Sediment Quality Verification (SQV) Sampling Objectives

- Establish baseline for continuous process improvement
- Characterize silt and sediment in the vicinity of outfalls and dry docks (eg operational areas not included in OUB sediment monitoring)
- Provide data to assess sediment impact zones for NPDES discharges
- Provide data to assess anti-degradation requirements for water quality certifications needed for pier and dry dock infrastructure improvements
- Provide data to support R&D studies of sediment treatability and bioavailability

SQV Technical Approach

- Characterize Surface and Deep Sediment Conditions at High Priority Locations
  - All Samples
    - Screening Metals (XRF); PAHs, PCBs (ImmunoAssay)
    - Total Hg Analysis
  - Confirmation for Subset of Samples
    - Metals (ICMP/MS); PAHs (GC/MS)
  - Evaluate Bioavailability
    - Pore Water Concentrations
    - Toxicity Assessment
- Support R&D Projects on treatability and bioavailability
  - SPAWAR: Laboratory Reactive Amendment Treatability Studies. Environmental Security Technology Certification Program (ESTCP) Proposal
  - ERDC-ERL. Assessing the bioavailability of contaminated sediments, proposal for the Strategic Environmental Research and Development Program (SERDP).

Summary of Samples and Analytical Methods

		XRF [1]	ImmunoAssay [2]		ICP Metals	CVAA	GCMS		
Samples	n	Cu, Pb, Zn	PAH_IA	PCB_IA	[3]	Hg [4]	PAHs[5]	Grain Size	TOC
2010 OUB M 500ft grid	71	71	71		19		22	71	71
2011 OOUB 1500ft grid	32	32	32		11		4	32	32
SQV Cores	48		48	48	48	48		48	48
SQV Grabs	48		48	48	48	48		48	48
Squeeze Cores	12				12	12		12	12
Pier 7 Transects	50	50	50	50	22	48		50	50
Pier 7 Bulk Samples	2			2					
Pier 7 Drum Samples	6			6					
Pier 7 Post Drum Samples	5			5	5			5	5
Storm Drains	3				3	3	3	3	3
Silts	20	20	20	20		18		20	20

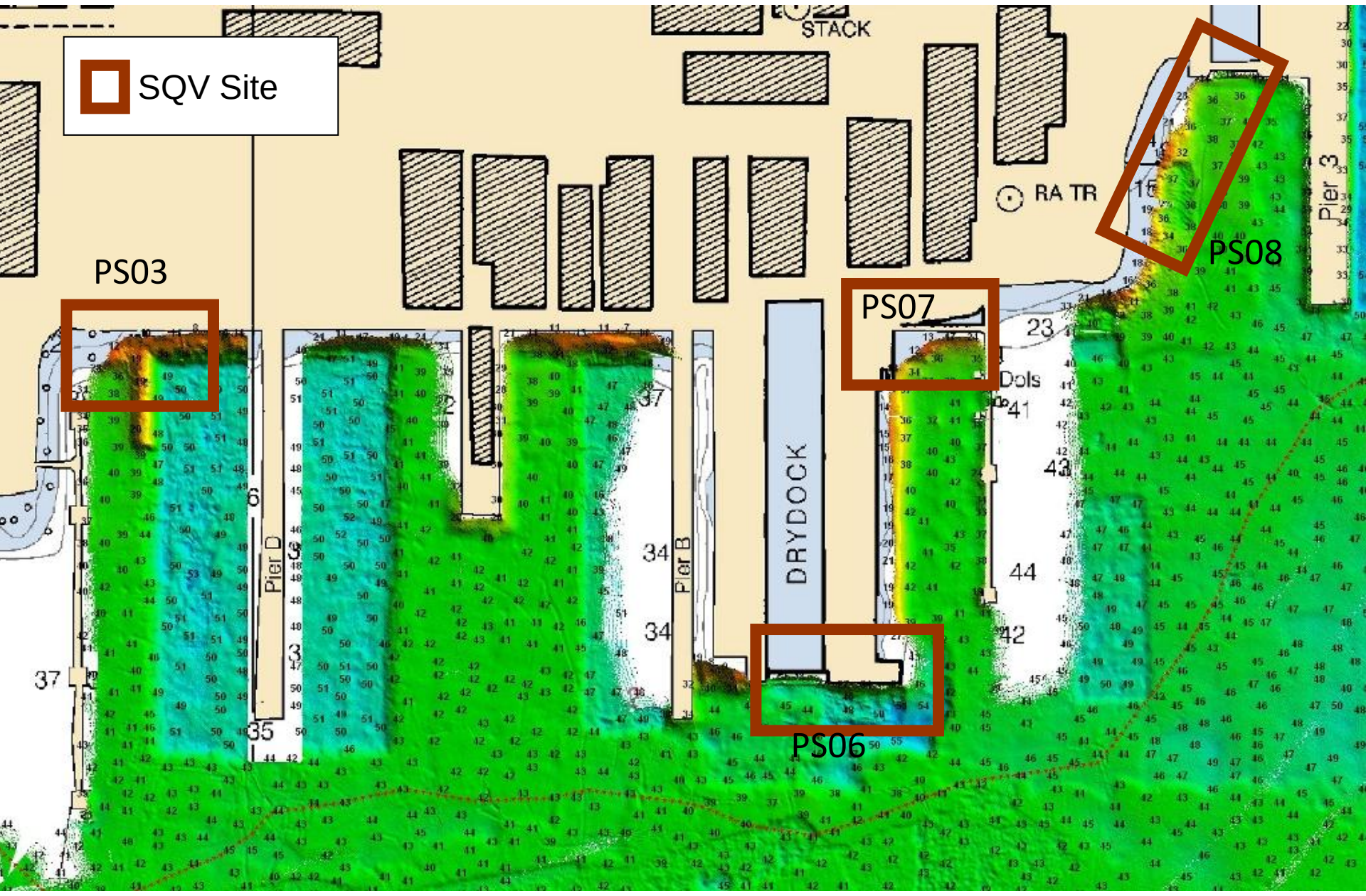
[1] Selected Metals (Fe, Cu, Zn, Pb, As) by Field Portable X-ray Fluorescence (FPXRF) Spectrometry EPA Method 6200

[2] ImmunoAssay: EPA Methods: 4020 (PCB) & 4035 (PAH) - For Soils (Modified for Marine Sediments)

