TDI-BROOKS BOX CORER

The TDI-Brooks box coring systems consist of hardware assemblies designed to be rigged together into a working core rig and deployed to the seabed for extracting a standard cubic box core. Such a core is 50cm x50cmx100cm (1-m deep) or 50cm x 50cm x50cm (0.5-m deep) in size

OVERVIEW

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Our box coring system is designed to be a safe, simple, effective mechanism for acquiring large-volume undisturbed shallow sediment samples from the seabed or lakebed. Such samples are essential for the accurate determination of geotechnical characteristics of submerged sediments, as well as for the assessment of the benthic ecology (infauna) as required in marine environmental impact assessments. **Figure 1** is a photo of both sizes of TDI-Brooks box corer.

The sample box of the core rig is fabricated from stainless steel and is clean and smooth to minimize frictional resistance between the box and the sediment. The corers have a adjustable weight capability so that the weight stack can be fine-tuned to suit the different seabed conditions that may be encountered.

Figure 1) TDI-Brooks Half-Meter And One-Meter-Deep Box Coring Rigs

The BC system is rigged to the main coring rope with a safety shackle, and then its trigger assembly is set for deployment. The main coring rope is load-tested and regularly inspected with Tuck eye splice termination woven into

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its loose end. The main winch, main coring rope, and the coring A-Frame is used for deploying and retrieving the box corer. In addition to the deployed hardware, support gear is mounted to the vessel working deck to manage the deployment and retrieval of the coring rig. These include the heel-block assembly and the main sheave from the coring A-Frame. Once the box corer is safely deployed, it is lowered to the seabed while performing the navigation protocols for lateral positioning, and then a core sample is acquired at the client-specified site.

Upon retrieval on deck the box corer is secured with the safety pin in the closed position and placed on its stand. The lid is opened and the contents inspected for quality and acceptability of the box core sample. The overlying water is siphoned off (gently as the water level approaches the surface of the mud so as to not disturb the surficial layers) to expose the sediment for sub-sampling, descriptions, and photography. The box corer is typically tilted slightly to one corner to facilitate pooling of the last amounts of water. A picture of the BC system with water being siphoned off is shown in **Figure 2.**

Figure 2) Siphoning Water From The Top Of A Box Core Sample

The sample is accepted if all the following conditions are met, and re-attempted if not:

- Box core jaws are fully closed and the box core is sealed. Water is not streaming out from the jaws of the closure device.
- Box core lid is closed.
- Overlying water in the box core is mostly clear. A box core sample with muddy water indicates a disturbance of the surficial layers.
- Surface of sediment is undisturbed (soil on the lid is disturbed by definition), not tilted, slumped or washed-out. A sample with a tilted surface (corer sticking at an angle less than perpendicular to the sediment surface) may be used with the appropriate precautions.
- Soil sample depth is greater than the minimum required.

For each cast or drop of the box corer, the following information is recorded on the sample log sheet and the sample labels:

- Date and time on bottom
- Water depth (wire indicator and fathometer)
- Site or Station Number,
- Penetration Depth (distance of sediment surface from lid of corer; soil sample depth is calculated from this)

- Pertinent comments regarding quality, etc. A brief description of the sediment surface noting texture, color, depth of loose surface layer, and any life seen for each box core.
- Digital photographs are taken of surface of representative box cores. Photographs are taken of any unusual surface features.

After the box corer is retrieved on board and is secured in its stand (**Figure 3)**, Minivane (**Figure 4)** and/or T-bar (**Figure 5**) testing is conducted at vertical intervals as specified by the client. Minivane readings are recorded on the Laboratory Sample Sheet along with a description of the box core sample. The least disturbed part of the core sample is typically sub-sampled with push-core tubes (**Figure 6)**. The bottom ends of these push-core tubes are pre-beveled to produce a cutting edge no larger diameter than the ID of the tube. The sub-sampling tubes are placed approximately 2 inches apart. A digital photograph is taken.

