Using Sound to Connect People to Green Bay

This is Wisconsin Water News, a production of the University of Wisconsin Sea Grant Program. I'm your host, Marie Zhuikov. Today's episode is: Using Sound to Connect People to Green Bay.

On a sunny morning in mid-June, I hopped aboard a small boat and headed out onto Green Bay with Sea Grant researchers who were recording its sounds. Emily Tyner and Bill Sallak with the University of Wisconsin-Green Bay were working on the project, which is associated with the development of a national estuarine research reserve on the bay.

The National Estuarine Research Reserve System is a network of 30 coastal sites that protect and study estuaries. In the Great Lakes, estuaries are areas where rivers empty into the lakes. The mission of the reserves is to practice and promote estuary stewardship via innovative research and education through a system of protected areas. It's a partnership program between the National Oceanic and Atmospheric Administration and coastal states.

When I met Tyner at the South Bay Marina, she described what's in store for the trip.

I'm Emily Tyner, the Director of Freshwater Strategy at UW-Green Bay and the state lead on the designation of a new National Estuarine Research Reserve for the Bay of Green Bay.

Zhuikov: And this will be the third reserve on the Great Lakes, right?

Tyner: It will. Yes, the third reserve on the Great Lakes after Old Woman Creek in Ohio on Lake Erie and the Lake Superior Reserve in Superior, Wisconsin. So, the second for UW system.

Zhuikov: What are we going to do today?

Tyner: This is exciting. We are going to go out and record some natural noises from the bay, particularly bird sounds. Our target location is the Cat Island Chain, which is a restoration project that is restoring what was previously barrier islands in the Bay of Green Bay that over time, the size went down because of fluctuating water levels and ice. And now there's a 30, 40-year project to restore them using fill and dredge material from the shipping channel, and then also creating new habitat for migrating shorebirds and nesting birds as they come through the bay.

So, we'll go out and we'll be recording around Cat Island to capture those bird noises. And then I think if we have some time after, we're going to go up some of the tributary mouths to get duck noises. And then maybe at the end, sweep around to Bay Beach and capture sounds of people enjoying recreation on the bay along with the carnival noise.

Then Tyner's co-investigator, Bill Sallak arrived.

My name's Bill Sallak. I'm an associate professor of music at UWGB.

Sallak was the sound recorder for the trip. He described how the idea for this project evolved.

Part of our original conception was more of a hard sciences, bioacoustics kind of angle. But then, we went out on a boat trip and we kind of went, 'That sounds cool, that sounds cool. All these things sound really fantastic.' And so, we decided to lean more towards the more humanistic kind of angle, which is, I think, also going to work better if we get to the point where there's a visitor's center,

because we can take these recordings and put them into a room with a surround sound speaker set up, and you can hear the bay in different locations, different seasons.

In their proposal, Tyner and Sallak stressed the importance of bringing the sounds of the Green Bay estuary to the community. Tyner enlarged on the concept.

Basically, right there is a restaurant that there's a Louie's Lagoon. That's one of the only places on the lower bay where you can go and have a beer and have a burger and be sitting out on the water. And there's almost no other places to kind of enjoy the bay. There's the amusement park, but then there's no kind of pier or boardwalk for access. There's no swimmable beaches. I mean, some of that's for health reasons, water quality reasons. There's no kind of other restaurant or infrastructure. So, to get onto the bay, you need to have a boat, an expensive boat, probably. Maybe you can do a bit of kayaking from shore, but the trail system, we don't really have that.

And for a long time, communities around the bay had closed themselves off from the bay because of smells and harmful algal blooms and the industrial uses. But now Green Bay and other communities around are kind of reopening themselves up and turning their front doors back. Especially with the Fox River cleanup, which was a $1.5 billion cleanup effort. And so, with that kind of trying to encourage the city and communities to turn their front doors this way, we also want to reconnect people. Because right now, there's just not a lot of ways to recreate or enjoy being on the bay. Like a few parks here and there, but just not a lot of infrastructure as compared to other cities. Like, Sheboygan's on that path, Milwaukee has a great waterfront, Chicago. This is one way, I think one step in getting us there. And we also know that not everyone can come to the bay, but there's still lots of ways to enjoy it through pictures, and then now hopefully through this audio experience that we're creating.

In sort of a happy accident, UW-Green Bay recently received funding for a new sound auditorium. Plans are for it to be completed this fall, and this Green Bay audio project will be the first to be featured. Sallak explains.

