Brazilian government pressured to punish environmental crimes

By Jonathan Watts, The Guardian, adapted by Newsela staff on 02.04.19
Word Count **985**
Level **1200L**

Image 1. Mud released by the collapse of a mining company's dam flows in the Paraopeba River near a community of Pataxo Ha-ha-hae indigenous people in Brumadinho, Brazil, Tuesday, January 29, 2019. Photo by: Leo Correa/AP Photo

One of the deadliest mining disasters in decades has struck Brazil, and its government has been urged to step up punishments for environmental crimes.

A torrent of mud and iron ore bits engulfed the community of Brumadinho on January 25. It continues to take a toll on residents, river systems and freshwater species.

At least 99 people died near the site, which is operated by Vale, one of the world's biggest mining companies. Hundreds of people are still missing.

Many were eating lunch or resting in a hotel when the tailings dam collapsed and swept them away in a tide of orange sludge. A tailings dam is a collection spot for residue from mining iron ore.

It is the second such calamity to strike a Vale facility in the Brazilian state of Minas Gerais in less than four years. In 2015, 19 people were killed when a tailings dam burst at an iron ore mine in the city of Mariana, Brazil. The Mariana dam was co-owned by Vale.

The amount of slurry this time is 75 percent lower, at about 3 billion gallons — equal to about 4,500 Olympic-size swimming pools. Still now, as then, the ecological damage could potentially persist for many years with grave consequences for local communities, wildlife and the national economy.

Many Miles Of River Are Threatened

Over the weekend, TV and social networks were filled with images of emergency workers in helicopters trying to pull people out of the mud. Now many posts have switched to the impact on fish, frogs and other freshwater species.

"Rio Paraopeba has started to die," noted one grim tweet with a video clip of oxygen-deprived fish leaping out of the muddy river water and flapping their last on the land.

The level of toxicity in the tailings is not yet clear, but iron oxide can choke river sand and poison the surrounding vegetation. It can also compact the soil, preventing new growth of plants on land. Three years after the previous disaster, water from the affected Doce River is still legally unfit for human consumption in 90 percent of monitoring stations.

A second and bigger impact is that previous man-made environmental problems have been worsened. The torrent of water stirred up the heavy metals buried in the sediment on the bottom of the river, which is a huge problem in the state of Minas Gerais. The area has a long history of poorly regulated resource extraction, according to the International Union for the Conservation of Nature (IUCN).

The immediate threat is to the 174 miles of Paraopeba River. Vale insists the problem will not spread to the São Francisco river basin, but conservationists remain concerned. The São Francisco River is the fourth-longest river in South America, and 64 percent of fish species there are found nowhere else on Earth, according to the IUCN. Even before the contamination, 10 percent were already classified as vulnerable. January is the end of the spawning season, which means the flood affected important small fish species for fisheries, such as croakers, curimbatás and surubins.

The slurry reached the hydropower plant at Retiro Baixo on Thursday, January 31. Authorities were hard at work to prevent the contamination from spreading down into the ocean, as happened in the case of the Mariana disaster. Nonetheless, hydropower generation and water supplies are likely to be affected for years.

Mining Businesses Take Advantage

The costs have yet to be calculated. After the previous calamity, Vale and Billiton paid $1 billion into land and river recovery efforts and even more to affected communities. Fishing is still prohibited so stocks can recover and a dam remains disrupted.

Activists say it is essential to tighten regulations for mining companies and punish those involved in the disaster.

Brazil has the most abundant water resources in the world, but mining businesses tap them recklessly because there is little government oversight. With a mere 154 inspectors for such a vast country, only 3 percent of Brazil's dams were inspected last year, according to the Folha de São Paulo newspaper.

The problems date back decades, but the risks look set to grow. The new Brazilian president, Jair Bolsonaro, has gutted the government's environment agency and pledged to make it easy for businesses to start projects.

Campaigners say this should now be unthinkable. "It would be offensive to victims of Mariana and Brumadinho if they fulfill that promise," said Carlos Rittl, who heads the Climate Observatory, umbrella group of environmental nongovernmental organizations in Brazil.

Punishments Aren't Really Enforced

Public fury is forcing some government ministers to shift their words. "At this moment, what we need is to make a regulation that ensures, firstly, that best dam practices are implemented," and that business concerns should be secondary, environment minister Ricardo Salles told local TV on January 28.

Environmental crimes are often punished with small fines that often go unpaid. As a result, campaigners say transgressions build into "time-bombs" that can explode, as was the case in Brumadinho. To avoid this, they say those responsible should be imprisoned, said Malu Ribeiro, the founder of the nonprofit environmental group SOS Mata Atlantica.

Vale's chief executive, Fabio Schvartsman, said in a television interview on January 27 that he did everything the law required. "I followed the technicians' advice and you see what happened. It didn't work," he said. "We are 100 percent within all the standards, and that didn't do it."

