# Proposed Clarification:

## Updated Dioxin Testing Requirements for Dispersive Disposal Sites in Puget Sound

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# Scope

## Included

- Need for dioxin testing for projects proposing dispersive disposal

## Not Included

- Non-Dispersive
- No change to Site Management Objectives
- 4 pptr TEQ

# Introduction

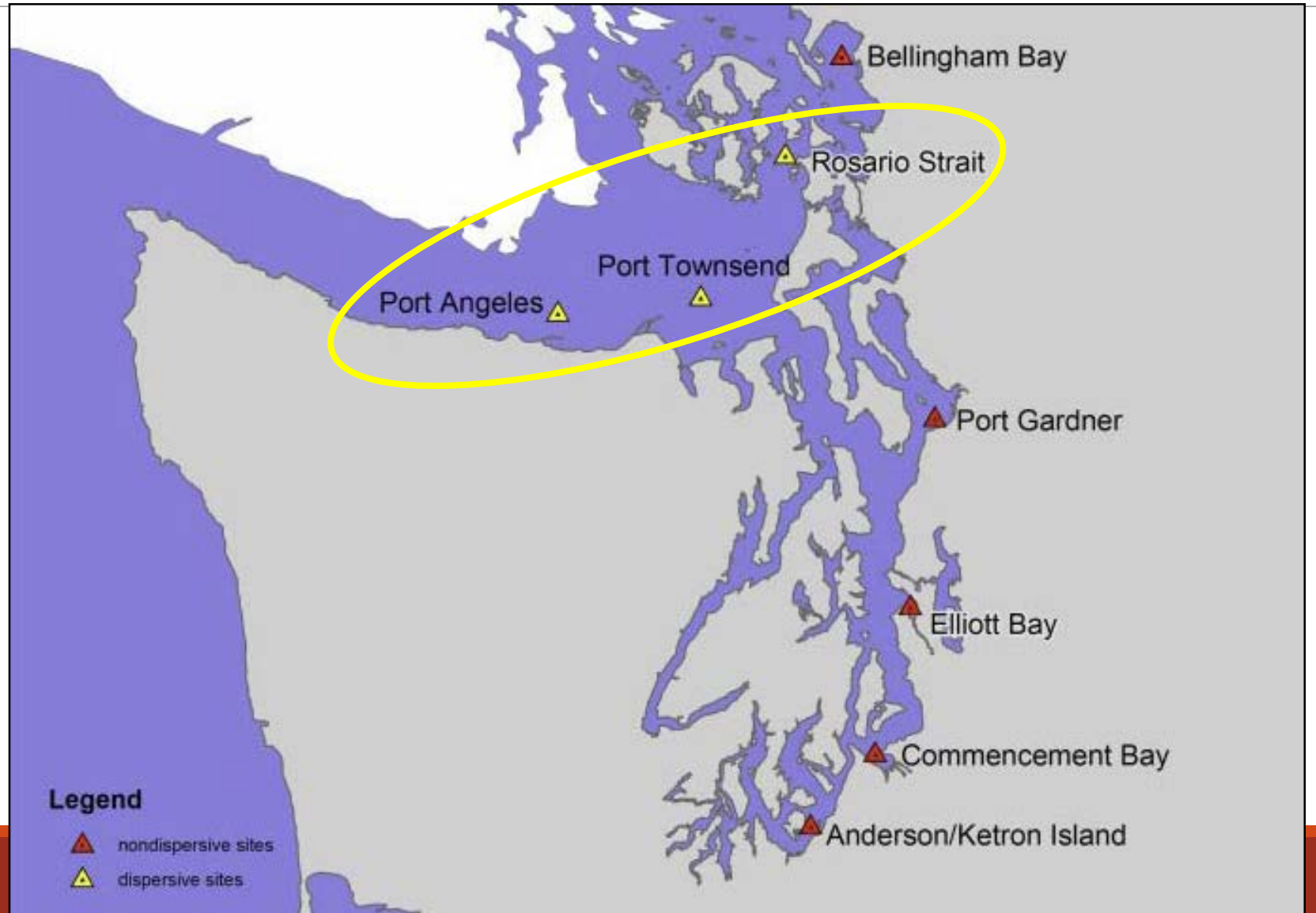
**2010 Dioxin Guidelines:**

Dioxin analysis required on a case-by-case basis

Factors that establish a reason to believe:

