dates; the predictions of Ingraham's Ocean Surface Current Simulator (OSCURS) matched nicely. This allowed Ingraham to refine OSCURS, and draw computer-animated Nike paths, "spreading like ganglia in the ocean and balling up in coastal currents. Then, based on historical weather data, they simulated identical spills for May 27 of every year, 1946 to 1991. The Nikes went a different way each time—a tribute to the ocean's variability. "The surface layer is a strange place," said Ingraham.

Even before it was published in the geophysical journal *EOS*, the study made them minor media stars (what reporter could resist science based on oceangoing sneakers?), and with this, Ebbesmeyer found his true calling. Hundreds of people phoned to see if he could advise on other odd floatables they had found. Failing to find even one other scientist pursuing such things, he decided he was the man for the job. He had already cut his paid workweek 40 percent in order to write more; now he awaited his fondest hope: another big container spill. Besides McLeod, his occasional unpaid "research assistants" included Barry Tweed, a retired Oregon contractor who had built two stunning seaside houses of cedar, hemlock and redwood logs salvaged from surf; John Anderson, a Forks, Washington, plumber



**Anderson's haul also includes Japanese soda bottles, orange C-ration containers and other finds.**

who had backpacked 30,000 drift-net floats from beaches to a very large pile by his garage; and Vern Krause, a Washington school bus driver with the distinction of having found a mysterious stainless-steel sphere that was confiscated by the military after Ebbesmeyer sought help in identifying it. (Deemed safe, it was returned the next week.)

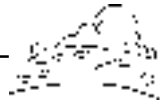
In December 1991 a friend sent Ebbesmeyer a message in a bottle found on southern Vancouver Island. Gingerly prying open the dampened ship's sheets, Ebbesmeyer saw Chinese characters—a printed appeal for the release of the famous dissident Wei Jingsheng, by then imprisoned 12 years. It took Ebbesmeyer and six colleagues a year of phone calls and help from a friendly American ex-intelligence man to, first, decipher the waterlogged message, and then establish that Taiwanese frogmen had been aiming propaganda bottles toward

the mainland for years. Evidence suggested this one had likely been released in summer 1980 near the island of Quemoy, when coastal currents were favorable. Obviously, it had gone off course. Ingraham again applied OSCURS to plot the probable route—through an island chain below Japan, then across the Pacific—and they published a paper in *EOS*, ending with the hope that the "magic of bottle notes" would secure Wei's release from a second term in prison. In 1997 Wei was freed—though no bottle connection is known—and when he came through Seattle, he met with Ebbesmeyer, who gave him a copy of the *EOS* paper.

In 1993 an article from the Sitka (Alaska) *Sentinel* metamorphosed into the team's proudest achievement. It reported that scores of tangerine-size yellow ducks, green frogs, blue turtles and red beavers had beached in Alaska coves. Another big container spill—bathtub toys, no less.

Ebbesmeyer confirmed some 400 sightings along 530 miles of Alaska shoreline. Deciding experiments were in order this time, he obtained samples from the toys' U.S. distributor, Kiddie Products. Each four-toy set was housed in a plastic shell with a cardboard backing, but soaking in seawater dissolved it, meaning the toys had probably been released to go their separate ways within 24 hours.

Ebbesmeyer also noted that some of the salvaged toys appeared to have been gnawed by sea otters,



## Message in a Bottle



**One theory behind Elián González's survival, vivified in a mural installed in Miami, is that dolphins nosed the boy's inner tube, an appealing floatable, to safety.**

so he drilled otter-tooth-sized holes in his samples to judge what portion of the originals might have sunk: none. "Very high-quality bathtub toys," said Ebbsmeyer. "Buoyant even when half-water-logged." He stuck them in his freezer to see if Arctic cold would crack them. Nope.

Then one day he got a call from a minor shipping executive, telling him his ship had come in and directing him to a Tacoma dock. Ebbsmeyer spent four hours with the captain, who opened the ship's log to the spill—29,000 toys dumped on January 10, 1992, at 44.7 degrees north, 178.1 degrees east. With the picture complete, OSCURS got huge amounts of new data. Best of all, Kiddie Products printed the duckies' calculated twisty 15,000-mile route on the back of every new bathtub-

toy package. "By far our best publication," says Ebbsmeyer.

He has since founded the nonprofit Beachcombers' and Oceanographers' International Association, complete with the *Beachcombers' Alert!* newsletter (500 paid subscribers from as far as West Africa and New Zealand) and its own Website ([www.beachcombers.org](http://www.beachcombers.org)). The organization has documented spills of everything from onions to hockey gloves.

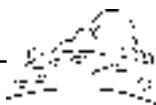
Aiming to census marine trash in general, in summer 1999 Steve McLeod signed onto a small sailing vessel owned by the environmentalist Algalita Marine Research Foundation for three weeks. They headed into one eye of the North Pacific Subtropical Gyre—dubbed the Garbage Patch, because it collects so much junk. McLeod

spent the three weeks seasick despite his years in the Coast Guard—but still scanning the horizon. About as far from land as one can get, they found piles of rope fishing gear, liquid containers, a volleyball, even a refrigerator. The main haul was nurdles: drags with fine nets indicated 129,000 per square mile—six times the mass of collected zooplankton. A mahi-mahi caught for dinner was full of nurdles.

Ebbsmeyer felt sick when he heard the results. "How do we measure the sea's wildness?" he said. "Like a doctor sizing up a patient, I'd look her in the face. She's breaking out in a nasty rash."

Lately he can be found in his basement warren of six rooms crammed floor to ceiling with newspapers, books and blue looseleaf binders marked by topic, all related somehow to floating things. I visited him there and saw he was continuing to expand: there were rare books on funerary practices of the ancient Vikings, who liked setting dead people adrift. One binder read CUBAN REFUGEE RAFTS. A recent subject of speculation, as reported in *Beachcombers' Alert!*: Did the shipwrecked Cuban boy Elián González survive because porpoises, supposedly attracted to the floatable inner tube, had nudged the boy to safety?

Next day I visited John Anderson, the plumber with the major fishing-float collection. Anderson had



## Message in a Bottle

obtained the superstructure of a large crane, planting it vertically in his front yard and covering much of its 40-foot height with foam fishing floats—a kind of totem pole. “My monument to beachcombing,” he said. A four-hour tour through the grounds, house and outbuildings showcased his meticulously organized acres of doll heads, fish gaffs, hard hats with peoples names on them, sake bottles, neoprene gloves, ropes, a police LSD-testing kit, fossils, animal bones. “Curt taught me not to overlook anything,” said Anderson.

Down in Canyon Beach, McLeod seemed a little depressed. He showed me around town, sporting a pair of fancy Nikes—he has a lifetime supply—but a business plan to sell sculptures of beachcombed kelp stalks had tanked due to lack of demand. The beaches were spectacular and covered with countless nurdles. Had they been gold flakes or garnets, we would have been rich. While we hiked, McLeod fantasized about new ways to make money, including a machine to filter recyclable nurdles from the sand.

On my travels I also did a lot of beachcombing myself. My best site was the Willapa National Wildlife Refuge at Leadbetter Point, Washington. It was a mile-and-a-half walk through dense bush and drizzle to a long, arcing beach where a receding tide, trackless sand and tsunamis of sanderlings flying just above the swash told me I was on a still-wild coast. There are so few left.

Here, in addition to countless plastic bags, bottle tops, and soda and water bottles, I logged 302 items. Partial List: beer cans—Coors, Bud, Miller, Hamm’s, Rainier; plastic Kodiak chewing tin; blue plastic 55-gallon drum, empty; blue plastic hospital ID bracelet, no name; peppermint Life Saver, individually wrapped; glass Oso Negro liquor bottle, top on; two foam fishing buoys; plastic deli clamshell; three car tires; Taco Bell bag; synthetic rope; 12 spent shotgun shells; intact fluorescent light tube; plastic containers for Windex, Spic & Span, Pennzoil, Dannon and Yami yogurts, Darigold cottage cheese, L’Oreal Kids shampoo; a sneaker made in Taiwan; red-billed cotton cap; two nice scallop shells; a golf-ball-size chunk of light gray pumice, possibly from Mount Saint Helens; and—beginner’s luck—a real live message in a bottle.

It was semitransparent white plastic vitamin bottle with a rusted metal cap, half buried in the fresh, wet sand, displaying a paper square jammed inside. I unscrewed it and pulled out two dry sheets—a photocopied memorandum dated Oct. 20, 1999, regarding lifeboats aboard the *USS Camden*. There was an informal Q&A regarding life, and its alternative, after abandoning ship for the boats.

*Q:* After you are in the water, what is the most likely cause of injury to be encountered?

*A:* Underwater explosion.

*Q:* How do you enter the water and proceed away from the ship in case of burning petroleum in the water?

*A:* Enter feet first, swim under water, coming to the surface for air by splashing water away and swim under water. Repeating the process until you are clear of the flame.

*Q:* With water, how long could a man survive without food?

*A:* Three weeks or longer.

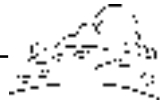
*Q:* How long could a man survive without water?

*A:* Eight to twelve days.

And so on.

I checked with the Navy. The *Camden* is a combat-support ship, based near Seattle. Most of its recent missions had been routine coastal exercises. As far as I could tell, all aboard were safe and well; I do not know why someone dropped this bottle, which probably did not drift far. I now keep it in a cabinet by my desk. For some reason, more than anything else I have, it reminds me of the sea.

Kevin Krajick’s *Barren Lands: A Journey to the North American Arctic in Search of Diamonds* is currently being published by W.H. Freeman. Photographer Rick Rickman is based in Laguna Niguel, California.



## European Group on Ocean Stations

### ‘Where decision-makers for buoy observations in the North Atlantic Ocean Meet’

*Torleif Lothe*  
*EGOS Technical Secretary*



In 1977, eight European countries agreed to initiate a project with the aim of setting up and maintaining an experimental European buoy network. The project\* was set up as an EEC programme and, in 1979, a Management Committee consisting of one representative from each Party was formally established to co-ordinate the project. A Technical Secretariat was appointed to support the work of the Management Committee and, in 1988, the European Group on Ocean Stations — EGOS — was formed to help co-ordinate the acquisition of meteorological and oceanographic buoy data in the North Atlantic. Eleven years later, in 1999, it was decided to also appoint a Technical Co-ordinator to help deal with the increasing number of drifting buoys.

EGOS currently functions as an action group of the joint WMO-IOC † Data Buoy Co-operation Panel (DBCP) and has grown to include nine member countries — Denmark, France, Germany, Iceland, Ireland, The Netherlands, Norway, Sweden, and the United Kingdom.

Since its formation, EGOS has proven to be an efficient forum for technical decision-makers with hands-on experience of the difficult observing regime that the oceans constitute. The buoy network has made marked advances since its early experimental phase, and the focus of EGOS has now moved on to advanced topics such as data quality, buoy metadata, deployment strategy and spatial/temporal data coverage.

*\*COST 43 or Co-operation in Science and Technology action 43*

*† WMO-IOC. World Meteorological Organization – International Oceanography Commission*

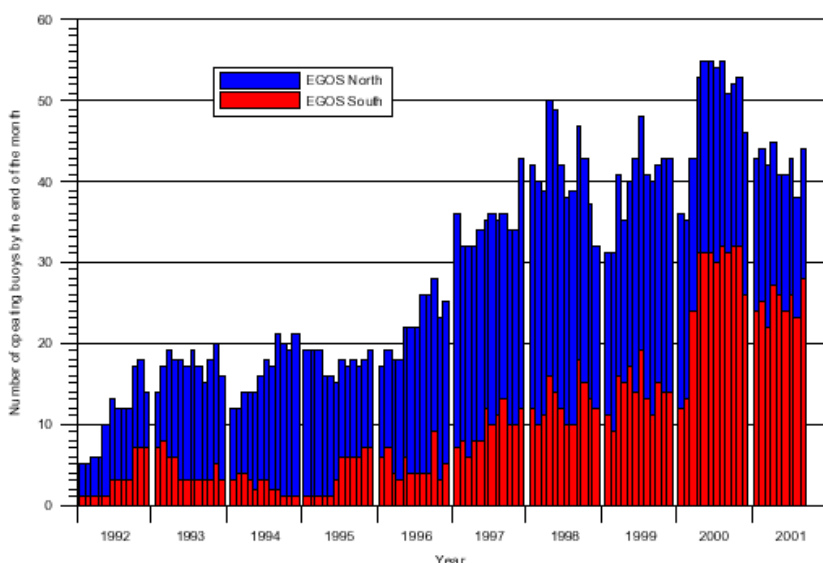
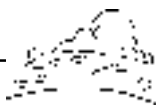
### Deployments

The EGOS drifting and moored buoys are deployed and operated in an area of interest bounded by the latitudes of 30° N. and 65° N. and between the longitudes of 50° W. and the European continent, including the adjacent waters of the Baltic Sea and the Mediterranean Sea.

In order to maintain a continuous operational drifting-buoy network, new buoys have to be deployed on a frequent basis. Drifting buoys are usually deployed by observing ships sailing from Iceland to the eastern coast of North America or by observing ships normally operating on routes from Denmark to Greenland, or from the UK to North America. In recent years an

The objectives of the EGOS programme are:

- to maintain an operational network of drifting and moored buoys in the data sparse areas of the North Atlantic;
- to co-ordinate the development of drifting buoys provided by EGOS members;
- to co-ordinate data dissemination and monitor data quality;
- to provide information on the operational status of buoys to members and co-operating parties.



**Figure 1. The number of EGOS drifting buoys reporting air pressure data on the Global Telecommunication System from 1992 to October 2001.**

*Note.* For the purposes of the graph on the left, EGOS is subdivided into two sub areas — EGOS North for buoys deployed north of 50° N., and EGOS South for buoys deployed south of 50° N. Because of its importance as a development area for cyclonic weather systems, most of the EGOS programme activity is in the EGOS North area.

moorings are examined every 12 months, and the mooring changed at three-yearly intervals.

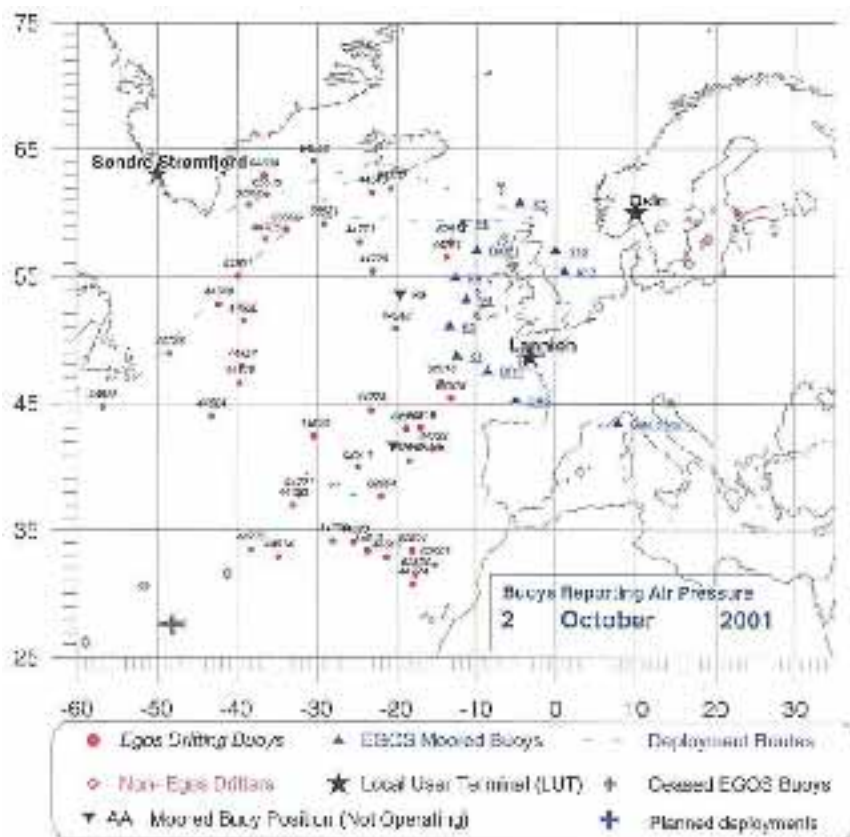
Figure 2 overleaf shows the locations of EGOS drifting and moored buoy arrays as at 2

increasing number of air deployments sponsored by the Commander, Naval Meteorology and Oceanography Command have helped to improve the spatial resolution.

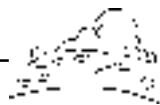
In the past decade, the annual average number of operational drifting buoys in the EGOS area increased from approximately 11 buoys in 1992 to 49 in 2000 (see Figure 1).

The regular seeding of the North Atlantic with drifter buoys, and the routine deployment and maintenance of the moored buoys, ensures a comprehensive network of in-situ observation data essential for forecasting and climatological purposes.

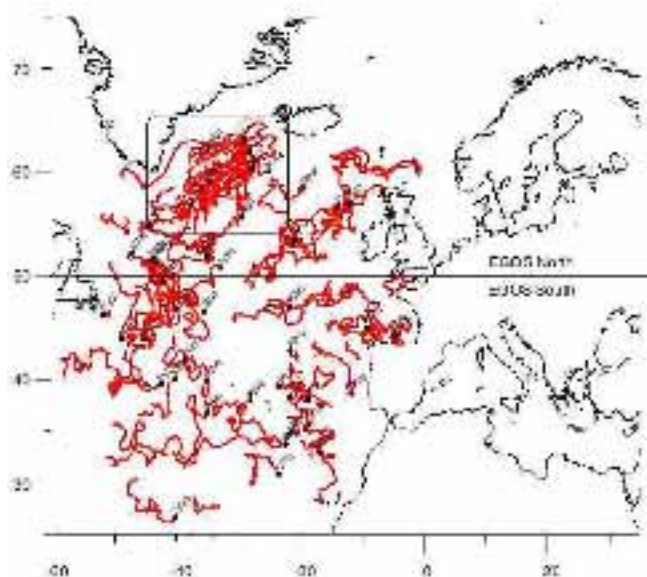
When possible, servicing visits are made to each moored buoy at six-monthly intervals. The upper



**Figure 2. Locations of EGOS drifting and moored buoy arrays as at 2 October 2001.**



EGOS Drifting Buoy Trajectories Jan 1- June 4 2001\*



**Figure 3. Drift trajectories of EGOS drifting buoys during the first half of 2001. (Note that very few of these buoys appear to be drifting to the south-west of Iceland.)**

October 2001, whilst Figure 3 shows the drift trajectories of EGOS drifting buoys during the first half of 2001. Interestingly, and contrary to normal expectations, very few of these buoys appear to be drifting out of the square (indicated on Figure 3) to the south-west of Iceland.

The Met Office currently contributes nine open ocean moored buoys to the EGOS programme and, in addition, jointly operates with Météo-France the 'Brittany' and 'Gacogne' buoys located within the Bay of Biscay\*. Météo-France also operates the 'Côte d'Azur' and 'Pomme' moored buoys. In collaboration with the Met Office, the Irish Marine Institute has also recently initiated a moored buoy programme and deployed their moored data buoy, 'M1', sited west of the Aran Islands. A further moored buoy, 'M2', was deployed earlier this year to the east of Dublin, and a

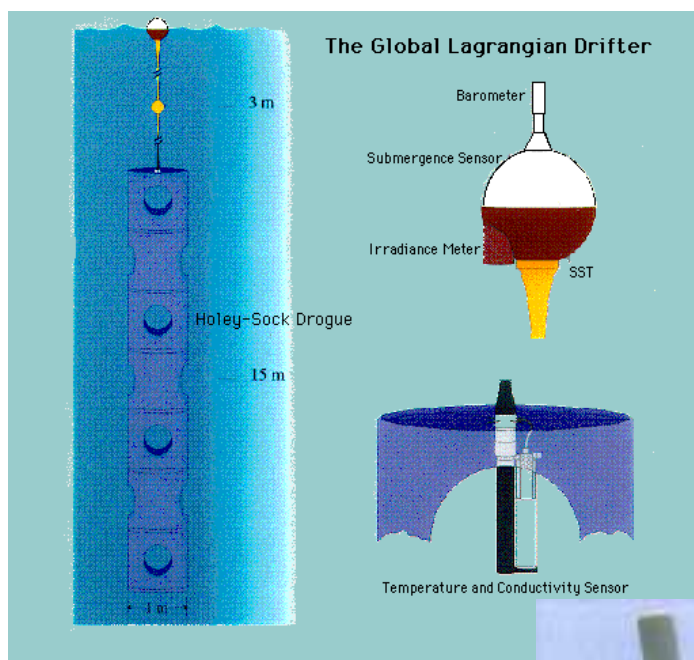
further three new deployments are planned.

### Buoy types

The **drifting buoys** currently deployed within the EGOS area of operation are primarily SVP-B type drifters which report air pressure, pressure tendency and sea-surface temperature on an hourly basis. (See Figures 4(a) and 4(b)). These buoys are made by a number of different manufacturers, and some are also designed to report wind speed and direction. A smaller number of buoys called FGGE † type buoys are also capable of reporting parameters

such as air temperature.

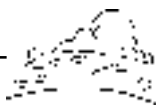
\* See The Marine Observer, 69, 116  
† FGGE. First GARP Global Experiment (GARP. Global Atmospheric Research Programme)



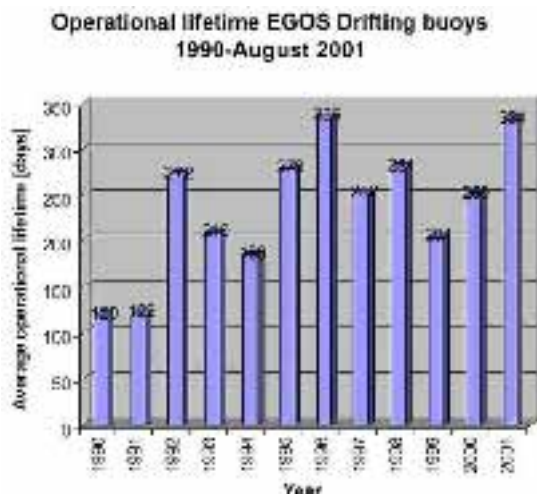
**Figure 4(a) (above). Schematic diagram through a SVP-B type drifting buoy and drogue system.**

**Figure 4(b) (right). A deployed SVP-B type drifting buoy.**





The average lifetime for drifting buoys within EGOS has increased significantly in recent years, as indicated in Figure 5. Although the buoys are expendable and not intended for recovery, they are recovered and re-deployed in suitable cases.



**Figure 5. Average operational lifetime of EGOS drifting buoys.**

The **moored buoys** form part of a more comprehensive observing programme off the European continental shelf, anchored in water depths of 2,000 to 4,500 metres (see Figure 2 for locations). Parameters measured by the moored buoys include, but are not limited to, the following:

- wind speed;
- wind gust;
- wind direction;
- air pressure;
- air temperature;
- sea-surface temperature;
- humidity;
- significant wave height.

Figure 6 (opposite) shows a typical moored meteorological open ocean buoy in the process of being serviced.

The hull of the moored buoy is normally made from a combination of mild steel

and closed cell buoyancy. The buoyancy, a yellow-coloured elastomer material, is protected against abrasion and damage.

The superstructure of the buoy normally comprises a truncated pyramid supporting an instrument sensor ring. The buoy moorings are usually an inverse catenary type with a one-tonne

reserve buoyancy sub-surface float and an acoustic release.

The data sensors for moored buoys are normally required to be capable of unattended operation in the marine environment for at least six months. The buoys' systems are powered by sealed lead-acid gel batteries and charged by solar panels attached to the superstructure.

Each moored buoy is fitted with two multi-element radar reflectors and a navigation lamp giving an amber light. The lamp has a visibility of 5 miles and has an illumination cycle of 5 flashes in a period of 10 seconds followed by a

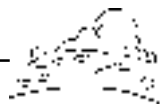


**Figure 6. Servicing a moored buoy.**

pause of 10 seconds with no illumination.

### Data transmission

The **drifting buoys** transmit data to the ARGOS system which is a satellite-based system collecting platform data, and delivers it to users world-wide. Telemetry from the platforms is used to calculate the geographic position. The ARGOS operation begins with transmissions from Platform Transmitter Terminals (PTTs) attached to the buoy sensors. The PTTs uplink (transmit) their messages at preset intervals to the ARGOS receivers that are on board the National Oceanic and Atmospheric Administration (NOAA) polar orbiting satellites. The transmitted messages are then relayed to one of the three main system ground stations at Wallops



### EGOS is improving the quality of data on the GTS

The EGOS Technical Co-ordinator continuously collects information on the quality of EGOS buoy data and can interact directly with the GTS distribution system when required. If a buoy produces suspect or erroneous data the Technical Co-ordinator can arrange for the sensor data to be corrected or removed from the GTS.

### EGOS maintains detailed buoy records and information

Data quality statistics produced by Météo-France comparing the buoy data with the model fields are reviewed and published in EGOS reports on a monthly basis. The monthly reports are prepared by the Technical Secretary and also include full details of buoys currently deployed, or planned for deployment, their locations, their sensor status etc. The reports are also made available on the dedicated EGOS web-site\*

### EGOS is increasing the amount of data on the GTS

EGOS aims to increase the number and coverage of data on the GTS by minimizing the time between deployment and GTS distribution, by optimizing deployment strategies, and by performing cost benefit analyses of different buoy systems

### EGOS secures data for generations to come

The Technical Secretary maintains a metadata database for all EGOS drifting buoys. This information is vital for the use of real time data in climatological studies. EGOS intends to make this database compatible with international standards currently being established

\* <http://www.cmr.no/conmar/egos>

EGOS home pages are located at <http://meteo.shom.fr/egos/>

Island (Virginia, USA), Fairbanks (USA) and Lannion (France). Received buoy data are also processed through local Land User Terminals (LUTs) located in Norway, Greenland and France (Oslo, Søndre Strømfjord and Lannion, respectively). This reduces the delay of disseminating data to the Global Telecommunication System (GTS).

On the **moored buoys**, all the data from the data acquisition and processing systems are transferred to a Data Collection Platform (DCP) and then transmitted via the Meteosat geo-stationary operated by EUMETSAT. There are usually two DCPs on each moored buoy. The data received by EUMETSAT (at Darmstadt in Germany) are then forwarded to the Met Office where they are

converted into WMO FM13-XI SHIP code for retransmission onto the Global Telecommunication System.

### Summary

By combining their national buoy programmes within the EGOS framework, it has enabled participating National Meteorological Services such as the Met Office to focus on their core activities while still being routinely updated on relevant technical and policy issues. Moreover, EGOS provides participating members with the necessary information to ensure that they can manage their buoy deployment strategies efficiently, and also acts as forum for the

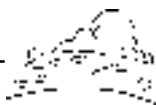
exchange of technical knowledge and ideas.

### Addendum

[A drifter was deployed from the UK Voluntary Observing ship **CanMar Pride** and two drifting buoys were deployed on behalf of the Met Office by the Icelandic Meteorological service at the end of October 2001.]

[A replacement K7 buoy (indicated as non operational in Figure 2), was successfully deployed in mid September 2001 and is operating normally.]

*Real-time observations from the EGOS moored buoys are posted on NDBC's web site (<http://www.ndbc.noaa.gov>).*



# SATELLITES, OR SIMPLY SHIPS AT SEA, BLEND TO HELP HURRICANE FORECASTERS

By Martin Merzer  
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Something ugly appeared to be brewing in the Gulf of Mexico, but it seemed too early, too unlikely. Hurricane forecasters huddled over satellite photos, analyzed computer printouts. Then, definitive information arrived the old-fashioned way - and the debate ended.

The research vessel **McArthur** reported extraordinarily high winds. Now forecasters knew that Tropical Storm Allison, the first of the hurricane season, was gathering itself into a drenching, deadly force. They rapidly posted warnings in Texas and Louisiana.

In an age of high-tech computers and high-flying satellites, forecasters still rely heavily on low-tech tools reminiscent of a simpler time: basic weather reports from ships at sea and amateur radio reports from remote corners of the hurricane zone.

"Without ship reports, we couldn't do our job, even in this day and age," said Dan Brown, a meteorologist with the Tropical Analysis and Forecast Branch, a government unit that works with the National Hurricane Center. "We have to know what's going on now

before we can figure out what will happen later."

### Vital Information

Located in a room adjoining the hurricane center's forecasting complex in West Miami-Dade, the unit gathers vital information from hurricane breeding areas in the Atlantic, Caribbean and Gulf of Mexico.

Much of that data arrives four times a day from scores of vessels - freighters, cruise ships and research craft that ply regions too distant to be reached by reconnaissance aircraft. For no compensation other than the generation of goodwill, crew members voluntarily report sea and sky conditions.

### 'Not Required'

"They're not required to report, but we certainly encourage them to," said meteorologist Robert Molleda. "The more data, the better."

And in it flows, day after day.

On Monday afternoon, for instance, the **Santa Maria** reported from 1,367 miles southeast of Miami that the water and air temperatures were 82°, 19 kt (22-mph) winds blew from the east, the dew point was 72° , and seas were five feet high.

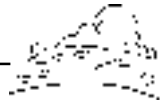
### Data From Buoys

Transmitted by radio, comparable information from other ships and from nearly 60 buoys moored close to shore, and floating freely in the ocean is collated on charts used by Brown, Molleda and their colleagues.



**Taken while experiencing gusts to 65 kt with sustained 45 kt, just 25 miles seaward of Galveston Bay, from the Training Vessel State of Maine.**

Photo courtesy of Bart Clendennon, Cadet Master



## Tropical Storm Allison



**NOAA Ship  
*McArthur***

Then, they issue marine forecasts for the tropics and subtropics - and they relay essential information to hurricane forecasters on duty just 20 steps away.

Satellite photos can pinpoint storms, and computerized models can help predict how those storms might behave, but neither can produce the precise, real-time data craved by forecasters. That's where ship and ham radio reports come in.

"This is extremely valuable material because it is the only way we can know for sure what is happening," said Lixion Avila, a lead forecaster at the hurricane center. "It's a report from an instrument - not just a picture."

### Seeing The Threat

It was that kind of information that helped forecasters determine earlier this month that the storm soon to be called Allison threatened residents along the Gulf.

On June 5, just five days into the hurricane season, the **McArthur** was conducting research for the National Oceanic and Atmospheric Administration about 100 miles east of the developing storm's center.

As conditions deteriorated, crew members began transmitting hourly weather updates. Finally, just after 1 p.m., the **McArthur** reported sustained wind of 55 mph, well above the 39-mph requirement of a named storm. Allison was born.

### 47 Deaths

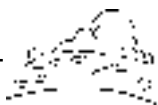
The storm and its remnants ultimately were blamed for 47 direct and indirect deaths, including nine in Florida.

When even stronger storms threaten land, a network of amateur radio operators cranks into action, and station W4EHW (Watching 4 Early Hurricane Warnings) returns to the air.

Another throwback to the early days of hurricane tracking, ham operators still serve as an important link between forecasters and those threatened or assaulted by a storm.

### Volunteer Shifts

Based at the hurricane center, the station is staffed during storms by



### TPC Calling All Ships At Sea

*Christopher Burr  
Chief, Tropical Analysis and  
Forecasting Branch  
Tropical Prediction Center,  
Miami Florida*

The NWS Tropical Prediction Center (TPC) is now able to contact ships at sea via an e-mail account set up through COMSAT Mobile Communications. By knowing a ship's Inmarsat (a global mobile satellite communications operator) Mobile Number obtained through the Inmarsat ship directory Web site, messages can quickly be exchanged with ships at sea and therefore assist forecasters in preparing tropical cyclone advisories and marine forecast products. This method of communication was used recently to obtain weather information from the ship **Nobel Star**, which was traveling near the center of Tropical Storm Dean.

"We routinely receive ship observations every six hours," said Christopher Burr, Chief of the Tropical Analysis and Forecasting Branch, TPC. But by using e-mail, NWS can now request more frequent observations and monitor storms more closely. "Having these more timely observations can really help increase the accuracy of our marine warnings and save lives" said Burr.

volunteers working around the clock on three-hour shifts. They relay data in both directions - local conditions are reported to forecasters in South Florida, and forecasts are transmitted to local residents.

"It's the human component that makes it so exciting," said John McHugh, a coordinator of the program.

During 1998, the station was on the air for 500 hours and proved particularly valuable during Hurricane Georges, when reports it relayed from Cuba helped forecasters reposition the storm's eye and recalculate its path through the Florida Keys.

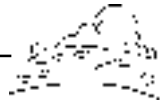
operators kept the station running for 120 hours.

In addition, the station's volunteers coordinate a network of more than 200 people who report local weather observations via e-mail and fax, another valuable source of information - and another example of what organizers call a genuine humanitarian activity.

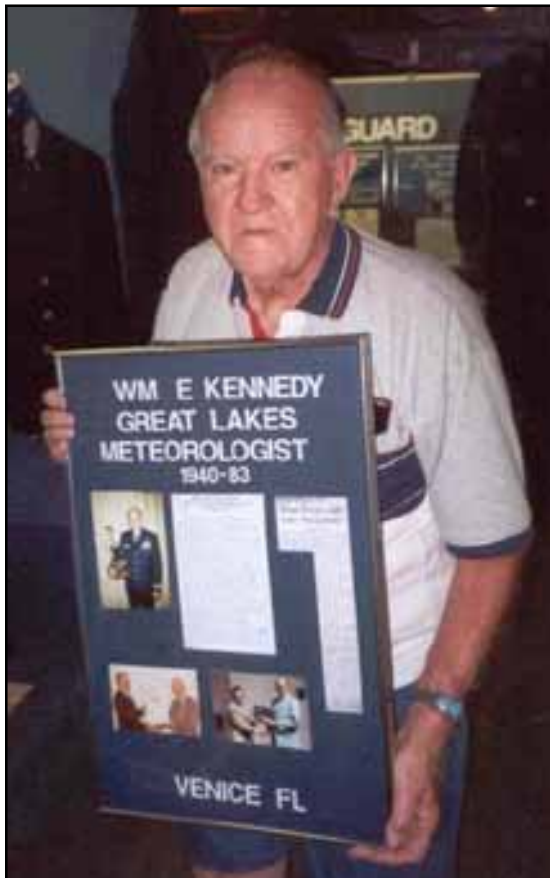
"It fulfills a lot of the things that you feel from your heart," said Julio Ripoll, a local architect who has been a radio operator and coordinator for W4EHW since it went on the air in 1980. "It's a reminder of the way things used to be."

#### Local Operators

Last year, 40 shifts of local



## Retired NWS Employee Inducted into Great Lakes Maritime Hall of Fame



A retired NWS employee was honored recently for his contributions to the Great Lakes maritime community by being inducted into the Great Lakes Maritime Hall of Fame. Bill Kennedy is the only person outside of the marine community ever inducted into the Great Lakes Maritime Hall of Fame, which typically honors

captains, mates, and engineers on ships.

