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EN577 Leg 1
Mud Patch Piston Coring
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Jason D. Chaytor
U.S. Geological Survey, Woods Hole Coastal and Marine Science Center, Woods Hole, MA

U.S. Department of the Interior
U.S. Geological Survey

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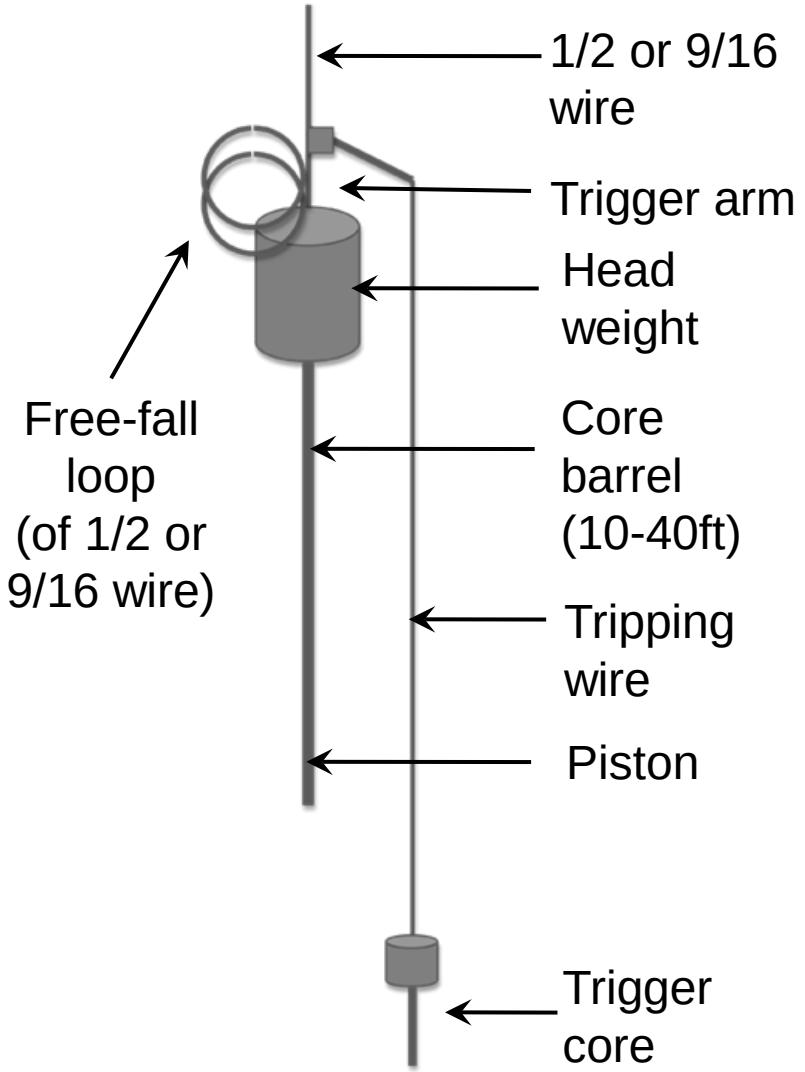
USGS Piston Coring System



- The piston corer consists of a 2400lb head weight atop a length of 4 inch diameter steel pipe (3.43” OD, 0.125” wall butyrate liner) that is driven into the ocean bottom to collect sediment.
- The coring system utilizes a piston that leaves the sediment theoretically undisturbed by removing the residual water in the pipe.
- A trigger mechanism causes the corer to free-fall into the sediment allowing collection of samples up to 40ft.
- Both free-fall and core length can be adjusted for different types of sampling.