Police have so far arrested five people, including three mining staff.

"We have to investigate and punish, but really punish," Brazil's vice-president, Hamilton Mourão, told reporters. "We have to preserve our planet in every possible way, because if not we'll have to live on Mars."

Quiz

1 Is the author of the article suggesting that the public's attitude toward environmental crimes in Brazil is changing?

Which selection from the article BEST supports your answer?

(A) Yes; The immediate threat is to the 174 miles of Paraopeba River. Vale insists the problem will not spread to the São Francisco river basin, but conservationists remain concerned.

(B) Yes; Public fury is forcing some government ministers to shift their words. "At this moment, what we need is to make a regulation that ensures, firstly, that best dam practices are implemented," and that business concerns should be secondary, environment minister Ricardo Salles told local TV on January 28.

(C) No; It is the second such calamity to strike a Vale facility in the Brazilian state of Minas Gerais in less than four years. In 2015, 19 people were killed when a tailings dam burst at an iron ore mine in the city of Mariana, Brazil.

(D) No; The problems date back decades, but the risks look set to grow. The new Brazilian president, Jair Bolsonaro, has gutted the government's environment agency and pledged to make it easy for businesses to start projects.

2 Which option would Fabio Schvartsman MOST LIKELY agree with? Which line from the article supports your answer?

(A) Protecting the environment is more important than making money for businesses; Brazil has the most abundant water resources in the world, but mining businesses tap them recklessly because there is little government oversight.

(B) Mining executives should not be held accountable for bad regulations; The new Brazilian president, Jair Bolsonaro, has gutted the government's environment agency and pledged to make it easy for businesses to start projects.

(C) Protecting the environment is more important than making money for businesses; "At this moment, what we need is to make a regulation that ensures, firstly, that best dam practices are implemented."

(D) Mining executives should not be held accountable for bad regulations; "We are 100 percent within all the standards, and that didn't do it."

3 Why did the author MOST LIKELY conclude the article by quoting Brazilian vice-president Hamilton Mourão?

(A) to highlight the impact that the Brumadinho mining disaster has had on politicians in Brazil

(B) to suggest that social media has allowed people worldwide to understand the danger of unregulated mining

(C) to show the far-reaching environmental impacts caused by irresponsible mining in Brazil

(D) to describe the wide range of economic consequences of spoiling Brazil's natural resources

4 What are the reasons why the dam collapse in Brumadinho was especially devastating?

1. *The dam failure was the largest environmental incident in Brazilian history.*
2. *The flood of toxic iron ore and mud poisoned plant and animal life.*
3. *The large amount of run-off spread toxins from other environmental disasters.*
4. *The disaster led to the extinction of several endangered plant and animal species.*

(A) 1 and 3

(B) 1 and 4

(C) 2 and 3

(D) 2 and 4

Want to help save animals threatened by extinction? Be a citizen scientist

By Kitson Jazynka, Washington Post on 04.04.19
Word Count **721**
Level **MAX**

Scientists say kids can help save endangered species such as the rufa red knot bird. There are lots of ways they can help; for instance, staying away from protected beach areas that are reserved for shorebirds such as the red knot. Photo by: U.S. Fish and Wildlife Service/Flickr

Have you ever heard of the rufa red knot? These hearty shorebirds pass through the Mid-Atlantic area for a kind of spring break each year — taking a rest during their annual 9,300-mile trek from the southern tip of South America to the Canadian Arctic. They stop at beaches within a few hours of the D.C. area to feast on horseshoe crab eggs.

Scientists at the U.S. Fish and Wildlife Service refer to one long-lived red knot they've studied as "Moonbird." This intrepid aviator, according to their calculations, has traveled enough miles in its lifetime to fly to the moon and at least halfway back.

Moonbird's species is threatened with extinction due, in part, to human activity and climate change. Scientists in the United States and around the world recognize that as a species, red knots are in trouble. And they're not alone.

According to the International Union for the Conservation of Nature (IUCN), 14 percent of the world's bird species are threatened with extinction, along with a whopping 40 percent of its amphibians and 25 percent of mammals. These numbers include such familiar and charismatic species as giant pandas, tigers and African elephants. But they also include lesser-known animals such as red knots.

Kids, many scientists believe, are a piece of the conservation puzzle. There are lots of ways they can help, for instance, staying away from protected beach areas that are reserved for shorebirds such as the red knot.

Kids can also help by becoming citizen scientists. As citizen scientists, they observe nature, document what they see and share what they know.

"Observing wildlife and nature is the start of everything when it comes to conservation," said Bill McShea, a conservation ecologist with the Smithsonian Conservation Biology Institute for more than 20 years. "It's the basis for what scientists do."

If kids spot a red knot on a trip to the Eastern Shore, they can let scientists know through eBird, a project of the Cornell Lab of Ornithology. The eBird website (or free mobile app) has a form with sections to identify the species and indicate the where and when of the sighting. The project has documented more than 100 million bird sightings, according to the eBird website.

