Infauna description of biomass cores sampled in the Corpus Christi Bay and Mission-Aransas Bays, Texas, USA between November 2017 and November 2018.

Website: https://www.bco-dmo.org/dataset/816622
Data Type: Other Field Results
Version: 1
Version Date: 2020-06-29

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
Dunton, Kenneth	University of Texas - Marine Science Institute (UTMSI)	Co-Principal Investigator
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Abstract
Infauna description of biomass cores sampled in the Corpus Christi Bay and Mission-Aransas Bays, Texas, USA between November 2017 and November 2018.

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Coverage

Spatial Extent: **N**:27.94371 **E**:-97.08205 **S**:27.75471 **W**:-97.15306
Temporal Extent: 2017 - 2018

Dataset Description

Infauna description of biomass cores sampled in the Corpus Christi Bay and Mission-Aransas Bays, Texas, USA between November 2017 and November 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.

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.

Infauna were picked from shell hash and remaining material. In cores with large amounts of shell hash and/or small molluscs cores were subsampled down to 1/10 of the original sample (noted in data spreadsheet). Infauna were identified to the lowest possible taxonomic level and enumerated.

Data Processing Description

BCO-DMO processing notes:

- Concatenate data sources: infauna and edge_interior
- Reworked the columns Date_Processed and Date_Collected to have dates in standard ISO format (yyy-mm-dd)
- Adjusted headers to comply with database requirements

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Data Files

File
infauna_concat.csv (Comma Separated Values (.csv), 41.72 KB) MD5:142145181fa9a7c8d4e6b870937a4375 Primary data file for dataset ID 816622

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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	Unique sample indentifier	unitless
Site	Site name	unitless
resource_name	Description infauna or "edge_interior'	unitless
Site_Latitude	Latitude of site, south is negative	decimal degrees
Site_Longitude	Longitude of site, west is negative	decimal degrees
Replicate	Replicate number (Q1 or Q2)	unitless
Date_Collected	Date sample was collected	unitless
Core_location	Where core was located relative to seagrass habitat (edge or interior)	unitless
Core_size	Size of core used for sampling	unitless
Date_Processed	Date sample was processed	unitless
Processed_By	Name of person who processed the sample	unitless
Subsample	Was subsampling used for processing C. astratum? (Y = Yes, N = No)	unitless
Random_sample_section_number	Cell # of randomly selected subsample	unitless
Ratio	Ratio of subsample to entire sample volume (e.g. 0.1 = 1/10 of sample	unitless
C_atratum_in_subsample	Number of C. atratum in subsample	unitless
Extrapolated_C_atratum	Number of C. atratum extrapolated to be in entire sample	unitless
Amphipoda	Amphipoda: Number of individuals in sample	unitless
Acteocina_spp	Acteocina spp.: Number of individuals in sample	unitless

Alpheus_spp	Alpheus spp.: Number of individuals in sample	unitless
Amygdalum_papyrium	Amygdalum papyrium: Number of individuals in sample	unitless
Angulus_tampaensis	Angulus tampaensis: Number of individuals in sample	unitless
Argopecten_irradians_amplicostatus	Argopecten irradians amplicostatus: Number of individuals in sample	unitless
Astyris_lunata	Astyris lunata: Number of individuals in sample	unitless
Astyris_multilineata	Astyris multilineata: Number of individuals in sample	unitless
Bittolium_varium	Bittolium varium: Number of individuals in sample	unitless
Brachiodontes_exustus	Brachiodontes exustus: Number of individuals in sample	unitless
Bulla_striata	Bulla striata: Number of individuals in sample	unitless
Calcinus_tibicen	Calcinus tibicen: Number of individuals in sample	unitless
Calinectes_sapidus	Calinectes sapidus: Number of individuals in sample	unitless
Calinectes_similis	Calinectes similis: Number of individuals in sample	unitless
Caryocorbula_contracta	Caryocorbula contracta: Number of individuals in sample	unitless
Cerithium_atratum_lutosum	Cerithium atratum/lutosum : Number of individuals in sample	unitless
Cerithium_translirata	Cerithium translirata: Number of individuals in sample	unitless
Cirripedia	Cirripedia: Number of individuals in sample	unitless
Chione_elevata	Chione elevata: Number of individuals in sample	unitless
Clibanarius_vitattus	Clibanarius vitattus: Number of individuals in sample	unitless

