Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve

SEACAR Habitat Analyses

Last compiled on 10 June, 2026

Contents

Funding & Acknowledgements

The data used in this analysis is from the Export Standardized Tables in the SEACAR Data Discovery Interface (DDI). Documents and information available through the SEACAR DDI are owned by the data provider(s) and users are expected to provide appropriate credit following accepted citation formats. Users are encouraged to access data to maximize utilization of gained knowledge, reducing redundant research and facilitating partnerships and scientific innovation.

With respect to documents and information available from SEACAR DDI, neither the State of Florida nor the Florida Department of Environmental Protection makes any warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose arising out of the use or inability to use the data, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

This report was funded in part, through a grant agreement from the Florida Department of Environmental Protection, Florida Coastal Management Program, by a grant provided by the Office for Coastal Management under the Coastal Zone Management Act of 1972, as amended, National Oceanic and Atmospheric Administration. The views, statements, findings, conclusions and recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the State of Florida, NOAA or any of their sub agencies.

Published: 2026-06-10

Threshold Filtering

Threshold filters, following the guidance of Florida Department of Environmental Protection's (*FDEP*) Division of Environmental Assessment and Restoration (*DEAR*) are used to exclude specific results values from the SEACAR Analysis. Based on the threshold filters, Quality Assurance / Quality Control (*QAQC*) Flags are inserted into the *SEACAR_QAQCFlagCode* and *SEACAR_QAQC_Description* columns of the export data. The *Include* column indicates whether the *QAQC* Flag will also indicate that data are excluded from analysis. No data are excluded from the data export, but the analysis scripts can use the *Include* column to exclude data (1 to include, 0 to exclude).

Table 1: Continuous Water Quality threshold values

Parameter Name	*Units*	*Low Threshold*	*High Threshold*
Chlorophyll a, Uncorrected for Pheophytin	ug/L	-	-
Dissolved Oxygen	mg/L	-0.000001	50
Dissolved Oxygen Saturation	%	-0.000001	500
Fluorescent Dissolved Organic Matter	QSE	-	-
Salinity	ppt	-0.000001	70
Specific Conductivity	mS/cm	-0.000001	200
Turbidity	NTU	-0.000001	4000
Water Temperature	Degrees C	-5.000000	45
pH	None	2.000000	14

Table 2: Discrete Water Quality threshold values

Parameter Name	*Units*	*Low Threshold*	*High Threshold*
Ammonia, Un-ionized (NH3)	mg/L	-	-
Ammonium (NH4)	mg/L	-	-

Parameter Name	*Units*	*Low Threshold*	*High Threshold*
Chlorophyll a, Corrected for Pheophytin	ug/L	-	-
Chlorophyll a, Uncorrected for Pheophytin	ug/L	-	-
Colored Dissolved Organic Matter	PCU	-	-
Dissolved Oxygen	mg/L	-0.000001	25
Dissolved Oxygen Saturation	%	-0.000001	310
Fluorescent Dissolved Organic Matter	QSE	-	-
Light Extinction Coefficient	mˆ-1	-	-
NO2+3, Filtered	mg/L	-	-
Nitrate (NO3)	mg/L	-	-
Nitrite (NO2)	mg/L	-	-
Nitrogen, inorganic	mg/L	-	-
Nitrogen, organic	mg/L	-	-
Phosphate, Filtered (PO4)	mg/L	-	-
Salinity	ppt	-0.000001	70
Secchi Depth	m	0.000001	50
Specific Conductivity	mS/cm	0.005000	100
Total Ammonia (N)	mg/L	-	-
Total Kjeldahl Nitrogen	mg/L	-	-
Total Nitrogen	mg/L	-	-
Total Nitrogen	mg/L	-	-
Total Phosphorus	mg/L	-	-
Total Suspended Solids	mg/L	-	-
Turbidity	NTU	-	-
Water Temperature	Degrees C	3.000000	40
pH	None	2.000000	13

Table 3: Quality Assurance Flags inserted based on threshold checks listed in Table 1 and 2

SEACAR QAQC Description	*Include*	*SEACAR QAQCFlagCode*
Exceeds maximum threshold	0	2Q
Below minimum threshold	0	4Q
Within threshold tolerance	1	6Q
No defined thresholds for this parameter	1	7Q

Value Qualifiers

Value qualifier codes included within the data are used to exclude certain results from the analysis. The data are retained in the data export files, but the analysis uses the *Include* column to filter the results.

STORET and WIN value qualifier codes

Value qualifier codes from *STORET* and *WIN* data are examined with the database and used to populate the *Include* column in data exports.

Table 4: Value Qualifier codes excluded from analysis

Qualifier Source	*Value Qualifier*	*Include*	*MDL*	*Description*
STORET-WIN	H	0	0	Value based on field kit determination; results may not be accurate
STORET-WIN	J	0	0	Estimated value
STORET-WIN	V	0	0	Analyte was detected at or above method detection limit
STORET-WIN	Y	0	0	Lab analysis from an improperly preserved sample; data may be inaccurate

Discrete Water Quality Value Qualifiers

The following value qualifiers are highlighted in the Discrete Water Quality section of this report. An exception is made for **Program 476** - *Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network* and data flagged with Value Qualifier **H** are included for this program only.