Another citizen science program, eMammal, encourages kids to become camera trappers. Volunteers help professional scientists collect and upload animal photos captured by camera traps, or motion-sensing cameras. The photos become part of the Smithsonian archives that scientists use to gain insight into the secret world of wildlife.

"Those observations, feeding into a central place, is the way we're doing science right now," McShea said.

And the photographic data does help scientists, said Stephanie Schuttler, a wildlife biologist and a research associate at the North Carolina Museum of Natural Sciences. She said kids participating in eMammal at a school near a protected tiger reserve in India had identified six tigers roaming near the school after dark. The discovery helped Schuttler and other scientists identify and count individual animals and determine where they go when people aren't around.

The kids' work also promotes future conservation by helping them connect with nature.

"That starts discussions about wildlife," Schuttler said, "and encourages conservation."

"Kids have a lot of power to change minds about the importance of taking care of nature," McShea said. "Most of our history is, when the people move in, the wildlife moves out. And we're kind of running out of that option. The big question is: Can we find a way to safely coexist?"

Become A Citizen Scientist

A citizen scientist is anyone (adults included) who documents what they see in nature and analyzes or shares it for the greater good, often as part of a real scientific project. Taking part in a citizen scientist program is a great way for kids to get involved with helping protect threatened species. Learn more at the websites below:

Check out eMammal.si.edu to learn more about becoming a citizen scientist at home or at school. The program is a collaboration of the North Carolina Museum of Natural Sciences and the Smithsonian Institution.

Visit ebird.org to find out how you can get register to help document bird numbers and locations.

Join up with bumblebeewatch.org, an effort to track and conserve North America's bumblebees.

At journeynorth.org/monarchs, help track the monarch butterfly's spring migration across North America.

Quiz

1 Which of these statements would be MOST important to include in an objective summary of the article?

(A) Citizen science includes watching familiar and charismatic species, such as giant pandas and African elephants.

(B) Citizen science is most fun when students are able to track and observe wildlife as part of a larger class project.

(C) A citizen scientist is anyone who documents what they see in nature and analyzes or shares it for the greater good.

(D) A citizen scientist who cares about the future of the planet should help track the monarch butterfly's spring migration.

2 The central idea of the article is developed by ____.

(A) explaining that people should stay away from beach areas reserved for birds

(B) describing websites students can use to help scientists with conservation efforts

(C) exploring the habits of wildlife, such as tigers that often roam during the night

(D) demonstrating that many endangered species in North America are not mammals

3 Read the first three paragraphs of the article.

What is the MOST likely reason for including information about Moonbird?

(A) It highlights the importance of the U.S. Fish and Wildlife Service, as an example for young citizen scientists.

(B) It demonstrates that rufa red knots are both hearty and intrepid, just as the author has characterized them.

(C) It provides an example of what scientists can learn through observation, and gives an identity to a species threatened with extinction.

(D) It suggests that the bird is unusual in comparison with the rest of her species, and illustrates how observation helped discover this.

4 Read the following paragraph from the article.

> *"Kids have a lot of power to change minds about the importance of taking care of nature," McShea said. "Most of our history is, when the people move in, the wildlife moves out. And we're kind of running out of that option. The big question is: Can we find a way to safely coexist?"*

What is the MAIN reason why the author includes this paragraph in the article?

(A) to emphasize the role of kids in contributing to the future of wildlife conservation efforts

(B) to introduce ideas about citizen science elaborated in the section "Become A Citizen Scientist"

(C) to demonstrate the relationship between humans and wildlife habitats throughout history

(D) to suggest that citizen science may fall short of its goals for preserving wildlife habitats

Dream Jobs: Planetary geophysicist

By NASA.gov on 12.08.16
Word Count **1,436**
Level **MAX**

Top: Lynnae Quick. NASA.

Lynnae Quick is a planetary geophysicist. She works at NASA, the U.S. space agency.

Where are you from?

I am originally from Greensboro, North Carolina.

Describe the first time you made a personal connection with outer space.

I never really thought much about space science until I took an Earth-science course during my junior year of high school. One of the units we covered was astronomy. (I remember learning about the H-R diagram and the life cycles of stars.) My teacher was great and always very enthusiastic about what he taught us: deaths of very massive stars, and the creation of gigantic black holes and how they consume everything in their paths. After that lecture, I was pretty much hooked on space.

How did you end up working in the space program?

Although my Earth-science class in high school influenced my interest in astrophysics, it was my high school physics teacher who suggested that it would be best for me to obtain a bachelor's degree in physics and then go on to graduate school for a Ph.D. in astronomy or astrophysics.

