

HEATWAVE DEATHS: WHY A HEAT STROKE KILLS, AND HOW TO STAY SAFE

Why in News?

- Amid heatwave deaths being reported in parts of the country, Union Health minister **Mansukh Mandaviya** held a meeting with senior officials of the India Meteorological Department, National Disaster Management Authority, and the Health ministry.

What is Heat wave?

- **Qualitatively**, heat wave is a condition of air temperature which becomes fatal to human body when exposed.
- **Quantitatively**, it is defined based on the temperature thresholds over a region in terms of actual temperature or its departure from normal.
- In certain countries it is defined in term of the heat index based on temperature and humidity or based on extreme percentile of the temperatures.

What is Criterion for Declaring Heat wave?

- Heat wave is considered if maximum temperature of a station reaches at least 40⁰C or more for Plains and at least 30⁰C or more for Hilly regions.
- **For coastal regions –**
 - When maximum temperature departure is 4.5⁰C or more from normal, Heat Wave may be described provided actual maximum temperature is 37⁰C or more.
- **Period of Heat wave over India –**
 - It is occurring mainly during March to June and in some rare cases even in July. The peak month of the heat wave over India is May.
- **Heat wave prone areas of India –**
 - Heat wave generally occurs over plains of northwest India, Central, East & north Peninsular India during March to June.

How India Meteorological Department (IMD) Monitors the Heat wave?

- IMD has a big network of surface observatories covering entire country to measure various metrological parameters like Temperature, Relative humidity, pressure, wind speed & direction etc.
- Based on daily maximum temperature station data, climatology of maximum temperature is prepared for the period **1981-2010** to find out normal maximum temperature of the day for particular station.
- Thereafter, IMD declared heat wave over the region as per its definition.

How Does Heatwave Affect Human Body?

- We all feel drained and tired after stepping out on an extremely hot day.
- This is referred to as **heat exhaustion**, which happens when the body sweats excessively to keep the core temperature low.
- A **heat stroke** happens when the ambient temperature is so high that the body is unable to sweat to regulate the core temperature, which shoots up to 40⁰
- In these cases, there is a **severe imbalance of salts such as sodium and potassium in the body**.
- The high core temperature coupled with salt imbalances disrupts organs, leading to a host of symptoms.
- It can affect the brain, making a person foggy, drowsy, and in severe cases may also lead to a person going into a coma.
- It can lead to kidney and liver damage as well. A cascade of such symptoms leads to death due to heat stroke.

How to Avoid Heat Stroke?

- The primary aim should be to **bring down the core temperature of the body fast**.
- This can be done by pouring cold water over the person, making them drink cold drinks, and giving them electrolytes to balance salt levels.
- To prevent heat stroke, it is better to avoid stepping out in direct sunlight, especially between noon and 3 pm. You should avoid strenuous activity during this time.

RESEARCH AND ANALYSIS WING (R&AW)



Recently, the Appointments Committee of Cabinet has approved the appointment of senior IPS officer Ravi Sinha as the chief of India's external intelligence agency Research and Analysis Wing (R&AW) for a period of two years.

About Research and Analysis Wing (R&AW)

- It was established in 1968 to handle **the India's international intelligence affairs.**
- It came into force after the China-India War in 1962.
- At present, the intelligence arm operates **under the aegis of the Prime Minister's Office.**
- **Working mechanism:** It collects military, economic, scientific, and political intelligence through covert and overt operations.
- The agency is also charged with monitoring terrorist elements and smuggling rings that transport weapons and ammunition into India.

Genesis of RAW

- Until 1968, the **Intelligence Bureau (IB)** was responsible for India's internal intelligence and also handled external intelligence.
- However, after the 1962 China-India war and the Indo-Pakistani war in 1965, India established a separate and distinct external intelligence organization – the Research and Analysis Wing.
- In 1968, then India's Prime Minister Indira Gandhi appointed R. N. Kao as the first director of RAW.

ASSAM RIFLES

The Assam Rifles recently moved additional troops to secure a bridge on a national highway in south Manipur.



About Assam Rifles:

- The Assam Rifles, **one of the central armed police forces**, is the leading **counter-insurgency force in the Northeast**.
- **Background:**
 - It is the **oldest paramilitary force in India**.
 - The unit **can trace its lineage back to a paramilitary police force that was formed under the British in 1835 called Cachar Levy**.
 - Since then, the Assam Rifles have **undergone a number of name changes**—the Assam Frontier Police (1883), the Assam Military Police (1891) and Eastern Bengal and Assam Military Police (1913), **before finally becoming the Assam Rifles in 1917**.
- **Role:** It is tasked with the **maintenance of law and order in the North East** along with the Indian Army and **also guards the Indo-Myanmar border in the region**.
- It is **also known as ‘Sentinels of the Northeast’**.
- **HQ: Shillong, Meghalaya**.
- **Motto: Friends of the Hill People**.

