Current Velocity data from an artificial reef in Jupiter, FL acquired with an ADCP from July 18 until December 4, 2020.

Website: https://www.bco-dmo.org/dataset/864372
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
Current Velocity data from an artificial reef in Jupiter, FL acquired with an ADCP from July 18 until December 4, 2020

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Coverage

Spatial Extent: **Lat**:26.97783 **Lon**:-80.02483
Temporal Extent: 2020-07-18 - 2020-08-19

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.

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.

Sampling location: East of Jupiter, Florida (N 27.0000, W 80.0000) on an artificial reef MG111 Barge (18m depth).

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:

- Adjusted column names to comply with database requirements
- Added ISO_Date
- Added latitude and longitude of ADCP location

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Data Files

File
current_velocity.csv (Comma Separated Values (.csv), 1.82 MB) MD5:9a4edddb85d7df2b791a432df8a5a61a Primary data file for dataset ID 864372

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Related Datasets

HasPart

Papastamatiou, Y. (2023) **Wave height data from an artificial reef in Jupiter, FL acquired with an ADCP from July 18 August 19, 2020.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2023-01-27 doi:10.26008/1912/bco-dmo.858542.1 [view at BCO-DMO]
Relationship Description: Wave height acquired with same ADCP at same time

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Parameters

Parameter	Description	Units
index	index	unitless
latitude	latitude of ADCP location	decimal degrees
longitude	longitude of ADCP location	decimal degrees
ISO_Date	Date and Time	unitless
Battery	Battery voltage	volts (V)
Heading	Heading	degrees
Pitch	Pitch	degrees
Roll	Roll	degrees
Pressure	Pressure, depth in meters	meters (m)
Temperature	Water temperature	degrees Celsius (°C)
Speed_1	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)

Dir_1	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_2	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_2	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_3	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_3	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_4	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_4	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_5	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_5	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_6	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_6	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_7	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_7	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_8	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_8	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_9	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_9	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_10	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_10	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_11	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_11	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_12	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_12	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_13	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_13	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees

Speed_14	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_14	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_15	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_15	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_16	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_16	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_17	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_17	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_18	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_18	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_19	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_19	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_20	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_20	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_21	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_21	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_22	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_22	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_23	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_23	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_24	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_24	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_25	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_25	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees

Speed_26	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_26	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_27	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_27	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_28	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_28	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_29	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_29	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_30	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_30	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_31	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_31	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_32	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_32	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_33	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_33	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_34	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_34	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_35	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_35	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_36	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_36	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_37	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_37	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees

Speed_38	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_38	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_39	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_39	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Speed_40	Speed cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	meters per second (m/s)
Dir_40	Direction cell. Water depth was approximately 18m. Data reported beyond that range should be excluded.	degrees
Source_File	Name source file	unitless

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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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