Weather Basics

Thermal Effects, Fog & Local Winds

Introduction

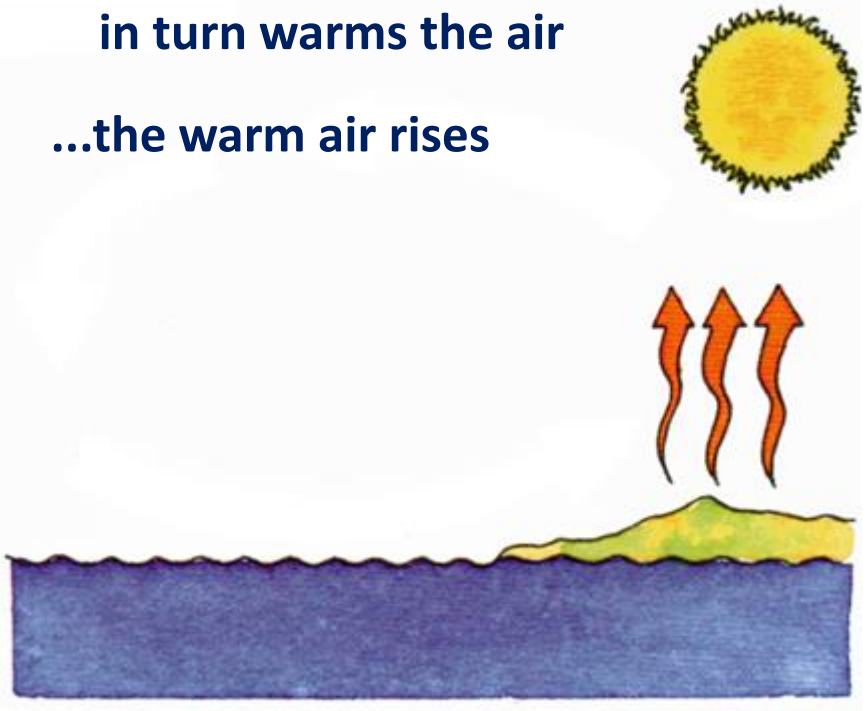
This presentation explains thermal effects, how fog forms and how land can create local winds

Sea Breeze

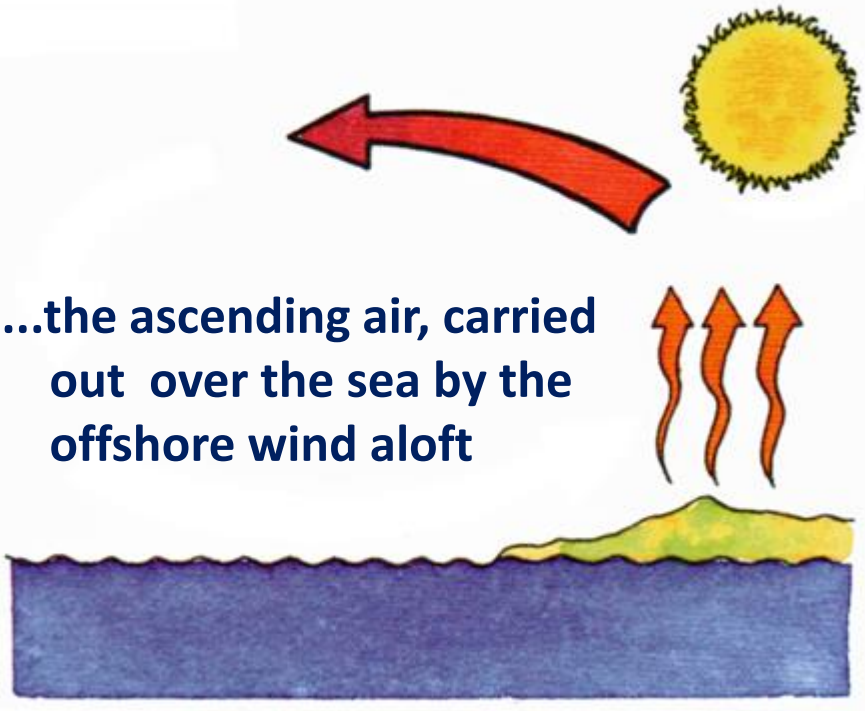
In fair weather with light to moderate offshore winds, a sea breeze is likely to develop

