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Supporting Data: Controls on Sediment Bed Erodibility in a Muddy, Partially-Mixed Tidal Estuary, York River, Virginia

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Spatial Information

All samples contained within (37°39'N, 76°54'W), (37°16'N, 76°20'W), (37°8'N, 76°24'W), (37°34'N, 76°0'W)

Data Access

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Abstract

Dataset consists of all sampling cruises with data that were analyzed and used in the statistical modeling associated with Wright (2021) and Wright et al. (2022). Each cruise folder includes erodibility data that was analyzed using a Gust Microcosm along with sediment and water column characteristics.

Description

During each sediment survey, the vessel was anchored and all sediment samples were taken within the swing circle of the vessel and its anchor chain. Samples were taken using a GOMEX Box Core (surface area = 625 cm²), then sub-cores were collected to minimize edge effects that would disturb the sediment/water interface. At each site, the top ten centimeters, if possible, from two 4" diameter sub-cores were sliced in 1 cm increments and combined for later analysis in the lab for grain size (sand, silt, and clay) distribution as well as percent moisture and percent volatile content by loss on ignition at 550 degree C°. Two additional 4" diameter cores were analyzed for sediment erodibility using a Gust Microcosm, and two rectangular cores were imaged by digital X-ray analysis. Salinity and temperature profiles were collected at each site with a CTD. For more complete methodology, see Wright (2021) and Wright et al. (202X) (Linked in **Associated Publications** below).

Each folder represents a single sampling cruise. Each folder name begins with "YR" (representing "York River") followed by six numbers which represent the date of sampling in the format YYMMDD. For example, August 31, 2014 would be YR140831.

List of files within each cruise folder:

- **CTD** – This folder includes raw data from the YSI Castaway CTD which was deployed for each cruise. This is available for most cruises after YR110720.

- **CWRIGHT** – This folder includes MATLAB m-files for all interpolation and extrapolation of the Gust shape profiles for statistical modeling.
- **Grain Size** – This folder includes grain-size distribution data for each cruise. For samples after 2010, this file also includes fecal pellet abundance data for most cruises. MATLAB m-files for processing are also included.
- **Gust Erodibility** – This folder includes the raw and processed data for each erosion experiment. MATLAB m-files for processing are also included.
- **Logbook** – Scans of hand-written field notes and instrument setup documents. All available field notes and complications/observations are included here.
- **Moisture** – This folder includes percent moisture and percent organics for each cruise. MATLAB m-files for processing are also included.
- **X-Rays** – This folder includes X-ray images of sediment cores. X-Ray images for cruises YR060418 to YR071017 can be seen in Dickhudt (2008) (Linked in **Associated Publications** below).

Additional Files:

- **Beta_ModelTables** – This Excel file includes a tab for each model set described in the associated manuscript. Within each tab, the candidate models for all six data subsets are listed with the corresponding β values for each multiple linear regression. Blue highlighting denotes a positive relationship with the response variables, and red highlighting denotes a negative relationship with the response variable. N/A means that explanatory variable was not considered for the subset. White, blank cells mean that variable was not included in the model, but was considered.
- **CompleteDataTable** – This Excel file includes the complete data set and all variables that were used in the associated manuscript. Colors highlighting denotes which cruises were considered outliers and were not included in statistical analysis.
- **CorrelationPlots** – This file includes correlation plots for each data subset between all explanatory and all response variables. Values at the intersection of two variables represents the Pearson correlation coefficient for those two variables. Upper diagonal plot shows Pearson correlation values for the Eroded Mass Model Set ($n = 157$). Lower diagonal plot shows Pearson correlation values for the Erosion Shape Model Set ($n = 138$). In each figure, the response variables for the corresponding model sets are boxed in blue.

DOI

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Keywords

Sediment erodibility, gust microcosm, estuarine sediment, sediment x-rays, grain-size distribution, organic content, water content, tidal range, CTD, box core, York River,

Associated Publications

Dickhudt, P.J., 2008. Controls on Erodibility in a Partially Mixed Estuary, York River, Virginia. Dissertations, Theses, and Masters Projects. William & Mary. Paper 1539617867.

<https://doi.org/10.25773/v5-63ty-az33>

Wright, C.L., 2021. Controls on Estuarine Sediment Bed Erodibility: Insights from the York River Estuary. Dissertations, Theses, and Masters Projects. William & Mary.

Wright, C.L., Friedrichs, C.T., Massey, G.M., 202X. Controls on Sediment Bed Erodibility in a Muddy, Partially-Mixed Tidal Estuary. *Frontiers in Earth Science*. *IN PRESS*

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