Dan Collins, Principal Investigator

SCAPE (Sustainable Communities and Place-based Education)

EPA grant / ASU Project #BTS0406

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RE: Quarterly Report #7 (January 1 – March 31, 2018)

Grant Number (FAIN): 83659001

Title: SCAPE (Sustainable Communities and Place-based Education)

Budget Period: 06/01/2016 – 5/31/2018

Dear Karen:  This seventh quarterly report reflects SCAPE EE curriculum development activities, project management, and documentation over the quarter ending March 31, 2018.

The next report will be our summative FINAL REPORT that is due within 90 days of the end of our grant period ending May 31, 2018.

**Quarterly Report #7 (January 1 – March 31, 2018)**

This Report focuses on our most recent full quarter (January 1 – March 31, 2018). All SCAPE teachers have implemented portions of the curriculum in their respective programs. The core team continues to work on alignment with state and national standards (standards for UNITS I – III completed). 3rd Quarter Surveys and Final post-interviews were organized and conducted with our partner teachers by SCAPE ASU evaluator, Matthew Gallagher. Our fourth “all SCAPE” conference call via SKYPE was negotiated on Friday, April 20, 2018. The team continues to refine the curriculum through more detailed assessment tools, careful editing, additional images and maps, and expanded the Resources, References, and Glossary sections. Effective budget oversight is provided by Linda Guerrero, our “fiscal specialist” at Arizona State University. An online compendium of SCAPE video documentation has been completed.

### Standards and Assessment

Currently, our recommendation is to use the NGSS (Next Generation Science Standards) on a Unit by Unit basis (rather than looking at the granular level of the Lessons themselves). Monica Elser is leading the efforts to bring the current curriculum into alignment with these standards. We are also in the process of adding additional assessment tools (esp. Lesson specific Rubrics) to the curriculum. As of this writing, standards for UNITS I – III are complete. See the online document with links here: <https://docs.google.com/document/d/1CCWdfKWly-iHqDvMCfc75CL5AyXpucRo5XQFqmHTHAA/edit>

(note: clicking on the link takes you directly to the curriculum on a shared Google Drive. To access links within the document, make sure you are in the “viewing” mode (see toggle in upper right).

### Quarterly SKYPE Conference Call

Our fourth “all SCAPE” conference call was conducted by Dan Collins on April 20, 2018 followed by individual communication via phone or email with most of the teachers. Poor phone connections, due to the weather, forced us to complete the call in stages between smaller sub-groups. This was our last scheduled conference call. The full agenda can be accessed here: <https://www.coloradoriverscape.org/reports.html>

The group conference call via Skype (completed in sections!) included Dan Collins (SCAPE PI), Matthew Gallagher (ASU/UOEEE evaluator), Shaun Ylatupa-McWhorter (ASU Computer Database Specialist), Dr. Elena Ortiz (Science professor, Phoenix College), Chris Bires (Science teacher, Boulder City, NV), Kevin Dunbar (Science teacher, Cedaredge, CO), Kristen McClellan (Science teacher, Grand Junction, CO), Jesus Cordova (PPEP High School, San Luis, AZ), and Hector Romero (Science teacher, PPEP High School, Somerton, AZ); Renu Singh (Director Gifted and Talented Academy, Maryvale HS, Phoenix, AZ), and Steve Smith (Animas HS, Durango, CO).

Two teachers were not able to participate: Mary Walker-Irvin (Science teacher, Grand County HS, Moab) and Deb Noble (Science teacher, Pinedale, WY),

### Status of the SCAPE Curriculum

As indicated in previous Quarterly Reports, the full curriculum should now be accessed on Google Drive (this is the new “coloradoriverscape.org address). The most convenient place to start is with the Table of Contents, which provides links to the entire curriculum (use control + click on link below. Once the document opens, make sure you are in the “Viewing” side of the Google .doc application and not the “Editing” side):

<https://docs.google.com/document/d/1vfBwsVr0WFMAkjCPyyMm4f33P5muKNdLjOXUZKi0hgE/edit?usp=sharing>

SCAPE Website & Media & Documentation

Kaard Bombe, our project videographer and documentarian, continues to work on developing engaging video and still images for the project. I have contributed my own share of images. See newly launched dedicated SCAPE VIMEO channel here: <https://vimeo.com/scapeworld>

Kaard and I are slated to do a major final tour of various schools to film students in the field between May 10 – 20, 2018.

