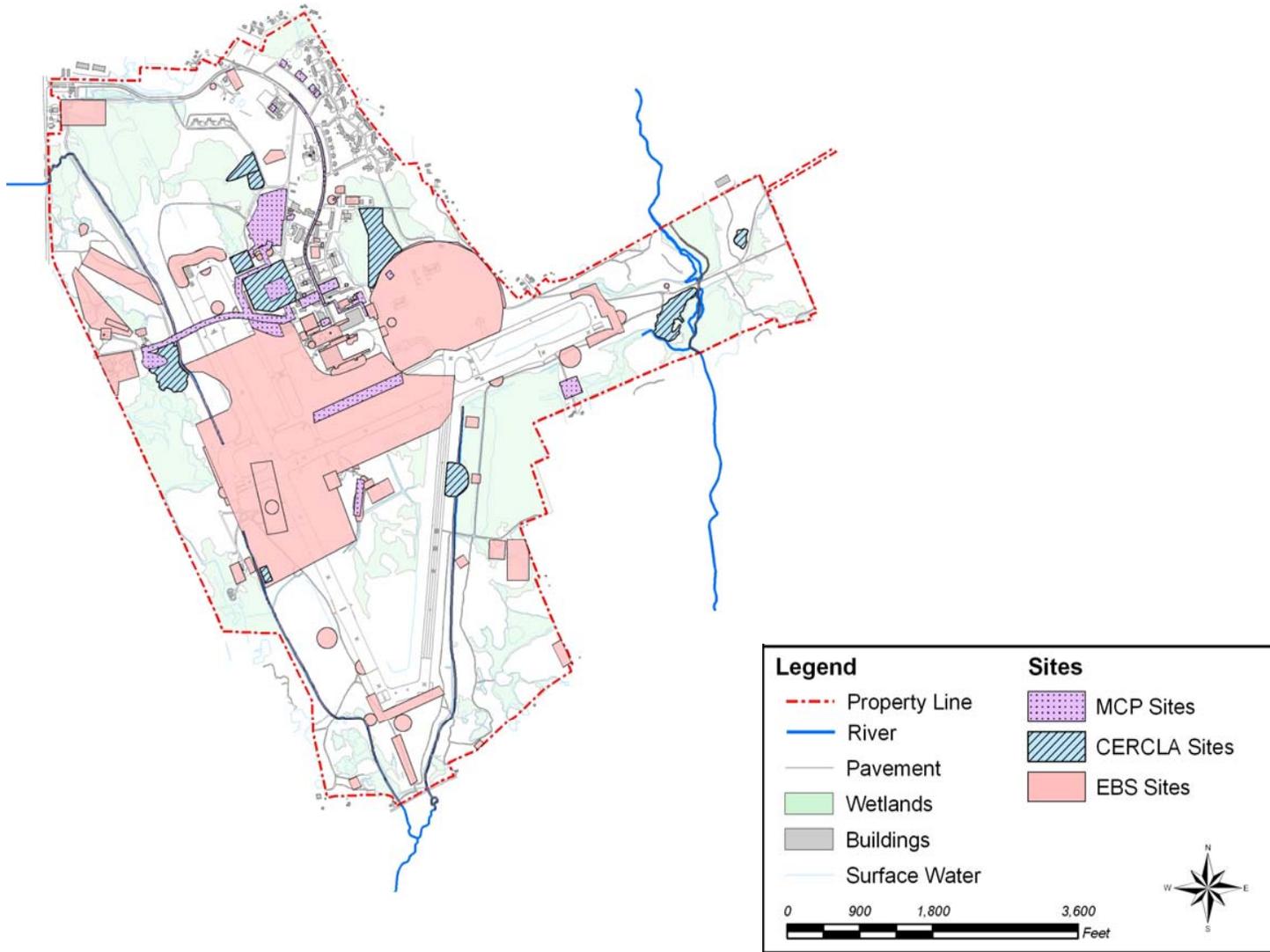

Basewide Assessment Update NAS South Weymouth Restoration Advisory Board Meeting July 20, 2006



Environmental Sites at NAS South Weymouth



Objective

- Update the RAB on the progress of the Navy's Basewide Assessment, specifically including:
 - ❖ Geochemical Evaluation (Floc Assessment)
 - ❖ Hydrogeological Evaluation
 - ❖ Human Health Risk Assessment
 - ❖ Ecological Risk Assessment

