

Local Rock Outcrop Project in Physical Geology & Historical Geology

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One way I get Physical Geology & Historical Geology students in my mid-Hudson Valley community college to apply new concepts is by giving them the option of studying a local rock outcrop for their final project. The process is really a mini-independent study as students apply what they learn in class about minerals, rocks, maps, geologic processes, and plate tectonics to “their” outcrop. I visit many of the students at their outcrops. Students can also share their own videos and photos of their site visits with me. The geology of most of the outcrops has not been recently described or interpreted in the geologic literature, or even in local hiking guidebooks, in any meaningful way, so students really must make their own observations and interpret them in order to unravel the geologic history of their outcrop.

Once students make their own primary observations and sketches, collect and describe samples, name the minerals and rocks they find, and make their own interpretations, then I help them find any related published resources, so they can weave together the geologic story of their outcrop. Students present their outcrop’s history in either oral presentation or poster format to the class. Students must come to grips with geologic time and geologic processes. For example, at first they may associate the sandstone in their outcrop directly with the Hudson River flowing near the outcrop. But eventually they come to understand that the ancient sandstone is hundreds of millions of years old, while the Hudson in its present form is thousands of years old.

The goal of the local outcrop project is to promote hands-on learning and primary inquiry, to encourage students to spend time outside, and to work in the same process/style as a field geologist. This local outcrop project supports student success by integrating learning from throughout the semester. Students gain confidence as they apply what they learn, and they learn how to “tell” a geologic story.

The main strength of this local outcrop project is that the students share their outcrop story with the class, and together, the various outcrop presentations share the geologic history of the Hudson Valley with all the students in the class. The most valuable aspect of this local outcrop project is that students are DOING geology, not just studying geology topics. They use a compass to measure strike and dips, look at the published geologic map, and gain confidence in their mineral and rock identification skills.

One challenge to implementation is that some students are less prepared for the task and require more individual guidance. If students are weak on mineral or rock identification, or don’t yet have a basic grasp on geologic time and processes, they flounder to understand the geologic story reflected in their outcrop.

My only evidence of effectiveness are comments students have shared, such as: I never even noticed rock outcrops before this class!; It’s so cool that I know more about how this area changed over millions of years.; Now when I hike with my friends, I can talk to them about the rocks and geology. Some of them don’t like that (smile); Geology used to be a class – now it’s a way of thinking.

This local outcrop project supports geoscience success in two-year colleges by giving students confidence that they are ready to transfer to a four-year school to continue the study of geoscience.