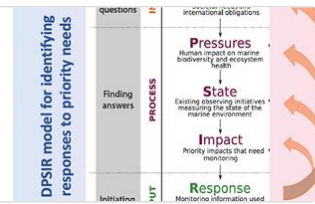


OLAUK0 Project robots everywhere

Coral Reef Monitoring, Reef Assessment Technologies, and Ecosystem-Based Management

Coral reefs are exceptionally biodiverse and human dependence on their ecosystem services is high. Reefs experience significant direct and indirect anthropogenic pressures, and provide a sensitive indicator of coastal ocean health, climate change, and ocean acidification, with associated implications

 <https://www.frontiersin.org/articles/10.3389/fmars.2019.00580/full>



the Importance lies on its biodiversity and species rich marine ecosystem. also related to 1 Billion people livelihoods and food security.

human activities in the form of fishing, pollution, recreation, transport and coastal development all has an impact on the coral reef ecosystem.

key words

Essential Ocean Variables (EOVs)

Group on Earth Observations (GEO)

Global Observing Systems

There is an increasing need for integrated, interdisciplinary data combined with increasing capability for generating, managing and using global datasets.

Currently the reef is monitored via: visual surveys, moored instrument arrays, spatial hydrographic and water quality surveys, satellite remote sensing, and hydrodynamic and ecosystem modeling that was collectively referred to as the International Network of Coral Reef Ecosystem Observing Systems (I-CREOS)

Variable:

hard coral cover> indicates the health of the coral reef

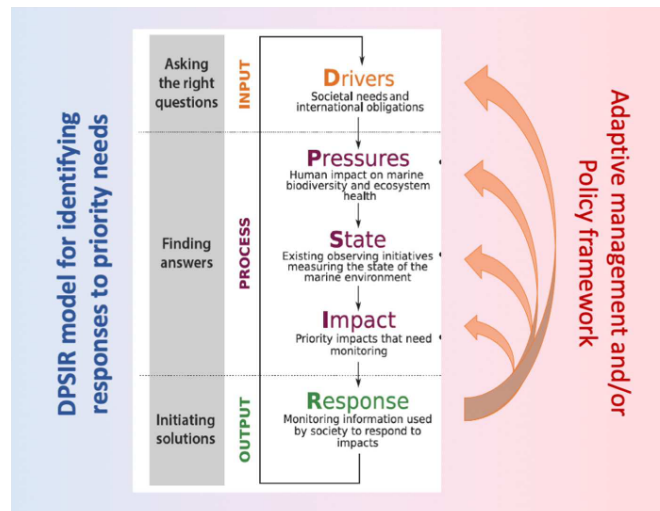
biological diversity, the composition and properties of the coral community, recovery potential, and functional, trophic, biogeochemical cannot be monitored via this variable

“Current practice recognizes that function and taxonomic discrimination among corals (e.g., recruitment, stress resistance), information on the algal community (particularly turf, fleshy, and coralline algae) and fish abundance, biomass, and trophic roles are key variables to understand the health of a reef”

“coral and macroalgal cover and composition and fish abundance and distribution” the top three EOVS

coral **bleach**

Coral Diseases



Autonomous High Resolution Data Collection Systems has been deployed, currently there is a need to for a autonomous system that can go monitor deeper water body (pg 10) problem with charging the vehicle

- citizen science network
- cheap
- 3D printed
- accessible
- **Acoustic**

Variable derive from satellite images (Microwave and radar are also used):

Total suspended sediment concentration (TSS), turbidity, colored dissolved organic matter (CDOM) absorption coefficient, chlorophyll concentration and chlorophyll fluorescence

CREWS system (The Coral Reef Early Warning System)

https://www.nexsens.com/case_studies/data-buoy-case-studies/case-study-the-coral-reef-early-warning-system-crews.htm

Key a takeaway

- there is a buoy system in place already under CREWS
- Our concept should still work (as it offer something current methodology doesnt have, which is to go into deeper water body)
- focus on Mitigation, as many of the system right now being deployed are focus on coral reef health, thus adaptation.
- involve citizen science, thus product should be: cheap, accessible in assembly and preferably be 3D printed
- Acoustic as a Variable to collect