After the Fact | What Does a Barbie Pig Have to Do With Seabed Mining?

Originally aired May 22, 2026

Total runtime: 00:22:18

TRANSCRIPT

Benny Martinez, host, “After the Fact” podcast: I grew up in rural northern New Mexico where the light pollution is nonexistent. That makes for some pretty stellar star-gazing if you looked up. But facing forward, that utter darkness just seemed endless. As a kid, I was always nervous about doing nighttime chores for my dad, because I didn't know what was out there. What was waiting for me?

Welcome to “After the Fact” for The Pew Charitable Trusts. I’m Benny Martinez.

Julian Jackson, project director, ocean governance, The Pew Charitable Trusts: You've got these different animals that have been imaginatively entitled—say, the Gummy Squirrel, or Casper the Octopus, or the Flying Spaghetti Monster.

Benny Martinez: You see? These are the names of creatures that, as a kid, I might think up in my head, worrying about them every step I took in the darkness. But that was Pew's Julian Jackson naming some very real animals that thrive in a dark, cold place … the deep sea.

It's a place with no light, near-freezing temperatures, and crushing pressure that would kill a land-dweller instantly. But, to quote Jeff Goldblum in “Jurassic Park,” "Life finds a way." So, contrary to what you might think, the deep sea is full of creatures that have adapted to handle these extremes.

It makes up 90% of the marine environment, yet recent science suggests we’ve seen less than 0.01% of it. But we're working on that. The documentary "How Deep Is Your Love" tells the story of taxonomists and captures their quest to understand the animals they pull up from the depths.

Documentary clip: Maybe it's taking in water there, it's storing it. That's what gets used for hydraulics. I don't know. Uh, probably nobody knows. This is the point. Nobody knows exactly how it works.

Eleanor Mortimer, director, "How Deep Is Your Love": The deep sea started to infiltrate my consciousness. I started reading about the deep sea. I became aware that a lot of it doesn't technically belong to any nation, and I was really interested in what that might mean for us as humans. Like, how do we relate to this place that most of us have never seen?

Benny Martinez: In 2021, Eleanor Mortimer was living on a boat when Jacob Thomas, a friend she had known since film school, came over for dinner with his wife, Muriel. Now, Muriel was a marine biologist working with taxonomists at the Natural History Museum in London. And like any dinner party, as much as you try to avoid it, their conversation turned to work. But we can give these three a break here because the discussion got pretty deep, pretty quickly. Pun intended.

Eleanor Mortimer: We started talking about the deep sea, and I was like, wow, this is crazy, because I've never heard of a taxonomist.

Benny Martinez: Taxonomists—those are the scientists who discover and name new species.

Eleanor Mortimer: I was so naive. I had no idea there were new species. I thought we'd found everything, but it makes sense, right? The deep sea is completely unknown, and there are all these new species, and there are these scientists who are finding them, describing them, and giving them names. And that was when I thought, there's a film here. And Jacob was like, OK. Eventually, he was like, OK, yeah, we'll make a film.

Benny Martinez: In the film, you cite the statistic that 90% of the life-forms in the deep sea have yet to be discovered. That's pretty shocking to me. What else, going through this process, shocked you in terms of how little we know about the deep sea?

Eleanor Mortimer: As a filmmaker, I'm all about observing and viewing the world. And when I discovered that actually much less than 1% of the seafloor has ever been seen by humans, it just blew my mind because suddenly, for me, the imagination comes into play. You know—what is down there? We're talking about a huge percentage of the surface of the Earth. This is not a small place.

Benny Martinez: And Jacob, what about you?

Jacob Thomas, producer, "How Deep Is Your Love": Part of what really drew us to this is that people were making decisions about something that we knew so little about, and those decisions weren't necessarily being driven by information or science. People have been studying the deep sea for a long time, and so it's not really fair to dismiss all the work that's gone on over the decades that they've been studying it. But we still really only have a snapshot of what's down there.

Benny Martinez: We are lucky enough to have been able to watch "How Deep Is Your Love?" and some of these creatures the taxonomists found were, like, the first representatives of their species. How did that feel, being there to capture that on footage?

Eleanor Mortimer: It was sort of an electric atmosphere on the ship with the scientists as they sent the robot down, and we'd all be completely glued to the livestream because at any moment you might look away and something, you know, amazing kind of comes in. I think I was very sleep-deprived the whole time because I just didn't want to go to sleep. These are 12-hour-long dives, and the scientists are on shift. But I'd be there trying to keep filming, thinking I would go to bed, and then the giant squid would come on screen.

Documentary clip: Oh, that's—yeah. Oh my God. There, they're there. There they are.

Eleanor Mortimer: I mean, it's like encountering another world.

