



advantage
boating 

The logo for Advantage Boating features the word "advantage" in a dark blue, sans-serif font, and "boating" in a lighter blue, sans-serif font. To the right of the text is a stylized icon of a camera aperture, composed of several overlapping, curved shapes in shades of blue and green.

Section V: Weather

Lesson Outline



- Lesson objectives
- Introduction
- Sources of weather information
- Types of clouds
- Local weather hazards
- Fog & reduced visibility
- Wind ranges & sail selection
- Summary
- Quiz

Lesson Objectives



- In this lesson you will learn more about weather and how to take it into consideration when venturing out for a sail.

Introduction



- It's important to have an appreciation for weather and how quickly it can change.
- Taking the weather into consideration at all times is an important factor for your safety and that of your crew.
- Appreciate mother nature and stay safe!

Becoming Knowledgeable about Weather!



- The weather is the number one critical variable that influences all aspects of your sailing adventures!
- Understanding the weather and monitoring changes to the environment are important skills for all sailors.

So let's begin!

Sources of Weather Information



- VHF Radio WX channels (03 Lake Simcoe)
- Weather Network Channel on Public Television
- Local Radio Station (e.g. CHAY FM)
- Telephone Environment Canada (for Lake Ontario 1 800 for one on one consultation 1 900 565 5555)
- Internet (i.e. Environment Canada or Weather Network)
EC <http://weatheroffice.ec.gc.ca/marine/>
WN <http://www.theweathernetwork.com/features/marine/>
- Weather Fax
- Airport Weather Office
- Newspaper

Fair Weather Cumulus Clouds



Cumulus clouds. Small cumulus clouds such as these are sometimes called *fair weather cumulus* or *cumulus humili*

Fair Weather Cumulus



Fair weather cumulus clouds develop later in the morning on warm summer days as land heats hot air rises. They have the following attributes:

- at a certain height will cool, condensing with dust particles to form clouds
- they are the picture perfect white fluffy clouds often with flattish, sometimes gray bottoms
- by afternoon, they frequently decay as the sun gets lower on the horizon and the land begins to cool
- by afternoon, however they may become much larger and more vertically developed (cumulus congestus)
- could further develop into huge towering clouds with very dark bottoms often with rain below and possibly with anvil top (cumulonimbus)

Cumulus Congestus



Cumulus Congestus. Resembles the head of a cauliflower sometimes referred to as *towering cumulus*. Most often a single large cloud, but occasionally several may grow into each other forming a line of towering clouds. Precipitation is showery.

