

Weather Forecasting

by Hank Foglino

The success of good weather forecasting is directly proportional to the data available. In years past we got the weather from the second page of the *New York Daily News* (then we turned to page 4 to see what Errol Flynn was up to). There was a circle with Fair, Rain, Snow and Cloudy at 0, 90, 180 and 270 degrees, respectively, and an arrow that pointed to one of them. Then along came radio and we went to the pari-mutual system, 30% chance fair weather, 10% clouds, 5% rain, etc. After that, television arrived with Carol Reed and then Tex Antoine. They all did a pretty good job of predicting, considering their data. This data is accessible on land, but since three-quarters of the earth is underwater, offshore data was scarce at that time, resulting in poor or no forecasting with sometimes dire results, as with the hurricane of 1938.

Today we have satellites that cover meteorological conditions all over the world, availing data to, hopefully, give us enough time to get back to port before a storm hits or, better yet, not to set out at all. This data is used in weather forecast models that perform millions of calculations using the laws of physics for air in motion. Taken into consideration are factors like temperature, lapse rate, relative humidity, winds, jet stream and a host of other meteorological components. The forecast veracity is directly proportional to the amount and reliability of the data input into the model. There are various models utilized which may emphasize a particular condition, wind, temperature, etc. that may be more applicable to a particular region or the choice of the individual programmer. The skill of a human forecaster depends on his/her knowledge of the various models and their applicability to the local area, as well as extensive knowledge of the local weather regimes and variations.

The National Weather Service Forecast Office here on Long Island is located at the Brookhaven Lab facility in Upton, NY. The facility obtains the data required to forecast the

weather via a satellite downlink into their Advanced Weather Interactive Processing System (AWIPS). The Long Island Weather Station has its own Doppler radar and launches two weather balloons daily at 7 a.m. and 7 p.m. that transmit meteorological conditions as a function of altitude. Data is also received from radar stations at JFK and Newark Airports, Fort Dix, NJ, and Taunton, MA. Data obtained from balloons launched at Chatham, MA and Albany, NY is also utilized by the station staff in their analysis. Local marine weather data is obtained from the National Data Buoy Center buoys located south of Long Island, along with the University of Connecticut's MySound buoy system (Figure 2) and the Port Jefferson to Bridgeport ferry that is instrumented to measure water temperature and wind velocity while crossing Long Island Sound.

Additional marine weather information is provided by National Ocean Service weather stations located at Robins Reef (in New York Harbor), Sandy Hook, King's Point and Bergen Point.

At the NWS facility, coastal weather forecasts are issued twice a day between 3:30 a.m. and 4:00 a.m. and 3:30 p.m. and 4:00 p.m., with updates anytime as needed due to changing weather conditions. Marine weather statements noting the advent of high winds, high sea state, freezing spray, low water levels, thunderstorms, etc. are also issued as needed. In an emergency, when winds are expected to exceed 34 knots for short periods of time (up to two hours) or if waterspouts are occurring, a special marine warning will be issued. The warning will be transmitted on the NOAA weather radio with a tone alert and repeated frequently until the threat is over. All NWS forecasts, statements and warnings are disseminated via the NWS Upton website (<http://weather.gov/nyc>), the U.S. Coast Guard, and weather television and radio stations.

The station is responsible for six marine forecast areas (figure 1) and, as of April 2007, two

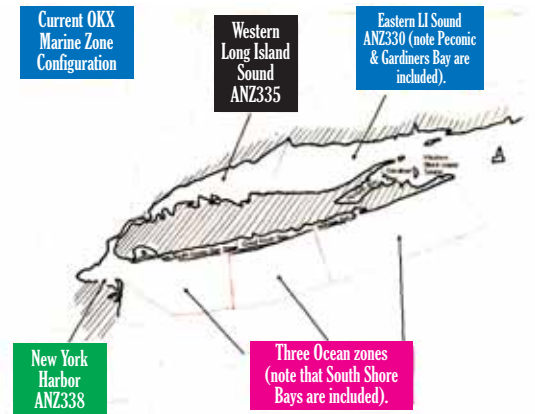


Figure 1

more areas have been added, Peconic Bay and Gardiners Bay, and the Long Island South Shore bays from Jones Inlet through Shinnecock Bay, including Great South Bay (figure 2).

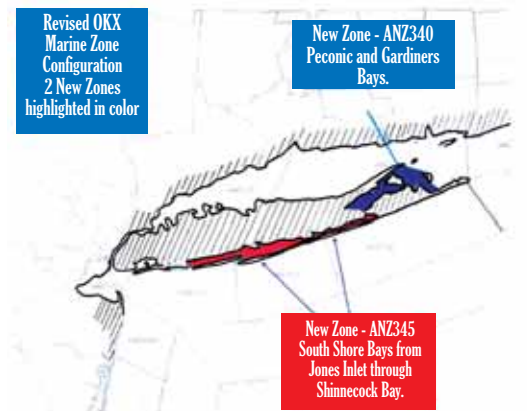


Figure 2

Boaters, when you plan a trip, it certainly makes sense to check the weather before you leave. Go on line to the NWS Upton website at <http://weather.gov/nyc>, to your VHF radio weather station or any other media interface that

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will alert you of any impending adverse conditions. An excellent source of wind and wave information in Long Island Sound can be found at the UConn MySound website at <http://mysound.uconn.edu>. (figure 3).

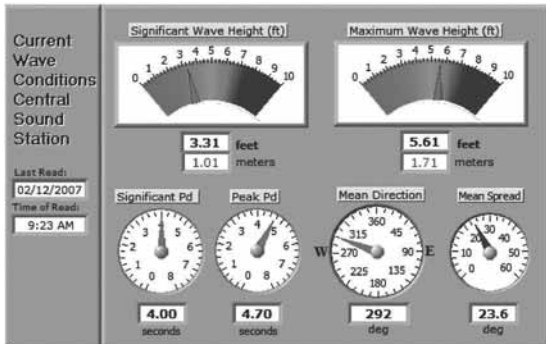


Figure 3

The University of Connecticut receives this data from various automated buoys that its staff maintains in Long Island Sound (figure 4)

- Execution Rocks (orange diamond) – meteorological data only
- Western Long Island Sound (aqua diamond) - meteorology and wave data

- Central Long Island (purple diamond) - meteorology and wave data
- Ledge Light (orange triangle) - meteorological data only
- Eastern Long Island Sound Offshore Station (red diamond) – measures water quality only and is not monitored by the National Weather Service



Figure 4

The National Weather Service Forecast Office operates a SKYWARN Program. Participants are trained to observe weather conditions in situ and send the information (via email or a phone call to a toll-free 800 number) to the NWS office. In addition, the NWS is currently developing a marine weather reporting program which aims to collect real-time weather data from boaters on the water. This data will supplement the existing buoy and other weather data and help the NWS to improve its marine forecasts, particularly for areas which do not have weather buoys such as Peconic Bay and Great South Bay. The SKYWARN and marine weather reporting programs are “data of opportunity” operations, and weather

information from boaters is deeply appreciated.

If you are interested in participating, please send an email to okx.webmaster@noaa.gov or call 631-924-0037 x406 for the date and location of the next training session.

There are a lot of people and resources being used to keep boaters informed of offshore weather conditions. Be wise and use this information to get yourself safely back to shore.

I'd like to thank Chris Jacobson and Gary Conte at the Upton National Weather Service Forecast Office for all their help and expertise in putting this article together.

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