Tuesday
September 18
2026

The Pulse Beneath the Waves

Why a Global Ocean Need a Global Guard

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Ecology for a sustainable world

Our Ocean

The vast blue waters, the dolphins jumping in the sunset, whale watching, swimming, diving to see the beautiful bright colors of the coral reefs, our oceans hold so much wonder for everyone worldwide. The sea is the most destined vacation spot globally. What is we weren't able to swim in the ocean anymore? What if we were no longer able to see the beauty of the sea? With all the human activities, our ocean is dying. More than fifty percent of the ocean's coral has been lost since the 1950's, that's more than half in seventy-six years. Coral reefs might seem like a distant, tropical holiday spot, but they act as the hidden engine driving everyday life across the globe. This article speaks to a universal audience- people living anywhere on Earth, whether in landlock prairies like me, bustling cities, or inland mountain ranges, who may feel disconnected from marine life. Truth is, coral reef's health affects us all worldwide. As you read, we are going to take a dive into the coral reefs of our oceans. We are going to talk about what coral reefs are, what they do for the people worldwide, what coral reef degradation is, and what we can do to save the world's biggest and most gorgeous ecosystem. Let's Dive in.



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Picture caption: coral that has been killed with little to no signs of life.



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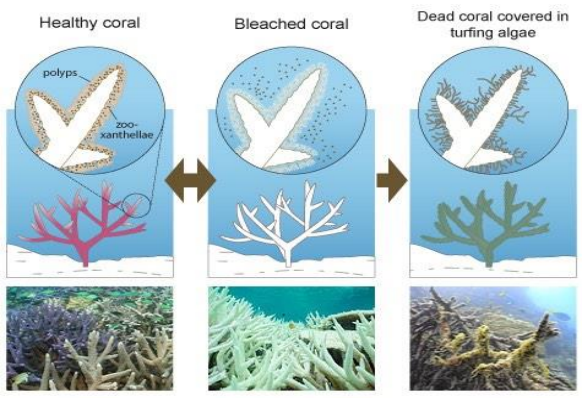
Picture caption: A beautiful coral reef triving with life

Our Coral reefs

The beauty of our ocean

The coral reef is an ecosystem built by groups of colonial creatures called coral. These corals are invertebrate animals that symbiose with microscopic algae to grow and build their colony. Even though they are a fragile ecosystem, coral reefs are an essential asset to human and animal life. They are "the rainforest of the sea"; they provide 25% of ocean diversity. They are habitats for many kinds of sea animals, from invertebrates to vertebrates, from snails to sharks. These biodiversity's also provide us with sources of food and medical raw materials. This ecosystem is the support for our fishing industries.

Without coral reefs, we wouldn't have fish to catch. It's rich biodiversity also provides beauty and attractions to support education and local tourism, especially in Bali. Besides, the coral reef also gives protection from storms and waves. Just like mangroves, coral reefs also minimalized risks from abrasion. So coral reefs aren't just colorful and beautiful, its home for many sea animals and also helps us. So before actually diving to a coral reef, stop and think what it does for us and the sea animals. Those colorful "plants" aren't plants, they are actual living creatures.



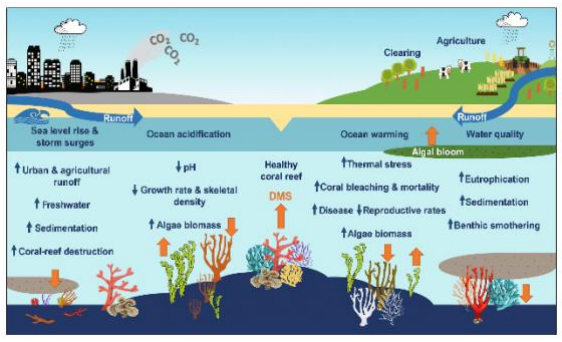
Healthy ocean systems-supported directly by coral reef habitats-produce more than fifty percent of the Earth's oxygen. Reefs act as marine nurseries supporting a quarter of all ocean life, directly feeding hundreds of millions of people and under pinning global seafood supply chains. Healthy ocean ecosystems absorb roughly thirty percent of global carbon emissions. When reefs collapse, marine balance falters, fueling unpredictable weather patterns everywhere. Compounds derived from coral ecosystems are actively used in treatments for cancer, arthritis, and heart disease, shaping modern global health care. So coral reefs are not just a beautiful vacation attraction, it provides food, medicine, oxygen, etc. to the whole world. It may be beautiful, but coral plays a big role in everyone's life worldwide.

Coral Reef Degradation

What's Happening to Our Coral?

What is Coral Degradation? Coral Degradation is literally the death of our coral reefs. Coral degradation is driven by global climate change and local stressors. Let's dive in closer to see what causes degradation to our coral reefs. There are four major causes for Degradation. Those causes are: Thermal stress and bleaching, ocean acidification, local pollution and runoffs, and overfishing. We're going to take a closer look to each of these causes so we can better understand each one and have a better concept to what's going on to our beautiful coral today. Thermal stress and bleaching: Rising ocean temperatures cause corals to expel the symbiotic algae they need for food survival. Now let's think about that, the rising temperatures, with all the air pollution that we put into the air, that causes global warming. Global warming rises the ocean's temperature.

