

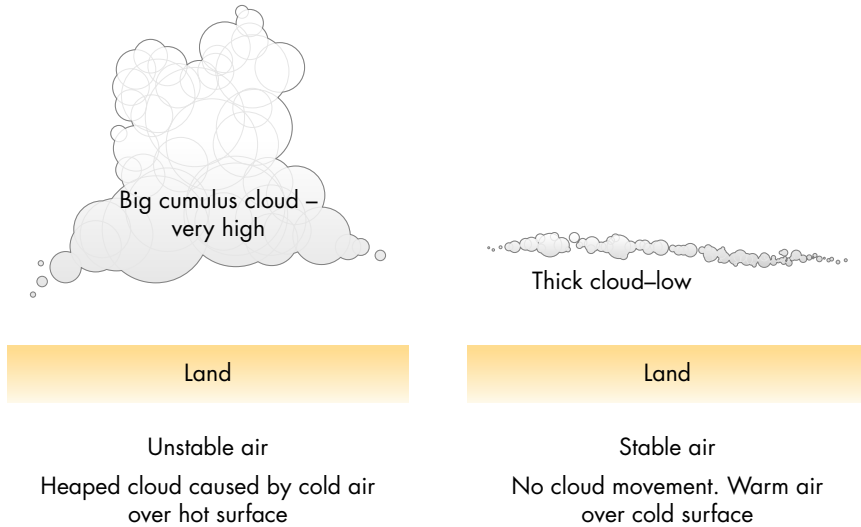
However, when thinking about what is going to happen next, remember that cold fronts move approximately at the same speed as the wind (assuming all isobars are parallel) and warm fronts move at about two-thirds of this speed.

### 10.3 Using Weather Forecasts

Having obtained and understood the weather forecasts, we now need to use them to our best advantage. Even the best sources of information are not always accurate. If you are training alone it is better to be safe than sorry. Always make sure you can get home (training in an offshore wind can be especially dangerous). If there are large waves breaking on the shore you may need to ensure there is someone who can help you recover your boat.

The typical wind from a given direction may give you an idea of what to expect on a day:

- A north wind will be coming from the Arctic, so there is very cold, dry air moving over warmer sea, giving an unstable wind.
- A north-east wind will be polar continental. In the winter the wind will be very cold, pass over warm sea and often bring snow. In the summer warm air over cool sea brings stable air, not good for sea breezes.
- A south-east wind comes from the tropical continent (a hot landmass), which produces a stable wind.
- A south-west tropical maritime is the prevailing summer wind, which in the UK brings warm moist air over a cold sea, and sometimes foggy weather.
- The north-west polar maritime is cold air moving over a warmer sea, with unstable wind, which is often squally. Therefore a north-westerly sees a warm, wet wind, which will have lots of clouds. These you can take advantage of when racing. Big grey clouds drop down wind and rain. Sail towards this (but not behind) for more wind.



### 10.3a

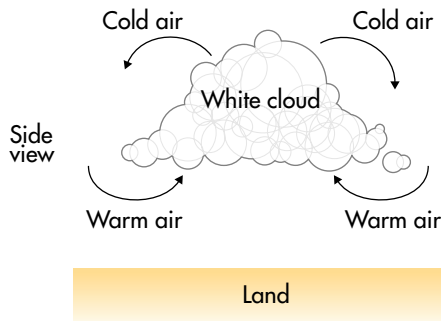
#### Stable and unstable air.

Stable air refers to the amount of mixing. How shifty a breeze is will also be determined by the amount of high landmass it has passed over. Big thick, cumulus clouds are a sure sign of air instability.

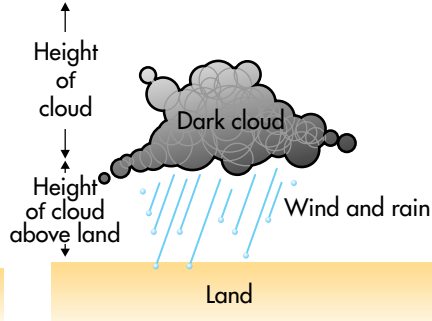
Big white clouds suck up wind. Avoid them at all costs; try and stay under the patches of blue sky! Head for dark clouds which are dropping wind and rain, but do not sail directly under them as you get lifted around the outside of the cloud. The clouds drop wind and rain when their height is greater than the height they are above the land/sea.

