Data Documentation

Item Identification

Title:

NCCOS Assessment: Underwater Video and Photographs for Ground Validation and Accuracy Assessment of Benthic Habitat Maps of Saipan Lagoon, Commonwealth of the Northern Mariana Islands, 2016-07-28 to 2016-08-09

Short Name: NCCOS Video: Saipan Lagoon Mapping

Status: Complete

Abstract:

Underwater video and photographs were acquired between 28 July 2016 and 9 August 2016 at nearly 600 sites throughout the lagoon to document the presence and percent-cover of benthic substrate and cover types. Two sets of independent data were collected, one for Ground Validation (n = 292) and the other for Accuracy Assessment (n = 273). Abundances for five substrate and seven cover types were estimated to the nearest 10% in real time. These presence/absence data were used to create and evaluate the accuracy of the habitat predictions and map in Saipan Lagoon.

For complete descriptions of these datasets and the methods used to generate them, please see: Kendall *et al*. (2017).

Purpose:

Ground Validation (GV) data are the basis for correlating observed substrate and cover types with their associated values in the predictor datasets. Ultimately, the data are used to train and optimize mathematical models that predict habitats throughout the lagoon. Accuracy Assessment (AA) data are used to independently evaluate the performance and accuracy of predictive models and the composite habitat map.

CNMI's Bureau of Environmental and Coastal Quality (BECQ) and NOAA's Pacific Islands Regional Office (PIRO) partnered with NOAA's National Centers for Coastal Ocean Science (NCCOS) to develop updated habitat maps and assess habitat changes in Saipan Lagoon, CNMI. NCCOS developed these spatially resolved maps using environmental predictors, underwater videos/photos and mathematical modeling techniques. The new maps were designed to inform the Saipan Lagoon Use Management Plan (SLUMP), which is being updated in response to changes in lagoon habitats, user activities, and increases in tourism. Understanding the present spatial distribution of benthic habitats is an important part of the Territorial Government's process to evaluate zoning scenarios, minimize user conflicts, ensure public safety, and prevent environmental degradation inside the lagoon. Products from this assessment may also support coastal and ocean management efforts by other territorial and federal agencies working in Saipan. This work was funded by NOAA Coral Reef Conservation Program (CRCP Project #31100).

Supplemental Information:

Collaborators:

- Steve McKagan (NMFS Pacific Islands Regional Office [PIRO], Habitat Conservation Division)
- Lyza Johnston (CNMI Bureau of Environmental and Coastal Quality [BECQ])

Funding:

- US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)
  - NCCOS Project #271, "Mapping Habitat Change in Saipan Lagoon, CNMI"
- US DOC; NOAA; NOS; Coral Reef Conservation Program (CRCP)
  - CRCP Project #31100, "Mapping Habitat Change in Saipan Lagoon, CNMI"

Keywords

Sea Areas, Water Bodies, Marine Protected Areas:

- Western Pacific
- Saipan
- Saipan Lagoon
- Mañagaha Marine Conservation District
- Lighthouse Reef Trochus Sanctuary

NCCOS Keywords:

- NCCOS Research Priority > Marine Spatial Ecology
- NCCOS Research Topic > Ecological and Biogeographic Assessments
- NCCOS Research Topic > Habitat Mapping
- NCCOS Research Location > Region > Pacific Ocean
- NCCOS Research Location > U.S. States and Territories > Commonwealth of the Northern Mariana Islands (CNMI)
- NCCOS Research Data Type > Field Observation
- NCCOS Research Data Type > Video

CoRIS Keywords:

- CoRIS Discovery Thesaurus:
  - Visual Images > Habitats
- CoRIS Theme Thesaurus:
  - EARTH SCIENCE > Biosphere > Zoology > Corals > Reef Monitoring and Assessment > Photographic Analysis > Videography
- CoRIS Place Country/Territory Keywords:
  - COUNTRY/TERRITORY > Northern Mariana Islands > Saipan > Saipan Island (15N145E0002)
- CoRIS Place Ocean/Seas Keywords:
  - OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Saipan Island > Saipan Island (15N145E0002)

GCMD Keywords:

