Weather - Introduction

To help go get started we have put together some basic information about the key topics that you should understand before joining us. We will build on your knowledge as you progress through the Yachtmaster Theory and practical course.

- Terminology and the Beaufort scale
- High and low pressure and how the wind flows around the isobars
- Wind direction and properties a parcel of air
- Passage of a frontal depression
- Weather front and clouds
- Sea breeze
- Advection and Radiation fog

Our recommended book, **weather handbook**, which can be downloaded as an ebook, will help fill in the gaps

Note: We are focusing on the Northern Hemisphere only.

Terminology and the Beautfort scale

Weather forecast terminology

Gale - sustained winds expected to be 34-47 knots

Imminent - something expected within 6 hours from time of issue of the forecast

Soon - expected within 6 - 12 hours from time of issue of the forecast

Later - Expected more than 12 hours from time of issue

Visibility

FOG - Visibility less than 1,000 meters

Poor - Visibility between 1,000 meters and 2 nautical miles

Moderate - Visibility between 2 and 5 nautical miles

Good - Visibility of more than 5 nautical miles

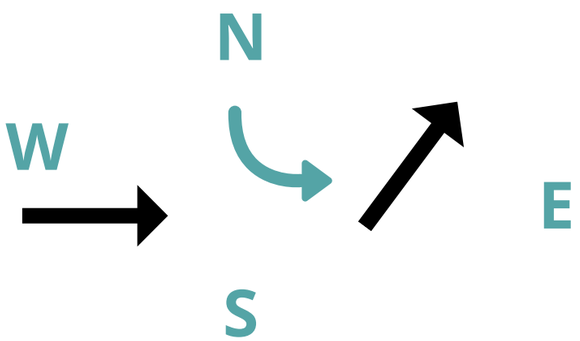
BEAUFORT SCALE

Beaufort Number	Name	Knots	MPH	Effects Observed Far From Land	Effects Observed On Land
0	Calm	Under 1	Under 1	Sea like mirror.	Calm; smoke rises vertically.
1	Light Air	1-3	1-3	Ripples with appearances of scales; no foam crests.	Direction of wind shown by smoke drift, but not by wind vanes.
2	Light Breeze	4-6	4-7	Small wavelets; crests of glassy appearance, not breaking.	Wind felt on face; leaves rustle; ordinary vane moved by wind.
3	Gentle Breeze	7-10	8-12	Large wavelets; crests begin to break; scattered whitecaps.	Leaves and small twigs in constant motion; wind extends light flag.
4	Moderate Breeze	11-16	13-18	Small waves, becoming longer; numerous whitecaps.	Raises dust and loose paper, small branches are moved.
5	Fresh Breeze	17-21	19-24	Moderate waves, taking longer form; many whitecaps; some spray.	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	Strong Breeze	22-27	25-31	Larger waves forming; whitecaps everywhere; more spray.	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7	Near Gale	28-33	32-38	Sea heaps up; white foam from breaking waves begins to be blown in streaks.	Whole trees in motion; inconvenience felt in walking against the wind.
8	Gale	34-40	39-46	Moderately high waves of greater length; edges of crests begin to break into spindrift; foam is blown in well-marked streaks.	Breaks twigs off trees; generally impedes progress.
9	Strong Gale	41-47	47-54	High waves; sea begins to roll; dense streaks of foam; spray may reduce visibility.	Slight structural damage occurs (chimney pots and slate removed).
10	Storm	48-55	55-63	Very high waves with overhanging crests; sea takes white appearance as foam is blown in very dense streaks; rolling is heavy and visibility reduced.	Seldom experienced inland; trees uprooted; considerable structural damage occurs.
11	Violent Storm	56-63	64-72	Exceptionally high waves; sea covered with white foam patches; visibility still more reduced.	Very rarely experienced; accompanied by widespread damage.
12	Hurricane	64 and over	73 and over	Air filled with foam; sea completely white with driving spray; visibility reduced.	

Backing and Veering, High and Low pressure

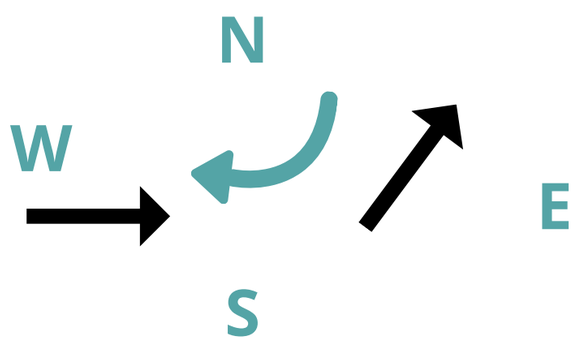
Wind Direction - indicates the direction from which the wind is blowing →

