

Propeller scar damage recorded in seagrass bed surveys in St. Andrew Bay and St. Joseph Bay, Florida from May to Jul 2023

Website: <https://www.bco-dmo.org/dataset/1006664>

Data Type: Other Field Results

Version: 1

Version Date: 2026-09-02

Project

» [RUI: The role of ecological memory in nearshore seagrass beds affected by multiple stressors](#) (EcoMem Project)

Contributors	Affiliation	Role
Stoner, Elizabeth	Bentley University	Principal Investigator
Archer, Stephanie K.	Louisiana Universities Marine Consortium (LUMCON)	Co-Principal Investigator
Whitman, Elizabeth R.	Florida International University (FIU)	Co-Principal Investigator
Johnson, Erin	Florida International University (FIU)	Student
McPherson, Brodie	Bentley University	Technician
Schlachter, Katherine	Louisiana Universities Marine Consortium (LUMCON)	Technician
Mickle, Audrey	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract

Seagrass beds are important coastal habitats, providing critical habitat for a wide-range of associated taxa, stabilizing shorelines, and acting as biogeochemical hotspots. Due to their location in shallow coastal systems, seagrasses are exposed to myriad anthropogenic threats leading to seagrass loss at a global scale. Two threats that seagrasses face are mechanical damage (e.g., propellor scarring) and overgrazing during population booms of herbivores. Here we surveyed seagrass systems in St. Andrew Bay and St. Joseph Bay, Florida to quantify seagrasses, propellor scars, and urchins throughout the system. St. Andrew bay was divided into 3 segments: North Bay, West Bay, St. Andrew Bay. Between May 4th and July 12th, 2023 we surveyed 95 randomly selected sites, 26 in St. Andrew Bay, 26 in North Bay, 19 in West Bay, and 24 in St. Joseph Bay. Sixteen sites were revisited to assess repeatability of sampling protocols. This datafile represents propellor scar prevalence and size data in seagrass beds. Related data files for these surveys include seagrass canopy height, seagrass and macroalgae percent cover, seagrass shoot density, and urchin (*Lytechinus variegatus*) counts and size data. Water quality data may also be added at a later date. See the Related Datasets section for more information on currently available data.

Table of Contents

- [Coverage](#)
- [Dataset Description](#)
 - [Methods & Sampling](#)
 - [Data Processing Description](#)
 - [BCO-DMO Curation Notes](#)
- [Data Files](#)
- [Related Datasets](#)
- [Parameters](#)
- [Instruments](#)
- [Project Information](#)
- [Funding](#)

Coverage

Location: St. Andrew Bay (30N 85W depth < 2m) and St. Joseph Bay (29N 85W depth < 2m)

Spatial Extent: N:30.29058 E:-85.30953 S:29.68175 W:-85.79214

Temporal Extent: 2023-05-04 - 2023-07-12

Methods & Sampling

Survey sites were randomly selected from points generated in ArcGIS by overlaying a 300 x 300 m grid on the continuous seagrass shapefile obtained from the Florida Department of Environmental Protection. Initially 30 sites per bay segment were randomly selected from the intersection of the grid. Due to safety concerns and logistical constraints some sites were not surveyed. At each site propellor scars were quantified along a 50m transect run perpendicular to shore.

All propellor scars that intersected the transect were enumerated, measured (total scar length, as well as the scar width and depth at the point it intersected the transect), and visually assessed for the presence of cut seagrass rhizomes and if seagrass had begun to regrow within the scar. All measurements were taken with either a measuring tape (length and width) or ruler (depth). Scar lengths were measured up to 20m, if the scar extended beyond this or the scar curved a note was made to indicate that the recorded length is an underestimate.

Data Processing Description

Data was recorded on paper datasheets in the field and manually entered. A different person reviewed the data entry. No other data processing was completed.

BCO-DMO Curation Notes

This section documents curation actions performed prior to publication review with the submitter, and additional information relevant to understanding and reusing this dataset. It distinguishes changes made to the submitted (meta)data from unresolved issues and/or enhancements that improve future reuse and interoperability.