...the sun warms the land which in turn warms the air

...the warm air rises

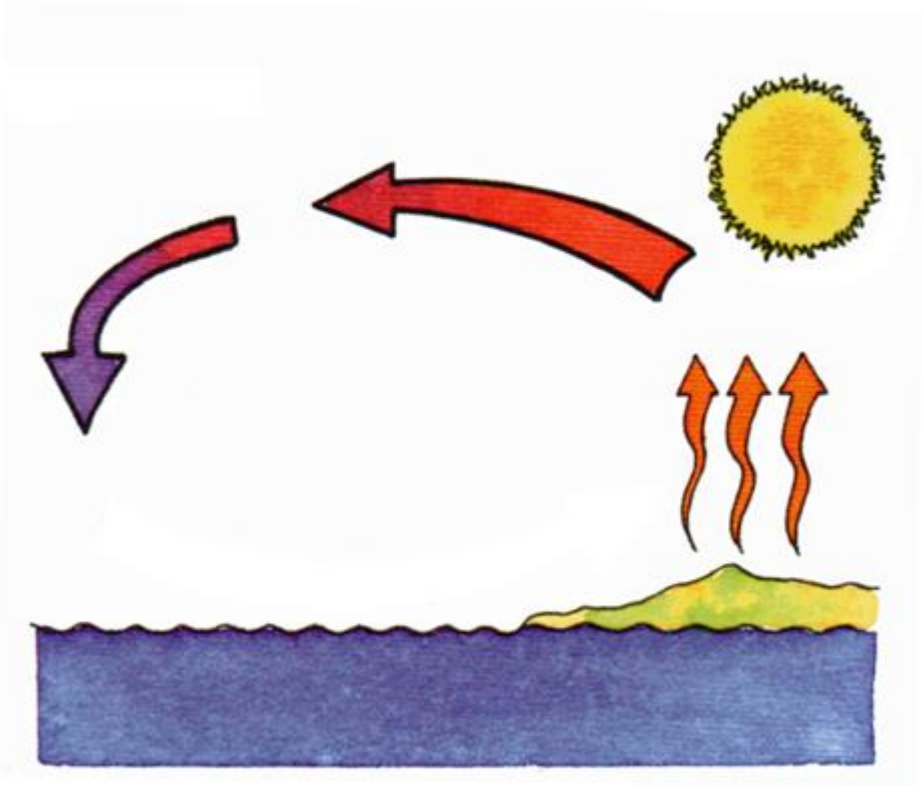


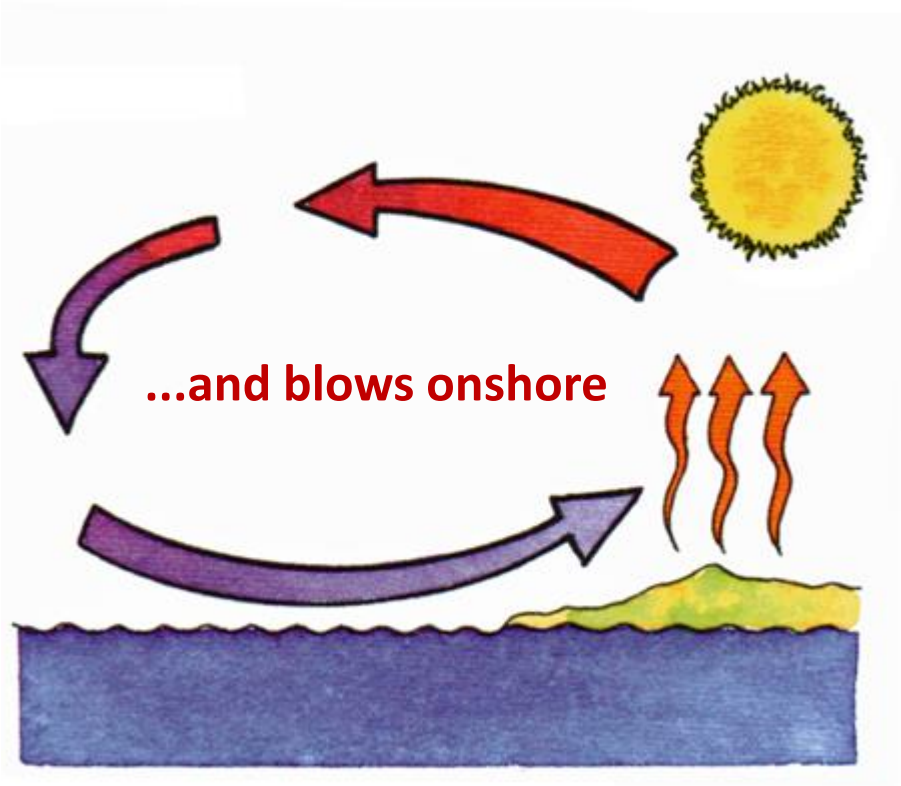
...the ascending air, carried out over the sea by the offshore wind aloft