- Location within an urban bay and having no historical information showing that dioxin is below guidelines
- Proximity to current or historical point sources, such as outfalls
- Proximity to chlor-oxide bleach process pulp mills, chlor-alkali and chlorinated solvent manufacturing plants, former wood treatment sites, phenoxy herbicide manufacture and/or use and handling areas
- Proximity to areas with high polychlorinated biphenyl (PCB) concentrations
- Proximity to former hog fuel burners/boilers and areas with previous fires or incineration sources
- Proximity to areas previously sampled that showed elevated levels of dioxins

# Dispersive Disposal Sites

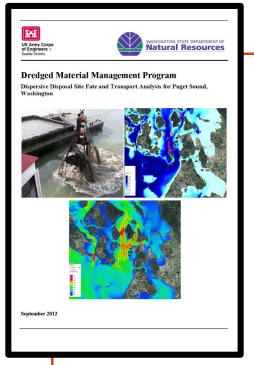


# 2010 Dispersive Dioxin Guidelines

"…in order to address uncertainties regarding the fate of sediments disposed at dispersive sites, the DMMP agencies may require dioxin testing for projects proposing disposal at dispersive sites. Specifically, for those projects for which dioxin testing would not normally be required under the reason-to-believe guidelines, the DMMP agencies may require dioxin analysis of a reduced number of sediment samples. The decision to conduct this testing will be based on the size of the project and the grain-size characteristics of the dredged material.

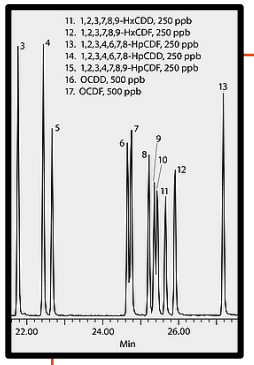
DMMP agencies are planning to conduct a fate and transport study for disposal operations at the Port Townsend and Rosario Strait disposal sites. **Depending on the outcome of this study, the expanded dioxin testing requirement may be retained or dropped**."

# Problem Identification




A dispersive site fate and transport study was conducted by USACE and presented at the 2012 SMARM

DMMP has continued to require dioxin testing of projects proposing dispersive disposal regardless of reason-to-believe




Data collected from these projects can be used to validate the reason-to believe guidelines for dispersive disposal sites

# Technical Evaluation:

## Dispersive Site Fate and Transport Study

**Study Goal:** Determine if hydrodynamic conditions indicate the potential for dredged material to be transported in the vicinity of critical shellfish habitat areas near dispersive disposal sites

Study Steps:

- USACE developed a 2-D depth-integrated hydrodynamic model of Puget Sound (CMS-FLOW)
- DNR funded a field survey (August 2011) of tidal currents in the vicinity of the dispersive disposal sites
- USACE calibrated and validated the hydrodynamic model using the field-collected current data.
- The calibrated hydrodynamic model was combined with a Lagrangian particle tracking model (PTM) to simulate the fate and transport of dredged material at the disposal sites
  - 72 hour simulation period
  - Grain size distribution based on sediments from previous disposal events at each site. Two size classes: sand and fines
- Model run for Port Angeles, Port Townsend, and Rosario Strait sites

