Metadata template for datasets of *LO-Letters* articles

Metadata provides sufficient structured information for other scientists to understand and use your data. To prepare your metadata, you will need the following information:

- Title of the dataset and an abstract that describes the study and associated data in text form
- Keywords
- People and organizations associated with the data
- Usage Rights
- Research Project information
- Coverage details (including spatial coverage of the sample sites and temporal coverage)
- Methods and Sampling
- Detailed description of the variables and units for each column of the dataset

Instructions:

1. Fill in the 2 tables below for your dataset that you will be making available. If you have more than one dataset, then fill both tables for each dataset separately, although, most of the information will be the same for Table 1.
2. Save this word file in either Word or PDF format and upload your metadata to the *LO-Letters* website when you submit your manuscript.
3. Timing of depositing your data in a repository: You should plan on submitting your data to a repository at the time of submission, however, you do not need to provide the link to the data until the paper is provisionally-accepted. During the review process, we will review your metadata. If your paper has been accepted, then we require the data to be posted in a data repository for our review. In some circumstances, reviewers may ask for the data during the review stage, at which point you need to make it available.

Congdon V. 2019. The effect of hurricane force winds on seagrass abundance and sediment physicochemistry. https://data.nodc.noaa.gov/cgi-bin/iso?id=gov.noaa.nodc:0181898. Environmental Data Initiative. Dataset accessed 01/05/2019.

Table 1. Description of the fields needed to describe the creation of your dataset.

Title of dataset	*The effect of hurricane force winds on seagrass abundance and sediment physicochemistry*
URL of dataset	*Data and metadata are published by the National Oceanic and Atmospheric Association National Centers for Environmental Information at https://data.nodc.noaa.gov/cgi-bin/iso?id=gov.noaa.nodc:0181898* *Data and metadata are also available at http://www.texasseagrass.org*
Abstract	*This dataset contains raw TIER 2 sampling data from 2015 and 2017 for Texas coastal waters related to seagrasses. Seagrass parameters measured include canopy height and percent cover. Seagrass species represented within the data include Halodule wrightii and Thalassia testudinum. Sampling takes place at 525 permanent stations in Aransas and Redfish Bays, Corpus Christi Bay, and the*

	Upper and Lower Laguna Madre. Latitudes and longitudes for station locations are based on the NAD83 datum. There was no sampling in 2016. Additionally, this dataset also contains sediment data collected in Redfish Bay in 2011/2012 and 2017. Sediment parameters measured include total organic carbon, ammonium concentrations, and grain size. This dataset also includes interpolated wind speed data values using the recorded maximum sustained gusts of Hurricane Harvey. All data are provided in CSV format.
Keywords	*Seagrass monitoring, percent cover, canopy height, sediment grain size, sediment total organic carbon, sediment ammonium concentrations, maximum sustained wind gusts, sediment physicochemistry*
Dataset lead author	*Victoria M. Congdon (University of Texas at Austin – Marine Science Institute)* *Kenneth H. Dunton (University of Texas at Austin – Marine Science Institute)* *Timothy L. Whiteaker (University of Texas at Austin)*
Position of data author	*Graduate Student* *Principle Investigator* *Research Scientist*
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Position of primary contact person	*Principal Investigator*
Address of primary contact person	*750 Channel View Drive, Port Aransas, Texas 78373*
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Organization associated with the data	*N/A*
Usage Rights	*Publicly available and free to use*
Geographic region	*This study spans the Texas coast, from the Coastal Bend to the Laguna Madre. These regions include the Mission-Aransas National Estuarine Research Reserve, Corpus Christi Bay, Upper Laguna Madre and Lower Laguna Madre.*
Geographic coverage	*Boundaries are in decimal degrees and range from -90 to 90 for latitude and -180*

