

Dataset Originator: *Timothy C. Kenna, Frank O. Nitsche, Cecilia McHugh*

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Dataset Title: *LIS phase 4 sediment core XRF chemical content data*

Online Linkage: *<http://www.marine-geo.org/portals/lis/>*

Abstract: *Processed results from of chemical composition of the sediment core as measured with the Lamont ITRAX Core Scanner (Cox Analytical Systems, Mölndal, Sweden). For XRF measurements, an X-ray tube equipped with a molybdenum anode was operated at a voltage of 30kV and a current of 55mA. Each measurement was made for 30s integrated over a depth interval of 0.5cm by 17mm wide. After scanning was complete, any spectra flagged as invalid were removed and all remaining spectra were summed into a single spectrum. A full spectrum fundamental parameter peak fitting program, provided by the manufacturer, was used to calculate individual elemental abundances in terms of element rates (i.e., cps/mA). Variables in the fundamental parameter algorithm were adjusted to minimize the difference between the measured spectra and the model fit. Once the fitting routine was complete, the optimized parameters were used to calculate down-core elemental rates. The analytical uncertainty of the element signals is estimated based on the dead time corrected total counts for each element. Prior to calibration, elemental rates were first normalized to the coherent scattering peak signal to account for matrix variability and then standardized for each core/each element by subtracting the average element rate and dividing by the standard deviation of the element rate.*

The data are presented as Excel spreadsheet with one worksheet per core.

Dataset purpose: *Sediment cores provide information on changes in the sediment environments over time including periods of deposition or erosion, as well as changes in chemical composition with time. Changes in chemical composition along the sediment cores provide information on layering and disturbances along the core as well as indications of sediment provenance. This information is guiding the sediment environment interpretation.*

Time period of content: *2024-08-13 to 2026-08-31*

Dataset Status: complete

Update Frequency: *none planned*

Theme Keywords: *Long Island Sound, sediment core, XRF, chemical composition*

Access Constraints: *none*

Use Constraints: Data and metadata are is licensed under a Creative Commons Attribution 4.0 (CC-BY 4.0) license. Appropriate acknowledgment with a byline/credit/link **must** be given to both the original scientists/data contributors by reference to their relevant publications and to the Marine Geoscience Data System (www.marine-geo.org). Where citation information has been provided to us by scientists it is included with the relevant database entries, and should be acknowledged when data are used. You may browse freely, but you may not circulate or publish materials you obtained from this site if you do not accept the terms of providing adequate citation.

Users are strongly encouraged to contact the original investigators responsible for data made available on this site. Where appropriate, researchers are also encouraged to consider collaboration and/or co-authorship with original investigators.

Data should not be used for navigation purposes

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Dataset Credit: *Long Island Sound Mapping Project, , Timothy C. Kenna, Cecilia McHugh, Frank O. Nitsche*

Data Quality Considerations: These are final processed data

Attribute accuracy: The attribute accuracy varies by element and is measured as +/- 1 standard variation

Completeness: *The dataset is mostly complete. There are some missing values in the tables in cases where data are below detection of the instrument.*

Positional accuracy: This dataset does not contain positional information

Attributes:

Core ID: Text describing the Name of the core.

Depth_m: depth below the surface along the core in meter with core top being 0 m.

Al: calibrated Aluminum content in ppm

Al +/-: error (standard deviation) of the Aluminum measurements

Si: calibrated Silicon content in ppm

Si +/-: error (standard deviation) of the Silicon measurements

P: calibrated Phosphorus content in ppm

P +/-: error (standard deviation) of the Phosphorus measurements

S: calibrated Sulfur content in ppm

S +/-: error (standard deviation) of the Sulfur measurements

Cl: calibrated Chlorine content in ppm

Cl +/-: error (standard deviation) of the Chlorine measurements

K: calibrated Potassium content in ppm

K +/-: error (standard deviation) of the Potassium measurements

Ca: calibrated Calcium content in ppm

Ca +/-: error (standard deviation) of the Calcium measurements

Ti: calibrated Titanium content in ppm

Ti +/-: error (standard deviation) of the Titanium measurements

V: calibrated Vanadium content in ppm

V +/-: error (standard deviation) of the Vanadium measurements

Cr: calibrated Chromium content in ppm

Cr +/-: error (standard deviation) of the Chromium measurements

Mn: calibrated Manganese content in ppm

Mn +/-: error (standard deviation) of the Manganese measurements

Fe: calibrated Iron content in ppm

Fe +/-: error (standard deviation) of the Iron measurements

Ni: calibrated Nickel content in ppm

Ni +/-: error (standard deviation) of the Nickel measurements

Cu: calibrated Copper content in ppm

Cu +/-: error (standard deviation) of the Copper measurements

Zn: calibrated Zinc content in ppm

Zn +/-: error (standard deviation) of the Zinc measurements

Rb: calibrated Radium content in ppm

Rb +/-: error (standard deviation) of the Radium measurements

Sr: calibrated Strontium content in ppm

Sr +/-: error (standard deviation) of the Strontium measurements

Zr: calibrated Zirconium content in ppm

Zr +/-: error (standard deviation) of the Zirconium measurements

Ba: calibrated Barium content in ppm

Ba +/-: error (standard deviation) of the Barium measurements

Pb: calibrated Lead content in ppm

Pb +/-: error (standard deviation) of the Lead measurements

Metadata reference: *Frank Nitsche, Lamont-Doherty Earth Observatory of Columbia University,
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