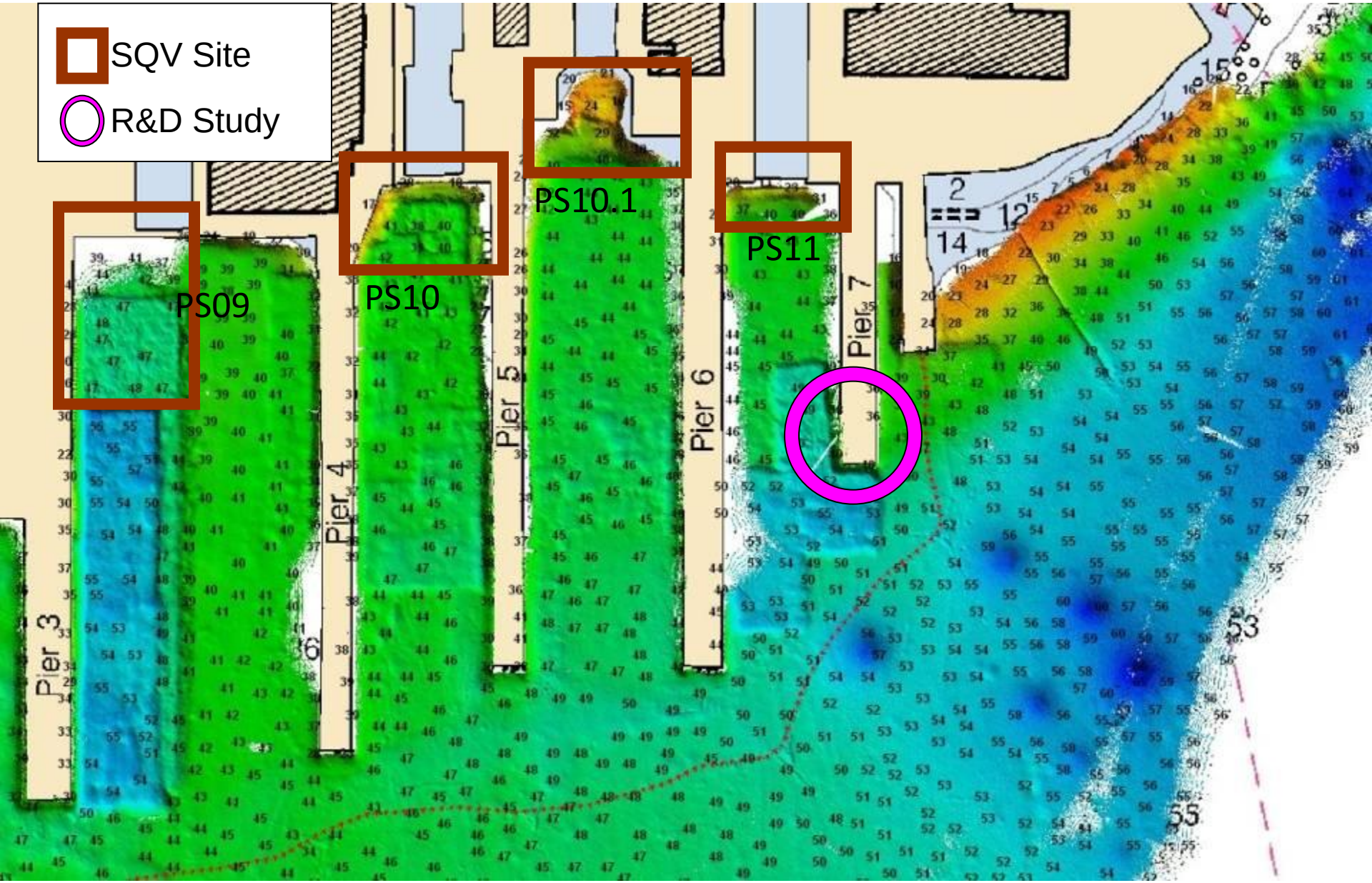
[3] ICP-MS Analysis (As, Ag, Cd, Pb), ICP-OES (Al, Cr, Cu, Fe, Mn, Ni, Zn)

[4] cold-vapor atomic absorption spectroscopy (CVAA)

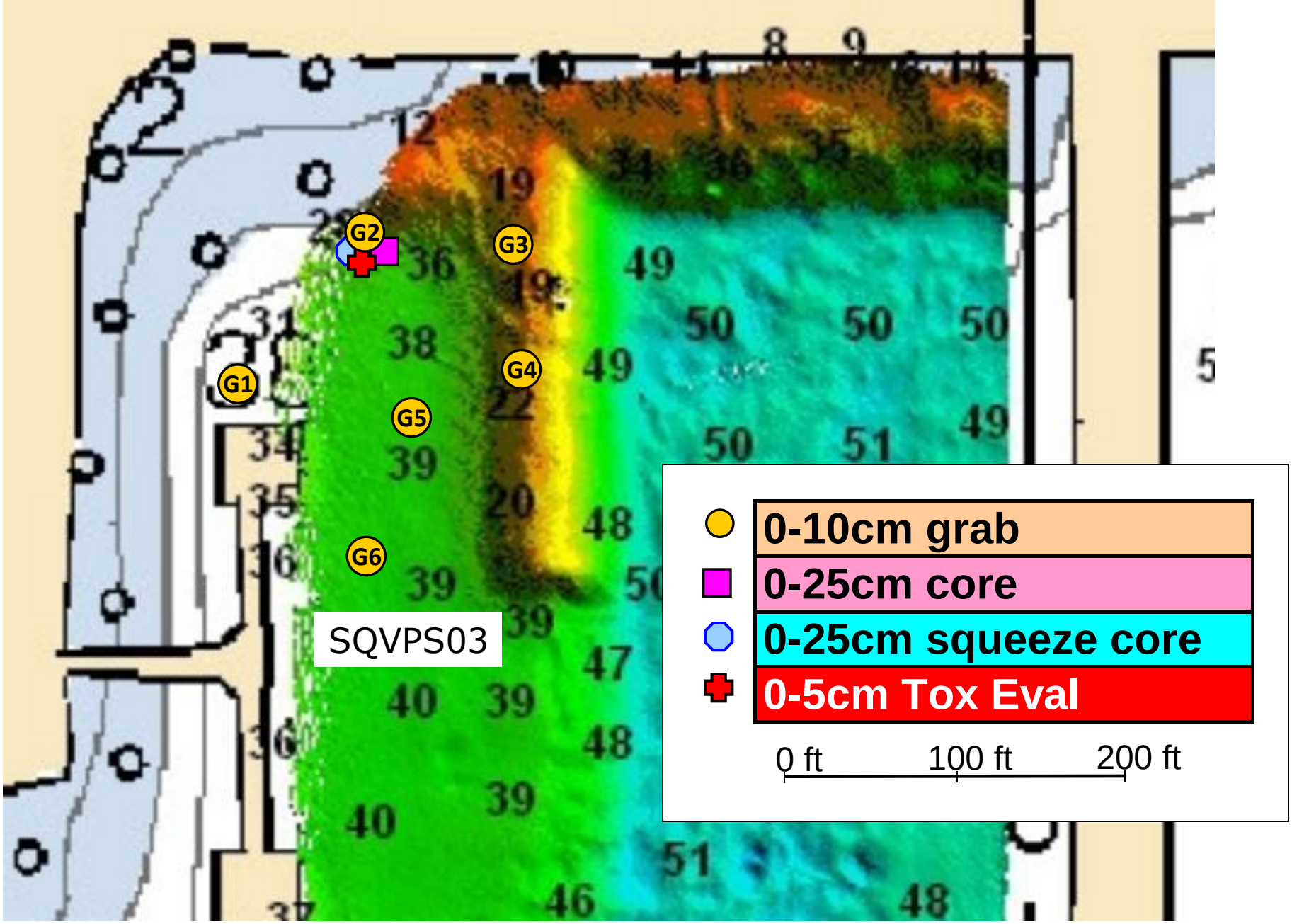
[5] 40 parent and methylatedPAH compounds