After high school, I attended North Carolina Agricultural and Technical State University (A&T) with a major in physics. While there, I was encouraged to apply to the Research Experiences for Undergraduates (REU) program during the summer. Through REU, I interned for the National Radio Astronomy Observatory. I also interned through the NASA Academy Program at NASA's Goddard Spaceflight Center (GSFC). I enjoyed both experiences and eventually returned to GSFC during my first two years of graduate school to conduct research in the Exoplanets and Stellar Astrophysics Lab.

While at GSFC, I became more and more interested in the characterization of exoplanets. At the time, there were all sorts of interesting theories about ocean planets: theorized exoplanets made mostly of water and/or ice. I decided that I would study more about ocean worlds in our own solar system in order to become more adept at characterizing ocean exoplanets.

I then applied for a summer internship at the Applied Physics Laboratory (APL) and spent about three months there learning about Jupiter's moon Europa. I became fascinated with this icy world (and with planetary science in general), so much that I changed my course of study to focus on planetary geophysics in the Earth and Planetary Sciences Department at Johns Hopkins University. I was able to continue the Europa research I'd already started at APL and also combine it with the knowledge of terrestrial volcanic processes gleaned from my adviser at Hopkins in order to conduct thesis research on cryovolcanic and cryomagmatic processes on icy satellites. During my last year of graduate study at Hopkins, I was awarded a NASA Postdoctoral Fellowship to study volcanic processes on Venus at GSFC.

What is a planetary geophysicist?

A planetary geophysicist is someone who investigates processes that occur on the solid bodies in our solar system, often using mathematical models to simulate conditions on these worlds. With these models we study the internal structures of rocky and icy bodies. We also study volcanic processes, tectonics, impact cratering, etc.

I am really excited about the work I do because it allows me to apply what we know about the rocky bodies in our solar system to the icy satellites of the giant planets. For instance, it's so exciting to study volcanism on Earth and Venus, and then compare it to volcanic processes on bodies such as Enceladus, Triton and Europa where lavas could be aqueous solutions of water, salts and volatiles instead of the molten rock that we're used to dealing with on the terrestrial planets.

Tell us about a favorite moment so far in your career.

Well, my career has really just begun, but I do have a few favorite moments.

I spent the summer after graduating from A&T studying Mars' remnant magnetic field in the Planetary Magnetospheres Lab at GSFC. My adviser, Mario Acuña, showed me how to bring up Mars Global Surveyor (MGS) images of the Martian surface on my computer. This was the first time I'd ever laid eyes, firsthand, on images of another planet's surface returned from a spacecraft. I remember just being in awe.

My second favorite moment has to be poring over mosaics of Europa and learning to identify and map chaos regions, impact craters and other surface units during my first summer at APL. Once again, I felt that there was a whole other alien world at my fingertips.

Who inspired you?

NASA astrophysicist Dr. Beth Brown was one of my biggest inspirations. I met her at an American Astronomical Society (AAS) conference my senior year in college. She was such a great role model and mentor to me. In fact, she was the one who encouraged me to apply for the internship studying Europa at APL.

Since then, I've really been inspired by Dr. Louise Prockter. I started working with Dr. Prockter my first summer at APL and continued working with her while pursuing my Ph.D. at Johns Hopkins. Dr. Prockter is a great scientist – she really took me under her wing and has also served as a great mentor.

During my undergraduate years, I just felt so inspired by being able to obtain my undergraduate degree in the same physics program that NASA astronaut Dr. Ronald McNair obtained his.

I must also mention my physics teacher at Dudley High, Mr. John Brown, who was the first person to really encourage me to seek a career path in the space sciences. He set in my mind early on that it was absolutely possible for me to succeed in a field where there aren't many women or minorities. Having that type of "You can do it" encouragement at an early age goes a long way.

What advice would you give to someone who wants to take the same career path as you?

Be bold. Search out people who work in your area of interest. I gained a lot of opportunities by just emailing folks that I thought did cool research and inquiring if I could be their summer intern.

Also, becoming a professional scientist requires, above all else, a willingness to persevere. It will require you to take upper-level science and math classes in high school and college that others generally try to shy away from; but if you can keep in mind that the end goal is being able to have a job where you do something that you really love every day, you'll get through it and probably also enjoy the journey. If possible, find a mentor either at your home institution or elsewhere that can encourage you, give you good advice and help you chart out the path that's best for you.

What do you do for fun?

I love to read and I love to write about non-science things – hence my love for creative writing. I began taking ballet as a stress-reliever during my last year and a half of grad school – I've really begun to enjoy it. I also like to catch a good movie and just hang out with friends and family.

If you were talking to a student interested in science and math or engineering, what advice would you give?

This probably sounds cliché, but take as many math and science courses as you can – it's important to have that foundation. Math will give you the tools needed to investigate the most interesting phenomena in our solar system – and beyond. Science courses, especially physics, give you experience in looking at the total problem, so to speak. They also teach you how to apply your math skills to the big picture.