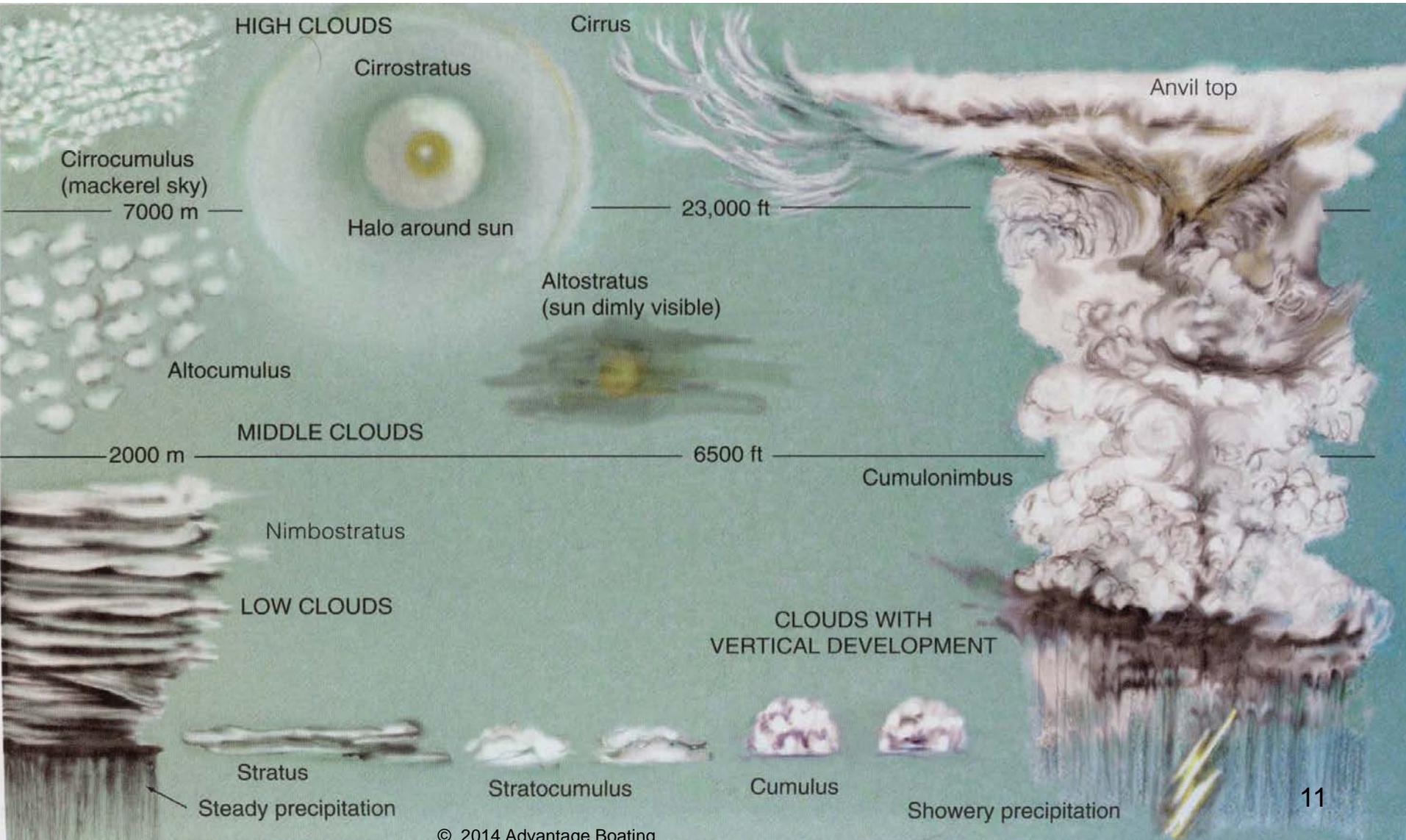
Thunderstorm Clouds



Figure 6.19

A cumulonimbus cloud. Strong upper-level winds blowing from right to left produce a well-defined anvil. Sunlight scattered by falling ice crystals produces the white (bright) area beneath the anvil. Notice the heavy rain shower falling from the base of the cloud.

Overview of Cloud Types



Local Weather Hazards



LOCAL HAZARD	IDENTIFIED BY	WARNING TIME
Deteriorating Weather	A thin, transparent wispy veil of high cloud (cirrus cloud) Halo around the sun or moon followed by lower, thicker clouds Wind backs' from west to south or east	6 – 24 hours

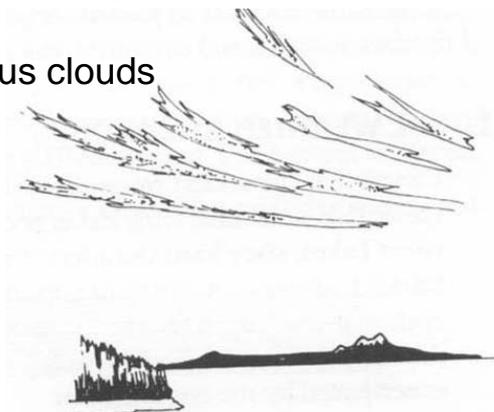
In the northern hemisphere when the wind backs it shifts in a counter-clockwise direction, for example, from west through south to east.

A backing wind often heralds the approach of poor weather, whereas a veering wind, which shifts in a clockwise direction, is considered to indicate improving weather.

