What most affects a seaman's (and your) life?

The Weather….?

Never go to sea without a weather forecast

On land

- TV
- National radio
- Local radio
- Newspaper
- Teletext
- Web
- Mobile phone
- Barometer

At sea

- BBC radio
- Coastguard VHF
- Metfax to PC
- Navtex
- Barometer
- Observation
- Mobile phone

The Shipping Forecast

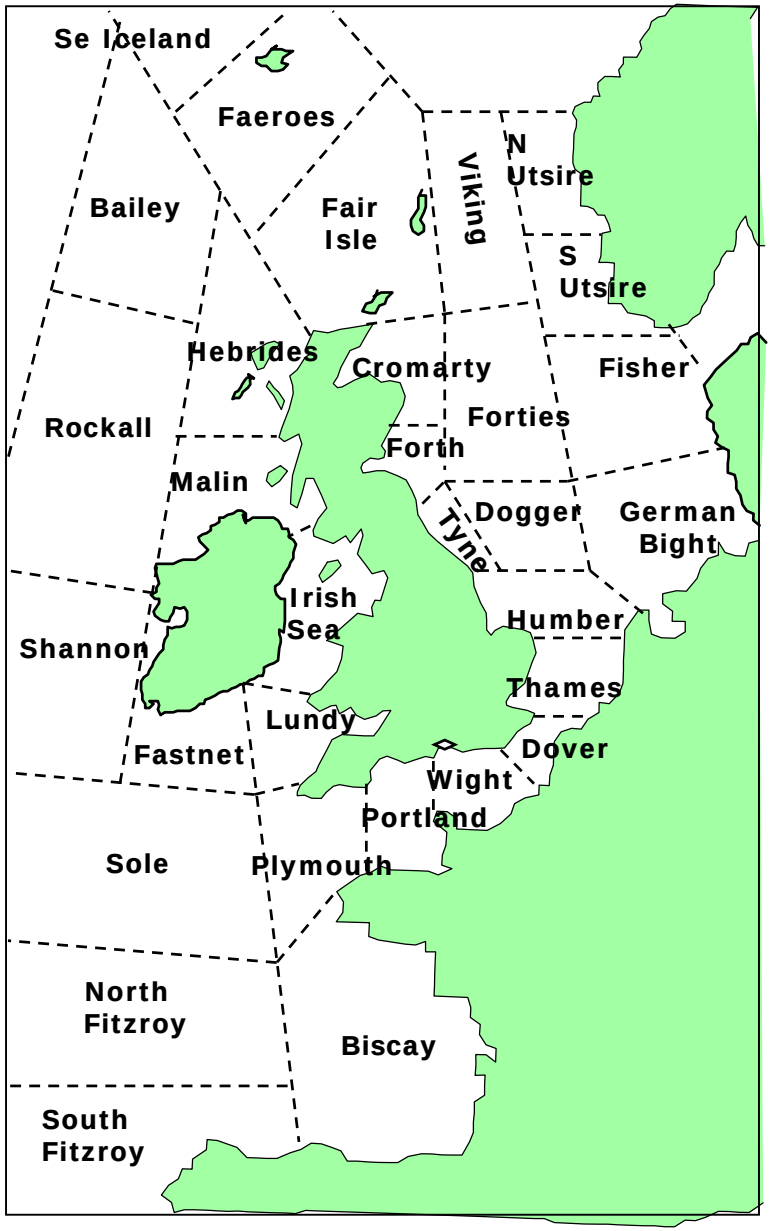
(0048, 0535, 1201, 1754 BBC LW)

1. Gale warning summary
2. General synopsis at time of issue
3. Sea-area forecasts:

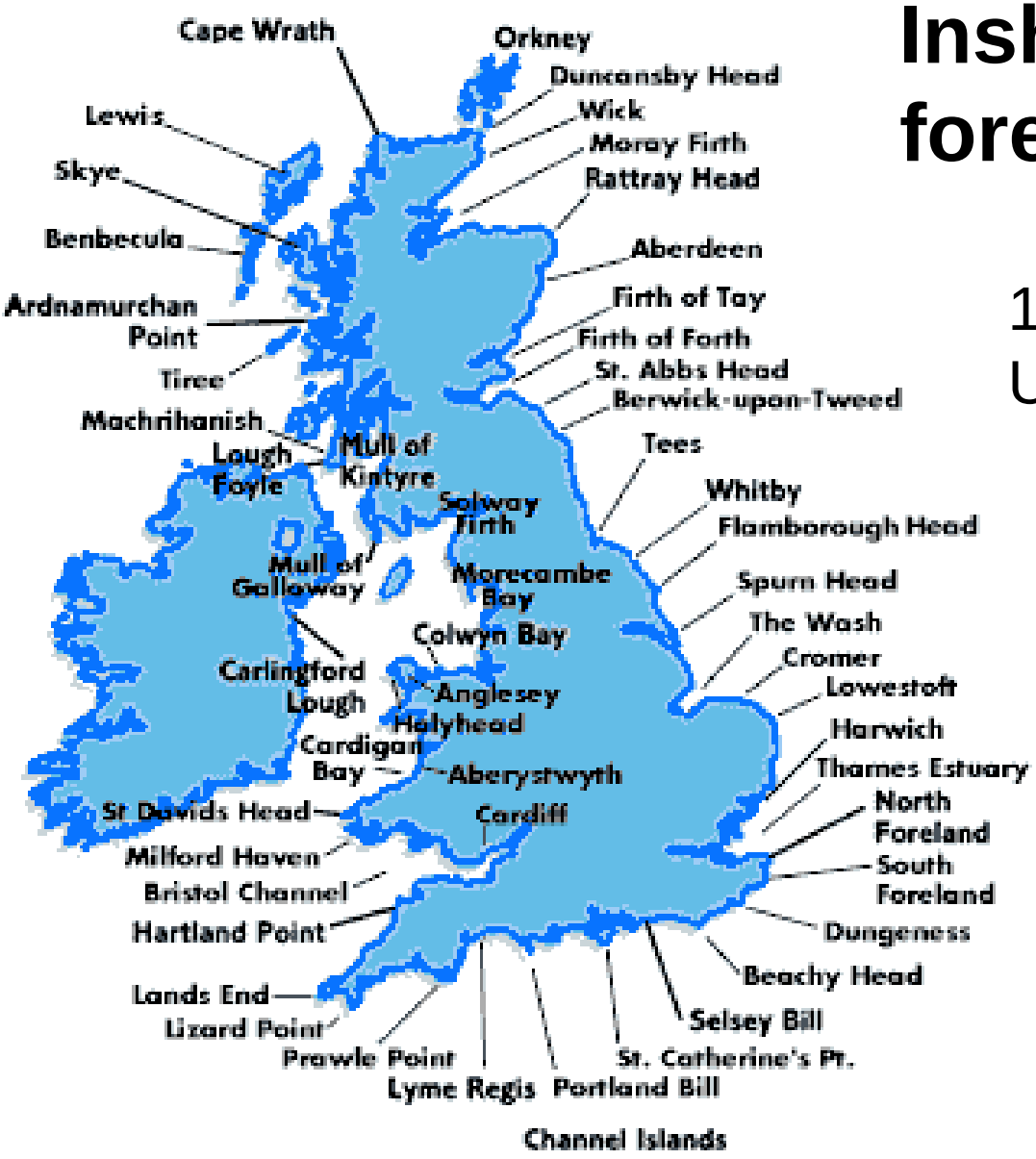
- Wind direction and speed
- Wind later
- Sea state
- Weather (ie rain, showers)
- Visibility

Reports from Coastal stations

Gale warnings are broadcast at the first available programme break



www.metoffice.com/education/curriculum/leaflets/shipping.html



Inshore waters forecast:

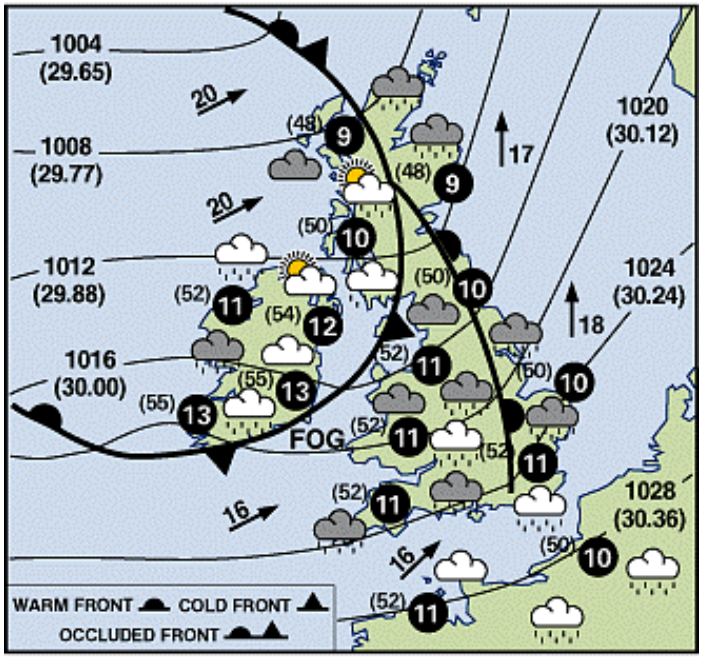
12 miles offshore of the UK coast

- Includes sea state
- + 24 hour outlook

Shipping forecast

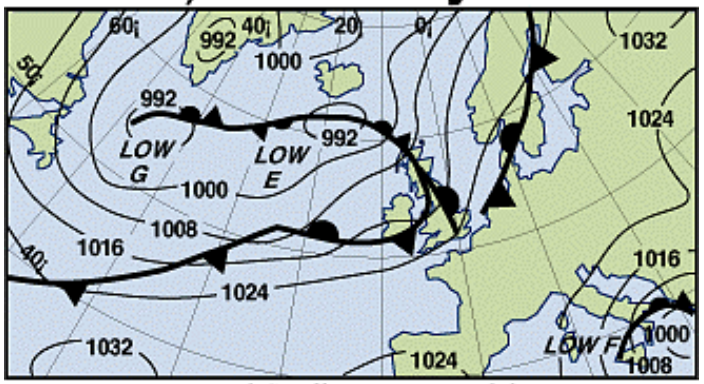
- The shipping forecast issued by the Met Office, on behalf of the Maritime and Coastguard Agency, on Monday 04 February 2008 at 1130
- There are warnings of gales in Viking, North Utsire, South Utsire, Forties, Cromarty, Tyne, Dogger, Fisher, German Bight, Humber, Thames, Dover, Wight, Portland, Plymouth, Biscay, FitzRoy, Sole, Lundy, Fastnet, Irish Sea, Shannon, Rockall, Malin, Hebrides, Bailey, Fair Isle, Faeroes
- **The General synopsis at 0600**
  Complex low Rockall 965 expected Faeroes 972 by 0600 tomorrow. Atlantic low moving rapidly northeast expected Ireland 977 by same time
  The area forecasts for the next 24 hours
  Viking, North Utsire, South Utsire, East Forties
  Southeasterly 6 to gale 8, occasionally severe gale 9 except east Forties. Very rough or high becoming rough. Rain or showers. Moderate or good
  West Forties, Cromarty, Forth
  Southerly 6 or 7, occasionally gale 8 except Forth, becoming cyclonic 5 or 6 later. Moderate or rough. Showers, rain later. Good becoming moderate
  Tyne, Dogger
  Southwest backing south 5 to 7, perhaps gale 8 later. Moderate or rough. Showers, rain later. Good becoming moderate
  Fisher
  Southeast veering south 6 to gale 8. Rough or very rough. Rain or showers. Moderate or good
  German Bight, Humber, Thames, Dover
  South or southwest 5 or 6, increasing 7 or perhaps gale 8 later. Moderate or rough, occasionally very rough later. Showers, rain later. Moderate or good
  Wight, Portland, Plymouth
  Southwesterly 5 or 6 increasing 7 or gale 8. Moderate or rough, becoming very rough or high in Portland and Plymouth. Showers, rain for a time. Good, becoming moderate or poor

Forecast for Noon Wed 25



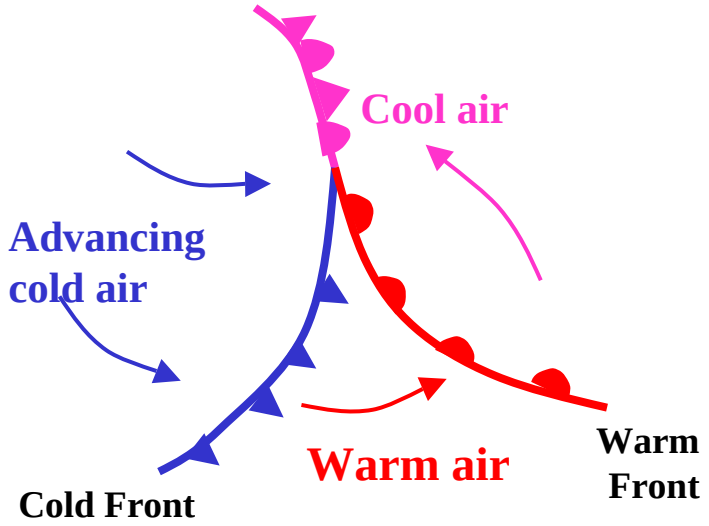
Black circles; temps in¡C (¡F in brackets). Arrows: wind speed in mph. Pressure in millibars (inches in brackets)

Atlantic, Noon Today



Lows E and G will move east and deepen. Low F will also move eastwards.

Occluded Front



An **occluded front** is formed when the faster moving cold front overtakes and merges with the warm front. Typical weather is cloudy, with light rain and poor visibility

BUYS-BALLOTS LAW

Christoph Buys-Ballot was a 19th century Dutch meteorologist. His Law says that in the Northern Hemisphere, if you stand with your back to the wind, the area of low pressure is to your left and the high to the right.

This is useful because lows bring bad weather - cloud, rain and snow - and highs usually bring sun shine and clear skies.

It results from the Earth's rotation, which deflects to the right air moving from areas of high pressure to areas of low in the Northern Hemisphere, due to the Coriolis effect. In the Southern Hemisphere, the effect is reversed.

