Projects and ActivitiesThu Mar 28 04:54:36 HST 2024

Name	Monitoring Marine Biodiversity in the Pacific Islands
Capability Area: Variability/Changes	- Understanding Climate Variability and Change - Observing Systems, Data Stewardship, Data Services - Research/Development
ECV	- Sub-surface (e.g., temp, salinity, nutrients, carbon, phytoplankton)
Status	- Proposed
Focus Area	- Marine and Terrestrial Ecosystems
Regions	- Central North Pacific - State Of Hawaii - Western North Pacific - CNMI - FSM - Guam - Palau - RMI - South Pacific - American Samoa

Description	Changes in biodiversity and the impacts to marine calcifiers are biological responses to climatic trends in the Pacific. An established systematic and standardize tool currently used to monitor biodiversity in the Pacific is the Autonomous Reef Monitoring Structure (ARMS). ARMS were developed by the NOAA Pacific Islands Fisheries Science Center's Coral Reef Ecosystem Division (CRED) as part of the Census of Marine Life's Census of Coral Reefs project. ARMS are a long-term collecting device designed to mimic the structural complexity of a coral reef and attract colonizing invertebrates. Through taxonomic identification and mass sequencing technologies they provide a consistent and comparable method to measure and monitor the biodiversity of these understudied organisms over time. They enhance ecosystem-based management and increase the ability to monitor and predict ecological impacts in response to natural and anthropogenic stressors. In conjunction with measured climatic variables such as temperature and salinity, ARMS could help advance our understanding of the relationship between climate variables and biodiversity. Currently, over 500 ARMS units are placed strategically throughout the Pacific, Indian, and Atlantic Oceans with the majority at sites in the Pacific. To help facilitate the data produced from each ARMS unit, an ARMSbase web-enabled biodiversity information system has been proposed. The ARMSbase would house all information related to the ARMS which would include all metadata related to deployment, retrieval, and processing as well as the raw taxonomic and molecular sequence information. This information can then be applied and related to physical climate variables collected across the Pacific to investigate the relationships between biodiversity and Pacific climate trends.
Objectives/Outcomes	1) Construct ARMSbase web-enabled biodiversity information system; 2) Advance our understanding of biodiversity changes in relationship to climate variables.
Lead Agencies	NOAA/PIFSC/CRED, JIMAR
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Partnering Agencies	1) Scripps Institution of Oceanography, Australian Institute of Marine Science, and NOAA/PIFSC/Coral Reef Ecosystem Division will provide input to and feedback on the ARMSbase data model. Biological data models used for similar projects can also be provided; 2) NOAA/PIFSC/Coral Reef Ecosystem Division will provide standardized ARMS units for field studies by partners and also will provide deployment and recovery support for ARMS sites in the U.S. Pacific; 3) Hawaii Institute of Marine Biology will provide use of their molecular laboratory facilities.
Required Resources	Financial or in-kind support for database development specialist and administrator. Financial or in-kind support for web hosting services. Support for a post doctoral researcher (environmental information systems, data modeler, marine biodiversity, or marine invertebrates).
Projected Timelines	1-2 years
Feedback/Evaluation	Availability of raw, in-process, and summarized data products from ARMS deployed in the Pacific and beyond.
Url	http://www.pifsc.noaa.gov/cred/arms.php