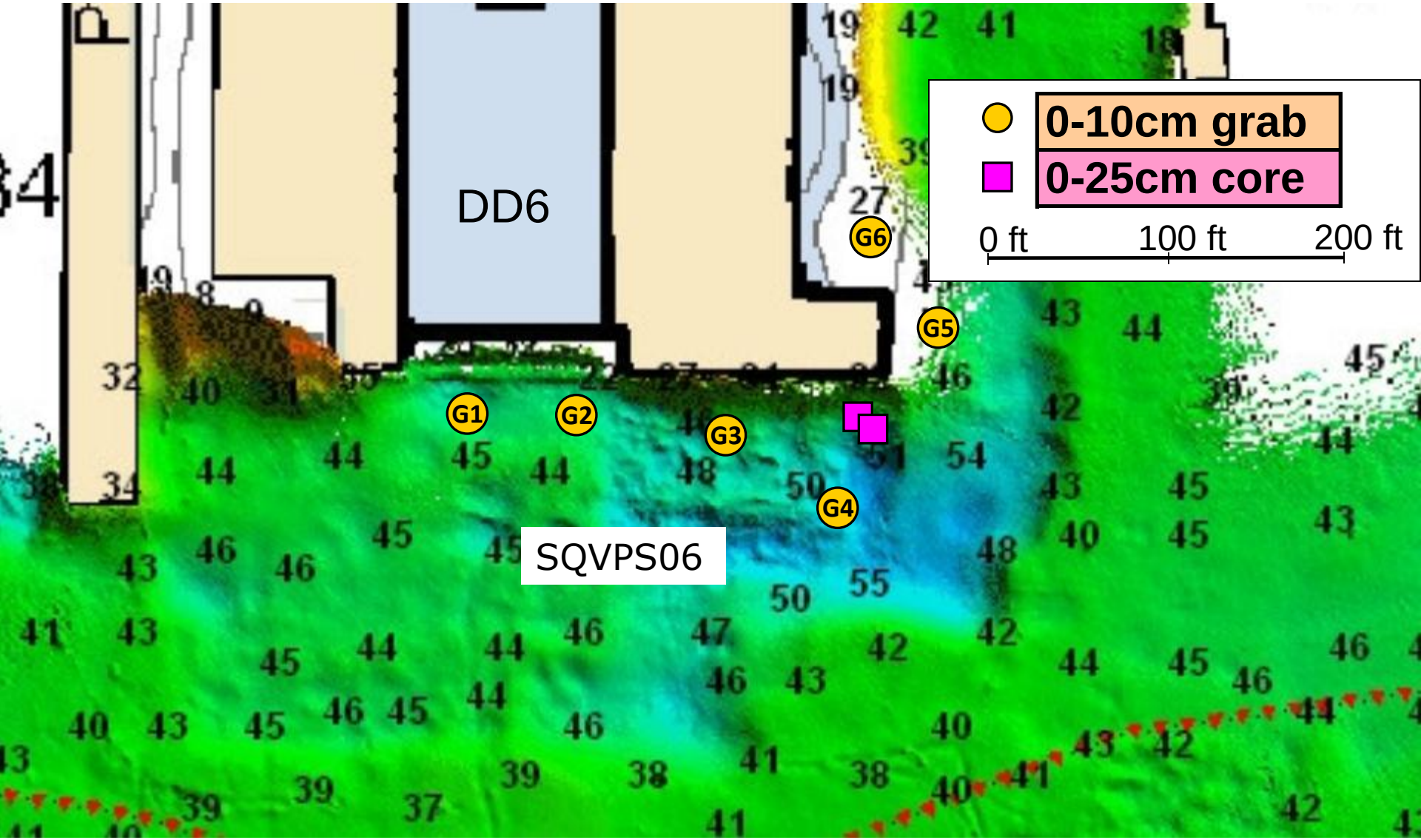
SQV Sampling Areas (West Side)