The Beaufort Scale of Wind Force

	Wind Speed	Description	Waves
1	1 - 3	Light airs	Ripples.
2	4 - 6	Light breeze	Small wavelets
3	7 - 10	Gentle breeze	Occasional crests.
4	11- 16	Moderate breeze	Frequent white horses
5	17- 21	Fresh breeze	Moderate waves, many white crests.
6	22 - 27	Strong breeze	Large waves, white foam crests.
7	28 - 33	Near gale	4m waves. Sea heaps up, spray, breaking waves, foam blows in streaks.
8	34 - 40	Gale	Moderately high waves (5.5m), breaking crests. Foam blown in streaks.
9	41 - 47	Severe gale	High waves (7m), spray affects visibility. Dense streaks of foam along the direction of wind; crests of waves begin to topple and roll over.
10	48 - 55	Storm	Very high waves (9m) long breaking crests
11	55 - 63	Violent Storm	11m waves Sea covered in foam. Visibility affected.
12	64 +	Hurricane	11m+ waves The air is filled with foam and spray; sea completely white with driving spray; visibility very seriously affected

Shipping Forecast Terms

Gale Warnings - Timing

Imminent = within 6 hours of issue

Soon = within 6 - 12 hours

Later = after 12 hours

Wind

Veering - changing direction clockwise

Backing - changing direction anticlockwise

Cyclonic - rapid changes in direction

Direction - where the wind comes from

Pressure Tendency

Steady: < 0.1 mb in 3 hrs

Slowly: 0.1 to 1.5 mb in 3 hrs

Rising/Falling: 1.6 to 3.5 mb in 3 hrs

Quickly: 3.6 - 6.0 mb in 3 hrs

Very Rapidly: > 6.0 mb in 3 hrs = Gale

Pressure System - speed of movement

Slowly - up to 15 kn

Steadily - 15 - 25 kn

Rather quickly – 25 - 35 kn

Rapidly – 35 - 45 kn

Fair = No precipitation

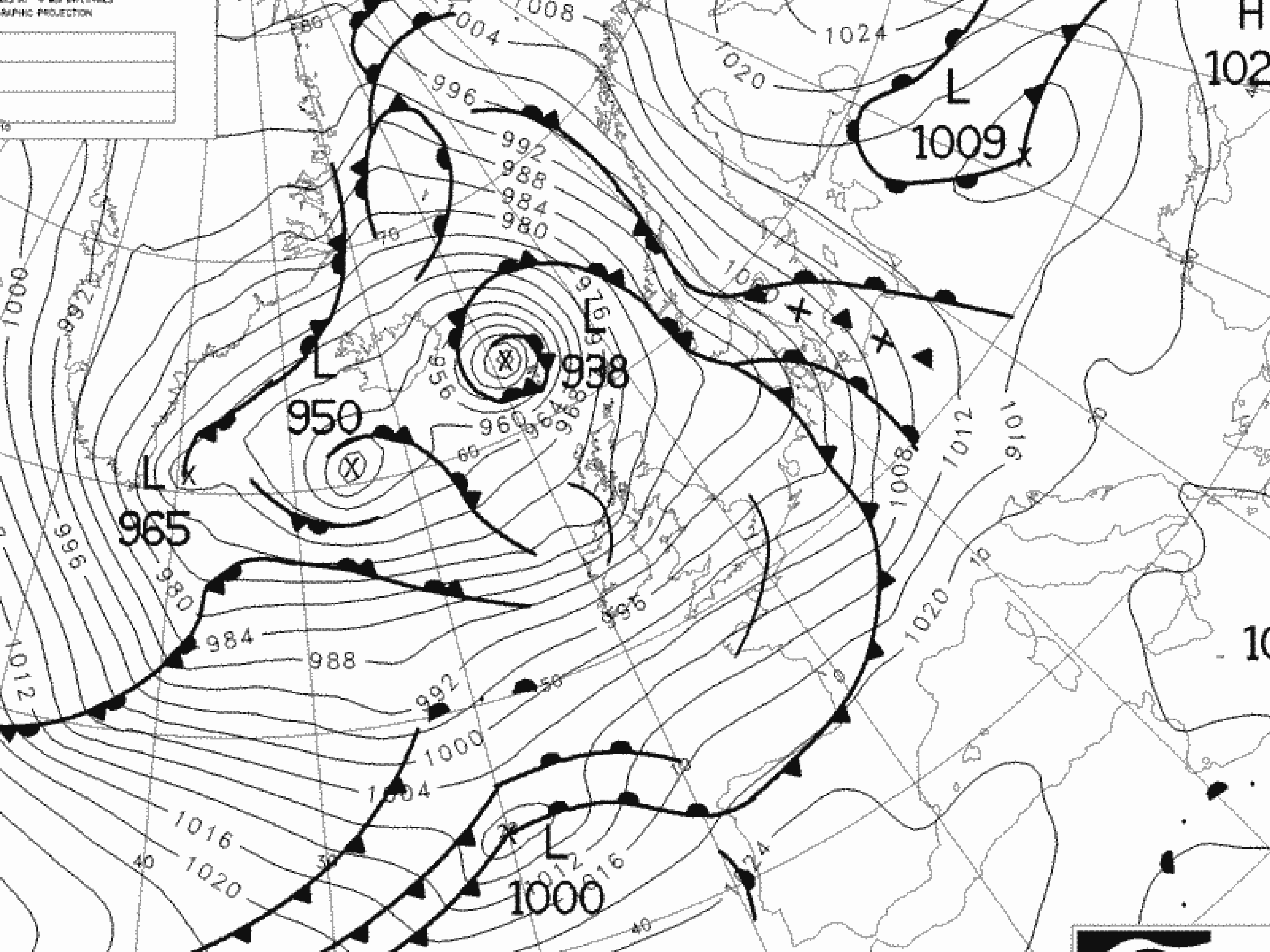
Visibility

Very poor = < 1000 metres

Poor = < 2 Miles

Moderate = 2 - 5 Miles

Good = > 5 Miles



L
938
L
950
L
965
L
1000
L
1009
H
1008
1004
996
992
988
984
980
976
960
964
968
956
1024
1020
1000
1012
1016
1008
1012
1016
1020
996
980
984
988
992
1000
1004
1016
1020
1012
1016

STATUS REPORTS

CHICHESTER HARBOUR MASTER

Updated 05 January
Sun 08 Feb: CYC - Snowflake 15.
Sat 14 Feb: HISC - 29 TT.
Sun 15 Feb: HISC - 29 TT. CYC -

SITE STATUS

9 Feb 2009
WARNING
The depth gauge is currently not reading correctly. It is overreading by about 1 metre.

CSG

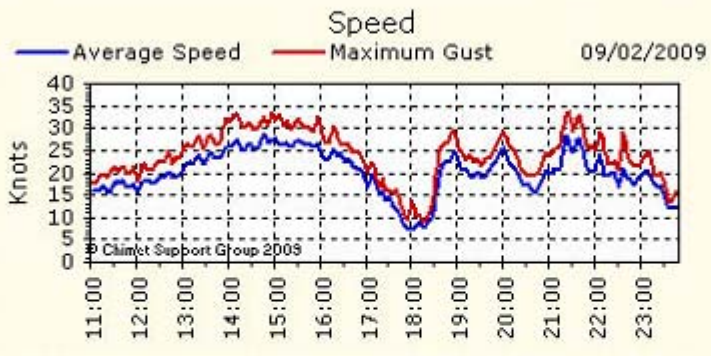
Built by Emworx

WEATHER REPORTS FROM CHICHESTER BAR

Latest Report | Wind | Sea | Atmospheric Conditions | Tides
Archives | Technical Notes | About CHIMET | CSG

Tuesday, 10 February 8:31 am

Wind « Latest Report



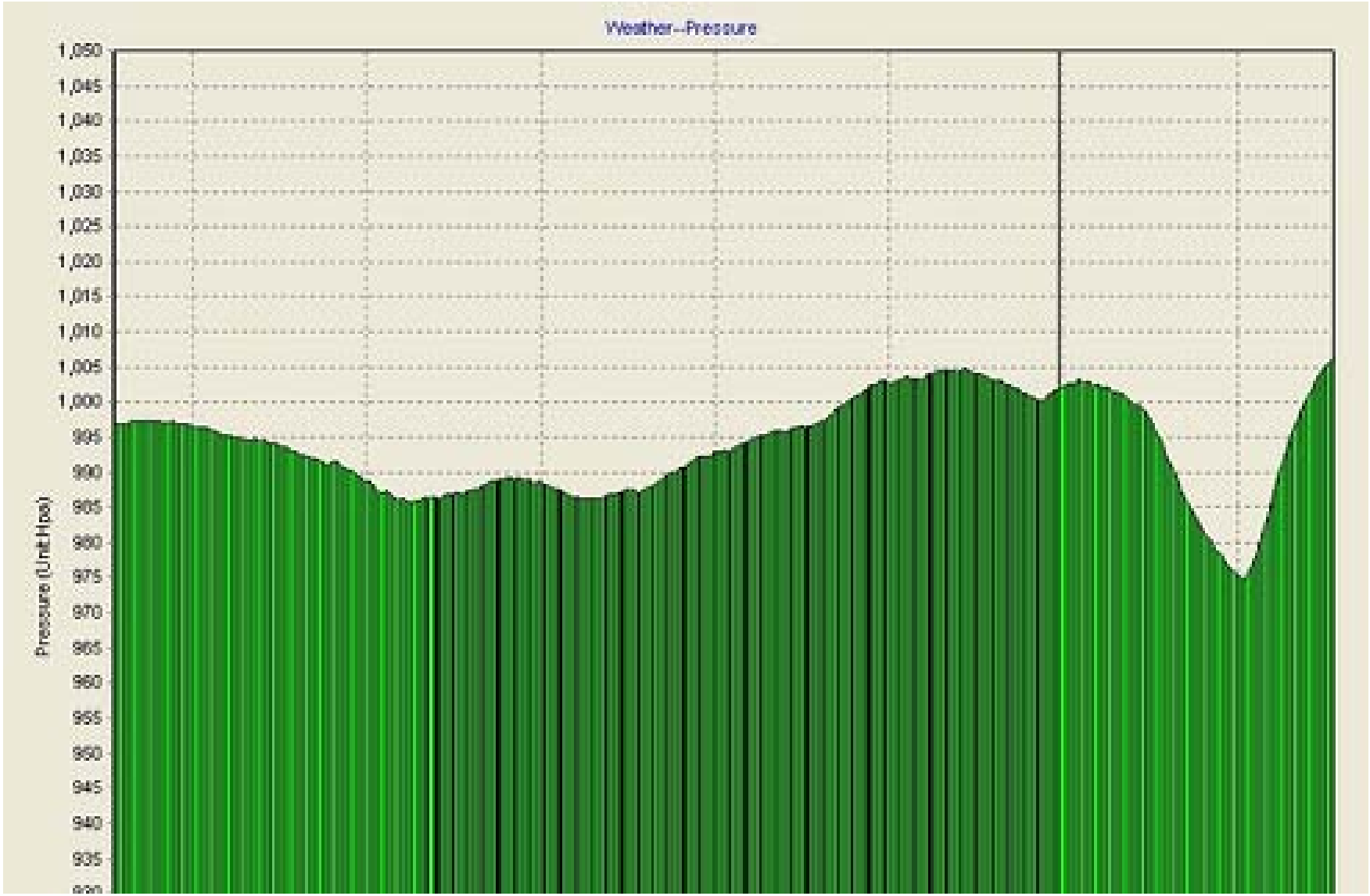
ASSOCIATED SITES:

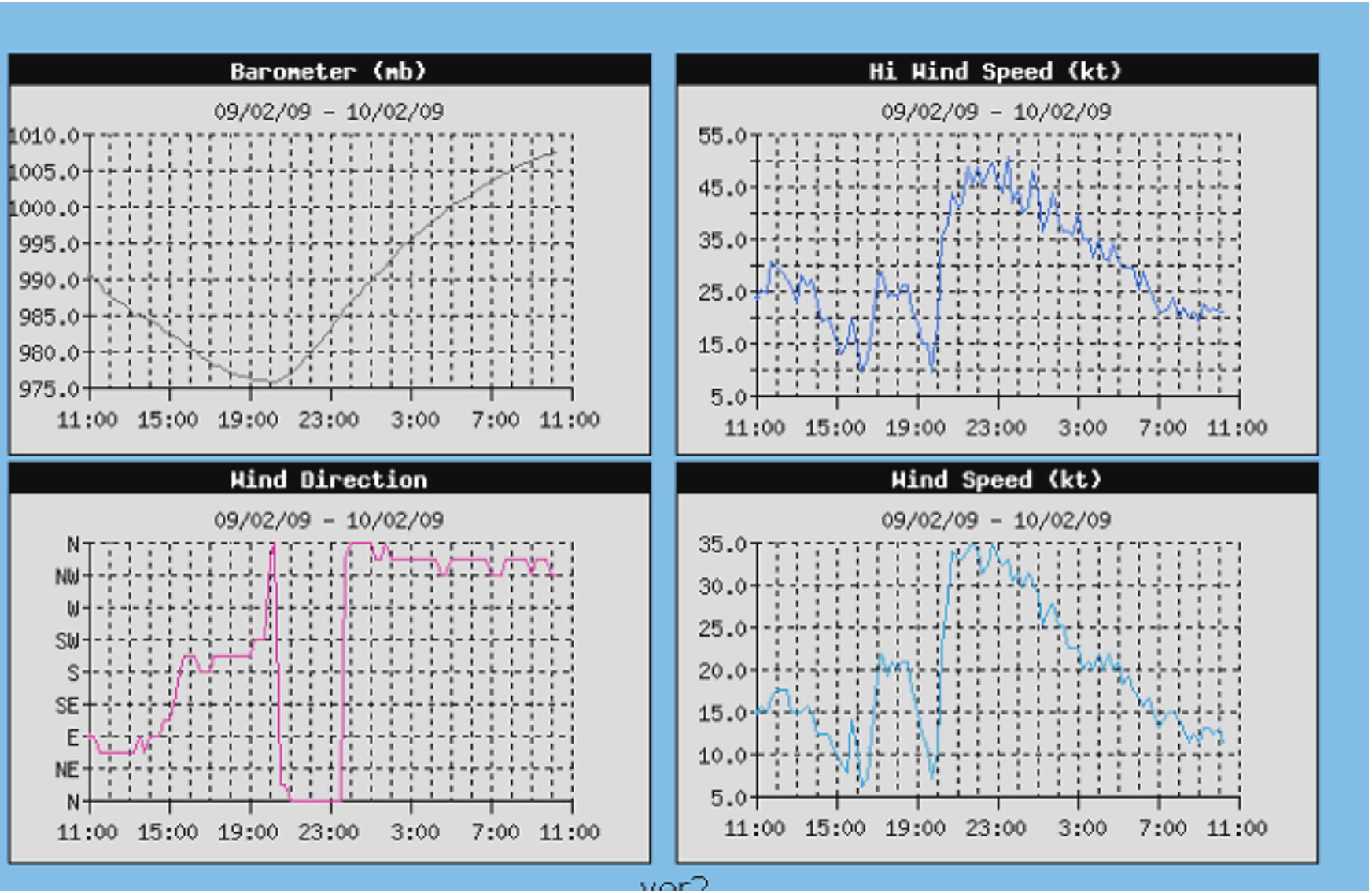
CAMBERMET.CO.UK
BRAMBLEMET.CO.UK
SOTONMET.CO.UK

Larger Map »