Control:

- It is the **only paramilitary force with a dual control** structure.
- While the **administrative control of the force is with the Ministry of Home Affairs**, its **operational control is with the Indian Army**, which is **under the Ministry of Defence**.

[GANGOTRI NATIONAL PARK](#)

Gangotri national park (GNP) authorities would soon be transferring around 50 hectares of land to the Army and Indo-Tibetan Border Police (ITBP) to develop new bunkers and border outposts near the LAC.

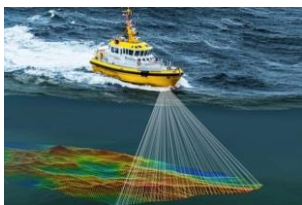


About Gangotri National Park:

- **Location:**
 - It is located in the **Uttarkashi District** region of the state of **Uttarakhand**.

- It sits **along the upper catchment of the Bhagirathi River.**
- The **northeastern** section of the park forms the **international boundary of India and Tibet (China).**
- The area enclosed by the **park also borders Kedarnath Wildlife Sanctuary and Govind National Park.**
- The park spans **2,390 sq km (920 sq mi)** of land across a **highly mountainous part** of the country.
- The **mountains in the park are part of the Gangotri Group of the Garhwal Himalayas,** which are a subrange of the eastern Himalayas.
- **Peaks:** Major peaks within the park include **Chaukhamba I, Satopanth, Chaukhamba II, Chaukhamba III, and Kedarnath Main.**
- The **famous Gangotri Glacier is located** in the park boundaries and is known for being one of the **primary sources of the Ganges.**
- **Ecology:**
 - It is home to **high-altitude ecosystems** that are common in the Himalayas.
 - **Western Himalayan subalpine conifer forests dominate the lower elevation** These forests are **filled with fir trees intermixed with deodar, oak, spruce, and rhododendrons trees.**
 - **Higher elevations in the park are home to Western Himalayan alpine shrubs.** **Alpine meadows** are also common **beneath the massive glaciers.**
- **Fauna:**
 - It is home to the **ever-elusive snow leopard.**
 - Other species include **brown bear, blue sheep, musk deer, Asian black bear, and the Himalayan tahr, among others.**

WHAT IS HYDROGRAPHY?



Union Defence Minister recently visited the hydrography ship South Jetty, Indian Naval station Kochi on the eve of World Hydrography Day to support the sustainable use of the oceans.

About Hydrography:

- Hydrography is the **branch of applied sciences** which deals with the **measurement and description of the physical features of oceans, seas, coastal areas, lakes and rivers**, as well as with the **prediction of their change over time**.
- This is done **mainly with specialised ships and boats operating echo sounders and sonars**, but also using survey aircraft fitted with lasers.
- Useful information can also be **derived sometimes from satellite observations**.
- Hydrography **also involves measuring the tide and the currents**.
- Unlike oceanography, hydrography will **include shore features, natural and manmade, lights and towers** that will **aid in fixing a ship's position**, as well as the physical aspects of the sea and seabed.
- The most **well-known application** of hydrographic information is **for making the nautical charts that all mariners use for navigation**.
- Hydrographic information is **required for the safe, efficient and sustainable conduct of every human activity** that takes place in, on or under the sea.

World Hydrography Day:

- It is **marked annually on June 21**.
- It is officially recognised and **implemented by the International Hydrographic Organisation (IHO)**.
- It serves as a platform to **highlight the crucial work carried out by hydrographers worldwide** and to promote the significance of hydrography itself.
- It aims to **increase public awareness and understanding of hydrography's role** in ensuring safe and efficient navigation, sustainable marine resource management, and coastal zone development.
- **2023 Theme: "Hydrography - underpinning the digital twin of the ocean."**

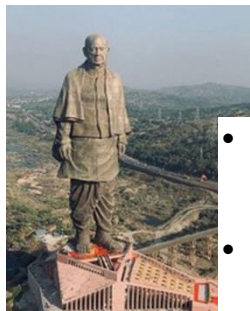
International Hydrographic Organisation (IHO):

- IHO, one of the oldest **intergovernmental organisations**, was **established in 1921** as a prominent entity **focused on addressing various aspects of marine life**.

