Project Bulletin

CICEET

Containing Oil in Fast-Current Estuaries

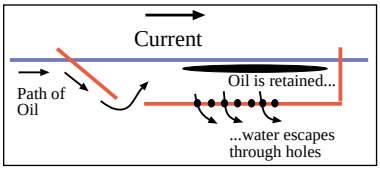
Challenge

Conventional oil booms have been an essential tool in major oil spill response operations, however their effectiveness is compromised in areas with high current velocities. When current speed exceeds a critical value (0.6-1.0 knots), conventional booms fail to contain oil, which is pushed beneath the boom by the force of the currents. This limitation poses a serious problem since tidal velocities in many harbors exceed the critical values. This CICEET project is developing a novel technology for the interception and containment of oil spills in fast current conditions.

Science

Design Concept

Researchers designed a submergence plane oil boom (see cross section below), which retains oil by allowing the water flow to drive oil down an inclined bow to a gap opening where the oil enters and is trapped.



Wave Tank Tests

A 12.2-m wide prototype of the boom was constructed and tested at OHMSETT, the national oil spill response test facility. The prototype retained heavy oil at speeds of 2 knots, doubling the critical velocity of conventional booms.

Field Tests

In the spring of 2001, a 30.5-m version of the boom was towed and moored near oil facilities located on the Piscataqua River (southern border of New Hampshire and Maine). Tests conducted on the flood tide confirmed that boom components could withstand being towed against currents greater than 2 knots.

Combined with Conventional Booms

Conventional booms can be used in conjunction with the submergence plane oil boom to increase the system's effective width. Conventional booms guide the oil into the submergence plane oil boom, where the oil is contained until it can be pumped out.

Application

Highly Mobile Units

Researchers also adapted submergence plane technology for use with vessel of opportunity skimming systems (VOSS). In this application, the boom would operate while secured to a marine vessel, instead of being attached to moorings.

Potential Clients

Project principle investigators are currently in discussions with potential clients in the U.S. and Canada. Project-affiliated manufacturers have expressed interest in the mass production of submergence plane oil booms if a market for the technology can be developed.

Project Essentials

Title: Submergence Plane Oil Containment Technology

Project Coordinator: M.R. Swift — University of New Hampshire, (603) 862-1837, mrswift@cisunix.unh.edu

Start - End Date: 09/01/1999 - 09/01/2001

NERR Reserve(s): Great Bay, NH

CICEET Contact: Kalle Matso — (603) 862-3508, kalle.matso@unh.edu