Sea Breeze

It then cools and descends

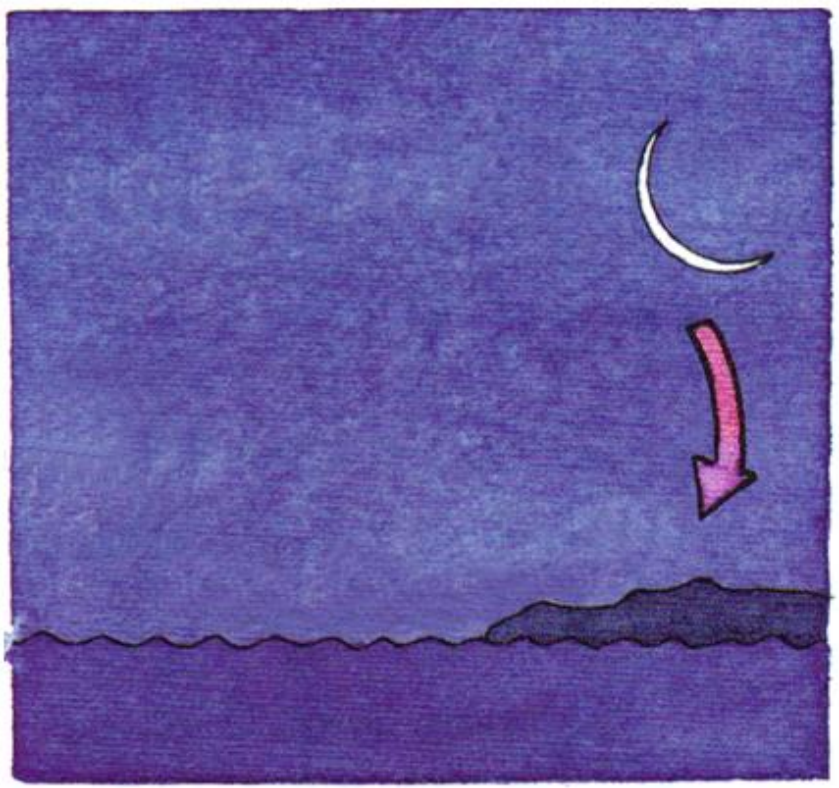


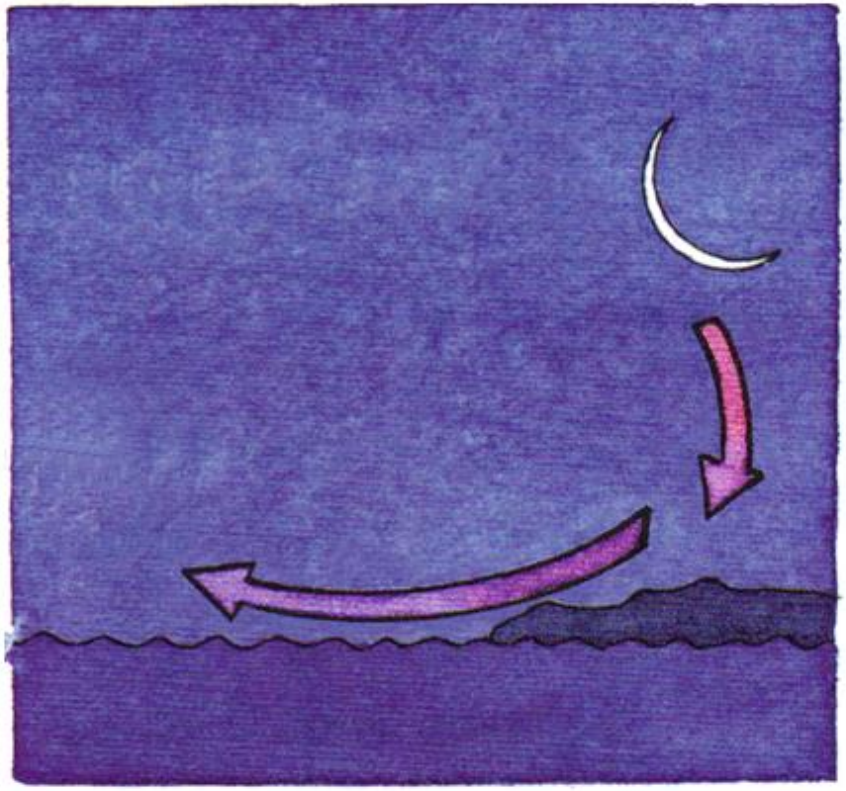


Land Breeze

This occurs on a clear night when the air cools over land, descends downhill...

