



**Fresh & Salty Podcast, Episode 1: Stuck in the Mud with Cory Riley and Mark Silberstein
7/29/20**

Peter - Hello everybody and welcome to the Fresh & Salty podcast, a deep dive into the world of estuaries: those special places where rivers meet the sea or the Great Lakes of the upper midwest.

As our guides, we will have on this podcast the people who know estuaries inside and out: the scientists, educators, and friends of the National Estuarine Research Reserve system. This unique NOAA-sponsored network of 29 reserves studies and protects more than 1.3 million acres of estuarine lands and waters nationwide, much of them open to the public for recreation and learning.

Like the waters of an estuary, this podcast is a fresh & salty mix. It explores the challenges facing estuaries and their communities, serves up solution-focused science and education, and, we hope, raises the curtain on the beauty and wonder of the great estuaries of the American shoreline.

Fresh & Salty is presented by the American Shoreline Podcast Network, and sponsored by our good friends at the National Estuarine Research Reserve Association, a national nonprofit that

supports and advocates for the Reserve system and their mission to serve their communities and the nation.

This pod is for anyone who lives, works, and plays on the coast and believes, like we do, that future generations should have the opportunity to do the same.

I'm your host, Peter Ravella, and for this inaugural episode of the Fresh & Salty podcast. I'm joined by two amazing guests: Cory Riley is the Reserve manager at the Great Bay National Estuarine Research Reserve in Portsmouth, New Hampshire. Cory's the boss and oversees the Reserve's education, research, stewardship, and coastal training programs. We're also joined today by Mark Silberstein, the executive director of the Elkhorn Slough Foundation in Monterey Bay, a nonprofit organization that works in concert with the Elkhorn Slough National Estuarine Research Reserve to conserve and restore one of the last remaining wetlands on the central California coast.

Thank you Cory and thank you Mark for joining us on the show today! Cory, I'd like to start with you. Can you tell us about the research Reserve that you manage and how you became part of that organization?

Cory - So, I'll tell you a little about Great Bay first. It is a really unique place. When people think of the coast they think of waves crashing on a beach, and the Great Bay estuary is actually 15 miles inland. It's a bay that opens up 15 miles inland from the Atlantic coast up a large river called the Piscataqua River.

If you Google Great Bay and you look at it, it looks like this big lake. But it's actually tidal, and it has a very strong tidal exchange. We receive water from seven rivers that surround the bay. So it has quite a bit of freshwater influence for an estuary, which makes it even more connected to the historic communities that surround it.

Here in New England, so many of the industrial cities were built along rivers because that's what the source of power was. And before that, in colonial times, that was really how people exchanged goods and got around, was the rivers. So we have this really rich cultural history of being connected to the water. In the Northeast and particularly this river.

If you came to Great Bay and you stood at our visitor's center, for about half the day you'd be looking at at least a football field of very large mudflats and you'd see all the birds swooping in and the large channels of the rivers coming into the Great Bay. So it looks very different than what some people think of when they think of a coast, but it's gorgeous and I love it, and I wouldn't want to be anywhere else.

Peter - Sounds like an extraordinary place. How did you get to the Reserve, Cory?

Cory - I ended up here because as a graduate student I knew I wanted to work on something coastal. Being from northeastern Massachusetts, I spent my life along the coast and knew that I loved wetlands. There's something about being stuck in the mud, and once you're stuck in a coastal wetland, you really do feel this sense of joy and freedom and you just want to stay in the mud forever. So I knew I wanted to do something.

And when I got to graduate school I explored both the physical sciences and the policy side, and I was working at an institute at the University of Massachusetts in Boston and I had the opportunity to work on a project with some of the Reserves around the country. My boss at the time said well, there are a few of them in New England, you should go conduct these interviews – because I was asked to interview the managers of the New England Reserves – you should go and do it in person.

I'll never forget it was March and it was cold and it was raining, and I drove down to Waquoit Bay which is on Cape Cod and I arrived there and I knew that this is what I wanted to do for the rest of my life. There was just something about the combination of science and the science being so driven by what was needed in the community and the integration of what people were learning with what they were sharing with students, citizens in the town, and state agencies that I just knew this is what matters, this is real applied work that I'm passionate about.

And so, after graduation I had an opportunity to work with the federal partner, for NOAA, and for about six years I was in DC and I love Washington DC, it has amazing food and wonderful colorful neighborhoods and lots of interesting work to do there, but it's hard to get to the ocean. So I was ready to come back to New England and be a little closer to the ocean, and after a few years I realized that I had about four Reserves to choose from to try and find a job at and I got very lucky and I happened to be working right at UNH when this job opportunity came forward, and I knew that that was my chance and I had to go for it.

