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NMFS Enterprise Data Management Program

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Guam Long-term Coral Reef Monitoring Program Reef Fish Surveys since 2010

Pacific Islands Fisheries Science Center

Data Set (DS) | ID: 47783 | Published / External

Created: 2017-11-05 | Last Modified: 2021-12-14

Parent: Guam Long-term Coral Reef Monitoring Program

Project (PRJ) | ID: 26296

ID: 47783
Data Set (DS)

*** Discovery**
• First Pass
» Metadata Rubric

Item Identification

*** » Title**	Guam Long-term Coral Reef Monitoring Program Reef Fish Surveys since 2010
Short Name	Guam LTMP Reef Fish Surveys since 2010
*** Status**	In Work
Creation Date	
Revision Date	
• Publication Date	2014
*** » Abstract**	The Government of Guam's Long-term Coral Reef Monitoring Program (GLTMP), coordinated through the Guam Coastal Management Program until October 2013 and now coordinated through the University of Guam Marine Laboratory, involves the collection of data for a suite of coral reef ecosystem health parameters at several high priority reef sites around the island of Guam. The program currently utilizes a split-panel sampling approach, whereby a mix of permanent and non-permanent sampling stations (one sampling station = one transect) are visited within each site. The monitoring sites were selected by an advisory body comprised of reef managers, researchers, and technicians. The locations of the sampling stations within each site are generated randomly using GIS software. Various coral reef surveys are carried out on an annual basis along the seaward slope between 7 and 15 m depth in the Tumon Bay Marine Preserve and East Agana Bay sites. Surveys are carried out less regularly along the seaward slope between 7 and 15 m depth in the Piti Bomb Holes Marine Preserve, the Achang Reef Flat Marine Preserve, the eastern side of the Cocos Barrier Reef (Cocos-East), and along the seaward slope (5–8 m) in Fouha Bay. Surveys were also carried at along reef margin (1–2 m) and slope (2–15 m) of Western Shoals, in Apra Harbor, in 2011. The surveys, which are conducted by University of Guam Marine Lab and NOAA PIRO biologists currently include benthic photo transects, quadrat surveys for coral colony size and condition, stationary point count fish surveys, macroinvertebrate belt

	transects, and chain-length rugosity surveys. These surveys have been conducted at the Tumon and East Agana sites since 2010 and the Piti site since 2012. Data collection for the Achang and Cocos-East sites has occurred in 2014, 2018, and 2021, and at the Fouha Bay site in 2015, 2019, and 2021. Baseline data is available for the Western Shoals site from 2011 but this site has not been re-visited since its establishment due to shifting management priorities. Fish are a culturally and economically valuable resource for the island of Guam (van Buekering et al., 2007). In recognition of the high value of this resource, reef fish surveys are a key component of the Guam Long-term Coral Reef Monitoring Program. Reef fish assessment surveys have been conducted at high priority reef sites around Guam since August 2010. The monitoring team uses a Stationary Point Count Method, adapted from Ault et al. (2006) and NOAA Fisheries, Coral Reef Ecosystem Division (Williams et al., 2011), to conduct the reef fish surveys. These monitoring data on reef fish communities provide results on fish density, biomass, and diversity; allow for exploration of community structure by functional group and size structure; and can be used to detect changes in fish communities over time. IMPORTANT NOTE: Changes have been made to the fish SPC survey methodology since its first deployment in 2010. These changes, which are documented in the Data Quality and Lineage sections of this metadata record, must be considered in order to properly analyze these data. Also, please note that the results of a 2020 analysis of the fish SPC data conducted by Dr. Peter Houk of the University of Guam Marine Laboratory indicated that data collected in 2010 and 2011 by one observer, and data collected by another observer at single site in 2015, did not meet quality assurance standards. In response to the results of this analysis observations recorded by these two observers are not included in the dataset submitted to NCEI. However, these data can be made available upon request. More information regarding Dr. Houk's analysis can be found in the Data Quality section of the metadata record.
*** Purpose**	The reef fish data are collected as part of the Guam Long-term Coral Reef Monitoring Program, which documents a number of important parameters related to ecosystem health; these parameters are grouped into three categories: water quality, benthic habitat, and associated biological communities. Many of these parameters are indicators of stressors, and significant changes in these parameters will likely raise concern and possibly trigger management actions. Data collected for these indicators provide important information about the resilience of high priority reef areas around Guam. Monitoring these parameters allows resource managers to evaluate the effectiveness of specific management strategies, and inform the development of new management actions.
Notes	Loaded by FGDC Metadata Uploader, batch 10199, 11-05-2017 15:29 The following FGDC sections are not currently supported in InPort, but were preserved and will be included in the FGDC export: - Spatial Reference Information (FGDC:spref),
Other Citation Details	

• Supplemental Information	Reef fish SPC data have been collected at permanent and non-permanent sampling stations within multiple monitoring sites since 2010, including: Tumon Bay: 2010 (belt: 10 perm, 10 non-perm; SPC: 10 perm, 10 non-perm); 2012 (2 perm, 2 non-perm); 2014 (0 perm, 5 non-perm); 2015 (12 perm, 10 non-perm); 2017 (12 perm, 10 non-perm); 2019 (12 perm, 10 non-perm); 2020 (12 perm, 10 non-perm); 2021 (12 perm, 10 non-perm) East Agana Bay: 2010 (10 perm, 10 non-perm); 2015 (10 perm, 10 non-perm); 2017 (10 perm, non-perm surveys); 2019 (10 perm, 6 non-perm); 2020 (10 perm, 10 non-perm); 2021 (10 perm, 10 non-perm) Western Shoals: 2011 (belt: 11 perm, 13 non-perm; SPC: 2 perm, 2 non-perm) Piti Bay: 2012 (6 perm, 8 non-perm); 2014 (10 perm, 2 non-perm); 2017-2018 (10 perm, 10 non-perm); 2020 (10 perm, 10 non-perm) Achang: 2014 (8 perm, 3 non-perm); 2018 (10 perm, 10 non-perm); 2021 (10 perm, 10 non-perm) Cocos-East: 2014 (3 perm, 4 non-perm); 2018 (no fish data collected); 2021 (10 perm, 10 non-perm) Fouha Bay: 2015 (10 perm); 2019 (10 perm); 2021 (10 perm) Data entry and quality control are complete for surveys conducted through 2020; the entry and quality control of data collected in 2021 has not yet been completed. Please note that data collected by two observers did not meet the program's data standards, based on an in-depth examination of inter-observer bias carried out with the support of Dr. Peter Houk of the University of Guam Marine Laboratory. These observations, which include most of the observations from 2010, half of the observations from 2011, and a portion of the observations from the Tumon site in 2015, will not be submitted to NCEI for archival, but can be made available upon request.
DOI (Digital Object Identifier)	
DOI Registration Authority	
DOI Issue Date	

