Microplastics in Antarctica Snow

For Prelims: Microplastics, Antarctica, Global Warming

For Mains: Implications of Finding Microplastics in Antarctica

Why in News?

Scientists have found **Microplastics** — plastic pieces smaller than a grain of rice — in freshly fallen **Antarctic snow** for the first time, which can influence the climate by **accelerating melting of ice.**

- Previous studies have found that microplastics **have negative impacts on the health of the environment**, limiting growth, reproduction, and general biological functions in organisms, as well as negative implications for humans.
- Finding microplastics in fresh Antarctic snow **highlights the extent of plastic pollution into even the most remote regions** of the world.

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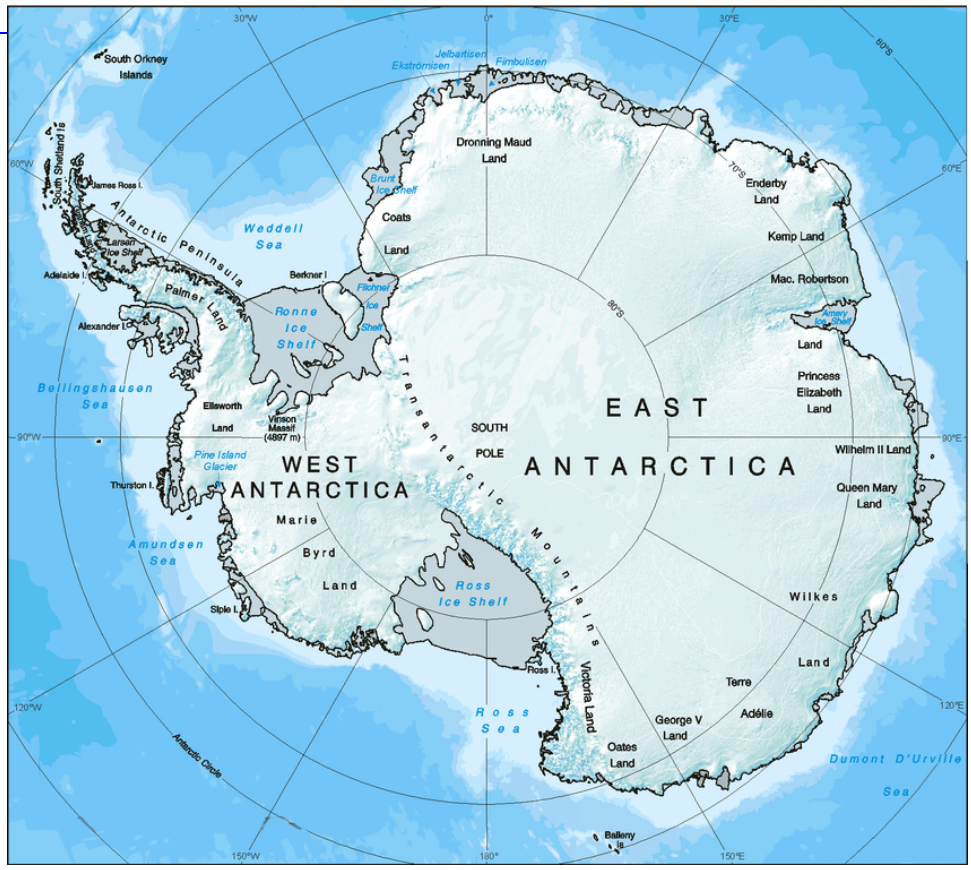

What are the Findings?

- Researchers gathered samples of snow from 19 different sites in the **Ross Ice Shelf** in Antarctica and discovered plastic particles in all of them.
- There were 13 different types of plastic found, with the most common being **PET (Polyethylene Terephthalate)**, commonly used to make soft drink bottles and clothing. The possible sources of microplastics were examined.
- An average of 29 microplastic particles per litre of melted snow, which is higher than marine concentrations reported previously from the surrounding Ross Sea and in Antarctic sea ice.
- Microplastics **may have travelled thousands of kilometres** through the air, however it is likely that **the presence of humans in Antarctica has established a microplastic 'footprint'.**

What are the Implications of this Finding?

- **Both Local and Wider Effects:**
  - Microplastics can **have harmful substances stuck on to their surfaces such as heavy metals,** algae.
  - So they can provide **a way in which harmful species can make it into some remote and sensitive areas**, that otherwise wouldn't get there.
  - Humans inhale and ingest microplastics via air, water and food. High levels of ingested microplastics in **the human body have the potential to cause harmful effects, including cell death and allergic reactions.**
- **Can lead to Global Warming and other Disasters:**
  - Microplastics may also be increasing the impact of global warming. Snowfields, ice caps and glaciers around the world are already melting fast, and scientists say dark-coloured microplastics deposited at these locations **can make things worse by absorbing sunlight and enhancing local heating.**
  - Clean snowpacks, icefields and glaciers can reflect much of the sunlight, but other polluting particles such as black carbon have also been found on icefields and glaciers of the Himalayas - and scientists say they accelerate the melting there.
  - Fast-melting glaciers on mountain ranges in different parts of the world are increasingly becoming hazards, leading to landslides and avalanches and causing **glacial lakes** to burst their banks.
  - The rapid thinning and retreat of glaciers also poses a threat to water supplies and agriculture in mountain regions around the world.

What are the Microplastics?

- **About:**
  - Microplastics are **small plastic pieces of less than five millimeters in size.**
  - It includes microbeads (solid plastic particles of less than one millimeter in their largest dimension) that are used in cosmetics and personal care products, industrial scrubbers which are used for aggressive blast cleaning, microfibers used in textiles and virgin resin pellets used in plastic manufacturing processes.
  - Apart from cosmetics and personal care products, **most of the microplastics result from the breakdown of larger pieces of plastic** that were not recycled and broke up due to exposure to the sun or physical wear.
  - Microplastics **damage aquatic creatures including turtles and birds**. It blocks digestive tracts, and alters feeding behavior. Subsequently, it reduces the growth and reproductive output in marine animals.
- **Related Initiatives:**
  - **Elimination of Single Use Plastic:** In 2019, the Prime Minister of India pledged to **eliminate all single-use plastic in the country by 2022,** with an immediate ban in urban Delhi.
  - **Important Rules:** **Plastic Waste Management Rules, 2016** state that every local body has to be responsible for setting up infrastructure for segregation, collection, processing, and disposal of plastic waste.
  - **Un-Plastic Collective**: **Un-Plastic Collective (UPC)** is a voluntary initiative launched by

the UNEP-India, Confederation of Indian Industry and WWF-India.
    - The Collective seeks to minimise externalities of plastics on the ecological and social health of our planet.
- **Extended Producer Responsibility (EPR):**
    - EPR is a policy approach under which producers are given a significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Q. Why is there a great concern about the 'microbeads' that are released into environment? (2019)

(a) They are considered harmful to marine ecosystems.
(b) They are considered to cause skin cancer in children.
(c) They are small enough to be absorbed by crop plants in irrigated fields.
(d) They are often found to be used as food adulterants.

Ans: (a)

Source: TH