Navy's Challenges with Compliance, Restoration, and MILCON

Melanie Kito, NAVFAC SW

December 4, 2019

SERDP • ESTCP SYMPOSIUM
2019 | Enhancing DoD's Mission Effectiveness

Presentation Outline

- Objective:
  - To understand the relationship between storm water, contaminated sediments, and active MILCON related dredging.
- Storm water - Sources, BMPs, technology, studies
- Restoration - CERCLA, environmental dredging, studies, and cleanup
- MILCON - Maintenance dredging, construction dredging activities
- Challenges- Budgeting, legal roles and requirements, navy missions

Goal

- Work within the NPDES permits, CERLA program while meeting MILCON missions.
- Budget for the appropriate amounts with three different colors of money: Compliance, Restoration and MILCON.
- Work within each program appropriately and legally, but yet work as one Navy team.

Maintenance Dredging

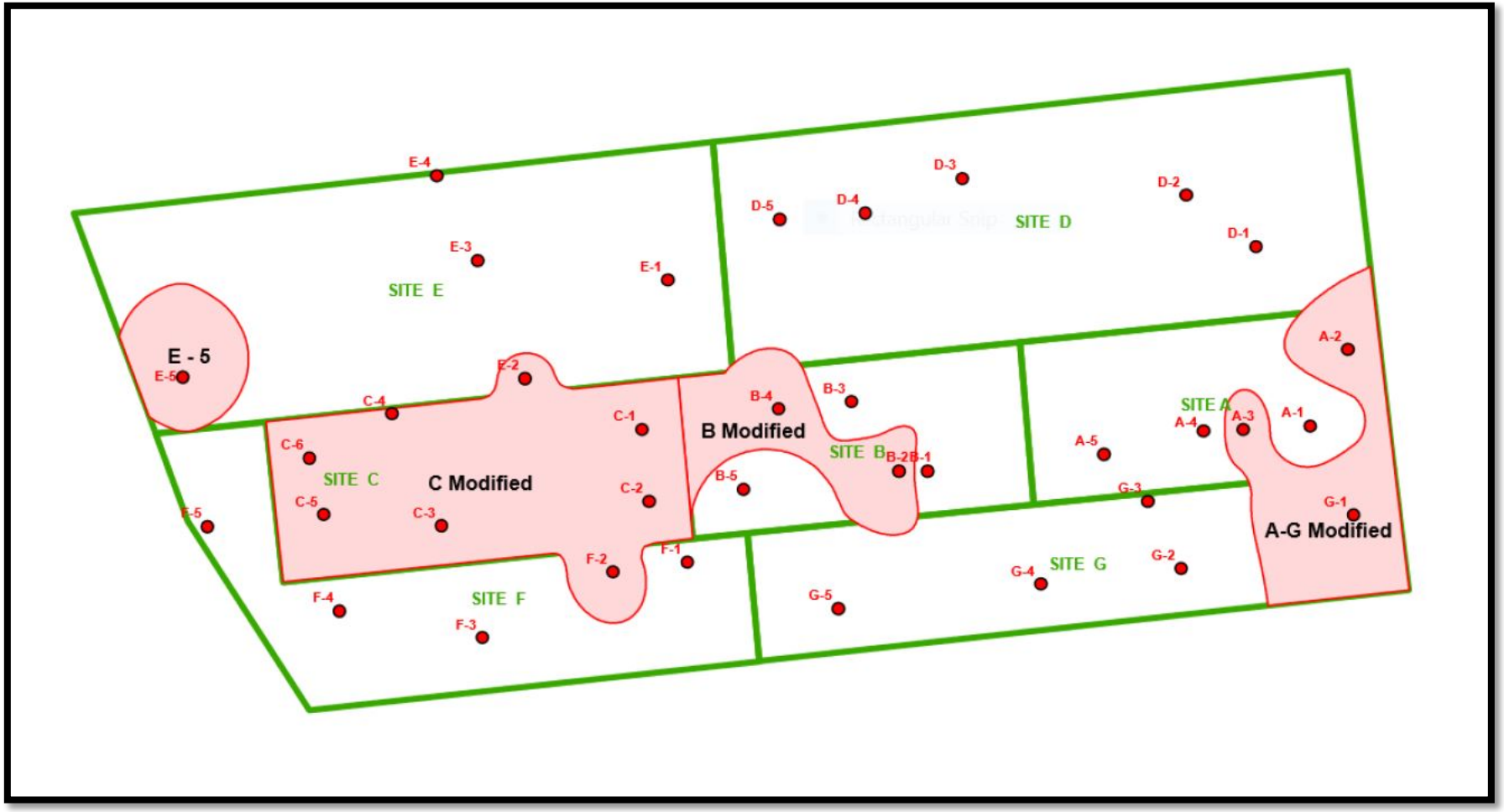
- Mandatory activity to maintain clearance for Naval ships berthing and navigation.
- Current and future trends indicate increasing use of deeper-draft, power intensive vessels that require deeper waters for safe navigation and berthing.
- Maintenance dredging will continue as new sediments move into San Diego Bay by fluvial transport or shoaling of existing material by prop wash, tides, currents, and wave action.
- Often dredge to 20-50 ft. mean lower low water (MLLW) in the San Diego Bay.
- Dredging frequency varies widely throughout the Bay.

