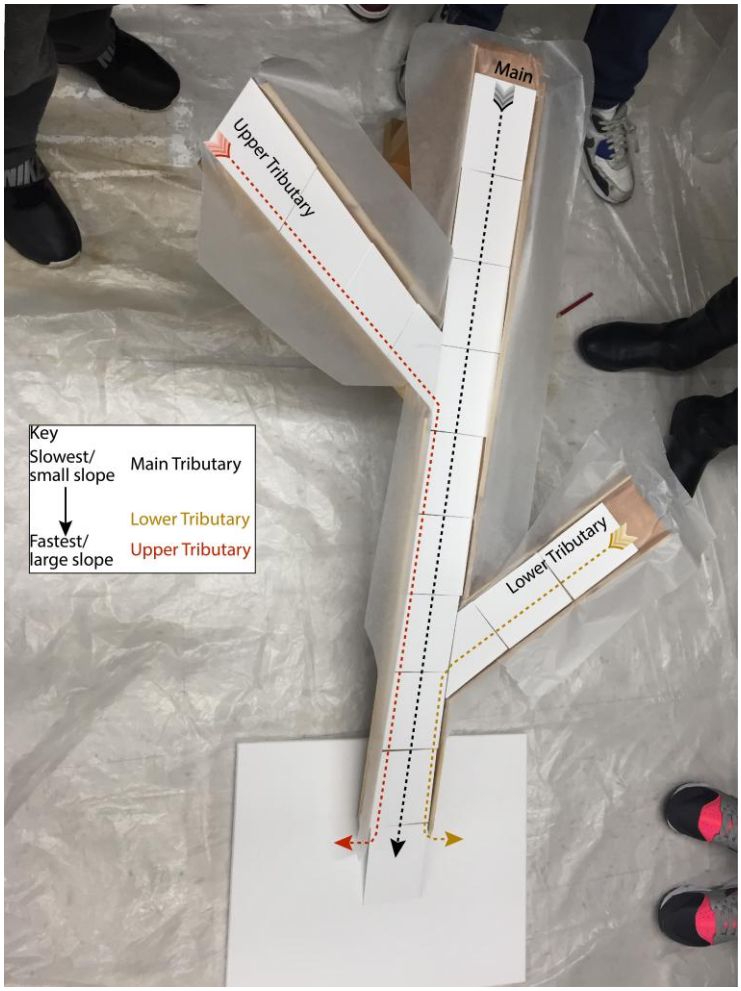
Geology Art: Outreach Report
12/23/2017
By: Carolyn Roberts

In late October, undergraduate geology student and local artist, Jeremy Stock, approached me for ideas on how to bring art and geology together. Jeremy was attempting to bring aspects of geology to his upcoming after-school art program at Waterfront Elementary School in downtown Buffalo. He also recruited my officemate, Scott Borchardt, to help develop the program.

Our idea was simple: let's use paint to demonstrate how different viscous fluids flow on Earth. We conducted some trial runs and narrowed down our objectives. One objective was to show the effect of slope: the closer surface was 90 degrees, the faster the paint/lava/ice flows downhill. Jeremy and his Dad built a ramp/glacier model out of wood to show this effect, with the main ramp at a modest slope, joined perpendicularly by tributary ramps set at steeper inclines. While our paint glacier was technically an abomination, flowing faster on the edges and slower in the middle, the aim was to show changes in velocity when tributary-paint joined the paint flowing on the main ramp.

