Good afternoon, everyone. My name is Sarah Kelly. I’m a second year graduate student pursuing a Master of Arts in Environmental Arts & Humanities. Today, I’ll be giving you an overview of the Discovery Trail, the curriculum, discuss research methods and goals, provide an example of a stop, and share some pilot data in the form of student feedback. My research explores the ways in which humans conceive themselves to be separate from nature, particularly how this separation worldview is represented in National Park Service interpretation programs. I will propose principles to alleviate this human/nature separation in interpretation by developing a socio-ecological interpretive framework and creating stops for this Discovery Trail as practical examples. This summer, I’m working with the Discovery Trail research team to lead field trips and support research efforts. We’ve already walked part of the discovery trail, which is one feature of the larger Schoolyard LTER program at the Andrews Forest. The physical trail was developed in 2011 as a place for visitors to explore the forest. A few years later, three Andrews LTER researchers--Lissy Goralnik, Mark Schulze, and Kari O’Connell--developed the place-based, integrated ecology and humanities curriculum for middle and high school students, which consists of 10 stops along the Discovery Trail.

The curriculum directly reflects the ecological science research that is conducted on site and the creative work that is produced through the ecological reflections program. This curriculum demonstrates the significance of multiple ways of knowing and making sense of our socio-ecological world, representing diversity in thought and appealing to a diversity of students. LTER research on disturbance, resource management, hydrology and wildlife ecology are woven with creative writing and native American storytelling. Students are guided through inquiry, reflection, and creative activities throughout the trail experience to facilitate the minds-on, hands-on forest learning experience. The content is delivered via iPads, which enable both the learning experience and the non-invasive data collection.

The discovery trail interpretive experience is more than a program merging humanities and ecology content on iPads in a research forest -- which has novelty on its own. The project is also an active research endeavor, developed with specific research questions and outcomes in mind. The primary research question is:  1) How does place-based, conservation science/arts/humanities interpretation impact student understanding and care about place? Our objective is to increase students’ knowledge about place and conservation science, while guiding them to reflect on their own relationships with place and their own personal responsibility for stewardship behaviors.

While learning on the trail, the students are inputting responses to questions about ecology concepts, creative readings, artistic works, and observations about this place. Among these questions, we ask about ecological relationships, personal experiences, and forests values. We also offer the teachers pre and post experience lesson plans to prime the students for the experience and facilitate integration afterward. Currently, we’ve collected data in the form of the answers on the iPads as well as feedback on the post-trail experience surveys. Other data will derive from pre- and post-intervention tests, which will be used alongside the pre and post lesson plans, and we’ll interviews with teachers who’ve led groups on the trail.

We have already lead four school groups, totaling 77 students, on the trail. The first pilot test last June was a static PowerPoint on iPads with the students recording their answers on pencil and paper; the digital platform was not completed yet. This year, we led two groups of high school students and one group of middle school students on the trail, using the finalized, interactive iPad program.

To give some more context about the content, we’ll use stop 3 where we’re currently located as an example. The students start by answering why they think there is a stream bed here. On the next screen, they see a time lapse video of this streambed over a six-month period accompanied by a graph of total daily rainfall in millimeters. You have a screen capture of that graph and time lapse on the back of your handout. It shows that when rainfall is highest, the stream bed is filled with water. The next three slides ask follow-up questions about the relationship between rainfall and stream flow and questions about larger watersheds and stream flow. This stop ends with a narrated reading by Robin Wall Kimmerer, a moss ecologist and director of the Center for Native Peoples and the Environment at SUNY Syracuse; she is also an Andrews writer in residence and a member of the Citizen Potawatomi Nation. I’ll read a brief excerpt from her Interview with A Watershed piece from the Forest Under Story book. Earlier in this piece she introduces the research technician John who is familiar with the data collection and instrumentation for this research. … (pg. 44)

“I ask John why they cut on such steep slopes. He looks at me quizzically and says, “That’s where the trees were.” Every tree was cut and hauled away, leaving a bare slope behind. They planted Doug-firs on the slopes, and built a weir and gaging station on the stream. Day by Day it sent out data on water flow and chemistry, data that told the story of a landscape hemorrhaging nutrients and filling the stream pools with sediment as the soil washed away, down to Lookout Creek, where it silted up the fish spawning beds. Sensors recorded the increased temperature of the stream flow, warming in the absence of the shading canopy, too warm for trout and salmon. Meanwhile, over at watershed 2, still covered with old growth, the stream ran clear and pure. … Water is a storyteller, and listening to that story helped to write a new one, in which old growth has a role. These studies have been pivotal in changing our thinking about forest management, in understanding the connections between what we sow in the short term and what we reap over time. The opportunity lies in listening to the land for stories that are simultaneously material and spiritual. It is a hopeful sign that people return to the words of the elders and again look to the land for knowledge. I like to think that, in the right hands, scientific research is a conversation, an interview of sorts between two parties that don’t speak the same language.”

After this reading students are asked to state the main points of the reading and consider how water can be a storyteller. The stop as a whole allows students to learn by drawing conclusions from data and by pursuing other forms of knowledge via storytelling and traditional ecological knowledge. And just what kind of insight are the students gaining from this trail? Here are a few comments from the students who participated in the experience this spring and summer. When asked what the students learned, one said “I learned that certain creeks only form when there is a lot of rain.” Another said, “I learned that we need to be more respectful of the environment around us and the environment at home as well.” Some of the students cite examples of their learning that are steeped in virtues like care for the environment; others include facts that they learned about the place, which demonstrates the variety of learning taking place on the trail due to the intertwining of arts, humanities and science.

When asked what the students most enjoyed about the trail, one said, “I love being able to go out and enjoy nature. It was nice to be able to go and physically see what we are learning instead of sitting in a classroom falling asleep.” Another student said, “I liked the hands on learning.” When combining all of the pilot survey responses for this question, the highest percentage of students, at 31 percent, said they most enjoyed being outside in nature or looking at scenery. Thirteen percent of students (the fourth most cited response) said that the interactive, group or hands-on learning was the element that they most enjoyed.

That’s all folks… Thank you for your attention. We have five minutes for any questions you may have about the discovery trail project, which myself, Mark or Kari would be happy to answer any of those for you.