

Engaging undergraduates using animations to demystify science concepts

Earth science frequently deals with content that includes difficult concepts, abstractions, mathematical laws, and theoretical entities that cannot be witnessed. Most of seismology is concerned with understanding processes that are not easily observed as they may be too small, too slow, too fast, or on too large a scale to convey in the classroom or to the general public. Geodetics, also, is tied to the surface manifestations of those same processes.

Our colleagues get what we do, but how can we capture the interest of geoscience undergraduates, as well as a broader science-phobic audience?

Both IRIS and UNAVCO have found value in creating animations that demystify their respective topics by using arrows and highlights to direct attention to critical changes in the action, analogies to link new concepts to the familiar, exaggeration to emphasize processes that can't be viewed in scaled models, the time dimension to sequentially reveal relations between objects that don't translate well either in text alone or in a sequence of static images. One pedagogical approach is to animate plate tectonic and earthquake processes by compressing time from centuries to seconds and scaling dimensions from 100s of kilometers on and beneath Earth's surface to centimeters on a computer screen. Examples include simple animations that cover fundamental processes such as faults, magnitude, and intensity, and more-advanced animations that incorporate complex processes such as focal mechanisms and regional tectonic settings.

In addition to creating a suite of over 150 animations and videos that range from basic fault motion to complex regional tectonics for grades 5-12 and undergraduates, we encourage collaboration with scientists who are eager to translate their recent work. Recent collaborations include USGS, ShakeAlert, Oregon State University, online geoscience textbooks, and museums.

The conceptual understanding gained by clarifying geophysical processes can engage students and motivate a desire to learn more about Earth processes; and ultimately about science in general.