While you're learning science and math, also embrace your humanities courses. Some of the most successful scientists I know are experts when it comes to being able to effectively communicate their ideas and results to non-scientists. There's no better way to improve your communication skills than taking courses that force you to read and write on a regular basis. To that end, because being a theorist requires, to some degree, being able to think outside the box, classes such as creative writing can be really helpful in honing original thinking.

Most of all, I would say really spend some time finding out what areas of science or engineering interest you the most and what you really like to do. Read articles to learn about new innovations and groundbreaking research in the STEM fields. Also, look for opportunities such as internships where you can get hands-on experience working in an area that interests you.

Quiz

1 Read the selection from the article.

> *It will require you to take upper-level science and math classes in high school and college that others generally try to shy away from; but if you can keep in mind that the end goal is being able to have a job where you do something that you really love every day, you'll get through it and probably also enjoy the journey.*

Which of the following conclusions can be drawn from this selection?

(A) You cannot be a planetary geophysicist if you are not naturally good at math.

(B) You must have dedication to succeed in the complex field of planetary geophysics.

(C) Many people will likely try to discourage you from becoming a planetary geophysicist.

(D) Many people will need to help you if you want to enjoy being a planetary geophysicist.

2 All of the following sentences from the article show how other scientists had a direct personal impact on Quick's career EXCEPT:

(A) Although my Earth-science class in high school influenced my interest in astrophysics, it was my high school physics teacher who suggested that it would be best for me to obtain a bachelor's degree in physics and then go on to graduate school for a Ph.D. in astronomy or astrophysics.

(B) My adviser, Mario Acuña, showed me how to bring up Mars Global Surveyor (MGS) images of the Martian surface on my computer.

(C) I started working with Dr. Prockter my first summer at APL and continued working with her while pursuing my Ph.D. at Johns Hopkins.

(D) During my undergraduate years, I just felt so inspired by being able to obtain my undergraduate degree in the same physics program that NASA astronaut Dr. Ronald McNair obtained his.

3 Why does the author include the final two paragraphs in the article?

(A) to demonstrate that a good scientist should have a broad range of interests and experiences

(B) to suggest that there are other possible fields of study for people who are not interested in science

(C) to explain that the best future job prospects lie in careers that require STEM training

(D) to advise students on the best ways to improve their communication skills in any career

4 Is the first paragraph an effective way to engage readers on the topic of planetary geophysics? Why or why not?

(A) Yes, it includes a description of Quick's work for NASA.

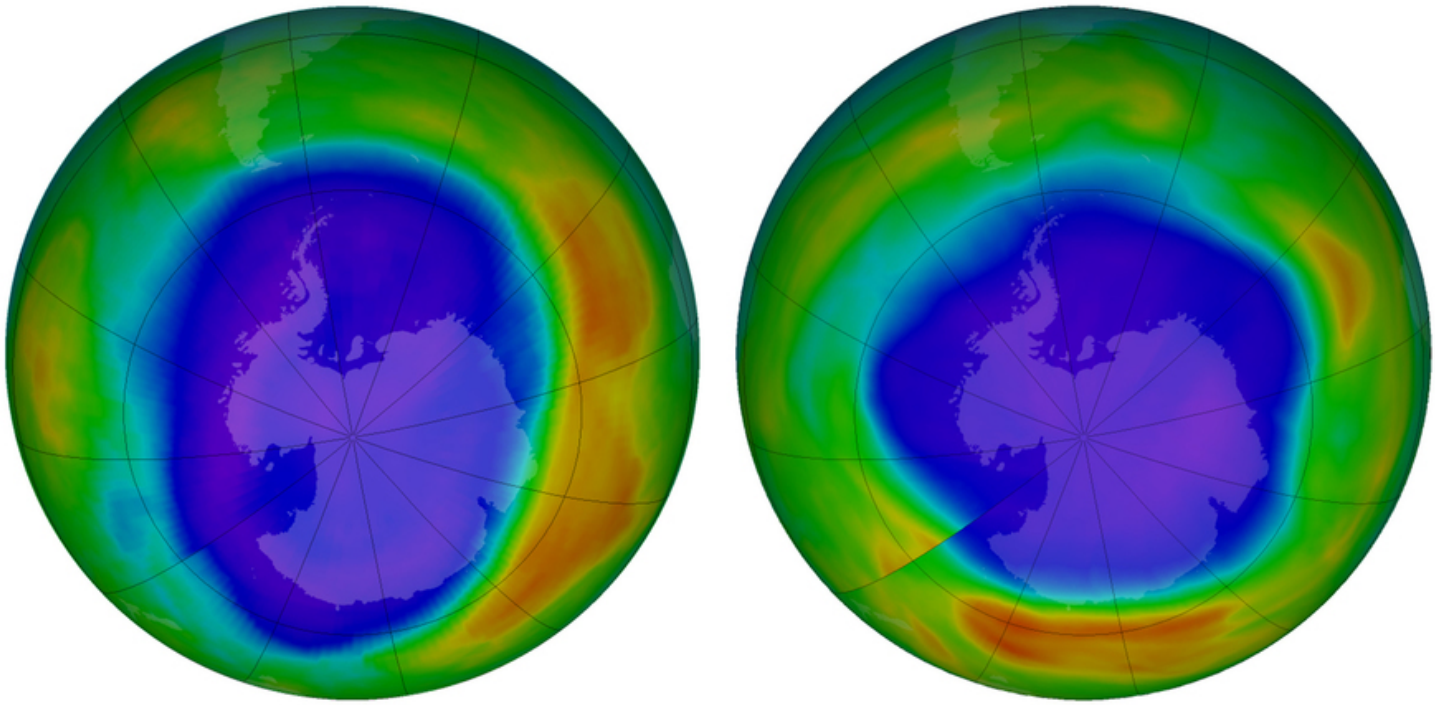
(B) Yes, it mentions NASA, which is interesting to everyone.