Peter - Cory, what an interesting journey and one that I really appreciate: from the marble halls of DC to the wetlands. I can see the appeal. Mark, why don't you give us a tour of the Reserve and how you got to Elkhorn Slough?

Mark - I first came to Elkhorn Slough on a college invertebrate zoology field trip in 1968, and we came to Elkhorn Slough which was already legendary for having really rich tide flats. The organisms living in the tidal flats at Elkhorn Slough had been written about starting in the 1920s by George McGinnity[?], noted zoologist and marine biologist, and then Ed Ricketts, of Cannery Row fame wrote his legendary book *Between Pacific Tides* which opened up the world of the intertidal zone to the world. And he wrote about Elkhorn Slough as a place where there was a unique suite of organisms that lived in these tidal flats.

And as a student I went and I dug up these strange creatures that live in these tide flats. And soon after that I started studying at Moss Landing Marine Laboratory which is located close to the mouth of Elkhorn Slough, and for those students going to the Moss Landing Marine

Laboratory, which is run by the state universities, Elkhorn Slough was our backyard. It was kind of where students cut their teeth on how to study and quantify these marine ecosystems. And I got stuck in the mud and could never free myself.

Peter - I wanted to ask you, being on the Foundation side and in the nonprofit community, what is that brings people to your door, into your programs, and into the Reserve System? What inspires them and sort of draws out of them this notion of seeking a greater understanding of these areas? What do you think? What can you say about that?

Mark - I think the first thing, Cory mentioned this too, is a sense of place. But when you come to this place, Elkhorn Slough, the visitor's center at the National Estuarine Research Center, which has a wonderful visitor's center and five miles of trails that wind through five miles of really interesting habitats from grasslands to oak woodlands down to these tidal marshes.

But for me, I walk from my little office across the parking lot to Dave Feliz, the manager of the Reserve, office, and I look out over this bluff to this sinuous meandering waterway flanked by marshes with Monterey Bay in the distance. And after all these years I still pause in my tracks and look over this place and think: *this is cool*. This is spectacular.

I think that people connect on these things in lots of different ways, but even for the most erudite scientists, you're simply moved by what you see, by the beauty. You're immersed in this panorama of living things, remarkable vegetation, trees. Elkhorn Slough and a lot of these sites around the country are hotspots for migratory birds, both aquatic and terrestrial, and so to pause, in the midst of some of the craziness of our busy lives when things aren't in the midst of a pandemic and breath that fresh, salty air and look out over these landscapes and hear these birds calling... I think that's, to me, those are the roots of inspiration. Then you layer on top of that. That stimulates your curiosity and your interest in learning more about what makes these places tick. But I think it's that fundamental connection to nature that is the springboard for inspiration.

Peter - One of the things, Cory, that I like about this, and it's in the name, is the National Estuarine *Research* Reserve System, and research and science is a real thing here. Can you talk about the importance of science in the work that you do, and help our audience understand how serious and endeavor that is?

Cory - This is really what the Reserve's primary purpose was when we were created by Congress. We are place-based, which means that, as Mark described, people can come and be inspired and visitors can come and be inspired and really gain an awareness and appreciation of estuarine systems, but the reason why Congress decided that we needed to be places was actually to protect them as platforms for longterm research and monitoring.

Understanding that when you sample, if you do that in a different place year after year, you never really know what the long term trend is. So it was very intentional that we would be places

where we could study both short term changes between seasons or before and after an event, but also longer term changes in the estuary.

And because at the time when Reserves were created, Congress knew wetlands were being destroyed at a phenomenal rate, but they didn't really even know what the effect of destroying those wetlands was. So we were really kind of established to figure that out. How does a good wetland function, and how can we make sure we maintain that, not just in these protected areas, but in other places around the coast?

Peter - The fact of the matter is that the amazing areas along the American shoreline and these coastal assets that we have in our country do not automatically protect themselves. It takes a boatload of work and dedicated people. I loved what you said Cory about the information being applied, that the scientific research year in and year out helps identify the trends, the threats, the changes, but the purpose of that science is to get that information in the hands of the decision-makers and hopefully, I think, we will do fewer bad things.

Mark, out in California, one of the states early hit by COVID, have you seen a change in how the area is used and the programs associated with it? And I'm curious about if there's been a change in the critters and how they're using the space too. Can you talk about how COVID has affected your area?

Mark - The Reserve did close. The guidance from the state and governor was that those public places just had to close down. So Dave Feliz the Reserve manager complied with that. Most staff have been working from home. As Cory described, there's been a great pivot, and particularly the education staff at the Reserve has been putting out fantastic online resources. I'll tell you about one response that was interesting and unexpected to me.

