**EPA**

**Moderator: Karen Scott**
**July 24, 2012**
**4:00 p.m. ET**

Karen Scott: Hello, welcome to the Environmental Education and Action Webinar Series. This is Karen Scott, I'm at the EPA headquarters in Washington D.C. and we are about to begin our latest webinar. This one entitled Community Based Environmental Education.

The webinar today will be presented by two of our grantees. They're in two very different locations in the United States and are facing two very different environmental issues. So we thought it would be interesting for you to hear some of the similarities and differences between these projects because of the different system of location.

We're going to be hearing from first of all from the Island Institute which is located in Maine and then we'll be hearing from Watershed Management Group which is located in Tucson, Arizona. Some of the similarities, beside this very different geographic locations and obviously very different environmental issues that they're facing, I'd like you as you listen to these presentations, listen for the similarities, some of which I've noticed have been that they both were looking at a local environmental issue when they made their proposal to us and decided to tackle something that was very important to the community itself.

So they did community assessments first to figure out the best way to tackle this issue. They also both had decided that they wanted to make their environmental goals a reality and do real work to accomplish these goals.

And to me, I think they both display not only good community based education but also good place based experiential learning.

So with that, I'm going to turn it over to our first presenter, Ruth Kermish-Allen from the Island Institute in Maine. Go ahead, Ruth.

Ruth Kermish-Allen: Thank you so much. How are you, Karen? It is really exciting to have all of you here with us to talk about our different projects and I'm just going to switch right in to my presentation mode here.

And can everyone see my screen OK, operator, can you my screen all right?

Operator: Yes, we can see you.

Ruth Kermish-Allen: Wonderful, thank you. So, thanks very much Karen Scott. My name is Ruth Kermish-Allen, I'm the Education Director here at the Island Institute and beside me is Suzanne MacDonald, our Community Energy Director.

And what we're going to be sharing with you guys today is a really exciting project entitled Energy for ME. And a lot of our programming here at the Island Institute, actually all of our programming here is very, very based in the community needs of the constituent that we work that out in the un-bridge Island communities and Coastal communities all throughout Maine.

We're a very small amount profit. We are based here in Rockland Maine right on the Coast across – nearly across the street from the ferry terminal. And we're heading into next year. It's going to be our 30th anniversary. So we're pretty well into our middle ages.

And as far as the way that we work, we really try to take a very ecological ethics to what we do trying to understand the balance needs of not only the ecology in the environment of these amazing inspiring places but also what is happening culturally. What are the needs and expectations and the challenges that the individual that are living in this communities that are so dependent on the natural resources for their livelihood. What are the challenges that they're dealing with.

And I'd love to share with a little bit about how the energy from your project really pull together all of those different pieces.

So, what we do is very interdisciplinary. On our staff, we have not only my education team, we have to have a strong community energy team, marine resources team to really look at all of the different issues that the communities that we work with are dealing with.

As you can see on the upper left-hand corner is a picture looking out at the day of the gulf of Maine. And you can see that the islands the one that we're looking at are not figure around islands communities but it's a very, very scattered archipelago. Where I know that if anybody is calling in from California, you may not believe it but Maine actually have more coastline than any other state in the lower 48. Because it is so jagged, there are so many island communities; there are 15 year-round island communities.

And about 100 years ago, there were over 200 or 300 year-round island communities. So these communities are very – are very fragile and really needs to be considered when thinking about sustainability. And we also take a very intergenerational approach to our work, working with the use in the community as well as the workers as well as elders of our community.

And in the middle of the – of the slide, you can really see kind of the way that we approach our work resulted in the (inaudible) wind turbine project which I'm sure many of you have heard having encountered a couple of problems but it was all based on community need.

A 98 percent both of the entire community really supported to make this happen. I think very successful in lowering their cost for the community members out there on the Fox Island.

So, that brings me to the approach that we take in understanding that ecological ethic and community based work into the education programming that we developed.

As I thought high school before taking on this position, the things that I saw most strongly affecting my student were projects so they could really sink

their teeth into it. Where they really felt like they were impacting some kind of change in a community in which they lived.

We all know that when students begin really thinking about how can their community – how can the school work that they're doing affected communities, somebody down in the – in the supermarket ask them "Hey, what were you doing at those (clam) slots? " They're going to want to tell more about, they're going to one and get more involved in it.

So throughout many years of working with these communities, this three tier model has developed.

First and foremost is really thinking about (safe base) education. These island communities are very inspiring beautiful places and students really should have pride in where they come from.

So why not use that beauty of their place the inspiration for the culture and the heritage that they have as multigenerational families on these communities and really use that momentum to inspire their learning as well using their place as something they can really get excited about and have continual work within.

Some of this – the – a piece of applied technologies really for today's student is looking at the hook. We all know students are the digital native, they're really excited to use different kind of technology in the classroom for their learning as with they want to learn.

So when I say applied technologies, we're talking about geospatial technologies, mapping technologies, documentary, looking at data in very different ways so that they can really use that hook of technology to get interest in the programming and then use a (safe base) education as a way to keep involved in it and to get their parents and their elders and everyone else as my community involved in it.

The third piece that we found, it works extremely well for middle school and high school students when thinking about community based education and the case reach 12 system as looking at non-harper learning community.

Now, what do I mean by that? I mean, looking at students and teachers learning the same exact materials, the same exact time. Where in many situations especially when technology is involved, these students become the teachers and the teacher is kind of step back and they can be a little bit of uncomfortable situation when they realized that, you know, my student actually do know a little bit more than I do about how to use this technology.

But when they are able to take that step back and really let students take the lead in talking about that really like to explore this concept in this particular way is an extremely powerful learning dynamic for both the students and for the teachers as well.

