



Pufferfish are the Metalheads of the Sea with Amy Liu

Nerdin' About Podcast Transcript, Season 2 Episode 3

Michael

Hey everyone, welcome to Nerdin' About, I'm Space Michael. With me as always is someone who I learned recently is really digging the Swedish indie bands that she used to listen to in the 1990s, and that would be Dr. Kaylee Byers.

Kaylee

Oh, hey, I don't know if they were from the 1990s. I mean, it was certainly 2007 for me, because that's the year that I was living there. So, I just kind of really bought all the Swedish music, and then sang along to it probably really poorly, and saying it almost entirely the wrong way.

Michael

So not all music is Abba. I think there's a metal band called In Flames, that's all the Swedish music I know.

Kaylee

Abba is my Dad's favourite band, and that meant that every time we went skiing, driving for hours, we listened to Abba on repeat, and I have to admit, they're great music, but I cannot stand listening to it. I'm sure at one point, I'll come back to it, but right now it's a struggle. You know what's funny, my favorite candy is Swedish Fish, and today, we're talking about fish. Today, we're joined by Amy Liu, they are a master's student at the University of British Columbia, and a self-proclaimed pufferfish enthusiast. Hi, Amy. How are you?

Amy

Hi, there, Kaylee. Hey, Michael. I'm pretty good. It's the day after my birthday, and I'm ready to rock and roll.

Kaylee

Well, we'll get right into it. On theme for the day after your birthday. So, Amy, can you tell us a little bit about your passion for things that live in the ocean? And how that led to what you're doing now?

Amy

Yeah, for sure. So, I feel like I was kind of a lucky kid in the way that I was always fascinated with the underwater world. I just kind of continued to pursue that interest. I think it's because I really enjoyed fantasy as a genre as a kid. So, lots of fantasy TV shows, lots of fantasy books, and the ocean is this fantasy world that exists in real life. Same with astronomy that's why I always really liked astronomy as well. The underwater world is so fascinating, not just oceans, but freshwater lakes and all that good stuff. So, I knew I liked science, and I just stuck through this passion through undergrad. I attended a lot of field semesters focusing on marine biology,



and ecology, places like Banfield Marine Science Centre, so shout out to one of my favorite places. It just felt natural to focus my research on fish.

Michael

I will point out that a lot of science fiction portrayal of space seems to be very human. So, you're right Amy, a lot of what's portrayed under the sea seems to be, from my standpoint, the most foreign and weird. I think it does actually lend itself more to this fantastical world, because we don't fully understand what's going on down there. So, I can really see where your interest and passion lies.

Kaylee

So, Amy, you're enthralled with the ocean, and really into studying fish. Can you tell us a little bit about the fish that you're working on, and what it is you're doing?

Amy

Yeah, of course. So, my research is on a group of fish in North America, mostly western North America and where we are in Vancouver, this group of fish is called the Arctic Char Complex, and the three fish that we focus on mainly are Arctic char, bull trout, and Dolly Varden.

Michael

I love her. Tell us about this. What is Dolly Varden?

Amy

Yeah, Dolly Varden, not Dolly Parton. So, Dolly Varden is the name of a fish, and it's also the name of a character in a Charles Dickens novel called "Barnaby Rudge". It's also a kind of style of dress. So, the pattern on a Dolly Varden trout looked like the pattern on the Dolly Varden dress, and so they thought it was an appropriate name.

Kaylee

That sounds magical. I don't wear dresses often, but I might wear one that inspired the name of a fish. So, what's special about this Arctic char complex?

Amy

So, for people who might not know about what char are, they belong to a group of fish with the genus *Salvelinus*, and they're closely related to salmon and other trout. This group of fish is important to study because they help us understand lots of questions about evolution, ecology, and biodiversity. There are entire conferences just focusing on Arctic char, and their related fish. They're game fish, they're food for us to eat, they have lots of different life histories, they are very diverse. So, it's important to study them for questions about evolution, and also monitor their populations for conservation efforts as well.

Kaylee

Very cool. What tools do you use to do that?



Amy

There are lots of different tools for answering questions about Arctic char. The tools that I use are mainly looking at their genetics. So, I look at their DNA, particularly their genome, which means all of the DNA in the fish. What I look at is the specific differences in their DNA that can tell apart species. So, these group of fish, they can look very, very similar, and they also tend to interbreed, and hybridize. So, it can be very hard to tell apart what they look like. So, if you look at the right areas in their DNA, the right locations, you can see that only Arctic char have this kind of DNA base pair, and then Dolly Varden have another DNA base pair. If you can just find those differences, you're able to correctly identify which species the fish belongs to.

