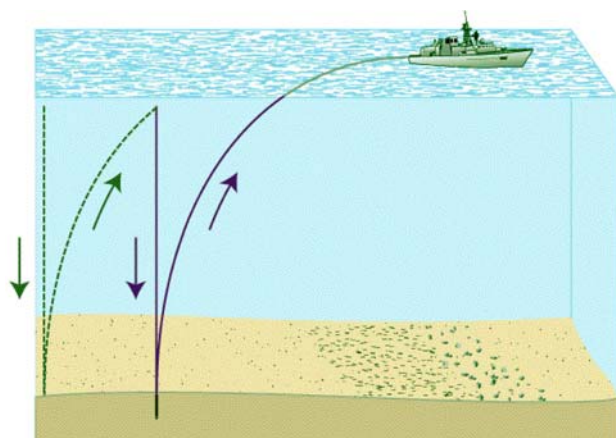




Free Fall Cone Penetrometer (FFCPT)

FFCPT development

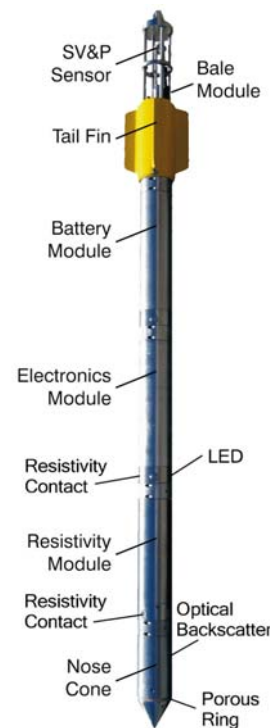
The FFCPT is a probe to characterize properties of the seafloor. It was developed by Brooke Ocean Technology (BOT) through a DRDC Atlantic research contract. DRDC Atlantic and BOT have been working together to evaluate the performance and enhance the capabilities of the instrument. The FFCPT has modular sections to allow optional payloads to be incorporated. To date, these payloads include a module to measure sound velocity and pressure (SV&P) during the probe's descent through the water column, and an experimental module to measure static resistivity (for sediment porosity) once it comes to rest in the seabed. Recent activity has focused on deploying the probe from a moving vessel.



Conceptual drawing of use of FFCPT & MVP for Military Oceanography and seabed classification.

Integration with a Moving Vessel Profiler

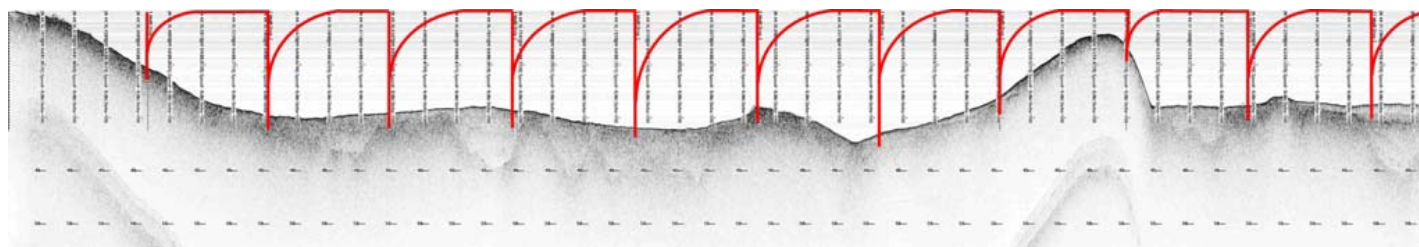
In spring 2005, DRDC Atlantic purchased a Moving Vessel Profiler (MVP200) from BOT. The MVP200 is a "free wheel-capable" slip ring winch. This greatly increases the number of times the FFCPT can be deployed to characterize marine sediments rapidly and *in situ* for naval applications, mine hunting in particular.