When you pull out three of this fears together into the model that we use in all of our – in all of our science technology engineering math and community based work here in with the schools, we're really looking at data. And how can all of the data tell story, the data about your place whether it's the, you know, data from electricity monitoring, whether be data from interviewing the elders within your community or geospatial data.

All of these different kinds of questions and all these different types of data tell story about your community. And we really want to put it out to the student to say what story do you want to tell about your community, what challenges are you most interested in learning more about and how can we help you impact that change?

And to talk about what was the emphasis of the challenges that really made Energy for ME happen. I'm going to hand it over to Suzanne MacDonald, our Community Manager.

Suzanne MacDonald: Great, good afternoon everybody. As Ruth said I'm Suzanne, I'm sort of Ruth's partner in crime when it comes to our Energy for ME program and Ruth spoke earlier in the presentation about the fragility of the communities that we work with and energy is certainly an area where we're seeing our island communities and coastal communities in Maine as extremely fragile.

What this slide shows you some of the context for what we were looking at when we began our community energy programming back in 2007 and 2008. And what these – what these graphics are essential talking about are the high energy cost that Maine residence both on the main land and on the island are facing.

Maine pays some of the highest electric rates in heating cost in the entire nation. We have the distinction of having the highest dependency on home heating oil in the entire country, there's very little natural gas infrastructure. In our state as you can see in the map on the right-hand side of the screen, when the price of home heating oil goes up, this data mean it's in a really precarious position.

We also have the distinction of having the oldest housing stock in the entire nation which is making it incredibly halfway to keep our home heated at comfortable and healthy.

When you go out to the remote communities and along our coast in National Island, the situation is really exacerbated because across their transporting needs, fuel make some even higher and is really becoming to be an increasing challenge and something that we've heard a lot from our community partners about.

And so again, because we really to find our work based on the priorities that we hear from communities, we began to pull together a number of programming initiatives around energy issues and we seek to basically provide technical assistance and community outreach support to this community.

Based partner as Ruth mentioned, we provided some support to some of the local electric cooperative on technical usability studies for renewable energy including wind and solar. We've helped one community, the Fox Island put up a 4-1/2 megawatt wind power project. And of course, we've been trying to do more around energy efficiency and modernization work. We just completed giving some basic air ceiling and insulation in eight home just this past week.

So this really was the contacts for our energy work and when Ruth and I started to partner and think about partnering more with evident that her models for the education work was a very powerful one to engage student, teachers and their families to do some really productive work in these remote areas. And that's really where Energy for ME came from was taking this local priority and sort of bringing that context to Ruth's education model and a lot of really exciting ways.

So I'm going to pass it over to Ruth to go through the project goals of Energy for ME.

Ruth Kermish-Allen: Great, thanks so much Suzanne. So you can see form the cost of what island communities and coastal communities were looking at back in 2008, 2009, energy was a hot topic. It was the topic in school; it was the topic at the dinner table. Everyone wanted to know what was going to be happening with their home heating fuel cost and, you know, everything was beginning sky rocket.

So teachers and families, everyone with these communities really wanted to be able to create some kind of change and hopefully help students find a way to really look at the data, the story that is happening within their community around their energy consumption. And hopefully, having what will be come the future leaders of these communities learn what is happening with energy and how to define their energy future together with the adults in their community.

So, therefore, Energy for ME was born. And the project goes that we were trying to really hit at was how do we get students really excited, how do we get kids excited about being the change within their community?

We all know that when kids pack intelligently with passion and really good information to back their recommendation, adults are going to listen and they're going to listen really, really well. And so that driving force is what this – is pushing this project forward.

As far as the direct goals, we also of course trying to meet the need of the communities to increase home and school efficiency. We're also providing

training for students for their teachers and for facility managers and many other community members that are interested in the project to really help become active and get more information beside that energy future.

We are also experiencing severe problem in the State of Maine with brain drain and I don't know how many of you are familiar with that term but many of our best and brightest young student live the State of Maine to go to college somewhere else as they feel like they can't have a really exciting well tamed career here in the State of Maine.

But I think especially true, the renewable energy market and energy markets in general in the State of Maine we have so far to go. The opportunities for innovation are very, very strong here and so we are trying to show student the opportunities for really exciting science technology engineering and math, career is focused on energy and renewable that they can do right here in the State of Maine.

And of course, heading back to that holy grill of how do we talk about data in the classroom? How can we really understand real time data analysis and the way that that it impacts their community? And of course, technology, we – students love it, it can be a wonderful thing in the classroom and a wonder – wonderful inspiring for us as well to really play to those that just made this with our student.

So, when we wrap all of that together, this project becomes a very, very strong community wide initiative that isn't just hitting student but is also hitting their families, their grandparents, and some community leaders within the state.

As far as our goals for the overall project this first year was very much a getting up and going and getting some initial projects in the schools going. This next year will be a focus on students and their teachers to actually develop energy investigations for their schools and then give recommendation to their school board about what they'd like to do in their school buildings to increase their energy efficiency and lower their cost.

And then in the following year, we're really looking for students to develop a community wide environmental investigation to tell this elect man and tell

other community leaders within their town and their district what student thinks should be change to really save the money and fee from efficiency.

So how are we going to do that? With a lot of hard work. The Energy for ME project has a very strong curriculum that is very, very flexible where we provide trainings to our student and our teachers. And then the community members that would like to join as well as the facility manager of the school to think about how would we want to do an energy investigation? What are the different aspect of it, what was it look like in the classroom, how can it be as experiential and hands on as possible?

And I have a nice link to our Web site and our newly developed curriculum for all of you to look at. And it's not prepackage piece at all, the way that we do our education work here is provide starting guide and activity guides as they hear some ideas and some options of project to get your mind going and get your creative juices swelling. Now, make it your own, turn it in to something that's going to work for you and for your (parchment) for your student.

I'm going to escape out of our – out of our slide show here for a second so I can show you some online aspects of Energy for ME.

