



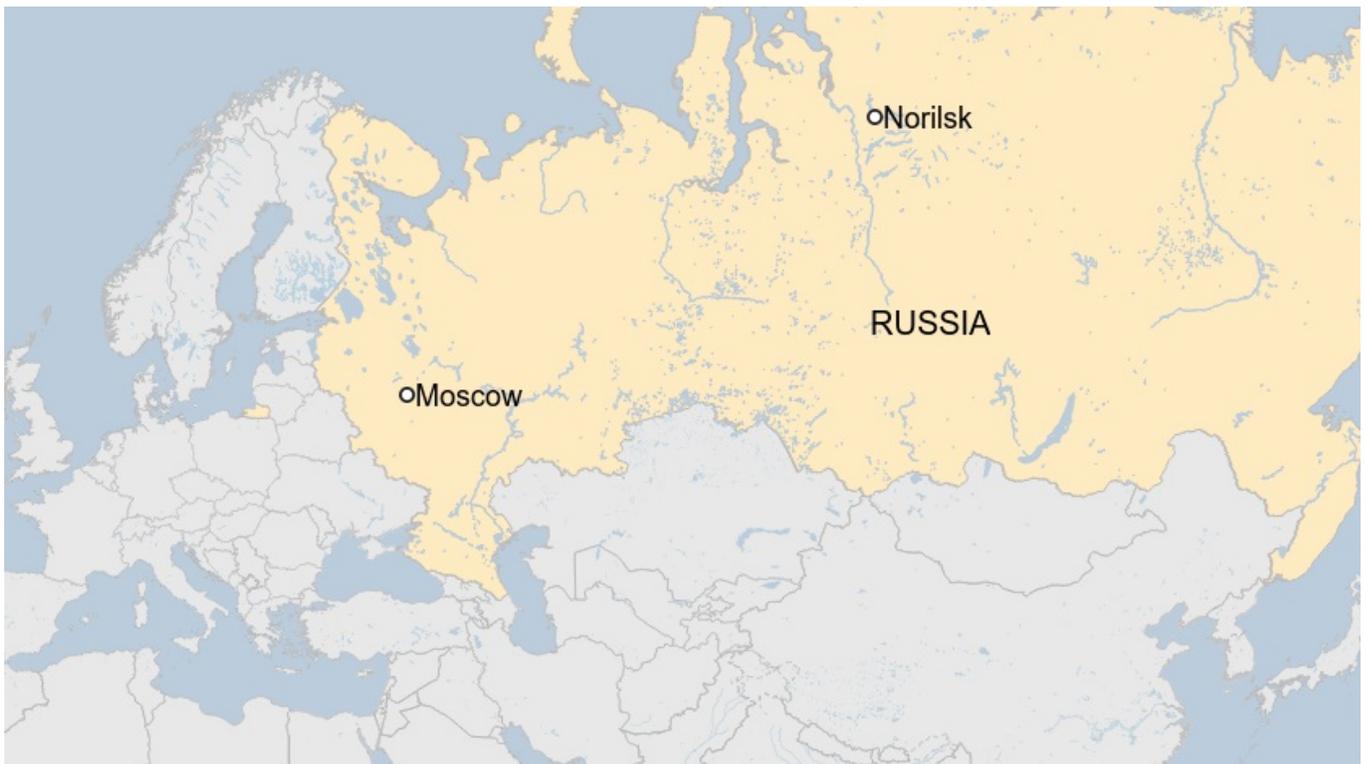
Oil Spill in Siberia

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Why in News

Recently, **Russia** has declared a **state of emergency** in its **Krasnoyarsk Region** after a power plant **fuel leaked** causing 20,000 tonnes of diesel oil to escape into **the Ambarnaya River**.

Krasnoyarsk Region is located in the vast and sparsely populated **Siberian peninsula** and the Ambarnaya river is part of a network that flows into the **environmentally sensitive Arctic Ocean**.



Key Points

- **Reasons for the Spill:**
 - The **thermoelectric power plant** which is located near **Norilsk city** (known as the country's **nickel capital**), around 3000 km northeast of Moscow, is **built on permafrost** which has **weakened** over the years owing to **climate change**.
This caused the **pillars that supported the plant's fuel tank to sink**, leading to a loss of containment.
 - According to a report, **Norilsk is one of the most heavily polluted places** on Earth.
- **Concerns:**
 - The leak can have a serious **impact on the local ecology**.
The Ambarnaya river flows to the **Pyasino lake and river Pyasina**, which connects it to the **Kara Sea**, a **part of the Arctic Ocean**.
 - The **most toxic components** of diesel fuel are light **aromatics** (benzene, toluene, ethylbenzene and xylene), which in significant quantities will nevertheless **dissolve in water** and **can in no way be collected**.
 - **Damages** to the Arctic waterways due to the spill could be at least **over USD 76 million**. The estimate does not include atmospheric damage due to **greenhouse gases** and **soil pollution**.
 - According to the environmentalists, the river would be difficult to clean, given its **shallow waters and remote location**, as well as the magnitude of the spill.
 - The **World Wildlife Fund** (WWF) described this as the **second-largest known oil leak** in modern Russia's history in terms of volume.
It is only exceeded by a crude oil spill in the **northwestern region of Komi** that took place over several months in **1994**.
- **Measures:**
 - The declaration of the state of emergency would bring in **extra forces and federal resources for the clean-up efforts**.
 - The Ambarnaya river is difficult to clean up because the **remote location has no roads**.
 - **Boom obstacles** (an obstacle strung across a navigable stretch of water to control or block navigation) are placed in the river but they are **unable to contain the oil** because of **shallow waters**.
 - There is a need to establish **monitoring of water quality** downstream up to the mouth of the Pyasina river.
Diesel fuel is **lighter** than oil so it is **likely to evaporate** rather **than sink** but it is **more toxic to clean up**.
 - **Burning the fuel** would be **too risky** as it will generate a lot of **heat** and will lead to the **melting of ice**.
 - It is recommended to **dilute the layer with reagents**.
A **reagent** is a substance or compound added to a system to cause a chemical reaction or added to test if a reaction occurs.

Permafrost

- The ground that remains frozen for two or more **consecutive years** is considered permafrost.
- Permafrost is composed of rock, soil, sediments and varying amounts of ice that bind elements together.
- Some permafrost is frozen for tens, hundreds or even thousands of years.

Source: IE