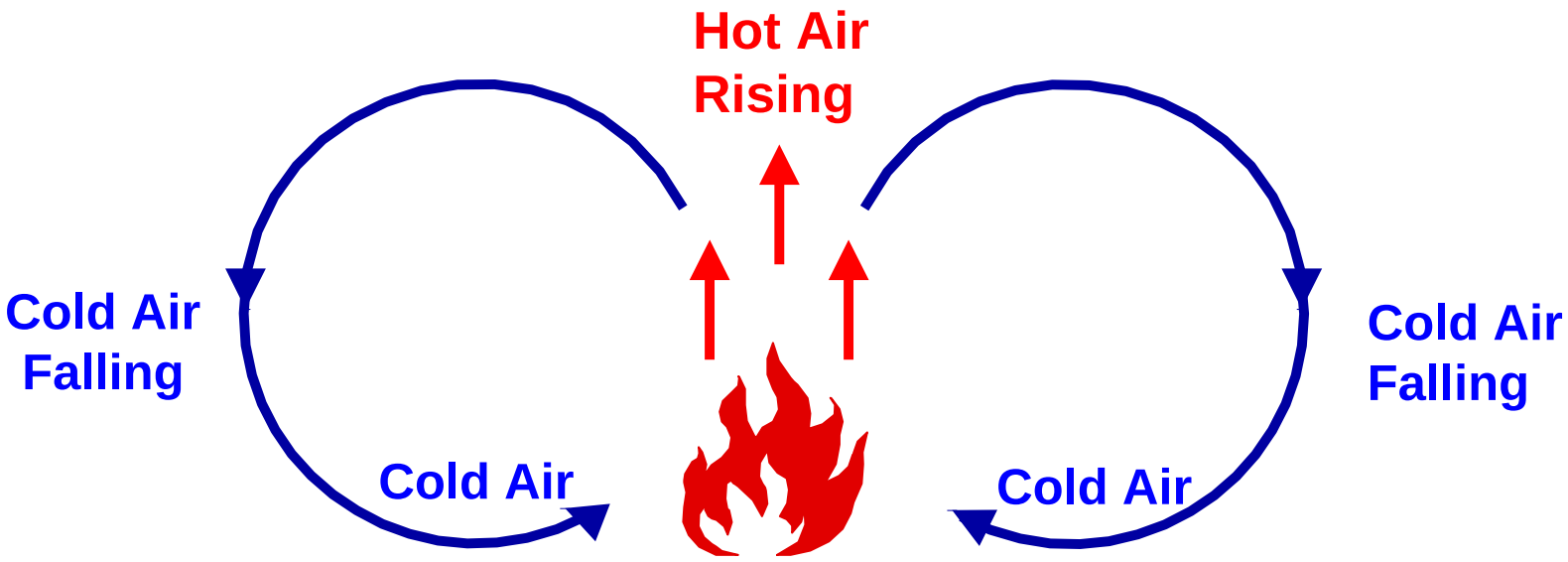
FUNDED & SUPPORTED BY

CHICHESTER HARBOUR FEDERATION





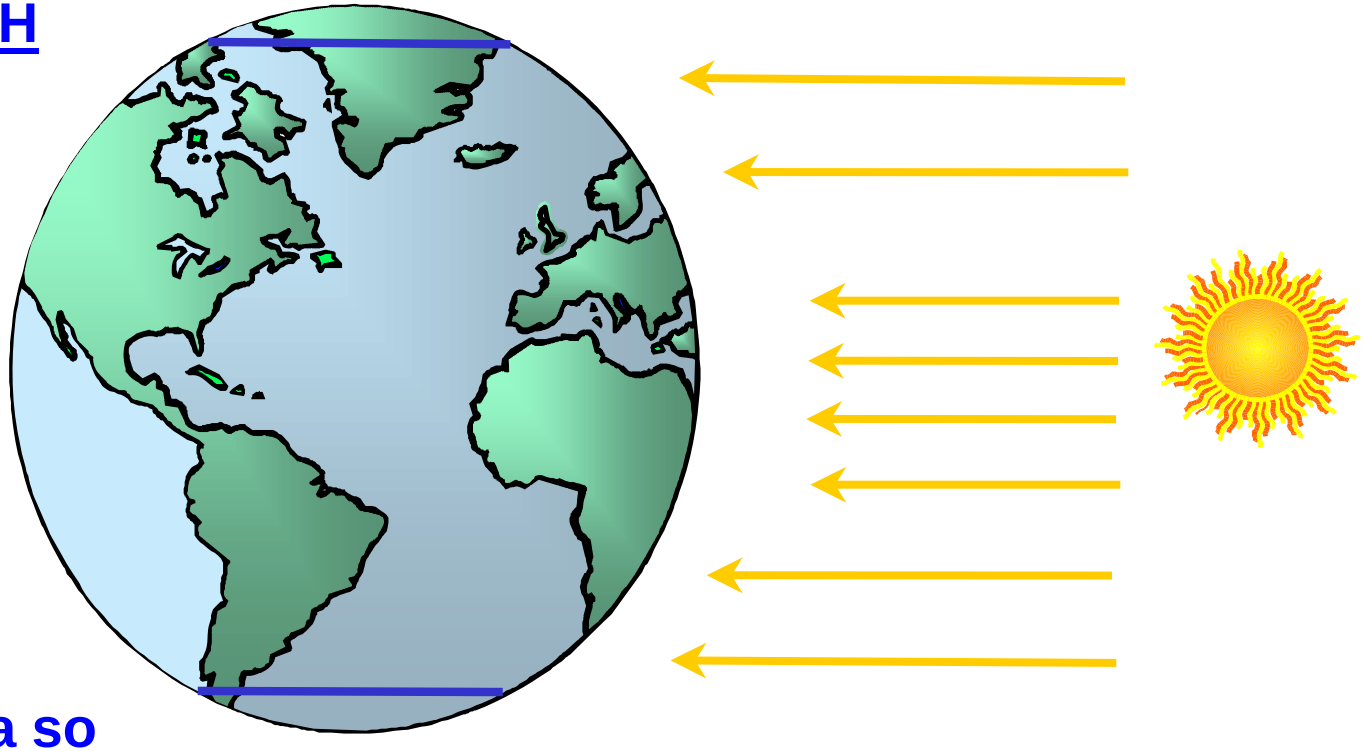
Fundamental Cause Of 'Weather'



