

Sound and Story Maps of the Poudre River: Engaging Schools in Colorado's Wild Environmental History

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Narrative Prospectus

Introduction:

Between September 9-16, 2013, Colorado experienced one of the most extreme rainfall and flood events in recorded environmental history. The combination of a slow-moving upper level system over the Great Basin region, favorable upslope easterly flow along the Front Range, and the presence of a stalled frontal system resulted in several episodes of torrential rainfall (NOAA 2013). By the week's end, a swath of 8-17 inches of rain resulted in widespread, devastating flash flooding in the South Platte River Basin from Denver downstream to western Nebraska and in the upper Arkansas River Basin along the upper Fountain Creek. Those living in Colorado in 2013 remember well the way in which the floods forced us to look at our communities not as isolated political entities but as a common *geographic region* grappling with similar struggles (e.g. transportation challenges, power lapses, storm damage). The Cache la Poudre River – which connects the communities of LaPorte, Timnath, Fort Collins, Windsor, and Greeley before its confluence with the South Platte - was one of the Colorado waterways directly affected by the 2013 rainfall. This river and its unique, interconnected history is also the focus of the proposed engaged teaching project for third through fifth graders in Colorado.

River Designations, History and Geography:

The Cache la Poudre River drains east from its headwaters near Roosevelt National Forest and Rocky Mountain National Park (3278 m) to join the South Platte River near Greeley (1400m). It is distinct in that it is the *only* Colorado river classified as Wild and Scenic as per the Wild and Scenic Act signed into law by Lyndon Johnson (WSA 1968). By comparison, New Jersey – smaller in size and arguably more industrialized than Colorado – possesses *five* rivers designated by law as Wild and Scenic.¹ More recently, Congress created the the Cache la Poudre River National Heritage Area “to provide for the interpretation...of the unique and significant contributions to our national heritage of cultural and historic lands, waterways and structures within the Heritage Area” (National Park Service 2014). The Heritage Area extends for 45 miles and includes all lands within the 100-year flood plain of the Cache la Poudre River. It is the first Heritage designation west of the Mississippi River and is

¹ Please note that the PI hails from New Jersey and in no way intends to slander the Garden State with this comparison.

meant to provide a framework for the promotion and interpretation of the area's **cultural** and **historic** character as well as the preservation of the natural and built environment.

Indeed, the Poudre River Heritage Area possesses a cultural and historic character that is often overshadowed by the allure of its wild and scenic value. It is important to note that Native Americans, for instance, once occupied the lower Cache la Poudre valley in northern Colorado though little is left of their legacy in modern geographic names. Roberts Ranch along the North Fork in extreme northern Larimer County contains a Ceramic Stage burial and a Ceramic Stage open camp/bison kill site. And, although there are few archaeological sites found directly on the Lower Poudre, there are more sites found near the confluence of the Poudre and the South Platte (Burris 2002).

European settlement similarly illustrates the captivating cultural history of the Poudre. The great demand for the pelts needed to satisfy the haberdashers in London, Paris and New York brought trappers to the Cache la Poudre Valley. The geographical location, being on the eastern edge of the foothills, slightly south of an easy pass through the mountains and south of the Oregon Trail, insured its use as a pathway for many travelers. Major Steven Long reported that the river's earliest name was in fact Pateros Creek and was given by "a Frenchman who was said to have bewildered upon it, wandering about for 20 days almost without food" (Fort Collins Express Courier 1936).

A modern day expedition down the length of the Poudre River reveals the fragmented nature of this now heavily populated riverscape. While some portions of the river are buffered by parks or protected areas (e.g. River Bend ponds) other segments are sandwiched between industrialized operations including hydrofracturing activities such as sand and gravel transport. In depth historical study of the Poudre River's shifting landscape thus provides an ideal "backyard learning" laboratory for educators eager to teach about the ways the river connects northern Colorado communities across time and space. Students, likewise, are interested in learning about problems and processes that are relevant to their everyday lives (Louv 2006).

