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2030** United Nations Decade
of Ocean Science
for Sustainable Development



Giving Our Ocean a Voice

By Josh Pysanczyn, The Marine Diaries

As part of its 'Spotlight on Seafife' article series, The Marine Diaries introduces readers to the wonderful array of creatures that inhabit the ocean, such as this flamingo tongue snail (*Cyphoma gibbosum*). Credit: Hedvika Michnova.



LOCATION



Tropical coral reefs are located between the latitudes of 20° North and 20° South of the equator. They are found in the Pacific Ocean, the Indian Ocean, the Caribbean Sea, the Red Sea, and the Persian Gulf. Coral reefs also occur further from the equator in places where warm currents flow out of the tropics, such as in Florida and southern Japan.

The total area covered by tropical coral reefs is around 284,300 km², which is around 0.1% of the ocean floor.

Reef-building corals are found in temperatures ranging from 18°C to 29°C.



IMPORTANCE

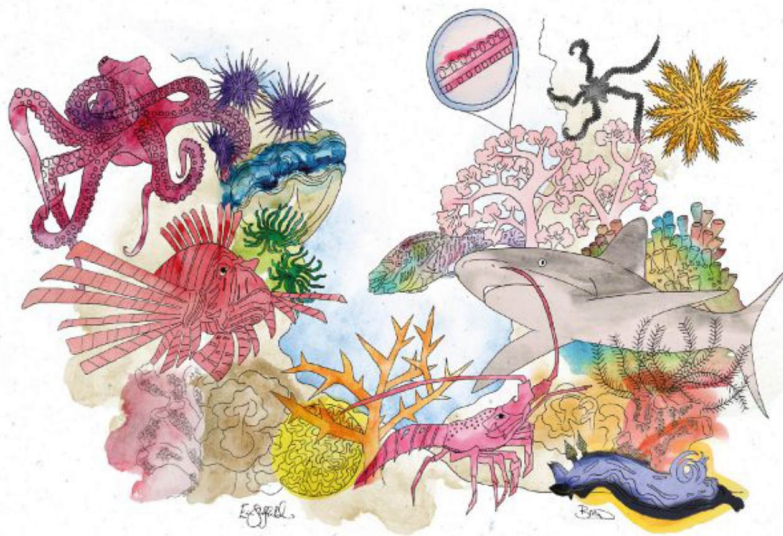
Coral reefs are the most biodiverse regions in the world and are home to more than 25% of marine species. Between 5 to 9 million species of fish, invertebrates, and algae are supported by the world's tropical coral reefs.

Tropical coral reefs protect coastlines from erosion by absorbing 97% of the energy from waves. This benefits around 197 million people who live near reefs, reducing damage from storms by more than \$4 billion annually.

They are also an important source of food and income, especially for coastal communities. Reefs generate a variety of seafood products including fish, mussels, crustaceans, sea cucumbers and seaweeds. Globally, recreation and tourism activities arising from coral reefs provide an estimated \$35.8 billion annually. The total worth of coral reefs globally is estimated to be up to \$1 trillion per year.

Coral reefs are often referred to as the "medicine cabinet of the 21st century," as they provide numerous substances with medicinal properties. Coral reefs are important sources of medicines that could treat cancer, arthritis, human bacterial infections, Alzheimer's disease, heart disease, viruses, and other diseases.

Tropical coral reefs are built by animals that lay down a calcium carbonate skeleton as they grow. Over millions of years these skeletons accumulate to form vast coral reefs. Reef-building corals come in many shapes and sizes; they can be thin and finger-like or shaped like boulders. The largest coral colony was found in American Samoa and is thought to be between 420 and 652 years old! Much like tree rings, corals are aged by counting the number of high and low density bands in their skeletons.



WWW.THEMARINEDIARIES.COM

DISCOVER ALL THE MARINE ECOSYSTEMS DIARIES ON OUR WEBSITE

Illustrators - Bethany Morgan-Davis, Erin Sheffield; Researcher - Heather Baxter; Graphic Designer - Janina Rossiter



THREATS

Climate change is increasing the acidity and temperature of the ocean. This is leading to a global decline in coral reefs. If carbon emissions continue at their current rate, we may no longer have coral reefs by 2100.

A temperature increase of just 1-2°C can cause corals to expel their symbiotic algae, in a process known as coral bleaching. If temperatures don't decrease quickly the coral will die. Mass bleaching events are now occurring yearly, leaving no time for corals to recover.

Ocean acidification makes it harder for corals to deposit their calcium carbonate skeletons. This slows down coral growth, and also makes coral skeletons weaker - leaving them more vulnerable to storms and predation.

