Teaching the Rocks and Minerals of Climate Change to Sixth Graders

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The NGSS includes a strong climate science emphasis in sixth grade which follows from some more traditional geology content including earth materials, natural resources, weathering, erosion, and more in earlier grades. It is possible that geology and climate science can appearm to be separated, leaving some students wondering how (or if) these seemingly disparate aspects of earth and environmental science are connected at all. Viewed another way, it is possible that students interested in climate change may fail to appreciate any connection or significance to the geology themes they heard about in earlier grades and soon forget about them altogether.

With the goal of illuminating the connections between different ESS themes that students are exposed to in the K-6 NGSS curriculum, I have piloted an interactive, auditorium style presentation for sixth grade called “The Rocks and Minnerals of Climate Change”. I have presented it to several hundred sixth graders in the past three years with good results; students remain engaged and interested, and teacher feedback has been positive as well. The presentation focuses on the ways in which certain rocks and minerals respond to climate change, record climate change, control climate change, and may help solve the modern climate crisis. The presentation centers on the weathering of feldspar (a common mineral that most students have seen or heard of) and the various products of that crucial geochemical reaction. Soils, ore bodies, evaporites, clay rich sediments, and marine limestone produced by feldspar weathering are all linked to the global carbon cycle or global energy consumption and production. Students act out how these different rock players effect the climate through their direct (or indirect) role in governing or responding to changes in greenhouse gas concentrations. This allows a segue to perhaps the most vivid climate-rock association: the melting of the ice sheets. Here, students realize that ice is a rock itself and its response to climate includes some familiar ramifcations (e.g. sea-level change, loss of polar habitat) as well some that are more subtle (e.g. altered ocean circulation, ice-albedo feedback). Finally, students brainstorm ideas for solutions to mitigate the modern climate crisis, on a few occasions even offering up viable carbon sequestration strategies involving rocks and minerals on their own.