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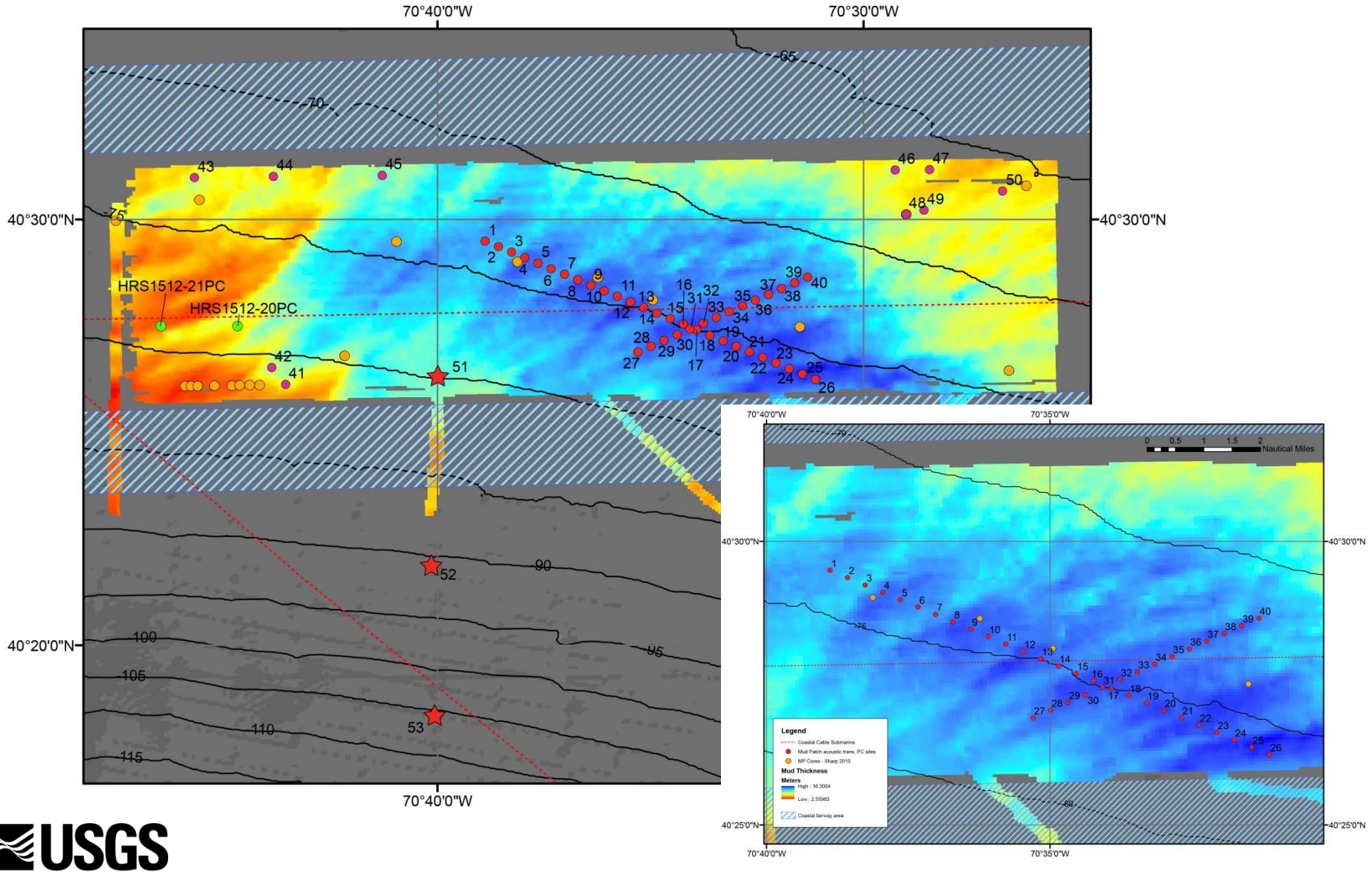
EN577 Leg 1 Piston Coring Plan