The final report submitted during Summer 2018 will feature a video overview that not only captures the work being done on site with our partner schools, but vignettes of team members reflecting on the successes—and failures—of the SCAPE project.

We continue to expand on the public website for the project: <http://coloradoriverscape.org>. The site features interactive maps, a document repository, a bibliography, links to team members and project partner schools, and all of our quarterly and annual reports to date.

An expanded sample “StoryMap” using ArcGIS software is now available:

[https://www.arcgis.com/apps/MapJournal/index.html?appid=e3b4683827354912b3794cf3f2f05463#](https://www.arcgis.com/apps/MapJournal/index.html?appid=e3b4683827354912b3794cf3f2f05463)

I am suggesting to our partner teachers, that this online mapping tool would be a good way to synthesize and share the work they are doing at their individual schools.

Research into various methods for displaying individual school data is also being conducted. While Google “My Maps” and ArcGIS StoryMaps will certainly be used as final documentation tools, we are experimenting with more sophisticated, Javascript enabled, APIs for showing “heat maps” and other visualizations of various parameters recorded by students in the field. An example of some of our first tests can be found here: <https://sites.google.com/coloradoriverscape.org/scape/maps> This research was precipitated by the less than satisfactory performance of the “heat maps” option found in Google’s Fusion Tables API. We remain very impressed with the usability and data processing performance of the Google sites data pipeline—which takes students through Google sheets > Google pivot tables > Google Fusion Tables (for final data visualization using charts and maps). We are just not recommending the use of one small feature of Google Fusion Tables—that is, the heatmaps data display option.

As mentioned previously, a second “internal” website has been developed using Google Sites. This provides a secure portal for SCAPE teachers who can use it to access instructions for utilizing the curriculum, building maps, uploading data, storing student work, and creating data visualizations. It can be accessed here: <https://sites.google.com/a/coloradoriverscape.org/units/home> If you have not already, I would suggest that you go through the process of requesting a @coloradoriverscape.org account so you can get a full view of how we are managing the project and implementing Cloud-based technologies with all of our partner schools.

We had a coupla minor snafus recently with teachers inputting student data incorrectly. This led to a temporary corruption of the upload FORM and column headers in the master SCAPE data sheet. But in the end this was a good thing as Shaun Ylatupa-McWhorter (our database and dashboard specialist) was able to institute protections for a more robust site.

SCAPE Budget Management

Our project “financial specialist” at ASU is Linda Guerrero who continues to keep on top of expenditures. Linda and I have been meeting regularly to discuss the financial picture. We are encouraging all teachers to submit final invoices for all purchases and their stipends by May 25, 2018. This should provide sufficient time for ASU to process all the paperwork, get folks paid, and close out the EPA account by the end of May 2018.

SCAPE Evaluation

The University Office for Educational Evaluation and Effectiveness (UOEEE)—in particular, Matthew Gallagher and Alison Cook-Davis—have provided invaluable assistance. Their involvement has increased with the start of the second year of the grant. We have developed a detailed calendar for their participation and deliverables (based in the original EPA grant formative and summative targets, but with more detail). The “SCAPE Quarterly Report” developed by Matthew has been renamed “SCAPE Quarterly Survey” to distinguish it from my regular quarterly reports to the EPA. The original version is linked here: <http://www.coloradoriverscape.org/info.html> (If the interactive .pdf does not load, first download the document to your local drive and open within the latest version of Acrobat Reader). For each survey, Matt is creating very useful spread sheets that distill teacher comments and Lesson implementation. Find all three Surveys here: <http://www.coloradoriverscape.org/reports.html>

Matt has also conducted Pre- and Post- Interviews with all of the project teachers.

Status of Goals for Quarters #7 & #8 (January 1, 2018 – May 31, 2018).

--Conduct “status” meeting in Phoenix, January 10, 2018, with SCAPE core team. COMPLETED

--Teachers complete 3rd SCAPE online Survey of curriculum implementation by mid March, 2018. COMPLETED.

--Matthew Gallagher to conduct Post-Interview with all teachers. COMPLETED

--Organize/conduct 3rd SKYPE conference call (April 20, 2018). COMPLETED

--Complete school visits or Skype calls as needed with individual teachers. COMPLETED

--Shoot/edit additional video footage for SCAPE documentation and potential funders. (May 2018)

--Share SCAPE curricular ideas with “Future of H2O” consortium at ASU. (Fall 2018)

--Complete Assessment protocols for each Lesson (Need work on UNIT IV, Lessons 1 & 4)

--Link appropriate NGSS standards to each Lesson (UNIT IV to be completed by May 31, 2018)

--Share suggestions for final “exhibition/display” for use by partner schools in their “end of year” displays. COMPLETED

--Create “publication ready” version of SCAPE curriculum. (SUMMER 2018)

--Seek funding for supporting SCAPE for third and fourth years (2018 – 2020). EPA EE Grant application was submitted for Region 8 on April 11, 2018. Proposal FP00014797.

