VoIP Hurricane Net Newsletter

November/December 2007

Volume 1, Issue 3

Noel Slams the Caribbean, New England Coast!!!

Special Holiday Issue

Max Mayfield Blog Premieres Here!

NASA's New Technology

A Closer Look at Aerosondes

From The Editor

Well this is the last issue of the newsletter for this hurricane season. I plan on continuing to print issues once a month all year around so don't think that since the season is over that this will be it. My goal is the same as always: to provide you the best information that's out there regarding what ham operators, the government, and others are doing to improve hurricane forecasting and preparedness. In order to do this I need **YOUR** help. I have had to discontinue the Station Profile section due to the fact that I haven't got any volunteers to write an article about their stations. I really need you all to help by writing articles about anything weather or ham radio related. If that's not your thing fine. Send an email and tell me what you think about the newsletter and what you would like to see. At the very least drop me a line and tell me that you are reading this!

On to better news. I have secured permission to reprint excerpts from Max Mayfield's blog. I'm very thankful to Rick and Michelle Solomon Executive Producer at Local 10 in Miami for permission and support to do this.

In this issue we will be looking at tropical storm Noel and its impact, some exciting new technology from NASA, and we will take a close look at Aerosonde UAV's. As always please share and enjoy this publication!!!

May you and yours have a merry Christmas and may Santa bring you an IC-7000 !
- Rich
kf6bka@voipwx.net

Are You Ready For Winter? - Ron Dodson, KA4MAP

As we are quite probably in the last gasps of our "good weather" days before the winter settles in, this is a good time to assess your equipment, its condition and any needs you might have. Let's will review some hints on effective equipment preparedness.

First your home station... Are your antennas in good condition? Are all guy wires and electrical connections sound? Do any tree branches that need removal before a winter storm brings them crashing down on your best antenna? Do you have spare wire, feed line and connectors so that you could use to throw up a quick replacement if something did go wrong? How about your back up power supply? Are your batteries or generator in need of maintenance before they might be pressed into service? Do you have a family disaster preparedness kit ready to go with enough non-perishable food, water, heat sources, etc. to get you through a long spell of the harsh conditions winter often brings to us?

How about your vehicles? Do they need new tires, battery, etc? Maintenance now can save a world of grief at fifteen or twenty below zero. Are your mobile antennas and electrical connections in good condition? Do you have a mini disaster kit in your car? It may seem unimportant now, but that box of tools, jumper cables, a blanket, flashlight and some non-perishable food etc. could be real nice if you became stuck overnight in unfamiliar territory in a big snow or ice storm.

One more word on this; ten to twenty inch snowfalls can make your own backyard "unfamiliar territory". Many people have died in winter storms when they became disoriented in heavy snows even when close to home in areas they traveled daily. Now let's look at your portable gear... How are you fixed for spare batteries? Make sure ahead of time that you have good spare batteries for your HT. If you have multiple radios, they EACH need spare batteries. Many universal chargers are available now, which can quick charge ALL your batteries even while you are mobile. You might consider one of these as a future addition to your equipment if you don't already have one.

A higher gain HT antenna is also very handy. There are several HT antennas that work much better than the small "rubber duck" that comes with the HT. The five-eighths wave and half-wave telescoping antennas, when fully extended, give the most improvement. When they are collapsed they work about as well as a rubber duck (but they are somewhat longer, and are more fragile). A shortened half-wave antenna (about 12 inches long on 2 meters) is a useful compromise, being about as efficient as a full length quarter wave antenna.

Many amateur dealers and home and auto supply stores have sales about this time of the year and now is a good time to check pricing on any gear or accessories you may need to build up your home, car and radio equipment so you will be ready when old man winter reaches your door. Christmas will soon be here and if you drop a few hints, maybe some of your equipment shortfalls might even wind up under your tree.

Source: Kentucky Amateur Radio Web Site – www.kyham.net

Impact of Hurricane Noel

Noel's Wrath on Coastal New England and Eastern Canada

Hurricane Noel was the deadliest storm of the Atlantic Hurricane season so far. The season ends officially on November 30. Noel brought gusty winds and heavy rains to coastal New England and Nova Scotia, Canada this past weekend before falling apart and heading into the North Atlantic Ocean. On Nov. 5, Noel had become an extratropical low in the northern Atlantic Ocean and part of a stationary front.

Noel was the 14th named storm this hurricane season, and is responsible for more than 120 dead. Noel's wrath was felt most in the Caribbean where it took those lives and left tens of thousands homeless, mostly in the Dominican Republic and Haiti, which share the island of Hispaniola.

This is a satellite image of the Atlantic Ocean from the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellite-12 (GOES-12). The area of cloudiness to the top right of the image are the remnant clouds from Noel mixing with clouds from a stationary front. This image was created on Nov. 5 at 12:02 p.m. EST by NASA's GOES Project, located at NASA's Goddard Space Flight Center, Greenbelt, Md. On Saturday, Nov. 3, as Noel moved northward to Canada, it brought heavy rains and 85 mph gusts to Cape Cod, Massachusetts downing trees and power lines and causing outages. Up to 50,000 residents were without power. Noel started affecting Canada on Saturday afternoon, Nov. 3 as strong winds and rain moved into southwestern Canadian Maritimes. By Saturday night and Sunday, Noel moved into eastern Canada. The fringes of Noel even brought snow to northwestern New Brunswick, southeastern Québec and Labrador. During the early morning hours of Sunday, Nov. 4, Noel's center reached the southwest coast of Nova Scotia, packing maximum sustained winds of 140 km/hr (86 mph). Noel's hurricane-force winds downed trees and power lines and caused 170,000 people to lose power throughout Nova Scotia, Canada. By Sunday afternoon the storm was over Labrador and fully extratropical in nature. The Canadian Hurricane Centre reported rainfall amounts and maximum wind gusts in towns through New Brunswick, Nova Scotia, Prince Edward Island and other areas. In New Brunswick, the town of Meadowbrook reported the greatest amount of rainfall at 112.3 mm (4.4 inches). The town of Moncton reported the strongest maximum wind gust at 96 km/hour (60 mph).

Nova Scotia had the most consistent reports of high winds, many towns reporting sustained winds over 100 km/hour (62 mph). Some of those include: Baccaro Point with 126 km/hour gusts (78 mph); McNabs Island with 135 km/hour gusts (83 mph), Halifax with 113 km/hour gusts (70 mph); Caribou Point with gusts to 122 km/hour (76 mph); Beaver Island peaking at 137 km/hour (85 mph); and the strongest winds at Grand Etang at 146 km/hour (91 mph).