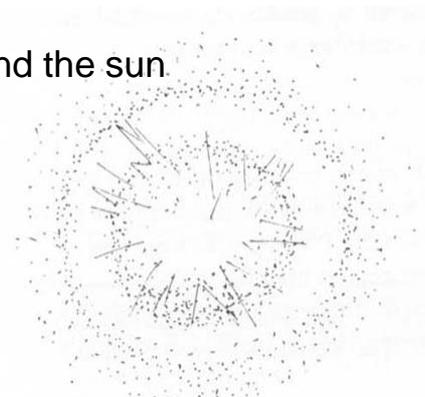
The above signs of deterioration after a spell of fair weather are common to all areas of the country. Keep an eye on the rate of deterioration and consider heading for harbour.

The weather may deteriorate only to an unsettled, cloudy condition or it may deteriorate into heavy rainfall with strong winds from the south or east.

High cirrus clouds



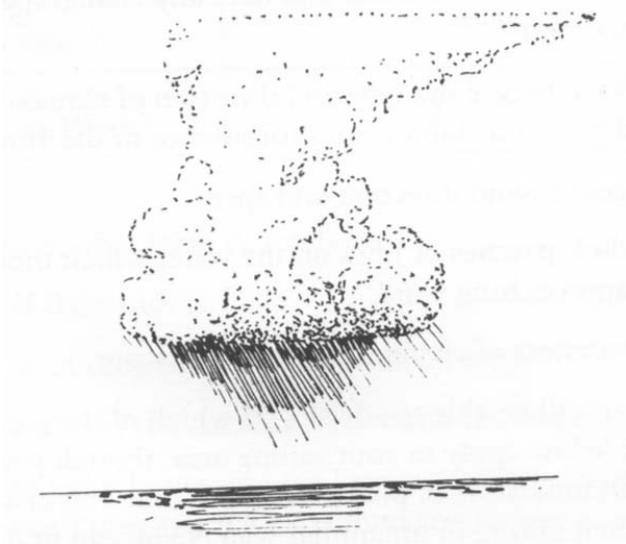
Halo around the sun





Local Weather Hazards

LOCAL HAZARD	IDENTIFIED BY	WARNING TIME
<p>Thunderstorms: & associated hazards</p> <ul style="list-style-type: none">•Violent gusty winds•Line squalls*•Lightning•Decreased visibility•Waterspouts**	<ul style="list-style-type: none">•Huge, cauliflower shaped clouds with flat dark bottoms, and flat fuzzy tops spreading out to form an anvil shape. (cumulonimbus)•These develop to the west and may be single clouds or a wall of cloud•As massive winds shift usually precedes a thunderstorm•There is often a "calm before the storm" followed by a fast-approaching line of dark water•Heavy static on the radio may indicate nearby thunderstorm activity	<p>15-30 min.</p>



