CORDAP Annual Report 2023

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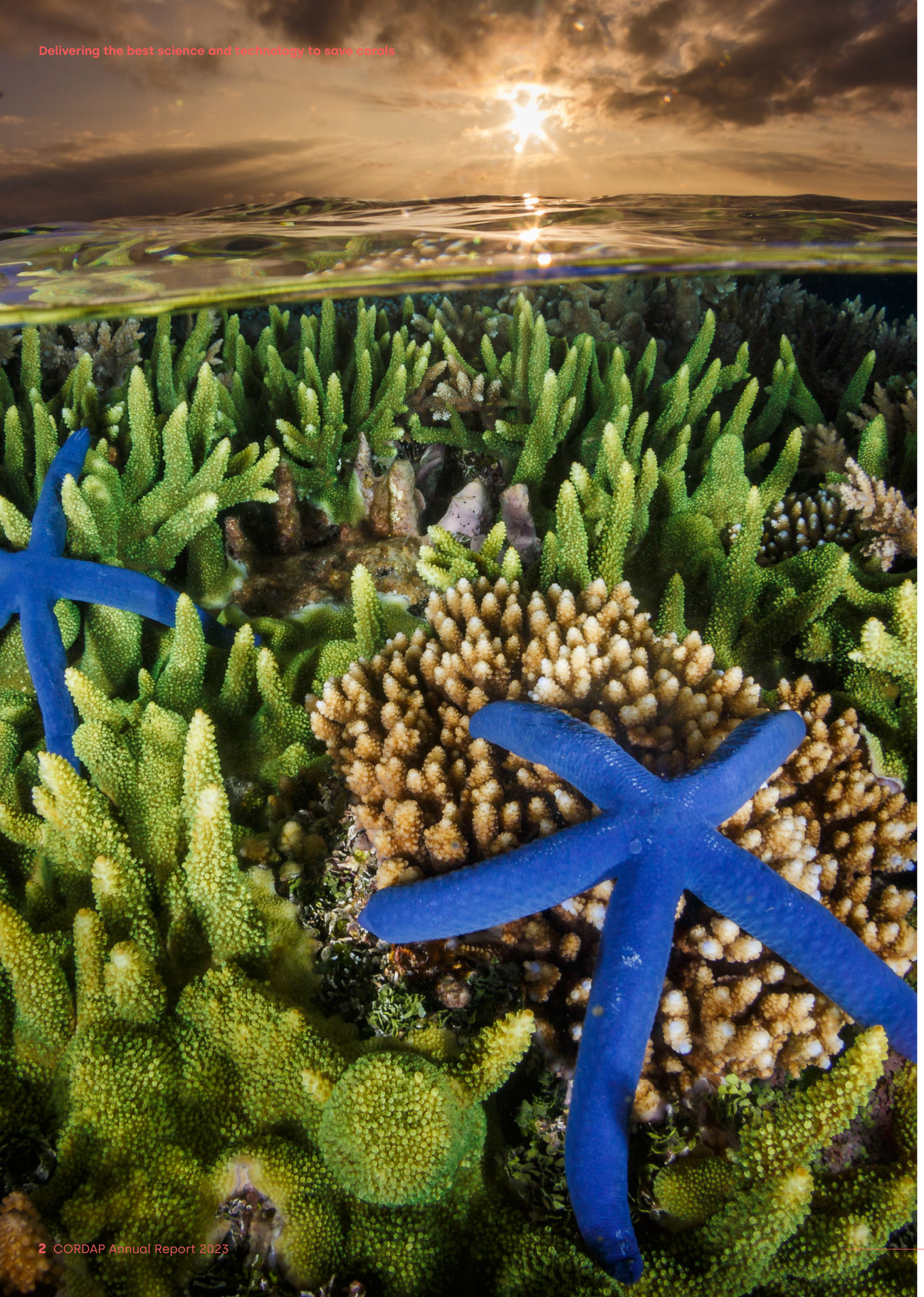
G20 Coral Research & Development Accelerator Platform



Delivering the best science and technology to save corals

Contents

Credits: Grant Thomas

CORDAP: Building a future for the world's corals

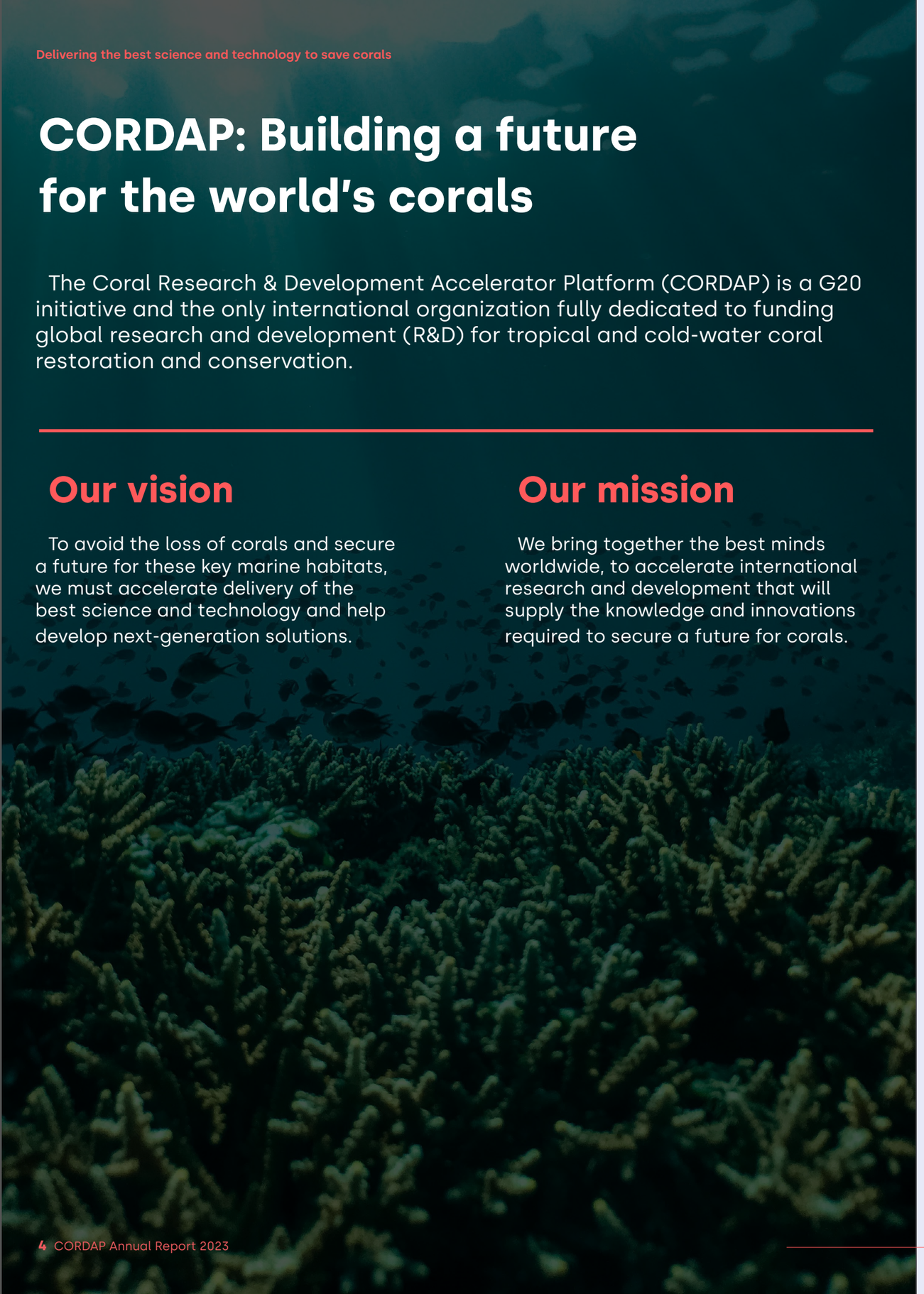
The Coral Research & Development Accelerator Platform (CORDAP) is a G20 initiative and the only international organization fully dedicated to funding global research and development (R&D) for tropical and cold-water coral restoration and conservation.

Our vision

To avoid the loss of corals and secure a future for these key marine habitats, we must accelerate delivery of the best science and technology and help develop next-generation solutions.

Our mission

We bring together the best minds worldwide, to accelerate international research and development that will supply the knowledge and innovations required to secure a future for corals.



Credits: Naja Bertolt Jensen

Letter from our Executive Director

The ocean is the basis of all life on our planet and corals play a vital role in maintaining their health. The world's corals and coral reefs brim with biodiversity, supporting a quarter of all marine fish species and improving the livelihoods of up to a billion people. Yet now, for the first time, the functionality of an entire ecosystem is at risk of extinction due to human activities.

We have already lost half of the world's reefs since the 1950s. The impacts of climate change, overfishing and pollution are destabilising our marine environment, with clear cascading consequences to people. A major bleaching event started in early 2023 in the Caribbean, which later expanded towards other regions. Rising sea temperatures will make these events ever more common globally, and climate change remains the biggest threat to coral survival worldwide. Meanwhile, local environmental stressors add an extra lethal layer of impact on reefs. This decade represents our last chance to prevent the total collapse of corals around the world.

Thankfully, the interventions to help improve the health of our oceans are within our grasp. We are living through a revolutionary period for marine science, with new technology and research shifting the boundaries of what is possible, namely on coral conservation and restoration. But we know it will take global will and ongoing investment to turn potential solutions into concrete successful results. That's where CORDAP is uniquely placed to help. Created by the G20, it is our mission to help unlock and upscale the science and innovation needed to protect and restore the world's corals.

In late 2023, we announced CORDAP's first round of awardees. From teams using AI and robotic boats to support coral reproduction, to projects experimenting with probiotics for corals and researchers exploring genetic selection of heat tolerant species, the projects we're funding all show the potential for R&D and new technology to help change the face of coral interventions. We also launched a series of Scoping Studies and workshops, developing technology roadmaps to bring the global research, practitioner and policy communities together to assess priority research and development investment goals in key areas to help save the world's corals.

In this report, we are proud to highlight how our work throughout 2023 has helped to positively impact coral outcomes, and outline our vision for the future. Reading it, I'm struck as ever by the continuing dedication of everyone we have worked with since our inception in 2020. Scientists, coral practitioners, partners and donors have devoted their time, energy and resources to help us create a better future for the world's corals and we are proud to have been able to work with them.

To all those who have already supported our mission, I offer my heartfelt thanks. And to those who have just heard about us, I encourage you to join our ongoing journey, contribute towards one of the several projects we fund, and help us secure a safe future for corals and people.

Together we will make a difference.

Prof. Carlos Duarte, Executive Director of G20 Coral Research and Development Accelerator Platform and CEO of CORDAP Foundation

Corals support life in our oceans and beyond

but they are under threat of functional extinction

For the first time, an entire ecosystem that supports millions of species and people may be lost at the hands of humans.

Approximately two-thirds of coral reefs have already been lost since the 1950's, and 70-90% of the remaining coral reefs may disappear in the next 10-15 years.

While the root causes of many of these threats need to be addressed by national and international actions, CORDAP is also working to support research and projects that will help deliver solutions on the ground.

Support the livelihoods of 1 billion people

Lower the number of people affected by flooding by 45% annually

Have invaluable cultural significance

Reduce storm damage costs by an estimated US$ 4 billion annually

Support at least 25% of marine fish species

Deliver US$ 36 billion annually through tourism

Reefs are a treasure trove of potential drug discoveries for cancer, arthritis, bacterial infections, and more

Provide ecosystem services worth US$ 9.9 trillion per year

Greenhouse gas emissions

Changes in land use

Water contamination

Deep-sea mining

Coral diseases

Invasive species

Bottom trawling fishing

Objectives and aims

We are shaping a future where corals and humans thrive together

CORDAP is redefining the boundaries of what is possible for coral conservation and restoration by supporting projects that will unlock the innovation needed to save corals and reefs worldwide.

We are:

Driving Research & Development (R&D)
We are the only international organization fully dedicated to funding coral conservation and restoration R&D.