H - Value based on field kit determiniation; results may not be accurate. This code shall be used if a field screening test (e.g., field gas chromatograph data, immunoassay, or vendor-supplied field kit) was used to generate the value and the field kit or method has not been recognized by the Department as equivalent to laboratory methods.

I - The reported value is greater than or equal to the laboratory method detection limit but less than the laboratory practical quantitation limit.

Q - Sample held beyond the accepted holding time. This code shall be used if the value is derived from a sample that was prepared or analyzed after the approved holding time restrictions for sample preparation or analysis.

S - Secchi disk visible to bottom of waterbody. The value reported is the depth of the waterbody at the location of the Secchi disk measurement.

U - Indicates that the compound was analyzed for but not detected. This symbol shall be used to indicate that the specified component was not detected. The value associated with the qualifier shall be the laboratory method detection limit. Unless requested by the client, less than the method detection limit values shall not be reported

Systemwide Monitoring Program (SWMP) value qualifier codes

Value qualifier codes from the *SWMP* continuous program are examined with the database and used to populate the *Include* column in data exports. *SWMP* Qualifier Codes are indicated by *QualifierSource=SWMP*.

Table 5: SWMP Value Qualifier codes

Qualifier Source	*Value Qualifier*	*Include*	*Description*
SWMP	-1	1	Optional parameter not collected
SWMP	-2	0	Missing data
SWMP	-3	0	Data rejected due to QA/QC
SWMP	-4	0	Outside low sensor range
SWMP	-5	0	Outside high sensor range
SWMP	0	1	Passed initial QA/QC checks
SWMP	1	0	Suspect data
SWMP	2	1	Reserved for future use
SWMP	3	1	Calculated data: non-vented depth/level sensor correction for changes in barometric pressure
SWMP	4	1	Historical: Pre-auto QA/QC
SWMP	5	1	Corrected data

Water Quality - Continuous

The following files were used in the continuous analysis:

- *Combined_WQ_WC_NUT_cont_Chlorophyll_a_Uncorrected_for_Pheophytin-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen_Saturation-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_Fluorescent_Dissolved_Organic_Matter-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_pH-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_Salinity-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_Specific_Conductivity-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_Turbidity-2026-Mar-06.txt*
- *Combined_WQ_WC_NUT_cont_Water_Temperature-2026-Mar-06.txt*

Continuous monitoring locations in Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve

Table 6: Station overview for Continuous parameters by Program

ProgramID	*ProgramLocationID*	*Years of Data*	*Use in Analysis*	*Parameters*
986	6	11	TRUE	Water Temperature

Program names:

986 - Water Temperature on Coral Reefs in the Florida Keys[1]