WORLD WIDE EFFECTS

Cool area so Pressure is HIGH

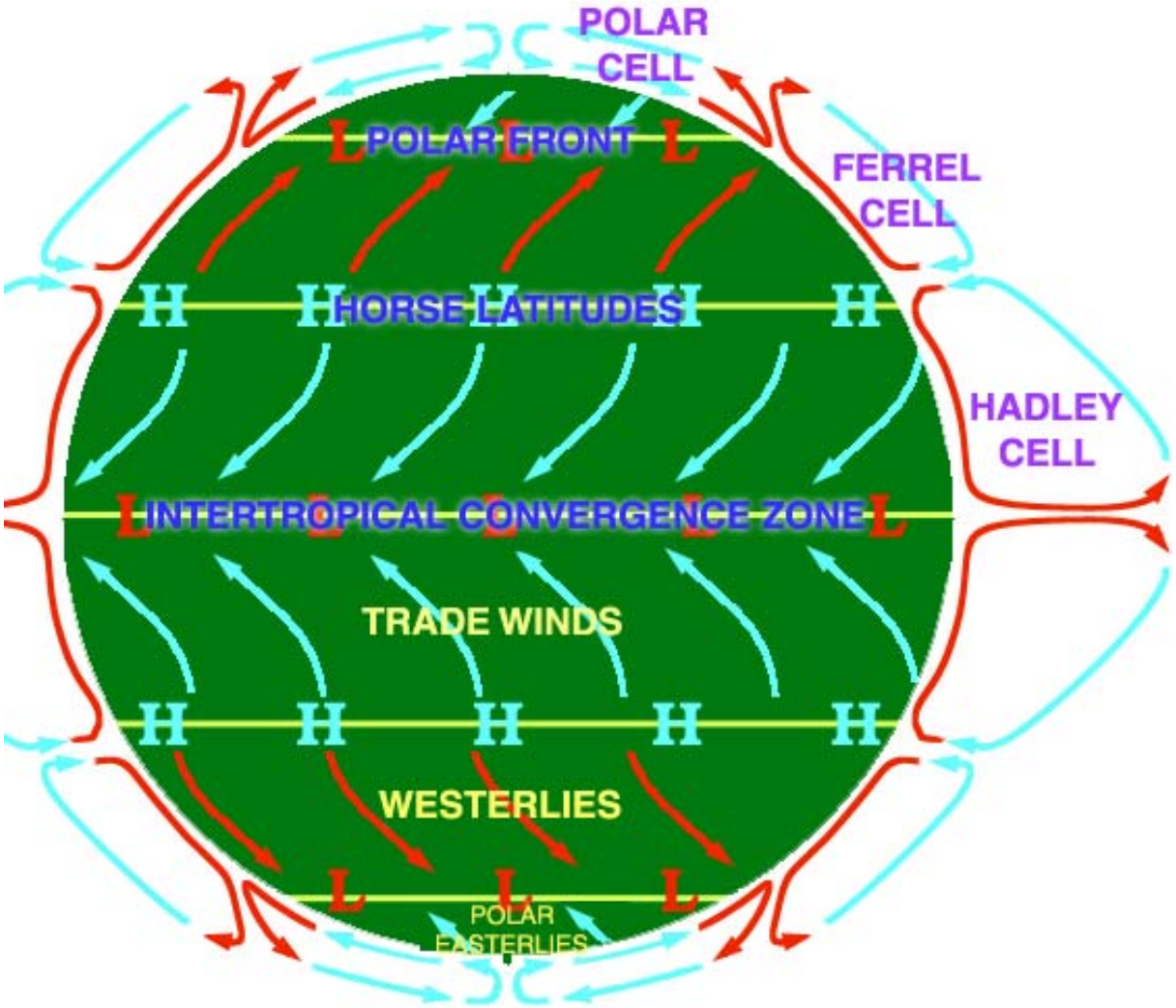
North Pole

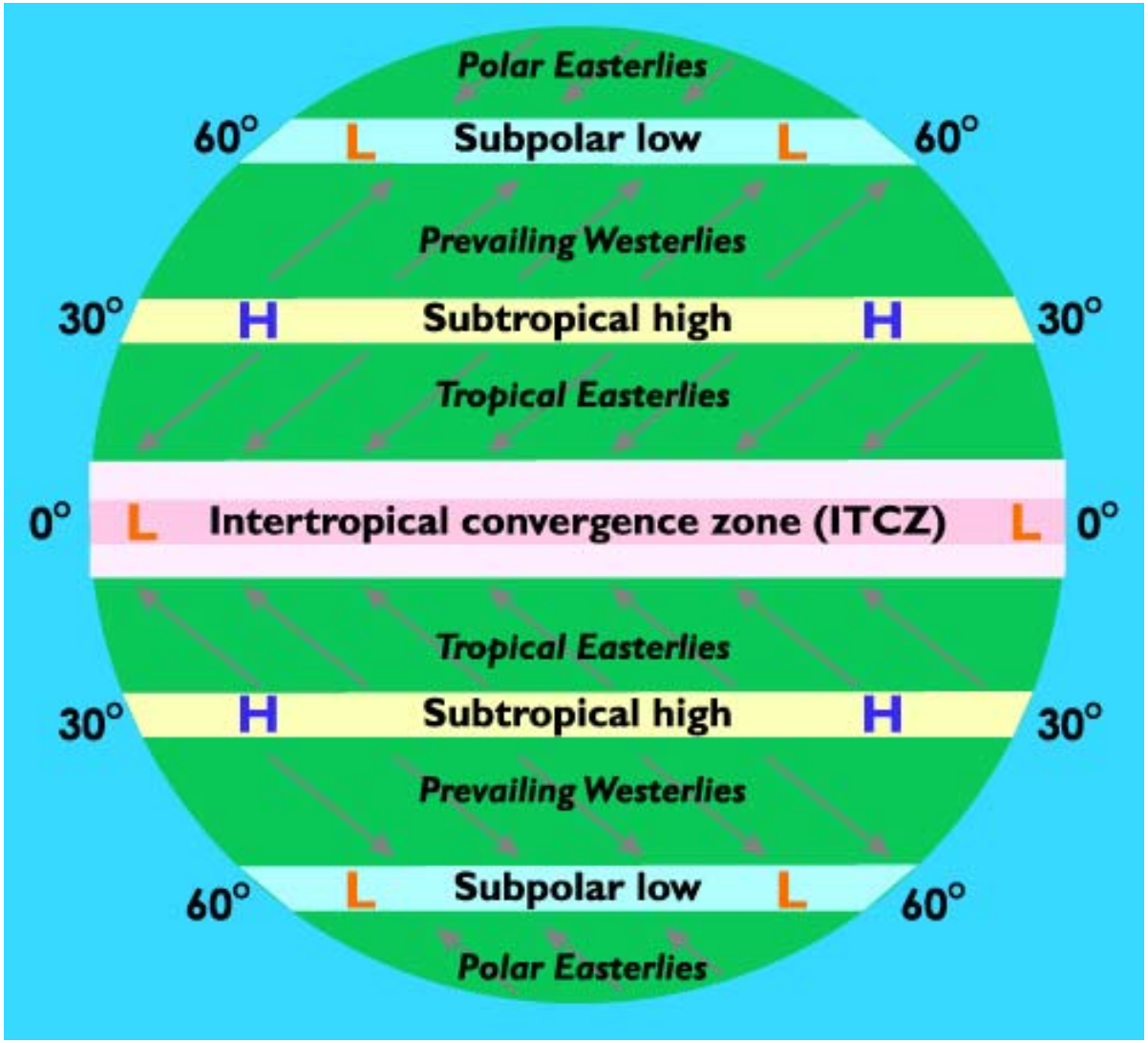


Warm area so Pressure is LOW

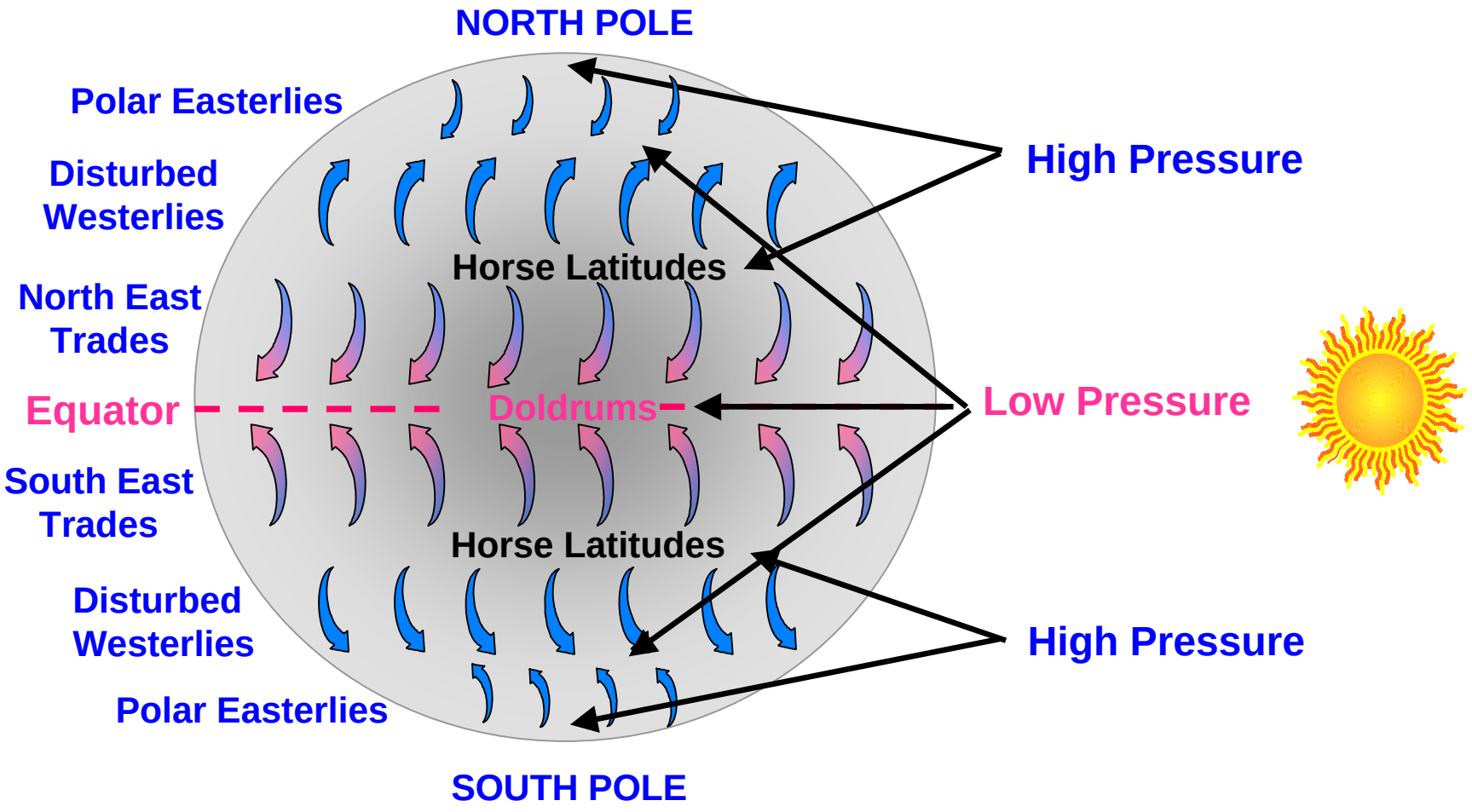
Cool area so Pressure is HIGH

South Pole

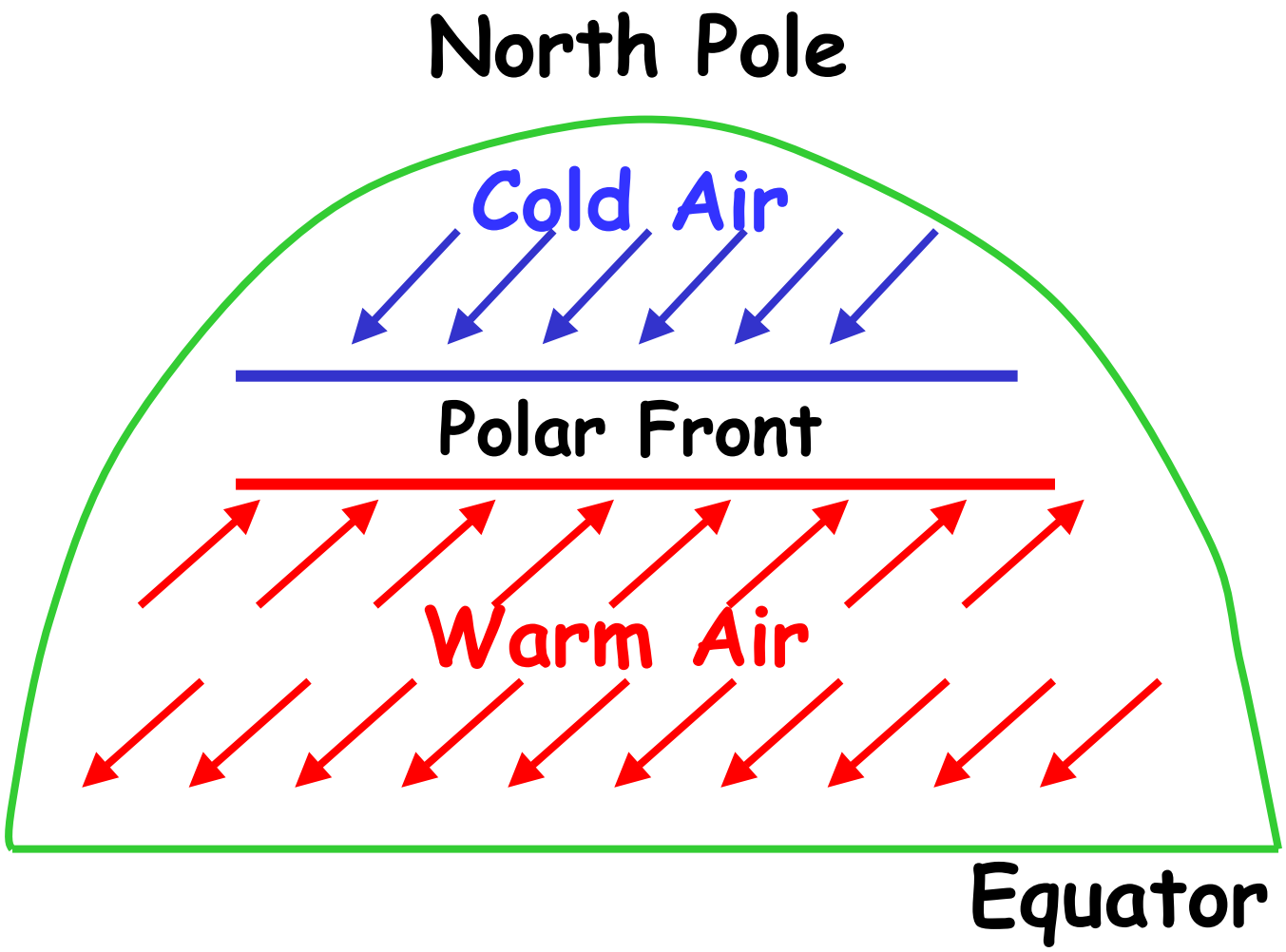




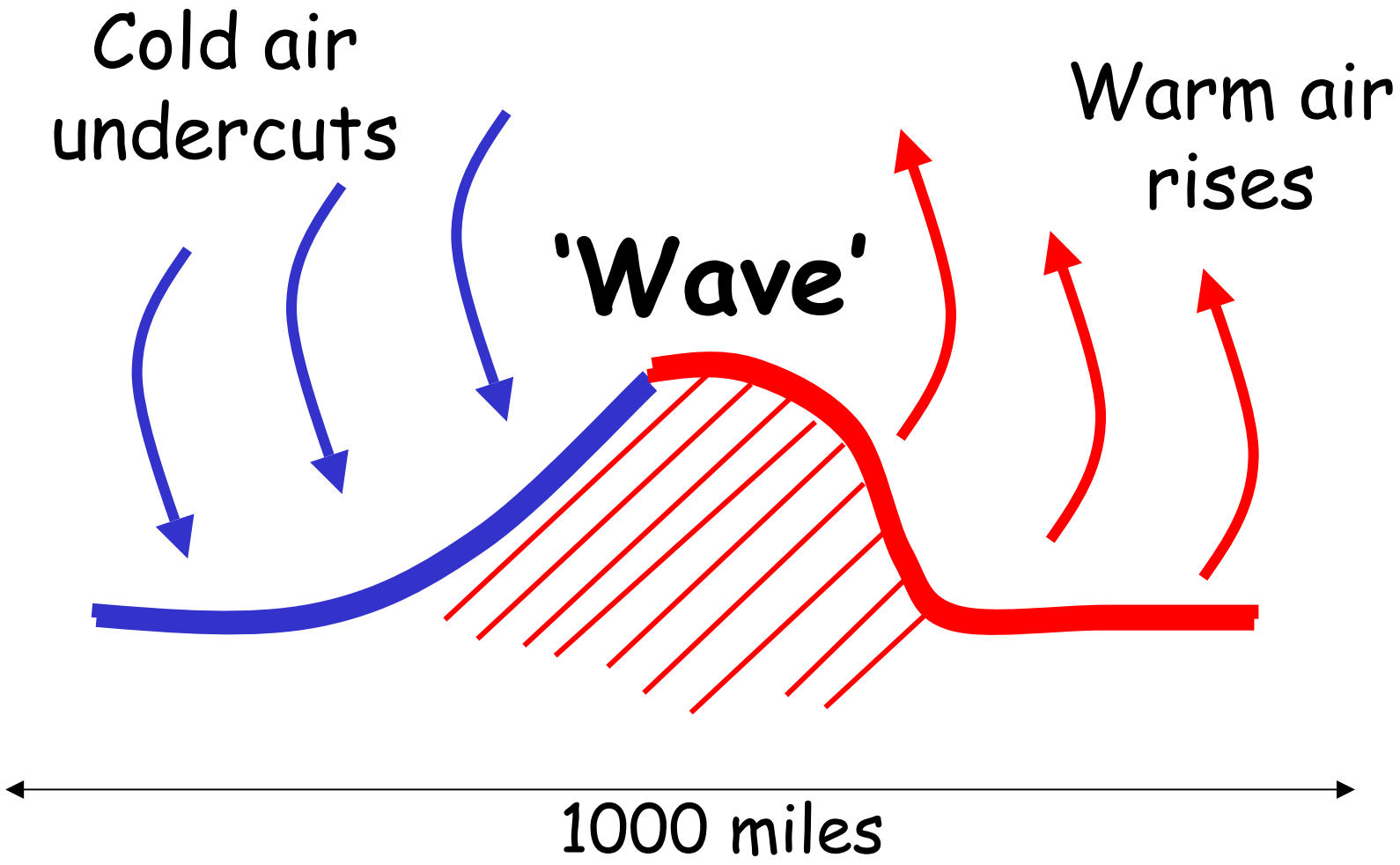
Wind Origins



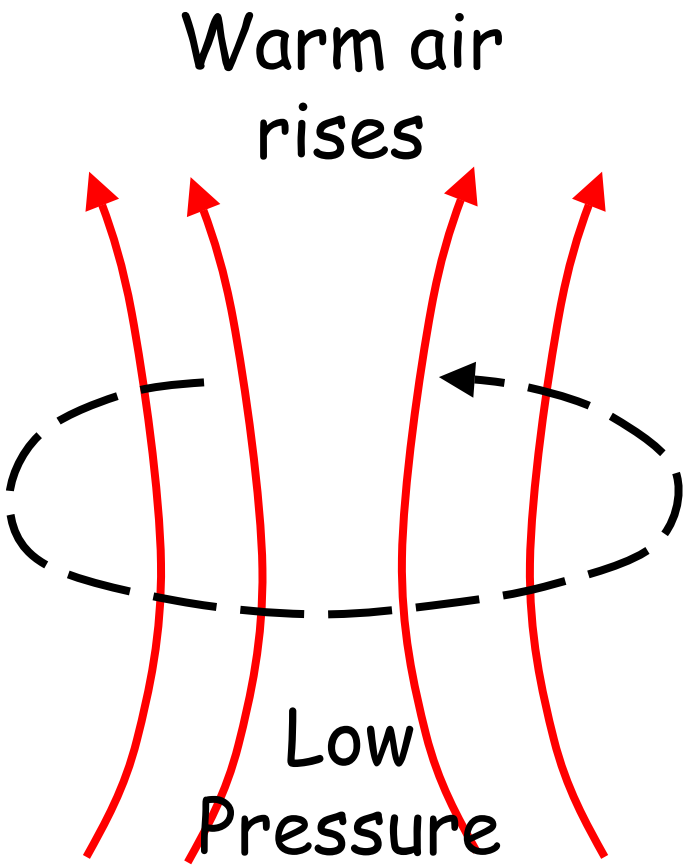
How a Depression Forms - 1



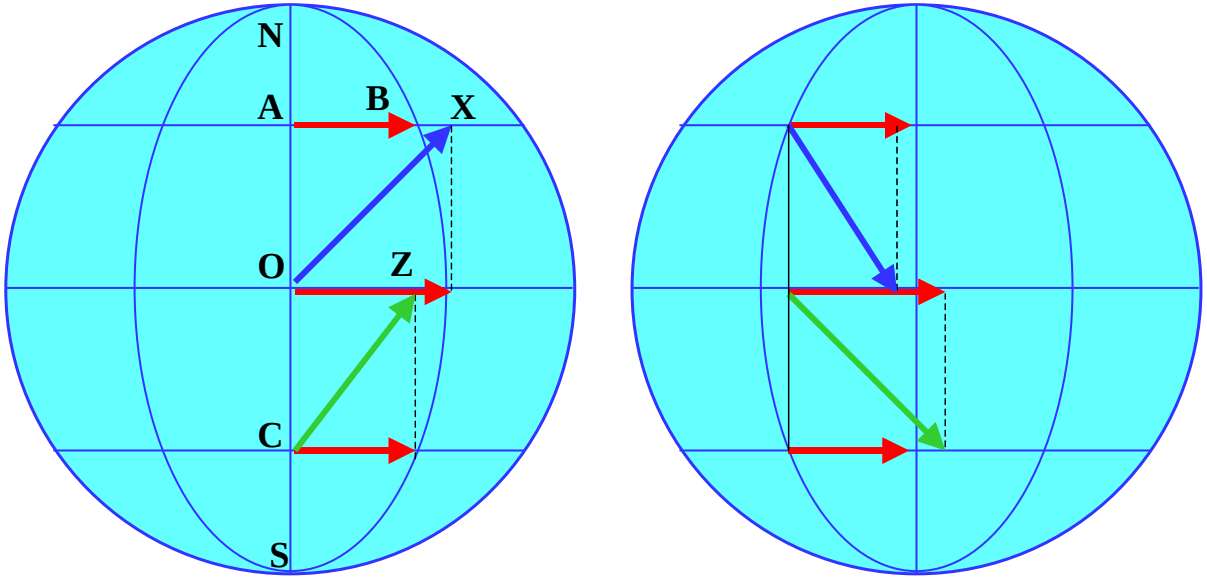
How a Depression Forms - 2

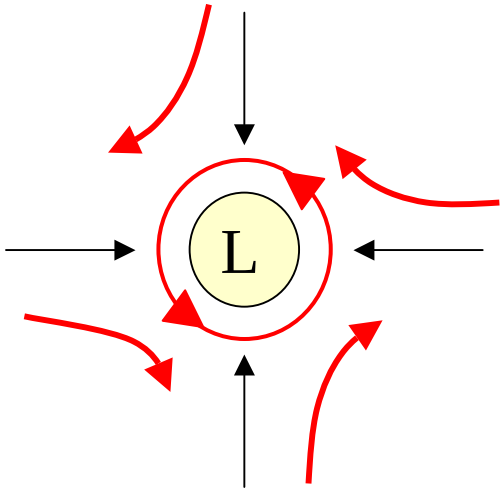


How a Depression Forms - 2



Coriolis Effect *(G-G Coriolis, French scientist, 1835)*





Wind attempts to blow towards the low pressure but is diverted to the right. (N Hemisphere)

The earth makes one rotation per day, but the linear speed of a stationary object on the surface at the Equator is approximately 900 knots, while closer to the poles the speed of an object on the surface reduces eventually to zero.

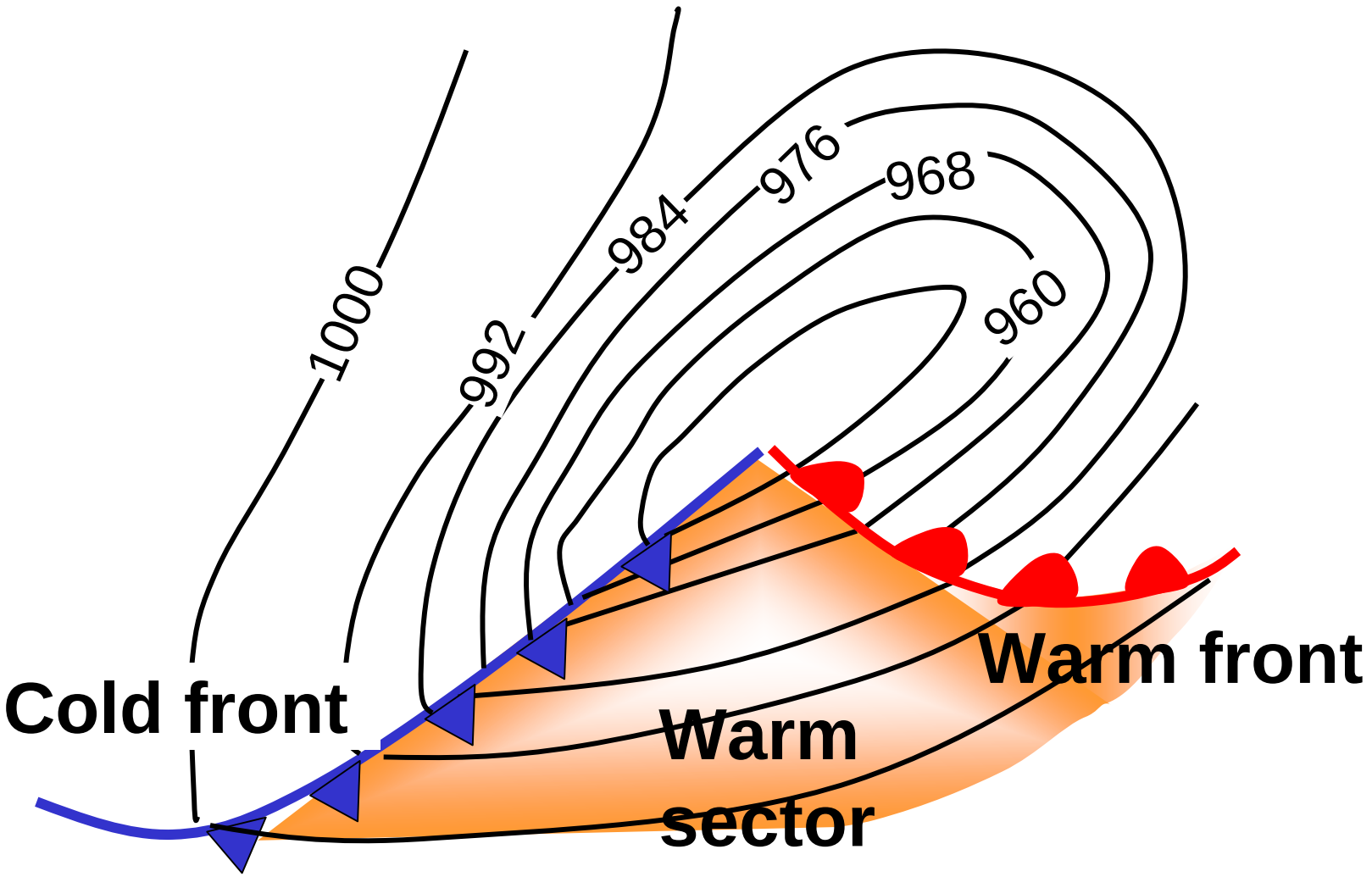
If an object is propelled northwards from the equator, it is still also travelling east at 900 knots. It arrives at point X before a stationary object starting at A travelling east at a slower speed. It thus appears to be diverted to the RIGHT compared to A-B. This why an air mass which starts as a south wind will become a south west wind, and depressions rotate anticlockwise.

In the southern hemisphere, the north bound object starting at C arrives at Z after a stationary object starting at O. It thus appears to be diverted to the LEFT. Thus depressions in the S hemisphere rotate clockwise.

The right hand diagram shows a similar effect for objects travelling south.

Coriolis affects wind and tides; a north bound current will be deflected to the right in the N hemisphere.

