

Audio Transcript: The edge of the ice

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Nate Hegyi: Elizabeth Rush couldn't sleep.

Elizabeth Rush: Um, it was really early in the morning and... I felt like a kid on Christmas who just kept waking up and is like, Is it Christmas yet?

Nate Hegyi: No, it was not Christmas. It was February, 2019 and Elizabeth was aboard a special ship called an "icebreaker..." at the western edge of Antarctica.

MUSIC: Waste or Vanish stem, Blue Dot Sessions

Elizabeth Rush: And sometime between 4 or 5:00 in the morning I woke up. You know there's not really night in Antarctica at this time of year, but it's a little bit darker this time of day...

Justine Paradis: After a month at sea, she was about to witness something nobody had ever seen up-close.

Nate Hegyi: The leading edge of an absolutely enormous wall of ice: Thwaites Glacier.

MUSIC SHIFT: Ebauches stems, Blue Dot Sessions

Elizabeth Rush: The only thing that I have is a visual reference point is that it sort of looks like the wall in Game of Thrones. So, you know, this wall of ice that's probably two times higher than the ship, the ship's like six stories high. And I was really in awe of it.... Folks who had spent more time along ice shelves than I had noticed things that I wouldn't have noticed.

They said, 'it looks mangled, or gnarly. It looks sick.'

Nate Hegyi: This is Outside/in. I'm Nate Hegyi.

Justine Paradis: And I'm Justine Paradis.

Nate Hegyi: And today, we're sharing a behind-the-scenes look at an international expedition to an unexplored part of this world.

Elizabeth Rush: She told me... it's going to be easier for us to get help to folks on the space station than it is for us to get help to you while you're at Thwaites.

Justine Paradis: And we'll get to know a glacier which could, in the next few decades, reshape every coast on this planet.

Elizabeth Rush: You know, the stakes are. They range from the personal to the financial to like the global. ...

MUSIC SWELL AND FADE

Justine Paradis: Elizabeth Rush is a writer. We've actually had her on the show before. And her path to Antarctica started long before she ever stepped foot on a boat.

Elizabeth Rush: I had been writing about sea level rise in particular for, I don't know, over half a decade. And I wanted to, like, see the source .

Nate Hegyi: In 2018, she got a once-in-a-lifetime offer: a spot on an international research vessel headed to a part of Antarctica where no one had ever been. Thwaites.

Elizabeth Rush: "They're deploying an icebreaker this year, and there's one berth remaining, and I recommended it be given to you...." It was a dream come true to be invited, truly.

Justine Paradis: To accept, Elizabeth had to put her life on pause. She and her partner had been planning to start a family, but...

Elizabeth Rush: I found out once I was accepted that pregnant people aren't allowed to deploy to the ice.

Justine Paradis: Because, basically, it would be too dangerous.

Elizabeth Rush: I was 35 at the time. And so, you know, that's like the number that's batted around as like, 'oh, your fertility starts to plummet in your mid to late 30s.' So I felt sort of like squeezed by this mandate to not get pregnant before going. But I also was kind of curious, like, I'm going to carry that desire with me onto this boat and how is this mission going to shape that desire? It felt very risky, to be honest.

MUSIC: Trajectories (one synth), Blue Dot Sessions

Nate Hegyi: This trip was special, even for a mission to Antarctica. You may have heard of Thwaites' nickname. The Doomsday Glacier. It's called that because if it collapses – the implications for global sea level rise will be profound.

Elizabeth Rush: It is just absolutely gigantic. It's the size of Florida. It's the size of Great Britain. And it alone contains enough ice to raise global sea levels two feet. It also, we think, acts as a kind of cork to the entirety of the West Antarctic ice sheet, which contains, you know, upwards of ten feet of global sea level rise.

Nate Hegyi: But, despite how important it is, scientists had very little first-hand knowledge about Thwaites: most of it based on satellite imagery and data from other glaciers.

Nate Hegyi: How hard is it to get to Thwaites?

Elizabeth Rush: Well, I'll say this again. We were the first human beings to ever get there, and no one has returned since. So it's extremely hard.