	to 180 to longitude. *Northern Boundary: 28.113* *Southern Boundary: 26.000* *Western Boundary: -97.508* *Eastern Boundary: -96.845*
Temporal coverage - Begin date	*2015-08-11 (YYYY-MM-DD)*
Temporal coverage - End date	*2017-11-17 (YYYY-MM-DD)*
General study design	*In 2015 and 2017, the Texas Seagrass Monitoring Program sampled 525 permanent stations along the Texas coast. We employed a restricted random sampling design where we generated one random, fixed station within a tessellated hexagon (Coastal Bend: 500-m edge; Laguna Madre 750-m edge). Hexagons were created using the National Oceanic and Atmospheric Administration's 2004/2007 Benthic Habitat Assessment (http://coast.noaa.gov/digitalcoast/data/benthiccover/) with a minimum threshold of 50% cover. As part of the Texas Seagrass Monitoring Program, we measured seagrass blade length (canopy height) and percent cover. In 2017, we revisited 126 stations prior to the landfall of Hurricane Harvey. To assess the immediate impacts of the storm on seagrass ecosystems, we re-surveyed those same stations and continued to sample the remainder of our 525 stations. Additionally, we used sediment physicochemical data (total organic carbon, grain size and ammonium concentrations) previously collected in 2011/2012 (pre-Harvey) and compared those values with post-Harvey (2017) sediment measurements.*
Methods description	*To determine seagrass composition at each of the 525 stations, we visually estimated percent cover by species using a 0.25 m^2 quadrat, subdivided into 100 cells, at four ordinal points around a shallow-draft vessel. Percent cover of seagrass species present in each quadrat was defined as the proportion of the frame obscured by vegetation. Immediately following each of the four cover observations, we collected five random shoots for all species present within the quadrat for measurements of blade length. Blade lengths were determined as the photosynthetic portion of the longest blade from each shoot. For subsequent analyses, we focused on the two dominant seagrass species, Halodule wrightii and Thalassia testudinum.* *In 2011 and 2012, sediment cores were collected from three fixed 50-m transects at a reference site within the Coastal Bend (27°54 N, 97°05 W) ranging in depth from 0.3-1.4 m. One core was collected at 10 permanent points along each transect and processed for sediment ammonium. Additionally, at each transect, two cores were collected at the 0 and 50-m point for total organic carbon (TOC) and grain size analysis. In 2017, following Hurricane Harvey, we obtained two sediment cores from 16 stations (n=32) near the 2011/2012 reference site. From each of the 16 stations, we processed one of the cores for porewater ammonium and the second core was subsampled for sediment grain size and TOC. All sediment samples were collected within colonized or previously colonized sediments and extracted using a 10 cm (60 ml) syringe corer, placed on ice, and*

	frozen prior to analyses. For porewater ammonium, we thawed then centrifuged the sediment core and processed the supernatant using the colorimetric techniques in Parsons et al. (1984). We determined sediment grain size fractions by weight using sieving and settling velocity to classify sediment particles (Folk 1961). Shell/sand fractions were classified as particles >63 μm. For the evaluation of organic matter, we used loss-on-ignition; samples were dried at 60 ℃ to a constant weight, weighed, combusted at 550 ℃ for 4 h, and re-weighed.
Laboratory, field, or other analytical methods	
Seagrass percent cover	*Species composition and areal coverage were obtained from four replicate quadrat samples per station at each of the four cardinal locations from the vessel boat (port-stern, port-bow, 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 m^2 quadrat framer subdivided into 100 cells.*
Seagrass canopy height/blade length	*The four corners of the boat (port-stern, port-bow, starboard-bow, and starboard-stern) were used as seagrass sample locations. Measurements were taken approximately 2-4 meters from the boat by tossing a 0.25 m^2 quadrat into the water. Within each quadrat, five random shoots were extracted for canopy height measurements for each seagrass species present. Blade lengths were determined as the photosynthetic portion of the longest blade from each shoot.*
Sediment grain size	*To determine sediment grain size, sand/silt/clay ratios were determined following the methods of Folk (1964). Percent contribution by weight was measured for four components: rubble (shell), sand, silt, and clay. A 20-ml sediment sample was mixed with 100 ml of 3% hydrogen peroxide and 75 ml of de-ionized water to digest organic material in the sample. The sample was then wet sieved through a 63μm mesh stainless steel screen using a vacuum pump and a Millipore Hydrosol SST filter holder to separate rubble and sand from silt and clay. After drying, the rubble (shell) and sand was separated on a 250μm screen. The silt and clay fractions were measured using pipette analysis. Briefly, the settling velocity was used to classify the particles and to determine the percent composition of each fraction, based on weight.*
Sediment total organic carbon	*To determine sediment total organic carbon, samples were homogenized, placed in aluminum weighing tins and dried in a 60 ºC oven (to remove water) for 12-24 hr. Samples were then removed from the oven and placed in a desiccator (to prevent moisture from the air changing the sample weight) to cool to room temperature. Once cooled, samples were weighed to the nearest 0.1 g, and placed in a muffle furnace to combust organic material, at 550 ºC for 4 hr. After cooling samples to room temperature in a desiccator, the samples were reweighed and Loss on Ignition (LOI) was calculated using the following formula, where DW is sample dry weight (in grams):* LOI_{550} *(as a percentage)* $= ((DW_{60} - DW_{550}) / DW_{60}) \times 100$ *The weight loss is proportional to the amount of organic carbon contained in the sample.*