(C) No, it does not offer any details about what Quick does.

(D) No, it does not explain why being a geophysicist would be interesting.

U.N. report says Earth's ozone layer shows signs of long-term healing

By Seth Borenstein, Associated Press on 11.15.18
Word Count **478**
Level **MAX**



This combination of images made available by NASA shows areas of low ozone above Antarctica in September 2000 (left) and September 2018. The purple and blue colors are where there is the least ozone, and the yellow and red colors are where there is more ozone. Photo by NASA via AP

Earth's protective ozone layer is finally healing from damage caused by aerosol sprays and coolants, a new United Nations report said.

The ozone layer had been thinning since the late 1970s. Scientists raised the alarm and ozone-depleting chemicals were phased out worldwide.

As a result, the upper ozone layer above the Northern Hemisphere should be completely repaired in the 2030s and the gaping Antarctic ozone hole should disappear in the 2060s, according to a scientific assessment released Monday at a conference in Quito, Ecuador. The Southern Hemisphere lags a bit and its ozone layer should be healed by mid-century.

"It's really good news," said report co-chairman Paul Newman, chief Earth scientist at NASA's Goddard Space Flight Center. "If ozone-depleting substances had continued to increase, we would have seen huge effects. We stopped that."

High in the atmosphere, ozone shields Earth from ultraviolet rays that cause skin cancer, crop damage and other problems. Use of man-made chemicals called chlorofluorocarbons (CFCs), which release chlorine and bromine, began eating away at the ozone. In 1987, countries around the world agreed in the Montreal Protocol to phase out CFCs and businesses came up with replacements for spray cans and other uses.

At its worst in the late 1990s, about 10 percent of the upper ozone layer was depleted, said Newman. Since 2000, it has increased by about 1 to 3 percent per decade, the report said.

This year, the ozone hole over the South Pole peaked at nearly 9.6 million square miles (24.8 million square kilometers). That's about 16 percent smaller than the biggest hole recorded — 11.4 million square miles (29.6 million square kilometers) in 2006.

The hole reaches its peak in September and October and disappears by late December until the next Southern Hemisphere spring, Newman said.

The ozone layer starts at about 6 miles (10 kilometers) above Earth and stretches for nearly 25 miles (40 kilometers). Ozone is a colorless combination of three oxygen atoms.

If nothing had been done to stop the thinning, the world would have destroyed two-thirds of its ozone layer by 2065, Newman said.

But it's not a complete success yet, said the University of Colorado's Brian Toon, who wasn't part of the report.

"We are only at a point where recovery may have started," Toon said, pointing to some ozone measurements that haven't increased yet.

Another problem is that new technology has found an increase in emissions of a banned CFC out of East Asia, the report noted.

And the replacements now being used to cool cars and refrigerators need to be replaced themselves with chemicals that don't worsen global warming, Newman said. An amendment to the Montreal Protocol that goes into effect next year would cut use of some of those gases.

"I don't think we can do a victory lap until 2060," Newman said. "That will be for our grandchildren to do."

Quiz

1 Which option provides an accurate and objective summary of the article?

(A) A new U.N. report says that the ozone layer has increased its rate of healing after it hit its lowest point in the 1970s. Many people were unaware that the CFCs they used in their everyday lives were damaging the planet. We all owe our gratitude to the countries who came together to ban CFCs in the Montreal Protocol.

(B) A new U.N. report says that the ozone layer shows signs of gradual healing. Ozone-depleting CFCs were phased out in the late 20th century after scientists reported one-tenth of the ozone layer was gone. Researchers are cautiously optimistic that the ozone layer will be mostly healed by the middle of this century.

(C) The ozone layer is the portion of the Earth's atmosphere that blocks harmful ultraviolet rays. The depletion of the ozone layer was allowing these rays through, increasing rates of skin cancer and crop damage. Locations that are near the largest holes in the ozone layer have reported the highest incidence of these problems.