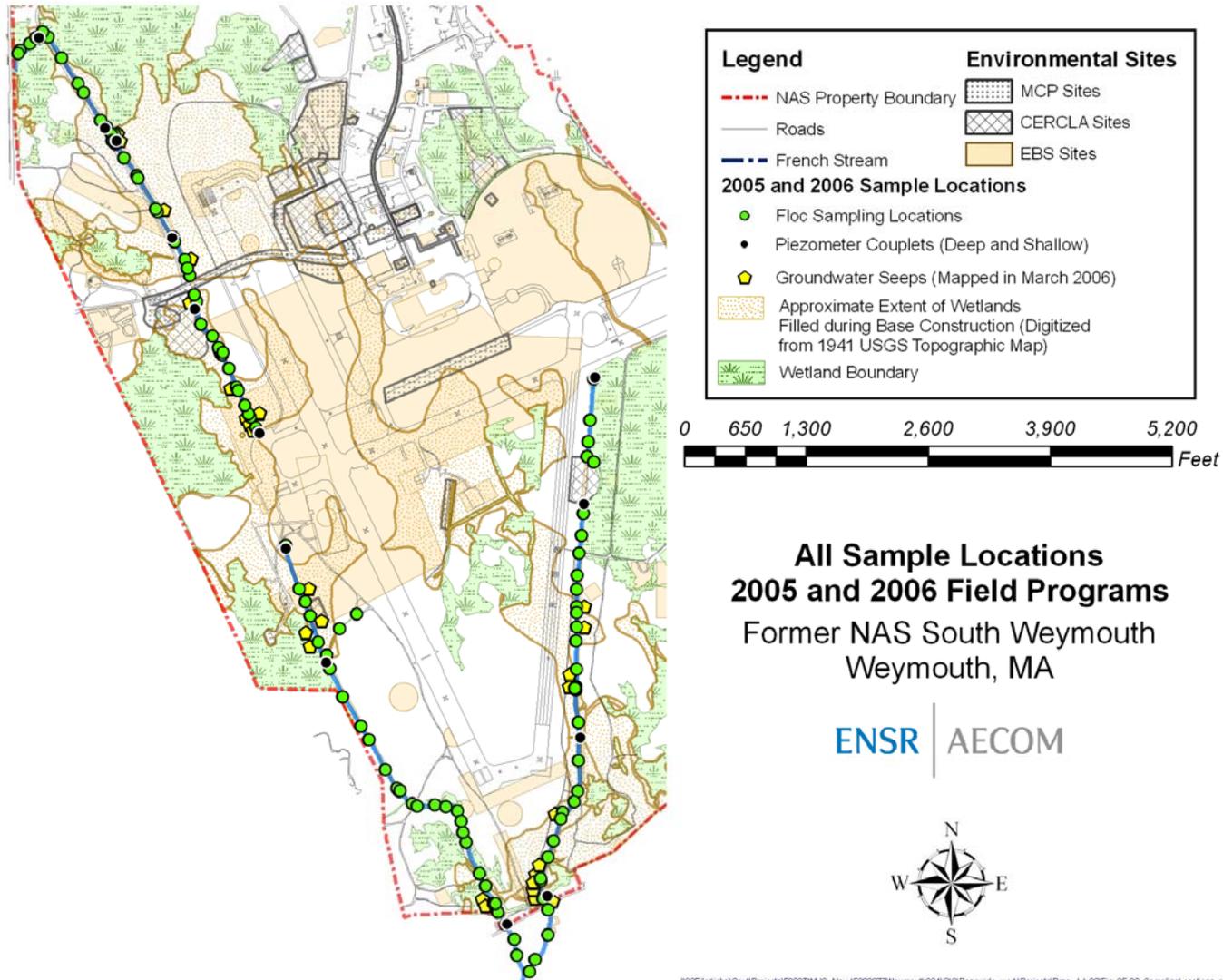


Field Effort Summary 2005/2006

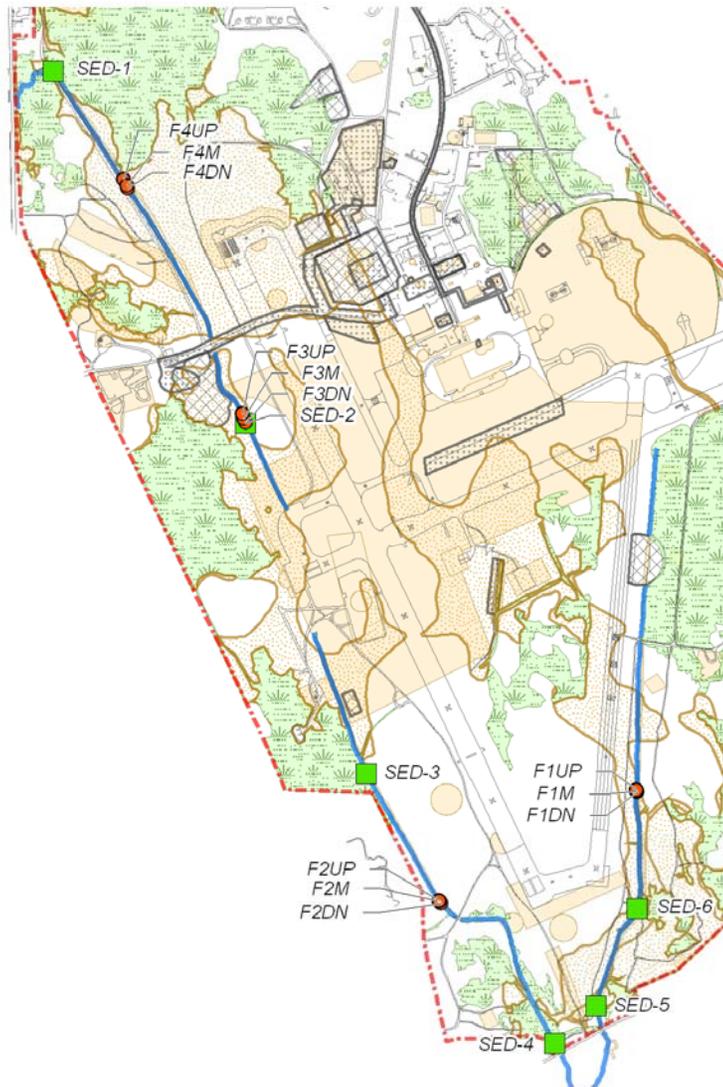
Field Effort	Start Date	End Date
Bedrock Geologic Mapping and Fracture Measurement	12/7/2005	1/13/2006
Baseline Reconnaissance Survey (61 locations) to Characterize Stream and Map Floc	12/12/2005	12/15/2005
Floc Sample Collection for Bacteria Identification (4 locations)	12/15/2005	12/21/2005
Floc Sample Collection (upstream, floc/surface water, and downstream samples at 4 locations) for Chemical Analysis	12/15/2005	12/21/2005
Piezometer Couplet Installation and Development (25 piezometers)	1/9/2006	1/19/2006
Sediment Sampling Program (6 locations) for Chemical Analysis	1/13/2006	1/13/2006
French Stream Characterization and Sampling and Groundwater Sampling Event (12 locations) for Chemical Analysis	1/19/2006	1/20/2006
Synoptic Water Level Gauging	1/26/2006	1/26/2006
Pressure Transducers (continuous water level devices) Placed at 4 Monitoring Wells (to observe trends prior to the water level measurement round)	1/24/2006	1/30/2006
French Stream Monitoring (13 locations) for Field Parameters	3/30/2006	3/30/2006
Floc Survey (data points collected using GPS (weigh points))	3/31/2006	3/31/2006
Reconnaissance Survey (61 locations) to Characterize Stream and Map Floc	5/8/2006	5/10/2006
French Stream Monitoring (13 locations) for Field Parameters	5/8/2006	5/9/2006