Benny Martinez: There's growing interest in something else down there, too: seabed mining. Mineral-rich rocks, called polymetallic nodules, grow on the seafloor over millions of years and could be used to help manufacture things like cell phones or EV [electric vehicle] batteries.

We've only explored a fraction of the deep ocean, and taxonomists are discovering new species with nearly every dive to the seafloor.

But the creatures themselves could hold something more valuable than minerals—what scientists call "marine genetic resources," DNA that could be the key to unlocking new medicines and discoveries we haven't yet imagined.

That's why Pew supports a moratorium on seabed mining until science catches up. Because when it comes to the deep sea, we don't know what we don't know.

Documentary clip: The ISA is at a crossroads. It is up to you, members of this assembly, which path to take: a pathway towards accelerated, unregulated extraction that will cause damage to the seabed that will outlast humanity.

Benny Martinez: You might recognize that voice. That's Pew's Julian Jackson addressing the International Seabed Authority in "How Deep Is Your Love." I had a chance to catch up with him recently about his work protecting the deep sea.

Hey, Julian. Thanks so much for being here. Tell us a bit about what you do at Pew and why Pew, as an organization, has a keen interest in seabed mining.

Julian Jackson: Yeah. Thanks, Benny. I've been working in the international biodiversity policy space for almost 20 years now. But I joined Pew about 10 years ago. My particular focus is on deep seabed mining. Pew has, obviously, a rich history in marine conservation, and deep seabed mining has the potential to impact lots of the work that Pew has done.

We're concerned that if it is done at all, it is done in an environmentally responsible way. That it doesn't undermine all the other marine ecosystems that Pew's been working hard over the years to protect.

Benny Martinez: Before we get into the nitty-gritty about seabed mining, let's set the stage a little bit. So, all I know is that there's no light, there are freezing temperatures, and immense pressure. So, I would imagine that for many people, and I'm including myself in this group, we're largely in the dark about what exists at the bottom of the ocean. So can you paint a picture for our listeners?

Julian Jackson: So, life looks very different, but there's definitely life down there, and it's older and, arguably, because it's older, it's more biodiverse than anything that we see on land. But you've got to imagine that because there's so little food at the bottom of the ocean, the life is actually very slow-moving, but the life cycles also take a very long time as well.

What I consider a great, sort of, iconic species of the deep is the Greenland shark. This is a shark that can live for up to 500 years. It takes up to 150 years before it reaches sexual maturity. So it means that it's going to be challenging for us to understand the impact of mining in a short amount of time. It's going to be very sensitive to any changes and will take a very long time to recover if anything happens, given that an entire generation will take 150 years.

Benny Martinez: Let's talk about the stakes here for a second. Why is there interest at all in what exists at the depths of the ocean?

Julian Jackson: Good question.

Benny Martinez: We try. We do our best here at “After the Fact.”

Julian Jackson: I think it must be 150 years ago the HMS Explorer discovered some nodules at the bottom of the Clarion-Clipperton Zone.

Benny Martinez: These are the rocks growing on the seafloor that I mentioned earlier.

Julian Jackson: At the time, nobody knew what they were, and nobody thought much of it. Fast forward to about 30, 40, 50 years ago, people are understanding that these nodules contain concentrations of cobalt, copper, nickel, and manganese. And these were thought to be helpful minerals for industrial applications, battery minerals, or general construction.

These nodules are millions of years old. They take a very long time to actually form, so they form naturally around, say, for example, a shark's tooth that has fallen through the water column. And then the minerals accrete around this. But it's worth bearing in mind that these are not necessarily commercially viable. So they're still a theoretical source of minerals.

Benny Martinez: And the world's highest concentration of nodules live at the bottom of the Clarion-Clipperton Zone. It spans roughly 1.7 million square miles of the Pacific Ocean between Hawaii and Mexico.

Julian Jackson: What's interesting, though, about the Clarion-Clipperton Zone is that this is in international waters. So it's underneath the UN Convention on the Law of the Sea. These minerals have the status of common heritage of humankind. So they're owned by none of us and all of us at the same time.

So that's a super hard challenge for the International Seabed Authority, the international institution that's responsible for overseeing any exploration and exploitation of minerals.

Benny Martinez: Speaking of exploration, we spoke with Eleanor Mortimer and Jacob Thomas, the director and producer of a film called "How Deep Is Your Love?," where they document an expedition to the Clarion-Clipperton Zone with some taxonomists who are exploring the deep sea.

And we've got a sneak peek of that film. And I've got to say, these nodules that you're talking about, maybe the size of grapefruits, look like black rocks, but they pepper the seafloor, and it's that ecosystem that we're talking about.

Julian Jackson: Yeah, that's right.

Benny Martinez: So talk to me a little bit about the disruption mining can cause to the ecosystems and what's at stake.

