Hey to all you fish enthusiasts out there. Whether you're an avid angler or just curious about fish, we'd like to welcome you to Fish of the Week!, your audio almanac of all the fish. It's Monday, June 19 2023. We're on a week by week tour of fish across the country with guests from all walks of life. I'm Katrina Liebich with the US Fish and Wildlife Service in Alaska,

and I'm Guy Eroh. This week, we've got a bit of an obscure fish for you, a little bit of a deep dive, if you will. We're talking about the Mariana Snailfish.

Awesome, and I'm very pleased to introduce our guests. Dr. Alan Jamieson is a deep sea scientist with the University of Western Australia. He's a leader in the biological exploration of the oceans hadal zone, which is basically ultra deep. We're also pleased to have Jihan Younis who's a US Fish and Wildlife Service park ranger and a visitor center services specialist for the Mariana Trench Marine National Monument. Really glad we could make the time zones work and a very warm welcome to both of you. So I love that we're going to be learning about this place somewhere that very few people ever get to go in their lifetime. Jihan we were hoping you could help ground us in terms of where you are, and where that is in relationship to the Mariana Trench. And then I have a follow up question for you, Alan, to help us actually. Imagine going beneath the surface as we start so we can understand where these fish are exactly.

All right, thank you so much. Håfa Adai everyone. I am Jihan Younis. I am a Saipan native. Saipan is part of a chain of 15 islands in the Marianas archipelago. And so the Mariana Trench Marine National Monument includes three units, one being the Islands Unit, which includes the three northern most islands of the Marianas, which is Farallon de Pajaros, also known in our native tongue, which is Chamorro, the Island of Maug, and also the island of Asuncion. The Islands Unit also includes three underwater sea mounts, which is Northwest Eifuku and the Ahyi Seamount seamounts. In the volcanic unit, we have 18 underwater volcanos, which are part of the Arc of Fire National Wildlife Refuge. And then within the Trench Unit, we have containing this emergency floor and lands from the Northern Limit of CMNIs [Commonwealth of the Northern Mariana Islands] exclusive economic zone to the southern limit of Guam's exclusive economic zone. And within the Trench Unit, we have the second deepest point, which is about 35,000 feet deep compared to Challenger Deep. I hope that gives you some reference to the area that we are at, which is the Western Pacific.

Western Pacific. Okay.

And the trench itself, I think it's like 1500 miles long, and then 44 wide or something like that...I mean, it's this is a big area were speaking about. And so

I calculated once that the volume of the trench is roughly the same volume as the Himalaya.

Wow.

There's roughly speaking about the same. So if you turned it upside down, it's essentially the Himalaya.

Yeah. So we always tell kids that, you know, the whole Mount Everest can fit in the Mariana Trench, with almost a mile to spare.

Amazing!

And if I look out my window right now, I'm looking at our tallest mountain here on Saipan. It's called Mount Tapochau. And so we like to tell our kids that you're standing on the tallest mountain in the world, below sea level.

Yeah, jetliners are like flying at that altitude, it's crazy to invert that. Now, Alan, kind of follow up for you. Now we're oriented, where we're going if we're at the surface, and we're actually going to dive our way down to the hadal depth, like, what is that like, what kind of gear we're going to need? I assume we're gonna need like some kind of special submersible to be in? If you could help us imagine getting down to depth where these fish are, I'd love to hear that.

Yeah. So if you want to go down, personally, then you need a submersible. And there are currently only two in the world that can go to those depths. So the Chinese have one that came online about a year ago, maybe, and we've been using one for about four years now. And it's very cramped, it's not a particularly nice experience. But you get used to it, it's kind of cool, but it's basically a two people in a titanium ball which is not much bigger than two people. And it has lots of buoyancy to bring it back at the end and has lots of weights to sink it and we have lights and cameras and thrusters and to get to that depth takes a long time. So we will be getting in the submarine and we get towed by the ship for maybe half an hour or two. We're on the launch point. And then they let us go and you leave the surface pretty quickly. And so the light diminishes very fast and just basically something like turning the dimmer switch and then it's just black. And then you basically sat there for four hours on the way down. So to get to Serenity, for example, takes just over four hours. And essentially freefall is is incredibly deep. And all the time you can see stuff coming past the viewport. This idea that the deep waters are somehow empty and void of life is not true, there's life all the way down. And then you finally get to the bottom and our submarine tends to slow down as you get deeper because the sea water density increases. So the last half hour seems to go on forever, because you just want to see the seafloor, and it just seems to take forever before it finally comes out of the darkness. And you see this seascape, which is strangely majestic. It's very humble, it's very quiet. Think perhaps sometimes when people think deep sea the imagination implants a lot of false images. But actually, even the deepest part on the planet is actually really quite tranquil. And you know, it's a real privilege to be able to do it sometime.

