

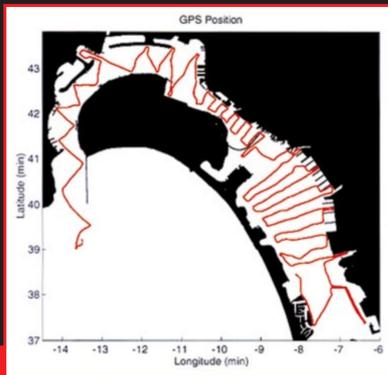
Marine Environmental Quality Assessment and Management

Supporting Environmentally Sound Fleet Operations and Coastal Facilities

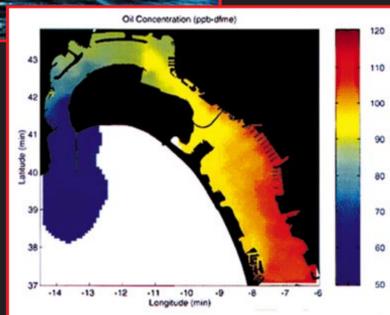


Marine Environmental Survey Capability

Rapid mapping and monitoring of harbors and coastal regions



6-hr mapping track



Oil concentration in San Diego Bay from storm runoff

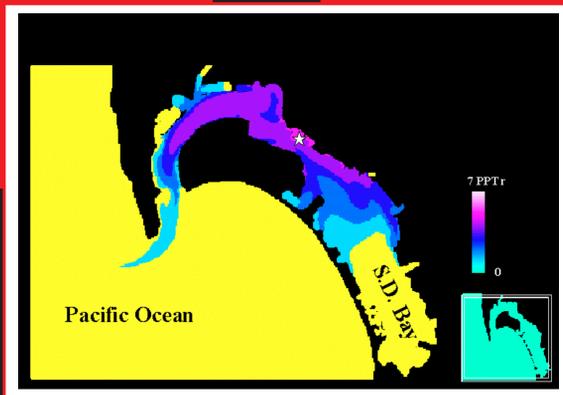
SSC San Diego survey craft RV ECOS

- Harbor/coastal mapping
- Model validation
- Remote sensing (sea truthing)
- Contaminant source evaluation

Modeling and Simulation

Develop predictive capabilities to quantify contaminant fate and transport in aquatic systems

- Linked hydrodynamic/contaminant transport models
- Watershed modeling
- Oil spill trajectory and fate nowcast
- Contaminated sediment transport and resuspension



Simulated copper contamination in San Diego Bay at day 21 following a continuous design discharge at the starred location.

Ecological Risk Assessment (ERA)

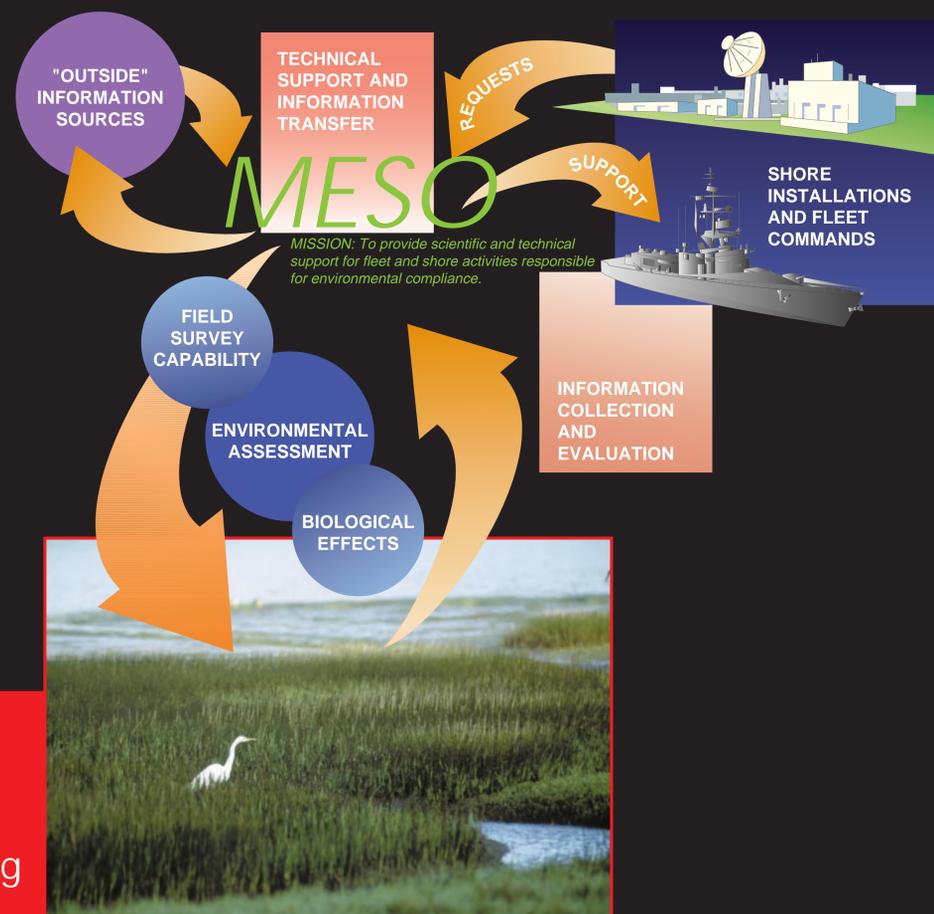
- Develop ERA methods and standard operating procedures
- Optimize and integrate cost effective assessment tools
- Site specific case studies