Backing



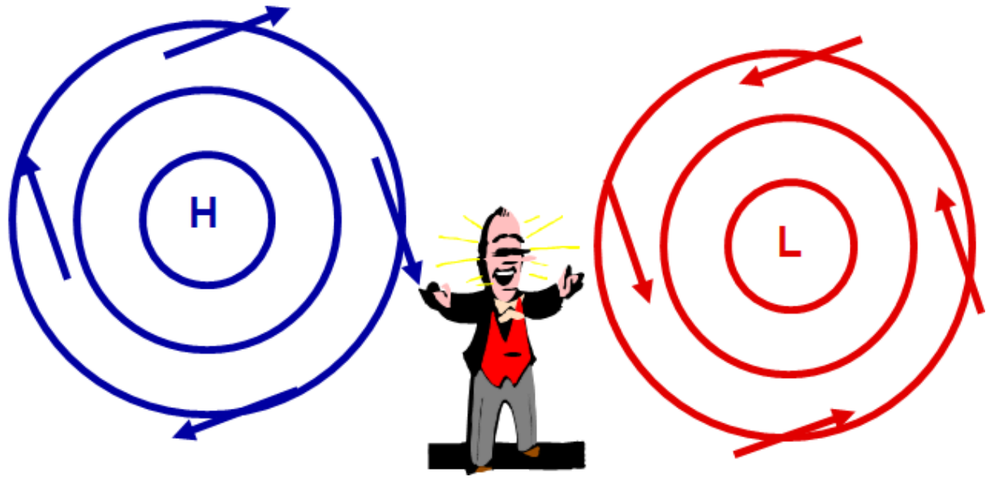
Backing is where the wind moves anticlockwise around the compass. Ins this example from West to South West

Veering



Veering is where the wind moves Clockwise around the compass. In this example from South West to West

Which way does the wind travel around a High and Low pressure in the Northern Hemisphire?



Wind flows Clockwise around a high and anticlockwise around a low.

Buy's Ballots Law. If the wind is on your back in the Northern Hemisphere, then the low pressure is on your left and the High on your right.

You can find out more about **high and low pressures** and how they affect you at sea

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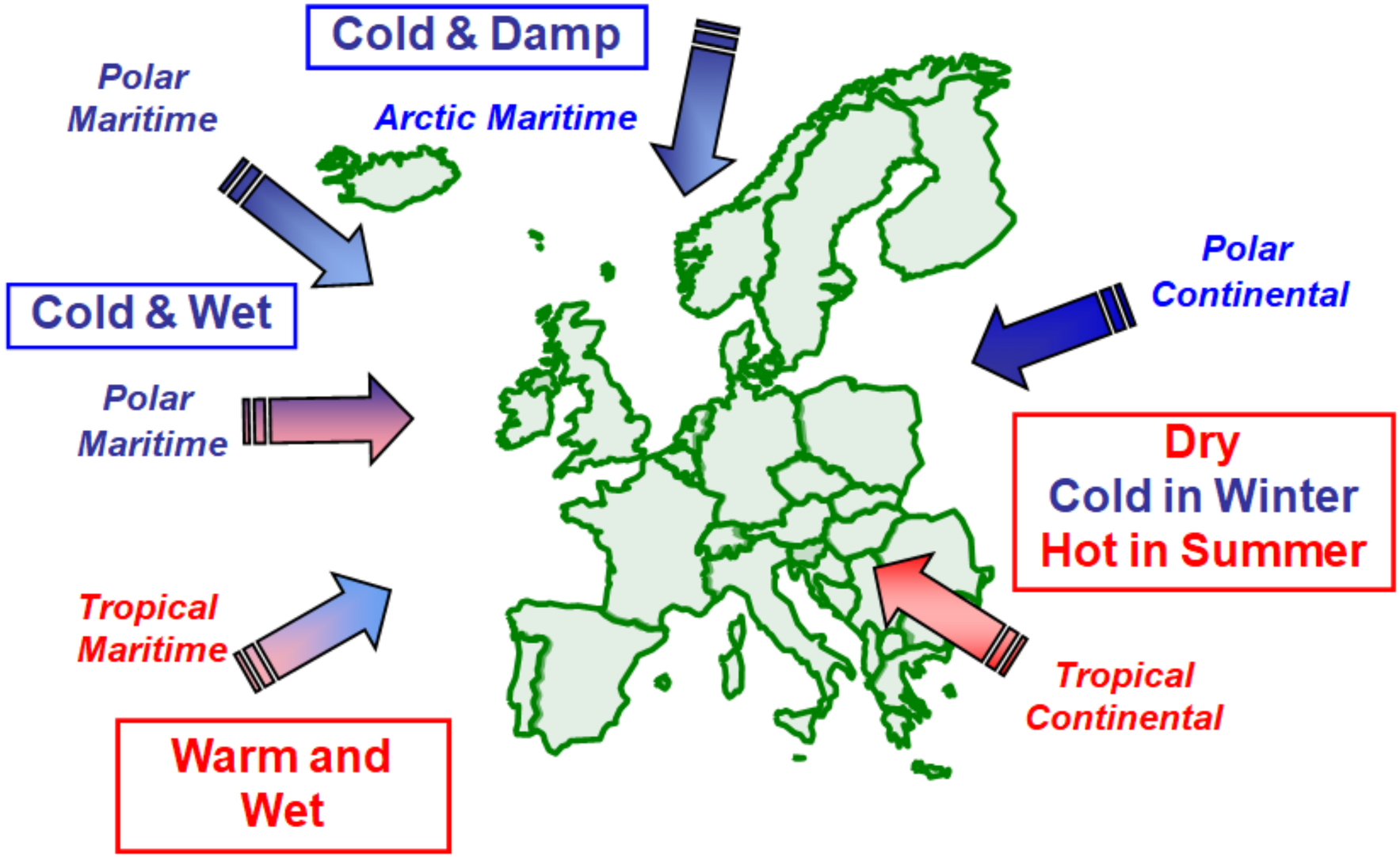
Where the wind comes from