All Sample Locations 2005-2006



Floc and Sediment Sampling Locations



Legend		Environmental Sites	
	NAS Property Boundary		MCP Sites
	Roads		CERCLA Sites
	French Stream		EBS Sites
Sample Locations			
	Sediment Sampling Locations		
	Floc Sample Locations		
	Approximate Extent of Wetlands Filled during Base Construction (Digitized from 1941 USGS Topographic Map)		
	Wetland Boundary		



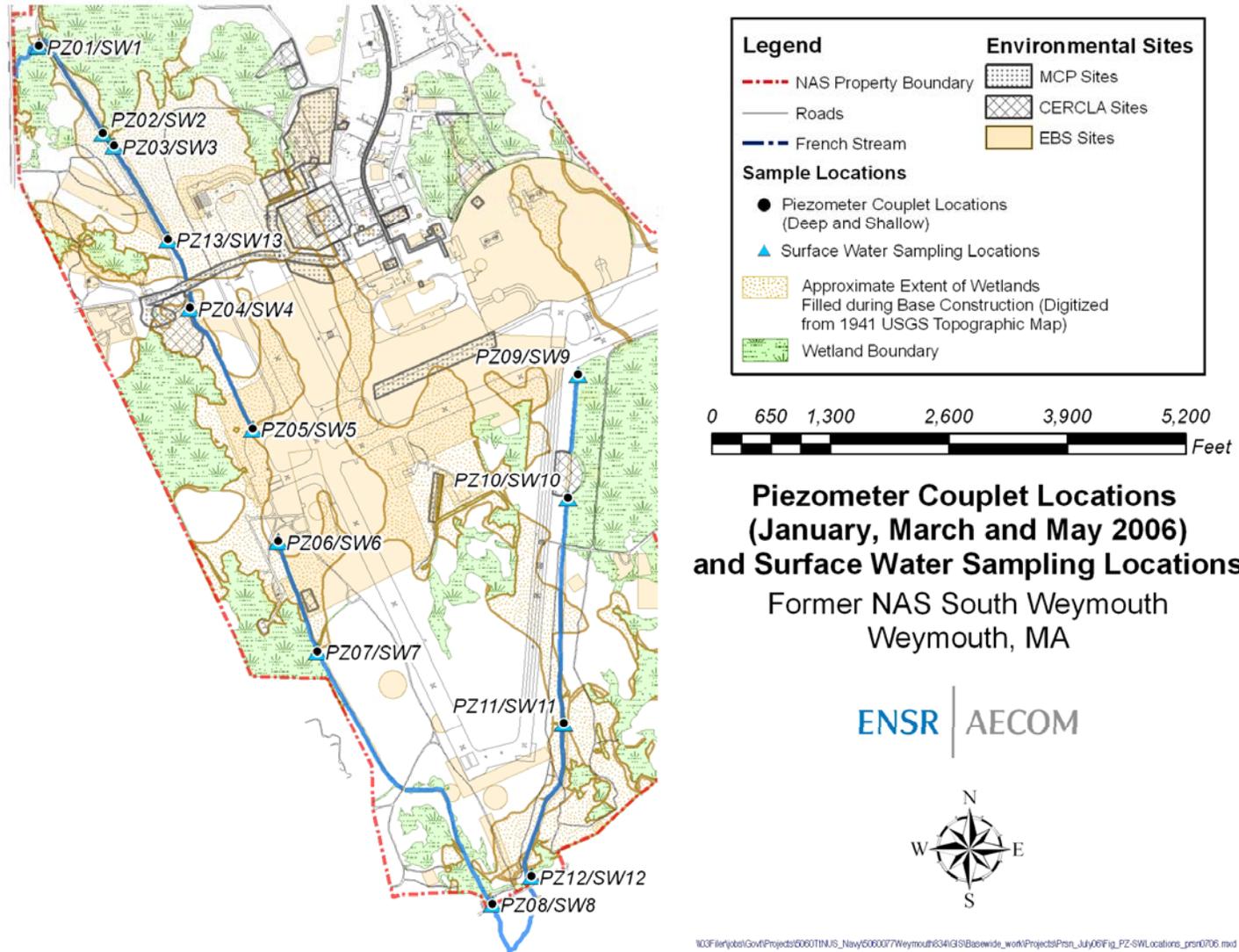
Floc and Sediment Sampling Locations

Former NAS South Weymouth
Weymouth, MA

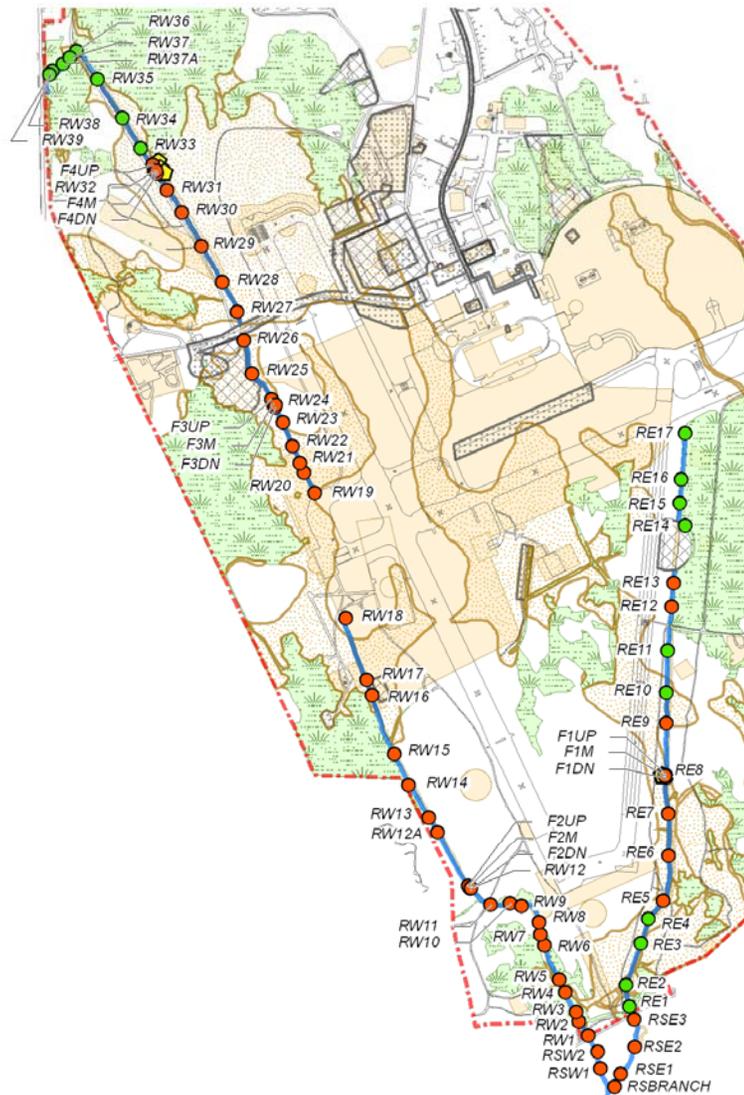
ENSR | AECOM



Piezometer Couplet Locations



December 2005 Floc Recon Results



Legend		Environmental Sites	
	NAS Property Boundary		MCP Sites
	Roads		CERCLA Sites
	French Stream		EBS Sites
	Floc		
	No Floc		
	Groundwater Seeps		
	Approximate Extent of Wetlands Filled during Base Construction (Digitized from 1941 USGS Topographic Map)		
	Wetland Boundary		

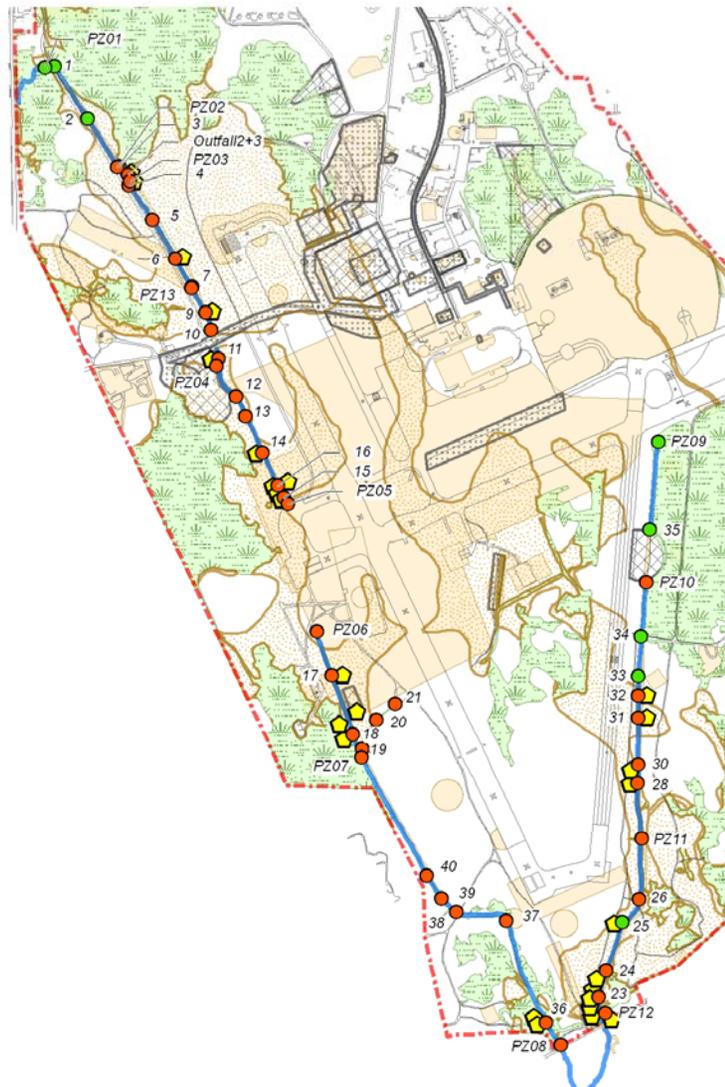


**December 2005 Floc Survey
French Stream
Former NAS South Weymouth
Weymouth, MA**

ENSR | AECOM



March 2006 Floc Survey Results



Legend		Environmental Sites	
	NAS Property Boundary		MCP Sites