Bird’s eye view of a Depression



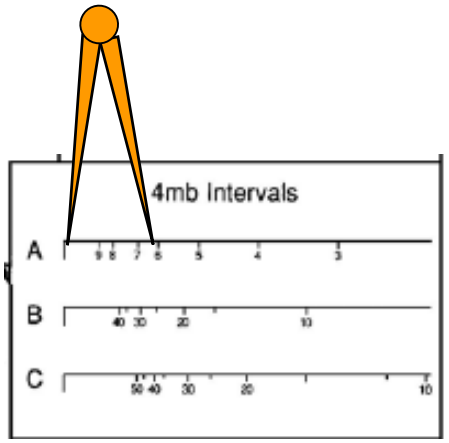
Predicting wind speed

Geostrophic scales at 2 and 4mb intervals

Scale A = Beaufort force

Scale B = Warm front speed

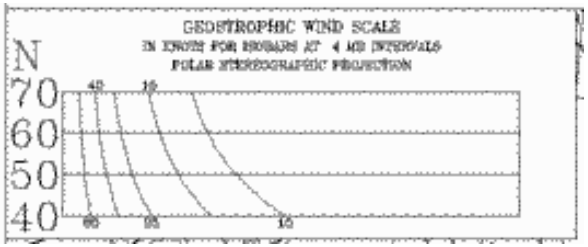
Scale C = Cold front and Occlusion speed



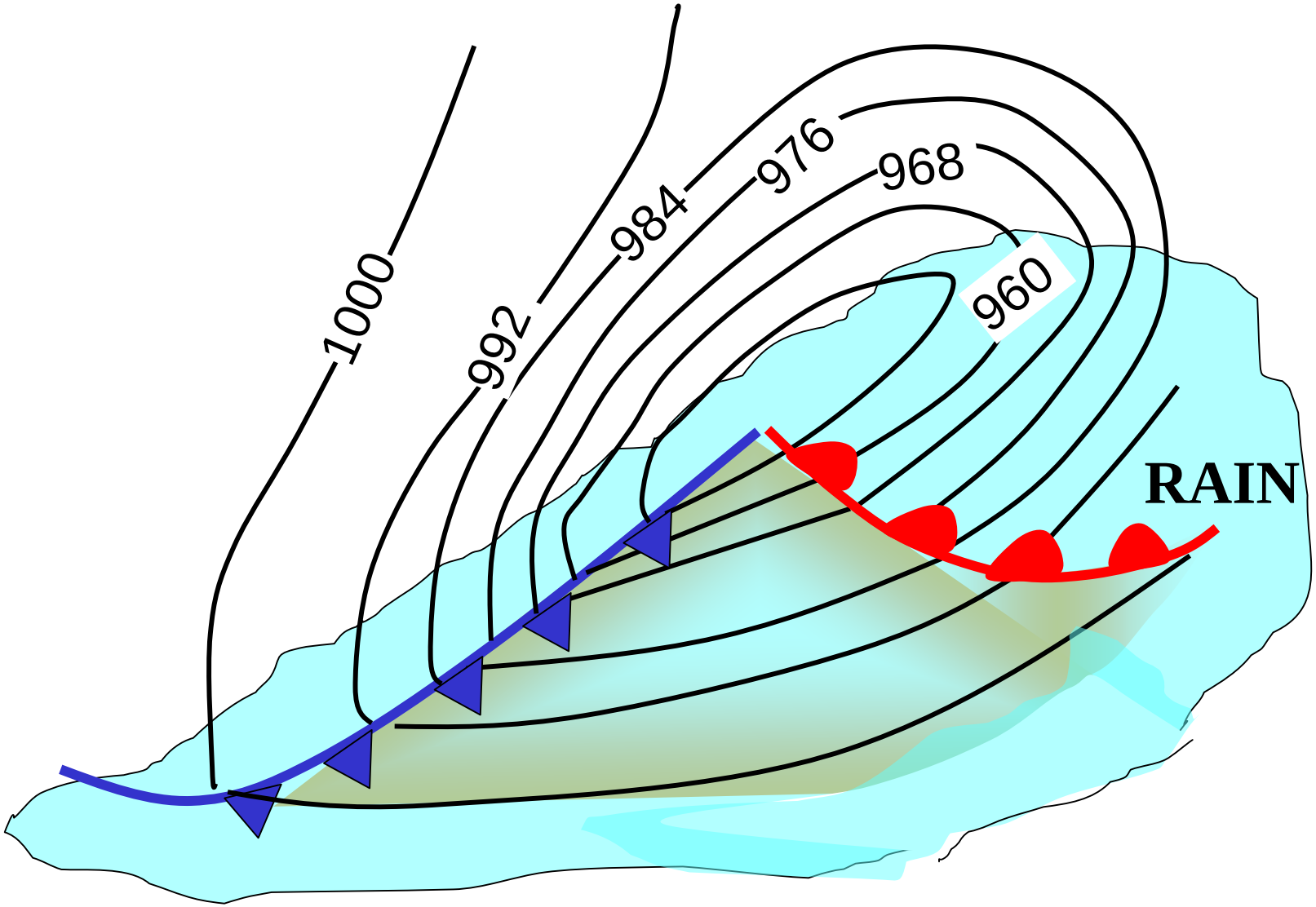
Measure the distance across the isobars, then apply the dividers to Scale A for wind force (reading from the left of the scale).

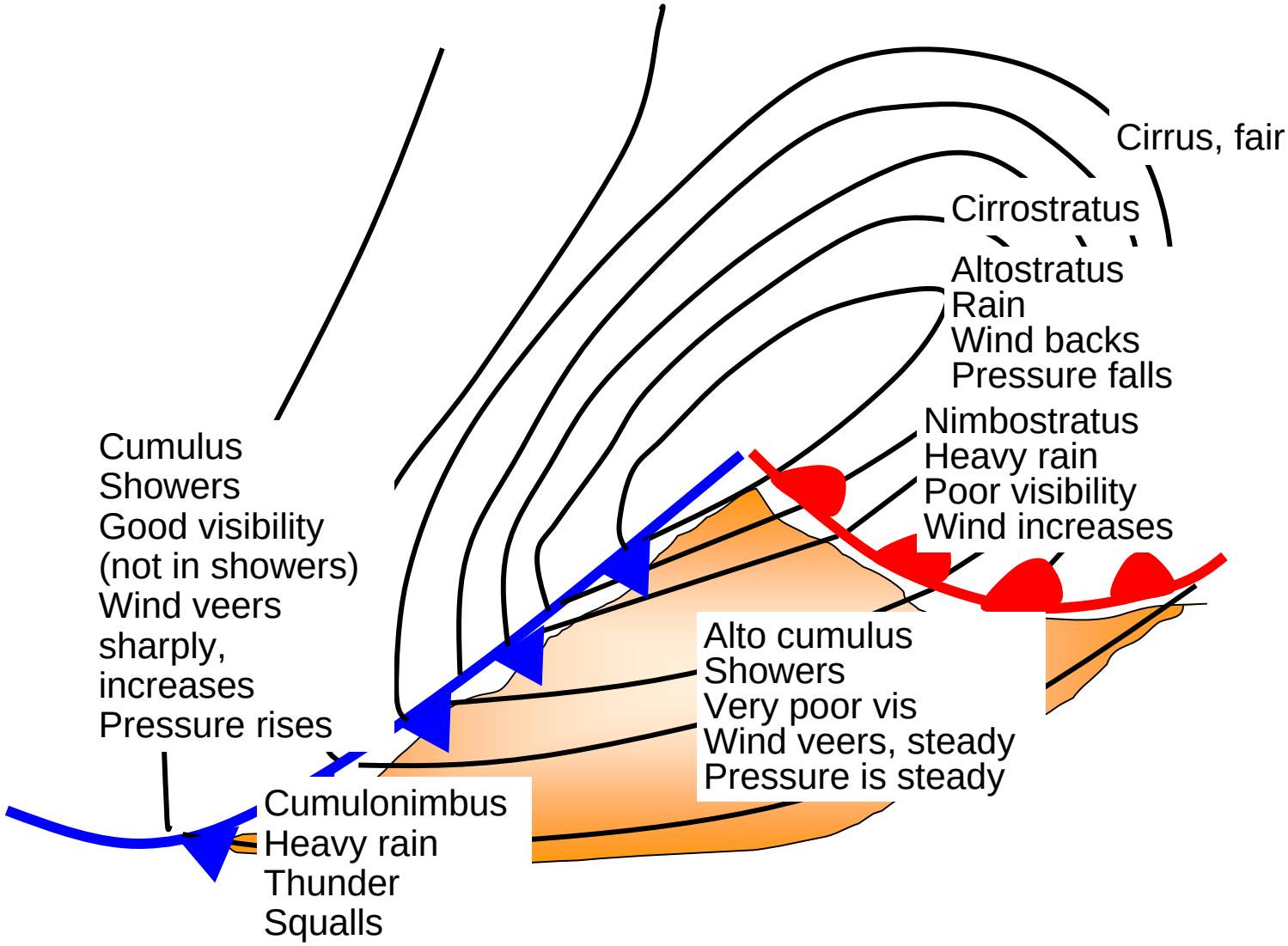
Similarly if you measure the isobars along a front you can find the speed of the front.

On some synoptic charts, the wind scale is a curve for various latitudes because the wind speed varies with latitude