Michael

So, Amy, have you made any discoveries? Obviously, you said that a lot of these char seem very similar on the surface, and now you're digging into their DNA. What have you found so far? Ultimately, what are you trying to figure out with these studies?

Amy

So, there's two main parts of my research, the first part of my research is to create this molecular tool to be able to tell apart these three species. So far as discoveries goes, I think just finding these fixed differences in their DNA that can tell them apart, it's kind of straightforward. There's no surprises, it's more like look in their DNA, find these fixed differences. Then you basically create this molecular tool to find them, and then you can use this. What I think is actually kind of interesting is the importance of this tool. An example that I'll use is that there was a project where they made this reference genome of Arctic char. A reference genome is basically all of the DNA of a certain species that you compare the DNA to. So, for example, the human genome, we've probably heard about that one, this is the arctic char genome, and they have made these genomes for lots of different animals, and plants. So, the Arctic char genome was made from a lot of different fishes that they were given, and said that these were all Arctic char, but it turned out some of them were Dolly Varden, and some of them were Arctic char. So, in the end, they had to change the name of the Arctic char reference genome into just a char reference genome. So, what's interesting is that I tested some of my molecular tools against those fish that they used in that project, and we were able to see that they were indeed hybrids, or they were Dolly Varden, and not completely Arctic char.

Kaylee

So, let's say, we have a molecular tool, we're able to look at these fish and be like, char, Dolly Varden, Dolly Parton (laughs), pull them all apart. Why is that helpful?

Amy

Well, we use the example of having correct reference genomes. So, there's that example, in this way, you can have the correct species for reference genomes, but it's really, really useful to tell apart species. I mean, not only for research, so you know what you're actually dealing with, but also for conservation, because depending on the species, you can have different designations,



you have different policies, protecting the species, and without the right identification, it's even hard to tell how many numbers of the fish that you have when you're doing population assessments. So, you have a lake, and you know that there's 500 fish, it's completely different if they were 500 Arctic char, or 200 Arctic char, and 300 Dolly Varden, for example. So, species identification is super important, I think for lots of different reasons, but specifically for research and conservation.

Kaylee

One more question, do you have a favorite of that complex?

Amy

Originally, I thought Arctic char were pretty cool, but I think Dolly Varden are super cool. I am also an artist, and I draw these fish quite a bit. I find that the Dolly Varden is really one of the prettiest fish, because of the beautiful green and red colour. They have such an interesting history, there's this particular watershed in Alaska called Chignik Lake Watershed where sometimes, depending on their age, they won't go out into the ocean. So, when they're young, these fish will go out into the ocean, and come back, and then they'll go out into the ocean again, but sometimes when they get old enough, they'll actually just stay there, because they're large enough. So, they have this choice of staying or leaving and I thought that was really interesting.

Kaylee

Do you think they all sing "Should I Stay or Should I Go?" (laughs)

Michael

So, Amy, speaking of really cool looking fish, let's get into pufferfish. You're a self-proclaimed pufferfish nerd and enthusiast. Looking up some pictures before we started, these things look straight out of Pokémon. What are pufferfish if you could explain to me a fish newbie?

Amy

So, I say I'm a self-proclaimed pufferfish enthusiast or nerd, because I don't formally study pufferfish, but they're just so fascinating. I love them. I love talking to people about them. So, what are they? Well, they are a group of fish, and they're separated into two groups of pufferfish, as people tend to know. There are the smooth puffers, and then there are the spiny puffers. Using scientific names, the smooth puffers are Tetraodontidae, and the spiny puffers are Diodontidae. The difference is that smooth puffers, they're generally smoother, they don't have the spines, and they have four teeth. Kind of like hamsters, so two on the top, and two on the bottom, and they're big teeth, they can bite through clam shells, and snail shells, and then can even bite off people's fingers. For Diodontidae, the spiny puffers, they have two teeth, so one on the top, and one on the bottom. So, they are different, but they both puff up. They both look very similar. They both have the poison, and they are adorable. I know you probably think that they look like Pokémon because you search them up on Google and every one of them is puffed up, but you should get to see an unpuffed pufferfish sometimes they are so cute.



Kaylee

Actually, aren't boxfish related to pufferfish?

