Watery Dewing About Water

Nerdin' About Podcast Transcript, Season 3 Episode 6

Michael
Hey everyone, welcome to Nerdin' About! I'm Space Michael, and with me as always is someone who loves to put together some Ikea furniture, and that is Dr. Kaylee Byers.

Kaylee
I don't know if I love putting together Ikea furniture. I feel like it's a rite of passage. Everyone has to do it, and if you survive it with your significant other, you come out better people.

Michael
How many pieces are currently in your apartment?

Kaylee
Do they have to be in full pieces? If they're currently falling apart does that count as one piece or multiple pieces?

Michael
Just a number, what are we talking about here?

Kaylee
Like seven?

Michael
Whoa, okay.

Kaylee
What about you? What's the IKEA composition of your apartment?

Michael
I think a little less like, I'm just looking around and I'm seeing maybe three. My place is small, though.

Kaylee
Yeah, there's probably something in another room that you're just not accounting for.

Michael
Probably.

Kaylee
Do you remember that old IKEA lamp commercial? "Do you feel sorry for this lamp?", and it had the lamp out on the corner. It's in the dark, and I did feel sorry for it.

Michael
They hooked you in.

Kaylee
Totally. And that's why all three of us today have Ikea furniture. Not just you and I Michael. But our guest today also has some IKEA going on, and that is Alan Shapiro. Alan is a Vancouver-based water and sustainability consultant and an instructor of BCIT's School of Business and Media. Alan has been leading Foresight cleantech accelerator centers, waterNEXT network, a national initiative to support the commercialization and adoption of Canadian water technologies. Oh, hey, Alan, how are you?

Alan
Oh, hey, I'm good. I never appreciated IKEAs instruction manuals, until we bought Structube furniture for the first time this year and let me tell you that you have to put it together just like Ikea furniture, and the instructions make no sense. So, I need someone in Sweden to be writing my instruction manuals in as intuitive way as possible.

Kaylee
I don't understand how there's any instructions for building furniture that make less sense than IKEA, you are blowing my mind. Especially because it'll say things like you've got 20 of these things, and you look, and you have 10 of them. Just confusing.

Alan
IKEA always struck me like Lego. It's like you either have the pieces or you don't and fair enough. Take it up with Central Command, you don't have the pieces. It's still following this simple instruction manual to get to something that resembles this bed.

Kaylee
Who knows what it could possibly be!? Adult Lego, you just never know, it's like a Create Your Own Adventure. Well, transitioning from some of the harder structured items to something a little more fluid. We're going to be talking today about water. We want to start off with Alan, you're a self-proclaimed “water nerd”. So, what about water makes you go H 2 Whoa? (Laughs)

Alan
Can I decline to answer any question with a terrible pun in it?

Kaylee
Are you kidding?

Alan
I'm joking, that was fantastic.

Kaylee
Do you know, my whole brand of comedy is just bad puns?

Michael
Oh, we're just getting started here, and we have a whole host of them coming to you here.

Alan
This is a whole topic of conversation. But do you know if you're a scientist or domain expert in a particular space, everyone tries the same puns on you, right? So, on the one hand, if you're the one making the puns, it's fantastic. But on the other hand, there's like three water puns.

Kaylee
I can't wait to learn what the other two are and then use them.

Alan
And I will not tell you!

Kaylee
But tell me why you love water?

Alan
I love water because I hated disciplinary silos right out the gate. My background is in geoscience, and right away, people were like, "Hey, you look at this thing or you look at this thing and you don't look at this thing and you interact with this community of experts." Water seemed to be one of those themes that inevitably brings together biologists, physicists, chemists, Earth scientists, and deals with real world problems, and I really enjoyed that. It's really hard to stay in a box, in part because you flow out of the box unless the box is hermetically sealed. (Laughs)

Michael
You just can't help yourself. It is a part of who you are. I love it.

Kaylee
So, what is it about water that brings all those different fields together?