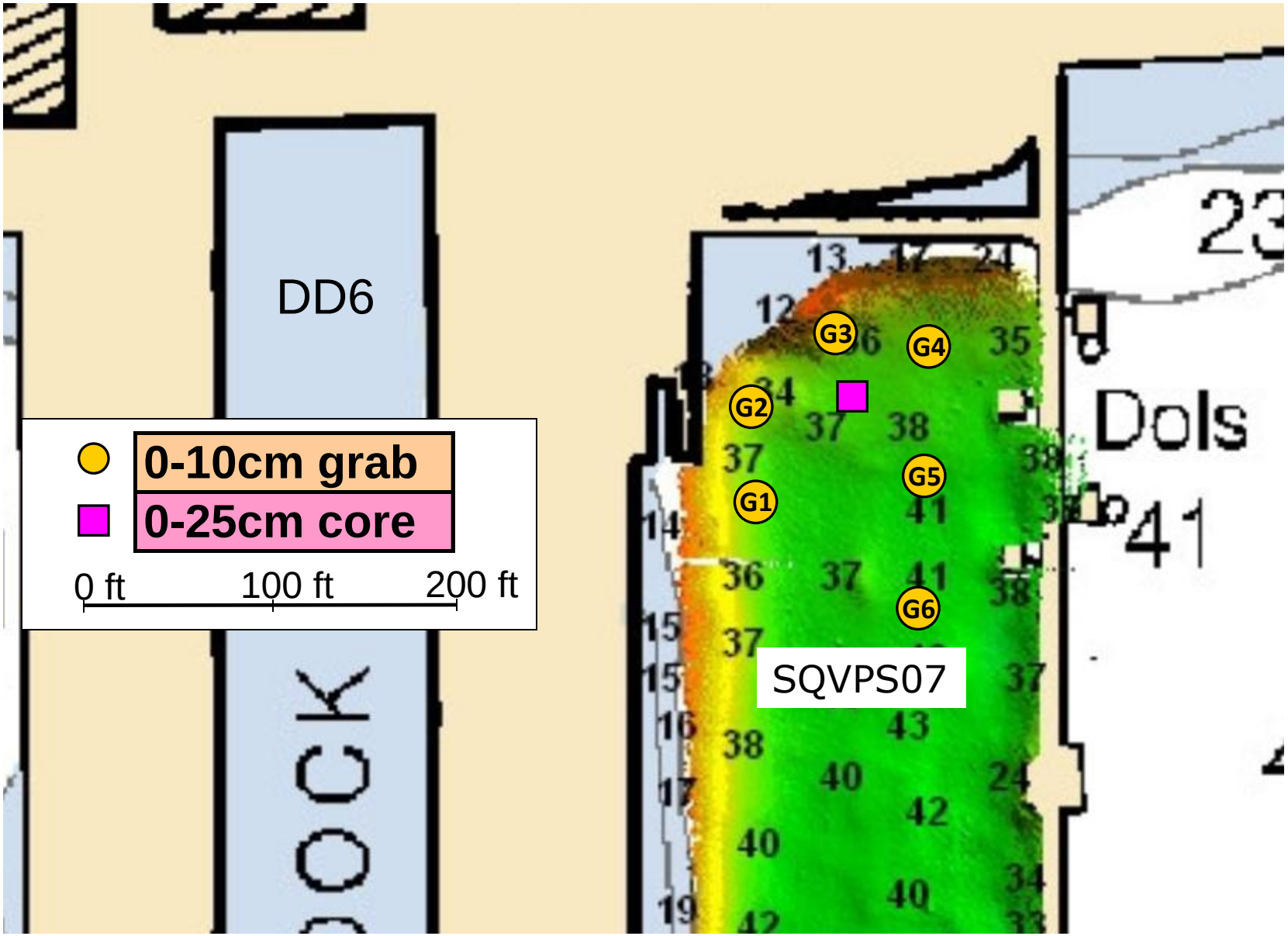


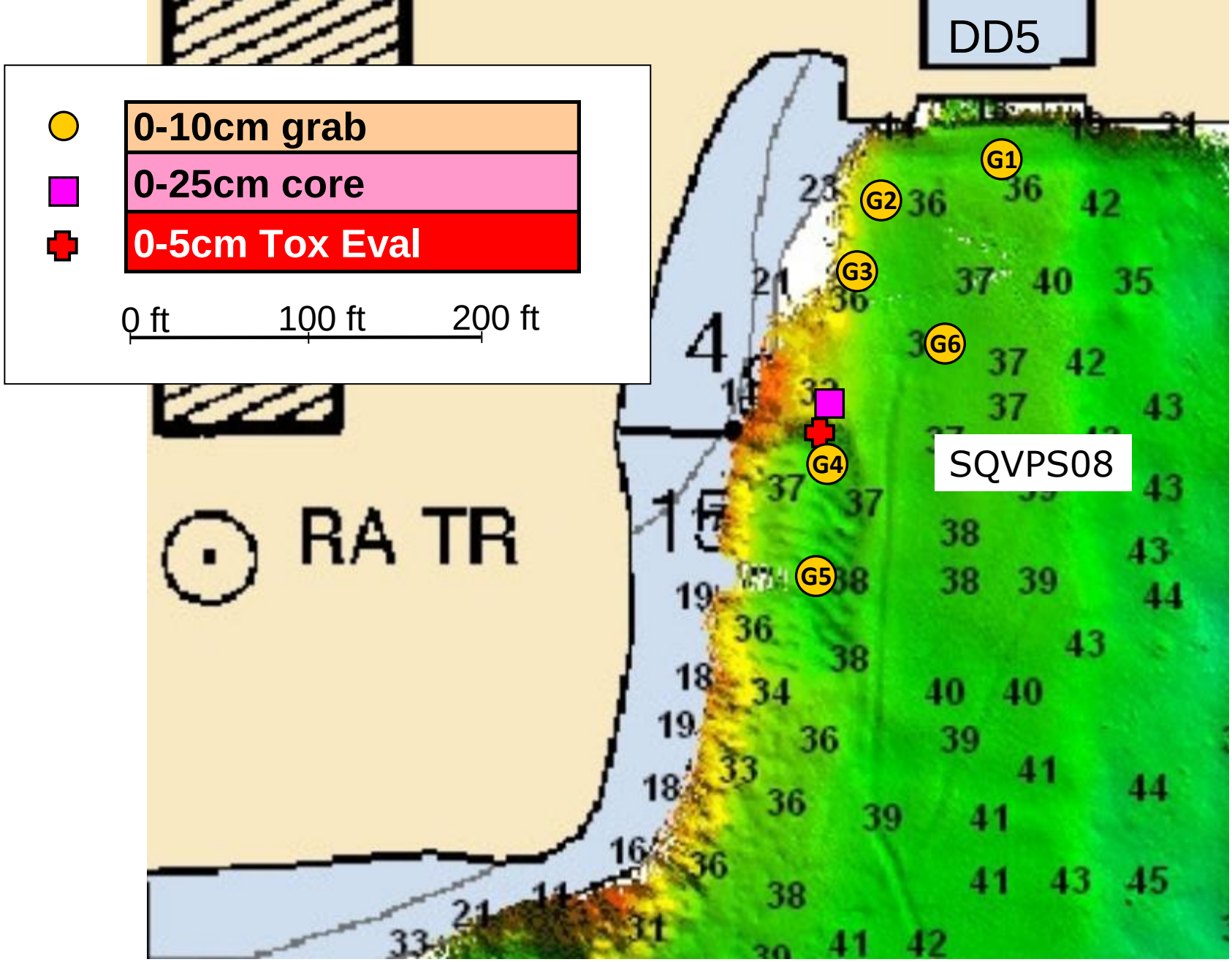
SQV Sampling Areas (East Side)