...and flows out to sea

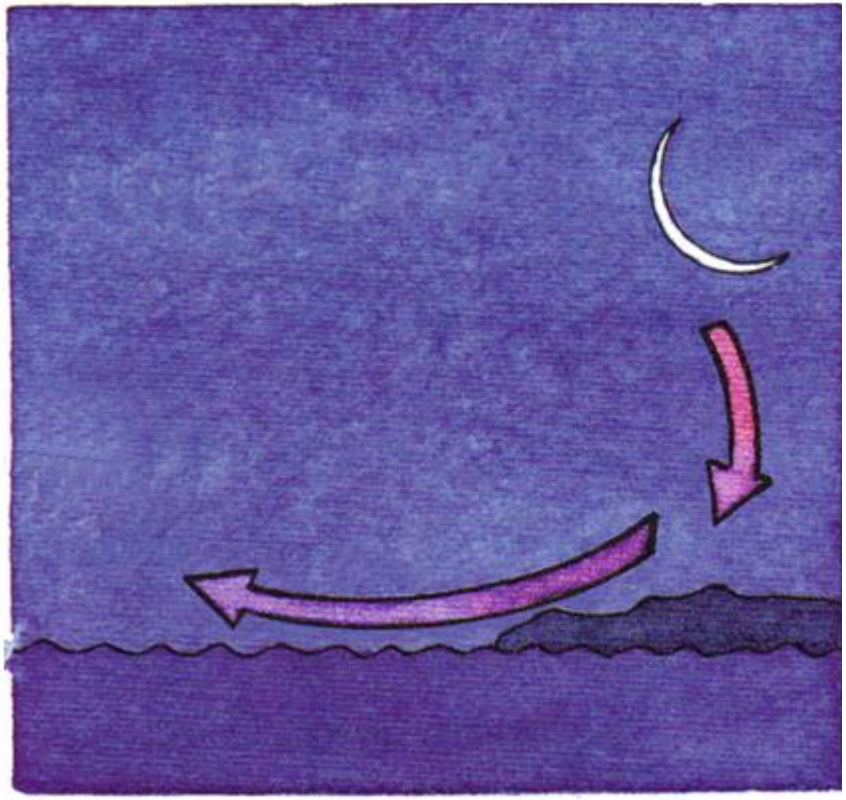


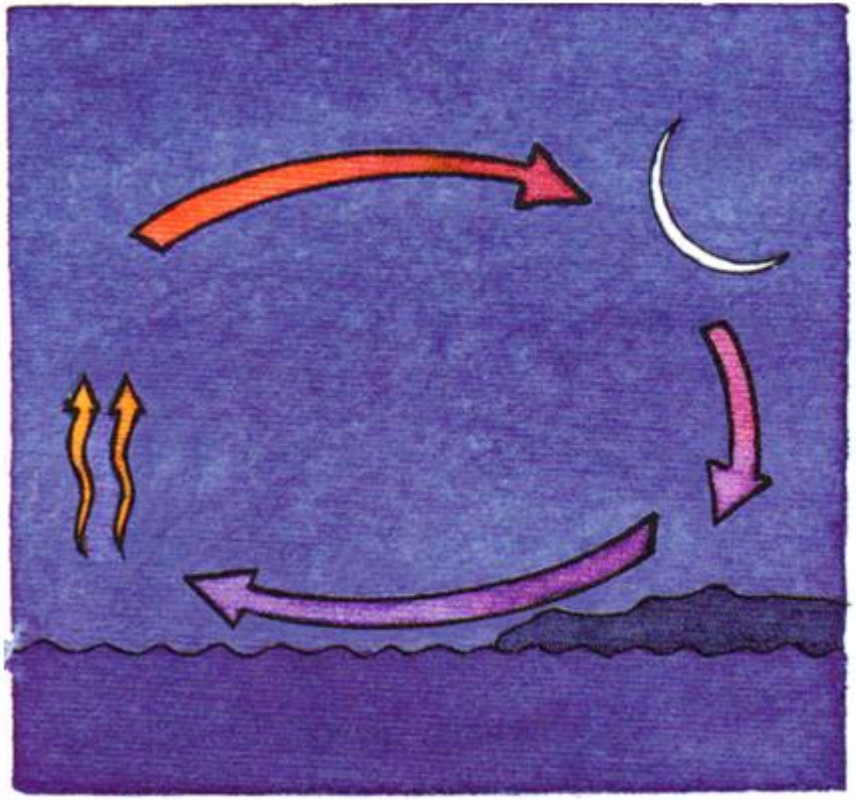


...usually the wind is light, except near mountains

Land Breeze

In regions where the sea is warm enough to lift the