Having an understanding of **Global weather patterns** will provide some insight as to how the weather in the tropics affects weather in the UK. Locally, knowing the wind direction can determine whether the wind will be cold, warm, wet, or dry. For example, if you have a SW wind coming across the Atlantic then it is reasonable to assume that the wind will be warm and wet. From the North, then assume it will be cold.

Further reading about the **Coriolis force** will provide an understanding of global wind directions



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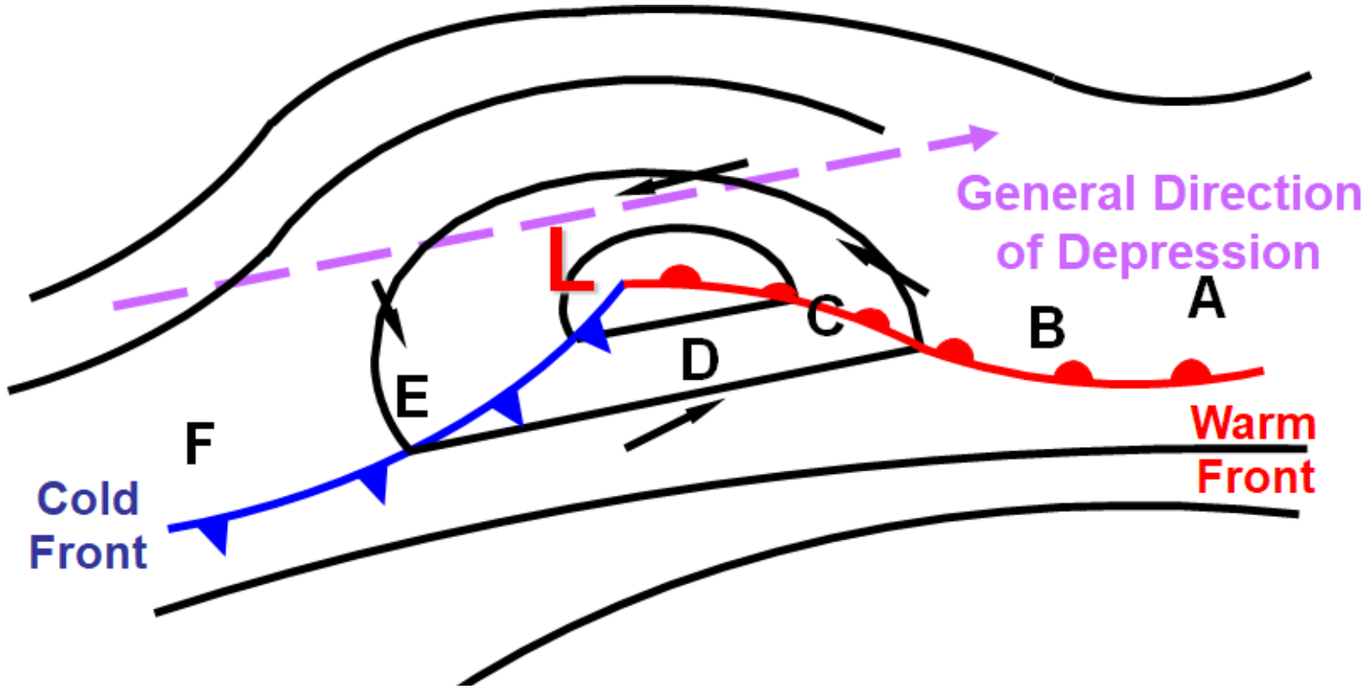
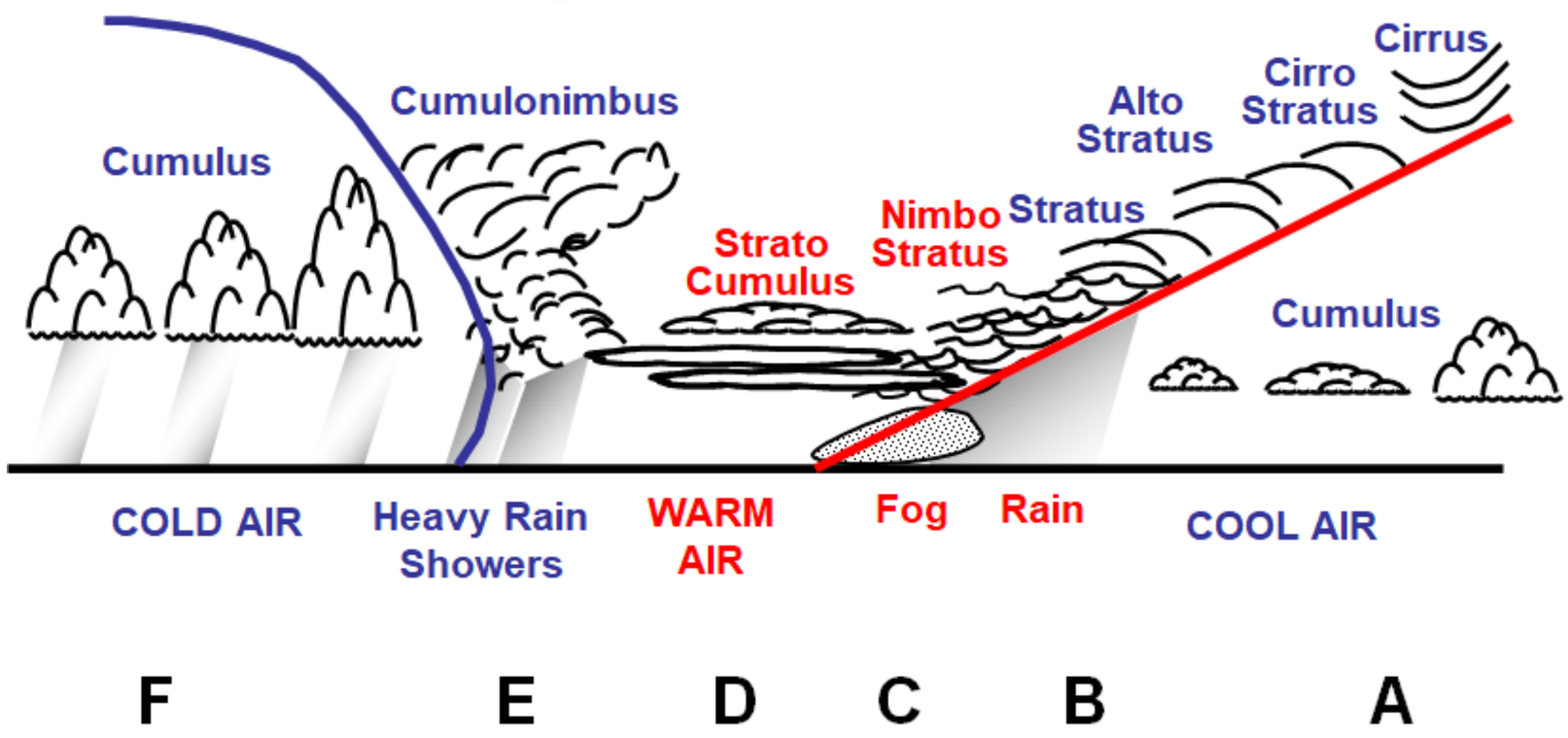
Frontal depressioin

