Blade morphometrics of selected shoots sampled in the Corpus Christi Bay and Mission-Aransas Bays, Texas, USA between November 2017 and February 2018.

Website: https://www.bco-dmo.org/dataset/814258
Data Type: Other Field Results
Version: 1
Version Date: 2020-06-04

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

Contributors	Affiliation	Role
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Abstract
Measured blade morphometrics (width and length) to nearest millimeter of up to six blades for five random shoots sampled in the Corpus Christi Bay and Mission-Aransas Bays, Texas, USA between November 2017 and February 2018.

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Coverage

Temporal Extent: 2017-11-03 - 2018-02-22

Dataset Description

Measured blade morphometrics (width and length) to nearest millimeter of up to six blades for five random shoots sampled in the Corpus Christi Bay and Mission-Aransas Bays, Texas, USA between November 2017 and February 2018.

Methods & Sampling

Field Procedures:

At each station, two replicate cores were used for estimates of above- and below-ground biomass following percent cover observations. A 15 cm inner diameter (ID) core was used to sample the seagrass species present (Thalassia, Halodule, Syringodium, Ruppia or Halophila) present within each quadrat. A PVC (polyvinyl chloride) core was used for the collection of below-ground and above-ground material. Care was taken to keep only the shoots that reside within the diameter of the core. Following placement of the 15 cm core on the seabed, the rubber stopper was removed from the top of the core. Before pressing the core into the sediment, the diver ran their fingers carefully around the bottom of the core. If grass was pulled under the core, it is removed. The diver pressed and twisted the core down into the sediment (10-15 cm depth). The stopper was re-installed in the 15 cm core, and the core was rocked back and forth. The diver worked their hand under the core and removed it from the grass bed, making sure to keep their hand under the bottom of the core in order to prevent loss of sample.. Samples were then placed in pre-labeled Ziploc bags and immediately placed on ice.

Laboratory Procedures:

Cores samples were kept in a refrigerator (4°C) until processing within one week of collection. Cores samples were sieved with filtered seawater through a 500 µm sieve to remove excess sediment. Seagrass tissue was carefully separated from infauna and shell harsh before further processing.

Prior to processing the samples for above- and below-ground biomass, we measured blade morphometrics (width and length) to nearest millimeter of up to six blades for five random shoots. Aboveground tissue, including leaves, sheath material and floral parts, were separated from all below-ground tissues. Leaves were carefully cleaned of all attached biota by scraping with a wet cloth or razor blade prior to analysis. All shoots were counted and scaled to the core area in order to obtain accurate estimates of shoot density. The below-ground and above-ground tissues were then placed in separate aluminum envelopes for drying. Sample labels included information on site, species, date collected, shoots or R/R, and number of shoots. Any dead plant material was discarded prior to drying. The live tissue (shoots, roots, and rhizomes) were dried to a constant weight in a 60°C oven and weighed to the nearest milligram. The drying process usually took 3-5 days. Lastly, the dry weight biomass for above- and below-ground tissues was used to calculate a root:shoot ratio.

Data Processing Description

BCO-DMO processing notes:

- Adjusted dates to standard ISO format (yyyy-mm-dd)
- Adjusted column headers to comply with database requirements

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Data Files

File
shoots.csv (Comma Separated Values (.csv), 223.97 KB) MD5:d6a4ddc756b1501ae27db9aa811a8948 Primary data file for dataset ID 814258

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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
Sample_ID	Sample ID: Site + quadrat #	unitless
Site	Site; CCB = Corpus christi bay; NERR = Mission-Aransas National Esturarin Research Reserve	unitless
Replicate	Quadrat #, Q1 or Q2	unitless
Sampling_Month	Sampling month	unitless
Sampling_Year	Sampling year	unitless
Date_Collected	Collection data	unitless
Date_Processed	Date sample was processed	unitless
Processed_By	Person who processed the sample	unitless
Total_Shoots	Number of shoots within the core	unitless
Shoot	Shoot replicate from the core (1-5)	unitless
Blade1_length	Length of blade 1 from the shoot in mm	millimeters (mm)
Blade1_width	Width of blade 1 from the shoot in mm	millimeters (mm)
Blade1_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 1	unitless
Blade1_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 1	unitless
Blade2_length	Length of blade 2 from the shoot in mm	millimeters (mm)
Blade2_width	Width of blade 2 from the shoot in mm	millimeters (mm)
Blade2_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 2	unitless
Blade2_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 2	unitless
Blade3_length	Length of blade 3 from the shoot in mm	millimeters (mm)
Blade3_width	Width of blade 3 from the shoot in mm	millimeters (mm)
Blade3_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 3	unitless
Blade3_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 3	unitless
Blade4_length	Length of blade 4 from the shoot in mm	millimeters (mm)
Blade4_width	Width of blade 4 from the shoot in mm	millimeters (mm)
Blade4_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 4	unitless
Blade4_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 4	unitless
Blade5_length	Length of blade 5 from the shoot in mm	millimeters (mm)
Blade5_width	Width of blade 5 from the shoot in mm	millimeters (mm)
Blade5_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 5	unitless

Blade5_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 5	unitless
Blade6_length	Length of blade 6 from the shoot in mm	millimeters (mm)
Blade_6_width	Width of blade 6 from the shoot in mm	millimeters (mm)
Blade6_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 6	unitless
Blade6_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 6	unitless
Blade7_length	Length of blade 7 from the shoot in mm	millimeters (mm)
Blade7_width	Width of blade 7 from the shoot in mm	millimeters (mm)
Blade7_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 7	unitless
Blade7_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 7	unitless
Blade8_length	Length of blade 8 from the shoot in mm	millimeters (mm)
Blade8_width	Width of blade 8 from the shoot in mm	millimeters (mm)
Blade8_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 8	unitless
Blade8_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 8	unitless
Blade9_length	Length of blade 9 from the shoot in mm	millimeters (mm)
Blade9_width	Width of blade 9 from the shoot in mm	millimeters (mm)
Blade9_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 9	unitless
Blade9_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 9	unitless
Blade_10_length	Length of blade 10 from the shoot in mm	millimeters (mm)
Blade_10_width	Width of blade 10 from the shoot in mm	millimeters (mm)
Blade10_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 10	unitless
Blade10_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 10	unitless
Blade11_length	Length of blade 11 from the shoot in mm	millimeters (mm)
Blade11_width	Width of blade 11 from the shoot in mm	millimeters (mm)
Blade11_Pre_scrape_grazing_scars	Number of grazing scar identified pre-scaping on blade 11	unitless
Blade11_Post_scrape_grazing_scars	Number of grazing scar identified post-scaping on blade 11	unitless
QC	Person who quality checked the datasheet	unitless
Notes	Notes	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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