Local Weather Hazards

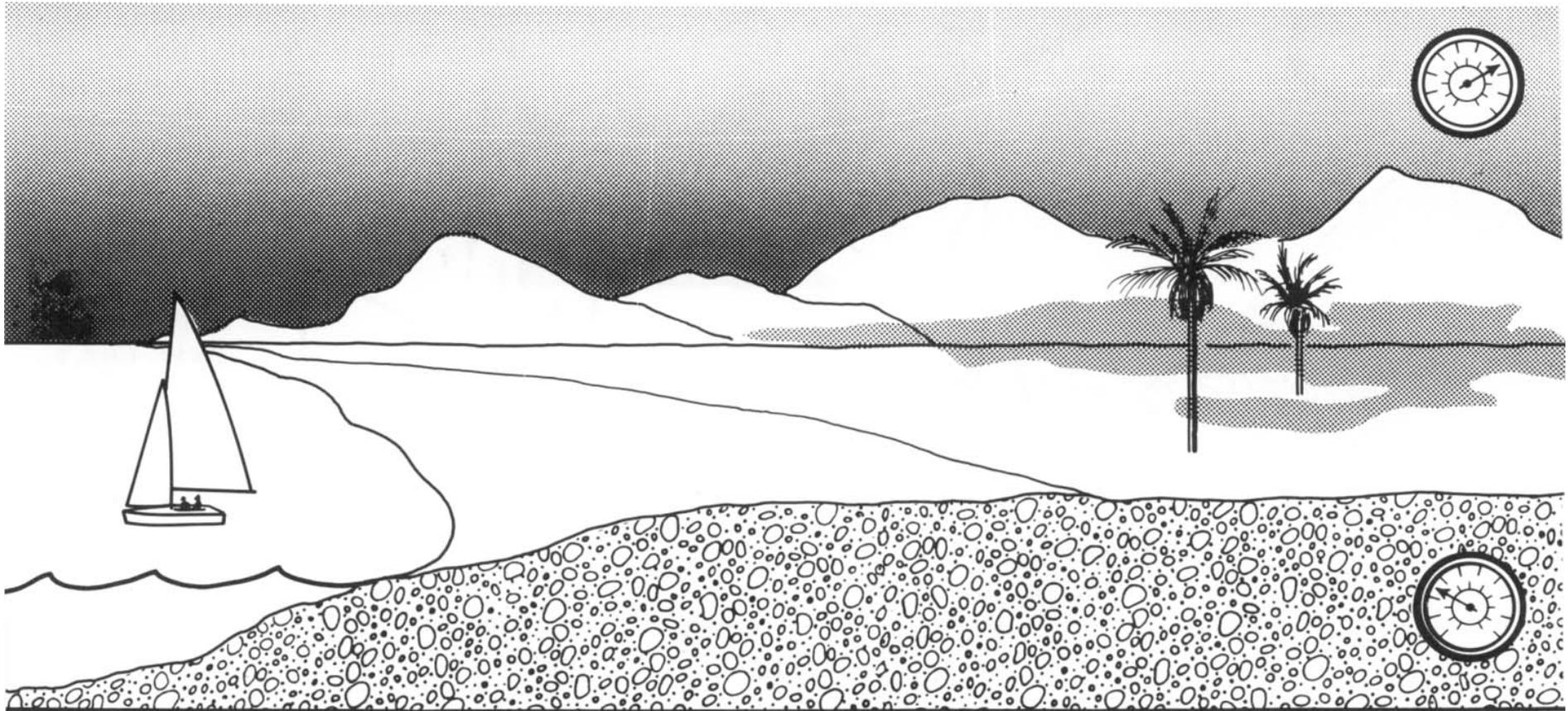


- **GUSTS & SQUALLS** are temporary increases in wind speed. The difference between them is that a gust only lasts a few seconds while a squall lasts a few minutes.
- **A WATERSPOUT** is a funnel-shaped vertical column of water similar to a tornado but is generally less violent. Waterspouts are to be avoided.



- **Thunderstorms usually occur in the afternoon in the lake areas of central Canada. They occur less frequently on the Atlantic and Pacific coasts.**
- **At the approach of a thunderstorm, get all sails down quickly.**
- **Thunderstorms are mercifully brief, though nasty while they last. Fatalities from lightning are rare on the water.**

Fog



Fog forms only near the ground in areas where the air above remains warmer.

Fog



- All air, even in the desert, has water vapor suspended in it.
- Air at higher temperatures can hold a greater volume of water vapor than cooler air can.
- Air is said to be saturated when it can hold no more water vapor.
- Dew point refers to a temperature at which the air mass becomes saturated and invisible moisture condenses and becomes visible (in other terms, when dew point and temperature coincide).
- Fog forms when innumerable water droplets condense and become visible yet float suspended in the air.
- **Radiation Fog:** Can form over land on cool clear nights in summer and fall;
- **Advection Fog:** Can form when warm moist air is blown over cold water