On Prince Edward Island, two towns, North Point and East Point, reported maximum wind gusts to 111 km/hour (69 mph). Meanwhile, Grindstone Island, one of the Magdalen Islands reported a maximum wind gust of 115 km (72 mph). hour, with 26.6 mm (1.04 inches) of rainfall.

By 6:00 p.m. Atlantic Standard Time on Nov. 4, the Canadian Hurricane Centre of Environment Canada had issued its last bulletin on Noel. At that time, Noel had become "completely extratropical."

- *NASA*

Several houses on Nantucket Island were severely damaged by the coastal flooding. [David Gray, Sr, W1ACK, Photo]

This pier on Nantucket received damage from the winds and rains of Noel. [David Gray, Sr, W1ACK, Photo]

Impact of Hurricane Noel

Remnants of Hurricane Noel Hit Northeastern US

After slamming into Cuba, Puerto Rico and the Bahamas, Noel (by then an Extratropical Storm) hit portions of Eastern New England November 3. Winds up to hurricane force caused significant tree and power line damage along with minor structural damage. The hardest hit areas were Southeast and East Coastal Massachusetts as well as Southeastern Rhode Island. Noel, which had been a Category 1 hurricane after it passed through the Bahamas, transitioned into a major "Nor'easter" system, passing less than 100 miles southeast of Nantucket Island off the coast of Massachusetts.

ARRL Eastern Massachusetts Section Emergency Coordinator and SKYWARN Coordinator for the National Weather Service (NWS) in Taunton, Rob Macedo, KD1CY, stated that ARES, RACES and SKYWARN groups in Eastern Massachusetts were activated Saturday morning. "Activation of SKYWARN started at 7 AM with operations at our NWS Taunton Ham Station, WX1BOX, with weather conditions deteriorating after 10 that morning." Carl Aveni, N1FY, and Phil McLaughlin, KB1CYO, assisted with operations at the NWS Taunton office.

With sustained strong winds at 25-35 MPH and gusts up to 60 MPH across Eastern and Southern Coastal Massachusetts and Southeastern Rhode Island that caused damage to trees and power lines, there were pockets of power outages across portions of the region; rainfall totals of 1-2 inches were common. Conditions on Cape Cod, Nantucket and Martha's Vineyard were far worse. Winds gusted well into hurricane force resulting in widespread power outages and structural damage, including damage to trees and power lines.

"We received a report from the Nantucket Harbormaster of a 90 MPH measured gust in the Madaket section on the western part of the island," said Nantucket RACES Radio Officer and ARES Emergency Coordinator George Allen, N1NBQ. Allen and several other amateurs manned the Nantucket EOC for the entire event. "Nantucket Island sustained a high-end moderate coastal flood event with lower-end moderate coastal flooding over Cape Cod and the Islands and Southeast Plymouth County Massachusetts" Macedo said.

Cape Cod ARES District Emergency Coordinator and Cape Cod Red Cross Communications Officer Frank O'Laughlin, WQ1O, said, "I had a wind gust of 89 MPH at my home in the Marstons Mills section of Barnstable before having my anemometer ripped off the tower and blown several houses down and destroyed." Roof damage to a few structures was reported in Falmouth and Fairhaven, Massachusetts as well as Nantucket Island. The police communications tower in Harwich blew down due to the hurricane force gusts.

With the Cape Cod Red Cross using call sign K1PBO and Dan Howard, K1DYO, serving as Net Control, the 146.955 repeater in Dennis was active from 9:30 AM Saturday through 12:30 AM EDT Sunday doing hourly roll calls of various EOCs. In between roll calls, he received other reports of damage and flooding. "Several shelters were opened, but not many people utilized them. Amateur Radio operators covered the Red Cross headquarters and also a couple of the most vulnerable shelters that may have a loss of communication capability," Macedo said.

Roughly 10 VHF/UHF repeaters were utilized during the activation across Eastern Massachusetts, Rhode Island and Eastern Connecticut. The New England VoIP Integrated Conference system, EchoLink Node: 9123/ *NEW-ENG* conference server with IRLP reflector 9123, was utilized as a command Net linking various repeaters together using the Internet. The Massachusetts State EOC, as well as Region 1 and Region 2 Offices of Massachusetts Emergency Management serving Eastern Massachusetts, were also on the system.

ARRL Emergency Preparedness and Response Manager Dennis Dura, K2DCD, logged on to the New England VoIP Integrated Conference system and received an update on conditions from the Nor'easter from the NWS Taunton Forecast Office. "Please thank everyone for their efforts on this dangerous system," Dura said.

The National Weather Service office in Gray, Maine, WX1GYX, was also active with SKYWARN Operations for Southern Maine and Southeastern New Hampshire; the New England VoIP Integrated Conference system allowed the NWS Forecast Offices in Gray and Taunton to keep in touch. "We recently installed HF at the National Weather Service in Gray and can now have point-to-point communications with the Taunton office through this means," said Tom Berman, N1KTA, weather forecaster and SKYWARN Program Leader for NWS Gray, Maine.

Rhode Island SKYWARN Coordinator Martin Mendelson, N1JMA, reported tree and wire damage in Washington County with pockets of power outages; a 30 foot sailboat broke its mooring and was washed ashore at the University of Rhode Island bay campus in Narragansett. There were more trees and wires down and more significant damage in Newport County where Portsmouth Emergency Management Agency Director Jim Lowrimore, KD4ONW said Bruce Gavin, KD1MW, reported a 64 MPH wind gust in Little Compton.

In Connecticut, Acting Section Emergency Coordinator, Wayne Grolund, N1CLV, activated ARES Region 4 (covering New London, Windham and parts of Tolland County) to Level 2 Standby status. A Resource Net was available to have people ready in case deployment was required. There were reports of tree and power line damage, but the damage was not enough to cause an ARES mobilization.