It's very much my baby. I mean, there was so much legwork done institution-wide to raise the gift money and everyone's been a fantastic partner, but now the audio production program at the Resch Institute for Music is gonna have probably the best facilities in higher education in the state. We were able to find about 1,600 square feet in the studio arts building and some underused space in the Wiedner Center. And we're putting in four new recording studios, one of which is an Atmos room. So, it's equipped with a 14-speaker surround sound setup. It's the same surround-sound audio system that's used in pretty much every movie theater that you go into. And so, we're going to have the capacity, not only to make surround-sound recordings, but really listen back to them and present them in an acoustically refined space. And then in studio arts, we're putting in just two brand new control rooms, live rooms, ISO booths, everything. It's going to be a professional recording studio in the building.

When the Atmos room gets finished, this is going to be the first project that goes in there and we're going to have a presentation for faculty, community stakeholders, Sea Grant, pretty much anyone who wants to come on up. There will be archives of the sound files on the web, both in full-surround format, but also in some stereo mixdowns, so you can just listen to them at home over a regular

stereo system. But yeah, it's exciting. It's the other thing I'm spending all my time on this summer because, you know, construction meetings and all this other stuff.

Soon, UW-Green Bay's research vessel, the Phoenix pulls up, piloted by Chris Houghton. The Phoenix is only 25 feet long, but that was plenty big enough for us and our equipment, plus first mate, Jacob Hoffman.

Sound of walking

Houghton: How's everybody doing?

Sallak: Good, how are you?

Houghton: Good.

Sound of engine starting.

So yeah, my name's Chris Houghton. I'm a fish ecologist and the main GIS professor at UW Green Bay. I also operate and maintain all the vessels and in the lab we have seven graduate students right now, and what, five undergrads working in the lab across a whole bunch of different projects mostly involving fish and aquatic ecology, those sorts of things.

But yesterday, we were actually deploying one of the monitoring buoys UW Milwaukee just put it out at Bay Beach. We have an ongoing project looking at harmful algal blooms in lower green bay which is a pretty big problem. They're trying to open up Bay Beach to swimming again, and we've been doing monitoring for that for six years or something like that now.

Sound of boat getting in gear.

Our first of five stops was off Cat Island.

Sounds of gulls calling.

Sallak: It's Wednesday, June 19th, 9 am. We're listening to a bunch of seagulls off Cat Island.

Then we visited the pelican colony on Cat Island. The pelicans were very quiet, so there wasn't much to hear, but watching dozens of the prehistoric birds fly overhead was inspiring.

Our third stop was Longtail Point Lighthouse, a crumbling structure on a long sandy point, where something unexpected happened. The Phoenix got beached!

Sound of waves lapping on boat

Houghton: We're beached.

Tyner: Uh oh.

Houghton: Shouldn't be a problem. (Laughs.) Famous last words.

Sallak: We're not going to run out of granola bars? Figure out who we have to eat first?

Tyner laughs

Houghton and Hoffman jumped over the side of the boat and tried to push us off the sandy bottom.

Houghton: If you guys could all move to the front…

I gotta figure out where we're actually beached on the hull.

Sorry you guys…

Zhuikov: Move to the back! Laughs

Sounds of motor on low and sloshing water

Tyner: Up?

Houghton: Yep. Yep. Turn it off. Yep. And then it's actually on the side of this handle.

Tyner: Here?

Houghton: Right there. Up, up, up.

Sound of motor raising.

Houghton: There we go. It's generally not a problem but the seiche can go up and down, like, three feet. Not today, but like, there's definitely going to be like a foot. We don't want to get more stuck than …

Tyner: Yeah. That's okay.

Sallak: And I, I got a couple minutes [of audio] before we ended up having to execute the rescue operation.

Houghton: Yeah, yeah.

Sallak: So, so we can, we can head out now.

Houghton: There's flares and everything if you want to shoot some of those off.

Laughter

Audio captured, we moved onto our next stop, which had the ominous name of Dead Horse Bay. As we recorded, a bald eagle sat in a tree, watching us as songbirds chirped at twittered.

Sounds of birds chirping and twittering

Sallak and I had a conversation about whether he would include human sounds in the audio show.

Zhuikov: So, there's the chainsaw in the background and a plane flew overhead. Do you foresee keeping that in the sound files or do you want it to be nature-made sounds?

Sallak: No, I mean, Emily was mentioning earlier, you know, human interaction is, we're not apart from everything that's going on. And I'm more interested in collecting what's literally here than trying to erase. Now, I mean, you know, if I go record somewhere that's next to a highway, maybe the sound of highway traffic is interesting and maybe it isn't. You know, for the purpose of this project, it's probably not the greatest choice. But no, I'm not, I'm not concerned about human-made sounds, quote, unquote, intruding on this.

Our fifth and final stop was full of human sounds offshore of Bay Beach Amusement Park. You'll hear those later. First, we talked about the research buoy that floated off our bow. Houghton had deployed it only the day before for various partners.

Houghton: Here we're at the Bay Beach monitoring buoy. This is a part of a long-term monitoring program that we have in partnership with UW Milwaukee and UW Green Bay and New Water. We've been monitoring harmful algal blooms, which is cyanobacteria, or it used to be called blue green algae.