In the northern hemisphere we get several types of breezes. North-easterly breezes are wet and cold and (no surprise) they tend to come in the winter (Brrrrrrr!). In the summer we get a south-westerly wind that changes as different fronts move across. On the south coast, especially in the south west of England, the north east wind will have come over lots of land so will be especially shifty, whereas the south west wind has not passed over much land and is therefore not as shifty.

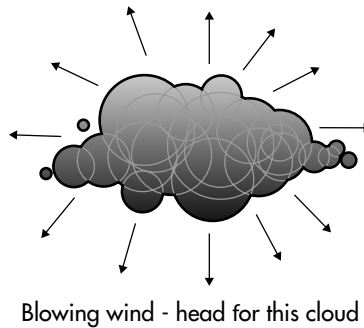
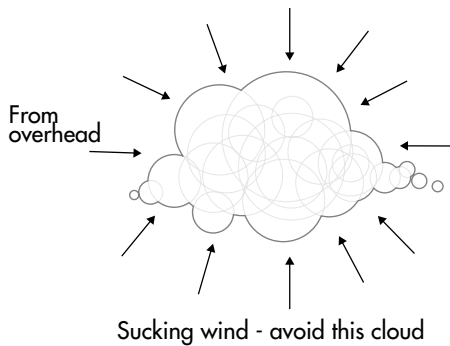
Remember, no one can get the weather forecast right all the time, and even with accurate observation the weather can be very unpredictable and may change very quickly!



Cumulus



A rain cloud rains when the cloud height is greater than or equal to its height above the land or sea. When the cloud rains, it gets smaller. The cloud's height reduces to a point where it is less than the height above the land or sea. Then it stops raining.

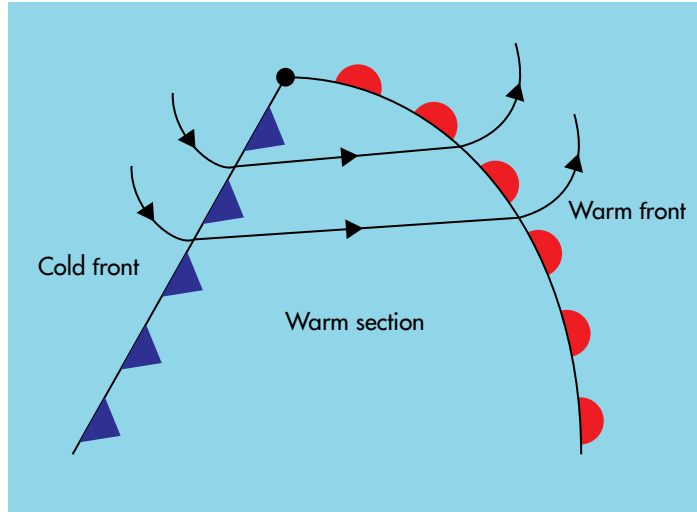


### 10.3b The effect of clouds sucking and dropping wind.

When the weather does unexpected things (and it often does), perhaps the most important thing is to be able to refocus and get on with the race (collecting as few points as possible!)

## Fronts

If a front is going through, you can expect the wind to vary according to the front. Try and find out when the front is going to come through, and nearer the time look for signs of it. Clouds are formed by air lifting and cooling until the water it contains cools enough to condense. Clouds are a very useful form of information.

