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STANDARDS

- **CCSS**: RI.6.8-8.8, RST.6-8.1, RST.6-8.8, RST.6-8.10, SL.6.1-8.1, SL.6.4-8.4, SL.6.5-8.5, WHST.6-8.8, WHST.6-8.9; RST.9-10.1, 2, 4, 5, 7, 8, 10; RST.11-12.1, 2, 4, 10; RI.9-12.8, SL.9.1-12.1, SL.9-12.4, SL.9-12.5, WHST.9-10.8, WHST.11-12.8, WHST.9-10.9, WHST.11-12.9
- **NGSS**: MS-LS2-3, MS-LS2-4, MS-LS2-5; HS-LS2-7, HS-LS-4.D, HS-ESS3-3, HS-ESS3.C, HS-ESS3.D, HS-ETS1.A-B, HS-ETS1-2, HS-ETS1-3
- **NGSS Practices**: 6, 7, 8
- **OLP**: (grades 6-8): 5.A.1, 5.A.3, 5.A.4, 5.A.6, 5.A.16, 5.A.21, 6.A.1-A.11, 6.B.1-B.4, 6.C.1-C.4, 6.D.1-6.D.21, 6.E.1-6.E.15; (grades 9-12) 6.A.1, 6.A.3-A.6, 6.B.1-B.6, 6.C.1-C.3, 6.D.1-D.19, 6.E.1-.14

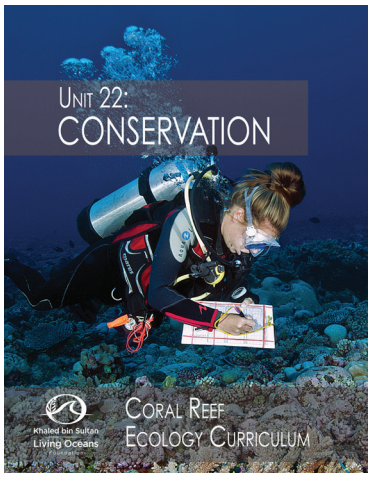
ONLINE CONTENTS

- *My Wish: Protect Our Oceans* Dr. Syvia Earle discusses the rapid decline of the ocean and the need for more protection.
- *Corals and MPAs* Learn about Marine Protected Areas and how they can help protect coral reefs.

CONSERVATION

This lesson is a part of the *Conservation* unit, which describes different actions that people can take to manage and conserve coral reefs. Below is a summary of what is included in the entire unit.

UNIT CONTENTS



A. Background Information
   - Introduction
   - Mitigating Threats
   - Stakeholder Involvement
   - Education & Outreach
   - Monitoring
   - Enforcement
   - Restoration

B. Lessons

Watch It! My Wish
- A worksheet to accompany the *My Wish: Protect Our Oceans* video

Watch It! Corals and MPAs
- A worksheet to accompany *Our Living Oceans, Episode 5: Corals and MPAs* video.

Lesson 1A: Explore a Hope Spot
- An activity that explores an existing Hope Spot. Students learn about ecosystem disruptions and services, and the reasons that make this place special.

Lesson 1B: Nominate a Hope Spot
- An activity where students nominate a new Hope Spot that needs protection. Students present their proposed Hope Spot to their classmates who act as the "Hope Spot Council," deciding if it should be approved.

Lesson 1C: Advocate for MPA
- Write a compelling letter that advocates for the creation of their proposed MPA to a stakeholder or group of stakeholders.

Lesson 1D: Manage an MPA
- An activity that creates a management plan for the three most important actions that are crucial to conserve their proposed MPA.

Read It! Maori Conservation
- A worksheet to accompany the *Traditional Māori Conservation Methods Help Protect Reefs in the Cook Islands* blog.

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WATCH IT! CORALS AND MPAS

INSTRUCTIONS: Watch an episode from Our Living Oceans film series titled “Corals and Marine Protected Areas” (*https://video.earthxtv.com/shows/our-living-oceans/season/1/episode/5*). Answer the questions below. For some answers, it may be necessary to conduct additional research.

