Oil Spill Response Research, Testing, and Training at Ohmsett

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Topics

Ohmsett Overview

Tank Specifications

Research, Testing and Training

Multi-agency weathering and remote sensing experiment

Marine Debris: Plastic Cleanup

Summary

Ohmsett's Mission

To improve oil spill response technologies and remediation techniques through testing, training, and research & development.

Provide independent and objective performance testing of full-scale response equipment and marine renewable energy systems.

Provide a world class venue for training and testing that simulates spill environments in a safe and controlled manner.

Ohmsett test facility

Operated by U.S. Department of Interior's Bureau of Safety and Environmental Enforcement (BSEE) and maintained through a contract with Applied Research Associates, Inc.
since September 2018

Largest outdoor salt water test tank in North America

- 203 meters (667 feet) long
- 20 meters (65 feet) wide
- 2.4 meters (8 feet) deep
- 10 million liters (2.6M gallons)
- Wave capacity: ~1 meter (~3 feet)
- Open ocean salinity (32 -35 ppt)

Located in Leonardo, New Jersey

- One hour south of New York City
- Nearby airports:
  - Newark
  - LaGuardia
  - JFK

Ohmsett test facility (cont.)

Moveable bridges capable of speeds up to 6 knots (3.1 m/sec)

State of the art data collection system

- Above surface and subsurface high definition video documentation

Computer controlled wave generator:

- Programmable amplitude, frequency, & wave length
- Wave spectrum capable
- Harbor chop: Height: $H_{1/3}$ = 83 cm
- Sine waves (practical maximums as measured):
  - Height: $H_{1/3}$ = 59 cm (wavelength =7.1m, period = 2.16 sec)
  - Wavelength: 25.3 m (at $H_{1/3}$=29 cm, Period = 5.48 sec)
- Wave damping beach system

Customers

Government agencies

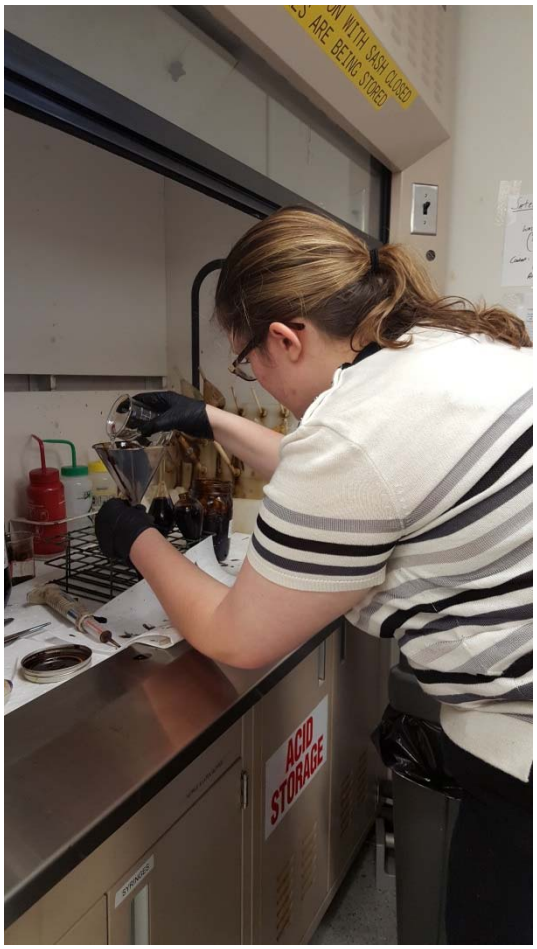
Academia

- Includes mentorship of local high school students enrolled in the STEM Program

Manufacturers

Researchers

Public and private companies



Technical specialties

Mechanical Recovery

- Containment booms
- Oil spill skimmer systems
- Sorbents

Chemical Treatments

- Dispersant testing
- Herder testing

Oil Behavior and Fate and Transport

- Behavior of dispersed and weathered oils
- Natural emulsions

Remote Sensing

- ROVs
- AUVs
- Rotary and fixed wing aircraft
- Satellite
- Fix mount (crow's nest/tower)

Oil Handling

- Temporary storage devices
- Viscous oil pumping
- Oil/water separators

Marine Debris: Plastic Cleanup

- Boom performance testing
- Collection systems

Instrumentation and special capabilities

Particulate size distribution

- Laser In-Situ Scattering and Transmissometry
- LISST 100X (qty: 2)
- Silcam

Water velocity

- Acoustic Doppler Velocimetry (ADV)

Surface area of oil and ice

- Tactical Rapid Airborne Classification System (TRACS)

Slick thickness

- Visual
- Acoustic

Underwater HD video

Cranes (2)

Wave height

Temperature

Wind speed

On-site oil/water chemistry laboratory

Ice making capabilities

Fabrication/work shop

Certified divers

Standards Development

Active member of the ASTM F20 Hazardous Substances and Oil Spill Response committee to develop and improve standardized equipment testing protocols

Ohmsett has initiated, developed, and updated numerous ASTM testing standards

Why test to the ASTM Standards?