First and I think most exciting is the community energy competition. So, this is a real time community energy competition where in each of the 10 participating communities, we have installed a brand new right off of the – so right off of the factory deck technology that looks at minute-by-minute, circuit-by-circuit electricity within a – within a three phase building.

So we have installed these electricity monitors in the school building, in a community building of student choice to be at a help center or town office, whatever have here. And then we've also installed on them in two residential homes that are volunteered to become part of the project.

So, the idea is for students to really looked at what are the different types of consumption trends that happen in the different venues across their community.

So here you can see, each of the 10 communities are accumulating points based on their total electricity use on the electricity per square foot and their percent reduction. We wanted to provide some kind of a balancing force between the newer schools and the older schools and the very large schools and the very, very small schools.

We're working and as you can tell, a very rural – very rural communities here but we also work in somewhat suburban rural communities where the high school are a little bit larger. So it's really interesting to see how electricity use between in a months those different group.

So here you can toggle between different types of graph, this is totally public and available for anyone to see. We're also getting data on their renewable electricity generation. Some of the school, they already have wind turbines and solar rays for that so we're able to capture that as well.

And I should mentioned that this dashboard is a product of the Island Institute. But to be able to get to this kind of level of granularity, here is a community page where each of the participating school has their own page and a list where they are at in the competition. You'll be able to see the carbon, the CO2 that they have paid from being put that into the atmosphere, the kilowatt hour save, the money save as well as the light bulb shut off.

And then we're also highlighting some of the student work. This is a movie that students created and here is a photo of some of our three kids that last year summer institute. That talks a little bit about the particular project that each of those – in each of those schools. And again, you can toggle between the homes, the community building and the school as well.

But to get about level of granularity is a product called the E-Monitor which is provided to that we have purchased from PowerWise system which is a company right here based in to a Blue Hill Maine which is really exciting for us to be able to use a magnificent product that is local.

So I'm going to head into Camden Hills High School and show you what is happening there right now. I'll go to Camden Hills room four.

So this is a residential unit where you can see exactly what is happening at anyone point of time and this is all password protected so only our students and teachers are allowed to view this data. You can see how much the home is using right now, what kind of appliances are on right now. You can look at exactly what happening in the living room at this period in time and then you can also look at what's been happening on the living room circuit today, yesterday, just today, last week, (inaudible) here, or last month.

OK, so I'm going to kind of just a little bit of a – of a slipper of the kinds of data that is available to our students and to participants in our project. Anybody has question, I'd be happy to answer them as soon as we finish up and I can always go back to this slide as well.

So I'm going to hand it back over to Suzanne to talk a little bit about our – more about our project element.

Suzanne MacDonald: Sure, I will move along that more quickly through this piece. But as Ruth said, we're trying to create professional development opportunities both for our teachers and facility mangers staff in each one of these schools, I'll talk about that in a moment.

And in addition to that – to that training, the technology piece of the E-Monitors in the curriculum, we're really trying to connect these remote communities with each other so that they can learn more about interesting and inspiring energy projects throughout the State of Maine and beyond.

And I'm really excited about connecting them also to colleges and universities in the area and industry partners and order to really try to prepare and inspire them to look in system or energy related career path.

So, we do this primarily through a couple of different events that we called Energy Quest. It's their – those are one of the events, their monthly webinars that we host in the evening so that students are able to learn more about a particular energy project or profession and actually in evening hours stick with their family members to learn more about it.

We also have had a number of members at the community energy group joined in during this time so there's a nice connection between the school and the rest of the community.

Annually, we host a very exciting energy fair when all the participating students from the 10 schools come together to highlight and celebrate their work as well as interact again with these professionals who present on their work and the interesting energy projects going on in our area.

And right now, we're busy preparing for another big component of the program which we call our summer institute. This year, we'll be sending a week with the students and teachers from the Energy for ME program learning side by side really emerging themselves in this technology and developing energy plans for their schools to the year going forward. So that's another significant piece of our programming.

But just to highlight quickly some of the partnership going beyond the focus on the students and the teachers, it's very important that we recognize in this situation that we need to reach out to the building managers of each of these schools. And so, we have not – we've been able to extend our training and support to these folks as well realizing that if we kind of set the students and teachers loose on them with suggestions for, you know, changes in the school but that might create a contentious situation.

So we're doing everything, we're really trying to empower this facility managers, give them the training on how to use the E-Monitors. We hosted actually a retreat, we didn't call it that because they thought that might be a little bit too cozy for them but we were able to visit some renewable installations to that local schools and talk about best practices for efficiency with other facility managers.

And fortunately, we've been able to sign up several of our facility managers to participate in the national certification program called building operator certification so that they're increasing their skill and knowledge base so they can help to make these changes to the systems in their schools and make energies more efficient there.

The other piece that industry and community partnership that has happened primarily through our energy class and energy fair and we've been able to partner community groups with school groups so they can work side-by-side on interior storm window building workshop and other types of investigation into local learning of their energy resources. So, that's another piece that we've been very excited to pull together.

Ruth Kermish-Allen: Great, thanks Suzanne. So, I'm just going to wrap it up pretty quickly here. This slide highlights a lot of a project that have happened over the past years. In the upper right-hand corner, some of you might recognize this fellow, he is Curt Spalding who is EPA region 1 administrator and he came up and visit our energy fair where students showcase a pedal power iPod charger that they have built by themselves and that's the middle picture right there is the students' building that.

And we also had a student researching in her German class, the difference between renewable energy in the state versus Germany and she gave her presentation both in English and in German.

We also had a middle school group look at – recruit over 80 families in their community to send them their electricity build each month and that group of student analyze those electricity bills and send out newsletters and pointers that would save their community lots of money.

We also had many interior storm window building opportunities for students where that is a hot topic and Maine where we try to lower our electricity by saving the heat in our home. And we've also had many students looking at that E-Monitor data and saving the families in their community a lots of money. We have one school look at their electricity use of the water heaters and save a family over $10 a month.