	Roads		CERCLA Sites
	French Stream		EBS Sites
	Floc		
	No Floc		
	Groundwater Seeps		
	Approximate Extent of Wetlands Filled during Base Construction (Digitized from 1941 USGS Topographic Map)		
	Wetland Boundary		



March 2006 Floc Survey
French Stream
 Former NAS South Weymouth
 Weymouth, MA

ENSR | AECOM



May 2006 Floc Recon Results



Legend

- NAS Property Boundary
- Roads
- French Stream
- Floc
- No Floc
- ◆ Groundwater Seeps
- Approximate Extent of Wetlands Filled during Base Construction (Digitized from 1941 USGS Topographic Map)
- Wetland Boundary

Environmental Sites

- MCP Sites
- CERCLA Sites
- EBS Sites

May 2006 Sample Locations



May 2006 Floc Survey
French Stream
 Former NAS South Weymouth
 Weymouth, MA

ENSR | AECOM





Drill Rig

Shallow Piezometer Installation





Preparing Water
Level Meter

Sediment Sampling



French Stream/Floc Reconnaissance



Evaluation of Location RW-1 (December 2005)

Various Floc Deposits



Gelatinous material located at a seep (March 2006)

Various Floc Deposits (Winter 2005/2006 v. Spring 2006)



Gelatinous material located at seeps

Various Floc Deposits (Winter 2005/2006 v. Spring 2006)



