Sea Level Rise
NASA Resources for Grades 9 through 12

NGSS related to Sea Level Rise:

HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
HS-PS4-2. Evaluate questions about the advantages of using digital transmission and storage of information.
HS-PS4-3. Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.
HS-PS4-4. Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
HS-LS2-8. Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce
HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity
HS-ESS2-1. Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.
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.
S-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.
HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
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.
HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
HS-ESS3-3. Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.
HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

NASA Resources

Websites:

NASA's Rising Waters interactive
NASA's Sea Level Rise Portal
Sentinel-6 Mission

NASA's Climate Change and Global Warning

- Sea Level

Lesson Plans:
Graphing Sea Level Slopes and Surface Currents
Data Jigsaw: Exploring Sea Level Rise with Others
Stability and Change: Monitoring Sea Level
Creating Your Own Sea Surface Height Model
Connect the Spheres: Earth Systems Interactions
Lessons in Sea Level Rise
Climate Change Inquiry Labs
Climate Change Online Labs
Connect the Spheres: Earth Systems Interactions
Could a World of Swimmers Raise Sea Level?

Activities:
ICESat-2 Sea Ice Towers Activity
Earth's Water Globe Activity
16 Years of Ice Loss from Greenland and Antarctica: A Comparison Activity

Virtual Interactive Activities:
Sea Level Rise IQuest
Tour of the Electromagnetic Spectrum online book with videos
Floods IQuest
Living in a Freshwater World interactive
Water Cycle IQuest
Weather and Climate IQuest

Articles:
Water's Family Tree: Where Did Earth's Water Come From? article
Sea Level 101: What Determines the Level of the Sea? blog
Bevy of Biomes learning poster
ICESat-2 Measures the Ice Shelf learning poster

Videos:
What is the Greenhouse Effect (2:29)
What Causes Sea Level Rise? (2:43)
Getting the Big Picture (2:39)
Watching Rising Seas from Space (1:58)
The Data Downpour (4:17)
ICESat-2 Atlas Laser Focus (series of videos)
Real World: ICESat-2 and Earth's Cryosphere (5:23)
Sea Level Rise (1:30)

Watching Rising Seas from Space (1:59)

STEM Career focus video series:
Meet Dr. Michael Freilich, Inspiration for the Sentinel-6 mission (5:51)
Ben Hamlington, NASA Scientist Studies Sea Level Rise from Space (1:30)
Shannon Statham: From Tuning Antennas to Making Dresses, Engineer Puts the A in STEAM (1:32)
Parag Vaze: NASA Engineer Observes Sea Level Rise from Space for 30 Years (1:34)
Severine Fournier: Science is International" Says French Sea Level Rise NASA Scientist (1:36)
Shailen Desai: NASA Engineer Helps Track the Global Impacts of Rising Seas (1:26)

Data Visualizations:
Draining the Oceans
22 Year Sea Level Rise: TOPEX/JASON