Projects and ActivitiesThu Mar 28 21:30:16 HST 2024

Name	Future Wind and Wave Projections for NPS and USFWS Managed Islands in the Pacific
Capability Area: Variability/Changes	- Understanding Climate Variability and Change - Research/Development - Historical Observations (hindcasts/climatologies) - Projections (modeling and downscaling)
ECV	- Surface (e.g., temp, precip, wind) - Surface (e.g., SST, SSH, salinity, ocean color)
Timeframe	- Seasonal (outlook) - Intra-annual to Decadal - Multi-decadal (scenarios)
Status	- Ongoing
Focus Area	- Coastal Inundation/Sea Level Rise, Extreme Weather, and Community Resilience
Regions	- Central North Pacific - State Of Hawaii - North Western Hawaiian Islands - Pacific Remote Islands - Western North Pacific - CNMI - FSM - Guam - South Pacific - American Samoa - Pacific Basin
Description	The goal of this proposed effort is to use GCM and coupled numerical wave model output to provide 3-hourly data and statistical measures (mean and top 5% values) of wave height, wave period, wave direction, wind speed, and wind direction for 15 DOI-managed coastal assets (parks and refuges) in the Pacific Ocean for the recent past (1996-2005) and future projections (2026-2045 and 2085-2100). These data are needed as baseline physical information for these DOI-managed assets, as winds and waves are the dominant spatially- and temporally-varying processes that influence coastal morphology and ecosystem structure, and can impact coastal infrastructure, natural and cultural resources, and coastal-related economic activities (e.g., fishing and tourism).

Objectives/Outcomes	This proposed effort would generate two general types of products: mean and extreme (top 5%) monthly statistics for wave height, wave period, wave direction, wind speed, and wind direction for each of the 15 study locations (Niihau, Hawaii, Midway Atoll, Guam, Saipan, American Samoa, Kwajalein, Rose Atoll, Baker Island, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Palmyra Atoll, and Wake Atoll. These statistics would be generated for the recent past and the two future emission scenarios for each of the two future time periods, for a total of 5 combinations of time frames and emission scenarios (1996-2005, 2026-2045@RCP4.5, 2026-2045@RCP8.5, 2085-2100@RCP4.5, 2085-2100@RCP8.5). The final peer-reviewed USGS report will be available online and maintained by the USGS Publications Warehouse; this report will provide data statistics in text, tabular, and graphical formats. This report will be disseminated not only to PICCC and PICSC, but also NPS, USFWS, DOD, and other federal, state, and local resource managers for the 15 study areas. The 3-hourly time-series data for the study areas will be made available upon request.
Lead Agencies	U.S. Geological Survey, Pacific Coastal and Marine Science Center
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Partnering Agencies	University of California at Santa Cruz - Ocean Sciences Department, PICCC, PI-CSC
Required Resources	1) Ph.D. student support (to help conduct analyses and do visualization); 2) Two 8-core PC computers to add to USGS-PCMSC numerical modeling cluster; 3) USGS Open-File Report EPN publication charges 4) Travel for briefing of results
Projected Timelines	See table embedded in full worksheet.