Coral reefs are also threatened by coastal pollution and development and removal of fish for the fishing industry and aquarium trade. Human activities are leading to increases in natural coral predators (crown of thorns starfish & Diadema urchins), which decimate coral reefs.



CONSERVATION

Conservation efforts must focus on tackling global warming, reducing local stressors, and replanting degraded reefs.

Researchers are working on increasing corals' tolerance to stressors such as heat. Replanting reefs with heat tolerant corals may help them survive warmer oceans.

Creating marine protected areas, where human activities like fishing, mining, and recreation are restricted, will make reefs more resilient to ocean warming and acidification.

How you can help

- Donate to coral restoration projects or adopt a coral.
- Reduce your carbon footprint & support governments who are tackling climate change.
- Use reef-safe sunscreen.
- Check that tropical aquarium corals and fish you buy have been sustainably sourced.

Educational poster on coral reefs, released as part of 'The Marine Ecosystem Diaries'. Credit: The Marine Diaries.

A collaboration of researchers and writers, artists and activists, photographers and graphic designers, make up The Marine Diaries – a non-profit, ocean science communication platform and collective of ocean advocates which spans many disciplines, countries and backgrounds.

Since 2018, The Marine Diaries has been on a mission to increase ocean literacy and communicate ocean science, bridging the gap between the scientific community and the public. The organization now consists of a diverse team of 35 volunteers from across the world, in addition to numerous collaborators working alongside the initiative. Through a range of digital media, combining academic literature with art, design, video and campaigning, The Marine Diaries is educating the public by telling the stories of the ocean.

"The Marine Diaries was created because we recognize that there was a disconnect between the scientific community and the general public. The Marine Diaries' mission is to bridge that gap, using digital media for science communication," says Rebecca Daniel, director of The Marine Diaries.

It's important to have everybody on the same page when it comes to protecting our ocean. The scientific knowledge we have cannot merely be stored in journals, available only to those within the academic community; it must be shared freely, in a way that engages, empowers, and inspires us all to make a

difference.

"By sharing stories, facts, and inspiring messages about the ocean, its creatures and the organizations working to protect it, The Marine Diaries is able to inspire people to care a little more, to maybe change their lifestyles, read up on things and generally live life more consciously," says Millie Rose, blog manager for The Marine Diaries.

The Marine Diaries has recently become part of the EU4Ocean Coalition, a new initiative by the European Commission which unites organizations, projects and people who contribute to ocean literacy across Europe. Through this, The Marine Diaries is connected to a network of organizations who support the sustainable management of our ocean.

Plastic Not Fantastic

Plastic waste is now found in all the world's major ocean basins, including ocean gyres and deep-sea trenches. In 2019, a research article published in *AAAS Science Advances*, presented the first global analysis of all plastics ever manufactured. Their results found that of the 6,300 million metric tons (Mt) of plastic waste generated, a mere nine percent had been recycled, and a staggering 79 percent had accumulated in the natural environment.

To raise awareness about the issue, The Marine Diaries launched its first digital awareness campaign, Plastic Not



Orca, like this female photographed off the coast of British Columbia (Canada), are among the many marine organisms who are drastically impacted by anthropogenic stressors such as plastic and noise pollution. Credit: Josh Pysanczyn, ©CetaceaLab2018.

Fantastic in 2019. The Plastic Not Fantastic campaign brought together over 35 organizations, researchers, influencers, and activists, who shared their knowledge on the detrimental impact plastic pollution is having on the ocean, and the new and exciting efforts in place to help reduce and prevent further pollution.

The campaign focused on three main questions: What are the main sources of plastic pollution? What impact is plastic pollution having on our ocean? And how can you live a plastic free life?

"This campaign was a great way to meet other organizations and businesses, and collaborate on a shared mission to reduce the impact we as humans have on the planet and specifically, the ocean. Through collaborations we were able to reach the audiences of other organizations, broadening our impact," says Rose.

The Marine Diaries engaged its followers in an interactive platform through which to learn about the impacts of plastic pollution and find plastic-free alternatives to various consumables including clothing, food and drinks, and beauty and healthcare products, offering its audience the chance to reduce their plastic footprint.

Members of the team even offered firsthand reviews of their experience with numerous plastic free, ocean saving products, such as plastic free toothpaste. This helped those interested save time and money when deciding which plastic free brands to choose.

Marine Ecosystem Diaries

This year, The Marine Diaries embarked on a new journey: The Marine Ecosystem Diaries.

With each month, comes a new ecosystem, and with each ecosystem comes an array of educational tools, including illustrated posters, awe-inspiring mini-documentaries and engaging articles, guiding the reader through nine globally important marine ecosystems.

