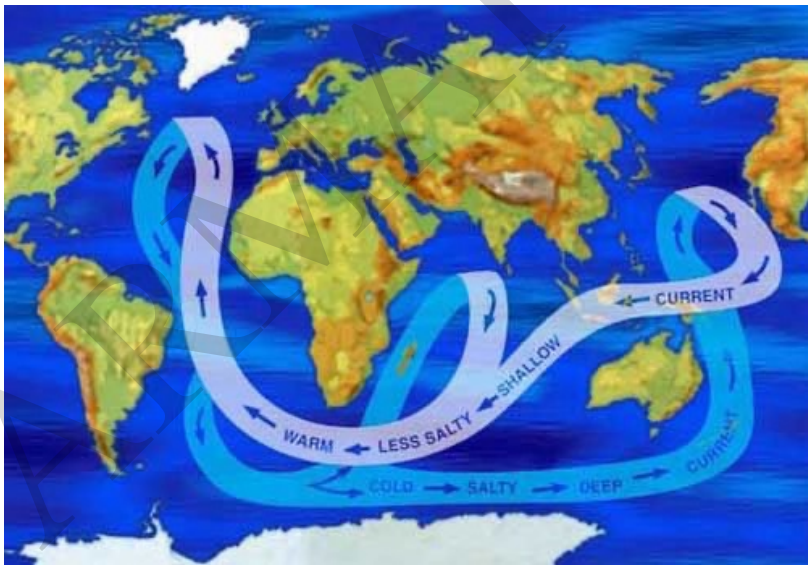


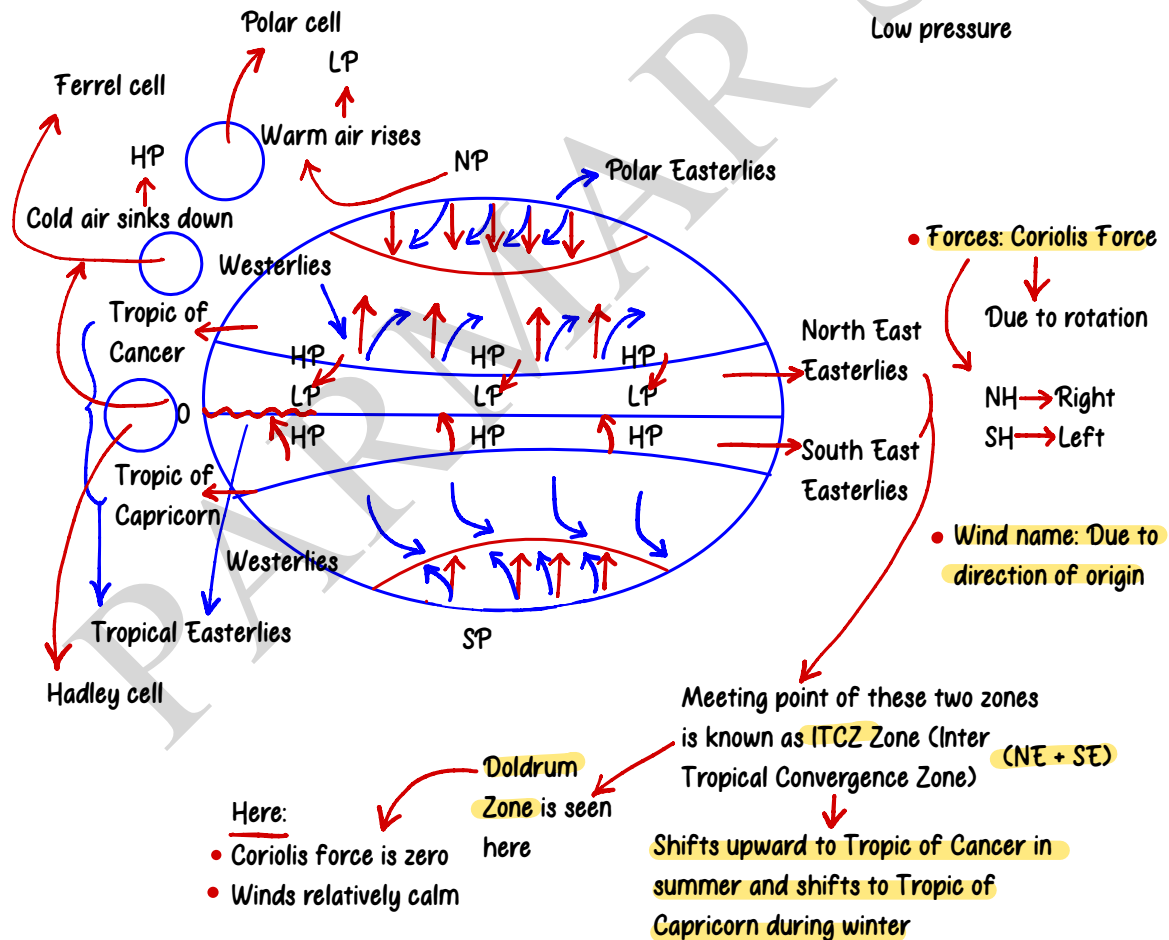
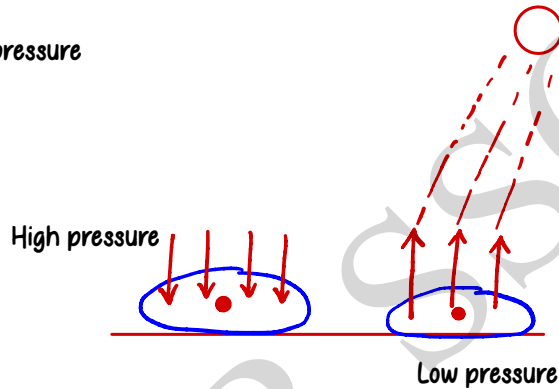
WINDS, CLIMATE, OCEAN CURRENTS