Report available on DMMO Website > Disposal Site Information

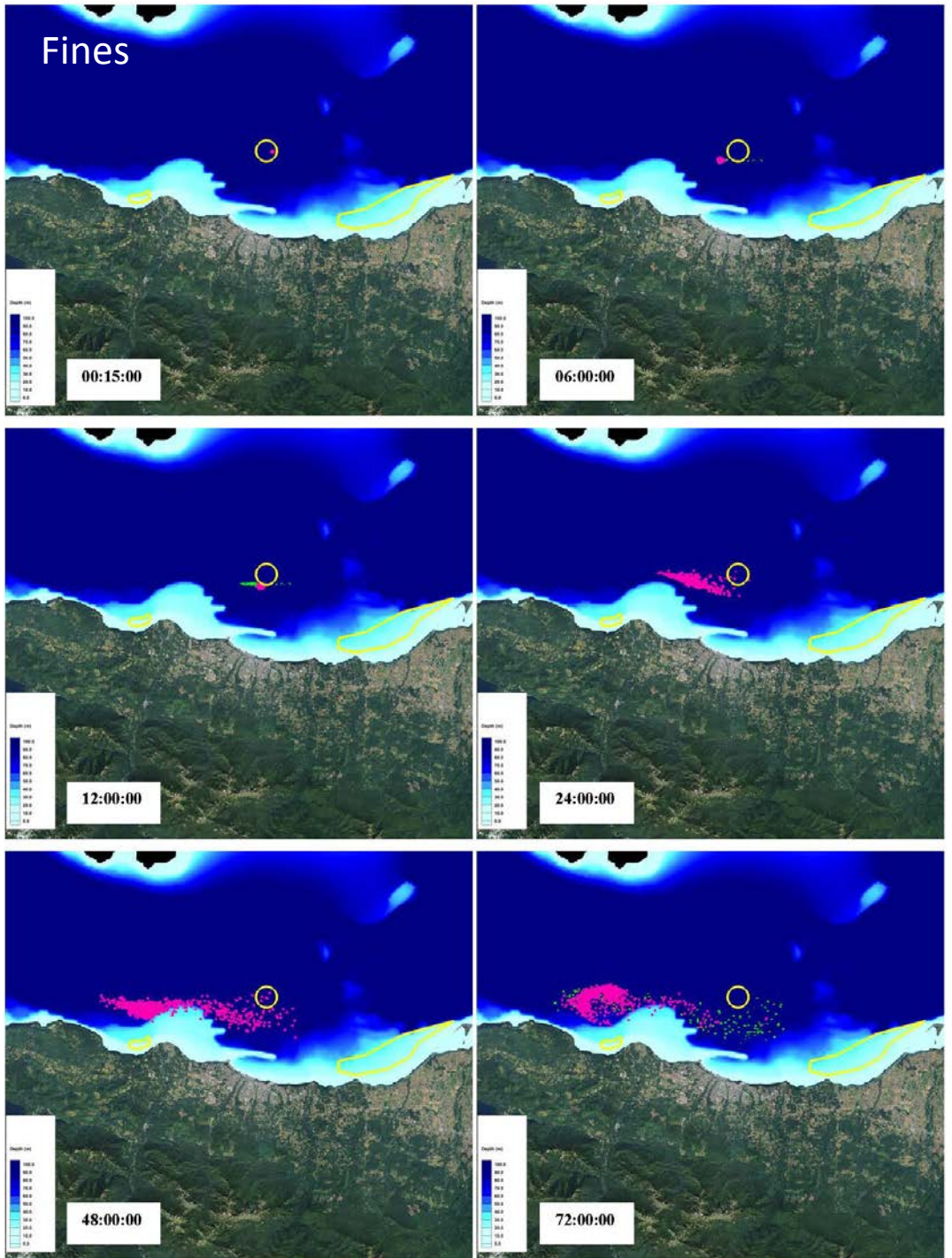
# Port Angeles Results

Most dispersive of all sites

- East-west trajectory concurrent with ebb and flood tides

After 72 hours:

- Fine grained sediment remained active up to 17 km west of the disposal site
- No sediment parcels (sands or fines) entered identified shellfish areas.



