Benthic cover transects sampled between July 2018 and December, 2018

Website: https://www.bco-dmo.org/dataset/816326
Data Type: Other Field Results
Version: 1
Version Date: 2020-06-22

Project
» RAPID: Degradation and Resilience of Seagrass Ecosystem Structure and Function following a Direct Impact by Hurricane Harvey (Harvey Seagrass)

Contributors	Affiliation	Role
Yeager, Lauren	University of Texas - Marine Science Institute (UTMSI)	Principal Investigator, Contact
Dunton, Kenneth	University of Texas - Marine Science Institute (UTMSI)	Co-Principal Investigator
Soenen, Karen	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Benthic cover transects sampled between July and December, 2018.

Table of Contents

Coverage

Spatial Extent: **N**:27.94371 **E**:-97.08205 **S**:27.75471 **W**:-97.15306
Temporal Extent: 2018-07-09 - 2018-12-01

Dataset Description

Benthic cover transects sampled between July 2018 and December 2018

Methods & Sampling

At each sampling site, two replicate, 10 m transects were placed and benthic cover was estimated along each transect in 2 m intervals. Areal percent cover of seagrass species or other benthic type was estimated by direct observation by trained observers, looking down at the seagrass canopy through the water using a 0.25 m2 quadrat framer subdivided into 100 cells with monofilament line.

Data Processing Description

BCO-DMO processing notes:

- Added site locations (lat,lon)

- Adjusted column headers to comply with database requirements

[table of contents | back to top]

Data Files

File
benthic_cover_transects.csv (Comma Separated Values (.csv), 21.75 KB) MD5:e6cafbaace5b35c2724d2aea1310aeff Primary data file for dataset ID 816326

[table of contents | back to top]

Related Publications

Congdon, V. M., Bonsell, C., Cuddy, M. R., & Dunton, K. H. (2019). In the wake of a major hurricane: Differential effects on early vs. late successional seagrass species. Limnology and Oceanography Letters, 4(5), 155–163. doi:10.1002/lol2.10112
Methods

Duffy, J. E., Ziegler, S. L., Campbell, J. E., Bippus, P. M., & Lefcheck, J. S. (2015). Squidpops: A Simple Tool to Crowdsource a Global Map of Marine Predation Intensity. PLOS ONE, 10(11), e0142994. doi:10.1371/journal.pone.0142994
Methods

[table of contents | back to top]

Parameters

Parameter	Description	Units
Site_ID	Site name	unitless
Date	Data surveyed US Central Time	unitless
Site_Latitude	Latitude of site, west is negative	decimal degrees
Site_Longitude	Longitude of site, south is negative	decimal degrees
Transect_number	Transect replicate within a site (1-4)	unitless
Cover_0m_Halodule	Percent cover at the 0 m mark of Halodule benthic cover type	percent (%)
Cover_0m_Thalassia	Percent cover at the 0 m mark of Thalassia benthic cover type	percent (%)
Cover_0m_Syringodium	Percent cover at the 0 m mark of Syringodium benthic cover type	percent (%)
Cover_0m_Ruppia	Percent cover at the 0 m mark of Ruppia benthic cover type	percent (%)
Cover_0m_Wrack	Percent cover at the 0 m mark of Wrack benthic cover type	percent (%)
Cover_0m_Bare	Percent cover at the 0 m mark of Bare benthic cover type	percent (%)
Cover_0m_Halophila	Percent cover at the 0 m mark of Halophila benthic cover type	percent (%)
Cover_0m_Grassalaria	Percent cover at the 0 m mark of Grassalaria benthic cover type	percent (%)
Cover_2m_Halodule	Percent cover at the 2 m mark of Halodule benthic cover type	percent (%)
Cover_2m_Thalassia	Percent cover at the 2 m mark of Thalassia benthic cover type	percent (%)
Cover_2m_Syringodium	Percent cover at the 2 m mark of Syringodium benthic cover type	percent (%)
Cover_2m_Ruppia	Percent cover at the 2 m mark of Ruppia benthic cover type	percent (%)