So, how do you look at to evaluate environmental occasion, are real key questions where what are students learning, how those community members involved and how do they influence those student motivation? And we use certain methodology including performance based assessment, pre-imposed survey and interviews.

We also use a lot of validate assessment between 21st century skills assessment, (Jackie Echols) expectancies and values to understand their motivation and their career interest questionnaire by Gerard Knezek as well.

So our results today as far as the technology within the classroom that has been going very, very well. Our summer institute gains where very, very high as you can see from a graph to the left, the data literacy understanding of how to active develop are really good question and how you begin to interpret data. We also had some really good content gains in that. But I – we had the biggest gain and really how do you generate a really good project and a really good question. So they're going to be doing that next.

So when we ask student to tell us about whether they think adults in their community are willing to listen to recommendations from students to decrease their energy use, the student who attended our summer institute, you can see the world up above. People listen, community listen, this was very warming to us.

The student that are in those same schools, in those same classes that did not come to our summer institute but are part – beginning just now to participate in Energy for ME activities, (Gary Blatently) said adults don't listen to kids. So we're going to get all those kids to our summer institute this year.

So our lessons learn is no add on for teachers, make sure it fits into their curriculum, make it very interdisciplinary, don't just heads for those science teachers head for everyone and Suzanne?

Suzanne MacDonald: I think making the change at home making this work that the students are task to do in the classroom translate to their everyday lives. And engaging their family members in this process and their broader community is going to a suggestive higher data so far is going to help them to master this system content more quickly and aspire to look into these careers as well.

And I think the piece in on the partnership is always a challenge to they think about bringing other folks into our own programming. I think we've seen this important to demonstrate the benefits of the partnership. Make sure that our

industry partners are getting genuine interactions with the students and that, you know, we're really maximizing the use of their time.

So with that, we'll wrap it up. We live you with some link so you can learn more about our work. Our program Web site is actually going to be updated next week but right now you can visit the link at the top and look at our pass energy quest webinars and get links to see our community energy dash board which is also included here.

And we'll be posting live updates next week as we start our summer institute so we'll encourage you to like us on Facebook and follow our works there.

So, we encourage anybody to contact us for questions and we're thankful for EPA support for this work and let's work keeping you up with it and how this progresses.

And now I'd like to hand it over to Tory Syracuse to us from Waters and Management group and well bring us to a much drier part of the country.

Tory Syracuse: OK, can everybody hear me? Karen, can you hear me?

Karen Scott: Yes, you're coming out loud and clear.

Tory Syracuse: OK and you can see my screen OK?

Karen Scott: Yes.

Tory Syracuse: All right, great.

Karen Scott: And can I just make it quick no, we're getting some questions about whether we're going to be posting these PowerPoint presentations and yes we will so, beyond our Web site epa.gov/education.

Go ahead Tory.

Tory Syracuse: OK, All right, great. Well thank you Ruth and Suzanne for your presentation and I'm really excited to be here presenting on our Green Street and Green

Neighborhood program which has been funded through an EPA grant for the last couple of years.

And I think it's interesting that Island Institute is doing so much great work around technology and making it more probably available people. We are actually implementing what you might think of as some low tech solutions to our environmental problems. So our context there but also similarities and the community based work that we're doing.

(Inaudible) the associate director of Watershed Management Group in Tucson, Arizona and I've been involved with the whole team of other people in implementing this project.

And to my screen does not seem to be changing. Let's see.

Ruth Kermish-Allen: You can try Enter.

Tory Syracuse: That's very strange. Let me hit Escape.

Ruth Kermish-Allen: I can – I can run it for you.

Tory Syracuse: Yes, that would be great because I can't seem to change my slide.

Ruth Kermish-Allen: OK, I'm going to take that.

Karen Scott: OK, hang on everybody; we're getting the PowerPoint put up on the screen here.

Tory Syracuse: Let me see this too if I can (inaudible). Exit, come on. Now, I'm not seem to be able to change mine if you want to go act to me briefly.

Ruth Kermish-Allen: OK, let me try that. One second.

Tory Syracuse: OK, thank you.

Ruth Kermish-Allen: All right, we're back up on you, Tory.

Tory Syracuse: OK, great. All right, so I'm sorry about that. An overview of my presentation, I'll just introduce you to Watershed Management Group then

give some context, since we're in an environment that many people may not be as familiar with. And then I'll go in to talking about the Neighborhood Leaders program which is the projects that was under to EPA.

So, Watershed Management Group is Tucson based non-profit, we've been around since 2003 so we're about to celebrate our 10 year anniversary next year. Hopefully we'll get to 30 years of place the Island Institute.

And we are really a community development organization within environmental focus. So, we work at the inner section of environmental and human health and prosperity. And I want to emphasize that we really try to empower people with the knowledge and skills to improve their environment and to live sustainable livelihood.

We have many programs that I don't have time to get in to us here that they'll be speaking about our Green Streets Green Neighborhood program. We are based in Tucson, we have offices in Phoenix and Santa Barbara California as well and also in international offices based in India.

And their common theme running to all our work is that we use a (Grass Street) model so we're teaching skills and knowledge through actual implementation of project and doing that in order to empower everyday people so that they can integrate these solutions in to their lives.

I wanted to just give you some quick definitions that are becoming more common nationally but in particular special to the southwest, here in southwest. Rainwater harvesting is simply capturing water in order to put it to beneficially use in the landscape.

So this is one example of active water harvesting for the water is slowing down the street and we cut the curb down in order to capture and grow vegetation and this is also an example of Green Infrastructure and all use to term similar interchangeably throughout its fragmentation. And this another example that I volunteer is building up a dam to keep water on site in order to put it to beneficial use.