Typical Maintenance Dredging Areas

Active Harbor Conditions

- Better understanding of remedy performance in active and dynamic harbor conditions including:
  - Piers
  - Quays
  - Wharves
  - Slopes
  - Ship draft clearance
  - Maintenance dredging
  - Prop wash

Example of a Dredge Area with Contamination



NAVFAC Naval Facilities Engineering Command
SERDP • ESTCP SYMPOSIUM
#SerdpEstcp2019

Restoration

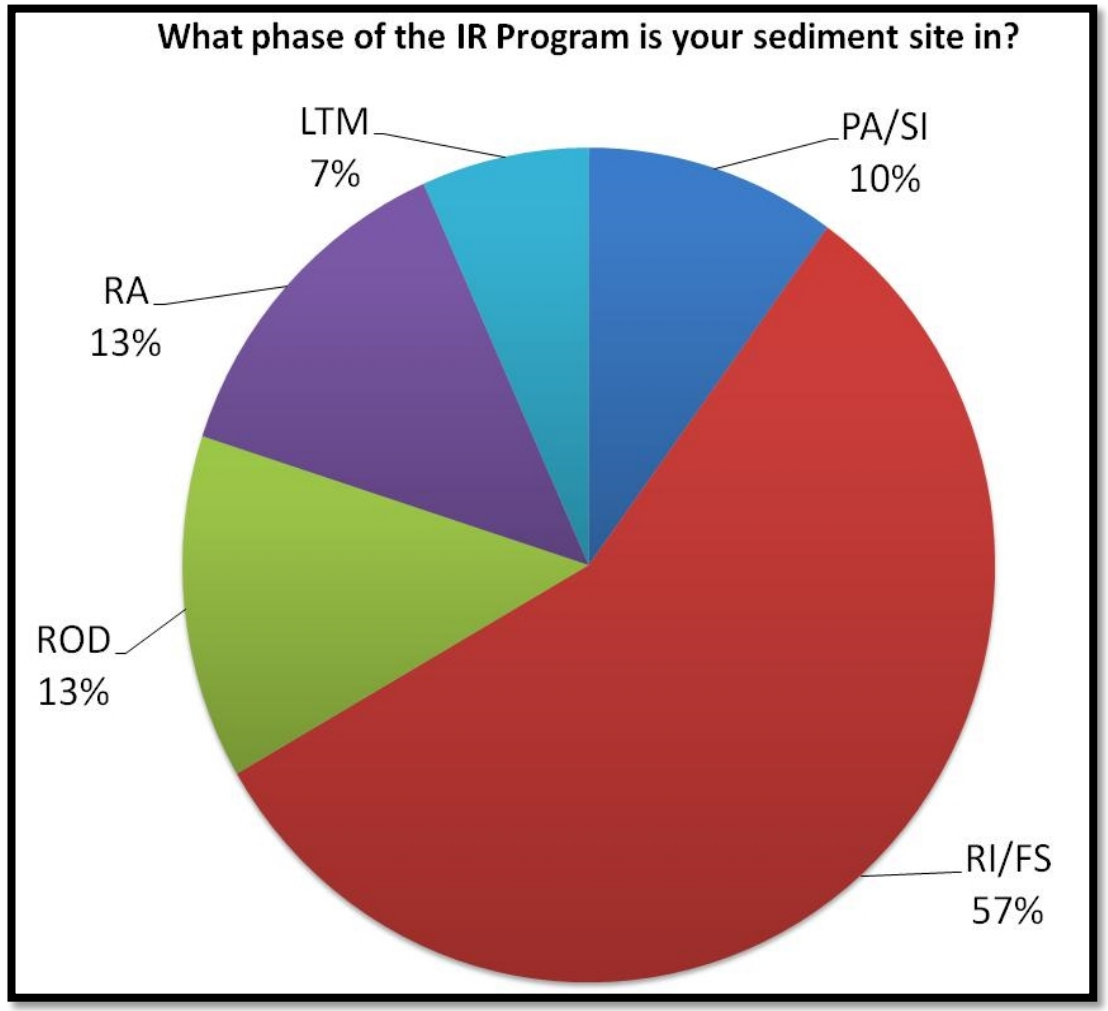
- Studies must be conducted to show that active operations are not a continuous source per the Navy Sediment Policy.
  - None have been conducted to date in the San Diego Bay.
- Typical contaminants: PCBs, metals, PAHs
- Contamination normally at depth- encapsulated, no exposure
- Long schedule with CERCLA