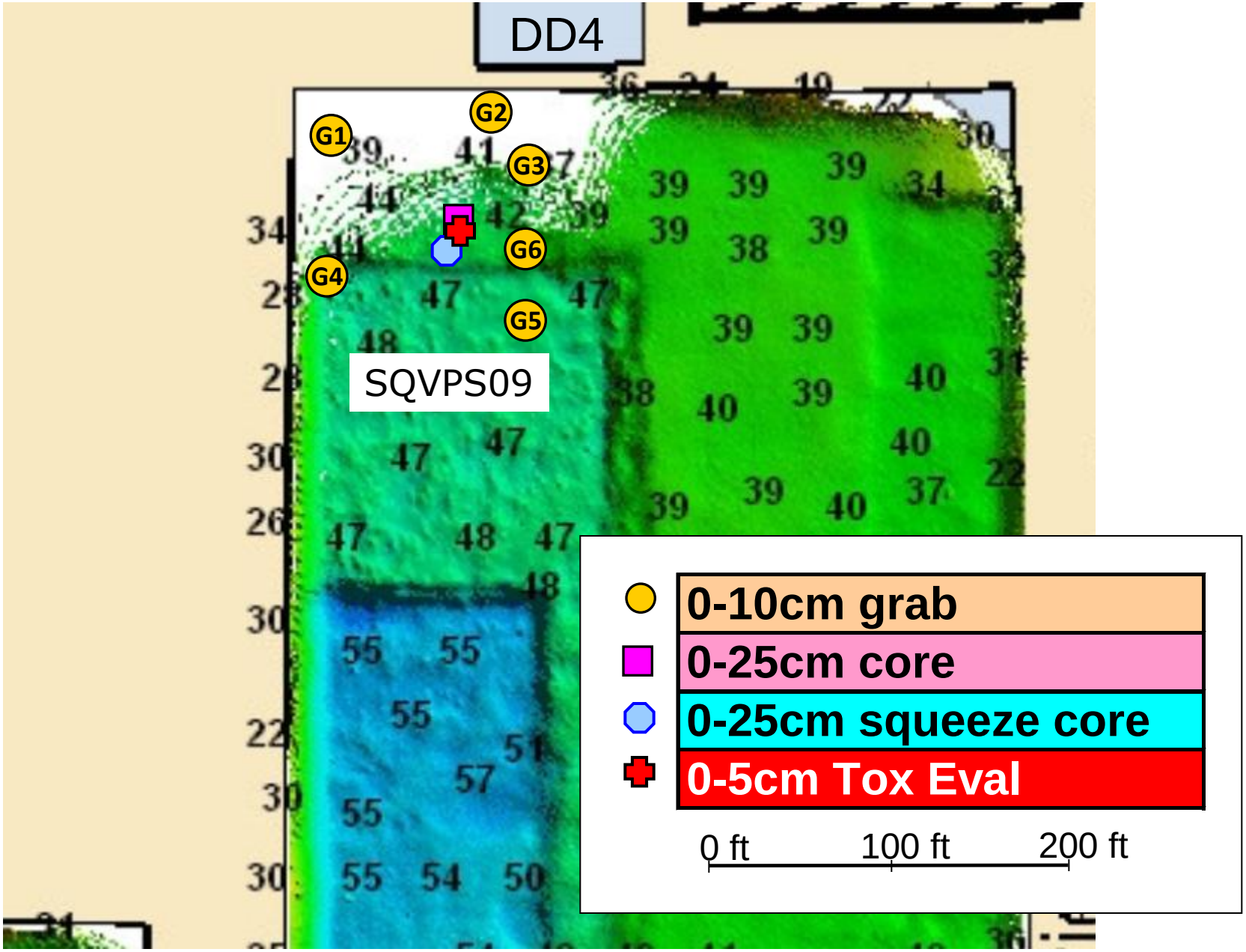
Sample locations for SQVPS03

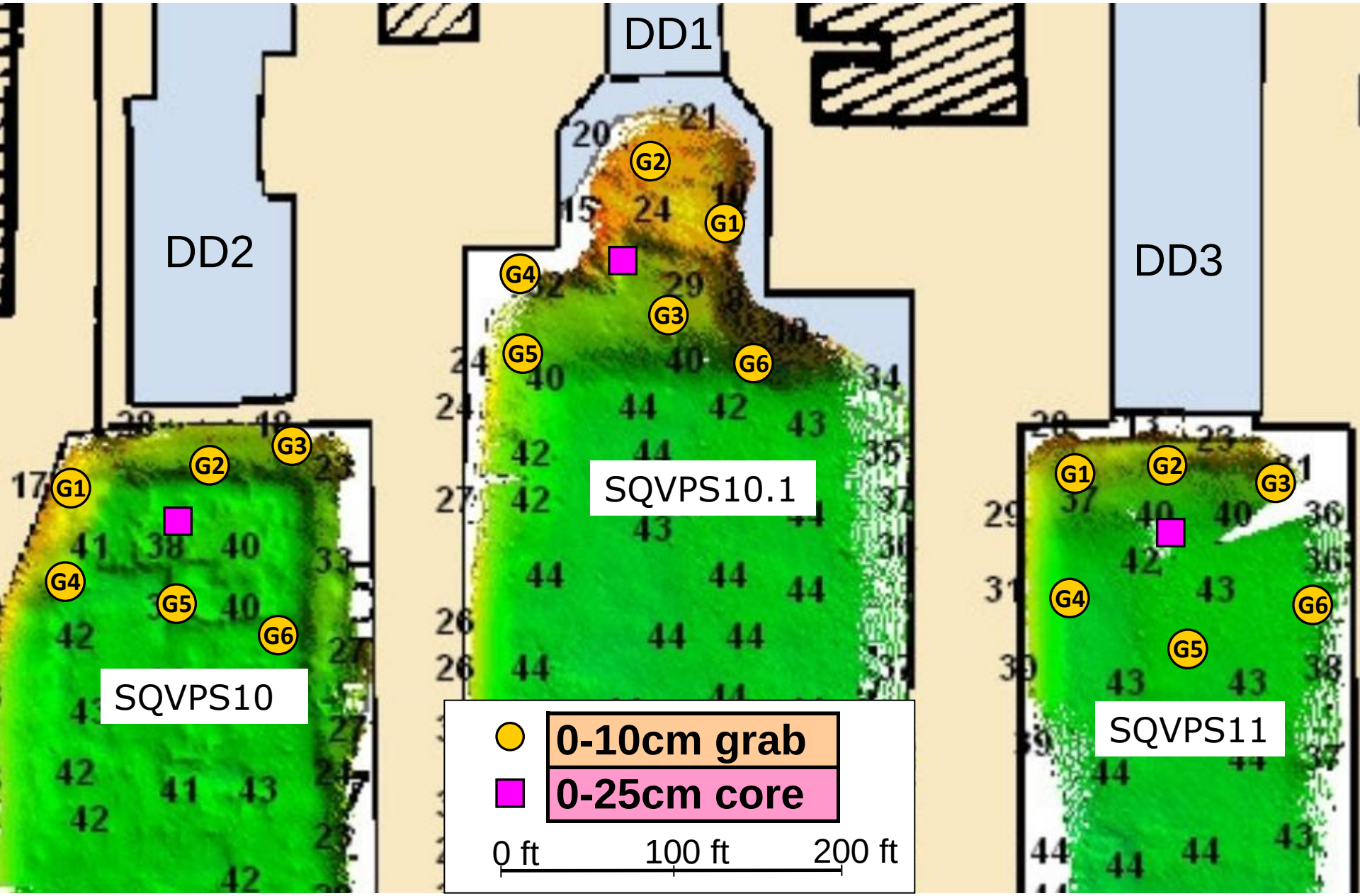

DD6
SQVPS06
G1
G2
G3
G4
G5
G6
0-10cm grab
0-25cm core
0 ft
100 ft
200 ft


DD6