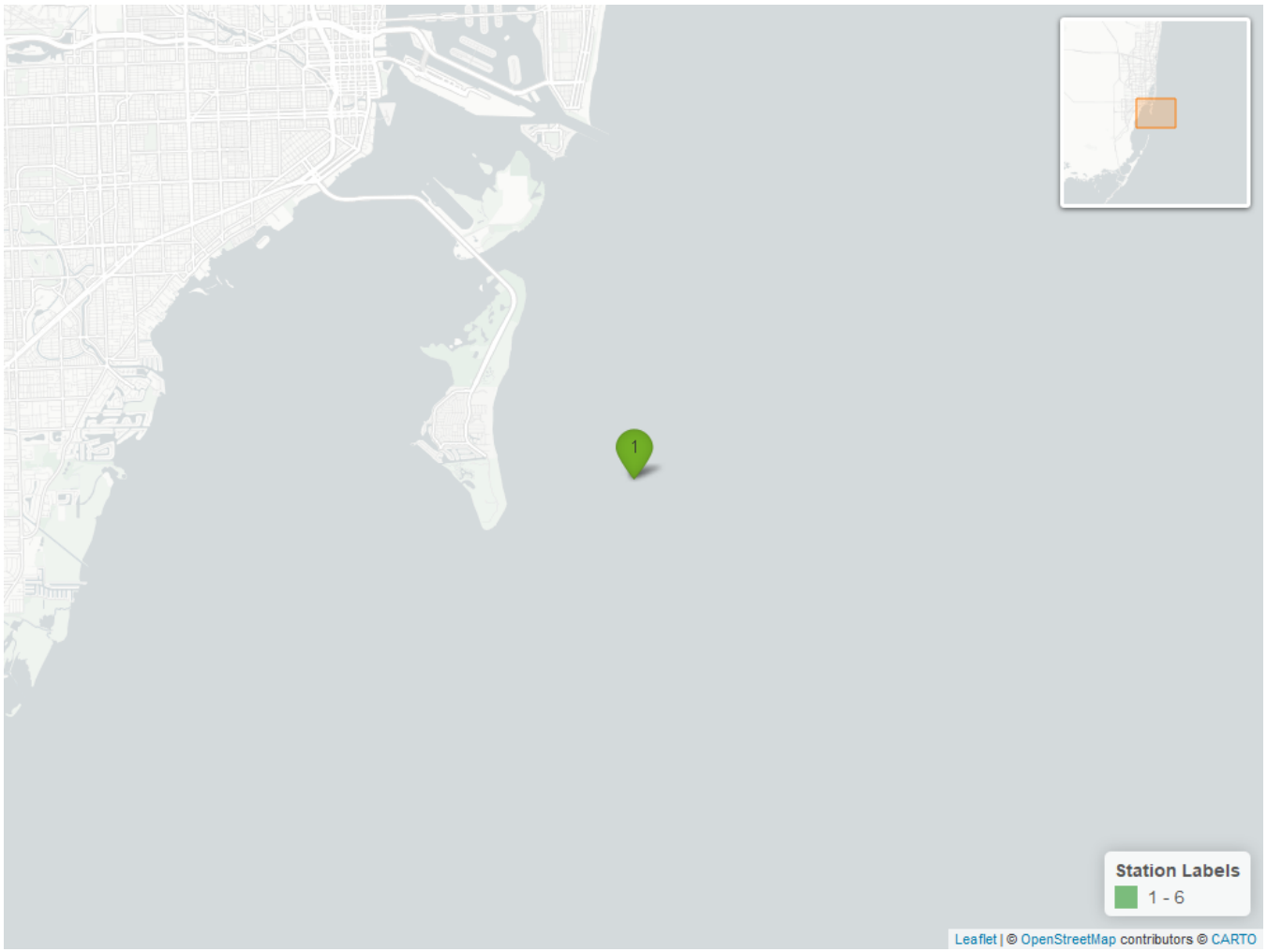

Figure 1: Map showing continuous water quality sampling locations within the boundaries of *Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve*. Sites marked as *Use In Analysis* (green) are featured in this report.

Water Temperature - Continuous

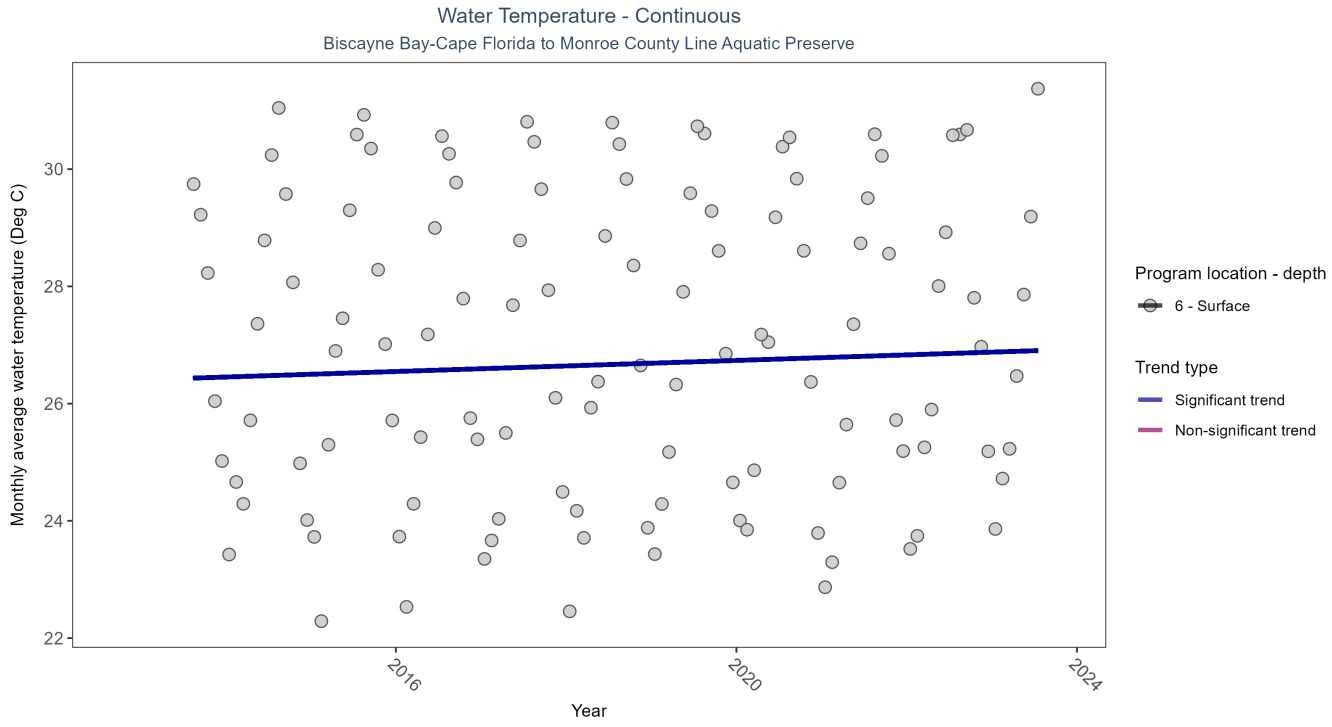

Figure 2: Scatter plot of monthly average water temperature over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 7: Seasonal Kendall-Tau Results for Water Temperature - All Stations

Program Location	Statistical Trend	No. of Samples	No. Years with Data	Period of Record	Median Result Value	Tau	Sen Intercept	Sen Slope	P
6	Significantly increasing trend	69753	11	2013 - 2023	26.84	0.19	26.41	0.05	0.01

At one program location, monthly average water temperature increased by 0.05°C per year.

