Squidpop consumption assays collected in the Redfish Bay area and the Corpus Christi bay between November 2017 and December 2018

Website: https://www.bco-dmo.org/dataset/815393
Data Type: Other Field Results
Version: 1
Version Date: 2020-06-16

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
Squidpop consumption assays collected in the Redfish Bay area and the Corpus Christi bay between November 2017 and December 2018

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Coverage

Spatial Extent: **N**:27.94371 **E**:-97.08205 **S**:27.75471 **W**:-97.15306
Temporal Extent: 2017-11-03 - 2018-12-01

Dataset Description

Squidpop consumption assays collected in the Redfish Bay area and the Corpus Christi bay between November 2017 and December 2018

Methods & Sampling

Sites were selected to correspond to long-term monitoring sites from the statewide Texas Seagrass monitoring data set (see Congdon et al. 2019 for a more detailed description of pre and post Hurricane sampling sites). We focused on 20 of the long-term sampling sites that varied in magnitude and type of impact from Hurricane Harvey. Eight of the sites were located in southern Aransas Bay (Redfish Bay area) experienced high freshwater runoff and longer retention time of freshwater (> 2 months). These sites included 4 that experienced high degrees of physical seagrass damage (>50 seagrass cover loss) and those with minimal seagrass loss (< 20% change in percent cover). Eight of the sites were located in northern Corpus Christi Bay (Redfish Bay area) and experienced freshwater runoff with shorter retention time (< 6 weeks). These sites included 4 that experienced high degrees of physical seagrass damage (>50 seagrass cover loss) and those with minimal seagrass loss (< 20% change in percent cover). Finally, 4 sites were located in the East Flat region of Corpus Christi bay which was further outside of the major impact zone and experienced lower degrees of seagrass loss and freshwater runoff. The 16 Redfish Bay area sites were sampled in November 2017, March 2018, July 2018, and November 2018. The East flats sites were sampled during July and November 2018.

To assess relative scavenging/predation rates at each site, we use Squidpop consumption assays as described in Duffy et al. 2015. Squidpops were placed 10cm above the sediment surface and set every 2 m along a 20 m transect at each site. After 1 h, squidpops were scored for presence/absence of dried squid and the bottom type (seagrass/bare) was recorded.

Data Processing Description

BCO-DMO processing notes:

- Added lat/lon of sampling sites from location dataset
- Adjusted time formats (HH:MM)
- Adjusted data formats (YYYY-MM-DD)
- Adjusted column headers to comply with database requirement

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Data Files

File
squidpop.csv(Comma Separated Values (.csv), 7.29 KB) MD5:53f614c74a441ce2089adcd42ae7821b Primary data file for dataset ID 815393

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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_Site	Site latitude, south is negative	unitless
Longitude_Site	Site longitude, west is negative	unitless
Date	Date sampled	unitless
Squidpop_start_time	Time squid pop assay was deployed (US Central local time)	unitless
Squidpop_end_time	Time squid pop assay was retrieved (US Central local time)	unitless
PA_Squidpop_1	Presence (P) or absence (A) of dried squid on squid pop replicate 1 after 1 hour soak time	unitless
Squidpop_cover_1	Benthic cover type of squid pop replicate 1 (note not recorded in November 2017)	unitless
PA_Squidpop_2	Presence (P) or absence (A) of dried squid on squid pop replicate 2 after 1 hour soak time	unitless
Squidpop_cover_2	Benthic cover type of squid pop replicate 2 (note not recorded in November 2017)	unitless
PA_Squidpop_3	Presence (P) or absence (A) of dried squid on squid pop replicate 3 after 1 hour soak time	unitless
Squidpop_cover_3	Benthic cover type of squid pop replicate 3 (note not recorded in November 2017)	unitless
PA_Squidpop_4	Presence (P) or absence (A) of dried squid on squid pop replicate 4 after 1 hour soak time	unitless
Squidpop_cover_4	Benthic cover type of squid pop replicate 4 (note not recorded in November 2017)	unitless
PA_Squidpop_5	Presence (P) or absence (A) of dried squid on squid pop replicate 5 after 1 hour soak time	unitless
Squidpop_cover_5	Benthic cover type of squid pop replicate 5 (note not recorded in November 2017)	unitless
PA_Squidpop_6	Presence (P) or absence (A) of dried squid on squid pop replicate 6 after 1 hour soak time	unitless
Squidpop_cover_6	Benthic cover type of squid pop replicate 6 (note not recorded in November 2017)	unitless
PA_Squidpop_7	Presence (P) or absence (A) of dried squid on squid pop replicate 7 after 1 hour soak time	unitless
Squidpop_cover_7	Benthic cover type of squid pop replicate 7 (note not recorded in November 2017)	unitless
PA_Squidpop_8	Presence (P) or absence (A) of dried squid on squid pop replicate 8 after 1 hour soak time	unitless
Squidpop_cover_8	Benthic cover type of squid pop replicate 8 (note not recorded in November 2017)	unitless
PA_Squidpop_9	Presence (P) or absence (A) of dried squid on squid pop replicate 9 after 1 hour soak time	unitless
Squidpop_cover_9	Benthic cover type of squid pop replicate 9 (note not recorded in November 2017)	unitless
PA_Squidpop_10	Presence (P) or absence (A) of dried squid on squid pop replicate 10 after 1 hour soak time	unitless
Squidpop_cover_10	Benthic cover type of squid pop replicate 10 (note not recorded in November 2017)	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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