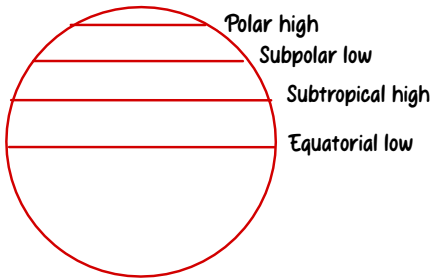


- Pressure difference causes wind because
 Warm air → Rises → Low pressure
 Cold air → Sink → High pressure

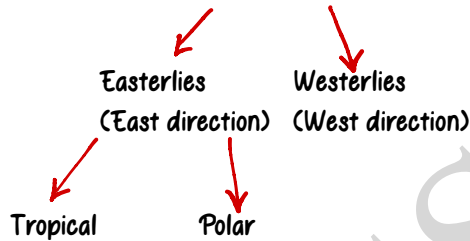
Type of winds
 Trade winds Local winds

- Wind: High pressure → Low pressure





Trade winds: Permanent winds

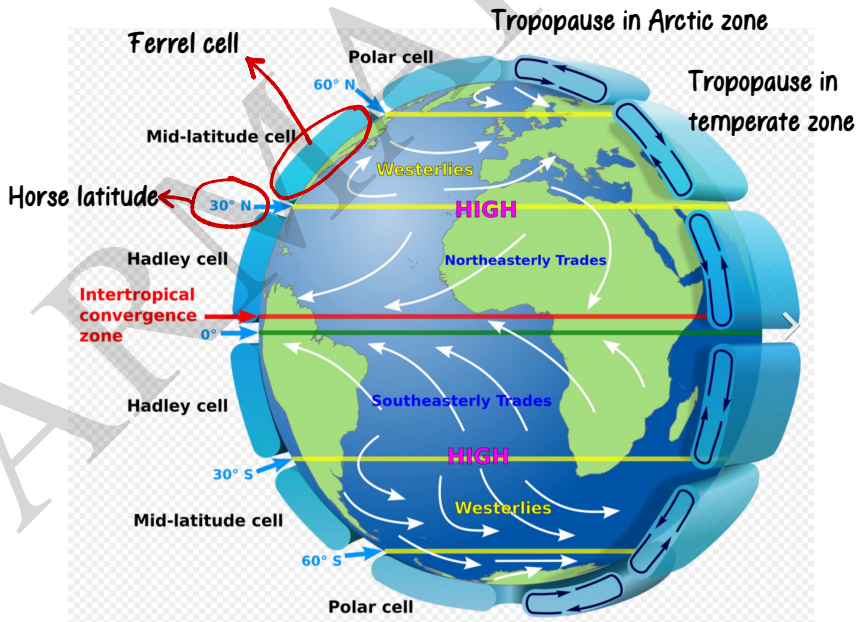


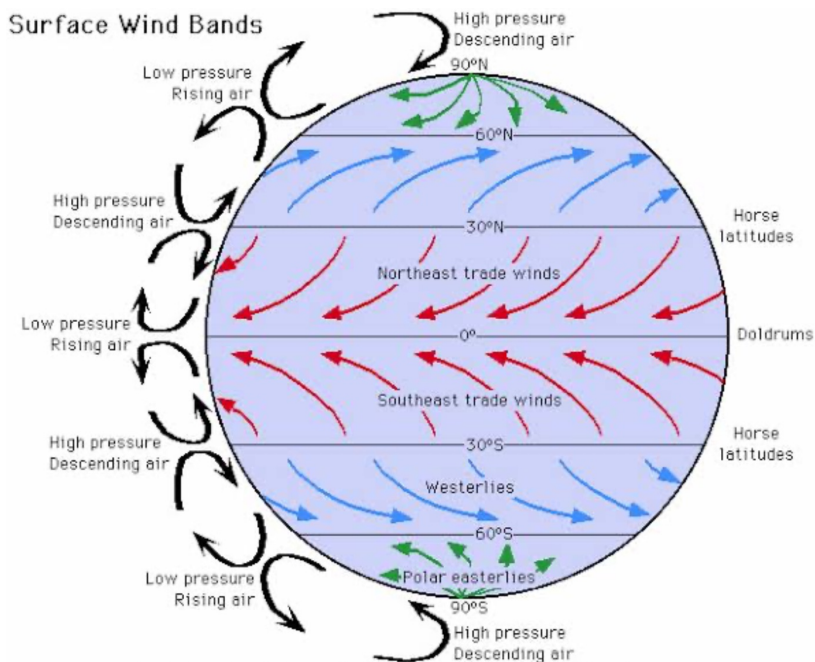
• **Horse latitude: seen in 30°N/30°S**

Coriolis force → Max at poles

Zero at equator

when at higher latitude, wind rotates a lot and blows parallel to isobar



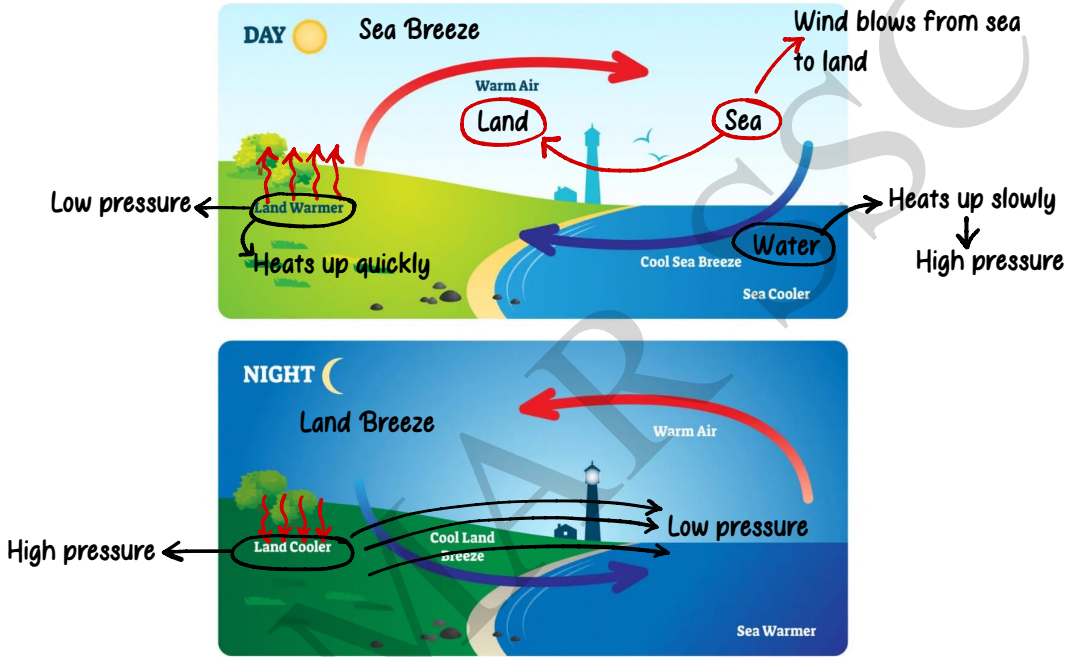