Alan
I think water is just so concrete and tangible. It's funny when we chat about science communication, on the Science Slam stage, and on the Nerd Nite stage, when we look at mathematicians or physicists, sometimes they're reaching for ways to make concepts relatable for folks. For me, it's the other problem of everyone knows what water is, everyone drinks it, or I hope everyone drinks it, and often you're dealing with misinformation. But inevitably, as a medium to communicate science it's really, really tangible. Everyone's got thoughts on this thing that falls out of the sky, or this puddle that I just stepped into, which is fantastic. It's this great way to pull in a range of different communities.

Michael
So, speaking of some of that miscommunication, Alan, you know, for the average person out there, the average "bag of mostly water", what are some of the things that humans don't know about water?

Alan
I think one of the big challenges we face is that we interact with water in the environment in our own ways. If you live in Vancouver, as I do, we look out the window and we see rain, or we go to the beach, and we see the ocean, which is fantastic. But we don't realize how much stuff is dissolved in that water, which really, from a human health perspective, or from a water treatment perspective, is the make or break, right? So, when we look at, you know, First Nations', drinking water is a huge challenge in Canada, or water accessibility for communities around the world, we're really talking about the same water that you and I might have here that comes out of a tap. But we don't necessarily have that understanding of what is dissolved in a glass of water. That's one of the big pieces of just understanding both the perceptions of water, which can be significant. Either perceptions of water as being clean when it isn't, or perceptions

of water as not being clean, when it is. Then also just making sure that we have the data that we need to make good decisions, which is part of every science regardless of where you happen to stay.

Michael
So, Alan, I recently did a little talk about the beginnings of life in the universe. It boiled down to this concept of water being really important. I have been dying to ask you this question if you could encapsulate maybe in better words than I used, why is water so special in the universe?

Alan
Water is incredibly special, we grow up with water being our reference fluid, right? That is what we associate all liquids as being but that's actually not the case, water dissolves, so many of the things around us, which is critical for it being a fluid that moves around our body and carries nutrients around for ourselves and waste from ourselves. Water is less dense in its solid form than it is in its liquid form. Which means that when we form ice on our lakes in the winter, we're not killing everything in those lakes. We see water around us in solid, liquid, and gas form, which is not the case for something like carbon dioxide. You might have seen dry ice, you might have seen carbon dioxide as a gas, but we don't have a liquid form of co2. The fact that water just does all of these things that we take for granted is actually really, really special. It's very much the exception rather than the rule.

Michael
That's much of what I said. I'm just joking. That was much better than what I said in my presentation.

Kaylee
But you did have dry ice for your presentation. Right?

Alan
That automatically wins out, for sure wins out.

Kaylee
So, what do you think the world would look like without water?

Alan
It would probably look really interesting and be a terrible place to live. Like, can you imagine if we had no water in the oceans for a second, we could go for a hike through the middle of the Atlantic Ocean. That would be pretty cool for like the first day. Then that would get old really, really quickly. In all seriousness, there's so many places in the world that don't have the water that we do in Canada, we've got the luxury of water being part of our culture. We talk about canoeing, or we talk about rain, and these are all things that we share as Canadians which is not true of many parts of the world. So, for sure there's many parts of the world where waking up to not enough water is very much within the realm of your day-to-day experience.

Michael
Well, even in Dune I don't know if you've seen the latest Dune Alan.

Alan
Not yet! I have tickets for two weeks from now,

Michael
Basically, this desert world is inhabited by humanoids that are full of water. So, the water inside them becomes very valuable when you're living in a world that doesn't have the oceans and this water cycle that we have. So even, tears and sweat and all of that stuff that exudes becomes ever so much more valuable. There's a dark future of certain places on Earth, that actually does become like a really big issue.