1. What are some ways that coral reefs are threatened? List five threats.

2. What are some ecosystem services that coral reefs provide? Provide three examples.

3. What is a Marine Protected Area (MPA) and what is their purpose?

4. What is the largest MPA in the world, where is it located, and how large is it?

5. What is the purpose of zones in an MPA? Provide one example.

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6. Where is the Republic of Palau and how is this country protecting their coral reefs?

7. Do remote coral reefs have a better chance of survival than reefs that are near populated areas?

8. What is coral bleaching?

9. What can aid in corals recovering from bleaching?

10. Why is it important to have local stakeholders involved in conservation efforts even if being conducted by international organizations like the Khaled bin Sultan Living Oceans Foundation?

11. Is it important to share scientific research with policymakers?

12. How do MPAs help improve coral reef fisheries? Make sure to include “spillover effect” in your explanation.

13. What is the 30X30 initiative?

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WATCH IT! CORALS AND MPAS

14. How can MPAs help local communities? Provide one example.

15. Do MPAs work immediately? Explain.

16. Are all MPAs managed the same way? Explain.

INSTRUCTIONS: Review the answers that you provided and answer each of the following questions.

17. Do you think it is important to create MPAs? Explain your position using factual evidence.

18. Even if you don't live near a coral reef, you are likely still affecting this ecosystem. How can you aid in protecting coral reefs? Provide three solutions.

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WATCH IT! CORALS AND MPAS

INSTRUCTIONS: Watch an episode from Our Living Oceans film series titled "Corals and Marine Protected Areas" (*https://video.earthxtv.com/shows/our-living-oceans/season/1/episode/5*). Answer the questions below. For some answers, it may be necessary to conduct additional research. **For students who may require additional assistance, answers or partial answers can be found in the film at the estimated times provided in parenthesis.**

1. What are some ways that coral reefs are threatened? List five threats.
   Answers may vary. Suggested answers include:
   - **Bleaching (8:51)**
   - **Overfishing (4:32 & 13:27)**
   - **Mining (4:32)**
   - **Impacts from tourism (4:32):**
   - **Climate Change and effects from ocean acidification**
   - **Destructive fishing methods**
   - **Boat anchor damage**
   - **Pollution**
   - **Sunscreens**
   - **Hurricanes/cyclones/typhoons**
   - **Introduction of invasive species**
2. What are some ecosystem services that coral reefs provide? Provide three examples.
   Answers may vary, but potential answers include (2:50 and 3:37):
   - **Food: Millions of people around the world fully rely on coral reefs for food. It's estimated that 1 billion people partially rely on coral reefs for food and income from fishing.**
   - **Jobs and income: Millions of people around the world rely on coral reefs which provide them with jobs.**
   - **Medicine: Many marine organisms have compounds that can be used to develop new medicines that induce and ease labor; treat cancer, arthritis, asthma, ulcers, human bacterial infections, heart disease, viruses, and other diseases; as well as sources of nutritional supplements, enzymes, and cosmetics.**
   - **Coastal protection: Corals help protect coastlines from storms, waves, and currents. They help to reduce wave energy that could otherwise flood and erode coastlines.**
   - **Tourism: Each year millions of people visit coral reefs, generating billions of dollars in tourism revenue. This revenue supports millions of jobs in areas such as tour operations, transportation, restaurants, and hotels.**
   - **Traditional and cultural value: There are many traditional, cultural, and spiritual beliefs regarding coral reefs. It is important to respect them.**
   - **Creates habitat: Coral reefs provide an estimated 1 million species with habitat.**
3. What is a Marine Protected Area (MPA) and what is their purpose?
   A Marine Protected Area, as defined in the film, is legal designation undertaken by a government to protect the ocean. The purpose of these protected areas is to reduce human threats to the ocean. (4:23 and 4:32)
4. What is the largest MPA in the world, where is it located, and how large is it?
   The Ross Sea, in the Antarctic, is the largest MPA. It's nearly 2 million km2, which is the same size as the Kingdom of Saudi Arabia. (4:46)
5. What is the purpose of zones in an MPA? Provide one example.
   MPA zones define the human activities that can or cannot take place in a designated area. One type of zone is called a no-take zone, which means that people are not allowed to take resources, such as fish, from this area. (5:08)

