

Storms and Thunderstorms: Radar Detection and Sailboat Storm Tactics

Know What to Do, Have the Right Equipment, and Be Prepared

By [Tom Lochhaas](#)

Storms are one of the most serious dangers sailors face both near-shore and offshore. Sudden, sometimes unexpected high winds can lead to capsize, and in shallower waters waves can build quickly and buffet the boat or lead to broaching or capsizing. Detection of a coming storm and preparations and tactics to employ depend on the boat's equipment and having an effective plan to manage whatever conditions may occur.

Watch the Clouds

Since times immemorial, mariners have learned to watch clouds for potential weather changes. In summer, most thunderstorms and squalls are heralded by advancing nimbus clouds, often anvil-shaped - big, black clouds that may approach quickly. Big white, puffy cumulus clouds seldom produce a thunderstorm and high wind but may mask nimbus clouds behind them or develop into nimbus clouds. Or the horizon may slowly darken with a deep overcast in which nimbus clouds cannot be seen but which contains storm cells or dangerous downdrafts or microbursts of extremely high wind. At night you may not see the clouds, but most thunderstorms and squalls are announced by lightning appearing on the horizon and growing closer. An experienced sailor never underestimates the storm potential with any of these signs of changing weather.

In addition to watching the sky, be alert to any wind change. Shortly before a thunderstorm or squall there may be a momentary lull in the wind as wind direction begins to shift. You may feel a sudden cooling of the air. Or the wind may gradually build, which can be almost unnoticeable if you're sailing downwind at the time.

Take any sign of a weather change seriously and begin making preparations.

Radar Detection and Avoidance

Thunderstorms and squalls generally show up quite vividly on radar and can allow you to predict if and when you may be hit. In addition to using a traditional radar unit on a sailboat, sailors near shore now also can use their smartphone or another online device or laptop to view current National Weather Service radar images for their immediate area. If you've never visited the NWS radar website, you're in for a real treat to discover the benefits of lake and coastal radar loops.

[Start here](#) and select your general area. Click on your specific area to zoom in to the nearest local radar image. On the left, click the "Composite Loop" to see the radar images for about the last hour. Green indicates light rain, yellow heavier rain and potential wind, and red thunderstorms. Other indicators are used for severe thunderstorms and tornados. The looped images allow you to estimate whether a storm is headed at you and how soon it may arrive.

With a smart phone, you can first locate your nearest radar area using your browser and save it to your favorites. Depending on your device, you may also be able to save the site on your home screen so that a single tap brings up the image. The photo above shows the radar image of a thunderstorm moving across the Gulf coast of Louisiana. This information is of incomparable value for knowing what's coming in time to make preparations.

Preparing for a Thunderstorm

Your preparations and tactics depend on your boat and its equipment, the conditions and duration expected, and your position near or offshore. Every boat and situation is unique, so it's important to think about these issues in advance so that you choose the best solution when needed. Following are some general possible preparations:

- **Change course to escape the storm.** With a small thunderstorm or squall, if you see it early enough on radar and can estimate its speed and direction, you may be able to sail out of its path. Be sure to keep monitoring the radar so that you're not caught unprepared if you need to change tactics.
- **Drop or [reef your sails](#) well before the risk of sudden high wind.** Don't wait until the boat is heeled over and deck conditions become frantic. Start the boat's engine, or be prepared to on a moment's notice, so that you can motor directly into the wind and waves during the worst of the storm if needed. Remember that almost all sailboats are designed to ride waves best bow-on and are at greatest risk of capsize if caught beam-on.
- **Reef sails, or switch to storm sails, and prepare to [heave-to](#).** Heaving to is a process of stalling the boat while pointed at an angle into the wind and waves and is much safer than simply dropping sails and drifting, called lying ahull. When lying ahull with sails down, most boats turn sideways and are at risk of capsize or being flipped by a wave. If you have never heaved-to, take some time to research the method that will work best for your type of boat and sail configuration, and practice ahead of time so you know what to do.
- **Reef sails, or switch to storm sails, and prepare to run off.** This tactic involves running downwind and down waves in a controlled manner. You must have sea room to be able to continue sailing downwind as long as the high winds lasts. If the storm may blow long enough for waves to grow large, you need to control boat speed to avoid surfing down a wave and burying the bow in the wave ahead, potentially causing the boat to pitchpole and capsize, likely with a broken mast.
- **In a tight spot, you might [anchor](#) before the storm hits.** This can help prevent being blown on the rocks or into other boats if you don't have the sea room to heave-to or run off. Since the wind may suddenly increase substantially in a thunderstorm, it's a good idea to keep your engine running and if needed put the boat in forward gear to ease the strain on the anchor rode.

Storm Tactics

Many full-length books are available that describe and debate the merits and disadvantages of different storm tactics. Adlard Coles' *Heavy Weather Sailing*, now in its 6th edition, is a classic on the subject. Lin and Larry Pardey in their *Storm Tactics Handbook* argue persuasively for heaving-to. The [Annapolis Book of Seamanship](#) by John Rousmaniere has a good introduction to storm tactics and heavy weather sailing in modern sailboats.

Here's an outline of choices to consider, again depending on your boat, equipment, and situation:

For a thunderstorm of expected short duration:

- Do not simply drop sails and lie ahull unless you have no better choice.
- Motor or sail with reefed or storm sails into the wind and waves.
- Heave to with the bow as much into the wind as possible.
- Anchor in a tight spot.
- Shorten sail and run off downwind if you have sea room.

For a major storm or storm of longer duration:

- [Heave-to](#) with or without a sea anchor adjusted to help the boat point more into the wind.
- Run off under storm sails with or without a drogue to help slow the boat and prevent plowing into the back of the wave in front.
- Lie ahull preferably only with a sea anchor adjusted to prevent the boat lying broadside to the waves.

Don't forget other aspects of sailing safety when making storm preparations:

- Everyone should be wearing a [PFD](#).
- Crew on deck should wear a [harness and tether](#).
- The captain should be [thinking ahead](#) and preparing for all contingencies, such as how to rescue a crew if someone [falls overboard](#).