- Earth Science:
  - Earth Science > Biosphere > Aquatic Ecosystems > Benthic Habitat
- Location:
  - Ocean > Pacific Ocean > Western Pacific Ocean > Micronesia > Northern Mariana Islands

Physical Location

Organization: National Centers for Coastal Ocean Science (NCCOS), Silver Spring, MD

Data Set Information

Data Set Publication Status: Published
Data Set Publication Date: 2017-03-20
Data Presentation Form: Video (digital)

Support Roles

Principal Investigator:

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Additional Principal Investigators:

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Point of Contact:

- Will Sautter, will.sautter@noaa.gov, National Centers for Coastal Ocean Science (NCCOS), 2017 to Present

Data Steward:

- NCCOS Scientific Data Coordinator, NCCOS.data@noaa.gov, National Centers for Coastal Ocean Science (NCCOS), 2017 to Present

Distributor:

- NCCOS Scientific Data Coordinator, NCCOS.data@noaa.gov, National Centers for Coastal Ocean Science (NCCOS), 2017 to Present

Metadata Contact:

- NCCOS Scientific Data Coordinator, NCCOS.data@noaa.gov, National Centers for Coastal Ocean Science (NCCOS), 2017 to Present

Extents

Western Boundary: 145.684723941
Eastern Boundary: 145.794770192
Northern Boundary: 15.2742160669
Southern Boundary: 15.1209203637

Time Frame Type: Range
Start Date: 2016-07-28
End Date: 2016-08-09

Access Information

Security Class: Unclassified
Data Access Procedure: Download from website
Data Access Constraints: None

Data Use Constraints: None

Distribution Information

Download URL:
https://nccos-coastalscience-products-web.azurewebsites.net/biomapper_explorer/index.php?path=NFUzanN3cHpHZDlRWE9LWG44ZDdIZz09

File Name: Saipan Lagoon Video Explorer
File Type: MP4
Description:

Online directory containing video files.

Download URL:
https://nccospublicstor.blob.core.windows.net/biomapper/saipan/documentation/Saipan_VideoPhotos_DataIndex.csv

File Name: Data Index for Saipan Lagoon Video
File Type: CSV
Description:

Data index containing file-level documentation for all video including benthic habitat characteristics: OBJECTID; PROJECT; GEOGRAPHIC REGION; SITE TYPE; SITE ID; VIDEO EXISTS; URL DOWN-LOOKING VIDEO; URL OBLIQUE-LOOKING VIDEO; PHOTO EXISTS; PHOTO COUNT; URL PHOTO 1; URL ADDITIONAL PHOTOS; DATE COLLECTED; TIME COLLECTED; LATITUDE; LONGITUDE; NORTHING; EASTING; DEPTH MLLW IN METERS; HABITAT NAME; Substrate - Abundance of Live Coral Reef; Substrate - Abundance of Upright Dead Coral Reef; Substrate - Abundance of Coral Rubble; Substrate - Abundance of Pavement; Substrate - Abundance of Sand & Gravel; Cover - Abundance of Bare; Cover - Abundance of Bare and Cyanobacteria Combined; Cover - Abundance of Seagrass Halodule uninervis; Cover - Abundance of Seagrass Enhalus acoroides; Cover - Abundance of Algae Mixed; Cover - Abundance of Algae Halimeda spp.; Cover - Abundance of Algae Other Filamentous; Cover - Abundance of Algae Turf; Cover - Abundance of Algae Crustose Coralline; Cover - Abundance of Cyanobacteria; Cover - Abundance of Mixed Algae; Cover - Abundance of Live Coral, Isopora palifera; Cover - Abundance of Live Coral, Acropora formosa, Acropora aspera and Acropora pulchra; Cover - Abundance of Live Coral, massive Porites species; Cover - Abundance of Live Coral, Other species

Download URL: https://doi.org/10.7289/V5NV9GB9
File Name: Saipan Lagoon Benthic Habitat Map Data
File Type: NCEI Data Archive Accession
Description:

Kendall, M., B. Costa, S. McKagan, and L. Johnston. 2017. Benthic habitat maps of Saipan Lagoon, Commonwealth of the Northern Mariana Islands (NCEI Accession 0162517). NOAA National Centers for Environmental Information. Dataset. https://doi.org/10.7289/V5NV9GB9