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6. Where is the Republic of Palau and how is this country protecting their coral reefs?
   The Republic of Palau is in the South Pacific Ocean. They have created a Protected Area Network (PAN), which allows each of Palau's 16 states to manage their own MPAs. They also plan on conserving 80% of their territorial waters as no-take zones. (6:23 & 17:46)

7. Do remote coral reefs have a better chance of survival than reefs that are near populated areas?
   Although this can be true, it's not that simple. Coral reefs suffer from threats at all sorts of scales from local stresses to larger issues such as climate change (8:07)

8. What is coral bleaching?
   Coral bleaching occurs when temperatures, or other environmental factors such as salinity, cause the zooxanthellae to expel from the coral. If conditions don't improve, the coral will be left without zooxanthellae, and they will starve and eventually die. The zooxanthellae are what gives corals their coloration, so when they are expelled, the corals appear white or bleached. (8:51)

9. What can aid in corals recovering from bleaching?
   Healthy local conditions reduce mortality from bleaching and these conditions make it easier for corals to recover after a bleaching event has finished. (9:09)

10. Why is it important to have local stakeholders involved in conservation efforts even if being conducted by international organizations like the Khaled bin Sultan Living Oceans Foundation?
    Stakeholders who are more involved in local conservation efforts are more likely to protect coral reefs. It is important for local and international organizations to work together to accomplish conservation goals. International organizations, like the Khaled bin Sultan Living Oceans Foundation, can aid in helping local scientists and communities to access their resources and bring in new technologies that can aid in conservation. (9:45 & 10:14)

11. Is it important to share scientific research with policymakers?
    Yes, science is important to share with policymakers so that they can make the informed decisions to protect the ocean. (10:31, 11:40, 12:09, and 13:43)

12. How do MPAs help improve coral reef fisheries? Make sure to include "spillover effect" in your explanation.
    MPAs can aid fisheries in recovering. When areas of an MPA are closed to fishing (no-take MPA), they can lead to larger fish and a greater abundance of fish. As this occurs, fish inside the MPA, move outside of it because there are no fences that keep the fish in it. This movement of fish from inside the MPA boundaries to the outside of it is called spillover effect. This spillover of fish and other organisms helps populate other nearby reefs and provides people with a source of food. (14:34 and 4:50)

13. What is the 30X30 initiative?
    This initiative is an international coalition whose goal is to protect 30% of the ocean by 2030 by creating marine protected areas. (17:27 and 17:46)

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14. How can MPAs help local communities? Provide one example.
Answers may vary, but below is suggested answer.
MPAs can aid in creating sustainable ecosystems which in turn provide goods and services to local communities. For example, in Palau, they are receiving more revenue from tourism because people want to visit healthy, thriving coral reefs. Fishers in Palau are also benefitting from the spillover effect because of the no-take areas that were implemented in their MPAs. (17:46)

15. Do MPAs work immediately? Explain.
Some actions may see immediate results, but to return and ecosystem to its original state, will likely take time. Depending on the severity of the damage, it could take years or decades for an ecosystem to recover. (19:19)

16. Are all MPAs managed the same way? Explain.
No, there is not a one-size-fits-all plan for managing MPAs. Actions that may work for one MPA, may not work for another. Each protected area has a unique ecology, and the disturbances of area often vary too. (20:27)

INSTRUCTIONS: Review the answers that you provided and answer each of the following questions.

17. Do you think it is important to create MPAs? Explain your position using factual evidence.
Answers may vary. It is important that students provide an answer based on evidence, not opinion, when answering this question.

18. Even if you don't live near a coral reef, you are likely still affecting this ecosystem. How can you aid in protecting coral reefs? Provide three solutions.
Answers may vary. They may include individual actions that they can take, or they may comprise of larger actions that society can participate in.