Extratropical Noel moved up into the Canadian Maritimes and caused similar conditions over Nova Scotia and New Brunswick - *ARRL*

The roof on this house was damaged due to the high winds. [Roland Nelthrop, Photo]

Developer of Hurricane Intensity Scale Dies at 90

Herbert Saffir

Herbert Saffir, who created the five-category system used to describe hurricane strength and warn millions of an approaching storm's danger, died Wednesday, November 21. He was 90. A structural engineer, Saffir created his scale in 1969 -- laying out for the first time what kind of damage could be expected from an approaching hurricane. It has since become the definitive way to describe intensity for storms that form in the Atlantic and parts of the Pacific. Before the scale, hurricanes were simply described as major or minor. Saffir's innovation was ranking storm destruction by type, from Category 1 -- where trees and unanchored mobile homes receive the primary damage, to Category 5 -- the complete failure of roofs and some structures. The five descriptions of destruction were then matched with the sustained wind speeds producing the corresponding damage. Saffir's scale was expanded by former National Hurricane Center director Robert H. Simpson and became known as the Saffir-Simpson scale in the 1970s. Simpson added possible storm surge heights for each category, and the hurricane center staff made a small adjustment to the scale's wind speeds

- ARRL

2007 Hurricane Season Summary

NAME	DATES	MAX WIND	DEATHS	U.S. DAMAGE
STS ANDREA	9-11 MAY	60	0	MINOR
TS BARRY	1- 2 JUN	60	0	MINOR
TS CHANTAL	31 JUL-1 AUG	50	0	0
H DEAN	13-23 AUG	165	40	0
TS ERIN	15-19 AUG	40	16	*
H FELIX	31 AUG-5 SEP	165	130	0
TS GABRIELLE	8-11 SEP	60	0	0
H HUMBERTO	12-14 SEP	90	1	50
TS INGRID	12-17 SEP	45	0	0
TD TEN	21-22 SEP	35	0	0
TS JERRY	23-24 SEP	40	0	0
H KAREN	25-29 SEP	75	0	0
H LORENZO	25-28 SEP	80	6	0
TS MELISSA	28-30 SEP	40	0	0
TD FIFTEEN	11-12 OCT	30	0	0
H NOEL	28 OCT-2 NOV	80	147	0

*UNKNOWN AT THIS TIME

— Source NOAA

As 2007 Atlantic Hurricane Season Ends, Questions Remain

As the 2007 Atlantic hurricane season officially comes to a close on November 30, NOAA scientists are carefully reviewing a set of dynamic weather patterns that yielded lower-than-expected hurricane activity across the Atlantic Basin. As a result, the United States was largely spared from significant landfalling storms. However several noteworthy events took place, including two back-to-back Category 5 hurricanes hitting Central America and the rapid near-shore intensification of the single U.S. landfalling hurricane.

Storm tracks of the 2007 Atlantic hurricane season

As a whole, the 2007 Atlantic hurricane season produced a total of 14 named storms, including six hurricanes, two of which became major hurricanes. NOAA's August update to the seasonal forecast predicted 13 to 16 named storms – of which seven to nine would be hurricanes, including three to five major hurricanes of Category 3 strength or higher. An average season has 11 named storms, with six becoming hurricanes, including two major hurricanes.

"The 2007 Atlantic hurricane season produced the predicted number of named storms, but the combined number, duration and intensity of the hurricanes did not meet expectations," said Gerry Bell, Ph.D., lead seasonal hurricane forecaster at NOAA's Climate Prediction Center. "The United States was fortunate this year to have fewer strong hurricanes develop than predicted. Normally, the climate patterns that were in place produce an active, volatile hurricane season."

The climate patterns predicted for the 2007 hurricane season – an ongoing multi-decadal signal (the set of oceanic and atmospheric conditions that have spawned increased Atlantic hurricane activity since 1995) and La Niña – produced the expected below-normal hurricane activity over the eastern and central Pacific regions. However, La Niña's impact over the Atlantic was weaker than expected, which resulted in stronger upper-level winds and increased wind shear over the Caribbean Sea during the peak months of the season (August-October). This limited Atlantic hurricane formation during that period. NOAA's scientists are investigating possible climate factors that may have led to this lower-than-expected activity.

All in all, one hurricane, one tropical storm and three tropical depressions struck the United States: Tropical Depression Barry came ashore near Tampa Bay, Fla., on June 2; Tropical Depression Erin hit southeast Texas on August 16 and Tropical Depression Ten came ashore along the western Florida panhandle on Sept. 21; Tropical Storm Gabrielle hit east-central North Carolina on Sept. 9, and Hurricane Humberto hit the upper Texas coast on Sept. 13.

Also this year, the U.S. was reminded of the dangers of inland flooding. "Texas and Oklahoma experienced deadly flooding when Erin dumped up to 11 inches of rain. Fresh water flooding is yet another deadly aspect of tropical cyclones," said Ed Rappaport, acting director of NOAA's National Hurricane Center.

Other noteworthy statistics of the season include:

- Eight storms formed in the Atlantic Basin during September - tying September 2002 for having the most storm formations during any given month.
- For the first time in recorded history, two Category 5 hurricanes made landfall in the Atlantic Basin during the same season. Hurricane Dean hit the Yucatan Peninsula near Costa Maya on Aug. 21 with 165 mph winds, followed by Hurricane Felix on Sept. 2, near Punta Gorda, Nicaragua, with 160 mph winds.
- With a central pressure of 906 millibars, Hurricane Dean had the third lowest pressure at landfall – behind the Labor Day 1935 Hurricane in the Florida Keys and Hurricane Gilbert of 1988 in Cancun, Mexico. Dean is also the first Category 5 hurricane to make landfall in the Atlantic Basin since Hurricane Andrew hit South Florida in 1992.
- Hurricane Humberto grew from a tropical depression with top winds of 35 mph into a hurricane with winds of 85 mph within 24 hours - only three others storms (Celia 1970, Arlene and Flora 1963) intensified faster during a 24-hour period from below tropical storm strength.

NOAA's Climate Prediction Center will release an official summary of the 2007 Atlantic Hurricane Season in January 2008. NOAA will announce its 2008 hurricane outlooks for the Atlantic, East Pacific and Central Pacific in May.