Amy

Boxfish are related to pufferfish. They all belong to this big group of fish called Tetraodontiformes, which is very similar to Tetraodontidae. This group includes boxfish, filefish, triggerfish, cowfish, and Mola Mola. They're a wonderful group of weird fish.

Michael

Well let's get into the puffiness of these fish Amy. Like, what is going on? Why are they puffing? When I first looked at them, I was like, "Are they always like that?", but now you've just explained that they can be puffed, and they can be unpuffed. So, what exactly is going on here with this puff sequence?

Amy

So, what happens with these pufferfish, and why they're called pufferfish, both the smooth and spiny puffers, is that they have this unique ability to inflate like a balloon. What they do is that they take in water through their very, very elastic stomachs. So, what happens is that they take in the water, their stomachs expand, their whole-body kind of expand along with them, so their spines can bend, they basically become this big ball, and if they have any spines, whether they're small or large, they kind of stick out like a mace. It makes it very hard for predators to eat or swallow them. There's this very gruesome picture of a pufferfish, a porcupine fish, so a spiny puffer that was stuck, and lodged inside of a shark's throat as the shark was trying to swallow it. The pufferfish kind of expanded.

Michael

Cool!

Kaylee

Did it escape?

Amy

Unfortunately, not. It's very metal, I should say. (laughs) So yeah, it's that elastic stomach that puffs, then when these puffers feel like they're out of danger, they will just spit out the water again, and be on their way as normal fish.

Michael

I'm picturing a bunch of badass pufferfish swimming around, and all of a sudden, some bad sharks come around, and they say "Alright, fish, let's puff!" You know, they expand out, looking super tough.

Kaylee

They got their leather jackets with the studs on them. (laughs)



Michael

They are so cool.

Kaylee

Earlier you mentioned the poison. This brought me back to watching The Simpsons, I think one of the earlier seasons, and there's this episode where Homer orders pufferfish, and is then told that it wasn't cut properly, he's consumed this poison, and he has 24 hours to live. Is that on the money? Is it 24 hours? Is it really quick or is it a longer process? Are they really poisonous? What's going on?

Amy

So, pufferfish are super poisonous. They are the most poisonous animals on the planet, especially animals that have a backbone, vertebrates. They have this poison called tetrodotoxin, which is this kind of neurotoxin that is produced in their liver, their skin, and their gonads.

Kaylee

Oh!

Amy

It's produced by this bacterium, and it's really lethal. Even in tiny amounts. So, I don't know how much Homer consumed.

Kaylee

Oh, the whole thing!

Amy

It's a very small amount that is lethal to a human adult. So, if it was a whole pufferfish, then Homer wouldn't have had 24 hours to live, it would have probably been like minutes, because the tetrodotoxin just acts super-fast. What it does is that it stops signals from your brain going to your muscles. So, what happens is that your lips might start to feel numb and tingly, and then you can't move your arms and legs. Because your lungs and your heart are also muscles that are beating with signals from your brain they'll stop too, and that's what ends up happening.

Kaylee

Gosh, that actually just reminded me of this time I ate shellfish, my mouth and tongue went all tingly, and I was with a friend I was like, "if this gets worse, get the phone ready." Because something's going on. So, okay that makes sense. So, if it's in the skin, the liver you said, and the gonads then that's why cutting the pufferfish very specifically would be very important to not consume poison. Like you wouldn't want to get any skin, any liver, any gonads?



Amy

It's super important to be a trained chef when you're cutting these pufferfish, there are entire schools probably, or diplomas dedicated to cutting these fish to serve to the public. Back in the days, they use to serve pufferfish for the Emperor of Japan, because it was considered a delicacy. What's really interesting is that a tiny, tiny amount of the dose of tetrodotoxin can actually make the fish taste better. So, they say that the most delicious part of the fish is the liver, which also happens to be one of the most poisonous. So, take of that how you will.

Kaylee

This is just classic people.

Michael

Just living on the edge.

Amy

I also wanted to say tetrodotoxin is also very useful in very tiny doses as a muscle relaxant. So, it's been used in medicine, so it's not just a terrible poison.

Michael

So, Amy these are truly the most metal fish in the ocean. I've been convinced of that. So, besides the puffiness, besides the venom, what really attracts pufferfish to you? Why do you think that they're so cool, and maybe give us some unknown facts about them?