Coral Reef

The data file used is: **All_CORAL_Parameters-2026-Jun-04.txt**

Percent Cover

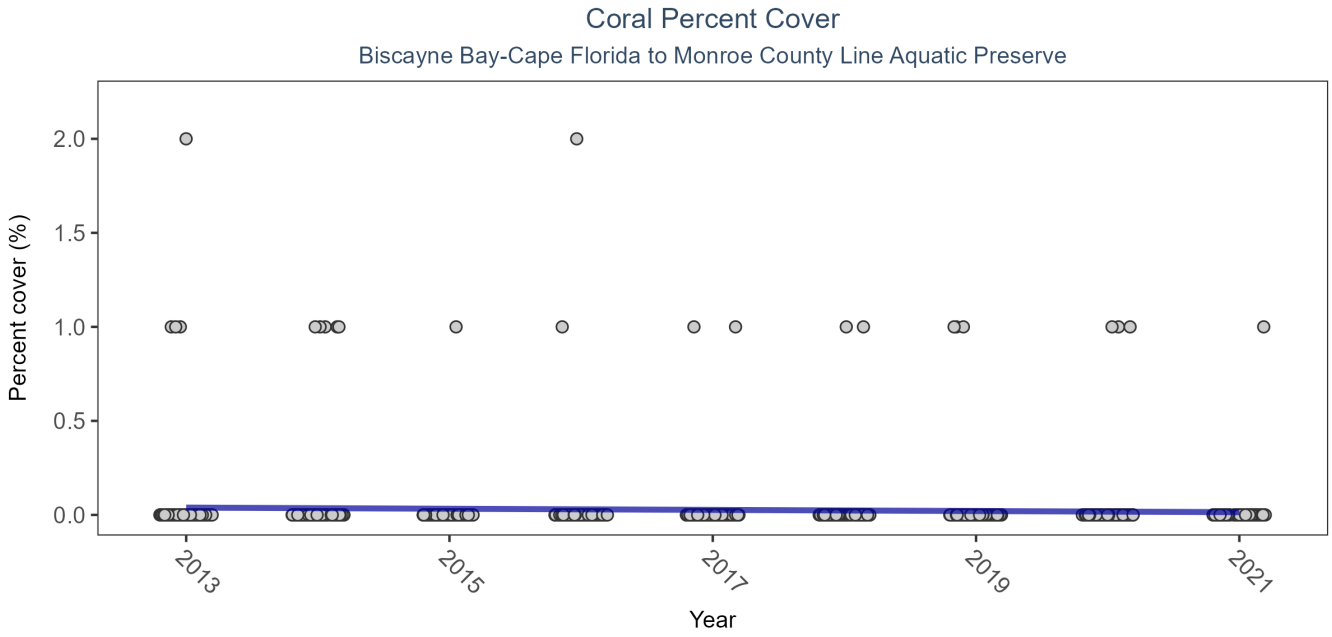

Figure 3: Scatter plot of live coral coverage over time as a percent of reef surface. Species groups include octocorals, milleporans, and scleractinians. If the time series included five or more years of observations, a significant (blue) or non-significant (magenta) trend line is also shown. Data points are jittered horizontally to reduce overlap.

Table 8: Coral Percent Cover

Statistical Trend	Period of Record	LME Intercept	LME Slope	p
No detectable trend	2013 - 2021	6.16822	-0.00304	0.16442

Percent cover showed no detectable trend between 2013 and 2021.

