

Elasmobranchology with MISS_Elasmo Shark Scientists

Ologies Podcast

July 19, 2021

Oh heey, it's this lady who's technically on sort of a honeymoon but had to. I *had* to put out this bonus minisode because it's Shark Week and you need to know these people. First off, if you need more shark facts, the very last episode in the *Ologies* queue is the encore presentation of Selachimorphology with Dr. Chris Lowe.

We did that episode originally in 2018, but in 2020, a great group of sharksperts banded together to form Minorities in Shark Sciences. And I was like, "Nuts! I've already covered sharks!" But! Shark science can also be called Elasmobranchology, coming from the Greek for "these fish have, like, metal plates for gills." It means 'metal plates'! New information is published all the time and it's never a bad day to make new friends.

Speaking of which, real quick, thanks to all our pals at [Patreon.com/Ologies](https://www.patreon.com/Ologies) for supporting the show and sending in questions for the episodes. Thanks to everyone keeping *Ologies* up in the science charts. It's #2 this week despite taking a little time off to get nuptialed to your PodMom Jarrett. And thanks to everyone leaving for reviews, of which I read all before fishing a freshie up to read, like this week's from Indie Abbey Jones, who wrote:

Five stars. Each ologist that Alie has on is wonderful and so passionate about their field expertise. It has encouraged me to go back to college this fall and finish my degree in plant science. Thanks, Dad!

That leaves me feeling great. Also, congrats to Talia B-E on your also July 10th wedding, you hot nerds!

Okay, Elasmobranchology. Let's get into it. You're about to meet three women in shark science who will soon have the keys to your heart. Scientist Jaida Elcock doles out some fishy facts and a bunch of shark riddles @SoFishtication on Twitter and on TikTok. Jasmin Graham, aka @Elasmo_Gal, is a shark conservationist and a sawfish researcher. And Amani Webber-Schultz is tweeting from her @Curly_Biologist handle as a different shark species every day during this, the holy week of shark. She's also the co-host of the podcast *Sharkpedia* alongside Meghan Holst, and you may know her from the #HowItPants. Highly encourage you to look at that.

So just get ready for three of the Minorities in Shark Science ladies to dish up fieldwork stories, and boat mishaps, fun facts, breaking news, weird eyeballs, best and worst shark media, and more, with this, a special bonus Shark Week episode with the Minorities in Shark Science Elasmobranchologists.

Jaida Elcock: Hello, hello! My name is Jaida Elcock; I use she/her pronouns. I am a PhD student at the MIT Woods Hole Oceanographic Institution Joint Program, and I study elasmobranch movement ecology and habitat use. More specifically, I am interested in looking at how sharks use the ocean ecosystems and environments to interact with the things around them. I'm interested in seeing how they use fronts, and eddies, and things like that to their advantage in finding prey, or in migration, and all kinds of things like that because there's so many mysteries surrounding sharks and I think that there are so many cool questions to be answered.

So, I'm really interested in looking at these, kind of, fine-scale things. I guess the way I think about it is... I say this all the time. If you've ever seen a stranger on the street, you just kind of wonder, "Who is this person? How are they interacting with their daily life? Do they need to take the bus today? Do they have kids that they need to go pick up? Are they going to the grocery store?" Those are the kinds of things that I also tend to apply to sharks, thinking, "How are you using the world to your advantage?" So that's what I'm interested in; that's what I'm looking to study, and I'm very excited to get started.

Aside: Just think of all the questions you could ask a shark. "Do you mind fish hitching a ride on your body? Do you know when it's your birthday? Are you a morning shark? Are you a night fish? Do sharks have any hobbies? Are you ever jealous of animals with shells?" So many questions lurking in the deep sea!

Jaida: On to what I love most about sharks. It's the diversity of the shark world. There are so many of them, they fill so many niches. Some are big, some are small, some are sleek, some are clunky, and they are *literally* everywhere. They started evolving over 400 million years ago and now they've taken over the entire ocean and have become such an essential part of keeping our ocean ecosystems healthy. And I cannot possibly have more admiration for that. They're everywhere! It's just so cool to think about the fact that they found a way to fill so many different niches and have evolved into so many different ridiculous-looking forms. I just can't get enough of it. They're so cool. Shark evolution is wild. I love them.

