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TODAY'S ANALYSIS

(18 December 2024)

TOPICS TO BE COVERED

- SANTA ANA WINDS
- OIL SPILLS IN KERCH STRAIT
- MCQs



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SANTA ANA WINDS

- Firefighters are still fighting a wildfire in **Malibu**, California, which started on December 9, 2024.
- The fire, called the **Franklin Fire**, has burned more than **4,000 acres** of land and affected around **22,000 people**.
- Officials have said it will take a few more days to fully control the fire, which was **20% contained** as of 12th December 2024.
- While the cause of the fire is still unknown, experts believe that two factors played a big role in making this fire so destructive: the **Santa Ana winds** and **climate change**.

WHAT ARE SANTA ANA WINDS?

- **Santa Ana Winds** occur when there is **high pressure** in the area known as the **Great Basin**, which is **located between the Rocky Mountains and the Sierra Nevada mountains**.
- At the same time, there is **low pressure** along California's coast.



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- This **difference in pressure causes powerful winds to move from the Great Basin's inland deserts**, across the mountains, and towards the Pacific Ocean.
- As the winds move down the mountains, they **compress and heat up**.
- The air becomes very dry, with **humidity dropping to less than 20%** or sometimes even **less than 10%**.
- This extremely dry air makes plants and trees lose moisture and become very **dry**—which makes them more likely to catch fire.
- **Timing of the Winds:** These winds usually happen from **October to January**, as winter weather patterns cause high pressure to build in the Great Basin.
- This interacts with low-pressure air over the Pacific Ocean.

HOW IT AIDS WILDFIRES?

The dry air from the Santa Ana winds in Malibu made the vegetation ready to catch fire quickly, fueling the Franklin Fire.

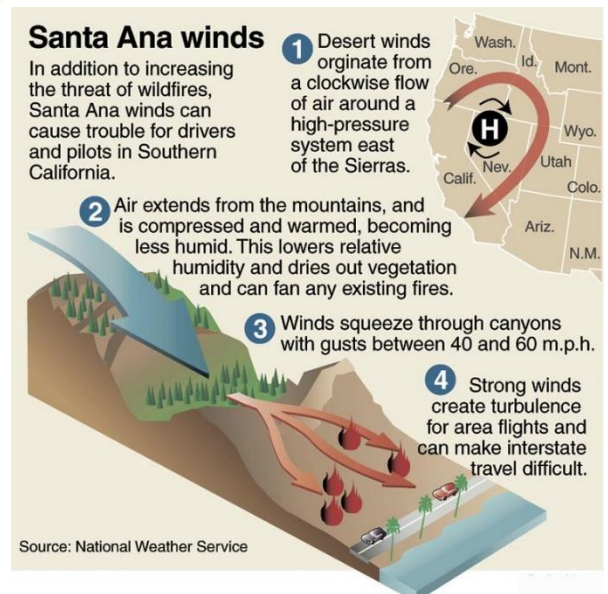
ROLE OF CLIMATE CHANGE

- **Wildfires Are Natural:** Wildfires, especially

those driven by Santa Ana winds, are a **natural part** of California's environment.

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- However, in recent years, the wildfire season has **become longer** and the fires have gotten **stronger**.
- **Longer Wildfire Seasons:** A **2021 study** published in the journal *Nature Scientific Reports* found that the wildfire season in California has **grown longer** over the past 20 years.
- It also found that the **peak** of wildfire season has shifted from **August** to **July**.
- **More Intense Fires:** According to a **2023 study** in the *Proceedings of the National Academy of Sciences*, **10 of the largest wildfires** in California's history have occurred in the past 20 years. **Five of those happened in 2020 alone**.
- **Climate Change's Impact:** These changes have mostly been caused by **climate change**.
- As the world's temperatures rise, we experience **warmer springs and summers**, as well as **early snowmelt in spring**.
- These changes create longer **dry seasons**, which put more stress on plants, making them more likely to catch fire.
- This has made California's forests and other areas more vulnerable to wildfires.
- **Future Projections:** The problem will likely continue to get worse unless greenhouse gas emissions are reduced. A recent **United Nations report** warned that if current climate policies continue, **global temperatures will rise by more than 3°C** by the end of the century. This is more than **twice the 1.5°C limit** that world leaders have aimed to stay below.

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OIL SPILLS IN KERCH STRAIT



- A Russian oil tanker broke apart during a heavy storm on **15th December 2024**, spilling oil into the **Kerch Strait**. One person has been confirmed dead.
- Another Russian tanker was also in trouble after taking damage.
- Both incidents took place in the waters between **mainland Russia** and **Crimea**, an area **Russia annexed from Ukraine in 2014**.

WHAT IS A STRAIT?

- A **strait** is a narrow waterway that connects two larger bodies of water, separating two land masses.

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THE KERCH STRAIT:

- **Location:** Eastern Europe; connects the **Black Sea** and the **Sea of Azov**.
- **Historical Names:**
 - Romans called it the *Strait of Cimmerian Bosphorus*.
 - Greeks referred to it as the *Cimmerian Strait*.