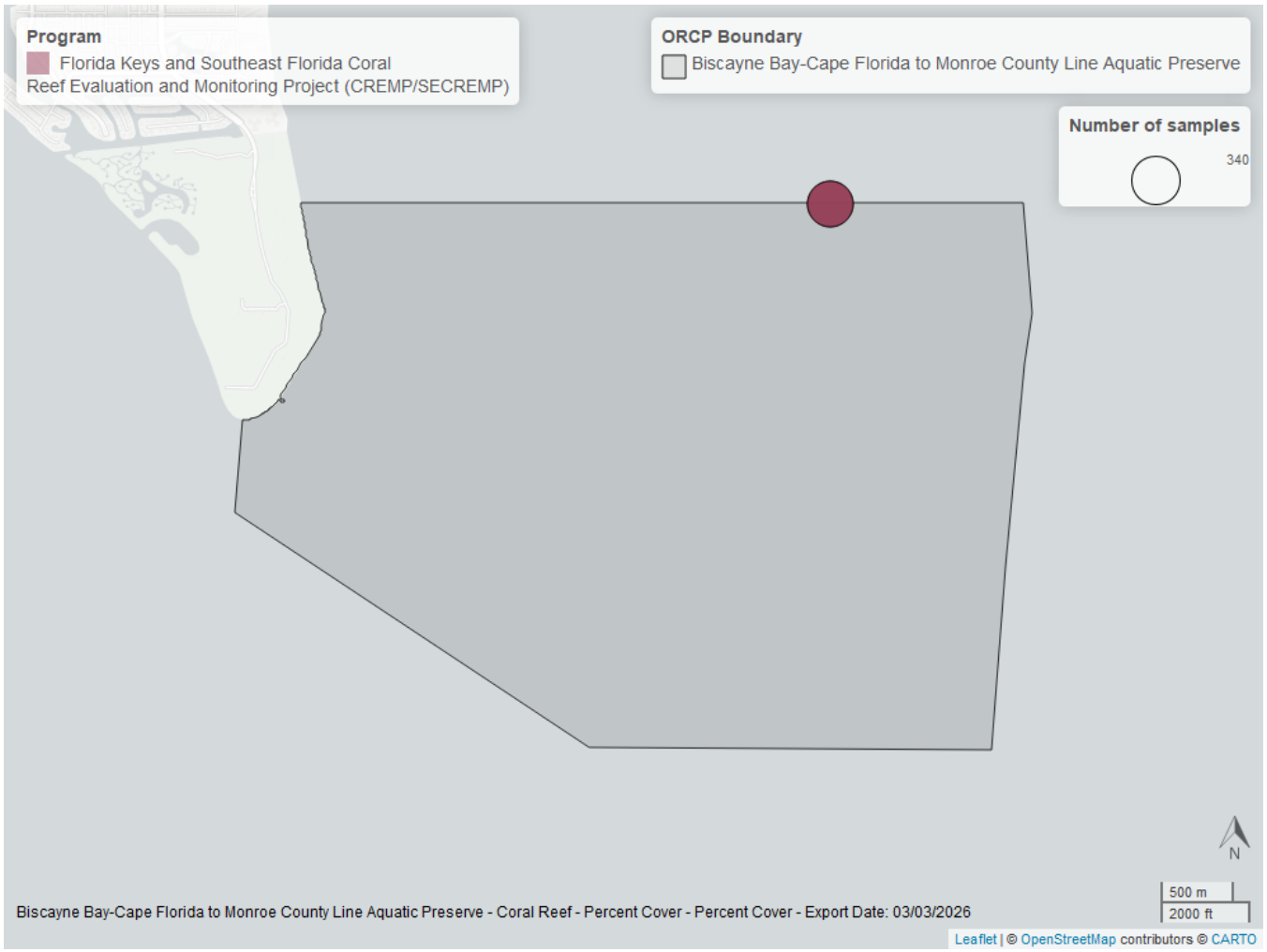

Figure 4: Map showing location of coral percent cover sampling locations within the boundaries of *Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Species Richness