MUSIC: Pacific Time, Blue Dot Sessions

Nate Hegyi: Getting to Thwaites... it's kind of like getting to the summit of Mt. Everest. There's a short window of time when the weather is good enough to risk it. Just 4 to 6 weeks.¹

Elizabeth Rush: In most years, the sea around Thwaites is frozen over for the, you know. Essentially all year. So the year we went, there was an exceptional pocket of unfrozen water directly in front of the glacier's calving age.

Nate Hegyi: They were setting off during the Antarctic Summer, when there's 24 hours of daylight at the South Pole. But sea ice conditions can change quickly in the southern ocean. And best case scenario, it would take weeks to get to Thwaites.

Elizabeth Rush: My program officer said a lot of interesting things in the prep for this mission. She told me: 'it's going to be easier for us to get help to folks on the space station than it is for us to get help to you while you're at Thwaites.'

MUSIC FADE

Justine Paradis: Elizabeth's home for the next 8 weeks - her space station, if you will- was called the RV Nathaniel B. Palmer. It's a type of ship called an icebreaker.

Nate Hegyi: This is a serious boat. About the length of a football field, and six stories high. One of the first things you notice about it... is its distinctive color scheme.

Justine Paradis: The hull is the color of a traffic cone. The rest is painted a kind of egg yolk yellow.

Elizabeth Rush: One of the Brits... looked at me and said, like, 'what's with the paint job? Was orange on sale or something?' like, it's a goofy color, this boat. But I also wondered, like if it's bright orange so that like, people could notice it against the landscape. It certainly stands out.

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Nate Hegyi: So, months after that first call, Elizabeth found herself standing on a pier in Punta Arenas, Chile , getting ready to board. Before they left port, she and her crewmates had been handed their government-issued cold weather gear.

Elizabeth Rush: And I thought it was really hilarious. Like the Swedish gear was so sexy. It was like these like full body, like black Starship Trooper outfits that I was like very jealous of. The Brits were very utilitarian. I felt like they regularly looked like car mechanics. And I was like, you know, they all had sort of like matching like embroidered insignias. And they were a little team.

And the US gear was so scrappy. It was hilarious. I felt like sort of a mixture of a rubber duckie slash like lobster fisher person.

MUSIC: Candlepower, Chris Zabriskie

SFX: Ice breaking recorded by Elizabeth Rush

Justine Paradis: Most scientific expeditions like this have a particular research focus – like sea ice, or deep ocean currents. But because Thwaites is so important – because of how difficult and expensive it is to get there – the plan was to gather as much direct observational data as they could.²

Nate Hegyi: There were a few different science teams on board. The rock team, the sediment team, the submarine team, even an elephant seal team. All told, there were 57 people on the ship, about half scientists, half crew.

Justine Paradis: Among the scientists, there was solid gender parity – about half women, half men. Among crew, a few were women. The two able-bodied sailors – which is an actual [term](#) – they hailed from the Philippines.

Elizabeth Rush: [Filipinos are famous sailors](#), um, but that also has to do with economic need and want... working on long range vessels is a

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lucrative profession for many in the Philippines. We had two black men on board. Both of them were cooks. And, you know, I think you can kind of see that those people who hailed from families who had access to centuries of economic resources off the boat tended to be the ones conducting the science. And those who didn't tended to be working in support of the scientists.

Nate Hegyi: Conditions in the Southern Ocean are, of course, extreme. The water is so cold that if you fell overboard without protection, [you'd stiffen and freeze in just minutes](#).

MUSIC: Let There Be Rain (drum stems), Silver Maple

Elizabeth Rush: So we left from Punta Arenas, the southern tip of Chile, we sailed out the Strait of Magellan, and in a couple of days we were crossing the Drake Passage which is the wildest, reliably wildest ocean passage in the world.

SFX: Ice breaking recorded by Elizabeth Rush

Justine Paradis: There's an ocean current that wraps around the entire continent of Antarctica. The Drake Passage is essentially its narrowest choke point.

Elizabeth Rush: We encountered.... 25 foot seas that basically caused the ship to roll like... Rollllllling back and forth for days on end. Most of my shipmates got really sick.

Nate Hegyi: Did you not get sick?