We continue to be happy with our team and proud of the progress made to date. Please advise if you need further documentation of our efforts.

Regards,

Dan

**ADDENDUM A:**

**Current List of SCAPE Core Team Members and Partner Teachers**

Bires, Chris - Science Teacher, Boulder City High School, Boulder City, NV  
Bombe, Kaard -  Videographer, Phoenix, AZ  
Collins, Dan - Professor, Arizona State University, Tempe, AZ (PI)

Cordova, Jesus - Science Teacher, PPEP Tec High School / Jose Yepez Learning Center, Somerton, Arizona  
Dunbar, Kevin - Science Teacher, Cedaredge High School, Cedaredge, CO  
Elser, Monica - Environmental Educator, ASU / Flathead Lake Biological Station   
Gallagher, Matthew – Project evaluator, University Office of Evaluation and Educational Excellence  
Lybrand, Rex - Science Teacher, Telluride High School, Telluride, Colorado  
McClellen, Kristen - Science Teacher, Grand Junction High School, Grand Junction, Colorado  
Noble, Deb - Science Teacher, Pinedale High School, Pinedale, WY  
Norenberg, Anne - Intern, Arizona State University, Tempe, AZ  
Ortiz, Elena – Professor, Phoenix College, Phoenix, AZ

Phelps, Vicki - Environmental Educator, Telluride Institute, Telluride, Colorado

​Romero, Hector - Science Teacher, PPEP Tec HS / Cesar Chavez Learning Center, San Luis, Arizona  
Singh, Renu - Teacher & Director, Gifted and Talented Academy, Maryvale HS, Phoenix, AZ  
Ylatupa-McWhorter, Shaun - Spatial Database Technologist

**Schools and Educational Centers (past & present)**  
  
Animas High School, Durango, Colorado  
Arizona State University ([GIOS](http://sustainability.asu.edu/), HIDA, SoLS)  
Boulder City High School, Boulder City, Nevada  
Cedaredge High School, Cedaredge, Colorado  
[Dine College](http://www.dinecollege.edu/index.php), Tsaile, Arizona [inactive]  
Grand County High School, Moab, Utah  
Grand Junction High School, Grand Junction, Colorado  
​Kofa High School, Yuma, AZ [withdrawn]  
Lake Havasu High School, Lake Havasu City, Arizona  
Maryvale High School, Phoenix, Arizona  
Navajo Youth Group, Chinle, Arizona [inactive]  
[Orme School](http://www.ormeschool.org/), Mayer, Arizona ([**SCAPE@Orme**](http://www.coloradoriverscape.org/scape_orme.html)Project) [withdrawn]  
Pinedale High School, Wyoming  
PPEP Tec HS / Cesar Chavez Learning Center, San Luis, Arizona  
PPEP Tec High School / Jose Yepez Learning Center, Somerton, Arizona  
Telluride High School, Colorado  
Telluride Institute, Telluride, Colorado

**ADDENDUM B:**

**Updated Water Quality Test Equipment**

Last update: November 8, 2017

**WATER QUALITY TEST EQUIPMENT for the SCAPE EPA GRANT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Notes** | **Description** | **Unit Price**  **“wired”** | **Unit price “wireless”** |
|  | WATER QUALITY WITH VERNIER | 48.00 | 48.00 |
|  | VERNIER LabQuest2 | 329.00 | 329.00 |
|  | STAINLESS TEMP SENSOR | 28.13 |  |
|  | STAINLESS TEMP SENSOR (Go Direct wireless)\* |  | 59.00 |
|  | PH SENSOR (wired) | 79.00 |  |
|  | PH SENSOR (Go Direct wireless)\* |  | 79.00 |
|  | OPTICAL DISSOLVED OXYGEN SENSOR\*\* | 299.00 | 299.00 |
|  | CONDUCTIVITY SENSOR (wired) | 95.00 |  |
|  | CONDUCTIVITY SENSOR (Go Direct wireless)\* |  | 89.00 |
|  | TURBIDITY SENSOR\*\* | 108.64 | 108.64 |
|  | FLOW RATE SENSOR\*\* | 129.00 | 129.00 |
| Wireless link converts standard wired sensors. | Go Wireless Link (includes charging cable) | 89.00 | 89.00 |
| School choice? | One Sensor chosen by school. |  |  |
|  | LABQUEST VIEWER SOFTWARE | 79.00 | 79.00 |
|  | Shipping (pro rata) | 12.90 | 12.90 |
| **Total “wired”** |  | **$1296.67** |  |
| **Total “wireless”** |  |  | **$1321.54** |