So you've been down there.

I have, yes. I've been to Sirena Deep, actually. So I did 35,000 feet, but four years ago. We've done about 16 dives. Since then, I also went to the bottom of the Philippine Trench, which was about the same depth. There are moments where it becomes quite surreal, where you can be sitting at the end of the dive. For example, we're in Serenity, we just sat the sub down on the bottom and sat and ate a bag of Doritos. And just took a moment just, you know, just sat down, like two old guys on a park bench. Sit there and then you realize you're seven miles underneath the ship. And when you leave the bottom there, you get a big sort of come down, your adrenals are like "oof" right? And you just have to wait.

And you know, so normally I take a couple of test tubes that are full of espresso, shots of espresso, with as much sugar as you can get. Yeah, you know, and you have this cool test tube of coffee, gives you a little perk, and then you can back up again. So it's very surreal. It's not for everybody. But it's worth it. Totally worth it.

Wow that's awesome.

Amazing.

So we do got to bust in and talk about the snailfish at some point. So I might as well go ahead and ask the question. What in the world is a snailfish and then what makes this one stand out from the rest because I think there's a lot more shallow water species in there are these deep sea ones, right?

That are, and I'm going to ruin something that you just said. But I'll leave that for a second. So the snailfish are amazing. They are the in terms of the family, a parody. They are the deepest family in the world by at least 1000 meters. They're not just a little bit deeper than other groups. They're quite significantly deeper. But what I love about them is that they're not a deep sea fish. That family, most of them are shallow water, you get them up estuaries and lagoons and places like that, you know, and they're currently radiating evolutionarily so that there are something like between three or 400 species of snailfish, they just don't care. They just overtaken all the old deep sea fish, and they've gone right down there. And then obviously, the Mariana Trench has a sailfish. And it lives at around depths between six and a half to 8000 meters. And it's just incredibly well adapted for high pressure, because one of the things that has to overcome obviously, those depths, there's pressure of 800 atmospheres, which is extraordinary. It also has to cope with a total lack of sunlight, very, very little food, the temperature is maybe 1.8 degrees Celsius, so it's super cold. And yet, every single time you put a camera down to those depths they are just doing fishy stuff just like this, like they just don't care. They're amazing.

What would it actually be like if we could hold this fish while it's alive? What would it be like?

Well, the first thing is a lot of people think that in the darkest depths of the ocean, things are going to be big. It's always really disappointing to tell people that they're not, they're really small, because there's no food there. There's no food to sustain a large animal. And so snailfish tend to be around maximum size, maybe 25 centimeters, which is I don't know, whatever that is, about 12 inches, 10 inches, something like that. And those are the relatively big ones. A lot of them are half that size. They're kind of pinky color, but they're actually transparent. So when you have them in your hands, you can see the white muscle and you can see the liver. When you film them on the water, you can almost see this orange coloring on its belly. That's actually its liver. It's not an external marking. And when you turn the females upside down, and you can see all of the eggs in there and you can see the skull up close. From a scientific point of view, there's a real problem with snailfish in that when you land them, and to be honest, we would rarely catch more than one or two at a time. Once they're on the deck, you got to get them in the cold. Quickly, quickly quickly. Like we're talking within minutes because they use this gel on the outside. The vehicle we brought them up in has gone through the surface water and around Mariana the surface water can be 20-30 Celsius. And so for that last 20 minutes, we're trying to get the

thing on board these fish are essentially cooking because they're supposed to be nearly freezing point. So when it comes on board, you have to chill and basically the skin just starts to fall off them, they start to just fall apart. And they're really super fragile. And when we finally taken a couple of biopsies and a couple of samples or whatever, and you put them in a jar of ethanol to preserve them, unfortunately, they just shrivel up into this yellow blob. And so a lot of people will come into our place and go, "Oh, you know, can you show me the Mariana Snailfish?" and you bring it out and they go "Ew."

I was going to ask if you had any jars of Mariana Snailfish that I could show my kids over here at the contact station.

Yes, I believe all of the original ones we caught are actually on Hawaii. And I can give you the number of the guy who's got them. So I think there's at least 45 Mariana Snailfish on Hawaii, which I'm pretty sure that they would love to send over.