Adapted from Duxbury, Allyn C. and Alison B. Duxbury. *An Introduction to the World's Oceans*, 4/e.
Copyright © 1994 Wm. C. Brown Publishers, Dubuque, Iowa.

LOCAL WINDS



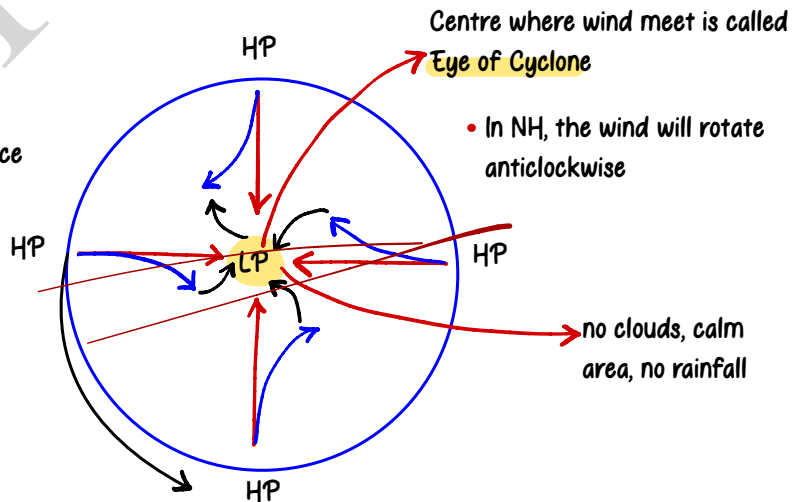
LAND VS SEA BREEZE



- Land: heats up and cools down quickly
- Water: heats up and cool down slowly

Cyclones

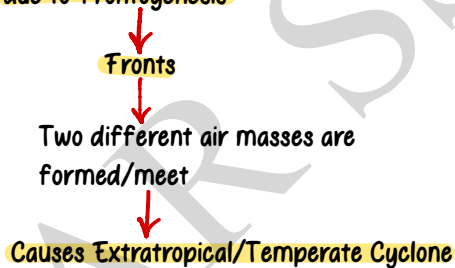
- At Equator, the Coriolis force is zero → No cyclone



Conditions favourable:

1. Large Sea Surface temperature
 2. Coriolis force
 3. Small variation in vertical wind speed
 4. Pre-existing weak LP area
- During cyclone, Cumulonimbus clouds are formed → Causes heavy rain and thunderstorms