Keywords

Theme Keywords

Thesaurus	Keyword
CoRIS Discovery Thesaurus	Numeric Data Sets > Biology
CoRIS Theme Thesaurus	EARTH SCIENCE > Biosphere > Ecological Dynamics > Species Richness

CoRIS Theme Thesaurus	EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment
CoRIS Theme Thesaurus	EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Rapid assessment studies
CoRIS Theme Thesaurus	EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Reef fish census
CoRIS Theme Thesaurus	EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Reef fish census > Stationary
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral reef ecology
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Marine Biology > Fish
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Marine Biology > Fish > Fish Assemblages
CoRIS Theme Thesaurus	EARTH SCIENCE > Oceans > Marine Biology > Fish > Fish Census
CRCP Project	488
CRCP Project	Guam Coral Reef Monitoring Data Management Initiative
ISO 19115 Topic Category	002
ISO 19115 Topic Category	biota
PARR Exclusion	Obsolete
None	Coral Reef Ecosystem
None	Fish Biomass
None	Fish Species Richness
None	Guam Long-term Coral Reef Monitoring Program
None	Long-term Monitoring Program
None	Marine Ecosystem
None	Rapid Ecological Assessments
None	REA
None	Reef Fishes
None	SPC
None	Stationary Point Count Survey

Temporal Keywords

Thesaurus	Keyword

* Spatial Keywords

Thesaurus	Keyword
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > Achang (13N144E0064)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > Cocos Barrier Reefs (13N144E0001)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > East Agana Bay (13N144E0063)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > Fouha Bay (13N144E0024)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > Guam (13N144E0000)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > Piti Bay (13N144E0061)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > Tumon Bay (13N144E0004)
CoRIS Place Thesaurus	COUNTRY/TERRITORY > United States of America > Guam > Western Shoal (13N144E0062)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam > Achang (13N144E0064)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam > East Agana Bay (13N144E0063)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam > Fouha Bay (13N144E0024)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam > Guam (13N144E0000)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam > Piti Bay (13N144E0061)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam > Tumon Bay (13N144E0004)
CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam > Western Shoal (13N144E0062)

CoRIS Place Thesaurus	OCEAN BASIN > Pacific Ocean > Western Pacific Ocean > Guam Reefs > Cocos Barrier Reefs (13N144E0001)
None	Mariana Archipelago
None	Mariana Islands
None	Marianas

Stratum Keywords

Thesaurus	Keyword

Instrument Keywords

Thesaurus	Keyword

Platform Keywords

Thesaurus	Keyword

Physical Location

• » Organization	University of Guam Marine Laboratory
• » City	Mangilao
• » State/Province	GU
• Country	USA
• » Location Description	

Data Set Information

*** Data Set Scope Code**	Data Set
• Data Set Type	CSV Files
• Maintenance Frequency	As Needed
Maintenance Note	
» Data Presentation Form	Table (digital)
• Entity Attribute Overview	Raw survey data includes metadata for each survey (where, when, who, area); site characteristics (depth, reef type, habitat, exposure); individual reef fish observations identified to the lowest taxonomic level possible (usually species) including size, count, and observation type; and parameters needed to calculate biomass and density.
Entity Attribute Detail Citation	
Entity Attribute Detail URL	https://www.fisheries.noaa.gov/inport/item/47785
Distribution Liability	While every effort has been made to ensure that these data are accurate and reliable within the limits of the current state of the art, NOAA cannot assume liability for any damages caused by errors or omissions in the data, nor as a result of the failure of the data to function on a particular system. The Guam Coastal Management Program makes no warranty, expressed or implied, nor does the fact of distribution constitute such a warranty.
Data Set Credit	Guam Coastal Management Program, NOAA Pacific Islands Regional Office, and University of Guam Marine Lab.

Support Roles

» At least one Distributor Org, one Metadata Contact, one Point of Contact, and one Data Steward should be listed.

*** » Support Role**	Data Steward
*** » Date Effective From**	2010
Date Effective To	
Person	Burdick, David R

Address	303 University Dr. Mangilao, GU 96913 USA
Email Address	burdickd@triton.uog.edu
Phone	671-735-2175
Fax	
Mobile	
URL	
Business Hours	0800-1700 Chamorro Standard Time (GMT+10)
Contact Instructions	

*** » Support Role**	Distributor
*** » Date Effective From**	2010
Date Effective To	
Person	Burdick, David R
Address	303 University Dr. Mangilao, GU 96913 USA
Email Address	burdickd@triton.uog.edu
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Contact Instructions	

*** » Support Role**	Metadata Contact
*** » Date Effective From**	2010
Date Effective To	
Person	Burdick, David R
Address	303 University Dr.

	Mangilao, GU 96913 USA
Email Address	burdickd@triton.uog.edu
Phone	671-735-2175
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Mobile	
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Business Hours	0800-1700 Chamorro Standard Time (GMT+10)
Contact Instructions	

*** » Support Role**	Originator
*** » Date Effective From**	2010
Date Effective To	
Organization	NOAA Coral Reef Conservation Program (CRCP) (CRCP)
Address	1305 East West Highway 10th Floor Silver Spring, MD 20910-3281
Email Address	
Phone	(301) 713-3155
Fax	
Mobile	
URL	http://coralreef.noaa.gov
Business Hours	
Contact Instructions	

*** » Support Role**	Point of Contact
*** » Date Effective From**	2010
Date Effective To	
Person	Burdick, David R
Address	303 University Dr. Mangilao, GU 96913 USA

Email Address	burdickd@triton.uog.edu
Phone	671-735-2175
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Business Hours	0800-1700 Chamorro Standard Time (GMT+10)
Contact Instructions	

*** » Support Role**	Principal Investigator
*** » Date Effective From**	2017
Date Effective To	
Person	Burdick, David R
Address	303 University Dr. Mangilao, GU 96913 USA
Email Address	burdickd@triton.uog.edu
Phone	671-735-2175
Fax	
Mobile	
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Business Hours	0800-1700 Chamorro Standard Time (GMT+10)
Contact Instructions	

