CIVICSPARK AMERICORPS

City of Arcata: Climate Change Education

Analysis of Findings

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The City of Arcata and the Coastal Ecosystems Institute of Northern California (CEINC) partnered with CivicSpark AmeriCorps to do a survey and assessment of K-12 grades to determine if climate change was being taught in Arcata schools. During the survey and assessment, nonprofits interested in developing climate change education resources were identified. The purpose of this survey was to use the data to create regional resources for the classroom, and determine which nonprofits could use and update resources once developed.

1. Introduction:

The Coastal Ecosystem Institute of Northern California (CEINC) and the City of Arcata partnered with CivicSpark AmeriCorps to assess the status of climate change education in Humboldt County K-12 schools, with a focus on Arcata school districts. This was a three tier process that involved:

1. Documenting resources used by teachers, if any
2. Determining if there was an interest in teaching climate change, and if so,
3. Determining what resources would be most valuable.

Based on the data collected, I selected a grade level and developed climate change education resources. I piloted a one hour climate change classroom kit in the classrooms of teachers identified during the survey and assessment phase. This report serves as a baseline of research to aid any future climate change education projects that develop out of this project. (This report outlines the process used to engage local schools. To gain insight on nonprofit engagement see Appendix 4.)

2. Methods:

In order to determine an accurate assessment of climate change education in Arcata I tried to engage as many Arcata teachers as possible. This process involved three main steps: gathering contacts, conducting surveys, and conducting interviews.

Step One: Gathering Contacts

I created an excel spreadsheet of all schools located in Arcata school districts. The excel sheet contained contact information, principal contact, and any relevant teacher connections at the schools. I used this spreadsheet throughout the project to document contact status and level of engagement in schools. I then drafted an email explaining my project and emailed the principal of each school. I followed up with a phone call to explain my project and gauge interest.

I then created a separate spreadsheet with all the individual contacts of the teachers I could find online. When teachers did not provide their emails online I called the principal and asked if they could provide teacher contacts.

I also used my connections with both Redwood Coast Energy Authority (RCEA) and Friends of the Dunes to engage teachers. An employee of RCEA whom works with local schools, introduced me via email to several local teachers that she has successfully engaged with in the past. Local nonprofit Friends of the Dunes forwarded my introductory and survey email (explained in more detail below) to teachers they had worked with in the area through their "Bay to Dunes" education program. This method proved invaluable as teachers were more willing to engage when introduced by a trusted source.

Step Two: Conducting Surveys

I created a teacher survey on SurveyMonkey (see Appendix 1) asking teachers to provide information on climate change resources they used, interest in resources, and type of standards they teach. I also included a question asking if they were available for a short interview. I sent out individual emails to teachers asking them to take my survey over the course of about two months. I sent my survey to 100 teachers with two reminder emails to "Take My Survey" throughout the two month period. The survey was sent to all the Arcata teachers in public or charter schools except for 6 due to complications which will be explained in the Analysis section.

Step Three: Conducting Interviews:

I kept an excel spreadsheet of contacts of teachers that expressed interest in the project through the survey and were available for interviews. After collecting this data I followed up and called all the teachers that were available for interviews. I had to call many teachers several times and often just received voicemails. I conducted most interviews in person, meeting with teachers at their school, at their convenience. I asked teachers to elaborate on the following topics:

- What, if anything, they already taught on climate change
- Where they could see resources fitting into their classroom
- What kinds of resources they would like
- How many lesson plans would they ideally like on climate change? (Ex: a unit, one classroom)
- When would be ideal timing for them to receive materials
- Would they be interested in piloting materials developed this year
- What standards were they following
- When do they plan their lesson plans for next year
- Advice on structuring lesson plans
- Advice on working with the age group they taught

Directly after the interview I would transcribe the interview and save for future reference. I would keep track of which teachers offered to pilot materials on the excel spreadsheet.

3. Results:

The next section will be split into three sections an overview of results, an analysis of the surveys, and an analysis of the interviews.

Overview:

Of the 100 teachers I sent surveys to 22 teachers responded, therefore 22% of the sample size responded. Teachers from 10 different schools responded, 7 of which were Arcata schools. I received responses from teachers in every age range within K-12. I interviewed a total of eight teachers, 6 in person, and 2 over the phone.

