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Greenland Shark Podcast and Scientist Interview

Somniosus microcephalus

Join shark expert Greg Skomal as he ventures under the Arctic ice in search of the Greenland shark. Sharing this icy, blue twilight with an apex predator is a thrill--so long as you don't end up being mistaken for a ringed seal, the shark's favorite meal. In this episode, we'll learn how Skomal's research is revealing how these evolutionary survivors endure despite astonishing obstacles.

Transcript

Ari: For the Encyclopedia of Life, I'm Ari Daniel Shapiro. And this is: One Species at a Time.

Greg Skomal is a thrill seeker.

Skomal: There's a lot of things that drive human beings to do what they do. But for me, you know, it's that anxiety, that edge, that mix of emotions, the clashing of human logic with human heart. Like two currents smashing together. Until one wins, it's a roller coaster ride.

Ari: And there's one kind of creature that does this for Skomal – that gets him on that roller coaster ride again and again.

Skomal: Sharks.

Ari: Skomal is a biologist with the Massachusetts Division of Marine Fisheries. He's in the water with sharks every chance he gets. Case in point – the Greenland shark, or *Somniosus microcephalus.*

Skomal: The Greenland shark is a very interesting, yet poorly understood species. The shark basically looks like a cigar – short fins, big nose. Not the most attractive shark I've really ever been in the water with. Lives up in the Arctic Circle. Due to the inhospitable nature of it and the fact that this shark lives under 6 feet of Arctic ice for most of the year, we just don't know a lot about it. So our goal was to get up there in the Canadian Arctic and try to figure out how this animal behaves under the ice.

Ari: And why were you interested in this question kind of in the large picture?

Skomal: We live on a changing Earth where ice is breaking up, where global climate change is occurring. And we want to know what the implications are for the ecosystem in the Arctic region, and part of that ecosystem is the Greenland shark.

Ari: Greenland sharks are apex predators. Nothing eats them, but they eat ringed seals. And Skomal wanted to figure out how the sharks hunt down these seals. Because – from his viewpoint – there are two big obstacles for the sharks. First:

Skomal: It has a parasite that bores into its eyeball that renders it virtually blind. We think the eyeball operates more like a light sensor.

Ari: So the sharks can't see the seals very well. The second obstacle has to do with the water temperature. It's bitterly cold. The salt allows the water to plunge a few degrees below freezing without turning to ice.

Skomal: Life in cold water, it tends to have very low metabolic rates. So these sharks reflect that – they're very sluggish, very slow.

Ari: Too slow, it seemed, to catch a fast-moving seal.

Skomal: This shark's taking half a minute to move its tail just from one side to the other. And its gills are just pulsing a bit. You know, you look at a dog, you get something, you look at a cat – you look at even a snake – you get something – it looks at you, its tongue moves, something happens. You look at a Greenland shark and all you get is this sense of – I'm a completely lifeless individual that's gonna live my life the way I wanna live it, and I'm not betraying anything to you.

Ari: But Skomal wanted answers. He wanted to figure out whether these sharks ate only dead seals, or if they could hunt live seals. So he set out to spy on the sharks, to see if they hung out where the seals were living – in the thick ice layer.

Skomal: We used something called passive acoustic telemetry, which basically means you put a pinger on the shark, you let it go, and you set up listening stations around the area to find out what the shark does.

Ari: That is, where it moves underwater. To attach the pingers, Skomal had to get in the water with the sharks. So he and his team dug holes in the ice, cast baited fishing lines into the water, and brought the sharks to the surface, one at a time. Which is when Skomal – wearing his scuba gear and dry suit – would descend down through the hole and into the icy water below.

Skomal: It's an incredibly eerie world to be in because there's no sound. You're in gin-clear water – it's like being in a giant martini. And there before me is an 8, 9 or 10-foot Greenland shark. You can hold them, you can keep them from swimming away because they're so cold in this environment. And believe me, being in that water does slow you down as well. I was comfortable for roughly about 15 minutes. Once your body core cools down, you need to get out of the water. You're working in water that is deep, so if you have buoyancy issues, you sink to the bottom, you're dead. If you can't find your ice hole, you get disoriented, you're dead. So there's always that gnawing at the back of your brain.

Ari: On numerous dives, Skomal did manage to stay focused and attach pingers to the dorsal fins of six Greenland sharks. And later, when he got the data back, he reconstructed their 3D paths.

Skomal: We thought, well, perhaps it will spend all its time on the bottom, just snarfing up like a vacuum seals that die. And certainly a couple of the sharks did that. But remarkably, a couple of the sharks ventured close to the ice-bound surface in areas where there were seals.

Ari: Skomal thinks the sharks may use their big noses to follow a seal's scent trail to the surface, their eyes to discern the bright hole in the ice ceiling where the seal would be living, and finally –

Skomal: These sharks have an amazing mouth. They have an ability to latch onto something, literally suck onto it, grab a hold of that seal, and feed on it. Unsuspecting, the seal may drown as the shark drags it under. We think that might be the mode this shark is using. Never observed, but derived indirectly from our technology.

Ari: This research almost doubled what was known about the Greenland shark. That pleases Skomal a great deal. But the fieldwork, the diving beneath the ice, also brought him to that edge he so adores – the place where logic and emotion face off.

Skomal: When you reflect back on it, you say, "Wow, that was incredible!" Not only being in probably the most inhospitable environment I've ever been in, but getting to see a species that very few people on Earth have ever seen. Underwater with a live Greenland shark. That, in and of itself, just drives me forward to want to keep doing these things.

Ari: Our series, One Species at a Time, is produced by Atlantic Public Media in Woods Hole, Massachusetts. I'm Ari Daniel Shapiro.

Meet the Scientist

Meet Dr. Greg Skomal, the scientist featured in the Greenland Shark podcast:

Where do you work?
Massachusetts Division of Marine Fisheries.

What do you study?
I study the life history, ecology, and physiology of sharks.

What are three titles you would give yourself?
Biologist, diver, photographer.

What do you like to do when you are not working?
My work involves both field and laboratory efforts. By far, the latter, which includes time both on and under the water is the most fun. When I am not working, I spend time with my family

What do you like most about science?
Making sense out of nature. That is, collecting data about sharks, then putting all the pieces of a puzzle together to assemble a discovery. The whole process involves physical and mental exertion as well as a bunch of creativity.

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