0-10cm grab
0-25cm core
0 ft
100 ft
200 ft
G1
G2
G3
G4
G5
G6
SQVPS07
Dols
41

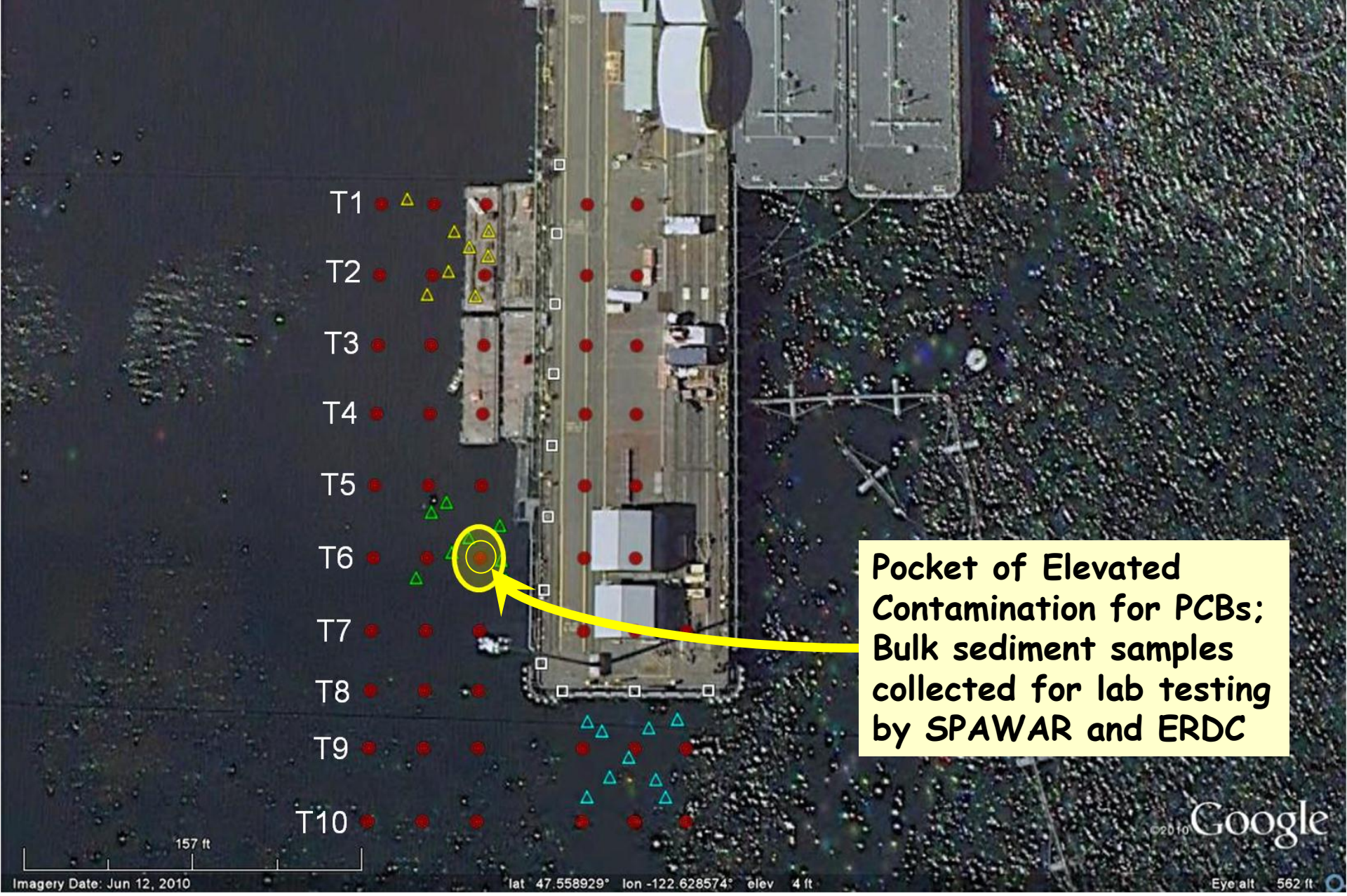


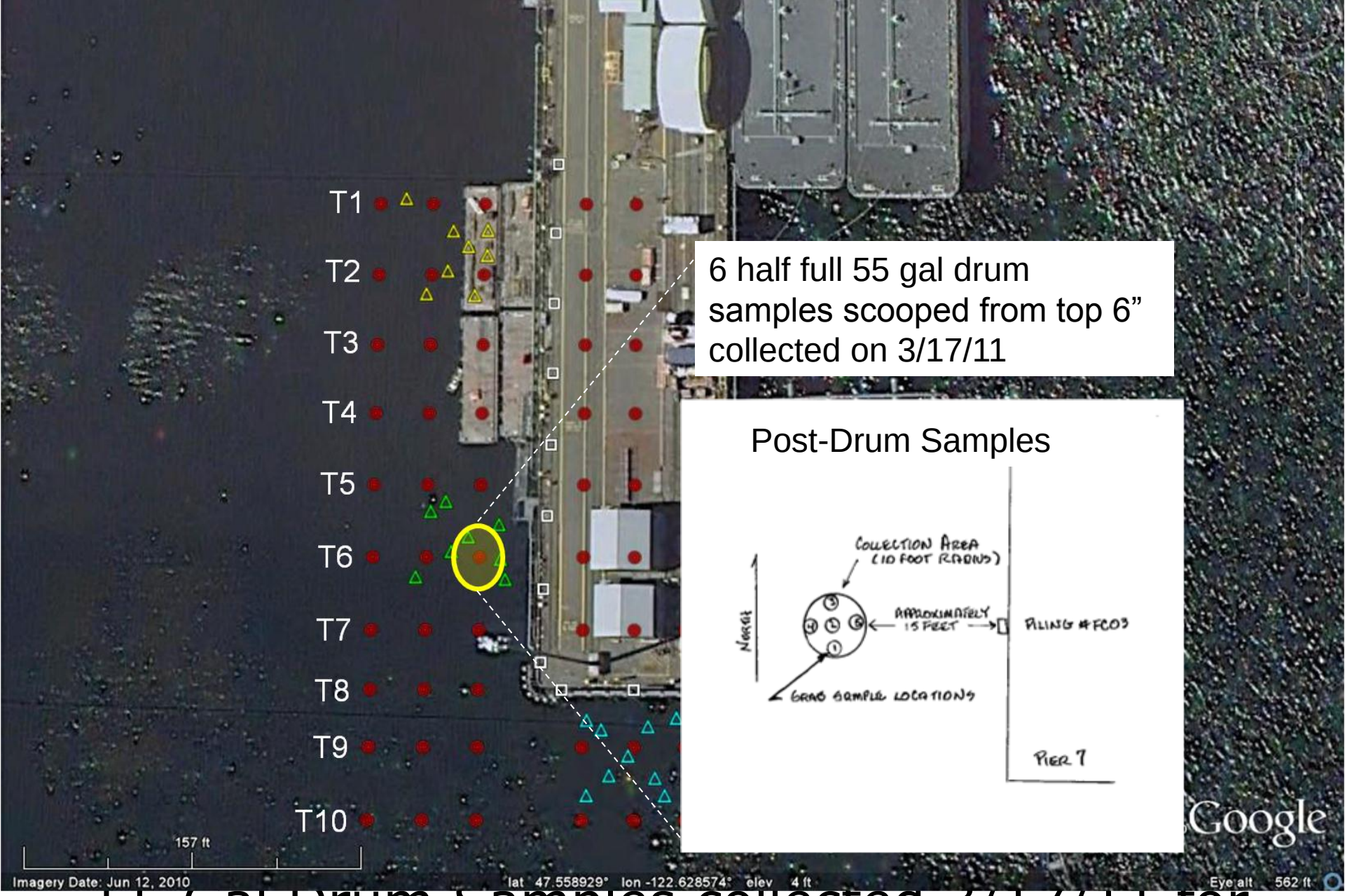
Sample locations for SQVPS08.


