Geography Class 27

A BRIEF REVISION OF THE PREVIOUS CLASS (09:11 AM)

- Air masses
- Front and its types
- Temperate cyclone

TROPICAL CYCLONES (09:22 AM)

- A tropical cyclone is a low-pressure and high-velocity wind system originating within the tropics over the oceans.
- It is called a cyclone in the Indian Ocean, a Hurricane in the Atlantic Ocean, Taifu in Japan, Bagui near Taiwan, Willy-willy near Australia, and a Typhoon near the South China Sea.
- **Classification/ Stages in Cyclone**

Table 2-2: Classification used in India for tropical cyclones

	Type	Wind Speed	
		km per hour (kmph)	*Knots*
1	Low Pressure area	Less than 31	Less than 17
2	Depression	31 to 49	17 to 27
3	Deep Depression	50 to 61	28 to 33
4	Cyclonic Storm	62 to 88	34 to 47
5	Severe Cyclonic Storm	89 to 118	48 to 63
6	Very Severe Cyclonic Storm	119 to 221	64 to 119
7	Super Cyclone	More than 221	More than 119

Note: One kmph = 0.54 knots; one knot = 1.852 kmph

- **Conditions necessary for the formation of cyclones**
- **High temperature** of above 27 degrees C of ocean water to ensure sufficient evaporation.
- Such high temperature occurs only over tropical oceans between 30 degrees North and 30 degrees South. Therefore, such cyclones do not form in Temperate areas.
- **Depth of warm water** i.e. 27 degrees C should extend up to 60-70 mts of depth.
- Along the western margin of continents within the tropical region, the presence of cold ocean currents and strong upwelling suppresses the formation of tropical cyclones. In these regions, the air is also too dry and has low humidity.
- **The amount of humidity** in the air should be high. Relative humidity should be at least 50-60%.
- **Coriolis Force** causing wind deflection causes it to move in an anti-clockwise direction around the low pressure. Therefore, cyclones do not develop between 5 degrees North and South due to the absence of Coriolis force.
- **Minimum vertical wind sheer** so that humid and warm air is not swept away.
- Cyclones develop more in the Bay of Bengal than the Arabian Sea due to strong wind shear in the Arabian Sea and the surface ocean temperatures of the Bay of Bengal remain high due to the large influx of freshwater from rivers.
- The **upper-air divergence** causes convergence near the surface.
- A pre-existing low-level disturbance intensifies to form cyclones.

Implications:-

High temperature of 27 degree celsius occurs only over tropical oceans between 30 degree north and south.

Along the western margin of continents within the tropical regions presence of cold ocean currents and strong upwelling suppresses the formation of tropical cyclones. In these regions the air is also too dry.

cyclones are not developed between 5 degree north and south due to absence of coriolis force.

FORMATION OF TROPICAL CYCLONES (10:09 AM)

- A strong convection along a large expanse of warm water of the ocean results in a huge build-up of cumulonimbus clouds.
- The release of latent heat provides more energy to the system supporting further strong convection.
- When the wind starts to descend along the sides, the entire system is stabilised.
- The lateral winds near the surface start to rotate around the low-pressure centre due to the Coriolis force.
- After some time, some of the dense air rising near the center starts to descend resulting in the formation of the eye.
- The entire system of cyclones moves under the influence of Planetary winds and moves towards the northwest.
- If the system encounters a land surface or comes in contact with cold waters, it dissipates.
- **Structure of the cyclone**
- **Eye-** It is the centre of the storm, 5 to 50 km in diameter with clear sky, calm conditions, the lowest pressure and the highest temperature.
- **Eye Wall-** It is a wall of thick Cumulonimbus clouds with 10-20 km of width. It has the strongest winds in the cyclone. Thunderstorms occur in this region due to intense convection and rainfall.
- **Spiral Bands-** Also known as feeder bands or rain bands. They extend for hundreds of km and lead to a galaxy-type appearance.
- **Annular zone-** Zone of suppressed cloudiness, high temperature and low humidity.
- **Outer Convective Band** - Present at the edge of the main cloud mass with instability and convection.