Building transdisciplinary collaborations
We integrate the abilities of the world's best scientific minds, creating collaborative and effective solutions for coral conservation practitioners. We combine inputs from multiple fields including mechanical and structural engineering, innovative manufacturing techniques, biology and architecture.

Delivering scalability
CORDAP only funds projects with the potential to deliver large-scale innovative coral restoration solutions.

Promoting participation of the Global South
We provide advanced research and development training to scientists from low and middle-income countries. We invest in capacity development and host inclusive programs, enabling and empowering scientists and researchers from the nations most affected by coral loss, to deliver solutions that work for their nations and beyond.

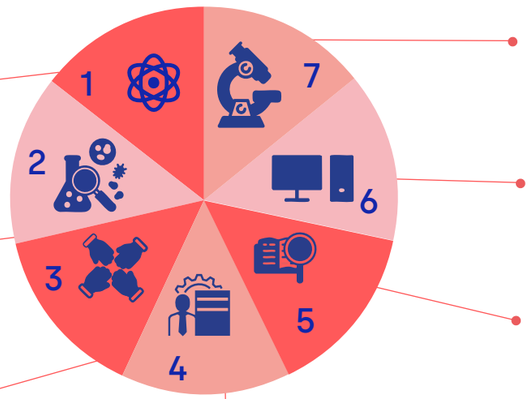
Fostering inclusivity
We support a gender-diverse, internationally inclusive, transdisciplinary, global community of scientists, technologists, community leaders, and innovators to develop scalable end to-end solutions.

CORDAP aims to:

1
Deliver novel science and technological solutions to conserve and restore corals and reefs through targeted funding programs supporting diverse and inclusive teams.

2
Connect existing national, regional, and international research and development programs.

3
Support a gender-balanced, transdisciplinary community of scientists, technologists, and innovators worldwide in achieving CORDAP's goals.



4
Engage the private sector in using and implementing CORDAP-developed solutions.

5
Provide advanced research and development training to scientists from low and middle-income countries.

6
Facilitate access to information and research facilities.

7
Develop and share novel scientific tools.

Delivering the best science and technology to save corals

CORDAP supports global impactful goals

Our work aligns with and contributes to several existing global agreements and targets, including the UN Sustainable Development Goals and the Kunming-Montreal Global Biodiversity Framework goals, which set out to halt biodiversity losses by 2050 and restore 30% of degraded habitats by 2030.

By supporting our work, our partners and members are also supporting internationally recognized action to:

- protect and restore marine biodiversity
- mitigate climate change impacts
- combat global poverty
- contribute to social responsibility corporate targets.

CORDAP supports the UN Sustainable Development Goals

CORDAP supports the Kunming-Montreal Global Biodiversity Framework

Target 2
30% of degraded areas are under effective restoration by 2030.

Target 4
Threatened species are recovering, genetic diversity is being maintained and human-wildlife conflict is being managed.

Target 8
Minimize impacts of climate change and ocean acidification.

Target 10
Areas under agriculture, aquaculture, fisheries and forestry are managed sustainably.

Target 11
Nature's contributions to people are restored, maintained and enhanced.

Target 20
Capacity-building and development, technology transfer, and technical and scientific cooperation for implementation is strengthened.

Target 21
Ensure that the best available data, information and knowledge are accessible to decision makers, practitioners and the public.

> **Accelerating the next generation of science and technology to help conserve and restore corals, while no efforts are spared to mitigate the pressures on them, must be a priority.**

Prof. Carlos Duarte,
Executive Director of G20 Coral Research
and Development Accelerator Platform and CEO of CORDAP Foundation

Credits: Renata Romeo

Principles and commitments

Supporting communities

We understand that the protection of coral reefs is not only vital from an ecosystem perspective, it's also critical for the people who depend on them.

In 2023, one of CORDAP's priorities was amplifying the voices of communities and stakeholders from the Global South. These regions are among the most affected by coral degradation, yet they are often underrepresented in global decision-making processes.

We ensured their insights were at the forefront of international discussions on coral conservation, giving stakeholders from the Global South a platform to share their unique challenges and help shape the global coral restoration agenda.

Credits: Morgan Bennett-Smith

Credits: KAUST

Inclusivity and diversity

We recognize that solving global coral challenges requires diverse perspectives, and have continued to prioritize inclusivity and diversity in our programs.

We encouraged young researchers from developing nations to participate in coral restoration projects, and actively promoted gender diversity, ensuring a significant percentage of participants and researchers in our programs were women.

By prioritizing gender balance and inclusion from underrepresented regions, CORDAP reinforced its commitment to creating a more equitable and effective global response to coral conservation.

Delivering the best science and technology to save corals

Innovation for the future

During 2023, CORDAP funded several cutting-edge initiatives aimed at scaling up coral restoration through innovation. One of the research projects is developing heat-resistant coral strains, a potential game-changer in the fight against climate-induced coral bleaching. We have also committed to support trials using artificial intelligence and remote sensing technologies to monitor reef health in real time, enabling faster responses to environmental threats.

Credits: James Guest

Credits: The Wave

Commitment to coral ecosystems

CORDAP continued to champion global efforts for the protection and restoration of coral reefs, establishing partnerships with leading institutions, stakeholders and innovative technology entities.
Our collaborative approach supported groundbreaking research to deepen our understanding of coral ecosystems, driving restoration efforts in key regions affected by bleaching and environmental stressors.

Transparency and accountability

CORDAP takes pride in its commitment to transparency. Our reporting mechanisms keep our stakeholders—governments, donors, partners—informed about our progress and the impact of our work. All funded projects are rigorously monitored, with clear measures of progress and success. Additionally, the establishment of CORDAP Foundation ensures that donor funds will be efficiently allocated to projects delivering the highest ecological and social returns, with regular audits to uphold our accountability.

Credits: Gabriel Barathieu

2023 Highlights

January 2023

Kick-start of CORDAP's Scoping Studies

January saw the launch of a series of Scoping Studies workshops that have brought together more than 70 coral specialists from around the world to assess priority R&D investment goals in key areas to help save the world's corals.

March 2023

CORDAP's Foundation established

A Saudi Royal order approved the creation of the G20 Global Coral R&D Accelerator Platform Foundation (CORDAP Foundation), a nonprofit organization that will serve as the financial arm of CORDAP.

May 2023

Cold-water corals restoration and conservation workshop

Co-organized with REV Ocean, at Engineerium, Norway, our workshop identified three priority areas to focus future R&D.

June 2023

Funded projects chosen

CORDAP's Initiative Governing Committee officially approved the projects that had been selected by the Scientific Advisory Committee to receive funding via the Coral Accelerator Platform (CAP) 2022.

August 2023

Champions for corals

CORDAP Foundation signed the first strategic partnerships with a range of organization at an activation event.

September 2023

New opportunities
CORDAP joined ICRI
CORDAP released the first R&D Technology Roadmap

We announced a new call to fund innovative ideas that lead to significant discoveries and improvements in coral conservation and restoration and announced the first CORDAP awardees.

November 2023

Artistic Residency at KAUST

Jana Winderen was CORDAP's first artist in residence. During her residency, Jana focused on recording the soundscape of coral ecosystems from the Red Sea.

December 2023

CORDAP at COP UNFCC 28

CORDAP hosted six events at the 28th Conference of Parties, which took place in Dubai, UAE.

Delivering the best science and technology to save corals

650 people at events

7 partnerships

14 projects funded

73 researchers

31 from LMIC

28 842 People engaged online

Our programs and impact

We acceleratethe next generation of science and technology. R&D can shift the boundaries of what is possible, ensuring that our ambitions for the future of corals are not limited by the technology available today.

The funding programs currently run by CORDAP include:

- **Coral Accelerator Program (CAP)**
- **Scoping Studies**

Coral Accelerator Program (CAP)

Our primary funding mechanism is the Coral Accelerator Program (CAP), which awards grants to international collaborative teams with impactful ideas for coral conservation and restoration.

The CAP funding process is set up to ensure an efficient, five-stage approach.

1) Submission of clear, short concept notes, through myCORDAP portal.

2) Evaluation of all submitted concept notes. Each submission is reviewed and evaluated by an expert panel.

3) Applicants with successful concept notes are invited to submit a full proposal.

4) Each proposal is peer reviewed by topic experts followed by a panel evaluation by CORDAP's Scientific and Advisory Committee.

5) The Initiative Governing Committee then reviews and approves the projects recommended for funding.

Credits: Valeria Pizarro

Delivering the best science and technology to save corals

Our priority areas: focusing CORDAP's funding

Corals face a range of challenges across their life cycles and according to their geographical location. With this in mind, we have identified various priority areas to focus our awards.

Preserve and conserve existing corals:
Saving and retaining existing corals is preferable to replacing them. We urgently need innovative conservation ideas, from developing treatments that can be applied to existing corals to finding ways to improve local water quality.

Limit early life mortality:
High mortality rates among young corals limit the efficiency of existing restoration methods. We need new solutions that promote coral survival at the early stages, from developing growth supplements to creating environments that mimic the natural substrata they grow upon.

Cold-Water corals:
These corals don't need the sun's rays to survive, can withstand near-freezing conditions and are every bit as vital for our ocean's health as their tropical relatives. More research is needed into their geographical distribution, their health, biology, reproduction and how best to restore them when damaged.

Blended artificial and natural reefs:
Many islands and coasts will be submerged unless they are defended by artificial structures, including hybrid reefs. We want to fund research to create and integrate these structures into existing reefs with minimal damage, offering surge protection and actively enhancing recovery of nearby coral communities.

Intervention planning and monitoring:
Achieving our bold restoration and adaptation goals will require effective decision making, placing our resources where we can have the highest impact. We are looking for projects that will help support better decision making and monitoring.

Supporting R&D in developing countries:
We're seeking to support the development of R&D in low- to middle-income countries, through projects which scale up restoration efforts in local communities, reduce drivers, enhance ecological functions and improve the survival of coral colonies.

Assisted evolution:
To avoid restored corals bleaching as climate impacts grow, we will need interventions that can help coral species adapt to environmental changes more quickly than they would via natural selection.

R&D capacity building:
We need to rapidly grow global R&D capability and build marine managers and practitioners capacity to understand and use new methods effectively.

Aquaculture:
Finding ways to make the production and planting of coral more efficient and effective is critical.

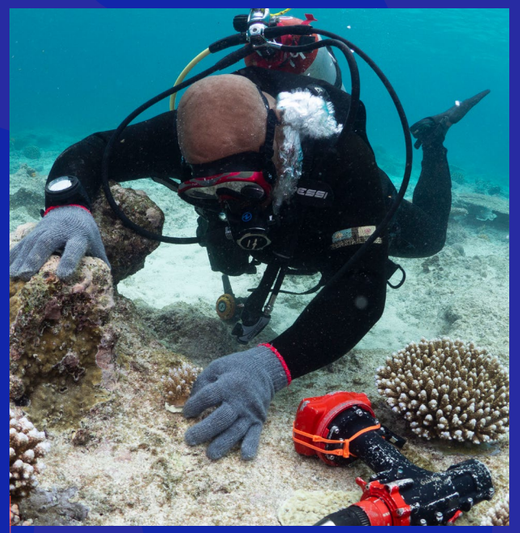
CAP 2022:
Our work in action

The awardees of the inaugural Coral Accelerator Program (CAP 2022) were announced in September 2023, with awards worth a total of US$ 18 million committed to multinational collaborative teams.

CORALADAPT: Identifying heat-resistant corals

Priority area: **Assisted evolution**
Nations involved: **UK, Australia, Philippines, Palau**
Project Lead: **Dr. James Guest, Newcastle University**

CORALADAPT is at the forefront of the global search for heat-tolerant corals. As sea temperatures rise, understanding why some corals can pass on heat tolerance to their offspring will be key to securing healthy populations. Through meticulous sampling and advanced techniques like *in vitro* fertilization, they will explore whether corals bred from more heat-tolerant parents also inherit this trait.