Elizabeth Rush: I did not get sick! I've never been super prone to sea sickness.

Nate Hegyi: In fact, even through the Drake Passage, Elizabeth liked to go to the ship's small gym. Someone had brought along "Insanity Max 30 workout videos." That were made more interesting by the rocking of the ship.

Elizabeth Rush: It was really fun to do those videos in heavy seas because you could like be doing jumping jacks and the ship would be like rolling beneath you. And so you would get like way more airtime on you're jumping jacks It was it was great fun, actually.

OCEAN SOUNDS + BEAT SWELL AND FADE

Justine Paradis: As exciting as it was to be on this unique, first of-its-kind mission, much of the day-to-day experience was not as thrilling as you might imagine.

Elizabeth Rush: Many of the scientists and crew would tell me, like the true challenge of Antarctic fieldwork is the boredom challenge, because you have these extremely long transits in which you're not doing the science.

Nate Hegyi: People passed the time in pretty unremarkable ways. They watched movies, did crossword puzzles³, read pulpy romance novels.⁴

Justine Paradis: So, there was one aspect of life on the icebreaker which was particularly important for the morale of all souls on board.

Food.

MUSIC: BradPKL (minus synth), Blue Dot Sessions

Elizabeth Rush: So there are four meals a day on the boat. And those four meals are like, ground your day. It's like I think 7 a.m. noon, 5:00 or 5:30, and then something called Midnight rations, which is at midnight.

And those four meals are like, ground your day.

One of the cooks said something to me that I thought was brilliant. He was like, you know, 'We aim to put out good food for meals a day because as soon as you're putting crappy food on the line, like the morale goes down.' People look forward to meals. And we'd get excited and like, you know, I remember Salmon Wellington was like, Wow, this is a big day.

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⁴ p56

... One of our cooks came from New Orleans. He did a king cake and we had like a Mardi Gras celebration in the galley....

SFX: Ship + ice breaking recorded by Elizabeth Rush

Justine Paradis: Beyond the card games and high seas. There were beautiful moments, too. Whales. Adelie penguins sliding off ice floes, flippers akimbo. The ocean, the same yet different every day. The eerie blues of the first iceberg, and the hundreds that followed.

Nate Hegyi: They'd been at sea for 3 weeks, and the Palmer was getting close. Maybe 12 hours from Thwaites.⁵ The excitement was palpable.

MUSIC: Chris Zabriskie, Where Have All the Cybertrackers Gone

Nate Hegyi: And then.

Elizabeth Rush: And, uh, and then the ship turned around...

Then we were all gathered in the computer lab and sort of told this news... one of our shipmates was in great physical danger and that we had to get this person to help as soon as possible.

Nate Hegyi: The details were mostly kept under wraps, and it was only months after the voyage was over that Elizabeth got the full story. A crew member was pregnant.

Justine Paradis: This was obviously unexpected, because, remember, pregnant people weren't allowed on the mission. But, in this case, she and her husband were both crew members on board. Elizabeth interviewed her about the medevac much later, and they think the child was probably conceived the day before they left port.

Nate Hegyi: But now, just hours away from the ice, this person was experiencing extreme abdominal pain. There were concerns that the pregnancy was ectopic, a life-threatening condition.

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MUSIC FADE

Elizabeth Rush: And quite frankly, if that had been the case, she would have died on her boat.

Justine Paradis: Of course... the crew's health is very important. But getting to Thwaites, I know everyone wants that. Like, how much did that set the was it was there a risk of not getting to Thwaites because of this?

Elizabeth Rush: Yeah, there was. I mean, it was the sea ice was open and everyone was like, Oh my God, we could be there right now. And at the same time it was like, But we have to get our shipmates safe..... yeah, there was just concern that the sea ice would close while we were on this medical evacuation, that we wouldn't get to go back and that would have been kind of devastating. But also, you know, it's a decision you make to value human life.

MUSIC: Rubber Ball Machine, Blue Dot Sessions

Justine Paradis: Time slowed down. People watched horror films. Taught each other to play bridge. Elizabeth organized the International Amundsen Sea Ping-Pong tournament. Late one night after a card game, a humpback whale spouted in the fog.