land breeze, a circulation may occur ...





Local Winds

Topography

Wind blowing offshore can be fluky in direction...

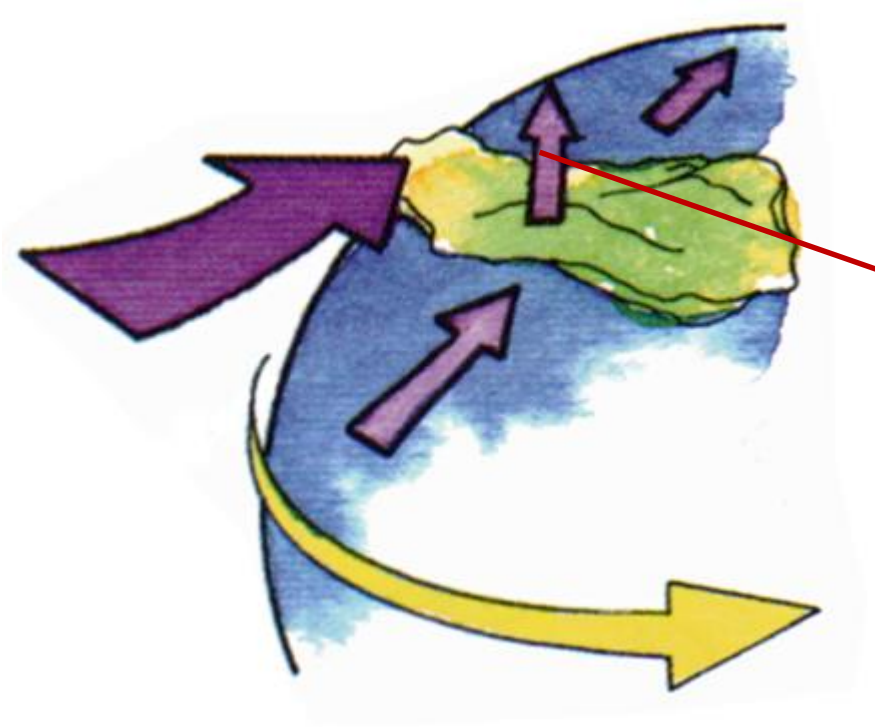
...especially when blowing off trees, buildings and cliffs etc