Credits: James Guest

Credits: Gayle Laird/California Academy of Sciences

Improving the health, growth, and survival of young corals

Priority area: **Limit early life mortality, Supporting R&D in developing countries**
Nations involved: **USA, Honduras**
Project Lead: **Dr. Rebecca Albright, California Academy of Sciences**

This project is helping support coral research and restoration in the second largest coral barrier reef in the world, the Mesoamerican Reef. A team of researchers is testing low-tech and low-cost methods to improve the health, growth and survival of coral larvae and setting up a coral-rearing laboratory in Roatán, Honduras, the first of its kind in Central America. Training up local communities and partners to take ownership of these projects will help ensure long term buy-in and better survival rates.

Delivering the best science and technology to save corals

Ramping up coral breeding in the Caribbean

Priority area: **Aquaculture, Supporting R&D in developing countries**
Nations involved: **USA, Netherlands Antilles, Dominican Republic**
Project Lead: **Rita Sellares, FUNDEMAR**

In the past, this team has successfully seeded half a million larvae to local reefs, the highest number reported in the Caribbean region. As part of the new project, a land-based facility for coral larval rearing will be established in the Dominican Republic and a second one will be planned and designed to be implemented in Bonaire. Together, these facilities will allow scaling of coral larvae production in the Caribbean, doubling seeding units produced and reproducing more coral species. By engaging local communities including coral restoration practitioners, students, the tourism industry, dive centers, and fishers, this project ensures widespread support and sustainability.

Credits: Rita Sellares

Credits: Kenneth Hoadley

Enabling quick, non-invasive, data-driven decision making

Priority Area: **Assisted evolution, Preserve and conserve existing corals**
Nations involved: **USA (inc. Guam), Fiji**
Project Lead: **Dr. Kenneth Hoadley, University of Alabama**

This team is studying the heat-tolerance of algae living inside corals using a submersible fluorometer. By using this low-cost, user-friendly system, researchers can quickly and non-destructively analyze algae physiology. It monitors the fluorescence of algae in corals to help identify coral colonies that are more likely to bleach. Transplants with the predicted best and worst heat-tolerant corals will be established and monitored to evaluate the success of this approach. This is a powerful tool that has the potential to enable quick, data-driven decisions to protect and revive corals around the world.

Building reef restoration and conservation capacity in the Caribbean

Priority area: **R&D capacity building**
Nations involved: **USA, Australia, Honduras, Dominica, Mexico, Turks and Caicos**
Project Lead: **Dr. Patricia Richards Kramer, Atlantic & Gulf Rapid Reef Assessment**

Following a severe coral disease outbreak and coral bleaching events in the Caribbean, this project brings together coral experts and marine resource managers, who maintain a network of more than 40 marine protected areas, spanning 18 countries. Working with communities, the team aims to share their technical expertise, scaling up regional restoration efforts and implementing science-based coral restoration roadmaps. They will expand coral breeding techniques to enhance natural recruitment and repopulate reefs and innovative approaches to restore key herbivores, like urchins and crabs, alongside corals are also being implemented to increase coral survival.

Credits: Patricia Kramer

Using AI and robotic boats to advance reef restoration efforts

Priority area: **Intervention planning and monitoring, R&D Capacity building, Assisted evolution**
Nations involved: **Australia, Maldives**
Project Lead: **Prof. Peter Harrison, Southern Cross University**

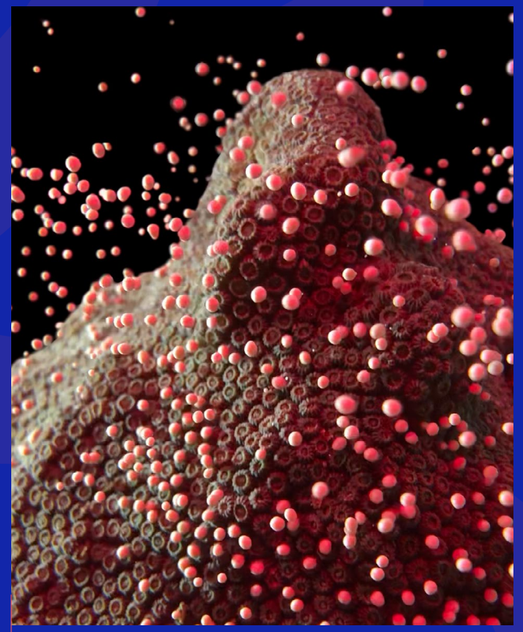
AI, satellite imaging and a remote controlled submersible robot boat are being used to help communities monitor and restore reefs in the Maldives. Local stakeholders will be trained to use fine mesh nets to capture coral eggs and sperm and then strategically cross them to produce robust, genetically diverse coral larvae, which are transported to degraded reefs to mature into adult corals. Imaging tools will be used to map reefs, monitor bleaching responses, and assess genetic diversity of corals. The floating 'LarvalBot' will also deliver larvae to their new homes, ensuring efficient and targeted restoration.

Credits: Maahil Ahmed

Editing genes to build more resilient corals

Priority Area: **Assisted evolution**
Countries involved: **USA, Philippines**
Project Lead: **Dr. Nicole Fogarty, University of North Carolina**

Scientists are using advanced technology to create heat-tolerant super corals, ready to face the challenges of a warming ocean. By using CRISPR, a technology that researchers apply to selectively modify the DNA of organisms, this project aims to design transgenic corals that are resilient in the face of heat stress and other threats. Scientists will briefly expose coral larvae, recruits and adults to heat stress to further study their DNA. The team expects to revolutionize the field of coral genomics by including "switchable" genes that respond and are controlled by environmental conditions.



Credits: Nicole Fogarty

Credits: AIMS

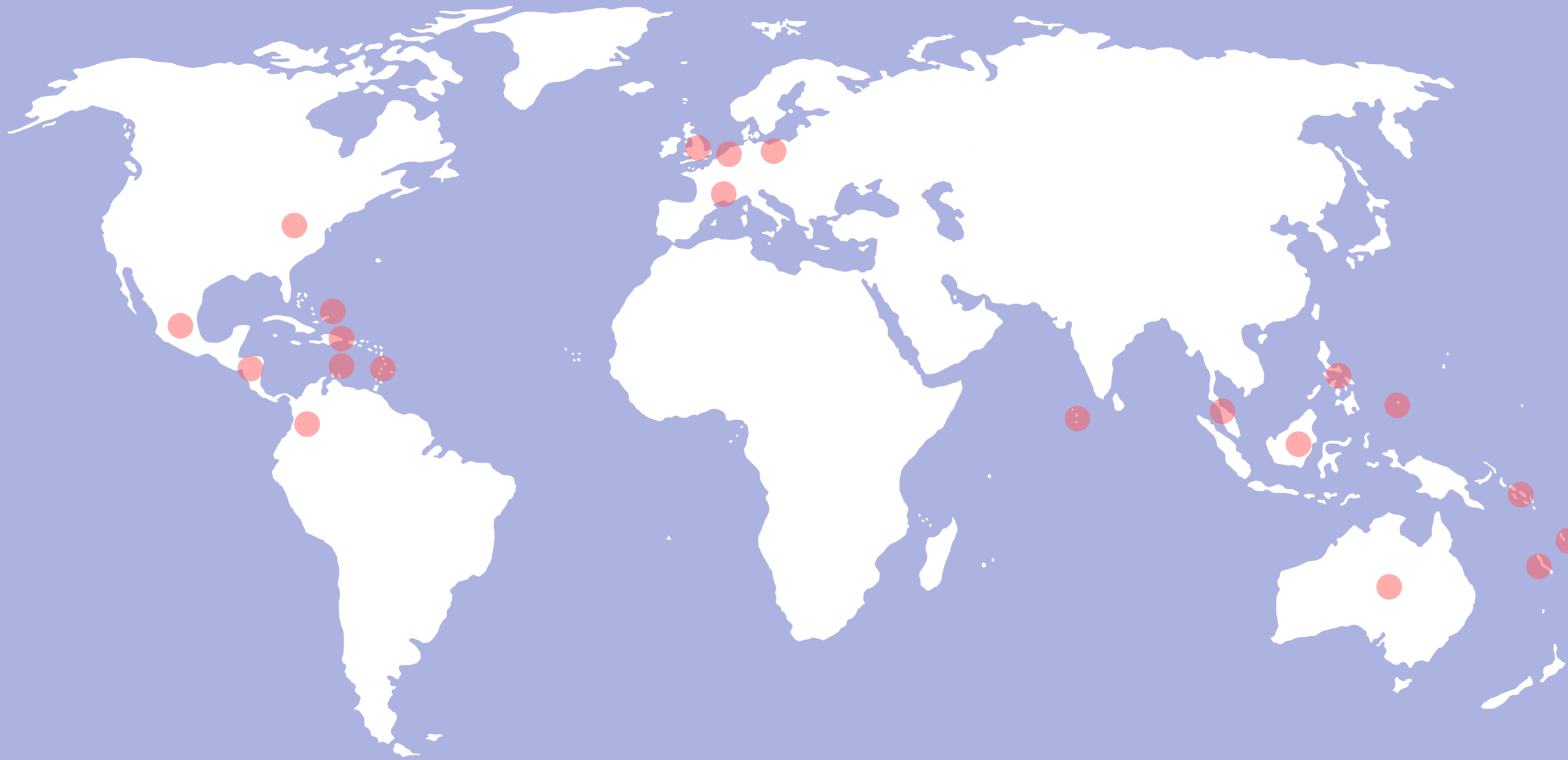
ReefSeed – delivering a portable aquaculture system

Priority area: **Aquaculture, R&D Capacity Building**
Nations involved: **Australia, Maldives**
Project Lead: **Andrea Severati, Australian Institute of Marine Science (AIMS)**

The "ReefSeed" project is a portable coral aquaculture system. This new method reduces coral reproduction time from months to weeks, by increasing fertilization rate and accelerating larval settlement and deployment. It can be operated from the surface, avoiding the costly use of divers, and delivers a high rate of coral survival. The system can generate up to 144,000 young corals per year, representing a step change in the scalability of future coral reef restoration efforts. By providing training and transferring knowledge and technology to Maldivian coral practitioners, ReefSeed will help local communities to efficiently restore degraded reefs.

Delivering the best science and technology to save corals

CORDAP is funding groundbreaking projects all over the globe, to secure a safe future for corals



Using probiotics to fight a lethal coral disease

Priority area: **Preserve and restore existing corals**
Nations involved: **USA, Colombia**
Project Lead: **Dr. Valeria Pizarro, Perry Institute for Marine Science**

This team of researchers will explore how probiotics can help protect corals from the Stony Coral Tissue Loss Disease (SCTLD), a highly lethal disease that has spread rapidly throughout the Caribbean, affecting 34 coral species and 30 countries and territories. While antibiotics have been used to save individual sick colonies, there is no cure for this infection. The project aims to develop probiotics that can be applied to corals to treat the disease, halt lesion progression, and prevent transmission. Knowledge transfer to Colombian coral restoration practitioners will also advance restoration and disease mitigation where the SCTLD has not yet arrived.

Credits: Valeria Pizarro

Credits: Sebastian Szereday/ CoralKu

ASSIST: a smart-decision framework for coral restoration

Priority area: **Intervention planning and monitoring, Aquaculture, Assisted evolution**
Nations involved: **Malaysia, USA, Germany**
Project Lead: **Sebastian Szereday, Coralku**

Scientists are creating a data-driven system to identify the best corals to transplant, grow in nurseries and use for reef restoration initiatives. ASSIST project will pre-screen corals for their climate resilience, identifying the most heat-tolerant coral colonies to study. Then, more than 2500 corals, comprising 12 species will be grown across 33 coral nurseries during the project. The team will compare three distinct restoration procedures, testing the success rate of targeting known heat-tolerant corals for restoration. This project aims to minimize the removal of corals from natural reefs while maximizing coral return to the wild, through long-term survival of nursery and outplanted corals.