All posters produced for their project are designed to be printed or used digitally, and are freely available. They can be used in conjunction with corresponding videos and articles by individuals, schools, marine NGOs, and other institutions to educate the public about the ocean.



The Marine Diaries open ocean mini-documentary, released as part of the Marine Ecosystem Diaries project. Credit: The Marine Diaries. Series producer: Rebecca Daniel. Videographer: Hedvika Michnova. Researcher: Emma Williams. Narrator: Bianca Uyen. Footage: Blue Ventures, Jenna Crowe-Riddell, Dive Buddies for Life, Natasha Ewins, Felicity Flashman, Pedro Furtado, David Girsh, Greenpeace, Karim Iliya, Marine Conservation Society, Dr. Peter Morse, Alexander Semenov, Bianca Uyen, Whale Watch Kaikoura, John Wheeler, Emma Williams



An example of Nina's Artivism work, highlighting the use of plastic in teabags. Illustration: Janina Rossiter.

"All marine life around the world is under threat; public awareness and education is essential to reversing this trend. We have launched Marine Ecosystem Diaries to give everyone a chance to see what's at stake and fall in love with the wonders under the sea. The team has put in some incredible time and energy into this project - so we hope everyone enjoys the content as much as we enjoyed creating it," says Daniel.

This vitally important resource creation aims to instill the importance of these ecosystems for the planet. From coral reefs to polar seas, this ambitious project focuses on identifying the different keystone species found in each ecosystem, the goods and services they provide, the threats they face, and how various people and organizations are committed to conserving them.

The Marine Ecosystem Diaries is a collaborative project, bringing together a group of people with a dynamic range of skills and expertise to produce engaging and educational materials. It has welcomed footage contributions from various organizations, including Blue Ventures and the Marine Conservation Society.

A number of illustrators have brought their unique flair to each poster. Working in partnership with The Marine Diaries on this project is award winning children's author, illustrator, and environmental activist Janina (Nina) Rossiter. Nina is a long-standing collaborator with The Marine Diaries and continues to use her platform to inspire others. Nina's artwork brings in elements of environmental activism in a movement coined 'Artivism', which evokes a sense of environmental sympathy alongside artistic appreciation.

"I have absolutely loved being an illustrator for the Marine Ecosystem Diaries. I was chosen to illustrate mangroves, which

are so beautiful to illustrate and provide so many benefits to the ecosystem. Through Artivism, you speak the language of art, which is universal. You don't need words, and anybody can understand it," says Rossiter.

Accompanying the posters is a breath-taking series of mini-documentaries. In February, the project highlighted the open ocean (also known as the high seas).

These mini-documentaries pull together many beautiful aspects of the underwater world. Utilizing archive footage to reduce carbon emissions, they highlight the weird and wonderful creatures found across ocean ecosystems. Nevertheless, they don't shy away from the truth. Each video dives headfirst into the threats the ecosystem is facing, bringing home the extent to which we are tipping the delicately balanced ecological scales, tipping them towards extinction.

"I hope that communicating the issue of overfishing through an engaging mini-documentary will inspire a wide audience to make changes in their daily lives and help protect the open ocean," says videographer of the open ocean mini-documentary, wildlife photographer and filmmaker, Hedvika Michnova.

A Voice Now and for the Future

As we continue to drift through this unprecedented period of uncertainty, The Marine Diaries and its collaborators have continued to provide a certain level of reassurance that there are people fighting to protect our ocean.

Informative and engaging articles, interviews, posters, and mini-documentaries, webinars and platforms to speak and be heard, enable *everybody* to discover new and exciting ways to become an ocean protector.

"In this modern world where most of us are online every day, it is important to change the way we communicate science and connect people with the ocean. The Marine Diaries makes ocean science accessible to everyone, reaching more people and spreading messages that matter," says Michnova.

The Marine Diaries plays a vital role in bridging the gap between academia and mainstream, accessible media. As an organization, it continues to grow, rapidly expanding its reach and influence. Through increasing ocean literacy and continuing to inspire and engage current and future ocean advocates, The Marine Diaries is striving to give *our* ocean a voice.

As a non-profit partner with *1% for the Planet*, The Marine Diaries leads by example; paving the way for local involvement and ensuring that anybody can positively contribute to the protection of our ocean.

"Joining the 1% for the Planet network as a non-profit partner felt like a great achievement for The Marine Diaries, because it gives us recognition and validation as an organization that is contributing towards a healthy planet. It also allows us to be paired with individuals or businesses who are part of the network, and to potentially receive financial donations or other kinds of support. As The Marine Diaries is currently un-funded and volunteer-led, this is a fantastic opportunity," adds Daniel.

if you'd like to support The Marine Diaries, visit their website and get in touch.

➤ www.themarinediaries.com