So the story of water in the Southwest then this gets to the problem that we're seeking to address of course is one of scarcity and in Tucson in particular, we are dependent on an underground occupier down water resources as well as water from the Colorado River which of, you know, is about 300 miles from Tucson. So it takes a lot of energy and effort to get that waters here.

So that idea of water scarcity is one of the big issue we're addressing and the idea that water harvesting can give us a really reliable source of water for landscaping and even for drinking. This kind of – there is a team that could potentially change our water feature.

And then active water harvesting, I won't be talking about as much but just many people think of these water systems or tanks, when they hear water harvesting and that just means storage, active water harvesting or storage of water for later use.

So, again getting back to the problem that we are seeking to address and this is just some background information for you. We have covered our urban environment with improving our surfaces and treated storm water really are the waste products in most cases.

And so we design our cities to remove that storm water from the urban landscape as quickly as possible. And in the Southwest, that's really treating what can be a tremendous resource as a waster product.

So we're trying to turn that idea on its head and recognize rainwater and storm water for the incredible resource it is and try to capture in anyway we can. So these are examples of Green Infrastructure, washes, concreted over in order to quickly convey storm water away from the urban environment.

And my favorite example of this is from the movie "Terminator 2" where you may remember that the "Terminator," Arnold Schwarzenegger and (movable) John Conner are in a chasing down the L.A. River and, you know, I may not know that that's the L.A. River because it doesn't really look like a river. So it's a classic example of Green Infrastructure.

And then sometimes create some problems. It creates a problem with quantity of storm water. So the issue on the left here, if you look carefully that's someone kayaking, this goes how many tunnel in Tucson that which is free for cars actually drive and it completely (for what) 13 feet of water after a large storm.

And down the Wingham side is there are picture of the (Rico) river which is almost always dry now except during storms. So as we've cover the dessert with some pervious surfaces, all of our storm water is being sent to places like the (Rico) river rather than landing in a national area and slowly spreading out in order to benefit vegetation or really overstressing our washes by sending this high volume and velocity of storm water to them.

And then we also have issues of course of water quality and Nonpoint Source Pollution. So as water moves across even pervious surfaces of picking up all kind of pollutions and then eventually, it's making it way back into our groundwater supply. And so we have to address those pollution issues. So this is cup of storm water, one of our volunteers picked up and you can see that it's not very appetizing.

Another problem with this approach is that it does create artificial drought that really just makes our national patterns of drought worst. So this is a relatively typical Tucson intersection specially in the raise of new development, you can see they are very few trees, a very wide street covered without fault and this pavement tends to absorbs heat and then radiate it back out and make the urban environment even hotter.

And when we do plant vegetation, we tend to do it on little planting tools. So you can see that the gravel is moving on to the sidewalk there. And so these several cactus are actually planted above the level of the sidewalk.

And to tell you the truth, these plants aren't really accomplishing to anything at all. They're not serving appropriate so not even very pretty. Even though I love cactus, they're not a shape tree.

And then the issues of community with mobilities. So when we have really over wide streets with not shade, people are not going to tend to walk or ride

their bicycle very much or even want to be outside at all, where as the picture in the right hand corner is of the newly placed curb extension or bumped out that owns the street and also harvest storm water and grows vegetation.

So how do w use during infrastructure as integrated solutions who this problem of great infrastructure. We can put in small (measure) effect fit site that serve all of these environmental function.

So it claim (inaudible) shape storm waters, wheat plant, automated vegetation. So we're not only planting vegetation that can survive this on the storm water, it falls on it but also creating wildlife habitat, we're creating shade, coming traffic, and generally enhancing neighborhoods and communities.

And the final both plant of course is not really an environmental service but I'll talk about how our approach can also build community.

Just a couple of additional picture so that you have a sense of what I'm referring too. Again storm water moving down the street and being capture by a curb cut which is – a curb down the level of the streets.

I want to emphasize that many of our photos are newly installed site. And so the vegetation doesn't yet look very significant but our native does a trees will grow out large and tall enough so really make it significant shade contribution.

And just a couple more picture this one taken during the monsoon storm which incidentally there's a big storm building up right now and we hope we get most of our rain in July and August here in Tucson and one more picture for you.

So you can see that as that storm water moves down the street and its capture by (inaudible) – not only is it providing water structure vegetation but it's also – we're actually also using bioinfiltration processes to filter pollutants out of the storm water so we can create little pocket of these features throughout the urban fabric, we are providing all of these benefits at the same time.

One final slide that showing a transformation, this is the location of some of first curb cuts in the Tucson which were put in the mid 1990s and the transformation that is possible going native vegetation just using storm water alone.

So that brings me then to Green Street Screening Program and we use the infrastructure to address all those desperate neighborhood problems that I just subscribe. We strongly in building the community's capacities implement these features and educate each other on their own.

So we don't go to neighborhoods and tell them what we'd like to do. We wait for them to come to us and express some interest in doing this. We do – we accomplish most of our work with volunteers and our work is very hands on, so it's not just sitting, listening to a PowerPoint, telling about something but rather actually getting there, digging in the dirt and implementing each features.

So our neighborhood leaders program trains volunteers from six Tucson area neighborhood to design plan and implement during infrastructure rack surface and public areas at a low establish small scale.

And so those volunteers participated in five training session that were focused on during a neighborhood assessment of their needs and where they could really use this kind of features as well as the more technical aspects of the implementing these projects.

And then the second component of the work was that we actually had fund for implementation of demonstration site and each of these neighborhood. So these are different picture of implementation which we did through volunteer workshop.

So not only did we have two or three core neighborhood leaders from each neighborhood participating in the training, but then we did implementation, we got direct to the neighborhood involved.

So and you can see from the picture on the right then in some cases that meant working with middle schoolers or the picture on the left, that's a Saturday

morning just community members in the neighborhood who wanted to come out and participate in a neighborhood improvement project.