Clean reefs: a pollution mapping and risk assessment tool

Priority area: **Intervention planning and monitoring**
Nations involved: **Australia, USA, Fiji, Solomon Islands, Bahamas**
Project Lead: **Dr. Amelia Wenger, University of Queensland**

Corals are very sensitive to pollution. It can affect reproduction rates and cause disease and death. This project is developing an open-access, near real-time pollution mapping and risk assessment tool, that will identify where pollution is coming from, where it ends up, which coral reefs are most at risk, and what level of pollution management is needed. Successful development will enable decision-makers, practitioners and citizen scientists, from 100+ coral reef countries and territories, to make management decisions that will protect corals, enhance restoration initiatives and improve outcomes for reefs and the people who depend on them.

Credits: Tom Vierus

Credits: Emma Camp

Boosting coral resilience with nutritional supplements

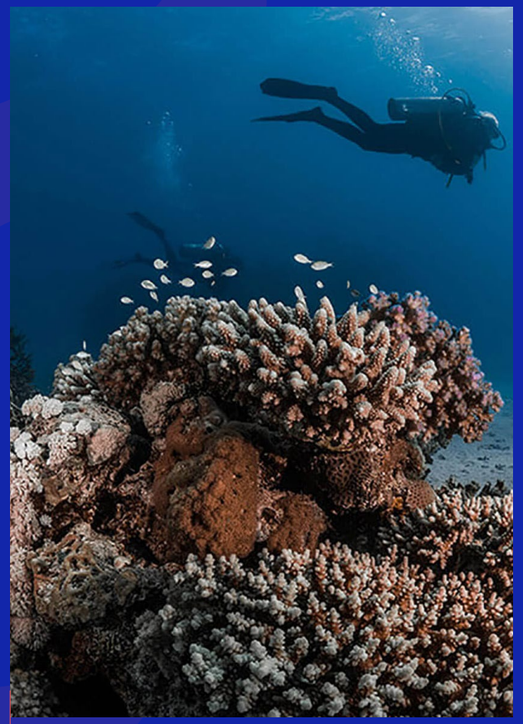
Priority area: **Preserve and conserve existing corals**
Nations involved: **Australia, Indonesia, Malaysia, Monaco**
Project Lead: **Dr. Emma Camp, University of Technology Sydney**

Just like humans, corals require a balanced diet of key vitamins and minerals to stay healthy, especially under stress. This team is developing a customized coral nutritional supplement called 'CoraBoost', which will enhance coral resilience during heat stress periods. The supplement aims to improve coral health and delay or mitigate coral bleaching, providing a crucial tool for future reef restoration efforts. CoraBoost will be tested in the aquaria of Australia's largest aquaculture facility and on wild coral reefs in Australia, Malaysia and Indonesia.

Creating a cryogenically preserved 'bio-bank'

Priority area: **Preserve and conserve existing corals**
Nations involved: **USA, Mexico, Australia, Curacao**
Project Lead: **Dr. Mary Hagerdorn, Smithsonian Institution**

This project aims to create a global coral cryopreservation network, with 'bio-banks' at five network nodes. These coral biorepositories will deep freeze corals, ensuring the preservation of coral genetic diversity on a global scale and applying cryopreservation directly within reef restoration programs. It will offer a lifeline for global research, conservation, and restoration efforts for years to come. In addition to establishing "coral reef fertility clinics" around the world, this project will expand collections of frozen sperm and larvae, protect endangered species, and create multilingual online courses to train coral cryopreservation teams around the globe.



Credits: The Ocean Agency

Credits: Martin Colognoli

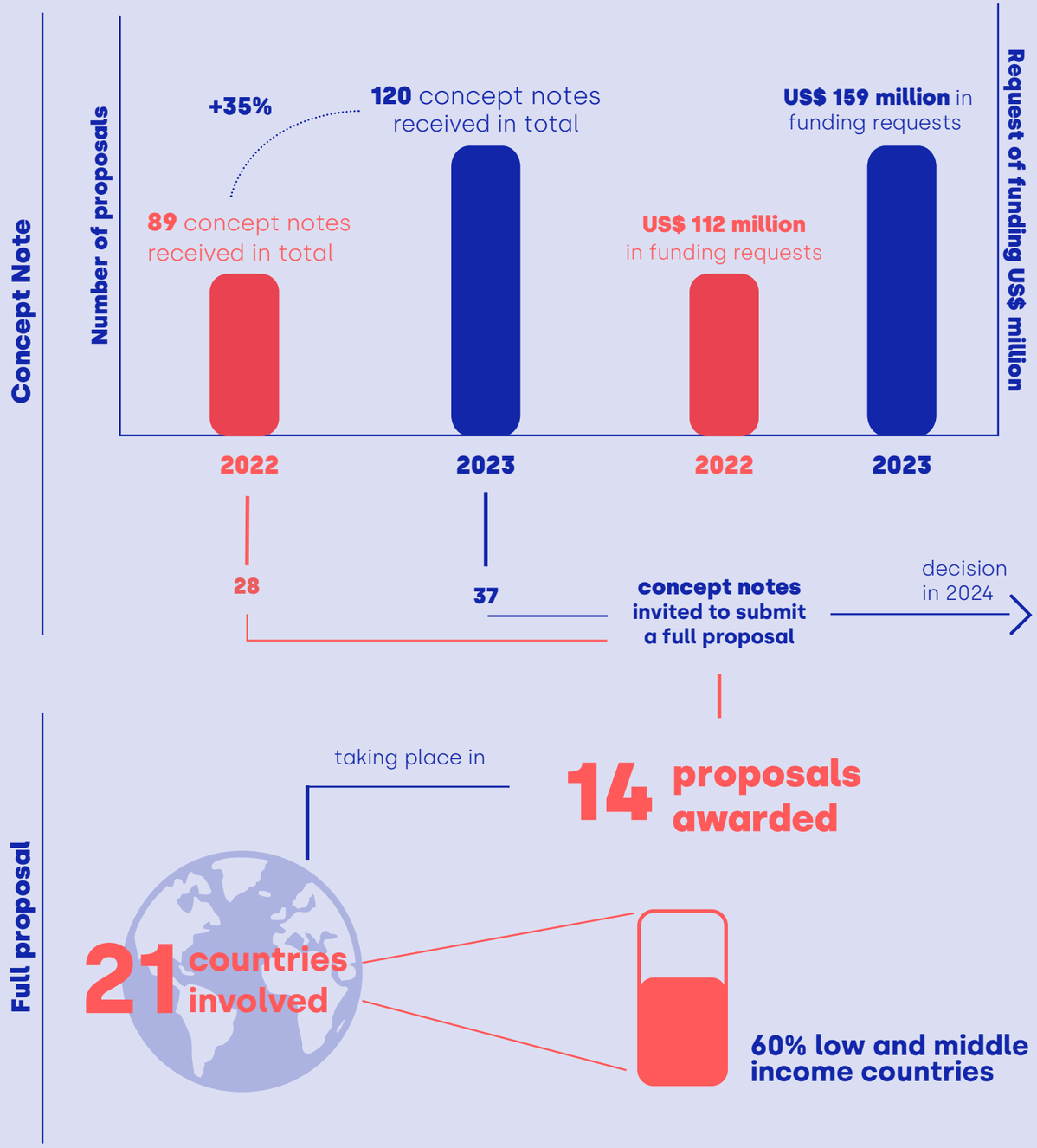
Reducing the impact of the wild coral trade

Priority area: **Aquaculture**
Nations involved: **UK, Indonesia**
Project Lead: **Dr. Rita Rachmawati, National Research and Innovation Agency**

Reproducing rare and ornamental coral species in the lab could help reduce the impact of the illegal wild coral trade. This project will produce a 'lab in a box' apparatus to reproduce coral species that are being harvested by the growing aquarium trade industry, reducing reliance on wild specimens, while also growing corals for restoration purposes. It is expected that 30% of grown corals will be utilized in the aquarium trade and 70% for coral reef restoration. This approach favors an economy where sustainable business practices fund and support local coral reef conservation.

CAP 2022 vs 2023

Since the launch of the funding call, we have been overwhelmed by the quality of the applications we have received. It is clear that there are a huge number of viable and worthwhile projects that need our support.



We need next-generation solutions to achieve the level of restoration needed in the next decade. Projects awarded funding under this program are expected to lead to significant discoveries, innovations and improvements in current coral protection and restoration.

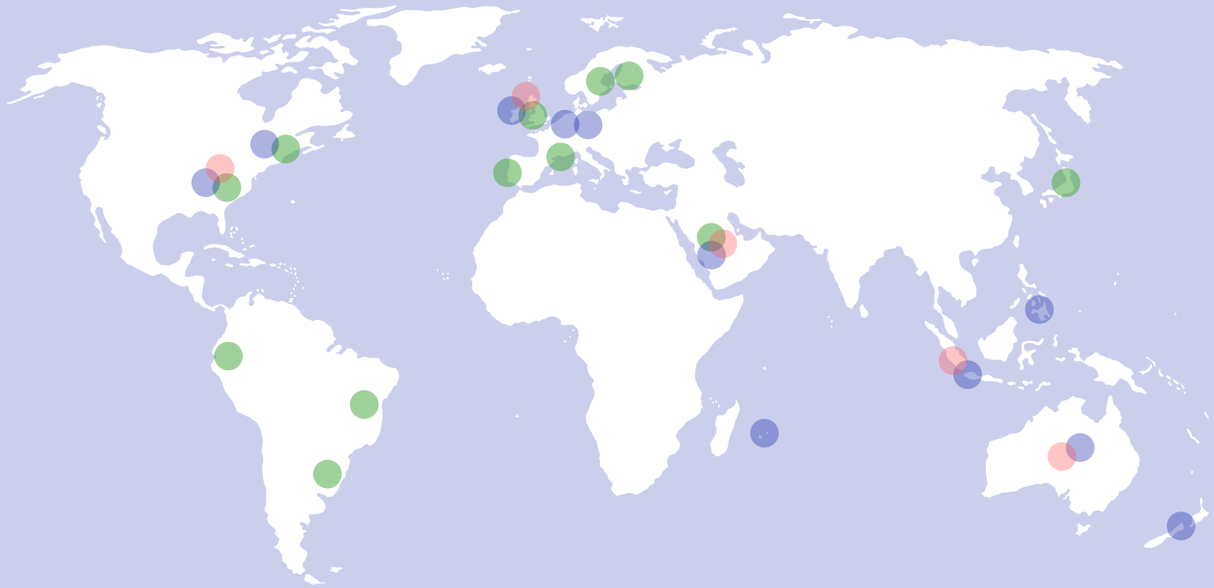
Mr. David Mead, CORDAP Scientific and Advisory Committee Chair

Credits: Martin Colognoli

Scoping Studies

In January 2023, we launched a program of Scoping Studies, bringing together more than 70 coral specialists from around the world, to assess priority R&D investment goals to help save the world's corals. The outputs from these studies, including a series of Technology Roadmaps, have been made available on CORDAP's website, to help guide national, regional, and international programs.

We ran three Scoping Studies over the year, addressing the following areas:



Natural Adaptation and Assisted Evolution of corals
Co-organized with the Australian Institute of Marine Science (AIMS)

Exploring the Frontier of Coral Aquaculture
Co-organized with KAUST Coral Restoration Initiative

Cold-water Corals Restoration and Conservation
Co-organized with REV Ocean

Credits: KAUST

Credits: Carla Lourenço

Credits: KAUST

Events, outreach and communications

Enhancing the impact of CORDAP's initiatives

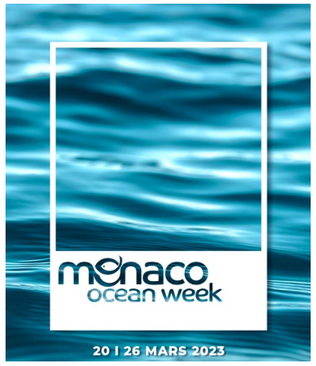
Bringing visibility to the groundbreaking work being done around coral research and restoration helps to support and magnify the impact of CORDAP's programmes and activities. This focus has become even more crucial as climate change intensifies global environmental challenges.

