

1. Why record number of Olive Ridleys came to nest in Odisha this year**Introduction**

Nearly seven lakh Olive ridley turtles laid eggs at the Rushikulya 'rookery' or nesting ground in Odisha's Ganjam district during a mass nesting between February 16 and February 25. The development came after the region did not witness any mass nesting in 2024. In 2023, around 6.37 lakh Olive ridleys, an endangered marine species, laid eggs at the same spot.

What are Olive ridley turtles?

Olive ridley turtles are the smallest and most abundant of all sea turtles in the world. They get their name from the olive green colour of their heart-shaped shell, and inhabit warm waters of the Pacific, Atlantic, and Indian oceans.

Olive ridleys can grow about two feet in length, and 50 kg in weight. Scientists do not know exactly how long they live, but like other sea turtles, Olive ridleys are likely long-lived — they reach maturity around 14 years of age.

Reduction in Population

According to International Union for the Conservation of Nature (IUCN), there has been a 50% reduction in population size of these sea turtles since the 1960s. The main reasons behind their decline include long-term collection of eggs and mass killing of adult females on nesting beaches, and unintended capture in fishing gear which can lead to drowning or cause injuries that result in death.

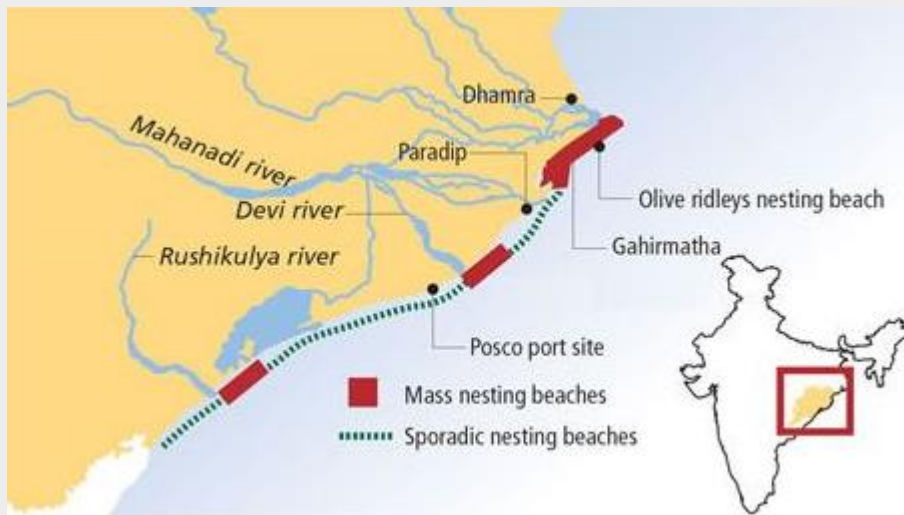
Arribada

These marine reptiles are best known for their unique mass nesting — also called arribada, Spanish for "arrival" — during which thousands of females come together on the same beach to lay eggs. Arribada nesting is a behaviour found only in Kemp's ridley and olive ridley sea turtles. Although other turtles have been documented nesting in groups, no other turtles (marine or land) have been observed nesting in such mass numbers and synchrony.

During nesting, more than 600,000 females emerge from the waters, over a period of five to seven days, to lay eggs. They lay their eggs in conical nests which they dig with their hind flippers and are one and a half feet deep.

Where does arribada occur?

While solitary nesting by Olive ridleys is known to take place in approximately 40 countries worldwide, arribada nesting occurs on only a few beaches. The coast of Odisha (where Rushikulya and Gahirmatha rookeries are situated) is the largest mass nesting site for the Olive ridley, followed by the coasts of Mexico and Costa Rica.



Experts say Rushikulya and Gahirmatha make for an ideal mass nesting site due to favourable weather conditions, warm sandy beaches, and an undisturbed coastal ecosystem.

The coast in Odisha typically witnesses arribada in the first

quarter of every year.

Why did Odisha see the arrival of so many Olive ridley turtles this year?

According to experts, a range of factors could be responsible for a large number of Olive ridleys arriving for nesting at Rushikulya this year.

One could be favourable weather conditions. Less rain means that there is no erosion in the beach, which, in turn, provides sufficient space near the river mouth for Olive ridleys to nest in large numbers.