*** » Support Role**	
*** » Date Effective From**	
Date Effective To	
*** » Contact**	
*** Contact Instructions**	

*** » Support Role**	
*** » Date Effective From**	
Date Effective To	
*** » Contact**	
*** Contact Instructions**	

*** » Support Role**	
*** » Date Effective From**	
Date Effective To	
*** » Contact**	
*** Contact Instructions**	

Extents

Currentness Reference	Ground Condition

Extent Group 1

Extent Description	Tumon Bay

Extent Group 1 / Geographic Area 1

*** » W° Bound**	144.789408
*** » E° Bound**	144.798507
*** » N° Bound**	13.517207
*** » S° Bound**	13.510711
*** » Description**	These bounding coordinates pertain to the Tumon Bay site boundaries modified after the 2010 survey effort and prior to the 2012 survey effort; these are the current boundaries for the Tumon Bay monitoring site.

Extent Group 1 / Geographic Area 2

*** » W° Bound**	144.784502
*** » E° Bound**	144.795528
*** » N° Bound**	13.512988
*** » S° Bound**	13.508506
*** » Description**	These bounding coordinates pertain to the original Tumon Bay site surveyed in 2010. The site boundaries were modified prior to the 2012 surveys; the coordinates of the modified site boundaries are presented in a separate Geographic Area above.

Extent Group 1 / Vertical Extent

EPSG Code	
Vertical Minimum	
Vertical Maximum	

Extent Group 1 / Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2012-09-05
End	2012-11-19
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2012 at the current Tumon Bay site, the boundaries of which were modified after the 2010 survey effort but before the 2012 survey effort.

Extent Group 1 / Time Frame 2

*** » Time Frame Type**	Range
*** » Start**	2014-09-03
End	2014-09-09
Alternate Start As Of Info	
Alternate End As Of Info	

Description	Time frame for fish surveys carried out in 2014 at the current Tumon Bay site, the boundaries of which were modified after the 2010 survey effort but before the 2012 survey effort.

Extent Group 1 / Time Frame 3

*** » Time Frame Type**	Range
*** » Start**	2015-08-10
End	2015-09-04
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2015 at the current Tumon Bay site, the boundaries of which were modified after the 2010 survey effort but before the 2012 survey effort. Note that the time frame for the fish surveys is different than the time frame for other surveys carried out in the Tumon Bay site in 2015.

Extent Group 1 / Time Frame 4

*** » Time Frame Type**	Range
*** » Start**	2017-04-10
End	2017-08-10
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2017 at the current Tumon Bay site, the boundaries of which were modified after the 2010 survey effort but before the 2012 survey effort. Note that the time frame for the fish surveys is different than the time frame for other surveys carried out in the Tumon Bay site in 2017.

Extent Group 1 / Time Frame 5

*** » Time Frame Type**	Range
*** » Start**	2010-08-04
End	2010-09-03
Alternate Start As Of Info	

Alternate End As Of Info	
Description	Time frame of fish surveys carried out within the original Tumon Bay site as established in 2010. The boundaries of the Tumon Bay site changed after the 2010 surveys were carried out and prior to the 2012 surveys.

Extent Group 1 / Time Frame 6

*** » Time Frame Type**	Range
*** » Start**	2019-07-26
End	2019-10-23
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2019 at the current Tumon Bay site, the boundaries of which were modified after the 2010 survey effort but before the 2012 survey effort. Note that the time frame for the fish surveys is different than the time frame for other surveys carried out in the Tumon Bay site in 2018.

Extent Group 1 / Time Frame 7

*** » Time Frame Type**	Range
*** » Start**	2020-07-23
End	2020-10-13
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2020 at the current Tumon Bay site, the boundaries of which were modified after the 2010 survey effort but before the 2012 survey effort.

Extent Group 1 / Time Frame 8

*** » Time Frame Type**	Range
*** » Start**	2021-06-23
End	2021-08-18
Alternate Start	

As Of Info	
Alternate End As Of Info	
Description	

Extent Group 2

Extent Description	East Agana Bay

Extent Group 2 / Geographic Area 1

*** » W° Bound**	144.758065
*** » E° Bound**	144.766983
*** » N° Bound**	13.491396
*** » S° Bound**	13.483792
*** » Description**	These bounding coordinates pertain to the current boundaries for the East Agana Bay site, which has been monitored since 2010

Extent Group 2 / Vertical Extent

EPSG Code	
Vertical Minimum	
Vertical Maximum	

Extent Group 2 / Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2010-09-07
End	2010-11-26
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2010 at the current East Agana Bay site, the

	boundaries of which have been consistent since the site's establishment in 2010

Extent Group 2 / Time Frame 2

*** » Time Frame Type**	Range
*** » Start**	2012-11-16
End	2012-11-28
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2012 at the current East Agana Bay site, the boundaries of which have been consistent since the site's establishment in 2010

Extent Group 2 / Time Frame 3

*** » Time Frame Type**	Range
*** » Start**	2014-09-10
End	2014-09-16
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2014 at the current East Agana Bay site, the boundaries of which have been consistent since the site's establishment in 2010

Extent Group 2 / Time Frame 4

*** » Time Frame Type**	Range
*** » Start**	2015-11-10
End	2015-12-04
Alternate Start As Of Info	
Alternate End As Of Info	

Description	Time frame for fish surveys carried out in 2016 at the current East Agana Bay site, the boundaries of which have been consistent since the site's establishment in 2010. Note that the fish surveys carried out in the East Agana Bay site in 2015 were conducted separately from the benthic surveys, which could not be carried out until early 2016.

Extent Group 2 / Time Frame 5

*** » Time Frame Type**	Range
*** » Start**	2017-07-12
End	2017-12-27
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2017 at the current East Agana Bay site, the boundaries of which have been consistent since the site's establishment in 2010. Note that the time frame for the fish surveys is different than the time frame for other surveys carried out in the East Agana Bay site in 2017.

Extent Group 2 / Time Frame 6

*** » Time Frame Type**	Range
*** » Start**	2019-10-30
End	2019-12-19
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2019 at the current East Agana Bay site, the boundaries of which have been consistent since the site's establishment in 2010. Note that the time frame for the fish surveys is different than the time frame for other surveys carried out in the East Agana Bay site in 2019.