And one of the problems that we have in Lower Green Bay is this hypereutrophic conditions that come into the Lower Bay from the Fox River. Those cause algal blooms. And some of those blooms wind up creating something called cyanotoxin, which is poisonous to humans and wildlife.

So, later on in the year, if you were to allow your dog or your kids to swim in Lower Green Bay there's a chance that they could actually be hurt by the cyanotoxin, ingesting that. So, here we have one of the monitoring stations. We come out here weekly to collect water samples to see how much toxin and what the algal biomass is in the water.

But we also have a continuous monitoring station put together by Todd Miller, who's a professor down at UW Milwaukee. It has a number of parameters that it's measuring all the time: conductivity, temperature, dissolved oxygen, cyano-phycocyanin, chlorophyll. So, it's actually measuring the amount of algae that's in the water. It's also measuring nitrogen, which is kind of an interesting sensor. It's got a camera on it, so you can actually access the images from this and the data through a website through UW Milwaukee.

Tyner: Above-water camera or below water?

Houghton: Above. Yeah, so it's actually facing Bay Beach.

Tyner: Oh, cool.

Houghton: And talking to fishermen when we're out, there's a number of these buoys. We actually are working with Mike Zorn to put out buoys around Green Bay as well. And the, the local community, especially fishers, are really interested in these buoys. So, they, they can access the camera and estimate how big the waves are, for instance, or look at like, is there a hypoxia or, or a dead zone that's in the area. So, they can determine do they want to come to the East Shore or the West Shore to go fishing? And that can be really important if your livelihood is dependent on being a guide, this information can be really useful.

All those data are collected, sent to a website. But in the end, the hope is that we can actually model whether or not those blooms are occurring and whether there's harmful algal blooms and that the harmful toxin actually in the water with the end goal of hopefully opening up beaches, right?

It's really hard to predict whether the toxin values are high or low and hopefully we can we can model that because it's difficult to take a water sample in the morning, and it takes at least three hours to get that water sample back. So, you don't necessarily know in real time whether or not the beach should be open or closed. Which is kind of the whole point of it.

Tyner: So, historically there was a swimming beach at Bay Beach. There was like you've seen pictures, right? Of these trampolines, people out swimming in the water. And I was talking to a state legislator yesterday about accessibility of beaches and kind of making more beaches accessible in the lower bay, but of course water quality is an issue. But with the end goal that like this could one day potentially have swimming, not every day probably, but some days if we had the right data information, is really cool and would kind of connect historical Green Bay to present-day Green Bay by reopening this as a swimming beach.

Houghton: Yeah, I've got little kids and I mean it would be really exciting to actually have access to the bay. The closest place for kids to go swimming is probably Bay Shore Park. And it's not much of a beach. It's really small. And it would be really nice, especially for people in the city that might not experience the lake very often to be able to just go down to the park and get their feet wet would be pretty huge for the city. So, I'm looking forward to it. Hopefully we'll get there one day.

Tyner: Until then, boardwalks. I think there's maybe plans, I've heard plans for like a pier, try to get like a fishing pier or a boardwalk. Something that would be getting folks out onto the water, even if it's not in the water, but more experiences kind of into it and on it and above it would be great too.

Houghton: And we also have Renard Island here; there's some master plans that are I think coming together. I don't know when construction, everything's money dependent, but using Renard Island as a dredge spoils facility. So, it's a contaminated bottom, the dredge spoils. And I think they're hoping to put on trails and buildings and maybe an amphitheater, that sort of thing out there. Which is really exciting too, to kind of bring back this area of the lower bay.

Okay. I promised you some human sounds. One of the most noticeable features of the Bay Beach Amusement Park from the water is the Zippin Pippin—a rollercoaster. We watched as the coaster cars made their slow way up to the top of the ride, and then . . .

Sounds from Bay Beach Amusement Park, ride screams!

Sallak has plans to go into the courtyard in the middle of the ride and get a recording for this project.

With audio captured, we motored back to the marina. There's nothing like spending a morning on the water, even if it involved getting beached.

Stay tuned for information regarding the debut in fall of 2024 of the sounds of Green Bay. The best way to get notified is to sign up for Wisconsin Sea Grant's news stories. Simply go to our website, which is seagrant.wisc.edu. Under the "news" tab, choose the "signup for enews" link and enter your email address.

That's it for this episode of Wisconsin Water News, just one of the ways that Wisconsin Sea Grant promotes the sustainable use of Great Lakes resources through research, education and outreach. Listen and subscribe to us through I-Tunes and Google Play or at seagrant.wisc.edu. Thanks goes to Emily Tyner, Bill Sallak, Chris Houghton and Jacob Hoffman. And thank you for listening.