



Sediment Erosion Actuated by Wave Oscillation and Linear Flow (SEAWOLF)



TECHNOLOGY SUMMARY

SEAWOLF (Sediment Erosion Actuated by Wave Oscillations and Linear Flow) is a method and apparatus for measuring erosion rates of sediments and high shear stresses in wave dominated environments. Accurate prediction of erosion rates is complicated by a lack of understanding regarding cohesive sediment interactions. A need exists for an apparatus that can accurately and directly measure the individual contributors to the total erosion rate of sediments from suspended and bedload erosion processes both in the lab and field.

Sandia National Laboratories has designed, constructed and tested a high shear stress flume that can superimpose a complex wave action with a unidirectional current upon a sediment surface. It allows effective shear stresses to be determined from erosion tests with in situ sediment samples, making SEAWOLF a useful tool for predictive modeling in coastal areas with wave dominated environments.

BENEFITS

Unidirectional Flow

Up to 1.1 m/s (36 GPM) in test section

Oscillating Flow

With period of 5 to 30 seconds and velocities of -1.9 m/s to 1.9 m/s (flowrates of -60 GPM to 60 GPM) driven by large pistons

Flow Capabilities

Include purely oscillating flow as well as pulsating flow with and without reversal

INTELLECTUAL PROPERTY

US PATENT #6,679,105
SD# 7031

POTENTIAL MARKET APPLICATIONS

- Offshore Wind Energy
- Wave Energy Conversion
- Anchors and Foundations
- Coastal Sediment Analysis
- Dredge Disposal
- Characterization

TECHNOLOGY READINESS LEVEL

Sandia estimates this technology at approximately TRL 8. The SEAWOLF Technology has been proven to work in final form under expected conditions.

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