The second reason is the beach gradient, the slope of a beach from the top to the water's edge, which is less this year compared to previous years.

Further, Rushikulya beach provided enough space for a large number of Olive ridleys to nest this year.

Relevance: GS Prelims; Environment

Source: Indian Express

2. NASA's PUNCH set to lift off: Why there has been an increase in the launch of solar missions

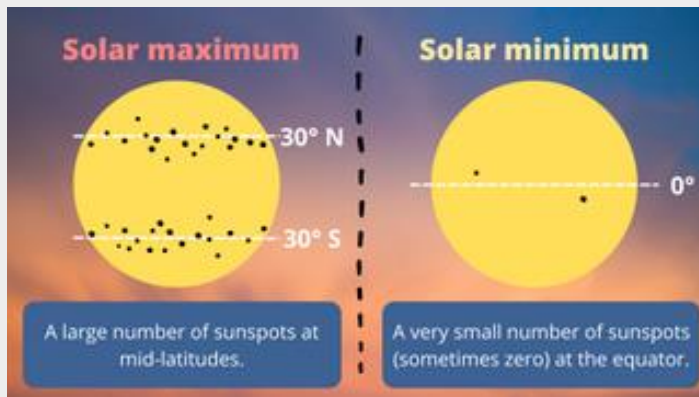
Introduction

The National Aeronautics and Space Administration (NASA) is set to launch its latest solar mission from Vandenberg Space Force Base in California. The mission, known as Polarimeter to Unify the Corona and Heliosphere (PUNCH), will be the third major solar mission to be launched in the past 18 months.

The increase in the number of solar missions is no coincidence. The reason behind this has to do with the solar cycle.

What is the solar cycle?

Like a bar magnet, the Sun also has a magnetic field with north and south poles. The magnetic field exists due to the constant movement of electrically charged particles within the Sun. Every 11 years or so, the Sun's magnetic field completely flips, meaning its north and south poles switch places. This periodic change is known as the solar cycle.



Impact on Sun's activity

The solar cycle affects activity on the surface of the Sun. For instance, the Sun is at its most active when the magnetic field flips. This phase is called the solar maximum. During this period, the star can send out more frequent and intense bursts of radiation and particles into space. After the flip, the star calms down until it reaches the solar minimum,

and a new cycle begins.

During the solar maximum, the Sun's surface has the most number of sunspots — small, dark and cooler areas where the magnetic field is particularly strong. During the solar minimum, the Sun has the least sunspots. Scientists track the solar cycle by counting the number of sunspots.

Moreover, giant eruptions on the Sun, such as solar flares and coronal mass ejections, also increase during the solar cycle. These eruptions send powerful bursts of energy and material into space. The bursts are significant as they can have an impact on Earth — they can disrupt satellite communication, and even affect electricity grids on the planet. That's the reason why scientists keep a tab on the solar cycle.

Why are so many solar missions getting launched now?

The present solar activity and number of sunspots suggest that this cycle may be nearing its maxima, though the official confirmation of the same is yet to be made. According to the National Oceanic and Atmospheric Administration (NOAA), which is one of the organisations that track solar cycles, solar activities in this cycle picked up momentum around May 2022 and has continued to remain above normal through most of 2024.

The solar maximum is the best possible window available for physicists to both launch and observe the sun. This is precisely why there has been a spike in the missions to observe the star. Solar physicists are well aware if they miss this window, the next possible intense solar activity will not be before 2035-2036.

Which missions have been launched?

Since September 2023, two solar missions by India and the European Space Agency have been launched. These are

Aditya L1, India: Launched on September 2, 2023

In September 2023, the Indian Space Research Organisation (ISRO) launched Aditya L1, the country's first solar mission.

Proba-3, European Space Agency: Launched on December 4, 2024

ISRO launched Proba-3, which has a unique design to study solar winds and solar storms.

PUNCH, NASA: Launch on March 06, 2025

PUNCH is a first-of-its-kind solar mission that will study the solar corona — the outermost layer of the Sun's atmosphere. Four identical suitcase-sized satellites will continuously image the Sun's inner corona and provide origins of solar flares, etc.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

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