Our strategic communication efforts have not only strengthened CORDAP's reputation but have also increased our international presence, positioning CORDAP as a critical asset for coral research. We are now recognized by a growing community of researchers, decision-makers, influencers, and environmental leaders as a key player in safeguarding the future of coral reefs.

Advancing the international coral agenda

CORDAP is committed to elevating global awareness of the urgent need to protect and restore coral ecosystems. This year, we participated in several key international events. These high-level gatherings facilitated stronger connections with current and potential partners and donors, fostering collaboration while amplifying CORDAP's mission.

COP28 was of particular relevance for CORDAP. As official partners of the Ocean Pavilion and the Science for Climate Action Pavilion, CORDAP hosted six events and participated in two more. Aimed at showcasing the work already being done to conserve and restore corals in the Global South, these events demonstrated examples of international collaboration in action in the Red Sea. They also brought attention to the relatively unknown world of cold-water corals and highlight the key role R&D must play in protecting corals worldwide.



Monaco Ocean Week, Monaco

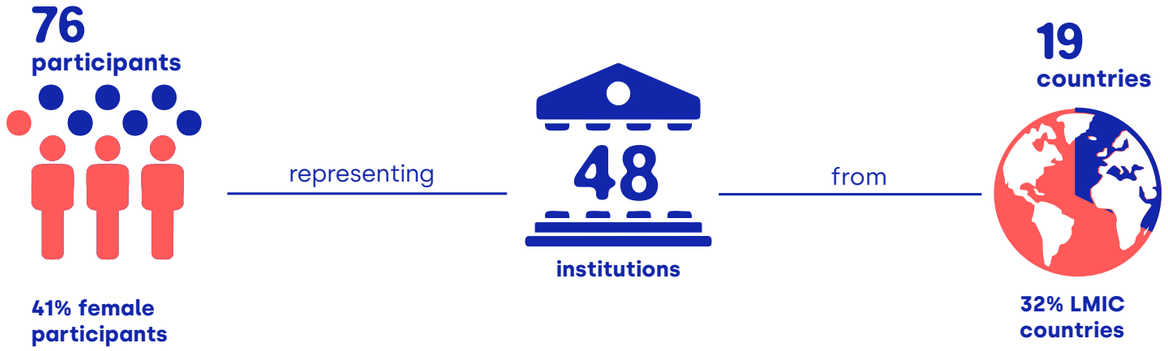
ICRI General Assembly, USA

MENA Climate Week, Saudi Arabia

COP28, UAE

Scaling up coral science

The Scoping Studies workshops totaled



We published the first CORDAP R&D Technology Roadmap. This report offers a visionary roadmap for understanding natural adaptation and assisted evolution of corals to climate change.

Activation and awareness

We hosted a landmark event celebrating the official launch of the G20 Global Coral R&D Accelerator Platform Foundation (CORDAP Foundation). The formal establishment of the CORDAP Foundation marked a major milestone, providing a financial structure to further CORDAP's mission and engage the international community in addressing the urgent coral crisis.

This event was also crucial for CORDAP as it solidified strategic partnerships with key Saudi organizations through Memoranda of Understanding and Letters of Intent. These agreements will significantly bolster CORDAP's efforts to accelerate research and development solutions for coral conservation on a global scale.

Credits: Adiprayogo Liemena

Team Coral advocating for corals worldwide

World Ocean Day saw the launch of CORDAP's Team Coral, a community of advocates helping to raise awareness of the importance and value of corals and reefs.
Over the coming years, this community will bring together a wide range of individuals and personalities, including artists, journalists, scientists, speakers, influencers, professors and all kinds of ocean enthusiasts. Coalescing around the conservation of this iconic ecosystem, Team Coral will serve as a focal point for their efforts to create a better future for corals.

CORDAP's Artist in Residence

Jana Winderen, an artist based in Norway with a background in fish ecology, mathematics and chemistry, became CORDAP's inaugural artist in residence. During her residency, Jana collaborated with a team of researchers, capturing the soundscape of the Red Sea's coral ecosystems. As part of the program, Jana visited The KAUST School to deliver talks on the intersection of sound, science and corals to over 170 students. She also enrolled on a seminar promoted by CORDAP to explore how art can help deliver scientific messages to the broader public.

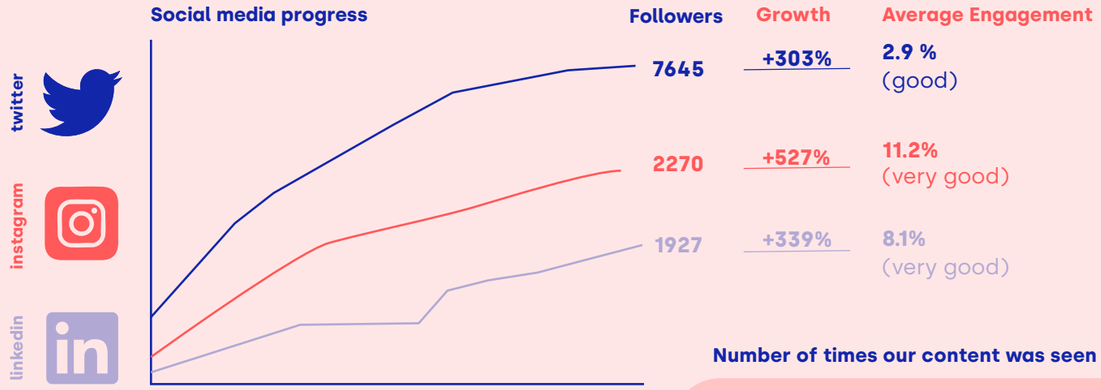
Credits: KAUST

In 2023, we made made significant strides in advancing the coral agenda, utilizing international and high-level events, social media, digital channels, and strategic outreach to engage a broader audience.
We also secured international media coverage, helping to amplify the unheard voices of communities in coral regions, and build the reputation of the innovative projects supported by CORDAP.

650
people at events

CORDAP online

Social media progress



	Followers	Growth	Average Engagement
twitter	7645	+303%	2.9 % (good)
instagram	2270	+527%	11.2% (very good)
linkedin	1927	+339%	8.1% (very good)

Number of times our content was seen

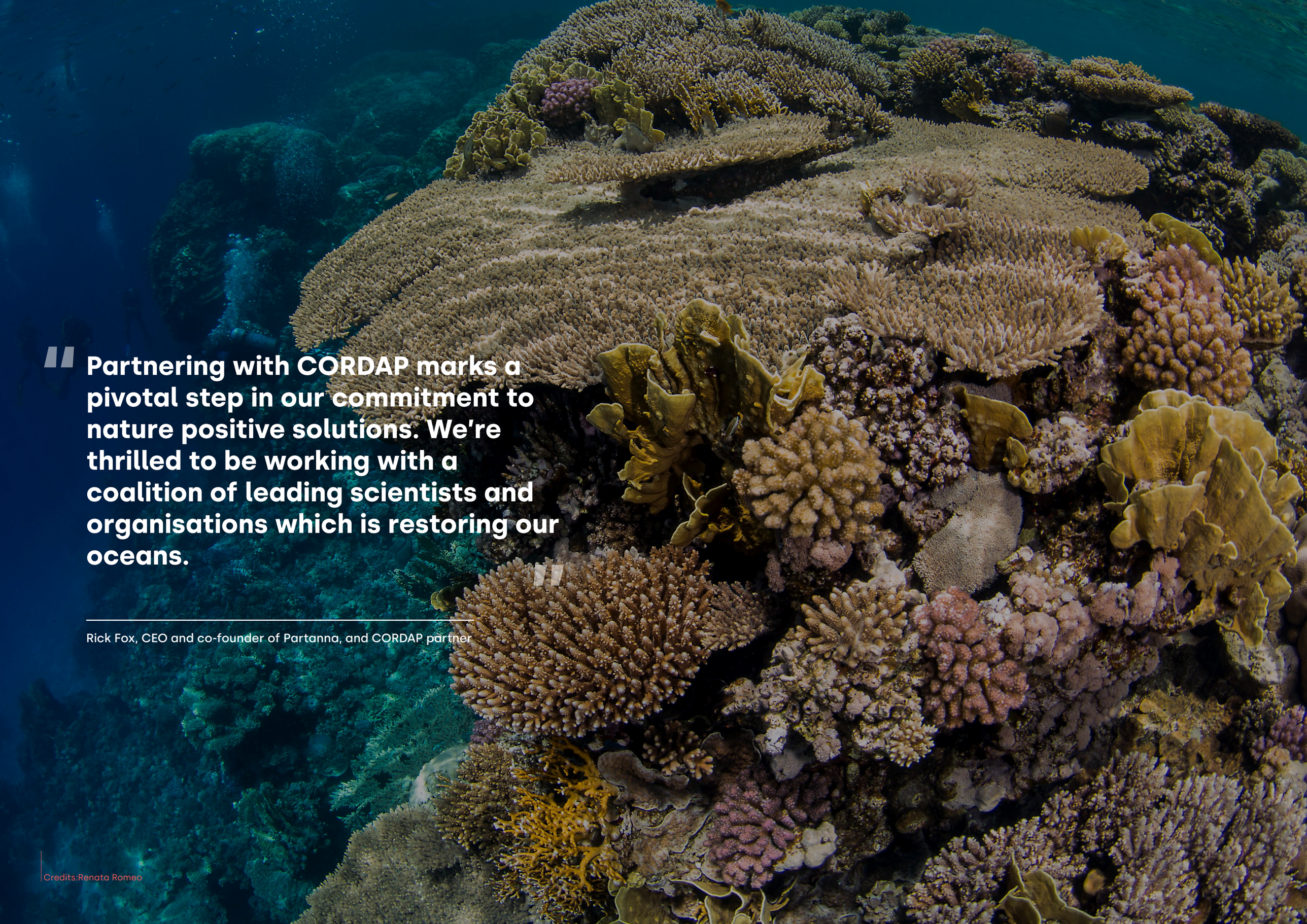
Twitter	Instagram	LinkedIn
4 million	1.5 million	71,000

CORDAP in the media

98 media articles

17 000 visitors from **188** nations and territories
46 000 views

CORDAP total audience was **28,842 people** with **5.5M** impressions and **21,644 engagements**



> **Partnering with CORDAP marks a pivotal step in our commitment to nature positive solutions. We're thrilled to be working with a coalition of leading scientists and organisations which is restoring our oceans.**

Rick Fox, CEO and co-founder of Partanna, and CORDAP partner

Credits:Renata Romeo

Key achievements

The CORDAP Foundation

In March 2023, the G20 Global Coral R&D Accelerator Platform Foundation (CORDAP Foundation) was officially registered as a nonprofit organization, established to secure the necessary resources to fund and support the G20 Coral Research and Development Accelerator Platform (CORDAP). Key milestones included appointing the Foundation Board and CEO, Professor Carlos Duarte (Executive Director of CORDAP), recruiting and onboarding the executive team, setting up administrative frameworks and bank accounts, and receiving the first installment of funding from the Kingdom of Saudi Arabia.

The CORDAP Foundation is dedicated to:

1. Developing approaches to facilitate the receipt of gifts, donations, subsidies, grants, bequests, endowments, and other contributions from both within and outside the Kingdom, in accordance with relevant statutory provisions.

2. Providing financial support for research and projects endorsed by the Scientific and Advisory Committee (SAC) and approved by the Initiative Governance Committee (IGC).

3. Managing the organization's funds according to the guidelines established by the IGC.

4. Implementing a system to oversee the disbursement of funds for research and projects approved by both the SAC and the IGC.