Nate Hegyi: Every day that passed was a day that they couldn't spend doing research on the glacier. They finally made it to a remote British base where the woman and her husband were evacuated.

Justine Paradis: And then they turned around again. Back towards the glacier. Back towards Thwaites.

MUSIC: Yan Terrien, Bees Keys String

BREAK

Nate Hegyi: Welcome back to *Outside/In*. I'm Nate Hegyi, here with Justine Paradis, picking up Elizabeth Rush's journey to Thwaites.

Justine Paradis: When Elizabeth knew that she'd be writing about Antarctica, her first stop was the library. To see what else had been written about this place.

Elizabeth Rush: I took out a bunch of books that first day, and I brought this huge stack of them back to my office. And it was only once I got to my office that I realized that, like, I don't know, of the two dozen books I took out, two were written by women. None were written by a person of color. And that, that was my first clue. Almost every single book about Antarctica really retells, like, the same six events.

Nate Hegyi: These are classic, if cliched, stories of male explorers, battling the elements. Amundsen's conquest of the pole. Scott, trying to beat Amundsen, dying in the attempt. Shackleton and the epic story of the Endurance.

Elizabeth Rush: And so, like a couple months into my research, I started to grow really bored... The language and the metaphors are metaphors of sexual dominance. So it's like 'Antarctica's broad white bosom draws men towards it,' and 'her impenetrable interior is the ultimate prize.' And so my boredom kind of gave way to a bit of rage. I'm not going to lie.

Justine Paradis: These stories of male heroism felt so incomplete. Because actually, no one goes to Antarctica on their own. Beyond the 57 people on the Palmer – scientists, cooks, crew, technicians, sailors – there were families at home. Support teams.

Nate Hegyi: This was a huge community that had contributed to make this journey possible. And Elizabeth realized: when she wrote about Antarctica., about this voyage... she could include all of that.

MUSIC: Friction, Nctrnm

Justine Paradis: The morning the icebreaker arrived at Thwaites, she got to see that collaboration in action.

Elizabeth Rush: it was like a switch flipped and suddenly it was a scientific overdrive. And. Yeah, it was just like it became very no BS... Like, boom, boom, boom, boom, boom. We're always trying to we're making use of literally every minute we have at this point. Right?

Justine Paradis: No more ping-pong.

Elizabeth Rush: Everyone on board started working 12 hour shifts, like 12 hours on 12 hours off.

Justine Paradis: No more horror movies.

Elizabeth Rush: Oh, gosh. You know, the stakes are. They range from the personal to the financial to like the global... This is career-making science for a lot of the people on board. You only get one shot... and for them, at a personal level, the data is stuff that they're going to work on for years afterwards. So like... it's a really big and important deal...

MUSIC FADE

Nate Hegyi: The actual science being done was pretty fascinating. The sediment team was gathering cores from the seafloor, which would then be stored in an archive, and studied by scientists all over the world.⁶

Justine Paradis: And meanwhile...

Elizabeth Rush: The ship itself is like constantly running sonar. So you're constantly trying to get, generate a picture of the seafloor that's like happening 24 hours a day in the background.

Justine Paradis: And, they enlisted some of the locals to help get readings under the ice shelf...

MUSIC: Kirkus, Blue Dot Sessions

Justine Paradis: ...seals.

SFX: Weddell seal [ringtone recordings](#)

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Elizabeth Rush: We also ... were sending scientists onto ice floes so that they could sedate Weddell seals and epoxy transponders to their foreheads so that these Weddell seals could take temperature readings of the water, salinity readings of the water...

Justine Paradis: The reason they did this is because, while the ship could only be there in person for a few weeks, the Weddell seals lived there year-round even when the ice is impenetrable to human vessels.

SFX: just one more [Weddell seal](#) sounding like it's laughing

Nate Hegyi: One of the most ambitious projects, led by the Swedish team, was a submarine – technically an autonomous underwater vehicle – that they deployed underneath the ice shelf.

Justine Paradis: This was a VERY tricky, expensive, and delicate maneuver. Like, they could have lost this state-of-the-art sub beneath the ice.

Nate Hegyi: And they sent it out – and got it back. Twice.