Sediment ammonium concentrations	*To determine sediment porewater ammonium, thawed then centrifuged the sediment core and processed the supernatant using the colorimetric techniques in Parsons et al. (1984). Once sediment samples were thawed, samples were homogenized by stirring with glass rod or squeezing the bag several times. We weighed each sample + centrifuge tube to the nearest 0.1 g and capped each centrifuge tube immediately after weighing to prevent evaporation from the sediment sample. To obtain the sediment porewater, we set the centrifuge to run for 10-20 min (depending on soil moisture) at 10,000 rpm. We used the following reagents: Ultra pure water; Phenol alcohol: dissolved 5 g reagent-grade phenol in 50 ml 95% ethanol; Sodium nitroprusside solution: dissolved 0.5 g sodium nitroprusside in 100 ml ultra pure water; Alkaline solution: dissolved 80 g sodium citrate and 4.0 g NaOH in 400 ml ultra pure water; Sodium hypochlorite: used commercially available hypochlorite (e.g. Ultra Clorox); Oxidizing solution: mixed 5 ml alkaline solution with 1.25 ml of sodium hypochlorite. For the Standard Curve, we added 133.7 mg NH_4Cl (FW = 53.49 g $mole^{-1}$) to a volumetric flask and bring to 500 ml with ultra pure water (= 5 mM). We then added 1 ml of this solution to a volumetric flask and brought to 100 ml with ultra pure water (= 50 μM). Standard curve and reagents were calculated for 2.5 ml samples. We diluted the stock solution as follows:* *We ran at least three replicates (n = 3) for each concentration. μM concentrations were calculated from μg NH_4^+/2.5 ml by multiplying by 22.2 (i.e., (1 μg NH_4^+/2.5 ml) x (1000 ml/L) x (1 μmole NH_4^+/18 μg NH_4^+) = 22.2 μmole/L). To process the samples, we added 2.5 mL of water sample or standard to corresponding test tube. We diluted as necessary with low-ammonia seawater (i.e., "blue water"). For example, for sediments, we diluted 0.5 ml sample with 2.0 ml "blue water". We added 0.1 ml phenol alcohol to the samples, vortexed, and waited one minute. We then added 0.1 ml sodium nitroprusside solution, vortexed, and waited one minute. Next, we added 0.25 ml oxidizing solution, vortexed, and waited one minute. We mixed samples thoroughly, capped or covered the tube with parafilm and allowed the sample to develop for 1 hr in the dark and at room temperature. On the spectrophotometer, we recorded absorbance at 640 nm and ensured to auto zero the spectrophotometer to blue water blanks that had chemicals added to them. We read standards first and again every 10 samples to ensure spectrophotometer was running properly. We regressed samples absorbance to standard curve considering the dilution factor.*