Alan
Think about the basic concept of sewage. When we think about flushing a toilet, we're essentially saying, we don't want this thing here. So, we're going to use as much water as we possibly can to move this thing from here somewhere else. Then to keep all of the things moving, we're going to flush that with more water, and the medium through which we get rid of our waste is water. That treats water is absolutely just a vehicle for moving other stuff around. So, if you think about a water scarce place, all of a sudden, you can't just flush the toilet and expect water to do all the work for you. So, it's not just water, that becomes the issue. But it's all of these systems that we built that rely on water as being abundant. So same with a desert world. flush toilets, probably not a thing.

Kaylee
Interesting. I had not considered that as part of the Dune-building universe, but I assumed that is true. I want to come back to clean water. What is it about place and space that can result in such different water experiences? So, having clean drinking water versus not having clean drinking water? Like what is it about that geography? Where are we with resources available to us? What is that about?

Alan
I think there's two pieces to that. One is where does contamination come from? And two is how do we get contamination out? So, the first piece of that is, when we live in or near environments that are relatively pristine, we have few sources of contamination, there's things that naturally can end up in our water, like, I don't necessarily want to be drinking giardia. So, we've gotten natural contaminants, but a lot of the stuff that ends up in water, if you think about Iqaluit's recent jet fuel in their water supply contamination, that is very much a symptom of the fact that we just have a lot more contaminants moving around and ending up in the environment today than we did 100 years ago. So that's one, where are contaminants coming from? How are they ending up in the water? And then two is how do we get them out? So, if you live in a city like Vancouver, a lot of our tax dollars go towards water treatment plants and those water treatment plants remove all forms of contaminants from our water. But if you live on a farm, and you have a well, then there's not a lot protecting you from contaminants that might end up in your well. So, whenever we talk about drinking water, we're really talking about how much do you have in terms of resources to protect the water that you're drinking, whether you're removing contaminants from it, or whether you just happen to be in a clean enough place where those contaminants aren't ending up there in the first place?

Kaylee
You were talking about Vancouver tax dollars going towards clean water. Is there federal oversight for some of that, or is it all mostly local?

Alan
It depends where you are, and that is part of the challenge that water is one of those things that crosses all forms of jurisdiction. So, water in Canada is managed at the local, at the regional, at

the provincial, and the federal level, depending on what you're talking about, which is why we are terrible at managing water in Canada. But at least from the health perspective, that's a mix of Health Canada regulations, and the province as the regulator to make sure that we are testing our drinking water and wastewater and keeping those according to the regulations that Health Canada defines.

Kaylee
So, you were talking about water, access to it, Canada's role in it. What exactly do you do? What does it look like to work for water?

Alan
That's a great question. I struggled for a while to figure out what my role was as a sci-commer in the water space, because part of it was, we've got so many cool stories to tell. And if water were my client, what would I be doing? Like what kind of stories would I be telling? I think the big overarching story that has shaped the work that I do is the myth of water abundance in Canada. We're all sold on this idea that we've got a ton of water, and we don't really have to worry about it. We don't pay much for water because we just assume that it will always be there, and that really underlies how we've shaped policy around water. It underlies how we use water, and how businesses use water. All of that together means that as an ecosystem, we don't really necessarily sit down to talk to each other as water scientists, and water policymakers, and water professionals and say, what are the high priorities that we have? If you're in Singapore, you have very, very limited water supply. So regardless of where you are working in the water space have a very good sense of where you fit in the bigger picture, and what the priorities are. In Canada, that priority list is still very much just floating around in the ether in the broth somewhere. So, I work with a few different hats to help coordinate that. I'm working both on the water innovation side, working on the water nonprofit side, and then the water and science communication side to really try to get more people in the same rooms, talking about the same things, coordinating and then coming up with those shared priorities.

Kaylee
So, I guess you would say that your work has more than one element. (laughs)

Michael
Alan, you talked about some of the stories that you tell. Can we maybe dig into some of those stories about us as Canadians? What do we need to know about water, and maybe what should we know, in the future for us in this country, about water?