MUSIC SWELL AND FADE

Justine Paradis: So what did we find out?

Elizabeth Rush: So that submarine that we sent under the ice shelf came back with really detailed images of the seafloor that illustrated hundreds of corrugation ridges that looked kind of like tractor tracks on the seafloor.

Justine Paradis: These ridges are a kind of record of how Thwaites has moved over the past couple centuries. Each ridge – was once the location of what's called the grounding line – the place where the floating part of the ice shelf connects to the land.

Nate Hegyi: Those ridges tell a story. That Thwaites could collapse faster than anything we've ever seen.

Elizabeth Rush: They tell us that the grounding line at Thwaites has retreated at rates two to three times faster than humans have ever observed... which is really significant.

Justine Paradis: Another major finding came from a team of scientists doing some Antarctic archaeology.

Elizabeth Rush: ...and this comes from the penguin bones that we were able to exhume from these remote island chains... at no time since the last glacial maximum has Thwaites regenerated. So we have no reason to believe that it will start growing in the near future.

MUSIC: Trajectories (one synth), Blue Dot Sessions

Nate Hegyi: The science frenzy at this part of Thwaites lasted less than a week.⁷ By the end of their time at the edge of the glacier, the Antarctic night was already noticeably longer. And then, the ship turned back east⁸. Back across the Drake passage. Back to Chile.

Elizabeth Rush: What I remember actually from returning after being gone for 54 days was that I could smell like Earth. I could smell a certain sort of like fecundity, and the ice has very little of that.

MUSIC FADE

Nate Hegyi: After one last evening ashore, drinking wine in Punta Arenas, the ship's community dispersed. To universities. To labs, across the world. They carried with them: sediment cores and water samples, ancient penguin bones and data.

Justine Paradis: Thwaites is nicknamed "the Doomsday Glacier." A complete collapse could lead to a staggering amount of sea level rise – the kind of thing that will transform cities across the world.. Elizabeth had just witnessed Thwaites and its ongoing disintegration first-hand... and now she had to go home and again, pick up her plans to try to start a family.

Which is something that a lot of people are grappling with. That question. Having children as human-caused climate change transforms the world – including Antarctica. What kind of planet and society our children will be living in and on?

⁷ p283

⁸ p291

But Elizabeth thinks Thwaites' nickname misses something vital.

MUSIC: Trajectories (two synths), Blue Dot Sessions

Elizabeth Rush: I don't love the nickname, but I am aware that it's catchy and a lot of people use it.... accelerated sea level rise doesn't have to mean apocalypse like. It depends on how human beings and human society responds to this shift. And even if we're talking, you know, multiple feet in a century, there are ways to transform our human society so that that is not nearly as catastrophic as it might otherwise be. So I feel like Doomsday Glacier kind of steals from us the possibility of being transformed and not just for the worse by this glacier. So that's why I don't love the name.

Justine Paradis: Later that same year that she traveled to Antarctica - Elizabeth got pregnant.

Elizabeth Rush: I think having a child means you have to commit to. Believing that the future can be better than the past. But it's not just a belief. You also have to commit to being part of that change. Like if you're going to bring them here, you have to be able to look them in the eye and say, I brought you here and here's what I'm doing to make the future livable for you.

MUSIC FADE

MUSIC: Come 2gether, Ooyy

SFX: [more Weddell seals baby](#)

Nate Hegyi: Elizabeth Rush is the author of “The Quickening: Creation and Community at the Ends of the Earth.”

Justine Paradis: Elizabeth took beautiful pictures of the voyage to Thwaites, some of which she graciously shared with us. We'll be posting a few on our Instagram and in our newsletter. And we'll be linking to the science that came out of this voyage and other expeditions like it.

Nate Hegyi: Find links to all that and more in the show notes and on our website, outsideinradio.org.

Justine Paradis: Also, these otherworldly sounds you're hearing are not the flourishes of a DJ, but the vocalizations of our Weddell seal allies in Antarctica, which are made available to download as ringtones at <https://weddellsealscience.com/>.

This episode was produced by Justine Paradis with help from me, Nate Hegyi. It was edited by Taylor Quimby. Our team also includes Felix Poon.

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