Navy Sediment Policy

- Navy Policy on Sediment Site Investigation and Response Action issued February 8, 2002
- The policy generally specifies:
  - Sources must be identified and controlled before cleanup
  - All investigations shall primarily be linked to a specific Navy CERCLA/RCRA site
  - Cleanup must be risk-based and have site-specific cleanup goals
  - Monitoring criteria for any long-term monitoring plan must be established before the first sample is collected

Phase of Installation Restoration Program

- Investigation
  67%
- Remediation
  33%



Compliance - Storm Water

- Pollutant Sources: Industrial, municipal and construction areas (that includes infrastructure, vehicles, etc.)

- BMPs – Process (sweeping, drip pans) and Structural (roof, media filtration, diversion)

- Studies:
  - Storm water and receiving water samples are collected via pulsed exposure and standard static exposure methodologies (NIWC)

  - *In Situ* monitoring ensures constant exposure through a storm event (NIWC)

Rainfall in San Diego

- San Diego, California is provided with an average of 251.5 mm (9.9 in) of rainfall per year, or 21 mm (0.8 in) per month.
- On average there are 44 days per year with more than 0.1 mm (0.004 in) of rainfall (precipitation) or 3.7 days with a quantity of rain, sleet, snow etc. per month.
- The driest weather is in July when an average of 0.5 mm (0 in) of rainfall (precipitation) occurs.
- The wettest weather is in January when an average of 45.7 mm (1.8 in) of rainfall (precipitation) occurs.

Precipitation Table

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Precipitation mm (in)	45.7 (1.8)	38.9 (1.5)	45 (1.8)	20.1 (0.8)	4.8 (0.2)	1.8 (0.1)	0.5 (0)	2.5 (0.1)	6.1 (0.2)	9.4 (0.4)	36.8 (1.4)	39.9 (1.6)	251.5 (9.9)
Precipitation Litres/m² (Gallons/ft²)	45.7 (1.12)	38.9 (0.95)	45 (1.1)	20.1 (0.49)	4.8 (0.12)	1.8 (0.04)	0.5 (0.01)	2.5 (0.06)	6.1 (0.15)	9.4 (0.23)	36.8 (0.9)	39.9 (0.98)	251.5 (6.17)
Number of Wet Days (probability of rain on a day)	7 (23%)	7 (25%)	7 (23%)	5 (17%)	2 (6%)	1 (3%)	0.5 (2%)	1 (3%)	1 (3%)	3 (10%)	4 (13%)	6 (19%)	44.5 (12%)
Percentage of Sunny (Cloudy)	68 (32)	65 (35)	70 (30)	60 (40)	58 (42)	58 (42)	69 (31)	68 (32)	71 (29)	69 (31)	72 (28)	77 (23)	68 (32)

Alternative Strategies for Assessment of Episodic Discharges

- Current static Whole Effluent Toxicity (WET) methods are not appropriate for episodic exposures such as storm water and dry dock discharges.

