Living Shoreline Workshop
Greater Portland Council of Governments
830am – 330pm

Minutes by Emily Greene

A. Welcome and Introduction

Pete Slovinsky – MGS (Maine Geological Survey)

***All presentations from the day will be available online**

Why are we researching Living Shorelines (LS)?

- Increase questions for permitting of LS stabilization projects, esp. for coastal bluffs.
- NOAA funded project of special Merit: Building Resiliency Along Maine's Bluff Coast
- NOAA funded regional project: High Resolution Coastal Inundation Modeling and Advancement of GI and LS approaches in Northeast
- NOAA funded regional project: Increasing resilience and reducing….

How you might deal with instability on a coastal bluff. Broad term of LS encompasses a range of shoreline stabilization techniques along estuarine coasts, bays, sheltered coastlines, and tributaries. A LS:

- Has a footprint mostly of native material. Incorporates vegetations or other living, natural elements.
- Maintain natural functions of coastline.
- Traditional response to bluffing is to cut back slopes, plant in front, place some riprap. What this doesn't account for is minimizing the transfer of soil sediment. Mackworth Island is where we will be looking at gullies, looking at site 4. There are eight erosion sites.

Troy Barry – Headwaters Hydro

Going Green: Living Shorelines Maine

Where this table comes from, looking at bank, bluff erosion and being able to compare it. Data sets from both of those, could judge equally to compare the two. It comes from a reconnaissance level assessment (RLA). Prediction level assessment (PLA) takes time. Design level assessment (DLA), but more conceptual for today when looking at Mackworth Island. But, we will look at the landscape, the history of it, and understanding the geology, bank failures, land slide, and other background information. I want to ID potential issues that have been causing erosion problems. The idea is to take this instability assessment (step 2 of the RLA), and rate using 12 parameters, based on what you see in each box. The key is to be consistent when rating. Parameters are listed on the sheet. Today, we will use the whole form to assess the entire bank. But, usually, I use four different forms for four different zones. Part of this rating form is to decide which areas you might need to focus on. You might need to phase the project and figure out which areas are of highest priority. The PLA is understanding exactly what you might need to focus on as well.

B. Mackworth Island Field Trip – Break out Discussion

Discussing and sharing notes from the field trip and the ratings that we gave them for LS. The goal is to bring people together to stabilize the site (case study in action) on Mackworth Island, Site 4. Each group will report on LS concepts in their break out session. Maybe use the instability rankings to get a hold on things. This rating system, will relate to the upland concepts, and the near shore concepts. This sheet should connect with how you make the decision that you make for your chosen concept.

The idea is to create common language with the use of the RLA, PLA, DLA. This group break out session was to gain some understanding of the concepts and processes that are happening naturally and anthropologically on Site 4. This is a great experiment to begin using your gut instinct rather than using the methods that have been used for decades (armory alone). This field trip that we conducted today is an example of RLA. We are at this level right now figuring out what we need to do for the site. PLA, we are dealing with predictive level. How much soil is coming out of the slopes? Over time, pins that were pounded flush with the ground become exposed from previous storms. Then we get into the conceptual design with SLA. Essentially, this is a level 1, 2, 3 assessments to help you figure out what you might need to do for your site. It is important to think about the scale at which you are working at. The root wads, tree logs, coir logs, etc. all need to be anchored somehow because it is possible for these projects to simply wash away down river or out to sea.

C. Review of State and Federal Permitting Requirements and Challenges

Marybeth Richardson – DEP (Department of Environmental Protection)
This LS concept is really exciting. But, our rules are not structured to be able to permit these projects.
Permit by rule – available for some public projects. If the project is being overseen by a conservation org, then you can actually work in the resource below the hat line. Enhancement of wildlife habitat or water quality improvement projects. We know that it will be monitored by a reputable group. If you can give us some assurance that it will fall into one of the two categories, then we can permit it. There is no limit in size, so it's a very general requirement for the permit. For private projects, any work in the resource or within 75 feet of the hat line, it's split up basically. The permitting is project-specific. The are set up where it really discourages activity below the hat line. It's assumed that you have a practical alternative for a few things. One of the things it talks about is creation of artificial reefs or some language to allow alteration in or adjacent to the particular resources, then we might give you a permit. As far as LS goes, I haven't heard of projects where there is fill being put below the hat line. You have to show that you are proposing the absolute minimal disturbance in the resource as possible. But there are exceptions.

The beneficial use aspect of oyster shells. The chapter 400 rules regulate the beneficial use of waste material. Oyster shells would be one of those things. The way you could do that now is to get a pilot project permit through the …use department.