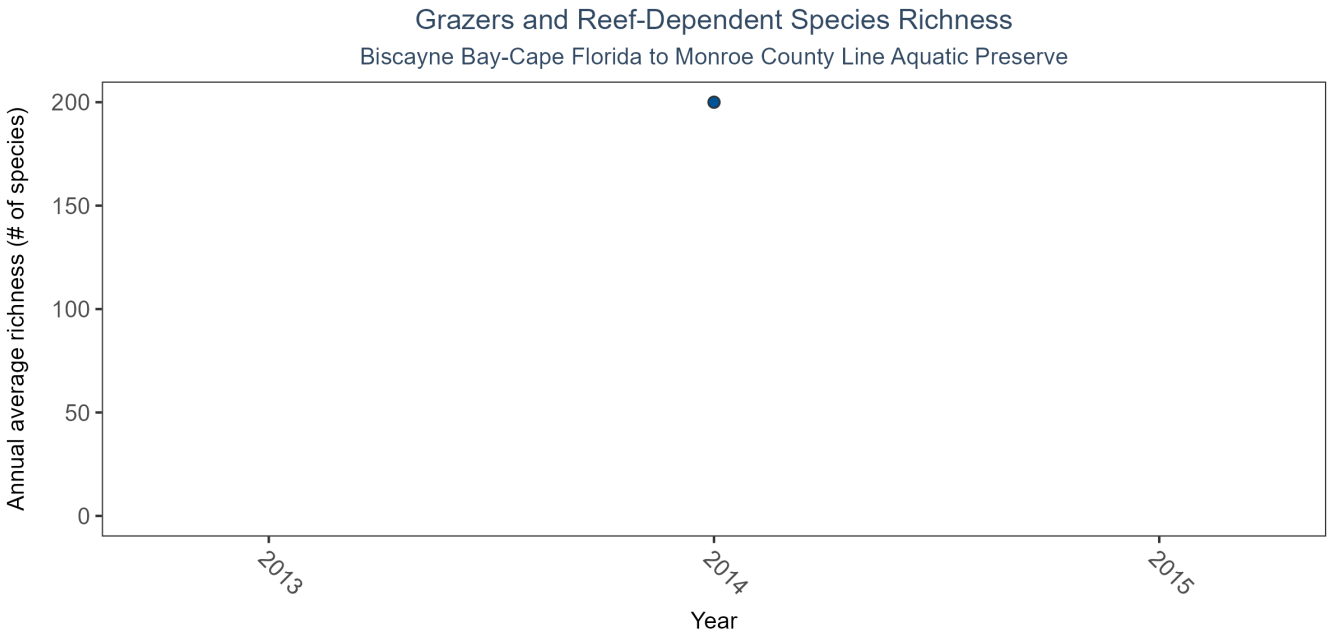

Figure 5: Line graph of annual average species richness of grazers and reef-dependent species over time. If the time series included more than one year of observations, a line connects the data points for visualization.

Table 9: Coral Species Richness

No. of Samples	*No. Years with Data*	*Period of Record*	*Median No. of Taxa*	*Mean No. of Taxa*
2	1	2014 - 2014	200	200

In the year 2014, 200 taxa were observed based on 2 observations.

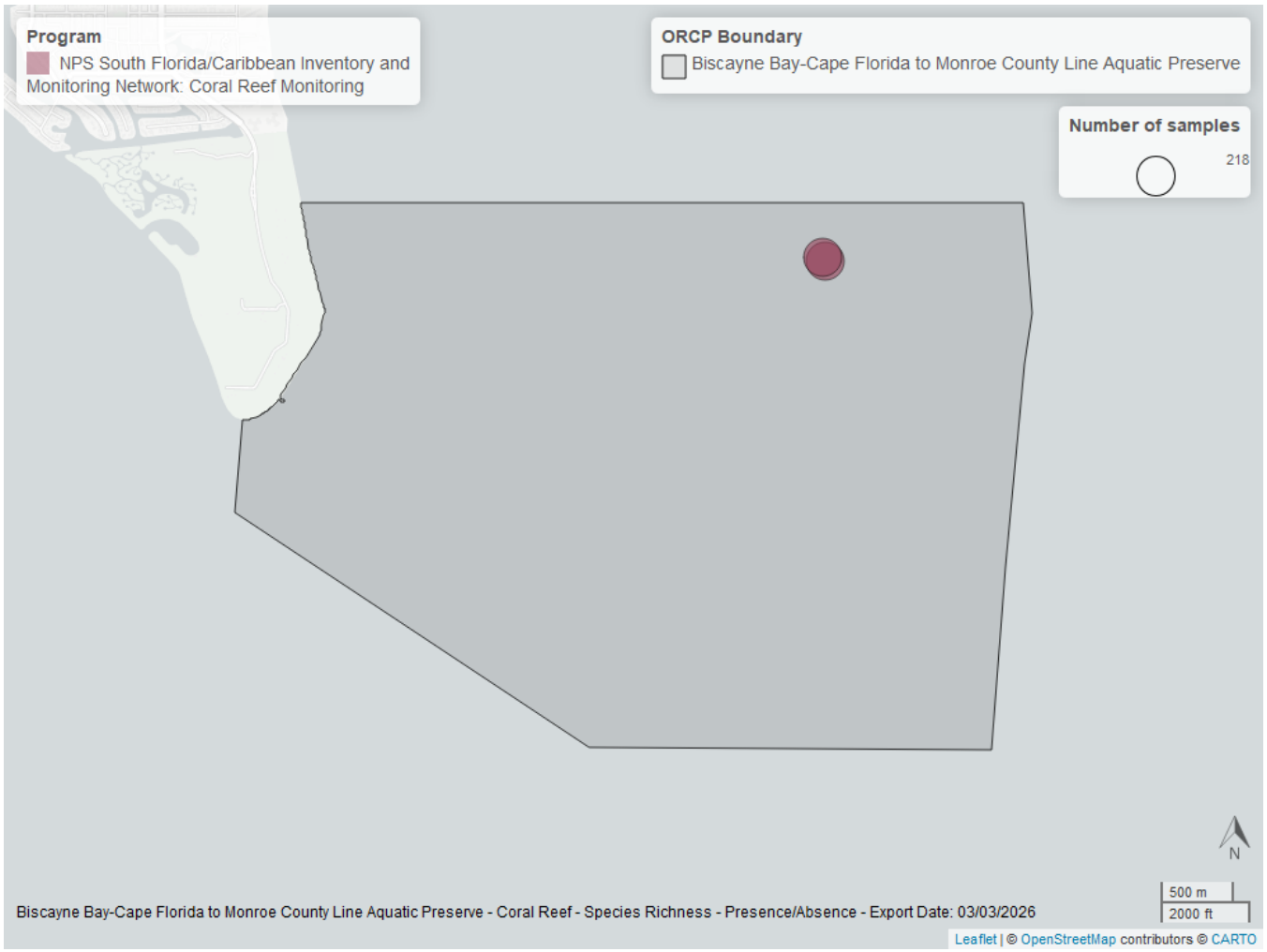

Figure 6: Map showing location of coral species richness sampling locations within the boundaries of *Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Species list