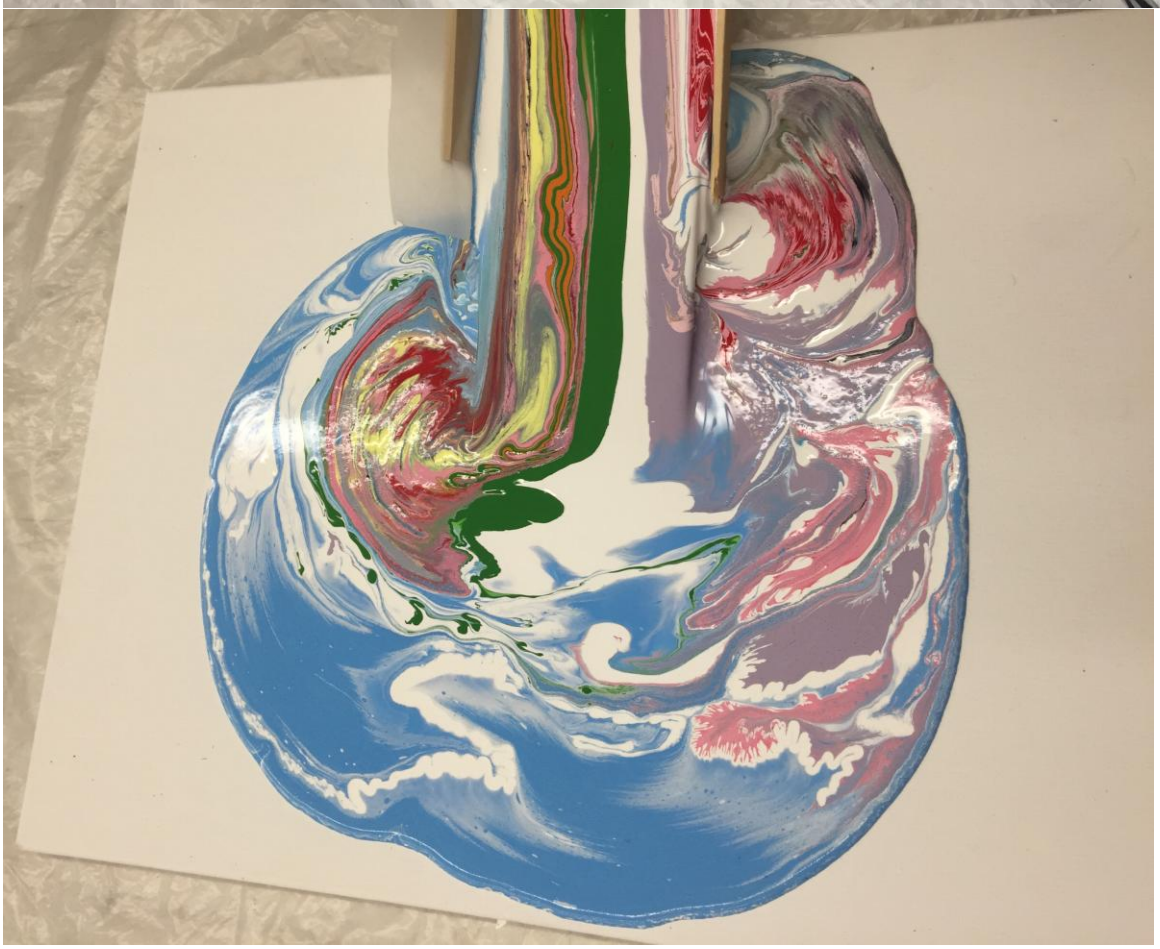


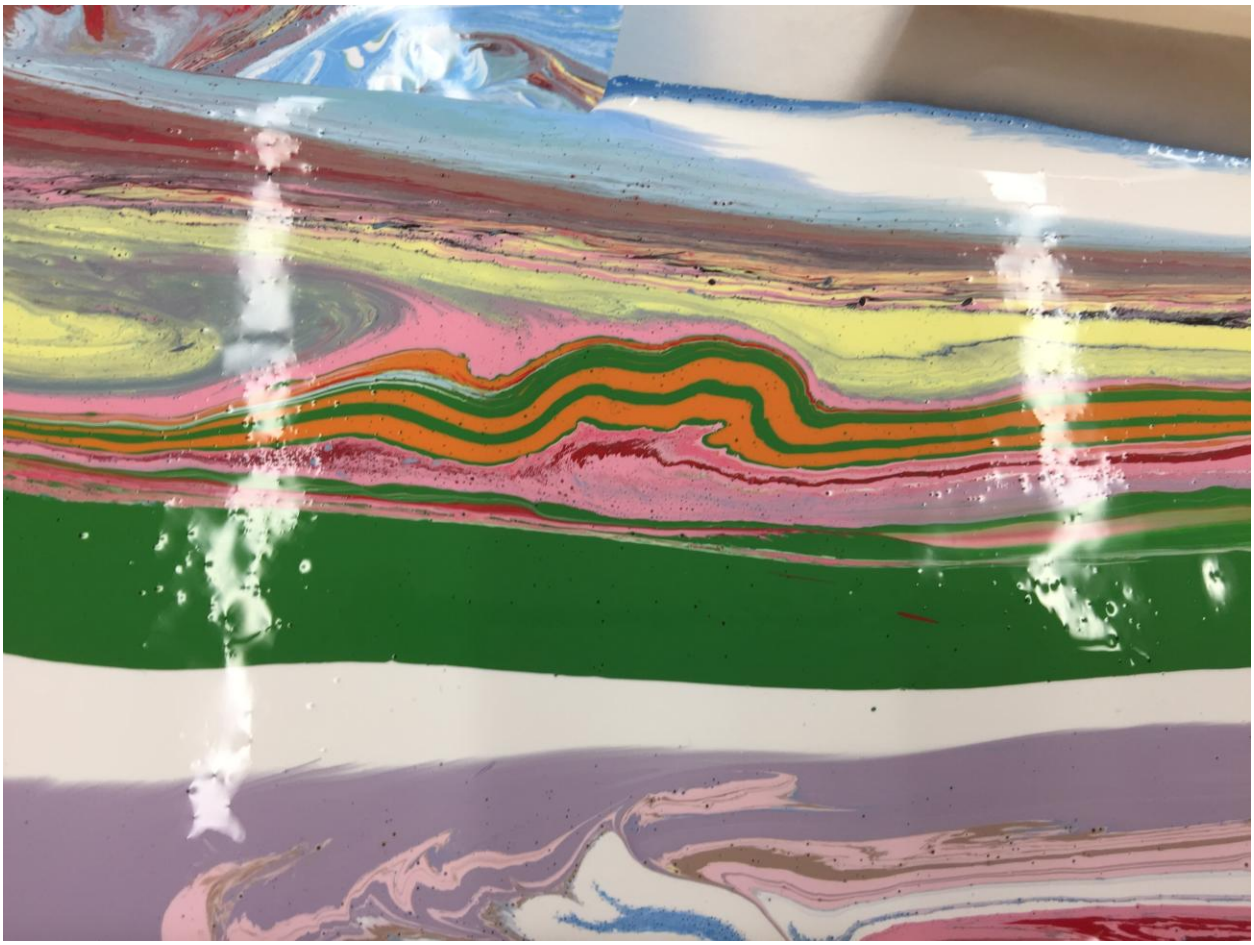
Another objective we had was to show the effect of viscosity, or a measure of a fluid's resistance to deformation/flow. To convey the difference between runny lava and more evolved viscous lavas, Jeremy thinned some paint with water so that we had a type that could flow faster downhill than regular acrylic