Free-fall cone penetrometer

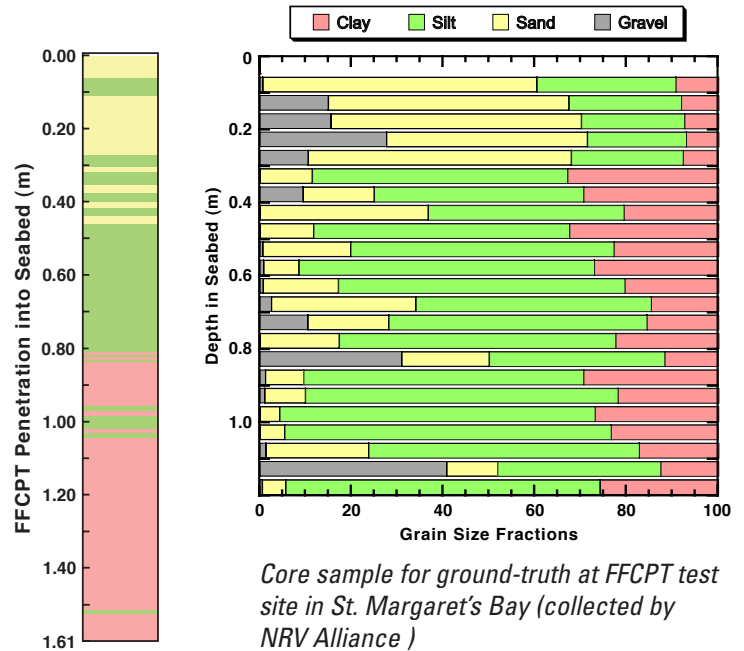
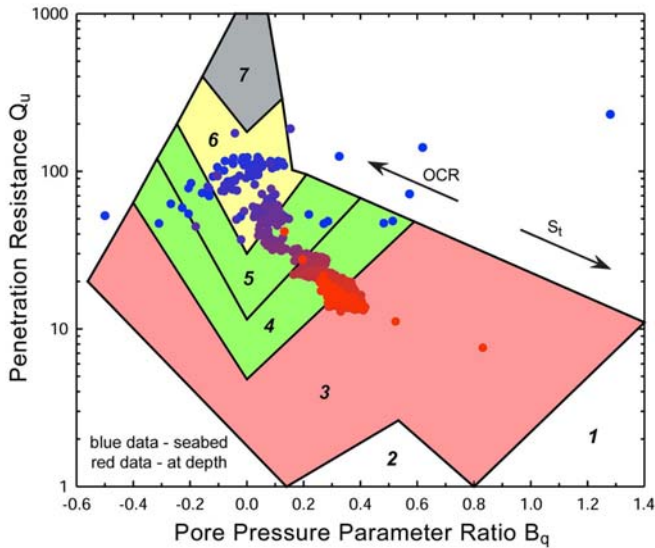
Demonstration of Underway Profiling Capability

During 2005 field tests aboard *CFAV Quest* and *CCGS Matthew*, the FFCPT was integrated with the MVP200 and deployed from a vessel underway at 4, 5, 6 and 8 kts. Approximately 250 underway drops were collected during four days of field testing.



Schematic of the FFCPT trajectory superimposed on a seismic reflection profile from trials in St. Margaret's Bay.

Free Fall Cone Penetrometer (FFCPT)



Sediment types (coloured areas above) are distinguished by an empirical relationship between two quantities measured by the FFCPT. Discrete measurements are made as a function of depth (coloured dots above). The sediment type determined by the FFCPT is displayed as a depth profile (right) for comparison with an actual core sample (far right).

Core sample for ground-truth at FFCPT test site in St. Margaret's Bay (collected by NRV Alliance)

Field Testing

The FFCPT has demonstrated its ability to characterize the seabed for a variety of sediment types. Results from the FFCPT compare favourably with independent geotechnical and geo-acoustic measurements on clay, silt, sand and gravel seabeds.



FFCPT being towed by an MVP200 on CFAV Quest.



FFCPT integrated with an MVP200 on CCGS Matthew.

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