Passage of a frontal depression



Cross-sectional view of the passage of a frontal depression



More information on
<u>weather fronts</u>

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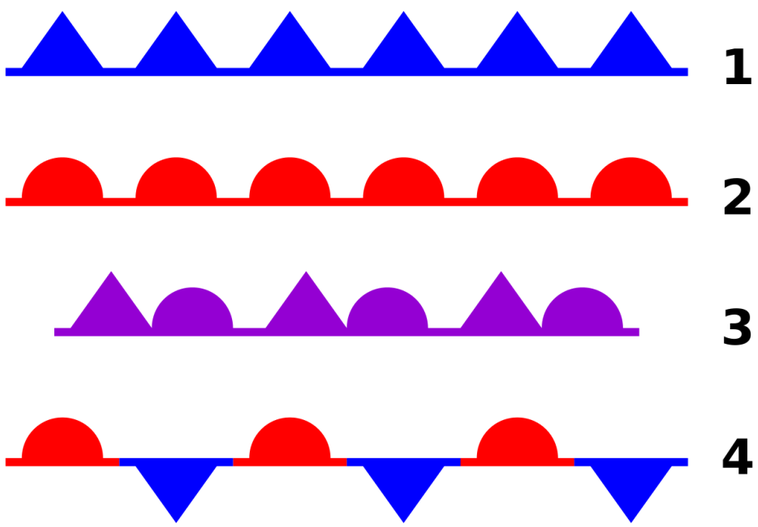
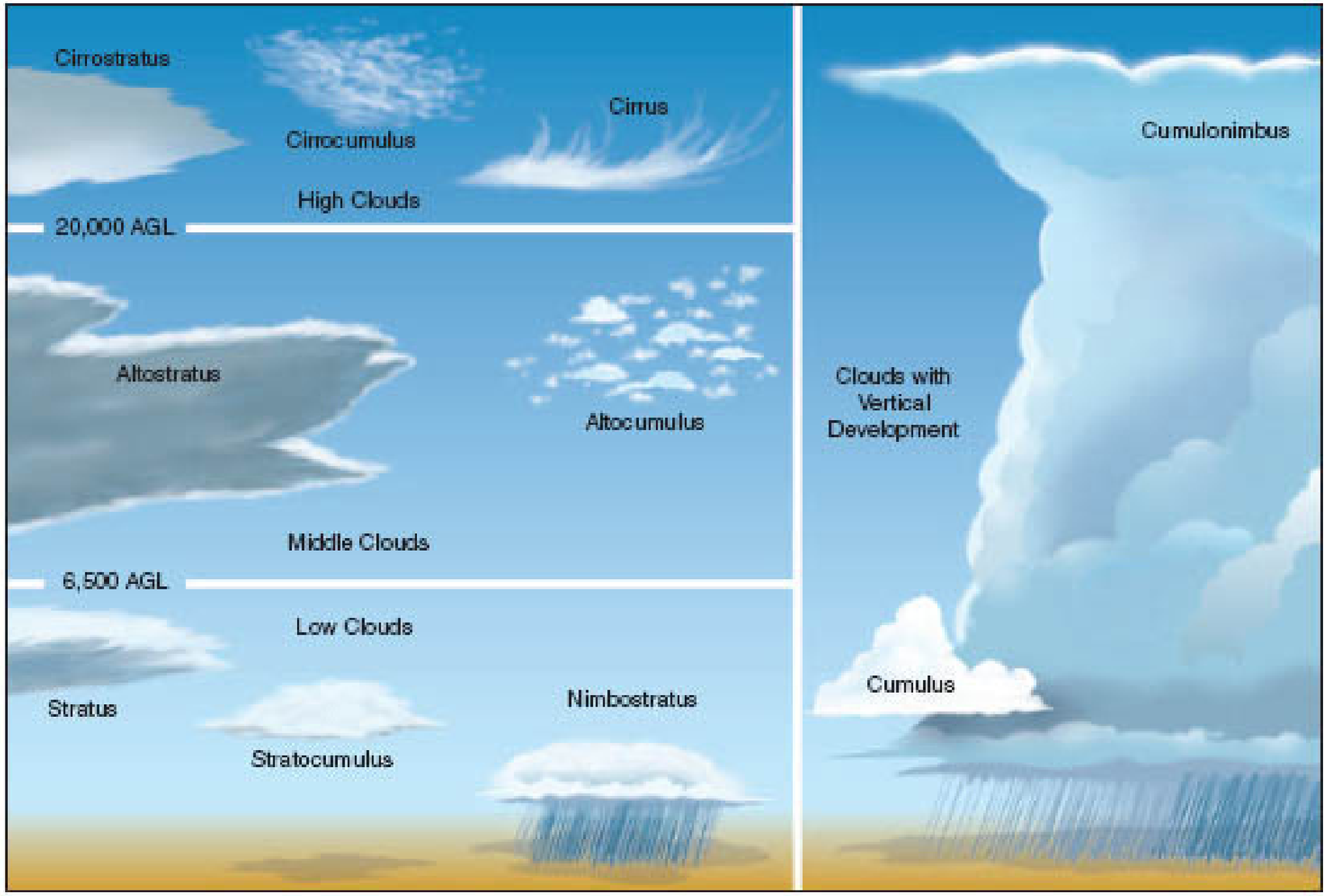
Weather fronts and clouds