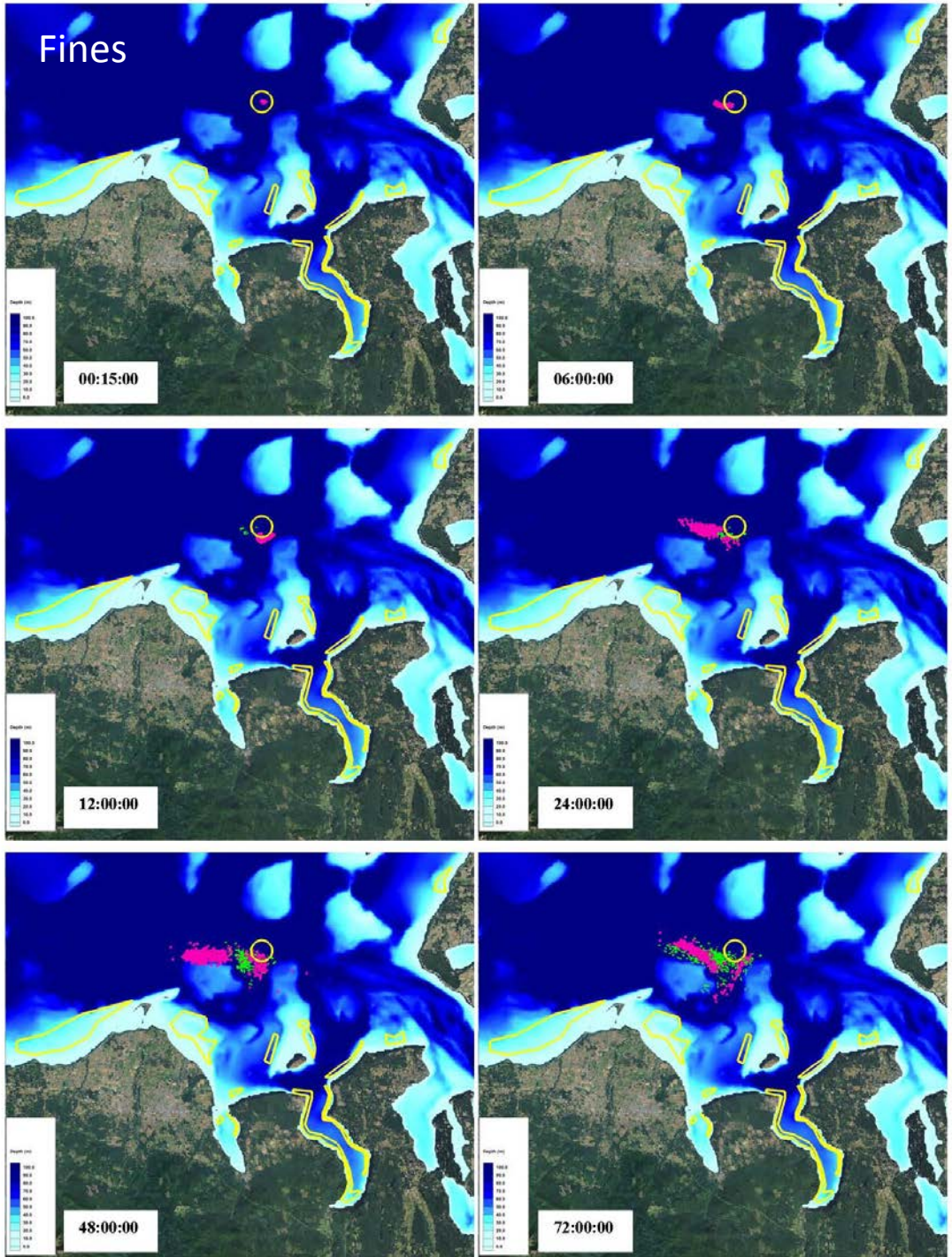

**Legend** Active Inactive

# Port Townsend Results

Bathymetric features limit dispersion of material to south and southeast – reduces sediment mobility after first 24 hours

After 72 hours:

- Fine grained parcels active up to 8 km west of disposal site
- No sediment parcels (sands or fines) entered identified shellfish areas.