Julian Jackson: As the producers of "How Deep Is Your Love?" have shown, the taxonomists are only just starting to understand the sea life that is down there. You've got these different animals that have been imaginatively entitled—say, the Gummy Squirrel, or Casper the Octopus, or the Flying Spaghetti Monster.

So these are great names of creatures for a podcast. But what's really interesting is that every time there's a dive, new species keep being discovered.

We are only just understanding what they are. We don't quite yet understand the next part of the problem, which is their life cycle. So we don't understand how any mining will impact them. I think, most importantly for us as humans, what's the impact on not just the immediate ecosystem but the wider ecosystem?

So if we don't know what the creatures we're talking about are, we don't know the life cycles properly, then we also don't understand the implications that any mining would have on the ecosystems and the ecosystem services that the deep ocean provides.

Benny Martinez: So, broken down to its core, this is an issue of we don't know what we don't know. So let's pump the brakes and spend some time to figure that out.

Julian Jackson: Yeah, exactly. There's been several studies looking at how do we answer some of those known knowns and unknown unknowns. But estimates of what we need to do to understand that have suggested that we need decades' worth of science before we fully understand some of these issues.

So a long time and a lot of investment is still required before we can say with any confidence that we're able to mine in any way that is environmentally friendly.

Eleanor Mortimer: When the remotely operated vehicle lands on the seabed, there's a cloud of sediment. It's very dramatic, actually. It looks like a moon landing. And then when that clears, you see a lot of these rocks. There's just millions of them. And then there's life-forms and animals that live on and amongst these rocks.

Benny Martinez: One of the curious elements about the film that I found is because of the expedition to the deep sea, these taxonomists are looking to document the different species or the different organisms they find there. And as sophisticated as this deep-sea-diving robot was, the claw attached to it didn't seem so dexterous. I think they were trying to pick up a sea cucumber that just escaped its grasp.

Jacob Thomas: You think of a claw game in an arcade or something like that, but most of those claw games, you're working in two dimensions. You can go forward and back and side to side, and the claw just drops down. Whereas this, you're working in three dimensions. Plus, you've probably got a time lag between your input on the claw control and what the claw does.

And then you've got all the pressure of trying to pick something up without damaging it. So, I have a lot of sympathy for them. And there's a couple of moments where they really struggle to pick it up, but then there's a lot of moments where they're surprisingly dexterous with it.

Benny Martinez: This is a film that follows taxonomists on an expedition and understanding how they categorize the different organisms that they encounter. But what I found a little whimsical was that each of the taxonomists themselves was categorized as Homo sapiens and then their actual name.

Eleanor Mortimer: I think right from the beginning, we had conversations about who are the characters of this film? And actually, we wanted the animals to be characters alongside the people. So we wanted to place the viewer outside, as much as possible, of the kind of anthropocentric human way of looking at the world and zoom out and see us, as humans, as another species here on Earth.

Something I felt being on a ship for that long is that you are completely interdependent with the other people on that ship for survival. And for me, that became a kind of microcosm of how, as a species, we are more vulnerable than we think, in terms of who we're dependent on for survival. We are dependent on this world that we live in, on the natural world.

Benny Martinez: Let's continue pulling on that thread a little bit and take a step back and talk about the marriage of art and science. It is a film that's trying to raise awareness for an issue that the average person might not know about. But arguably, I think you're also contributing to science by capturing some of the only footage of these animals and organisms. So talk to us a little bit about that.

Eleanor Mortimer: You could make a film that was a lot of opinions about deep-sea mining, people for and against and this and that, and all the reasons why we shouldn't. And one of the actually joyful things about working quite in close collaboration, not just with the scientists in the film, is that their outlook on the world is about questioning. For me, science and art, they're not so opposite in the sense that they're both really about asking questions and exploring the world and exploring the kind of conundrums of life.

Benny Martinez: Let's talk about love for a second. The film is titled "How Deep Is Your Love?" How deep is your love for the deep sea?

Jacob Thomas: Good question. I hold a lot of, kind of, love and appreciation for everything that I've observed with the scientists in the deep, for this kind of magical space that is extremely ancient. And I think it would be a huge mistake to just, like, make quick decisions, because it doesn't come back.

Jacob Thomas: Maybe we didn't know how much we loved the deep sea when we started this project. But I think that seeing what lives down there and also seeing how deeply the scientists, these taxonomists, love what's down there—and that was one of the things that we were always asking ourselves as we were making it: Will this love translate? Will people get this? Will people fall in love with this weird, gloopy animal? And it was always like, hopefully they will, because they'll see how much this other person can love that animal.