Survey Analysis:

Schools:

The schools I received survey responses from were:
North Coast Preparatory and Performing Arts Academy (NPA), Arcata High, Pacific Union, Jacoby Creek, Sunny Brae Middle School, Arcata Elementary, Laurel Tree Charter School, Redwood Coast Montessori, and Monument Middle School (Rio Dell) (See Appendix 2, Table 1).

Grades:

I received a wide range of interest from teachers that taught various age groups and subjects. I organized interest of teachers into four age groups for purpose of organization and utility. The line of thought was that materials for students in the age groups of K-2nd, 3rd-5th, 6th-8th, and 9th-12th could be easily adapted to fit these three or four grades. I received the most interest as seen in the survey for the grade grouping of 6th-8th (See Appendix 2, Table 2).

Subjects:

Teachers who responded to the survey taught a variety of subjects including: Social Studies, Art, Environmental Education, Chemistry, AP Biology, AP Environmental Science, Math, Science, Marine Biology, Logic Puzzles, English/Language Arts, History, French, and "Multi/All Subjects"

Interest:

The teachers responded largely positively to the project. On the survey question "Are you interested in incorporating materials?" 15 responded "Yes", 6 responded "Sure/Maybe/Depends" and only 1 teacher responded "No".

Resources:

There was interest from teachers in a wide variety of resources. I provided the options of: local speakers, curriculum, activities, PowerPoint, teacher training, other, and all of the above. The resource of "activities" ranked highest from the list provided followed closely by "local speakers", "curriculum", and thereafter "all of the above" (See Appendix 2, Table 3).

Standards:

I received a variety of responses related to standards used in schools. The most common standard followed was the "Common Core". Thirteen teachers responded that they use Common Core. The Science standard of Common Core is called Next Generation Standard (NGSS). Five teachers stated that they use NGSS while three stated that their school was transitioning to NGSS. Other standards taught included: Foss Science, Montessori curriculum, International Baccalaureate, Science Technology Engineering Arts Math (STEAM) curriculum, and Education and Environmental Initiative (EEI). The EEI is a resource that was developed to incorporate into NGSS (See Appendix 2, Table 4).

Miscellaneous:

Other topics covered in the survey were looking at what subjects teachers already incorporated climate change resources into, what kinds of resources teachers already used, and if there were any barriers to teaching climate change. To see these results please see Appendix 2, Table 5.

Interview Analysis:

I interviewed two teachers over the phone and six teachers in person. Interview length ranged from half an hour to an hour. I interviewed teachers that taught a range of subjects and grades so my responses were often varied. Below is a summary of common responses received to several of the questions asked.

1. What was already being taught on climate change?

For the most part teachers responded to this question that they fit discussion of climate change informally into topics they were already covering. For example, several teachers mentioned climate change while talking about current events or geography. One school had participated in "Cool the Earth" in the past. Two teachers had a more in depth focus on climate change, but this was unusual. For the most part, the lessons students were receiving on climate change were informal and discussion based.

2. Where would climate change resources fit into the classroom?

Many of the teachers who taught Science were interested in teaching a unit on climate change. There was interest in teaching more in depth. Teachers that did not teach science were more interested in incorporating resources into their lesson plans sporadically.

3. What kinds of resources do teachers want?

All the teachers agreed that a database of relevant climate change resources would be useful. Many teachers were also very interested in resources being linked to the new science standards. Most teachers agree that in class presenters would be useful, but one teacher made the point that sometimes presenters

can be hard to organize. Teachers were also interested in inquiry based and interactive activities. PowerPoint could be used in all the classrooms I surveyed. Teachers were also interested in place-based learning. Many teachers wanted to get away from the teacher lecture model and get kids engaged.

4. When do teachers want resources provided?

The teachers had different techniques for developing materials. Some teachers stated that they develop their materials during the summer while others waited until the end of the summer. All teachers agreed that providing a database of resources to them over the summer before or at the beginning of the school year would be helpful in their lesson planning.

5. Are teachers available to pilot resources this year?

I got a lot of positive response from teachers in regards to piloting materials. Six teachers stated that they would be willing to pilot a classroom kit on climate change this year.

6. What curriculum standards do teachers follow?

Most of the teachers were in the process of switching over to the new science standards called "Next Generation Science Standards" (NGSS). Learning about the science standards was one of the most important insights gained from the interview process. Apparently, schools are at different stages of switching over to NGSS. There was relatively little understanding from the teachers as to what switching over to NGSS entailed. There are no resources yet developed for NGSS and so teachers may have to develop their own resources.