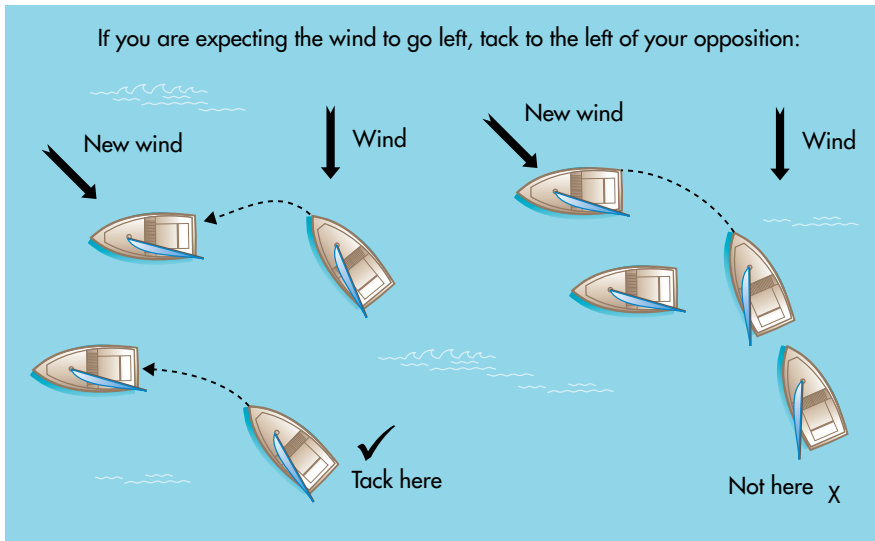


### 10.3c Passing fronts.

Front	Some signs (some or all may occur)
Low pressure	High cirrus clouds, the wind backs, and the barometer falls.
Approaching warm front	Cloud thickens and lowers. It then rains, and the barometer falls. The faster it falls the stronger the wind. The wind backs south and it continues to rain.
Warm front arrives	Rain breaks, and the wind veers to the south-west. The barometer steadies, and the air temperature rises, leading to steady wind from the south-west (and steady pressure), low cloud, and possible drizzle or mist.
Cold front passes	Wind backs, then increases and veers. The wind can be squally before the cloud breaks, the rain stops and the sky clears. Pressure rises suddenly.
Occluded front	Thickening and lowering of cloud; the barometer falls slowly and the rain increases as the front arrives. As the front passes you get sunshine and showers. The barometer slowly starts to rise.

## Local Effects

The smaller the race course or the quicker the races, the more local any effects are. There may be just one shift a beat. In terms of your fleet positioning you may need to protect one side. If you are expecting the wind to shift that way, you should have 'a lane' and can carry on sailing without ending up being lee-bowed (a boat under you to leeward giving you bad wind) or rolled (a boat to windward giving you bad wind).



### 10.3d

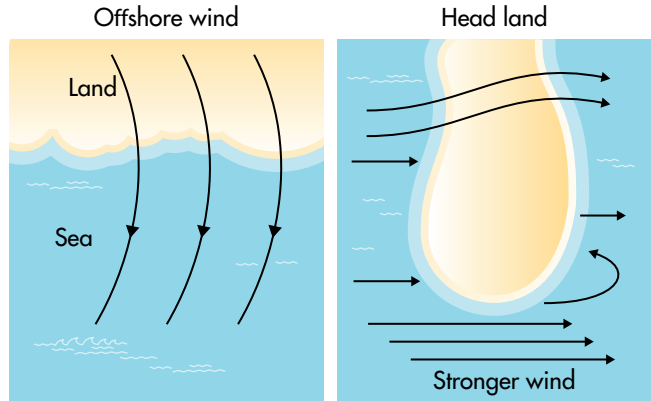
#### Finding and holding a lane.

Often the last race of a series may be a medal race, which will be very short and held close to land. This means that the local topography will have more effect than the overall weather system. The wind will back over the land. If the course is close to shore this can be crucial.

If the land becomes warmer than the sea, a sea breeze can develop. There needs to be a light offshore breeze (under 15 knots) and a slack pressure gradient. If you start to see cumulus (big, white, fluffy) clouds developing over the land, there is convection and you should expect a wind of around 15 knots, or even more, to develop.

## 10.3e

The land's effects on the wind for onshore and offshore winds in relation to the forecast.