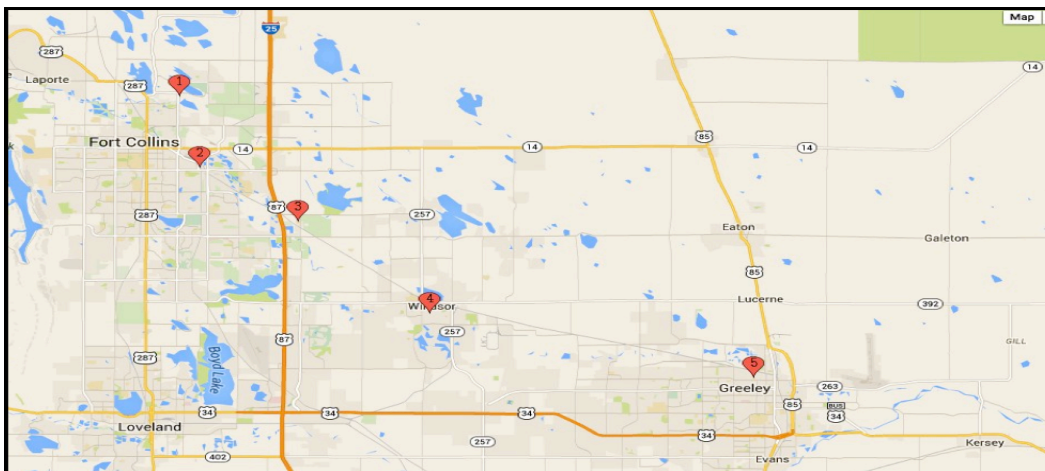
Plan and Demonstrated Need

Phase 1: Mapping and Curriculum Development

This project aims to map "sounds and stories of the Poudre" in order to create digital curriculum for elementary schools in LaPorte, Fort Collins, Timnath, Windsor, and Greeley (**Figure 1**)– five communities with distinct linkages to this Colorado river course. The PI will use soundscape technology already acquired for an National Park Service grant -ipads, recorders, shotgun and omni microphones and windscreens, song meters - to record geophonic (wind, waterfalls), biophonic (birds, mammals, amphibians), and anthropogenic (human, industrial, historic) sounds at numerous riverine sites. In cases where sounds are no longer present (e.g. bison kills), audio will be recreated or borrowed from other archival sources (e.g. flint knapping may be reenacted). Pending approval from

Dr. Michael Welsh (UNC History), audio segments from his “Oral History of the Poudre River Heritage Corridor” will also be folded into the Story/Sound maps given their special emphasis on historic land use patterns along the river (National Park Service: UNC Collection 87). All sounds including any associated oral history segments will be embedded on Google Maps and Soundcloud with linkages to a UNC project website for dissemination to classrooms (including those beyond the five selected schools). While ArcGIS provides greater functionality for projects of this type, Google Maps is free, easily accessible, and it allows users to embed audio files to specific placemarkers. Upon completing the Story and Sound Maps, the PIs will work together to create associated curriculum in line with Colorado State competencies. Phase 1 of the project will require the majority of time given the substantial curriculum development involved.

Figure 1: Participating Poudre River Elementary Schools



Phase 2: In Service Training at the PLC

Educators will have the opportunity to attend three hour sound and story workshops held at the Poudre Learning Center (PLC) and then beta test lesson plans in their individual classrooms. These workshops will be organized in collaboration with Ray Tschillard and his staff at the PLC given his expertise. The PIs have selected five elementary schools (3 classrooms each) based on proximity to the Poudre River as well as our existing partnerships with these institutions on previous projects. Schools are listed in an upstream to downstream sequence as follows: (1) Tavelli Elementary School, LaPorte; (2) Rivendell Elementary School, Fort Collins; (3) Timnath Elementary School, Timnath; (4) Mountain View Elementary School, Windsor; and (5) Billy Martinez Elementary School, Greeley. We will target third, fourth and fifth grade classes as per advice from participating teachers on the developmental characteristics of this age cohort. Also, many elementary school children recall the Colorado floods as one of the more visceral, formative experiences of their childhood (personal communication, partner teachers). Participating educators will be granted stipends for their workshop participation and travel expenses and will be required to provide feedback on use of curriculum in the

classroom. The Poudre Learning Center excels at providing a community space for citizen science and field based learning and we value the opportunity to work with this local institution.