NOAA's Atlantic and East Pacific hurricane outlooks are official products of its Climate Prediction Center in collaboration with scientists at the National Hurricane Center, Hurricane Research Division and the Hydrometeorological Prediction Center. NOAA's Central Pacific Outlook is an official product of the Central Pacific Hurricane Center in Honolulu, Hawaii, and in collaboration with the Climate Prediction Center. *—NOAA*

NOAA Awards $115 Million Contract to Support Operational Space, Ground Systems

NOAA officials today announced a $115 million contract award with Riverside Technology, Inc., of Fort Collins, Colo., to provide technical support, systems engineering and engineering services for NOAA's Satellite and Information Services. The contract will support NOAA's operational space systems, including the current and next-generation polar and geostationary environmental satellites that supply data for the weather and climate forecasts, and the ground systems, which comprise the command, control and communications segment, along with the product generation, distribution and archiving. The contract has a 12-month base period, with four additional 12-month option periods. The total value of the contract, including the option years, is $115 million. The contract will support the program offices for the future National Polar-Orbiting Environmental Operational Satellite System, or NPOESS, and the next-generation Geostationary Operational Environmental Satellite (GOES-R). The contractor will provide strategic planning to resolve space and ground system issues, and design requirement analysis, systems engineering, data management, contract administration and acquisition support. Support services will also be geared toward NOAA's Satellite and Information Service's headquarters, Office of Systems Development and Chief Information Officer. "NOAA's satellites play a major role in the success of today's weather and climate forecasts," said Mary E. Kizca, assistant administrator for NOAA's Satellite and Information Service. "We need solid, reliable support to keep these satellite systems operating, and we'll look to Riverside Technology, Inc. to provide this critical service." The National Oceanic and Atmospheric Administration, an agency of the U.S. Commerce Department, is celebrating 200 years of science and service to the nation. From the establishment of the Survey of the Coast in 1807 by Thomas Jefferson to the formation of the Weather Bureau and the Commission of Fish and Fisheries in the 1870s, much of America's scientific heritage is rooted in NOAA. NOAA is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and information service delivery for transportation, and by providing environmental stewardship of our nation's coastal and marine resources. Through the emerging Global Earth Observation System of Systems (GEOSS), NOAA is working with its federal partners, more than 70 countries and the European Commission to develop a global monitoring network that is as integrated as the planet it observes, predicts and protects. *—NOAA*

Hams and the National Weather Service: Working Together for SKYWARN Recognition Day

The Ninth Annual SKYWARN Recognition Day recognizes Amateur Radio operators for their commitment to help keep communities safe. Co-sponsored by the ARRL and the National Weather Service (NWS), the event is scheduled for Saturday, December 1. During this 24 hour special event, Amateur Radio operators, working together with their local NWS offices, will activate Amateur Radio stations and work as a team to contact other hams across the world.

"This is a fun event," said ARRL Media and Public Relations Manager Allen Pitts, W1AGP. "For 364 days of the year, hams aid in providing the NWS offices with real-time information on severe weather when people and property are at risk. But this one day is for fun, friendship and recognition of the critical services given to communities by the hams."

Scott Mentzer, N0QE, organizer of the event and Meteorologist-In-Charge at the NWS office in Goodland, Kansas, concurred. "Radio amateurs are a tremendous resource for the National Weather Service. These folks are dedicated, and the assistance they provide throughout the year is invaluable. SKYWARN Recognition Day is our way of saying thank you."

In 2006, 90 NWS offices across the country participated and logged more than 16,000 radio contacts, according to Goodland's Warning Coordination Meteorologist David Floyd, N5DBZ. In typical SKYWARN operations during severe weather, direct communication between mobile spotters and local NWS offices provides critical "ground truth" information for forecasters. In summer, spotter reports of hail size, wind damage and storm rotation in real time greatly assist the radar warning operator, since that information can be correlated with Doppler radar displays. In winter, snow nets are held, where reports of snow totals, ice accumulations and whiteout conditions in blowing snow help NWS forecasters assess the extent and severity of winter storms. In recent years during wildfire situations, Amateur Radio operators have reported the precise locations of thick smoke and zero visibility, allowing forecasters to provide crucial weather updates to fire fighters.

"NWS offices utilize the real-time reporting of weather events to assist in warning operations, but certainly hurricanes Katrina and Rita have shown us that ham radio operators are equally important during the recovery phase of large-scale natural disasters," Floyd pointed out. He also cited the example of the Hurricane Watch Net (HWN). He notes that the HWN, organized in 1965 during Hurricane Betsy, started out as an informal group of amateurs but has since developed a formal relationship with the National Hurricane Center (NHC) in Miami via its Amateur Radio station WX4NHC. Ham radio operators and volunteers at Miami work together when hurricanes threaten to provide real-time weather data and damage reports to the Hurricane Center's forecasters. *-ARRL*

"Towering" Achievement for Goddard's Visualization Studio

"Towers in the Tempest," a NASA visualization that illustrates the complex science of hurricane hot towers, has been selected for an award by the National Science Foundation (NSF) and Science Magazine's fifth annual International Science and Technology Visualization Challenge.

Science Magazine, published by the American Association for the Advancement of Science (AAAS), invited illustrators, photographers, computer programmers, and graphic specialists from around the world to submit their unique work. Science and technology visualizers from 23 countries rose to the challenge, and "Towers in the Tempest" was selected for an honorable mention from a pool of more than 200 entries. It was produced by NASA's Scientific Visualization Studio, located at the NASA Goddard Space Flight Center, Greenbelt, Md.

Jeff Nesbit, director of NSF's Office of Legislative and Public Affairs, applauded the winners for the innovation and insight demonstrated in their varied work. In a statement to be released September 28, Nesbit stressed the value of these visual aids and said their ability to engage an audience and effectively communicate complex science is unmatched. "Breakthrough moments in science and engineering are often portrayed in movies and literature as 'ah-ha!' moments," he said. "What these artists and communicators have given us are similar experiences, showing us how bats fly or how nicotine becomes physically addictive. We look at their visualizations, and we understand."

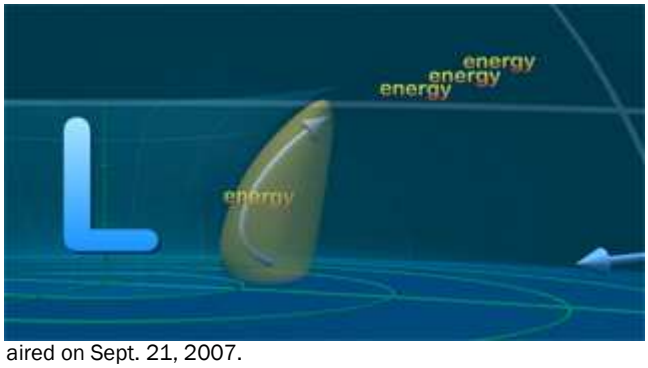


Image left: TRMM's precipitation radar data of Hurricane Bonnie. **Credit:** NASA/SVS

Breaking down a complex scientific topic and discerning how to make it visually palpable is no small feat, but Goddard's team of science visualizers rise to the challenge on a daily basis. Greg Shirah served as lead visualizer on "Towers in the Tempest," collaborating with NASA Goddard hurricane researcher Scott Braun. The visualization was first released on May 10, 2007. It was included in the Discovery Channel program called "Earthshocks: Hyper Hurricanes," which aired on Sept. 21, 2007.

