Wave height data from an artificial reef in Jupiter, FL acquired with an ADCP from July 18 August 19, 2020.

Website: https://www.bco-dmo.org/dataset/858542
Data Type: Other Field Results
Version: 1
Version Date: 2023-01-27

Project
» Collaborative Research: RAPID: Storm and tropical cyclone effects on the spawning activity, larval dispersal, and ecosystem impacts of an endangered marine predator (Storm effect on predator)

Contributors	Affiliation	Role
Papastamatiou, Yannis	Florida International University (FIU)	Principal Investigator, Contact
Soenen, Karen	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Wave height data from an artificial reef in Jupiter, FL acquired with an ADCP from July 18 August 19, 2020.

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Coverage

Spatial Extent: **Lat**:26.97783 **Lon**:-80.02483
Temporal Extent: 2020-07-07 - 2020-12-05

Dataset Description

Data have been published “as is”. Final review by the data submitter was not received after it was imported into the BCO-DMO data system.
*** Parameter descriptions are not complete**
* **No confirmation on time zone of the data (assumption: UTC time).**

Methods & Sampling

An Acoustic Doppler Current Profiler (ADCP) was deployed at the MG111 barge between 7 July and 5 December 2020. The instrument was programmed to collect 512 samples at 2Hz every hour in 50cm vertical bins. Operating frequency was 1MHz. Current velocity (cm s-1) and direction (degrees), water temperature (°C), wave height (m), wave direction (degrees), and wave period (s) were recorded.

Data Processing Description

Data are provided as downloaded from instrument. Wave height must be processed further to derive wave height, energy, and period information.

BCO-DMO processing notes:

- Added ISO_DateTime_UTC parameter. NOTE: the column seconds has decimal seconds in it. However the ISO_DateTime_UTC variable has not. Seconds were rounded to nearest whole number.
- Added latitude and longitude of ADCP location.

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Data Files

File
wave_height.csv (Comma Separated Values (.csv), 55.09 MB) MD5:579d1ee47f3072d0744771677896f1aa Primary data file for dataset ID 858542

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Related Datasets

IsPartOf

Papastamatiou, Y. (2023) **Current Velocity data from an artificial reef in Jupiter, FL acquired with an ADCP from July 18 until December 4, 2020.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2023-01-27 doi:10.26008/1912/bco-dmo.864372.1 [view at BCO-DMO]
Relationship Description: Current velocity acquired with same ADCP at same time

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Parameters

Parameter	Description	Units
count	?	?
source	?	?
longitude	Longitude of ADCP location	decimal degrees
latitude	Latitude of ADCP location	decimal degrees
year	Sampling year	unitless
month	Sampling month	unitless

day	Sampling day	unitless
hour	Sampling hour	unitless
min	Sampling minute	unitless
second	Sampling seconds (decimal seconds)	unitless
ISO_DateTime_UTC	ISO_DateTime_UTC	unitless
pressure	pressure, depth in meters	meters
ast_dist1	?	?
ast_dist2	?	?
ast_quality	?	?
analog	Analog input	counts
vel_beam1_x_E	Velocity beam 1	meters per seconds (m/s)
vel_beam2_y_N	Velocity beam 2	meters per seconds (m/s)
vel_beam3_Up	Velocity beam 3	meters per seconds (m/s)
Amp_beam1	Amplitude beam 1	counts
Amp_beam2	Amplitude beam 2	counts
Amp_beam3	Amplitude beam 3	counts

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Instruments

Dataset-specific Instrument Name	NORTEK Acoustic Wave and Current Profiler – 1 MHz
Generic Instrument Name	Acoustic Wave And Current Profiler
Dataset-specific Description	NORTEK Acoustic Wave and Current Profiler – 1 MHz
Generic Instrument Description	A family of instruments that simultaneously measure current profiles and wave height and direction designed for coastal monitoring.

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Project Information

Collaborative Research: RAPID: Storm and tropical cyclone effects on the spawning activity, larval dispersal, and ecosystem impacts of an endangered marine predator (Storm effect on predator)

Coverage: Jupiter, Florida; and Bahamas

NSF Award Abstract:

Many species of reef fish form large seasonal gatherings at specific locations to spawn. Such aggregations may lead to population overfishing if not well managed. Additionally, spawning aggregations in shallow coastal areas may also be susceptible to prolonged surge, high volumes of freshwater run-off and potentially changes in salinity associated with large storms and tropical cyclones. Yet, the impact from such events, which are becoming increasingly prevalent, has not been studied. This study investigates the impacts of hurricane Dorian on spawning activity of the endangered goliath grouper (Epinephelus itajara) fish species off the southeast coast of Florida. The broader impacts of the project relate to its value to inform fisheries management plans for goliath grouper. The project supports two early career faculty members and training of a postdoctoral researcher, a graduate student, and several undergraduate students at Florida International University.

Hurricane Dorian occurred at the peak of goliath grouper's spawning aggregation in Florida's shallow waters. This project takes advantage of ongoing acoustic surveys since 2017, telemetry, biophysical modelling, and behavioral studies of goliath grouper at spawning sites to assess how hurricane Dorian: 1) influenced the duration of spawning events and the size of aggregations, 2) affected individual residency to spawning sites and spawning behavior, 3) changed the dispersal patterns of goliath grouper larvae and identify nursery habitats with/without storm or hurricane events, and 4) influenced trophic cascades at the reef ecosystem level due to goliath grouper spawning aggregations as determined by changes on lower trophic level foraging rates and the subsequent changes to the benthos. The combination of methods provide insight into how storms affects spawning behavior from the individual to the group level, and how subsequent larval recruitment may be influenced. Finally, this project tests the utility of acceleration sensors for identifying spawning behavior in free ranging fishes, which will be of major significance to spawning studies across taxa.

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.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-2006293
NSF Division of Ocean Sciences (NSF OCE)	OCE-2006295

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