Phase 3: Field Trips

The PIs will also host two Poudre River field trips that emphasize the practical ways in which to hear and record natural and human soundscapes. This working field trip will introduce interested teachers, students, and UNC teacher *candidates* to the fundamentals of sound and will provide participants with hands on, field based opportunities along various sites of the Poudre River Heritage Area. These trips will be arranged in Summer 2016 in coordination with the Poudre Learning Center and the PIs will follow existing field trip protocol as per participating school regulations. This highly participatory workshop will include a special section on sound walks as well as low tech ideas for employing sound and story maps into any classroom project. PI Barton has already coordinated soundscape workshops for other organizations and has an existing template for this type of instruction. Barton is also conducting a soundmapping project for the Continental Divide Learning Center at Rocky Mountain National Park that will include sound and story sites within park borders.

Significance and Need:

Why sound? Why stories? Why listen? On a theoretical level, we argue that the use of audio is particularly important given the way in which the social sciences have afforded an epistemological privilege to sight over hearing. The majority of human geography, for instance, is devoted to seeing the world, or speaking about it (Smith 1994 232-233). And while the study of landscape lies at the heart of human geography, geographic research has been more attentive to the visual. Ethnographic research has become more central to cultural geography, focusing on the critical importance of the local or micro-scale, yet it nonetheless emphasizes the collection of visual images to accompany a researcher's detailed societal observations (Smith 1994). Sound maps *in many ways* are the most effective auditory archive of an environment, touching on aspects of the political, artistic, cultural, historical, and technological.

On a more *practical* front, this project has the potential to better connect today's youth and teachers to the natural world – particularly to backyard environments that are both accessible and relevant to their everyday lives. In *Last Child in the Woods*, journalist Richard Louv (2006) writes that society has taught young people to avoid direct experiences with the outdoors, and that nature has ultimately become something to watch on television or to simply ignore. In particular Louv cites “nature deficit disorder” as a type of human-environmental affliction that has become more common among today's millennial generation. In this vein, we hope that workshop participants and their students will learn the ways in which *listening* - through activities such as *soundwalks and story maps*- can lead to a greater appreciation of the natural world and promote a sense of place. Sound exercises allow us to slow our pace and utilize one of the key senses, an activity which is particularly critical for youth. At

the same time, our Sound and Story map will provide a kind of digital fossil or acoustical benchmark for *future* generations wishing to learn more about the Poudre River Heritage Area.

Colorado State Academic Standards:

The proposed project addresses several of the 21st Century Skills and Readiness Competencies as outlined in the Colorado State Academic Standards for Social Science. For example, this project will target the following standards for 5th Grade History and Geography:

- SS09-GR.5-S.1-GLE.1 Analyze and interpret historical sources to ask and research historical questions (History)
- SS09-GR.5-S.1-GLE.2 Historical eras, individuals, groups, ideas and themes in North America dating from 1491 through the founding of the US governments (History).
- SS09-GR.5-S.2-GLE.1 -Use various geographic tools and sources to answer questions about the geography of the United States (Geography).
- SS09GR.5-S.2-GLE.2 – Causes and consequences of movement (Geography).

(<http://www.cde.state.co.us/cosocialstudies/statestandards> – Retrieved on March 23, 2015).

As per the Colorado State Academic Standards, the Sound and Story Mapping the Poudre River enables students to focus on core 21st Century competencies as follows: (1) Inquiry Questions (e.g. deeper thinking about the historic role of the Poudre River in Northern Colorado; (2) Relevance and Application (e.g. the cultural and political ecology of the Poudre River watershed across time and space; and (3) Nature of the Discipline (e.g. how engagement with the Soundmapping project provides a sense of place for individual students and communities).

Colorado History standards stress the importance of creating historical thinkers who study people, places and events from multiple perspectives. Likewise Colorado Geography standards emphasize the importance of geographic tools and technologies to answer questions about the geography of regions. Students participating in the Soundscape project will learn to understand the consequences and causes of movement and make connections to current or personal events.