"We worked closely with a research scientist to develop a solid script and storyboard that was strongly tied to visuals," explained Shirah. "We were then able to carefully create a continuous-shot visualization that moves from observed data, to illustrations of scientific understanding, to computational model data."

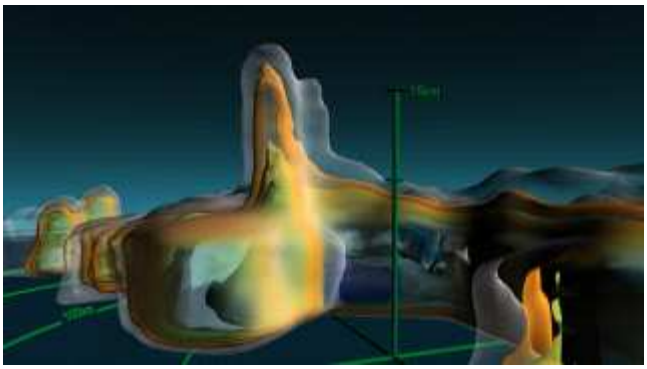


Image right: Hot towers act like "express elevators," accelerating the movement of energy up into a hurricane. **Credit:** NASA/SVS

To devise the visualization, Shirah and Braun used data observed from the Tropical Rainfall Measuring Mission (TRMM), a NASA spacecraft that observes weather with the world's only space-based precipitation radar. TRMM examines the internal structure of clouds, and its measurements revealed a dramatic cloud feature in the structure of Hurricane Bonnie. TRMM data revealed towering rain clouds nestled by the hurricane's eye that nearly reached Earth's stratosphere. Now known as "hot towers," the newly discovered features are providing scientists with fascinating new insights on hurricanes.

While TRMM's hot tower data is staggering on its own, the visible towers Shirah and his team have crafted enable a deeper understanding of the unique features. "Visualizations are extremely important in communicating science as well as in conducting research," Shirah said. "Vast amounts of data are often used in conducting scientific research. Once new discoveries are made, visualizations can distill subsets of the data into carefully designed images that communicate the science stories." A visual image can communicate a powerful response in a viewer. "In my experience, science stories are most successful when accompanied by insightful visualizations," Shirah said.

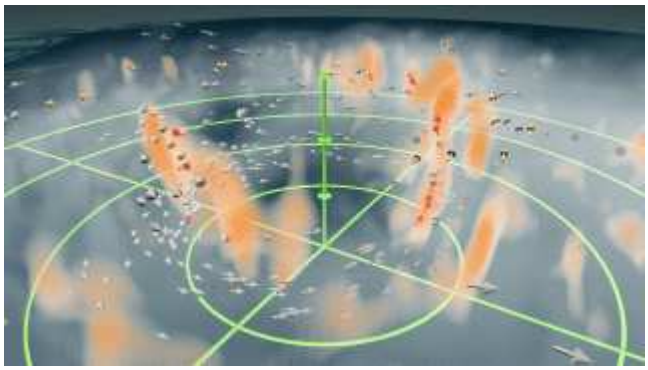


Image left: The winds and updrafts continue to change in the hurricane. The green circles are 50 kilometers (km), 100 km, 150 km, and 200 km from the center of the simulation. **Credit:** NASA/SVS

The mission of the Scientific Visualization Studio is to facilitate scientific inquiry and outreach within NASA programs through visualization. To that end, the SVS works closely with scientists in the creation of visualization products, systems, and processes in order to promote a greater understanding of Earth and Space Science research activities at the Goddard Space Flight Center and within the NASA research community.

Shirah and his team have much to be proud of. Their science visualizations continue to improve scientists' ability to work with and understand data. Their efforts are attracting well-deserved attention. Winning an award at the International Science and Technology Visualization Challenge is a towering achievement indeed.

Tech Tips and Tricks — Echolink Firewall

The EchoLink system now has features that make it more "firewall-friendly", when used with Version 2.0 or above. This is particularly useful for users who are operating at Internet hot-spots, or who have certain types of satellite or wireless Internet service.

Overview

Your connection to the Internet might be going through a *router* or a *firewall*. These devices can improve the security of your computer, and can allow a single Internet address to be shared by more than one computer on your network.

However, routers and firewalls can be a problem for peer-to-peer programs such as EchoLink. The reason is that EchoLink nodes communicate directly with each other over the Internet, rather than sending all of their packets through a server. This is good for the efficiency and scale of the system, but it is not always "firewall-friendly".

By far, the most common problem involves a device called a NAT router. Now that broadband Internet connections are so common, NAT routers are more widespread than ever. NAT stands for *network address translation*. If you have a home network or DSL service, you're likely to have one of these. It poses a problem for EchoLink because it normally does not allow unsolicited packets from the Internet to reach your PC. The solution to this problem is to configure the *port forwarding* feature of the router to allow certain packets to reach the EchoLink software.

However, port forwarding is not always a good solution. Each make and model of router has a different procedure for setting up port forwarding, so the steps to follow aren't easy to document. (A good starting point, however, is portforward.com.) Furthermore, in many situations (such as public Wi-Fi hotspots and wireless Internet service), you might not even have access to the router to be able to change its configuration.

A Solution

A new feature has recently been rolled out on the EchoLink system that allows EchoLink to work through most types of NAT routers without any special configuration changes. It accomplishes this by automatically setting up a *flow* within the router when a new connection is being established.

Firewall-friendliness is a feature of version 2.0 or above of the software. Although this is the version of EchoLink most commonly found in the system, many nodes are still running earlier versions. Until all nodes on the system upgrade to 2.0, some types of connections still won't work through an unconfigured NAT router.