NAMING SYSTEM OF CYCLONE (11:17 AM)

- In 2004, 8 countries of the Indian Ocean agreed to have a common naming system for cyclones in the Northern Indian Ocean.
- Each of the countries arranged in alphabetical order submitted a set of 8 names.
- The suggested names shall be neutral politically, religiously, culturally and with respect to gender.
- It should be easy to pronounce.
- The regional specialised meteorological centre of WMO located in New Delhi maintains the list arranged in sequential order and assigns the name.
- In 2019, in new matrix suggested by 13 countries was agreed upon.
- Presently the countries participating in the system are Bangladesh, India, Iran, Maldives, Myanmar, Oman, Pakistan, Qatar, Saudi Arabia, Sri Lanka, Thailand, UAE, and Yemen.

RECURVATURE OF CYCLONES (11:35 AM)

- When the air currents in the local atmosphere push cold air from poles towards the equator and interfere with cyclone formation, the cyclone which is about to diminish gets more wind and deflects right or Eastward under the influence of westerlies. This phenomenon is called as re-curvature of cyclones.
- Recurvature is very difficult to predict. E.g. Cyclone Ockhi of 2018.
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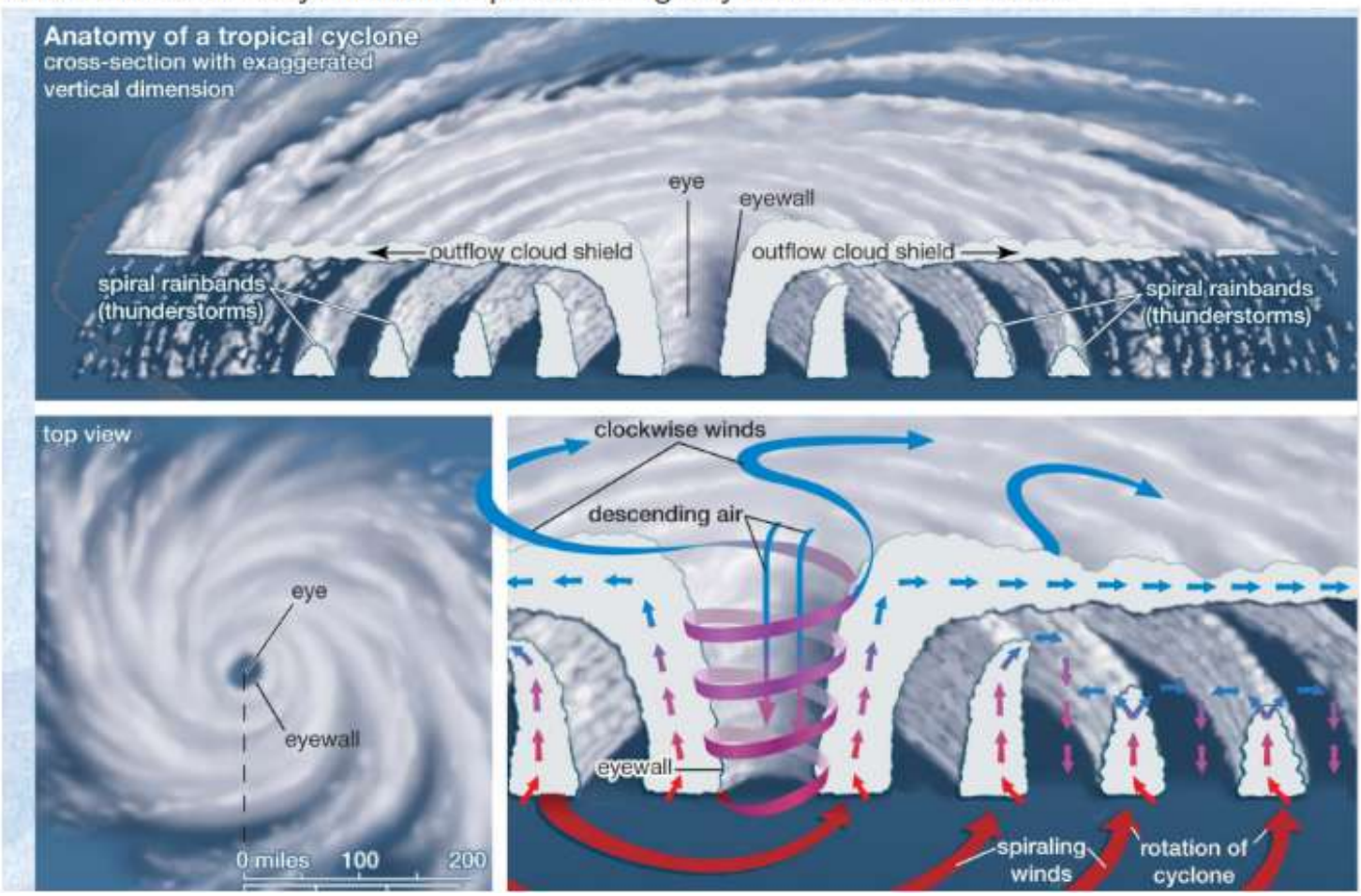