Extent Group 2 / Time Frame 7

*** » Time Frame Type**	Range
*** » Start**	2020-10-13
End	2020-11-24
Alternate Start As Of Info	

Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2020 at the current East Agana Bay site, the boundaries of which have been consistent since the site's establishment in 2010.

Extent Group 2 / Time Frame 8

*** » Time Frame Type**	Range
*** » Start**	2021-08-04
End	2021-09-03
Alternate Start As Of Info	
Alternate End As Of Info	
Description	

Extent Group 3

Extent Description	Western Shoals

Extent Group 3 / Geographic Area 1

*** » W° Bound**	144.653292
*** » E° Bound**	144.656443
*** » N° Bound**	13.454042
*** » S° Bound**	13.449599
*** » Description**	These bounding coordinates pertain to the Western Shoals monitoring site in Apra Harbor. The Western Shoals site has not been re-surveyed since 2011 due to a shift in management priorities.

Extent Group 3 / Vertical Extent

EPSG Code	
Vertical Minimum	

Vertical Maximum	

Extent Group 3 / Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2011-07-11
End	2011-08-19
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out at the Western Shoals site in 2011. Subsequent surveys have not been carried out at this site due to a shift in management priorities.

Extent Group 4

Extent Description	Piti (Tepungan) Bay

Extent Group 4 / Geographic Area 1

*** » W° Bound**	144.683913
*** » E° Bound**	144.697634
*** » N° Bound**	13.47632
*** » S° Bound**	13.468317
*** » Description**	These bounding coordinates pertain to the Piti (Tepungan) Bay site, which has been surveyed since 2012.

Extent Group 4 / Vertical Extent

EPSG Code	
Vertical Minimum	
Vertical Maximum	

Extent Group 4 / Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2012-07-23
End	2012-08-31
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out within the Piti (Tepungan) Bay site in 2012

Extent Group 4 / Time Frame 2

*** » Time Frame Type**	Range
*** » Start**	2014-09-17
End	2014-11-13
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out within the Piti (Tepungan) Bay site in 2014

Extent Group 4 / Time Frame 3

*** » Time Frame Type**	Range
*** » Start**	2018-01-02
End	2018-08-28
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out within the Piti (Tepungan) Bay site in 2018. Note that the time frame for the fish surveys is different than the time frame for other surveys carried out in the Piti Bay site in 2018.

Extent Group 4 / Time Frame 4

*** » Time Frame Type**	Range
*** » Start**	2020-06-30
End	2020-07-16
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out within the Piti (Tepungan) Bay site in 2020.

Extent Group 4 / Time Frame 5

*** » Time Frame Type**	Range
*** » Start**	2020-06-30
End	2020-07-16
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out within the Piti (Tepungan) Bay site in 2020.

Extent Group 5

Extent Description	Achang

Extent Group 5 / Geographic Area 1

*** » W° Bound**	144.69765
*** » E° Bound**	144.712233
*** » N° Bound**	13.242611
*** » S° Bound**	13.239282
*** » Description**	These bounding coordinates pertain to the current Achang monitoring site boundaries, which were established in 2014.

Extent Group 5 / Vertical Extent

EPSG Code	
Vertical Minimum	
Vertical Maximum	

Extent Group 5 / Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2014-10-22
End	2014-10-27
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2014 at the Achang site

Extent Group 5 / Time Frame 2

*** » Time Frame Type**	Range
*** » Start**	2018-09-04
End	2018-09-26
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2018 at the current Achang site, the boundaries of which have been consistent since the site's establishment in 2014. Note that the time frame for the fish surveys is different than the time frame for other surveys carried out in the Achang site in 2018.

Extent Group 5 / Time Frame 3

*** » Time Frame Type**	Range

*** » Start**	2021-04-21
End	2021-05-14
Alternate Start As Of Info	
Alternate End As Of Info	
Description	

Extent Group 6

Extent Description	Cocos-East

Extent Group 6 / Geographic Area 1

*** » W° Bound**	144.674888
*** » E° Bound**	144.685944
*** » N° Bound**	13.23992
*** » S° Bound**	13.235939
*** » Description**	These bounding coordinates pertain to the current Cocos-East site, which was established in 2014

Extent Group 6 / Vertical Extent

EPSG Code	
Vertical Minimum	
Vertical Maximum	

Extent Group 6 / Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2014-10-27
End	2014-10-28
Alternate Start As Of Info	

Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2014 at the Cocos-East site

Extent Group 6 / Time Frame 2

*** » Time Frame Type**	Range
*** » Start**	2021-04-30
End	2021-06-10
Alternate Start As Of Info	
Alternate End As Of Info	
Description	

Extent Group 7

Extent Description	Fouha Bay

Extent Group 7 / Geographic Area 1

*** » W° Bound**	144.653677
*** » E° Bound**	144.656082
*** » N° Bound**	13.305903
*** » S° Bound**	13.303514
*** » Description**	These bounding coordinates pertain to the current Fouha Bay monitoring site, which was established in 2015

Extent Group 7 / Vertical Extent

EPSG Code	
Vertical Minimum	

Vertical Maximum	

Extent Group 7 / Time Frame 1

*** » Time Frame Type**	Range
*** » Start**	2015-05-06
End	2015-10-27
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2015 at the Fouha Bay site

Extent Group 7 / Time Frame 2

*** » Time Frame Type**	Range
*** » Start**	2019-05-20
End	2019-05-22
Alternate Start As Of Info	
Alternate End As Of Info	
Description	Time frame for fish surveys carried out in 2019 at the Fouha Bay site

Extent Group 7 / Time Frame 3

*** » Time Frame Type**	Range
*** » Start**	2021-05-19
End	2021-05-27
Alternate Start As Of Info	
Alternate End As Of Info	
Description	

Spatial Information

Spatial Resolution

Angular Distance	
Angular Distance Units	
Horizontal Distance	
Horizontal Distance Units	
Vertical Distance	
Vertical Distance Units	
Equivalent Scale Denominator	
Level of Detail Description	

Spatial Representation

Grid Representation Used?	
Vector Representation Used?	
Text / Table Representation Used?	
TIN Representation Used?	
Stereo Model Representation Used?	
Video Representation Used?	

Grid Representation

Dimension Count	
Cell Geometry	
Transformation Parameter Available?	