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WATCH IT! CORALS AND MPAS

Script: Our Living Oceans
Episode 5: Corals and Marine Protected Areas

00:12	Dr. Nancy Knowlton	This decade is the last decade in which we have to make a meaningful difference.
00:19	Angelo Villagomez	Our overall goal is to protect 18 million square kilometers of ocean.
00:24	Erika Bergman	My name is Erika Bergman. I'm a submersible pilot. Fly support systems are on, we're ready to dive, dive, dive.
00:32	Erika Bergman	The ocean is my office. Here, I witness amazing things, but I know the ocean is rapidly changing and not for the better. We're on the brink, or perhaps we've passed it. I talked to the world's leading experts, including those who are part of the Global Reef Expedition. Together, we'll find out what's happening and what can be done. This is Our Living Oceans.
01:03	Erika Bergman	We are all connected to the world's oceans. The oceans are a critical source of food, income and even oxygen for the entire planet, therefore, global threats to the health of these oceans are something that affects us all. In this episode, we talk to the experts about the importance of marine-protected areas and conserving coral reefs before it's too late. Yes, we are on the brink, right on the edge, but fortunately, we can find ways to save, to conserve what we love. Unfortunately, the ocean is not a sea of eden anymore.
01:43	Dr. Sylvia Earle	Don't we want the world to be at least as good as the world we have known? And really, don't we want it to be better? Don't we want all of the great things that human ingenuity has developed about how we communicate, how we live, how we power our prosperity? I think the answer is yes.
02:02	Angelo Villagomez	Coral reefs are one of the most threatened ecosystems on the planet, and we need to be doing all that we can to protect them.
02:10	Erika Bergman	News of the depletion of coral reefs has been getting a lot of attention in the media, but why is it important to conserve coral reefs?
02:20	Angelo Villagomez	The more information that we have to protect our coral reefs, the better we're gonna be at protecting them.
02:26	Alexandra Dempsey	The best way to describe a coral reef is really the rainforest of the sea, because coral reefs really are the foundation and are very integral for so many different food resources and shelter and protection for so many different animals.
02:41	Erika Bergman	So, what are some other ecosystem services that a coral reef provides our planet and humanity even?
02:50	Alexandra Dempsey	So one thing that is really, really unique about coral reefs is they're actually a refugia or a sanctuary for juvenile species of all sorts, from fish to sponges, to really anything you can even imagine on a coral reef. It does start at some point as a juvenile on a coral reef system, and that in and of itself provides an incredible ecosystem. So many people depend on the coral reef, not only for food and sustenance and employment, but it really is an incredible protection against storm surges. We would see a lot of drastic, drastic storm surges if coral reefs were to be completely decimated or removed from near shore.
03:34	Erika Bergman	Dr. Nancy Knowlton is a coral reef biologist.

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03:37	Dr. Nancy Knowlton	It's not just for people that reefs are important, something like a quarter to perhaps as many as a third of all the different species that live in the ocean, live associated with coral reefs. That's an amazing statistic because coral reefs themselves cover just a tiny, tiny fraction of the ocean, but they host all of this amazing biodiversity.
04:00	Dr. Sam Purkis	And so this gives us a 3D map of the topography of the reef...
04:05	Erika Bergman	So it's abundantly clear that coral reefs are important to the entire planet. I asked marine biologist, Sam Purkis, what can we do to help these fragile ecosystems?
04:14	Dr. Sam Purkis	If there's one tool in a quiver of conservation strategies, marine-protected areas seems to be the one that works.
04:23	Angelo Villagomez	A marine-protected area is a legal designation undertaken by a government to protect the ocean.
04:29	Erika Bergman	Why are marine-protected areas so important?
04:32	Angelo Villagomez	Typically, they're designed to reduce human threats to the ocean, these can be things like fishing, mining, impacts from tourism, and they can be very small. Some marine-protected areas are only a square kilometer in size, while others are huge. The largest marine-protected area is the Ross Sea, it's nearly two million square kilometers in size, which is about the same size as the Kingdom of Saudi Arabia.
04:56	Erika Bergman	Liz Thompson is the Director of Communications with the Khaled bin Sultan Living Oceans Foundation.
05:04	Liz Thompson	A lot of the most effective marine-protected areas are no-take marine-protected areas where you're not allowed to take anything from the area itself. So fishing is not allowed, but you're allowed to visit it and enjoy it. And a lot of marine-protected areas also have zones of activities that are allowed. So while you may be able to fish in one area, setting aside other areas of the reef where fish have a chance to recover, that seems to be a relatively effective conservation strategy.
05:40	Angelo Villagomez	The growth of marine-protected areas around the world has been exponential, and a lot of it has been driven by indigenous communities all across the Pacific. If you look at maybe the 10 largest protected areas in the planet, about half of them are in the Pacific Islands.
06:00	Tommy E. Remengesau, Jr.	From an early childhood age, we as children were taught that we must respect the ocean, we must respect the environment. This is our nest of life.
06:12	Erika Bergman	As the former president of Palau, Tommy Remengesau was instrumental in establishing successful policies to protect the ocean resources of his native country.
06:23	Tommy E. Remengesau, Jr.	Palau is only 1% land and 99% ocean. I'm very happy to say that we have 16 states that make up the Republic of Palau, and each state have what we call a PAN, Protected Area Network, in which our local governments actually set aside marine-protected areas. So, they're run by the states, they're enforced by the states, you cannot separate life above, middle and in the bottom of the ocean. They're all intertwined. They're all interconnected.
06:57	Erika Bergman	As a submersible pilot, I spend a tremendous amount of time under the sea, so I'm always eager to hear about successful ocean conservation efforts, being used around the world. Through extensive scientific research, we're learning about the current state of the major coral reefs of the world, and what can be done to improve the areas in decline.

