

Week 2.2 Climate 101

Local Island Weather/Climate

Overview of this Week:

- * Participants can explain the difference between weather and climate.
- * Participants explore the PCEP booklet to learn about climate on their island location, and to start becoming familiar with the ways climate change can impact their communities.
- * Participants use PCEP books to compare different island environments and their sensitivity to climate change.
- * The Ocean Sciences Sequence (OSS) curriculum provides opportunities to compare and begin to explain some climate features of distant locations.

Before Teaching this Week:

- * On Day 1 participants compare weather and climate before exploring a PCEP booklet describing weather and climate in their island location.
- * Participants use a science literacy reading strategy to research and discuss the general features of the local climate.
- * Review Session 1.4 in the Ocean Science Sequence Unit 1 Teacher's Guide. The left-hand pages provide the script for what the students and the instructors do. The right-hand pages provide Teacher Considerations. See description of Day 3 below for changes that we are making in doing this session before doing Sessions 1.1 through 1.3.
- * Make a copy for each participant of the Student Investigation Notebook for Unit 1 (SN1 – Unit1.pdf on OSS 6-8 Resource Disc or in materials)
- * Make a copy for each participant of page 21 (Australia and Nearby Islands) from the Unit 1 Copymaster Packets (CM1 – Unit1.pdf on OSS 6-8 Resource Disc or the AustraliaAndIslands Word doc file in the Week 2 PCEP folder)
- * Optional: have some globes available for Day 3.
- * Review the Power Point slides file in the course folder from PCEP. It should be easier to use those slides than trying to combine for yourself slides from PCEP and OSS.

Day 1: Participant Experience with Island Environments

Show Slide 1 and begin by having participants individually think about the difference between weather and climate, and make a note of their ideas. Presenter then distributes the “Weather, Climate or Both?” Handout and shows the six “Weather or Climate?” slides (**Show Slides 2 through 7**). Each participant individually circles “WEATHER” “CLIMATE” or “BOTH” for each of the six slides. After all the slides have been shown, presenter goes back to the first “Weather or Climate?” slide and has the participants raise their hands to indicate which choice they made. Repeat for the other five examples. These slides, the participant votes, and the correct answers for the slides (provided as necessary by presenter) are used to clarify the distinction between weather and climate.

Show Slides 8 through 10 to summarize the differences between weather and climate. Presenter can also initiate a discussion about whether this distinction exists in any form in the local language. These slides then lead into the exploration of the booklet describing climate change in the home island.

Give each participant a color copy of the PCEP Climate Change booklet for your regional location. Explain that the author(s) are leaders of the Pacific Islands Climate Education Partnership (PCEP). This booklet was developed to help teach about climate change in the tropical Pacific islands. Participants will be using the booklet in the course, can keep it, and can photocopy it to use in their schools.

Show Slide 11 (RMI Weather Conditions and Climate Patterns) and elicit and chart responses from the class. Tell class that today we will practice a way of understanding the booklet, especially its visual features. Give them up to 5 minutes to discuss in pairs and find at least three different kinds of visual images. Call on people to share the visual features. Make sure they include drawings (Figures 1 and 7), maps (Figures 2 and 3), graphs (Figures 4 and 8), photos (Figures 5, 6, 12 and 13), Tables (page 6), and concept diagrams (Figures 9, 10, 11 and 14). (**NOTE:** these directions and the handout were contextualized for the Marshall Islands. Your booklet may have different page numbers for the different kinds of visual features.)

Show Slide 12 and 13 and distribute the Visual Features Handouts for each Participant. Use this slide to introduce the activity. Have the participants form five groups. Give each participant the handout called “Learning with Visual Features in the *YOUR ISLAND* Book” (page 1 of that word document; the second page provides guidance for the instructor during the whole class sharing). Give each group a piece of chart paper to use for their presentation.

Show Slide 14 (Interact with a Visual Feature). Have each group write at least one question about their assigned visual feature before reading their section. Help each group do their assignment so there is enough time for each group to finish their individual assignment, and to share with the whole class. Have each group post its chart, and then use that chart to talk about their assigned Visual Feature. (Instructor: Use the second page of the word document to help fill in any important missing information.)

Debrief about this activity as a strategy for helping students understand readings that have images. Debrief about working in small groups and sharing with the whole class. **Show Slide 15 (Tropical Pacific Island Climates)** during whole class discussion to highlight the major local climate features.

NOTE: if you did not complete the Visual Features activity, you can finish it at the beginning of Day 2.

Day 2: Climate Change and Island Environments

During this course, we will all learn about climate change and how it will affect different island environments and the human communities that live on the island. Today we will begin to discuss climate change and how the impacts of climate change will affect different island environments including the organisms that live there.

