Seagrass percent cover data from long-term monitoring of 20 selected sites sampled through the Texas Seagrass Monitoring program from August 2011 to September 2018.

Website: https://www.bco-dmo.org/dataset/813480
Data Type: Other Field Results
Version: 1
Version Date: 2020-05-29

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
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Abstract
Seagrass percent cover data from long-term monitoring of 20 selected sites sampled through the Texas Seagrass Monitoring program from August 2011 to September 2018.

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Coverage

Spatial Extent: **N**:27.944 **E**:-97.0823 **S**:27.85421 **W**:-97.152246
Temporal Extent: 2011-08-02 - 2018-09-24

Dataset Description

Seagrass percent cover data from long-term monitoring of 20 selected sites sampled through the Texas Seagrass Monitoring program from August 2011 to September 2018.

Methods & Sampling

Species composition and areal coverage were obtained from two replicate quadrat samples per station at two cardinal locations from the vessel boat (starboard-bow and starboard-stern). Percent cover of areal biomass was estimated by direct observation, looking down at the seagrass canopy through the water using a 0.25 m2 quadrat framer subdivided into 100 cells.

Additionally, we include percent cover data from long-term monitoring (2011-2018) of 20 selected sites sampled through the Texas Seagrass Monitoring program. Survey methods are described in Congdon et al. 2019.

Data Processing Description

BCO-DMO processing notes:

- Adusted column headers to comply with database requirements
- Added ISO_Data_Local field

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Data Files

File
seagrass_pct_cover.csv (Comma Separated Values (.csv), 9.66 KB) MD5:9a1c9f4428a032e3d946e897e820f50d Primary data file for dataset ID 813480

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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

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Parameters

Parameter	Description	Units
Site_ID	Site name	unitless
Latitude	Latitude, south is negative	unitless
Longitude	Longitude, west is negative	unitless
Month	Month surveyed	unitless
Day	Day surveyed	unitless
Year	Year surveyed	unitless
PCovHalodule	Percent cover of Halodule wrightii	percentage (%)
PCovThalassia	Percent cover of Thalassia testudinum	percentage (%)
PCovSyringodium	Percent cover of Syringodium filiforme	percentage (%)
PCovHalophila	Percent cover of Halophila spp.	percentage (%)
PCovRuppia	Percent cover of Ruppia marina	percentage (%)
PCovAllGrass	Percent cover of all seagrass	percentage (%)
PCovBare	Percent cover of bare substrate	percentage (%)
ISO_Date_Local	Date in ISO format YYYY/mm/dd in US central Time.	unitless

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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.

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Funding

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

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