Alan
There's this really overused cliche statement that if climate change is sharks, water is its teeth. I think it's cliche on the one hand, but on the other hand, we're all recording this from Vancouver. A week ago, we had a massive atmospheric river event in Vancouver with a ton of flooding across the province. So inevitably, we're starting to feel that whether that's not enough water, or too much water, we are seeing that kind of overarching climate change trend, shaping how we interact with water day to day, and in different ways depending on where you live. So, if you live on Vancouver Island, you might live in a community that has water shortages every summer, and that's now becoming the norm. If you live currently, in the Lower Mainland of BC, you live in a place where flooding is becoming a much higher risk. If you live in a First Nations community that might already have an insecure water supply where there's contamination that's ending up in your water, chances are climate change is accenting that in some capacity. So, one of the things that we need to be aware of is that when we talk about climate change, one of the ways

that we feel that, and will continue to feel that more acutely, is through water in a range of different ways. If we don't understand those impacts, or if we don't even have good water baseline data to begin with, which we don't in many parts of Canada, it becomes a lot harder to understand those impacts and trends.

Michael
Yeah, that's really interesting how it's very specific to where to where you live, obviously, water is not equal everywhere in the world, that's a different issue, depending on where you are. Something like water sustainability, then also is going to be something that is going to be talked about on a federal level, but then is also going to be very impactful in the microcosm of communities. How do you go about tackling water sustainability on a larger scale, or even on a smaller scale inside of our communities?

Alan
That is the million-dollar question which we're really struggling with right now. Because in a way, CO2 is easy as a contaminant, it's one we don't see, and that's a problem getting people united against a contaminant that we don't see. One CO2 molecule that is put into the atmosphere in India is equivalent to a CO2 molecule that's removed from the atmosphere in Canada. With water, it becomes this question of how we have a coordinated global and national conversation, but also have data at the local and regional level and have initiatives at the local and regional level. So, there's just a lot more players, and the issues become much more locally rooted, but that's also an opportunity. So again, communities around the world, regardless of where you ask, if you start talking about water, they've got a lot of thoughts. It becomes this really engaging medium again, to pull people in. Understanding the crisis of water, which is something we overuse. We're in this collection of local water crises that we need to make sure are getting enough airtime at a coordinated level where we can sit down and say, hey, you know what, what a First Nations community in Saskatchewan is facing is actually really similar to what a First Nations community in Quebec is facing. If we can just make sure that we are sharing our best practices, we're sharing our data well enough, then all of a sudden there's an opportunity to work together and learn from each other.

Kaylee
Well, and getting resources to the places that need them in order to actually, as you say, remove contaminants from water and ensure clean drinking water supplies. When we think about water sustainability and water stewardship, is that largely driven by local initiatives that then inform national policies and practices?

Alan
Yeah, exactly, and there's a lot of really cool successful initiatives locally and regionally. In BC, one organization to check out is called the healthy waters initiative. They've been allocating a bunch of provincial funding over the past years. So, the province of BC put up, I don't remember how many million dollars to support watershed restoration work. So, the healthy waters initiative has been working with nonprofits and community groups, essentially, to allocate that money to local projects. The range of local projects is just phenomenal from looking at salmon habitat, at riparian zone enhancement, and at algae bloom in a lake and how we can support improvements in lake quality. So, there's so many success stories, and that's one of the things that really gives me hope working in this space that I do is, it's not a global challenge. It's a collection of local challenges, but also local initiatives and local stories that really can inspire people.

Michael
Oh, amazing. Well Kaylee, I think we should turn things over to another inspired group.

Kaylee
Is it the nerd herd?

Music

Michael
All right, if you want to get in on the nerd herd questions, we post for them on our social media @NerdNiteYVR Twitter, Instagram and Facebook. Our first one comes in from Matt, who's an American, we've talked mostly about Canada. We know Matt, he used to live in New York, he's moved to Los Angeles. So, his question is, should he feel guilty about doing so, since, you know, water?

