






# My NASA Data - Interactive Models

## Sea Ice and the Earth System Story Map

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A Story Map    

Introduction Engage Explore Explain Elaborate Evaluate NASA Connection Teacher Resources

Sea Ice and the Earth System 

### Arctic Sea Ice Extent Story Map

**Purpose:**  
Students will explore changes in **sea ice extent** as it relates to other spheres within the Earth System. Students will develop an iterative concept map that they will use to document their understanding of the Earth System as it relates to changes in sea ice. During the Evaluate stage, they will consider how an increase in our air temperatures may impact other parts of the system that have been explored in this story map.


**Grade Level:** 7-12

**Essential Questions:**

1. How do seasons influence changes in sea ice extent?
2. How does sea ice melt influence the Arctic ecosystem?
3. What affect does changing air temperatures have on observed trends in sea ice extent?
4. How does sea ice melt change ocean circulation patterns?
5. What is albedo and how does it affect the cryosphere?

**Estimated Time for Completing Activity:** Two 50 minute class periods

**Tasks:**



Sea ice is frozen seawater that floats on the ocean surface in both the Arctic and the Antarctic. This floating ice has a profound influence on the polar environment, influencing ocean circulation, weather, and regional climate. Sea ice is constantly changing with periods of growth and melting throughout the year. The amount of sea ice in the Arctic increases during the winter months, usually starting in September, and decreases during the summer months, usually starting in March.

To learn more, visit:

- The [Snow and Ice Extent Phenomena page](#) for background information

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.

## Grade Band

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- 6-8
  - 9-12

## Supported NGSS Performance Expectations

- [5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.](#)
- [MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.](#)
- [HS-ESS2-2: Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.](#)
- [HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.](#)

## NGSS Disciplinary Core Ideas

- ESS2A: Earth Materials and Systems
- ESS3C: Human Impacts on Earth Systems

## Science and Engineering Practices

- Developing and Using Models
- Analyzing and Interpreting Data

## Crosscutting Concepts

- Systems and System Models
  - Stability and Change
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## Related Resources

- [Sea Ice and the Earth System Story Map](#)
- [Instructional Strategies for the Earth Science Classroom](#)
- [Data Literacy Cube Guide](#)