At the north end of Elkhorn Slough, on land that the Elkhorn Slough Foundation owns, we set up an outdoor classroom across from Hall elementary School. It's in the community of Las Lomas, a disadvantaged community, a 90% Spanish-speaking community. Really a lot of unemployment and COVID just exacerbated those things.

But the past four years the kids from the elementary school have been walking across the street and coming to this outdoor classroom and going down to the creek. The school itself is an asphalt-encrusted schoolyard with one little green space. But across the street are 3000 acres of this amazing land and these organic farms. And when this hit, as Cory described, these students just stopped coming overnight. Our staff had just bonded with these kids.

One of our donors challenged us: what is the relevance of a land trust during times like this? When people have these critical needs? I agree with Cory: getting outside is critical for mental health and all around, but a lot of folks in this small community of Las Lomas were running out of food. So what do we do? So this donor challenged us: what's the relevance in a time like this? How does land conservation have any impact at all on people's immediate needs?

So we thought about it, and saw an opportunity that even though the school had closed, it was a distribution hub for meals. And so the families, the kids families would come every morning and pick up breakfast and lunch for the students. And they were serving 600 meals a day. The parents would come by and pick up the food.

And we realized that right across the street there were farmers growing crops on land protected by the Elkhorn Slough Foundation, beautiful organic produce. So this donor challenged us and gave us a little bit of money and in two days we doubled the \$5000 he had given us and started buying produce from the farmers who were also challenged by changing markets.

The farmers delivered this beautiful food to the school where it's been distributed to the families coming to pick up food every week. In the first eight weeks we distributed eight tons of this beautiful organic produce. In two days we matched the original gift. The community foundation stepped in. We've now raised \$60,000 and are expanding the distribution of this organic produce grown on conservation lands to three schools in the district and helping these families that are really challenged right now. This wouldn't have happened unless we had a community that had donors like the one who approached us and said 'Hey, what are you doing about this?'

It's heartwarming. The farmers are grateful for the support. They're proud to be delivering good food they've grown to the students and the school. It's been a nice circle linking healthy lands, healthy kids, healthy food... Anyways, this has been quite interesting, and it's something that would not have happened had we not been faced with this challenge.

Peter - Mark, I think you're understated. Ladies and gentlemen, that's how it's done. And it relies on the experience and judgment of someone of your caliber and duration there, the donor base you have, the connection to the Reserve. Really outstanding, what a great story. I don't know that anyone would say there's a silver lining to this pandemic that our country is suffering, but that's about as good a story as you could possibly hear.

Mark, it's not easy to manage coastal resources and coastal lands. A lot of challenges involved. How has the Reserve system and your organization been received in the community over time?

Mark - I think that when you struggle with some of these challenges you get some credibility. I will tell you one of the things that struck me: you know, when we first started this work Elkhorn Slough suffered from serious damage from eroding farms on steep slopes above the estuary, literally thousands of tons of sediment came off these slopes. In 1984, what was then the Soil Conservation Service from the US Department of Agriculture did work in the Elkhorn watershed. They measured the highest rates of erosion of anywhere west of the Mississippi river in this little watershed.

These steep sandy slopes that were cultivated and subject to massive erosion were a serious problem. And in those early days, my thought was 'these guys are evil.' This is really easy, this

is unconscionable, this shouldn't be happening, make it stop. And when we started managing farms, we made a decision to keep some of the land that we had acquired in production. And we saw how difficult it is to make a living as a farmer and how hard you have to work and how you are balancing capital and markets – it gives you a little bit of humility.

But I think it also gave us a connection to the folks that are doing this work. So we were able to do some of these experiments at our expense and work with the Soil Conservation Service which became the Natural Resource Conservation Service, we worked closely with that staff, and implemented these practices on farms and demonstrate that you could do this in a way that was economically viable, met regulatory requirements, and measurably reduced the inputs of these damaging elements into water.

So I think generally there's a positive relationship between the farm community and the work we do. We collaborate on a lot of these things. It's been satisfying. But it's humbling to see what it's like to farm land in these areas and do it in a way that's both economically viable and environmentally responsible. We've developed great appreciation.

Peter - I think that's kind of the key to it. The credibility of the practices that you're trying to promote, founded in good science, founded in research. I imagine that the Elkhorn Slough Reserve scientists can probably plot out on a graph what the tons of sediment and erosive material coming into the estuary were back in the 1980s and show you what it looks like today, because it's that continuity of research and scientific understanding that you talk about Cory, that really helps you demonstrate there's a better way.

When you're looking at the history of the Great Bay Estuarine Research Reserve over the years, Cory, is there a similar evolution in understanding at the community level?