Fog

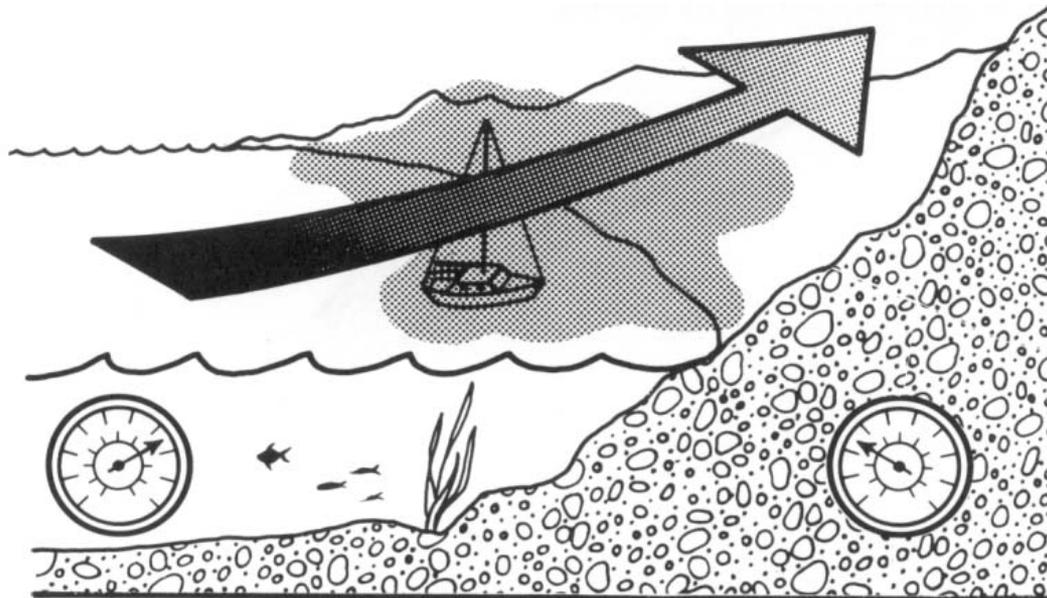


- Radiation fog occurs over land at night. Heat escapes from the earth into the clear sky, cooling the ground.
- The ground cools the air directly above it when it is below its dew point and fog occurs.
- The fog is limited to the cooled air close to the ground;
- Warmer air a bit higher stays above the dew point and is fog free.
- Radiation fog will not occur during periods of high winds because the wind mixes the air and prevents creation of a cool layer close to the ground.
- Radiation fog can spread over a body of water that is sufficiently cool to keep the air temperature below its dew point.
- It tends to burn off over land as the sun rises higher in the sky but cold water can delay the process.
- The conditions necessary for radiation fog usually occur at night and in late summer and fall.

