My NASA Data - Mini Lesson/Activity

Systems and System Models: Megadroughts in our future?

Grade Band

- 6-8
- 9-12

Time

- 15 minutes

Overview

Students watch a visualization video and answer questions on the potential of increasing megadroughts in the southwest and central United States from 1950-2095 using models created by soil moisture data.

Student Directions

Drought conditions have affected much of the United States in recent years. Scientific data helps scientists develop models that describe Earth processes and project future scenarios in climate. Scientists now believe future droughts could increase. Computer models of soil moisture show increasing greenhouse gas emissions. They are driving up the risk of megadroughts which are droughts lasting more than 30 years.

Review the video System Models: Megadrought below and answer the following questions:

Video: System Models: Megadrought

System Models: Megadrought | https://www.youtube.com/watch?v=LhpjBsMveKA | Source: NASA Scientific Visualization Studio

Steps:

1. Check with your instructor on how to submit your answers.
2. Describe the phenomenon you observe.
3. Identify the patterns do you see in this model.
4. What are the limits of this model?
5. What evidence of Earth System interaction (among Atmosphere, Hydrosphere, Biosphere, Cryosphere, Geosphere) do you see?

Source:

1. Shirah, G., & Zhang, C. (2015, February 12). SVS: Megadroughts in U.S. West Projected to be Worst of the Millennium. NASA Scientific Visualization Studio. Retrieved August 11, 2022, from https://svs.gsfc.nasa.gov/4270

Teacher Note

Teachers, these mini lessons/student activities are perfect "warm up" tasks that can be used as a hook, bell ringer, exit slip, etc. They take less than a class period to complete. Learn more on the "My NASA Data What are Mini Lessons?" page.

Teachers who are interested in receiving the answer key, please complete the Teacher Key Request and Verification Form. We verify that requestors are teachers prior to sending access to the answer keys as we've had many students try to pass as teachers to gain access.

NGSS Three Dimensional Learning

NGSS Disciplinary Core Ideas

- ESS2D: Weather and Climate
- ESS3D: Global Climate Change

Crosscutting Concepts

- Systems and System Models

Science and Engineering Practices

- Asking Questions and Defining Problems
- Developing and Using Models
- Constructing Explanations and Designing Solutions