Alfond W² Ocean Engineering Lab

Combined wind-wave simulation basin with tow carriage and variable depth floor

A 1:50-scale offshore model testing facility that accurately simulates towing tests, variable water depths, and scaled wind and wave conditions that represent some of the worst storms possible anywhere on Earth.

Wave Basin
30 meters long by 9 m wide (98 x 30 ft) with a working depth of floor of 0 - 4.5 meters. The basin contains a 16-paddle wave generator, a beach, a moving wind wall, and an adjustable floor.

Multi-directional Wave Generator
The 16-paddle wavemaker can simulate regular waves and all standard spectra as well as custom random seas with directional waves and a range of frequencies. It can produce wave angles in excess of +/- 60 degrees relative to the basin centerline. Waves can be the maximum height of 0.6 m at T = 1.65 seconds, and 0.8 m at T = 2.3 seconds.

Towing System
The system has a maximum speed of 1 meters/second (3.3 feet/second)

Wind Generator
The 5 m x 3.5 m x 6 m wind machine can generate wind speeds up to 12 m/s with flow direction relative to waves up to 180 degrees.

Beach System
The elliptical profile beach was designed and constructed in-house. It has aluminum ribs and a composite surface with a removable central structure to accommodate the towing system.

In-House Model Design and Fabrication Capabilities
Fabrication can be completed with a variety of materials including metals, composites, plastics, foams, and others. Equipment in the ASCC lab facilities allows for in-house fabrication using a water jet, welder, CNC machine, 3D printer, and other options.

Instrumentation
The W² data acquisition system is built on industry-leading National Instruments hardware and can accommodate a large variety of instrumentation including force, acceleration, and velocity measurements. Non-contact motion tracking above and below the water is made possible by two linked Qualisys camera systems. Flexible synchronization and data I/O allow for integrating hardware- or software-in-the-loop control systems and supplemental data acquisition systems. Custom instrumentation and integration support are available.

Contact:
Matthew Tomasko, M. Sc., M.B.A
Business Manager
matthew.tomasko@maine.edu