Alan
I mean, your choices are your choices. Should you feel guilty about living in LA? Only for sending occasional sunshine back to of all of us in Canada. I think that's a reasonable decision. From a water perspective. I think you're okay. Unless part of your life in LA just happens to be a lot more terrible for water. In which case, maybe you're not okay. Make good water decisions.

Michael
I guess it's kind of crazy, because I first really learned about Los Angeles from the movie Chinatown, which describes how Los Angeles became a city in a desert, essentially. So, I guess thinking about how huge California is, there are so many people living there. What are the major issues happening in California around water?

Alan
Yeah, it's a funny question. Because if we want to feel terrible about living anywhere, from a water perspective, it's probably Canada, because many drier parts of the world like California have major struggles with water right now. Especially as an agricultural producer, and agriculture uses a huge amount of water. That is something that really starts to cross our minds when we think about climate and sustainability. So really, if you're going to feel guilty about anything, it's the fact that we live in Canada, and we don't talk about water enough. LA actually spends a lot more time talking about their water supply than Vancouver does about ours.

Kaylee
Oh, great Alan, thanks very much. I didn't have enough things that I feel awful about, so glad that I've got one more, I'll just add it to the Jenga that I've got going on. Second question, speaking about Jenga, and the bonds that hold it together. Sophia asks, "Why are H Bonds so important? And how are they so strong?"

Alan
Great question, Sophia, I'm going to take a crack at this. But I will be honest, that I'm not a chemist, as like a weird person who looks at high level interactions between humans and water and contaminants and all that fun stuff. It's been a while since the last time I thought about H Bonds. The most I could pull out on the spot is that some of those fancy properties of water we chatted about in a previous question, are really due to the fact that water is a polar molecule. So, what has got a little bit of a plus charge attached to its hydrogens and a little bit of a minus

charge attached to its oxygens, which means that our water molecules want to stick together, which gives water all sorts of fun, cool properties, but as it happens, I know a chemist. And if I'm allowed to, can we phone a friend?

Michael
Oh, yeah, let's do a Phone-A-Science-Friend segment which allows us to play some really cool music!

Music

Alan
So, I'm going to phone one of my best science friends and just a fantastic, sci-commer, Alex Gellé, Alex hopefully is going to join us from Gaspé where she wears a bunch of different hats. She's the co-founder of ComSciComCanada, she's the Director of Pint of Science Canada, she's a renewable energy knowledge broker at Nergica, and just generally a chemistry nerd, which is perfect. So, Alex tell us about hydrogen bonds?

Alex
Hi, guys, I am so happy that you called me with that question. I had dived back into my chemistry books from years ago, because it's something so fundamental that we just forget about it and take it for granted. So basically, if you shake water, those hydrogen bonds are going to be broken up, and they may rearrange in other shapes depending on the surrounding environment. So, they're not that strong compared to regular bonds, but they're very important for biochemistry, because all proteins on nuclear acids on OH could maybe surround themselves on OH, but otherwise, they're not that strong, but they're very important. This is what gives ice those very important properties as well. I have a lot of fun facts on ice too.

Michael
Oh, do share.

Alex
Basically, because of all those hydrogen bonds in between all the molecules is why water expands and then may break water if you forget that in your car overnight, for example. So those hydrogen bonds are actually longer than covalent bonds, and they are longer than regular bonds. Then when water freezes, they cannot stay in place, and they keep all those water molecules further apart than they are in the liquid phase. This is why it expands and then you have this emptiness in between all those water molecules, and then the density gets lower, and then ice floats on water. So, this is another big reason why water is important, and so unique.

Alan
Okay, that's super cool, because ice floats on water was one of our fun facts from earlier. I just honestly didn't know why that was a thing. So, hydrogen bonds, apparently.

Michael
Wow, this is amazing. Thank you so much, Alex, for answering our new segment called Phone-A-Science friend.

Alex
It was a pleasure. Thank you for having me.

Michael
Oh, yeah. Do you want to nerd out some more Alan?