Kennedy spent 30 years of his 42-year career in Cleveland, OH, as a Port Meteorological Officer. Hired in 1953, he was primarily responsible for setting up a Marine Weather Program on the Great Lakes, in addition to writing for the Mariner's Weather Log and designing special maps for each lake so ships could easily report their locations.

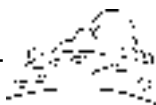
In fact, some of the inductees worked on vessels navigating the Great Lakes during Kennedy's tenure in Cleveland. "After being retired for 18 years, I'm so honored that they still think of me," he said of his recent award. "It is not every day that a NWS employee receives such an honor." According to Bob McLeod, Awareness Branch Chief, Office of Climate, Weather and Water Services, who worked with Kennedy in Cleveland, "Bill's

knowledge of the Great Lakes and commitment to the NWS are well known, and this award is well deserved. I have known Bill for many years and he did some good work up there on the Lakes."

Although Kennedy has been recognized many times for his numerous contributions to the field of meteorology - he was bestowed an Honorary Lifetime Membership in the International Ship Masters Association and received a bronze medal for developing a Marine Program on the Great Lakes - he says this Hall of Fame induction is his greatest honor.

These days Kennedy is well known in his Venice, FL, community as the "Venice Gondolier Staff Meteorologist" because of his many weather-related contributions to the local paper. He even has his own weather station and takes observations for the paper. "After being a weatherman for 61 years, I'm still very much involved," he said.

For more information about the Hall of Fame, contact Mr. Ed Brklacich, Director, Great Lakes Lore Museum, Sebawaing, MI (517) 883-3225 or [lore@avci.net](mailto:lore@avci.net)



### Protostatis: Liberty Ship of World War II

*Skip Gillham  
Vineland, Ontario, Canada*

**P**ROTOSTATIS was originally one of the Liberty ships of World War II. These vessels were modeled on a British design and used prefabricated sections. By the end of the war over 2,700 had been built to assist the Allied effort.

President Franklin D. Roosevelt reportedly nicknamed these ships the “Ugly Ducklings” and although they were not beautiful, they were functional. The Liberty ships measured 441.5 feet in length by 57 feet at the beam and they could carry close to 10,000 tons dead-weight of cargo in five cargo holds.

The **John Philip Sousa** was built by the St. John’s River Shipbuilding Co. of Jacksonville, FL and completed in 1943. The vessel was steam powered and burned oil, rather than coal, when it joined the United States Maritime Administration. The first two voyages had problems with boiler water. When examined, it was discovered that the boilers had been installed before the protective grease had been removed.

#### **John Philip Sousa**

served the country well as a cargo carrier and when peace was achieved, it, like many of the Liberty ships, was surplus. Some of these ships were retained in the Reserve Fleet, but most were sold to foreign interests to rebuild their mercantile fleets nearly destroyed by war.

This vessel was purchased by a Honduran flag firm in 1946 and sailed as **Erato**. It was sold and renamed **Taxiarchis** in 1954.

In 1960 Greek interests acquired the ship and operated it as the tramp steamer **Prostatis**. She made two trips to the Great Lakes in 1965, but the last one was plagued with problems.

On the final voyage, **Prostatis** loaded scrap metal at Detroit and departed for Genoa, Italy. The vessel ran aground at Traverse Shoal, Lake Ontario, on September 30, 1965, and some cargo had to be removed before tugs could pull the hull free.

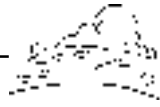
The ship reloaded in the shelter of



Wolfe Island, off Kingston, ON and departed under tow in mid-November. Rounding the eastern end of Wolfe Island, **Prostatis** again went aground.

By now the crew was low in morale and running out of food. They eventually left for home in a dispute with the owner. Scavengers made night calls and removed various items of value and before long **Prostatis** was frozen in for the winter.

Tugs finally freed the freighter in January and it was towed to Toronto to wait for spring. By then only an overseas trip to Spanish shipbreakers remained. The vessel was pulled into Valencia on July 5, 1966, where ship and cargo were both melted down for recycling. This was an inglorious end to one of the heroic Liberty ships of World War II.



## **Marine Weather Review**

### **North Atlantic Area—May through August 2001**

*George P. Bancroft*  
*Meteorologist*  
*Marine Prediction Center*

The late spring and summer months are normally the least active of the four-month periods for which marine weather summaries are prepared. With the Bermuda High weaker than usual in May to August 2001, last winter's active pattern of fronts and low-pressure centers moving off the U.S. East Coast persisted in weaker form through the summer. This pattern produced two major storms described in this article, one in late May and the other late in August. Otherwise, the main track of low-pressure centers across the North Atlantic during the summer was north of 50°N., with some of the centers turning more north or northwest toward Greenland. A few of these developed storm-force winds near Greenland or over the northeast Atlantic near the British Isles. There was one named tropical cyclone in MPC's North Atlantic area during the period, Tropical Storm Dean, which occurred late in August.

#### **Tropical Activity**

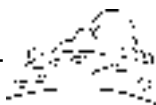
##### **Remnants of Tropical Storm**

**Allison:** MPC's waters were not directly affected by Allison, which moved ashore on the upper Texas coast late on June 5. Allison's remnant low-pressure center later emerged off the mid-Atlantic coast on the 16<sup>th</sup> and merged with a frontal system moving off the U.S. East Coast on June 17. Allison was known more for heavy rains produced over land than for winds, which were below gale force, except in squalls, off the East Coast.

##### **Regeneration of Tropical Storm Dean, 25-27 August:**

Dean existed as a tropical storm well south of MPC's marine area prior to August 24, before dissipating north of Hispaniola on the 23<sup>rd</sup>. The remnants moved north into MPC's waters near Bermuda by the 25<sup>th</sup>, and re-intensified into a tropical storm at 0600 UTC August 27 with maximum sus-

tained winds of 50 kt with gusts to 60 kt. Prior to regeneration, the remnants of Dean appeared as a weak low in both surface charts of Figure 7, near 33°N., 68°W. in the first chart (0600 UTC August 25) and near 36°N., 65°W. in the second analysis chart (0600 UTC August 26). The first part of Figure 10 depicts Tropical Storm Dean at a maximum strength of 60 kt with gusts to 75 kt (just below minimal hurricane strength of 64 kt for sustained winds). The **Lykes Navigator** (WGMJ) reported a southeast wind of 35 kt and 6-m (20-ft) seas near 37°N., 59°W. at 0000 UTC August 27, followed by a south wind of 55 kt and 11.5-m (37-ft) six hours later at 38°N., 61.5°W. The intensifying tropical storm passed just west of this ship during that period. Dean then weakened over cooler water and became an extratropical gale twenty-four hours later (second part of Figure 10), and eventually merged with another gale center near Greenland late on August 30.



### **Other Significant Events of the Period**

#### **Gale off U.S. East Coast, 7-9 May:**

The center formed south of MPC's waters prior to this period. Blocked by a strong ridge of high pressure east of New England, the center drifted north to near Bermuda at 1200 UTC May 9 with a central pressure of 1002 mb. An area of east to northeast gale winds developed in MPC's far southern waters between 55°W. and 70°W. by the 7<sup>th</sup> and spread north to 40°N. by May 9. The **Oleander** (PJJU) and another ship (GBCF) reported northeast winds of 35 kt near 34°N., 68°W. and 33°N., 65°W., respectively, at 1200 UTC May 8. Satellite-sensed scatterometer data indicated winds up to 40 kt. The second ship also encountered 7.5-m (24-ft) seas. The blocking high pressure to the north weakened on the 9<sup>th</sup> and allowed the system to move northeast. By 0000 UTC May 11, the center was near 41°N., 60°W., with winds below gale force.

**Storm of 21-23 May:** This storm originated from an open frontal wave of low pressure south of Newfoundland on May 20 and moved northeast, absorbing another low-pressure system to the north near 55°N., 42°W. during the period of most rapid development (Figure 1). The drifting buoy 44549 (47°N., 39°W.) reported a pressure of 972 mb at 2200 UTC May 21, indicating the storm was at least that deep at that time. Therefore, the drop in central pressure was at least 29 mb in

only a 16-hour period since the analysis time of the first chart in Figure 1. The 500-mb analysis in Figure 2 is valid at a time just prior to the period of rapid deepening and depicts a strong short-wave trough and northwest jet behind it (close spacing of 500-mb contours) supporting this development. See Reference 1 for more information on use of the 500-mb chart and the relationship of the 500-mb flow to surface features. The author determined from the color version of the QuikScat image (Figure 3) that maximum winds in this storm were at least as high as 55 kt. There was possible rain contamination in the higher winds (up to 70 kt), rendering them unreliable. The maximum wind reported by a ship was north 52 kt from the **Faust** (WRYX) near 47°N., 40°W. at 0000 UTC May 22. Twelve hours later, the same ship reported southwest winds of 45 kt and 12.5-m (41-ft) seas near 46°N., 36°W. East of the center, the **Meteor** (DBBH) encountered southeast winds of 51 kt near 47°N., 35°W. at 2100 UTC May 21. Twelve hours later, the same ship was north of the storm center, reporting east winds of 45 kt and 8-m (26-ft) seas. The storm center subsequently weakened and drifted more northwest on May 23 before turning west on the 24<sup>th</sup> and continuing to weaken.

**Eastern North Atlantic Storm of 10-11 July:** A low-pressure center moved east off the Labrador coast late on July 7 and developed gale force winds after passing 40°W. on the 8<sup>th</sup>, then briefly developed storm force

winds southwest of the center on July 10. Figure 4 depicts 24-hour movement and development of this system into a storm approaching Great Britain at 1200 UTC July 10, with some 35 to 40 kt ship reports south and west of the center. A high-resolution QuikScat image (Figure 5), valid about 6 hours prior to the time of the second analysis chart of Figure 4, shows an area of 50 to 55 kt northwest winds between 55°N. and 58°N. on the back side of the storm center. One 60 kt wind barb appears near 55.5°N., 19°W. There is more crowding of wind barbs in this version of QuikScat imagery due to the higher data density, but the winds of 50 kt or higher stand out. Among ships, the vessel 9KKF (53N 12W) reported a west wind of 45 kt at 0000 UTC July 11, with a nearby buoy (62090) near the Irish coast reporting 5.5-m (18-ft) seas. At 1800 UTC July 10, the **Western Bridge** (C6JQ9), to the south near 51°N., 10°W., reported west winds of 40 kt and seas of 7.5 m (25 ft). The storm center reached a maximum intensity of 984 mb at 0600 UTC July 10 near 57N 16W. The system then moved into the North Sea and weakened to below gale force on July 12.

**Eastern North Atlantic Gale of 15-18 July:** This system followed a track similar to that of the 10-11 July storm until July 16, when the system redeveloped southeastward to form a new center south of Ireland by 1800 UTC July 17 (Figure 6). In the July 16-18 period there were numerous reports of gale force winds west

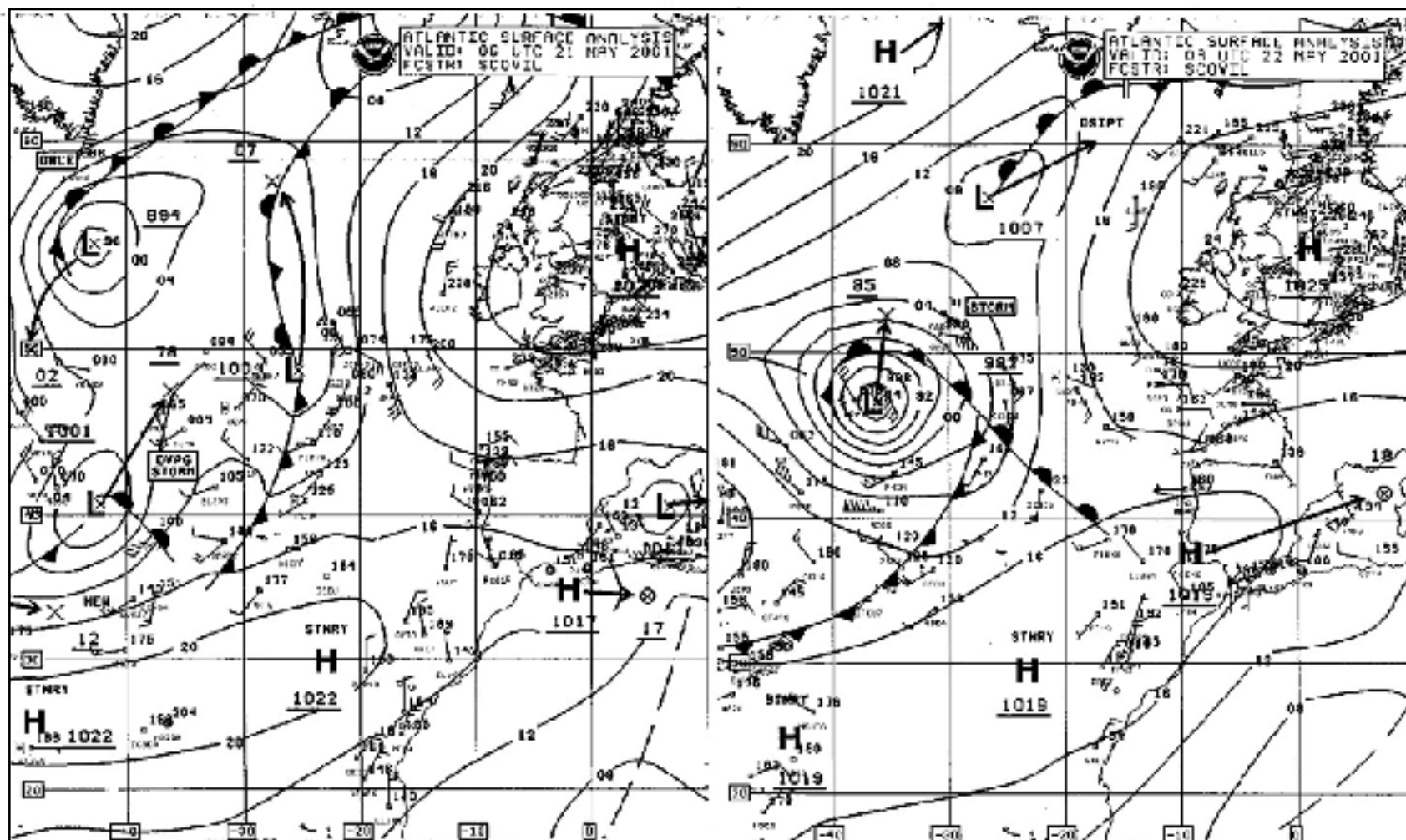


Figure 1. MPC North Atlantic Surface Analysis charts (Part 1) valid 0600 UTC May 21 and 22, 2001



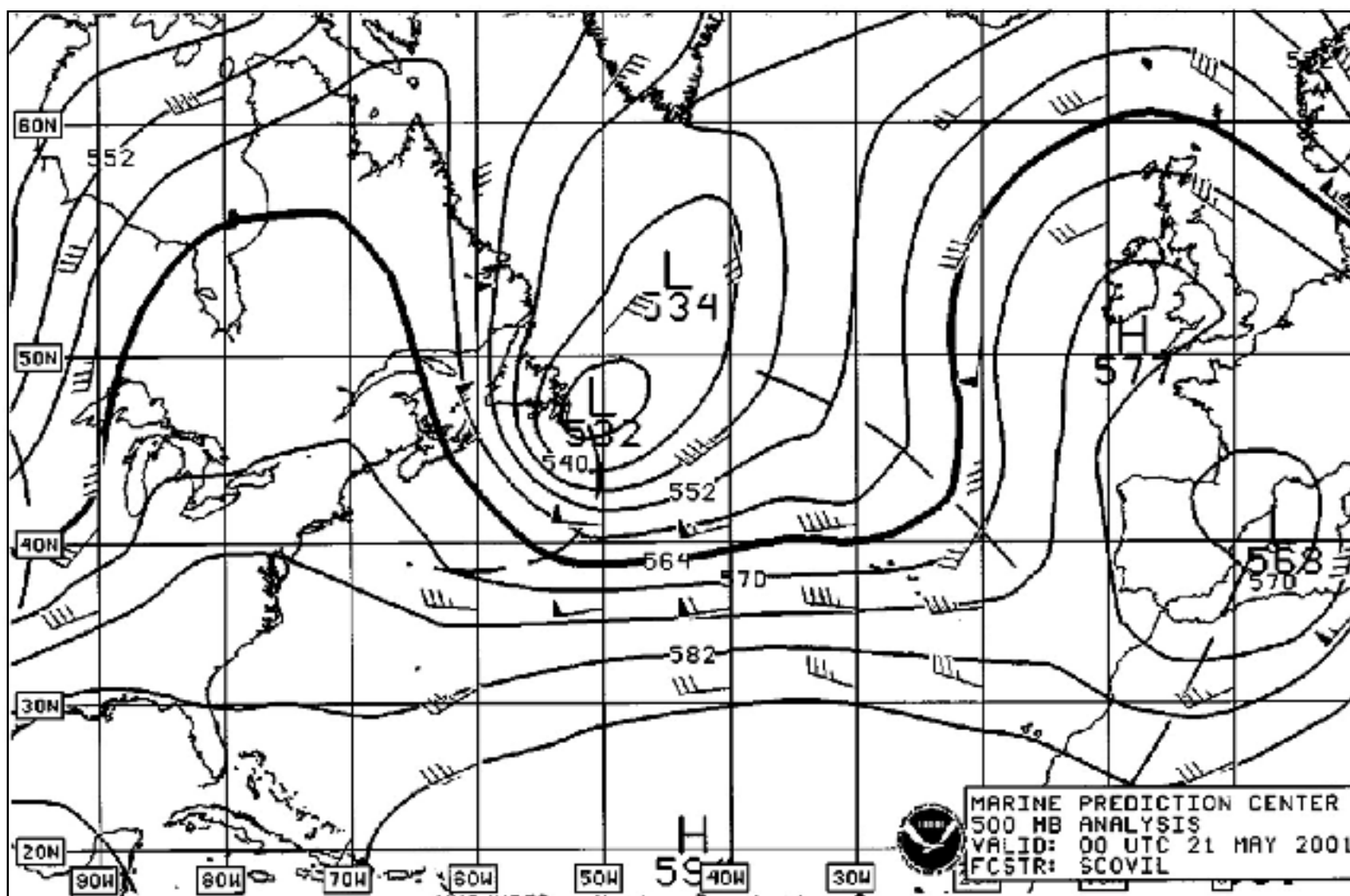
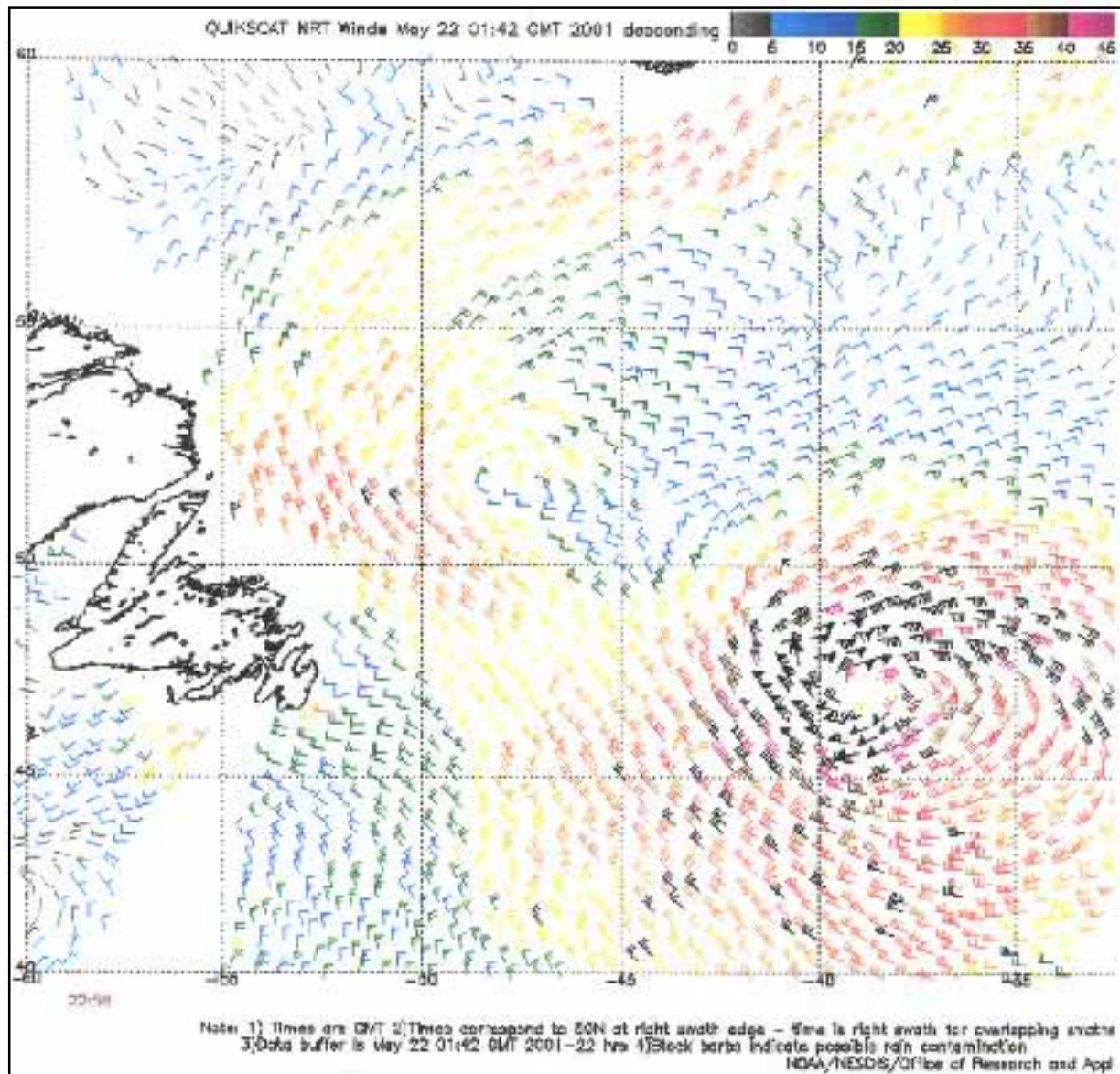
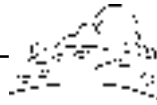


Figure 2. MPC 500-Mb Analysis of North Atlantic valid at 0000 UTC May 21, 2001. The valid time is six hours prior to that of the first surface analysis of Figure 1. The broken or dashed lines are short-wave troughs.



**Figure 3. QuikScat scatterometer image of satellite-sensed winds for 2258 UTC and 2117 UTC May 21, 2001 (from NOAA/NESDIS/Office of Research and Applications)**

and south of the system, extending down into the Bay of Biscay. There was an isolated report of storm force winds from the ship FNVABATO (48°N., 5°W.), reporting a west-southwest wind of 50 kt at 0000 UTC July 18. The **Lykes Navigator** (WGMJ) and the ship ELXX6 experienced

west winds of 47 kt near 47°N., 8°W. and 46°N., 8°W., respectively, at that time. Also at 0000 UTC July 18, the **Pharos** (ELTX9) encountered southwest winds of 45 kt and 9.5-m (31-ft) seas, the highest seas reported in this event. The gale center then

moved into northern France and weakened inland late on the 18<sup>th</sup>.

**Storm of 25-27 August:** This developing storm followed a track similar to that of the late-May storm, except with faster motion northward after initial rapid

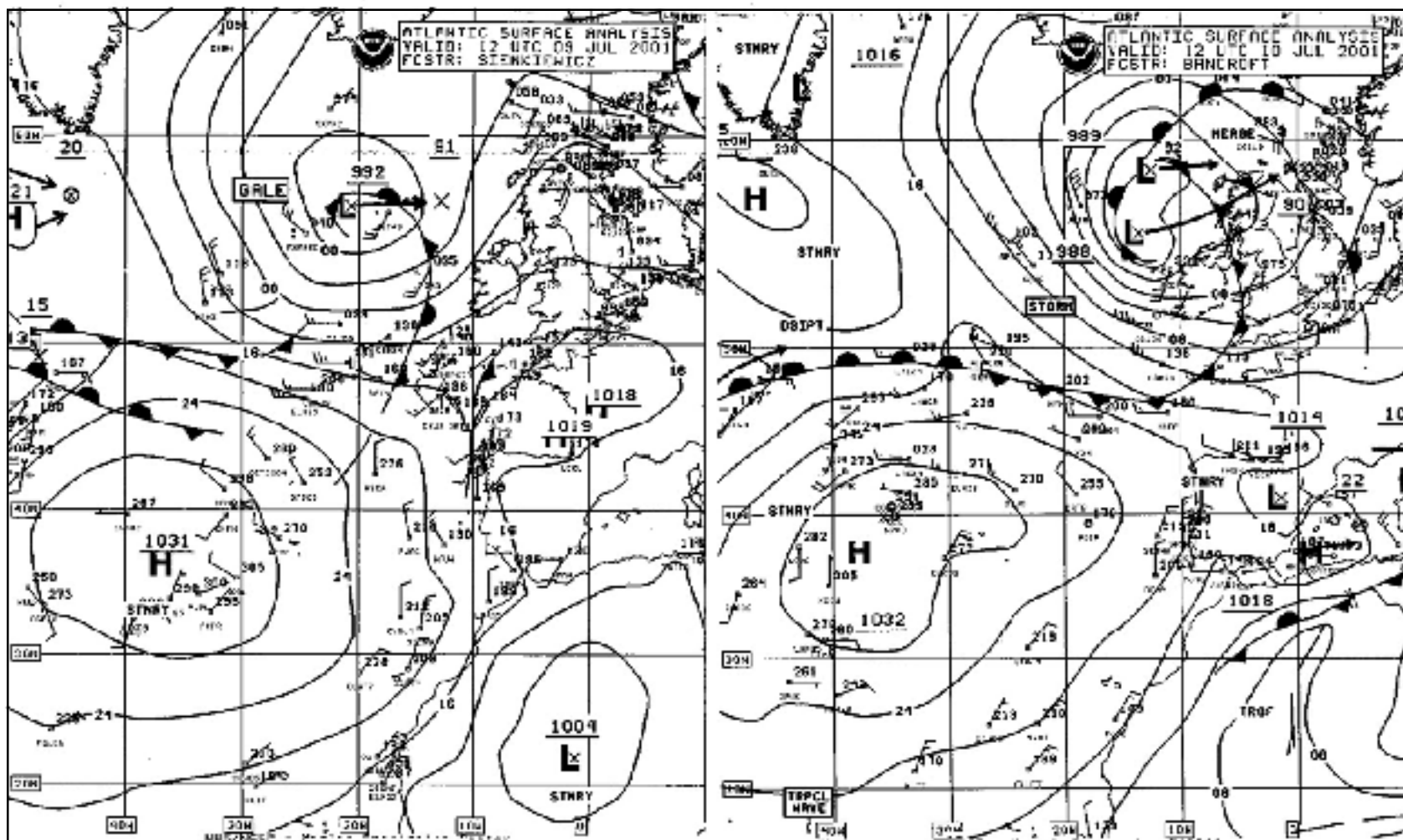
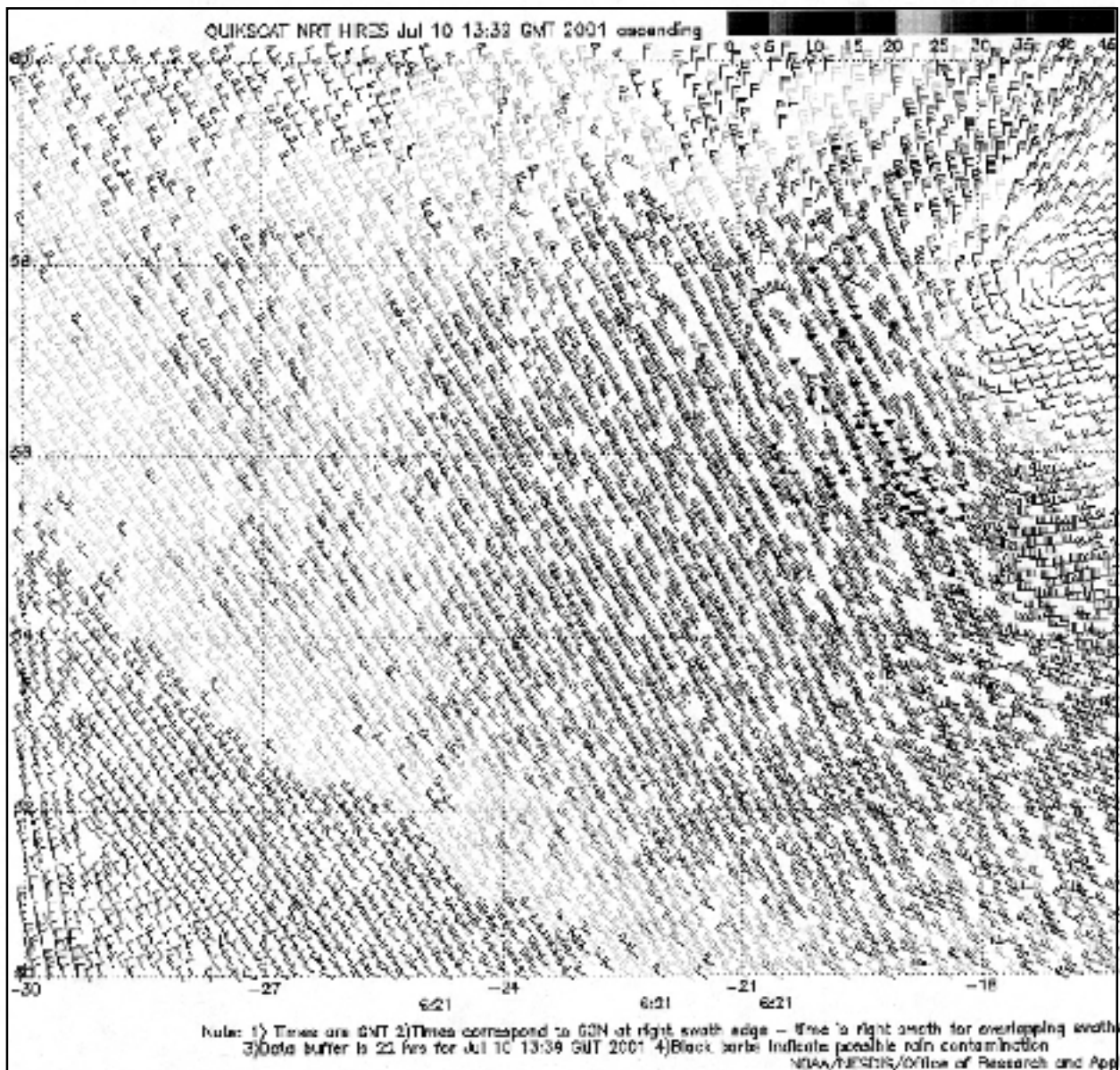
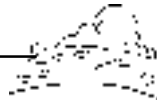


Figure 4. MPC North Atlantic Surface Analysis charts (Part 1) valid 1200 UTC July 9 and 10, 2001.



**Figure 5. High-resolution QuikScat image of satellite-sensed winds valid for 0621 UTC July 10 (from NOAA/NESDIS/Office of Research and Applications). The resolution is 12.5 km for regular QuikScat imagery.**

intensification. Figure 7 depicts the developing storm, initially southeast of Newfoundland, merging with a cold front coming off the east coast of Canada and rapidly intensifying, with the central pressure dropping 32 mb in only 24 hours. A drifting buoy (44621 near

54°N., 42°W.) reported a pressure of 969 mb at 1000 UTC August 26. The storm is shown at maximum intensity, 968 mb, at 0600 UTC August 26. This was the most intense non-tropical low (in terms of central pressure) of the May-to-August period in both the

North Atlantic and North Pacific areas. The METEOSAT 7 satellite image of Figure 8 shows the storm near maximum intensity with a frontal cloud band wrapping around the south and east sides of a well-defined center. The storm moved into an area of sparse ship

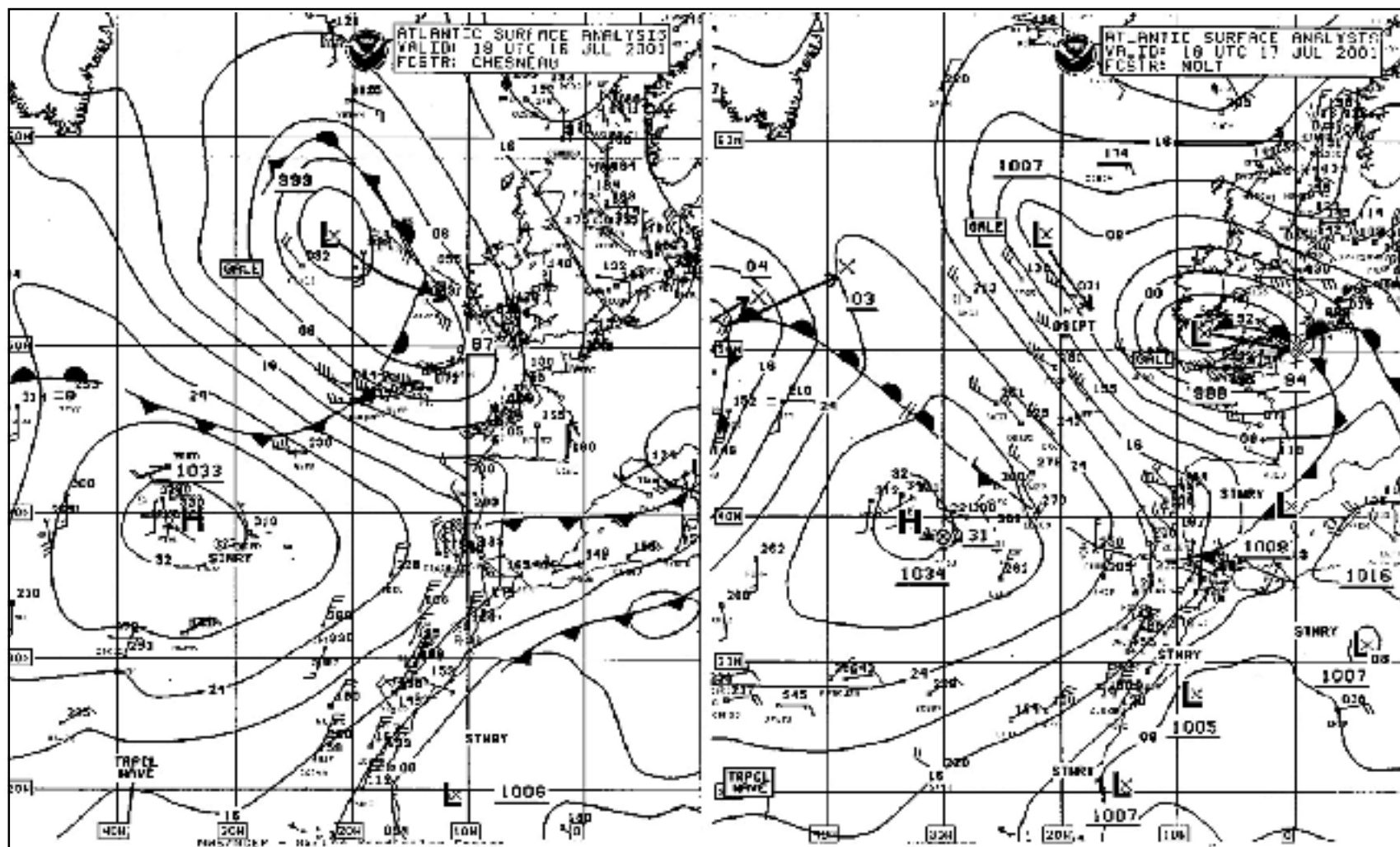


Figure 6. MPC North Atlantic Surface Analysis charts (Part 1) valid 1800 UTC July 16 and 17, 2001.