- A more realistic assessment of the toxicological impacts of stormwater runoff (or other episodic discharges) on the receiving waters is a critical need.

Noon Day 1

Morning Day 2

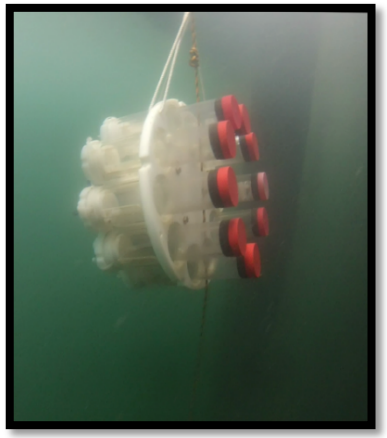
Photos: C. Stransky

Leveraged funding from NESDI Project #547. PI: Molly Colvin (NIWC)

NAVFAC Naval Facilities Engineering Command
SERDP • ESTCP SYMPOSIUM #SerdpEstcp2019

Technical Objectives – Method Validation

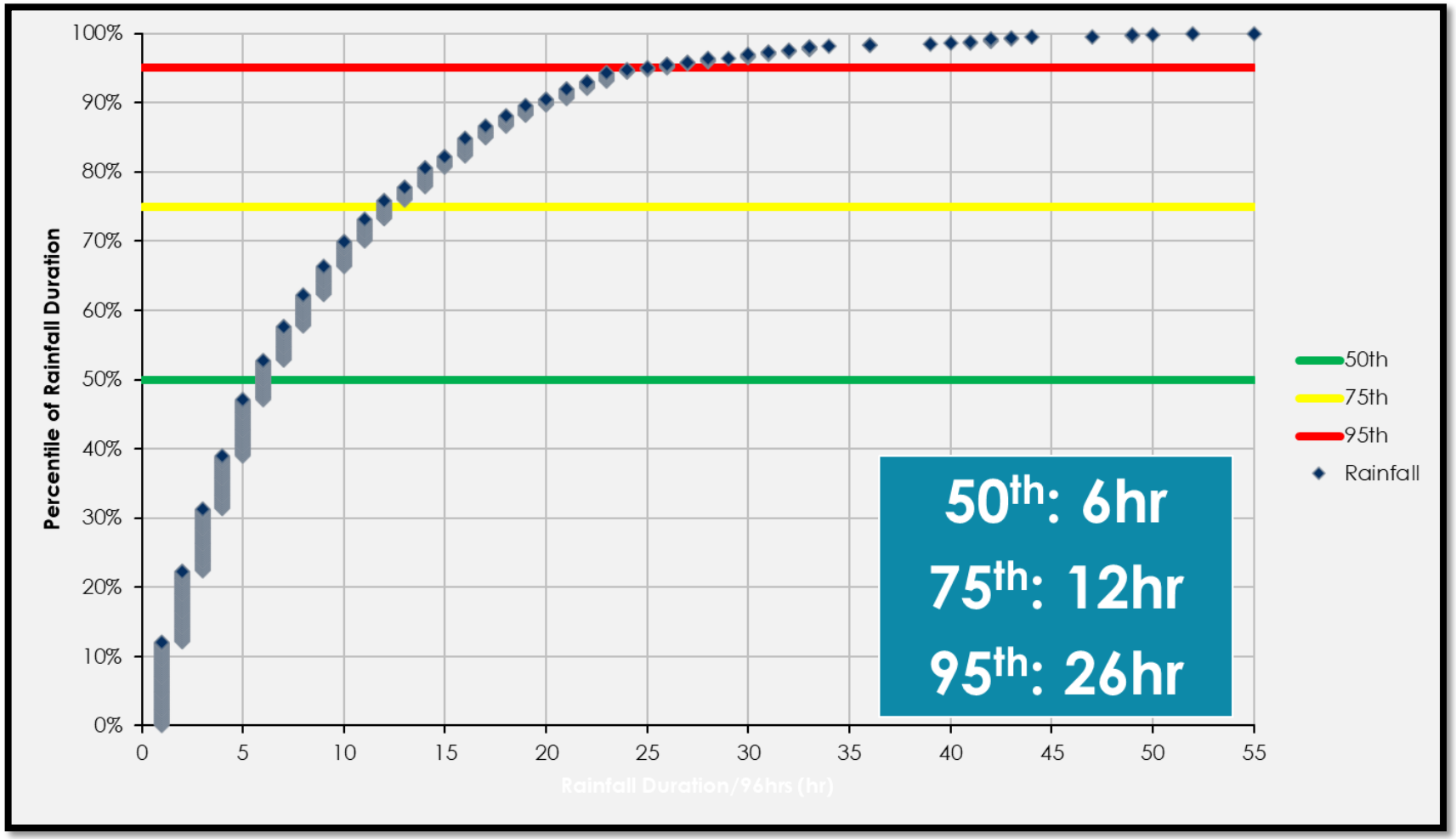
- Method validation at DoD Sites
  - Stormwater/Receiving Water Laboratory Testing
  - Pulsed exposure
  - Standard exposure
- *In Situ* monitoring
- Water quality characterization