Show Slide 16 (Impacts of Climate Change) to highlight the four main impacts of climate change that are emphasized in this course. Try to elicit what participants already know about these four impacts and help clarify any major misconceptions or lack of familiarity:

- Sea Level Rise
- Higher Temperatures (air and ocean temperatures)
- Changing Rainfall Patterns (including drought and tropical storms)
- Ocean Acidification.

Show Slide 17 (Climate Change Impacts on Ecosystem Services) to highlight that each of these climate impacts can cause damage to natural environments and the services that they provide. This slide indicates that rising sea level affects island environments in ways that harm cultural values and traditions; food and resources; and income from fishing and tourism. Slides 16 and 17 come from a computer interactive that they will explore in more detail in the second half of the Climate 101 course. **Show Slide 18** to guide participants to the appropriate section of the island climate change booklet and to the PCEP Climate Change Impacts Interactive.

Assign one environment to each participant, and **Show Slide 19 (Explore One or More Island Environments)** to initiate and guide their reading about their assigned environment. Have participants report about the environments in the same order as they appear in the book. Participants can follow along in the book as the participant reports about it. Try to have participants add more information based on their experiences with all these different island environments.

The Table below highlights the potentially most damaging climate impacts for the different island environments:

TYPE OF ISLAND ENVIRONMENT	CLIMATE IMPACTS THAT CAN CAUSE DAMAGE
High Island Agroforest	Changes in precipitation; Warming
High Island Valley Forest	Changes in precipitation; Warming
High Island Upland Forest	Changes in precipitation; Warming
High Island Cloud Forest	Changes in precipitation; Warming
High Island Disturbed Area	Changes in precipitation; Warming
High Island Seagrass Beds	Sea level rise; Warming; Ocean Acidification (OA)
High Island Mangrove Swamp	Sea level rise; Changes in precipitation; Warming
High Island Wetland	Sea level rise; Changes in precipitation; Warming
High Island River	Changes in precipitation; Warming
High Island Estuary	Sea level rise; Changes in precipitation; Warming
High Island Grassland	Changes in precipitation; Warming
High Island Karst	Sea level rise
High Island Beach	Sea level rise; Changes in precipitation; OA
High Island Reef	Sea level rise; Ocean Acidification; Warming
High Island Lagoon	Sea level rise; Changes in precipitation; Warming
High Island Small Island	Sea level rise; Changes in precipitation; Warming

Low Island Atoll Forest	Changes in precipitation; Warming
Low Island Villages	Sea level rise; Changes in precipitation; Warming
Low Island Agroforest	Changes in precipitation; Warming
Low Island Taro Patch	Sea level rise; Changes in precipitation; Warming
Low Island Lagoon-Facing Shore	Sea level rise; OA; Changes in precipitation
Low Island Ocean-Facing Shore	Sea level rise; OA; Changes in precipitation
Low Island Islands Without People	Sea level rise; Changes in precipitation; Warming
Low Island Lagoon	All four
Low Island Lagoon-Facing Reef	All four
Low Island Patch Reef	All four
Low Island Ocean-Facing Reef	All four
Low Island Open Ocean	Ocean Acidification; Warming

Day 3: OSS Session 1.4: Temperatures around the World

This session is the first one we are using in the Climate 101 Course based on the Ocean Science Sequence (OSS) for Grades 6-8 developed by the Lawrence Hall of Science. This session reinforces the concepts on the Unit 1 Teachers Guide page 42, namely that the ocean keeps temperatures more even all over the planet by warming cold air and cooling warm air. Two other climate concepts are the hemisphere differences between timing of seasons, and the comparison between temperatures near the equator with locations closer to the poles.

Show Slides 20 through 28 during this session. Generally follow the Teachers Guide instructions, but there are changes because we are doing this session before Sessions 1.1, 1.2 and 1.3. For us, Session 1.4 fits better in Week 1 because we begin by emphasizing the importance of place. We are not referring to the mystery of Bakersfield/Morro Bay (California) during the session or as homework. We are also not referring to the Session 1.2 “Scientific Evidence Chart.” We are just beginning to introduce the idea of scientific evidence in this Session 1.4.

Make sure that participants use their Unit 1 Student Investigation Notebooks during Day 3, especially pages 20 (“Earth is Heated Unevenly”) and 22-23 (“Mystery #2: Locations X, Y and Z”). Conclude the session by highlighting the pedagogy focus of this course. Keep referring back to how they might use some of the types of lessons in their own contexts, especially ways they could adapt what they experience in the course to their classroom contexts (e.g., no overhead projection).

Homework: No homework this week.