Local Winds

Coriolis force

Local winds often vary significantly from the forecast or gradient wind

Wind is slowed down by friction which is greater over land than sea

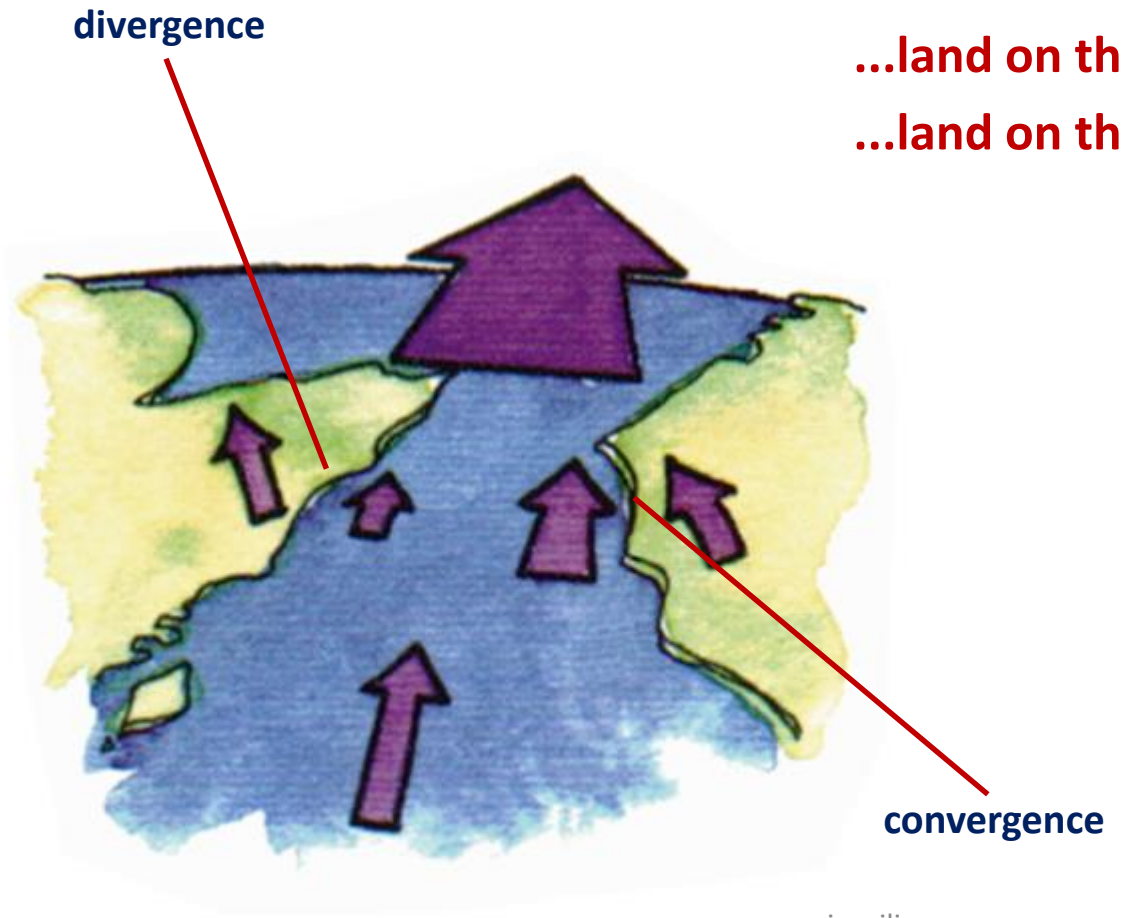


when the wind slows down, the Coriolis force causes it to back

Local Winds

Coastal divergence and convergence

When near the coast with the wind on your back...