I attended a teacher meeting on NGSS and discovered that there are also differences between the national NGSS standards and the California NGSS standards. One teacher explained NGSS as being much more interactive and less lecture based than past standards. Teachers expressed that if I could align my lesson(s) with the standards it would be very useful.

7. What techniques do teachers use for structuring lesson plans and working with kids?

Every teacher I spoke with advised me to break lessons into chunks of different activities. Several teachers gave the example of splitting a classroom period into three fifteen minute distinct activities, for example 15 minutes of lecture, 15 minutes of group activity, and 15 minutes of reading or writing. The teachers recommended getting kids involved in problem solving, actions, and solutions.

8. Miscellaneous

Some other suggestions and points teachers made are listed below:

- Provide a teacher workshop after resources are developed going over materials
- Climate change can be taught across disciplines
- Providing a short teacher background on climate change would be useful
- If I am to create experiments make them easily replicated
- Target science teachers at schools

4. Conclusions:

The following section will be split into three sections: challenges, next steps, and further opportunities. The "barriers" section will lay out challenges I came up against in the project. The "next steps" section will describe how the results influenced the next steps and what those next steps are. The "further opportunities" section will outline where there is room to expand on this project in the future.

Challenges:

There were several challenges to this project. These challenges were: timing, state standard change, and size of scope.

One of the main barriers was timing. It was challenging engaging teachers early on; since teachers are so busy I had a slow start hearing back. Once I did hear back and gather data the school year was coming to a close. The project contract only went through September 2015 and schools get out for the summer in early June. This gave me very little time to work on the development and pilot of resources component of the project.

The next barrier was that schools were in the process of switching to new standards. It is important that I understand the standards so that whatever resources I develop will be able to be used once the new standards are put in place. It was a challenge to understand the standards since many teachers themselves were unfamiliar and confused by the standards.

The last barrier was the size of the scope of the project. The scope was ambitious for the time frame. I was supposed to survey and assess grades K-12. From the survey I was to determine what grade to develop materials for and what kinds of materials to develop. Because the scope was so broad I received responses from teachers across many different disciplines and grades. It was challenging determining how to narrow down which grade to focus on and what kinds of resources to develop given the immense diversity in response.

Next Steps:

The next steps of this project were to develop and pilot resources for one to two classrooms before the end of the school year. In order to determine which grade to focus on I looked at two things:

1. amount of teacher interest demonstrated across grades
2. alignment to NGSS

Grade:

I focused on these two steps because since I have a limited timeframe to deliver this project it made sense to work with teachers that I had developed relationships with. Teachers had also expressed a strong interest in materials aligning with the NGSS so it made sense to create materials with NGSS as a guideline.

In order to determine number one of the steps above I looked at the number of teachers in each age group, K-2, 3rd-5th, 6th-8th, 9th-12th that expressed interest in teaching climate change. The rationale for splitting grades into these categories was the hope that materials could be easily adapted between the grades in the categories. Although I received interest across all grade categories I got the most interest for the grade group 6th-8th. This was also the grade group that I received the most number of teachers willing to pilot resources this year.

In order to determine number two of the steps above I spoke to teachers about NGSS and studied the California NGSS online. It appears that the most direct fit to teach climate change according to the California NGSS's is in 6th grade. The criteria MS-ESS3 "Earth and Human Activity" directly correlates with climate change. One of the disciplinary core ideas in this section is "Global Climate Change". Due to the answers to step one and two it made the most sense to develop resources for sixth grade.

I piloted the resources in two sixth grade classrooms at Jacoby Creek and one Upper Elementary classroom at Redwood Coast Montessori. I also piloted one lesson plan in a Second and Third grade class at Redwood Coast Montessori (the teacher adapted the resources for the younger grades).

Resource Development:

In order to align the resources with NGSS I chose one "Disciplinary Core Idea"(DCI) to focus on for each lesson plan. I chose the DCI that could align most directly to place based education. Under the NGSS subject **MS-ESS3 Earth and Human Activity** there are four DCIs. The DCIs the lesson plans attempt to tie to are **ESS3.B: Natural Hazards, ESS3.C: Human Impacts on Earth Systems,** and **ESS3.D: Global Climate Change**.