Weather fronts



1. Cold front
2. Warm front
3. Occluded front
4. Stationary front

Types of Clouds



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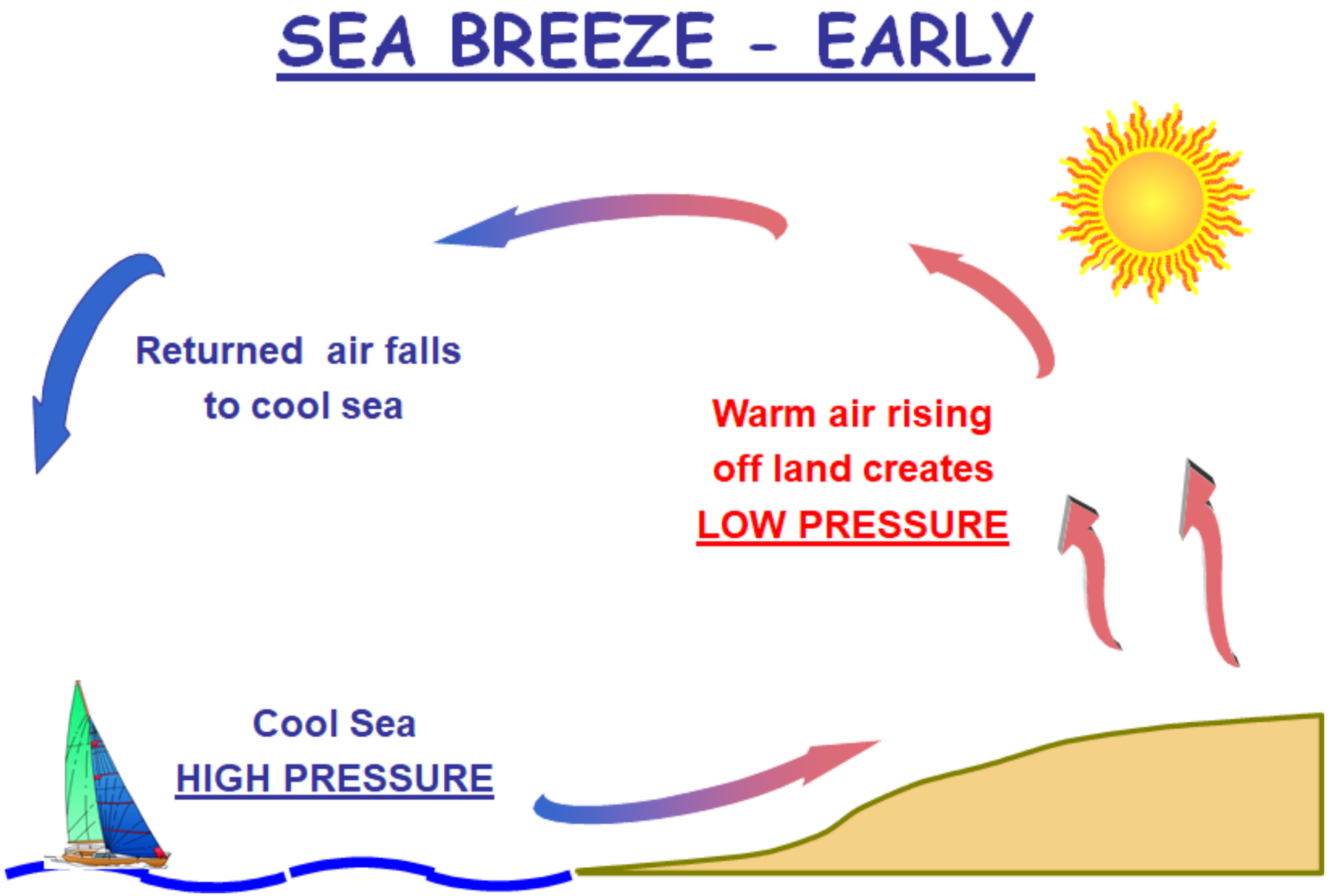
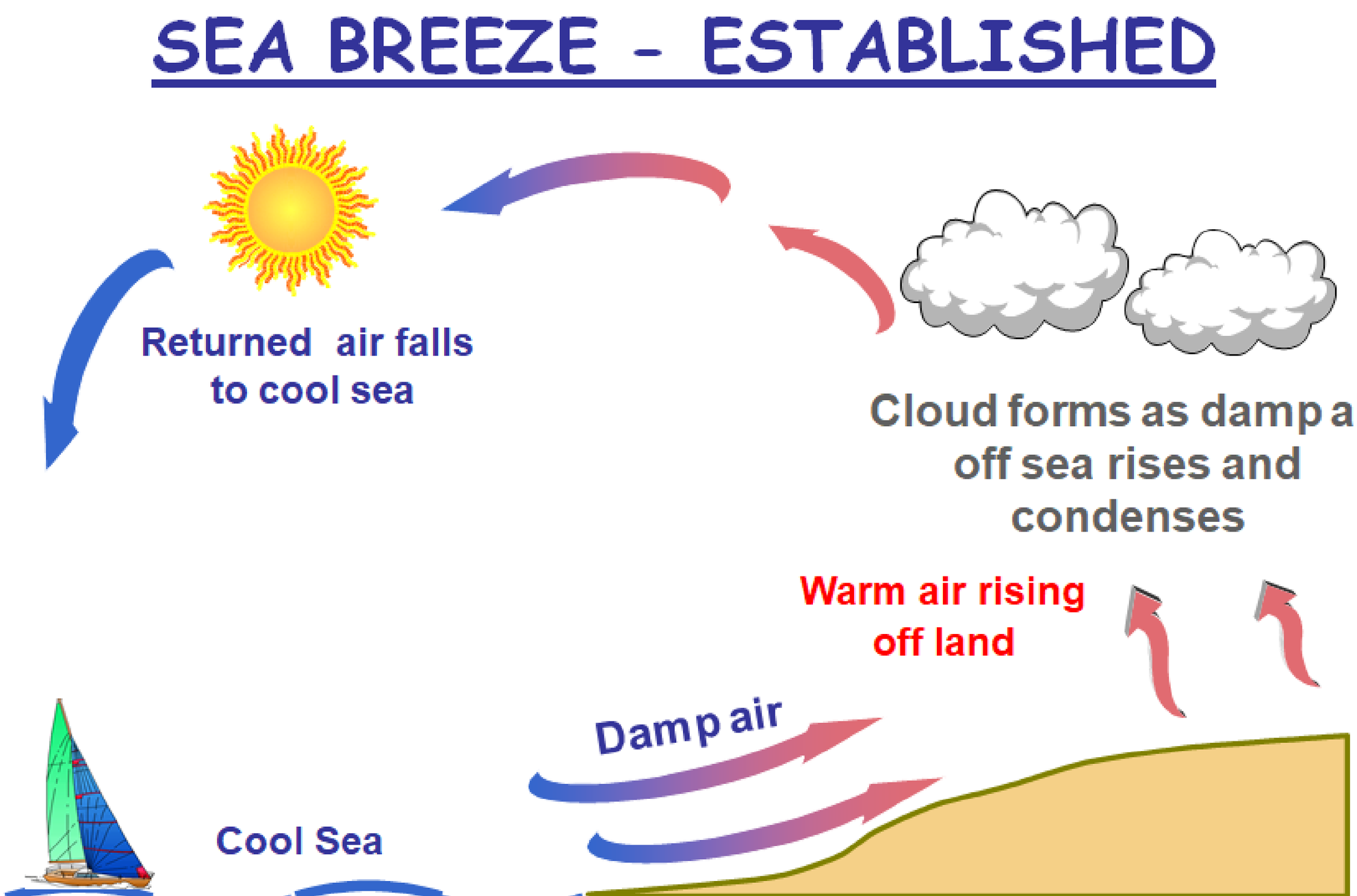
Sea Breeze