Axis Dimension

Dimension Type	
Size	
Resolution	
Resolution Units	
Resolution Type	
Description	

Axis Dimension

Dimension Type	
Size	
Resolution	
Resolution Units	
Resolution Type	
Description	

Vector Representation

Topology Level	
Complex Object Present?	
Complex Object Count	
Composite Object Present?	
Composite	

Object Count	
Curve Object Present?	
Curve Object Count	
Point Object Present?	
Point Object Count	
Solid Object Present?	
Solid Object Count	
Surface Object Present?	
Surface Object Count	

Reference Systems

Reference System

EPSG Code	

Horizontal Resolution

Horizontal Encoding Method	
Latitude Resolution	
Longitude Resolution	
Coordinate X Resolution	
Coordinate Y Resolution	
Row Resolution	
Column Resolution	
Horizontal Units	
Distance Resolution	

Distance Units	
Bearing Resolution	
Bearing Units	
Reference Direction	
Reference Meridian	

Vertical Resolution

Vertical Encoding Method	
Vertical Resolution	
Vertical Units	

Access Information

*** » Security Class**	Unclassified
*** Security Classification System**	Not applicable
Security Handling Description	Not applicable
• Data Access Policy	
» Data Access Procedure	Data can be accessed online via the NOAA National Centers for Environmental Information (NCEI) Ocean Archive.
• » Data Access Constraints	None
• Data Use Constraints	Please cite the Guam Coastal Management Program when using data collected prior to October 2013. Guam Coastal Management Program, Guam Bureau of Statistics and

	Plans, Government of Guam. Please cite the University of Guam Marine Laboratory when using data collected after (and including) October 2013. Example citation: For data collected from 2010 to 2012: Guam Coastal Management Program (YEAR accessed). Guam Long-term Coral Reef Monitoring Program Reef Fish Surveys since 2010. NOAA's National Center for Environmental Information, https://www.fisheries.noaa.gov/inport/item/47783. For data collected after 2012: University of Guam Marine Laboratory (YEAR accessed). Guam Long-term Coral Reef Monitoring Program Reef Fish Surveys since 2010. NOAA's National Center for Environmental Information, https://www.fisheries.noaa.gov/inport/item/47783.
Metadata Access Constraints	None
Metadata Use Constraints	None

Distribution Information

Start Date	
» Download URL	http://accession.nodc.noaa.gov/accession#
Distributor	
File Name	GLTMP_fish_2010-2019.csv
Description	Fish observations from the Guam Long-term Coral Reef Monitoring Program sites between 2010 and 2019
File Date/Time	
File Type	csv (comma-separated values)
File Size	
Application Version	
Compression	
Review Status	

Start Date	

End Date	
» Download URL	
Distributor	
File Name	
Description	
File Date/Time	
File Type	
FGDC Content Type	
File Size	
Application Version	
Compression	
Review Status	

Start Date	
End Date	
» Download URL	
Distributor	
File Name	
Description	
File Date/Time	
File Type	
FGDC Content Type	
File Size	
Application Version	
Compression	
Review Status	

Start Date	

End Date	
» Download URL	
Distributor	
File Name	
Description	
File Date/Time	
File Type	
FGDC Content Type	
File Size	
Application Version	
Compression	
Review Status	

URLs

URL	https://guamcoralreefmonitoring.files.wordpress.com/2020/02/guam_ltmp_spring2019_report_final-2.pdf
Name	A report of the Comprehensive Long-term Coral Reef Monitoring at Permanent Sites on Guam Project
URL Type	Online Resource
File Resource Format	PDF
Description	End-of-grant report that includes detailed information about the monitoring program's background and survey methodology, as well as the results of an analysis of baseline data collected at the Fouha Bay, Achang, Tepungan (Piti) Bay and the modified Tumon Bay site, and an analysis of time series data collected at the Tumon Bay, East Agana Bay, and Tepungan (Piti) Bay sites.

URL	https://guamcoralreefmonitoring.wordpress.com/
Name	
URL Type	Online Resource
File Resource Format	
Description	Guam Long-term Coral Reef Monitoring Program website

URL	
Name	
URL Type	
File Resource Format	
Description	

URL	
Name	
URL Type	
File Resource Format	
Description	

URL	
Name	
URL Type	
File Resource Format	
Description	

Activity Log

Activity Time	
Activity Type	
Responsible Party	
Description	

Activity Time	
Activity Type	
Responsible Party	
Description	

Activity Time	
Activity Type	
Responsible Party	
Description	

Issues

Issue Date	
Author	
Issue	

Issue Date	
Author	
Issue	

Issue Date	
Author	
Issue	

Technical Environment

Description	Observations recorded on data sheets are entered into a data management website that populations a Microsoft SQL Server administered by the University of Guam Office of Information Technology

Data Quality

Representativeness	
Accuracy	Observations included in this dataset were made by divers who have been trained, and met minimum standards in identifying species present at the survey location. Small fishes and those cryptic during the day, such as apogonids and holocentrids, are likely undercounted. While some small and/or cryptic taxa, such as most gobies or blennies, are not given high priority in the survey and are usually not reported, some larger-bodied or otherwise notable representatives of those taxa, such as Exalias brevis, Plagiotremus spp., and Valenciennea strigata may be reported. Observations, including species identification, counts, and cylinder size and fish length estimates were periodically checked for consistency between divers. A 2020 analysis carried out by Dr. Peter Houk of the University of Guam Marine Laboratory detected some interobserver biases involving the two observers who's observations are included in this dataset. These biases, which are described in the Bias and Comparability sections below, appear to be related to the detection of more cryptic taxa, such as holocentrids, by the more experienced observer, and the detection of a greater number of larger-sized fish species identification. The latter bias may be related to differences in the degree of accuracy each observer exhibited in estimating cylinder size, but it may also have been an artifact of the survey methodology. No significant differences in the accuracy of species identifications or size estimates were detected between the two observers whose data is included in this dataset. However, observations by two other observers were removed from the dataset following Dr. Houk's study, as it was determined that total biomass and individual size estimates for survey replicates conducted by a relatively inexperienced observer in 2010 and 2011 were consistently higher in comparison to survey replicates carried out by a more experienced observer, and sampling station biomass was consistently lower for survey replicates conducted in 2015 by another observer.
Analytical Accuracy	
Horizontal Positional Accuracy	