I created a matrix to document how each lesson plan connects to the NGSS to the best of my ability. This alignment is solely based on my understanding of the standards based on research and trainings. I am not an expert on the standards, nor do I claim to present a perfect alignment. The matrix was only created as a guide to connect the lesson plans to NGSS. The lesson plans will not be able to be fully aligned to the standards at this time because the standards are so new it will take some time to fully understand how to follow them. I have attended several NGSS trainings and received the message that the shift over would take time.

My project scope of work suggests I focus on place-based education. This was something teachers also strongly supported. Due to this materials were developed with a focus on regional climate change impacts. The climate change impact focused on for the lesson plan was sea level rise on Humboldt Bay. The reason for this choice is that it is one of the most obvious impacts our region will face and can be tied into other important lesson plans associated with water.

Based on suggestions received from teachers I developed four consequent lesson plans for teachers. These lesson plans were designed so teachers can pick them up and easily teach them without needing someone external to come in and teach. This lesson plans include:

- A teacher background on sea level rise
- A teacher background on each lesson plan
- Generalized tie to standards
- Vocabulary key
- Student objectives
- Lesson plan procedures for four stand alone lessons
- List of materials
- List of time needed
- Extending the learning suggestions

The rationale for developing a teacher's guide is to make sure that the resources can be duplicated and used once my term is complete. It is important to make sure the resources can stand alone and be used by teachers without relying on an outside person coming in to complete the lesson. If the lesson plan is aligned to the new standards and is self contained, teachers will be more likely to use the resource in the future.

Piloting:

Piloting Metrics

I piloted all three consequent lesson plans in two sixth grade classrooms at Jacoby Creek. I piloted lesson one in a second and third grade classroom at Redwood Coast Montessori and lesson three in a sixth grade classroom at Redwood Coast Montessori. The same science teacher taught the two classrooms at Jacoby Creek. There were 24 students in one class and 25 students in the other for a total of 49 students. The classrooms at Redwood Coast Montessori contained about 10-15 students in each class.

I developed a pre and post survey before piloting at Jacoby Creek to gauge where students were at with their comprehension of climate change. I asked 4 pre survey questions and 5 post survey questions (Appendix 3). The point of the surveys was to gauge what knowledge students took into the lessons and what they left with.

With the surveys I specifically wanted to gauge the following five questions:

1. Are students able to convey that sea level rise is a consequence of climate change?
2. Are students able to understand how human activity is linked to climate change?
3. Do students understand that climate change is an issue that will affect their community? (directed towards sea level rise)
4. How hopeful are students about climate change solutions after the lesson plans?
5. Did students talk to their parents about climate change after the lesson plans?

Challenges

Unfortunately, there were some issues with the surveys that made it difficult to quantify results. For the first question in the pre survey half of the students were given the question "What do you know about climate change?" while the second half got the question "What do you feel about climate change?" The questions were also written in a way that was open-ended and difficult to quantify. However, I broke down answers into categories in order to group similar answers together.

Results

Jacoby Creek

Despite difficulty in neatly quantifying answers, there was a marked difference in the students' answers between the pre survey and the post survey. Students answered questions with many more specifics in the post survey. For example, in the pre survey I asked students: "What do you know about climate change?" Many students responded with vague answers such as "It is our climate changing." Upon completing the lessons many students responded to the question "What did you learn about climate change this week?" with more specific answers such as "I didn't know that the ocean could rise due to warmer weather."

The surveys showed that the students were much more able to convey that sea level rise was a consequence of climate change after the lessons versus before. Before the lesson plans only 4 students described sea level rise consequences as an effect of climate change; in the post survey 38 students listed issues related to sea level rise as a consequence (Appendix 3, Table 2).

Similarly, pre surveys showed 28 students thought climate change would affect someone they know, 19 of those students did not explain if the person affected lived locally, 3 students specifically mentioned a local person but thought the effect would be because of temperature, and 6 students specifically referenced a local effect not related to weather. In the post survey 38 students thought climate change would affect someone they know and specifically referenced a local effect not related to weather (most if not all were related to sea level rise) (Appendix 3, Table 1).

In gauging students hope around climate change solutions there was also a positive correlation after the lessons. Originally, only 29 students felt hopeful about climate change and afterwards 42 students were hopeful. In the pre survey 28 students answered that there were solutions to climate change and 1 student

answered there were solutions through adaptation. In the post survey 32 students answered there were solutions and 10 students listed there were adaptation solutions (Appendix 3, Table 3).