A Sea breeze is formed when the land is heated, which in turn causes the air to heat and rise. Rising air creates a low pressure over the land, this warm air flows out over the sea and cools. Cool air sinks creating a high pressure at sea level, mother nature tries to stabilise the air pressure, so cool air flows back towards land. The result is a cool (Sea breeze) flowing onto the coast.



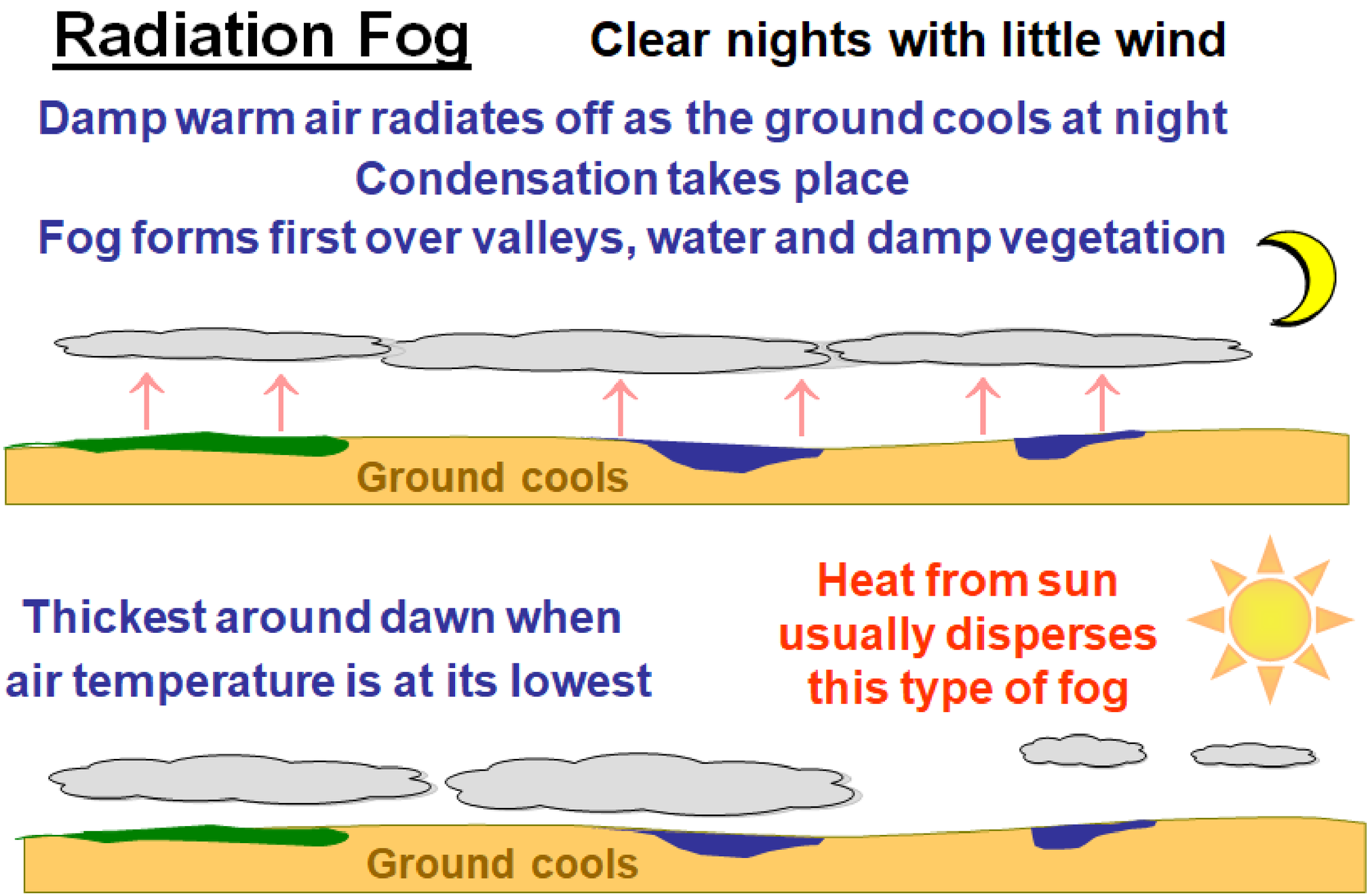
Sea Breeze

A s the day progresses the system builds and the pressure imbalance between high and low increases, causing the wind to increase in strength. You may notice clouds forming over the coast, a good sign that a sea breeze has formed.