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07:19	Tommy E. Remengesau, Jr.	It's surprising to many people that we think we know everything there is to know about the ocean, but obviously the truth is we have so much still to find out.
07:39	Erika Bergman	The Khaled bin Sultan Living Oceans Foundation has been studying many of the world's coral reefs since 2000. Through their extensive project called the Global Reef Expedition, or GRE, researchers were able to build a large data set to develop science-based solutions to the world's coral health crisis. Dr. Art Gleason is one of many scientists working with data collected on the GRE.
08:07	Erika Bergman	It sounds impressive to have an expedition that lasts that long and have all of that data to be able to work together.
08:14	Dr. Art Gleason	I think there was a lot of hope 10 or 15 years ago, that something like deep reefs or very isolated reefs uniformly could be refugia for corals in a time of global warming, say, and I think that the Global Reef Expedition data is showing us that it's not uniformly the case, or it's not as simple as finding the most remote reef. Coral reefs suffer from threats at all sorts of scales, and that is one of the unique things that we can try to tease out from this GRE data set, is what threats are important at watch spatial scales?
08:51	Dr. Nancy Knowlton	Recent studies have shown that even global warming, which causes the phenomenon of bleaching, which is when the symbiosis between the coral and the little algae cells in their tissues breaks down and the coral essentially starts to die as a result, that used be thought there was nothing that you could do to reduce mortality from a bleaching event, but it turns out that helping local conditions actually make it reduce the mortality from bleaching, in addition to of course, making it easier for the corals to recover after a bleaching event is over.
09:32	Erika Bergman	We're finding out that we can make a difference, that reefs can recover if they're left alone. This data behind the GRE was used to guide local leaders to develop conservation efforts.
09:45	Dr. Sam Purkis	Having local scientists and managers and stakeholders out on the ship as well, I think that really garnered momentum towards conservation. So it was a sort of double punch, first to get people out on their own reef systems who wouldn't have access any way, and then second, using these really new high technologies to make the maps, which we could then pass back to the host nations, and then the conservation just sprang up organically.
10:14	Dr. Nancy Knowlton	It's really important to have local people engaged. Really, marine conservation never works if local people aren't behind it. But then having a synergy between local efforts and national efforts really can be a very powerful recipe for success.
10:31	Tommy E. Remengesau, Jr.	And we cannot continue to talk about the future of the oceans, or the sustainability of the ocean, or proper management of ocean resources, without really understanding what is not just on the top, but on the middle, and especially on the bottom. And so every expedition, every research that can be scientifically done, around on waters, is very much welcomed and appreciated, because only then can we make the right policies, can we make the right decisions, and how we can continue to protect and sustain the ocean.
11:12	Dr. Sam Purkis	The corals evidently bleaching, as we've seen all around the atoll, but they're improving, the baby corals are coming in very well. So there's every hope there'll be a good recovery. Saw a manta ray at the beginning, I've just seen a shark at the end. So all in all, a very good dive.