To determine if students had communicated about climate change with their parents I included a question in the post survey to see if they had talked to their parents. Unfortunately, not many students talked to their parents, 7 students answered "yes" and 39 students answered "no" (Appendix 3, Table 4).

Redwood Coast Montessori

Lesson one was adapted for the second and third graders and went well. Lesson 3 was given alone to one class of 4th-6th graders and one class of 6th graders. The lesson worked well as a standalone lesson but from observation seemed that it is more comprehensive when following lesson 2. Based on class discussion it seemed that students got a lot out of this lesson (regional role play lesson) and were able to convey the risks of sea level rise in our community from several different perspectives.

Teacher Feedback

Through the piloting phase I worked closely with two teachers, one from Jacoby Creek and one from Redwood Coast Montessori. An important part of piloting the lesson plans was determining if they were easy to use for the teachers. I received excellent feedback from both teachers stating that the lesson plans were extremely easy to follow and user friendly. Slight revisions to resources were made based on feedback. Both teachers stated that were going to use the lesson plans next year as well.

Future Opportunities:

There is huge potential for further development of this project. There was an immense amount of interest from teachers across many different grades and across many disciplines. Many teachers expressed gratitude that this work was being done. There is relatively little being taught on climate change in the classroom now but a huge amount of interest to teach it if resources are provided. Below is a list of potential for expansion:

- Develop resources for age groups other than 6th grade.
- Develop resources looking at other regional impacts besides sea level rise.
- Create multi-disciplinary resources.
- Create resources to align with other NGSS standards.
- Design a unit on climate change.
- Develop and lead a teacher workshop around teaching climate change and how to use resources created.

- Create after school or summer school activities or resources on climate change.

Appendix 1

Climate Change Education Survey

Providing Resources

The City of Arcata is working with CivicSpark AmeriCorps members to help provide resources and curriculum for local schools on climate change. Currently we're developing an assessment report of current climate change curriculum and resources available for K-12. We want to assess what resources are available and being utilized by teachers and where there are barriers to incorporating education materials (be it funding, time, resources, etc). This survey will give us a better idea of how we can best serve Arcata schools in getting climate change education into the classroom.

1. Please provide your contact information below (Optional)

Please provide your contact information below (Optional)

Name

Email

Phone

2. What school do you teach at?

3. What grades and subjects do you teach?

4. Do you incorporate any materials related to climate change in your teachings? If yes, please explain:

5. If resources were made available would you be interested in incorporating climate change education material in your classroom?

6. What kinds of resources would be most useful for you in teaching climate change? (For example: activities, local speakers, curriculum, powerpoints, teacher trainings, etc.)

7. What, if any, barriers do you face in teaching about climate change?

8. What curriculum standards do you follow (common core, next generation science standards, other)? Do you incorporate EEI materials in your classroom?

9. Would you be available for a short, informal interview?

10. Please provide any additional comments or questions you may have below:

Done

Appendix 2

Table 1: School Response

Name of School	Number of Teacher Response
Arcata High	1
North Coast Preparatory and Performing Arts Academy (NPA)	3
Sunny Brae Middle School	2
Monument Middle School (Rio Dell)	1
Jacoby Creek	6
Pacific Union	1
Laurel Tree Charter School	3
Redwood Coast Montessori	2
Blue Lake Charter School	1
Arcata Elementary	2

Table 2: Teacher Interest by Grade

Grade	Number of Teacher Response
Kindergarten	2
Kindergarten-Eighth	1
Second	1
Second-Third	1
Third-Fourth	1
Fifth	1
Fourth-Sixth	1
Sixth	1
Fifth-Twelfth	2
Sixth-Twelfth	1
Seventh-Eighth	6
Ninth	1
Ninth-Twelfth	1
Tenth-Twelfth	2

Grade Groupings	Number of Teachers Interested
K-Second	5
Third-Fifth	4*
Sixth-Eighth	9
Ninth-Twelfth	4

*One teacher expressed interest but did not fill out the survey

Table 3: Types of Resources Wanted

Resource	Amount of Interest
Local Speakers	9
Curriculum	9
Activities	12
PowerPoint	3
Teacher Training	2
Other	2
All of the Above	6

Table 4: Types of Standards

Standards	Amount of Response
Common Core	13
Next Generation Science Standard (NGSS)	5
Transitioning to NGSS	3
Foss Science	1
Montessori Curriculum	1
International Baccalaureate	2
STEAM	1