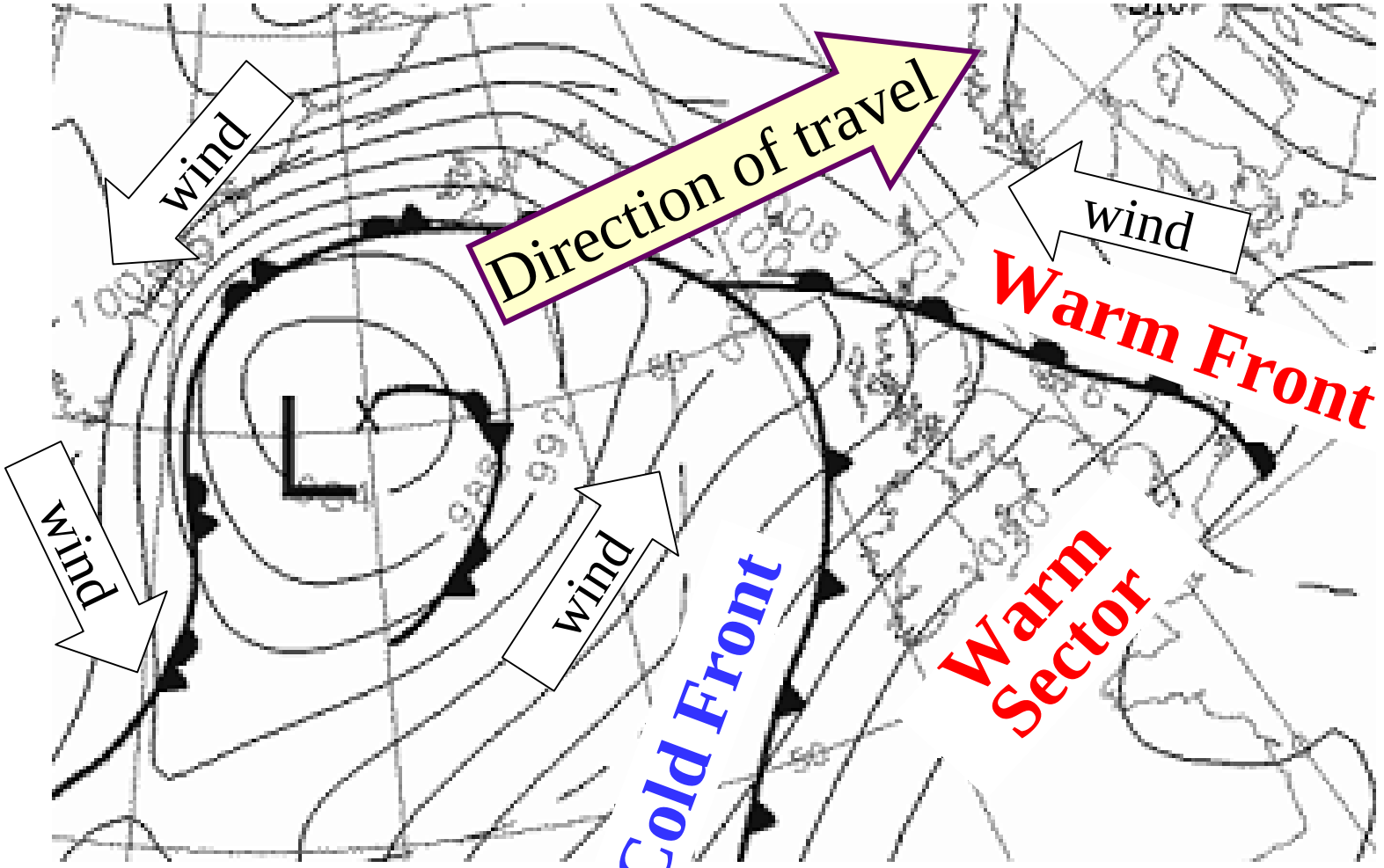


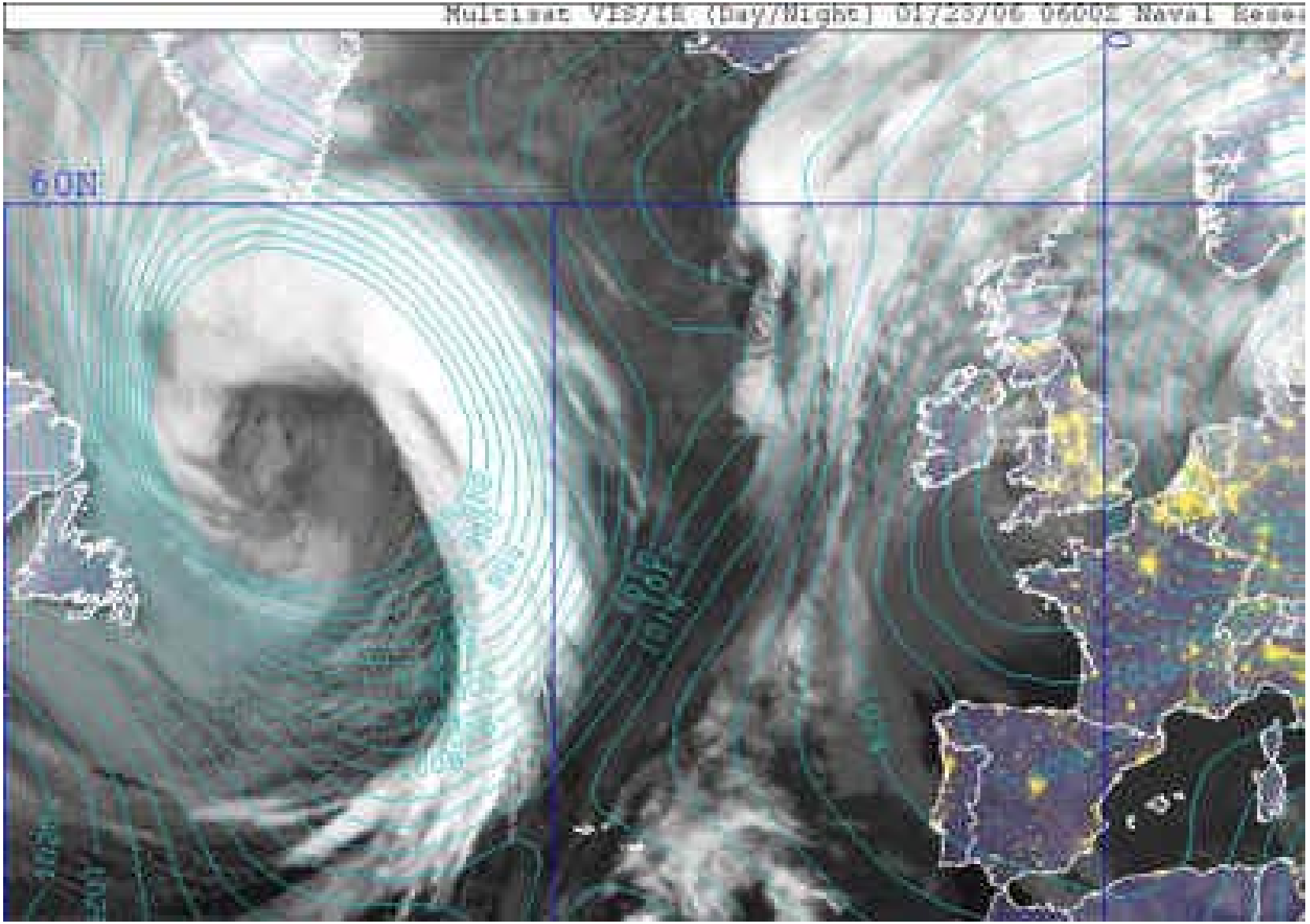
Bird’s eye view of a Depression



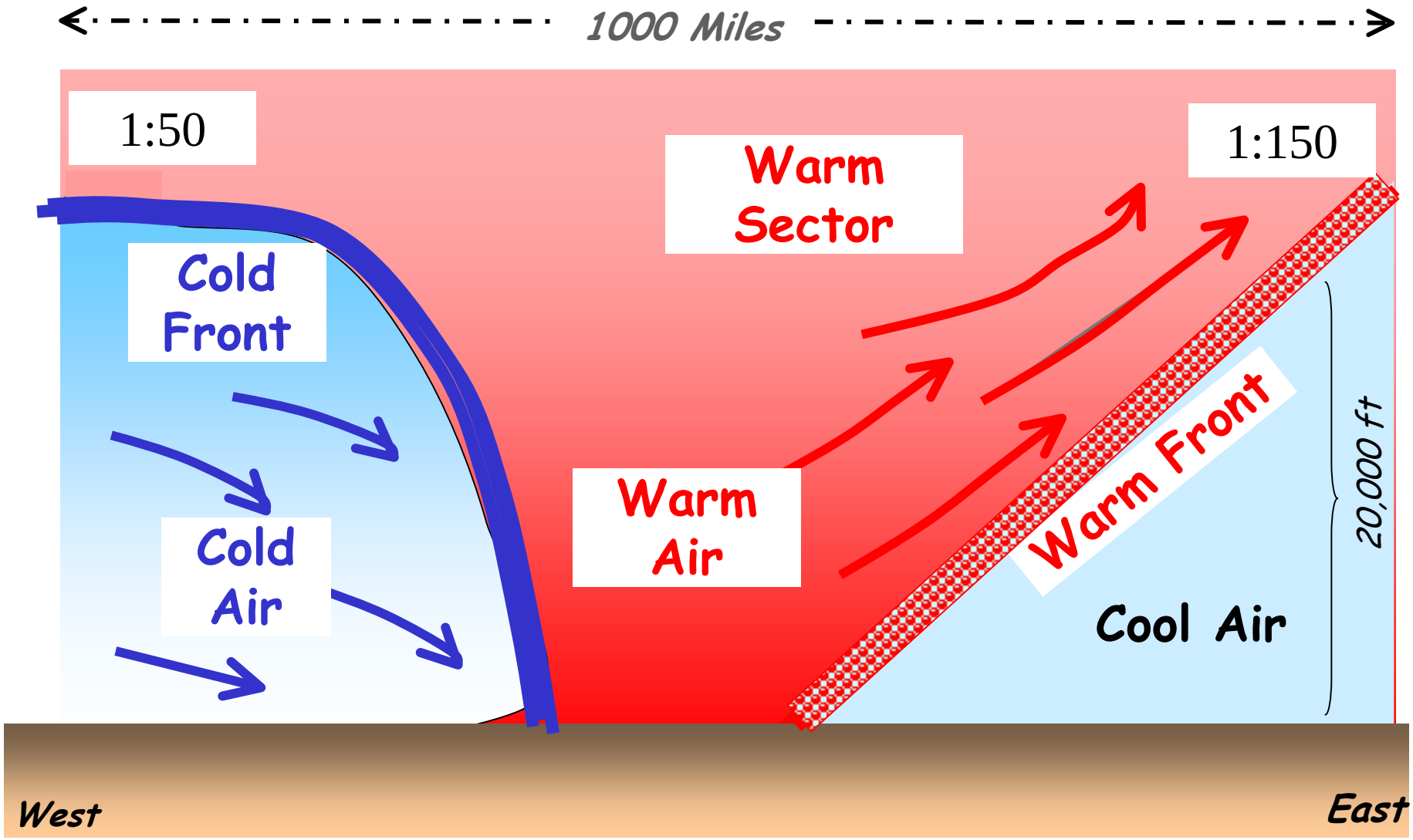


An Atlantic Depression

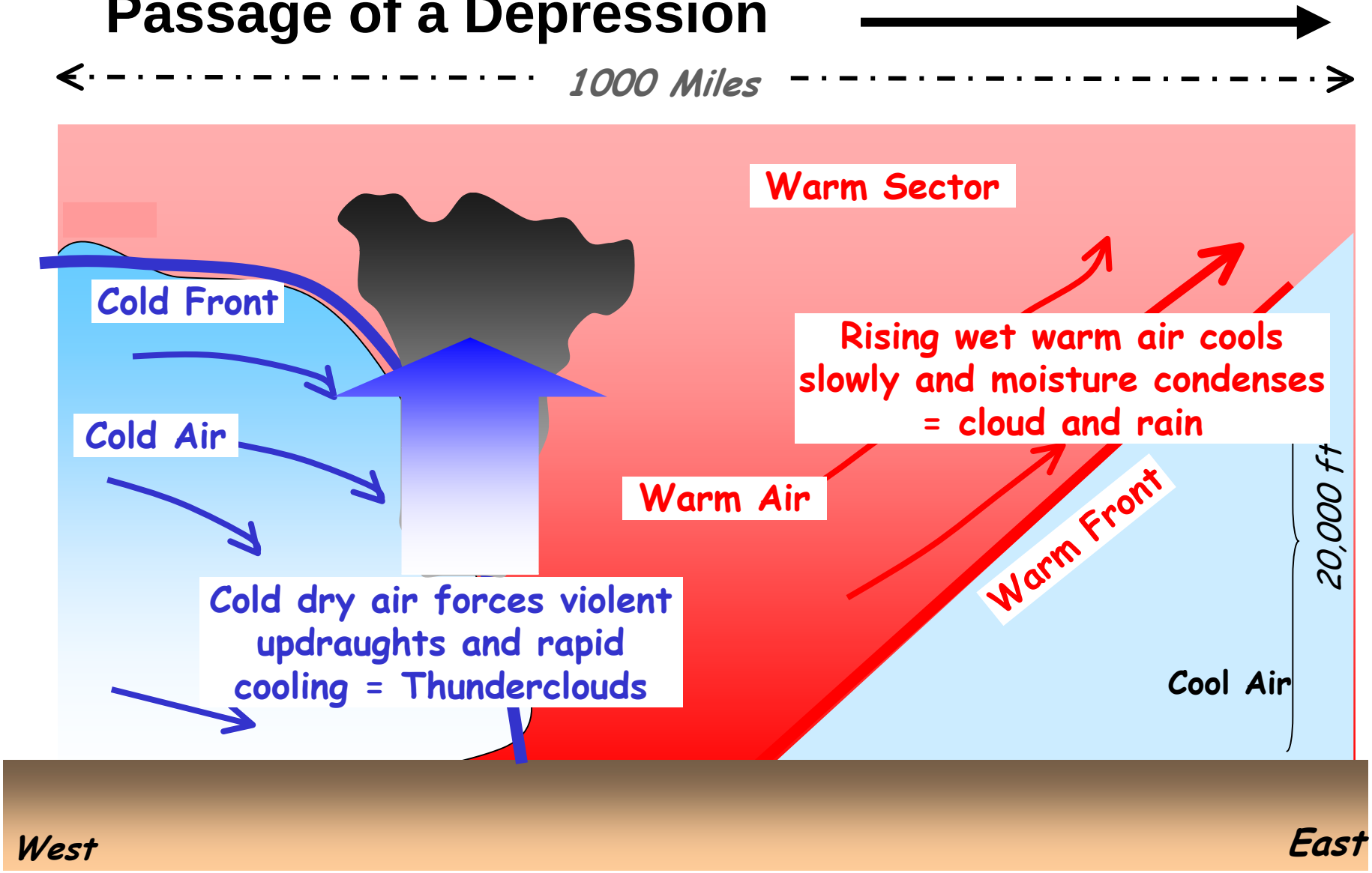




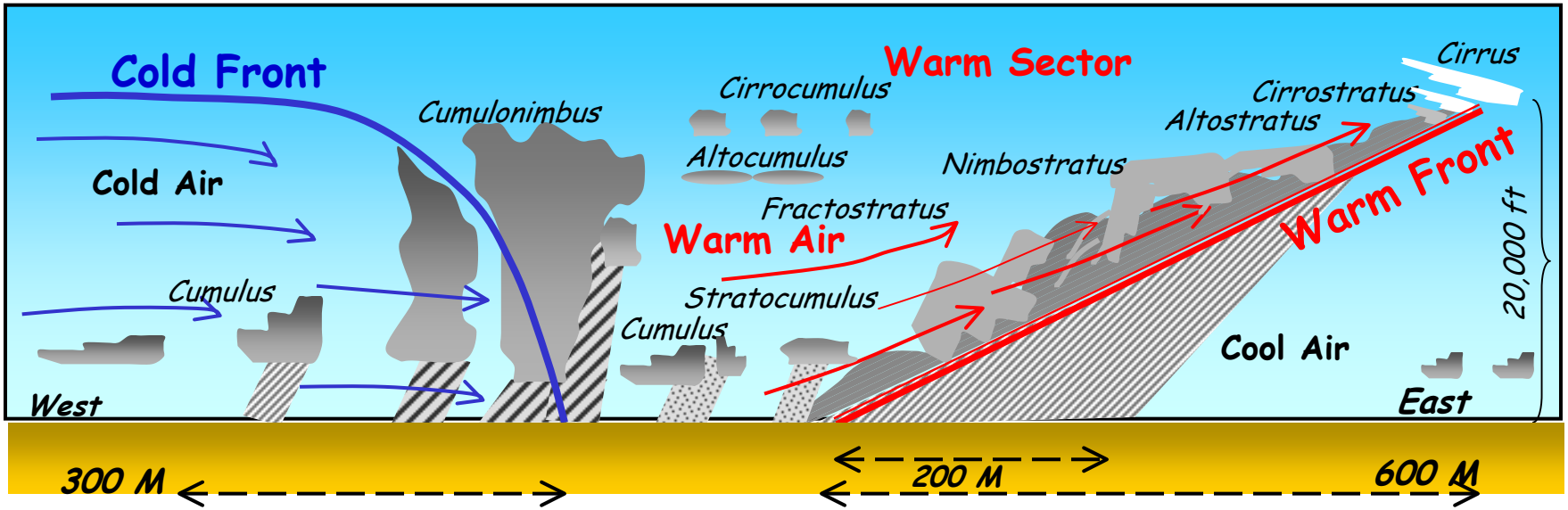
Passage of a Depression



Passage of a Depression



Passage of a Depression



WIND	Strong gusts	Veers sharply Squalls	Steady	Veers	Backs & increases	WIND
PRESSURE	Rises, then stable	Rises quickly	Steady	Steady	Falls	PRESSURE
RAIN	Sunny, squally showers	Heavy rain, thunder, hail	Light rain	Drizzle	Becomes heavier and prolonged	RAIN
VISIBILITY	Good except in showers	Poor in rain	Poor Fog	Poor	Poorer	VISIBILITY
TEMP	Cold	Falls	Warm	Warm	Rising	TEMP

Clouds

Cirrus	Curl
Stratus	Layer
Cumulus	Heaped
Alto	High
Nimbus	Rain bearing

Clouds

Low-level clouds (base 0 - 2 km high)

Stratus (S) - extensive, featureless, shallow cloud sheet, can yield drizzle or light rain

Stratocumulus (Sc) - shallow cloud sheet, broken into roughly recurring masses of cumulus, may drizzle or snow

Cumulus (Cu) - separate, hill-shaped puffy clouds, with level bases. Usually fair, but may bring showers after a cold front.

Cumulonimbus (Cb) - very large, high (up to10km) cumulus, with dark bases and anvil shaped top. Can bring thunder, lightning, squalls and heavy rain

Medium-level clouds (base 2 - 4 km high)

Altocumulus (Ac) - shallow cloud sheet with roughly regular patches or ripples of small rounded clouds. Usually fair weather

Altostratus (As) - featureless, thin, translucent cloud sheet. Usually fair weather.

Nimbus (Ns) - extensive, very dark cloud sheet, usually yielding precipitation

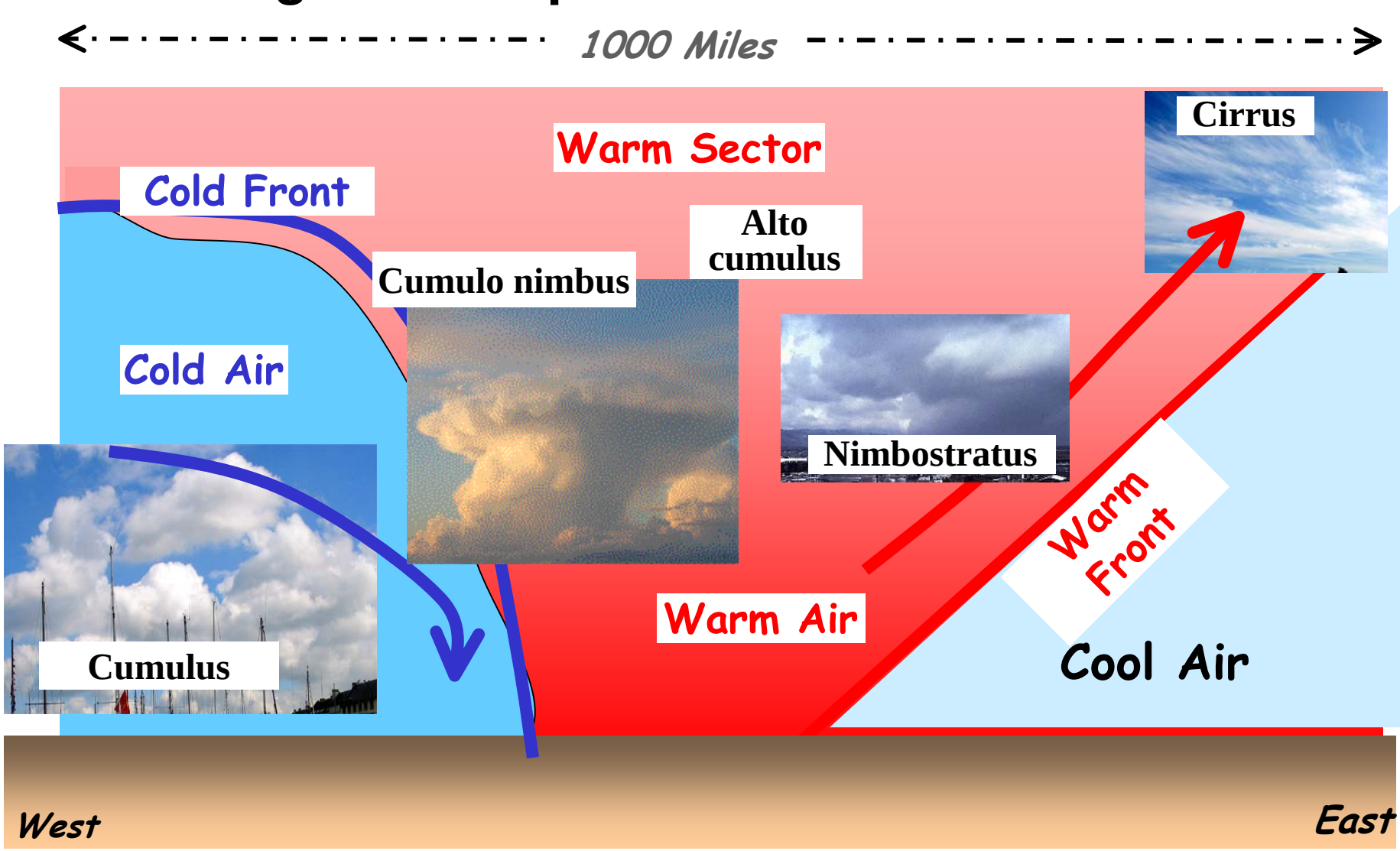
High clouds (base 5 -15 km high):

Cirrus (Ci) - streaky, white, feather-like cloud. Indicates an approaching depression