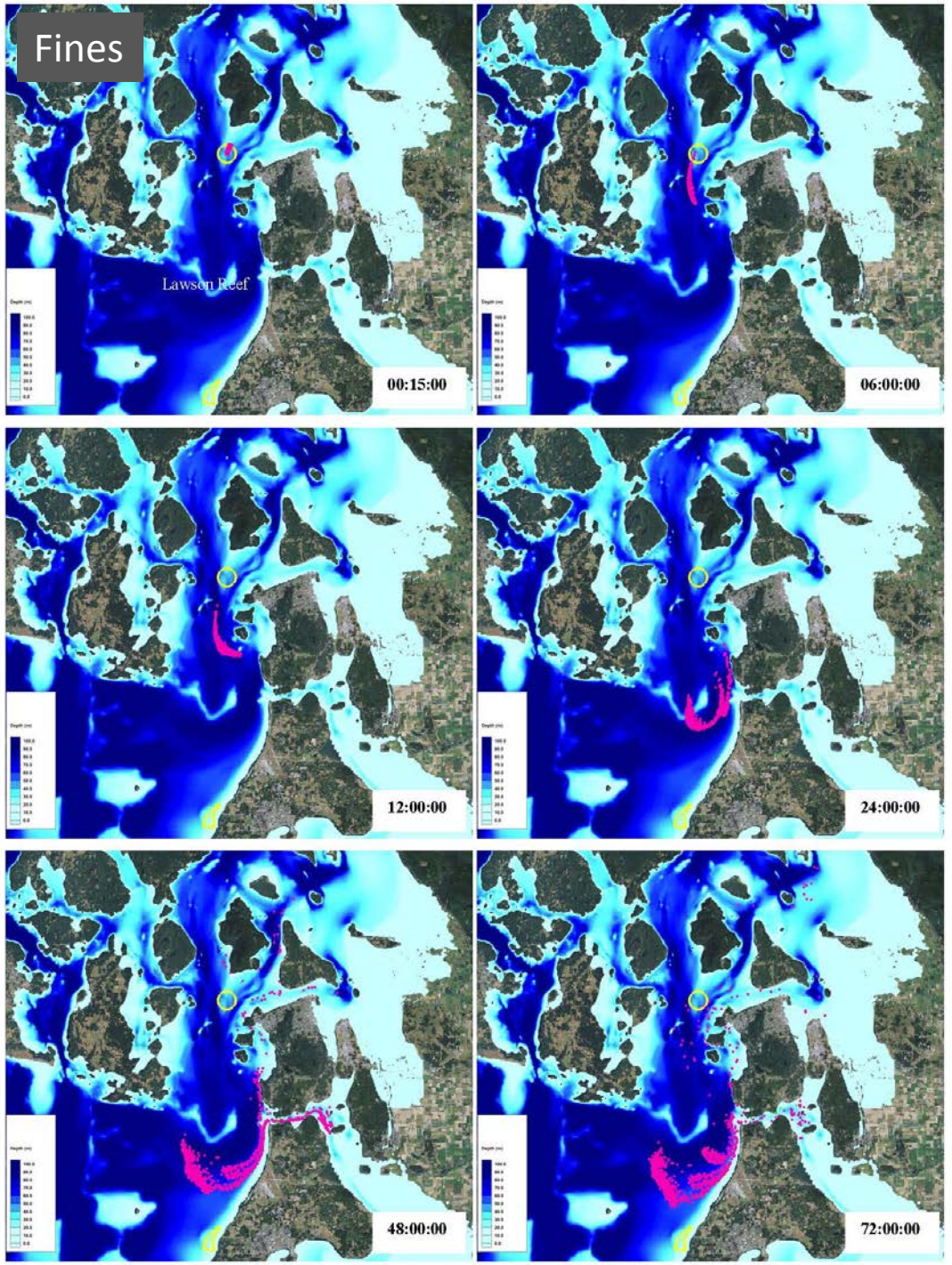



**Legend** Active Inactive

# Rosario Strait Results

Highest current velocities. Lawson Reef captures majority of sand parcels (not shown).