Jay Clement – USACE (US Army Corps of Engineers)
In many cases of DEP permitting, you need federal permitting. Under section 10 of the Rivers and Harbors Act, navigable water ways are all tidal waterways. "Work" is basically anything. Anything beyond mean high tide water levels, then you need a Corps permit almost always. Permits are also required for temp or permanent dredged discharge or fill material on any adjacent wetlands under section 404 Clean Wetland Act, beyond the high tide line. Regulatory matters and challenges in LS is much like DEPs. We haven't seen a lot of these LS projects. We don't collectively have a lot of experience with these. There are a lot of activities that can be done without the USACE. The way that we look at fill projects, is what is the purpose of the fill and what are the alternatives to achieving that purpose while either not filling, or filling as little as possible? We want to know what the purpose of the project is. Then we have a no-bill alternative, which is just doing nothing. We do issue permits for some seaward encroachment. But to go back out to what is used to be however many years ago, that probably won't happen. The other real challenge is for those proponents of LS in the audience, and we understand the value of LS, but the challenge is not convincing the regulators, but the home owners and contractors of this world. They understand stone structures where there are a lot of models and examples. But for land owners, you are asking them to take a risk, going to survive the long-term. And it's going to satisfy the issue that they have. These are the challenges that I see. The issue for us is determining what is worth keeping or losing.

Pete Slovinsky
State of the Practice Report/Profile Pages: Profile pages are helpful for looking at how would I approach a problem and what are the questions I need to ask?

<u>Regulatory findings</u>
Maine Geological Survey GIS-based LS suitability DST.

- Shoreline suitability based on red, green and yellow indicators. Green meaning that it would be most suitable to no suitable at all.
- It looks at NOT excluding, but categorizing shoreline suitability.

Site selection: eroding bluff or marsh, ownership, access, possible to high living shoreline suitability, relatively straight, consistent shore type, approx. 150 feet, representative geography, proximity to mapped special habitat types, educational opportunities, proximal previous or additional work on or adjacent to the site.

<u>Actions Needed</u>
Education and outreach, technical support.
Regulatory recommendations for LS in Maine, there are none right now.
We have not implemented any recommendations yet. Trying to get LS easier to get moving on the ground.
Amend Maine GP to incorporate select elements of NWP 54
Develop/adopt common definition of LS projects.
Amend NRPA and DEP chapters.
Amend Land Use Planning Commission zoning standards.
Amend definition of structure for submerged lands leasing.
LS is not a submerged structure.

Initial demonstration treatment concepts for LS in Casco Bay
How can we beneficially reuse naturally occurring fallen trees?
Potentially driving in trees into the slope or vertically into the marsh for intertidal zones? Bagged shells are widely used in other areas of the country. Drive the tree wads into the mud flats, put bagged shells there, do the same thing above and below the high tide line.

Monitoring LS Projects in Maine
Where there has been a lot of LS projects, are within the z foot tide zone. But in New England, it is very difficult to do when we have 12-foot tides. Conceptual Framework: problem with monitoring, is that I don't know which components of LS projects are able to be monitored until we do it. National models based on multiplayer systems, proposed designs in Maine somewhat simpler, monitoring should reflect that. Considerations: monitoring framework that works across states and sites, how will information be used, discussion with other states, controlling coasts and level of effort.
Case studies: few sites in each of the NEW states, focus on performance at each site, generalization to future projects is based on other case studies, exposure gradient, post stratifying sites based on site-level characteristics. Monitoring themes and questions: what is the context of the project, do LS/GI technologies work, do they have positive ecosystem benefits, do they have negative impacts? Monitoring phases: pre-project data, as built documentation, performance monitoring, end of study intensive data collection. Monitoring at two levels: site (wave energy, fetch, ling resources, bathymetry) and treatment levels. Method selection, we want to id core questions, and then develop some core metrics. What questions or information will be most important to regulatory agencies to support future permitting decisions? What kind of data quality objective need to be met to make resulting data of value to regulatory agencies?

Joel Ballesteros - New Hampshire experience with Living Shorelines for Fringing Salt Marshes
I'll tell you about three projects that we have.
Wagon hill Farm: our first project site. 140 acre parcel. It's very publicly used. The town of Durham has been very cooperative and excited to do restoration work. About 2,000 feet of bank, that have lost about 60-80 feet over the past 100 years. About 30 feet of erosion since 1992. Part of coming up with a design is to figure out where the impairments are coming from. Understanding where the loss of marsh is important to figuring out what to do to restore them. Erosion pins are monitored quarterly. We see about .2 feet per year of erosion. What we see at the site, most of the energy is from the tide, not the waves or waves made by boats. We have collected data of sunlight effect on stability.