paint. Adding water had secondary effects, too, such as entrainment of paint from neighboring paint units, and erosion of basal (older) paint units. A built-in, or bonus, objective was to make art and have fun doing it! Keep in mind, these were just the objectives that survived the planning phase. There are plenty of ideas Jeremy, Scott and myself first had that require further consideration and testing to determine methods that work.

With any demonstration, it is best to go with the flow and have several options for each step. If you build different levels of understanding and detail into your demonstrations, you will have flexibility when performing them at outreach events. Fellow graduate student and outreach coordinator, Tayler Schweigel, highlights that "one of the most important elements of a good demo is layers." She explains that layers "can help you reach a broader audience. Not every kid will have the same amount of interest in every demo...These layers can help you shape your outreach to each specific kid or group you interact with." Tayler also notes that "being able to read a kid's level of interest in a demo is important," and that being prepared to discuss basic and multiple intermediate levels of detail will help create "an experience tailored for each kid," that will ensure they leave "feeling good about themselves and science."

I went into the experience with the expectation that it would be okay if I couldn't get any terms to stick (4th - 6th grade is a wide range to prepare for), because they would be directly connecting with the physical process. By experimenting with paints with different properties and observing the effects of changing slopes and physical barriers, they were grasping viscous fluid deformation in a tangible way. We were successful: the kids had fun, asked a lot of questions, and made really interesting art. Conceptually, volcanoes and lava flows were considerably easier to explain with paint compared to glaciers and ice deformation. Volcanos are exciting/active, and thus capture kids' attentions. Not only are glaciers slow/boring, but it is difficult to explain advance and retreat with this analog. We can only create one type of glacier (Piedmont glacier), but we are able to simulate different types of lava flows and eruption styles (so far, only basaltic effusive eruptions, and rhyolitic lava domes —but we have a plan for making Hawaiian- and Strombolian-style eruptions).





Over time, we were able to isolate the most-effective elements. We were the most successful when we started with videos. We would pause to ask questions like "what do you think will happen when the lava is poured on the ice?", and then we would collect all their different ideas before unpausing and showing what happened next, followed by a short discussion. It was also advantageous to follow the videos with a short demonstration using the different types of paint (running vs. viscous) on a test canvass. This progression of seeing a natural process in real time (video), and then seeing the different analog types in real time (test canvass demo), allowed for the most cohesive experience: practically everyone was engaged for all 90 minutes. Even though Thursday was the final class at Waterfront, we will keep developing our ideas on how to bring geology and art together. If you have any suggestions, we're all ears (carolynr@buffalo.edu).

I enjoyed being the December blog author, and I'm look forward to what Dave Hyman has in store for the January post! (If you would like to be the author of the February blog post, please contact Joe, Kirstie, or myself)

On that note, I wanted to wish you all a very merry break and a Happy New Year!