Stock solution	*Blue Water*	*μg NH_4^+/2.5 ml*	*μM NH_4^+*
0.0 ml	*2.5 ml*	*0.00*	*0*
0.5 ml	*2.0 ml*	*0.45*	*10*
1.0 ml	*1.5 ml*	*0.90*	*20*
1.5 ml	*1.0 ml*	*1.35*	*30*
2.0 ml	*0.5 ml*	*1.80*	*40*
2.5 ml	*0.0 ml*	*2.26*	*50*

National Weather Service maximum sustained wind gusts	*We used 10-m maximum sustained wind gusts obtained from 70 weather locations reported by the National Weather Service (NWS; M. Buchanan) in the NOAA National Hurricane Center Hurricane Harvey tropical cyclone report (Blake and Zelinsky 2018). In ArcMap 10.3 (Environmental Systems Research Institute), we imported these wind data and used Inverse-Distance Weighting (IDW) interpolation to assign values to areas between sampling points, weighted by distance. We used 12 sampling stations identified from a variable search radius (100 m^2) to generate a predicted value for each unknown point. We then used the tool 'Extract Values to Points' to extract cell values of the interpolated wind raster for each of the 525 seagrass sampling stations.*
Quality control	*The data were carefully reviewed by all authors.*
Additional information	*See the supporting information for the manuscript for additional details.*

Table 2. Description of the variables (i.e., columns) in the dataset in sufficient detail for another user to understand and use the data. If there are 10 variables (i.e., columns) in the dataset, then there should be 10 rows in this column that describe each column.

Data Table Name: CanHeight.csv
Description: Seagrass blade length

Column name	Definition	Units
The name of the variable in the dataset	*A detailed definition of the variable*	*Units the variable is measured in*
OID2	Ordinal Identifier Number - entered in a continuous serial increasing fashion	1–70800
SiteUniqueID	Year sampled + Station Name	YYYY-NAME
Quadrat #	Quadrat number at fixed locations around sampling vessel (starboard-bow=1, and starboard-stern=2, port-stern=3, port-bow=4)	'1', '2', '3', or '4'
Hw_CanHeight	*Halodule wrighti* blade lengths were determined as the photosynthetic portion of the longest blade from each shoot	centimeter
Tt_CanHeight	*Thalassia testudinum* blade lengths were determined as the photosynthetic portion of the longest blade from each shoot	centimeter
ID1	Identifier number associated with an individual station	1–567
ID2	Station Name	NAME
Latitude	Decimal latitude	degree
Longitude	Decimal longitude	degree
Year	Year the sample was collected	YYYY
System	Area the station is located within	'NERR', 'CCBAY', 'ULM', or 'LLM'
Region	Systems are classified into larger areas (Regions): CB = NERR and CCBAY; ULM; LLM)	'CB', 'ULM', or 'LLM'
Treatment	Sample collected before ('Pre') or after ('Post') the hurricane	'Pre' or 'Post'

Data Table Name: Extracted_nws_winds.csv
Description: Hurricane wind speeds

Column name	Definition	Units
The name of the variable in the dataset	*A detailed definition of the variable*	*Units the variable is measured in*
OID2	Ordinal Identifier Number - entered in a continuous serial increasing fashion	1–525
ID1	Identifier number associated with an individual station	1–567
ID2	Station Name	NAME
Latitude	Decimal latitude	degree
Longitude	Decimal longitude	degree
extracted_nws_winds_kph	Interpolated maximum sustained winds by station	kilometers per hour