Vertical Positional Accuracy	
Quantitation Limits	
Bias	The results of an analysis of the fish SPC dataset (food fish only) carried out in 2020 by Dr. Peter Houk of the University of Guam Marine Laboratory indicated that the size estimates of one observer ("RD") who participated in data collection efforts at the Tumon Bay and East Agana sites in 2010 and at the Western Shoals site in 2011 were consistently different enough from the more experienced observer ("VB") to justify removing these observations from the archived dataset. The removed observations include observations made by RD in 2010 at all of the surveyed stations in the Tumon and East Agana sites, and in 2011 at most of the sampling stations in the Western Shoals site. The observations made by RD in 2010 comprised the vast majority of fish SPC data obtained at the Tumon and East Agana sites that year, with data collected by VB at these sites in 2010 only representing one SPC replicate each at the TUM-16, TUM-18, EAB-10, EAB-16, and EAB-20 sampling stations. The increased availability of VB for surveys at the Western Shoals site in 2011 allowed VB to carry out at least one SPC replicate at most of the sampling stations at that site that year. Dr. Houk's analysis also showed that the observations of another observer ("RS") who briefly assisted with surveys of the Tumon Bay site in 2015 were consistently smaller than those carried out by the fish team lead at the same sampling stations. These observations, which were obtained during one replicate SPC survey each at 11 sampling stations in the Tumon site in 2015, were also removed from the archived dataset. Data collected by observers RD and RS can be made available upon request. Additionally, Dr. Houk's analysis of the fish SPC data indicated that VB's observations generally included a larger number of species each site, and a greater number of observations of larger-sized fishes, than were recorded by AH. VB, who was the more experienced observer, tended to detect more species of cryptic fishes, such as holocentrids than the less experienced observer (AH). VB's detection of a greater number of larger-bodied species that tended to be more wary of divers could potentially be an artifact of the survey methodology, or of differences in the accuracy of each observer's estimate of the cylinder size. With the departure of VB from the monitoring program in late 2019, and the resulting reliance on a single observer (AH) to carry out both replicates at each sampling station in 2020 and 2021 will eliminate inter-observer bias for recent data collection efforts. However, any comparisons of fish SPC data collected before and after 2020 should account for the inter-observer bias between VB and AH detected in Dr. Houk's analysis.
Comparability	As mentioned in the Bias section above, the results of an analysis of the fish SPC data by Dr. Peter Houk indicated that a more experienced fish observer (VB) consistently reported a greater of number of species, and a greater number of larger-bodied species, than the less experienced fish observer (AH). Any comparison of data collected during the same time period by these two observers must account for

	these biases, as does any comparison of data collected before 2020 (by both VB and AH) to data collected during and after 2020 (solely by AH). Additionally, changes in the fish SPC survey methodology must be taken into account. These changes, which are described in more detail in the Lineage section of the metadata record, include the addition of non-instantaneous observations in 2012; the delineation of different types of non-instantaneous observations from 2015 to 2019; and a major change in methodology beginning in 2020 whereby 1) all species are still listed during the first 5 minutes, 2) only food fishes are counted and sized after 5 minutes, 3) some non-food fishes are counted but not sized after 5 minutes, and 4) non-instantaneous observations are not delineated by timing. While species lists generated during the first 5 minutes of each survey should generally be directly comparable across all years, the shorter total survey time for a single replicate SPC survey beginning in 2020 (~15-25 min compared to ~35-40 min before 2020) will likely include fewer species if additional species recorded after the first 5 minutes are included in the species list. The exclusion of non-food fishes from the counting and sizing portion of the survey beginning in 2020 will prevent direct comparisons of total reef fish biomass for sites surveyed before 2020 and those surveyed during and after 2020. However, abundance, biomass, and length data for those taxa and taxonomic groups surveyed across all years are still directly comparable (but note inter-observer bias described in the Bias section above). Comparisons of fish data across years should also take into account differences in lunar and tide phase. In addition, it should be noted that beginning in 2015 fish surveys were sometimes carried out during different sampling periods than other surveys (e.g., benthic photo transect, coral quadrat, macroinvertebrate, and rugosity surveys) for a given year. These sampling periods can be found in the Extents section of the metadata for each dataset. Comparisons of data across sites or across years must also take into account differences in environmental and biological aspects of each site. Comparisons for a given site across time should consider any changes to the site boundaries over time. Please refer to the Extents section of this metadata record to for a description of how the Tumon site boundaries shifted after 2010.
Completeness Measure	
Precision	
Analytical Precision	
Field Precision	

Sensitivity	
Detection Limit	
Completeness Report	Only hard-bottom habitats are surveyed. Surveys are conducted annually to biennially for the Tumon and East Agana sites, but are conducted on a less frequent basis at other sites. In addition, while all permanent sampling stations are generally surveyed each sampling period, surveys are not always conducted at the full set of non-permanent stations for each site during each sampling period. Below is a summary of the number of permanent and non-permanent sampling stations surveyed each year for each site: Tumon Bay: 2010 (belt: 10 perm, 10 non-perm; SPC: 10 perm, 10 non-perm); 2012 (2 perm, 2 non-perm); 2014 (0 perm, 5 non-perm); 2015 (12 perm, 10 non-perm); 2017 (12 perm, 10 non-perm); 2019 (12 perm, 10 non-perm); 2020 (12 perm, 10 non-perm); 2021 (12 perm, 10 non-perm) East Agana Bay: 2010 (10 perm, 10 non-perm); 2015 (10 perm, 10 non-perm); 2017 (10 perm, non-perm surveys still in progress); 2019 (10 perm, 6 non-perm); 2020 (10 perm, 10 non-perm); 2021 (10 perm, 10 non-perm) Western Shoals: 2011 (belt: 11 perm, 13 non-perm; SPC: 2 perm, 2 non-perm) Piti Bay: 2012 (6 perm, 8 non-perm); 2014 (10 perm, 2 non-perm); 2017-2018 (10 perm, 10 non-perm) Achang: 2014 (8 perm, 3 non-perm); 2018 (10 perm, 10 non-perm); 2021 (10 perm, 10 non-perm) Cocos-East: 2014 (3 perm, 4 non-perm); 2018 (no fish data collected); 2021 (10 perm, 10 non-perm) Fouha Bay: 2015 (10 perm); 2019 (10 perm); 2021 (10 perm) Data entry and quality control are complete for surveys conducted through 2020; the entry and quality control of data collected in 2021 has not yet been completed.
Conceptual Consistency	The same method of data collection was used at each of the stations surveyed between 2010 and 2019, with some minor changes over time to refine data collection as described below in the process description. While the core SPC method continues to be utilized, significant changes were implemented in 2020 in order to simplify and shorten the survey. These changes include the exclusion of non-food fishes from the counting and sizing portion of the survey (although certain non-food fishes are still counted but not sized) and the elimination of recording timing (e.g., 5-10 min, 10-15 min, etc.) for non-instantaneous observations of fish taxa that enter the cylinder after the 5 min listing phase of the survey.