Program Sponsorship

- Office of Naval Research
- Naval Facilities Engineering Command
- Naval Sea Systems Command
- Strategic Environmental Research and Development Program
- Environmental Security Technology Certification Program

Marine Environmental Support Office

An office of the Naval Environmental Protection Support Services



Providing Direct Environmental Support to Navy Fleet and Facilities

- Resource Center for technical and scientific queries
- Direct support for environmental restoration (RI/FS) and compliance programs
- Environmental data integration and management
- Assessment of shipboard liquid and solid wastes

ENVIRONMENTAL QUALITY TECHNOLOGY

effective technology, assessment, and information for environmental management

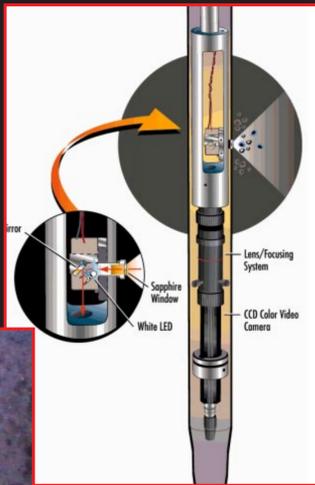
Advanced Assessment and Sensor Technology

Providing Rapid Environmental Characterization at Reduced Cost

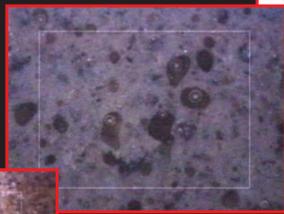
Navy Site Characterization and Penetrometer System (SCAPS)

- New sensor development
- Regulatory acceptance
- Technology transfer via Cooperative R&D Agreement
- Transition via NFESC and commercialization

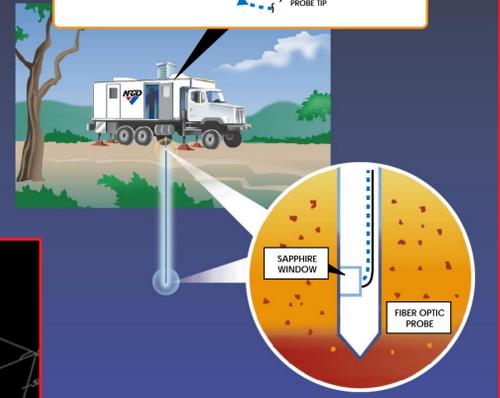
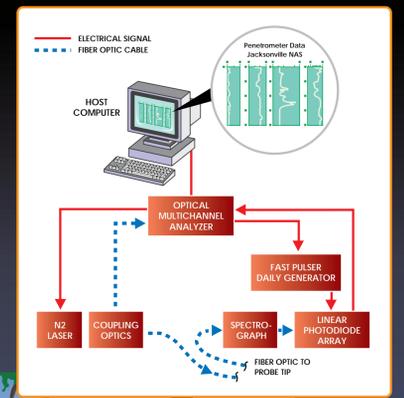
Schematic of GeoVis soil video imaging system probe for imaging subsurface soil environment



