The Coral Reef Sentinels: A Mars Shot for Blue Planetary Health
Decade Programme

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Lead Institution

The Smithsonian Institution

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KEY PARTNERS

- The Smithsonian Tropical Research Institute (STRI)
- Conservation X Labs (CXL)
- Conservify
- Nasa Ames
- University of Sydney

DECADE CHALLENGES ADDRESSED

CHALLENGE 1: Understand and beat marine pollution

CHALLENGE 2: Protect and restore ecosystems and biodiversity

CHALLENGE 3: Sustainably feed the global population

CHALLENGE 4: Develop a sustainable and equitable ocean economy

CHALLENGE 8: Create a digital representation of the Ocean

CHALLENGE 9: Skills, knowledge and technology for all

CHALLENGE 10: Change humanity's relationship with the ocean

OCEAN BASINS

North Atlantic   South Pacific
South Atlantic   Indian

Summary

Coral reefs provide habitat for millions of species and supply jobs and food for over half a billion people. However, coral reef loss over the past 40 years has been dramatic and widespread, signalling an ecological crisis. To meet the scale and scope of this global reef decline, the Coral Sentinels Program will use frontier technologies to develop a scalable, automated, and global reef monitoring system. The resulting data will be rapidly translated into evidence-based conservation action in collaboration with local communities and stakeholders. The program will also invest in training a new generation of marine biologists and engineers across the world and will develop a new open-source database to guide reef conservation policies and programs. The Coral Sentinel Program will use a combination of new and emerging technologies to enable reef monitoring in near-real time, creating an early warning system to detect climate change and other anthropogenic impacts, and in turn, alert and empower reef managers and coastal communities to make conservation interventions.

Duration: 01/09/2021 - 31/12/2030

Priority Activities (first 2 years)

Partners will work together to build a global partnership to develop, implement, and ensure permanent long-term effectiveness of the Coral Sentinels. Phase one will involve testing assumptions, coalition building, fundraising, co-design with local stakeholders and initial system development in the Caribbean. At scale, near real-time data will be provided on a continuous basis to:

- Assess coral reef health at the spatial and temporal scales necessary to enable regional and global marine conservation.
- Identify bright spots of accelerated acclimatization and adaptation that could be used for engineering resilience and restoration.
- Test and develop automated techniques for surveying, reef health, fish biomass, and reef restoration in a range of reef types and environmental conditions with our field-based reef-managing partners.
- Develop new technological innovations in reef biodiversity and restoration.
- Develop conservation interventions and shape policies that will deliver sustained success, harnessing a global community of problem solvers.

"Coral Reef Sentinels sets an ambitiously high bar. It will deploy autonomous robots in coral reefs around the world to create an early warning system called "Global Coral Watch" for coastal communities, conservationists and decision makers."

Kristen Minogue & Beth King, Smithsonian

CORAL SENTINEL