» Quality Control Procedures Employed	All observations entered into the database through the online data entry system are compared against observations recorded on the raw data sheet. Once all database records are verified the quality control process is marked as complete for all observations associated with a given station/sampling period. It should also be noted that the data management system employs hard and soft validation to minimize data entry errors.

Data Management

» Have Resources for Management of these Data Been Identified?	Yes
» Approximate Percentage of Budget for these Data Devoted to Data Management	Unknown
» Do these Data Comply with the Data Access Directive?	Yes
» Is Access to the Data Limited Based on an Approved Waiver?	No
» If Distributor (Data Hosting Service) is Needed, Please Indicate	
» Approximate Delay Between Data Collection and Dissemination	Unknown
» If Delay is Longer than Latency of Automated Processing, Indicate Under What Authority Data Access is Delayed	
» Actual or	NCEI-MD

Planned Long-Term Data Archive Location	
» Approximate Delay Between Data Collection and Archiving	Unknown
» How Will the Data Be Protected from Accidental or Malicious Modification or Deletion Prior to Receipt by the Archive?	University of Guam Marine Lab resources and assets

Lineage

» Lineage Statement	The Stationary Point Count Survey methodology for reef fishes, employed by the Guam Long-term Coral Reef Monitoring Program since 2010.

Sources

Citation Title	
Contact Role Type	
Contact Type	
Contact Name	
Publish Date	
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	
Citation URL Name	
Citation URL Description	
Scale Denominator	

Citation Title	
Contact Role Type	
Contact Type	
Contact Name	
Publish Date	
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	
Citation URL Name	
Citation URL Description	
Scale Denominator	

Citation Title	
Contact Role Type	
Contact Type	
Contact Name	
Publish Date	
Extent Type	
Extent Start Date/Time	
Extent End Date/Time	
Citation URL	
Citation URL Name	
Citation URL Description	
Scale Denominator	

Process Steps

Process Step Number	1
» Description	The fish team uses a Stationary Point Count Method (SPC) adapted from Ault et al. (2006) and NOAA Fisheries Coral Reef Ecosystem Division (Williams et al., 2011). Slight modifications to the method were made in 2012, allowing more refined classification of non-instantaneous observations, but more substantial changes to the method were implemented beginning in 2020. These changes are described in detail below. While the core method remains intact, and some parameters are still directly comparable across all years, these changes must be taken into account when making comparisons of certain parameters using observational data obtained before 2020 and those obtained during and after 2020. All sampling stations have been selected in hard-bottom habitats using a stratified random sampling design, and the stations have been designed using the split-panel approach (combination of fixed and non-fixed transects).
Process Date/Time	
Process Contact	Burdick, David R
Phone (Voice)	671-735-2175
Email Address	burdickd@triton.uog.edu
Source	

Process Step Number	2
» Description	Each sampling station is located using a GPS receiver. Upon reaching a given station, a small weight and line tied to a buoy is carefully lowered to the ocean floor. In optimal situations where four divers are available, two divers enter the water first to carry out the fish surveys. For permanent sampling stations marked with rebar, the divers descend to the weight tied to the buoy and locate the rebar representing the beginning of the transect. For non-permanent sampling stations the weight tied to the buoy is used to represent the beginning of the transect. A 30-meter transect is laid out [25 m-long transects were used prior to 2017] beginning at the rebar or weight. The transect is laid out in a clockwise direction relative to the island, following the depth contour if it can be readily determined; if the area is relatively flat and a depth contour is not readily discernible the transect is laid at an angle parallel to the reef margin (which is determined prior to entering the water). At permanent sampling stations the transect tape is deployed between the three rebar representing the beginning, middle, and end of the transect. Surveys are not completed if the visibility is less than 7.5 m. Compact digital point and shoot cameras and housings are used by individual observers to document unknown organisms, incidences of coral disease, and species/behaviors of special interest. To conduct the reef fish surveys divers are positioned at 7.5 m and 22.5 m along the transect and count fish within a 7.5 m radius cylinder extending from the substrate to

	the limits of vertical visibility. The simultaneous surveys start once the divers deploy the transect and both divers are ready to proceed. To minimize diver disruptions, the two divers conducting the benthic surveys enter the water approximately 20-30 minutes after the divers conducting the fish surveys, once the fish team has finished enumerating fish. In situations where only three divers are available, all three divers enter the water at the same time and remain as a three-person buddy team to ensure diver safety throughout the survey. A fish diver partners with a benthic diver when two fish divers are not available. In this situation, the fish diver lays the transect and conducts the first SPC at 22.5 m while the benthic diver works from 0-15 m; they then switch positions along the transect.
Process Date/Time	
Process Contact	Burdick, David R
Phone (Voice)	671-735-2175
Email Address	burdickd@triton.uog.edu
Source	

Process Step Number	3
» Description	The SPC surveys are conducted in two parts. During the first five minutes, divers record all species observed within the cylinder, but do not count or size fish. All fish are identified to species level or the next lowest taxonomic level possible (genus or family). While some small and/or cryptic taxa, such as most gobies or blennies, are not given high priority in the survey and are usually not reported, some larger-bodied or otherwise notable representatives of those taxa, such as Exalias brevis, Plagiotremus spp., and Valenciennea strigata are typically reported. Small fishes and those cryptic during the day, such as apogonids and holocentrids, are explicitly targeted for the survey but are likely undercounted. If a rare fish (shark, species of concern, large mobile predators, etc.) is observed during the first 5 minutes, it is counted and sized, but the diver notes that it was not an instantaneous count. Note that this approach to surveying rare fish was not in place during surveys carried out at the Tumon Bay and East Agana Bay in 2010 and at the Western Shoals site in 2011. For surveys at these sites during that time period rare fish were counted and sized but it was not clear if it was an instantaneous count or not. After the first five minutes divers enumerate fish, one species grouping at a time, using rapid visual sweeps of the plot. The counts are designed to be instantaneous to avoid double counting. All fish of the target species within the SPC boundaries are counted and sized to the nearest centimeter; however, divers use size classes for large schools or high densities. Note that the list of species considered a target species for counting and sizing changed beginning in 2020 to include only food fishes (see process step below for more information). At the end of the survey, divers swim throughout the 7.5-m radius plot to enumerate small and cryptic species that were not captured from the stationary central position. The fish team conducts roving diver swims

