



Novel Tools for Climate Change Learning and Responding in Earth Science Education

Elena Sparrow (1), Jessica Brunacini (2), and Stephanie Pfirman (3)

(1) University of Alaska Fairbanks, International Arctic Research Center, Fairbanks, United States (ebsparrow@alaska.edu),
(2) Columbia Climate Center, New York, United States, (3) Barnard College and Columbia University, New York, United States

Several innovative, polar focused activities and tools including a polar hub website (<http://thepolarhub.org>) have been developed for use in formal and informal earth science or STEM education by the Polar Learning and Responding (PoLAR) Climate Change Education Partnership (consisting of climate scientists, experts in the learning sciences and education practitioners). In seeking to inform understanding of and response to climate change, these tools and activities range from increasing awareness to informing decisions about climate change, from being used in classrooms (by undergraduate students as well as by pre-college students or by teachers taking online climate graduate courses) to being used in the public arena (by stakeholders, community members and the general public), and from using low technology (card games such as EcoChains- Arctic Crisis, a food web game or SMARTIC – Strategic Management of Resources in Times of Change, an Arctic marine spatial planning game) to high technology (Greenify Network – a mobile real world action game that fosters sustainability and allows players to meaningfully address climate change in their daily lives, or the Polar Explorer Data Visualization Tablet App that allows individuals to explore data collected by scientists and presented for the everyday user through interactive maps and visualizations, to ask questions and go on an individualized tour of polar regions and their connections to the rest of the world). Games are useful tools in integrative and applied learning, in gaining practical and intellectual skills, and in systems thinking. Also, as part of the PoLAR Partnership, a Signs of the Land Climate Change Camp was collaboratively developed and conducted, that can be used as a model for engaging and representing indigenous communities in the co-production of climate change knowledge, communication tools and solutions building. Future camps are planned with Alaska Native Elders, educators including classroom teachers, natural resource managers, community members, leaders, and climate scientists as participants.