Advection Fog

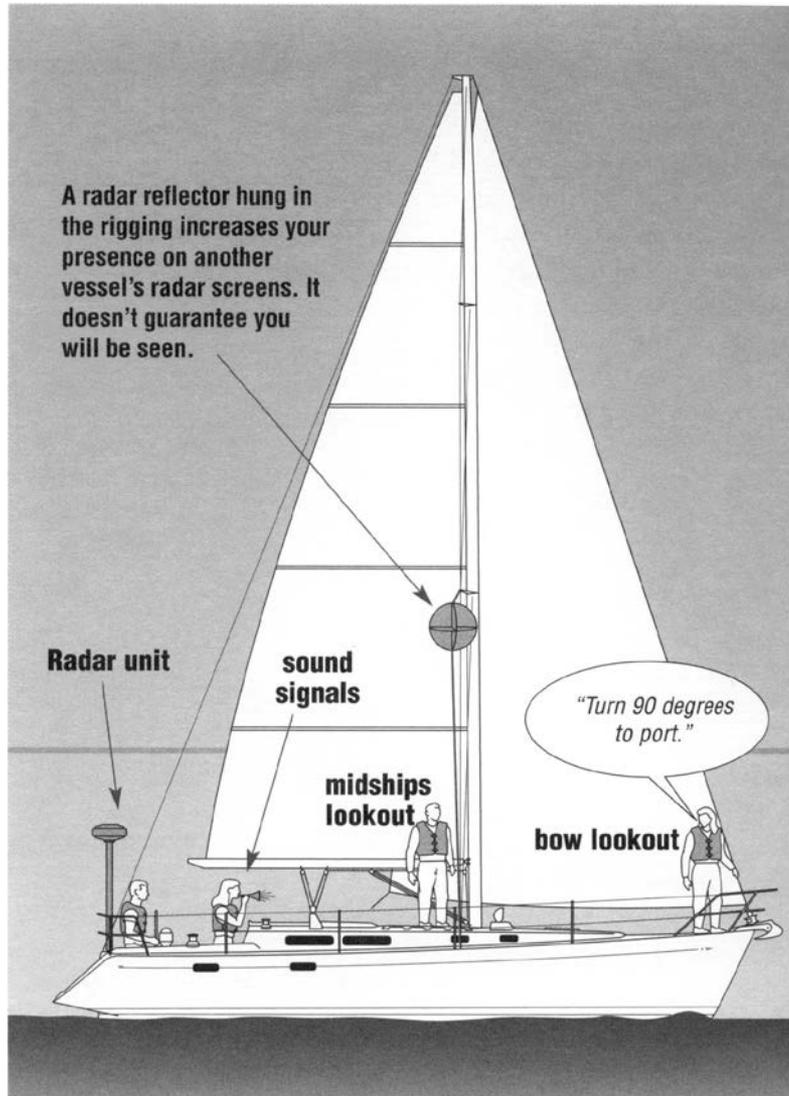


- **Advection fog** can develop in any season and at any time of the day or night.
- It occurs when warm, moist air moves over a surface cool enough to drop its temperature below the dew point.
- Unlike radiation fog, it can be warmer, moist air from above the water that turns to fog as it flows over the cooler land, accompanied by winds and persist for prolonged periods.



Warmer, moist air from above the water turns to fog as it blows over the cooler land.