	throughout the survey station after the SPCs to document species richness across the site. While core aspects of fish SPC survey, namely the listing of all species in the first 5 minutes and the instantaneous counting and sizing of targeted species after 5 minutes, have remained consistent since the first GLTMP surveys in 2010, significant modifications have been made to the original method in the intervening years. These modifications, which must be taken into account during any temporal analysis of these data, are detailed in the process step below.
Process Date/Time	
Process Contact	Burdick, David R
Phone (Voice)	671-735-2175
Email Address	burdickd@triton.uog.edu
Source	

Process Step Number	4
» Description	Record of modifications to the fish SPC method Survey years 2010-2011: Only instantaneous observations were recorded during this period. Non-instantaneous observations, such as those made of species that were listed during the first 5 minutes but were no longer present in the cylinder during the counting and sizing phase of the survey, were not recorded. However, as noted above, it appears as though some rare or transient taxa observed during surveys conducted in 2010 at the Tumon and East Agana sites and in 2011 at the Western Shoals site may have been recorded even if those observations were not technically instantaneous observations. Survey years 2012-2014: Beginning in 2012 non-instantaneous observations were included in the survey. Non-instantaneous observations include observations of species that are listed during the first 5 minutes but which are no longer present in the cylinder during the counting and sizing phase of the survey. For these observations divers record their best estimate of the size and number of that species as observed during the listing phase. Species that entered the SPC cylinder after the first five minutes were noted on the species list for the site, but on occasion rare taxa were counted and sized and noted as non-instantaneous observations. Survey years 2015-2019: Beginning in 2015 an additional type of non-instantaneous observation was recorded in order to account for fishes that were not recorded during the listing phase but which entered the SPC cylinder during the counting and sizing phase. All surveyed taxa--not just rare taxa--were accounted for, and these non-instantaneous observa-

	tions were delineated by the time period within which they entered the cylinder (e.g., 5-10 min, 10-15 min, 15+ min). However, a review of the data collected during this period found that the two observers represented in this dataset differed in how they denoted fish that entered the cylinder after 15 minutes, with one observer (VB) explicitly noting them as occurring in the cylinder after 15 minutes and the other (AH) noting them as PRESENCE observations and providing count and sizing information for each. Because PRESENCE observations can also include fish observed outside the cylinder, and occasionally counts and sizing information provided for rare or otherwise notable taxa that occurred outside the cylinder, unless fish observations were explicitly denoted as occurring in cylinder it should not be assumed that this was the case. Survey years 2020-present: Beginning in 2020 significant changes to the fish SPC survey methodology were implemented in an effort to significantly shorten survey times. The core survey structure was retained in order to maximize comparability to previous observations, but the decision was made to focus only on food fishes (and a small number of notable non-food fishes) during the counting and sizing phase, and to eliminate observations of fish that were not present during the listing phase (e.g., Non-instantaneous 5-10, Non-instantaneous 10-15, etc.). A list of all food and non-food species and how each species is surveyed (e.g., counts and sizes, counts only, presence/absence only) using this modified method will be made available with the raw data when acquired from NCEI or can be provided upon request.
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	

Process Step Number	5
» Description	Raw data include individual fish observation records with the corresponding methodological information and physical data that reflect the description of the site. Fish observation records include species identification, length (cm), and length-weight values. The physical/methodological data for all records includes the following: site, station, station type, observer, date (day, month, year), latitude (dd), longitude (dd), transect, cylinder radius (m), SPC replicate, observation type (instantaneous/non-instantaneous), depth (m), habitat, and wave exposure.
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	

Source	

Process Step Number	
» Description	
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	

Process Step Number	
» Description	
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	

Process Step Number	
» Description	
Process Date/Time	
Process Contact	
Phone (Voice)	
Email Address	
Source	

Acquisition Information

Instruments

Instrument Unavailable Reason	

Identifier	
Docucomp UUID	
Instrument / Gear	
Instrument Type	
Description	

Identifier	
Docucomp UUID	
Instrument / Gear	
Instrument Type	
Description	

Identifier	
Docucomp UUID	
Instrument / Gear	
Instrument Type	
Description	

Platforms

Platform Unavailable Reason	

Identifier	
Docucomp UUID	
Description	

Mounted Instruments

Identifier	
Identifier	
Identifier	

Identifier	
Docucomp UUID	
Description	

Mounted Instruments

Identifier	
Identifier	
Identifier	

Identifier	
Docucomp UUID	
Description	

Mounted Instruments

Identifier	
Identifier	
Identifier	

FAQs

Date	
Author	
Question	
Answer	

Child Items

Rubric scores updated every 15m

Score	Type	Title
	Entity (ENT)	Guam Long-term Monitoring Program: Fish Observations

Related Items

Item Type	Relationship Type	Title
Data Set (DS)	Cross Reference	Guam Long-term Coral Reef Monitoring Program Benthic Cover Derived from Analysis of Benthic Images since 2010
Data Set (DS)	Cross Reference	Guam Long-term Coral Reef Monitoring Program Benthic Images since 2010
Data Set (DS)	Cross Reference	Guam Long-term Coral Reef Monitoring Program Coral Colony Size and Condition Surveys since 2010
Data Set (DS)	Cross Reference	Guam Long-term Coral Reef Monitoring Program Macroinvertebrate Belt Transects since 2010

Catalog Details

Catalog Item ID	47783
Metadata Record Created By	Troy T Kanemura

Metadata Record Created	2017-11-05 15:29+0000
Metadata Record Last Modified By	David R Burdick
» Metadata Record Last Modified	2021-12-14 01:45+0000
Metadata Record Published	2021-04-14
Owner Org	PIFSC
Metadata Publication Status	Published Externally
Do Not Publish?	N
Metadata Workflow State	Published / External
Metadata Next Review Date	2022-04-15

Tags