Data Table Name: GrainSize.csv
Description: Sediment grain size

Column name	Definition	Units
The name of the variable in the dataset	*A detailed definition of the variable*	*Units the variable is measured in*
OID2	Ordinal Identifier Number - entered in a continuous serial increasing fashion	1–27
Project	Name of the project which samples were collected	'Tier3' or 'RAPID'
Site	Site name	NAME
Transect	Transect number where the sample was collected	'1', '2', '3', or 'na'
Latitude	Decimal latitude	degree
Longitude	Decimal longitude	degree
Date	Date the sample was collected	YYYY-MM-DD
Year	Year the sample was collected	YYYY
Sand	The weight of sand in the sample	gram
Rubble	The weight of rubble in the sample	gram
Clay	The weight of clay in the sample	gram
Silt	The weight of silt in the sample	gram
Total_weight_g	The combined weights of sand, rubble, clay, and silt	gram
percent_sand	The percentage of sand in the total sample	percent
percent_rubble	The percentage of rubble in the total sample	percent
percent_clay	The percentage of clay in the total sample	percent
percent_silt	The percentage of silt in the total sample	percent
Total_percentage	The sum of percent sand, rubble, clay, and silt	percent

Data Table Name: PerCov.csv
Description: Seagrass percent cover

Column name	Definition	Units
The name of the variable in the dataset	*A detailed definition of the variable*	*Units the variable is measured in*
OID2	Ordinal Identifier Number - entered in a continuous serial increasing fashion	1–5089
SiteUniqueID	Year sampled + Station Name	YYYY-NAME
Quadrat #	Quadrat number at fixed locations around sampling vessel (starboard-bow=1, and starboard-stern=2, port-stern=3, port-bow=4)	'1', '2', '3', or '4'
Pcover_Hw	Percent cover was defined as the proportion of the 0.25 m^2 quadrat frame obscured by *Halodule wrightii*	percent
Pcover_Tt	Percent cover was defined as the proportion of the 0.25 m^2 quadrat frame obscured by *Thalassia testudinum*	percent
ID1	Identifier number associated with an individual station	1–567
ID2	Station Name	NAME
Latitude	Decimal latitude	degree
Longitude	Decimal longitude	degree
Year	Year the sample was collected	YYYY
System	Area the station is located within	'NERR', 'CCBAY', 'ULM', or 'LLM'
Region	Systems are classified into larger areas (Regions): CB = NERR and CCBAY; ULM; LLM)	'CB', 'ULM', or 'LLM'
Treatment	Sample collected before ('Pre') or after ('Post') the hurricane	'Pre' or 'Post'

Data Table Name: SedAm.csv
Description: Sediment porewater ammonium concentrations

Column name	Definition	Units
The name of the variable in the dataset	*A detailed definition of the variable*	*Units the variable is measured in*
OID2	Ordinal Identifier Number - entered in a continuous serial increasing fashion	1–75
Project	Name of the project which samples were collected	'Tier3' or 'RAPID'
Site	Site name	NAME
Transect	Transect number where the sample was collected	'1', '2', '3', or 'na'
Meter	Meter number along the transect where the sample was collected	3–50
Latitude	Decimal latitude	degree
Longitude	Decimal longitude	degree
Date	Date the sample was collected	YYYY-MM-DD
Year	Year the sample was collected	YYYY
Sed_ammon	The concentration of ammonium in the sediment porewater	μM

Data Table Name: stations_remove.csv
Description: Sampling stations removed from analyses

Column name	Definition	Units
The name of the variable in the dataset	*A detailed definition of the variable*	*Units the variable is measured in*
OID2	Ordinal Identifier Number - entered in a continuous serial increasing fashion	1–42
ID1	Identifier number associated with an individual station	1–567
ID2	Station Name	NAME

Data Table Name: TOC.csv
Description: Sediment total organic carbon

Column name	Definition	Units
The name of the variable in the dataset	*A detailed definition of the variable*	*Units the variable is measured in*
OID2	Ordinal Identifier Number - entered in a continuous serial increasing fashion	1–28
Project	Name of the project which samples were collected	'Tier3' or 'RAPID'
Site	Site name	NAME
Transect	Transect number where the sample was collected	'1', '2', '3', or 'na'
Latitude	Decimal latitude	degree
Longitude	Decimal longitude	degree
Date	Date the sample was collected	YYYY-MM-DD
Year	Year the sample was collected	YYYY
dry_weight_g	The dry weight of sample dried at 60 °C	gram
combust_weight_g	The dry weight of sample combusted at 550 °C	gram
LOI_percentage	The percentage of total organic carbon	percent