Episode 5: Horseshoe Crabs Featuring Mark Botton (MB) and Christina Colón (CC)

Hosted by Helen Cheng (HC)

Air Date: October 2017

Following the tides, living fossils crawl into the shallow waters of the beach. It's an annual spectacle that has happened since the age of the dinosaurs. A learned person steps carefully and observes gently. Welcome to Jamaica Bay.

-Music-

You're listening to Jamaica Bay, a podcast series bringing you stories of the people that work, live, and play in Jamaica Bay, New York City. I'm your host, Helen Cheng. And I'm from the Science and Resilience Institute at Jamaica Bay and New York Sea Grant.

-Music-

Plumb Beach is an interesting place. Right off the Belt Parkway Highway, the beach has some amazing wildlife. I went to the beach and had the opportunity to participate in some on-going research.

But I had to find the researchers first…

HC: "You may or may not hear it but I'm right next to the busy Belt parkway and there's like maybe a few meters between the highway and the beach so it's pretty remarkable. This is a large beach so we'll see if I can find somebody who looks like they're doing research."

I was looking for Mark Botton, a professor of Biology from Fordham University – Lincoln Center, and Christina Colon, a professor of Biology from City University of New York: Kingsborough Community College.

-Sounds of mallets and chatter-

I found them, along with a group of students helping with their research.

CC: "…Take one through five…"

HC: "Can you explain what they're doing?"

CC: "Yea, so what we're doing here is surveying this quadrat, this grid, of the beach for horseshoe crab eggs."

Horseshoe crabs have existed and remained unchanged for more than 450 million years – that means existing since the age of the dinosaurs. They are important members of the Jamaica Bay estuary, providing a source of food for migratory birds and creating new habitat for other animals by burying into the sand.

Using a rubber mallet and a little bit of a PVC pipe, Christina and her students were collecting plugs of sand in different areas of the Plumb Beach.

CC: “So we collect those plugs of the sand, we take them back to the laboratory and then each one we survey and sift for how many eggs are in there and we record that data year after year so it gives us an index.”

Every late spring, horseshoe crabs crawl into the shallow waters of Jamaica Bay to mate and lay eggs in the sand.

MB: “You know, you think about the great animal migrations, the Serengeti, or something like that, yet we have one of these spectacular migrations occurring right here in the city and for people who might not ever have the chance to witness mass spawning events that occur elsewhere in the world, there’s something right here that you can see that is quite spectacular.”

Horseshoe crabs are also important to humans. Their blood is able to test for bacterial contamination in pharmaceutical drugs and vaccines. So if you’ve ever gotten a flu shot, thank a horseshoe crab for making sure it was safe.

Horseshoe crabs are harvested for their blood as well as a source of bait for several fisheries.

MB: “Although they don’t do that – this is all National Park Service area so there’s no legal catch permitted here on this beach.”

Mark and Christina have been looking at horseshoe crabs at Plumb Beach for several years now. In addition to the understanding the population of horseshoe crabs, they are also studying their habitat.

MB: “So the main reason we are doing this particular project is because in 2012 at the western end, the beach was severely eroded and there was basically a serious threat of undercutting the Belt Parkway. It had started to erode badly and they had put some sand bags and rubble and stuff like that on the beach.”

We were at the eastern end of Plumb Beach, making our way west, collecting sand.

MB: “And this area, although it’s not really a natural beach, it’s a more natural beach – less disturbed.”

To prevent further erosion, in 2012 there was an enormous amount of new sand placed on the western end by government agencies.

MB: “So we have really sort of a nice before-after control type study where we know what the other end looked like before they did the restoration, we know what this area stayed relatively constant, so what we are looking at is whether or not the crabs respond to this beach nourishment and have they come back in numbers that are comparable to the undisturbed area. “

After about 5 years of this study, the researchers found that horseshoe crabs still prefer to mate on the natural - undistributed beaches.

MB: “So I think it has to do with the type, the texture of the sand that was put back is not really as suitable as the sand that’s accumulating here.”

To assist with this multi-year project, students have been participating in the research.

CC: “It’s a great project to do with these undergrads because they get to collect real field data, they’re participating in a long term research project so this is their civic engagement experience contributing to the solution of a local community problem.”

MB: “It also is a good learning tool to show students who are from an urban area that there’s actually some pretty neat ecology right in their own backyards.” HC: “Yeah, absolutely.”

The students seem to agree.

Student 1: “This my second time coming here, to Plumb Beach, and it’s awesome.” HC: “Yea, so why is it awesome?” Student 1: “I mean, not every day you get to come out and look for horseshoe crabs – I didn’t even know what a horseshoe crab was before I even came out here - I didn’t know what it even look like until I Googled it. But it’s like nice, you know you pick it up. At first it looks creepy, it looks like vicious, but it’s like harmless. And also they’re very important to our everyday lives. They’re very beneficial to us.”

Student 2: “How many classes can you say let you actually go outdoors and do something? So there’s that and I feel like it kind of gives you some experience in the field like what the proper protocol and procedure is. So for students, it gives them good experience.”

HC: “What is it that you like about coming out here and helping out with the research?” Student 3: “It’s interesting, I mean it’s also something to do, something to get out. I didn’t know there were so many opportunities for citizen science and then now that I took her ecology class and really I can see that there’s a lot opportunities and there’s a lot that us random civilians can do and find research. It’s cool, you’re more involved.”

They also agreed that this experience will help them in the future.

HC: “So do you think being out here is going to help you with that next step?”

Student 4: “Yea, because I learned about the protocols about research project, anything from size of the area you’re studying to time, all the little important details that it’s my first experience dealing with.”

Student 3: “Knowing about the bigger picture is very important and it’s interesting. Being actually able to participate in it and do research on it is great.”

Student 1: “It’s kind of opened my mind to trying to hopefully join more research programs over the summer.”

Student 2: “What I want to do in the future is something that focuses on lab work, doing lab work and field work. I’m not sure exactly what since biology is like a broad field.” HC: “And do you think this experience will help you put you wherever you want to be?” Student 2: “I think so.”

It was great being out with this group of people contributing to a great cause. Despite their prehistoric appearance, horseshoe crabs can connect people to place.

MB: “So I mean, a lot of people kind of are attuned to the importance of the animal and I think there is generally respect for it. I see people who might not otherwise know much about the animal, come along and overturn the ones that are flipped over and rescue them.”

MB: “Horseshoe crabs have been around for 400 and some odd million years. So you have animals that really have been survivors that persist even now in these urban locations as well as in more pristine areas. And so throughout the world, there are people that are concerned about the declining numbers of horseshoe crabs, what might be the cause, and what might be some steps that people can take to try to keep these animals from seeing their numbers go even lower.”

-Music-

MB: I mean, horseshoe crabs are, I think something that reminds of me of the spirit of New York itself; a tough survivor, not necessarily the prettiest animal out there, but something that is resilient over time. Jamaica Bay is obviously a very urbanized location. They’re sort of symbolic I think of an urban ecology.

-Music-

Many thanks to Mark Botton, Christina Colón, and their students.