DD4
G1
G2
G3
G4
G5
G6
SQVPS09
0-10cm grab
0-25cm core
0-25cm squeeze core
0-5cm Tox Eval
0 ft
100 ft
200 ft



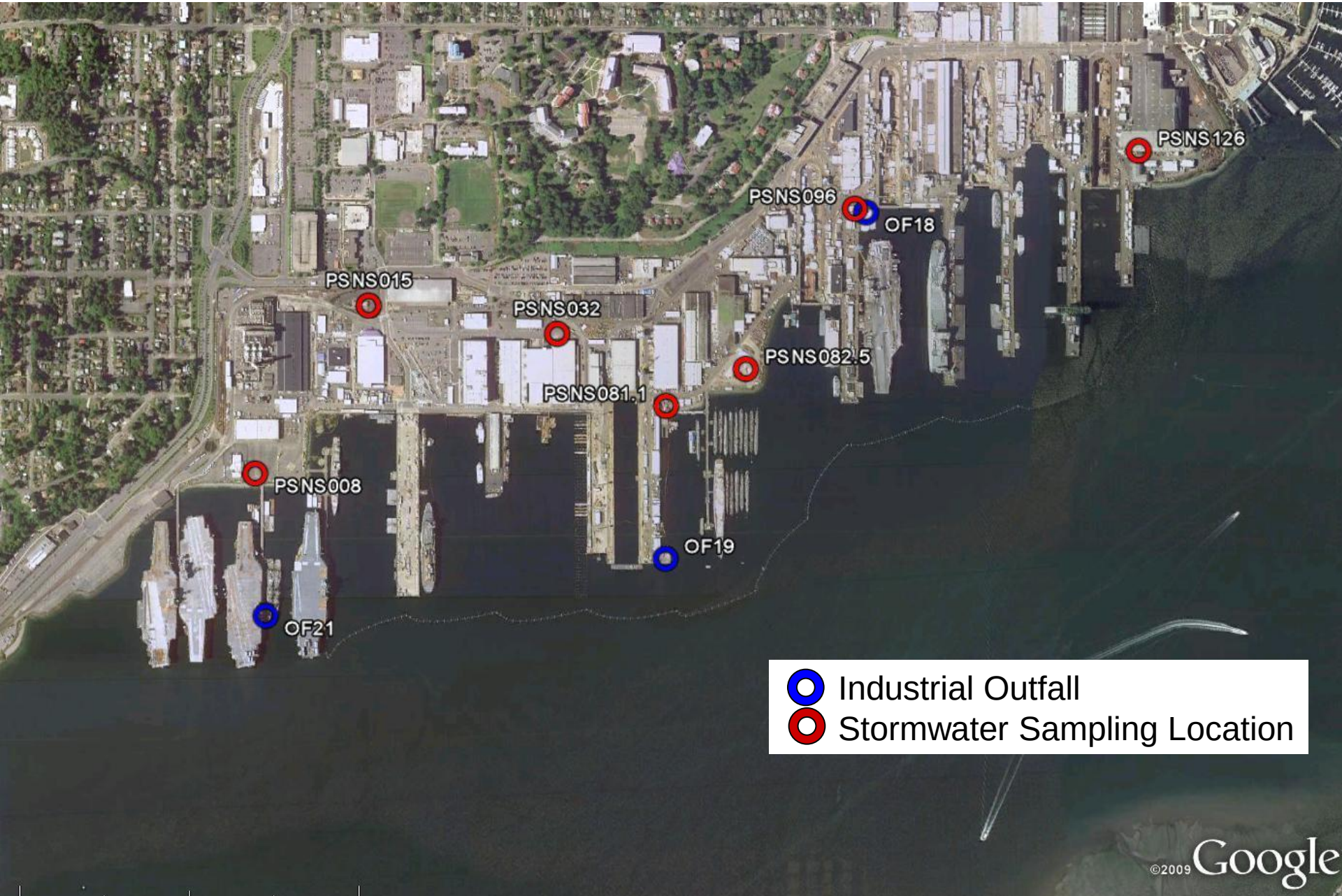
Sampling locations for stations SQVPS10, SQVPS10.1, and SQVPS11.


T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
Pocket of Elevated Contamination for PCBs; Bulk sediment samples collected for lab testing by SPAWAR and ERDC
157 ft
Imagery Date: Jun 12, 2010
lat 47.558929° lon -122.628574° elev 4 ft
Eye alt 562 ft
Google