Floc deposits on woody debris



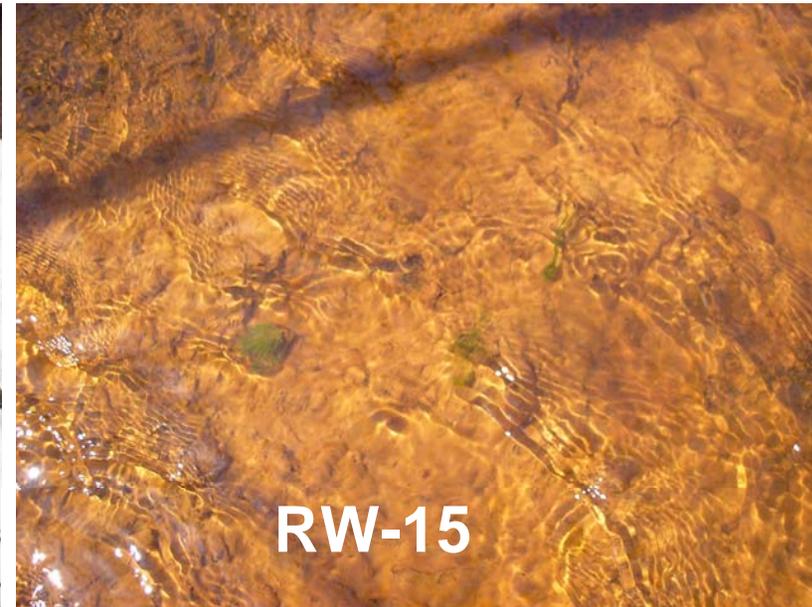
Various Floc Deposits (Winter 2005/2006 v. Spring 2006)



flaky Floc deposits in water column

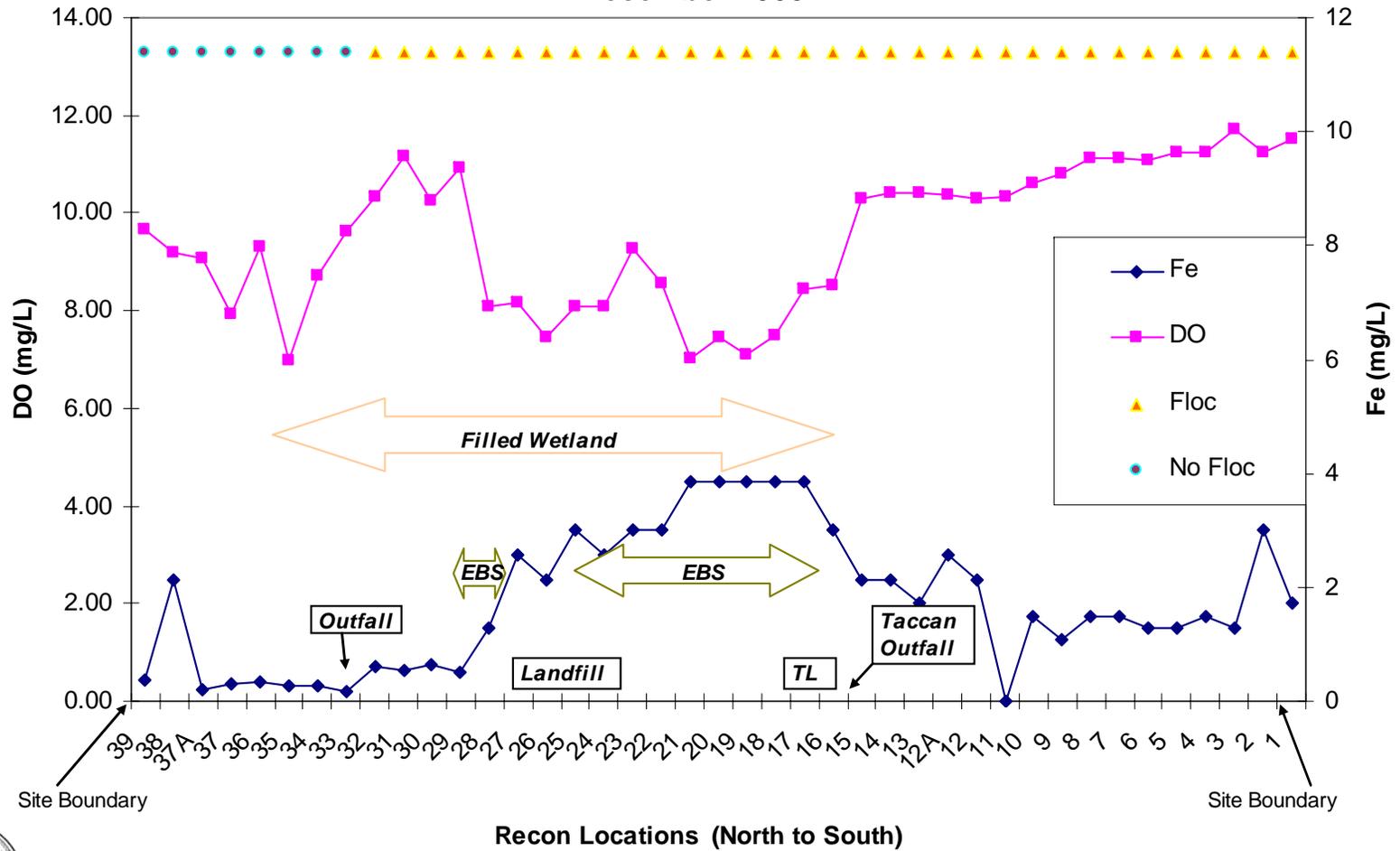


Various Floc Deposits (Winter 2005/2006 v. Spring 2006)