\*Choose either the “wireless” version (which uses Bluetooth) or the “wired” version. Currently, the “Go Direct” wireless does not communicate with the LabQuest2 Interface (PDA)…but it should in coming months. It does connect directly with Labquest Viewer software enabled tablet or laptop.

\*\*Wireless option not yet available

**TRADITIONAL WATER QUALITY TEST EQUIPMENT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hach Scientific Supply** | | | | |
| **Notes** | **Description** | **# of units** | **Unit Price** | **Total Price** |
|  | Test Kit, Stream Survey | 1 | 395.00 | 395.00 |
|  | pH paper (pk/5) | 1 | 12.19 | 12.19 |
| Seems high. | Shipping |  | 41.67 | 41.67 |
| **HachTotal** |  |  | **$448.86** | **$448.86** |

**MACROINVERTEBRATE COLLECTION KIT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ben Meadows Scientific Supply** | | | | |
| **Measurement** | **Instrument or Material** | **# of units** | **Unit Price** | **Total Price** |
| Water sample collection | 1 cases (24 count) 250 ml plastic bottles. | 1 | 6.37 | 6.37 |
| Aquatic or terrestrial vegetation / Algae collection | Amber Narrow-Mouth Safety- Coated Glass Bottles 24 per case = 140.10 | 1 | 14.01 | 14.01 |
| Aquatic or terrestrial vegetation / Algae collection | Foam-Backed PTFE-Lined Phenolic Caps (12 count) | 1 | 1.96 | 1.90 |
| Safety Equipment | Latex Gloves. 100 per box. | 1 | 8.79 | 8.79 |
| Safety Equipment | Safety Glasses, Uncoated, Clear, 12/Box | 1 | 20.89 | 20.89 |
| Macroinvertebrate collection | Complete Bottom Kick Net - 40in handle, Nitex, 500µm. | 1 | 187.50 | 187.50 |
| Macroinvertebrate collection | Aquatic Invertebrate Lab Kit | 1 | 333.50 | 333.50 |
|  | Sampling Kit contains: |  |  |  |
|  | •Twelve (12) Small white "critter pickin (TM)" pans (182-F20) |  |  |  |
|  | •Twelve (12) Forceps (7905-T10) |  |  |  |
|  | •Sink sieves (184-A15), pack of 6 |  |  |  |
|  | •Plastic vials (7912-P50), 48 count |  |  |  |
|  | •Twelve (12) Clear plastic rulers (039030) for measuring specimens |  |  |  |
|  | •Twelve (12) Hand Lenses (78-520) |  |  |  |
|  | •Teasing needles (7905-T24), pack of 12 |  |  |  |
|  | •Set of comprehensive teacher instructions |  |  |  |
|  | •Twelve (12) Insect ID  sheet (039020) with instructions |  |  |  |
| **Ben Meadows Total** |  |  |  | **$572.96** |

**TOTAL Expenses per Vendor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Vendor Totals** | **Description** |  |  | **Total Price** |
| Vernier | Digital Water Quality Test Equipment Equipment (suggested) |  |  | 1400.00 |
| Hach | Traditional Water Quality Test Equipment |  |  | 448.86 |
| Ben Meadows | Macroinvertebrate Collection Kit |  |  | 572.96 |
| **Grand TOTAL** | Estimated total may vary depending on your choice of Vernier Sensors. Also, Hach equipment NOT necessary for implementation of SCAPE curriculum. For the purposes of budget tracking, reserve at least $2500 in your budget for equipment. |  |  | **$2421.82** |

$344.28 is budgeted for each school to conduct one field trip; Mileage = ~100 miles @ $0.445/mi., meals

@ $12 ea. for 25 students. (Note: actual mileage & meal costs may vary from school to school, but no sub-grant shall exceed the $5,000 limit).

Overhead for each school is budgeted at 10% per the RFP.

For further information, contact Dan Collins (PI), [dan.collins@asu.edu](mailto:dan.collins@asu.edu) / 480-206-2037