Abudefduf saxatilis[1]
Acanthemblemaria aspera[1]
Acanthemblemaria maria[1]
Acanthostracion polygonium[1]
Acanthostracion quadricornis[1]
Acanthurus bahianus[1]
Acanthurus chirurgus[1]
Acanthurus coeruleus[1]
Acanthurus sp.[1]
Acropora cervicornis[2]
Aetobatus narinari
Agaricia agaricites[2]
Agaricia fragilis[2]
Agaricia lamarcki[2]
Aluterus schoepfii[1]
Aluterus scriptus[1]
Aluterus sp.[1]
Amblycirrhitus pinos[1]
Anisotremus surinamensis[1]
Anisotremus virginicus[1]
Apogon binotatus[1]
Apogon maculatus[1]
Apogon pseudomaculatus[1]
Apogon townsendi[1]
Archosargus probatocephalus[1]
Archosargus rhomboidalis[1]
Astrapogon sp.[1]
Atherinomorus stipes
Aulostomus maculatus[1]
Azurina cyanea[1]
Balistes capriscus[1]
Balistes vetula[1]
Blenniidae sp.[1]
Bodianus pulchellus[1]
Bodianus rufus[1]
Bothus ocellatus[1]
Brachygenys chrysargyreum[1]
Calamus bajonado[1]
Calamus calamus[1]
Calamus nodosus[1]
Calamus penna[1]
Calamus proridens[1]
Callionymus bairdi[1]
Cantherhines macrocerus[1]
Cantherhines pullus[1]
Canthidermis sufflamen[1]
Canthigaster rostrata[1]
Caranx bartholomaei[1]
Caranx crysos[1]
Caranx hippos[1]
Caranx latus[1]
Caranx ruber[1]
Caranx sp.[1]
Carcharhinus leucas
Epinephelus morio[1]
Epinephelus striatus[1]
Eques lanceolatus[1]
Equetus punctatus[1]
Eucinostomus argenteus
Eusmilia fastigiata[2]
Euthynnus alletteratus
Favia fragum[2]
Fistularia tabacaria[1]
Gerres cinereus
Ginglymostoma cirratum
Gnatholepis thompsoni[1]
Gobiosoma sp.[1]
Gymnothorax funebris[1]
Gymnothorax miliaris[1]
Gymnothorax moringa[1]
Gymnothorax vicinus[1]
Haemulon album[1]
Haemulon aurolineatum[1]
Haemulon carbonarium[1]
Haemulon flavolineatum[1]
Haemulon macrostomum[1]
Haemulon melanurum[1]
Haemulon parra[1]
Haemulon plumierii[1]
Haemulon sciurus[1]
Haemulon sp.[1]
Haemulon striatum[1]
Haemulon vittatum[1]
Halichoeres bivittatus[1]
Halichoeres cyanocephalus[1]
Halichoeres garnoti[1]
Halichoeres maculipinna[1]
Halichoeres pictus[1]
Halichoeres poeyi[1]
Halichoeres radiatus[1]
Harengula humeralis
Harengula jaguana
Hemiemblemaria simula[1]
Hemiramphus brasiliensis
Heteropriacanthus cruentatus[1]
Holacanthus bermudensis[1]
Holacanthus ciliaris[1]
Holacanthus tricolor[1]
Holocentrus adscensionis[1]
Holocentrus rufus[1]
Hypanus americanus
Hypoplectrus gemma[1]
Hypoplectrus hybrid[1]
Hypoplectrus nigricans[1]
Hypoplectrus puella[1]
Hypoplectrus sp.[1]
Hypoplectrus tann[1]
Hypoplectrus unicolor[1]
Oculina diffusa[2]
Oculina sp.
Ocyurus chrysurus[1]
Odontoscion dentex[1]
Ophioblennius macclurei[1]
Opistognathus aurifrons
Opistognathus macrognathus
Opistognathus whitehursti
Orbicella annularis[2]
Oxyurichthys stigmalophius[1]
Parablennius marmoreus[1]
Pareques acuminatus[1]
Pareques umbrosus[1]
Pempheris schomburgkii[1]
Pomacanthus arcuatus[1]
Pomacanthus paru[1]
Porifera
Porites astreoides[2]
Porites divaricata
Porites spp.[2]
Priacanthus arenatus[1]
Prionotus ophryas[1]
Prognathodes aculeatus[1]
Pseudodiploria clivosa[2]
Pseudodiploria strigosa[2]
Pseudupeneus maculatus[1]
Ptereleotris calliura
Ptereleotris helenae
Pterois miles[1]
Pterois volitans[1]
Razorfish sp.[1]
Remora remora
Rypticus maculatus[1]
Rypticus saponaceus[1]
Sargocentron coruscum[1]
Sargocentron vexillarium[1]
Scartella cristata[1]
Scarus coelestinus[1]
Scarus coeruleus[1]
Scarus guacamaia[1]
Scarus iseri[1]
Scarus sp.[1]
Scarus taeniopterus[1]
Scarus vetula[1]
Scleractinia[2]
Scolymia sp.[2]
Scomberomorus maculatus
Scomberomorus regalis
Scorpaena plumieri[1]
Scorpaenodes caribbaeus[1]
Selachii
Seriola dumerili[1]
Serranid sp.[1]
Serranus baldwini[1]