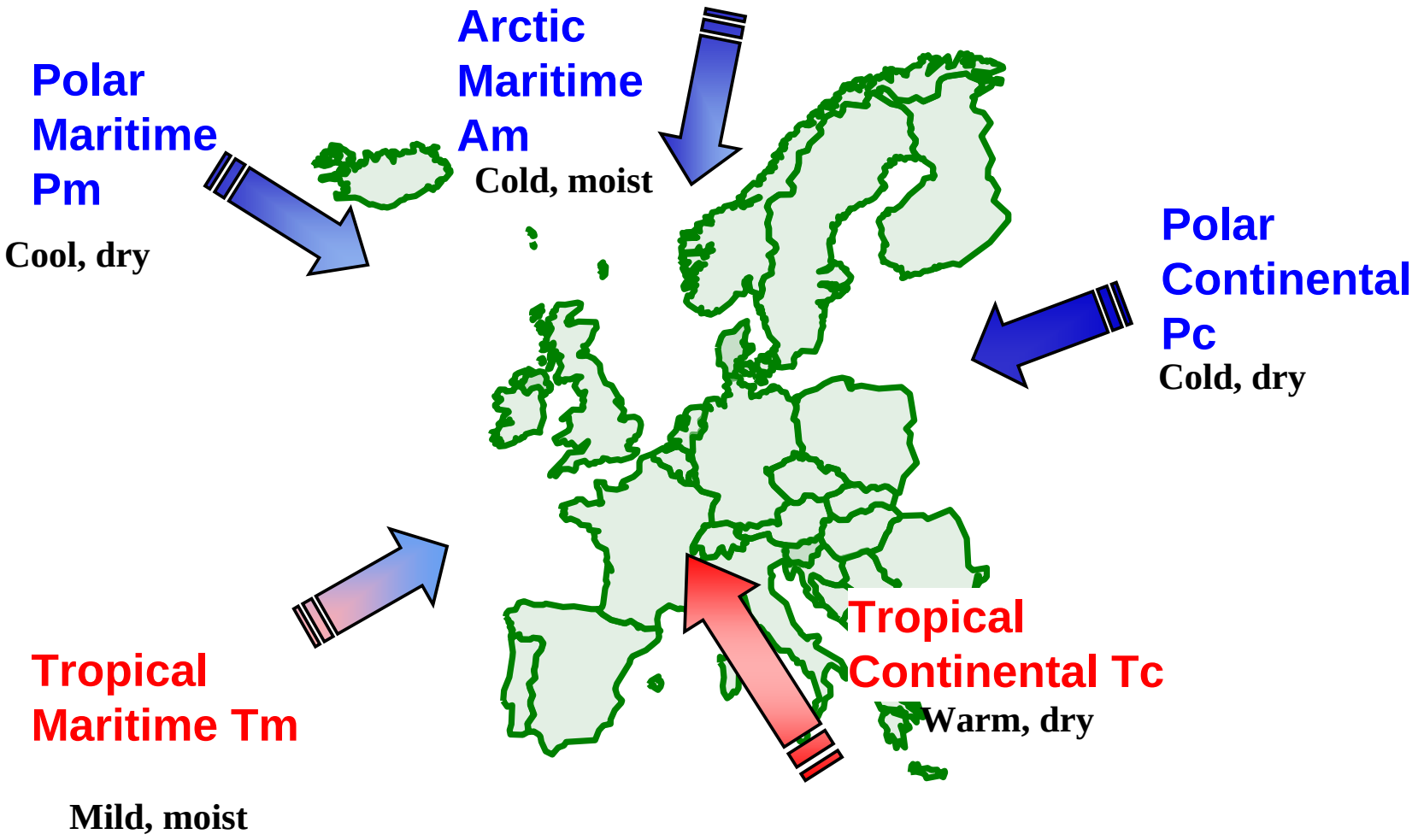
Cirrocumulus (Cc) - shallow, more or less regular patches or ripples of cloud. Fair weather.

Cirrostratus (Cs) - shallow sheet of largely translucent cloud. Fair weather

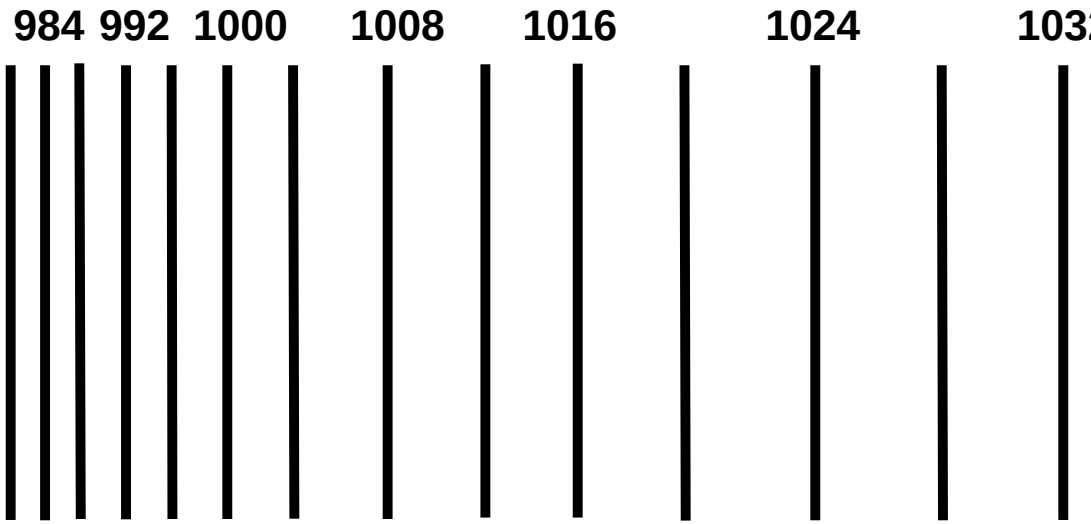
Passage of a Depression



Wind – Air Mass Effects on UK Weather



ISOBARS



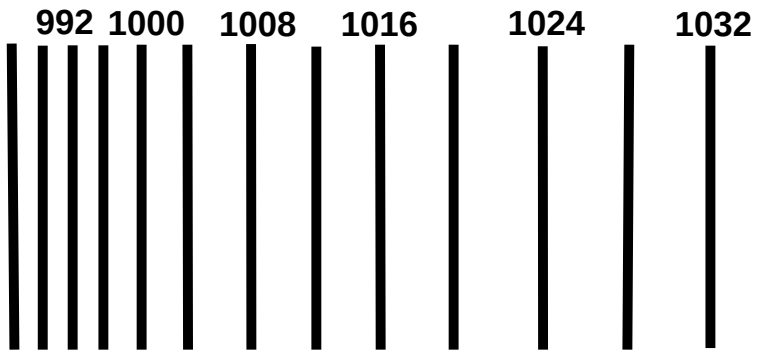
Low Pressure

High Pressure

ISOBARS CLOSE TOGETHER
Steep pressure gradient
Strong winds, rain

ISOBARS FAR APART
Gentle pressure gradient
Light winds, little cloud

Buys Ballot's Law

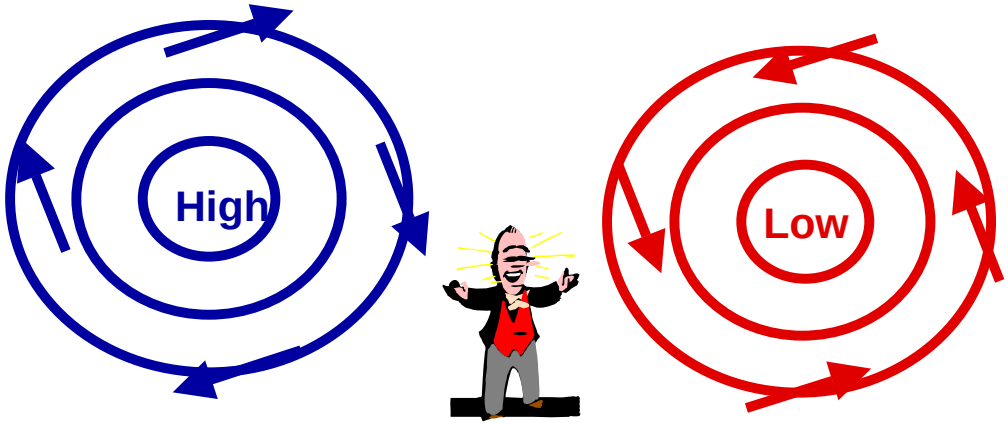


Low Pressure

High Pressure

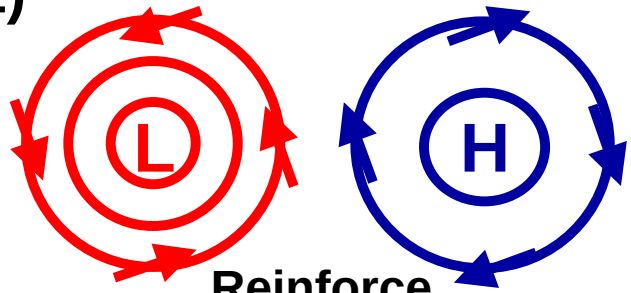
Buys Ballot's Law

In the Northern Hemisphere, if you stand with your back to the wind, the LOW PRESSURE area is to your left



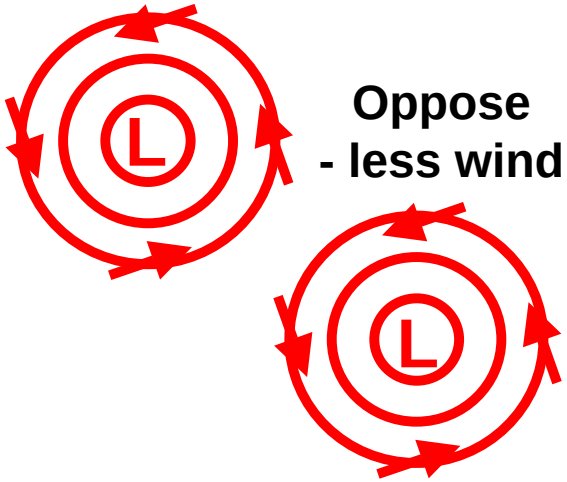
Effect Of Multiple Systems

1)



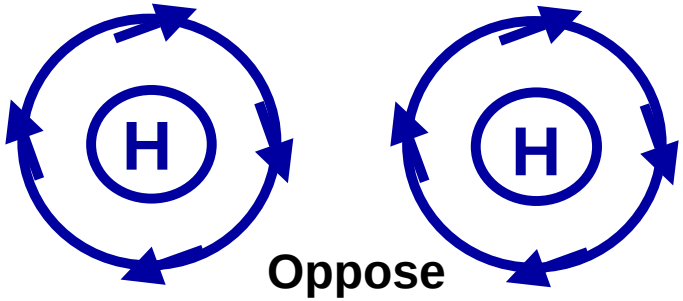
Reinforce
- more wind

2)



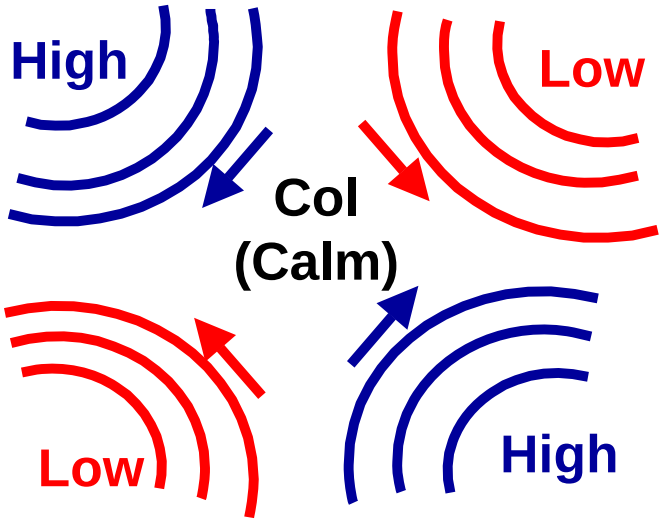
Oppose
- less wind

3)



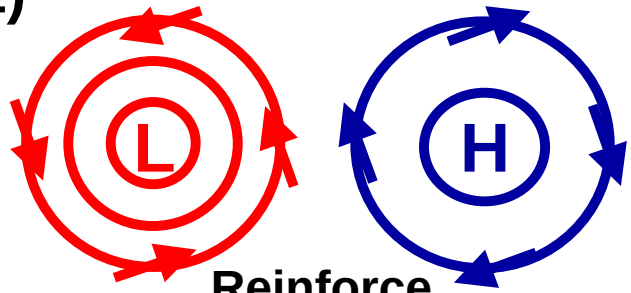
Oppose
- less wind

4)



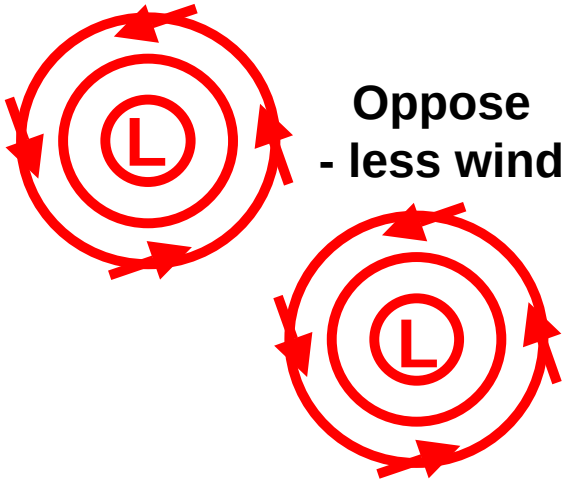
Effect Of Multiple Systems

1)



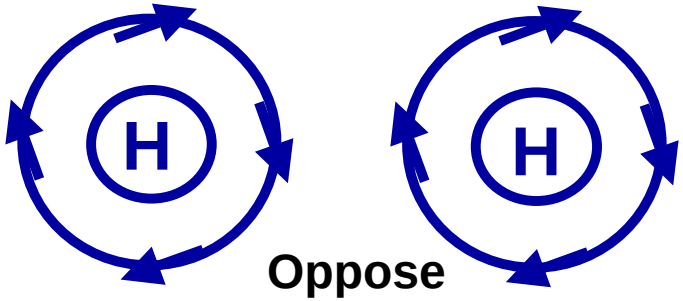
Reinforce
- more wind

2)



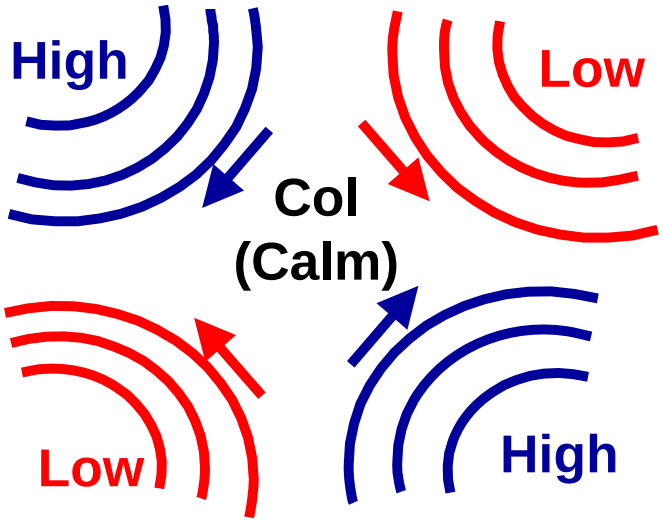
Oppose
- less wind

3)