...land on the right – stronger wind

...land on the left – lighter wind

Radiation Fog

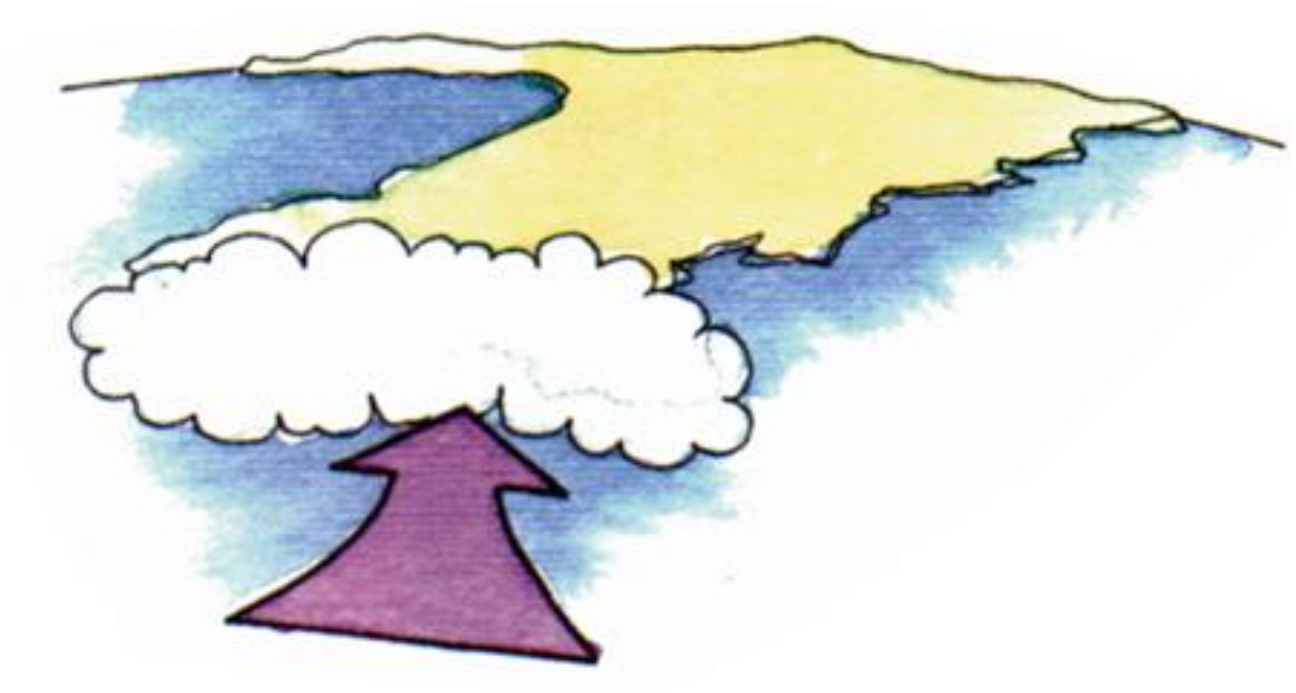
Land fog usually occurs during settled weather in autumn/winter...

...land cools down quickly at night

...moisture condenses and forms fog

Advection Fog

Advection or sea fog occurs when warm moist air blows over a colder sea...



...most common in spring when the sea temperature is at its lowest

Further Reading

We highly recommend Chris Tibbs's
RYA Weather Handbook (G1)

We highly recommend David Haughton's
RYA Weather Forecasts(G5)

You can buy a copies of these books by visiting our on-line shop at
www.penguinsailing.com