Cryosphere

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News

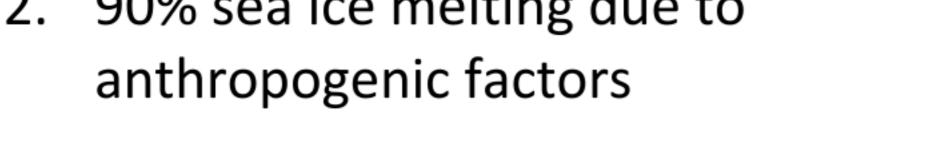
- Loss of Arctic sea ice is inevitable -Nature journal 2. 'Sea-ice free' summer can happen
- before 2030 if drastic emission control for reduction of temperature is not taken up. 3. Sea ice in Antarctica fell to the lowest
- this summer (Oct-Mar 2023)

Sea ice thinnest at mid-September,

Facts

Thickest at March ***

2. 90% sea ice melting due to



High albedo of ice - keeps polar regions

Importance of Arctic Sea ice

cool, maintains earth's energy balance.

1. Influence on global climate

- Diagram: Surplus Deficit energy transfer
- 3. Crucial for biodiversity
- Issues 1. Warming of Arctic Ocean

Feedback loop created

- Diagram: Melting ice -> decreasing albedo -> warming of Arctic ocean ->
- Further melting of ice 2. Atlantification of Arctic Warming of sea water leads to influx of

Sea leading to aggravated melting. 3. Weakened polar jet stream

Unseasonal showers in North India

saline waters to Arctic, esp. at Barrent

4. Biodiversity affected Eg. Polar bears and Walruses require sea ice for hunting, breeding and

Rising T, Heat waves in Europe,

migrating. 5. Distrupted food chain Eg. Changing prey base lead to mass

mortality of Grey whales

6. Arctic population affected

ANTARCTICA specific

Rise in global sea level

8.

1993

flow

species

- Subsistence hunting of Yup'ik, Iñupiat and Inuit affected
- 7. Thawing of Permafrost Release of methane Collapse of overhead man made
 - structures Eg. Enlarging **Bhatagaika crater** in Russia
 - Antarctica account for one-third of global average rise in sea level since

Acc. to NASA, meltwater from

Changes Oceanic Circulations Affects global climate Acc. to IPCC, Southern Ocean is crucial in transfer of heat from atmosphere to oceans. Increase in cold water distrupts

circulation of water across globe

Change in T affects deep water nutrient

Eg. Sea ice is home to algae that is fed by smaller crustaceans. Diminishing sea ice means less food to support Antarctic food chain

11. Altered migration patterns of marine

Eg. Antactic Krill fishes are expected move further south to manage T from warming ocean water

overall surface area into more fragile state. <u>Advantages</u>

winter) generally thinner, changes

12. Freshly formed ice (forms again in

Opening of **shipping lanes** in Arctic Ocean

Commercial

- Increased access to Arctic natura resources
- Copper, Nickel, Iron ore

Eg. Hydrocarbons, Phosphate, Bauxite,

Way Forward Recent studies - encouraging herbivores(caribou, musk oxen) diversity in Tundra could decrease

behaviour affecting plant diversity

impack of Climate change Reason: Their different browsing