My NASA Data - Mini Lesson/Activity

Changing Albedo and Sea Ice

Grade Band

- 9-12

Time

- 15 minutes

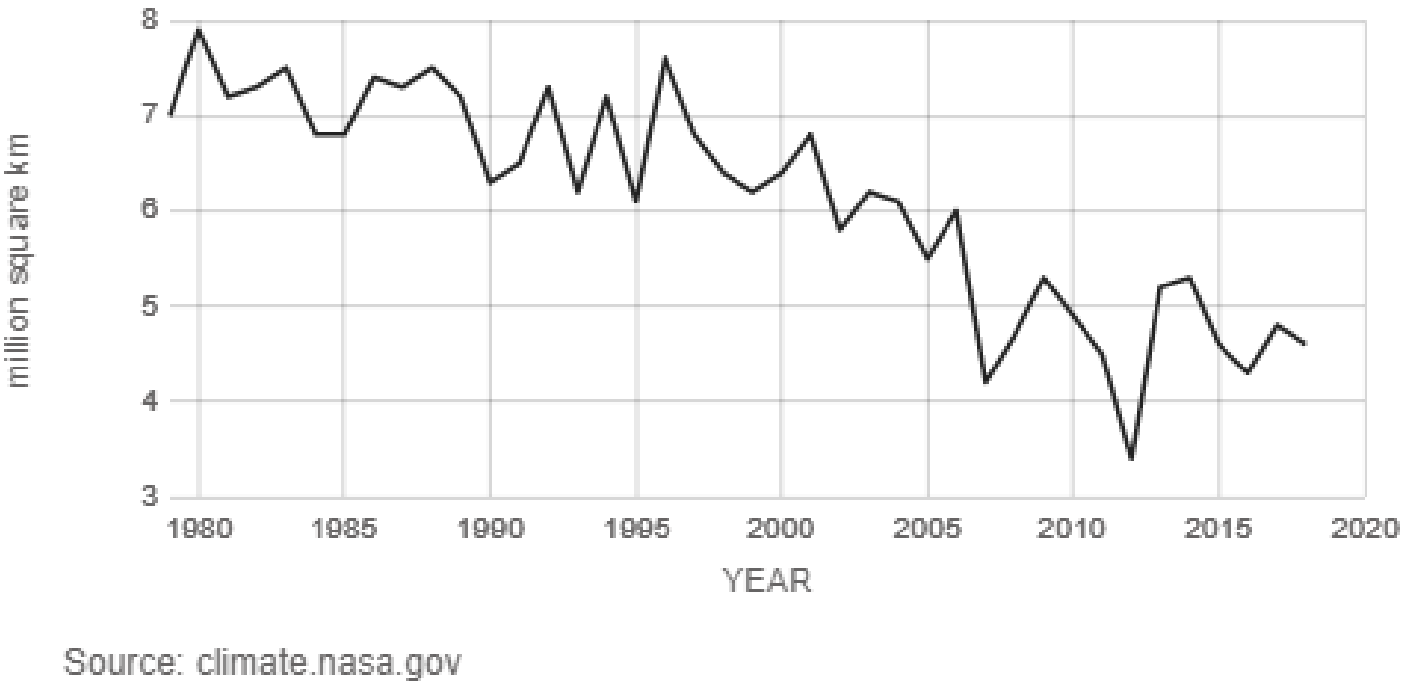
Overview

Students explore albedo, sea ice, and the relationship between changing albedo and changing sea ice using data visualizations.

Student Directions

Video: 2018 Arctic Sea Ice Ties for Sixth Lowest Minimum Extent on NASA Record

2018 Arctic Sea Ice Ties for Sixth Lowest Minimum Extent on NASA Record | https://www.youtube.com/watch?v=pyIdwDbtcGs | Source: NASA Goddard



This image displays the average annual September sea ice extent from 1980 to 2020.
Credit: NSIDC/NASA
https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/SeaIce%20%281%29_0.png

Steps

1. Watch the video from NASA's Goddard Space Flight Center.
2. As the video displays, Arctic sea ice reaches its minimum each September. Review the graph of Average Annual September Sea Ice Extent from NSIDC/NASA. This graph demonstrates the average monthly Arctic sea ice extent each September since 1979, derived from satellite observations.
3. Answer the following questions about the graph. Check with your instructor on how to submit your answers.

    1. Which year had the lowest recorded Arctic sea ice?
    2. Which year had the highest recorded Arctic sea ice?
    3. What is the overall trend in the annual Arctic sea ice minimum?
    4. What factors might explain the trend in the annual Arctic sea ice minimum?

Video: Link between Sea-Ice Fraction and Absorbed Solar Radiation over the Arctic Ocean

Link between Sea-Ice Fraction and Absorbed Solar Radiation over the Arctic Ocean | https://www.youtube.com/watch?v=gQMap0CgL9Q | Source: NASA Scientific Visualization Studio

1. The short animation from NASA Scientific Visualization Studio describes the link between sea ice fraction and solar radiation. Watch the animation and answer the questions that follow.

    1. What do you notice about the areas of increased solar radiation?
    2. What do you notice about the areas of decreased sea ice?

Exit Ticket

1. Summarize the link between albedo and sea ice as an exit ticket. Check with your instructor on how to submit your answer.

Sources:

1. NASA Goddard, 2018 Arctic Sea Ice Ties for Sixth Lowest Minimum Extent on NASA Record -https://www.youtube.com/watch?v=pyIdwDbtcGs

2. NASA Scientific Visualization Studio, Link Between Sea-Ice Fraction and Absorbed Solar Radiation over the Arctic Ocean - https://youtu.be/gQMap0CgL9Q

Teacher Note

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.

NGSS Three Dimensional Learning

NGSS Disciplinary Core Ideas

- ESS2A: Earth Materials and Systems
- ESS3A: Natural Resources

Crosscutting Concepts

- Cause and Effect

Science and Engineering Practices

- Analyzing and Interpreting Data

Google Slide interactive Files

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