

ED034 - Using place-based approaches to enhance geoscience learning

Rooting learning in places of importance to individual or community can provide motivation and context for learning. This strategy, 'place-based' education, is consonant with practices of Indigenous and historically rooted peoples. It has effectively broadened participation in STEM, leveraging human connections to place (sense of place) for context and relevance while teaching Earth science. Place is central to geoscience: geoscientists study and compare specific places to construct understanding of Earth processes and history. Their findings enhance place-making. Geoscience knowledge is location specific, enabling hazards protection, resource extraction and environmental protection for resilience. This session explores how connecting geoscience education to sense of place can strengthen learning and build capacity for all students by means of face-to-face and online strategies, reciprocity in community/educator collaborations; successes for specific audiences; guidance from geoscience education research; and enhanced inter- and transdisciplinary learning and problem solving from place-based learning.

Engaging learners around climate change impacts in their communities - Strategies learned from in-class, after-school and informal learning education programs in rural communities of the Southwestern US.

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Communities across the Southwestern US are increasingly experiencing major disruptions from a changing climate and natural hazards, such as fire, flood, and drought. With this rise in hazardous events, there is a pressing need to support local education and community resilience efforts around climate change impacts. Teaching climate change can be challenging for educators, given the scientific complexity and the need to disentangle political dimensions surrounding the topic. Climate change and environmental hazards are tangible when their impacts are observed close to home. Grounding science learning in personal experiences provides an entry point for learners to the topic and makes learning relevant. In our experience, place-based learning has proven to be a powerful and transformative experience that unites learners through a shared place. Here we present results from three place-based educational programs that serve rural and tribal communities in the Southwestern US and highlight the common findings across these programs around changes in student beliefs and levels of transformation: 1) an after-school program in which students develop a short film about ways in which climate change impacts their community. The storytelling component of film making allows for culturally-sensitive

engagement; 2) an in-class instructional unit focused on increasing community resilience in which students learn about local natural hazards through engaging with authentic data, scenario-based role play games and the development of their own community resilience strategy that students present to local community leaders; and 3) a library-based informal science learning program in the southwestern US where communities engage around water as a scarce and valuable resource and share their common stories around the relevance of water. All three programs share a deep grounding in shared place and culture and offer examples of effective engagement with rural communities.