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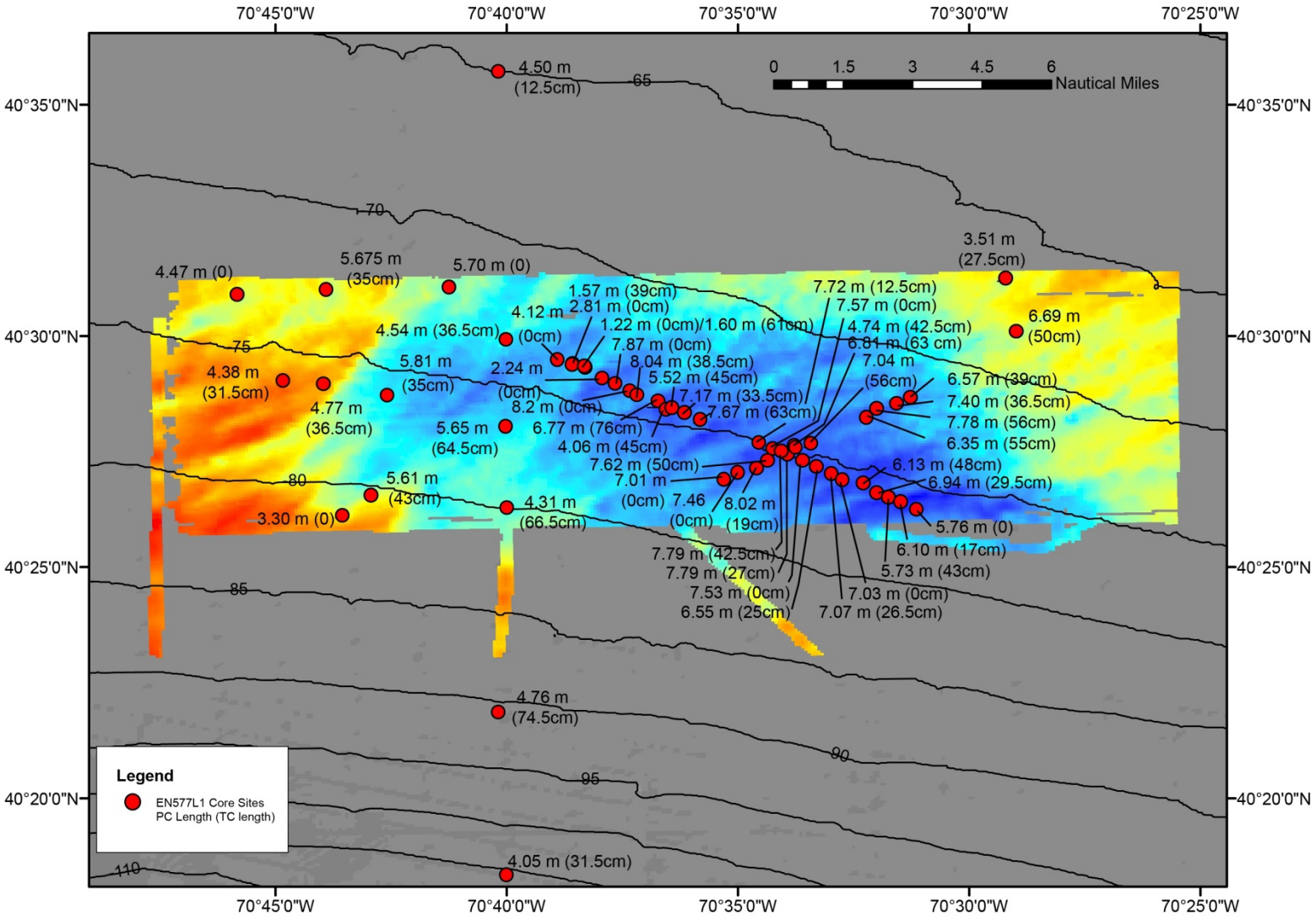
Southern New England Mud Patch – EN577L1