5. Ensuring the disbursement of funds aligns with plans approved by the IGC.

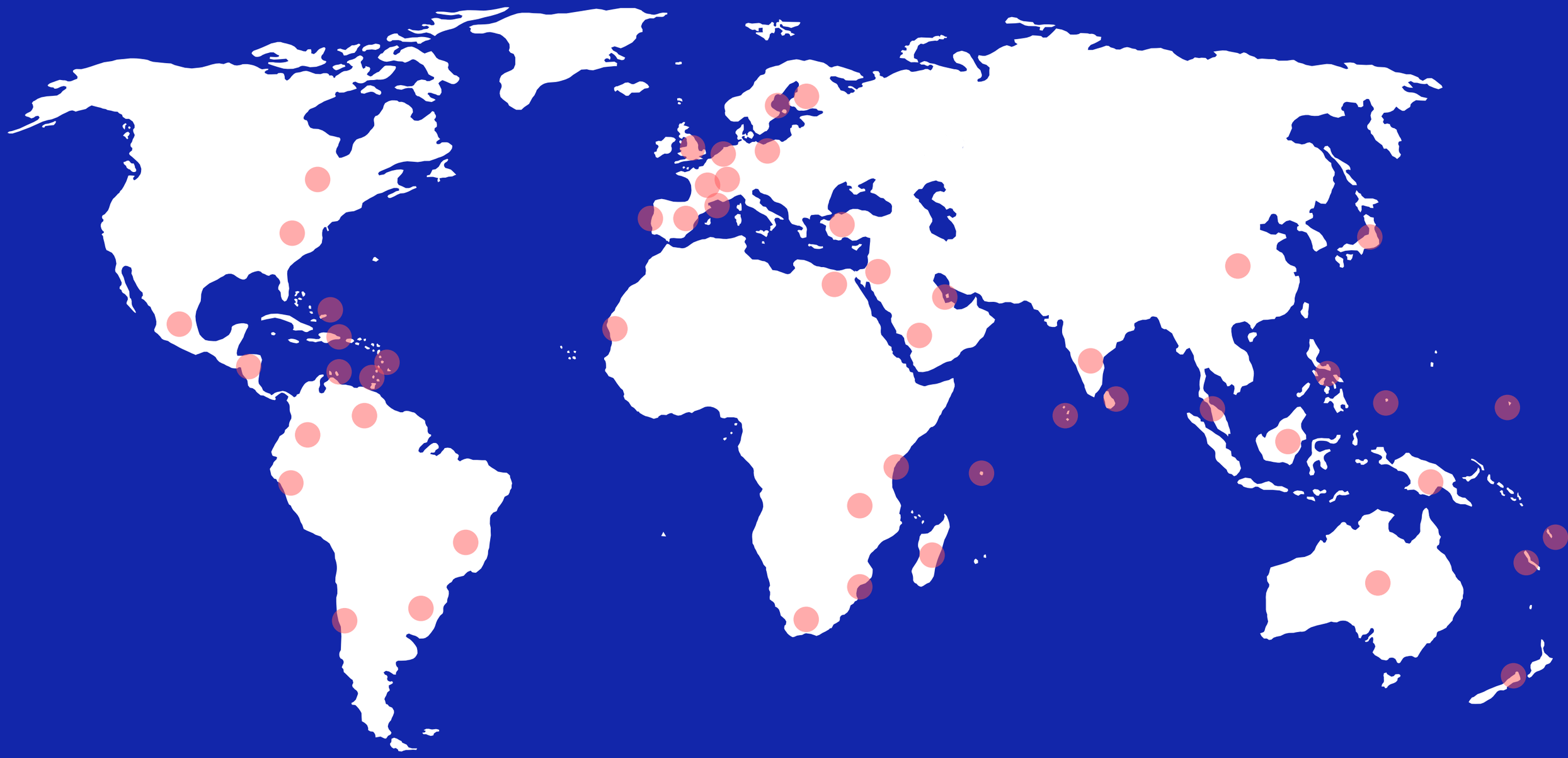
Partnering for change

In 2023, the G20 Global Coral R&D Accelerator Platform Foundation (CORDAP Foundation) partnered with several organizations, leveraging our combined resources to help deliver the solutions required to secure a safe future for corals. We are most excited to partner with:

In a significant development for coral reef conservation, CORDAP has officially become a member of the International Coral Reef Initiative (ICRI), a prominent global alliance of organizations dedicated to safeguarding coral reefs. This momentous membership was formally accepted during the 37th ICRI General Meeting held in Hawaii from September 19th to the 23rd.

Since 2021, CORDAP has collaborated with 165 institutions worldwide from 52 countries

56% were low and middle-income countries



Looking ahead...

2023 was highly productive for CORDAP, delivering against many of our strategic objectives. Looking to the future, given the escalating climate and human-induced challenges, our focus on developing transformational change for corals is becoming more urgent than ever. With this in mind, we will continue to focus our work where it is needed the most.

Expanding the CORDAP R&D Technology Roadmap series

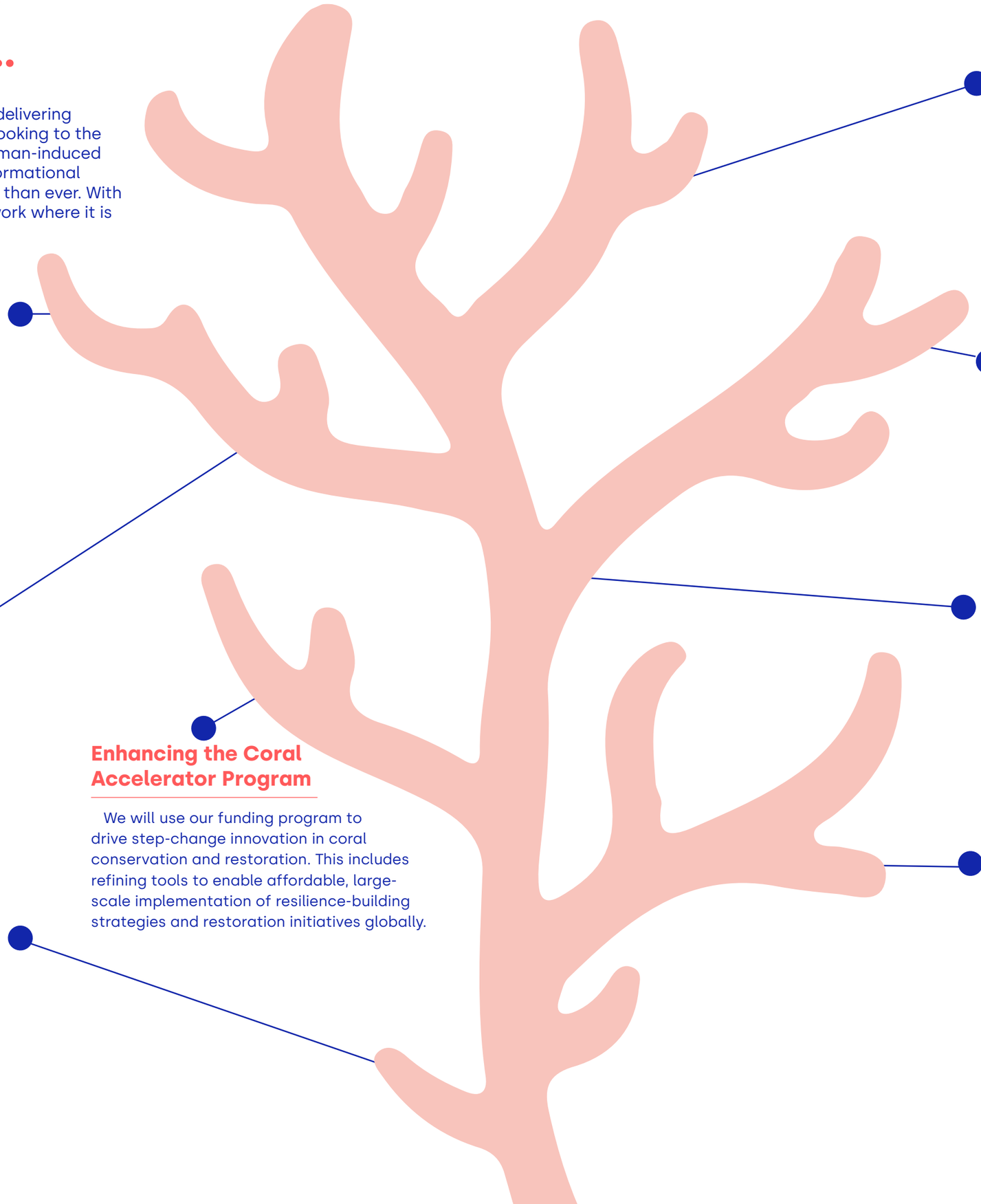
Following the successful launch of the first R&D Technology Roadmap in 2023, we will publish several new roadmaps. The first will emerge from our Coral Aquaculture and Cold-Water Coral Scoping Studies, highlighting critical knowledge gaps and opportunities for global R&D collaboration. Additionally, forthcoming studies will be undertaken on Managing Ecological Risk and Coral Diseases during 2024.

Strengthening global research leadership

Our study and workshop on Capacity Development and Leadership in the Global South will explore how to elevate the voices of underrepresented scientists from this region, providing new perspectives to the global coral research community.

Developing our operational infrastructure

We will develop a comprehensive risk management system, covering both project-specific and institutional risks, as well as aligning key performance indicators to our primary objectives. By collaborating with our partners, we will ensure a robust and resilient operational environment, capable of supporting our expanding portfolio and growing membership.



Enhancing the Coral Accelerator Program

We will use our funding program to drive step-change innovation in coral conservation and restoration. This includes refining tools to enable affordable, large-scale implementation of resilience-building strategies and restoration initiatives globally.

Delivering the best science and technology to save corals

Mobilizing resources

We will launch an ambitious fundraising campaign to secure the resources needed to support our expanding portfolio of projects and initiatives. This campaign will focus on engaging new partners from the public and private sectors, philanthropic organizations, and international development funds. By diversifying our funding sources, we will ensure the long-term sustainability of our programs.

Building awareness

CORDAP will continue to drive global awareness of the urgency surrounding corals R&D and conservation efforts. We will continue to actively engage with key stakeholders at major global forums, expand our social media presence, and amplify our message through our network of Coral Ambassadors.

Supporting developing nations

We will strengthen our commitment to recognizing the pivotal role these countries play in protecting the coral ecosystems on which their coastal communities depend. Our efforts will center on strengthening their capacity to address the multiple challenges they face in the coming decade.

Broadening global representation

Following the expansion of the advisory organization of the IGC and the addition of new member countries, we aim to further expand our membership. We are committed to ensuring a diverse and representative body, including both G20 and non-G20 nations. This expanded membership will enhance the collective knowledge and region-specific input, driving more inclusive solutions for coral and reef conservation.

... and beyond for corals and people

Scientific Initiatives

New funding call (CAP 2024)

Collaborative research programs
Strengthening partnerships with research institutions and universities, particularly in the Global South, to advance knowledge-sharing and capacity building.

Scoping Studies and Technology Roadmaps
A Leadership and Capacity Development in the Global South workshop and a Coral Disease Scoping Study, aiming to identify and evaluate the current state of knowledge on coral diseases and guide future research priorities.

Fundraising and Engagement

Diversifying funding sources
Our focus will be on securing new donors, including government, philanthropists, foundations, and individuals, to drive meaningful positive impact for the planet.

Strategic partnerships
We will work on establishing strategic partnerships across the public and private sectors, including tourism, sports, and renewable energy, to collaborate effectively and garner support for our mission.