Leveraged funding from NESDI Project #547. PI: Molly Colvin (NIWC)

NAVFAC Naval Facilities Engineering Command
SERDP • ESTCP SYMPOSIUM #SerdpEstcp2019

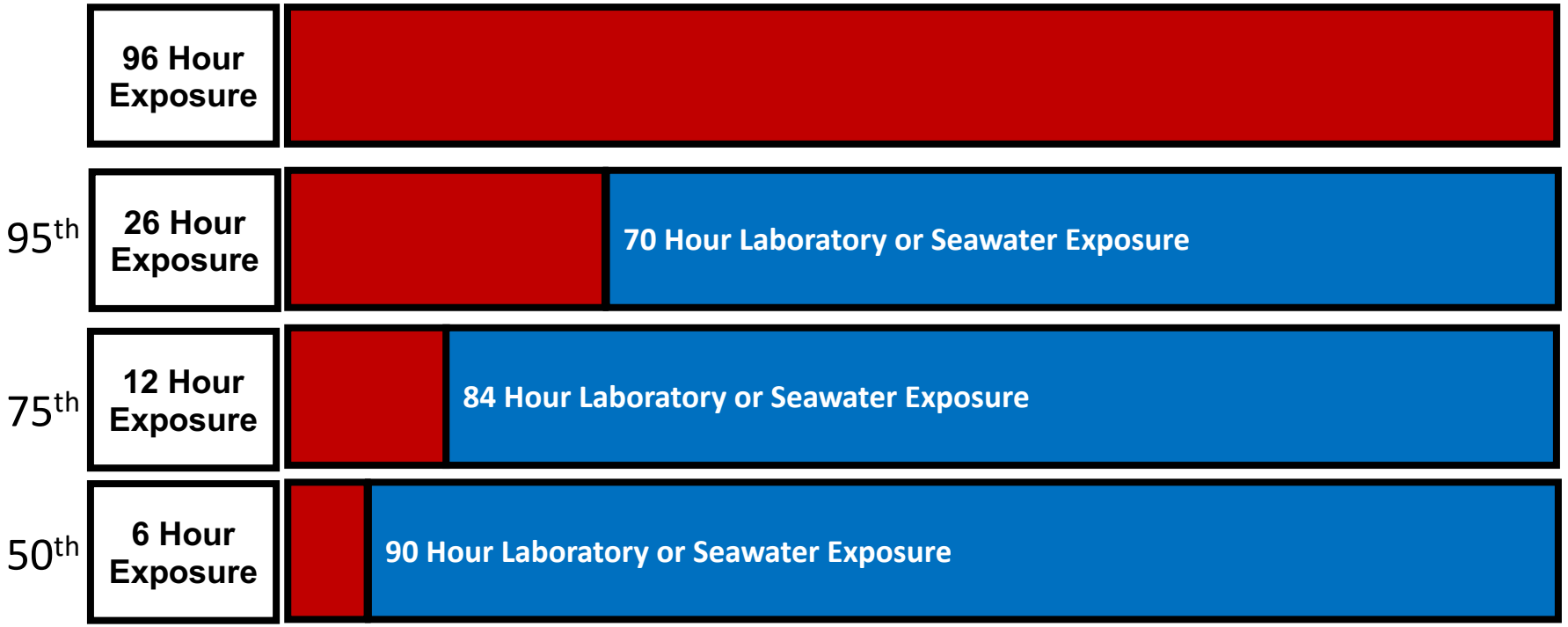
Rainfall & Discharge Analysis (NIWC study)