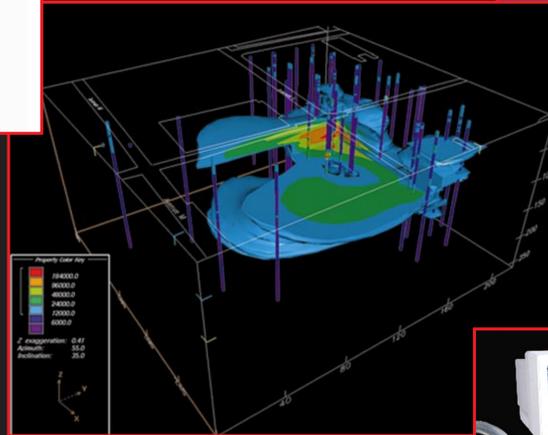
Video detection of DNAPL microglobules



Video image of soil characteristics



Laser-induced fluorometry – hydrocarbon sensor system



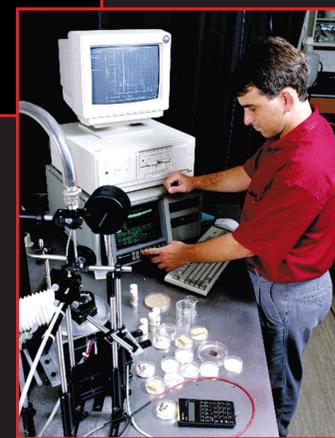
NAS Alameda hydrocarbon plume visualization



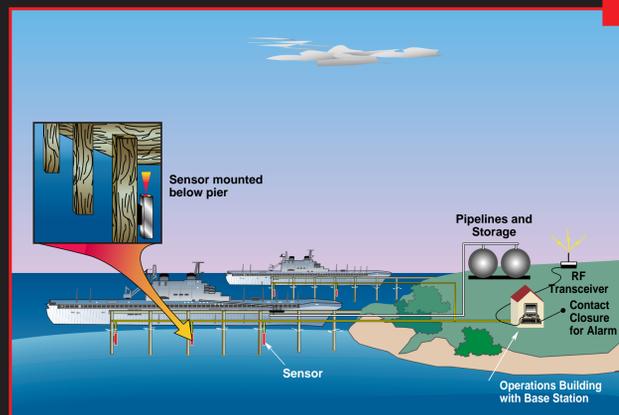
OwikLite Bioassay System for rapid low-cost biological testing

Environmental Sensor Development

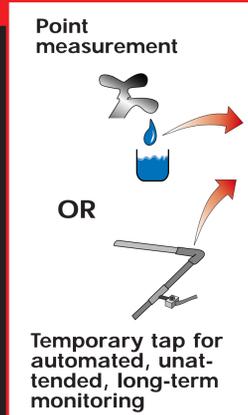
- Rapid contaminant/spill assessment and characterization
- Technology transfer to industry
- On-site analysis/detection



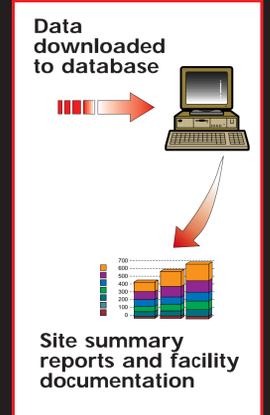
Fiber optic metals sensor - Laser-induced breakdown spectroscopy



Pierside Oil Spill Detection System



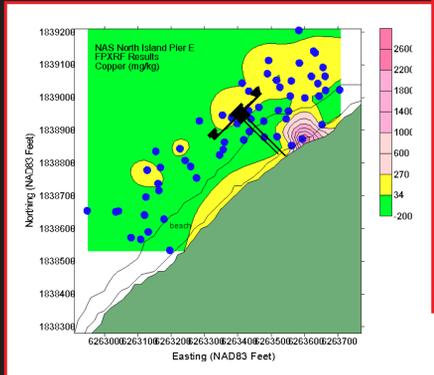
Portable on-site trace metal analyzer



RESEARCH ➡ TECHNOLOGY DEVELOPMENT ➡ TECHNOLOGY TRANSITION/TRANSFER ➡ DIRECT SUPPORT

Integrated Sediment Assessment Technology and Management Strategies

Supporting Cleanup and Compliance



Map of copper concentrations in surface sediments using x-ray fluorescence field-portable screening tool



