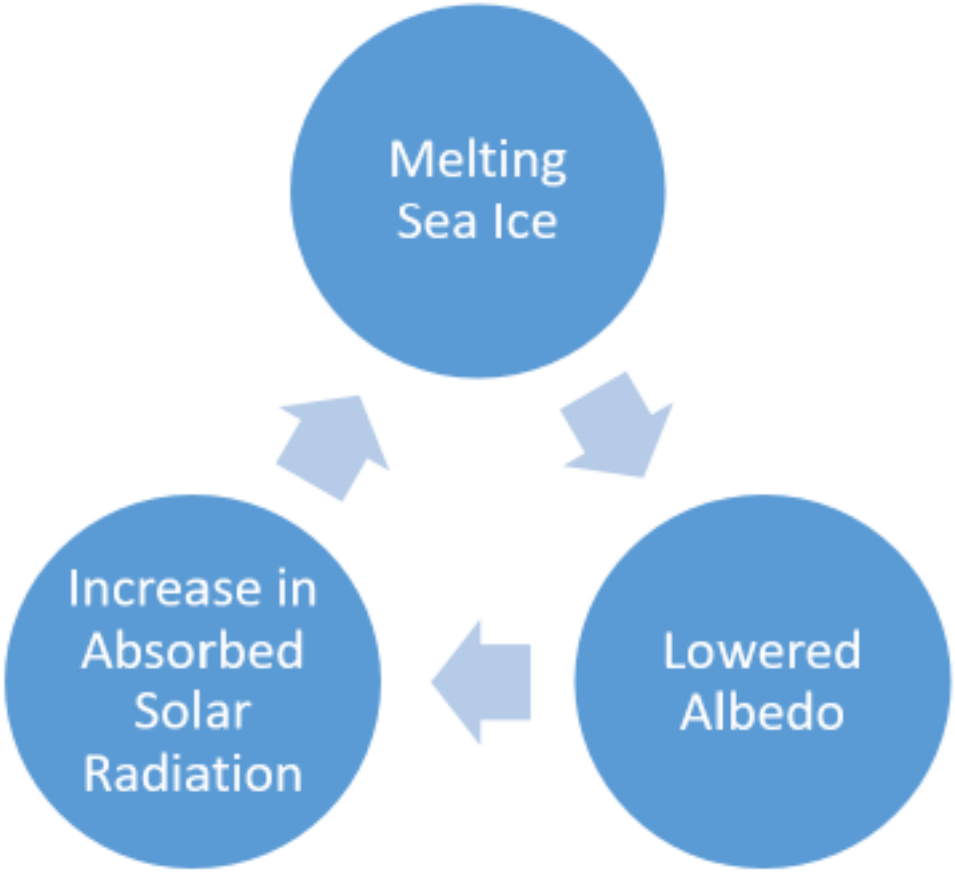
My NASA Data - Mini Lesson/Activity

Does Albedo Affect Arctic Populations?