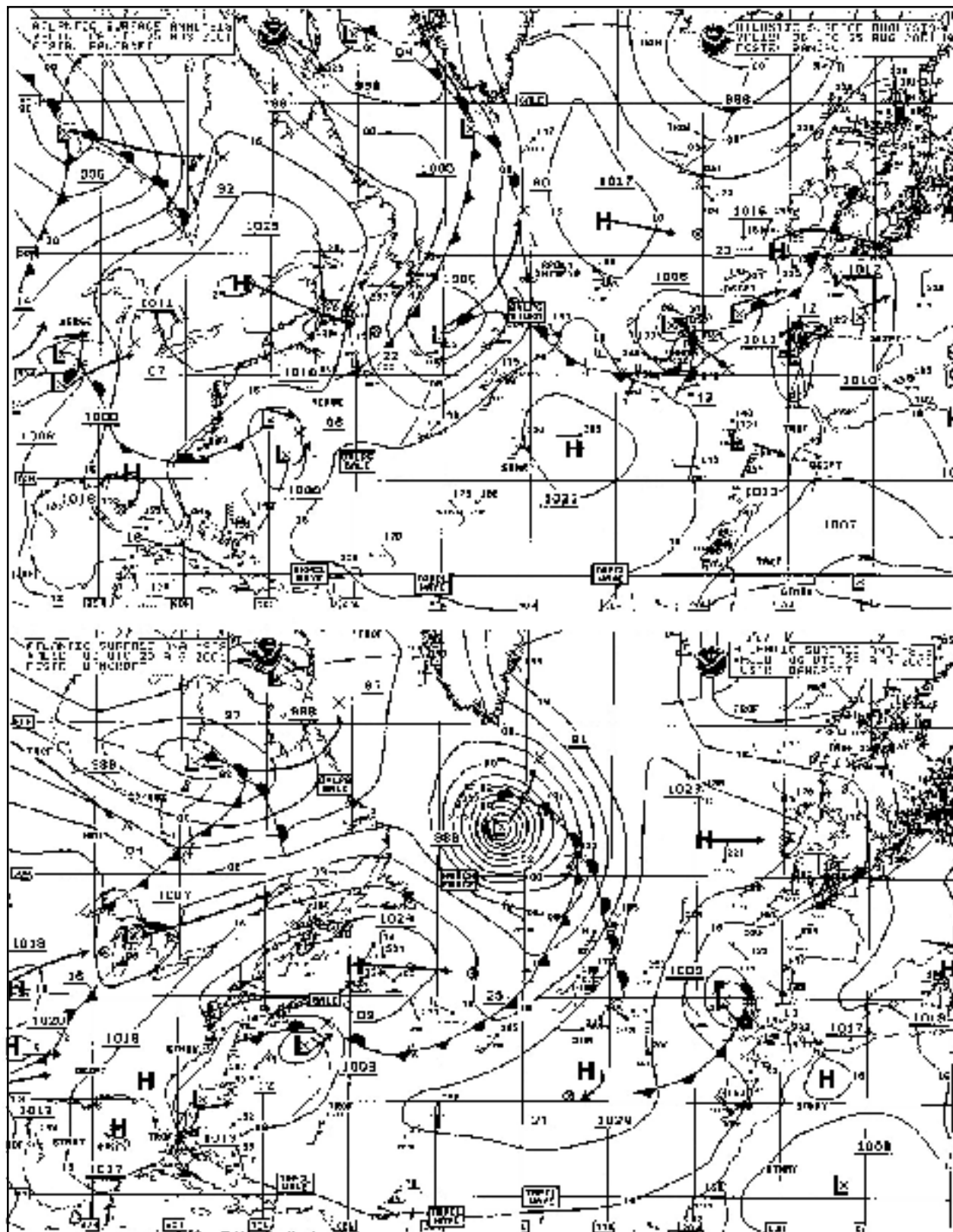
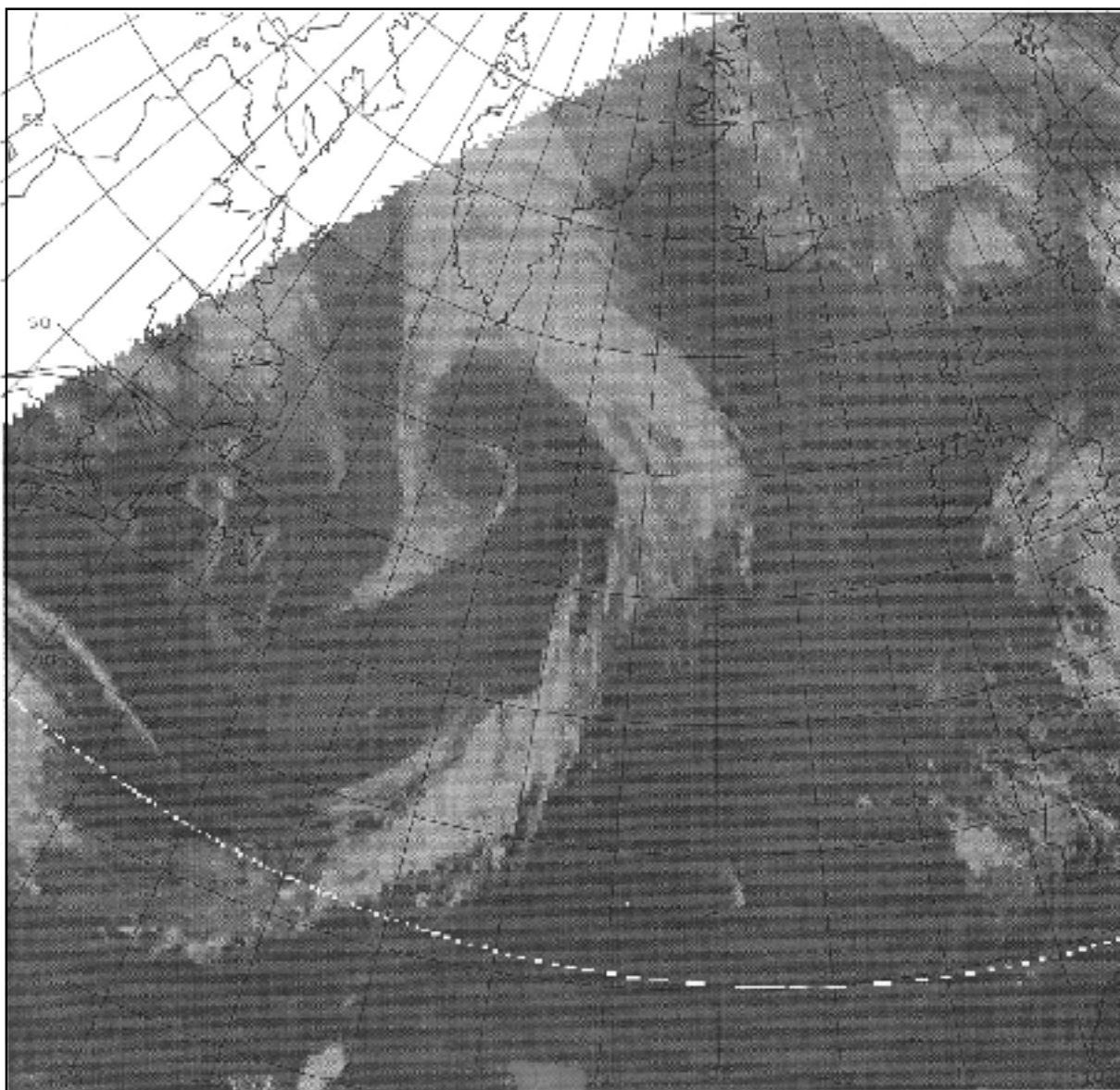
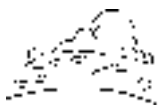


Figure 7. MPC North Atlantic Surface Analysis charts valid 0600 UTC August 25 and 26, 2001.



**Figure 8. METEOSAT7 infrared satellite image valid 1030 UTC August 26, 2001. Satellite senses temperature on a scale from warm (black) to cold (white) in this type of image. The valid time is four and one-half hours after time of the second surface analysis of Figure 7.**

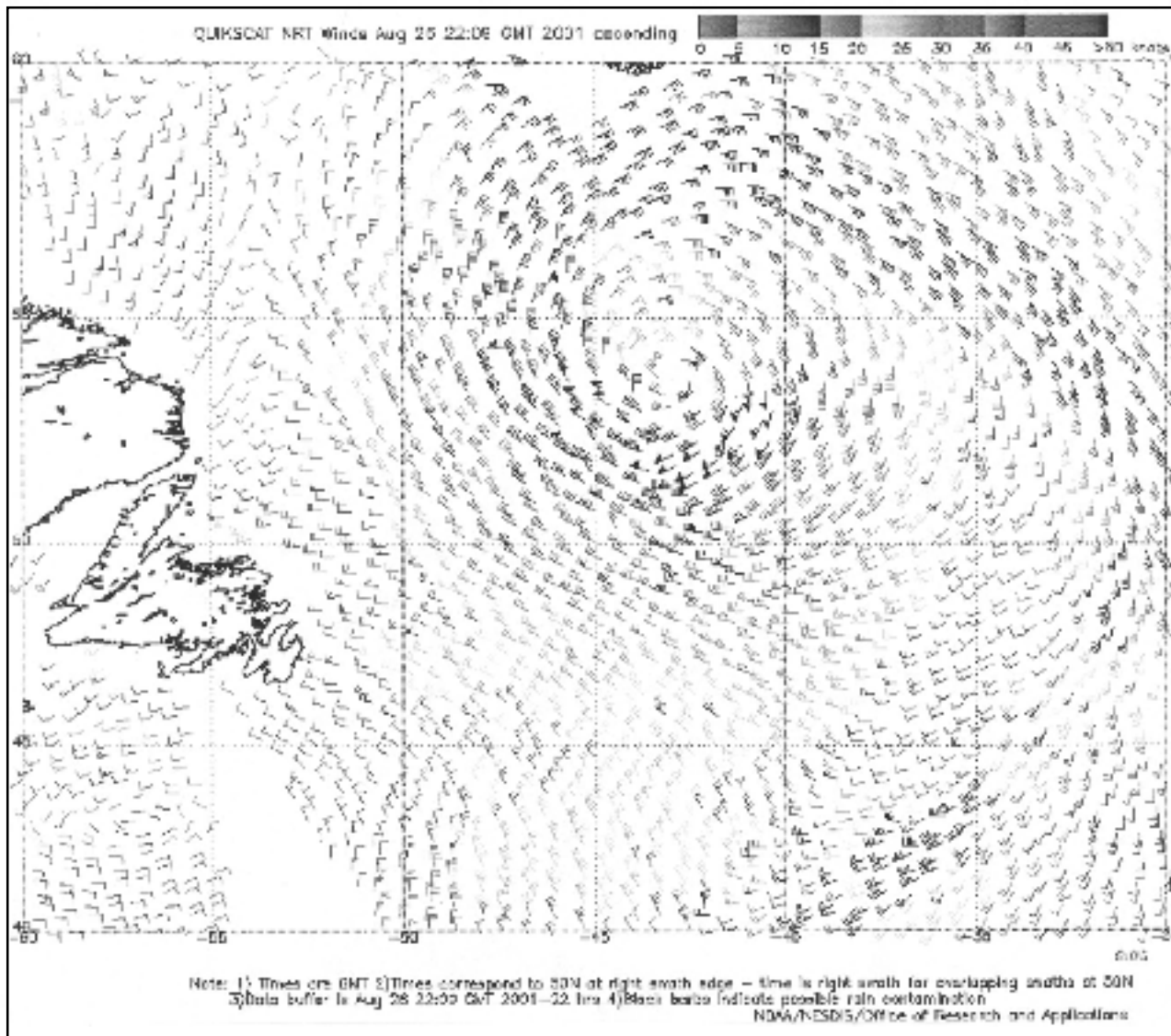
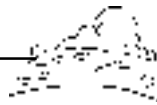
data, but QuikScat imagery (Figure 9) near the time of maximum intensity shows winds of up to 60 kt in the south semicircle of the center. At 0600 UTC on August 26, a ship northeast of the center (Figure 7), the ZCBP6 (55°N., 38°W.) reported a southeast wind of 50 kt and 4.5-m (15-ft)

seas. The storm subsequently weakened, with winds diminishing to below gale force as the center approached Iceland on August 28.

#### **Introduction**

The weather pattern from May through the first half of June was a

continuation of the late winter and early spring pattern. Low-pressure centers moved from near Japan or the southwest part of the North Pacific northeast to the Gulf of Alaska or near the eastern Aleutians, but blocking high pressure



**Figure 9. QuikScat scatterometer image of satellite-sensed winds for 0806 UTC August 26, 2001 (from NOAA/NESDIS Office of Research and applications). The time of the pass is only about 2 hours after the valid time of the second surface analysis of Figure 7.**

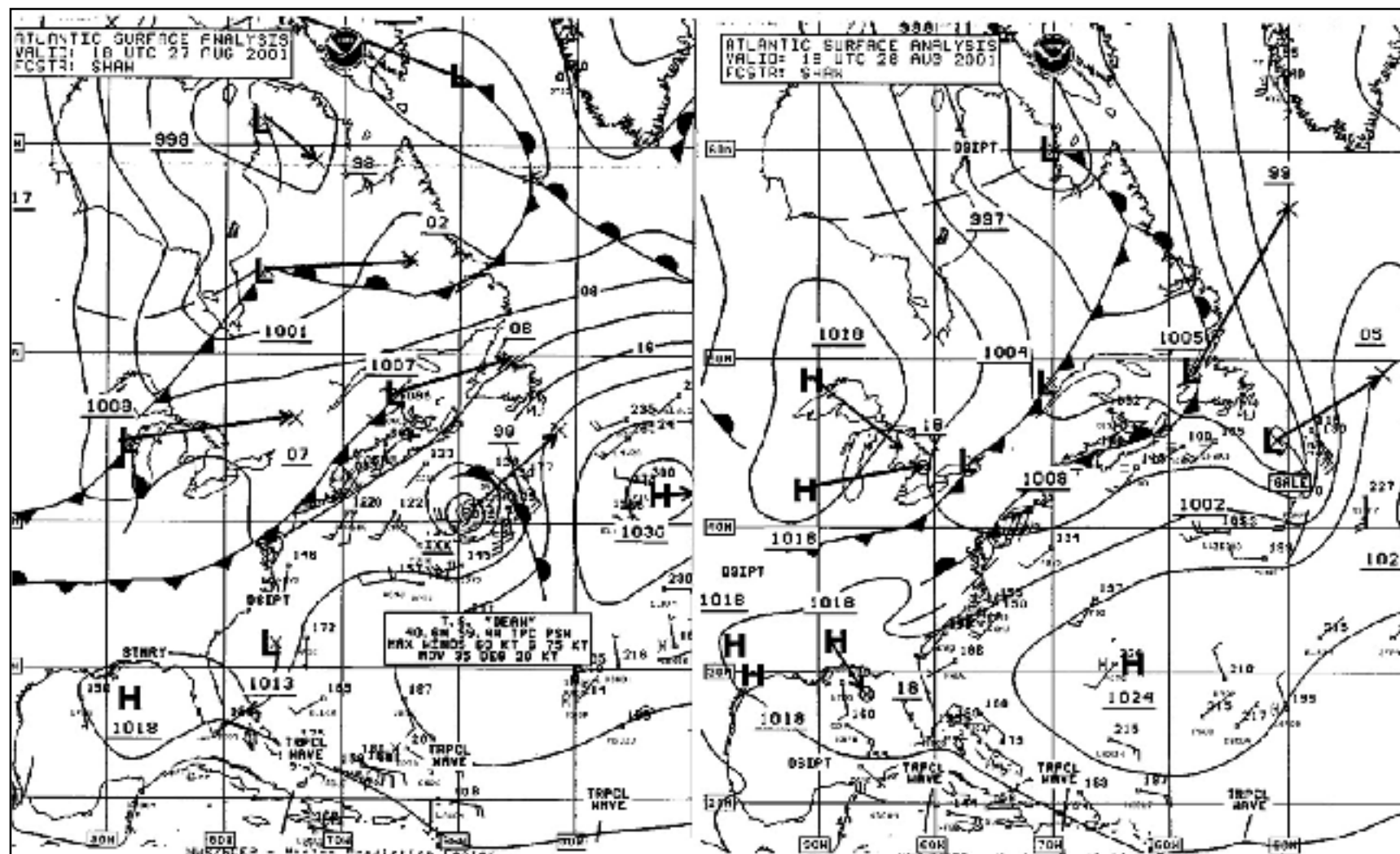
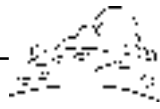


Figure 10. MPC North Atlantic Surface Analysis charts (Part 2) valid 1800 UTC August 27 and 28, 2001.



## **Marine Weather Review**

### **North Pacific Area—May through August 2001**

*George P. Bancroft*  
*Meteorologist*  
*Marine Prediction Center*

over the Bering Sea forced some of the low-pressure systems in the west to stall or turn northwest. Many of these produced gale force winds, with a few accompanied by storm force conditions, especially in the first half of May. As the season progressed into summer, high pressure strengthened over the eastern Pacific and by August had spread west, forcing the low-pressure tracks to shift more north into the Bering Sea. Some of these, especially late in August, redeveloped in the Gulf of Alaska. The tropics became active in late July, producing several tropical cyclones which moved north of 30°N. and passed near or east of Japan before becoming extratropical (similar to lows with fronts typically found outside the tropics). One of these, Kong-Rey, became an intense extratropical storm in MPC's high seas area and another, Sepat, entered the high seas area as a tropical storm. The southwest corner of MPC's high seas area is 30°N., 160°E. (See reference 2). Tropical cyclones also formed in the eastern North Pacific, but they remained well south of 30°N.

#### **Tropical Activity**

**Typhoon Kong-Rey:** Kong-Rey was named as a tropical storm

near 25°N., 150°E. at 0000 UTC July 22 and drifted northwest over the next three days, becoming a typhoon by 1200 UTC on July 23. At 1200 UTC July 23, after crossing 30°N. near 142°E., Kong-Rey turned more northeast and reached maximum strength near 31°N., 144°E., with maximum sustained winds of 85 kt and gusts to 105 kt at 0000 UTC July 27. At 0900 UTC July 27, the ship PCBZ reported a south wind of 40 kt and 7.5-m (24-ft) seas. Nine hours later, with the center of Kong-Rey passing about 60 nmi to the north, the same ship, PCBZ, (31°N., 147°E.) encountered southwest winds of 60 kt. Kong-Rey then weakened to a tropical storm with sustained winds to 50 kt and gusts to 65 kt near 34°N., 150°E. at 0600 UTC July 28. Re-intensification followed as the storm merged with a polar front to the north and became an intense, compact extratropical storm with hurricane force winds, as shown in Figure 1. The GMS satellite image (Figure 2), shows the ex-typhoon with not only a trailing frontal cloud band typically found in extratropical lows, but also a tropical characteristic such as a ring of clouds with thunderstorms near the center. There were no ships reporting near the center, but

QuikScat data valid about seven hours after the system became extratropical (Figure 3) reveals 50 to 80 kt wind barbs around the center. The author determined that, due to contamination from heavy rain, the higher wind speeds are unreliable and concluded that maximum winds in the extratropical storm were at least 65 kt. The storm subsequently drifted northeast and weakened to a gale near 48°N., 173°E. at 0000 UTC July 31, and later dissipated in the western Bering Sea early on August 3.

**Typhoon Man-Yi:** Man-Yi first appeared on MPC's North Pacific surface charts as a minimal typhoon near 16°N., 148°E. at 0600 UTC August 3 and took a more northward track than Kong-Rey. The typhoon developed highest sustained winds of 115 kt with gusts to 140 kt between 1200 UTC August 4 and 0600 UTC August 5 as it drifted north-northwest. It later reached that intensity again at 1200 UTC August 6 when the center was near 27°N., 145°E. The center then turned more north-northeast and crossed 30°N., near 148°E. at 1200 UTC August 7 with maximum sustained winds of 100 kt and gusts to 125 kt. Man-Yi weakened to a tropical storm near

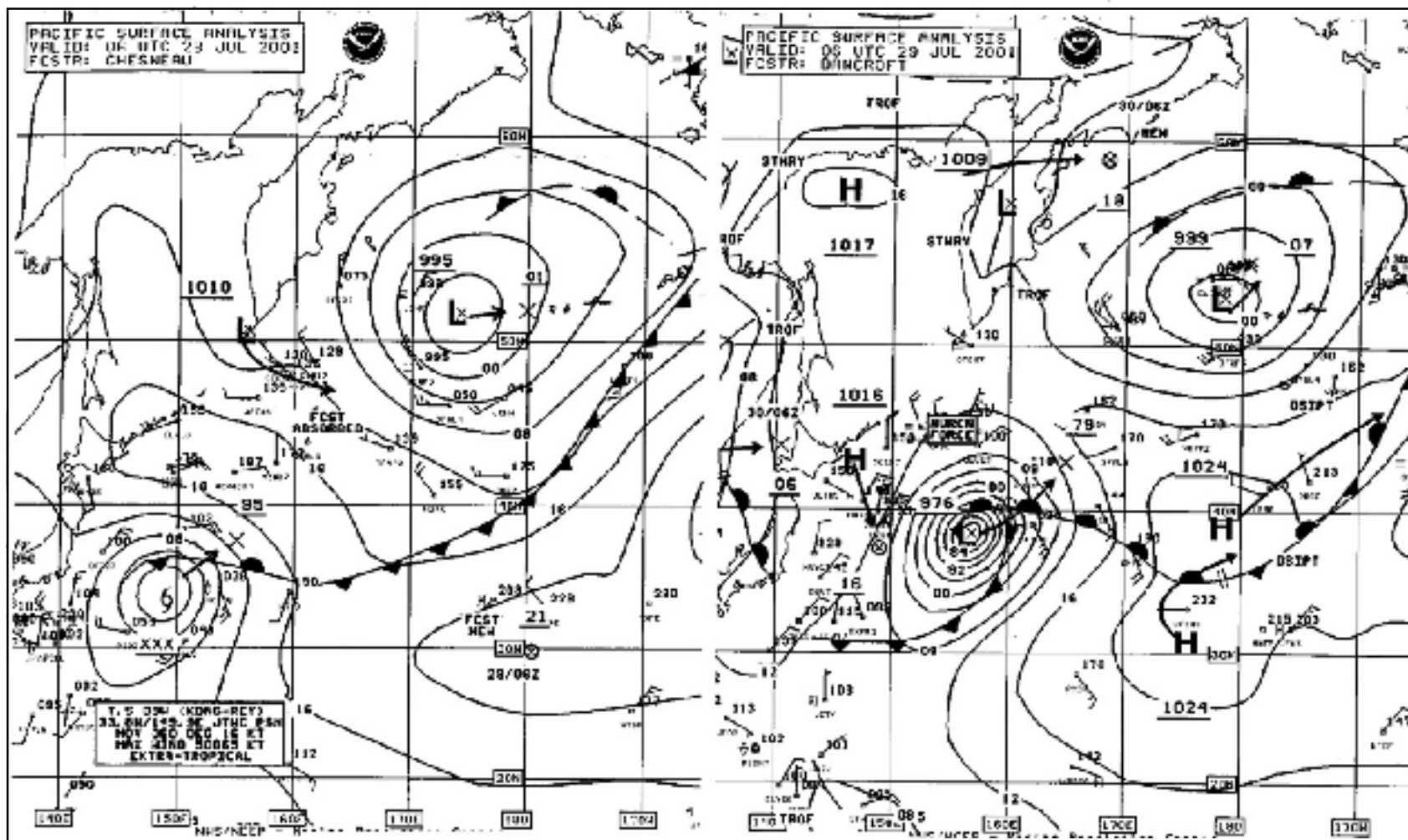
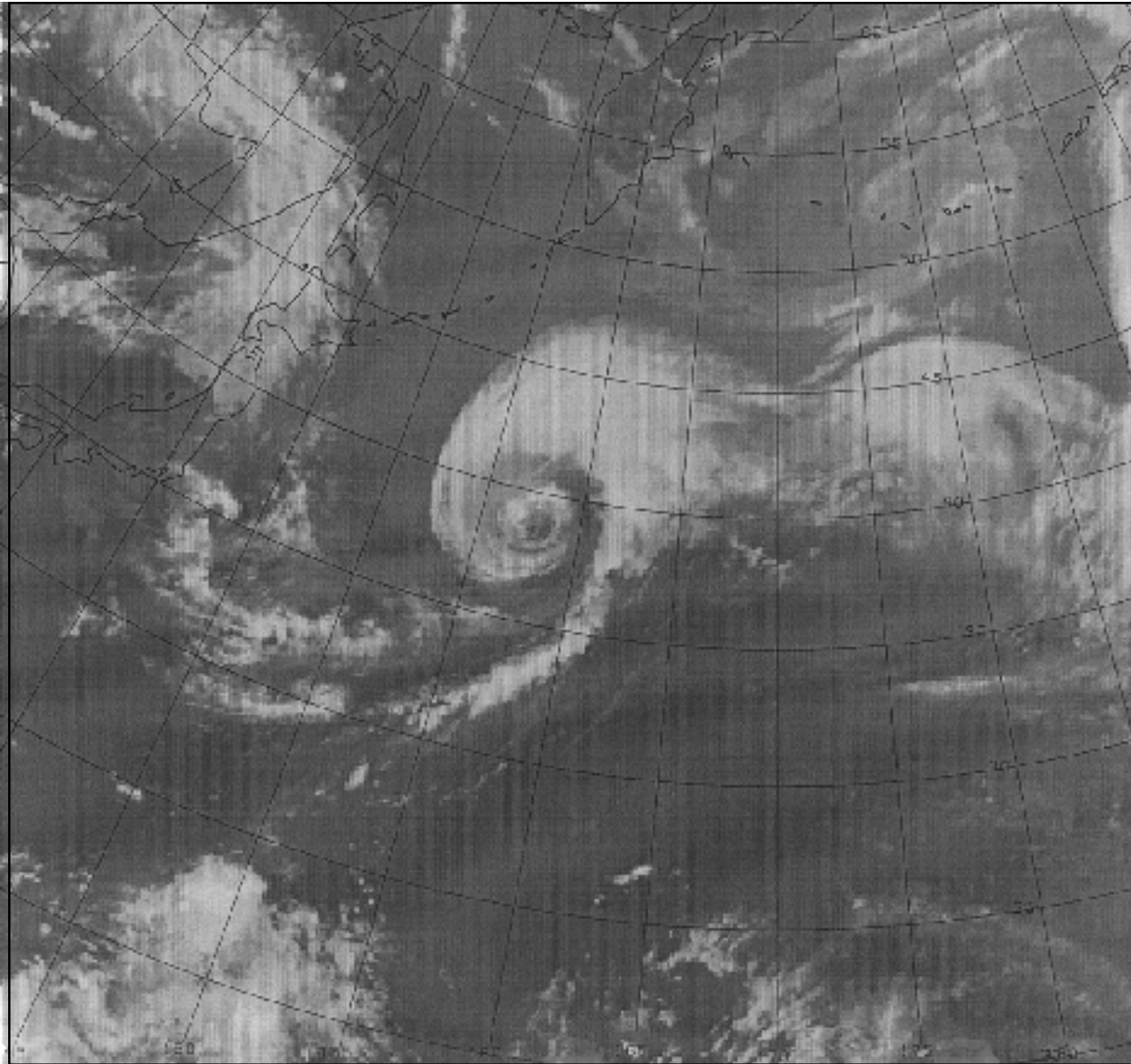
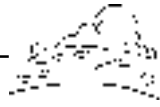


Figure 1. MPC North Pacific Surface Analysis charts (Part 2) valid 0600 UTC July 28 and 29, 2001.

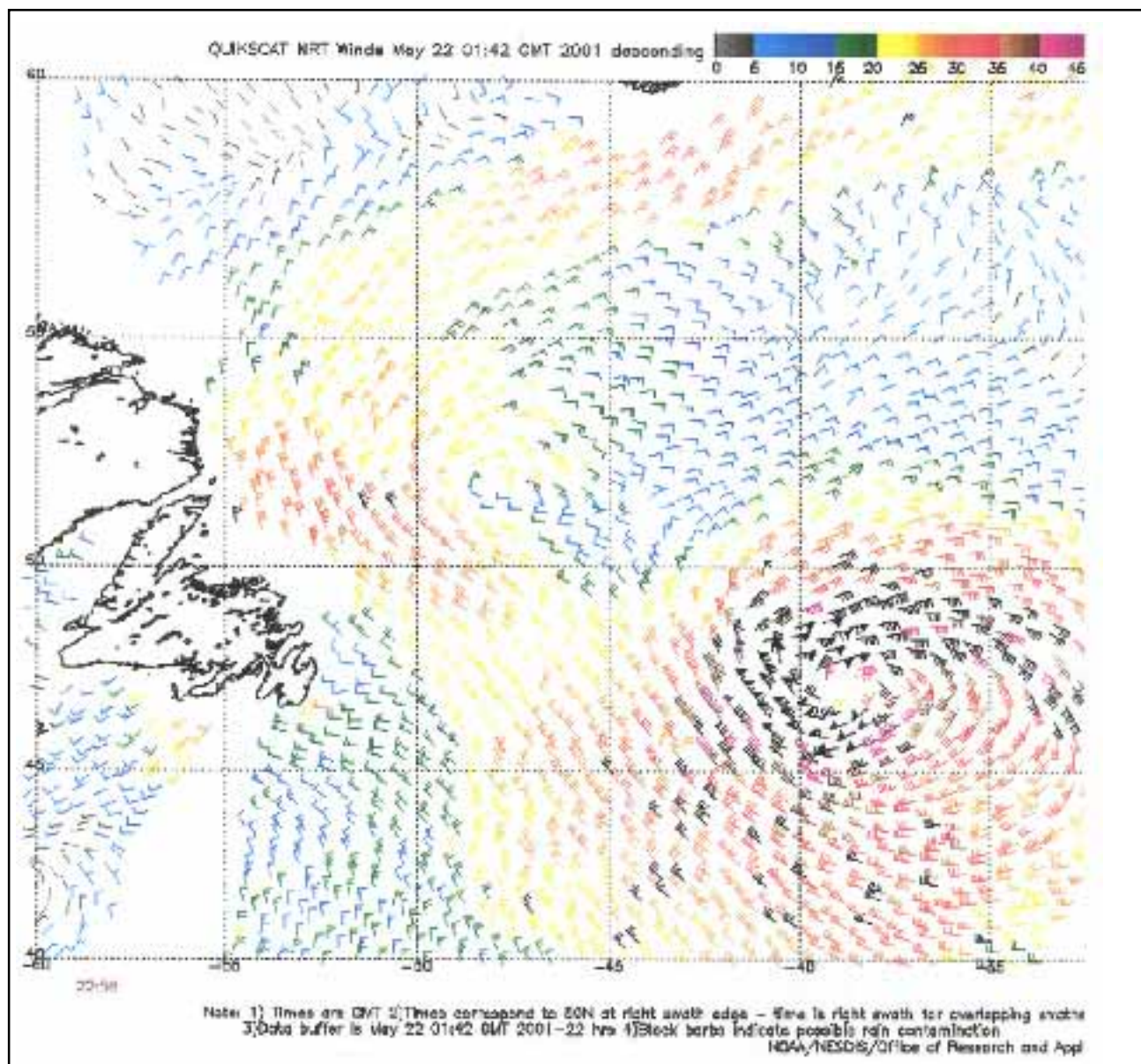
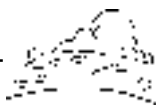


**Figure 2. GMS infrared satellite image valid at 0732 UTC July 29, 2001. Satellite senses temperature on a scale from warm (black) to cold (white) in this type of imagery.**

38°N., 151°E. at 1800 UTC August 8, with maximum winds of 55 kt and gusts to 70 kt before becoming extratropical six hours later. Man-Yi did not redevelop into an intense extratropical storm, but instead continued to weaken, becoming a low near 47°N., 153°E. at 0000 UTC August 10, with winds below gale force.

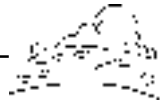
**Typhoon Pabuk:** Tropical Storm Pabuk formed near 19°N., 145°E. at 1200 UTC August 14. It moved northwest, intensifying to a typhoon near 21.5°N., 138°E. at 0000 UTC August 17, with maximum sustained winds of 85 kt and gusts to 105 kt. The ship VNCG encountered southeast winds of 55 kt near 32°N., 136°E. at 1800

UTC August 20. Pabuk then weakened to a tropical storm before turning more northeast across Japan, emerging east of Japan as a tropical depression near 39°N., 143°E. at 1800 UTC August 22. The **Super Rubin** (3FWP5) reported a south wind of 40 kt east of the center near 37°N., 145°E. at 1200 UTC August 22, and again near 37°N.,



Note: 1) Times are GMT 2) Times correspond to 30N at right swath edge - time is right swath for overlapping swaths 3) Data buffer is Jul 28 22:27 GMT 2001 - 22 hrs 4) Black barbs indicate possible rain contamination

**Figure 3.** QuikScat scatterometer image of satellite-sensed winds around the storm in Figures 1 and 2. The valid time of the pass is 1843 UTC July 28, or about halfway between the times of the surface analyses in Figure 1. Image is courtesy of NOAA/NESDIS/Office of Research and Applications



144°E. six hours later. Pabuk became an extratropical gale near 44°N., 141°E. at 0000 UTC August 23 before weakening to a low in the northeast Sea of Okhotsk at 0600 UTC August 24.

**Tropical Depression 15W:** See **Northeast Pacific Storm of 30-31 August** in the section **Other Significant Events** for more information.

**Tropical Storm Sepat:** Tropical Depression 17W formed near 22°N., 162°E. at 0600 UTC August 27 and moved north-northwest. It entered the southwest corner of MPC's high seas waters near 31°N., 161°E. as Tropical Storm Sepat at 0600 UTC August 29. Sepat was a minimal tropical storm with maximum sustained winds of 35 kt and gusts to 45 kt from 0000 UTC through 1800 UTC August 29, before weakening to a tropical depression near 36°N., 159°E. at 0000 UTC August 30. Sepat became a 992-mb extratropical gale near 40°N., 161°E at 1200 UTC August 30 and moved northeast while slowly weakening.

