

Dan Collins, Principal Investigator  
SCAPE  
Arizona State University  
PO Box 871505  
Tempe, AZ 85287-6011

Phone: 480-206-2037

October 23, 2016

Karen Scott  
Senior Environmental Education Specialist  
US EPA  
Office of External Affairs & Environmental Education  
1200 Pennsylvania Ave., NW, 1426D  
Washington, DC 20460

Phone: 202-564-2194

RE: Quarterly Report #1

Grant Number (FAIN): 83659001  
Title: SCAPE (Sustainable Communities and Place-based Education)  
Budget Period: 06/01/2016 – 5/31/2018

Dear Karen: I want to thank you for ensuring that our grant application made it to the finish line...and was fully funded. As you know, we weren't given our final approvals until August 3, 2016. This first "quarterly" report reflects activities of the past four months. Subsequent reports will use the Award Date of June 30 as the official anniversary. A more formal report will be delivered on or before December 30, 2016, our sixth month anniversary.

We conducted our first formal workshop June 24 – 26, 2016. This "Water Quality Curriculum Design Workshop" involved much planning and development well before the actual meeting (starting in earnest last February). Our gathering included thirteen individuals—from highly regarded water quality scientists, to environmental educators with long experience in curriculum development, to master teachers who are in the process of testing the pilot curriculum this academic year. Workshop activities included presentations by each of the project team members along with hands-on activities in the field to test and make recommendations regarding the digital water sampling equipment and macroinvertebrate field kits. We also had a presentation from a member of the Navajo tribe who helped us connect the perspective of the Diné with an expanded definition of water quality (one that may not be fully measured with a Vernier probe!). See photos at the end of this report.

Subsequent to the workshop, information was compiled regarding "best practices" in the field along with a comprehensive bibliography. Results from the workshop presentations and discussions were compiled in a document that was shared with the team. In addition, individual projects and sample curricula were solicited from project participants as well as nationally recognized programs. A comprehensive framework for water quality education was launched. We are using Google .docs to share the entire curriculum development process with all of the team members.

A website has been created to support the project: <http://coloradoriverscape.org> The site features interactive maps, a document repository, a bibliography, links to team members and project partner schools, and a detailed report of our first Curriculum Design workshop. The online map utilizes ArcGIS protocols so layers from existing geospatial information sources can be added to easily accessible Google “My Maps” as needed.

Research into cloud-based technologies for supporting the project and facilitating the sharing of information across our 10 schools is being conducted by project tech guru, Shaun Ylatupa-McWhorter from ASU’s University Technology Office.

The project has been assigned a financial team by ASU. Our project officer is Linda Guerrero who has outlined a set of tasks for keeping on top of expenditures. One of the challenges has been to receive reimbursement for travel, supplies, and technical equipment that were purchased in the months leading up to the start of the project. To date, most major expenses have been reimbursed through the grant. However, I have some follow-up work to do with the Telluride Institute and other miscellaneous expenses. Linda and I have a standing meeting to stay on top of the finances.

There have been some changes in personnel. Most significantly, one of our lead scientists, Dr. Paul Haberstroh, suffered a stroke last Spring and has removed himself from the project. He was replaced, temporarily, by Dr. Karl Topper, a soil chemist with affiliations to the Telluride Institute. Karl’s contributions to the Workshop were considerable. He was paid as part as an independent contractor through an arrangement with the Telluride Institute. We are currently interviewing environmental educators to replace Karl, who will not be able to continue with the project. We also added a teacher and Navajo healer, Damien Jones, from Gallup, New Mexico. Damien helped us to appreciate the spiritual dimensions of “water quality” and the importance of understanding the environment holistically (and not simply as a set of spreadsheets). His insights into the cultural and economic impacts of the recent “Gold King Spill” were enlightening.

Two conference calls--August 17th and September 12<sup>th</sup>--have been conducted with myself and members of the University Office of Evaluation and Educational Effectiveness (UOEEE) at ASU. Matthew Gallagher, a new face at UOEEE, replaced Stephanie Leite in early September. Alison Cook Davis and Matthew Gallagher have provided invaluable feedback and perspective on the project. Matthew recently developed an online instrument for teachers to provide feedback when they utilize specific modules/lessons in their classes. This questionnaire—with both quantitative and qualitative dimensions—provides an effective way to track and report on teachers’ experiences.