Great, thank you. 50 million acres of the trench itself is unknown to us. And growing up here in the Marianas, we didn't learn about our backyard, you know, the Mariana Trench. We learn about the 50 states and the Great Lakes and Chesapeake Bay. So I'm still learning and it's exciting to be bringing a lot of this education to our community, and making a lot of those local connections to the Marianas.

Great. Very cool. Do you have Is there a local term for a Snailfish that you could tell us?

We still don't have local names, right? Translated into both the native cultures we have here, the Chamorro language and the Refaluwasch language. And so even right now we're doing a naming of a newly discovered like volcanoes that are found in the Mariana forearc that's between the trench and the islands. So we have about 19 active Mud Volcanoes that occur there. And there were three unnamed ones. And right now we're doing a naming contest with the local community to name them in our indigenous language. And so with the Mariana snailfish, it would be cool to try and get some kind of local naming for snailfish.

Yeah, yeah.

I'm trying to imagine what it would be like to have to withstand the pressure down there. What would happen to a person or a surface animal if they were down at that depth, and likewise, what would happen to the fish if it was up at the surface?

Well, nothing happens to the fish on the way up. Because the reason why humans would don't want to go deep is because your lungs will collapse. And so to compress or decompress in a violent kind of way, you need to have a gas cavity in you somewhere, a balloon somewhere to explode. What the snailfish have done is they don't have swim bladders. So most fish have some sort of swim bladder for buoyancy. The reason why the snailfish is so good at high pressure is they don't have that. So they've got nothing to explode on the way up. So what they do is rather than using a gas bladder for buoyancy, they've got rid of all their skin and scales and decided to use gel so they get buoyancy off of their exterior surfaces. And their bone density is vastly reduced. They're evolved different adaptations to

maintain neutral buoyancy. I don't know if you know this, but it's actually no longer the deepest fish in the world.

I did read that.

I read that article

And you found that other one right in a different trench?

Yes, it did. Yeah. Yeah. Unfortunately, the Mariana lost its prestige about six months ago. But it's not such a bad story. We found another snailfish in the trench north of Mariana in the Ogasawara Trench. And it's about 150 meters deeper, but, hot off the press. We haven't told anyone this yet. Genetically, a lot of these snailfish we're finding and Nansei-Shoto Trench or Philippine trench or Japan, or Ogasawara or Mariana. The genetic difference between them is so small, that we're kind of sitting on the fence here going, "are these actually all different species or are these all exactly the same thing?"

I was gonna ask if there's any, like mixing...if they hop trenches at all...

We thought they don't do that, because with a minimum depth of 6500 meters, the sills between each trench are much shallower than that so they cannot get over and back down again. And actually, from that perspective, the Mariana Trench is actually five different deep bits all together because they're being cut off from one another by subducting seamounts. Mechanically, if the fish can go less than 6000 meters, there are five populations of Mariana alone, before we even get to Ogasowara or before you get to Palau or Yap. But each one of these has its own fish. And so well, the Mariana snailfish as a brand is no longer the deepest fish. It might be in terms of if they're all the same. And we even found snailfish in the trench off Indonesia recently. And it's always, always always the snailfish that are killin' the deep stuff.

Killin' the deep stuff. That's awesome.

What is it that is putting this roof on where the Mariana Snailfish or these real deep water snailfishes can live? Why can't they pop up over that and go down?

It is to do with the cell. So whenever you see a deep sea fish on internet or on TV, and it's got big fangs or a lure or big, crazy eyes, or it's black. That's all to do with being in the dark, that's got nothing to do with deep sea, that's dark sea fish. That's about hunting in the twilight. Any adaptations to high pressure tend to be a molecular level, right? You see in Mariana Snailfish, it doesn't look that different than shallow water. It's what's going on the cellular level. So each of your cells are in a closed sphere. For some reason, there's an evolutionary advantage to going down deep, which in this case is probably access to food in the form of little amphipod crustaceans. What they're doing is they're packing their cells full of an osmolyte. And this osmolyte basically allows the cell to experience 800 atmosphere pressure without collapsing, so you're matching the internal pressure to the external pressure. But by doing that, you're always giving yourself a minimum depth range by pushing to the top because the cell walls never going to be that fluid, because. When you're cold, it hardens the what's called the

phospholipid bilayer. So it's like butter. Some butter goes hard when you chill it some bar goes solid when you chill it. And so it's not very flexible. So the adaptation to high pressure has made you have to sacrifice how shallow you can go in return.