### Other Significant Events

**Gulf of Alaska Storm of 6-7 May:** This storm originated just east of Japan as May began and remained weak while crossing the Pacific until it made a turn toward the Gulf of Alaska early on May 5. Rapid intensification occurred as the system absorbed another low and its trailing arctic front approaching from the northwest (Figure 4), and the central pres-

sure dropped 24 mb to 979 mb in the 24-hour period ending at 0000 UTC May 7. The strongest reported winds were north of the center, where the **Northern Lights** (WFJK) reported from near 57°N., 143°W. with an east wind of 55 kt, along with 5-m (17-ft) seas at 2100 UTC May 6. The **Great Land** (WFDP), northwest of the center, experienced north winds of 45 kt and 6.5-m (21-ft) seas near 58°N., 149°W. at 1200 UTC May 7. At 0000 UTC May 7, in the vicinity of the occluded front, the **CSX Kodiak** (KGTZ) near 55°N., 138°W. encountered southeast winds of 40 kt and 10.5-m (35-ft) seas, the highest seas reported in this storm. Six hours later, the **CSX Anchorage** (KGTX) reported south winds of 35 kt and 8-m (26-ft) seas. Also at this time the **Kenai** (WSNB) was reporting northeast winds of 40 kt and 8-m (26-ft) seas near 58°N., 146°W. The Canadian buoy 46205 (54.2°N., 134.3°W.), reported a maximum wind of southeast 35 kt with gusts to 49 kt at 0000 UTC May 7, and maximum seas of 6.5 m (21 ft) three hours later. The storm center, at maximum intensity in the six-hour period ending 0600 UTC May 7, then began to weaken while drifting northeast. The system weakened to a gale near 57°N 142°W at 0000 UTC May 8 before moving inland late on May 8.

**Storm of 11-13 May:** A complex area of low pressure moved east of Japan on May 9 and developed a new center near 38°N 163°E at 0000 UTC May 10, and as it moved east-northeast, it slowly

intensified. After 0000 UTC May 11, the center turned more north, with much of the intensification occurring in the following 24-hour period when the central pressure dropped 18 mb. At 0600 UTC May 12, near 51°N., 169°W., the system was a 980 mb storm which produced marginal storm force winds around the eastern Aleutians. At 0600 UTC May 12, the **CSX Kodiak** (KGTZ) reported from near 54°N., 161°W. with a southeast wind of 50 kt and 8-m (26-ft) seas, the highest seas reported in this event. Twelve hours later the ship JNKT (54°N., 166°W.), reported east winds of 50 kt and 5.5-m (18-ft) seas. At that time, the storm center developed a lowest central pressure of 975 mb near 53°N., 169°W. before looping back to the southwest and then east and weakening. The system then dissipated south of the Alaska Peninsula near 49°N. on May 14.

**Western Pacific and Bering Sea Gale of 19-22 June:** This system originated as a low which moved off the coast of northern Japan at 0600 UTC June 19 and six hours later developed into a 994-mb gale near 39°N 142°E. Figure 5 depicts the period of most rapid development of this system, when the central pressure dropped 22 mb in the 24-hour period ending 1200 UTC June 21. The second surface analysis of Figure 5 shows the gale at maximum intensity, 970 mb, which is unseasonably strong for late June. The GMS satellite image (Figure 6) reveals a mature system with a well-defined center and frontal cloud band or occlusion which has moved well east of the

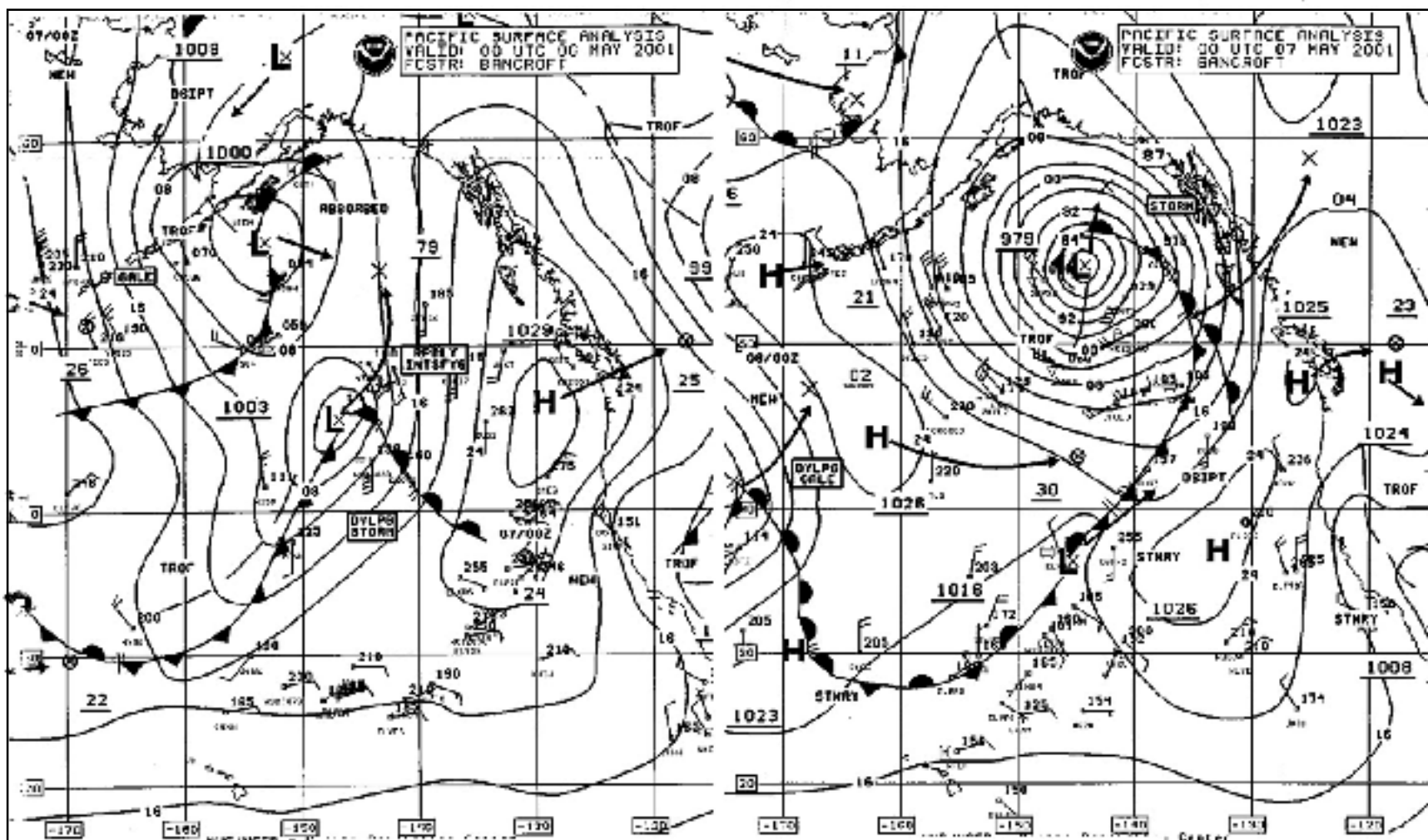
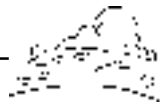


Figure 4. MPC North Pacific Surface Analysis charts (Part 1) valid 0000 UTC May 6 and 7, 2001.



center. The fact that this system had the lowest central pressure, 970 mb, along with the two late-August storms described below, made this the most intense extratropical cyclone (in terms of central pressure) to occur in the North Pacific oceanic surface analysis area during the May-to-August period. At 1200 UTC on June 21, there was an isolated report from the ship **Aquarius Ace** (3FHB8), (45°N., 176°W.), of south winds of 50 kt ahead of the occluded front, but other ships reported 35 kt or less. The maximum seas reported in this event were 8 m (27 ft) from the **Aquarius Ace**. In spite of the intensity of the system, reported winds did not exceed 35 kt over the cold waters of the Bering Sea, where stable conditions near the surface make it difficult for stronger winds aloft to mix down to the surface in summer. The gale center remained nearly stationary during the following twenty-four hours, and then weakened to below gale strength by June 23.

### **Gulf of Alaska Storm of 19-21**

**August:** This developing storm originated as a weak low which moved east across the southern Sea of Okhotsk on August 15 and 16, and then intensified into a gale in the central Bering Sea late on August 18. The system then rapidly intensified into a storm as it moved into the Gulf of Alaska (Figure 7) and pulled in colder air that was over northwest Alaska (north of the stationary front in the first surface chart of Figure 7). Like the late-June event, this storm developed a lowest central pressure of 970 mb at 1800 UTC

August 20. The 500-mb analysis of Figure 8 shows a short-wave trough and jet stream entering the Gulf of Alaska, supporting this development. The ships H3EP (54°N., 156°W.) and the **Caroline Maersk** (OZWA2) at 53°N., 159°W., reported northwest winds of 45 kt at 0000 UTC August 21, the highest reported by ship. There were no reports closer to the center on the south side, where pressure gradients were tighter. At 0000 UTC August 21, The **CSX Kodiak** (KGTZ) reported a northeast wind of 40 kt and 7.5-m (24-ft) seas, and Buoy 46066 (52.5°N., 155°W.) reported seas of 7.6 m (25 ft). Later that day, at 1800 UTC, the **CSX Liberator** (KHRP) at 48°N., 147°W. encountered west winds of 35 kt and 10-m (32 ft) seas, the highest seas reported in this event. By 1200 UTC August 21, the center had reformed to the southeast near 51°N., 140°W., before moving northeast and dissipating near the Queen Charlotte Islands by August 24.

### **Northeast Pacific Storm of 30-**

**31 August:** The origin of this storm can be traced back to Tropical Depression 15W which formed near 24°N., 162°E. at 0600 UTC August 25 and initially moved northwest. After becoming extratropical near 38°N., 145°E. by 1200 UTC August 27 and turning northeast, the developing storm reached the Central Aleutians at 0000 UTC August 30 and turned east. The center intensified into a storm while passing through the southern Gulf of Alaska (Figure 9), attaining a lowest central pressure

of 970 mb at 1200 and 1800 UTC August 31. The ship MTFH (48°N., 145°W.) reported seas of 6.5 m (21 ft), with a west wind of 55 kt, as plotted in the second part of Figure 9. At the same time, the **CSX Spirit** (WFLG) encountered south winds of 45 kt and 9-m (30-ft) seas near 52°N., 141°W., followed six hours later by southwest winds of 50 kt and 11-m (36-ft) seas near 51°N., 138°W. At 0300 UTC September 1, Buoy 46004 (51°N., 136°W.) reported a highest wind of 35 kt, with gusts to 47 kt from the southwest, followed three hours later by a maximum significant wave height of 6.5 m (21 ft). The storm center then turned toward the northeast and weakened near the coast of Southeast Alaska on September 1.

### References

1. Sienkiewicz, J. and Chesneau, L., *Mariner's Guide to the 500-Mb Chart* (Mariners Weather Log, Winter 1995).
2. Bancroft, G., *High Seas Text Bulletins Issued by MPC* (Mariners Weather Log, Vol. 40, No. 2, Summer 1996)

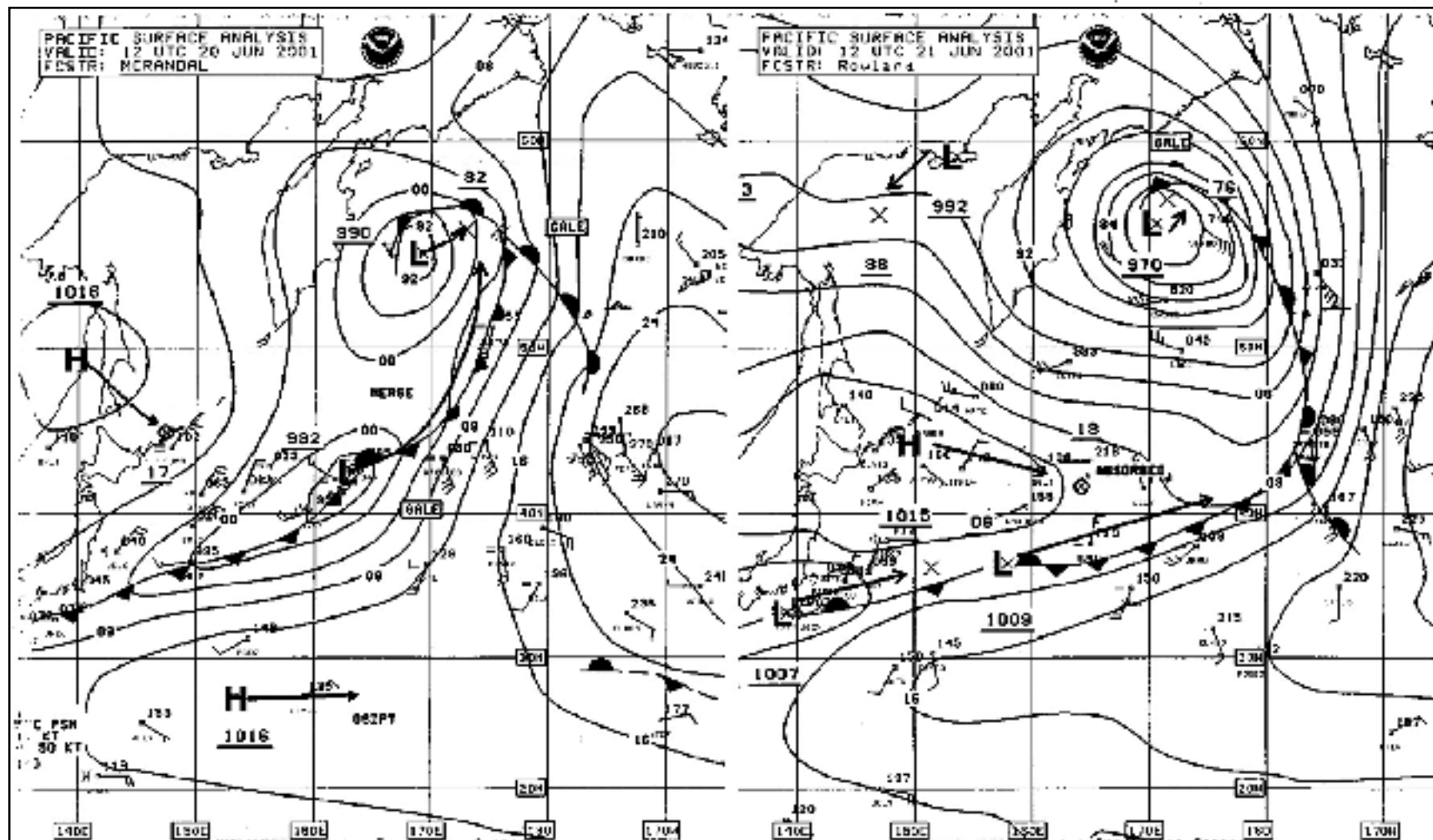
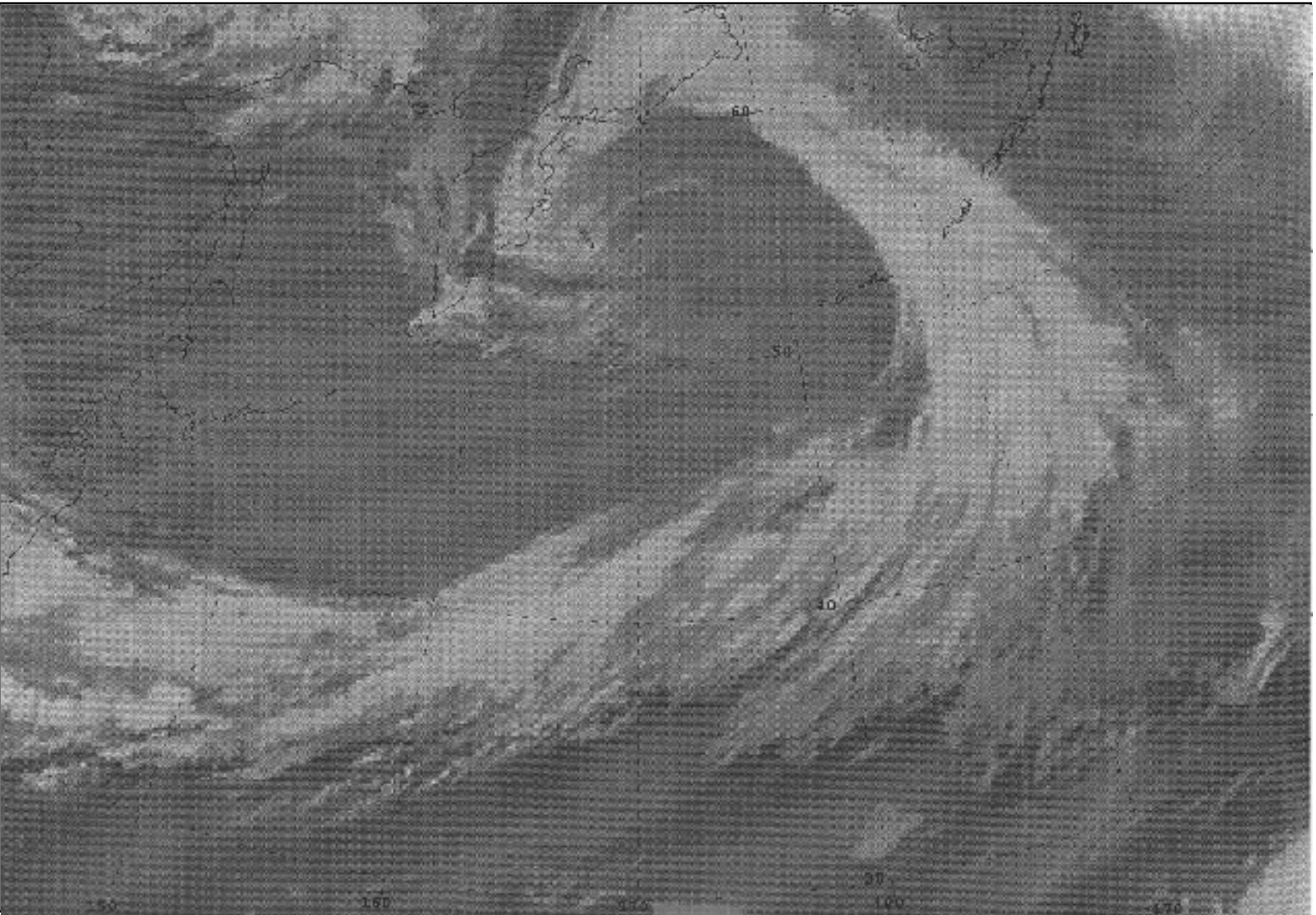


Figure 5. MPC North Pacific Surface Analysis charts (Part 2) valid 1200 UTC June 20 and 21, 2001.



**Figure 6. GMS infrared satellite image valid at 1832 UTC June 21, 2001, or about six and one-half hours after valid time of second surface analysis in Figure 5.**

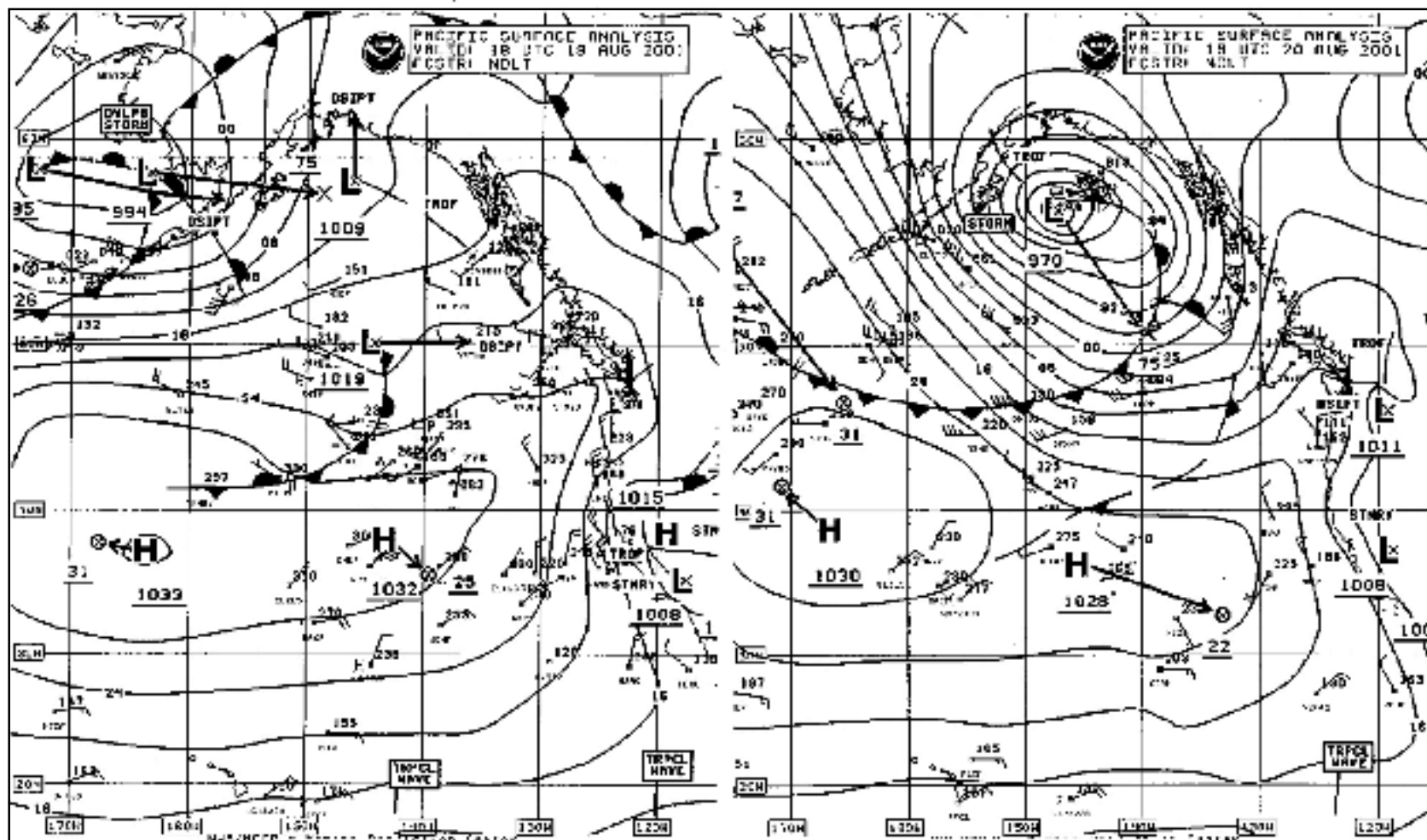


Figure 7. MPC North Pacific Surface Analysis charts (Part 1) valid at 1800 UTC August 19 and 20, 2001

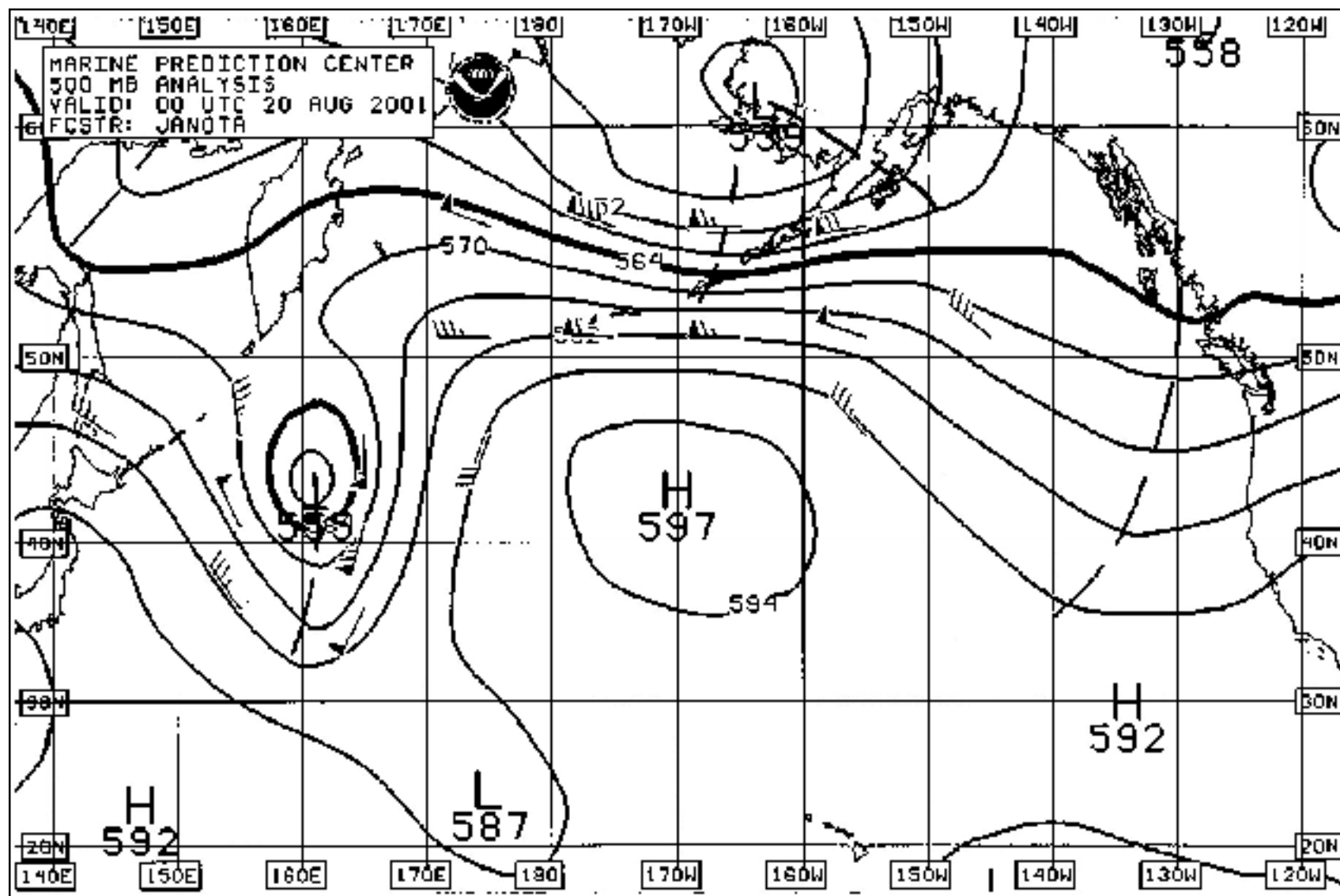


Figure 8. MPC 500-Mb Analysis of North Pacific valid at 0000 UTC August 20, 2001. The broken lines denote short-wave troughs.

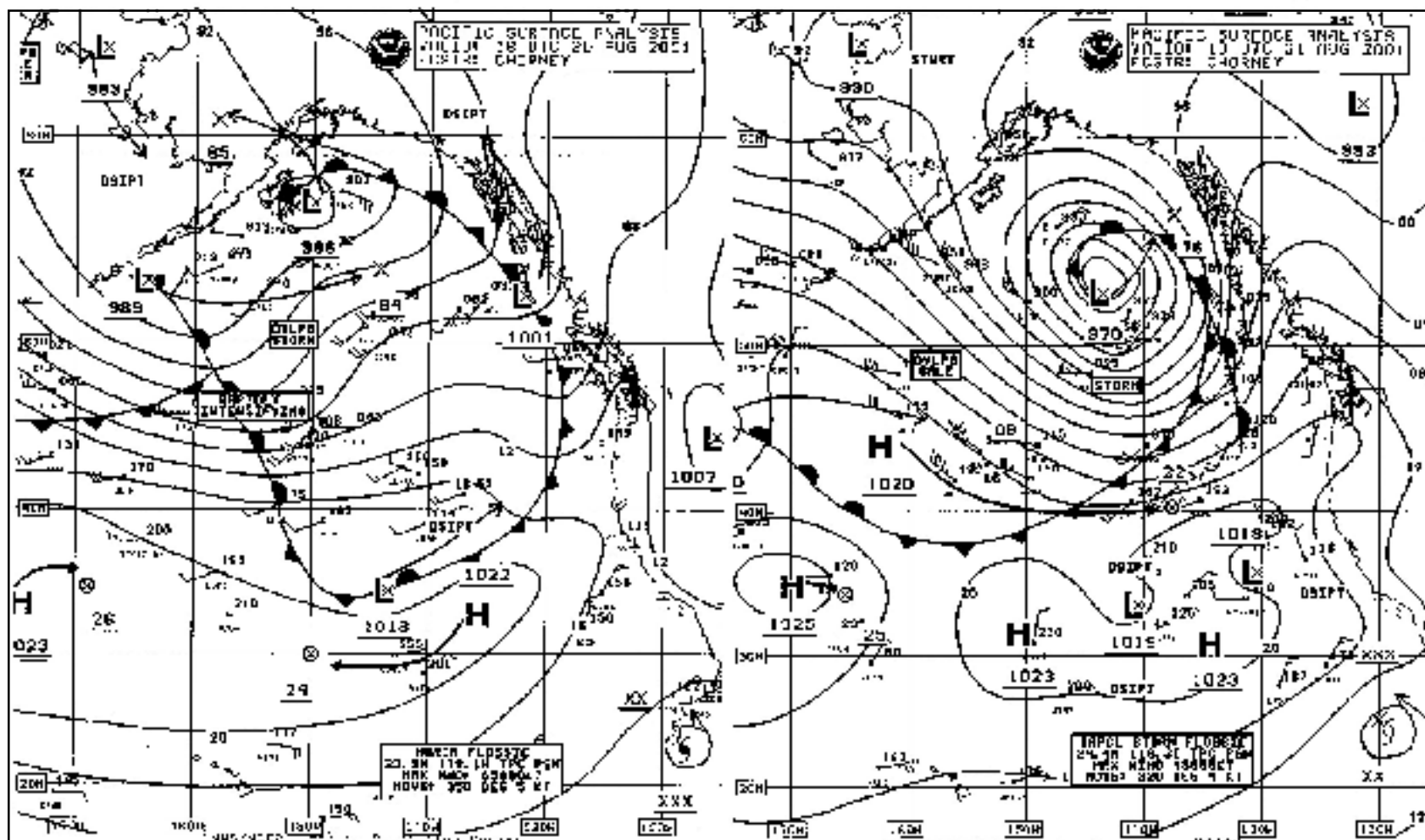
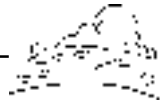


Figure 9. MPC North Pacific Surface Analysis charts (Part 1) valid at 1800 UTC August 30 and 31, 2001.



## **Tropical Atlantic and Tropical East Pacific Areas—May 2001 - August 2001**

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### **I. Introduction**

The normal change from winter to summer weather occurred in the Tropical Prediction Center (TPC) area of responsibility during this period. Two late season gale events occurred in the Atlantic in early May, while twelve tropical cyclones occurred in the Atlantic and Eastern North Pacific basins.

### **II. The New TPC Tropical Cyclone Danger Area Graphic**

Throughout this past hurricane season, the TPC has been producing a “Tropical Cyclone Danger Area” graphic available via the Internet and the U.S. Coast Guard high frequency facsimile (HF Fax). This chart is issued four times per day for both the Atlantic and Eastern/Central Pacific and coincides with the tropical cyclone forecast/advisories issued by the National Hurricane Center (NHC) and Central Pacific Hurricane

Center (CPHC) when a tropical cyclone occurs. During periods of no tropical cyclone activity, the product continues to be issued, indicating no active systems in the basin. Developed and implemented at the request of TPC and mMarine Prediction Center high seas customers, this product fills a gap in tropical cyclone warning responsibility to the mariner.

Based on a technique taught in Coast Guard-approved heavy weather avoidance courses, the graphic attempts to account for the inherent track errors in tropical cyclone forecasts. The technique, known as the 1-2-3 Rule, uses values related to the latest NHC 10-year forecast track averages of 100 nautical miles at 24 hours...200 nautical miles at 48 hours...and 300 nautical miles at 72 hours. The 1-2-3 Rule is applied to create an area around the predicted track of a tropical

cyclone, marking a region of the high seas that should be avoided by mariners. The graphic also depicts the current and forecast intensity category (tropical depression, tropical storm, or hurricane) of each tropical cyclone along its forecast track. The result is a new product, readily available to the mariner, that provides a visual reference of the latest track/intensity forecast along with minimum recommended distance to maintain from each tropical cyclone. Figure 1 shows an example of this graphic for the Eastern and Central Pacific basin.

Tropical cyclones pose a very serious threat to the mariner, and no single graphic can completely remove the risks involved with operating near these systems. In situations where tropical cyclone forecasts appear uncertain, crew experience is limited, or vessel handling is degraded, it is recom-

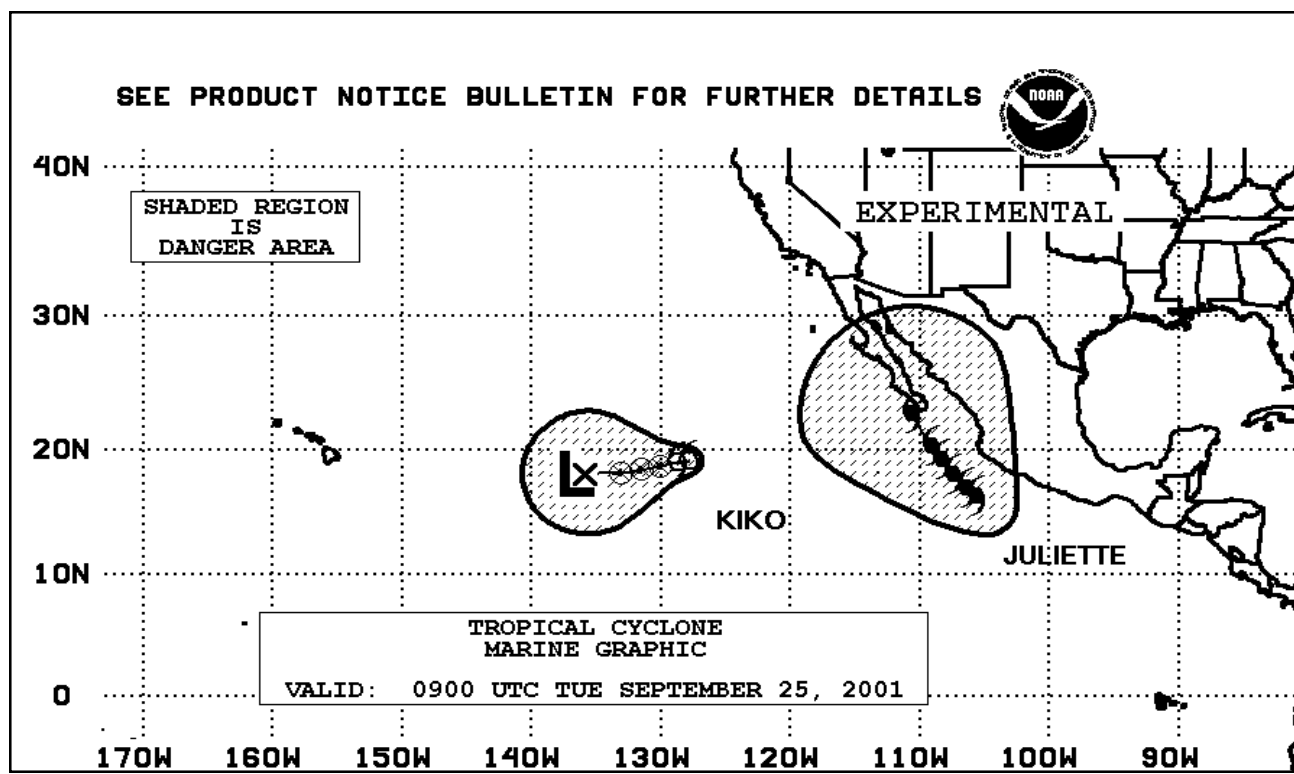
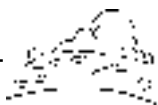


Figure 1: Example of the Tropical Cyclone Danger Area Graphic issued by the Tropical Prediction Center

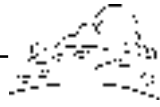
mended that vessels increase separation beyond that depicted in the graphic. The 1-2-3 Rule does not account for situations such as the outward expansion of the wind field in tropical cyclones transitioning to extratropical gales/storms. Additionally, the rule does not account for problems encountered with smaller ships operating in seas of 12 feet or more. Vessel masters operating in the vicinity of tropical cyclones must also take these factors into consideration. The TPC/NHC recommends that mariners operating in the vicinity of tropical cyclones continually monitor latest advisories from NHC and proceed at their own risk.