Cover_2m_Wrack	Percent cover at the 2 m mark of Wrack benthic cover type	percent (%)
Cover_2m_Bare	Percent cover at the 2 m mark of Bare benthic cover type	percent (%)
Cover_2m_Halophila	Percent cover at the 2 m mark of Halophila benthic cover type	percent (%)
Cover_4m_Halodule	Percent cover at the 4 m mark of Halodule benthic cover type	percent (%)
Cover_4m_Thalassia	Percent cover at the 4 m mark of Thalassia benthic cover type	percent (%)
Cover_4m_Syringodium	Percent cover at the 4 m mark of Syringodium benthic cover type	percent (%)
Cover_4m_Ruppia	Percent cover at the 4 m mark of Ruppia benthic cover type	percent (%)
Cover_4m_Wrack	Percent cover at the 4 m mark of Wrack benthic cover type	percent (%)
Cover_4m_Bare	Percent cover at the 4 m mark of Bare benthic cover type	percent (%)
Cover_4m_Halophila	Percent cover at the 4 m mark of Halophila benthic cover type	percent (%)
Cover_6m_Halodule	Percent cover at the 6 m mark of Halodule benthic cover type	percent (%)
Cover_6m_Thalassia	Percent cover at the 6 m mark of Thalassia benthic cover type	percent (%)
Cover_6m_Syringodium	Percent cover at the 6 m mark of Syringodium benthic cover type	percent (%)
Cover_6m_Ruppia	Percent cover at the 6 m mark of Ruppia benthic cover type	percent (%)
Cover_6m_Wrack	Percent cover at the 6 m mark of Wrack benthic cover type	percent (%)
Cover_6m_Bare	Percent cover at the 6 m mark of Bare benthic cover type	percent (%)
Cover_6m_Halophila	Percent cover at the 6 m mark of Halophila benthic cover type	percent (%)
Cover_8m_Halodule	Percent cover at the 8 m mark of Halodule benthic cover type	percent (%)
Cover_8m_Thalassia	Percent cover at the 8 m mark of Thalassia benthic cover type	percent (%)
Cover_8m_Syringodium	Percent cover at the 8 m mark of Syringodium benthic cover type	percent (%)
Cover_8m_Ruppia	Percent cover at the 8 m mark of Ruppia benthic cover type	percent (%)
Cover_8m_Wrack	Percent cover at the 8 m mark of Wrack benthic cover type	percent (%)
Cover_8m_Bare	Percent cover at the 8 m mark of Bare benthic cover type	percent (%)
Cover_8m_Halophila	Percent cover at the 8 m mark of Halophila benthic cover type	percent (%)
Cover_10m_Halodule	Percent cover at the 10 m mark of Halodule benthic cover type	percent (%)
Cover_10m_Thalassia	Percent cover at the 10 m mark of Thalassia benthic cover type	percent (%)
Cover_10m_Syringodium	Percent cover at the 10 m mark of Syringodium benthic cover type	percent (%)
Cover_10m_Ruppia	Percent cover at the 10 m mark of Ruppia benthic cover type	percent (%)
Cover_10m_Wrack	Percent cover at the 10 m mark of Wrack benthic cover type	percent (%)
Cover_10m_Bare	Percent cover at the 10 m mark of Bare benthic cover type	percent (%)
Cover_10m_Halophila	Percent cover at the 10 m mark of Halophila benthic cover type	percent (%)

[table of contents | back to top]

Project Information

RAPID: Degradation and Resilience of Seagrass Ecosystem Structure and Function following a Direct Impact by Hurricane Harvey (Harvey Seagrass)

Coverage: Corpus Christi Bay and Mission-Aransas Bays, Texas, USA

NSF Award Abstract:

Disturbance has long been recognized as a major organizing force in marine communities with the potential to shape biodiversity. Hurricanes provide a natural experiment to understand how acute physical disturbances (storm surge and wind energy) may interact with longer-term changes in environmental conditions (salinity or turbidity) to alter the structure and function of ecological communities. As models indicate that hurricane intensity and precipitation will increase with a warming climate, understanding the response and recovery of coastal ecosystems is of critical societal importance. Harvey made landfall as a Category Four hurricane on the Texas coast on August 25, 2017, bringing extreme rainfall as the storm stalled over the middle Texas coast. The heavy rainfall and freshwater run-off created a low salinity lens that continues to persist two months later. Seagrass ecosystems may be particularly vulnerable because they grow on shallow, soft-sediment bottoms (and thus are easily dislodged or buried) and because seagrasses are sensitive to changes in salinity and turbidity. The societal implications of seagrass loss are well recognized: seagrasses provide highly valuable ecosystem services of large economic value for estuarine and nearshore dependent fisheries, serve as nursery habitats, and sequester gigatons of carbon on a global scale. Using measurements of the health and function of the seagrass and of the community for which it is habitat, the PIs are assessing the impact of the hurricane and of the persistent freshwater lens. Context is provided by looking at non-impacted sites and by six prior years of data.

This project addresses the overarching question: How do intense physical disturbances in conjunction with chronic chemophysical perturbations affect loss and recovery of seagrass community structure and function, including local production, trophic linkages, and metazoan community diversity? To understand the impacts of Hurricane Harvey on seagrass ecosystems across the middle Texas coast, the investigators are (1) documenting losses in physical habitat structure, (2) teasing apart independent and interactive effects of multiple stressors associated with storm events on biodiversity and ecosystem function, and (3) identifying factors that promote resilience following disturbance. A state-wide seagrass monitoring program with six years of data from areas within Harvey's path and surrounding seagrass systems will provide invaluable context. The investigators are measuring seagrass structure, employing a Before-After-Control-Impact design at sites that experienced severe physical damage and appropriate reference sites. In situ loggers deployed after the storm track the evolution of the low salinity event together with seagrass physiological stress measurements (e.g. chlorophyll fluorescence, pigment loss, reduced growth). Changes in seagrass habitat function is assessed through measurements of faunal biodiversity within impacted and reference sites sampled via cores, benthic push nets, and seine nets. Tethering assays of seagrass blades and common invertebrate prey enables comparison trophic interactions across sites that vary in disturbance impact. These data are used to create models of ecosystem response to an extreme disturbance event and identify factors that best predict recovery of the physical structure of the habitat and of associated ecosystem functions.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1807143

[table of contents | back to top]