Cory - One of the greatest evolutions I've been around to witness is the way that communities in coastal New Hampshire are thinking about climate adaptation. This is something that for a lot of places around the country was not discussed broadly enough until recently. Here in New Hampshire, there was a dedicated group of natural resource professionals, community leaders, and academics that got together a while ago and said we're gonna form a group, a pretty informal group, to share information and make sure that we're all kind of matching up what the real concerns are going to be in New Hampshire with local science and really being proactive about helping communities deal with this issue. And it's been phenomenal. There is no question that community leaders are not just aware of the issue, they're really incorporating expected changes in precipitation, sea level rise, temperature shifts, into the way they do their master plans and infrastructure planning. And we've been able to work with this incredible community of organizations to make sure that we're all working together to leverage resources and bring those resources to New Hampshire so that we can address this issue.

So that's one thing that I've been both sort of a public perception shift on, a real understanding of the value of local science because we've had a lot of downsail studies and very detailed work

done here to understand specifically what we can do. So that's a place where I've really seen this type of evolution. Circling back, I also just think that Mark's example about how difficult it was to be in the shoes of the farmers and how much you can learn from that, there's a couple examples from Great Bay that I can share related to that.

One is that we've really tried to walk the walk when it comes to building sustainably. When we've had an opportunity to, we've always incorporated green features into our landscape at our visitor's center. That includes a solar roof, composting toilets, geothermal heat, porous pavement parking lot, all kinds of rain gardens and innovative landscaping. We have all had the opportunity to not just do this in a righteous way but way where we're really clear about explaining it and explaining what's worked well and what hasn't worked well and what you can learn from us as an early adopter of some of these technologies.

Our geothermal system was WAY sized wrong, and it's because we were one of the first ones in our region that was installed for this type of application. Our porous pavement was installed by a contractor that had never done it before, so there were some mistakes in the way it was put down. It worked really well for a while, and now we're having some issues. But we can relay those lessons learned to our community, and say these systems work, and here's our advice on how it could have worked better, and we can be a resource for you because we tried it early on. Our experience with green facilities has been something we can transfer to the rest of the community.

Another thing is restoration. I think restoration science is so interesting, and Elkhorn Slough is actually a national leader in thinking about restoration and how do you put current restoration efforts in the context of how natural systems on the coast change anyways. In New Hampshire we've had some great restoration success and also been able to learn from techniques that were popular for a few years to encourage certain species and then there's a new technique that's popular to facilitate different species... and that's an important thing for some organization to track and be honest about over time so that the community of practice around restoration can learn from each other and continue to monitor what's working long time for the plants and animals we're trying to encourage here in New Hampshire. That as well has been an interesting learning experience as the conditions around us change, as the climate is changing and water levels are changing, the condition of the estuary and the plants and animals that live in it are going to change, and how does that impact land management decisions?

It's great to be a community resource where we're asking sincere questions that we don't know the answers to. We're trying to learn so that we can all make the right choices, as right as we can make them, moving forward.

Peter - I'm telling you, it's the coolest program on the American shoreline, is the NERRS. I think it really is for the very reasons you and Mark described. You know, if you're a farmer and you're wondering how can I do this differently, how can I retain soil and not contribute to the decline in the estuary, and you can go talk to Mark's group and go visit the farm that they're running and

managing where the techniques have been in place for years, where the outcomes have been evaluated by the research reserve system.. I mean, you've got so much to offer on the development side. Building with green infrastructure and water retention, impervious pavement, if all of that... If folks are just thinking oh jeez, these regulations are so complicated, how do I do any of this stuff, well, just go visit the Great Bay National Estuarine Research Reserve and go look at it! Talk to the people who designed it and built it and monitor it and ask how much it costs and how hard it is and could it be done better. There's just such power in the real-world applications of science in the hands of people committed to the best stewardship possible.

So I really wanted to thank you both for being on the inaugural episode of the Fresh & Salty podcast on the American Shoreline Podcast Network, a collaboration between the ASPN and the wonderful people at the National Estuarine Research Reserve Association, we want to thank them... Cory, closing thoughts?

Cory - My closing thoughts are really just that I can't wait for all your listeners to learn more about the Reserves. There are so many interesting people who have fantastic stories and expertise to share. So keep tuning in, it's amazing community to be a part of, and thank you for inviting us to be on the podcast!

Peter - You are welcome! And Mark, what would you like to leave our listeners with?

Mark - Get down to the shore. Also, I want to thank you Peter and Cory. It's a pleasure.

Peter: We're also looking forward to future episodes of the Fresh & Salty podcast. Listeners, you can follow along with this series by subscribing to the American Shoreline Podcast Network on Spotify, Apple Pods, and Google Play, or wherever else you get your podcasts. And check out the National Estuarine Research Reserve Association at nerra.org.