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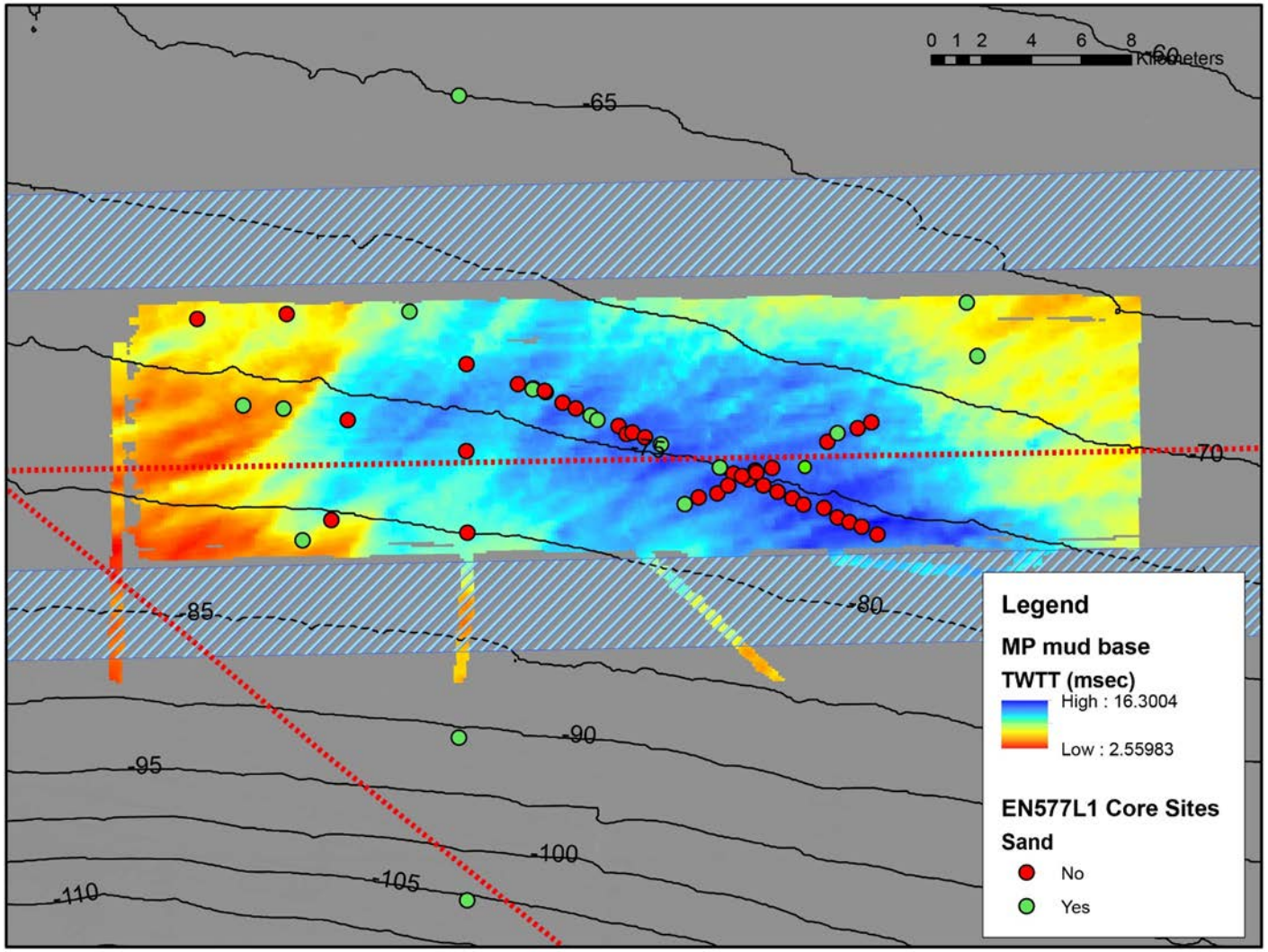
Southern New England Mud Patch – EN577L1



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Southern New England Mud Patch – EN577L1

