PROJECT SUMMARY

Landscape images are a powerful but underutilized tool for doing and teaching science. They provide a personal and human-scale linkage to geologic processes and the geography of place and time. This project will facilitate the widespread use of web-based landscape image archives to catalyze both formal and informal science education from K-12, to college, graduate school, and beyond. To accomplish this goal, we will build on five years of experience to create a toolbox of standards-compliant educational materials and catalyze a network of people from around the country to support each other in this endeavor of collecting and using landscape imagery to do and teach science. The work proposed here is based on the education, research, and outreach success of the Landscape Change Program (uvm.edu/perkins/landscape), a 10,000+ image archive that we have developed with NSF support (Bierman et al., 2005).

Over the next four years, we will develop, demonstrate, evaluate, and disseminate educational materials and ideas. Development will be done by students working in close concert with PI Bierman to create both image analysis and retrieval tools as well as web- and classroom-based educational materials, all centered on doing and learning science with landscape imagery. Teams of students, working summers, will demonstrate just how much science can be done by analyzing images quantitatively. Throughout the process, collaborator Manduca and the staff of the Science Education Research Center (Carleton College) will guide evaluation activity.

Dissemination is central to this project. We seek to catalyze the development of a national network of web-based landscape image archives and faculty interested in using such collections to teach both formally and informally. Central to this goal are teams of vested people (scientist, K-12 educator, technical or library staff). To bring together and intellectually equip such people, early on we will sponsor a national workshop in Vermont. Teams from around the country will learn from our experiences, share what they know, and begin a dialog that we anticipate will last for years. To refine best practices for working with K-12 teachers, Native Americans, and at-risk students, we will hold and evaluate a series of workshops locally. As the project matures, we will follow up with additional workshops at national meetings of educators, scientists, and digital librarians, publish in scholarly journals, and pursue other funding for synergistic informal science activities including writing a popular book and a preparing a traveling exhibit.

Intellectual Merit – In the past decade, the world-wide-web has changed the way imagery can be used and accessed. Formal and informal science education can be done in wholly new ways. With our experience studying Earth’s surface, developing educational materials, and using historic images to do and teach science, my students and I seek to change and improve the way people communicate landscape-scale science, particularly that involving the relationship between societies and the environment in which we live. Place-based learning and understanding human-geology linkages over space and time are not only fundamental to Earth science education, they are critical to human survival as recent events (Indonesia’s tsunami) so disastrously indicate.

Broader Impacts – By intimately integrating educational and discipline-based research activity, centered on understanding human-landscape interaction over time by means of historic images, we seek to model and disseminate a new paradigm for interdisciplinary, place-based education in natural science. This project will catalyze a national network of educators and web portals that will bring images, and the stories they tell about landscape-scale processes, to the classroom and to the broader community of life-long, informal science learners. There is no better way to catch people’s attention and promote an informed citizenry, than the scientific, environmental, and historical awareness catalyzed by the visceral impact of imagery. This project includes key roles for undergraduates, graduate students, and K-12 educators.