Alan
Yeah, let's do it.

Music

Michael
All right. If you want to get on the nerd outs, you can let us know, drop us an email, send us a message. Tell us what you are nerding out about and Eric sent in that he is nerding out about supply chain disruption. Alan, has there been any supply chain disruptions happening in your life?

Alan
There are definitely supply chain disruptions happening. From a flooding perspective in Vancouver for those of us rationing fuel right now. I was actually emailing a friend of mine who runs a coffee shop in Edmonton, and he was saying that he hasn't been able to get coffee imports from Vancouver, and from Asia because trucks aren't moving back and forth. It definitely reminds us how vulnerable we are.

Kaylee
Yeah, it was pretty wild waking up and being like, oh, the one road that connects us to the rest of the country is gone now.

Alan
If you're an earthquake person, and you haven't listened to Fault Lines, which is CBCs podcast from a few years ago that Johanna Wagstaffe did, talks about what would happen if there was an earthquake in Vancouver. In this particular case, Vancouver is fine and the roads connecting Vancouver to the rest of the world are a challenge. Can you imagine if there was an earthquake and we lost the roads, but also Vancouver really, really needed support stat? It really throws that into perspective.

Michael
Alan water you nerding about? (Laughs)

Alan
Water great question. (Laughs) That was weak. So, I'm nerding out about sand dollars because I grew up in Alberta. We don't have sand dollars, and I was just in Tofino last week. I found a bunch of them on the beach. I'd never found them before. I just assumed it was this weird conspiracy people made up, but they're like living things that become not living things that are fossil rocky things that you can then find and take home, which is just such a strange series of events. I say as a non-biologist who knows nothing about sand dollars. So please, Kaylee enlighten me.

Kaylee
It's as if you were to die, and then someone came along and picked up your bones, and then put it on my table at home. That's a little bit of the process that you just outlined.

Alan
Except I don't think I would look very exciting on a coffee table, and sand dollars do. I think that's the big difference.

Kaylee
Yeah, the thing that I always loved about sand dollars, because we spent a lot of time in Nova Scotia, and there's this sandbar just off from where we would go swimming. There used to be a lot of sand dollars there, there aren't anymore. You'd swim around, you try to find the ones that were dead versus the ones that were alive, and actually that's kind of morbid, like find the dead ones. It was the flower-like pieces on them, that symmetry that they have, it's just like really, really beautiful. I've always found them just so stunning.

Alan
This just randomly makes me think of trace fossils. So, trace fossils are these things that geologists are obsessed with, which are recurring patterns that you see in the rock record, and you don't know necessarily what made them because you're not studying the organism, you're studying the traces that that organism leaves behind, often the poop that organism leaves behind in the fossil record. So about as much as I know, of living beings is how they are preserved through rock, which is kind of a sad statement on life actually.

Kaylee
What about you, Michael? What are you nerding about? Do you have a whole chest full of crumbling dollars?

Michael
I have a chest of old coins that are probably crumbling somewhere. They're probably rusting. I collected coins way back in the day. But I am nerding out about a very special telescope that is getting ready for launch, the James Webb Space Telescope. If you're Canadian, and if you've not heard about this, if you've been around me at work, this is the big news of the year. It feels like forever but now it's getting close to launch as of this recording from French Guiana, (UPDATE: It was successfully launched December 25, 2021) I had to actually do some geography nerding because I had no idea about French Guiana. It's actually not even its own country. It's a French territory, which is the second largest region in France, which is kind of weird because it's in South America. Then there's also Guyana, which is just a little bit west of French Guiana, which is also in South America, and also Guinea, which is in Africa, which used to be French Guinea. So, colonialism is really messed up and weird, but I did enjoy learning something new about geography. The Webb telescope, though, is named after a guy. I don't know if you know this, but he was not a friend to the LGBT community. There was actually a review this year to try and change the name, which didn't go through, which really sucks. But there's still a chance that if Biden steps in, he might be able to change it. You know, he's not super popular these days. Maybe, he needs a win. You know, they should never name these things after old dead white men. I just don't understand why they do that. Although I do kind of like when last names become their own words like Hubble, it is its own word. It kind of sounds like a word even if you don't really think about Edwin Hubble anymore. Like who cares about Edwin Hubble, we now have this really cool telescope that makes amazing discoveries. JWST, which I think is what I'm going to refer to it now is a big deal for Canada. There is a Canadian made instrument on the telescope, which means it's one of the biggest financial investments in space, since the Canada Arm. Which also means Canadian scientists will get a good chunk of scheduled time on this telescope. So, I'm thinking about past guest, Michelle Kunimoto, who is an exoplanet researcher now at MIT. So, it has the potential to discover worlds harboring life,