### III. Significant Weather of the Period

**Tropical Cyclones:** The Atlantic hurricane season started with five tropical cyclones, of which four became tropical storms; however, none reached hurricane strength. The first half of the Eastern Pacific season saw seven tropical cyclones develop. Six of these became tropical storms, with three reaching hurricane strength and one reaching major hurricane status. *Note: Tropical cyclone data should be considered preliminary. Only the tracks of the depressions will be included here. Maps showing the tracks of all the named storms of 2001 will be available in the next Mariner's Weather Log.*

#### Atlantic

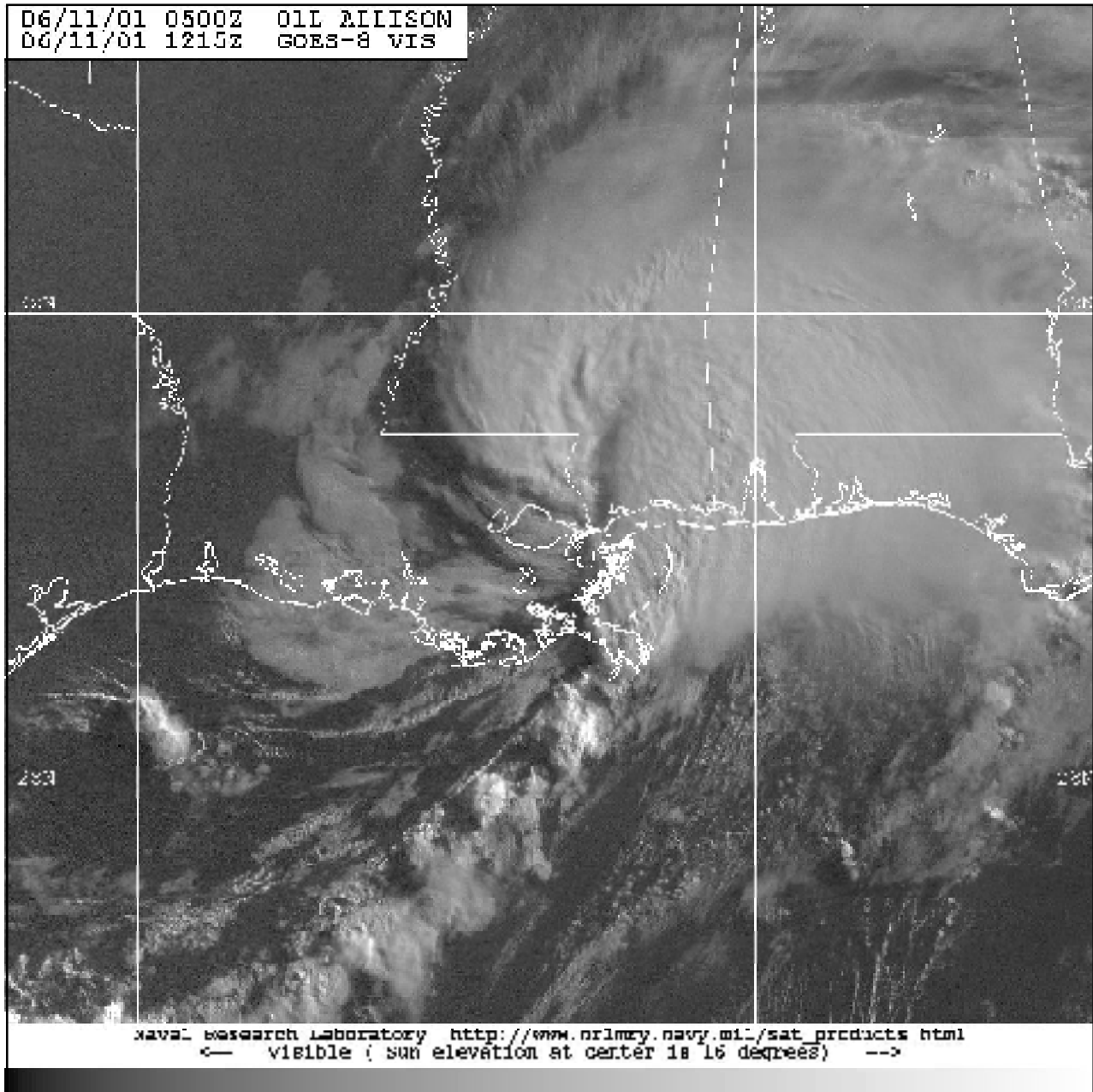
**Tropical Storm Allison:** An area of disturbed weather formed over the Gulf of Mexico on 4 June, due to a combination of a tropical wave and an upper level low. Strong, southerly flow developed east of the system, and when a closed circulation formed about 120 nmi south of Galveston, Texas on the June 5, it immediately became a tropical storm. Allison moved northward with maximum sustained winds reaching 50 kt before landfall near Freeport, Texas later that day. The cyclone continued northward and weakened to a tropical depression over eastern Texas on the 6<sup>th</sup> and 7<sup>th</sup>.



Usually, that would have been the end of Allison; however, events did not progress normally. Allison made a slow loop over southeastern Texas, then moved back into the Gulf of Mexico late on 9 June. It turned east-northeastward and moved across southeastern

Louisiana and southern Mississippi into southwest Alabama on the 11<sup>th</sup>. During this motion, an approaching upper level trough caused Allison to re-intensify as a subtropical storm, even though the center was over land (Figure 2). Allison weakened to a subtropical

depression while crossing southern Alabama on the 12<sup>th</sup>, and the east-northeastward motion persisted until the cyclone was over southern North Carolina on the 14<sup>th</sup>. Allison then meandered over southern and eastern North Carolina until beginning a slow



**Figure 2: GOES-8 visible image of Allison as a subtropical storm at 1215 UTC 11 June 2001. Image courtesy of the Naval Research Laboratory, Monterey, CA.**

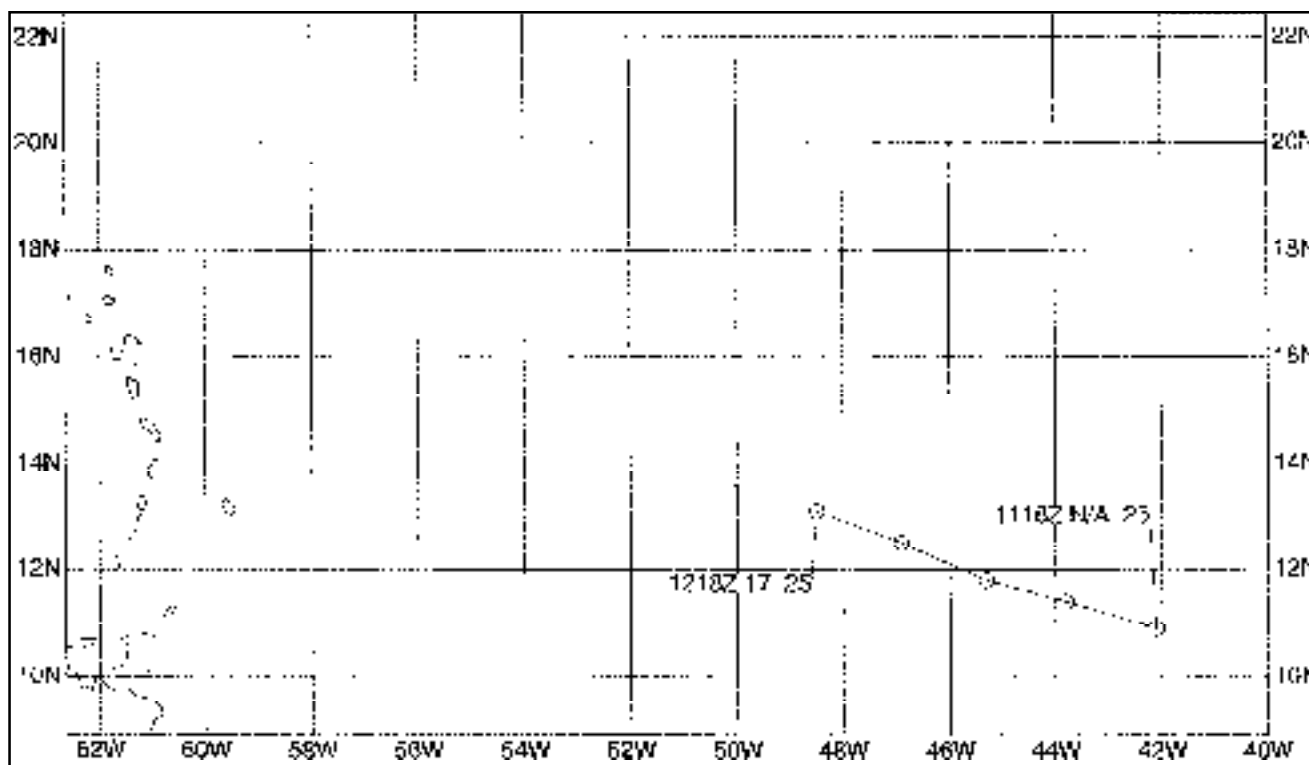
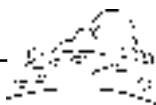


Figure 3: Best track of Tropical Depression Two, 11-12 July 2001.

northward motion on the 15<sup>th</sup>. A northeastward motion on the 16<sup>th</sup> brought the center offshore, passing near the Delmarva Peninsula on the 17<sup>th</sup> and to the south of Cape Cod on the 18<sup>th</sup>. Allison regained subtropical storm status on the 17<sup>th</sup> and maintained 35-40 kt winds until it became extratropical on the 18<sup>th</sup>.

Allison caused some problems for mariners. The NOAA ship **McArthur** (call sign WTEJ) reported 48 kt winds at 1700 UTC 5 June, while the **Paul Buck** (call sign KDGR) reported 34 kt winds at 1200 and 1800 UTC the same day. NOAA buoy 42007 near the Mississippi coast reported 34 kt winds with gusts to 49 kt on 1120 UTC 11 June. On 17 June, sailboats involved in a race also reported sustained winds as high

as 48 kt with gusts to 68 kt near the mouth of Delaware Bay and Cape May, New Jersey. However, since these observations are inconsistent with nearby official observations, their accuracy is uncertain.

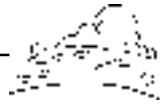
The worst effects of Allison occurred in southeastern Texas. The slow, looping motion produced widespread excessive rainfalls, with storm totals as high as 36.99 inches at the port of Houston. These rains caused widespread severe flooding and severe damage in the Houston metropolitan area. Heavy rains, flooding, and a few tornadoes were noted elsewhere along the track of Allison. In total, the storm was responsible for 41 deaths and estimated damage of more than \$5 billion. This makes Allison the deadliest

and most costly tropical or subtropical storm on record in the United States.

#### **Tropical Depression Two:**

Reports from a U.S. Navy drifting buoy indicate that a tropical wave spawned this depression about 1000 nmi east of the Windward Islands on 11 July (Figure 3). Vertical wind shear prevented further development of the 25 kt system, and the cyclone dissipated late the next day about 600 nmi east of the Windward Islands.

**Tropical Storm Barry:** A tropical wave that moved westward from the African coast on 24 July showed an increase in convection as it approached the Lesser Antilles on the 28<sup>th</sup>. The wave moved into the southeastern Gulf



of Mexico on 1 August, where a broad low pressure area first formed. On the 2<sup>nd</sup>, the low became a tropical depression about 175 nmi west-northwest of Key West, Florida. An Air Force Reserve Hurricane Hunter aircraft determined that the system became Tropical Storm Barry later that day. Barry initially moved west-northwestward, but slowed to a west-southwestward drift on the 3<sup>rd</sup> and a northeastward drift on the 4<sup>th</sup>. Vertical shear caused Barry to briefly weaken to a depression on the 4<sup>th</sup>. This was followed by intensification as Barry turned northward on the 5<sup>th</sup>. Barry reached a peak intensity of 60 kt before making landfall in the Florida Panhandle between Panama City and Destin early on the 6<sup>th</sup>. The cyclone weakened to a depression later that day and to a low on the 7<sup>th</sup>, which dissipated over southeastern Missouri on the 8<sup>th</sup>.

Shipping generally avoided Barry. One unidentified ship reported 30 kt winds with gusts to 50 kt as the system was first developing on the 2<sup>nd</sup>. The only other significant marine observation was from NOAA buoy 42039, which reported 39 kt sustained winds with gusts to 54 kt and a 1001 mb pressure at 2000 UTC 5 August. The maximum winds observed at an official land station were 42 kt, with gusts to 69 kt at Eglin Air Force Base; however, unofficial observations, including reports from two sailboats, indicate maximum sustained winds of 60-65 kt with gusts to hurricane force.

No deaths were directly attributed to Barry, and the storm caused an estimated \$30 million in damage.

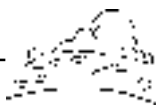
**Tropical Storm Chantal:** A tropical wave that moved westward from the coast of Africa on 11 August developed into a tropical depression about 1300 nmi east of the Windward Islands on the 14<sup>th</sup>. Moving westward as fast as 30 kt, the depression weakened back to a wave on the 16<sup>th</sup>. After passing through the Windward Islands, the wave re-organized and developed into Tropical Storm Chantal on the 17<sup>th</sup>. The storm moved westward until it was south of Jamaica on the 19<sup>th</sup>, when it turned west-northwestward. Chantal twice reached a peak intensity of 60 kt – the first time on the 19<sup>th</sup> and the second on the 21<sup>st</sup>, just before it made landfall on the Yucatan Peninsula near the Mexico-Belize border. Chantal gradually turned west-southwestward after landfall and dissipated over southeastern Mexico the next day.

Two ships reported tropical-storm force winds in Chantal. The **St. Lucia** (call sign C6LF8) reported 37 kt winds at 1200 UTC 18 August, while the **C6RO7** (name unknown) reported 38 kt winds at 1800 UTC the same day. Stations in and around Chetumal, Mexico reported 35 kt sustained winds with gusts to 54 kt.

No deaths were directly attributed to Chantal, and damage in Belize caused by the storm was estimated at \$4 million.

**Tropical Storm Dean:** A tropical wave that moved westward from Africa on 14-15 August began to show signs of organization near the Lesser Antilles on the 21<sup>st</sup>. The wave passed through the Virgin Islands on the 22<sup>nd</sup>, and an Air Force Reserve Hurricane Hunter aircraft determined that by afternoon the wave had developed into Tropical Storm Dean with 50 kt winds. This phase of Dean's life was short – by the next day vertical shear had caused it to weaken back to a tropical wave. The wave moved quickly to the north, and on 24 August re-developed into a broad low pressure area. The low turned slowly northeastward on the 25<sup>th</sup> and 26<sup>th</sup>. The low became a tropical depression late on the 26<sup>th</sup> and regained tropical storm status the next day. Dean gradually accelerated northeastward and reached a peak intensity of 60 kt later on the 27<sup>th</sup>. It became extratropical southeast of Cape Race, Newfoundland the next day.

Several ships encountered Dean, and selected observations of tropical-storm force winds are given in Table 1. The observation from the **Lykes Navigator** at 0600 UTC 27 August was particularly important, as it helped to determine that Dean had again become a tropical storm. Squalls with winds to tropical-storm force occurred over the Virgin Islands and Puerto Rico, with St. Thomas reporting 35 kt sustained winds with gusts to 42 kt.



| Date/Time (UTC) | Ship name/ call sign            | Latitude (°N) | Longitude (°W) | Wind dir/speed (kt) | Pressure (mb) |
|-----------------|---------------------------------|---------------|----------------|---------------------|---------------|
| 22 / 1100       | <b>Nobel Star</b> (KRPP)        | 18.8          | 62.8           | 110 / 37            | 1016.0        |
| 27 / 0600       | <b>Lykes Navigator</b> (WGMJ)   | 37.8          | 61.6           | 190 / 55            | 1004.0        |
| 27 / 1800       | <b>Jingu Maru</b> (JPPT)        | 41.0          | 55.9           | 170 / 47            | 1012.5        |
| 28 / 0000       | <b>Greenwich Maersk</b> (MZIF7) | 40.8          | 53.3           | 170 / 36            | 1017.2        |

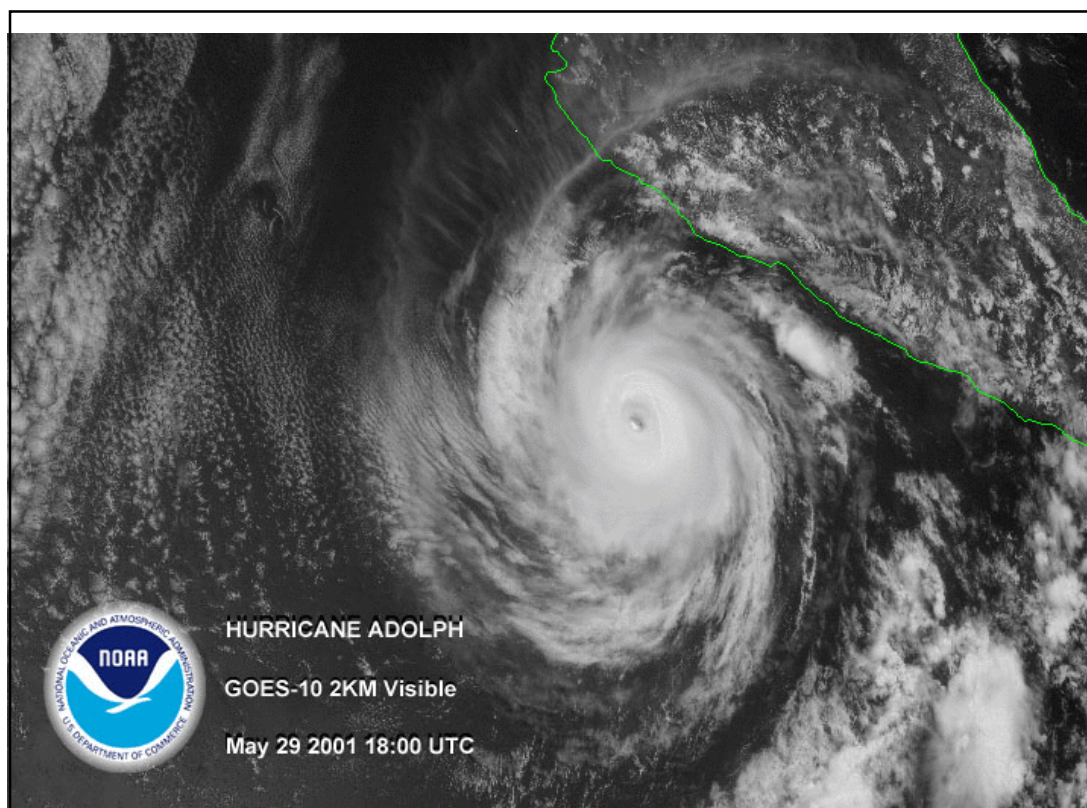
There were no reports of casualties associated with Dean, and damage in Puerto Rico caused by the storm was estimated at \$2 million.

### Eastern Pacific

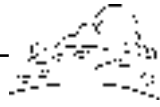
**Hurricane Adolph:** A low pressure area that was likely associated with a tropical wave moved from Central America into the Pacific on 22 May. The system gradually organized, and a tropical depression formed on the 25<sup>th</sup> about 215 nmi south-southwest of Acapulco, Mexico. Initially moving west-northwestward, the

cyclone turned to a slow east-southeastward motion the next day as it became Tropical Storm Adolph. A slow turn to the north occurred on the 27<sup>th</sup> as Adolph became a hurricane. Adolph turned west-northwestward and intensified on the 28<sup>th</sup>, reaching an peak intensity of 125 kt the next

day (Figure 4). Adolph then turned westward and gradually weakened. It became a tropical storm early on 1 June and was downgraded to a depression later that day. The cyclone dissipated early on 2 June about 400 nmi south-southwest of Cabo San Lucas, Mexico.



**Figure 4: GOES-10 visible image of Hurrican Adolph near peak intensity at 1800 UTC 29 May 2001. Image courtesy of the National Climatic Data Center.**



The only report of tropical-storm force winds was from the **CMA CGM Seurat** (call sign DLBX), which reported 39 kt winds and a 1006.0 mb pressure at 0600 UTC 28 May.

Although Adolph was the strongest May hurricane of record in the Eastern North Pacific, there were no reports of casualties or damage.

**Tropical Storm Barbara:** A tropical wave that emerged from the African coast on 1 June reached the Pacific on 10-11 June. It first showed signs of organization on the 18<sup>th</sup>, and it developed into a tropical depression on the 20<sup>th</sup> about 1150 nmi southwest of Cabo San Lucas. Moving west-northwestward through its lifetime, the cyclone became Tropical Storm Barbara later that day and reached a peak intensity of 50 kt the next day. Vertical shear then caused the system to weaken to a tropical depression on the 22<sup>nd</sup> as it crossed 140°W into the Central Pacific Hurricane Basin. The depression eventually weakened to a tropical wave to the northwest of Kauai on the 26<sup>th</sup>.

A ship with the call sign **V2FA2** (name unknown) reported 47 kt winds 105 nmi from the center at 0000 UTC 22 June. While this report is close to the estimated intensity at that time, the distance of the ship makes the wind speed appear inconsistent with expectation.

There were no reports of damage or casualties from Barbara.

**Tropical Storm Cosme:** A tropical wave that crossed Central America on 6 July moved westward and slowly organized. A tropical depression formed on the 13<sup>th</sup> about 330 nmi southwest of Manzanillo, Mexico, which became Tropical Storm Cosme later that day. Maximum sustained winds reached 40 kt as Cosme moved west-northwestward. Cosme weakened to a depression on the 14<sup>th</sup>, and then to a low pressure area on the 15<sup>th</sup>, when it was about 440 nmi west-southwest of Cabo San Lucas. The remnant low moved slowly westward until it dissipated on the 18<sup>th</sup>.

There were no reports of casualties, damage, or tropical-storm force winds from Cosme.

**Hurricane Dalila:** A tropical wave that moved westward from Africa on 10 July reached the Eastern Pacific on the 18<sup>th</sup>. The system organized into a tropical depression on the 21<sup>st</sup> about 250 nmi south of the Gulf of Tehuantepec. Moving west-northwestward, it became Tropical Storm Dalila later that day. Dalila continued moving west-northwestward through its lifetime, passing about 100 nmi off the southwest Mexican coast on the 22<sup>nd</sup> and 23<sup>rd</sup>. Dalila briefly became a 65 kt hurricane on the 24<sup>th</sup>, weakening back to a tropical storm before the center passed over Socorro Island on the 25<sup>th</sup>. It weakened to a tropical depression on the 28<sup>th</sup> and dissipated later that day about 650 nmi west of Cabo San Lucas.

Heavy rains associated with Dalila caused flash floods that damaged homes in Chiapas state in Mexico. There were no reports of casualties or tropical-storm force winds.

**Tropical Storm Erick:** A tropical wave that moved into the Pacific on 16 July began organizing on the 18<sup>th</sup>. The system developed into a tropical depression on the 20<sup>th</sup> about 695 nmi southwest of Cabo San Lucas. Moving west-northwestward, it became a 35 kt tropical storm the next day. Erick maintained minimal tropical storm strength until weakening to a depression on the 23<sup>rd</sup>. It dissipated the next day about 1050 nmi west of Cabo San Lucas.

There were no reports of casualties, damage, or tropical-storm force winds from Erick.

**Tropical Depression Six-E:** An area of disturbed weather, possibly associated with a tropical wave, spawned a tropical depression on 22 August about 1300 nmi east of the Hawaiian Islands (Figure 5). The system moved generally north-northwestward before dissipating on the 24<sup>th</sup> about 1000 nmi east of the Hawaiian Islands. There were no reports of casualties or damage.

**Hurricane Flossie:** A portion of the tropical wave that spawned Atlantic Tropical Storm Chantal moved into the Pacific on 21 August as Chantal was about to move into the Yucatan Peninsula. The system slowly organized and became a tropical depression on the 26<sup>th</sup> about 235 nmi south-

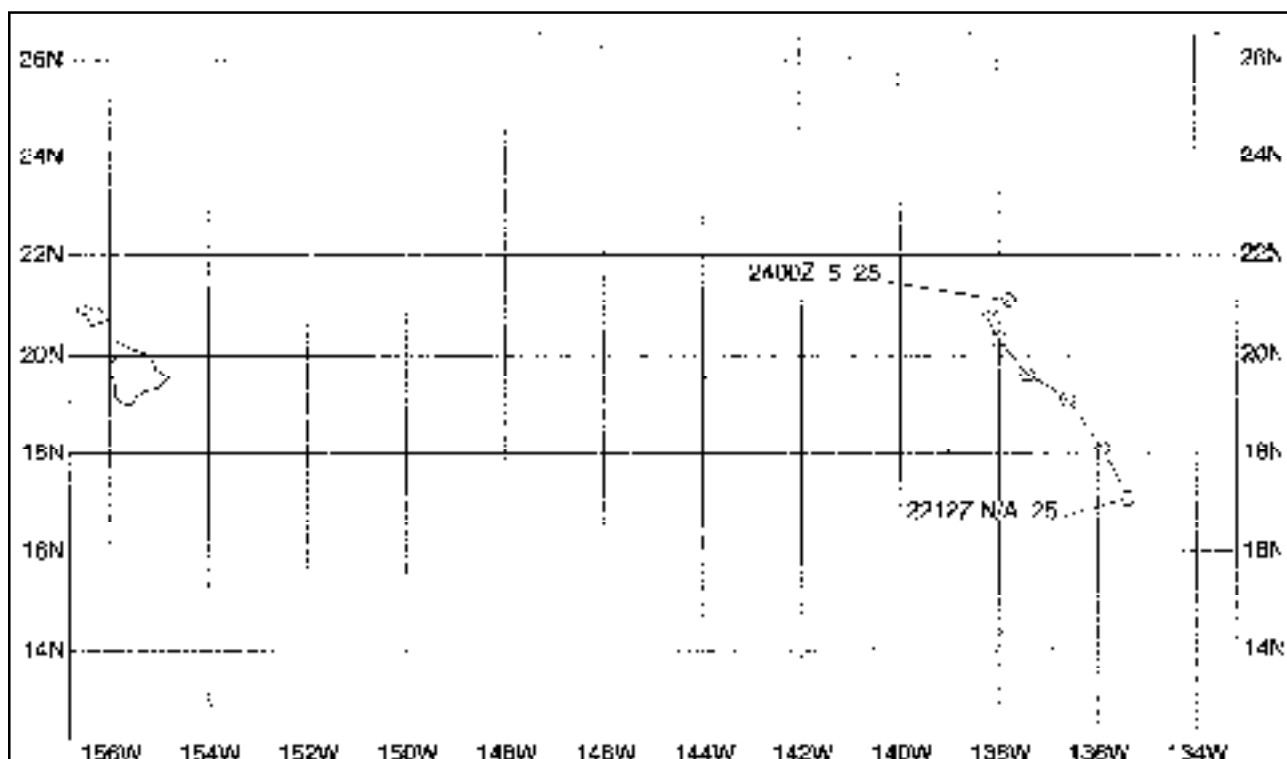
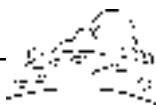


Figure 5: Best track of Tropical Depression Six-E. 22-24 August 2001

southeast of Cabo San Lucas. The cyclone moved westward and became Tropical Storm Flossie later that day. Flossie turned to a slow southwestward motion on the 27<sup>th</sup> as it reached hurricane strength. This was followed by a slow looping motion on the 28<sup>th</sup>. Flossie began a northwestward motion on the 29<sup>th</sup> as it reached a peak intensity of 90 kt. Flossie weakened to a tropical storm on the 31<sup>st</sup>, then weakened to a depression on 1 September as it recurved slowly to the northeast. The cyclone dissipated the next day about 200 nmi of Punta Eugenia, Mexico.

There were no reports of casualties, damage, or tropical-storm force winds directly associated with Flossie. However, moisture

and thunderstorms associated with the remnants of the cyclone spread over portions of southern California on 2-3 September. Lightning strikes from the storms caused two deaths, while associated flash flooding and gusty winds caused minor damage.

#### Other Significant Events

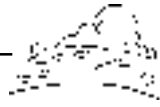
Two late season gale events occurred over the western Atlantic in early May. These gale centers developed along a stationary front that was draped across the western Atlantic. Strong high pressure north of the front produced strong northeast winds across the western Atlantic for several days prior to the onset of the gale force winds. The first gale center was short-lived, while the

second event produced gale conditions south of 31°N. for about 72 hours. No significant non-tropical weather events occurred in the Eastern Pacific basin.

#### Atlantic, Caribbean and Gulf of Mexico

##### West Atlantic Gale 3-4 May:

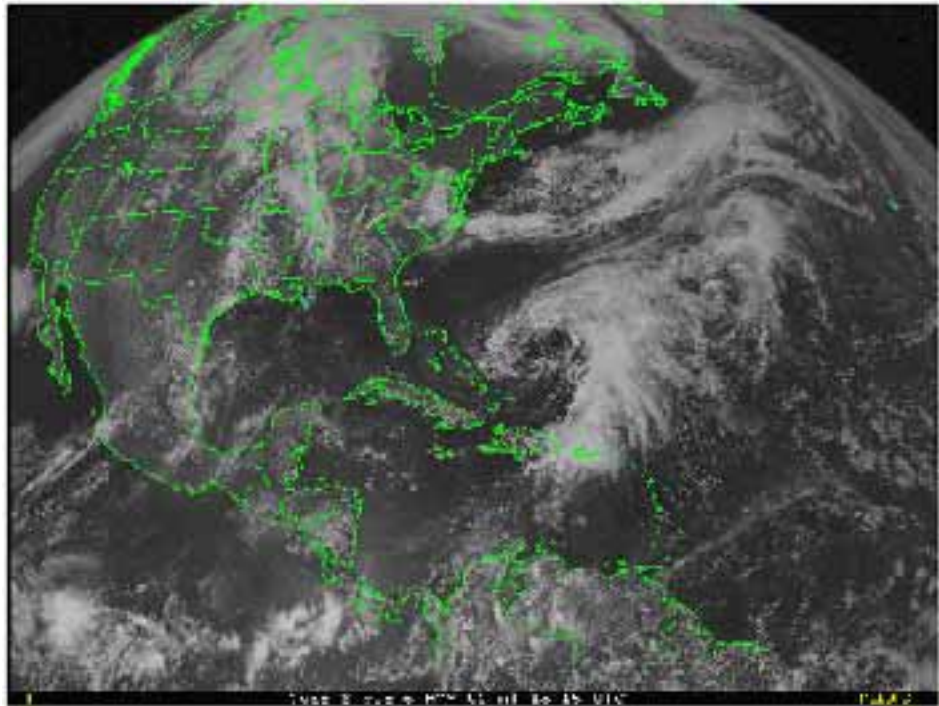
This short-lived gale center developed on 2 May as a low along the stationary front draped across the west Atlantic. The low formed northeast of the central Bahamas and at 0000 UTC 3 May was analyzed as a 1013 mb low near 26°N., 66°W. A Quikscat pass from 1000 UTC 3 May detected an area of 25 to 30 kt winds north of the center. At 1200, UTC the ship **Liberty Sea** (call sign KPZH) near 29° N., 62° W.,



observed winds of 40 kt. Based on this observation, the low was upgraded to a gale center at that time. The gale moved northeast at 10 to 15 kt and at 1800 UTC was centered near 27° N., 60° W. The next Quikscat pass at 2220 UTC 3 May detected a solid area of 30 kt winds, while the **Liberty Sea** continued to report 35 to 40 kt winds at both 1800 UTC 3 May and 0000 UTC 4 May. Quikscat data at 0934 UTC 4 May indicated that the winds associated with the gale center had weakened. At 1800 UTC 4 May gale warnings were discontinued, and the weakening gale was analyzed as a 1011 mb low near 27° N., 57° W. The low remained nearly stationary and finally dissipated about 48 hours later.

### West Atlantic Gale 6-9 May:

On 4 May another low began to develop along the old stationary front across the western Atlantic and central Bahamas. The developing gale drifted northeast and became a 1006 mb gale with center near 25° N., 71° W. at 0000 UTC 6 May. Quikscat data at 1023 UTC 6 May detected 30 to 35 kt winds within 240 nmi over the northwest semicircle of the gale center. At 1800 UTC, the ship **Joseph** (call sign ELRZ8) encountered northeast winds of 37 kt near 28°N., 72°W. The ship **Sea-Land Expedition** (call sign WPGJ) observed 34 kt winds near 29°N., 70°W. Visible satellite

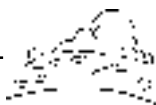


**Figure 6: GOES-8 visible image of the west Atlantic gale at 1815 UTC 6 May 2001. Image courtesy of the National Climatic Data Center.**

imagery at 1815 UTC 6 May (Figure 6) depicted a well defined gale centered over the western Atlantic. At this time another strong high pressure center was building over northern New England behind a cold front located off the mid-Atlantic Coast. This increased the pressure gradient across the western Atlantic, and a large area of 25 to 30 kt northeast winds developed well north of the gale center.