End users need standardized tests for objective performance data. Data collected to ASTM standards provides producers and other stakeholders the ability to verify and accurately report performance of equipment and amount of oil removal.

ASTM standards developed using testing and data from Ohmsett

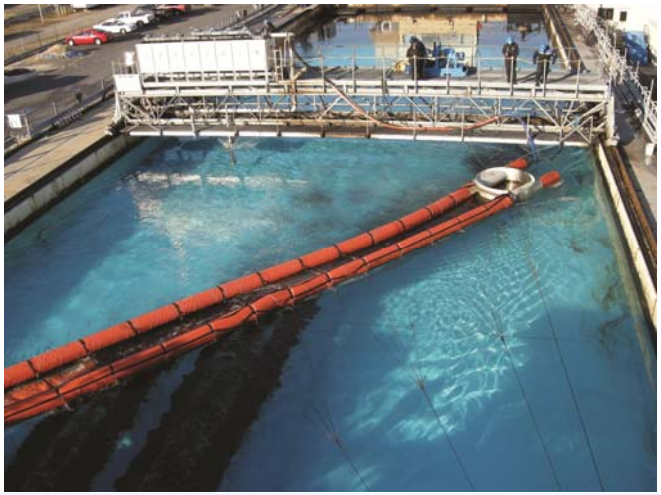
Skimmer Nameplate Capacity (F2709)

Skimmer Performance (F631)

Advancing Booms Systems (F-2084)

In-situ burns (Propane) for fire boom testing (F2152)

Oil Spill Containment Boom B/W ratio (F2682)



New potential standards

Standards being proposed to the ASTM F20 Committee:

- Collecting Skimmer Performance Data in Ice Conditions
- Advancing Skimmer Performance
- Full-scale Sorbent Protocol
  - Develop test methods that yield performance attributes relatable to filed use
    - Maximum oil capacity test
    - Water uptake test
    - Point of no dripping
  - Establish conditions that are attainable and repeatable
  - Use readily available test oils for standardization and comparability
  - Use full or near full scale sample sizes; in the range of commercially available products

Research & Development Projects

NOAA Oil Slicks and Emulsions Study

- Remote sensing systems using mobile platforms

EPA Bakken Crude Oil Study

- Effectiveness of mechanical recovery of unweathered and weathered oil
- Fate and behavior study

Remote Detection of Oil Spills

- Detect and map the thickness of an oil slick in real-time

Dispersant Comparison Testing

- Cold water & Warm water

Large scale emulsion generation

HOOPS at multiple states of weathering

- Evaporation states: Fresh, 10%, 20%, 24% weight loss
- Photooxidized over 3 weeks
- Emulsions: over 80% water (Maintained with wave action)

Ohmsett developed novel oil control methods

- Sprayers
- Boom
- Ice eaters
- Waves

Hands-on Oil Spill Response Training

Classroom and ‘Hands-on’

Recovery of real oil, not a surrogate material

Students use full-scale oil spill recovery equipment

Customized classes to meet customer-specific training needs

Oil Spill Response Training Classes

Oil Spill Response Strategies & Tactics Training

- Texas A&M National Spill Control School

Oil Spill Responder Training (OSRT) and SMART Training

- U.S. Coast Guard

Customer-specific training available

- Oil Spill Response Training (Custom)
  - Chevron Response Training
  - Alaska Clean Seas
  - Clean Harbors Cooperative
- Oil Spill Dispersant Workshop
  - American Petroleum Institute

Upcoming training at Ohmsett

Oil Spill Response Strategies & Tactics with Texas A&M

- May 14-17, 2019
- August 6-9, 2019
- www.ohmsett.com/registration.html

Oil Spill Responder by the USCG

- April 29 - May 3, 2019
- August 1-16, 2019

Oil Spill Response Training by Clean Harbors Cooperative:

- October 7-11, 2019
- October 21-25, 2019

Marine Debris: Plastic Cleanup

Controlling and collecting plastic waste from our waterways is an engineering challenge. It takes innovation to design a cleanup system that can collect, sort and compact the debris.

- Engineering services
- Controlled repeatable test conditions
- Test protocol development
- Boom structural testing, conformance to waves, seaworthiness & durability testing
- Collection system testing
- Custom testing for new & unique technology

Summary

At Ohmsett you can test with real oils and waves to ASTM standards

Emulsion capability allows study of weathered oil spill response on a large scale

Custom experiments can be accommodated

Highly skilled staff

Contact us for tank time.

Five year refurbishment is scheduled for May 2020 through August 2020

Questions?

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BSEE
Bureau of Safety and Environmental Enforcement