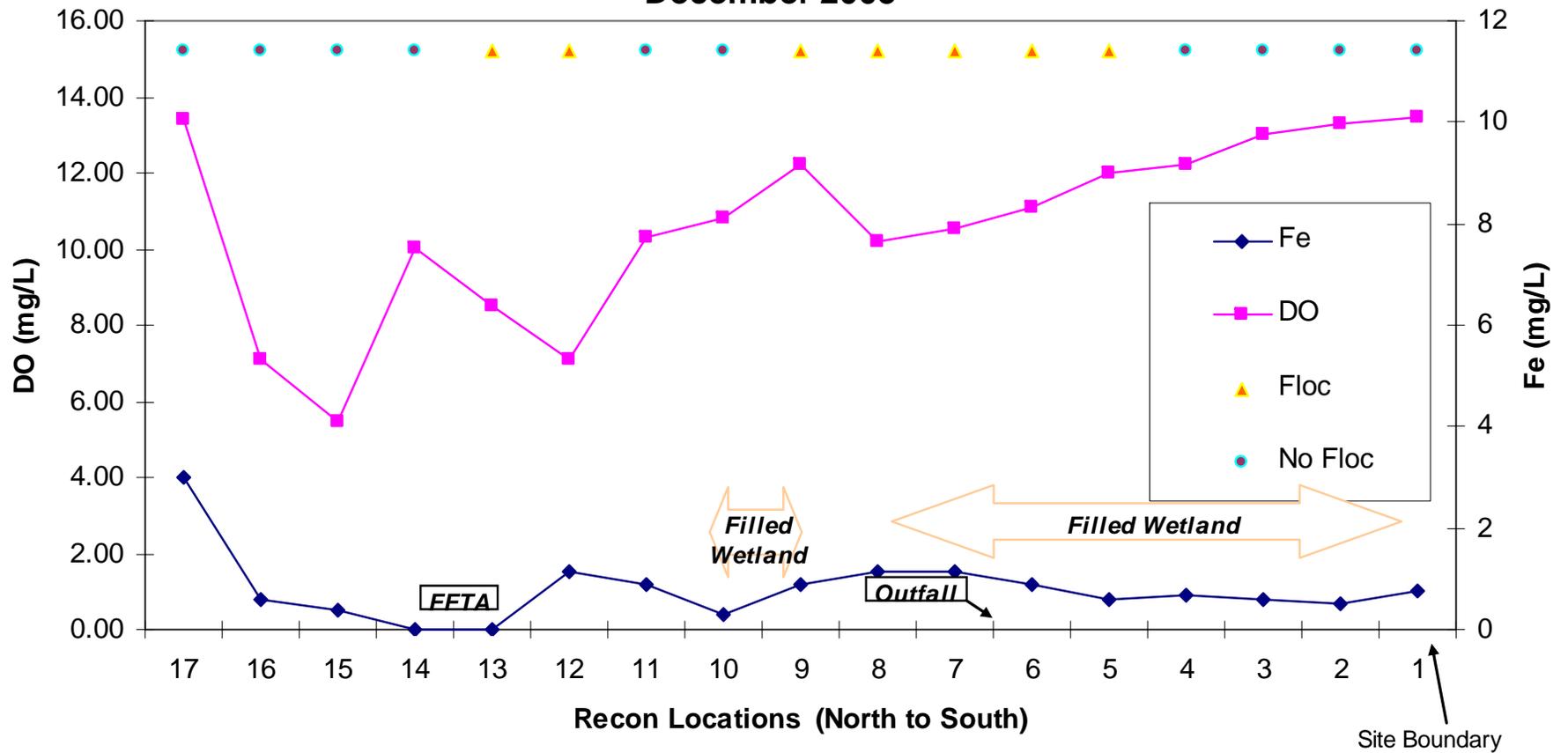


Slimy Floc deposits on stream substrate

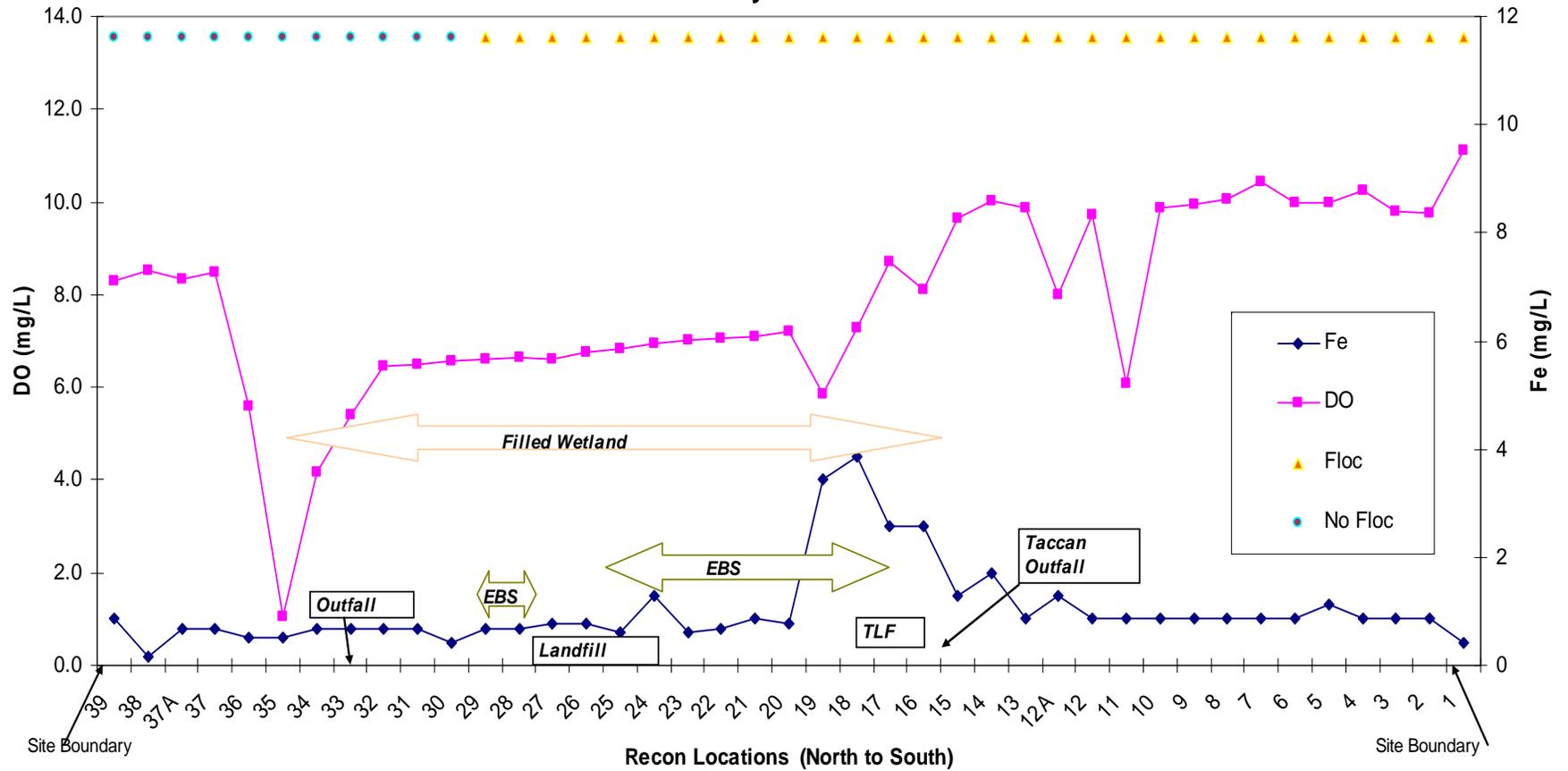
NAS Weymouth Basewide Recon - French Stream West Branch December 2005