Leveraged funding from NESDI Project #547. PI: Molly Colvin (NIWC)

NAVFAC Naval Facilities Engineering Command
SERDP • ESTCP SYMPOSIUM
#SerdpEstcp2019

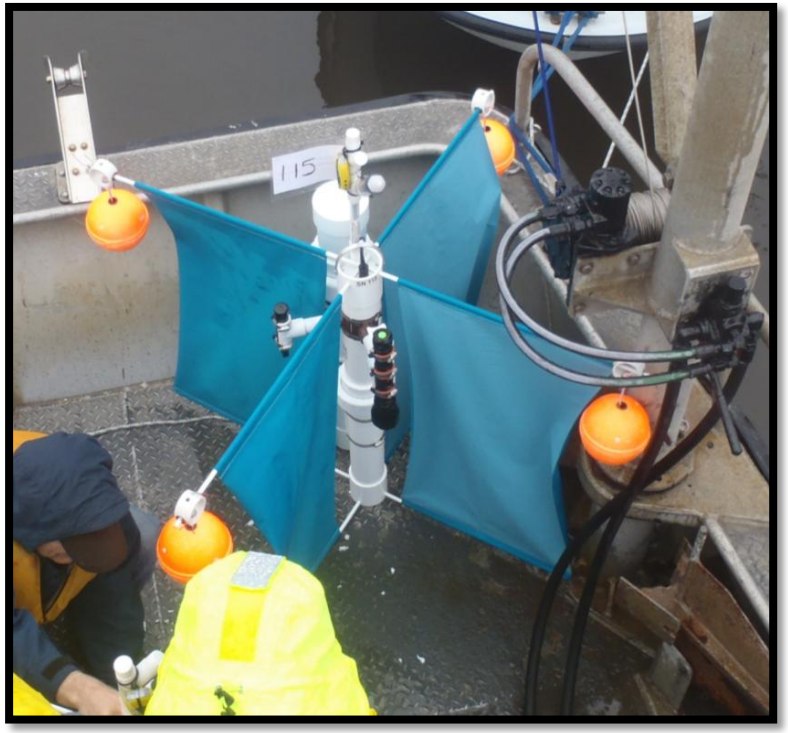
Refinement of Toxicity Testing Methodology (NIWC)