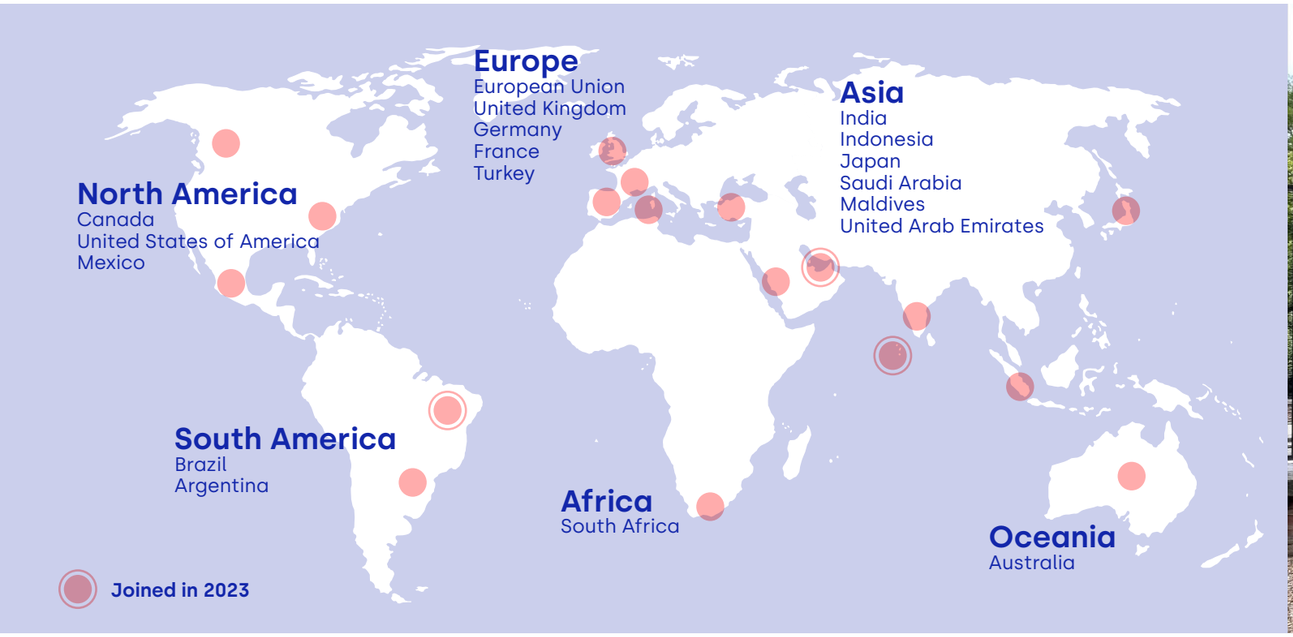
Public campaigns and awareness initiatives
We aim to launch global awareness campaigns that engage the public in coral conservation efforts, fostering community involvement and creating potential fundraising opportunities.

Delivering the best science and technology to save corals

Credits: KAUST

Delivering the best science and technology to save corals

CORDAP's governance structure



Credits: Adiprayogo Liemena

Initiative Governing Committee (IGC)

This international committee consists of G20 nations, non-G20 nations, and international organizations that support CORDAP in an advisory role. It approves CORDAP's strategic plans and operating procedures and approves funding allocations to research projects recommended by the Scientific and Advisory Committee.

The CORDAP IGC is

Chaired by
Dr. Osama Faqeeha,
Deputy Minister of Environment, Ministry of Environment, Water and Agriculture, Saudi Arabia.

Vice-chaired by
Ms. Jennifer Koss,
Director, NOAA Coral Reef Conservation Program, United States.

Prof. Carlos M. Duarte
CORDAP Executive Director and CORDAP Foundation CEO.

Advisory Members to the IGC

Coral Restoration Consortium (CRC)
Dr. R. Scott Winters

Global Fund for Coral Reefs (GFCR)
Mr. Yabanex Batista

Great Barrier Reef Foundation (GBRF)
Dr. Theresa Fyffe
Ms. Margot Andersen

International Coral Reef Initiative (ICRI)
Mr. Francis Staub

International Coral Reef Society (ICRS)
Prof. Christian Voolstra

Observer Japanese Coral Reef Society (JCRS)
Dr. Atsushi Watanabe

The Commonwealth Secretariat
Dr. Nicholas Hardman-Mountford

UN Environment Programme (UNEP)
Mr. Hally Blanchard
Ms. Sinikinesh Jimma
Dr. Leticia Carvalho
Mr. Gabriel Grimsditch

XPRIZE
Mr. Peter Houlihan

Scientific and Advisory Committee (SAC)

The Scientific and Advisory Committee (SAC) comprises renowned international coral scientists, managers, and engineers. It assists the Initiative Governing Committee by providing guidance and recommendations on CORDAP's overall strategy, funding program priorities, resource allocation and deliverables. The SAC monitors project performance, reviews the results of the overall Platform program and delivers its evaluation and recommendations to the IGC.

The SAC is

Chaired by
Mr. David Mead,
Executive Director of Strategic Development at the Australian Institute of Marine Science.

Vice-Chaired by
Prof. Anastazia Banaszak,
Research Professor at the Institute of Ocean Sciences & Limnology, National Autonomous University, Mexico.

The Scientific and Advisory Committee

In 2023, we welcomed three new members to the Scientific and Advisory Committee

Dr. Rachel Pears
Australian Institute of Marine Science (AIMS)

Dr. Nathalie Hilmi
Monaco Scientific Centre

Dr. Michelle Taylor
University of Essex, School of Life Sciences

who joined 18 other coral experts

Prof. Anastazia Banaszak (Vice Chair)
Institute of Ocean Sciences & Limnology at the National Autonomous University of Mexico

Prof. Callum Roberts
University of Exeter, United Kingdom

Prof. Carlos Duarte
CORDAP Executive Director and Distinguished Professor at King Abdullah University of Science and Technology (KAUST)

Dr. Daniel Lauretta
National Scientific and Technical Research Council (CONICET-Argentina)

Mr. David Mead (Chair)
Australian Institute of Marine Science (AIMS)

Prof. David Obura
Coastal Oceans Research & Development-Indian Ocean (CORDIO) East Africa

Dr. Elizabeth McLeod
The Nature Conservancy, United States

Dr. Ian McLeod
The General Organization for Coral and Sea Turtles in the Red Sea (SHAMS)

Dr. Joanie Kleypas
Climate & Global Dynamics Lab at the National Center for Atmospheric Research (NCAR)

Dr. Mark Gibbs
Australian Institute of Marine Science (AIMS)

Prof. Michelle Devlin
Centre for Environment, Fisheries and Aquaculture Science and Collaborative Center for Sustainable Use of the Seas (CCSUS) at University of East Anglia, United Kingdom

Mr. Muhammad Abrar
Research Center for Oceanography - National Research and Innovation Agency

Prof. Nur Eda Topcu Eryalcin
Istanbul University, Faculty of Aquatic Sciences Turkish Marine Research Foundation

Prof. Ramesh Ramachandran
National Centre for Sustainable Coastal Management, Ministry of Environment, Forest and Climate Change, Government of India

Dr. Raquel Peixoto
King Abdullah University of Science and Technology (KAUST)

Dr. Sean Porter
Oceanographic Research Institute, South African Association for Marine Biological Research

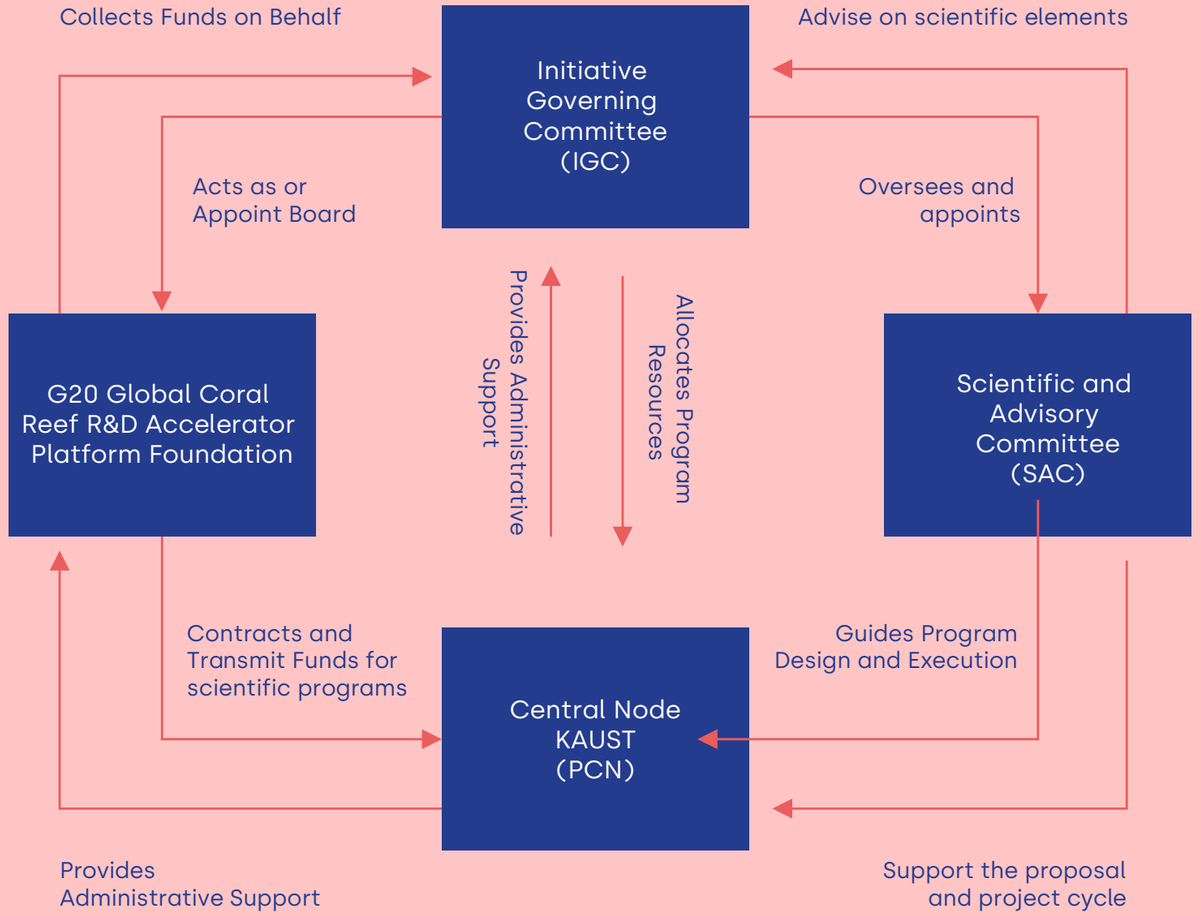
Prof. Serge Planes
Centre of Island Research and Environmental Observatory (CRIOBE), French Polynesia

Dr. Tali Vardi Coral Restoration Consortium, United States

CORDAP Foundation & the Platform Central Node (PCN)

The G20 Global Coral R&D Accelerator Platform Foundation (CORDAP Foundation) is the nonprofit organization that serves as the financial arm of CORDAP. Headquartered at King Abdullah University of Science and Technology (KAUST), the CORDAP Foundation receives the donations and contributions and distributes the Platform's financial resources to fund CORDAP's coral research and development programs and activities.

The Platform Central Node administers the overall Platform, supporting the IGC and SAC and is also based at and fully financially supported by KAUST.



Key Policies

The core of CORDAP's mission is to generate innovative, practical, and sustainable solutions for accessible and further use and translation by conservation and restoration efforts across the world. CORDAP's funding policies reflect this focus and further work will be undertaken in 2024 to expand and implement the necessary policies to ensure our effectiveness, transparency, and long-term impact.

Credits: Maahil Ahmed

Intellectual property policy

We believe strongly in the full sharing of the knowledge and innovations generated, we will therefore manage intellectual property (IP) so that it can be applied by coral restoration efforts worldwide. This will ensure the resulting technologies are accessible and affordable to those communities and populations living in poor and disadvantaged regions of the world, where many of the world's tropical coral reefs are located.

Awardees and their institutions must agree to grant a public license (non-exclusive royalty free) to IP resulting from any project funded by CORDAP to entities for any not-for-profit, or affordable, coral restoration use. This will include essential background IP, such as any IP previously generated that is necessary for the successful and legal implementation of the project IP.

That CORDAP funded developments and technologies should be made available and accessible at an affordable price to all coral restoration projects is a guiding principle. While it is expected that beneficiaries of CORDAP funding will act in good faith regarding this principle, this aspect will be monitored as projects and their outputs progress and are implemented.