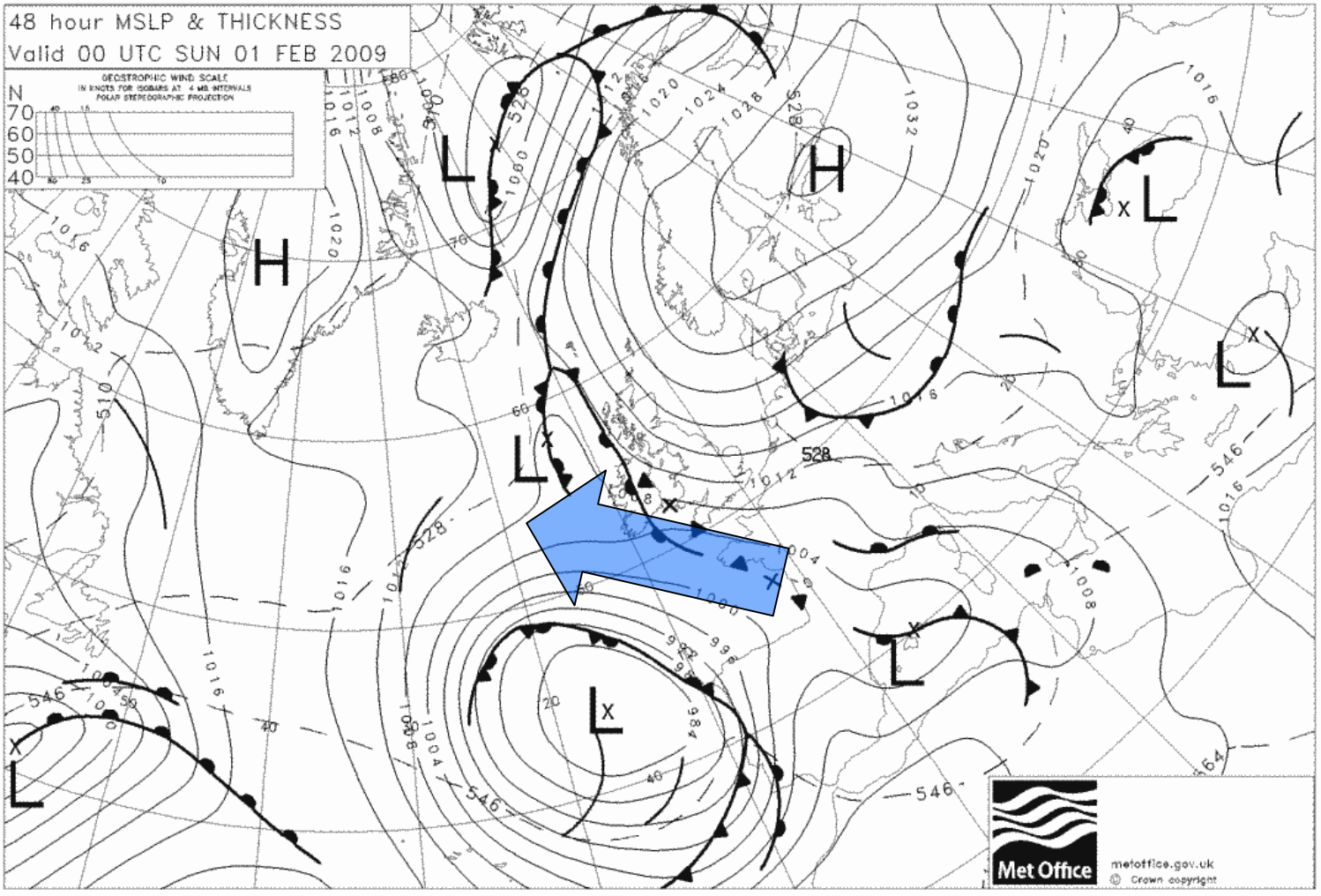


Oppose
- less wind

4)



Effect Of Multiple Systems



Subtle stuff – Easterlies on S edge of a High

Why are wind speeds increased on the southern edge of high pressure systems?

It is all to do with the balancing out of the Coriolis force (CF1), centrifugal force (CF2) and the pressure gradient force (PGF).

In the northern hemisphere the Coriolis force acts to balance out the combined effect of centrifugal force and pressure gradient force (i.e. CF1=CF2+PGF).

However the centrifugal force will help a parcel accelerate into areas of low pressure and, because the forces still need to balance, this speeds up until the Coriolis force strengthens and the flow remains in balance once again.

The effect of this is to make the anticyclonic flow on the southern side of an area of high pressure (which has a weaker Coriolis until it is forced to speed up) to be stronger than the equivalent cyclonic flow.

Is this the reason why easterlies don't drop in the evening or is there yet another reason?

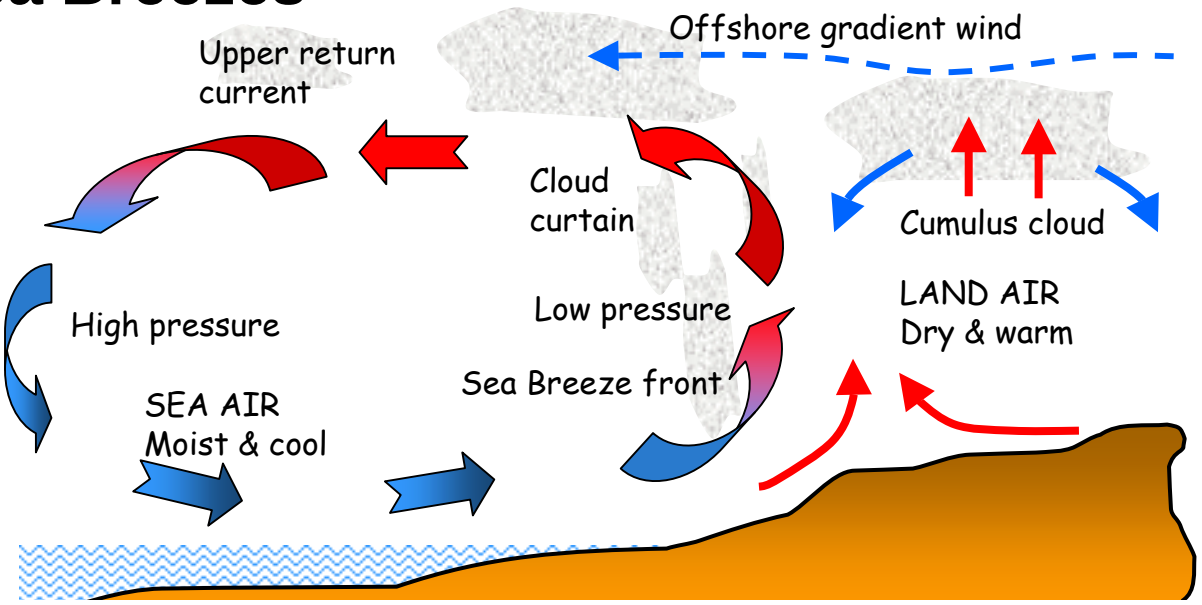
Yes, as the wind inherently has more geostrophic in it, the surface layer reduction in turbulence as evening arrives is not eased as quickly and hence the wind speeds to not drop as quickly.

Simon Keeling www.weatherweb.com

What affects Wave Height?

1. **Wind speed and duration**
2. **Tide speed and direction**
   wind against tide causes higher waves
3. **Depth of water - waves break in shallows**
4. **Fetch - the distance over which the wind blows**
5. **Swell - the wave pattern before the current weather**

Sea Breezes

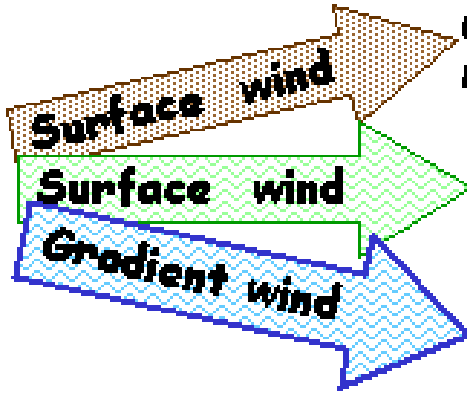


Sea breezes are caused by unequal heating and cooling of adjacent land and sea surfaces. A sea breeze blows from the sea to the land as a result of this unequal heating. During the day, especially in summer, solar radiation causes the land surface to become warmer than the sea surface. The difference between land and sea surface temperatures rises during the day to a maximum around mid-afternoon.

The warmed air rises over the land surface and cool air from the sea is drawn in over the land. The ascending air returns towards the sea. As the sun's heating effect increases, the sea breeze gains in strength, and may reach 15 knots (Force 4). A sea breeze in early summer may extend 10 M inland during the afternoon, and under favourable circumstances the sea breeze may penetrate as much as 30M inland. The sea breeze has maritime characteristics such lower temperature and higher humidity.

A land breeze develops at night as the land cools relative to the sea and an opposite circulation is set up. The temperature difference is much less than during the day and the breeze strength is much less.

Coastal Wind Effects



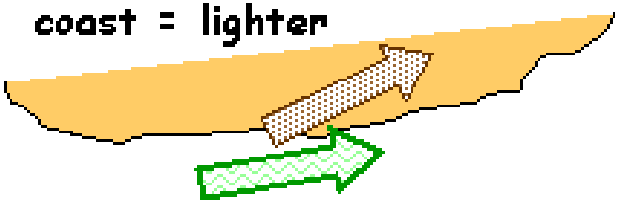
Over land
More friction

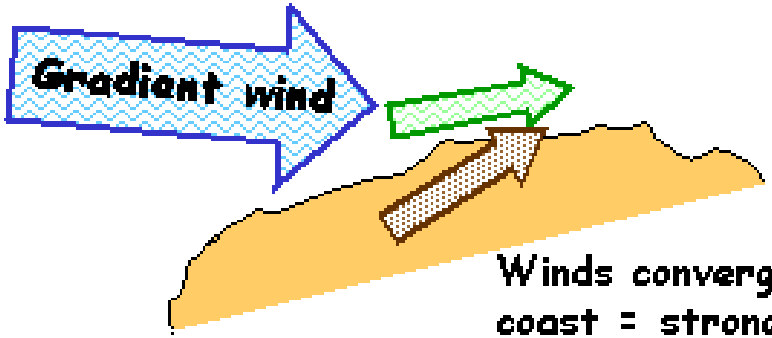
Over sea

At 500 m

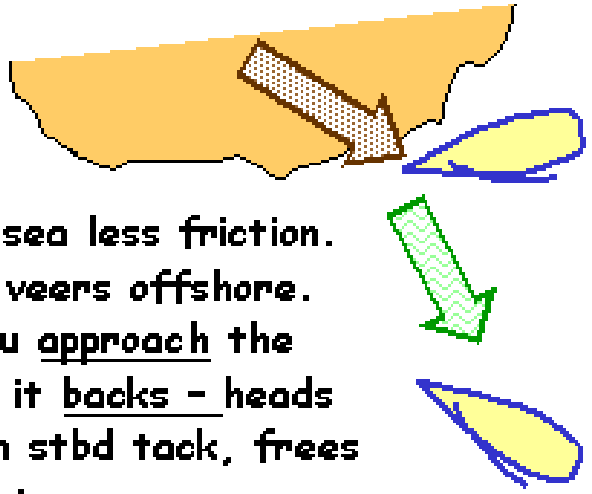
Wind backs (in N Hemisphere) due to surface friction and Coriolis effect

Winds diverge at coast = lighter





Winds converge at coast = stronger



Over sea less friction.
Wind veers offshore.
As you approach the coast it backs - heads you on stbd tack, frees on port

Fog

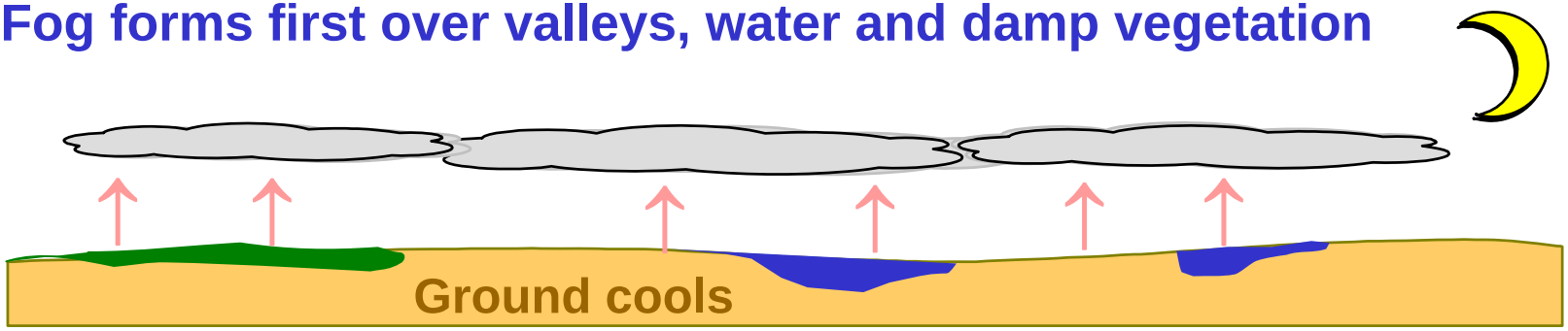
Land (Radiation) Fog

Clear nights with little wind

Damp warm air radiates off as the ground cools at night

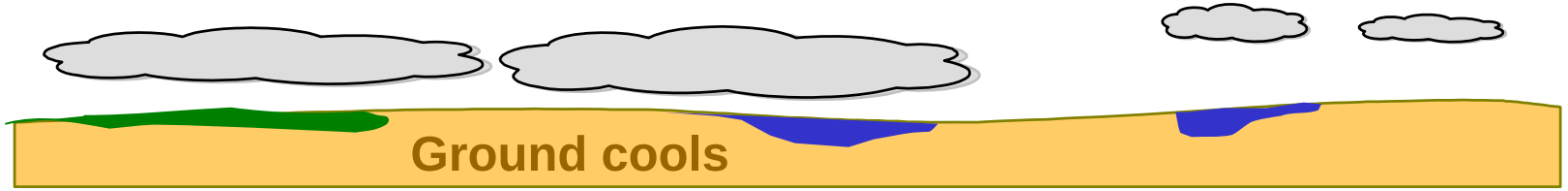
Condensation takes place

Fog forms first over valleys, water and damp vegetation



Thickest around dawn when air temperature is at its lowest

Heat from sun usually disperses this type of fog

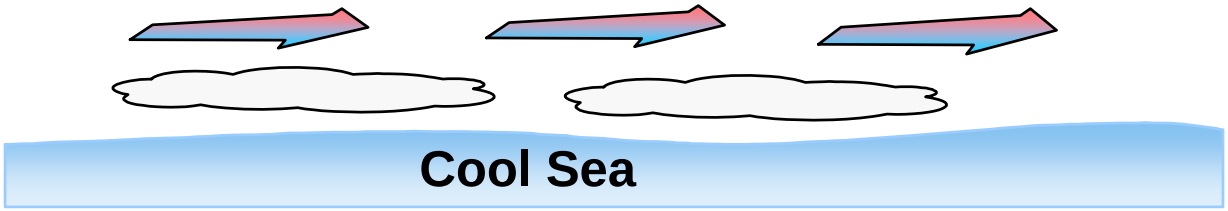


FOG

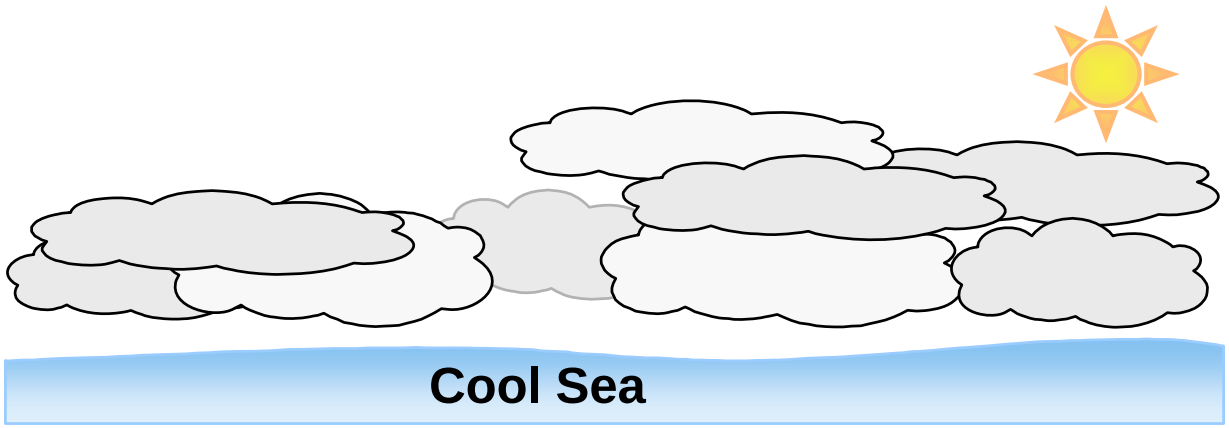
Sea (Advection) Fog

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