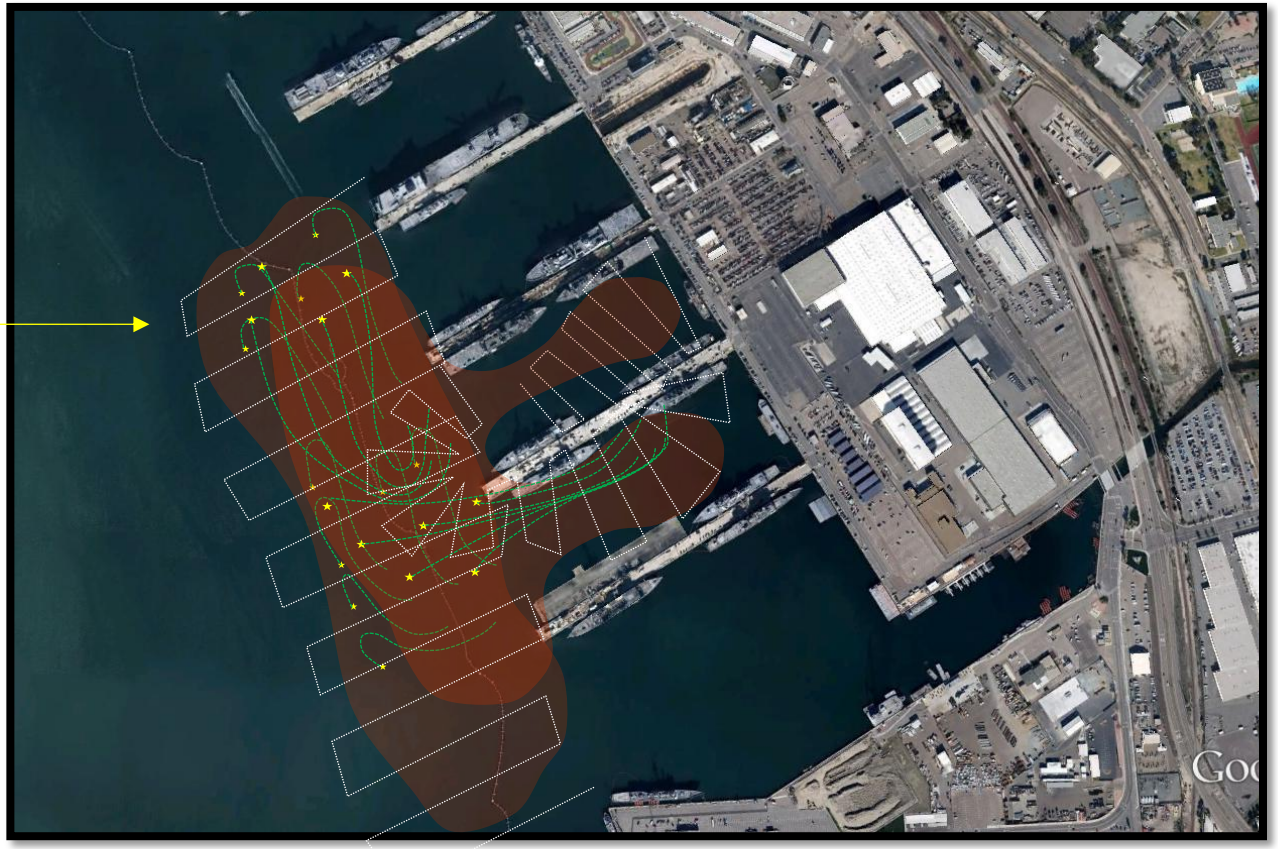
Schematic of pulsed exposures followed by transfer to receiving water or clean laboratory water

Leveraged funding from NESDI Project #547. PI: Molly Colvin (NIWC)

Alternative Strategies: Drifting Exposure System (DrEx)



Areas of NPDES permits and Drifting Exposure System (DrEx -NIWC)



Challenges with working between Compliance, Restoration and MILCON

- Compliance
  - Only have money for BMPs, studies associated with stormwater.
  - Cannot sample sediment unless it is associated with an outfall or mixing zones to support stormwater permits.
- Restoration
  - Can only start restoration if all requirements meet Navy Sediment Policy.
  - CERCLA can take many years from Preliminary Investigation to Remedial Action.
- Restoration (cont)
  - Can only use ERN money if the contamination is considered “legacy”.
- MILCON
  - Must occur for Navy activities to continue for National Security.
  - Contaminated sediment can increase cost exponentially, with removal and disposal and additional BMPs.
- Residual Contamination after Activity
  - What program can fund cleanup?
  - How do we know its Navy contamination

Navy Sediment Issues and Challenges

Policy Issues

- Determining background/ reference locations
- Identifying and controlling non-Navy sources/inputs
- Identification and delineation of potential sites

Technical Challenges

- **Developing site-specific cleanup goals**
- **Evaluating sediment transport**
- **In-Situ Remediation**
- **Sediment toxicity and assessing bioavailability of contaminants**
- **Performance Metrics for Monitoring Tools**

Conclusion: Navy's Perspective

- Risk Management Approach
  - Establish Site Specific Cleanup Goals
- Partnership with Regulators
  - Team with Water Board and local regulators and keep them informed and provide transparent communication
- Applied New Technologies/Studies
  - Sediment transport modeling, Passive sampling techniques, and Bioavailability evaluation
- Applied in-situ remediation
  - AC amendment and apply clean dredging material for ENR, EMNR and MNR

POCs

- Melanie Kito
- NAVFACSW
- 619-532-2273
- Melanie.Kito@Navy.mil