- **Functions:**
 - It works to ensure that all the world's seas, oceans and navigable waters are surveyed and **charted**, thereby supporting the safety of navigation and the protection of the marine environment.
 - It coordinates the activities of national hydrographic offices and sets standards in order to promote uniformity in nautical charts and documents.
 - It issues survey best practices and provides guidelines to maximize the use of hydrographic information.
 - **Headquarters: Monaco**
-

STATUE OF UNITY

The Statue of Unity Area Development and Tourism Governance Authority (SOUADTGA) recently issued a tender to resume the suspended helicopter joyride services at the Statue of Unity.



About Statue of Unity:

- It was created as a tribute to the 'Iron Man of India', Sardar Vallabhbhai Patel.
- **Location:** It is Located in Gujarat, by the banks of River Narmada on the River Island of Sadhu Bet overlooking the Narmada Dam.
- **Height:** The statue, **182-metre tall**, is described as the world's tallest as it exceeds the height of China's Spring Temple Buddha by 177 feet.
- The statue was built by Indian construction major Larsen & Toubro (L&T) and designed by Padma Bhushan-winning sculptor Ram V Sutar.

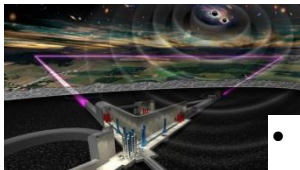
Key facts about Sardar Vallabhbhai Patel:

- He was an Indian barrister and statesman, one of the leaders of the Indian National Congress during the struggle for Indian independence.
- He was born on 31st October 1875, in Nadiad, Gujarat.

- Patel **first made his mark in 1918**, when he **planned mass campaigns of peasants, farmers, and landowners of Kaira, Gujarat, against the decision of the Bombay government to collect the full annual revenue taxes despite crop failures** caused by heavy rains.
- He was so **influenced by Gandhiji's ideas that in the year 1920, in the non-cooperation movement**, he adopted indigenous Khadi items and started boycotting foreign clothes.
- **Patel led the Satyagraha movement in Nagpur in 1923** against the British law of banning the hoisting of the Indian Flag.
- **In 1928** Patel successfully **led the landowners of Bardoli** in their resistance **against increased taxes**.
- His efficient leadership of the Bardoli campaign **earned him the title of sardar ("leader")**.
- He was appointed as the **first Deputy Prime Minister and Home Minister of India from 1947 to 1950**.
- He is highly **credited for the peaceful integration of the princely Indian states** into the Indian Union and the **political unification of India**.

WHAT IS EINSTEIN TELESCOPE?

CERN is helping build and realise the Einstein Telescope, a massive subterranean gravitational wave detector that is expected to be ten times as sensitive as the detectors so far.



About Einstein Telescope:

- It is an **advanced gravitational-wave observatory**, currently in the **planning stage**.
- It **builds on the success of current**, second-generation laser-interferometric detectors Advanced Virgo and Advanced **LIGO**, whose breakthrough discoveries of merging black holes (BHs) and neutron stars over the past 5 years have ushered scientists into the new era of gravitational-wave astronomy.

- The Einstein Telescope will achieve a greatly improved sensitivity by increasing the size of the interferometer from the 3km arm length of the Virgo detector to 10km, and by implementing a series of new technologies.
- The expected sensitivity of the Einstein Telescope will be at least a factor of ten times that of Ligo.

Applications:

- It will make it possible, for the first time, to explore the Universe through gravitational waves along its cosmic history up to the cosmological dark ages, shedding light on open questions of fundamental physics and cosmology.
- It will probe the physics near black-hole horizons (from tests of general relativity to quantum gravity), help understand the nature of dark matter, and the nature of dark energy and possible modifications of general relativity at cosmological scales.
- Its low-frequency sensitivity will allow us to detect intermediate-mass black holes.

What are Gravitational Waves?

- They are 'ripples' in space-time caused by some of the most violent and energetic processes in the Universe.
- Albert Einstein predicted the existence of gravitational waves in 1916 in his general theory of relativity.
- Einstein's mathematics showed that massive accelerating objects (things like neutron stars or black holes orbiting each other) would disrupt space-time in such a way that 'waves' of undulating space-time would propagate in all directions away from the source.
- These cosmic ripples would travel at the speed of light, carrying with them information about their origins, as well as clues to the nature of gravity itself.
- The strongest gravitational waves are produced by cataclysmic events such as colliding black holes, supernovae, and colliding neutron stars.