Okay, thank you.

The big players other than the amphipods and the snailfish are, in Mariana, the next deepest fish is called Bassozetus. It's a Cusk eel, which is part of the family Ophidiidae. And they are possibly one of the most abundant animals on the planet that no one's ever seen. No one's ever heard of them, because they're a little bit too far offshore, a little bit too deep than most people go but the entire Pacific Ocean is a little bit too far offshore and a little bit deeper than most people go. So those are huge, big, big brown fish. If you cut them open, you'll find that they're also packing themselves with gel. So again they're cheating because they're trying to get away from having to use gas swim bladders. And they do have one but it's quite well reduced. So they're the next big fishy player. The two most conspicuous other animals are probably the big red prawns, they go down to about 7800 meters. They're beautiful, big red, flamboyant animals. Beautiful, beautiful things. They're all over the Mariana. And then there's what's called the supergiant amphipod. So most amphipods are about two centimeters long. This one's like a foot long. It's massive.

Oh, my goodness.

They're all across the Mariana too. And the other thing we found a couple years ago is there are jellyfish, just normal track images of jellyfish down to just over 10,000 meters in the Mariana. And they're just swimming around. But normal jellies. And so yeah, this the whole bunch of stuff going on.

That's awesome.

How do you go about studying this fish when you're only able to observe for a short amount how and you must have harvested a holotype at some point. So how did you go about getting that?

Easy peasy.

So it's the easiest thing in the world to do.

Oh, I could go down there and do it you're telling me?

No, you don't have to go down. There's a misunderstanding that submersibles are great for all science. Submersibles are only good for some science. A lot of the majority of stuff we've done has come from static cameras and traps. And so they just freefall down and we call them back later and report back to the surface. It's a really interesting mix of high tech versus low tech, the communication device, you need to talk to this camera. That's very expensive. It's a titanium tube, and it tells you what depth it's at. You can tell it to drop a weight to come back up. And the buoyancy to bring it back up is also very expensive. So these things can cost like say 100,000-150,000 dollars. But the bit that catches the amphipods or the fish is like a $20 fish trap from a fishing shop up the road. We just gonna go out and

buy them all out and say "how many fish traps you got?" Guy's like "I've got 10 left in stock." And we're like "cool, put on a credit card." Lash them to $150,000 vehicle and fire it down to the bottom of the Mariana and it's...the fish are not snobs. They, you know, you put a mackerel in a tube behind the funnel and they'll get in there. And that's it. So it's relatively easy.

That's amazing. I've got a question for you, Jihan. So it seems like this is a really amazing place where researchers from all over the world can come and study these amazing fish and seamounts and other things. Like how is that managed? Like did Alan have to get a permit from you know, the monument or how does that all work with the study of this area?

Yeah, anyone wanting to do research or exploration within the Mariana Trench Marine National Monument would have to come get a special use permit from the US Fish and Wildlife Service, which is then collaboratively managed and coordinated with NOAA, and also our local monument manager here in the Northern Mariana Islands, which is the local Department of Lands and Natural Resources. So we kind of all package that permit application for the researcher. One exciting expedition was just this past December, we were able to get a local citizen scientist from Saipan by the name of Jordan Suel, who was able to get on the Kilo Moana expedition as a resource monitor for the US Fish and Wildlife Service. So we're always looking for opportunities to get our local students and local community members on these research vessels. That cultural connections to the monument and this area.

What an amazing backyard.

What's the general attitude of the community like towards like these research expeditions? Is it positive? Do people celebrate these discoveries like the snailfish? Or is it not a big news story when that happens?

So slowly were trying to get all this education and outreach out, promoting a lot about the Mariana Trench, and all the cool deep sea species that have been explored there. There's a lot of research that has gone into it. But I feel like it's just a matter of getting all that information to the community, and making sure that there's a space. And so currently, we have the Mariana Trench Marine National Monument visitor's contact station that I'm sitting on right now, where we're coming up with concept planning and design, to really have the space to have this Learning Center where the community can come in, and feel like they're in the Mariana Trench, you know, and learn about our backyard because it's so hard to access for many of us. I've only gone as far as the island of Pagan, which is north of Saipan, and south of the monument and the islands unit. It's very hard for our locals to access the area. So there was a need for us to bring the Mariana Trench to our community.

Okay, that's very good.

Alan, I'm curious what these fish are eating. I've heard about whale falls, I saw some of your work on like, just kind of what you've seen down there. What are they eating? And is it pretty diverse or are they just kind of opportunistic?