Carcharhinus perezii	Isophyllia sinuosa[2]	Serranus tabacarius[1]
Centropomus undecimalis	Jenkinsia sp.	Serranus tigrinus[1]
Cephalopholis cruentata[1]	Kyphosus sectatrix[1]	Serranus tortugarum[1]
Cephalopholis fulva[1]	Lachnolaimus maximus[1]	Siderastrea radians[2]
Chaetodipterus faber	Lactophrys bicaudalis[1]	Siderastrea siderea[2]
Chaetodon capistratus[1]	Lactophrys trigonus[1]	Snapper sp.[1]
Chaetodon ocellatus[1]	Lactophrys triqueter[1]	Solenastrea bournoni[2]
Chaetodon sedentarius[1]	Liopropoma rubre[1]	Sparidae sp.[1]
Chaetodon striatus[1]	Lutjanus analis[1]	Sparisoma atomarium[1]
Chilomycterus antennatus[1]	Lutjanus apodus[1]	Sparisoma aurofrenatum[1]
Chilomycterus reticulatus[1]	Lutjanus buccanella[1]	Sparisoma chrysopterum[1]
Chromis enchrysurus[1]	Lutjanus griseus[1]	Sparisoma radians[1]
Chromis insolata[1]	Lutjanus jocu[1]	Sparisoma rubripinne[1]
Chromis multilineata[1]	Lutjanus mahogoni[1]	Sparisoma sp.[1]
Chromis scotti[1]	Lutjanus synagris[1]	Sparisoma viride[1]
Clepticus parrae[1]	Macroalgae	Sphoeroides[1]
Colpophyllia natans[2]	Madracis auretenra[2]	Sphoeroides spengleri[1]
Coryphopterus dicrus[1]	Madracis decactis[2]	Sphyraena barracuda[1]
Coryphopterus eidolon[1]	Malacanthus plumieri	Squirrelfish sp.[1]
Coryphopterus glaucofraenum[1]	Malacoctenus aurolineatus[1]	Stegastes adustus[1]
Coryphopterus personatus[1]	Malacoctenus macropus[1]	Stegastes diencaeus[1]
Coryphopterus punctipectophorus[1]	Malacoctenus triangulatus[1]	Stegastes leucostictus[1]
Coryphopterus sp.[1]	Meandrina meandrites[2]	Stegastes partitus[1]
Cryptotomus roseus[1]	Megalops atlanticus	Stegastes planifrons[1]
Ctenogobius saepepallens[1]	Melichthys niger[1]	Stegastes sp.[1]
Cyanobacteria	Menidia sp.	Stegastes variabilis[1]
Decapterus macarellus[1]	Microgobius carri[1]	Stephanocoenia intersepta[2]
Decapterus punctatus[1]	Microspathodon chrysurus[1]	Strongylura notata[1]
Dichocoenia stokesii[2]	Millepora alcicornis[2]	Substrate
Diodon holocanthus[1]	Millepora complanata[2]	Synodus foetens[1]
Diodon hystrix[1]	Monacanthus ciliatus[1]	Synodus intermedius[1]
Diplectrum formosum[1]	Monacanthus tuckeri[1]	Synodus synodus[1]
Diplodus argenteus[1]	Montastraea cavernosa[2]	Thalassoma bifasciatum[1]
Diplodus holbrookii[1]	Mulloidichthys martinicus[1]	Tigrigobius macrodon[1]
Diploria labyrinthiformis[2]	Mycetophyllia aliciae[2]	Trachinotus falcatus[1]
Echeneis naucrates	Mycteroperca bonaci[1]	Tylosurus crocodilus
Echeneis neucratoides	Mycteroperca microlepis[1]	Urobatis jamaicensis
Elacatinus oceanops[1]	Mycteroperca phenax[1]	Xyrichtys martinicensis[1]
Elagatis bipinnulata[1]	Mycteroperca venenosa[1]	Xyrichtys novacula[1]
Epinephelus adscensionis[1]	Myripristis jacobus[1]	Xyrichtys splendens[1]
Epinephelus guttatus[1]	Nicholsina usta[1]	Zoanthidae
Epinephelus itajara[1]	Octocorallia[2]	Abudefduf saxatilis[1]

1 - Coral Reef - Species Richness, 2 - Coral Reef - Percent Cover

References

1. Florida Fish and Wildlife Conservation Commision (FWC); Florida Wildlife Research Institute (FWRI). Water Temperature on Coral Reefs in the Florida Keys. (2022).