Table 5: Miscellaneous

Topics Climate Change Education Already Incorporated In	Utilized Resources Already	Barriers
Social Studies	Movies/Episodes	None
Environmental Elective	Websites	Time
Current Events	Research Projects	Personal Knowledge
Watersheds	Activities	Meeting Science Standards
Ocean Health	Text Book Resources(AP Environmental Science)	Teaching to Age Group
Evolution	Readworks	Climate Deniers
Weather	Cool the Earth Program	Inertia/Prep
Visual Arts	Guided Discussions	
French		

Appendix 3

Pre Survey Questions

1. What do you know about climate change?
2. What do you think are the possible effects of climate change?
3. Do you think climate change will affect you or someone you know?
4. Do you think there are solutions to climate change? Why or why not?

Post Survey Questions

1. What did you learn about climate change this week?
2. What are some consequences (impacts) of climate change?
3. Do you think climate change will affect you or someone you know? Who? If yes, why?
4. Do you think there are solutions to climate change? **Why or why not?**
5. Did you talk with your parents about sea level rise or climate change this week? If yes, what did you talk about?

Table 1: Will Climate Change affect you or someone you know?

	Yes	**Yes, Locally**	**Yes, Weather**	**Yes, Local, Weather**	**Maybe/Unsure**	**No**
Pre-Survey	19	6	6	3	9	6
Post-Survey	2	38	1	0	1	6

Key:

1. **Yes**=Answers do not specifically relate back to regional climate change effects. Students answered "Yes" but it is unclear if the people they are referring to live in Humboldt.
2. **Yes, Locally**=Answers directly referenced regional climate change effects or people they knew who would be affected locally. The effects listed were not related to temperature (important to make distinction because most post answers were related to sea level rise while many of the local pre-survey answers were related to temperature).
3. **Yes, Weather**=Answers did not specifically relate back to regional climate change effects and listed temperature as the main issue that would affect people.
4. **Yes, Local, Weather**= Answers directly referenced regional climate change effects in reference to temperature change.
5. **No**=Answers were sometimes unclear why students did not think people they knew would be affected

Table 2: What are the effects of climate change?

	Related Sea Level Rise	Other
Pre-Survey	4	41
Post-Survey	38	21

Key:

1. **Related to Sea Level Rise**=Answers specifically related sea level rise as a main consequence of climate change.
2. **Other**=Answers included other consequences than just sea level rise.
   Note: Answers could fall in both categories, if a student mentioned sea level rise and other effects their answer was marked in both categories.

Table 3: Do you think there are solutions to climate change?

	Yes	Yes, Adaptation	Yes, Misconception	Can't stop completely/Maybe	No, Misconception	No, humans can't change Earth temp./natural process	No
Pre-Survey	28	1	1	0	3	6	11
Post-Survey	32	10	0	2	0	0	5

Key:

1. **Yes**=Answers were often focused on solutions to climate change related back to human behavior and mitigation.
2. **Yes, Adaptation**= Answers focused on adaptation as a solution.
3. **Can't stop completely/Maybe**=Answers showed hope in slowing down effects but not stopping completely, or were unsure if there were solutions.
4. **No, Misconception**=Answers were based on misconceptions about climate change. For example, "No! You can't change the weather, or climate. You can't change if the sun moves or not". It's inferred from this answer that the student believes climate change is caused from the sun moving closer to the Earth.
5. **No, humans can't change Earth temperature/Natural process**=Answers showed that students believed either that climate change was not caused by humans, was a natural process, or was a process of the weather so could not be affected by humans.
6. **No**=Answers did not always have an explanation why

Table 4: Did you talk to your parents about climate change this week?

	Yes	No
Post-Survey	7	39

Appendix 4

Non Profit Connections

During the course of this project I also identified nonprofits that would be useful to collaborate and connect with. I interviewed people from several nonprofits and attended a California Regional Environmental Education Community (CREEC) meeting where I was introduced to many important connections with environmental educators. Below I have outlined the nonprofits I spoke in depth with followed by a listed of relevant contacts garnered from being involved in the CREEC community.

North Coast Environmental Center (NEC)

I spoke with the director of NEC, about the education project to see if there was any way to partner with them. I was directed to speak with their environmental educator. I met with him twice and talked about collaborating on education materials, unfortunately time did not allow for this to come to fruition as their environmental educator was completing his term position with NEC in April.

