My NASA Data - Mini Lesson/Activity

Systems and System Models: Megadroughts in our future? (Student Activity)

Student Directions

Review the video below and answer the following questions:

Example Questions for Students:

1. Describe the phenomenon you observe.
2. What patterns do you see in this model?
3. How do Data Visualizers make this video? Where do these ideas come from?
4. What are the limits of this model?
5. How is this model precise? What benefits are there in using this model?
6. What scientific principles are guiding this phenomenon?
7. Predict the future of the phenomenon based on the model you've observed.
8. What evidence of Earth System interaction (among Atmosphere, Hydrosphere, Biosphere, Cryosphere, Geosphere) do you see?
9. What question would you like to research based on this model?
Drought conditions have affected much of the U.S. Southwest and Central Plains in recent years. But scientists now believe future droughts in the last half of this century could be the worst in the past millennium. Computer model projections of soil moisture show increases in human-produced greenhouse gas emissions are driving up the risk of megadroughts, droughts lasting more than 30 years.

Scientific data is used to develop models that describe Earth processes with fidelity and project alternate scenarios when baseline conditions are changed. Scientific models allow us to experiment with and understand a phenomenon that is too small, too large, too fast, or too slow to detect directly using our senses.

A team of researchers led by scientists at NASA’s Goddard Institute for Space Studies analyzed model results from two climate scenarios: a moderate scenario where greenhouse gas emissions stop increasing by the year 2050, and a high scenario where emissions continue to rise at their current rate through 2100. In both cases, the team found conditions in the western United States are drier and the risk of decades-long drought increases. Watch the videos to see computer simulations that show how soil conditions in North America change under each emissions scenario.

Credit: NASA Scientific Visualization Studio