answer questions of the origins of the universe, there's so much cool stuff that could come out of this telescope. It's hard to imagine what astronomy was like before Hubble, you know, like my place of work, the HR Macmillan Space Centre was born out of the space race in the 60s, and then expanded in the 90s after Hubble, because space then became full of beautiful pictures, which we never had before, and then they became screensavers on all the computers that people started to use in the 90s. So, who knows what new innovations JWST will bring and then become part of our lives without us even really knowing about it?

Kaylee
Do you think that transition from being like this grand beautiful thing to people's screensavers was really sad for space?

Michael
No, I honestly think it was a big deal because those two things happened at the same time. Like we started to use computers more and then this background screensaver and then pictures of space. In the 80s there were no beautiful pictures of space, we had fuzzy blurry ones. There's a weird picture of Saturn with a ring around and then all of a sudden it just became this magical world, like what the hell are rings? So those two things that happened simultaneously are coincidental and special, you know, for the field of astronomy, and could happen again. What about you Kaylee? What have you been psyched about?

Kaylee
Well, I've been super excited. So, season three, episode one guest, Dr. Cylita Guy came on to talk to us about her research with bats, and also her new children's book called "Chasing Bats and Tracking Rats", and that is now out. I have to admit, this is a little self-serving, because I'm one of the characters in the book. I actually ordered several of these books and I got a call from the bookstore where I had ordered them. They were like, one of your books is in. "So where are the other ones?" "We don't know." They're there somewhere else, they got separated somewhere on their magical journey." So, I like to imagine that they're on their way to me right now. I'm just really, really excited for this book to be out. It tells stories of 11 different scientists and their experiences doing urban ecology, the artwork is stunning. It was also a little embarrassing when I went to pick up my copy, because then I immediately ordered several more of them, and the person behind the desk was like, "Oh, you want to order another book?" And I was like, "Yeah, I'll take four or something." And she was like, "Okay, what book?" I was like, "Oh, this one." (Laughs) "The one that you currently have in your hand?" "Yes, I can see how odd this is." Anyway, they're going out to all the kidlets in my life and the non kidlets. So pretty excited. Congratulations, Dr. Guy, on a fantastic book.

Michael
Wonderful. Well, Alan, thank you so much for punning out with us about water and nerding out with us. This was an amazing conversation. Where can people learn more about your storytelling around water, your nerdery and all of the initiatives that you do?

Alan
Well, the best place to find me is on Twitter @watercomm. Whatever I happen to be learning about that day or if you've got questions about water feel free to jump in. I'm always happy to find weird watery folks from around the world. I guess the definition of humans is weird watery folks from around the world.

Kaylee
Oh, I love the idea of everyone just mashing their watery fingers into their keypads to message you. Juice is flying everywhere. Well, thank you, this was an absolute delight and thank you to everybody for listening. If you want to hear more from us, you can follow us on our socials @NerdNiteYVR on Twitter, Instagram and Facebook. This episode was hosted by us edited by me and mixed by Elise Lane. We'll be back in a couple of weeks but until we meet again, have a waterful week and we'll mist you.

Transcribed in part through Otter.ai