NEC is very interested in developing climate change education resources with a particular focus on sea level rise. Currently NEC is getting a new watershed model representing the Humboldt Bay developed. I have received permission to use the model, develop resources around the model, or direct teachers to check out the model once it is completed.

Friends of the Dunes

I spoke with the director of Friends of the Dunes to see if there could be a way to incorporate climate change education into any of their volunteer or education programs. They were supportive of the idea if there was a fit. Each year Friends of the Dunes puts on a "Naturalist Training" program. This program is a six week intensive course that offers two lectures a week around coastal ecology and conservation. Last year, Humboldt Adaption Planner, Aldaron Laird spoke about sea level rise on Humboldt Bay.

Friends of the Dunes runs several environmental education programs for children as well. In order to determine if it would be a good fit to incorporate climate change education into the programs already running I shadowed the "Cows to Cattails" program and went through a three day "Bay to Dunes" training. To learn more about these programs please see the following link: http://www.friendsofthedunes.org/programs/education/

Upon shadowing and receiving training for these programs I decided it did not make sense at this time to try to incorporate climate change education into these programs as the programs were already fairly structured with little room to add new activities. In the future, it might make sense to add a component on sea level rise in relation to the dunes in the classroom presentation portion of the program.

Humboldt Baykeepers

Early on in the project I met with the director of Humboldt Baykeepers. This meeting was held early on before the school survey had been developed. I explained the scope of work and desire to partner with Humboldt Baykeepers around climate change education. Humboldt Baykeepers was supportive of the idea to incorporate sea level rise education in some way into their docent training program. We talked about what this could look like. A good fit would be updating their docent manual to include a section on regional sea level rise and including a yearly training on climate change to their trained docents.

California Regional Environmental Education Community (CREEC) Network

I was introduced to the CREEC network by meeting with the regional coordinator and attending an environmental educator meeting. This network is an important resource for working in the environmental education field. CREEC is an organization created by the California Department of Education that focuses on connecting educators to resources and creating communication between schools and environmental organizations. To learn more about CREEC: http://www.creec.org/

Every few months a CREEC meeting is organized to connect environmental educators in the community. These meeting serve as a great network and education opportunity. The CREEC website also serves as a great education resource; teachers can search by subject or region to find materials. Through the CREEC meeting I was able to meet:

1. The program director of the CCC Watershed Stewards Program. She expressed interest in working with CivicSpark to incorporate climate change education into other local AmeriCorps programs.
2. The program Coordinator for After School Programs and Redwood EdVentures. She expressed the possibility in incorporating climate change education and resources into after school programs, as there is often more flexibility on what can be taught in these kinds of programs.
3. An author and organizer of a Redwood Science Project at HSU. He is working on a three year grant to help local science and math teachers switch over to NGSS. He stated that once I had created materials he would encourage their use and offer them as a resource through his work with the grant.

Miscellaneous

I met with a local Curriculum Specialist, to look over my lesson plan ideas and offer feedback.

I met with a former Everglades Park Ranger (who focused on climate change education). He offered tips on communicating climate change and provided me with a disc of climate change resources to look through. With Litten's permission I would like to pass on the disc to those that could use the resources with the completion of this project.

Future Connections

A future connection to make is with Friends of the Arcata Marsh (FOAM). I connected with a Board Chair member of the Arcata Marsh through email. She expressed interest in the Arcata project and a desire to develop an educational opportunity around climate change at the interpretive center.

Non Profit Next Steps

I have split the following section into two parts:

1. Scope Completion: follow up and next steps
2. Future Opportunities: potential opportunities working with nonprofits outside this year's project scope

Scope Completion

1. Upon completion of resources they will be uploaded to the Coastal Ecosystem Institute of Northern California's website as a free resource for teachers and nonprofits. I will email teachers and nonprofits with a link to access materials.

Future Opportunities

1. Work with North Coast Environmental Center on more elaborate education resources around sea level rise.
2. Investigate possibility of including section on climate change in Friends of the Dunes volunteer docent manual.
3. Work with Humboldt Baykeepers to update their docent manual to include materials on sea level rise and climate change.
4. Develop docent training on climate change for docents at Humboldt Bay Keepers, Friends of the Dunes, North Coast Environmental Center, and CREEC network.
5. Upload resources to CREEC website.
6. Create after school education program and work with the Humboldt County Office of Education coordinator of after school programs to organize.
7. Follow up with Friends of the Arcata Marsh and support their desire to develop climate change education opportunities at their interpretive center.