Open access policy

CORDAP policy is that publications, knowledge and data arising from CORDAP funded activities be made freely available as soon as possible, and licensed in ways which allow others to build upon and re-use this content. This includes the provisions that publications, and underlying data, will be immediately, freely and openly accessible to all. There should be no barriers to the re-use and dissemination of CORDAP funded publications and research data and software should be Findable, Accessible, Interoperable and Reusable (FAIR).

Credits: Maahil Ahmed

Risk management

CORDAP understands that accelerating coral conservation and restoration technologies in a transformational manner requires, to a large degree, a bold, high-risk, high-reward approach. Our commitment to innovation in research and development means we need to embrace the inherent uncertainties of breakthrough science.

To balance this at a project level, we implement a risk management framework within project proposals that allows the research community to pursue transformative solutions while mitigating potential challenges. By fostering a culture of calculated risk-taking, we aim to push the boundaries of coral conservation, driving impactful advancements that contribute to the resilience and survival of coral ecosystems globally. At the institutional level, a risk management system is being designed to identify and mitigate strategic, operational, financial and compliance risk.

“CORDAP is a unique funder in the types of projects they invest in, really targeting those sitting between the research, technology, and implementation space, which is so rare, but also the space where real progress can occur.”

Dr. Amelia Wenger, CORDAP awardee from CAP 2022

Credits: Warren Baverstock

Financial overview

At the point of inception during the G20 summit in 2020, the Kingdom of Saudi Arabia committed US$ 98 million to G20 CORDAP for the direct funding of research projects over a period of 10 years. This year, we received the first installment of US$ 28 million from the Kingdom of Saudi Arabia, which represents the combined disbursements for three years. Of this, US$ 17,986,427 was committed to awardees of the CAP 2022 program, with the remainder transitioning to 2024 towards commitments for the second round of awards (CAP 2023) to be announced in 2024.

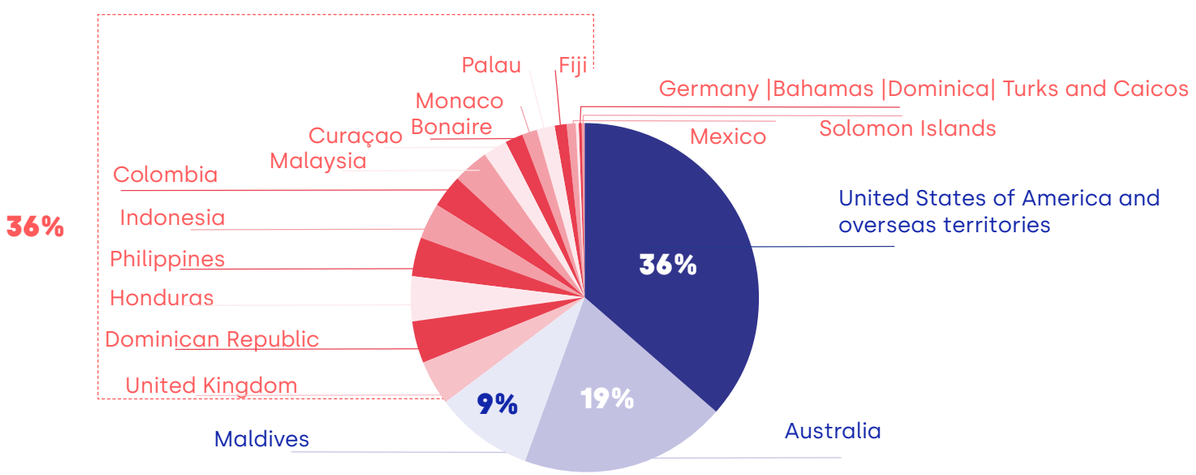
		2023
REVENUE	CONTRIBUTIONS	US$ 28,000,001
TOTAL		US$ 28,000,001
FUNDS COMMITED	PROGRAMS ADMINISTRATIONS & SUPPORT	US$ 17,986,427 *see Operational costs
TOTAL		US$ 17,986,427
NET INCOME AFTER COMMITMENTS		US$ 10,013,574

The funding available for CAP 2023 is significantly reduced compared to CAP 2022, and emphasises the need to increase donations and global financial activation.

Funds committed

As CORDAP commits to upscale and advance the science needed to secure a safe future for corals, projects are funded across the globe and financial resources are distributed over several nations and institutions.

CAP 2022 funding allocated by country



Operational costs

Since 2021, King Abdullah University of Science and Technology (KAUST) has funded and supported the entirety of CORDAP's administrative costs. KAUST has provided resources for CORDAP operational costs, including high-level international and awareness events, and promoting and hosting scoping studies to identify strategic research areas for investment. In 2023, KAUST also provided additional financial support and resources for the operation of the CORDAP Foundation. This generous support means all funds raised from donors go directly towards the research and development programs.

جامعة الملك عبدالله للعلوم والتقنية
King Abdullah University of Science and Technology

Credits: KAUST

Future funding

We are profoundly grateful for the Kingdom of Saudi Arabia's generous pledge of approximately US$ 10 million per annum for the period 2020-2030, along with in-kind contributions from KAUST that support our administration and operational tasks. This foundational support has enabled us to commence delivering on our mission, ensuring that all additional funds raised can be directed entirely to our programs.

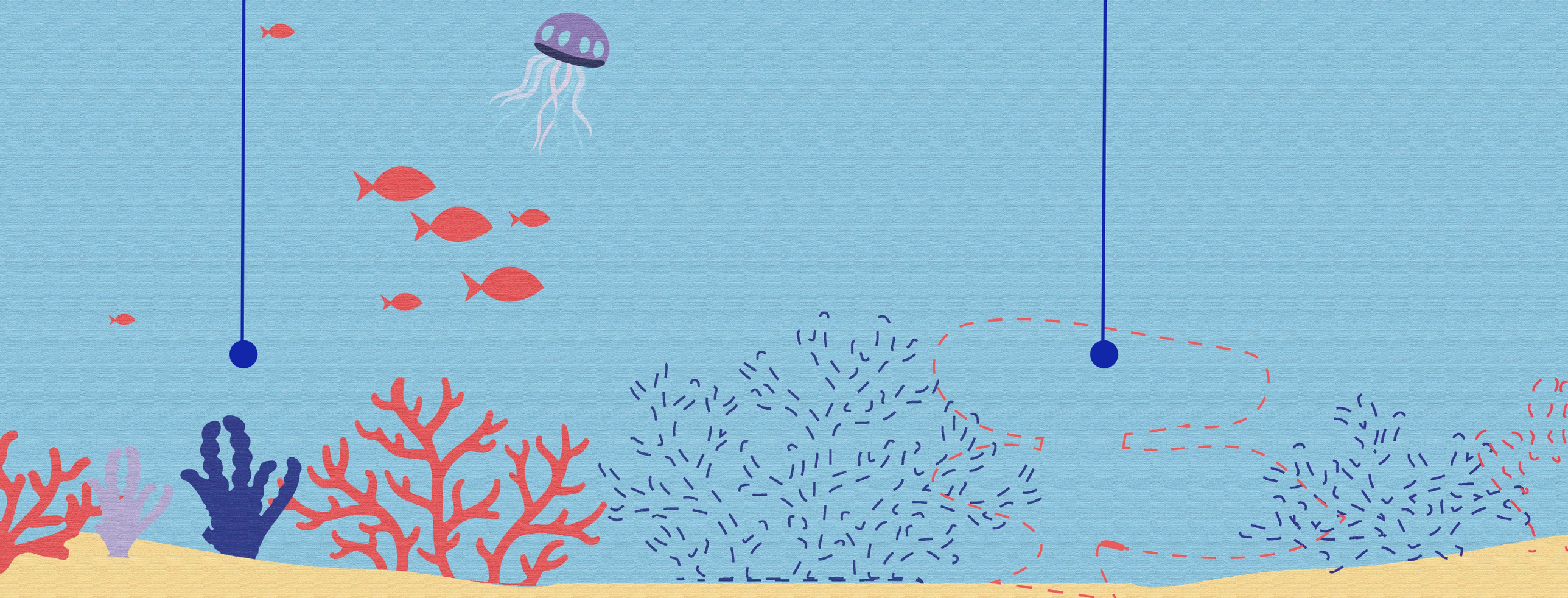
To fully realize our vision

and be able to fund groundbreaking scientific innovations that help secure a safe future for corals, we require at least US$ 30 million annually over the next decade. However, we currently face a funding gap of US$ 20 million. The CORDAP Foundation is intensifying its fundraising efforts to mobilize resources from governments, philanthropists, foundations, corporations, and individuals.

Our efforts are crucial not only for restoring some of the most diverse marine ecosystems but also for protecting coastal communities from the devastating impacts of storms and floods, ensuring that corals and coral reefs can be enjoyed by future generations.

Donors commited to US$ 10 million/year

We are still missing US$ 20 million/year



Ways of supporting our work

We are incredibly grateful for the diverse ways our supporters contribute to our mission of securing a future for corals and reefs worldwide. From the Caribbean to the Indo-Pacific, the projects funded by CORDAP are making strikes that would be impossible without our donors' involvement. Your contributions enable us to drive innovation that creates a meaningful global impact, integral to help to restore and preserve entire ecosystems for the benefit of both people and nature for generations to come.

Structured funding opportunities:

We are actively pursuing partnerships with the following groups to secure grants, and other funding mechanisms:

Government agencies

Foundations

Corporations and institutions

There's never been a more critical time to invest in our ocean's future.
You can make this possible through these various options:

- **Donate in-kind services**
- **Encourage matching donations**
- **Sponsor a project of your choice**
- **Make a one-time donation**
- **Become a monthly donor**
- **Add CORDAP to a legacy plan**
- **Introduce CORDAP to potential donors**
- **Host a fundraising event**
- **Turn your birthday into a fundraising action**
- **Make a charitable gift for your loved ones**

Credits: Adiprayogo Liemena

Message from the Chair:

2023 saw CORDAP continue to deliver on its ambition, announcing the awardees of the first Coral Accelerator Platform (CAP) funding call. In total, almost US$ 18 million were awarded to projects to deliver innovative solutions to the challenges facing coral conservation and restoration practitioners around the world. Another great milestone was the launch of scientific scoping studies and workshops which helped identify major knowledge gaps in key coral research areas.

A significant milestone was the launch of the CORDAP Foundation. This not-for-profit entity will act as the financial arm of the initiative, helping to source and secure resources, and to drive the new partnerships that have been established to support CORDAP's ongoing mission.

But there is much work still to be done, as 2023 is the first year when ocean temperatures have reached +1.5 °C above preindustrial levels, leading to a global mass bleaching event, impacting across coral reefs worldwide. Ocean warming compounds with local pressures, such as deteriorated water quality, physical damage from anchoring and damaging fishing practices, among others, leading to rapid global coral loss. This serves as a reminder of the urgency of delivering on our mission, which can only be achieved through rapid, unified action to deliver the new science and technology to conserve and restore corals, reefs and human lives. We need ambitious international action and greater financial support to protect and restore the world's reefs.

Global problems need global solutions. The G20 nations recognised this need when they established CORDAP in 2020. They created CORDAP.org as an initiative that would bring together the best minds from around the world, to accelerate innovation in coral conservation and restoration. And the will to act exists.

In late 2022, with the ratification of the Kunming-Montreal Global Biodiversity Framework, the world set out a clear target of protecting and restoring 30% of the world's marine ecosystems by 2030. CORDAP is a key enabler toward the implementation of this ambitious Framework, and with the marine elements of the SDG's, so those supporting CORDAP's work, support these global goals.

Now more than ever, this work will prove vital.

CORDAP's progress report shows some of the collective, collaborative efforts already underway to turn the tide for coral conservation. There is still time to protect the world's corals, but we must act together, and we must act now.

Dr. Osama Faqeeha, G20 CORDAP Initiative Governing Committee Chair, Global Coral R&D Accelerator Platform Foundation Chair, and Deputy Minister of Environment, Ministry of Environment, Water and Agriculture, Saudi Arabia.

Join **#TeamCoral**

cordap.org

Contact us at **info@cordap.org**

cordap

G20 Coral Research & Development Accelerator Platform