Northern Colorado Community Partners and Potential Budget Match:

We have partnered with the following individuals and organizations to help coordinate the proposed project: (1) Ray Tschillard, Poudre Learning Center, Greeley (2) Tavelli Elementary School, LaPorte Rivendell Elementary School, Fort Collins; (3) Timnath Elementary School, Timnath; (4) Mountain View Elementary School, Windsor; (5) Billy Martinez Elementary School, Greeley (6) Poudre Heritage Alliance, Greeley; (7) Coalition for the Poudre River Watershed, Fort Collins and (8) Ben Baldwin, Continental Divide Learning Center, Rocky Mountain National Park. In terms of cost sharing, sound and story equipment needed for the project has been awarded via Barton's NPS grant (in kind). The Poudre Learning Center has agreed to supply space for our workshops. In addition, the PIs are in the process of applying for a \$5000 grant from the Poudre Heritage Alliance to help support this engaged

teaching project. Our proposed timeline for the May 2015-May 2017 (two year) grant is as follows:

Timeline*:

Tasks	S2015	F2015	Spr2016	S2016	F2016	Spr2017	S2017
Submit to IRB	X						
Field recordings/create sound/story map	X						
Curriculum/website Development	X	X					
PLC Workshops				X			
Field Trips				X			
Assessment/Feedback					X		
Submit Final Report						X	
Submit Journal Manuscript							X

*Timeline is contingent upon when/if funds become available as well as approval of project by UNC's Institutional Review Board.

Dissemination:

Sound and story maps are fast becoming key tools in which to make environmental history come alive for young people. The PI is an active member of Purdue's Global Sustainable Soundscapes Network (GSSN) which promotes soundscape education and we anticipate the proposed teaching project contributing to the organization's existing work (<https://www.globalsoundscapes.org/>). While only five schools (15 classes total) will participate in the original workshops we will reach numerous students and teacher candidates through the field trips and soundwalking workshops. All curricula will be made available online and advertised through the Colorado Geographic Alliance. The PIs plan to submit a manuscript of this work to the *Journal of Community Engagement and Higher Education*.

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Name of Project: Sound and Story Maps of the Poudre River: Engaging Schools in Colorado's Wild Environmental History

Submitted by: Karen S. Barton, Department of Geography and GIS

*Please see subsequent page for detailed budget justification.	Year 1 Hewitt Funding	Year 2 Hewitt Funding	Year 1 Other Funding	Year 2 Other Funding	Total	Notations, Assumptions, Description (optional)
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*Please see subsequent page for detailed budget justification.	Year 1 Hewitt Funding	Year 2 Hewitt Funding	Year 1 Other Funding	Year 2 Other Funding	Total	Notations, Assumptions, Description (optional)
Expenditures						
Personnel Expenditures						
Faculty Full-time (assume full benefits)	2,903	2,903			5,806	Barton:140 hrs @ \$41.47/per hour
Faculty Part-time (assume full benefits)	-00	-00	-00		-00	
Faculty Adjunct (assume reduced benefits)					-00	
Faculty PSA (assume full benefits)					-00	
Subtotal Faculty	2,903	2,903	-00	-00	5,806	
Exempt Full-time (assume full benefits)					-00	
Exempt Part-time (assume full benefits)					-00	
Exempt PSA (assume full benefits)					-00	
Subtotal Exempt	-00	-00	-00	-00	-00	
Classified Full-time (assume full benefits)					-00	
Classified Part-time (assume full benefits)	-00	-00	-00		-00	
Classified Overtime / Shift Differential (assume full benefits)	-00	-00	-00		-00	
Subtotal Classified	-00	-00	-00	-00	-00	
Graduate Stipends (no benefits)			-00		-00	
Graduate Waivers (no benefits)			-00		-00	
Student Wages (no benefits)					-00	
Other Wages/Compensation (assume reduced benefits)					-00	
Subtotal Student/Other Wages	-00	-00	-00	-00	-00	
Total Salaries & Wages	2,903	2,903	-00	-00	5,806	

