Marine Debris

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Why in news?

- Under the Ocean Clean-up project, a floating device designed to catch plastic waste has been redeployed in a second attempt to clean up an island of trash swirling in the Pacific Ocean between California and Hawaii.

What is this?

- Marine debris is defined as **any persistent solid material** that is manufactured or processed and directly or indirectly, **disposed of or abandoned into the marine environment or the Great Lakes.**
- Marine debris tends to collect in areas called **ocean gyres**, which are circular ocean currents formed by the Earth's wind patterns and the forces created by the rotation of the planet.
- The circular motion of the gyre draws in debris which makes its way into the center of the gyre, becomes trapped and builds up.
- Trash build-ups in the middle of gyres are known as **garbage patches.** For example, the Great Pacific Garbage Patch exists in the North Pacific Ocean between the U.S. states of California and Hawaii.

Effects:

- Marine debris injures and kills marine life, interferes with navigation safety, and poses a threat to human health.
- Our oceans and waterways are polluted with a wide variety of marine debris ranging from soda cans and plastic bags to derelict fishing gear and abandoned vessels.
- Plastic products can be very harmful to marine life. For

instance, loggerhead sea turtles often mistake plastic bags for jellyfish, their favorite food.

- Many sea animals and birds have become strangled by the plastic rings used to hold six-packs of soda together.
- Plastics do not biodegrade quickly. Cooler ocean temperatures prevent these products from truly degrading. They simply break down into tiny particles called micro plastics.
- **Micro plastics are pieces of debris between 0.3 and 5 millimeters (0.01 to 0.20 inches) thick**, no thicker than a grain of rice.
- These tiny pieces of plastic can collect in the stomachs of marine animals, interfering with digestion and the animals are at risk of malnutrition and starvation.
- Floating on the ocean's surface, these **microplastics can block the sun's rays from reaching plants** and algae that depend on the sun to create nutrients. When these organisms are threatened, the entire marine food web may be disturbed.
- As plastics get smaller and smaller, they release chemicals such as **bisphenol A (BPA)** which interferes with animals' reproductive systems and exposed fish produce fewer healthy offspring.
- BPA and other chemicals build up in the fish's body through a process called **bioaccumulation**.
- Top predators such as sharks or dolphins, which eat the fish, accumulate the most chemicals.
- Fisheries shrink, weakening the area's economy.
- **Discarded fishing lines and nets** trap fish, along with marine mammals, turtles, and birds.
- The United Nations reported that the approximate environmental damage caused by plastic to marine ecosystems represents 13 billion USD.

Ocean cleanup project?

- The Ocean cleanup project is a **non-profit organization,**

based in the Netherlands which is developing advanced technologies to rid the world’s oceans of plastic.

- It has conducted two expeditions to the North Pacific Gyre.
- The clean-up approach uses barriers in ocean gyres to scoop up marine debris as the barrier is pushed by wind and current.
- The project aims to launch a total of 60 such systems in the patch by 2021.
- **India is a part of the Ocean Clean-up project.**
- It has also initiated lending hand in the cleanup of the great pacific garbage patch.