There is a problem at this site with many dogs and human foot traffic. The Town of Durham has been very supportive in wanting to discourage walkers from walking on the salt marsh while it is being restored. The potential first phase, we have used coir logs, anchored logs, root wads, and large rocks. We first wanted to test a mock structure. We did not need a permit because it was all done by hand. We learned that it is extremely labor intensive to create these things. Within one storm, an 800-pound root wad and the entire things was gone. The coir without having weight on top of it, it would rock back and forth with the waves. The motion eroded below it

and then the measures holding it down completely disintegrated it. Wagon Hill outlook: thinking of salt marsh mats rather than individual plant sets. Armored sill most likely candidate. Possible use of random root wads in rock sill as well as seaward of sill.

Cutts Cove: Historically has been a salt marsh. But the railroad and traffic has made it what it looks like today, which is two 600-foot length marshes. We are planning to put oyster reefs. Then we did volunteer plantings of Spartina plugs.

Upcoming project is Great Bay: we will collect reference data. Additional metadata obtained offline. The goal is to develop a database of metrics and metadata that describe the spectrum of stable to impaired fringing salt marshes. Similar to stream restoration using natural channel design.

D. Living Shoreline Panel & Facilitated Group Discussion

Charlie – DOT (Department of Transportation)
We did complete in the past year some feasibility studies. We did it with NH DOT. The main project that we looked at was Popham Beach. The stretch of road where it is between the park and the beach. It's about as different as can be from what we looked at today. My take away was that it is very different geology and processes going on, so we approach things a different way. With some of these resources, you will come across similar and basic settings between here and Popham. Where we ended up, the solution would have been on the hard side. The results from the researchers, said that the sediment supply is a problem here. No chance of stabilization for that kind of dynamic system. So we ended up with a hybrid of hard and soft measures. The most attractive hard measure, was sheet steel and maybe some beach nourishment farther down the beach. But we didn't expect that to last long term. I don't see DOT doing a lot of these. I suspect the right place and time will be what does it for us. We want to be confident that what we build will not be a perpetual head ache. My suggestion was to terminate the DOT road at the state park and let the town deal with it.

Troy (continuation of his previous presentation)
For USACE, you do not need a permit to vertically excavate below the HAT line. With DEP, you need a NRPA permit because you are within 25 feet of the HAT line.

Barry Baker – Baker Design Consultants
Challenges in Maine: Retreating shorelines, SLR and climate change, client education, economic solutions, regulatory requirements. Opportunities in ME: no shortage of coastal erosion, developing expertise, new products. Our shoreland zoning is not keeping up with how fast erosion episodes are occurring.

John Edgerton – Wright Pierce
LS are desirable where feasible, but not everywhere. Challenge is where and when they make sense. We look for hybrid solutions. Understanding fluctuating water levels, including SLR. Selection criteria: we look for lower energy environments. When we get into the estuaries, you have riverine/estuary areas, lakes and ponds, and oceanfront including beaches. We also look for soil substrate and slope.

Design and regulatory elements: must understand the topography of the area (bathymetric surveys). Characterize protected natural resources, establish level of structural elements, determine appropriate plant species, develop drawings and specification, and seek regulatory approvals.

Riverine/estuarine applications: Falmouth, Freeport, Harpswell (bluffs subject to block failures, maintain stable tow, wave action/SLR). Madawaska, Brewer, Veazie (reconstruct natural shoreline).

Lake/Pond applications: greenwood, Coburn Gore (directional wave action, dams/embankments/understand fluctuating water levels).

Oceanfront/beach applications: Old Orchard Beach, Wells Beach (reestablishing dune vegetation, in concert with other work, such as beach nourishment). Kennebunkport, Bristol (more reliance on structural measures where wave energy is highest).

Facilitated Group Discussion
How do we advance LS projects? How to best engage people who are no in the room?

As an estuary person, the reason I came today was because my backyard is in a state of transition on the river inside Marcus Point. We have had discussions about what to do, we have enjoyed our backyard a lot, and we want to know where do we go to start with ideas, and regulations?

- Finding an NGO that stabilization of a project somehow fits within their priorities for undertaking things, my s is that it does. Its up to the landowner to make the initiative and make the investment for whatever it is to jumpstart the project.
- We have also been trying to build a network of practitioners. Those people can look at your site and point you in the direction you need to go in. This workshop is to help point fingers so that the citizen of municipality can at least get at some of the resources to make decision. The best thing to do is pheon some of the regulators and they can always point you in the right direction.
- Projects that are similar have been undertaken in your town.
- Or you come to things like this and the field service and force staff will give you their cards.
- Right now what we are doing, is going out to a site, and looking at the sites. We are exchanging ideas, each group had reps from each perspective, and we ae doing what we need to be doing, talk about the challenges and obstacles, and figure a path forward.
- If you go back to what I said in a general sense, understanding the risk elements of what we monitor, is giving engineers better tools to zero in on what they can better do. We need demonstration projects and give us a better understanding of those risks.
- There is a need for information that is at an intermediate level and answer if LS make any sense at all. There is a screening level of info that is needed as we understand this work more. We do a fair amount of screening level work. But we can look at these assessment tools and say this looks like a great site or no, and at least get a level of conversation started with people.