Navigating in Fog

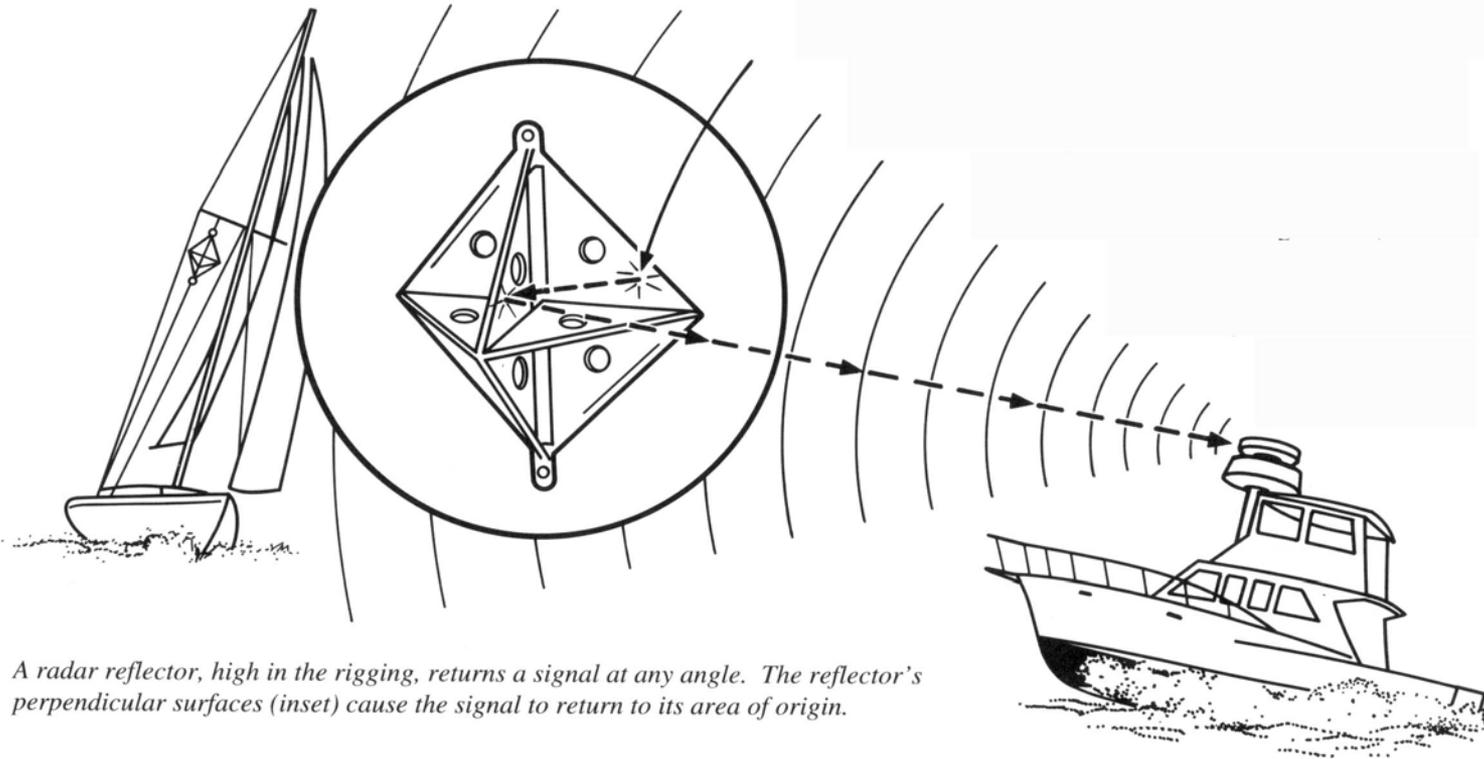


- Reduce speed
- Update navigation
- Post a lookout
- Turn on navigation lights
- Make sound signals
- Hoist radar reflector
- Place crew in PFD's
- Turn on radar if available and post radar watch
- Listen for sound signals and engine noise of other vessels

Sound signals (every 2 min or less)

- Sail - One long & two short
- Power – One long
- Not making way – Two long
- Long 4 – 6 sec
- Short 1 sec

Deploying a Radar Reflector



A radar reflector, high in the rigging, returns a signal at any angle. The reflector's perpendicular surfaces (inset) cause the signal to return to its area of origin.

- Mount as high as possible in the rain catch position.
- Can be blanketed by a wet sail.
- Choose style similar to above which provides a larger image.

Actions to be taken in Reduced Visibility



- Slow down
- Post a lookout
- Make correct sound signals: if under Power one long; under Sail one long 2 short every 2 minutes and respond if you hear another
- Turn on navigation Lights
- Hoist a radar reflector
- Turn on depth sounder
- Plot position on chart
- If available turn on radar
- Anchor well away from channel

Wind Ranges



WIND WARNINGS

WINDS ARE EXPECTED TO EXCEED

Small craft warning

20 knots

Gale Warning

34 knots

Storm warning

47 knots

Hurricane

64 knots



TRUE WIND SPEED

0 – 12 Knots

13 - 18 Knots

19 - 26 Knots

27 - 34 Knots

SAIL SELECTION

Genoa and full main

Jib & full main or Genoa and reefed main

Jib & reefed main

Jib or reefed main

Summary



- By knowing about weather, you can determine what the current weather will be and predict what kind of weather is coming.
- You also have a better idea what precautions you should take when you are in certain weather conditions and what sail selection you should consider based on the wind strength.

Next Steps!



- In the next lesson, Section VI, you will focus on learning about the duties of the skipper and the crew.

Let's practice!



- Complete the following quiz to test your knowledge about 'Weather'.



- Give three examples of a hazard, weather indication, and warning.
- Name five actions you should take in reduced visibility.
- What is the expected wind speed in a Gale?
- What is advection fog and how is it caused?