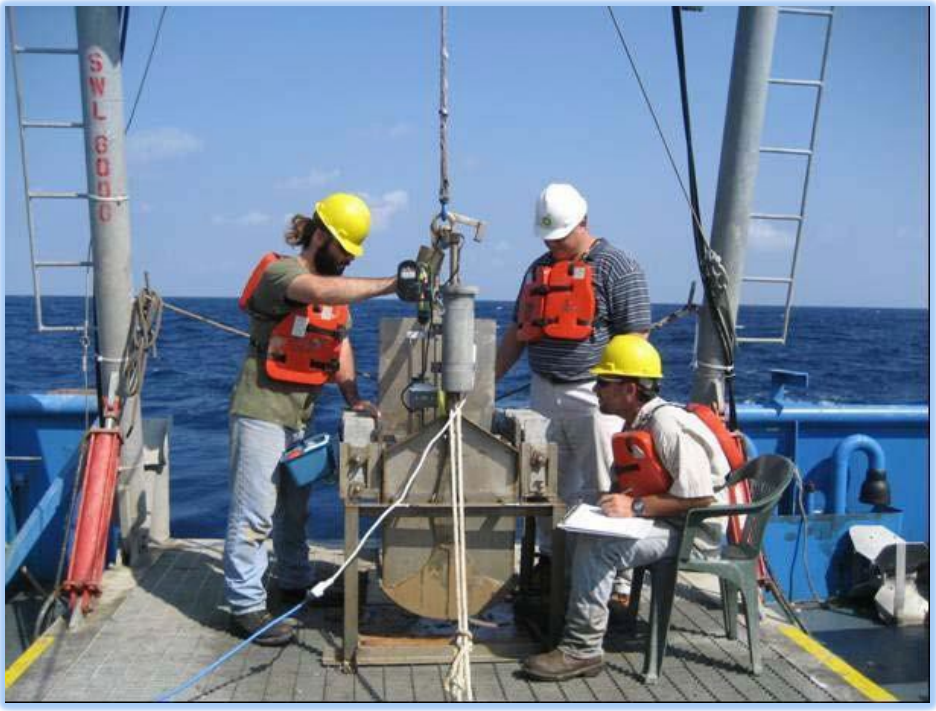

Figure 3) Processing the Box Core

The bottom and top of the tubes are then capped immediately (the bottom capped before extraction from the body of soil in the rig). The tops and bottoms of the tubes are marked and the tubes are labeled. The tubes are stored and secured in a vertical position in a manner that minimizes vibrations and bumping. All tube and bulk samples are delivered to the onshore geotechnical testing laboratory in a timely, uninterrupted, temperature-controlled manner after completion of the coring activities.

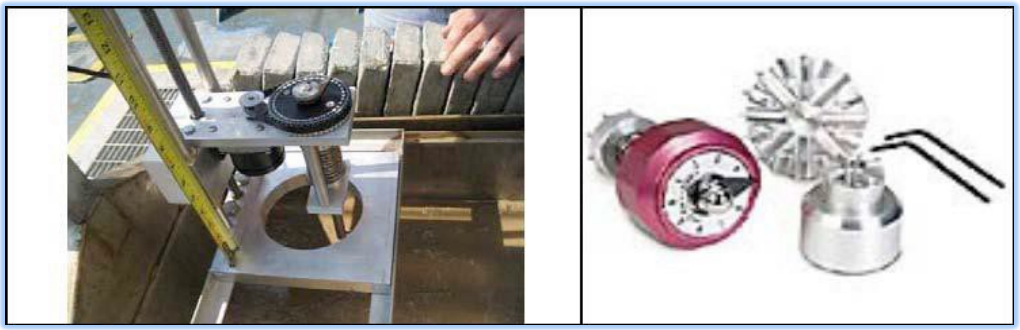

Figure 4) Miniature Vane On Box Core And Torvane

Figure 5) T-Bar Measurements On Box Core

Figure 6) Box Core Sub-Sampled With Push-Core Tubes