- The Properties Owner Guide to Erosion Hazards. I would look at that on our website (ME DEP) and it answers those questions for a property owner.

As a practitioner of the Penobscot area, I was speaking to a lot of people on bluffs. I might as well speak to bluff owners and get some people in. Cumberland County Soil and Water Conservation District and I are partnering to have some talks in the region, which will be public events this summer. I'm excited about putting this program together. I encourage all of you to do something like that in your neighborhood.

You need to make sure your name and email is on the sign in sheet. Then we will get ideas of the event and send that info out to everyone.

Barney, the project you showed, was that a collection of houses?

- Yes, that was a total of 7 owners one of which was the town. If you can get your neighbors involved, there is a collective benefit to that.
- Yeah, that was my question. A land owner might do it by themselves, but if their neighbors are not doing it, then it's a limited benefit.
- Right. It was led by a couple property owners. We got the town involved because we said they didn't have to pay anything, just help us through the permitting process. There was a property owner who couldn't pay. So they ended up working out a special financial deal. These families had known each other for 50 years, so they knew each other very well. You should talk to your neighbors.

Regarding keeping the conservation open, I thought if any of you guys have given presentations to universities. That's a helpful tool.

- So I run the Casco Bay Estuary Partnership, and it is very much a part of making connections. This is a great project for us to be a part of. We have not been working with engineering faculty, they are in other kinds of engineering. We do look for opportunities, but we work with NH folks a lot. Folks down there do a lot of this kind of work. It depends on who your local engineering faculty are. You find the opportunities when you can.
- We work with UMaine folks as well. For Phase 1, there was a track 1 to it, developing wave models, to develop that data, to help with LS design, sighting and more. We continue working with UMaine on that. There is some overlap, but not as much as it should be. But it hasn't' resulted in maps yet. It is resulting in data that is then put out on the internet.
- Those models have lot of potential applications. The models have gone way up. The biggest problem for us, is that they are giant files of data. We need to contract those down to something that is useful for us engineers.

I've heard that it takes a really big storm to wake people up to get real action to take place. I wonder if your thoughts are on that and if that is what it will take to get people moving?

- From a geological standpoint, that we have had an influx with phone calls about dunes eroding 30 or 40 feet. But now, many people are creating zigging and zagging permits for the paths to their beaches. We haven't had a dynamic shift in LS thinking, but there is a higher level of interest because of the erosion problem. Events like this, will put an exclamation point at the end of our long-term erosion problems. My hope is that we don't allow legislation change just for dumping of rocks. We need to allow for natural transgressional features and creating natural habitats at the same time.

To not forget the urban condition, but I think that cities as a place for experimentation where there isn't much to lose economically, and where there is an expectation where people have to interact with their environment, there is a lot good reasons to look at urban areas for this LS experimentation.

- NY and NJ have done amazing things after Sandy in terms of furthering concepts of LS. They have done so much work.

To the point of advancing this further, such as the storms we have had, if we had a little cache of funds that could be thrown into PSA, to get the word out, if the regulators are getting calls, that would be the time to pull the trigger to pull something like this for the public. Workshops. Who knows when that will happen. So you have to have that group ready together and ready to go kind of like EMS. It would be an effective way to increase understandings rapidly. Because we have solutions to present to them.

Mine was more of a comment. I was just looking around, we have a ton of riprap projects coming in. You know who is not here, the contractors, that are doing the work and doing the permitting. None of them have hired them to talk about what we are talking about today. We need contractors into this room.

- My experiences was that I just relocated from VA. There is lot of flooding. So, what there were doing, the communities that all had water, developed a "light house" program where people were given tax credits for improving issues with water. As a result, landscapers who got involved, were given regulations from the cities, they were allowed to do "x" things. Grants were also used to fund these projects.

What does it take to make change?

- My colleagues experience after Sandy, was because everyone was panicking. There was no time for preparation for projects like these. But, we have to recognize in terms of thinking a different kind of border between human and oceans, disasters will not move us past how will we form these projects.
- Build on that, if you're in the sand dune system, there is a whole other regulation area. A lot of our calls at DEP, was that they wanted to maintain their structure because it is grandfathered. Everyone is always interested in maintaining their seawalls. The regulations need to be looked at closer at some point, but I'm not sure where that starts. Some of our regulations could be made more user-friendly towards these greener LS options that don't get any consideration.
- Some things I know what is going on, is the Coastal Caucus. They have not achieved their primary goal, but they are working on. For the Wells Reserve, we don't need to be paid more that IS our job. We can organize these meetings and workshops. The symposium later in April will be about salt marshes (special symposium on Thursday the 26th).

Pierson already does willow planting, coir logs, etc. so if you want to reach out to us, we are in Dayton, ME. Please contact us if you want more information.