LakeErieWX

Marine Weather Education and Forecasting Resources

Marine Weather Forecasting

Learn a little meteorology and reduce some of the uncertainty of coastal and offshore cruising. Whether you are cruising the Chesapeake, the Caribbean, or the coastal waters of the Atlantic, an enhanced understanding of basic weather principles and a few simple forecasting skills can improve cruise planning and reduce the likelihood of being exposed to uncomfortable or hazardous weather conditions.

The *Marine Weather Forecasting Seminar* provides attendees with an understanding of basic meteorological principles and explores the conditions favoring the development of severe weather. Animated graphics and analyses of past weather events are used to delve into the interesting and unique weather forecasting challenges associated with coastal and offshore cruising. Attendees will develop a basic forecasting resource kit based upon readily available government and university websites.

Section 1: Introduction

My background and a discussion of the seminar's structure and goals. The various NOAA government agencies responsible for producing marine weather forecasts and their areas of responsibility will be introduced.

Section 2: A Solid Foundation

An understanding of the weather requires a familiarity with basic physical and meteorological principles. This section addresses concepts such as barometric pressure, air masses, atmospheric instability and other meteorological terminology in order to build a foundation for the remainder of the seminar.

Section 3: Interpreting Weather Graphics

Weather forecast graphics use a confusing array of symbols, meteorological shorthand, and color schemes to display current weather conditions and portray future weather patterns. The symbols identifying high and low pressure systems, frontal boundaries, troughs, ridges, tropical cyclones and other meteorological features will be explained.

Section 4: Waves

Wave heights and direction can make all the difference between a pleasant trip and a wet, uncomfortable one. This section explains the dynamics of wave formation and the forces that sustain them. We will review a variety of forecasting resources to help you predict the size of the waves you will be encountering. Resources for determining the location and conditions associated with the Gulf Stream will also be examined.

Section 5: The Invisible Forces Controlling the Wind

Mariners have attempted to explain the capricious nature of the wind for thousands of years. This section looks at the forces that control the wind and reviews a variety of online resources that will improve your ability to predict its speed and direction. Small-scale and short-lived features such as sea and land breezes will also be presented.

Section 6: Observational Tools – Radar and Satellite Imagery

Doppler weather radar and satellite imagery have a lot to offer the weather-savvy mariner. This section will introduce common types of Doppler weather radar and satellite imagery and provide instruction in their interpretation and use. You'll learn how weather radar works (along with a few of its quirks) and how it can be used to monitor the development, intensity, and speed of approaching thunderstorms. Offshore cruisers venture beyond the reach of Doppler radar, and therefore must rely on satellite imagery to monitor approaching weather systems. We'll investigate how to use visible, infrared, and water vapor satellite imagery to enhance marine weather observations and forecasts.

Sections 7 and 8: Understanding Low Pressure Systems

Cruising the Chesapeake, the Caribbean, or the coastal Atlantic will place you in the path of low pressure systems, known as "cyclones" in the meteorological community. Cyclones come in two basic varieties – extratropical (mid-latitude low pressures systems) and tropical (tropical depressions, tropical storms and hurricanes) – which form in very different environments from fundamentally different atmospheric dynamics. Both types of cyclones are associated with bad weather. Their arrival often presents a significant risk to boaters in the form of strong, gusty, shifty winds, steep waves, dangerous lightning, damaging thunderstorms, and, in the case of land-falling tropical cyclones, storm surge and tornadoes. Sections 6 and 7 will investigate both types of cyclones in detail, and review a variety of resources for predicting the development, strength, and movement of these weather-makers.

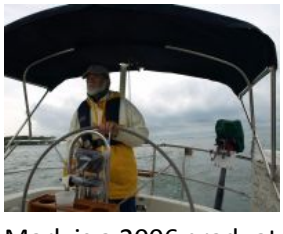
Section 9: Thunderstorms

Thunderstorms can quickly spoil a cruise in many ways—strong winds, large waves, dangerous lightning or visibility-limiting rain. This section will examine the various types of thunderstorms and the atmospheric ingredients that lead to their formation. Learn why thunderstorms often 'pop-up' late on summer afternoons and why some storms have short life-spans while others persist for hours. Discover why thunderstorms remain independent on some days and form into damaging long-lived squall lines on others. Reduce your chances of a hair-raising or wind-swept encounter with a thunderstorm by learning to assess the potential for their development using readily available Internet resources and the sky.

Section 10: Conclusion

This section will present a daily forecasting routine and strategy for managing weather forecast information.

Instructor Biography



Mark Thornton began sailing on Lake Erie in 1994 and he and his wife Susan currently own Osprey, a 1985 C&C 35. His interest in weather forecasting grew from his experiences cruising and racing on the Great Lakes. In addition to sailing and weather forecasting, Mark enjoys publishing summaries of interesting weather events and teaching basic weather forecasting skills to recreational boaters.

Mark is a 2006 graduate of the Penn State University Certificate of Achievement in Weather Forecasting, a two-year program that develops skills in general, tropical and severe weather forecasting. He maintains a website (www.lakeeriewx.com) devoted to marine weather education and forecasting resources and is the past president of the Northeast Ohio chapter of the American Meteorological Society. Mark is employed as the Vice-President of Administration for the law firm of Wegman, Hessler & Vanderburg and as a Teaching Assistant in the Certificate of Achievement in Weather Forecasting Program at Penn State University.