Amy

I'm really happy you asked this question, Michael. Because most people know about the fact that pufferfish are very metal, they're poisonous, and that they puff up. Most people know that about pufferfish, at least that's what I read in aquarium signs all the time. What I don't think is advertised enough is that pufferfish are really smart, and charismatic.

Michael

Like metal heads!

Amy

I found this out actually completely by accident. When I was in high school, I volunteered for the Vancouver Aquarium as a work experience student, and they had this really big pufferfish back in the day. I remember it was love at first sight. I think that's kind of where it started. I just met this fish, it was big, and it had big eyes, and it had these soft lips, and would press them up against the window glass whenever I came over, and I was just like, "Oh, hello, how are you doing?" I was really fascinated by how charismatic it was. The more I talk to people about people who own pufferfish, they just tell me that they're like little water puppies. They recognize their owners, they beg for food, they will spit out water when you're trying to feed them, and they are just so full of personality. There are videos where you can train a pufferfish to recognize



certain symbols or colors so that they can be fed independently of the other fish in the aquarium. So, at the Vancouver Aquarium, for example, they lower a little box, and then the pufferfish will swim in, they'll drop the clams in the box, and then the pufferfish will eat the clams, and then it'll swim out. At the New England Aquarium, they used different paddles each containing a different symbol, and then the three-different pufferfish in the tank will go to a different symbol to be fed.

Kaylee

That is super-duper cool. I know that we're ending on intelligence, and that's what I should appreciate, but I can't get the fish with its luscious lips out of my head.

Michael

Now immediately I want to have a pet pufferfish and name it Dave Mustaine, James Hetfield, Ozzy Osborne, you know, they're just sweet and charismatic, even if they have a really hard, spiny exterior.

Amy

I have to warn you though Michael, as someone who has also worked in a pet and aquarium store, pufferfish are not easy pets, and I would not recommend them for people who are beginners to fish keeping. If you're a beginner fish keeper, please stick to beta fish and guppies, but pufferfish are definitely intermediate to advanced fish, because they are very, very sensitive. They can be bullies to your other fish. So, if you stick them in – even the tiny little puffers - if you stick them with other fish, they can beat them up.

Michael

Should we get to some audience questions?

Kaylee

We got actually have quite a few cool pufferfish questions. So, let's get over there.

Michael

All right. If you want to get it on our audience questions, you can reach us on our socials @NerdNiteYVR, Instagram, Twitter, Facebook, we post them there. Our first one comes in from Nicole, who asks, "Is there anything that bothers you about how pufferfish are portrayed in the media?"

Amy

Why are pufferfish always puffed up!? Have you ever seen how cute pufferfish are when they're unpuffed? Why is it that when you do a Google search, they look like they're terrified, their big eyes are popped out, they're always ballooned. I don't blame people because that's why they are so unique, but please look up what an unpuffed pufferfish looks like. That's how you see their little cute lips, that's how you see their little smiles. They are so adorable.



Kaylee

Well, and I guess that also means a lot of people are taking pictures of some stressed out fish.

Amy

Yes, that's true. So, I know that there's another audience question, "is it harmful for pufferfish to puff up?" The answer is yes, and no, but mainly, it is stressful for a pufferfish to puff up, because that's their defense mechanism. That's what they do when they're really stressed out. So, some people will take out a pufferfish from the water, and being a fish it can't breathe, so it will try and puff up, or get away. So that's a very stressful response, something like a human fainting, like sometimes we get really anxious or stressed, and suddenly we'll just faint. So, it's not really good for pufferfish to puff up. I know this because working with live fish sometimes, and you have customers or guests who come over and they're like, "oh puff up!", but it's not a good thing for the animal. I really like unpuffed pufferfish because they're cute, and they're not stressed out. Funny thing is that pufferfish can also puff up on their own. So, aquarium owners who keep pufferfish say they will sometimes puff up on their own, and it's really funny and they take a video of it, but that's just the pufferfish doing their thing. As long as they're not stressed in that way that's totally fine for the fish to puff up on their own.

Kaylee

Just practicing, just making sure they still got it, you know?

Amy

Yeah.

Kaylee

Well, we have another question. This is from Tim who asked, "Are there other species of fish that puff?"