If you're running 2.0 behind a NAT router, you may find that you can connect to conference servers, EchoIRLP nodes, and EchoLink nodes running 2.0 or above without making any adjustments to your router. To connect to other nodes, you'll need to adjust your router just as before.

Please note that we still recommend that you configure Port Forwarding in your NAT router for use with EchoLink, if you can. The firewall-friendly feature is provided as a convenience for users who are unsure about how to configure their router, or who are using a type of Internet service that doesn't allow router changes, such as a satellite ISP or a public hot-spot. *—Echolink Website*

Portrait of a Storm Hurricane Gilbert 1988

A tropical wave exiting the African coastline on September 3rd developed into the 12th tropical depression of the season on September 8th while approaching the Windward Islands. The cyclone rapidly strengthened to hurricane status on September 10th as a west-northwest motion brought Gilbert into the eastern Caribbean Sea. Gilbert passed directly over Jamaica on September 12th as a major hurricane, becoming the first direct impact for the island from a hurricane since 1951. Winds gusted to nearly 150 mph as Gilbert produced a 9-foot storm surge along Jamaica's northeast coast. Jamaica was devastated as the eyewall traversed the entire length of the island. During this period the eye contracted from 25 nmi to only 12 nmi upon exiting Jamaica.

Gilbert emerged off the western coastline of Jamaica and began a period of extraordinarily rapid intensification. The ferocious hurricane strengthened to Category 4 status as its northern eyewall pounded Grand Cayman Island with 155 mph wind gusts early on September 13th. Gilbert's remarkable intensification trend continued as the cyclone reached Category 5 status on the afternoon of the 13th and eventually reached peak winds of 185 mph. The minimum central pressure of the cyclone plummeted to 888 millibars, which represented a 70-millibar drop in only a 24-hour period. This minimum central pressure recorded by NOAA aircraft remains the lowest pressure ever recorded in the western hemisphere. Gilbert crossed the northeast coast of Mexico's Yucatan peninsula on September 14th, becoming the first Category 5 hurricane in the Atlantic basin to strike land since Camille in 1969.

Gilbert weakened over the Yucatan peninsula and emerged into the western Gulf of Mexico as a Category 2 hurricane. Gilbert's large circulation regained major hurricane status as the cyclone continued on a west-northwest course on the 16th. The hurricane made its final landfall near the town of La Pesca on the Mexican Gulf Coast on the evening of September 16th as a strong Category 3 hurricane. Gilbert's remnants spawned 29 tornadoes over Texas on September 18th, with flooding spreading to the Midwest as the remnants merged with a frontal boundary over Missouri on September 19th. Although no reliable measurements of storm surge exist from Gilbert's two Mexican landfalls, estimates are that Gilbert produced between 15 and 20 feet of surge along the Yucatan and 8 to 13 feet at landfall in mainland Mexico.

Gilbert's large size and impacts were felt over much of the Caribbean, Central America as well as portions of the United States. The death toll of 318 gives an idea of the scope of Gilbert's impacts: Mexico 202, Jamaica 45, Haiti 30, Guatemala 12, Honduras 12, Dominican Republic 5, Venezuela 5, United States 3, Costa Rica 2, and Nicaragua 2. The deaths from Costa Rica, Guatemala, Honduras, Nicaragua, and Venezuela were caused by inland flash flooding from outer rainbands.

Interoperability - David K1ZZ

Public safety communicators have been grappling with the problem of interoperability for decades. When everyone used analog FM voice it was possible, in principle, to solve the problem simply by designating a common frequency. In practice it wasn't always that easy. Different agencies used different frequency bands, and even when they could get on the same frequency they couldn't talk very far and often used different jargon. The emergence of a variety of trunked and digital systems exacerbated the situation. Today there are technical solutions to the public safety interoperability problem -- but they depend on the availability of specific hardware, training, and a willingness on the part of agencies to relinquish control.

By comparison, Amateur Radio scores well in terms of interoperability. All CW stations built in the past 80 years are able to communicate with one other, assuming they have a frequency in common. The same is true of all SSB stations built in the past 60 years. (Historical note: The first amateur SSB transmission was made on September 21, 1947 from the Stanford University Radio Club, and the first two-way SSB contact was established on 20 meters between club station W6YX and W0TQK in Missouri on November 3 of that year.) On VHF FM, a newly minted operator with a brand new handheld transceiver can communicate with an old-timer who has used the same tube-type rig for the past 40 years.

Things get more complicated with digital modes. Codes and protocols become as important as hardware. As we move from the realm of hardware to software, maintaining interoperability becomes a greater challenge and does not occur automatically. A modern computer-based RTTY station can communicate with the old mechanical marvels, but only because they both use the venerable Baudot code. AMTOR stations can only communicate with other AMTOR stations. PSK31 is a remarkable development and a great improvement over Baudot-based RTTY for keyboard-to-keyboard communication, but its devotees can only communicate among themselves. With a few exceptions (the three versions of PACTOR are backward compatible and G-TOR is structured to be compatible with HF Automatic Link Establishment, or ALE) the HF data modes are independent islands in the digital stream. The story is much the same with regard to digital voice, which is developing more slowly except with regard to Internet-based internetworking such as IRLP and EchoLink.

For routine amateur operations, this is of no great consequence. We would like to be able to identify other stations that we encounter in the amateur bands and sometimes are frustrated by our inability to decode their transmissions, but this is a relatively minor issue most of the time. However, in emergencies we must be able to communicate with one another. If we do not maintain our interoperability within the Amateur Radio Service as we branch out in different digital directions, a call for help could go unheeded even if other stations are in range -- with potentially tragic consequences. In addition, the agencies we serve in responding to emergencies *expect* us to be able to communicate with one another, because we have done it so well for so long. Interoperability is one of Amateur Radio's distinguishing features; losing it would be a giant step backward.

This aspect of digital development has been a concern for some time, so it was reassuring to hear a series of presentations at the Third Global Amateur Radio Emergency Communications Conference (GAREC-07), held in Huntsville on August 16-17 just before the ARRL National Convention. In explaining how they are applying specific advanced technologies to emergency communications, speaker after speaker identified interoperability with other technologies and networks as a key objective.

It was a pleasure to hear how the VoIP Hurricane Net, **www.voipwx.net**, is utilizing both EchoLink and IRLP to provide "ground truth" reports to the National Hurricane Center.