- After 72 hours
  - Fine-grained parcels remain active up to 21.5 km south
  - Also enter Whidbey sub-basin through Deception Pass and into Bellingham Bay through Bellingham Channel and Guemes Channel
  - No sediment parcels (sands or fines) entered identified shellfish areas.



# Fate and Transport Study Summary

## Modeling Results

- **No sediment parcels (sands or fines) entered identified shellfish areas after 72 hours at any of the dispersive disposal sites**

## Sediment Mobility

- Port Townsend
  - After 24 hours less than 10% of fine sediment parcels remain in top 20 m of water column. After 72 hours, less than 3% remain there.
- Port Angeles
  - After 24 hours less than 10% of fine sediment parcels remain in top 20 m of water column. After 72 hours, less than 3% remain there.
- Rosario Strait
  - Approximately 41% of fine sediment parcels remained in the top 20 m after 24 hours, and remained suspended after 72 hours.
    - Due to high fines content from Squalicum Waterway disposal event
- Wind-generated currents primarily contained within top 1 meter surface layer. More than 99% of all sediment parcels located below 1 m after 18 hours. **Low potential for on-shore transport of dredged material.**

# Technical Evaluation:
## Dioxin Reason-to-Believe Factors

Since DY09, 10 projects with proposed dispersive disposal have conducted dioxin testing.

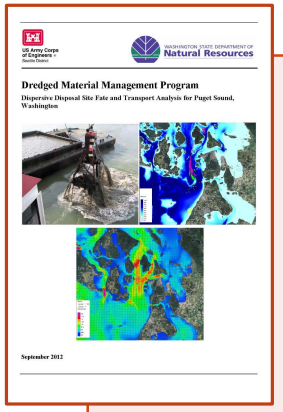
5 projects with NO reason-to-believe

Average Dioxin = 0.33 pptr TEQ

**Dioxin is not found at levels near site management objective in areas with no reason-to-believe.**

| Projects with proposed dispersive disposal since DY09 | SDM[1] year | Disposal site | Dredge year (DY) disposed | Dioxin reason-to-believe | Dioxin results[2] (pptr TEQ) |
|---|---|---|---|---|---|
| **City of Anacortes, Skyline Marina** | 2009 | Rosario Strait | DY11 and DY12 | yes | 2.5 |
| **USACE Swinomish** | 2009 | Rosario Strait | DY13 and DY15 | no | 0.16 |
| **Thatcher Bay Restoration** | 2009 | Rosario Strait | DY15 | no | 0.34 |
| **NPI outfall, Port Angeles** | 2010 | Port Angeles | not yet dredged | yes | 0.1 |
| **USACE Keystone Harbor** | 2012 | Port Angeles | not yet dredged | no | 0.7 |
| **Cap Sante Boat Haven, Anacortes** | 2012 | Rosario Strait or Port Gardner | not yet dredged | yes | 42.7 |
| **Bay Head Marina** | 2013 | Rosario Strait | not yet dredged | no | 0.09 |
| **Port of Anacortes, Pier 2 and Curtis Wharf** | 2014 | Rosario Strait or Port Gardner | not yet dredged | yes | 0.2 |
| **Silver King LLC** | 2014 | Port Townsend | not yet dredged | no | 0.38 |
| **Shelter Bay** | 2015 | Rosario Strait | not yet dredged | yes (due to fire) | 1.6 |

# Evaluation Summary




## Fate and Transport Study

- Concluded that dredged material does not reach known shellfish beds in the vicinity of the dispersive disposal sites.

## Reason-to-Believe Validation

- Reason to believe factors are well designed and sufficient to determine the need for dioxin testing.

# Proposed Clarification

**Drop expanded dioxin testing requirement for dispersive disposal sites.**

# Questions?

COMMENTS DUE BY JUNE 4TH

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