Amy

I can't actually think of other fish that puff up in the same way. I think of a lizard when they have their frills out, or make their fins really big. Within the group of Tetraodontiformes, so that big group of pufferfish, like Mola Mola, and boxfish. There's one fish called the tritooth pufferfish, and it's not really a pufferfish. So, we talked about smooth and spiny pufferfish. Smooth are fourtooth puffers, and then there's twotooth puffers, then there's threetooth puffers, they're unique, and they're very strange, and they're very rare. Instead of being able to puff up by sucking in water to inflate, they have a sac on the bottom of their body, and that's how they use it to inflate. So, it's a normal fish, and then it has this sac trailing below it. So, it inhales and then that sac expands, and it puffs. So that's what I can think of, but it's still in that group of pufferfish and friends.



Kaylee

I think I'd be nervous to have like a dangly sac that anything could come along, and nip at you know? It just seems like a hazard.

Michael

Well, yes. (laughs) That's all I'll say about that. Our last question comes in from Armin, who asks, "Are there any species named after Mrs. Puff from SpongeBob SquarePants?"

Amy

I love that question. Well her name is Mrs. Puff, right? I don't know if she has a first or last name so in a way all pufferfish are Mrs., or Mr., or Miss Puff. Interpret that question how you will. There might be Doctor puffs, there might be just all sorts of different puffs. So, in a way, yes, and in a way, no.

Kaylee

I would like Mrs. Puff to get up to Dr. Puff. That would be delightful.

Amy

She enrolls in whatever University they have in Bikini Bottom – Bikini Bottom University.

Kaylee

That's the whole reason I got a doctorate actually, so that when a service provider asked me if they could call Miss or Mrs., I could say "actually, Doctor, thank you so much."

Amy

Exactly. That's it.

Michael

Should we nerd out?

Kaylee

Oh, yes, please.

Michael

All right, if you want to get in on the nerd outs, then once again hit us up on our socials @NerdNiteYVR. Our first one came in from Daniel, who is nerding out about sleight of hand in general, and card magic. Amy, have you ever given your hand to some magic tricks?

Kaylee

What bit of sleight of fin do we think a pufferfish would get into?



Amy

The funny thing about pufferfish is that they're actually really slow swimmers. They are not the strongest swimmers. They swim quite slowly, they kind of rotate in the water, their little fins just beat. They don't swim very fast. There's even this video of two pufferfish that were caught in this vortex of swirling water that they couldn't come out of. So, they were just swirling in the water column. Because they were not very fast swimmers. So, I don't think that pufferfish would be very good at sleight of fins or magic tricks.

Kaylee

They just have the cards in front of them, and then they just inhale them really quickly, when they puff up. (laughs)

Michael

Amy, what about you? What have you been nerding out about recently?

Amy

Can I talk about something that's related with fish?

Kaylee

You must.

Amy

I remember in university one of my professors told me that one of the reasons that fisheries and fish are hard to connect to is because we don't often see them. We see cats, and dogs, and birds, and all other lovely animals, but fish we don't really interact with them unless they're in an aquarium. So, it can be hard to care about an animal that we don't tend to interact with or see on the daily. But there is this lovely project called "[Coral City camera](#)", which is a live stream of a human-created coral reef in Florida where they just live stream these videos of this coral reef, and they have these fish that spend their time around the area. So, it's kind of like a real-life Bikini Bottom. Let me just tell you about some of my favorite inhabitants. There's actually a group of checkered pufferfish that make their way around the coral city, and they have been dubbed a "Huffle of Puffle", a puffer gang. There are boxfish, there are trunkfish, there are barracudas, there's octopuses, and my favorite resident is actually not a pufferfish. There's a parrotfish called Ramon, and he sleeps, he tends to nap, and there are some videos of this little fish on the substrate, on the ground, just relaxing and hovering back and forth. It's just napping, and we like to chat about what this parrotfish could be dreaming about. I love it. They post their videos almost daily, and it's just this beautiful vibrant coral reef, and all the different fish that inhabit it. It's very lovely.

Michael

Yeah, a huffle of pufferfish certainly doesn't sound very metal, but I can certainly see how it's a very relaxing vibe if you had an encounter with a huffle.



Kaylee

I don't know if you heard them scream "huffle of puffle!" I think you'd find it pretty metal. What about you, Michael? What are you nerding about?