It was encouraging to hear the proponents of D-STAR, Winlink 2000, and ALE all address the need to ensure that communication can take place between their platforms.

It was enlightening to hear how Army MARS is pursuing its mission of providing an auxiliary communications conduit for military, civil, and disaster officials during periods of emergency, and the steps already being taken to increase collaboration among the Army, Air Force and Navy-Marine Corps MARS organizations.

It was instructive to learn how disaster response organizations such as the American Red Cross, the Salvation Army, and Southern Baptist Disaster Relief meet their communications requirements using a variety of tools -- including Amateur Radio when appropriate -- and what they need from us now, which is quite different from just a few years ago. "Please send this spreadsheet to our headquarters" is an example.

Tying much of this together is the Internet. By its very nature, the Internet is able to survive a lot of disruption -- but connections to it from a disaster area may be non-existent at first and woefully inadequate, even via satellite, for hours, days, and possibly even weeks afterwards.

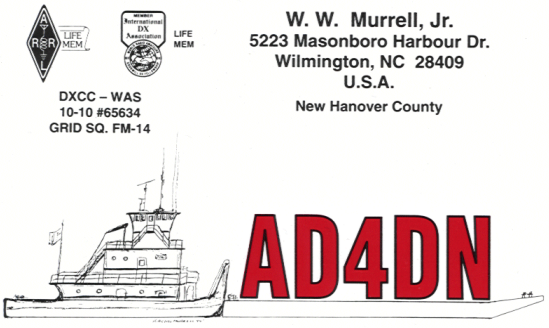
So it was a joy to share the GAREC experience with nearly 100 dedicated, committed Amateur Radio volunteers who were as intent on cooperating as on explaining and advocating their favorite technologies. This spirit of cooperation and the recognition of the need to preserve our interoperability bode well for the future of Amateur Radio emergency communications, and for our ability to continue to serve our local, national and global communities. --*ARRL*

Weather and Radio on the Web

This month we take a look at online receivers. One of note for me was the site of Mr. Murrell (AD4DN).

http://www.ncskeet.com/tune.html

This is home to his PCR-1000 that he has located at his home in Wilmington, NC on a wire antenna. It has a chat feature to talk with other users and a very simple graphical display. I've had many hours of enjoyment tuning the band and listening in.. So enjoy!! — Rich



NASA Data May Help Improve Estimates of a Hurricane's Punch

As Tropical Storm Noel churns off Florida's east coast, NASA and university scientists have announced they have developed a promising new technique for estimating the intensity of tropical cyclones from space. The method could one day supplement existing techniques, assist in designing future tropical cyclone satellite observing systems, and improve disaster preparedness and recovery efforts.

The technique uses NASA satellite data, including simultaneous, accurate measurements of cloud-top temperatures from the Moderate Resolution Imaging Spectroradiometer on NASA's Aqua satellite, and cloud-top height and cloud profiling information from NASA's CloudSat satellite. Both satellites fly in formation as part of NASA's "A-Train" of Earth-observing satellites. This new technique was developed by scientists at NASA's Jet Propulsion Laboratory, Pasadena, Calif.; Colorado State University, Fort Collins, Colo.; and the Massachusetts Institute of Technology, Cambridge, Mass.

Scientists commonly use measurements of a tropical cyclone's maximum sustained winds to define their intensity and gauge their destructive potential. Maximum sustained winds are defined as the one-minute average wind speed at an altitude of 10 meters (33 feet).

The framework used by the team to estimate tropical cyclone intensity was developed by co-author Kerry Emanuel of the Massachusetts Institute of Technology and his colleague Valerie Wong. It requires cloud profiling information from over or near a storm's eye. Of the more than 150 tropical cyclones that CloudSat flew over during its first six months after launch in April 2006, nine of the storm overpasses met this criterion. The team analyzed NASA satellite data from these nine storms and calculated their peak winds. The estimates were then compared with available weather data, including data from aircraft. Initial results show the technique's estimates agreed with available weather data, and the technique appeared to work better for stronger storms.

Emanuel and Wong's framework measures the intensity of tropical cyclones in relation to the total energy contained in both their eyewalls and the surrounding environment outside the storms, as well as other measurements. By coupling measurements of temperatures and cloud top heights from a storm's eyewall out to its outer regions with an estimated difference in temperature between the sea surface and the storm's cloud tops, a storm's intensity can be estimated.

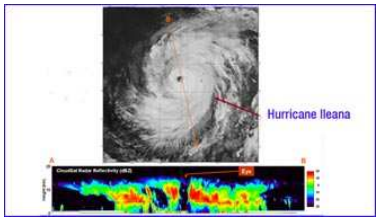
"Our study represents a unique and first-of-a-kind test of a hurricane intensity theory that had not been verified against real-world data, one that relies on actual satellite data," said lead study author Zhengzhao "Johnny" Luo, now with the City College of New York. "While our analysis is not yet mature enough for this technique to be used operationally, we plan to further refine it as more tropical cyclone data become available."

Meteorological satellites have been used to monitor tropical cyclones since the mid 1960s. Relating measurements of storm intensity to existing satellite data has proven difficult. The primary technique used since the mid 1970s, developed by Vernon Dvorak of the National Oceanic and Atmospheric Administration, estimates a storm's maximum sustained winds by looking for recognizable patterns of clouds in visible and infrared satellite images and calibrating them against reconnaissance aircraft data.

CloudSat Principal Investigator and study co-author Graeme Stephens of Colorado State University, Fort Collins, Colo., said the latest results show the value of being able to look inside storms to reveal their inner structure. This information is unique to CloudSat. "Current hurricane intensity estimating techniques are generally effective but have higher wind speed errors than scientists would like," he said. "This new technique may reduce those error rates."

Results of the study are published in the September issue of the Institute of Electrical and Electronics Engineers publication, Geoscience and Remote Sensing Letters.

-NASA



Scientists could soon have an improved way to estimate the intensity of hurricanes like seen here in these images from NASA's CloudSat and Aqua satellites. A promising new technique developed by NASA and university scientists combines cloud data from the two satellites to improve estimates of storm intensity.

October Tropical Storms and Hurricanes — Max Mayfield

The historical record in the Atlantic basin (includes the entire Atlantic Ocean, Caribbean Sea, and Gulf of Mexico) lists 280 tropical storms, of which 158 became hurricanes and 53 became major hurricanes (Category 3, 4 or 5 on the Saffir-Simpson Hurricane Scale) according to The Deadliest, Costliest, and Most Intense United States Tropical Cyclones from 1851 to 2006 .