Currently, our two master high school science teachers, Casey Jones (Orme School, Mayer, AZ) and Rex Lybrand (Telluride High School, Telluride, CO), are evaluating individual lessons and determining how to best integrate the completed elements of our new curriculum with their existing teaching schedules and obligations. While the overall curriculum is a work in progress, key lessons have been identified by both instructors that make sense in their particular schools and adjacent environments. Casey is working at the headwaters of the Agua Fria River near Prescott, Arizona. Rex is teaching near the headwaters of the San Miguel River high in the San Juan mountains of SW Colorado. They will provide essential feedback for refining the curriculum before we roll it out to the other teachers working in both the upper and lower Colorado River Basin next summer.

We are already in the planning stages for our second Curriculum Design Workshop and Water Camp (teacher training and roll-out). A week of activities is tentatively scheduled for June 19 – 23. June 19 –

18 will be devoted to placing the finishing touches on the curriculum. June 20 – 21 will be in-service training for teachers from our partner schools from Wyoming, Utah, Nevada, Colorado, and Arizona.

With respect to project documentation, our videographer, Kaard Bombe, was on site in Colorado for the 1<sup>st</sup> curriculum design workshop in June. Kaard and I are in the process of determining a travel schedule for documenting SCAPE implementation in the field. Most of this work will of course happen in Year Two when we hope to travel to most of the schools.

I have a sabbatical in 2017-2018 and my proposal is focused exclusively on the management and completion of the SCAPE project.

Please advise if you need further documentation of our efforts to date.

Regards,

Dan



Fig. 1. Field trip to the confluence of Deep Creek and the San Miguel River to test digital probes and macroinvertebrate field kit (20160624).





Fig. 2. Image from Telluride Institute field trip showing use of kick net to collect macroinvertebrates.



Fig. 3. Environmental Studies specialist, Vicki Phelps, showing Navajo students how to key out benthic macroinvertebrates during 1<sup>st</sup> SCAPE water quality curriculum workshop (20160624).



Fig. 4. Typical macroinvertebrate (Mayfly larvae) collected with kick-net.



Identification Key #3

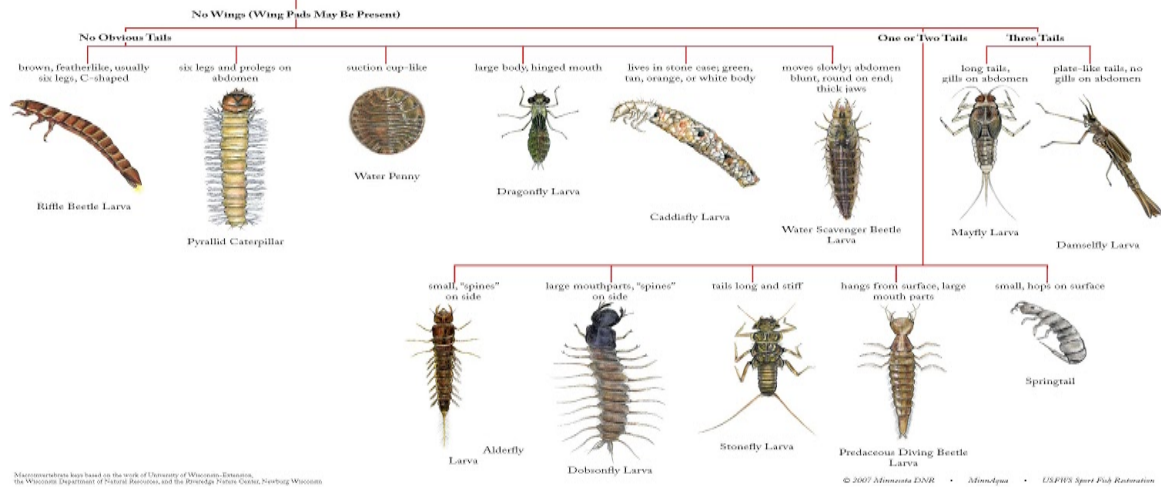


Fig. 5. Dichotomous key from SCAPE curriculum. Note image of Mayfly Larvae under "three tails" section (upper right).



Fig. 6. Project scientist Hilairy Harnett and Telluride High School teacher Rex Lybrand test the Vernier digital probes for recording temperature, pH, and dissolved oxygen levels at the base of Deep Creek during SCAPE workshop (20160624).



Fig. 7. Stock image showing use of Vernier probe “Labquest” for recording water quality parameters.



Fig. 8. The “icehouse” at Deep Creek served as a combination classroom/lab and studio for interviews with the participants.





Fig. 9. Closing ceremony on the back deck of the Stone House at Deep Creek led by Navajo teacher and healer, Damien Jones (in light blue shell).