As the gale center drifted northeastward on 7 May, the ships **Maersk Shetland** (call sign MSQK3) and the **Lykes Explorer** (call sign WGLA), between 0600 and 1800 UTC, observed northeast winds of 35 to 37 kt near Bermuda. By 1200 UTC 8 May, the gale center had

moved northward and was located near 30°N., 64°W. At this time gale conditions continued over the TPC area north of 27° N. and west of the gale center to 70° W. The ship **ZCRR6** (name unknown) encountered northeast winds of 30 kt near 30° N., 74° W. At 1200 UTC, two ships near Bermuda, the **Oleander** (call sign PJJU) and the **Pacific Princess** (call sign GBCF) reported gale force winds of 35 kt and 37 kt, respectively. The gale center continued to move northward, and by 1200 UTC 9 May moved north of the TPC forecast area. Gale conditions ended south of 31°N., however large northerly swells of 2.5 to 3.5 m (8 to 12 ft) continued over the western Atlantic west of 65° W. for the next few days.



## Mean Circulation Highlights And Climate Anomalies - July Through October 2001

*A. James Wagner*

*Senior Forecaster, Climate Operations Branch  
Climate Prediction Center /NCEP/NWS/NOAA*

### **JULY - AUGUST 2001**

The mean 500-mb circulation during the middle and late summer was characterized by a moderately amplified train of troughs and ridges at middle and high latitudes of the Northern Hemisphere. Enhanced ridges with above normal 500-mb heights were located over the western Aleutians, the northern Great Plains, the central Atlantic, and most notably, eastern Europe. At the surface, both the subtropical Pacific High and the Bermuda-Azores High were stronger than normal. Interspersed between the ridges, slightly stronger than normal troughs were located over the eastern Gulf of Alaska, near the east coast of North America, over the extreme eastern Atlantic, and near the Urals in central Asia.

During July, except for an early-month heat wave over the West, above normal temperatures were observed mainly over the middle of the U. S. Along the eastern seaboard, rather cool conditions prevailed most of the time, in

response to the stronger than normal upper level trough which prevented the movement of significant amounts of hot and humid air into the region. During August, the heat expanded in different directions for at least part of the month, which affected most of the country. A short, but severe, heat wave developed over the Northeast during the second week, and excessive heat pushed back into the Northwest toward the end of the month. Wildfires became widespread over the Northwest, following a long drought that had its origins during a deficient previous winter rainy season.

The anomalously strong ridge over eastern Europe and western Russia led to a prolonged period of warm and dry weather over most that region. From time to time, this area of excessive heat expanded into southern Europe, northeastern Africa, and the Middle East.

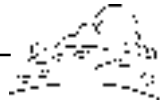
The recent La Niña had faded to a near-neutral condition, as measured by equatorial sea surface temperatures in the Pacific and

most indices of atmospheric circulation. The monsoon was well-developed over India and southeast Asia, with most areas receiving normal or greater rainfall. Under these conditions, the Madden-Julian Oscillation (MJO) was favored to be quite active, and it strongly modulated tropical activity in both the Pacific and the Atlantic sectors.

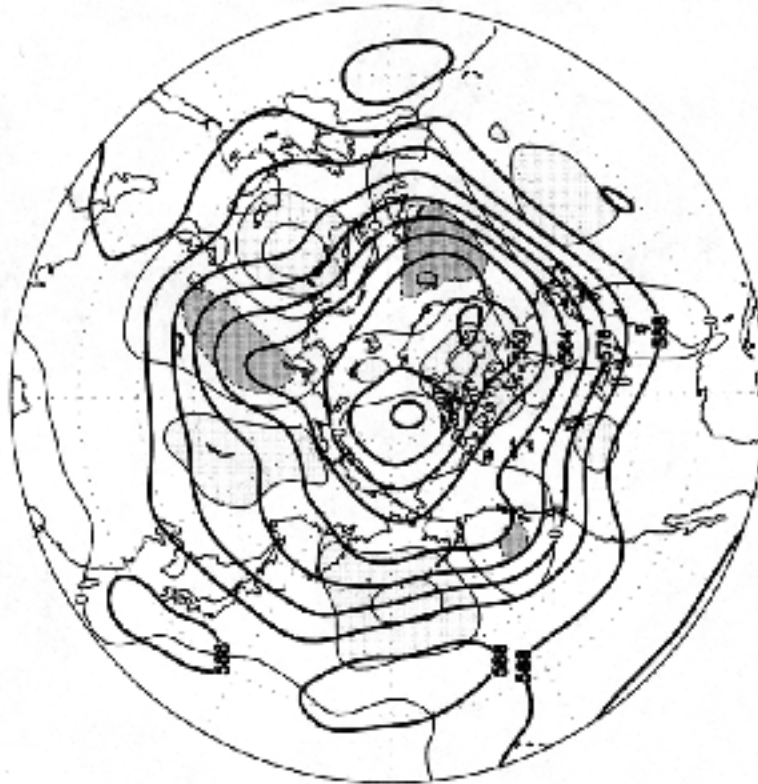
There were several periods when typhoons were numerous over the western Pacific, but the eastern Pacific had somewhat less activity than usual.

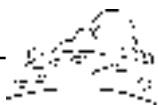
Four named storms had developed over the Atlantic region by the end of August, but only Barry affected the U.S., producing heavy rains along the central Gulf Coast during the second week of the month.

The phase of the MJO was such as to suppress tropical activity in the Atlantic sector during the latter part of August, resulting in only three weak storms when activity is normally rapidly increasing.



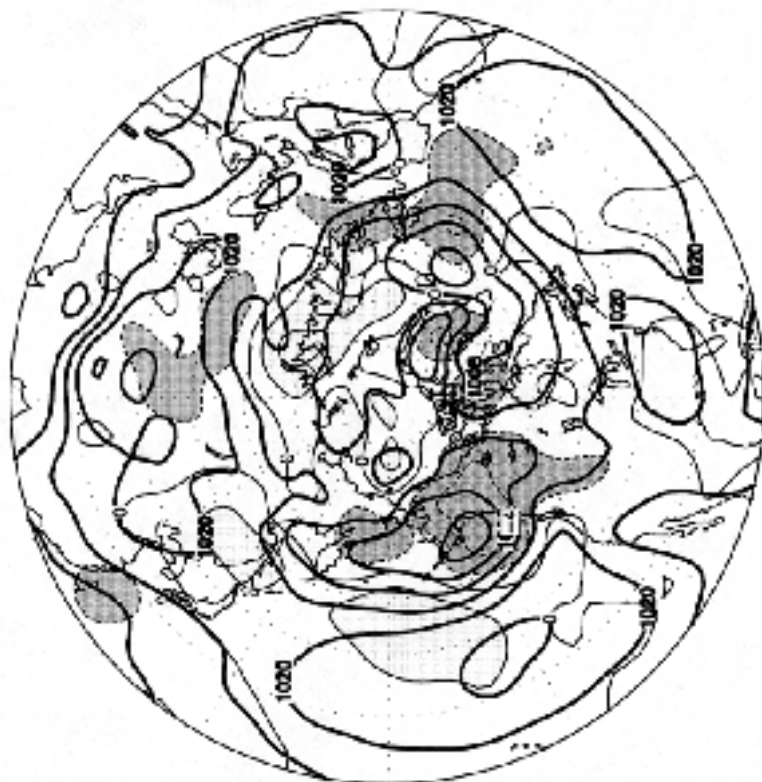
July–August 2001  
500 mb Height, Anomaly      Sea Level Pressure, Anomaly

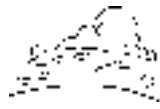




## September–October 2001

500 mb Height, Anomaly      Sea Level Pressure, Anomaly





### Figure legends and description of units:

The chart on the left in each pair shows the two-month seasonal mean 500-mb height contours at 60 m intervals in heavy solid lines, with alternate contours labeled in decameters (DM). Height anomalies are contoured at 30 m intervals. Areas with mean height anomalies greater than 30 m above normal are shown by light solid lines with light shading, and areas where the mean height anomaly was more than 30 m below normal have light dashed lines with heavy shading.

The charts on the right show the seasonal mean sea level pressure at four mb intervals in heavy solid lines, labeled in mb. Anomalies of SLP are contoured in dashed lines and labeled at two mb intervals, with light shading and light solid lines in areas greater than two mb above normal, and heavy shading and light dashed lines in areas more than two mb below normal.

### SEPTEMBER - OCTOBER 2001

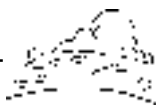
The mid-tropospheric circulation during the early fall showed a continuation of the well developed ridge and underlying surface high over the central Pacific. Lower than normal pressure prevailed across the Bering Sea and northern Gulf of Alaska, resulting in strong high latitude westerlies and an early onset of the fall rainy season and gales.

Over the United States, an anomalously strong 500-mb ridge prevailed over the West, accompanied by warmer and drier weather than usual, continuing the drought and wildfire threat past the usual time of onset of fall rains and cooler weather. Under the slightly enhanced but broad trough that covered most of the eastern U.S., temperatures were below normal over the southeastern third of the Nation during September, and the abnormal coolness persisted over the Gulf and south Atlantic states during October, accompanied by heavy rainfall near the Gulf coast. Areas of above normal temperatures was limited to the far West, Southwest, and parts of the Northeast during October. In the West, only parts of the immediate California coastline remained cooler than normal during both months, due to the influence of below normal sea surface temperatures (SSTs) near the shore.

The westerlies over the Atlantic were somewhat south of normal, with above normal heights prevailing across the north from Newfoundland to the Greenland and Barents seas. Below normal heights and enhanced cyclonic activity continued over the eastern Atlantic, but extended inland across central Europe, especially during the latter half of September and the first week of October, when heavy rains occurred over southern and central Europe. This blocking pattern was associated with a negative phase of the North Atlantic Oscillation (NAO). The trough and associated storminess retrograded to the west over

the ocean during the latter half of October, and Europe became warmer and drier than normal.

Throughout the entire year, the rainfall distribution over the tropical Pacific has been more typical of that accompanying La Niña, even though since spring many of the indices that monitor the El Niño/Southern Oscillation (ENSO) cycle have averaged close to zero, reflecting a neutral condition. Below normal sea surface temperatures prevailed over the eastern Pacific and much of the adjoining subtropical waters, but above normal SSTs developed eastward as far as the Dateline. As is typical in La Niña years, the Asian monsoon was active, and there were numerous typhoons over the western Pacific, although tropical activity declined sharply in that region during most of October. Again this year, although the number of named tropical storms was somewhat above normal over the western Atlantic region, many of the storms were relatively weak, in spite of above normal SSTs. This was due to greater than normal shear from enhanced westerly components in the high-level winds and periods in which the MJO modulation was unfavorable for strong development. Of the Atlantic tropical storms, only Gabrielle, which produced heavy rains over the Florida Peninsula during the second week of October, had a substantial effect on the U.S.



## A Storm By Any Other Name

by Larry Peabody  
National Weather Service  
Weather Service Forecast Office  
San Antonio

**T**hey're called *typhoon* in the western Pacific; *baguio* in the Philippines; *cyclone* in the Indian Ocean. In the Atlantic Ocean, Caribbean Sea, Gulf of Mexico and eastern Pacific, they go by the name *hurricane*. And in Baja, California and along the west coast of Mexico, they're known as *chubasco*!

Chubasco? What in the world is a chubasco, you ask? To the uninformed, it may sound like a brand of picante sauce. Or the latest dance craze sweeping Cabo San Lucas. Maybe even that new heavy metal mariachi rock band playing the La Paz circuit. Most likely it's what I came down with the last time I had huevos rancheros for breakfast and then wrestled 12-foot seas off the East Cape of Baja.

Actually, it's none of the above (although one might get a vote or two on that last choice). To the unaware, coming face-to-face with a chubasco can be terrifying. Some have lived to tell about it; others haven't.

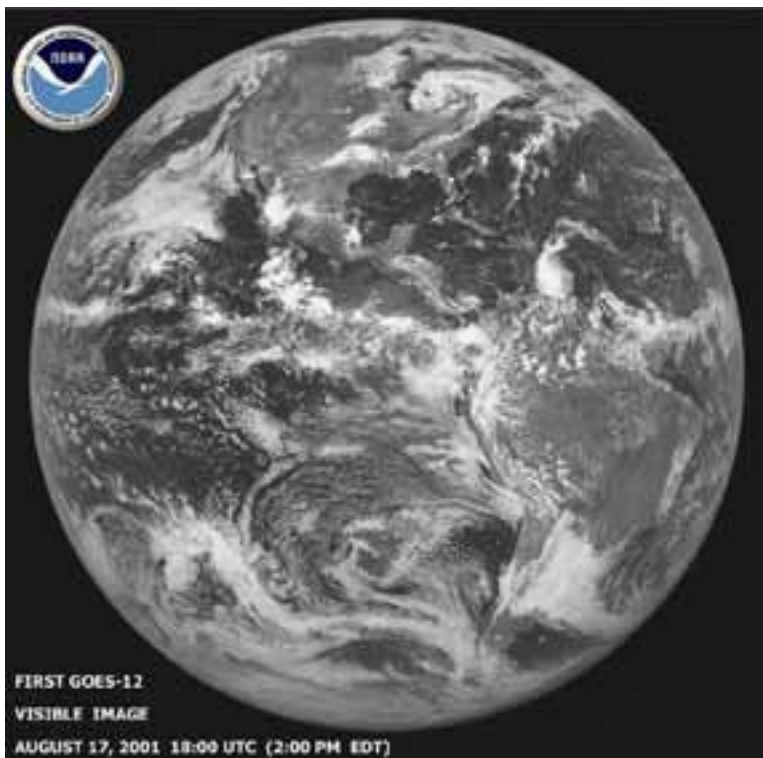
According to the *Glossary of Meteorology* (American Meteorological Society, 1959), the 'bible' of weather terminology, chubasco is defined as "a severe thunderstorm with vivid lightning and violent

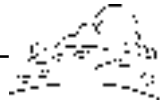
squalls coming from the land on the west coast of Nicaragua and Costa Rica in Central America." In addition to severe thunderstorms and squalls, the term also has been applied locally to tropical storms and hurricanes that strike the west coast of Mexico and the Baja Peninsula.

In late spring and summer, when the inter-tropical convergence zone (ITCZ) is most active, eastern Pacific tropical storms and hurricanes develop in the warm tropical waters southwest of Mexico. Most of these will die at sea as they migrate over colder ocean waters; wander aimlessly westward across the Pacific Ocean south of Hawaii; move inland and perish over the desert; or strike the lower California coast

as squalls. But there are destructive exceptions when storms recurve back toward Baja and the west coast of Mexico.

When a tropical storm or hurricane does affect the Baja Peninsula or mainland of Mexico, it is accompanied by damaging wind, pounding surf and torrential rain. The wind damages trees, roofs, houses and buildings. The surf erodes unprotected beaches and coastlines; wreaks havoc on vulnerable fishing and pleasure vessels; undermines exposed or poorly constructed structures; and seriously damages marinas. The rain introduces new threats – viscous mud slides flowing down from nearby hills or mountains, and rampaging flash floods gouging a





*Continued from Page 72*

normally dry river or creek bed, *arroyo* (gully) or *ramal* (branch).

Even tropical storms or hurricanes that pass hundreds of miles south and west of Baja can have a far-reaching effect. Swells generated by these distant tropical cyclones can reach heights of 20 feet or more on the Pacific side of Baja. On the opposite side, the much smoother Sea of Cortez is spared, thanks to the protection offered by the elongated land mass.

Thunderstorms and squalls formed by the orographic lifting of warm moist air across coastal mountain ranges then drifting across the Sea of Cortez, are known locally as *colla* or *tribunada*. The mountains which reach to the shore along Baja, California and the west coast of Mexico are favorable areas for development. They can develop in other ways, such as along a frontal boundary or some other type of atmospheric disturbance. Whatever they're called, they pose the same threat as thunderstorms in the continental U.S. – intense lightning, sudden wind shifts and buffeting gusts, and torrential rain. In the open ocean, gale-force winds produced by an approaching storm can cause seas to build suddenly, threatening to broach or capsize small fishing and pleasure boats caught unprepared. Angry seas of 15 feet or higher and pounding surf are produced by the increase in wind and waves. Although rare, hail, funnel clouds, tornadoes or waterspouts may accompany these storms.

With the torrential rain comes the threat of a *torrente* (flash flood),

especially in mountainous regions. A *torrente* can be deceptively treacherous, since its source can be miles away from unsuspecting campers, motorists or villages. It also can be particularly devastating when it strikes at night under the cloak of darkness.

A *colla* or *tribunada* can be detected early by noting the formation of building cumulus clouds over distant mountain ranges or by the approach from the sea of cumulonimbus clouds – the squall or thunderstorm. Late morning or early afternoon are the most favorable times for development, although they can form at other hours. Usually they tend to dissipate during the late afternoon or evening, or if their passage takes them over cooler water, but they have been known to persist throughout the night and last for several days.

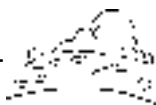
Few locations along the west coast of Mexico or Baja, California are immune. The most favorable regions, however, are those areas where warm water and steeply-rising terrain are closest. There are numerous spots along the west coast of Mexico where this exists. Any place in Baja California Sur would meet this requirement, especially on the Sea of Cortez side, from Loreto southward past La Paz and the East Cape to Cabo San Lucas. Normally, the much cooler water on the Pacific Ocean side inhibits such formation.

The best protection against the effects of a *colla* or *tribunada*, as with most other forms of adverse weather, is common sense and advanced planning. Keep a

weather eye out for the rapid approach of threatening clouds and have a plan of action to avoid or minimize the threat. If you haven't left port yet and see developing weather, just don't go! Why take a chance? There's always *mañana* (tomorrow). If you can't reach safe harbor and are caught in the open, prepare for rough weather, stay below deck and ride out the storm, if possible. Make sure there are enough personal flotation devices (PFDs) on board, and *all* crew members and passengers are wearing one. Due to their rapid movement, *collas* or *tribunadas* seldom affect a spot for more than a few hours, although documented accounts of gale-force winds, blinding lightning, deafening thunder and monster seas may make the experience seem like a lifetime, and liken it to scenes from "*The Perfect Storm*."

Whatever you call them, *chubasco*, *colla* or *tribunada*, they are the exception to the normally-tranquil weather of Baja, but an exception that can't be ignored, and one which can turn a few hours of fishing and pleasure into an eternity of extreme discomfort and pain, even tragedy, if you're not prepared.

*Larry Peabody is Senior Forecaster at the Austin/San Antonio Texas National Weather Service Forecast Office; a Certified Consulting Meteorologist (CCM) and freelance writer; a member of the American Meteorological Society, National Weather Association, Texas Outdoor Writers Association, Outdoor Writers Association of America and, along with wife and fishing companion Barbara, a frequent visitor to Baja, California and advocate of tag-and-release billfishing.*



## SEPTEMBER 2001 ALASKA MARINE & PUBLIC SERVICES REPORT

### New Monthly Record for Alaska BBXX OBS in September!

**A**laska set a new, all-time record for Monthly BBXX Observations with 2,268 for September 2001! This beat the old monthly record of 2,059 which was set in August 2001. Congratulations to the following Alaska personnel who visited ships in September: Larry Hubble (7); Rich Courtney (4); Mike Kutz (3); Kimberly Vaughan (1); Jerry Painter (1); James Bunker (1); and Wilford Burson (1).

**Kodiak** was the "A Division" Station of the Month for September 2001 with a score of 7,416 points. The **Kodiak** staff again led the way with the most BBXX observations transmitted in Alaska, 570, and the most pilot briefings, 146. **Cold Bay** was the "A Division" second place site with a score of 3,016 points. They had their best monthly BBXX total of the year with 182. 2nd place site with a score of 2,805 points. **Juneau** had 1 ship visit, and 240

BBXX observations. **Yakutat** was the "A Division" third ranked station with 1 ship visit, and had an Alaska best 879 marine briefings for a score of 2,616 points. Juneau was the fourth place station with a score of 2,345 points and 1 ship visit.

In the "B Division", **WFO Anchorage** led the way with a score of 1,554 points. **ARH Anchorage** was second with 1,400 points on 7

## NWS ALASKA RANKINGS and SCORES

### A DIVISION

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#### September 2001

|    |               |              |
|----|---------------|--------------|
| 1. | <b>Kodiak</b> | <b>7,416</b> |
| 2. | Cold Bay      | 3,016        |
| 3. | Yakutat       | 2,616        |
| 4. | Juneau        | 2,345        |
| 5. | Valdez        | 1,275        |

#### JAN – SEP 2001

|    |               |               |
|----|---------------|---------------|
| 1. | <b>Kodiak</b> | <b>69,072</b> |
| 2. | Juneau        | 31,554        |
| 3. | Cold Bay      | 20,130        |
| 4. | Yakutat       | 11,576        |
| 5. | Valdez        | 10,770        |

#### 2001 Most Improved

|    |               |                |
|----|---------------|----------------|
| 1. | <b>Juneau</b> | <b>+11,438</b> |
| 2. | Kodiak        | +8,991         |

#### October 2001

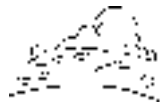
|    |               |              |
|----|---------------|--------------|
| 1. | <b>Kodiak</b> | <b>7,197</b> |
| 2. | Juneau        | 2,928        |
| 3. | Cold Bay      | 2,675        |
| 4. | Yakutat       | 1,371        |
| 5. | Valdez        | 1,250        |

#### JAN – OCT 2001

|    |               |               |
|----|---------------|---------------|
| 1. | <b>Kodiak</b> | <b>77,589</b> |
| 2. | Juneau        | 34,482        |
| 3. | Cold Bay      | 22,805        |
| 4. | Yakutat       | 12,947        |
| 5. | Valdez        | 12,020        |

#### 2001 Most Improved

|    |               |                |
|----|---------------|----------------|
| 1. | <b>Juneau</b> | <b>+12,038</b> |
| 2. | Kodiak        | +8,669         |



ship visits. **St. Paul** was third with a score of 1,244 points and 1 ship visit.

In the "C Division," **Barrow** was first again with 300 marine briefings and a score of 1,301 points. Second place McGrath had their first ship visit of the year when they went aboard the tug

that hauled their year's supply of helium for weather balloon operations to town. Third place **Bethel** had the second highest total of Pilot Weather Briefings in Alaska for September with 123.

After the first 8 months of the year 2001, the Alaska Marine Division leaders are **Kodiak**,

**ARH Anchorage**, and **Barrow**. **ARH Anchorage** has the most ship visits with 82. Kodiak has the most BBXX transmitted with 4,615, the most Marine Briefings with 7,421, and the highest total of Pilot Weather Briefings, with 1,082. Juneau has 4 FAM Floats and Flights in 2001. St. Paul has the highest total of broadcasts with 7,429. Juneau is the 2001 Most Improved Marine and Public Service Program so far with a

## NWS ALASKA RANKINGS and SCORES

### B DIVISION

#### SEPTEMBER 2001

|    |               |       |
|----|---------------|-------|
| 1. | WFO Anchorage | 1,554 |
| 2. | ARH anchorage | 1,400 |
| 3. | St. Paul      | 1,244 |
| 4. | King Salmon   | 966   |
| 5. | Annette       | 716   |

#### JAN – SEP 2001

|    |               |        |
|----|---------------|--------|
| 1. | ARH Anchorage | 17,000 |
| 2. | St. Paul      | 11,210 |
| 3. | WFO Anchorage | 8,755  |
| 4. | Annette       | 8,094  |
| 5. | King Salmon   | 6,307  |

#### 2001 MOST IMPROVED

|    |               |        |
|----|---------------|--------|
| 1. | ARH Anchorage | +9,200 |
| 2. | WFO Anchorage | +5,964 |

#### SEPTEMBER 2001

|    |               |       |
|----|---------------|-------|
| 1. | ARH Anchorage | 1,400 |
| 2. | WFO Anchorage | 1,396 |
| 3. | Annette       | 1,341 |
| 4. | St. Paul      | 1,043 |
| 5. | King Salmon   | 921   |

#### JAN – OCT 2001

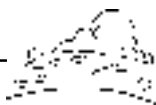
|    |               |        |
|----|---------------|--------|
| 1. | ARH Anchorage | 18,400 |
| 2. | St. Paul      | 12,253 |
| 3. | WFO Anchorage | 10,151 |
| 4. | Annette       | 9,435  |
| 5. | King Salmon   | 7,228  |

#### 2001 MOST IMPROVED

|    |               |         |
|----|---------------|---------|
| 1. | ARH Anchorage | +10,000 |
| 2. | WFO Anchorage | +7,095  |



Pictured on the left - While at the Port of Anchorage on September 26, 2001, the Crowley Tug Seneca received the Alaska Marine Program "Award of Excellence." During August 2001, the Seneca had the highest monthly total of observations in recent Alaska history with 142. The Seneca has 396 observations so far this year, and they led all Alaska vessels in the year 2000 with 475 observations. Pictured from left to right are: Buff Pudwill, Charles Tessaro, and Greg Marsh.



## **NWS ALASKA RANKINGS and SCORES**

### **C DIVISION**

---

**September 2001**

|    |               |              |
|----|---------------|--------------|
| 1. | <b>Barrow</b> | <b>1,301</b> |
| 2. | McGrath       | 1,064        |
| 3. | Bethel        | 806          |
| 4. | Nome          | 765          |
| 5. | Kotzebue      | 643          |
| 6. | Fairbanks     | 125          |

**JAN – SEP 2001**

|    |               |              |
|----|---------------|--------------|
| 1. | <b>Barrow</b> | <b>8,430</b> |
| 2. | McGrath       | 7,084        |
| 3. | Nome          | 5,468        |
| 4. | Bethel        | 5,143        |
| 5. | Kotzebue      | 3,972        |
| 6. | Fairbanks     | 1,969        |

**2001 Most Improved**

|    |               |               |
|----|---------------|---------------|
| 1. | <b>Bethel</b> | <b>+4,486</b> |
| 2. | McGrath       | +5,964        |
| 3. | Barrow        | +3,454        |
| 4. | Kotzebue      | +1,530        |
| 5. | Nome          | +917          |

**September 2001**

|    |                |              |
|----|----------------|--------------|
| 1. | <b>McGrath</b> | <b>1,179</b> |
| 2. | Nome           | 835          |
| 3. | Kotzebue       | 755          |
| 4. | Barrow         | 705          |
| 5. | Bethel         | 436          |
| 6. | Fairbanks      | 195          |

**JAN – OCT 2001**

|    |               |              |
|----|---------------|--------------|
| 1. | <b>Barrow</b> | <b>9,135</b> |
| 2. | McGrath       | 8,263        |
| 3. | Nome          | 6,303        |
| 4. | Bethel        | 5,579        |
| 5. | Kotzebue      | 4,727        |
| 6. | Fairbanks     | 2,164        |

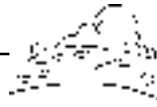
**2001 Most Improved**

|    |                |               |
|----|----------------|---------------|
| 1. | <b>McGrath</b> | <b>+5,159</b> |
| 2. | McGrath        | +4,840        |
| 3. | Barrow         | +3,584        |
| 4. | Kotzebue       | +2,100        |
| 5. | Nome           | +1,255        |

## **BBXX REPORT**

Here is the latest information on the **TOP 10 VOS WEATHER REPORTING VESSELS** in Alaskan waters for this year.

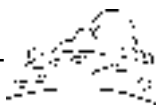
| <b>SEPTEMBER 2001</b> | <b>OBS</b> | <b>OCTOBER 2001</b> | <b>OBS</b> | <b>JAN – OCT 2001</b> | <b>OBS</b> |
|-----------------------|------------|---------------------|------------|-----------------------|------------|
| 1. GUARDIAN           | 220        | 1. GUARDIAN         | 165        | 1. GUARDIAN           | 810        |
| 2. SENECA             | 151        | 2. WARRIOR          | 116        | 2. ARCTIC SUN         | 700        |
| 3. ADVENTURER         | 111        | 3. SENECA           | 108        | 3. SENECA             | 656        |
| 4. MALOLO             | 92         | 4. CSX ANCHORAGE    | 92         | 4. NORTHERN SPIRIT    | 565        |
| 5. ARCTIC SUN         | 91         | 5. ARCTIC SUN       | 88         | 4. CSX ANCHORAGE      | 565        |
| 6. PACIFIC PRIDE      | 85         | 6. C.F. CAMPBELL    | 77         | 6. POLAR EAGLE        | 514        |
| 7. SEA VENTURE        | 82         | 7. MALOLO           | 70         | 7. WARRIOR            | 496        |
| 8. CSX ANCHORAGE      | 76         | 8. SEA VENTURE      | 66         | 8. SEABULK MONTANA    | 490        |
| 9. NORTHERN SPIRIT    | 71         | 9. SINUK            | 62         | 9. CSX KODIAK         | 417        |
| 10. TUSTUMENA         | 67         | 10. GRETA           | 56         | 10. SAMSON MARINER    | 407        |
| * ALL ALASKA SHIPS    | 2,268      | * ALL ALASKA SHIPS  | 1,990      | * ALL ALASKA SHIPS    | 13,514     |

**ALASKA SHIP VISITS SEPTEMBER RANKINGS**

| Rank | Name             | Location      | JAN – SEP 2001 | SEPTEMBER 2001 Only |
|------|------------------|---------------|----------------|---------------------|
| 1.   | Larry Hubble     | ARH Anchorage | 82             | 7                   |
| 2.   | Rich Courtney    | Kodiak        | 75             | 4                   |
| 3.   | Greg Matzen      | ARH Anchorage | 28             |                     |
| 4.   | Jerry Painter    | Juneau        | 14             | 1                   |
| 5.   | Angel Corona     | Juneau        | 7              |                     |
| 5.   | Royce Fontenot   | Cold Bay      | 7              |                     |
| 7.   | Ralph Johnson    | Yakutat       | 5              |                     |
| 8.   | Kimberly Vaughan | Yakutat       | 4              | 1                   |
| 8.   | Wilford Burson   | St. Paul      | 4              | 1                   |
| 10.  | Mike Kutz        | MOBEU         | 3              | 3                   |
| 10.  | Lynn Chrystal    | Valdez        | 3              |                     |
| 10.  | Ed Harris        | Cold Bay      | 3              |                     |
| 10.  | Terry Stamey     | MOBEU         | 3              |                     |
| 10.  | Laura Furgione   | Juneau        | 3              |                     |
| 15.  | Mike Ford        | WFO Anchorage | 2              |                     |
| 15.  | Aimee Devaris    | Juneau        | 2              |                     |
| 15.  | Todd Helms       | MOBEU         | 2              |                     |
| 15.  | Jim Roberts      | King Salmon   | 2              |                     |
| 15.  | Chuck Wilson     | Annette       | 2              |                     |
| 20.  | Janet Trimbur    | Cold Bay      | 1              |                     |
| 20.  | Art Puustinen    | Juneau        | 1              |                     |
| 20.  | Ed Plumb         | Juneau        | 1              |                     |
| 20.  | Herschel Knowles | ARH Anchorage | 1              |                     |
| 20.  | Jerry Steiger    | Nome          | 1              |                     |
| 20.  | Donovan Price    | Barrow        | 1              |                     |
| 20.  | James Bunker     | McGrath       | 1              | 1                   |
| 20   | Craig Eckert     | Cold Bay      | 1              | 1                   |



Pictured on the left - After 8 months of the year 2001, the *CSX Anchorage* is one of the Top 10 weather reporting vessels in Alaskan waters with 397 observations. Pictured here is William Johnson, 2nd Mate on the *CSX Anchorage*, receiving the Award of Excellence while in port in Anchorage, Alaska on September 25th, 2001.

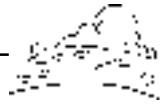


## ALASKA SHIP VISITS OCTOBER RANKINGS

| Rank | Name             | Location      | JAN – OCT 2001 | OCTOBER 2001 only |
|------|------------------|---------------|----------------|-------------------|
| 1.   | Larry Hubble     | ARH Anchorage | 89             | 7                 |
| 2.   | Rich Courtney    | Kodiak        | 81             | 6                 |
| 3.   | Greg Matzen      | ARH Anchorage | 28             |                   |
| 4.   | Jerry Painter    | Juneau        | 15             | 1                 |
| 5.   | Royce Fontenot   | Cold Bay      | 9              | 2                 |
| 6.   | Angel Corona     | Juneau        | 7              |                   |
| 7.   | Ralph Johnson    | Yakutat       | 5              |                   |
| 8.   | Kimberly Vaughan | Yakutat       | 4              |                   |
| 8.   | Wilford Burson   | St. Paul      | 4              |                   |
| 10.  | Mike Kutz        | MOBEU         | 3              |                   |
| 10.  | Lynn Chrystal    | Valdez        | 3              |                   |
| 10.  | Ed Harris        | Cold Bay      | 3              |                   |
| 10.  | Terry Stamey     | MOBEU         | 3              |                   |
| 10.  | Laura Furgione   | Juneau        | 3              |                   |
| 15.  | Mike Ford        | WFO Anchorage | 2              |                   |
| 15.  | Aimee Devaris    | Juneau        | 2              |                   |
| 15.  | Todd Helms       | MOBEU         | 2              |                   |
| 15.  | Jim Roberts      | King Salmon   | 2              |                   |
| 15.  | Chuck Wilson     | Annette       | 2              |                   |
| 20.  | Janet Trimbur    | Cold Bay      | 1              |                   |
| 20.  | Art Puustinen    | Juneau        | 1              |                   |
| 20.  | Ed Plumb         | Juneau        | 1              |                   |
| 20.  | Herschel Knowles | ARH Anchorage | 1              |                   |
| 20.  | Jerry Steiger    | Nome          | 1              |                   |
| 20.  | Donovan Price    | Barrow        | 1              |                   |
| 20.  | James Bunker     | McGrath       | 1              | 1                 |
| 20   | Craig Eckert     | Cold Bay      | 1              |                   |

**Captain James Faria and 2nd Mate Dave Swimelar from the *Tug Guardian* received the Alaska Marine Program Award of Excellence while in the port of Anchorage on September 26, 2001. With 121 observations, the *Guardian* took the 2nd highest total observations in Alaskan waters for August 2001. So far, the *Guardian* is ranked 3rd in Alaska for 2001 with 425 observations**

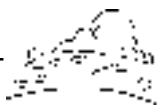




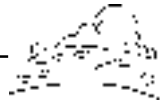
Pictured on the left - 3rd Mate Gary Lightner of the *CSX Kodiak* while in the port of Anchorage on October 2nd, 2001. After the first 8 months of 2001, the *CSX Kodiak* was one of the Top 10 of Alaskan reporters.



Pictured above - Captain John Emmel of the *Crowley Tug Warrior* received the Alaska Maine Program Award of Excellence while in the port of Anchorage on October 1st, 2001. Captain Emmel was the pioneer in Alaskan waters in sending e-mail weather observations to the National Weather Service beginning the summer of 1999. During this visit, Captain John loaded the latest SEAS 5.30 software on the *Warrior's* laptop computer. Although the *Warrior* has spent a good length of time undergoing repairs in the summer of 2001, the *Warrior* is still randed in the Top 10 in Alaskan waters with 329 observations for the period January through August 2001.