(D) The ozone layer is the portion of the Earth's atmosphere that is made up of three oxygen atoms. It is interesting to consider how the depletion of a simple chemical compound could be so dangerous for the planet. Scientists now believe that the ozone has recovered after banning harmful chemicals.

2 Which of the following details from the article BEST develops a central idea?

(A) The ozone layer had been thinning since the late 1970s. Scientists raised the alarm and ozone-depleting chemicals were phased out worldwide.

(B) Use of man-made chemicals called chlorofluorocarbons (CFCs), which release chlorine and bromine, began eating away at the ozone.

(C) At its worst in the late 1990s, about 10 percent of the upper ozone layer was depleted, said Newman. Since 2000, it has increased by about 1 to 3 percent per decade, the report said.

(D) The ozone layer starts at about 6 miles (10 kilometers) above Earth and stretches for nearly 25 miles (40 kilometers). Ozone is a colorless combination of three oxygen atoms.

3 How does the author connect the healing of the ozone layer with the banning of CFCs?

(A) by providing an explanation about the science of how the chemical compounds in CFCs disrupt the reactions of the chemical compounds that form the ozone layer

(B) by providing an explanation that shows the largest holes in the ozone layer occurred above areas that had the largest production and output of products containing CFCs

(C) by providing data that indicates a direct and immediate correlation between the amount of ozone layer and the amount of CFCs being released into the atmosphere

(D) by providing data about the increase in the ozone layer since the ban on CFCs along with projections about how much ozone would have been lost if they were not banned

4 Why does the author conclude the article by quoting the perspectives of Toon and Newman?

(A) to reiterate the need to amend the Montreal Protocol if it is to continue to protect the ozone layer

(B) to refine their hopeful attitudes regarding the future of scientific research on the ozone layer

(C) to emphasize that there is still a lot that needs to be done to protect the Earth from harmful chemicals

(D) to elaborate on the contrast between their perspectives on the latest report about the levels of ozone

Environment still recovering from devastating Exxon Valdez oil spill

By Seattle Times, adapted by Newsela staff on 04.11.19
Word Count **1,097**
Level **1210L**

Image 1. The tanker Exxon Valdez is pulled across Prince William Sound, Alaska on April 5, 1989, by a tug boat, past floating ice, after having been freed from the reef it struck 13 days earlier. Photo by: Bettman/Getty Images

SEATTLE, Washington — Before sunrise on March 24, 1989, Dan Lawn stepped off of a small boat and onto the ladder dangling from the grounded Exxon Valdez oil tanker. As he climbed, he peered down into the water of Prince William Sound and saw, in the glare of lights, an ugly debacle he'd never forget.

"There was a 3-foot wave of oil boiling out from under the ship," recalls Lawn, who was then working in Valdez, Alaska, as an oil business watchdog for the state's Department of Environmental Conservation. "You couldn't do anything to stop it." A watchdog is a person or organization that monitors and publicizes the behavior of others, which can include individuals, corporations or the government.

Lawn was a first responder to the 986-foot long Exxon Valdez after it went off course and punctured its hull on Bligh Reef in a disaster that had its 30th anniversary this year.

11 Million Gallons Of Oil

Lawn spent a long day on board assessing the damage as oil gushed out. There would be no quick and coordinated spill response to slow the spread. Some 11 million gallons of oil would leak from the Exxon Valdez in what was then the largest spill in U.S. history, and one Lawn had long warned about.

Eventually, the oil would foul parts of 1,300 miles of coastline, killing marine life ranging from microscopic planktons to orca whales. The accident would change how oil transportation is done in Alaska, and, to a lesser extent, elsewhere in the world.

Today, due to changes in the law, all oil tankers crossing the oceans are double-hulled, unlike the more breech-prone single hull of the Exxon Valdez. This double-layer significantly reduces but does not eliminate the risk of spills. Last year, a double-hulled Iranian tanker exploded and leaked oil after crashing into a ship in the South China Sea.

New Safety Requirements

In Washington, the state government overhauled oil-spill laws after the Exxon Valdez. More than 9.45 billion gallons of oil products travel in the nearby waters annually. Now, all barges carrying oil — as well as oil tankers — must have double bottoms. Another requirement is that a rescue tugboat is stationed nearby.

The volume of oil that tankers carry through Washington waters could increase dramatically in the years ahead. Canada is poised to triple its oil shipping.

The threat of massive spills does not only come from tankers. The 2010 Deepwater Horizon drilling rig explosion that killed 11 workers led to an oil spill of 168 million gallons — making the amount released by the Exxon Valdez look small in comparison.

Before the Exxon Valdez spill, Lawn was an outspoken critic of the Alaska oil industry's lack of preparation for a potential spill.

Lawn sounded the alarm within the ranks of the state Department of Environmental Conservation. He told them there wasn't enough equipment available in the rescue plan by Alyeska Pipeline Service Company, an oil industry organization.