COLOUR-CODED WARNING SYSTEM OF IMD FOR CYCLONES (11:46 AM)

- It is used to signify the intensity of the situation and the warning associated with it.
- **Four colours are used-**
- Green - No warning
- Yellow- Be aware
- Orange- Be prepared
- Red- Take Action
- The objective is to alert people of hazardous weather and be prepared for disaster-like situations.
- It is issued during floods and heavy rainfall.
- For cyclones, a colour-coded warning system is represented through a matrix.

Green	No severe weather expected
Yellow	**Be Aware:** There is a moderate risk of severe or a low risk of extreme weather occuring.*Remain alert and ensure you access the latest weather forecast*
Amber	**Be Prepared:** There is a high risk of severe or a moderate risk of extreme weather occuring. *Remain vigilant and make sure you access the latest weather forecast.* Take precaution where possible
Red	**Take Action:** There is a high risk of an extreme weather event occuring. *Remain extra vigilant and ensure you access the latest weather forecast. Follow orders and any advice given by the authorities under all circumstances and be prepared for extra ordinary measures*

DIFFERENCE BETWEEN TROPICAL AND TEMPERATE CYCLONES (12:00 PM)

Difference between Tropical Cyclones and Temperate Cyclones

Tropical Cyclones	Temperate Cyclones
1. Tropical cyclones are produced mainly over the sea.	1. Temperate cyclones are produced both on land and on sea.
2. They generally originate in the tropical region between 8° and 20°N and S.	2. They originate in the mid-latitudinal region between 35° latitude and 65° latitude.
3. They are limited to a small area.	3. They occupy areas measuring thousands of kilometres.
4. They travel from east to west.	4. They travel from west to east.
5. They are forecasted by high temperature and humidity but still air.	5. They are forcasted by fall in temperature and pressure, wind shifts and a halo around the sun and the moon.
6. They are associated with violent winds with great speed, dense clouds and heavy rains.	6. The wind speed is low and the rainfall is light, which continues for many days.
7. They are largely a summer phenomena.	7. They are most intense in winter.