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11:30	Erika Bergman	You've got this huge repository of data, satellite imagery, and then completed maps. How can an organization use that to make a difference for ocean health?
11:40	Dr. Sam Purkis	What the foundation could provide to those host nations was this broad-scale overview of where their reefs were and what status they have. Once we are able to provide that, we found that local initiatives for conservation, they really started to spring up, because that was the missing piece of information that the countries were looking for.
12:01	Erika Bergman	You've worked with a lot of policy makers. How necessary is that for policy and for ocean advocacy?
12:09	Dr. Sam Purkis	Oh, it's incredibly important, because there's really no point doing science on coral reefs unless it's gonna translate quickly into policy and conservation. Because we're not gonna have reefs in 20 years' time unless we do something really quickly and at a very broad scale. So, we saw some really great conservation initiatives, marine-protected areas, or networks of protected areas springing up shortly after the foundation finished its work. And of course, the foundation is always standing by. If a nation needs help with those conservation efforts. The foundation will swing in and help if asked to do so.
12:56	Erika Bergman	Dr. Ben Halpern is the lead scientist for the Ocean Health Index and an expert in marine conservation and resource management.
13:03	Dr. Ben Halpern	We've seen a really large increase in the number of marine-protected areas that have been created around the world, especially the very large marine-protected areas that have been created in the South Pacific and the Indian Ocean, and those actions have had a demonstrable benefit for the Ocean Health Index at a global scale for the goals that are connected to conservation and protection of marine biodiversity.
13:27	Tommy E. Remengesau, Jr.	Well, there is no question right now that reality will tell us there's over-fishing, there's over-exportation, and there is a lot of man-made damages to the coral reefs.
13:39	Erika Bergman	What is Palau doing to help maintain healthy reef communities?
13:43	Tommy E. Remengesau, Jr.	Here in Palau, I'm happy to say that what we actually have done is make our traditional values and practices to become the law of the land. So we have asked congress to enact laws that mandates conservation.
14:04	Dr. Ben Halpern	We also have seen in the last 10 years in many countries real improvement in fisheries management of over-harvested stocks. Not everywhere by any means, there's a lot of room for improvement there, but we've seen especially in developed countries that have the infrastructure and the ability to enforce rules and regulations well, fisheries regulations, really making a noticeable improvement, and we see that in aspects of food provision and the sustainable provision of food to people.
14:34	Angelo Villagomez	So what marine-protected areas can do is improve overall ecosystem health. They can lead to more fish, they can lead to bigger fish, larger abundance of fish, and there's evidence that a healthy ecosystem will help coral reefs.

