



## Sea to Space Particle Investigation Webquest

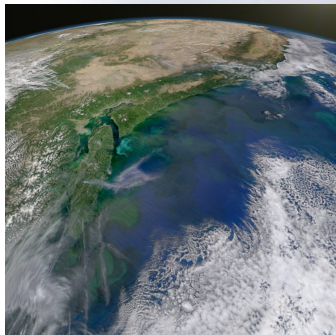
The GLOBE Program's ENSO Student Research Campaign has been invited to be involved in an extraordinary opportunity! We have been invited to participate virtually in many aspects of an upcoming research investigation that will take place in the Pacific Ocean. Dr. Stephanie Uz, a NASA oceanographer, has been an active participant with both phases of the ENSO Campaign. She will be taking part in a research cruise, called the "Sea to Space Particle Investigation" and she has invited us to be involved with this project from beginning to end.

On February 1<sup>st</sup>, we will be invited to join the researchers on the ship during a Google Hangout. Before we join them though, we need to conduct a little research ourselves to learn more about the researchers and their investigations. That is what this webquest is designed to do- to help frontload some important information to prepare us!

**Activator:** Before you do any research, take a minute to think about the title of this investigation- "Sea to Space Particle Investigation. *What do you think these scientists are going to be studying? Make a list of five possible topics that you think they might be learning about on this research cruise.*

Let's get started- Click on [this link \(https://schmidtocean.org/cruises/\)](https://schmidtocean.org/cruises/) to see a wide variety of different research cruises that are offered by the Schmidt Ocean Institute. Pretty amazing to see how many different types of research being conducted to help us better understand our home planet! Find the "Sea to Space Particle Investigation"- *When will this cruise take place?* Now click on the picture for this cruise, and let's see what this is all about!

**Background Information:** As you read the first two paragraphs, find the answers to these questions- *What are "particles"?* *What can learning about these particles help us better understand?* *What is the overall aim of the investigation?* "Particle size distribution products"- that is a mouthful! We will learn more about what these are and why knowing the size of these particles are important. *What will improving the accuracy of these records help us to better understand?* If you see any words that you don't understand, take a few minutes to list them and find the definitions for them before you move ahead.





Click on the “Show More” button and let’s dig a little deeper to better understand what the researchers are studying on this cruise. *Why are satellites used to help measure particles in the oceans? Why do some direct measurements need to be taken in addition to the satellite and remote-sensing measurements?*

Now read the section called “Recording Ground Truth” and use the information to answer these questions. *What do you think it means to “ground truth” satellite data? What will the science team create a process for? What two types of data will their prototype instrument collect? What is their goal? How will achieving their goal ultimately help scientists?*

*Where will their ship depart from? Where will the ship finish the research? How will researchers compare their data to that of satellite observations?*

**Meet the Research Team-** Before we finish this introduction, go to the top menu and click on “The Team”. Let’s meet the Lead Scientist, Dr. Ivona Cetinic first. Answer these questions about her: *What type of scientist is she? What does she use optical tools to learn more about? We also want to learn a little about Dr. Stephanie Uz, as she is our regular ENSO scientist who works closely with us. What does her research focus on?*

**Learn More-** We are going to learn a little more about how satellites are able to help us measure ocean particles and collect other important data to determine the health of the world’s oceans. Go to the top of the page and click on the link for “Data Publications”. Click on the “NASA PACE” information. Use the information on this page to answer these questions. *What does PACE stand for? What will this satellite primarily measure? Which two key climate variables will this research help us learn more about? What is “chlorophyll?” How is carbon cycled through Earth’s oceans?*

Watch this short “Climate Bits” video to learn more about Earth’s carbon cycle:  
<https://youtu.be/6XZWLD5Fs6M>

We are looking forward to keeping up with this research during their time at sea. There will be more opportunities to hear from these scientists during their voyage. Thanks for coming along with us on this voyage.