Pictured above from left to right is Captain Leonard Hansen and Chief Mate Jeffery Coryell from the *Tug Seneca* while in port in Anchorage on August 30, 2001. Their 80 observations in Alaskan waters from the month of July 2001 qualified them for the Alaska Marine Program “Award of Excellence” as one of the top observing vessels in the VOS program. Pictured directly above is the *Tug Seneca*.



## VOS Program Awards

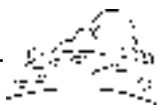


Pictured on the left - The *Chevron Arizona* was chosen by Bob Drummond, PMO Miami, as one of the stellar performers of 2000. Pictured from left to right are: 3rd Mate Dave Corbett, Chief Mate Dan Whyte, and Captain Terry Stark.

Pictured on the right - Amy Seeley presents a 2000 VOS award to the *Oglebay Norton*. Pictured is Captain Patrick J. Nelson. Other mates not pictured who took observations are: Bryce Sunderlin, John Sarns, James Sievwright, Andrew Kania, and Reed Wilson.



Pictured on the left - San Francisco PMO Bob Novak awarded the *President Polk* for outstanding performance during 2000. From left to right: Captain Jerry Blackmon, (outgoing), 2ND Officer Doug Heler, and Captain Jeff Cowan (incoming).



## VOS Program Awards

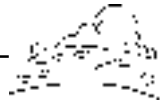
Pictured on the right - The *Westward Belinda* was chosen by Pat Brandow, PMO of Seattle, for a VOS award for the year 2000. Pictured left to right, 3RD Officer F. Punay, Captain Umesh Dixit, 3RD Officer P. Cariquitan, and Chief Officer A. Mehta.



Pictured on the left - The crew of the *Ocean Camellia* performed an exceptional job in taking observations for the VOS program in the year 2000. A VOS Awards Plaque was presented at the Blair Log yard in Tacoma. Pictured left to right: 2ND Officer A. Montano, Captain Mo Kim, Chief Officer T. Batistil Jr., and 3RD Officer N. Salvanera. Standing in the background is PMO Pat Brandow of Seattle.

Pictured on right - Jim Saunders, PMO Baltimore (on right), presents VOS award plaque to Captain Phillip Hansen of the *Tellus*.





## VOS Program Awards

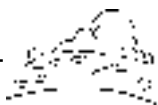


Pictured on the left - A 2000 VOS plaque was awarded to the *Vladivostok* for the high quality of surface marine observations. Pictured from left to right: PMO Pat Brandow of Seattle, Captain Yevgeniy Konev, and 3RD Officer Igor Manokhin.

Pictured on the right - Captain Alan Hinshaw (on left), of the *Sealand Integrity*, receiving his 2000 Outstanding award from Jim Nelson PMO Houston (on right). This has been one of the top ships for the last 12 years. Kudos to the Captain and Mates of the *Sealand Integrity*.



Pictured on the left - The *M/V Tropic Key* was chosen by Bob Drummond, PMO of Miami, for a VOS award for the year 2000. Pictured left to right are: Chief Mate Alan Gumboc, Captain Rodrigo I. Elgincolin Jr., and 2ND Mate Mario Fampo.



## VOS Program Awards

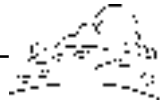
Pictured on the right - The *Duncan Island* was one of the ships recognized in 2000 by the VOS program for excellence in weather reporting. From left to right are Captain Brian Stewart and Chief Mate Zdzislaw Tocki.



Pictured on the left - Jim Saunders, PMO Baltimore (not shown), presented VOS award plaque to the *Frances L.* From left to right are: 3RD Officer Abner T. Manglinong, Captain Michel Chapelle, and Chief Officer Rosaliro R. Rafa Jr.

Jim Saunders, PMO Baltimore, (right) presents VOS award plaque to Captain Chase (left) of the *Faust*.



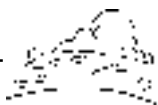


## VOS Program Awards



Pictured on the left is Juneau HMT, Jerry Painter, presenting a VOS award for the year 2000 to 1ST Mate Michael Daigler of the *Tug Northern Spirit* (below), while in port in Juneau, Alaska on September 19, 2001. The *Northern Spirit* had the 4th highest total of BBXX observations in Alaskan waters for the 2000 with 253. After 8 months of 2001, the *Northern Spirit* has the 2nd highest total of BBXX observations with 447. The *Northern Spirit* has helped pioneer the use of the SEAS software and 34-mail to encode and transmit BBXX observations in Alaskan waters.





## VOS Program Awards

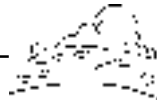
Pictured on the right - VOS award plaque presented by Jim Saunders, PMO Baltimore, to the *Fidelio*. Pictured left to right are: Chief Mate Scott Wegand, Captain Mike Fry, and 2ND Mate Frank Lang.



Pictured on the left - The *Nolizwe* was chosen by Pete Gibino, PMO of Norfolk, as one of the top performers of 2000. A VOS plaque was presented to the crew. Pictured from left to right are: 2ND Officer Rudy Villahermosa, Captain Konstantinos Ntamagkas, and 3RD Mate Jaime Amparo.

## NATIONAL WEATHER SERVICE VOLUNTARY OBSERVING SHIP PROGRAM NEW RECRUITS FROM 01-AUG-2001 TO 31-OCT-2001

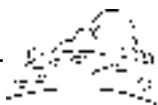
| NAME OF SHIP         | CALL SIGN | AGENT NAME                  | RECRUITING PMO    |
|----------------------|-----------|-----------------------------|-------------------|
| COASTAL EXPLORER     | WCY3112   | COASTAL EXPLORER            | KODIAK, AK        |
| HARMONY ACE          | H3QA      | BARBER SHIP MGMT.           | JACKSONVILLE, FL  |
| KNIGHT ISLAND        | NMFN      | USCG KNIGHT ISLAND          | MIAMI, FL         |
| LIBERTY WAVE         | KRHZ      | LIBERTY MARITIME            | HOUSTON, TX       |
| LYKES VOYAGER        | ELZU5     | STRACHAN SHIPPING CO.       | HOUSTON, TX       |
| M/T MONTAUK          | WDCJ      | SEALIFT INC                 | NEW ORLEANS, LA   |
| M/V PITTSBURG        | ELTQ6     | REEDEREI F. LAEISZ GMBH     | BALTIMORE, MD     |
| MATANUSKA            | WN4201    | ALASKA MARINE HIGHWAY       | KODIAK, AK        |
| NAVIGATOR            | WBO3345   | NAVIGATOR                   | ANCHORAGE, AK     |
| PATRICIA S.          | WCY3527   | ISLAND TUG AND BARGE CO.    | ANCHORAGE, AK     |
| RADIANCE OF THE SEAS | ELIY5     | ROYAL CARIBBEAN CRUISE LINE | MIAMI, FL         |
| ROBERT L.            | WTW9264   | SAUSE BROS OCEAN TOWING CO  | KODIAK, AK        |
| SEA TIGER            | DGRR      | T. PARKER HOST              | NORFOLK, VA       |
| SEA VICTORY          | WBH9635   | CROWLEY MARITIME            | ANCHORAGE, AK     |
| TAKARA               | LAZN4     | WILHELSSEN                  | JACKSONVILLE, FL  |
| TROPIC OPAL          | J8WN      | TROPIC SHIPPING INC.        | MIAMI, FL         |
| USNS POMEROY         | NHRD      | MAERSK LINES LTD.           | NEW YORK CITY, NY |
| YELLOWFIN            | WTE8340   | WESTERN PIONEER             | KODIAK, AK        |



## VOS Cooperative Ship Report — January through September 2001

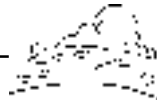
The values under the monthly columns represent the number of weather reports received via radio messages. Comments or questions regarding this report should be directed to David McShane, VOS Technical Lead, telephone: (228) 688-1768, or via e-mail to: david.mcshane@noaa.gov.

| Ship Name              | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 1ST LT BALDOMERO LOPEZ | WJKV    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 1ST LT JACK LUMMUS     | WJLV    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 2ND LT. JOHN P. BOBO   | WJKH    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| A. V. KASTNER          | ZCAM9   | Jacksonville  | 41  | 55  | 19  | 66  | 76  | 47  | 43  | 83  | 37  | 467   |
| A.P. MOLLER            | OYQ2    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 29  | 29    |
| AALSMEERGRACHT         | PCAM    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| ADVANTAGE              | WPPO    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 19    |
| ADVENTURER             | WBN3015 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 32  | 32    |
| AGNES FOSS             | WYZ3112 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| AGULHAS                | 3ELE9   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALASKA MARINER         | WSM5364 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALBEMARLE ISLAND       | C6LU3   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| ALBERNI DAWN           | ELAC5   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| ALBLASGRACHT           | PCIG    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 42  | 25  | 75    |
| ALERT                  | WCZ7335 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALEXANDER VON HUMBOLDT | Y3CW    | Miami         | 22  | 627 | 735 | 711 | 734 | 703 | 714 | 736 | 335 | 5317  |
| ALKMAN                 | C6OG4   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALLEGIANCE             | WSKD    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALLIANCA ROTTERDAM     | DHGE    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALLIGATOR FORTUNE      | ELFK7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALLIGATOR GLORY        | ELJP2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| ALLIGATOR HOPE         | ELFN8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALLIGATOR LIBERTY      | JFUG    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALPENA                 | WAV4647 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ALPHA HELIX            | WSD7078 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| ALTAMONTE              | 3EIG4   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| AMBASSADOR BRIDGE      | 3ETH9   | Oakland       | 40  | 16  | 60  | 43  | 57  | 51  | 42  | 51  | 30  | 390   |
| AMERICA                | WCY2883 | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| AMERICA SENATOR        | 9WCR3   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| AMERICA STAR           | GZKA    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| AMERICAN MARINER       | WQZ7791 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| AMERICAN MERLIN        | WRGY    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| AMERICANA              | C6QG4   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ANASTASIS              | 9HOZ    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ANATOLIY KOLESNICHENKO | UINM    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ANKERGRACHT            | PCQL    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| APACHE                 | WCY5541 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| APL CHINA              | S6TA    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| APL GARNET             | 9VVN    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| APL JAPAN              | S6TS    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| APL KOREA              | WCX8883 | Seattle       | 31  | 78  | 37  | 27  | 34  | 23  | 24  | 29  | 27  | 310   |
| APL PHILIPPINES        | WCX8884 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 56  | 33  | 18  | 107   |
| APL SINGAPORE          | WCX8812 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 49  | 29  | 20  | 98    |
| APL THAILAND           | WCX8882 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| APL TURQUOISE          | 9VVY    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| APOLLOGRACHT           | PCSV    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ARCTIC BEAR            | WBP3396 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 24  | 21  | 10  | 55    |
| ARCTIC OCEAN           | C6T2062 | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ARCTIC SUN             | ELQB8   | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 21  | 21    |
| ARGENTINA STAR         | C6MD8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 29  | 29    |
| ARGONAUT               | KFDV    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| ARIES HARMONY          | 3FEY7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ARISO                  | 3FHJ6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ARKTIS FUTURE          | OXUF2   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ARMCO                  | WE6279  | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| AROSIA                 | V2SB    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ARTHUR M. ANDERSON     | WE4805  | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 15    |
| ASTORIA BRIDGE         | ELJJ5   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 61  | 80  | 27  | 168   |



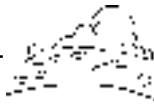
## VOS Cooperative Ship Reports

| Ship Name             | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul  | Aug | Sep | Total |
|-----------------------|---------|---------------|-----|-----|-----|-----|-----|-----|------|-----|-----|-------|
| ATLANTIC              | 3FYT    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 312  | 324 | 118 | 754   |
| ATLANTIC CARTIER      | C6MS4   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 10  | 10    |
| ATLANTIC COMPANION    | SKPE    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 47   | 45  | 10  | 102   |
| ATLANTIC COMPASS      | SKUN    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 17  | 17    |
| ATLANTIC CONCERT      | SKOZ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 20  | 20    |
| ATLANTIC CONVEYOR     | C6NI3   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 20  | 20    |
| ATLANTIC ERIE         | VCQM    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 6   | 6     |
| ATLANTIC FOREST       | ELTN8   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 15  | 15    |
| ATLANTIC NOVA         | 3FWT4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| ATLANTIC OCEAN        | C6T2064 | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 2   | 2     |
| ATLANTIS              | KAQP    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 3   | 3     |
| ATTENTIVE             | WCZ7337 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| AUCKLAND STAR         | C6KV2   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| AWARE                 | WCZ7336 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| B. T. ALASKA          | WFQE    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 3   | 3     |
| BARBARAANDRIE         | WTC9407 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 5   | 5     |
| BARRINGTON ISLAND     | C6QK    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BAY BRIDGE            | ELES7   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BELLONA               | 3FEA4   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BERING SEA            | C6YY    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BERNARDO QUINTANA A   | C6KJ5   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 66   | 60  | 26  | 152   |
| BLACKHAWK             | WBN2081 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BLARNEY               | WBP4766 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BLUE GEMINI           | 3FPA6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BLUE HAWK             | D5HZ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BLUE NOVA             | 3FDV6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 44   | 10  | 25  | 79    |
| BOHEME                | SIVY    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BONN EXPRESS          | DGNB    | Houston       | 734 | 834 | 788 | 867 | 863 | 865 | 1212 | 984 | 409 | 7556  |
| BRASILIA              | DGVS    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 11  | 11    |
| BRIGHT PHOENIX        | DXNG    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BRIGHT STATE          | DXAC    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BRISBANE STAR         | C6LY4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BRITISH ADVENTURE     | ZCAK3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 66   | 47  | 21  | 134   |
| BROOKLYN BRIDGE       | 3EZJ9   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BUCKEYE               | WAQ3520 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BUFFALO               | WXS6134 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BUNGA ORKID DUA       | 9MBQ4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BUNGA ORKID TIGA      | 9MBS3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| BUNGA SAGA TIGA       | 9MBM8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CABO NEGRO            | ELEM2   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CALCITE II            | WB4520  | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CALIFORNIA JUPITER    | ELKU8   | Long Beach    | 0   | 0   | 0   | 0   | 31  | 15  | 35   | 46  | 32  | 159   |
| CALIFORNIA MERCURY    | JGPN    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 17   | 17  | 6   | 40    |
| CALIFORNIA SENATOR    | DEBB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 14   | 71  | 37  | 122   |
| CAPE KNOX             | KAOP    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CAPE WRATH            | WRGJ    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CAPRICORN             | PDAY    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 3   | 3     |
| CAPT STEVEN L BENNETT | KAXO    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 24  | 24    |
| CARIBBEAN MERCY       | 3FFU4   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CARIBE CHALLENGER     | WDA3588 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 3   | 3     |
| CARNIVAL DESTINY      | 3FKZ3   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CARNIVAL PARADISE     | 3FOB5   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 9   | 9     |
| CARNIVAL SPIRIT       | 3FPR9   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 1   | 1     |
| CARNIVAL TRIUMPH      | 3FFM8   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CARNIVAL VICTORY      | 3FFL8   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CAROLINA              | WYBI    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CAROLINE MAERSK       | OZWA2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CARSTEN MAERSK        | OZYB2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CASON J. CALLAWAY     | WE4879  | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 13  | 13    |
| CAVALIER              | WBN5983 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CELEBRATION           | H3GQ    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 5   | 5     |
| CENTURY               | ELQX6   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CENTURY HIGHWAY NO. 2 | 3EJB9   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CENTURY HIGHWAY NO. 1 | 3FFJ4   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 13  | 13    |
| CENTURY HIGHWAY NO. 3 | 8JNP    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0     |
| CENTURY LEADER NO. 1  | 3FB16   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 22  | 22    |
| CF CAMPBELL           | WCT3784 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 14  | 14    |
| CGM RENOIR            | ELVZ8   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 20  | 20    |
| CHANG-LIN TIEN        | C6FE6   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 4   | 4     |



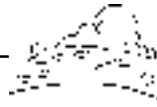
## VOS Cooperative Ship Reports

| Ship Name              | Call    | PMO          | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|------------------------|---------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| CHARLES ISLAND         | C6JT    | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 51  | 21  | 95    |
| CHARLES L. BROWN       | KNCZ    | Jacksonville | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHARLES M. BEEGHLEY    | WL3108  | Cleveland    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHASTINE MAERSK        | OZZB2   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| CHC NO.1               | 3FSL2   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHELSEA                | KNCX    | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHEMICAL PIONEER       | KAFO    | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| CHEMICAL TRADER        | KRGJ    | Jacksonville | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHERRY VALLEY          | WIBK    | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| CHESAPEAKE BAY         | WMLH    | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 38  | 13  | 70    |
| CHEVRON ARIZONA        | KGBE    | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| CHEVRON ATLANTIC       | C6KY3   | New Orleans  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHEVRON COLORADO       | KLHZ    | Oakland      | 0   | 0   | 0   | 0   | 0   | 0   | 40  | 30  | 17  | 87    |
| CHEVRON COPENHAGEN     | A8GL    | Oakland      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHEVRON EMPLOYEE PRIDE | C6MC5   | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHEVRON FELUY          | C6FH5   | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHEVRON MISSISSIPPI    | WXBR    | Oakland      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 29  | 29    |
| CHEVRON PERTH          | C6KQ8   | Oakland      | 0   | 0   | 0   | 0   | 0   | 0   | 47  | 26  | 31  | 104   |
| CHEVRON SOUTH AMERICA  | ZCAA2   | New Orleans  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 24  | 43  | 67    |
| CHEVRON WASHINGTON     | KFDB    | Oakland      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHIEF GADAO            | WEZD    | Oakland      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| CHINOOK                | WCY2791 | Kodiak       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHIQUITA BARU          | ZCAY7   | Jacksonville | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHIQUITA BELGIE        | C6KD7   | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 20  | 20    |
| CHIQUITA BREMEN        | ZCBC5   | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| CHIQUITA BRENDA        | ZCBE9   | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 31  | 21  | 90    |
| CHIQUITA DEUTSCHLAND   | C6KD8   | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHIQUITA ELKESCHLAND   | ZCBB9   | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 26    |
| CHIQUITA FRANCES       | ZCBD9   | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 26    |
| CHIQUITA ITALIA        | C6KD5   | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CHIQUITA JEAN          | ZCBB7   | Jacksonville | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| CHIQUITA JOY           | ZCBC2   | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 46  | 65  | 35  | 146   |
| CHIQUITA NEDERLAND     | C6KD6   | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 61  | 34  | 30  | 125   |
| CHIQUITA SCANDINAVIA   | C6KD4   | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| CHIQUITA SCHWEIZ       | C6KD9   | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 23    |
| CITY OF DURBAN         | GXIC    | Long Beach   | 66  | 57  | 78  | 56  | 49  | 51  | 38  | 72  | 26  | 493   |
| CLEVELAND              | KGXA    | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CLIFFORD MAERSK        | OYRO2   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CMA CGM MONET          | ELRR6   | New Orleans  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 51  | 51    |
| COASTAL MERCHANT       | WCV8696 | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| COASTAL NAVIGATOR      | WCY9686 | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| COASTAL NOMAD          | WSK2703 | Kodiak       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COASTAL PILOT          | WBP7281 | Kodiak       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COASTAL SEA            | WCA7944 | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COASTAL TRADER         | WCO6020 | Kodiak       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COASTAL TRADER         | WSL8560 | Kodiak       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLORADO               | KWFE    | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLUMBIA               | WYR2092 | Kodiak       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLUMBIA BRIDGE        | ELXS4   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 8     |
| COLUMBIA STAR          | WSB2018 | Cleveland    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLUMBUS CALIFORNIA    | ELUB7   | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLUMBUS CANADA        | P3RD8   | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLUMBUS CANADA        | ELQN3   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLUMBUS CANTERBURY    | ELUB8   | Norfolk      | 28  | 52  | 51  | 64  | 76  | 31  | 60  | 46  | 42  | 450   |
| COLUMBUS QUEENSLAND    | ELUB9   | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COLUMBUS VICTORIA      | P3RF8   | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| CONDOLEEZZA RICE       | C6OK    | Baltimore    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CONTSHP AMERICA        | V7BZ3   | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CONTSHP ENDEAVOUR      | ZCBE7   | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| CONTSHP SUCCESS        | ZCBE3   | Houston      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CONTSHP WASHINGTON     | ELVZ5   | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| COPACABANA             | PPXI    | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 27  | 27    |
| CORAL SEA              | C6YW    | Miami        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CORMORANT ARROW        | C6IO9   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CORNELIUS MAERSK       | OYTN2   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| CORNUCOPIA             | KPJC    | Oakland      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COSCO NORFOLK          | P3ZY6   | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| COSMOWAY               | 3EVO3   | Seattle      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| COUGAR ACE             | 9VKE    | Norfolk      | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



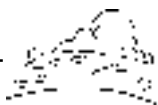
## VOS Cooperative Ship Reports

| Ship Name               | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|-------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| COURIER                 | KCBK    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| COURTNEY BURTON         | WE6970  | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| COURTNEY L              | ZCAQ8   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10  | 10    |
| CRIMSON GALAXY          | 3FIQ6   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 24  | 24    |
| CROSS POINT             | WCW8728 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CROWLEY UNIVERSE        | ELRU3   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| CROWN OF SCANDINAVIA    | OXRA6   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 26    |
| CSAV BUSAN              | ELWZ3   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| CSL CABO                | D5XH    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| CSS HUDSON              | CGDG    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| CSX DEFENDER            | KGJB    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| CSX PATRIOT             | KHRF    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 40  | 23  | 22  | 85    |
| CSX ANCHORAGE           | KGTX    | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 62  | 55  | 37  | 154   |
| CSX CONSUMER            | WCHF    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| CSX CRUSADER            | WZJF    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| CSX DISCOVERY           | WZJD    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 15    |
| CSX ENTERPRISE          | KRGB    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 45  | 45    |
| CSX HAWAII              | KIRF    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 34  | 34    |
| CSX INNOVATOR           | WGKF    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 59  | 38  | 27  | 124   |
| CSX KODIAK              | KGTX    | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 38  | 18  | 94    |
| CSX LIBERATOR           | KHRP    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| CSX SPIRIT              | WFLG    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 25  | 25    |
| CSX TACOMA              | KGTY    | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| CSX TRADER              | KIRH    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 34  | 46  | 21  | 101   |
| CYNTHIA FAGAN           | KSDF    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7   | 7     |
| DAGMAR MAERSK           | ELZD9   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 25  | 25    |
| DAGNEY                  | WX8482A | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DAISHIN MARU            | 3FPS6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 21  | 21    |
| DANIA PORTLAND          | OXEH2   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DANIEL FOSS             | WTS3171 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DAVID Z. NORTON         | WZF9655 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DELAWARE BAY            | WMLG    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| DENALI                  | WSVR    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| DIANE H.                | WUR7250 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| DILMUN FULMAR           | ZCRR6   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DIRCH MAERSK            | OXQP2   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| DIRECT CONDOR           | ELWP7   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| DIRECT EAGLE            | ELWY5   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DIRECT FALCON           | ELWQ5   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DIRECT JABIRU           | ELYJ9   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 60  | 39  | 36  | 135   |
| DIRECT KOOKABURRA       | ELWB8   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| DON PASQUALE            | SFQG    | Unknown       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DON QUIJOTE             | SFQP    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DORTHE MAERSK           | DHPD    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DORTHE OLDENDORFF       | ELXC4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DRAGOER MAERSK          | OPW2    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DRESDEN                 | ELXZ4   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DREW FOSS               | WYL7518 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| DUHALLOW                | ZCBH9   | Baltimore     | 0   | 0   | 4   | 2   | 44  | 110 | 60  | 111 | 30  | 361   |
| DUNCAN ISLAND           | C6JS    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 40  | 40    |
| E.P. LE QUEBECOIS       | CG3130  | Norfolk       | 0   | 0   | 2   | 188 | 225 | 229 | 230 | 241 | 111 | 1226  |
| EARL W. OGLEBAY         | WZE7718 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ECSTASY                 | H3GR    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| EDGAR B. SPEER          | WQZ9670 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 27  | 27    |
| EDWIN H. GOTT           | WXQ4511 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| EDYTH L                 | C6YC    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| EL MORRO                | KCGH    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| EL YUNQUE               | WGJT    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 44  | 31  | 21  | 96    |
| ELATION                 | 3FOC5   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EMPIRE STATE            | KKFW    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ENCHANTMENT OF THE SEAS | LAXA4   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ENDEAVOR                | WAUW    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 33  | 33    |
| ENDURANCE               | WYA4377 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ENDURANCE               | WAUU    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ENERGY ENTERPRISE       | WBJF    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ENGLISH STAR            | C6KU7   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| ENIF                    | 9VVI    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ENTERPRISE              | WAUY    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 26    |
| ESSEN EXPRESS           | DHEE    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |



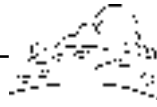
## VOS Cooperative Ship Reports

| Ship Name                | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|--------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| EVER DECENT              | 3FUO7   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER DELIGHT             | 3FCB8   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER DELUXE              | 3FBE8   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER DEVELOP             | 3FLF8   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| EVER DEVOTE              | 3FIF8   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10  | 10    |
| EVER DIADEM              | 3FOF8   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER DIVINE              | 3FSA8   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER GAINING             | BKJO    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER GENERAL             | BKHY    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER GIFTED              | BKHF    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER GLOWING             | BKJZ    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER GROUP               | BKJI    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 20  | 20    |
| EVER LEVEL               | BKHJ    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER LYRIC               | BKHI    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER RACER               | 3FJL4   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| EVER REFINE              | 3FSB4   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER RENOWN              | 3FFR4   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10  | 10    |
| EVER RESULT              | 3FSA4   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER RIGHT               | 3FML3   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER ROUND               | 3FQN3   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER ROYAL               | 3FGI3   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER ULTRA               | 3FEJ6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7   | 7     |
| EVER UNION               | 3FFG7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| EVER UNIQUE              | 3FXQ6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVER UNISON              | 3FTL6   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| EVER UNITED              | 3FMQ6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| EVERETT EXPRESS          | DPGD    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| EWA                      | WEZM    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 56  | 38  | 37  | 131   |
| EXPLORER OF THE SEAS     | ELWX5   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 318 | 257 | 190 | 765   |
| FAIRBANKS                | WGWB    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FAIRLIFT                 | PEBM    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FAIRMAST                 | PJLC    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FALSTRIA                 | C6BD8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FANTASY                  | ELKI6   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FARALLON ISLAND          | FARIS   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FASCINATION              | C6FM9   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FAUST                    | WRYX    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| FIDELIO                  | WQVY    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 50  | 45  | 25  | 120   |
| FIGARO                   | S6PI    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 53  | 32  | 22  | 107   |
| FISHHAWK                 | WRB5085 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| FOREST TRADER            | A8GJ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FRANCES HAMMER           | KRGK    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FRANCES L                | C6YE    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 23    |
| FRANK A. SHRONTZ         | C6PZ3   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| FRANKFURT EXPRESS        | 9VPP    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| G AND C PARANA           | LADC2   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GALE WIND                | WAZ9548 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| GANNET ARROW             | C6QF5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GARDEN BRIDGE            | ELVF6   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GEMINI                   | KHCF    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GENE DUNLAP              | WAS2433 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GEORGE A. STINSON        | WCX2417 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| GEORGE SCHULTZ           | C6FD4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GEORGE WASHINGTON BRIDGE | JKCF    | Seattle       | 24  | 60  | 47  | 68  | 71  | 53  | 45  | 39  | 32  | 439   |
| GEORGIA RAINBOW II       | VRVS5   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| GERMAN SENATOR           | ELPL3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GINGA MARU               | JFKC    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GITTQA OLDENDORF         | ELWO7   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GLADIATOR                | WBN5982 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| GLOBAL LINK              | WWDY    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GLOBAL MARINER           | WWXA    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 26    |
| GLOBAL SENTINEL          | WRZU    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GLORIOUS SUCCESS         | DUHN    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GOLDEN BEAR              | NMRY    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GOLDEN BELL              | 3EBK9   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GOLDEN GATE              | KIOH    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 45  | 45    |
| GOLDEN GATE BRIDGE       | 3FWM4   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GOLDEN LAKER             | 3FNQ6   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GRAND PACE               | 3FGJ9   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



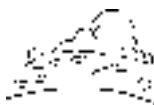
## VOS Cooperative Ship Reports

| Ship Name            | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|----------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| GRANDEUR OF THE SEAS | ELTQ9   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GREAT BLESS          | VRVL3   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GREAT JADE           | VRVL7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GREAT LAND           | WFDP    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10  | 10    |
| GREEN BAY            | KGTH    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GREEN COVE           | WCZ9380 | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| GREEN DALE           | WCZ5238 | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| GREEN ISLAND         | KIBK    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 15    |
| GREEN LAKE           | KGTI    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GREEN POINT          | WCY4148 | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| GREEN RAINIER        | 3ENI3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GREEN RIDGE          | WRYL    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GREENWICH MAERSK     | MZIF7   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| GRETA                | WCY2853 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| GRETE MAERSK         | OZNF2   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| GROTON               | KMJL    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| GUANAJUATO           | ELMH8   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GUARDIAN             | WBO2511 | Anchorage     | 0   | 0   | 0   | 0   | 39  | 87  | 91  | 118 | 66  | 401   |
| GUAYAMA              | WZJG    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 8     |
| GUDRUN MAERSK        | OZFQ2   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 21  | 26    |
| GUS W. DARNELL       | KCDK    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GYPSUM BARON         | ZCAN3   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| GYPSUM KING          | ZCAN2   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HADERA               | ELBX4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 59  | 86  | 39  | 184   |
| HANJIN BARCELONA     | 3EXX9   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HANJIN HONG KONG     | P3UX7   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HANJIN KAOHSIUNG     | P3BN8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| HANJIN NAGOYA        | 3FJW8   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HANSEWALL            | V2AO3   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HEIDELBERG EXPRESS   | DEDI    | Houston       | 501 | 335 | 752 | 302 | 747 | 785 | 762 | 686 | 369 | 5239  |
| HENRY HUDSON BRIDGE  | JKLS    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 19    |
| HERBERT C. JACKSON   | WL3972  | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HOEGH DUKE           | ELWP2   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| HOLIDAY              | 3FPN5   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HONG KONG SENATOR    | DEIP    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HONSHU SILVIA        | 3EST7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HOOD ISLAND          | C6LU4   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| HORIZON              | ELNG6   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HOUSTON EXPRESS      | 3FQT9   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HUAL TRANSPORTER     | C6QO3   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HUMACAO              | WZJB    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 37  | 14  | 89    |
| HUMBERGRACHT         | PEUQ    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HUME HIGHWAY         | 3EJO6   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HYUNDAI DISCOVERY    | 3FFR6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HYUNDAI FORTUNE      | 3FLG6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HYUNDAI FREEDOM      | 3FFS6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HYUNDAI INDEPENDENCE | 3FDY6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| HYUNDAI LIBERTY      | 3FFT6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| IMAGINATION          | C6FN2   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| INDAMEX MISSISSIPPI  | ZDDT5   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| INDAMEX WASHINGTON   | ELRJ6   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| INDIAN OCEAN         | C6T2063 | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 27  | 27    |
| INDIANA HARBOR       | WXN3191 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 22  | 22    |
| INFINITY             | ELXX7   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| INLAND SEAS          | WCJ6214 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| INTEGRITY            | WNHL    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ISLA DE CEDROS       | 3FOA6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 41  | 26  | 33  | 100   |
| ISLAND CHAMPION      | WCZ7046 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ITB BALTIMORE        | WXKM    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| ITB MOBILE           | KXDB    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ITB NEW YORK         | WVDG    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| IVARAN EAGLE         | DNEN    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| IVER FOSS            | WCY6442 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| IWANUMA MARU         | 3ESU8   | Seattle       | 82  | 31  | 102 | 112 | 76  | 54  | 80  | 74  | 52  | 663   |
| J. BENNETT JOHNSTON  | C6QE3   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| J. DENNIS BONNEY     | C6FH6   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| J.A.W. IGLEHART      | WTP4966 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JACKLYN M.           | WCV7620 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 53  | 12  | 91    |
| JACKSONVILLE         | WNDG    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |



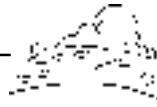
## VOS Cooperative Ship Reports

| Ship Name           | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|---------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| JADE ORIENT         | ELRY6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JADE PACIFIC        | ELRY5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JAMES A. HANNAH     | WU8842  | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JAMES N. SULLIVAN   | C6FD3   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 27  | 23  | 16  | 66    |
| JAMES R. BARKER     | WYP8657 | Cleveland     | 0   | 0   | 0   | 75  | 63  | 37  | 82  | 85  | 32  | 374   |
| JEB STUART          | WRGQ    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JO CLIPPER          | PFEZ    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 22  | 22    |
| JO LONN             | PFEW    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 33  | 34    |
| JOHN G. MUNSON      | WE3806  | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| JOHN J. BOLAND      | WZE4539 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| JOHN PAGE           | WPKS    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JOIDES RESOLUTION   | D5BC    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| JOSEPH L. BLOCK     | WDA2768 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| JUBILEE             | 3FPM5   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JUDY LITRICO        | KCKB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| JUNEAU              | KSBG    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KANIN               | ELEO2   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 20  | 20    |
| KAPITAN AFANASYEV   | UFIL    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| KAPITAN BYANKIN     | UAGK    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KAPITAN KONEV       | UAHV    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| KAPITAN MASLOV      | UBRO    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KAPITAN SERYKH      | UGOZ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KAREN ANDRIE        | WBS5272 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| KAREN MAERSK        | OZKN2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KATRINE MAERSK      | OZLL2   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KAUAI               | WSRH    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 21  | 21    |
| KAYE E. BARKER      | WCF3012 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| KAZIMAH             | 9KKL    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KEE LUNG            | BHFN    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KEN KOKU            | 3FMN6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KEN SHIN            | YJQS2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| KEN YO              | 3FIC5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KENAI               | WSNB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KENNETH E. HILL     | C6FA6   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KENNETH T. DERR     | C6FA3   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KENNICOTT           | WCY2920 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KINSMAN INDEPENDENT | WUZ7811 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KIRSTEN MAERSK      | OYDM2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KIWI ARROW          | C6HU6   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KNOCK ALLAN         | ELOI6   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 72  | 63  | 52  | 187   |
| KNORR               | KCEJ    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KNUD MAERSK         | OYBJ2   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KOELN EXPRESS       | 9VBL    | New York City | 669 | 775 | 852 | 823 | 846 | 855 | 880 | 901 | 386 | 6987  |
| KUPARUK RIVER       | WBN4379 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| KURE                | 3FGN3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| LAKE GUARDIAN       | WAO9082 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LECONTE             | WZE4270 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LEO FOREST          | 3FPH8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| LEONARD J. COWLEY   | CG2959  | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LIBERTY GLORY       | NBDP    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LIBERTY SEA         | KPZH    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 29  | 42  | 38  | 109   |
| LIBERTY SPIRIT      | WCPU    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LIBERTY STAR        | WCBP    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| LIBERTY SUN         | WCOB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 20  | 20    |
| LICORNE PACIFIQUE   | J8CV5   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 28  | 28    |
| LIHUE               | WTST    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 34  | 34    |
| LILAC ACE           | 3FDL4   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 26  | 35    |
| LNG LEO             | WDZB    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LNG LIBRA           | WDZG    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LNG TAURUS          | WDZW    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LNG VIRGO           | WDZX    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LOIS H.             | WTD4576 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| LOK PRAGATI         | ATZS    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LONG LINES          | WATF    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LOOTSGRACHT         | PFPT    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LT CAMPBELL         | WBD5759 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LUISE OLDENDORFF    | 3FOW4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LURLINE             | WLVD    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| LYKES CHALLENGER    | FNHV    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