These projects tend to have a highly technical aspects just in terms of understanding somewhat a management and the basics of the design. And what could management group staff members, myself included, were mostly responsible for the planning but involves the neighborhood leaders as much as possible.

And we work with a lot of contractors, for example, to these things like remove, concrete, can dig basin. One of the things that we really try to focus on it's possible to have volunteers come and really do nothing but dig in the dirt and that's a good way they never have – a person come back to volunteer end specially on a hot Tucson day.

And, so we try to press the site in a way that we'll allow the volunteers to really focus on wandering about watershed health and watershed issues and also doing sort of the fun things like rock work and planting new native vegetation.

And so the picture on the bottom, I just want to emphasize these workshops well one of the goals I to implement project and demonstration site, the real goal with vegetation. And so that's a watershed map behind my colleague there in which we help participants to identify what watershed they lived in.

And he's doing a demonstration of how urban watersheds work and why these Green Infrastructure strategies ideal ways to start to heal our urban watershed.

So speaking success of the neighborhood leaders program, I'll – I can show you some before and after data in just a moment but overall we had an increase in knowledge of the environmental problems related to urban watershed that I just describe for you and also an increase in people's perception that they have the skills to interact those issue.

And I want to emphasize that this is not only the people who participated on neighborhood leaders program but also anyone who came to an implementation workshop over the course of the project.

And in terms of environmental impact, we implemented two to three demonstrations sites per neighborhood and so we were in six neighborhoods approximately 15 demonstration sites total. And while those demonstration sites definitely do have an environmental impact certainly in increasing shade and wildlife habitat for example in unifying and creating more visible communities.

I think the real power in those demonstrations site is just showing people what's possible and piquing their curiosity when they walk by and see a curb cut and wander how is water being treated differently in the situation.

So it is just a few of the results some are before and after surveys. We survey workshop participants the week before they came to the workshop and then we waited six months or more and surveyed them again.

So one key question about Nonpoint Source Pollution and we had an increase in the number of people who knew what that was after participating in a workshop. I think this is a really important one when you're making decisions about landscaping, are you creating rain gardens and water harvesting basins, are you cognizant of seeing the landscape in a new way that will allow you to capture water resources.

And we went from 27 percent saying they always did that before the workshop to 67 percent saying they always did it. And actually to 100 percent of participants saying that they always are sometimes take these things into account.

And to me, this is the biggest one that I have the skills and knowledge to take actions to improve environmental conditions in my neighborhood. So it's really getting at that community capacity building and empowering people to help their neighbors improve their community.

And we saw it across the board an increase in the feeling that they did have those skill and that knowledge. I want to mention just a few challenges, a quick participations and when you ask volunteers to participate in something over the course of two years, it's a big commitment and we did have a few

challenges and participation although we had an equal number of success stories in terms of people really seeking with the project.

There are always site constraints when you're retrofitting everything from under the utilities to whether or not the neighbor is willing to do a project and maintenance is a huge challenge with these projects across the board.

This picture in the background is actually a site that where the curb cut is so (inaudible) crack that the water is actually flooding backup stream. And so there's sort of a dry old looking volunteer who's going to have to tackle that Bermuda grass patch.

So lessons learned. The first one, motivation must come from a community not from outside of it. We already knew this. So I think most people who work with community groups are really highly aware of this but it's always excellent to be reminded.

The most successful unsustainable project are those in which the community members and the participants in the project take the most ownership. The best maintained most beautiful site we have is at the church were the population of homeless men, that shelter at that church are maintaining the site.

And they were there for the implementation. They were involved in the planning and now they are beautifully maintaining that site because of the ownership that they have over it. The technical aspects to train people to do this are challenging and I think we still have works to do on curriculum development to be able to truly say that these projects are simple enough for anyone to implement, but we're getting there and as I mentioned planning for maintenance in the beginning is very important. We don't want these assets to really become liabilities.

But finally I think the most important lesson again in – this ties back to the other things I mention is the hands on involvement really leads to the most sustainable outcome. And as Ruth was mentioning, doing a needs assessment and finding out whether or not a community feels this is a problem and if so if this is the best way to address it or what among those many problems that I mention are people most interested in solving.

And the great thing about Green Infrastructure is some people want to solve a flooding problem and some people want to solve a lack of shade and other people want to just beautify the neighborhood and others want to create bird watching habitat and really the truth is you can solve all those problems with these solutions.

So that is all I have for you and I'd be more than happy to answer any questions. You can contact me or we obviously have I hope a little bit of time remaining for questions right now.

Karen Scott: Thank you, Tory, and thanks, Ruth and Susan, also for you presentation. And yes, we do have a little bit of time. If it's OK with you, operator we'll go over a little bit over the hour. We'll be taking questions both from the webinar and from the phone line. So if people wish to answer any – or ask any questions, if you could go ahead and start entering those either on the webinar or letting the operator know. While you're doing that, I just wanted to mention that we did get a couple questions about future requests for proposals for this grant program under which these fine projects are funded.

I just wanted to let, you know, that probably in the month of August this coming month, we will be publishing a request for proposals. So watch for that, go to our Web site at epa.gov/education and click on the Grants page and we will have announcements there. There you can go also to sign up to get notification about new request for proposals that come out. So with that, do we have any questions first of all on the phone line?

Operator: At this time, I would like to remind everyone, in order to ask a question, press star then the number one on your telephone keypad. We'll pause for just a moment to compile the Q&A roster.

Karen Scott: OK, while you're doing that operator, I think we do have some questions from the webinar.

Operator: Yes, our first question asks, do the volunteers who went through the neighborhood leaders program get any compensation for all the time they devoted to the project?

Tory Syracuse: Yes, that's a great question and the short answer is no. They truly did this on a volunteer basis and I have been in conversations with many people about Green Jobs Training and the potential that this holds to actually be an economic driver and I think that there is a lot of potential for that. But in this case, there was no compensation.