MORE ABOUT KERCH STRAIT

- **Geography:**
 - **Separation:** Divides the **Kerch Peninsula** (part of Russian-occupied **Crimea**) from the **Taman Peninsula** (Russia).
 - **Dimensions:**
 - Length: ~3 km.
 - Width: ~15 km.

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- Depth: 18 meters.
- Narrowest point: 3–5 km at the northern end of the **Chushka Landspit**.
- **City of Kerch:** Located near the center of the strait, on the Crimean side.
- **Strategic Importance:**
 - Key **global shipping route** connecting the Black Sea with the Sea of Azov.
 - **Military & Political Significance:**
 - Became a focal point of **conflict between Russia and Ukraine** since Russia annexed Crimea in **2014**.
 - Vital for trade and naval control in the region.

Kerch Strait Bridge (Crimean Bridge)

- **Purpose:** Links **mainland Russia** with **Crimea**.
- **Construction:** Completed in **2018**.
- **Structure:** Includes both **road** and **rail** connections.
- **Length:** **19 km** – the longest bridge in Europe.
- **Political Symbolism:** Represents Russia's annexation of Crimea in **2014**.

THE TANKER ACCIDENT

- The Russian oil tanker **Volgoneft 212** was **136 meters** long and was carrying **15 crew members**.

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- During the storm, the tanker was **split in half**, with the front part (**bow**) sinking. Waves were seen washing over the deck, as shown in footage from state media.
- The **Volgoneft 212** was built in **1969** and had **run aground**, which means it got stuck on the seabed.
- According to Russia's **water transport agency (Rosmorrechflot)**, the ship **spilled petroleum products** into the water during the incident.
- **The Second Damaged Tanker**
 - A second tanker, the **Volgoneft 239**, was also damaged.
 - This tanker was **132 meters** long and had a crew of **14 people**. It was built in **1973**.
 - After sustaining damage, the **Volgoneft 239** was **drifting** in the storm.
 - Both tankers were designed to carry **around 4,200 tonnes of oil products** each.
- **The Impact and Response**
 - The exact **cause** of the damage or the **extent of the oil spill** was not provided by officials.
 - However, it was clear that the storm caused serious trouble for both tankers.
 - **Rescue efforts:** Over **50 people** and various **rescue equipment**, including **Mi-8 helicopters** and **rescue tugboats**, were sent to help.

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- The spill happened in the **Kerch Strait**, a busy waterway between **mainland Russia** and **Crimea**.

Details about the spilled oil:

- According to Russia's **Kommersant newspaper**, the **Volgoneft 212** was carrying about **4,300 tonnes of fuel oil** when it split apart.
- **Unverified video** shared on **Telegram** showed the **blackened water** around the tanker and a **half-submerged vessel** in the stormy seas.

Casualties

- **At least one person** was confirmed dead due to the incident, though the exact cause of the death was not provided.

METHODS USED TO CLEAN OIL SPILLS

Method	Description	Pros	Cons	Best Used For
Containment (Booms)	Floating barriers placed around the spill to contain the spread of oil.	Prevents spread of oil.	Requires calm waters to be effective.	Large-scale spills, especially in open water.
Skimmers	Machines that remove oil from the water surface by scooping or sucking it up.	Removes oil directly from water.	Effective only in calm conditions.	Open water, small to medium-sized spills.
Chemical Dispersants	Chemicals sprayed to break oil into small droplets, allowing natural breakdown.	Helps oil biodegrade faster.	Can be toxic to marine life.	Deep water or remote areas, especially large spills.

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Method	Description	Pros	Cons	Best Used For
Bioremediation	Use of microorganisms to break down oil into harmless substances.	Environmentally friendly.	Slow process, may take weeks to months.	Coastal areas, beaches, or shorelines.
In-Situ Burning	Controlled burning of oil on water to remove it.	Quickly eliminates large amounts of oil.	Releases pollutants into the atmosphere.	Small-scale spills in open water.
Sorbents	Materials that absorb or adsorb oil (e.g., peat moss, synthetic pads).	Easy to deploy and effective for small spills.	Limited capacity, less effective for large spills.	Small to medium-sized spills, particularly on water.



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MCQs

1. Consider the following statements wrt Santa Ana winds & mark the correct one:

1. Santa Ana winds blow from West to East.
2. These are offshore winds.

- (A) Only 1
(B) Only 2
(C) Both 1 & 2
(D) Neither 1 nor 2



Ans. (C)

2. Which of these states of USA do not share a coastline with Pacific Ocean?

- (A) California
(B) Oregon
(C) Utah
(D) None of the above

Ans. (C)

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3. Consider the following statements wrt Kerch Strait and mark the correct one:

1. It connects Sea of Azov & Black Sea
2. It divides the Kerch Peninsula from the Taman Peninsula.

- (A) Only 1
(B) Only 2
(C) Both 1 & 2
(D) Neither 1 nor 2

Ans. (C)

4. Consider the following statements wrt Skimming technique to disperse oil spills and mark the correct ones:

1. It is done by machines that remove oil from the water surface by scooping or sucking it up.
2. It is best used in large spills.

- (A) Only 1
(B) Only 2
(C) Both 1 & 2
(D) Neither 1 nor 2

Ans. (A)

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