So, one of my fun facts about them is that you are more likely to be killed by a flying champagne cork, a falling coconut, a lightning strike, a cow, or a vending machine than you are to be killed by a shark. These are things that – aside from a lightning strike – that I wouldn't necessarily be afraid of and maybe wouldn't even really think about. I don't even remember the last time I encountered a vending machine. The fact that that's more likely to kill me than a shark is kind of astonishing.

Aside: For more on lightning, see the Fulminology episode from September of 2020. Also, I could do a whole episode on vending machines. Did you know the first vending machine came into existence right after the turn of the Common Era, 2,000 years ago? And it was used to dispense holy water in exchange for coins. That doesn't seem above board! Also, there are between eight and ten million vending machines in the US, and in some of them you can buy live worms.

Anyway, all vending machines are evil. They want to kill you and devour your still-beating heart. More so than sharks, is the point.

Jaida: But these are all things that potentially we would encounter in our daily life, and yet we fear one of the most essential parts of our oceans more than we fear these daily things. Which is weird to me because so many people will never come into contact with a shark aside from in, like, an aquarium. So, I understand why some people are afraid of sharks. They're big and they have sharp teeth. But what we have to remember, and as much as it pains me to say this, as much as I want them to care about me, they don't care about us. ["Wow... *That really hurts.*"] They have no interest in us whatsoever. They don't care that you exist.

So, while I think that a healthy fear is fine, we have to make sure that we're keeping the respect that we should have for them and their ecosystems. Again, they're just too important for us to keep making them out to be villains. So what I'm trying to say is: Give sharks a break and thank them for keeping our ocean ecosystem so healthy.

Next time you see a shark at an aquarium, wave at it, blow it a kiss, tell it thank you, because they're doing some awesome work out here. (I hope that was good!)

Aside: Good?! It was great, Jaida! And for anyone who is on TikTok and needs more fish and shark facts in your life, get @SoFishtication on your page, people. Sharks don't give a rip about you. But Jaida cares about you caring about them, and I care about that.

Next up is shark scientist and environmental educator Jasmin Graham, and then I do airhorns with my mouth, like *hau-hau-hau*. Yay.

Jasmin Graham: Hi everyone, my name is Jasmin Graham. My pronouns are she/her, and I am the President and CEO of Minorities in Shark Sciences, also known as MISS.

Some of my favorite facts about sharks... My first one is that bonnetheads are the only known omnivorous shark, meaning that they eat fish, crustaceans, but also seagrass. They like to have a little side salad with their fish. I think that's a really fun fact.

Aside: I looked them up, and bonnethead sharks, they look like if a shark wanted to get a haircut hammerhead style but chickened out, and just played it safe, and went only halfway there. They're also called shovelhead sharks and they're a member of the hammerhead genus. But yes, their heads look like a shovel, or a bonnet, or something that we would have discussed on the Phallology episode. Hm.

Onward.

Jasmin: Another fun fact is that when sand tiger sharks are developing, they actually swim into the other uterus and eat their sibling. I think that's super metal. That's very intense. Who does that? They do. [*"It's nothing more than sibling rivalry."*]

And let's see... Some of my favorite field stories... One time I was driving the boat, we were hauling in a longline, we caught a lemon shark...

Aside: PS: longline fishing means a line that has several hooks attached and shark researchers do catch and release. And drum fishing, by the by, involves a floating buoy with a baited hook. Again: Catch, Science, Release.

But yes, she was hauling in a longline and caught a lemon shark, which, if you're wondering, "Is that a little bit yellow?" it is. It's that kind of sunny color to blend into the sandy seafloor.

Jasmin: Lemon sharks tend to want to bite things. This particular lemon shark decided that it wanted to bite our hydraulic steering line and bit through it. Hydraulic steering fluid went everywhere. I had to drive the rest of the day with only one engine because the poor engine was no longer steering anymore. So, that was fun. That's the story of how a shark destroyed our engine.