CURATION ACTIONS PERFORMED ON DATA

- Loaded survey_propellorscars.csv, treating empty strings, "nd", and "NA" as missing values
- Renamed columns to remove dots for BCO-DMO naming convention: scar.width to scar_width, scar.depth to scar_depth, scar.length to scar_length, cut.rhizomes to cut_rhizomes, seagrass.regrowth to seagrass_regrowth
- Parsed date_time_UTC (format %m/%d/%Y %H:%M) and reformatted as ISO 8601 UTC datetime string (%Y-%m-%dT%H:%M), a pure reformat with no timezone shift since values were already UTC
- Parsed date_time_local (format %m/%d/%Y %H:%M) and set as ISO 8601 UTC datetime string (%Y-%m-%dT%H:%M)
- Created date_time_local_EDT column by copying date_time_local values only where local_timezone equals America/New_York, other rows left missing
- Created date_time_local_CDT column by copying date_time_local values only where local_timezone equals America/Chicago, other rows left missing
- Reordered columns to: uID, date_time_UTC, date_time_local_EDT, date_time_local_CDT, date_time_local, local_timezone, siteID, general_location, latitude, longitude, scar_width, scar_depth, scar_length, cut_rhizomes, seagrass_regrowth, note
- Deleted columns date_time_local and local_timezone
- Replaced blank/missing scar_length values with the value 20, upon submitter request
- Replaced siteID value "271" with "271.0" to match formatting used in uID, upon submitter request
- Output as 1006664_v1_propellor_scars.csv

CURATION ACTIONS PERFORMED ON METADATA

- BCO-DMO's standard metadata entry and text formatting steps were performed.

ISSUES POTENTIALLY IMPACTING REUSE

- N/A

Data Files

File
1006664_v1_propellor_scars.csv (Comma Separated Values (.csv), 8.65 KB) MD5:3b161ac754b755d6509645c09eac7b07
Primary data file for dataset ID 1006664, version 1

Related Datasets

IsRelatedTo

Archer, S. K., Stoner, E., Whitman, E. R., Johnson, E., Schlachter, K., McPherson, B. (2026) **Seagrass and macroalgae surveys of St. Andrew Bay and St. Joseph Bay, Florida from May to Jul 2023.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2026-09-02
doi:10.26008/1912/bco-dmo.1006527.1 [\[view at BCO-DMO\]](#)
Relationship Description: Data collected during the same surveys

Archer, S. K., Stoner, E., Whitman, E. R., Johnson, E., Schlachter, K., McPherson, B. (2026) **Urchin count and size surveys in St. Andrew Bay and St. Joseph Bay, Florida from May to Jul 2023.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2026-08-28
doi:10.26008/1912/bco-dmo.1006613.1 [\[view at BCO-DMO\]](#)
Relationship Description: Data collected during the same surveys

Parameters

Parameter	Description	Units
uID	A unique identifier that links survey occurrences across data sets and data tables. All data records that share a uID were recorded during the same survey of the site.	unitless
date_time_UTC	Date and time of the beginning of the survey in UTC	unitless
date_time_local_EDT	Date and time of the beginning of the survey in the local time zone, Eastern Daylight Time	unitless
date_time_local_CDT	Date and time of the beginning of the survey in the local time zone, Central Daylight Saving Time	unitless
siteID	Project-assigned site ID	unitless
general_location	The bay segment the site is located within	unitless
latitude	Latitude of the sampling location, North is positive. WGS84	decimal degrees
longitude	Longitude of the sampling location, West is negative. WGS84	decimal degrees
scar_width	Width of the propellor scar where it crossed the transect line	meters
scar_depth	Depth of the propellor scar where it crossed the transect line	meters
scar_length	Length of the propellor scar; comment in 'note' parameter.	meters
cut_rhizomes	Whether or not cut seagrass rhizomes were observed within the propellor scar. Y=yes: cut rhizomes were observed; N = no: cut rhizomes were not observed.	unitless
seagrass_regrowth	Whether or not seagrass shoots were observed within the propellor scar. Y=yes: seagrass shoots were observed within the scar; N = no: seagrass shoots were not observed within the scar	unitless
note	Notes on the measurements of the propellor scar.	unitless