5 to 25 degree

TOPIC OF THE NEXT CLASS- WORLD CLIMATE REGIONS

Because Tropical cyclone needs strong convection which can happen only in sea whereas Temperate cyclones need covergence of air masses

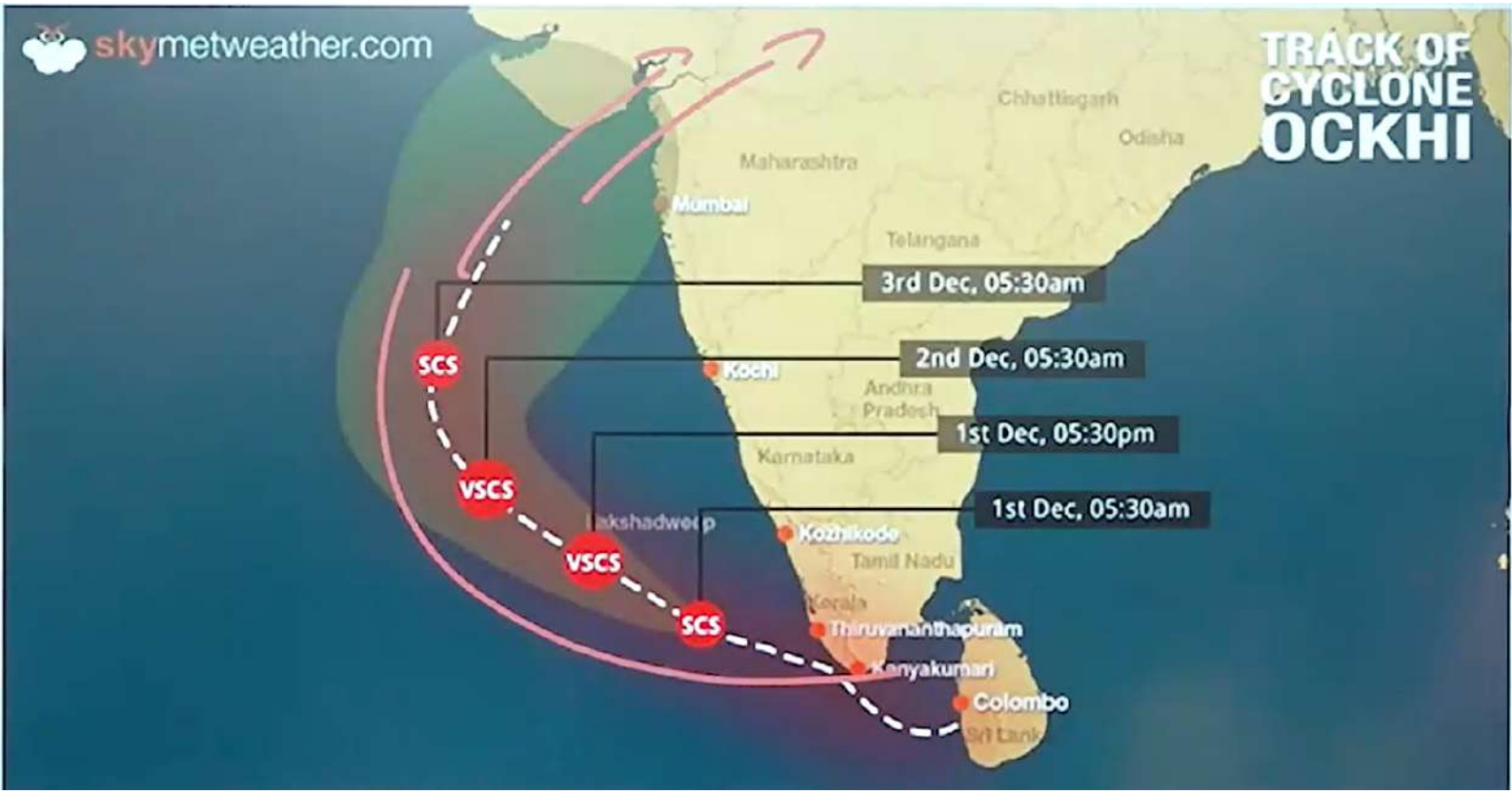
Cyclones part is important

List of Northern Indian Ocean tropical cyclone names

List	Contributing nation							
	Bangladesh	India	Maldives	Myanmar	Oman	Pakistan	Sri Lanka	Thailand
1	Onil	Agni	Hibaru	Pyarr	Baaz	Fanoos	Mala	Mukda
2	Ogni	Akash	Gonu	Yemyin	Sidr	Nargis	Rashmi	Khai-Muk
3	Nisha	Bijli	Aila	Phyan	Ward	Laila	Bandu	Phet
4	Giri	Jal	Keila	Thane	Murjan	Nilam	Viyaru	Phailin
5	Helen	Lehar	Madi	Nanauk	Hudhud	Nilofar	Ashobaa	Komen
6	Chapala	Megh	Roanu	Kyant	Nada	Vardah	Maarutha	Mora
7	Ockhi	Sagar	Mekunu	Daye	Luban	Titli	Gaja	Phethai
8	Fani	Vayu	Hikaa	Kyarr	Maha	Bulbul	Pawan	Amphan

List of Northern Indian Ocean tropical cyclone names (effective from 2020)

List	Contributing nation												
	Bangladesh	India	Iran	Maldives	Myanmar	Oman	Pakistan	Qatar	Saudi Arabia	Sri Lanka	Thailand	U.A.E.	Yemen
1	Nisarga	Gati	Nivar	Burevi	Tauktae	Yaas	Gulab	Shaheen	Jawad	Asani	Sitrang	Mandous	Mocha
2	Biparjoy	Tej	Hamoon	Midhili	Michaung	Remal	Asna	Dana	Fengal	Shakhti	Montha	Senyar	Ditwah