Another time we were bringing in a tiger shark, and tiger sharks tend to throw up when they get stressed, which I relate to. And it threw up a hunk of what we think is manatee, and it was the most rank thing that I have ever smelled. And I'm pretty sure everyone wanted to throw up. And it smelled like that all day and we couldn't figure out why until we got back to the dock and we discovered that there was a chunk of what we think was manatee on our boat. That was gross. So, those are two of my favorite field stories.

Aside: If you need to know, Jasmin and everyone, I was editing this while I was eating a giant sandwich and it was very sensually conflicting for me.

Jasmin: What I love most about sharks is that they're just so unique. There's so many different species. They're so different from each other. They've been around a long time. They have these weird adaptations that really just make me marvel at how incredibly evolution works and how all of this is just from random mutations. They're so well adapted. It's pretty wild to see creatures that have been on the earth so long that they have really maximized their potential in very unexpected ways.

Aside: Any favorite or least favorite pop cultural sharks?

Jasmin: My favorite shark movie is *Deep Blue Sea* because it's so ridiculous. The science is so ridiculous that it's hilarious. It is genetically modified sharks, which I think is a very interesting take on things. I liked that in the movie they talk about how the natural order of sharks, they're not aggressive, they're not doing all these things. So they set the stage and say, "We're going to make this movie, but we're going to acknowledge that sharks aren't actually like this. This is a very special situation where someone has really messed with these sharks and that's why they're acting like that."

It's one of those movies that really makes you root for the shark because they have been done wrong and I relate. Also, the greatest scene ever where Samuel L. Jackson is giving an impassioned speech... [*Sam L. Jackson from Deep Blue Sea: "We're going to pull together, and we're going to find a way to get out of here!"*] ... and then gets eaten by a shark. It's hilarious. The greatest moment in cinematic history, in my opinion.

So yeah, that's what I have to say about sharks.

Aside: What about Minorities in Shark Science?

Jasmin: We are an organization dedicated to supporting women of color interested in shark science and we want everyone to get an appreciation for sharks. There is a misconception that sharks are these man-eating, mindless killing machines and that is not true. Sharks are extremely intelligent. They're actually more discerning in what they want to eat than what we give them credit for in movies and things like that. They're not aggressive. They're actually more afraid of us than we are of them, which they should be because we kill millions of sharks a year and only one or two people a year are killed by sharks.

Aside: It's true. The 2020 shark chomp report, it's a real snooze, to be honest! Not a lot going on. These facts are, like, sleepy at best. 33 people in the US got bitten by sharks last year; three fatally. Only ten fatalities worldwide from sharks. What??!

So how many sharks die by human hands each year? Well, the journal *Marine Policy* estimates 100 million.

Jasmin: So, in this scenario, definitely the sharks have a bigger reason to be afraid of us. That's really what I want people to take away from all the outreach and education that I do, that sharks are just like any other animals. They're just out here trying to survive, and they need our help because we are killing them at an alarming rate. Some of them are endangered. Many of them are threatened. And it's important that we think about what it would mean for the ecosystem if we were to take these apex and meso predators out of our systems. That is why I study sharks.

Aside: And that is why Jasmin and MISS are amazing. Because of that, we'll be giving an honorarium to each of these scientists for their outreach and inclusion and also another donation to Minorities in Shark Science to continue to provide support and visibility to scientists.

Big shout out also to Carlee Jackson, another co-founder of the organization whose handles are linked in the show notes. And big thanks to the following *Ologies* sponsors for making those donations possible.

[Ad Break]

Okay, one more sharkspert for you to meet.

Amani Webber-Schultz: Hi everyone. My name is Amani Webber-Schultz. My pronouns are she and her. I think what I love most about sharks and what I find the most interesting about them is the crazy diversity of adaptations that they have evolved over the millions of years that they've been alive.

We have bull sharks that can go from saltwater to freshwater and back to saltwater. We have basking sharks that, for some reason, breach out of the water, and do that even though they are the second largest fish in the world. We have sharks that have adapted to be able to see in super low light. We have goblin sharks with their slingshot jaws. There's all these crazy adaptations that they've evolved to have, and I'm so curious about the reasoning behind that, what adaptations we don't even know about.

