

## My NASA Data - Lesson Plans

### Graphing Sea-Level Trends



### Overview

In this activity, students will use sea-level rise data to create models and compare short-term trends to long-term trends. They will then determine whether sea-level rise is occurring based on the data.

### Learning Objectives

The student will:

- Graph sea-level rise data to create models
- Compare short-term trends to long-term trends
- Analyze whether sea-level rise is occurring based on the data

### Why Does NASA Study This Phenomenon?

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Global sea level rise is accelerating incrementally over time rather than increasing at a steady rate, as previously thought, according to a new study based on 25 years of NASA and European satellite data.

If the rate of ocean rise continues to change at this pace, sea level will rise 26 inches (65 centimeters) by 2100—enough to cause significant problems for coastal cities.

Full story: [Link](#)

## Credit

[NASA's Goddard Space Flight Center](#)

## Essential Questions

- How is sea level changing?
- What evidence do we have about sea level change?

## Materials Required

- Student Record Sheet - [download PDF](#)
- Data Files - download [text files](#), [CSV files](#)
- Spreadsheet software (e.g., Microsoft Excel or Google Sheets)

## Preparation:

- For this activity, 130 years of sea-level measurements have been divided into 20 data sets for examination. Depending on class size, the steps in “Procedures” can be done by individuals or groups of students. Students will examine all 20 data sets to learn how scientists study data over short and long periods of time. Some groups or individuals may need to examine multiple data sets in order to model all 20 sets.
- If you plan to have students transfer data into spreadsheet software, have them use the text files to do so. Otherwise, if students don’t have the skills to transfer the data into a spreadsheet, create graphs using the CSV (comma separated values) files.
- Depending on students’ familiarity with spreadsheets, the activity may need to be split into two days: one day for entering the data into spreadsheets and one day for analyzing the data.

## Procedure

For procedures, see full lesson plan at NASA's JPL Education: [Graphing Sea-Level Trends](#)

CLASSROOM ACTIVITY

## Graphing Sea-Level Trends



This graph shows the rise in global sea level from 1880 to 2013. Data for short

*This activity is related to a Teachable Moment from April 12, 2017. See "Celebrate Earth Day with NASA Science Data"*

[Explore more on the Teachable Moments Blog](#)

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### Activity Details

**Subjects:** SCIENCE, MATHEMATICS

**Types:** CLASSROOM ACTIVITY, GRAPHING, TEACHABLE MOMENTS, MODEL

**Grade Levels:** 5 - 12

**Primary Topic:** EARTH AND SPACE SCIENCE

**Additional Topics:** DATA COLLECTION, ANALYSIS AND PROBABILITY, EARTH AND SPACE SCIENCE, EARTH PROCESSES, EARTH SCIENCE, MEASUREMENT, SCIENCE AND SOCIETY, THE SCIENTIFIC PROCESS

**Time Required:** 1hr - 2hrs

**Next Generation Science Standards (Website)**

5-ESS2-1  
HS-ESS2-2  
HS-ESS3-5

**Common Core State Standards for Mathematics (Website)**

5.G.A.2  
5.MD.B.2

## Extensions

In addition to causing sea-level rise, the increase in global temperatures linked to higher CO<sub>2</sub> concentrations leads to more heat waves and greater area affected by drought. We also see an increase in heavy precipitation events and flooding on land. Warm surface waters can damage coral reefs, reducing opportunities for fishing and tourism, and leave coasts vulnerable to storm surges and erosion.

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How can you make a difference? [Calculate your carbon footprint](#) to find out just how much carbon you're contributing to the environment. Then, create a plan of action to reduce your impact.