[[table of contents](#) | [back to top](#)]

Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Manual Biota Sampler
Dataset-specific Description	All propellor scars that intersected the transect were enumerated, measured (length, width and depth at the point it intersected the transect), and visually assessed for the presence of cut seagrass rhizomes and if seagrass had begun to regrow within the transect.
Generic Instrument Description	"Manual Biota Sampler" indicates that a sample was collected in situ by a person, possibly using a hand-held collection device such as a jar, a net, or their hands. This term could also refer to a simple tool like a hammer, saw, or other hand-held tool.

Dataset-specific Instrument Name	measuring tape
Generic Instrument Name	Measuring Tape
Dataset-specific Description	All measurements were taken with either a measuring tape (length and width) or ruler (depth).
Generic Instrument Description	A tape measure or measuring tape is a flexible ruler. It consists of a ribbon of cloth, plastic, fibre glass, or metal strip with linear-measurement markings. It is a common tool for measuring distance or length.

Dataset-specific Instrument Name	ruler
Generic Instrument Name	ruler
Dataset-specific Description	All measurements were taken with either a measuring tape (length and width) or ruler (depth).
Generic Instrument Description	A device used for measuring or for drawing straight lines, consisting of an elongated piece of rigid or semi-rigid material marked with units for measurement. Device that allows one or more physical dimensions of a sample or specimen to be determined by visible comparison against marked graduations in units of measurement of dimension length.

[[table of contents](#) | [back to top](#)]

Project Information

RUI: The role of ecological memory in nearshore seagrass beds affected by multiple stressors (EcoMem Project)

Coverage: Florida Panhandle

NSF Award Abstract:

This project seeks to determine how ecological memory, shaped by an extreme disturbance, informs the

response of coastal ecosystems to multiple stressors at population, community, and ecosystem levels. Seagrass ecosystems are among the most highly productive ecosystems on earth, yet are vulnerable to disturbance by both human activity and natural processes. Hurricane Dorian was a Category 5 hurricane that hit the Bahamas in 2019. By comparing seagrass communities in the direct path of the storm with neighboring areas that were less impacted, this project is evaluating how ecological memory might affect responses of seagrass ecosystems to common human-caused and natural stressors. The investigators are early-career scientists, and results from this study are likely to inform conservation, management, and restoration of seagrass ecosystems. They are providing substantial educational opportunities for students in the United States and in the Bahamas, including virtual and hands-on field research experiences for undergraduate students, some from groups traditionally underrepresented in science. Facilitated by Friends of the Environment, a local NGO on Abaco Island, virtual reality videos and curricula will also enhance STEM educational opportunities for Bahamian high school students

Seagrass ecosystems, a widespread and ecologically important nearshore system, may be shaped by the ecological memory of past disturbances. These legacies may influence how seagrass ecosystems respond to environmental change. The investigators will conduct new research that complements seven years of existing data in a study system in the path of Hurricane Dorian in the Bahamas to assess how ecological memory shapes the response of coastal seagrass beds at multiple levels of biological organization. They are using a combination of modeling, field observations, field experiments, and laboratory analyses to compare highly and minimally hurricane-impacted sites to determine: the distribution and relative abundance of three seagrass species; the relative abundance and species diversity of naturally occurring invertebrate and vertebrate grazers; overall species richness, functional diversity, and habitat complexity of each field site; seagrass growth rates and primary productivity; and abiotic environmental characteristics — irradiance, temperature, and nutrient content— of ambient seawater. They will sample twenty plots per site each quarter—including unaltered controls and experimental plots simulating mechanical damage, increased grazing pressure, and both mechanical damage and grazing. The goal is to provide a better understanding of how ecological memory drives the outcome of current ecological processes, which in turn will inform conservation and restoration efforts as seagrasses continue to decline globally.

This award reflects NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.

This award is funded in whole or in part under the American Rescue Plan Act of 2021 (Public Law 117-2).

[[table of contents](#) | [back to top](#)]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-2045212

[[table of contents](#) | [back to top](#)]