Michael

Well, I thought I'd give an update to my Buffy watching as we've been doing. I finally finished Season Three. So, in previous episode, you and Travis nerded out about Amy the Rat, so I had to catch up on a bunch of Season Three stuff. So, here's some notes from Season Three, loved it. Great season. So, my favorite season overall of the first three. First thing, Trick dies, was not happy about Trick dying, basically he's the only Black character, and he was really cool. He was this rogue vampire that was a very different kind of vampire character, then I have seen portrayed. Of course, that really sets up the Faith, Buffy scenario, and I do have to say that relationship is really cool, very satisfying resolution to that storyline. Buffy, Angel, I was so sick and tired of them breaking up and getting back together. I just don't care. I'm definitely not on Team Angel. I was happy with him being evil Angel.

Kaylee

Oh yeah, Evil Angel is an excellent character, he gets to you.

Michael

Well speaking of fantastic characters, maybe my favorite new one was the Mayor just an amazing, weird goofy villain. Really great choice to create that character, the Mayor, really setting up the whole graduation day, the final two episodes of the season, final two episodes of them in high school. Assuming the show really changes after this. So, it really builds up to this culmination of the metaphor of being in high school,

Kaylee

It's hell (laughs)

Michael

This pandemic has really helped fill 90's voids in my life. So, I'm really enjoying it. What about you, Kaylee, what have you been nerding out about?

Kaylee

Well, you were reminding me about our Buffy/Star Trek watch. You actually started watching Buffy well before I started watching Star Trek. So, I don't know what this is going to say about you. I don't what it's going to say about me, but your favorite show is TNG. So, I was watching The Next Generation, and I actually just finished it last week.

Michael

Wow!



Kaylee

I know! Our journeys are similar. They're both seven seasons long. There's about the same number of episodes, and I have far surpassed you.

Michael

I'm a slow burn.

Kaylee

Yeah, I'm a dedicated binger, but I really liked it. I love the series finale, and I had a lot of emotions. As it was coming to an end, I'm like, "What am I going to do with my time?" Which apparently, I spent a lot of watching Star Trek, and then I was like, oh, thank science for Deep Space Nine. So I am into Deep Space Nine. What, I was really excited for was the very first episode, unlike Michael, I'm not going to give you all the spoilers. What I will say is that in Star Trek, they introduce a character that was very interesting to me. It's a species called the Trill, which is essentially a symbiotic species. So, they have a symbiont that lives inside of a host, and that symbiotic will change hosts whenever that host gets older, or that host becomes ill. I really love that idea, because I love parasites. They're like my favorite thing. I think they're so interesting. One of the characters in Deep Space Nine is a Trill, and so instantly love that, and you meet this character, Dax, and Dax in this show is a 28-year-old woman, and was previously an old man. I'm very much looking forward to seeing how all the dynamics change, and learning about her life. When she was in a different host, and it brings up questions like, is this a new person now that you've got this melding of identities? All of that I just find really interesting. So, I'm really appreciating Star Trek for tackling some interesting storylines. I'm really excited about Dax, I'm like team Dax right now.

Michael

Oh, absolutely. There's a great meme. I don't know if you've gotten to the episode yet, it's not going to spoil anything, but it's when there's this old battle worn Klingon, he learns about Dax, and then Dax explains, well, you know, "I used to be a man" and the Klingon looks very confused, and then immediately says "oh, okay, I accept that". It's like, if this old Klingon can accept the Dax used to be a man, then the rest of humanity can accept trans people as well.

Kaylee

I think I might actually be in that episode right now. So, I think you just spoiled that. I just started it yesterday. Thank you.

Michael

I don't think it spoils anything. It's a great moment. Amy, thank you so much for nerding out with us about your love of all of the Pokémon that live under the sea. All of the metal things that live under the sea, pufferfish, and Arctic char and Dolly Parton. Dolly Varden sorry, where can people learn about you and your work?



Amy

I've been trying to set up an art Instagram for a lot of the art that I do on different fishes and just different things, but that's not up yet.

Kaylee

I just picked up my phone to follow you. I'll just put it back down.

Amy

You know what I will let you know immediately when I do make it, because things are so busy right now, but I do have a Twitter handle that is @tetraodontidaes. I was able to get that handle, or you can look me up Amy Jubjub with a little pufferfish emoji after the name.

Kaylee

Thank you so much. I already follow you. I think everybody should get over there and follow Amy. Thank you so much for spending time with us. This was an absolute delight. I learned some extra things about fish, and some extra things about pufferfish which was delightful. Thank you everybody so much for listening. If you'd like to hear more from us, you can follow us on our socials @NerdNiteYVR. You can like and subscribe to this podcast and that helps us reach new folks. We'll be back in a couple of weeks. But until we meet again, puff puff puff, puff it up!