Download URL:
https://www.ncddc.noaa.gov/arcgis/rest/services/BenthicMapping/Saipan_Dynamic/MapServer/

File Name: Saipan Lagoon MapServer Web Service
File Type: ESRI Map Service
Description:

CNMI's Bureau of Environmental and Coastal Quality (BECQ) and NOAA's Pacific Islands Regional Office (PIRO) partnered with NOAA's National Centers for Coastal Ocean Science (NCCOS) to develop updated habitat maps and assess habitat changes in Saipan Lagoon,CNMI. NCCOS developed these spatially resolved maps using environmental predictors, underwater videos/photos and mathematical modeling techniques. The new maps were designed to inform the Saipan Lagoon Use Management Plan (SLUMP), which is being updated in response to changes in lagoon habitats, user activities, and increases in tourism. Understanding the present spatial distribution of benthic habitats is an important part of the Territorial Government's process to evaluate zoning scenarios, minimize user conflicts, ensure public safety, and prevent environmental degradation inside the lagoon. Products from this assessment may also support coastal and ocean management efforts by other territorial and federal agencies working in Saipan. This work was funded by NOAA Coral Reef Conservation Program (CRCP Project #31100).

Download URL: https://maps.coastalscience.noaa.gov/biomapper/biomapper.html?id=Saipan
File Name: Saipan Lagoon BIOMapper Web Application
File Type: Web Application
Description:

A free, fully interactive, user friendly, online platform designed to let users explore benthic habitat mapping data. Users can create fully customizable maps by clicking on a data layer in the table of contents and display aerial and acoustic imagery rasters, benthic habitat and geographic zone shapefiles, and ground validation/accuracy assessment video sites. Ground validation and accuracy assessment videos are available for viewing (streaming) and for download in standard or high resolution.

URLs

URL: https://coastalscience.noaa.gov/project/mapping-habitat-change-saipan-lagoon-cnmi/
URL Type: Online Resource
Description:

NCCOS Research Project Webpage: Mapping Habitat Change in Saipan Lagoon, CNMI

URL: https://products.coastalscience.noaa.gov/collections/benthic/default.aspx
URL Type: Online Resource
Description:

NCCOS Data Collections: Benthic Habitat Mapping

Data Quality

Completeness Report:

For details of data quality control methods, see Kendall *et al*. (2017). All users should independently analyze the dataset according to their own needs and standards to determine data usability.

Lineage (Methods)

Sources:

- Kendall, M.S., B. Costa, S. McKagan, L. Johnston, and D. Okano. 2017. Benthic habitat maps of Saipan Lagoon. NOAA Technical Memorandum NOS NCCOS 229. Silver Spring, MD. 77 pp. https://doi.org/10.7289/V5/TM-NOS-NCCOS-229

Process Step:

Sequence Number: 1

Process Contact: Will Sautter, will.sautter@noaa.gov

Source Citation: Kendall *et al*. (2017)

Description:

Locations of the GV sites were selected manually to include the full range of habitats, depths, and environmental settings found in the lagoon. AA sites were chosen by randomly scattering points in nine habitat types.

The process for collecting both the GV and AA data was identical at each field site. Sites were typically accessed via small boat, kayak, or wading. At each site, two Go Pro HERO4 Black cameras were deployed on an aluminum pole for sites <9 m deep and on a rope with a rotating camera system for deeper sites. On both deployment systems, a downward facing camera was fixed at 1 meter above the bottom to standardize the field of view to encompass ~ 1 m2 of seafloor, and an oblique facing camera captured surrounding habitats. Once the cameras were deployed, our precise location was recorded every five seconds using a GPS receiver. Abundances for the five substrate and seven cover types were estimated to the nearest 10% in real time. GPS data were post-processed and differentially corrected. Average positions were calculated for each site, and all underwater videos and photos were reviewed for quality control. Substrate and cover abundances were converted to presences (1) and absences (0).

For complete descriptions of these datasets and the methods used to generate them, please see: Kendall *et al*. (2017).

Document Information

Date: 2018-07-08

Resource Provider: NCCOS Data Manager, nccos.data@noaa.gov, US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)