Projects and ActivitiesThu Mar 28 21:48:17 HST 2024

Name	Application of Latest IPCC Climate Models to Forecast Possible Marine Ecosystem Changes in the North Pacific Over the 21st Century (1 of 2)
Capability Area: Variability/Changes	- Understanding Climate Variability and Change - Operational Products and Services - Research/Development - Historical Observations (hindcasts/climatologies) - Projections (modeling and downscaling) - Training and Capacity Building, Education, Outreach
ECV	- Sub-surface (e.g., temp, salinity, nutrients, carbon, phytoplankton)
Timeframe	- Intra-annual to Decadal
Capability Area: Impacts/Adaptations	- Understanding Climate Impacts and Informing Adaptation - Climate Impacts - Historical Observations (hindcasts/climatologies)
Sectors	- Ecosystems
Status	- Proposed
Focus Area	- Marine and Terrestrial Ecosystems
Regions	- Central North Pacific - Western North Pacific - South Pacific
Description	Coral reef ecosystem health is highly impacted by ocean temperature variability. The NOAA Pacific Islands Fisheries Science Center (PIFSC) Coral Reef Ecosystem Division (CRED) has been recording subsurface temperature data from various habitats (forereef, backreef, and lagoon) and depth ranges (1 – 35 m) in coral reef environments from around the Pacific in disparate oceanographic regimes for 10 years. To better understand subsurface temperature variability across various habitat, depth, and regional oceanographic conditions, these data need to be analyzed in the context of seasonal to interannual variability, for correlations of regional to basin scale forcing mechanisms, and compared to remotely sensed products, which is currently the scientific standard for assessing thermal conditions on coral reefs.

Objectives/Outcomes	Advance our understanding of subsurface thermal variability on coral reefs in the context of seasonal changes and interannual forcing across each of the US Pacific jurisdictions. Develop subsurface temperature climatologies for general habitat/depth ranges. Compare subsurface temperate data with remotely sensed data products (e.g. Coral Reef Watch [CRW] and the Coral Thermal Anomaly Database [CoRTAD]) to develop an algorithm which focuses on specific habitat/depth temperature variations and coral bleaching indices. Develop a predictive model for future temperature changes based on IPCC output for resource managers.
Lead Agencies	NOAA Pacific Islands Fisheries Science Center (PIFSC)
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Partnering Agencies	NOAA PIFSC Coral Reef Ecosystem Division (CRED) and University of Hawaii Joint Institute for Marine and Atmospheric Research (JIMAR) provides data access and availability to archived and on-going datasets. Concomitant biological data from the monitoring site may also be available. Scripps Institution of Oceanography (SIO) will provide collaborative support including statistical expertise. Remotely sensed data products will be provided by NOAA NODC and NOAA CRW.
Required Resources	Postdoc or funds for a postdoc.
Projected Timelines	2-3 years
Feedback/Evaluation	Presentations at scientific meetings and publications in peer reviewed journals. Outreach and dissemination of high-resolution temperature data and region specific thermal metrics for resource managers and stake-holders.