Radiation fog

Radiation fog is formed when the ground surface cools through radiation, usually at night, cooling the air just above the ground to its saturation temperature (Dew point). At the Saturation point the air, full of water droplets that condense to form low-level clouds which we call fog.

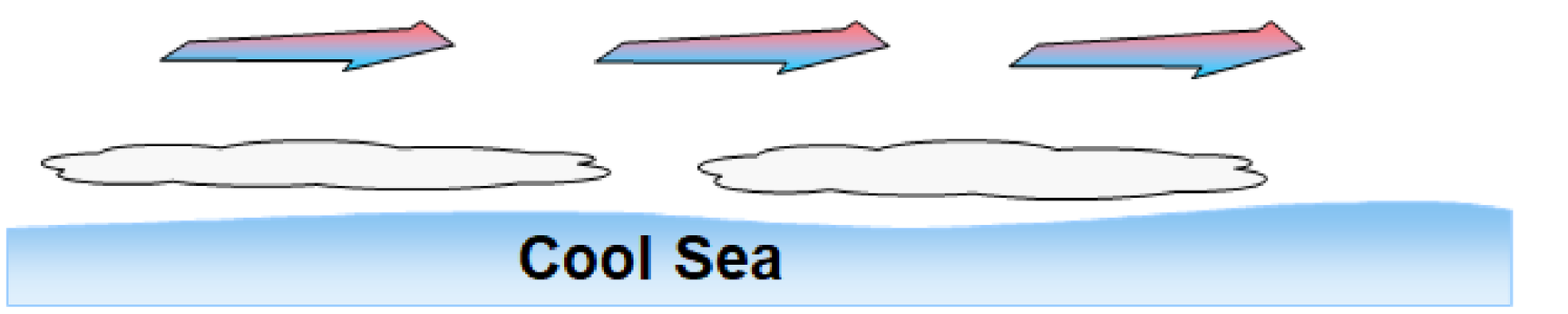


Advection fog

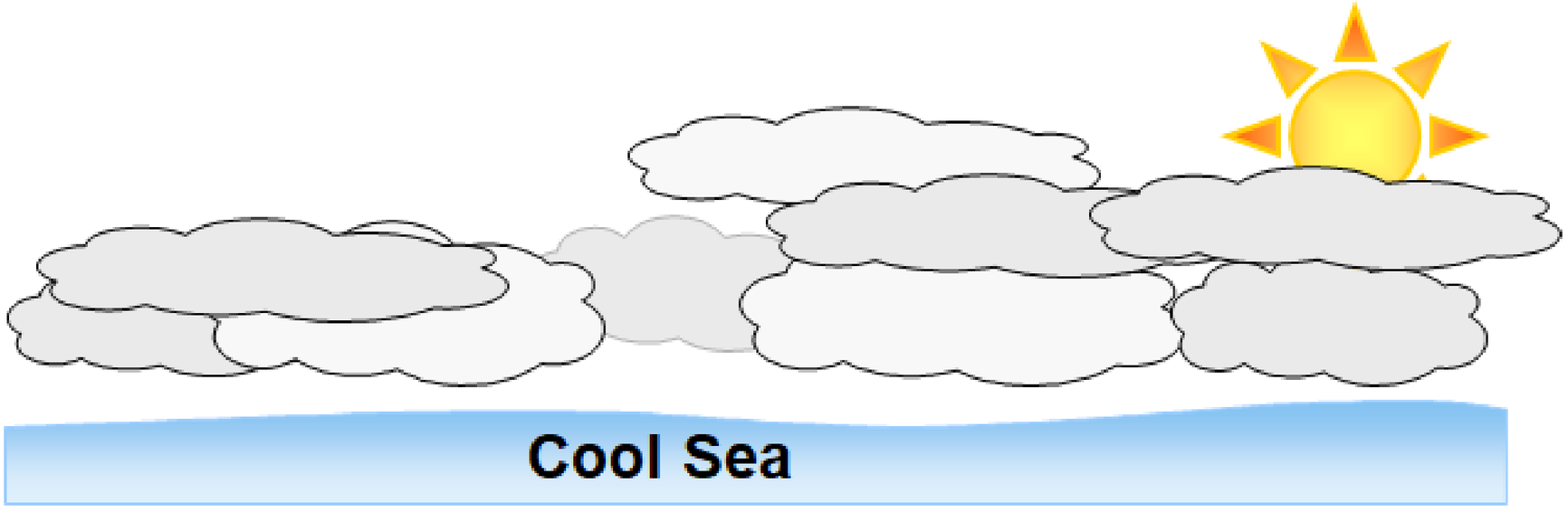
Advection fog is fog produced when air that is warmer and more moist than the ground surface moves over the ground surface. The term advection means a horizontal movement of air. Unlike radiation fog, advection fog can occur even when it is windy. Also unlike radiation fog, advection fog can occur when the skies aloft are initially cloudy.

Tropical Maritime - warm moist wind blowing over cold sea

Air cools and water vapour condenses to form fog



Force 5/6 winds will lift the fog to form low stratus cloud



Sun tends to thicken the fog by warming the air further

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