Karen Scott: OK, thank you. Do we have a question from the phone line ready yet?

Operator: And there are no questions at this time.

Karen Scott: OK, we have another question I think from the webinar.

Operator: Sure, I'm not sure who this is going out to – I think Tory. How will you tackle ongoing O&M? Who will fund it? I'm guessing that's operations and management.

Tory Syracuse: Yes. We have – we're currently developing stewardship programs to – I'm assuming that your question is about maintaining these sites and please correct me if that's incorrect.

We were developing stewardship programs through watershed management group to maintain these sites on a volunteer basis and to teach people to maintain these sites. We are also in continuing conversations with the city of Tucson about how we can best partner with them to do this kind of maintenance.

It is a challenge because these sites are implemented in public areas but homeowners are responsible for their maintenance in general. So people sign an agreement saying they'll maintain the sites but it's difficult to hold them accountable for that. So we are – they're working on developing more structured programs to that.

Karen Scott: OK, thank you. Any questions on the phone yet?

Operator: Yes, and your first question comes from the line of (Steven Field).

(Steven Field): Hello. I'm here in Connecticut and I'm a ecological institute designer, permaculture designer and for the project Southwest there, it looks great. Obviously our weather patterns a little bit different.

Karen Scott: Sure.

(Steven Field): But I'm curious as to how to get the community interested much that I'm trying to do a peer if not – they doesn't give me much community interest yet …

Karen Scott: Yes.

(Steven Field): … I just have to drive an hour north where I get most of my education out to the Pioneer Valley Area of Massachusetts and the swamp.

Tory Syracuse: Yes, I don't know if my answer will be helpful for you given the different context. I think Tucson is trying to become sort of a model communities for how we can live sustainably in the Southwest and of course water is absolutely the central issue for us.

There has been a lot that Tucson has historically has been relatively speaking very aware of water conservation that I think that rainwater harvesting has really captured people's imagination as a way to solve that problem and to start that are becoming more sustainable. And I also think there's a huge amount of feel to having a volunteer opportunity where you can go meet your neighbors and, you know, meet like minded people to implement these solutions.

So I would say, going to a community and, as I was mentioning before, trying to get a sense of what they feel their pressing problems are. Because it maybe that it's something that can be solve through your approach and you don't have to be creative and dedicating people about how to get there and that being said we do a lot of outreach presentations especially when we're starting to work in new communities and half the battle is teaching people that a problem even exist so I sympathize.

(Steven Field): Again, I mean – (inaudible) we've got a UConn here and there was course in rainwater harvesting, I'm sorry rain garden. But there's just generally in the state, it's very light, whether it be in higher education or the school systems. I'm an environmental educator on a farm …

Tory Syracuse: Yes.

(Steven Field): … even harder to get folks to come out there and participate in projects.

Tory Syracuse: Wow.

(Steven Field): … and their key notes CSA member and so on.

Tory Syracuse: Sure.

(Steven Field): You know, I don't know if it's Connecticut or not. I mean there's other things happen in different areas but people are pitching in and then everyone's value have a corporate volunteer group come and …

Tory Syracuse: Sure.

(Steven Field): … do some work. And then that gets I guess media attention which …

Tory Syracuse: Yes.

(Steven Field): … they require …

Tory Syracuse: Yes.

(Steven Field): … it's just a struggle.

Tory Syracuse: Yes, and I can sympathize and I can tell you, you know, our pictures (inaudible) grade and we have these big, really well attended workshops and I've also been at workshop with four people. So it's not that it's universally, we just have more – we do have more that in that we can handle but then finding the on the ground volunteers certainly sometimes is a struggle.

(Steven Field): Well, I guess I'll keep my nose to the grindstone.

Tory Syracuse: Yes. Feel free. I'd be happy to talk with you more about it. You know, if you want to send me an e-mail, that would be fine.

(Steven Field): Hopefully, will it be posted – were you in – I didn't write it down.

Karen Scott: Yes, we'll be …

Tory Syracuse: OK.

Karen Scott: … well, we'll be posting the entire presentation online at epa.gov/education. But at the end here, we could click put up the last slide from each of the presentation.

Operator: OK, just copy and paste them that contact information at.

Karen Scott: We'll copy and paste the contact information and put it on the same screen so that everyone can see it.

(Steven Field): OK, and then who I would be – who – who was it that I've been speaking with?

Tory Syracuse: That was – I'm Tory Syracuse.

(Steven Field): Tory, OK. Thank you.

Tory Syracuse: All right, yes. Sure.

Karen Scott: And then I think we have other questions from the webinar.

Operator: We do. Let me hold this up. Do you need to irrigate any of the projects and if so, did the city help with that?

Tory Syracuse: The answer is yes for establishments. So we as I mentioned plant – automated plants can survive without supplemental irrigation that they do have to be established using irrigations for about two years.

And the city of Tucson also implements these projects and when they do is they usually use a water truck or install this irrigation. When we implement this project, we rely on either neighbors basically, we rely on neighbors.

If we're working at schools and we can sometimes install this irrigations from a temporary system. We have related to the previous question actually in the past not under this trend but in the past we have paid local residents to ensure that new plants get water over the course of two years, we paid them on a monthly stipend for that work.

So we have implementation as well as our ongoing management as community driven at this point.

Karen Scott: OK, thanks. Are there any other questions from the phone line?

Operator: And there are no further questions.

Karen Scott: OK, we have more questions from the webinar. Maybe let's take one for Island Institute. I think that's (inaudible).

Operator: Sure, what's the performance testing methodology of the Earth Island Project?

Ruth Kermish-Allen: It was the Energy for ME project and we use a series of different methodologies. We use some performance base assessments method where we actually had students, we develop – we develop some activity presume to do that actually because of their skills on in doing different things with the – with the data and with the technology that we use in the classroom.