It's a kind of indirect, diverse feeding. So all your organic matter, from plankton to jellies to squid to whales, unfortunately, stuff at the surface has to die. Not everything is killed by humans. All these naturally occurring, organic falls go down into the trash. And it's not the snailfish, which is eating them at all. It's the amphipods. And amphipods are a little crustaceans. And they are amazing. They are the true true gardeners of the hadal zone. So anything that comes down, they will eat it. And they will intercept super fast consume it really fast, they will gorge themselves to the point that they can survive long periods of time with no food. And they turn it to lipid or fat very, very quickly. So they become essentially peanuts, right really high energy, you know, small volume but high density food source. And then there's the snailfish. They obviously smell when there's a dead fish there. And you associate that with a big swarm of amphipods. So when they come to our cameras, they're not coming because there's macro bait there, they're coming to just pick off the amphipods. And so the problem with feeding on amphipods is amphipods are so voracious, if you swallow one, it will just bore its way through your body cavities, right?

[laughs] oh my gosh.

So what the snailfish did is got two months, they have two mouths. They have a mouth that you can see on the exterior.

What? It's like an alien.

It's for suction feeding. So if you notice the video, it's got these little pores around its face and that's to detect vibration, because he can't see and so it will suck in an arthropod and then it will just sit on the seafloor for a bit. And originally we were like "what on earth are these things doing? Why did he keep passing out? It's got a second jaw on the inside which is like two grinding plates. So it sucks the amphipod into his mouth and when it's swallowing it the amphipod is getting ground between two plates so that when it enters the stomach the amphipod is dead and doesn't do an alien on it.

Oh my goodness. That is crazy! These fish are amazing that they have so many neat adaptations. That's just amazing.

Well they're literally goofy and cute, but they're horrible predators.

My goodness, you want one guy?

Yeah, sure. Well, the thing is, I just don't know how much we know about this. Might as well ask. Do you know anything about the reproductive behavior of this species at all?

Not really. Most of the females have extremely big eggs in terms of egg diameter to body size. That seems to be a thing. They're probably brooders. We did a study about four years ago, which still left everybody slightly perplexed in that you if you analyze the otoliths, which is the ear bone, and you can cut those fish, and it will tell you how old it is, and it looks like the age of the snailfish is between 10 and 15 years old, they don't grow might not live much longer than that. But we use the rings on the otolith a little bit like a tree, and you count the number of years and whatever. But you can also do this

interesting stuff with oxygen isotopes, it tells you the type of environment it's been in on each one of those years. And it was a colleague who had...it was in Hawaii at the time the done this work. And she basically concluded that after the larval stage, these things were sitting at five degrees Celsius, I'm sitting there going that can't work that's way too warm. Where do you go that is warm, and we had these checked and cross checks and double checked. And this is what the otolith says, just after the hatch, they are sitting at five degrees Celsius, and we're like, well, the only way to get to five degrees Celsius from the bottom of Mariana is to go straight up in the water column to about 1000 meters, and then hang around there for a year and come back down again, but then how would the come back down on that spot, because after a year, it would have drifted halfway across the Pacific. And so in terms of life history, there are some interesting, confusing clues kicking around. But right now, I don't really know what to make of that.

I'm a bit surprised that you see annuli on the ear bones at all, because I would think that it'd be kind of a constant temperature down there with a kind of constant growth rates, is that not the case? So they having like good growing seasons and poor growing seasons that lay down those different rings.

That's one of the criticisms of using this in deep water. But the originally there was a lot of talk about how deep sea animals had no seasonality. And that's not true, we put a pressure sensor down, you can see the tides, right? You can see down there. You can see deep tides, spring tides, in to constituents, because the sea levels rising up and down. So if you zero yourself to 8000 meters, the sea is going from 8000 to 8002. So you're still experiencing the same two meter swell as any other fish in the sea. And with that you have seasonality. And the big one for deep sea animals is what's happening on the surface, because you have spring blooms, you have these big periods of crazy surface productivity, and after a couple of months, the bloom dies and sinks and then suddenly you have this huge input of organic matter. And that lays down a layer on your otolith. That's the thinking. It certainly works for a lot of deep sea animals. But you know, when it comes back to the snailfish, you're like, oh, something else has going on somewhere. I don't know. It's really interesting.

How did you get interested in the job you're doing?