There's 500 species of sharks. There's no way that we know all of the adaptations they have developed, and there's so much room to be curious about that. And that also just makes them super cool. I think we can all agree that sharks are super cool for the crazy adaptations that they have.

Aside: Yes. Agreed. Also a fact: Amani is cool.

Amani: I will be starting a PhD at the New Jersey Institution of Technology in September. What I am super interested in is morphology; form, function, why a shark's body is shaped the way it is, what on the shark's body allows it to move throughout the water so easily. In general, why does the shark look like this? What on this shark is making it so they can go about their life in the way that they do? What is the reasoning behind that? Why is that advantageous to them? So, I'm super excited to explore research. I am especially interested in shark skin. The scientific term for shark skin is dermal denticles...

Aside: I looked them up, and under an electron-scanning microscope, these teeth-like placoid scales look like really cool, overlapping, grooved tiles. So tiny! Also, just imagine having skin made of teeth. You have skin made of teeth! You have to respect these shy beasts.

Amani: I know that is a huge mouthful. I'll say it again. Dermal denticles. And that is the name for scales specifically on elasmobranchs. I am super curious about them because they are very, very cool under a CT scanner. They are shaped differently and they reduce drag really well for sharks. They vary in shape and size across a single shark but also across multiple species of sharks. Why do their scales look different depending on the shark? Why do they vary across the body? What is the reasoning behind this? I will talk about shark skin all day. So, I'm super interested in morphology, specifically shark skin.

Aside: What is it like for Amani to be an elasmobranchologist? Can you imagine being in a bar and someone's like, "Meet my friend. She is a shark scientist."? I would be there until last call begging for field stories.

Amani: I think the field story that always comes to mind for me first, is one, the first time I saw a great hammerhead. I was not expecting it. We were offshore, drum lining off the coast of Miami. And you know, we're pulling up this drumline, it's in 70-80 feet of water. We get to

the monofilament, we're hauling the monofilament in, and all of a sudden this huge dorsal fin just pops out of the water. All of the staff on the boat is like, "There's only one species that comes up to the surface like that and does all these turns that it's doing, and that's a hammerhead."

To be around a creature that is that large is humbling and also just... the adrenaline that was going through my body was crazy. I'd never seen one before, I'd never seen their crazy head. Never seen their giant dorsal fin. I was in awe the entire time and I probably had a smile on my face for the next 24 hours.

I think the other field story I want to mention is the first time that I saw a sawfish.

Aside: I was like, "What do sawfish look like?" Oh... like a fish with a chainsaw for a face. Which is perhaps why they're also called carpenter fish sometimes. They can get up to 25 feet long, and have I mentioned that their face looks like a hedge trimmer? Even sharks are like, "That's too nuts to even be one of us."

Amani: Sawfish are not sharks. They are rays. And they are super endangered. They are critically endangered. They were the first species put on the Endangered Species Act.

We were longlining in Miami and we caught a sawfish. To work up sawfish, you have to have all these special permits. We had the permits for that. And seeing the rostrum, which is the saw part of the sawfish, was crazy. They look funny just, like, in pictures, but in person it is so cool to see this rostrum with these teeth sticking out and just seeing how weird this ray looks. I was in complete awe of this species. Both of those field stories are times that I am likely to never forget.

Aside: And neither will we. And now, let's burn some trivia into your brains.

Amani: Fun facts. I love talking about fun facts. There are so many of them, I don't know which ones to pick. I'm going to start with the one that relates closest to the things that I'm interested in, shark skin.

So, a paper came out in 2020 that basically showed that whale sharks have eye denticles on their eye. So, they actually have dermal denticles, which is what is on their skin. They have that on the eyeball, which is super cool because other sharks have that on their nictitating membrane, which is the little eyelid that you'll see go down... I think most people have probably seen this on great white sharks, this little membrane that will come up and cover their eyes, kind of like our eyelids that cover ours.