Field portable x-ray fluorescence for on-site measurements of metals in sediments on board survey craft

Sediment Screening Technology

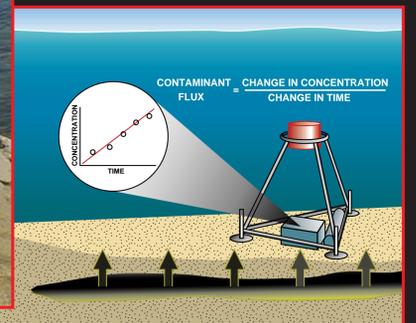
- Rapid chemical screening of PAH's and metals using field-portable x-ray fluorescence screening tools
- Low-cost biological screening (Qwiklite)
- Integrated approach to support ERA and remedial design

Advanced Sediment Assessment and Characterization

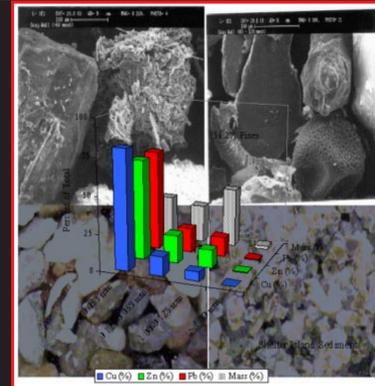
- Assesses and predicts site-specific contaminant behavior
- Understanding contaminant distribution and behavior within a sediment matrix provides insight into appropriate management decisions
 - In-situ contaminant sampling
 - Direct quantification of sediments as sources or sinks
 - Measures: Contaminant flux, ground-water seepage/migration and pore water concentrations
 - Characterizes contaminant distribution and integration with in the sediment



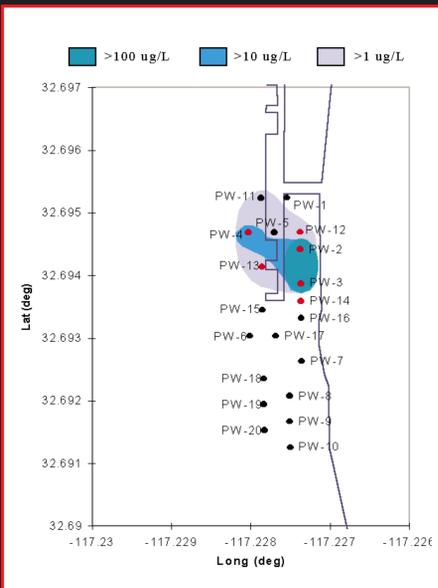
Commercialized Benthic Flux Sampling Device for in-situ measurement of contaminant transport into or out of sediments



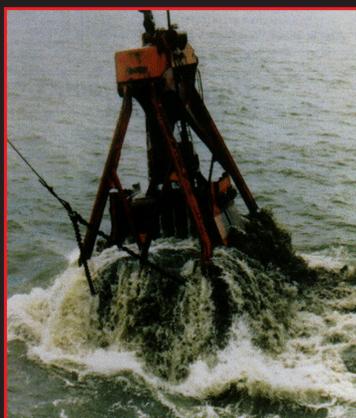
Conceptual model of the Benthic Flux Sampling Device and its application for determining the remobilization of contaminants from sediment



SEM and video images of various sediment mesh sizes and their contaminant distribution



Pore water concentration of TCE, DCE and vinyl chloride adjacent to land-based HW source. Collected with in-situ pore water sampler



Clamshell dredge may cause contaminant suspension and release—sediment characterization can predict potential impact

Sediment Management Strategies

- Integration of field screening and advanced sediment characterization improves site-specific remedial planning
- Dredging, cleanup, or site closure are expedited if sediment-appropriate management plans are developed