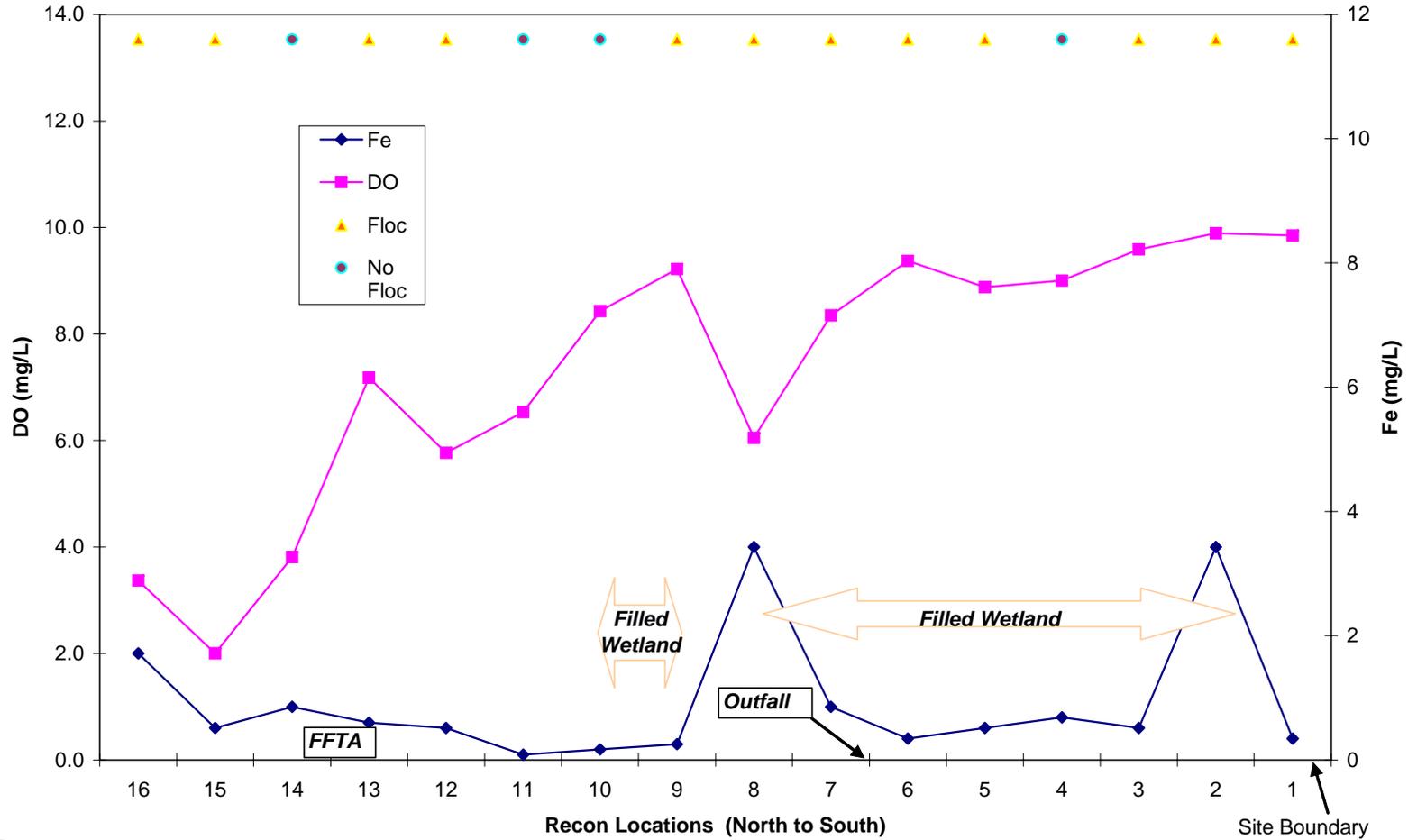
NAS Weymouth Basewide Recon - French Stream East Branch December 2005



NAS Weymouth Basewide Recon - French Stream West Branch May 2006



NAS Weymouth Basewide Recon - French Stream East Branch May 2006



Floc Samples for Bacteria Analysis

Location	F4 (RW-32)	F3 (RW-24)	F2 (RW-12)	F1 (RE-8)		
Floc Description	gelatinous textured	flaky orange-brown	flaky orange-brown	gelatinous, textured, orange-brown spots		
Species					General Occurrence	Locations Found
<i>Propionivibrio spp.</i>	X	X	X	X	very common	variety of environments including on human skin
<i>Zoogloea spp.</i>	X	X	X	X	not common	rivers, streams, sludge
<i>Leptothrix spp.</i>	X		X		common	groundwater and in streams
<i>Acidovorax spp.</i>			X		very common	soil, water
<i>Polaromonas spp.</i>			X		not common	rivers, streams, sludge
<i>Variovorax spp.</i>		X			moderately common	aquatic environments, soil
<i>Enterobacteriaceae</i>		X			very common	guts/intestinal tracts of animals
<i>Shigella spp.</i>		X			very common	related to Escherichia
<i>Escherichia spp.</i>		X			very common	aka e. coli, found in intestinal tracts