Cyclone at High Latitudes are caused due to Frontogenesis



• Difference in Tropical and Temperate cyclone

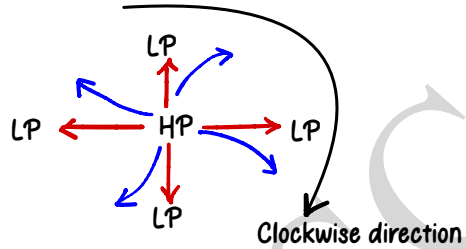
Tropical

- Only in Sea
- More destructible
- Not frequent
- Flows East to West

Temperate

- In land/sea
- Less destructible
- More frequent
- Flows from West to East

Anticyclone: forms around high pressure



Cyclone

Anticlockwise

NH → Anticlockwise

Clockwise

SH → Clockwise

Anticlockwise

Different names of cyclones:

1. Atlantic Ocean: Hurricane
2. Australia: Willy-Willy
3. Western Pacific/South China Sea: Typhoon
4. Indian Ocean: Cyclone

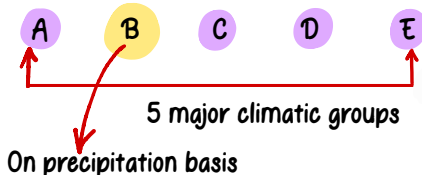
Koeppen Climatic Classification

- **Weather**: short term
- **Climate**: long term → Roughly 30 years data is taken

• Mediterranean Sea: Cs

Koeppen in 1884 → Empirical Climatic Classification

- Used capital and small letters
- Climatic groups represented with different codes



Steppe

Koeppen's Classification

S

A: Tropical → Average temperature of coldest month: 18°C or higher

B: Dry Climate → Potential evaporation exceeds precipitation

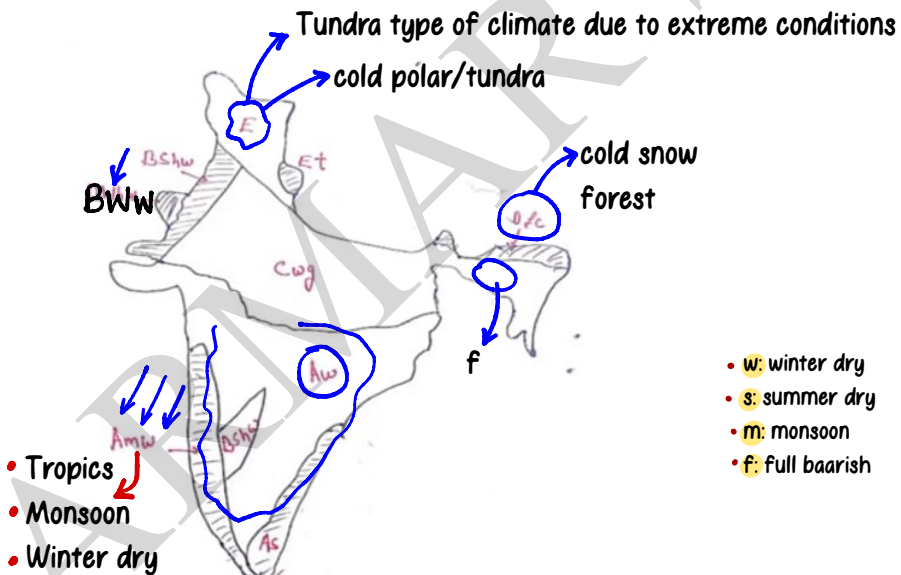
W

C: Warm Temperate → Average temperature of coldest month of climate years is higher than -3°C but below 18°C