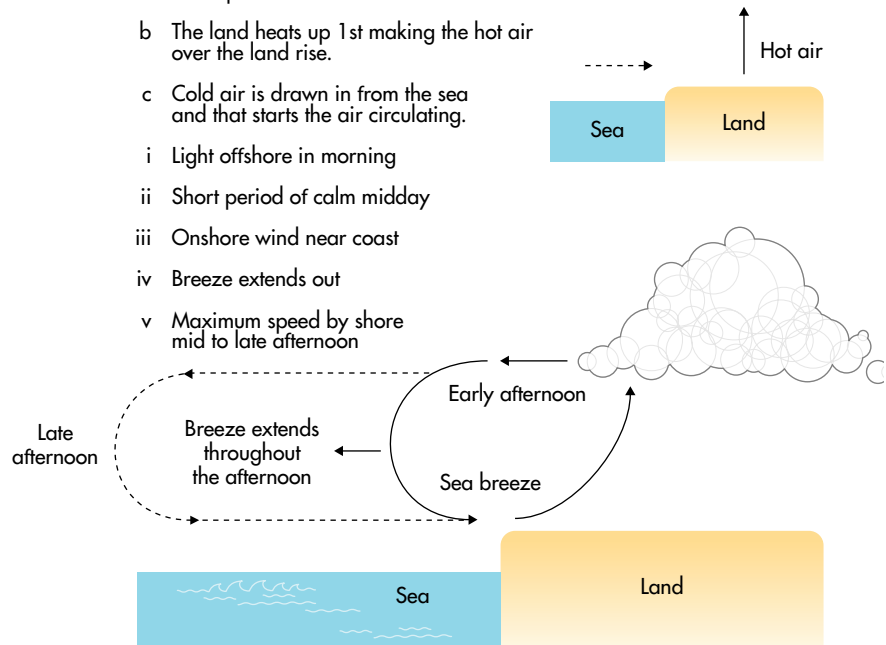


a The sea breeze is caused by the difference in temperature between the land and the sea.

b The land heats up 1st making the hot air over the land rise.

c Cold air is drawn in from the sea and that starts the air circulating.

- i Light offshore in morning
- ii Short period of calm midday
- iii Onshore wind near coast
- iv Breeze extends out
- v Maximum speed by shore mid to late afternoon



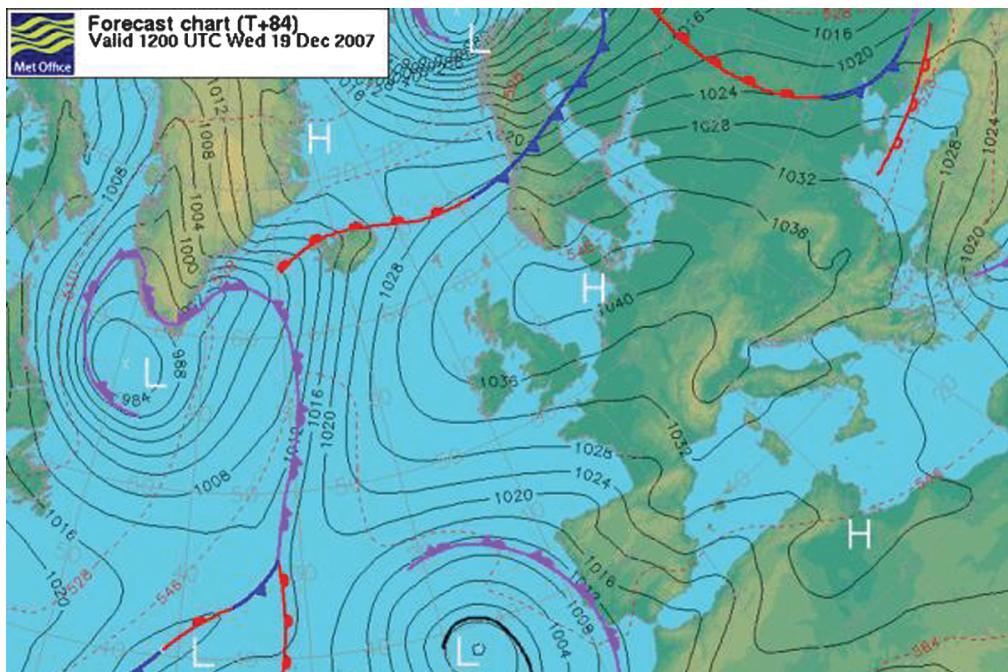
## 10.3f

Sea breeze.

### Advice from Joe Glanfield:

Because, in general, dinghy racing is on such short courses, the Met. plays a slightly strange role in the racing we do now, but I still think it is essential to know and understand 'the golden rules' of the Met. Most dinghy racing is held very close to land, so understanding the theories of various land effects on the wind often comes into use.

I always check a weather forecast before a race day, just in case there is a change through the day. For instance, if the wind is forecast to back through the day you might push further into left shifts before tacking.



**10.3g** Surface pressure forecast © Crown copyright 2007, the Met Office.