- Piston Cores collected:
  - 54 (two of these were disturbed by liner failure and repeated; only one core with no recovered)
  - 313 m (liner length) of sediment collected
  - Approx. 1/3 recovered shells and clean quartz sand

- Trigger Cores collected:
  - 39
  - ~ 16.5 m of sediment (many preserving sediment water interface)

- Piston and trigger core catcher/cutter bagged samples for almost all cores

- Over-penetration of around 1 m for most cores

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Southern New England Mud Patch

Sand, silt, clay mixture
Mud Patch “Mud”

Quartz sand with mollusk shells
(& shell fragments)

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Piston Core Recovery

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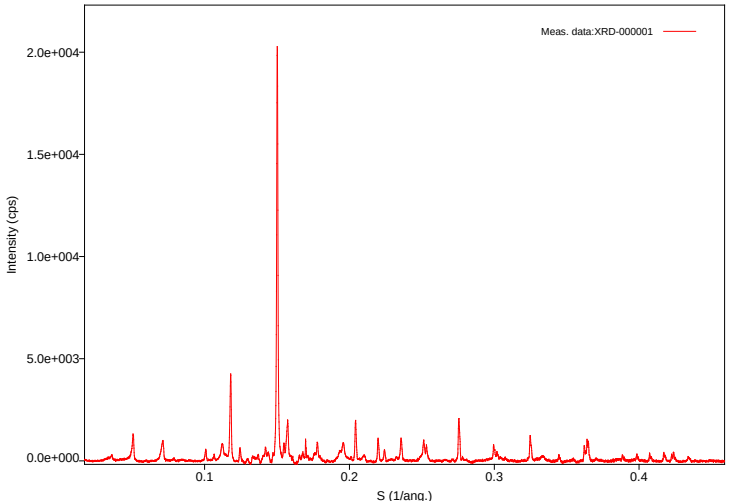
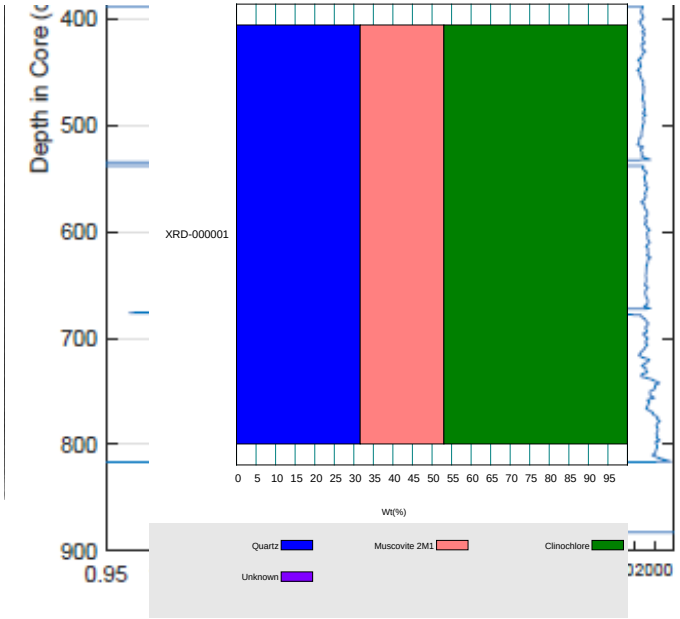
Sediment Characterization & Analysis

Multi-phase approach:

- Physical properties (multi-sensor core logger – bulk density, p-wave velocity, etc.)
- Photographs
- Visual description (sediment texture, visible structures, deformation, mineralogy, coring artifacts, paleontology)
- Undrained shear strength & water content measurements, calcium carbonate & bulk organic concentrations
- X-radiographs
- Particle (grain) size measurements
- X-ray diffraction (XRD) and visual compositional analysis
- Paleontological sampling & radiometric (radiocarbon, ^{210}Pb, ^{7}Be, ^{137}Cs)/Isotopic (C, O) dating





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