Whale sharks do not have a nictitating membrane. They do have the denticles, though, directly on their eye, which is super cool and super weird. And because this is such a new discovery, we don't actually know why. We can only guess as to why.

Aside: For more on this, see the 2020 paper titled "Armored eyes of the whale shark" by a research team in Okinawa, whose work will change your small talk forever.

Amani: And the other thing that this paper showed is that they can, basically, retract and move their eye into their skull. [*Come again?*] They can move the eye about halfway into their skull, which is really weird. We currently don't know of any other sharks that do that, so that was another amazing discovery.

Aside: So yes, if anyone tries to say that some sharks can't retract their eyeballs, you say, "Ha! That is not flimflam. I heard it from a shark expert."

Now, what are some sharky myths?

Amani: Flimflam to debunk! All of the flimflam! Every flimflam ever in any shark documentary, that is what I want to debunk.

I think the one that I really want to point out that bothers me the most is when someone says, "A shark can smell your blood from a mile away," as if, if you get in the water and let's say you cut yourself on a coral or something like that, and as soon as your blood touches the water the shark is like, "There is human blood in the water. I'm going to go find it!"

Their noses work the same way that ours does. A particle of that blood needs to actually get into their nose for them to smell it. So, if you're sitting, you know, up current from a shark, it has to float all the way down that current to their nose. So if you're in the water, I guess maybe as long as a particle floats into their nose, they could smell it from a mile away. But they cannot smell it from the instant it gets into the water. They do not have a little lightbulb or pointy arrow on the top of their head that's just going around in a circle to point out if there's blood in the water.

So ask shark experts bloody good questions because that's the only way you'll ever truly appreciate life on this tiny, tiny spinning marble.

Also, add these items to your to-do list. Follow Minorities in Shark Science at [@MISS ElasmO](#). Follow Jaida Elcock on [Twitter](#), [Instagram](#), and [TikTok](#) @SoFishtication. Follow Jasmin Graham [@ElasmO Gal](#). Follow Amani Webber-Schultz [@Curly Biologist](#). Check out [#HowItPants](#). Those links are all in the show notes as well as a link to [Minorities in Shark Science](#) and the previous full episode about [sharks with Dr. Chris Lowe](#), just chock-a-block with shark facts.

We are @Ologies on [Instagram](#) and [Twitter](#). Also, feel free to tweet @Jeopardy and tell them I want to come on the show and I want to read some clues and answers to their category -Ologies. I mean, come on! C'mon *Jeopardy*, put me in the game! Also, I'm @AlieWard on [Instagram](#) and [Twitter](#). Thank you, Erin Talbert, for adminning the *Ologies* Podcast [Facebook group](#). Hello to everyone on the *Ologies* [Discords](#) and [subreddits](#). Hi!

Ologies merch is available at [OlogiesMerch.com](#), thanks to Boni Dutch and Shannon Feltus for managing that. Thank you to Noel Dilworth for scheduling interviews, gathering these assets for this last-minute but very important shark minisode. Thanks, Susan Hale, for handling the books and some great 'grams. Emily White of the Wordary transcribes these professionally for accessibility and for anyone to download for free at [AlieWard.com/Ologies-Extras](#). Bleeped episodes are also available, and Caleb Patton does our bleeping.

Thank you to editor and fresh, shiny, hunky husband Jarrett Sleeper, aka your PodMom. And thanks to long-time help Steven Ray Morris who hosts *The Purrrcast* and *See Jurassic Right*.

And if you stick around to the end of the episode, I divulge some kind of secret, and this one, since Jarrett and I just got married a few days ago, might as well be wedding related. It's that we had a keg of kombucha leftover. That's right, we got more than one keg of kombucha for our wedding. Did everyone drink it? No, but we loved it. It was from the wonderful Sage Bistro and Brewery. And we had a keg leftover in our garage. Jarrett and I were like, "Let's crack this thing." We tried to open it in the kitchen, both of us opting just to wing it instead of googling 'how to tap a keg'. And I'm going to make this story short, but... We have to repaint our kitchen ceiling.

Okay, berbye.

Transcribed by Emily White at TheWordary.com

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