Costoanachis_avara	Costoanachis avara: Number of individuals in sample	unitless
Costoanachis_translirata	Costoanachis translirata: Number of individuals in sample	unitless
Crassostrea_virginica	Crassostrea virginica: Number of individuals in sample	unitless
Crepidula_convexa	Crepidula convexa: Number of individuals in sample	unitless
Crepidula_fornicata	Crepidula fornicata: Number of individuals in sample	unitless
Panopeidae	Panopeidae: Number of individuals in sample	unitless
Gobionellus_boleosoma	Gobionellus boleosoma: Number of individuals in sample	unitless
Haminoea_antillarum	Haminoea antillarum: Number of individuals in sample	unitless
Haminoea_cf_elegans	Haminoea cf. elegans: Number of individuals in sample	unitless
Hippolyte_spp	Hippolyte spp.: Number of individuals in sample	unitless
Holothuroidea	Holothuroidea: Number of individuals in sample	unitless
Ischnochiton_papillosus	Ischnochiton papillosus: Number of individuals in sample	unitless
Isopoda	Isopoda: Number of individuals in sample	unitless
Laevicardium_mortoni	Laevicardium mortoni: Number of individuals in sample	unitless
Laevicardium_pictum	Laevicardium pictum: Number of individuals in sample	unitless
Laevicardium_serratum	Laevicardium serratum: Number of individuals in sample	unitless
Lucapina_aegis	Lucapina aegis: Number of individuals in sample	unitless
Lyonsia_hyalina	Lyonsia hyalina: Number of individuals in sample	unitless
Macoma_mitchelli	Macoma mitchelli: Number of individuals in sample	unitless

Macoma_psuedomera	Macoma psuedomera: Number of individuals in sample	unitless
Macoma_tenta	Macoma tenta: Number of individuals in sample	unitless
Mulinia_lateralis	Mulinia lateralis: Number of individuals in sample	unitless
Myrophis_punctatus	Myrophis punctatus: Number of individuals in sample	unitless
Nassarius_vibex	Nassarius vibex: Number of individuals in sample	unitless
Neritina_virginea	Neritina virginea: Number of individuals in sample	unitless
Pagurus_annulipes	Pagurus annulipes: Number of individuals in sample	unitless
Parvilucina_crenella	Parvilucina crenella: Number of individuals in sample	unitless
Penaus_spp	Penaus spp.: Number of individuals in sample	unitless
Phacoides_pectinata	Phacoides pectinata: Number of individuals in sample	unitless
Pinnixa_chaetopterana	Pinnixa chaetopterana: Number of individuals in sample	unitless
Pitar_cf_munda	Pitar cf. munda: Number of individuals in sample	unitless
Polychaeta_head_or_whole	Polychaeta head or whole: Number of individuals in sample	unitless
Polyplacophora	Polyplacophora: Number of individuals in sample	unitless
Porifera	Porifera: Number of individuals in sample	unitless
Pyrogocythara_plicosa	Pyrogocythara plicosa: Number of individuals in sample	unitless
Solen_viriduis	Solen viriduis: Number of individuals in sample	unitless
Stenoplax_bahamensis	Stenoplax bahamensis: Number of individuals in sample	unitless
Tagelus_divisus	Tagelus divisus: Number of individuals in sample	unitless

Unknown	Number of individuals of unknown taxa in sample	unitless
Total	Total number of organims in sample	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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