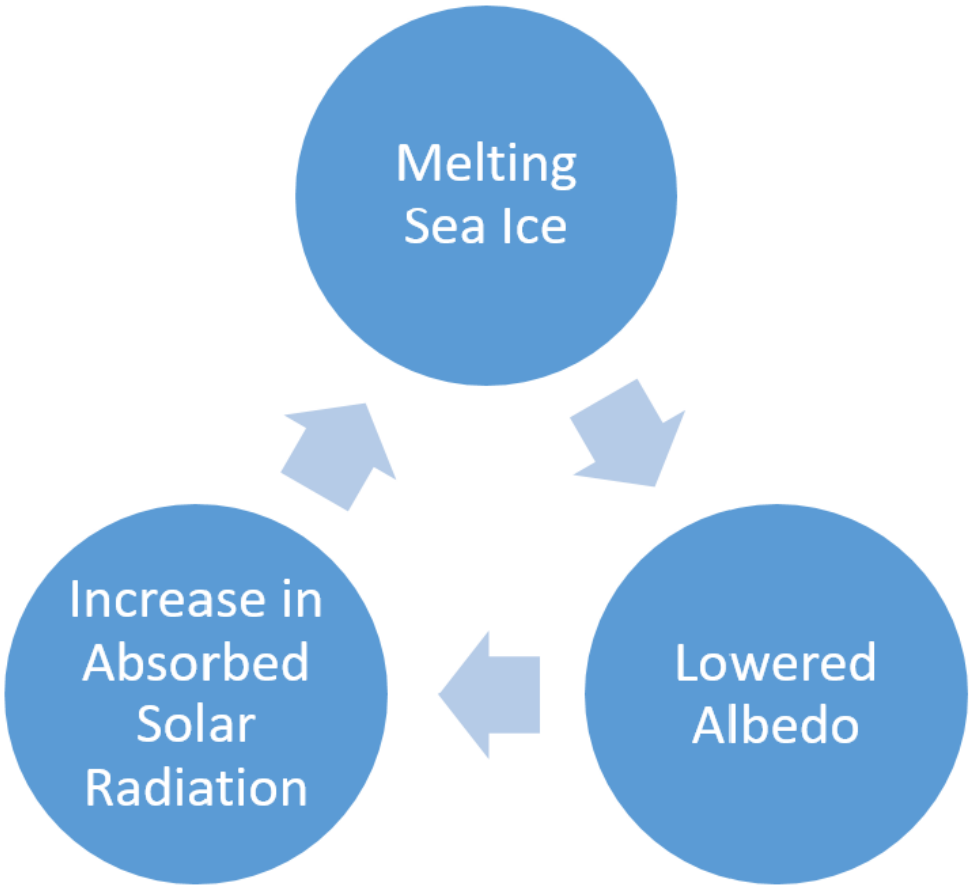
Student Directions

Review each section and watch the videos. Then answer the questions.

The Effect of Rising Temperatures

Warming trends are strongest in the Arctic region, where 2018 saw the continued loss of sea ice. This occurs because as the Arctic experiences warming, the resulting sea ice and snow loss significantly lowers the albedo of the Arctic. This results in increased absorption of solar radiation, leading to a cycle of more sea ice melt.

Review the diagram and watch the video Global Temperature Anomalies from 1880 to 2018 showing global temperature anomalies on Earth over time.



Albedo Changing Ice Diagram. Source. My NASA Data | https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/albedo%20ice%20loop.png

Video: Global temperature anomalies from 1880 to 2018

Video

Global temperature anomalies from 1880 to 2018 | https://www.youtube.com/watch?v=gXXOkhoki8s | Source: NASA Climate Change

Animals Struggling From Sea Ice Loss

Watch the video Shrinking Ice: Impacts on Animals and People (Part 4) about how animals like polar bears depend on sea ice for nearly all aspects of their life, including hunting, traveling and breeding.

Melting Ice: Impacts on Animals and People (Part 4). Video Length: 2:25. Source: NOAA Ocean today | https://oceantoday.noaa.gov/fullmoon-shrinkingice/welcome.html

Animals Benefiting From Sea Ice Loss

As the ice melts, it does not affect all wildlife equally. While some animals, like Polar Bears, may experience hardship due to the melt, other animals could experience benefits, like an increase in their habitat or food source. For example, sea ice melt exposes more ocean water to sunlight, spurring photosynthesis in phytoplankton. With less sea ice, comes more phytoplankton. Additionally, animals like the Bowhead whale, who eat phytoplankton, will find that their food source grows more plentiful as sea ice melts. Also, a lack of sea ice, exposes more Arctic waters for the Bowhead whale to swim around in.

Review the map below. Recently, two Bowhead whale populations, from the Pacific and Atlantic, were able to meet each other for the first time. This is because the sea ice that had normally blocked the path to each other had melted enough so that they could travel across the Arctic Ocean region above Canada.

Bowhead Whale Populations Mingle. Source: NASA Climate Kids

Steps:

1. Check with your instructor on how to submit your answers.
2. Explain why the Arctic is more sensitive to warming then other regions on Earth.
3. Review the circle diagram. Explain what you think is the relationship between melting sea ice, lowered albedo, and increasing solar radiation.
4. Identify what role sea ice plays in polar bears' lives.
5. Think of another animal that may be affected by changes in sea ice. How would this animal be affected?

6. Explain how changes in sea ice extent could benefit some animals.

Exit Ticket

1. Explain how albedo can be linked to changes in habitats for polar bears and bowhead whales.

Teachers, these mini lessons/student activities are perfect "warm up" tasks that can be used as a hook, bell ringer, exit slip, etc. They take less than a class period to complete. Learn more on the "My NASA Data What are Mini Lessons?" page.

Teachers who are interested in receiving the answer key, please complete the Teacher Key Request and Verification Form. We verify that requestors are teachers prior to sending access to the answer keys as we've had many students try to pass as teachers to gain access.

My NASA Data Visualization Tool

- Earth System Data Explorer