



Maryland and Delaware Climate Change Education Assessment and Research (MADE CLEAR)

Session 3: Examining Sea Level Rise from a Local to Global Perspective

Overview

In this session, teacher interns will build on their understandings of the causes (see Session 2) and local effects (see Session 1) of climate change, now taking a global perspective on the issue. They begin by recalling the potential effects of sea level rise on human safety, economic activity, and tourism they identified for the Mid-Atlantic region during the Online Sea Level Rise Investigation. Next, they explore sea level rise projections for a different world region of their choice, using another online interactive map. They also view a short United Nations video illustrating the effects of sea level rise on Pacific island nations. Teacher interns discuss how approaching climate change from a local to global perspective can help to develop learners' understanding of the topic as well as their global competency. The session concludes with an opportunity for interns to revisit and add to their climate change drawings (see Session 1), and complete a written reflection on their current thinking about strategies, benefits, and challenges related to teaching the topic of climate change.

Objectives

Teacher interns will:

1. Compare local sea level rise impacts to sea level rise impacts in another world region
2. Discuss how the topic of climate change can be used in the science classroom to broaden students' global perspectives and improve their global competency
3. Reflect on their own learning about climate change content and pedagogy

Materials

- [Global Perspectives PowerPoint presentation](#)
- Print copies of the [Global Perspectives Activity Guide](#) for each intern
- Colored pencils, markers, or crayons
- Completed [Climate Change Drawing Assessments](#)
- [Learning Progressions in Science Education PowerPoint presentation](#) (optional)
- [Draft hypothesized learning progression on sea level rise](#) (optional)
- [Sea level rise teaching progression aligned with the NGSS](#) (optional)
- [Sea Level Rise Drawing Assessment](#) (optional)
- [Sea Level Rise Multiple Choice Assessment Instrument](#) (optional)



Sessions were designed by the MADE CLEAR Learning Sciences Research Team (www.ClimateEdResearch.org) at the University of Maryland and implemented in courses taught by J. Randy McGinnis (jmcginni@umd.edu) and Emily Hestness (hestness@umd.edu). Please contact the instructors with any questions or comments.



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Getting Started

Begin the session by reviewing the [Carbon Dioxide and Temperature data investigation](#) from session two. Review the relevant [NGSS science and engineering practices and cross-cutting concepts](#). Discuss the central question: "Why are scientists and the public interested in the rising global mean temperature?" (The planet is undergoing observable changes associated with the warming trend.)

Procedure

Engage

Connect back to the online sea level rise investigation, reminding teacher interns that they have already investigated one effect of warming temperatures affecting our region. Now, the focus will be on investigating other observable effects of climate change.

In small groups, ask interns to recall the impacts they associated with sea level rise for our region.

*See slide 2 of the [Global Perspectives PowerPoint presentation](#)

Explain that in science education, it is important for learners to understand issues that are observable and which affect their local environment, but it is also possible to use science topics such as global climate change to foster students' global awareness, another goal of science education in the 21st century.

Consider mentioning a few contemporary world events related to climate change (extreme weather events potentially related to climate change, international climate talks, etc.) to illustrate the global nature, relevancy, and immediacy of the topic.

*Use or adapt examples on slide 3 of the [Global Perspectives PowerPoint presentation](#)

Explore

Introduce the idea that science educators can help learners more fully understand climate change by examining it both locally and globally.

Relate the topic to state and district objectives. For example, Standard 1 (Environmental Issues) of the [Maryland Environmental Literacy Standards](#) states that students will "investigate and analyze environmental issues ranging from local to global perspectives..."

*Standard is listed on slide 4 of the [Global Perspectives PowerPoint presentation](#)

Introduce the National Geographic map, *If All the Ice Melted*, <http://ngm.nationalgeographic.com/2013/09/rising-seas/if-ice-melted-map>

Explain that teacher interns, working in pairs or small groups, will examine the impact of sea level rise on global regions.

*Link and activity instructions are available on slide 5 of the [Global Perspectives PowerPoint presentation](#)

Distribute the [Global Perspectives activity guide](#). Groups or pairs will begin by completing Part 1 of the activity. Part 1 asks teacher interns to pick one world region from the map and answer the following questions based on their knowledge of the region:

In what ways do you think the impacts of sea level rise on human safety, economy, and ecosystems would be similar to our region?

In what ways do you think the impacts would be different?

Explain

Ask each small group to briefly share their observations and discussion highlights from the map exploration activity.

Discuss: *How does the combination of looking at sea level rise projection maps for local regions and world regions provide students with a broader perspective on the issue?*

Elaborate

Explain that students may gain a different kind of understanding of the issue by moving from looking at a map to looking at how communities are actually being affected.

Ask for a volunteer to find the island nations of Kiribati and Tuvalu on a globe or map.

*See slide 6 on the [Global Perspectives PowerPoint Presentation](#)

Explain that these regions are particularly affected by sea level rise.

Then watch the UN video (2 min): [Sea Level Rise in the Pacific: Loss of Land and Culture](#)

Ask teacher interns, in small groups, to discuss the questions in Part 2 of the [Global Perspectives Activity Guide](#):

- *How can seeing the impacts on a real community help students to understand the issue from a local to a global perspective?*
- *How does this perspective influence your thinking about how you would teach about sensitive topics like climate change and sea level rise?*

If time allows, discuss how a “local to global” approach to the topic of climate change could support students’ development of global competency.

*On slide 7 of the [Global Perspectives PowerPoint presentation](#), see the four areas of global competency on the figure from the Asia Society (2011) publication, [Educating for Global Competence: Preparing Our Youth to Engage the World](#).

Evaluate

Provide teacher interns with their [climate change drawing assessments](#) completed during the last session. Invite them to add any additional dimensions to their drawings that reflects their current understanding of global climate change.

On the back or on a separate sheet of paper or as a journaling activity outside of class, ask them to write a brief written reflection on their thinking about teaching the topic of climate change (e.g., potential strategies, benefits, and challenges).

Additionally, to evaluate their current understanding of the sea level rise construct, teacher candidates may compare their knowledge to:

- NGSS standards related to sea level rise, using a [sea level rise teaching progression](#) aligned with the NGSS
- A [draft hypothesized learning progression on sea level rise](#)
 - *Learning progressions may be optionally introduced using the [PowerPoint presentation: Learning Progressions in Science Education](#)
 - *Teacher interns may also complete the [sea level rise drawing assessment](#) or the [multiple choice assessment instrument](#) to evaluate their own levels of understanding as articulated the learning progression