Being a Saipan and a local to the Marianas, we are always very connected to the ocean. And like I said, growing up here, we didn't really learn about our backyard. So as I got older, it was something that was very much interested in. And so much of my career has been in coral reef management with the local government. So the past 12 years, I've been doing a lot of local coral reef communications. And it wasn't until last year of March, did I assume this position as a park ranger.

It was all pretty much an accident, to be honest. I see that a undergraduate degree in Industrial Design. And I ended up working with a guy who was a professor in deep sea biology. And he was looking for a mechanical engineer at the time, and this stuff he was asking me to build was just so weird. And this is not just like deep cameras, he was wanting to put like electric shock gear at 4000 meters to give fish electric shock in front of a high speed camera because you can't bring any of these fish up alive. Right? So the basic studies we used to do on shallow water fish 100 years ago, we're only just now doing deep sea. Anyway, like traps that were watertight. So you can measure oxygen consumption, but all completely tight. It was just there was weird stuff. And it was fascinating. And over time, it just just sort

of realized that a lot of the stuff we were building for the experiments were working because we knew so little about the behavior of the fish. So I ended up starting sort of analyzing more about fish behavior than the actual experiment. And overtime, I think everyone in deep sea either comes in and engineer ends up a biologist or comes in as a biologist and ends up an engineer because it's that type of environment that you need to be both. At some point, given my engineering background. I remember going to Boston saying why do people only ever go to 6000 meters? Why are people not going to 11,000? Because engineering principles are the same. There's no reason why the can't, and cost wise is not that much different. And just that little spark, I thought I want to build something and go all away.

I was like how people kind of get into their careers. It's really interesting to hear. Thank you.

What about you, Alan? What what's kind of the next bit of research that you'd like to see done in this area, this part of the world or with these kinds of fishes,

When you used to work in trenches there's a tendency to focus on the Mariana because it's the big one that people have heard of. And it's the deepest one and it's prestigious and with absolutely no disrespect to the Mariana, there's like another 27 trenches. And we need to study the Mariana in context. And so the analogy I normally use is, how much about the flora and fauna of Mount Kilimanjaro would you learn if you only ever studied Mount Everest? So you have to study lots of different ones. So this is why we go to Orion sometimes we go to Mariana sometimes go to Philippines, sometimes New Zealand, sometimes Chile, sometimes of Tonga. And then you start to try and disentangle what are the laws of high pressure biodiversity globally? What are things that happen in let's say, the Mariana on its own, because right now, you could study the Mariana every square inch of it, but we don't know how much of that is because of where it is right now, or because of recent history, or because those are just the laws of ecology. And so, the Mariana is an amazing flagship trench, and the Mariana Snailfish is like the quintessential deep-water snailfish. But as we go around and place it in a greater context, I think we learn a lot more about what makes the trenches special against the rest of the deep sea, and what makes certain trenches more special than the others. Gonna take a long time.

Yeah, long time lot of money.

Do you have kind of a career goal for yourself in terms of like, questions you want to answer or just keep discovering?

Yeah, we've done 16 trenches already. But the other thing we're also trying to do is trying to work out what's happening on the abyssal plains in between. So the trench story with the deepest fish is a story in the vertical, right? It's just a how deep do they go down, how deep can they come up all that kind of stuff. There's also the horizontal story. The Pacific is huge. I mean, Jihan will know this, when you look at a map of the Pacific Ocean, right? None of these islands are really standing out - the Pacific is just unbelievably big. And so there's been a tendency over the years for science to be done relatively close to shore, even deep-water science. And the idea is to try and fill out these big white spots in our map of biodiversity. To me, that's just as important as the deepest stuff is the distance story as well.

I've been looking forward to this one for a while. It's just like, fascinating to like, think of a place that I'm never gonna go to but learn about it from folks like you. It's awesome. Appreciate it.

Thank you so much. I learned so much from you.

Yeah, yeah. Well, thanks so much, and get out there and enjoy all the fish especially the snailfish. They're super cool!

Thank you. Thank you.

Thanks for listening to Fish of the Week! My name is Katrina Liebich. And my co host is Guy Eroh. Our production partner for this series is citizen racecar. Produced and story edited by Tasha AF Lemley. Production management by Gabriela Montequin. Post production by Alex Brower. Fish of the Week! is a production of the US Fish and Wildlife Service, Alaska Regional Office of External Affairs, we honor thank and celebrate the whole community, individual tribes states, our sister agencies, fish enthusiast, scientists and others who have elevated our understanding and love as people and professionals of all the fish.