Benny Martinez: I did find myself gravitating or feeling a little emotional to one particular creature called the Barbie Pig. It's just this bright pink, funny-looking creature that just swims in a very peculiar way. Curious, after having gone through this experience, what your favorite sea creature is from the deep sea?

Jacob Thomas: I feel terrible because in a film about taxonomy, I don't know the name of this particular animal, but there's a worm that swims around, and it's a spiky, spiny worm.

Eleanor Mortimer: I think my favorite is one that's been nicknamed the Headless Chicken Monster. This animal can swim. It's translucent and pink and purple, and it ejects its guts out to defend itself from any threats. And I just think it's very inventive. Love it.

Benny Martinez: “Inventive” might be putting it lightly.

There’s one thing we haven’t touched on yet, and that’s how seabed mining is actually governed. Right now, that power lies with the International Seabed Authority, or the ISA.

The ISA was created through the United Nations Convention on the Law of the Sea. That's the international agreement that sets out how countries can use the world's oceans. It covers everything from international fishing rights to the seabed beyond national borders.

I'm back with Julian Jackson.

In the film "How Deep Is Your Love?," they're not allowed to record or film the convenings, but we were able to hear some voices. I'm pretty sure your voice was in there. So, you know, a little plug for Julian Jackson and The Pew Charitable Trusts. But talk to me about your perspective on the governance that exists, or lack thereof, and how that might change in the not-so-distant future.

Julian Jackson: What's really fascinating is you've got a group of 40 or so countries who make up what's called the International Seabed Authority's Council. And it's a little bit unique in that you've got a multilateral system trying to create the nitty-gritty, fine details to govern a frontline industry that will be taking place thousands of miles offshore in international waters, thousands of meters below the surface, for an activity that we know is going to be damaging.

And then you've also got other multiple responsibilities that the ISA has to carry out that potentially produce a sort of conflict of interest—the Convention on the Law of the Sea that says that it has to have these certain functions and a dual function of overseeing the mining activity, collecting any revenue from the mining activity, dispersing it, and perhaps even providing sanctions.

And that's why these rules are taking a long time. And it's quite right that we take the time to do this right. And in the meantime, Pew has been suggesting we have a moratorium on seabed mining to make sure we're not pressured and we're not rushed into creating hasty rules. And we don't start mining before we fully understand the risks and having placed the checks to ensure that the marine environment can be properly protected.

Benny Martinez: Can you talk to me a little bit about what's underway to improve the scientific understanding of what exists, and why should someone focus on this issue or care about something like this that's happening miles into the ocean and miles deep?

Julian Jackson: So I think the thing that people probably can think about and understand the most are the thresholds of impact. So, what are going to be the sources of harm and the levels of harm, and what does that mean for them? The ISA has identified that there are a number of thresholds that they need to agree upon.

So that's how much noise pollution, how much light pollution, how much toxicity, how much turbidity—that's how much muck there is in the water and how toxic that could be.

To me, if we're talking about toxins, what's the interconnection between where some of the damage happens on the bottom of the ocean versus the mid-water. Because there will be this return of mud and toxins from the broken-up nodules going into the mid-water column.

We know that has the potential to spread very far, and we know that it'll also dissolve certain chemicals, and that can have impacts.

Then the other sort of impacts that people think about in terms of wider ocean health, and what really keeps me awake at night is what happens to the oceanic carbon cycle?

Benny Martinez: Julian explained that microscopic organisms living on the seabed help capture and store carbon in the ocean. Some experts are concerned that mining would disrupt these ecosystems, potentially releasing stored carbon or weakening the ocean's ability to do it in the future.

Julian Jackson: And that's why someone should care about this even though it's thousands of miles offshore.

Benny Martinez: Now, I posed this question to both Eleanor and Jacob at the close of yesterday's interview. And their film is titled "How Deep Is Your Love?," but to you, how deep is your love for the deep sea, and how does that express itself in your everyday life?

Julian Jackson: I'm always astounded by the footage that these scientists come back with. So it's super inspiring to see the variety of life and how life can actually find its way to the deepest and darkest places.

And the fact that you've got these creatures that are around for such a long time—we are scurrying around on a surface in some ways, but they're just doing their own thing at a much different pace of life. It also suggests how fragile that world is compared to the sort of impacts that we might have that are long-lived.

Benny Martinez: Thanks again for listening, and if you're interested in learning more about how the ocean is shared and protected, be sure to listen back to our December 2025 episode called "The Treaty That Could Save the Ocean."

And for our U.S. listeners, keep an eye out for Eleanor and Jacob's film "How Deep Is Your Love?" releasing here this fall.

And of course, make sure you're subscribed to "After the Fact" wherever you get your podcasts. I'm Benny Martinez, and this is "After the Fact" from The Pew Charitable Trusts. Until next time.