Fringe Benefits					-00
Full Fringe (32.2%, 32.7% and 33.2%)	935	935	-00	-00	1,870
Reduced Fringe (16.2%, 16.7% and 17.2%)					-00
Total Fringe Benefits	935	935	-00	-00	1,870
Total Personnel Expenditures	3,838	3,838	-00	-00	7,676

Non-personnel Expenses						
Travel	500	500			1,000	Mileage Reimbursement
Printing and Supplies	150	150			300	Curriculum Material
Field Trip Transportation	450				450	UNC Van Rental
Soundscape Soundscape Sensors, Mikes, Recorders			9,989		9,989	in kind equipment match/NPS
Workshop Refreshments	500				500	
Stipends for Educator Participants	4,000				4,000	\$100 X 40 participants
Capital					-00	
Total Non-personnel Expenses	5,600	650	9,989	-00	16,239	
Total Expenses	9,438	4,488	9,989	-00	23,915	
Total Requested from Hewit					13,926	

Hewitt Budget Justification; Barton and DeWitt: April 1, 2015

*HSS's Kara O'Dell has kindly assisted in the development the Pis in the details of this budget.

1. **Personnel Costs:** The majority of funds will go towards personnel expenses for the essential but time-consuming activities of (1) recording sounds of the Cache la Poudre (2) embedding these and any associated oral histories into Google Maps and connecting them to the Soundcloud platform; (3) creation of curricula and website; (4) workshop development and delivery; (4) field trip logistics and instruction; (5) program assessment. This includes summer support for the PI. The Principal Investigator (Barton) will be responsible for the successful execution of the projection and the bulk of the sound recording, file embedding, curricular work, and field trip design. The Co-PI (DeWitt) will be instrumental in co-leading workshops and field trips educators given his expertise in teaching as well as his connections through the Weld-Evans Board of Education. DeWitt is also a broadly trained anthropologist who has extensive knowledge on Native American settlement and history in the West. He has led several field trips related to cultural and physical anthropology and such experiences should enhance the overall design of the project. Together Barton and Dewitt will work on the final report and scholarly publication. PI Barton will spend approximately 140 hours on the project over a two year period. Summer salary for Barton is calculated at \$41.47/per hour as per the HSS Business Office. However, the project will take more than the allotted 3.5 weeks and the PI anticipates putting in additional hours to complete the proposed work. Co-PI DeWitt has not requested any funds due to the fact that any additional summer salary will affect his PERA status. However, Prof. DeWitt will be compensated for all travel related to the project.

2. Non-Personnel Costs:

Travel: \$500 is requested for mileage (1000 miles X .50 X 2) for each year of the grant (total: \$1000). There will be significant driving between Greeley-partner schools and recording sites though this number may be reduced through efficiencies.

Printing and supplies: \$300 is requested for printing and supplies associated with the project. The bulk of the work will be digital in nature, but we will print out some curriculum materials as part of the sound and story workshops for participants to utilize in their classrooms (to be distributed during workshops).

Stipends: We will be offering \$100 stipends to those educators who successfully complete the workshop. Calculation: \$100 X 40 participants = \$4000. There is some debate over whether to offer such incentives to teachers for a three hour workshop. However, this amount seems warranted given the role that participants will play in the 3 hour workshop, the beta testing of curriculum, and the follow up assessment that is required.

Field Trip Van Rental: \$450 is estimated for field trip van rental per discussions with the UNC Fleet Office. PI Barton is licensed via Michael Stadler's training program.

Workshop refreshments: \$500 is requested for the cost of modest refreshments for workshops. Printing and supplies: \$300 is requested for printing and supplies associated with the project. The bulk of the work will be digital in nature, but we will print out some curriculum materials as part of the sound and story workshops for participants to utilize in their classrooms.

Cost Sharing:

1. Nearly \$9989 in sound recording equipment acquired from another Park Service award will also be used for this project (ipads, recorders, shotgun and omni microphones, earphones, song meters).
2. As stated in the narrative prospectus we will also be applying for funds from the Poudre River Alliance in 2015 to help offset costs associated with the proposed work (\$5000). If awarded these funds may reduce personnel costs to Hewitt for Year 2.