We've also used a number of different ones of course preimposed surveys and interview data as well. We also listed a number of validated assessments that we use. One was learning 21st centuries skills assessment from learning.com which assesses on technology skills of students specifically for middle school and high school.

And then we also use a science motivation expect into value skill. That's by Jacquelynne Eccles and we also use a science interest survey that's from (Gerald Comisequard), I'd be more than happy to post those links to those – to those papers.

Karen Scott: Great, thank you. So let's take another question from the webinar.

Operator: Sure. How does you assess community concerns at the beginning before developing our project? Could you do a need assessment so as this to go out to either or both of you?

Ruth Kermish-Allen: Yes, this is Ruth over Island Institute and every other year, we have an Island to just conference that brings together many of our – all of our Island teachers and administrators.

And the energy was certainly one of the major topic that came up as far as their challenges and something they've like to do in their classes. And also prior to the Energy for ME project, we had a series of other projects that focused on Natural Resource Stewardship questions in the community using that same model that I spoke about.

And as I was coming to a close, the teachers really said, yes, we know that these kinds of education is working, we want more but we want more training, let's talk about energy. And then we did a formal needs assessment as those teachers cycled out of that project and in to this one and also we did a formal lead assessment during the Island teachers conference as well.

Karen Scott: Thank you. Tory.

Tory Syracuse: Yes, this is Tory. We did not do a formal need assessment. We know based on other studies that the need for increase education in Tucson and conservation of water is very high.

What we did was put out applications to neighborhood, where neighbors actually had to apply to participate in the neighborhood leaders program. And through that process, we established what their reasons were and interest was in working with us. And then once they were accepted into the program, that was the stage that which on a neighborhood by neighborhood basis, we didn't need assessments.

So we actually walked the neighborhood leaders through looking at the existing conditions in the neighborhood and working through their neighborhood association or to go through surveying some other community group trying to get out what the – what the needs of the neighborhood were,

not as to encourage the neighborhood but according to as soon as a larger sample of the neighborhood as much as possible.

So we assess needs on very small neighborhood or even street scale before we start to implement project.

Karen Scott: OK, thank you. We do have a couple more questions from the webinar?

Operator: Yes, sure. How do water law in Arizona allow for the capture of rainwater?

Tory Syracuse: In Arizona, you can capture water that falls on your property. So in other words, I can install a system that capture the water that flows off my roof. When is it lands on my property, it's considered to mine water is.

If you'll notice in much in the photograph that I show anytime that we are bringing water that's flowing down a public street into a landscape area. We always do it in a publicly owned area.

And so, we're not bringing water on to private property owner property that was once publicly allocated water. I know in other states like Colorado for example, water (rain flag) for the stream water harvesting. Here in Arizona, it has not become an issue yet but we do – within the city of Tucson, we are not allowed to bring water into unsurprised property that was previously flowing down – flowing in a public area.

So the short answer because there is certainly long answers when it comes to rainwater (rates) is that it's not a problem yet but our state legislature has been looking more carefully at water harvesting and how to regulate. So it could be – it could be more an issue in the future.

Karen Scott: OK, thank you. I think we're just going to take one more question and then we'll have to end for the day. But I would urge people with more questions to go ahead and e-mail the presenters and I believe we have the information about their e-mail address is up on the screen.

Operator: All right, can the speakers talk about the ways you facilitate the many different issues that local residents might be concerned or solutions residents

might be interested in. For example, in Maine, is it typically majority rules or are there other ways you negotiate multiple possibilities? So it's a question that's for both you.

Ruth Kermish-Allen: That's a very, very good question. This is Ruth. And I think from our advantage point here working in Maine is really our role of Island Institute to find the best most useful data and information that's possible about a particular challenge or question that communities have and provide to our community members and also of the stakeholders and the most understandable format possible.

And then, that provide a really face and open environment for all of the individuals to talk about their differences in a non threatening way and that's a very, very difficult thing to do that and it's a very difficult thing to have you students involved in as well.

But it's a very, very exciting and engaging learning process as well. So it's tenuous but just finding the best information that you can and providing in a very understandable way and understanding how it's going to relate specifically to their communities. Suzanne, do you want to add something to that.

Suzanne MacDonald: No, I think that's great.

Karen Scott: OK, thanks, Ruth and Suzanne. And Tory, do you have an answer?

Tory Syracuse: Yes, I wish I had, you know, the answer to that question. First, it really tends what level we're working at and what scale we're working at. And so, I think as Ruth is alluding to that an open process of education and of looking at what data exist and where for example, how do we make decisions about where we're going to work or what priority areas we might be working in.

Is that's really based on whole lot of factors and of course with in the places where there's a need to win mostly in that decisions is based on also a willing partner and a partner that's interested in working with us.

So the nice thing about that the questions that is actually not terribly controversial. People buying large really want to implement these projects. So for us, the difficulty is in prioritizing where funding should go and where we could do our work.

And as we feel that there's an area where we could be working and they don't have the capacity yet to do that, then it's the process of educating equal and starting very gradually to go back capacity and then on a smaller scale as I was mentioning, on the neighborhood scale as they already know we're going to be working in the neighborhood is a matter of making sure that has many residence and stakeholders as we possibly can reach how to say and what project is implemented. And that looks different depending on which neighborhood you're working in.

Karen Scott: Great, thank you. Thank you, Tory and Ruth and Suzanne. I think that we've some very interesting information given to us today and thank you participants. It looks like we weren't able to cover all those questions but I do urge you to e-mail the presenters with the rest of your questions and to visit our site in about a week to see the PowerPoint presentation and to hear the reporting of these webinar.

With that, I think that concludes the presentation for today and thank you very much for joining in.

Operator: Thank you. This does conclude today's conference call, you may now disconnect.

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