3	Arnab	Murasu	Akvan	Kaani	Ngamann	Sail	Sahab	Lulu	Ghazeer	Gigum	Thianyot	Afoor	Diksam
4	Upakul	Aag	Sepand	Odi	Kyarthit	Naseem	Afshan	Mouj	Asif	Gagana	Bulan	Nahhaam	Sira
5	Barshon	Vyom	Booran	Kenau	Sapakyee	Muzn	Manahil	Suhail	Sidrah	Verambha	Phutala	Quffal	Bakhur
6	Rajani	Jhar	Anahita	Endheri	Wetwun	Sadeem	Shujana	Sadaf	Hareed	Garjana	Aiyara	Daaman	Ghwyzi
7	Nishith	Probaho	Azar	Riyau	Mwaihout	Dima	Parwaz	Reem	Faid	Neeba	Saming	Deem	Hawf
8	Urmi	Neer	Pooyan	Guruva	Kywe	Manjour	Zannata	Rayhan	Kaseer	Ninnada	Kraison	Gargoor	Balhaf
9	Meghala	Prabhanjan	Arsham	Kurangi	Pinku	Rukam	Sarsar	Anbar	Nakheel	Viduli	Matcha	Khubb	Brom
10	Samiron	Ghurni	Hengame	Kuredhi	Yinkaung	Watad	Badban	Oud	Haboob	Ogha	Mahingsa	Degl	Shuqra
11	Pratikul	Ambud	Savas	Horangu	Linyone	Al-jarz	Sarrab	Bahar	Bareq	Salitha	Phraewa	Athmad	Fartak
12	Sarobor	Jaladhi	Tahamtan	Thundi	Kyeekan	Rabab	Gulnar	Seef	Alreem	Rivi	Asuri	Boom	Darsah
13	Mahanisha	Vega	Toofan	Faana	Bautphat	Raad	Waseq	Fanar	Wabil	Rudu	Thara	Saffar	Samhah


skymetweather.com
TRACK OF CYCLONE OCKHI
Chhattisgarh
Odisha
Maharashtra
Mumbai
Telangana
3rd Dec, 05:30am
2nd Dec, 05:30am
Kochi
Andhra Pradesh
1st Dec, 05:30pm
Karnataka
1st Dec, 05:30am
SCS
VSCS
VSCS
SCS
Kozhikode
Tamil Nadu
Kerala
Thiruvananthapuram
Kanyakumari
Colombo