Human Health Risk Assessment

- Historic CERCLA: Navy conducted risk assessments at 3 sites on French Stream – Fire Fighting Training Area, West Gate Landfill and Tile Leach Field.
 - ❖ Evaluated frequent exposure by a child and adult to surface water and sediment.
 - ❖ Using conservative EPA risk assessment methods, showed that exposure to surface water and sediment would not pose health risks.
- On-Going EBS: As part of Basewide effort, Navy is in the process of conducting a risk assessment of entire French Stream corridor

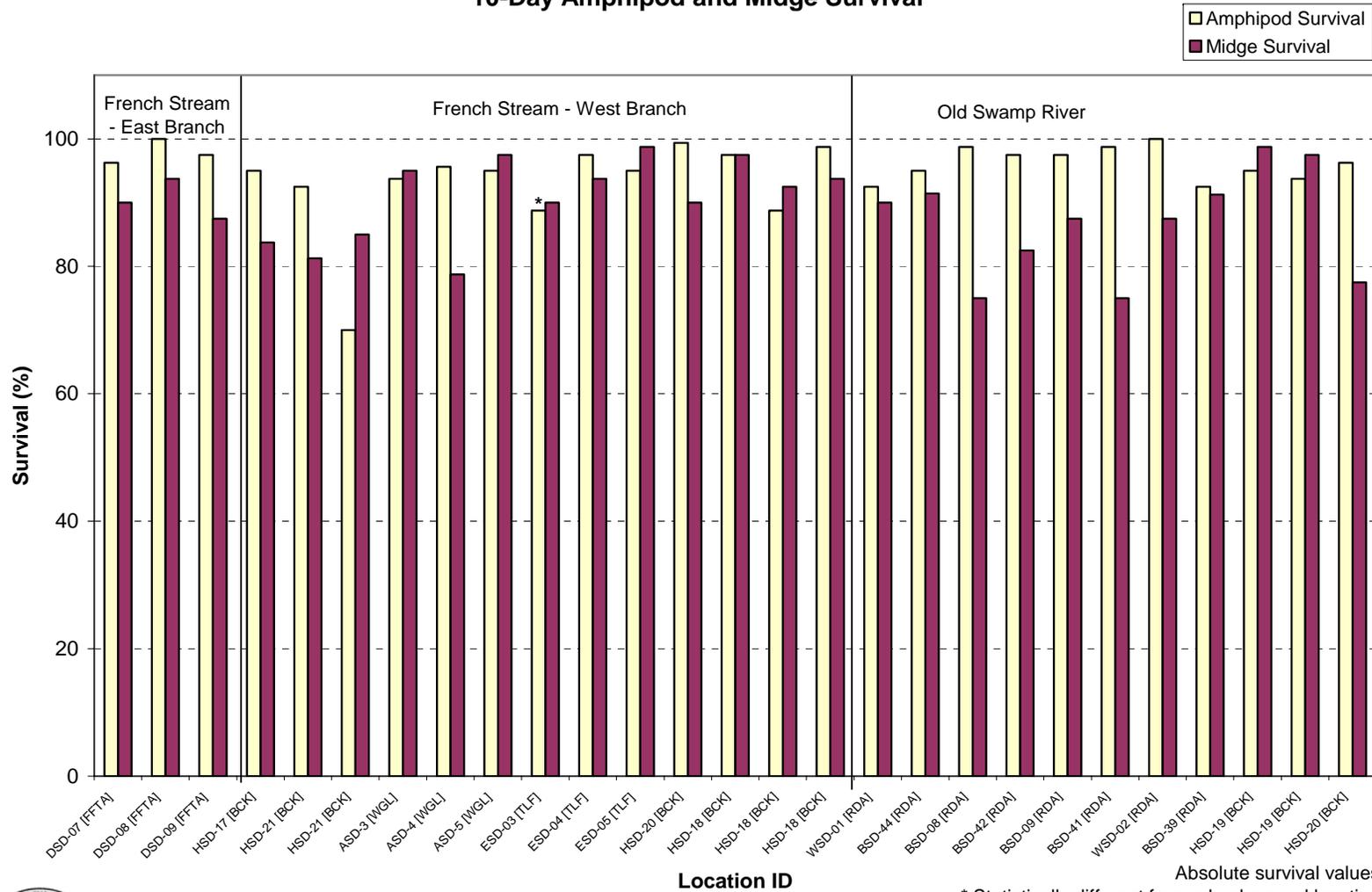


Ecological Risk Assessment: Stream Assessment

- Historic CERCLA: Navy conducted risk assessments at 3 sites on French Stream – Fire Fighting Training Area, West Gate Landfill and Tile Leach Field.
 - ❖ Evaluated surface water and sediment exposures
 - ❖ Little to no significant ecological risk to aquatic invertebrates, amphibians, fish
- On-Going EBS: As part of Basewide effort, Navy is in the process of conducting a risk assessment of entire French Stream corridor
 - ❖ Review of upstream to downstream toxicity testing and macroinvertebrate data



10-Day Amphipod and Midge Survival



* Statistically different from a background location



Ecological Risk Assessment: Higher Trophic Wildlife Assessment

- Historic CERCLA: Navy conducted risk assessments at 7 Sites:
 - ❖ Food chain modeling
 - ❖ Focused on lower trophic level receptors
 - ❖ Did not consider higher trophic level, wide-ranging receptors
- On-Going EBS: As part of Basewide effort, Navy is in the process of conducting wide-ranging, higher trophic level ecological assessment



Higher Trophic Level Risk Evaluation

- Will assess potential risks to vertebrate wildlife with large home ranges
 - ❖ Focus on carnivores and omnivores
 - ❖ Food chain uptake
 - » Considerable tissue residue data from base available
 - ❖ Persistent, bioaccumulative, and toxic chemicals
- Will rely on existing chemistry and biology data
- May involve complex modeling effort, depending upon initial findings



Basewide Food Chain Evaluation



Schedule and Pathways Forward

- Draft Technical Memoranda
 - ❖ Late summer 2006
 - » Geochemical/Floc
 - » Hydrogeological
 - ❖ Fall/winter 2006/2007
 - » Watershed Wide Risk
 - » Higher Trophic Level Risk