Of course, it is reasonable to assume that some tropical cyclones went undetected before the geostationary satellite era which started around the mid 1960s. The numbers of tropical storms, hurricanes, and major hurricanes over the entire Atlantic basin from 1966 to 2006 are 74, 40 and 13, respectively. It is interesting to note that in both the geostationary satellite era and the period before 1966 we average 1.8 tropical storms, 1.0 hurricanes, and 0.32 to 0.35 major hurricanes in the month of October. Most of the other months show an increase in the averages during the geostationary satellite era.

So what does this mean for the United States and South Florida in particular? The records should be better for U.S. landfalling hurricanes given the fact that these events have a greater probability of being detected. There have been 51 hurricane strikes in October in the U.S. mainland since 1851. This means that we average 0.33 hurricanes hitting the U.S. per year, or one about every three years. It should be noted, however, that it is still likely that some hurricanes hit less populated areas and were not detected, especially before 1900.

If we focus on major hurricanes making direct hits in Florida during the month of October, there are only 10 on record going all the way back to 1851. Although this is an extremely low number, it should be noted that most of the U.S. major hurricanes in October occur in South Florida. *–Provided courtesy of WPLG-TV Channel 10 Ft. Lauderdale, Florida. To read more of Max Mayfield's blogs go to WPLG-TV's* website www.local10.com

A Closer Look — Aersondes

Pilotless Aircraft Flies Toward Eye of Hurricane for First Time

A pilotless hurricane hunter is being flown by remote control into hurricane force winds for the first time to give researchers from NOAA and NASA a real time, low altitude look at a storm with hurricane category 1 winds hovering around 80 miles per hour.
Even though the internal structure of Hurricane Noel may change from a warm to a cold core and lose its defined eye and hurricane status, the winds will remain at hurricane force power and test the mettle of the aircraft's sensors and data delivery capabilities.
The five-foot-long aircraft with a wing span of 10 feet was launched at 2:08 p.m. today from Wallops Island, Va., and is expected to penetrate the hurricane eyewall or storm center at 10 p.m. tonight during its anticipated 20-hour-long mission.
"Unmanned flights at very low altitude are important since they give us unique insights and continuous observations in a region of the storm where the ocean's energy is directly transferred to the atmosphere just above. Attempting this type of research flight with our hurricane hunter aircraft would risk the lives of our crew and scientists," said Joe Cione, hurricane researcher at NOAA's Atlantic Oceanographic and Meteorological Laboratory in Miami, and project manager for the Aerosonde field study. Cione will monitor the Aerosonde's progress from NOAA's National Hurricane Center in Miami.

NOAA hurricane researchers are leading the collaborative effort to test the ability of using a remotely controlled unmanned aircraft system, or UAS, to fly into the eyewall of a hurricane at altitudes as low as 500 feet. Scientists hope using unmanned aircraft will help fill a gap in near-surface data. The data have been hard to gather because of the safety risks of low-level flight.
In future missions, a second Aerosonde may be launched as the first aircraft returns. This would result in longer continuous storm coverage. Once in the storm, up-to-the-minute command and control of the UAS will occur at NOAA's National Hurricane Center.
NOAA scientists are coordinating the Aerosonde flight to coincide with a manned NOAA Hurricane Hunter WP-3D mission as well, providing a volume of data on Hurricane Noel from top to bottom. This level of information saturation is valuable to researchers, providing a more complete picture of storm structure and strength that becomes a valuable tool for forecasters.
In September 2005, the Aerosonde was flown from the NASA Wallops Flight Facility into Tropical Storm Ophelia on a 10-hour mission sending back data from readings that were taken and relayed every half-second as the storm moved off North Carolina's Outer Banks and past the Virginia coast.
The Aerosonde UAS is owned and operated by AAI Corporation subsidiary, Aerosonde Pty Ltd., located in Victoria, Australia.
The National Oceanic and Atmospheric Administration, an agency of the U.S. Commerce Department, is celebrating 200 years of science and service to the nation. From the establishment of the Survey of the Coast in 1807 by Thomas Jefferson to the formation of the Weather Bureau and the Commission of Fish and Fisheries in the 1870s, much of America's scientific heritage is rooted in NOAA.
NOAA is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and information service delivery for transportation, and by providing environmental stewardship of our nation's coastal and marine resources. Through the emerging Global Earth Observation System of Systems (GEOSS), NOAA is working with its federal partners, more than 70 countries and the European Commission to develop a global monitoring network that is as integrated as the planet it observes, predicts and protects.

The UAS is launched from a moving platform to rendezvous with an approaching hurricane

Departing NASA's Wallops Island Flight Facility, Va., the UAS can stay aloft for roughly 20 hours recording hurricane data.

A Closer Look — Aersondes

Wingspan
2.9m

Weight
13 - 15kg

Engine
24cc Fuel Injected

Performance
Cruises at 80 to 150kph
Range > 3,000km, > 30rs
Surface to 7km

Payload
Up to 5,000g

Operation
Autonomous

Navigation
GPS

Communications
UHF Radio, LEO Satellite

Pressure Ports
Pitot-static

Battery Pack
20W-hr (~1hr power)

1.2kg Avionics Set
Twin computers,
Flight control sensors,
UHF modem
C/A code GPS

Fuel Tank
5kg premium
unleaded petrol

Sensors Pods
Air pressure,
temperature
& humidity

Generator
60W

Your monthly update about the VoIP Hurricane Net !!

VoIP Hurricane Net Manager—Kevin Anderson, KD5WX, kd5wx@voipwx.net
VoIP Hurricane Net Manager—Danny Musten, KD4RAA , kd4raa@voipwx.net
Public Information Officer—Lloyd Colston, KC5FM, kc5fm@voipwx.net
Editor—Richard Long , KF6BKA

Director of Operations—Rob Macedo, KD1CY
kd1cy@voipwx.net
Asst. Director of Operations — Dennis Dura, K2DCD
K2DCD@arrl.org
Submit articles to kf6bka@voipwx.net

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Photo of the Month

The Great Waterspout in Vineyard Sound, August 19, 1896 Second spout of the storm Photograph taken from Cottage City at 1:15 P.M In: Monthly Weather Review, July 1906, p. 356. Figure 32