Final Project Guidelines

The final project, which will be centered around development of a data-based lesson plan, will provide the opportunity to show what you've learned, and as such will include the following components:

- Use of near or near-real time data, ideally local data to where you are, which helps to develop an explanation of a climate science related concept
- Incorporation of the learning cycle instructional model into the design of the activity
- Demonstration of knowledge of 3-dimensional teaching and learning through specifically addressing crosscutting concepts, science and engineering practices, and disciplinary core ideas (e.g. performance expectations)
- Demonstration of understanding of a climate science concept(s)

Complete the following table. 100 Points Total

Introduction: Lesson Content Goals and Learning Objectives (5%)	Student Learning Objective (content and data)	
	How is your activity three dimensional? (describe the climate science concepts, science and engineering practices, and crosscutting concepts that students will demonstrate their understanding of)	
	What data skills will students **demonstrate** upon completion of your lesson?	
	How does this lesson use real or near-real time scientific data, ideally local data, to help students learn to	

	develop an understanding of a climate science-related concept?	
Science Content Overview: What is the science behind your Topic Area Question? (10%)	What is your Topic Area Question?	
	Provide background information about this topic area as to why the question is relevant.	
	What ideas do students typically hold about this content?	
	What information related to this science content will the students need to know ahead of time to be successful in completing this lesson?	
	If appropriate, list the state standards or NGSS disciplinary core ideas covered by your Topic Area Question.	
	What were your **More Focused Questions**? (*Data Components of Final Project Part 1)*	
Data Components: Use the "Data Components of Final Project" handout to help complete parts of this section. (30%)	What **Testable Question** will the students investigate? Explain how your Testable Question meets each aspect of the the **SMART** checklist.	
	Identify the **data sources/portal** that the data used in your lesson came	

	from to provide evidence towards the Testable Question. (*Data Components of Final Project Part 2)*	
	What **data visualization(s)** did you include in the lesson to enable students to investigate the Testable Question. Why did you choose that kind of data visualization?	
	Three Levels of Engagement with Data Visualizations. (Worksheet from Session 9 - *Data Components of Final Project Part 4*) a) Identify what scaffolds your lesson provides to help the students move through **orientation, interpretation** and **synthesis** levels of engagement with the data visualization(s) in the lesson. (Sessions 4 & 10) b) Identify what data skills the students will need to have before the lesson to be successful with the data components of the lesson. (HW Session 10)	
Develop your lesson using the **Learning Cycle** instructional model	**Invitation**: Introduce the Topic Area Question, set the context and help make the questions and content relevant to your students, access prior	

(50%)	knowledge and anticipate student ideas about on the topic/concepts.	
	Exploration Part 1: Introduce students to the data visualization(s) and have them explore on their own a bit – what initial questions do they have about the data, the science, and how it relates to the Topic Area Question. What questions can you add to help them with the initial exploration?	
	Concept Invention Part 1: Teacher acts as a guide as students talk about their ideas about the data visualization, what additional information they need to know about the science and data in order to make sense of it etc. Teacher provides more context and helps with making sense of the science as needed. Could include general info on a study area, how an instrument collects/processes data, an overview of a scientific experiment/expedition, background on how a scientific process works, and/or why the process or experience students are about to investigate matters.	

	Exploration Part 2: Students follow procedures teacher outlined as they work to explain their view or understanding of the data visualization(s) you have selected, and consider the Testable Question. What guidance questions -- data orientation, interpretation, and synthesis questions -- will help students interpret the data and make inferences about the science concepts. (Worksheet - *Data Components of Final Project Part 4*).	
	Concept Invention Part 2: Students make connections and develop deeper understandings of the science content through interpretation and synthesis of the data. Teacher helps facilitate understandings and adds clarifying questions to help students develop a claim from the data evidence. The objective is to help students understand the process and nature of science by building their science skills in analyzing and interpreting data, and constructing explanations with respect to the Testable Question. How have you used the crosscutting concepts and science and engineering practices to help students make sense of the science?	

	Application: Students make a claim and support it with evidence. (Include 2–3 expected student responses.)	
	Reflection: How will you have your students reflect on this learning experience? Be specific about what types of prompts or activities you might have your students do here. Make sure to include opportunities for students to reflect on the content, data skills, and scientific process here.	
Personal Reflection (Classwork Sessions 10, 11) (5%)	Which sections did you struggle with most as you developed your activity? How did you incorporate feedback from instructors or peers into your lesson design to help you work through these issues?	