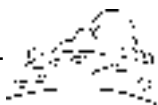
## VOS Cooperative Ship Reports

| Ship Name              | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| LYKES CHALLENGER       | ELXM4   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LYKES COMMANDER        | 3ELF9   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LYKES COMMANDER        | 3FRY9   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 23    |
| LYKES CONDOR           | DGGD    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LYKES DISCOVERER       | WGXX    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 46  | 46    |
| LYKES EAGLE            | ELZE3   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 20  | 20    |
| LYKES EXPLORER         | WGLA    | Houston       | 47  | 81  | 47  | 46  | 60  | 46  | 49  | 54  | 20  | 450   |
| LYKES HAWK             | ELVB6   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LYKES HUNTER           | DNKL    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LYKES LIBERATOR        | WGXX    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| LYKES MOTIVATOR        | WABU    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 40  | 18  | 58    |
| LYKES NAVIGATOR        | WGMJ    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| LYKES RAVEN            | DIGF    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| LYKES VOYAGER          | DJPL    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| M/V PITTSBURG          | ELTQ6   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 33  | 33    |
| M/V SAFMARINE INFANTA  | V7CN8   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| MAASDAM                | PFR0    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 5   | 43    |
| MACKINAC BRIDGE        | JKES    | Seattle       | 66  | 78  | 53  | 79  | 91  | 57  | 58  | 86  | 45  | 613   |
| MADISON MAERSK         | OVJB2   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| MAERSK ALASKA          | KAKF    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK ARIZONA         | KAKG    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 27  | 27    |
| MAERSK CALIFORNIA      | WCX5083 | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 101 | 80  | 45  | 226   |
| MAERSK CHARLESTON      | ELRO2   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| MAERSK ENDEAVOUR       | XP4210  | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK GIANT           | OU2465  | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK SEA             | S6CW    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK SHETLAND        | MSQK3   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK SOMERSET        | MQVF8   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK STAFFORD        | MRSS9   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK SUFFOLK         | MRSS8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK SURREY          | MRSG8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK TAIKI           | 9VIG    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK TAIYO           | 9VJO    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| MAERSK TENNESSEE       | WCX3486 | Miami         | 0   | 0   | 50  | 44  | 47  | 4   | 30  | 81  | 28  | 284   |
| MAERSK TEXAS           | WCX3249 | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| MAERSK VALENCIA        | ELXK7   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAERSK WAVE            | S6TV    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| MAERSK WIND            | S6TY    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 24  | 24    |
| MAERSK VALENCIA        | OUJH2   | Newark        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| MAGLEBY MAERSK         | OUH2    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| MAHARASHTRA            | VTSQ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| MAHEGA                 | IR4009  | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAHIMAH                | WHRN    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| MAIRANGI BAY           | GXEW    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 15    |
| MAJ. BERNARD F. FISHER | KBGK    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MALOLO                 | WYH6327 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 25  | 25    |
| MANFRED NYSTROM        | WCN3590 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MANHATTAN BRIDGE       | 3FWL4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 34  | 34    |
| MANOA                  | KDBG    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MANUKAI                | KNLO    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MANULANI               | KNIJ    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 42  | 18  | 68    |
| MARCHEN MAERSK         | OWDQ2   | Long Beach    | 0   | 32  | 22  | 23  | 21  | 24  | 23  | 34  | 25  | 204   |
| MAREN MAERSK           | OWZU2   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 22  | 22    |
| MARGRETHE MAERSK       | OYSN2   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 34  | 37  | 42  | 113   |
| MARIAANGELICOUSSIS     | C6FP2   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 7   | 15    |
| MARIE MAERSK           | OULL2   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MARINE CHEMIST         | KMCB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 63  | 37  | 22  | 122   |
| MARINE COLUMBIA        | KLKZ    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| MARION GREEN           | PIAN    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MARIT MAERSK           | OZFC2   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MARK HANNAH            | WYZ5243 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MARSTA MAERSK          | OUNO5   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| MARY CATHERINE         | WTW9216 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MATHILDE MAERSK        | OUU2    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| MATSONIA               | KHRC    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MAUI                   | WSLH    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| MAURICE EWING          | WLDZ    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| MAYAGUEZ               | WZJE    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| MAYVIEW MAERSK         | OWEB2   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 32  | 25  | 57    |



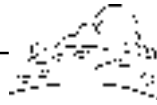
## VOS Cooperative Ship Reports

| Ship Name                | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|--------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| MEKHANIK KALYUZHNIY      | UFLO    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MEKHANIK MOLDOVANOV      | UIKI    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MEKONG PIONEER           | V2JN    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 113 | 56  | 169   |
| MELVILLE                 | WECB    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 67  | 39  | 132   |
| MERCURY                  | 3FFC7   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MERLIN                   | WBHU    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 28  | 28    |
| MESABI MINER             | WYQ4356 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 20  | 20    |
| METEOR                   | DBBH    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 115 | 115   |
| METTE MAERSK             | OXKT2   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MICHAEL O'LEARY          | WCP9556 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MICHIGAN                 | WRB4141 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MIDDLETOWN               | WR3225  | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MIKI HANA                | WTW9252 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MING ASIA                | BDEA    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| MING PEACE               | ELVR9   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MOKIHANA                 | WNRD    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MOKU PAHU                | WBWK    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| MOL BRAVERY              | 3FXX4   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| MOL COLUMBUS             | 3ETV8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 8     |
| MONCHEGORSK              | P3NL5   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| MONTEREY BAY             | 3FDO6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 26    |
| MORMACSKY                | WMBQ    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MORMACSTAR               | KGDF    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| MORMACSUN                | WMBK    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 23    |
| MOSEL ORE                | ELRE5   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 29  | 29    |
| MSC BOSTON               | 9HGP4   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MSC CALIFORNIA           | LAKS5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MSC FEDERICA             | C4LV    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MSC XINGANG              | 3EHR6   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MUNKEBO MAERSK           | OUNI5   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 15  | 32    |
| MV CONTSHP ROME          | ELVZ6   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| MYRON C. TAYLOR          | WA8463  | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| MYSTIC                   | PCCQ    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NAGOYA EXPRESS           | P3LE4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NANUQ                    | WCY8498 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NATHANIEL B. PALMER      | WBP3210 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NATOMA                   | WBB5799 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NAVAJO                   | WCT5737 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NEW HORIZON              | WKWB    | Long Beach    | 0   | 12  | 3   | 13  | 16  | 40  | 17  | 32  | 35  | 168   |
| NEW NIKKI                | 3FHG5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NIEUW AMSTERDAM          | PGGQ    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOAA DAVID STARR JORDAN  | WTDK    | Seattle       | 0   | 0   | 0   | 68  | 56  | 51  | 23  | 47  | 34  | 279   |
| NOAA SHIP ALBATROSS IV   | WMVF    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 94  | 112 | 34  | 240   |
| NOAA SHIP DELAWARE II    | KNBD    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 90  | 173 | 54  | 317   |
| NOAA SHIP FERREL         | WTEZ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| NOAA SHIP KA'IMIMOANA    | WTEU    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 99  | 67  | 53  | 219   |
| NOAA SHIP MCARTHUR       | WTEJ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOAA SHIP MILLER FREEMAN | WTDJ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 168 | 152 | 94  | 414   |
| NOAA SHIP OREGON II      | WTDO    | New Orleans   | 0   | 0   | 0   | 0   | 6   | 40  | 89  | 181 | 55  | 371   |
| NOAA SHIP RAINIER        | WTEF    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOAA SHIP RONALD H BROWN | WTEC    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 120 | 16  | 42  | 178   |
| NOAA SHIP T. CROMWELL    | WTDF    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| NOAA SHIP WHITING        | WTEW    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOAAS GORDON GUNTER      | WTEO    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 108 | 88  | 17  | 213   |
| NOBEL STAR               | KRPP    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOBLE STAR               | 3FRU7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOL STENO                | ZCBD4   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 49  | 14  | 89    |
| NOLIZWE                  | MQLN7   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOMZI                    | MTQU3   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NOORDAM                  | PGHT    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| NORASIA SHANGHAI         | DNHS    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| NORDCLIFF                | P3GB4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NORDMAX                  | P3YS5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 62  | 63  | 26  | 151   |
| NORDMORITZ               | P3YR5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NORMA H.                 | WYL6686 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| NORMAN S.                | WCW7514 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| NORTHERN LIGHTS          | WFJK    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 8     |
| NORTHERN SPIRIT          | WAQ2746 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 29  | 37  | 21  | 87    |
| NORWAY                   | C6CM7   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| NORWEGIAN WIND           | C6LG6   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



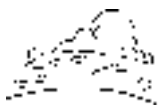
## VOS Cooperative Ship Reports

| Ship Name                | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|--------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| NTABENI                  | 3EGR6   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NUERNBERG EXPRESS        | 9VBK    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| NYK SPRINGTIDE           | S6CZ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| NYK STARLIGHT            | 3FUX6   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OCEAN CAMELLIA           | 3FTR6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 41  | 79    |
| OCEAN CITY               | WCYR    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OCEAN CLIPPER            | 3EXI7   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| OCEAN MARINER            | WCF3990 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OCEAN ORCHID             | 3ECQ9   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OCEAN PALM               | 3FDO7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 80  | 66  | 40  | 186   |
| OCEAN RANGER             | WAM7635 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OCEAN SERVICE            | WTW9263 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OGLEBAY NORTON           | WAQ3521 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OLEANDER                 | PJJU    | Newark        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| OOCL AMERICA             | ELSM7   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OOCL CALIFORNIA          | VRWC8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 32  | 32    |
| OOCL FAIR                | VRWB8   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 22  | 13  | 50    |
| OOCL FIDELITY            | VRWG5   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OOCL FORTUNE             | VRWF2   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OOCL FREEDOM             | VRV7    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OOCL FRIENDSHIP          | VRWD3   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OOCL HONG KONG           | VRVA5   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 60  | 57  | 35  | 152   |
| OOCL NETHERLANDS         | VRVN6   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| ORIANA                   | GVSN    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ORIENTAL ROAD            | 3FXT6   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ORIENTE GRACE            | 3FHT4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ORIENTE HOPE             | 3ETH4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ORIENTE NOBLE            | 3FVF5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ORIENTE PRIME            | 3FOU4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ORIENTE VICTORIA         | 3FVG8   | Seattle       | 22  | 36  | 41  | 22  | 44  | 20  | 31  | 42  | 33  | 291   |
| OURO DO BRASIL           | ELPP9   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 8   | 8     |
| OVERSEAS CHICAGO         | KBCF    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OVERSEAS HARRIETT        | WRFJ    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| OVERSEAS JOYCE           | WUQL    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 19    |
| OVERSEAS MARILYN         | WFQB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OVERSEAS NEW ORLEANS     | WFKW    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| OVERSEAS NEW YORK        | WMCK    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OVERSEAS PHILADELPHIA    | WGDB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OVERSEAS VIVIAN          | KA AZ   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| OVERSEAS WASHINGTON      | WFGV    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| P & O NEDLLOYD BUENOS AI | PGEC    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| P & O NEDLLOYD VERA CRUZ | PGFE    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| P&O NEDLLOYD GENOA       | MYMX5   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 19    |
| P&O NEDLLOYD HOUSTON     | PGEB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 47  | 53  | 40  | 140   |
| P&O NEDLLOYD LOS ANGELES | PGDW    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| P&O NEDLLOYD MARSEILLE   | MYSU5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| P&O NEDLLOYD SYDNEY      | PDHY    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 15    |
| P&O NEDLLOYD TEXAS       | ZCBF6   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACDREAM                 | ELQO6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACDUKE                  | A8SL    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACIFIC HIRO             | 3FOY5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACIFIC MERCHANT         | ELXR8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACIFIC PRIDE            | WCN4995 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| PACIFIC SENATOR          | ELTY6   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACKING                  | ELBX3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACOEAN                  | ELJE3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PACPRINCESS              | ELED8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| PAN ATLANTIC             | ELYJ7   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PARAGON                  | WDA2311 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PATRIOT                  | KGBQ    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PATRIOT                  | WDA2500 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PAUL BUCK                | KDGR    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| PAUL R. TREGURTHA        | WYR4481 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| PEARL ACE                | VRUN4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 51  | 9   | 10  | 70    |
| PEGASUS HIGHWAY          | 3FMA4   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PEGGY DOW                | PJOY    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PELAGIA                  | PGRQ    | Houston       | 86  | 66  | 90  | 100 | 95  | 67  | 106 | 161 | 47  | 818   |
| PENANG SENATOR           | DQVH    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PFC EUGENE A. OBREGON    | WHAQ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PFC WILLIAM B. BAUGH     | KRPW    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PHILADELPHIA             | KSYP    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



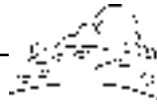
## VOS Cooperative Ship Reports

| Ship Name                | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|--------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| PHILIP R. CLARKE         | WE3592  | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PIERRE FORTIN            | CG2678  | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PINO GLORIA              | 3EZW7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PISCES EXPLORER          | MWQD5   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| POLAR ALASKA             | KSBK    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| POLAR CALIFORNIA         | WMCV    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| POLAR EAGLE              | ELPT3   | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 66  | 94  | 23  | 183   |
| POLAR ENDEAVOUR          | WCAJ    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| POLAR INDEPENDENCE       | KLHV    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| POLAR TEXAS              | KNFD    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| POLAR TRADER             | WCZ3758 | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| POLYNESIA                | V2CA2   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| POTOMAC TRADER           | WXBZ    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| POWHATAN TATF 166        | WCY9968 | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| POWHATTAN                | WTX7883 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PRESIDENT ADAMS          | WRYW    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 63  | 66  | 25  | 154   |
| PRESIDENT GRANT          | WCY2098 | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| PRESIDENT JACKSON        | WRYC    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 11    |
| PRESIDENT KENNEDY        | WRYE    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 33  | 33    |
| PRESIDENT POLK           | WRYD    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 32  | 32    |
| PRESIDENT TRUMAN         | WNDP    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 57  | 75  | 37  | 169   |
| PRESIDENT WILSON         | WCY3438 | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| PRIDE OF BALTIMORE II    | WUW2120 | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 39  | 21  | 32  | 92    |
| PRINCE OF OCEAN          | 3ECO9   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PRINCE WILLIAM SOUND     | WSDX    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PRINCES HIGHWAY          | 3ERU8   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PRIWALL                  | DQVF    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| PROJECT ARABIA           | PJKP    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 27  | 45    |
| PRUDHOE BAY              | KPFD    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| PUDONG SENATOR           | DQVI    | Seattle       | 0   | 82  | 106 | 13  | 64  | 21  | 73  | 93  | 50  | 502   |
| PUSAN SENATOR            | DQVG    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| PVT FRANKLIN J. PHILLIPS | WMFW    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| QUEEN ELIZABETH 2        | GBTT    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 48  | 48    |
| QUEENSLAND STAR          | MZBM7   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 35  | 35    |
| R. HAL DEAN              | C6JN    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| R.J. PFEIFFER            | WRJP    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 33  | 36  | 82    |
| R.V. DAY                 | WS6709  | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| R/V TIGLAX               | WZ3423  | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| RADIANCE OF THE SEAS     | ELIY5   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RAINBOW BRIDGE           | 3EYX9   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 24  | 24    |
| RANGER                   | WBN5979 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| RANI PADMINI             | ATSR    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RAYMOND E. GALVIN        | C6FD6   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| REBECCA LYNN             | WCW7977 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10  | 10    |
| REDFIN                   | WTP2735 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 3   | 3     |
| REDOUBT                  | WCG3013 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| REPULSE BAY              | MQYA3   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| RESERVE                  | WE7207  | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RESOLUTE                 | KFDZ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RICHARD G MATTHIESEN     | WLBV    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| RICHARD H HATZKE         | C6FE5   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RICHARD REISS            | WBF2376 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| RIO APURE                | ELUG7   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ROBERT E. LEE            | KCRD    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ROGER BLOUGH             | WZP8164 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ROGER REVELLE            | KAOU    | New Orleans   | 1   | 32  | 78  | 57  | 74  | 39  | 70  | 65  | 30  | 446   |
| ROTTERDAM EXPRESS        | S6IG    | Long Beach    | 788 | 899 | 930 | 904 | 977 | 868 | 942 | 938 | 447 | 7693  |
| ROUGHNECK                | WTW9262 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ROYAL PRINCESS           | GBRP    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 27  | 10  | 15  | 52    |
| RUBIN ARTEMIS            | 3FAH7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RUBIN BONANZA            | 3FNV5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RUBIN KOBE               | DYZM    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RUBIN PEARL              | YJQA8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| RUBIN STELLA             | 3FAP5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SABINE PHILADELPHIA      | WNFJ    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SAGA CREST               | H3FB    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SAGA SPRAY               | VRRW5   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SALLY J.                 | WQZ9646 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SALLY MAERSK             | OZHS2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SALOME                   | S6CL    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SAM HOUSTON              | KDGA    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



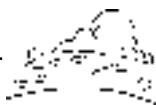
## VOS Cooperative Ship Reports

| Ship Name                  | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|----------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| SAMSON MARINER             | WCN3586 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 49  | 61  | 14  | 124   |
| SAMUEL L. COBB             | KCDJ    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SAMUEL RISLEY              | CG2960  | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SAN MARCOS                 | ELND4   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SANDRA FOSS                | WYL4908 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SANKO LAUREL               | 3EXQ3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SANTA CHRISTINA            | 3FAE6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SANTA MONICA               | ELNJ3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SAUDI DIRIYAH              | HZZB    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SAUDI HOFUF                | HZZC    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 16  | 30    |
| SC BREEZE                  | ELOC6   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SC HORIZON                 | ELOC8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SCL INFANTA                | GBSA    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA BREEZE                 | WBN3019 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| SEA CHEETAH                | V2PM9   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA FLYER                  | WBL8673 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA MARINER                | J8FF9   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA MERCHANT               | ELQN2   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 114 | 96  | 51  | 261   |
| SEA PRINCESS               | KRCP    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA RACER                  | ELQI8   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA RANGER                 | WBM8733 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| SEA RIVER HICHINBROOK      | WJBG    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA TIGER                  | DGRR    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA VALIANT                | WBN9213 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA VALOR                  | WBN9212 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA VENTURE                | WCC7684 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| SEA VICTORY                | WBH9635 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA VIKING                 | WCE8951 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA WISDOM                 | 3FUO6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA/LAND VICTORY           | DIDY    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 15    |
| SEABULK MONTANA            | WCW9126 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7   | 7     |
| SEALANDACHIEVER            | WPKD    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 19    |
| SEALAND ARGENTINA          | DGVN    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEALAND ATLANTIC           | KRLZ    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| SEALAND COMET              | V7AP3   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 21  | 21    |
| SEALAND COMMITMENT         | KRPB    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 66  | 45  | 43  | 154   |
| SEALAND DEVELOPER          | KHRH    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 28  | 28    |
| SEA-LAND EAGLE             | V7AZ8   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEALAND EXPEDITION         | WPGJ    | Jacksonville  | 85  | 90  | 48  | 79  | 66  | 48  | 72  | 68  | 37  | 593   |
| SEALAND FLORIDA            | KRHX    | Houston       | 66  | 104 | 83  | 76  | 39  | 42  | 56  | 55  | 30  | 551   |
| SEALAND FREEDOM            | V7AM3   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEALAND HONDURAS           | OUQP2   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| SEALAND INDEPENDENCE       | WGJC    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEALAND INTEGRITY          | WPVD    | Houston       | 219 | 95  | 175 | 145 | 85  | 127 | 141 | 85  | 84  | 1156  |
| SEALAND INTREPID           | 9VWZ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEALAND MARINER            | V7AM5   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEALAND MERCURY            | V7AP6   | Oakland       | 29  | 46  | 56  | 52  | 39  | 40  | 63  | 54  | 20  | 399   |
| SEALAND METEOR             | V7AP7   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 35  | 60  | 35  | 130   |
| SEALAND MOTIVATOR          | WAAH    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 76  | 34  | 110   |
| SEALAND NAVIGATOR          | WPGK    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 72  | 53  | 29  | 154   |
| SEALAND PERFORMANCE        | KRPD    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| SEALAND PRIDE              | WDA3673 | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 25  | 25    |
| SEALAND QUALITY            | KRNJ    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| SEALAND RACER              | V7AP8   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEA-LAND URUGUAY           | DGVZ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEARIVER AMERICAN PROGRESS | KAWN    | Valdez        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEARIVER GALENA BAY        | WGZK    | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| SEARIVER NORTH SLOPE       | KHLQ    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SELMA KALKAVAN             | TCSX    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SENECA                     | WBN8469 | Anchorage     | 0   | 0   | 0   | 0   | 85  | 88  | 75  | 142 | 53  | 443   |
| SENSATION                  | C6FM8   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| SETO BRIDGE                | JMQY    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 42  | 42    |
| SEVEN OCEAN                | 3EZB8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEVEN SEAS                 | 3FBS9   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SEWARD JOHNSON             | WST9756 | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SHIRAOI MARU               | 3ECM7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 38    |
| SIDNEY FOSS                | WYL5445 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SIDNEY STAR                | C6JY7   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SIKU                       | WCQ6174 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SINE MAERSK                | OZOK2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| SINGA STAR                 | 9VNF    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



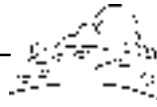
## VOS Cooperative Ship Reports

| Ship Name                | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|--------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| SINUK                    | WCQ8110 | Anchorage     | 0   | 0   | 0   | 0   | 38  | 55  | 56  | 53  | 19  | 221   |
| SKAGEN MAERSK            | OYOS2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SKAUBRYN                 | LAJV4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9   | 9     |
| SKAUGRAN                 | LADB2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 25  | 55    |
| SKODSBORG                | OYRJ4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SNOHOMISH                | WSQ8098 | Kodiak        | 29  | 19  | 33  | 12  | 12  | 17  | 49  | 23  | 10  | 204   |
| SOFIE MAERSK             | OZUN2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SOL DO BRASIL            | ELQQ4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SOLAR WING               | ELJS7   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 38    |
| SOROE MAERSK             | OYKJ2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SOUTH FORTUNE            | 3FJC6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SOUTHDOWN CHALLENGER     | WA4659  | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| SOVEREIGN MAERSK         | OYGA2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11  | 14  | 25    |
| SPLENDOR OF THE SEAS     | LAUS4   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SS BADGER                | WBD4889 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| SS OCEANIC               | C6IF7   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SSGT EDWARD A. CARTER JR | WPWH    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ST BLAIZE                | J8FO    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ST. CLAIR                | WZA4027 | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ST. LUCY                 | ELPO3   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STACEY FOSS              | WYL4909 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STALWART                 | WBN6512 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STALWART                 | WYP8962 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR ALABAMA             | LAVU4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR AMERICA             | LAVV4   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR EAGLE               | LAWO2   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 34  | 43  | 30  | 107   |
| STAR EVVIVA              | LAHE2   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 50  | 39  | 37  | 126   |
| STAR FLORIDA             | LAVW4   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   | 4     |
| STAR FRASER              | LAVY4   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10  | 10    |
| STAR GEIRANGER           | LAKQ5   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| STAR GRAN                | LADR4   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| STAR GRINDANGER          | LAKR5   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR HANSA               | LAXP4   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| STAR HARDANGER           | LAXD4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR HARMONIA            | LAGB5   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10  | 10    |
| STAR HERDLA              | LAVD4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR HIDRA               | LAVN4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 38  | 13  | 43  | 94    |
| STAR HIDRA               | LAVX4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR HOSANGER            | LAXF4   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR HOYANGER            | LAXG4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR IKEBANA             | S6BK    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| STAR ISMENE              | LANT5   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR SKARVEN             | LAJY2   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STAR TRONDANGER          | LAQQ2   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 12  | 25    |
| STATENDAM                | PHSG    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STELLAR KOHINOOR         | 3FFG8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STENA CLIPPER            | C6MX4   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 74  | 32  | 124   |
| STEWART J. CORT          | WYZ3931 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| STONEWALL JACKSON        | KDDW    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STRONG CAJUN             | KALK    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| STRONG PATRIOT           | WCZ8589 | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SUCO DO BRASIL           | ELAQ5   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 37  | 14  | 74    |
| SUN ACE                  | 3EMJ6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SUN DANCE                | 3ETQ8   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 23    |
| SUNBELT DIXIE            | D5BU    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| SUNDA                    | ELPB8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SUPER RUBIN              | 3FWP5   | Seattle       | 0   | 0   | 0   | 0   | 1   | 69  | 38  | 79  | 46  | 233   |
| SUSAN MAERSK             | OYIK2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SUSAN W. HANNAH          | WAH9146 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| SVEND MAERSK             | OYJS2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| SVENDBORG MAERSK         | OZSK2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 25  | 25    |
| T/V STATE OF MAINE       | NTNR    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TAGUS                    | LAZA2   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TAI HE                   | BOAB    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 23  | 23    |
| TAIHO MARU               | 3FMP6   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TAIKO                    | LAQT4   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TAKAMINE                 | LACT5   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TAKASAGO                 | LACR5   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TALISMAN                 | LAOW5   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



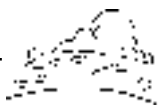
## VOS Cooperative Ship Reports

| Ship Name           | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|---------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| TAMPA               | LMWO3   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TANABATA            | WCZ5535 | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 36  | 45  | 19  | 100   |
| TAN'ERLIQ           | WCY8497 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TAPIOLA             | LAOQ2   | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TARAGO              | LAPN5   | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TATNUCK             | WBY2415 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| TAURUS              | WYH6499 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 15    |
| TAUSALA SAMOA       | V2FA2   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 22  | 22    |
| TELLUS              | WRYG    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 33  | 33    |
| TEQUI               | 3FDZ5   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TEXAS               | LMWR3   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TEXAS CLIPPER       | KVWA    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| THOMAS G. THOMPSON  | KTDQ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| THORKIL MAERSK      | MSJX8   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 43  | 24  | 23  | 90    |
| TITAN               | WAW9232 | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TJALDRID            | XPRT    | Unknown       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TMM PUEBLA          | ELRZ8   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 17  | 17    |
| TMM VERACRUZ        | V2PC4   | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TOBIAS MAERSK       | MSJY8   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 26  | 26    |
| TOKYO HIGHWAY       | 3EDF9   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TOWER BRIDGE        | ELJL3   | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| TRADE COSMOS        | VRUQ2   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TRANSWORLD          | 3FFY3   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TREIN MAERSK        | MSQQ8   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 19    |
| TRIANON             | LAIZ4   | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TRINITY             | WRGL    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| TRITON              | WTU2310 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TRIUMPH ACE         | H3CB    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 22  | 12  | 36  | 70    |
| TROJAN STAR         | C6OD7   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| TROPIC FLYER        | J8NV    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TROPIC JADE         | J8NY    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TROPIC KEY          | J8PE    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TROPIC LURE         | J8PD    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1     |
| TROPIC OPAL         | J8WN    | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TROPIC OPAL         | J8NW    | Unknown       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 27  | 75  | 102   |
| TROPIC SUN          | 3EZK9   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TROPIC TIDE         | 3FGQ3   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TROPICALE           | ELBM9   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| TUDOR STAR          | C6OD8   | Unknown       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 28  | 28    |
| TUSTUMENA           | WNGW    | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 32  | 34  | 25  | 91    |
| UNITED SPIRIT       | ELYB2   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 30    |
| UNIVERSE EXPLORER   | 3FMF2   | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC ACACIA        | NODY    | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC ACTIVE        | NRTF    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC ACUSHNET      | NNHA    | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC ALEX HALEY    | NZPO    | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 5   | 5     |
| USCGC ANTHONY PETIT | NERW    | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC BRAMBLE       | NODK    | Cleveland     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC COURAGEOUS    | NCRG    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC DURABLE       | NRUN    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC FIREBUSH      | NODL    | Kodiak        | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC GENTIAN       | NBHF    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC HAMILTON      | NMAG    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC HARRIET LANE  | NHNC    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC HEALY         | NEPP    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC KATMAI BAY    | NRLX    | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC KUKUI         | NKJU    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC MACKINAW      | NRKP    | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC MELLON        | NMEL    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| USCGC MIDGETT       | NHWR    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC MORGENTHAU    | NDWA    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 12  | 12    |
| USCGC NORTHLAND     | NLGF    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC OSPREY        | NBRF    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC POLAR SEA     | NRUO    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC POLAR STAR    | NBTM    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC SASSAFRAS     | NODT    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| USCGC SEDGE         | NODU    | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC SHERMAN       | NMMJ    | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC STEADFAST     | NSTF    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |



## VOS Cooperative Ship Reports

| Ship Name                    | Call    | PMO           | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Total |
|------------------------------|---------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| USCGC SUNDEW                 | NODW    | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC VIGOROUS               | NQSP    | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USCGC WOODRUSH               | NODZ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS 1ST LT. HARRY L. MARTIN | NDFH    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS ALTAIR                  | NRZA    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS APACHE                  | NIGP    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS BRUCE C. HEEZEN         | NBID    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 31  | 31    |
| USNS CAPELLA                 | NBXO    | Jacksonville  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS GILLILAND               | NAMJ    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS IMPECCABLE              | NINT    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS JOHN MCDONNELL          | NJMD    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| USNS MENDONCA                | NBMK    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS NAVAJO                  | NOYK    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS REGULUS                 | NLWA    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS SEAY                    | NZIN    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS SHASTA                  | NRNC    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 19  | 47  | 32  | 98    |
| USNS SODERMAN                | NANL    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS SPICA                   | NMJG    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS SUMNER                  | NZAU    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS VINDICATOR              | NTOR    | Norfolk       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| USNS WATKINS                 | NIJB    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| VEGA                         | 9VJS    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| VICE PRESIDENT - GULF PORTS  | MMP1    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| VIRGINIA                     | 3EBW4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| VLADIVOSTOK                  | UBXP    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| VOYAGER OF THE SEAS          | ELWU7   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7   | 7     |
| WARRIOR                      | WBN4383 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WASHINGTON HIGHWAY           | JKHH    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 24  | 24    |
| WASHINGTON SENATOR           | DEAZ    | Long Beach    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WAYNE FARTHING               | MMP2    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WEATHERBIRD II               | WCT6653 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WECOMA                       | WSD7079 | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 22  | 22    |
| WEST DIANA                   | 3FCZ4   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WESTERN BRIDGE               | C6JQ9   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 29  | 29    |
| WESTERN MARINER              | WRB9690 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WESTERN NAVIGATOR            | WAX7602 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WESTERN RANGER               | WBN3008 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WESTERN TITAN                | WCX4599 | Anchorage     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WESTWARD VENTURE             | KHJB    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 24  | 22  | 16  | 62    |
| WESTWOOD ANETTE              | C6QO9   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| WESTWOOD BELINDA             | H9IM    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 57  | 33  | 90    |
| WESTWOOD BORG                | LAON4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 54  | 37  | 91    |
| WESTWOOD BREEZE              | LAOT4   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 63  | 49  | 42  | 154   |
| WESTWOOD CLEO                | H9GW    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   | 6     |
| WESTWOOD JAGO                | C6CW9   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WESTWOOD MARIANNE            | C6QD3   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| WILFRED SYKES                | WDA2769 | Chicago       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 14    |
| WILLIAM E. CRAIN             | ELOR2   | Oakland       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WILLIAM E. MUSSMAN           | D5OE    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WILSON                       | WNPD    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| WORLD SPIRIT                 | ELWG7   | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 54  | 51  | 20  | 125   |
| YEOMAN BRIDGE                | C6JY9   | Baltimore     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2     |
| YURIY OSTROVSKIY             | UAGJ    | Seattle       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| ZENITH                       | ELOU5   | Miami         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7   | 7     |
| ZIM AMERICA                  | 4XGR    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 59  | 34  | 109   |
| ZIM ASIA                     | 4XFB    | New Orleans   | 0   | 0   | 0   | 0   | 0   | 0   | 43  | 25  | 35  | 103   |
| ZIM ATLANTIC                 | 4XFD    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 18  | 18    |
| ZIM CHINA                    | 4XFQ    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 13  | 13    |
| ZIM EUROPA                   | 4XFN    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 16  | 16    |
| ZIM HONG KONG                | 4XGW    | Houston       | 0   | 0   | 0   | 0   | 0   | 0   | 32  | 58  | 40  | 130   |
| ZIM IBERIA                   | 4XFP    | New York City | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 36  | 36    |



## VOS Cooperative Ship Reports

| Ship Name          | Call | PMO           | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul   | Aug   | Sep   | Total |
|--------------------|------|---------------|------|------|------|------|------|------|-------|-------|-------|-------|
| ZIM ISRAEL         | 4XGX | New Orleans   | 0    | 0    | 0    | 0    | 0    | 0    | 15    | 34    | 32    | 81    |
| ZIM ITALIA         | 4XGT | New Orleans   | 0    | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 0     | 0     |
| ZIM JAMAICA        | 4XFE | New York City | 0    | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 0     | 0     |
| ZIM KOREA          | 4XGU | Miami         | 0    | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 7     | 7     |
| ZIM PACIFIC        | 4XFC | New York City | 0    | 0    | 0    | 0    | 0    | 0    | 34    | 19    | 43    | 96    |
| ZIM U.S.A.         | 4XFO | New York City | 0    | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 21    | 21    |
| Observation Totals |      |               | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul   | Aug   | Sep   | Total |
|                    |      |               | 3676 | 4592 | 5342 | 5137 | 5947 | 5759 | 11081 | 11852 | 11258 | 64644 |

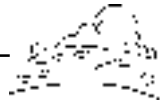
**On the right - CHRISTIAN  
RADICH at Statue of Liberty  
October 4, 2001**



**Above - STRATSRAAD LEHMKUHL and EUROPA  
arrive at Statue of Liberty as part of SEA TREK  
2001, October 4, 2001**

**On the right - STAD AMSTERDAM June  
23, 2001 Photos by Thad Koza Tall Ships  
International**





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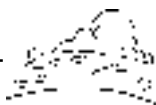
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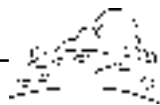
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