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14:50	Tommy E. Remengesau, Jr.	But if you continue to exercise and practice conservation in marine-protected areas, they help to ensure that, yes indeed, the reef has a longer chance of surviving and a longer chance of being a good habitat for the marine resource. There's a spill-over factor for anything that is protected inside a pool or a conservation area. Again, there's no fence surrounding these marine-protected areas, so fish are free to go in and go out, but that's the value of the protected area. It provides relief, it provides a less stressful environment, it provides reproduction, it provides healing. The more marine-protected areas you set up, the more it is for the surrounding areas, unprotected areas, to actually benefit from what we're doing to a particular place.
15:54	Tommy E. Remengesau, Jr.	The state of the ocean is so in dire need of people's actions, not just attention, but people's actions.
16:04	Dr. Sylvia Earle	This is our opportunity to be the generation that really turns from decline to recovery to sustainability within the natural systems that make our existence possible.
16:20	Erika Bergman	What is the Pew Charitable Trust? And what are you trying to achieve?
16:24	Angelo Villagomez	The Pew Charitable Trust is an independent non-government charity. We work on public policy. I work on our global environment program with the Blue Nature Alliance, which is a global partnership to create new and better protected areas. Our overall goal is to protect 18 million square kilometers of ocean. Just to put that in context, that's about twice the size of the continental United States.
16:50	Erika Bergman	The Pew Charitable Trust and the Khaled bin Sultan Living Oceans Foundation are just two of the many organizations assisting both global and local policy makers to help save our oceans.
17:03	Dr. Art Gleason	I would say that the long-term solution to any sort of global coral reef crisis is going to have to be a global solution. We do also see evidence that local action does work in places and so for that reason, local scale actions and management are also still important in my mind. I don't think you can separate the two.
17:27	Dr. Sylvia Earle	The goal that many are now embracing is to protect, really highly protect, fully protect at least 30% of the land, at least 30% of the ocean in the next 10 years.
17:42	Erika Bergman	Can you tell us about the Palau National Marine Sanctuary?
17:46	Tommy E. Remengesau, Jr.	The Palau National Marine Sanctuary has received worldwide attention because as we all know, the plan for the international community is 30X30, conserving at least 30% of your marine areas by the year 2030. Palau made a conscious decision with the support of the resource owner, especially the fishermen, that we're not just gonna talk about 30%, we're gonna go 80%. And so 80% of our territorial waters is a no-take zone. It's a pool. We have found out that because the effects of the Palau National Marine Sanctuary is actually helping our local fishermen, it's also helping tourism. There's so many economic activities that can also be generated, including catch and release programs, snorkeling and special spots that have rebounded in the fish population. All of these are actually turning out more resource coming to the island, more financial benefits to the islands than simply the 6% return that we got from selling our fishing rights to foreign nations. If we really want the world to sustain itself for the long haul, then we need to do a more aggressive and Palau is proving that it's working.

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19:19	Dr. Sylvia Earle	Resilience is the key. Embracing areas in the ocean where we take the pressure off, let the natural systems recover, stop killing the fish, it takes a little while, but in five or six years, you begin to see more diversity. The creatures that we have in the past extracted, the fish are larger and more abundant. And in 10 years, you can see greater recovery. It will take centuries, even thousands of years to restore health to anything like what was there when we began the large-scale industrial extraction of ocean wildlife, and we'll never go back to what was, but we can make things better than they otherwise would be.
20:13	Liz Thompson	Everyone's really pursuing the same goal, right? They want a healthy ecosystem, a healthy ecosystem that people can use for generations to come. They want fish for their communities, they want tourists coming in, they want healthy reefs.
20:27	Alexandra Dempsey	Probably the number one thing to learn is it is not a one-size-fits-all. What's gonna work in Fiji is not gonna work in the Bahamas. What works in the Bahamas is not gonna work in Palau. And that's something that's great about the Global Reef Expedition is that we did go to all of these places to really open our eyes into understanding how complicated ocean conservation is and being able to survey and research as many different marine ecosystem, reef ecosystems as possible to really give a fighting chance for some of the conservation in marine-protected areas to be set up.
21:00	Liz Thompson	And so once everyone understands that we are pursuing the same goals, what we do is we provide them with scientific information they can use to help them decide where they should protect, what resources might be particularly valuable to their community, what reefs are in really good shape and should be protected, and what reefs are maybe not in that good of a shape and need help now before they disappear forever.
21:32	Dr. Sylvia Earle	Of course the economy matters. Of course health matters. Security matters. But nothing matters if we can't breathe. Nothing else matters if we don't have a planet that can support us.
21:47	Tommy E. Remengesau, Jr.	I have to have hope. I have to have hope that we will come together and do the right thing. It cannot just be about economy and capitalism and free-for-all. The older generations are not enthusiastic about the answers. It's really the young generations that are taking to the streets, that are feeling the social media about what needs to be done, and the same thing is in Palau. I have hope because of the young people.
22:21	Dr. Ben Halpern	But what's wonderful about the oceans for me and that keeps me feeling hopeful is that they so far have proven to be very resilient.
22:32	Liz Thompson	Humanity has really tackled big problems before. If we've done it before, we could do it again.
22:39	Dr. Sylvia Earle	The more we do right now, the more we can save, and the better the chance that the children of today will have a prosperous future, a safe future. We'll have a future, period.