What happens when we go without food? We starve, we die. Coral is living creatures like us, without food, they die. Ocean Acidification: Higher carbon dioxide levels lower water PH, making it harder for corals to build their hard calcium carbonate skeletons. Coral absorbs roughly thirty present of global carbon emissions like you read earlier. With less coral, that means more carbon. More carbon means less coral can grow. That also means less carbon emissions get absorbed. What happens when we breath in Carbon dioxide? Honestly, we die. We need coral to balance it out. Local pollution and runoff: Agricultural and urban stormwater introduce sediments and nutrients that smother corals and fuel harmful algae growth. Look at a globe or map, where do all flowing water end up? All streams that connect to rivers, those rivers connect to other rivers, but they all lead to the ocean. Rain washes all the trash left on the ground into drains, streams, rivers, that end up in our oceans. Overfishing: Removing Herbivorous fish and marine species lead to algal overgrowth that crowds baby corals to where they eventually die.



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Picture Caption: To make your document look professionally produced, Word provides header, footer, cover page, and text box designs that complement each other.

Mirjam Nilsson

Global impacts of degradation.

What we get to expect from this.

Global impacts of coral degradation: Coral degradation- the decline in coral reef health and structure- widespread consequences for marine ecosystems, human livelihoods, and global economies.

Biodiversity and ecosystem collapse: Coral reef are often called the "rainforests of the sea," supporting twenty-five percent of all marine species despite covering less than one percent of the ocean floor. As reefs degrade, their complex three- dimensional structure disappears, leading to habitat loss, species displacement, and extinction.

This disrupts food webs and reduces overall marine diversity. Fisheries and food security: Reefs act as nurseries and feeding grounds for many commercially important fish species. Degradation reduces fish stocks, threatening the food security and income of millions of people who rely on small-scale fisheries, especially in coastal and island communities. Coastal protection loss: Healthy reefs buffer coastlines from wave energy, reducing erosion and storm surge damage. As reefs erode, coastal areas

Become more vulnerable to flooding, property damage, and infrastructure loss, especially in the face of intensifying storms linked to climate change. Economic impacts: Coral reeds generate billions of dollars annually through fisheries, tourism, and coastal protection. Degradation reduces tourism revenue, damages fisheries, and increases cost for coral management, creating economic instability for dependent regions. Climate change feed back loops: Coral degradation is both a cause and a consequence of climate change. Reefs store carbon in their calcium carbonate structures, and their decline releases stored carbon. Additionally, degraded reefs are less effective at sequestering carbon, weakening their role in climate change. Cultural and social impacts: many coastal communities have cultural ties to reefs, which are part of their heritage and identity. Loss of reefs can erode cultural traditions, reduce access to traditional foods, and displace people. Global scale problem: Degradation is driven by global climate change (ocean warming, acidification) and local stressors like pollution, over fishing, and coastal development. Mass bleaching events are now occurring too frequently for reefs to recover and some reefs may not survive without urgent intervention.



What People are doing to help our Coral.

Success stories

The Rescue a Reef in Florida: The RAR program utilizes a combination of land-based and offshore nurseries to cultivate threatened coral species using science-based propagation techniques. Once grown, healthy coral colonies are outplanted to local degraded reefs by researchers alongside recreational scuba divers and snorkelers during citizen science field expeditions. RAR engages the public directly by offering hands-on restoration opportunities for community members. Participants receive educational training on coral reef ecosystems, environmental and economic threats to reefs, and practical conservation tools before assisting researchers with nursery maintenance and coral outplanting. Ecologically, the program has Provided a sustainable source of healthy corals for active reef restoration while generating data for research on climate resiliency and coastal protection. Socially, it builds ocean stewardship, increases conservation awareness, and empowers community members to participate directly in marine research. **Fragments of Hope in Belize**: FOH uses a holistic, community-based model focused on coral propagation, transplantation, and continuous monitoring within protected areas like Laughing Bird Caye National Park. The program emphasizes micro-fragmentation and nursery techniques tailored to shallow degraded reef environments. FOH heavily involves local stakeholders-specifically fishers and tour guides-by offering formal training and certification in coral restoration techniques. Over 70 Belizeans have been certified through their specialized curriculum, fostering local ownership and providing supplemental income opportunities outside traditional fishing and tourism. The program has achieved significant ecological impact, generating annual coral cover increases of 10% to 20% in restored areas and replenishing over one hectare of shallow degraded reef. Socially, it strengthens community resilience, diversifies local livelihoods, and builds long-term local capacity for marine management. Both initiatives owe their success to active community participation, robust educational components, and strong partnerships between scientific experts and local stakeholders. While RAR focuses heavily on citizen science expeditions for recreational divers and broad public outreach in an urban educational setting, FOH emphasizes capacity building, professional certification, and alternative livelihood creation for local fishers and guides in a developing coastal economy.



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What we can do to make a difference.

Let's get moving to help!

There is so much that we can do to help our coral survive and save our planet. I'll go over seven important things we can do globally to help; four things we can do every day and three things we can do when we visit the ocean. Let's start with what we can do every day. Save Energy: Use less electricity at home to cut down on greenhouses gas emissions that warm the oceans. Stop fertilizer overuse: Limit chemical fertilizers and lawn treatments that wash into local waterways and travel to the sea. Dispose of trash properly: Recycle plastic and avoid littering so debris never reach the ocean. Eat sustainable seafood: choose responsibly sourced fish and avoid eating species like parrotfish that clean the reefs. Now what we can do when we visit the ocean. Wear safe sunscreen: choose sunscreen with non-nano zinc oxide and avoid toxic chemicals like oxybenzone. Dive and boat responsibly: NEVER touch the coral, and always drop your anchor in sandy areas or use mooring buoys. Volunteer: Join local beach and watershed cleanups through organizations like the Nature Conservancy. Let's get out there and make a difference. Every single person counts.

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