Desert

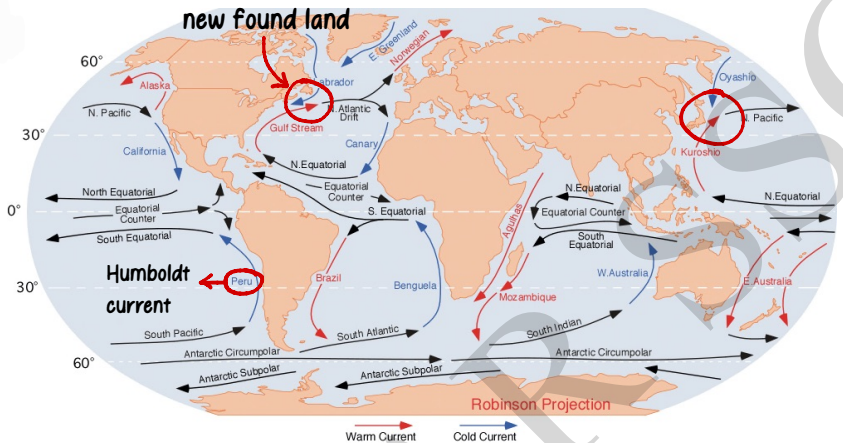
D: Cold Snow Forest → Average temperature of coldest month is -3°C or below

E: Polar type (cold) → Average temperature for all months is below 10°C

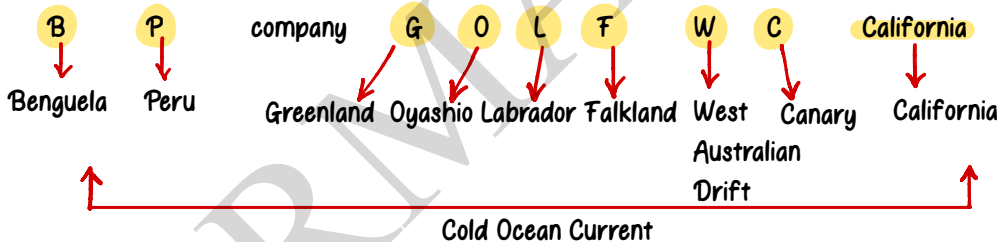


Koeppen's India's climatic Regions

Ocean Currents



TRICK



Reasons of origination:

1. Heating by Sun
2. Wind
3. Density different
4. Coriolis force
5. Coastline of continents

- Cold air: water holding capacity less
- Warm air: water holding capacity high

Types of Ocean Currents

Surface: 10% Deep Sea: 90%

Cold water moves from poles to equator
Warm water moves from equator to poles

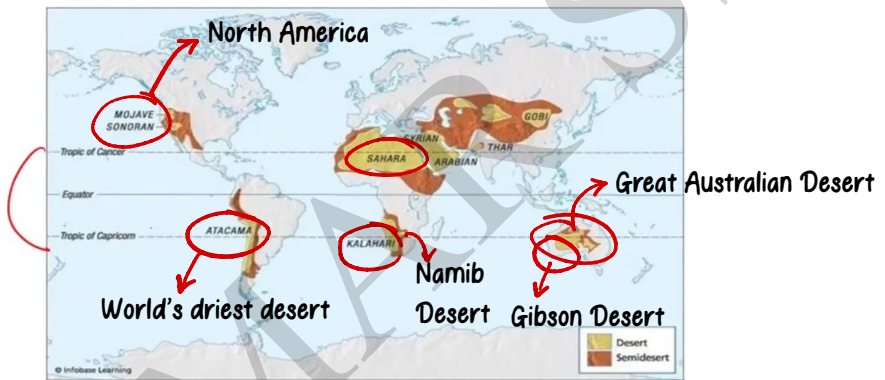
Effects:

1. Warm ocean current + cold ocean current → Best fishing zones

Creates foggy conditions: worst for Harbours

2. Cold ocean current: creates **desert**

Max. desert seen on Western side of the continent



• Grasslands: areas where there is not much precipitation (Rainfall)



Water vapour: it is a gas, the amount of which **decreases with altitude**

Products of volcanic eruptions:

Pyroclastic debris

Ash and dust

Nitrogen compounds

Sulphur compounds

On June 21, every year, Tropic of Cancer and Arctic Circle experiences a sunlight of more than 12 hours

Coriolis force increases with increase in wind velocity, and it is maximum at poles and is absent at the equator