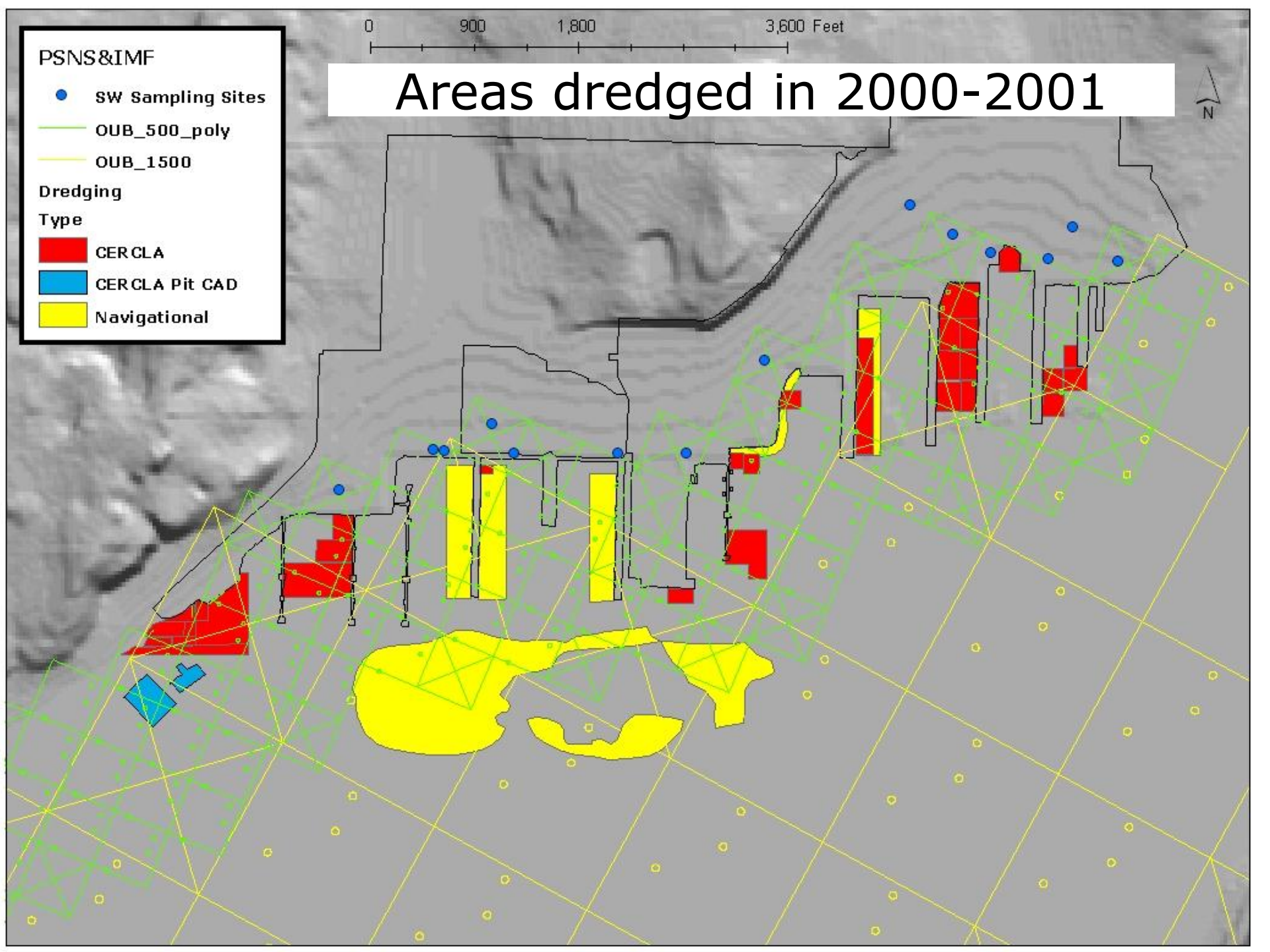


55 Gal Drum Samples collected 3/17/11 for ERDC

Stormwater Monitoring Locations FY2011



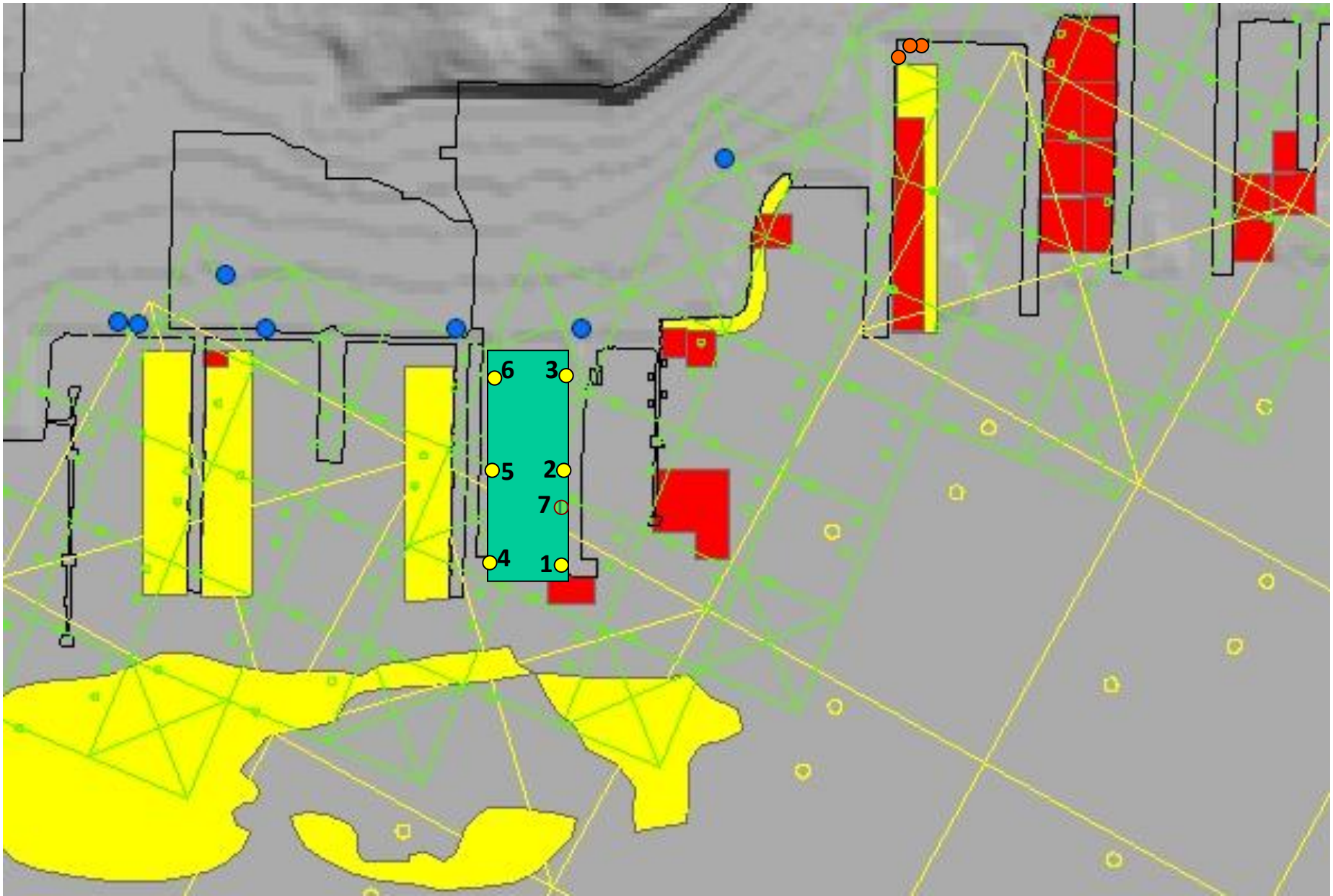
Stormwater and Ambient Monitoring Stations FY2012



Areas dredged in 2000-2001

Dry Dock Silt and OF18 Sediment Samples
DD6 open to Inlet from Apr-Jul 2010

- Silt Core
- Silt Grab
- Sediment Grab



Caisson Sample Locations

Divers collected nephloid sediments accumulated at the base of the dry dock caissons with a “slurp” gun at the locations shown. The “slurp gun” consisted of a 2” core liner fitted with a plunger. Two sizes of cores were used at DD4, 3ft and 1ft (samples 1-6). Samples 7-12 were taken with 3ft cores, samples 13-14 were taken with 1ft cores.