"The managers were told that, but they didn't want to hear it," said Lawn, who is now retired and divides his time between Kirkland, Washington, and Valdez, a Prince William Sound town. There, tankers still load up with oil that arrives through the Trans-Alaska pipeline.

When the accident happened, some of the limited rescue equipment was buried in snow.

Four-Year, $2.1 Billion Cleanup

For three days, relatively calm weather prevailed. The oil lay thick around the vessel, offering a crucial window of time for action. Then came a storm that scattered the oil, splattering coastlines to the west and south. For four years, crews embarked on a $2.1 billion cleanup that left behind oil that still can be detected on some stretches of the Prince William Sound shoreline.

Up to 10,000 workers and 1,000 boats helped clean up. At first, one method used hot water on the beaches, but that was stopped when it was found to cook marine life and do more harm than good, according to research cited by the Exxon Valdez Oil Spill Trustee Council.

In One Pod Of 36 Whales, 14 Disappeared

Amid the oil slicks in the water, killer whales surfaced to breathe. Among a resident transient pod of 36 whales in the area, 14 had disappeared by 1990, according to the Trustee Council.

Over the long term, another traveling whale pod that also frequented Prince William Sound fared the worst. Before the spill, the pod had 22 whales. Since then, the pod has declined to seven whales, and there have been no new calves born.

Craig Matkin, a researcher, has monitored the whales since 1984. He said these whales, which eat seals, were probably the most affected by the spill. They not only breathed the fumes and oil, but also ate oiled prey.

That pod appears doomed. "It is so sad," Matkin said.

Three decades after the spill, Alyeska and the oil companies — under pressure from the state of Alaska — have greatly expanded measures to prevent spills. Two escort tugs, for example, accompany every oil-laden tanker that motors through Prince William Sound. If needed, they can steer the tanker, counter any unwanted move or take it under tow.

The capacity to store cleaned-up oil with barges or other floating equipment is more than 50 times greater than in 1989.

"The technology has changed immensely," said Andres Morales, Alyeska's director of emergency preparedness. "And there are about 300 people dedicated to preventing and responding to spills."

Still, the Prince William Sound Regional Citizens Advisory Council, the oversight group created after the spill, continues to have concerns. The worries include a continued response problem. Studies funded through the council found that it "still is not possible to effectively clean up an oil spill during the strong winds and waves in which tankers are allowed to transport oil."

Scientists with the National Oceanic and Atmospheric Administration, along with the Washington Department of Fish and Wildlife, have practiced drills to herd orca whales away from oil. In the event of a spill, they bang on pipes underwater, making loud noises.

Quiz

1 Which of the following sentences from the section "11 Million Gallons Of Oil" BEST develops a central idea of the article?

(A) Lawn spent a long day on board assessing the damage as oil gushed out.

(B) There would be no quick and coordinated spill response to slow the spread.

(C) Eventually, the oil would foul parts of 1,300 miles of coastline, killing marine life ranging from microscopic planktons to orca whales.

(D) Last year, a double-hulled Iranian tanker exploded and leaked oil after crashing into a ship in the South China Sea.

2 Since the Exxon Valdez oil spill, the way oil transportation is managed has changed.

Which two details from the article BEST support the summary above?

1. *More than 9.45 billion gallons of oil products travel in the nearby waters annually.*
2. *The volume of oil that tankers carry through Washington waters could increase dramatically in the years ahead.*
3. *Two escort tugs, for example, accompany every oil-laden tanker that motors through Prince William Sound.*
4. *The capacity to store cleaned-up oil with barges or other floating equipment is more than 50 times greater than in 1989.*

(A) 1 and 2

(B) 1 and 3

(C) 2 and 4

(D) 3 and 4

3 Which of the following statements BEST represents Dan Lawn's approach toward Alaska's oil industry before the Exxon Valdez spill?

(A) He accurately predicted the Exxon Valdez oil spill after spending time on board the oil tanker and noticing that it was a single-hull ship.

(B) He denounced the industry's inadequate preparation and urged the state's environmental department to do something before it was too late.

(C) He was concerned by Alaska's oil industry but failed to take public action that would have effectively prevented the oil spill.

(D) He was oblivious to the growing threat of oil spills despite his previous experience as an oil business watchdog for the state.

4 Why did the author conclude the article by highlighting efforts by the National Oceanic and Atmospheric Administration and the Washington Department of Fish and Wildlife?

(A) to suggest that it is impossible to successfully clean up an oil spill during strong weather and ocean conditions

(B) to demonstrate what groups did during the Exxon Valdez oil spill that helped some orca whales avoid the area

(C) to describe some of the measures that groups are taking to lower the impact on whales should another oil spill occur

(D) to illustrate that not much has changed since the Exxon Valdez oil spill in terms of trying to prevent a loss of sea life