

Olympic Region Harmful Algal Bloom (ORHAB) partnership protects public health

Beach Monitoring ...

- prevents recalls, illness
- allows for selective beach openings or closures
- provides early warning of HAB events




• ORHAB training class


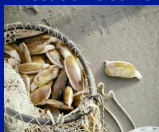


• tribal members digging clams





• seawater sampling and toxin testing is done weekly at 4 beaches

ORHAB early warning system least technical form of ocean observing system

Past – Reactive
0-2 days warning

1. Dig for clams

2. Test clams at DOH


Present – Proactive
2-10 days warning

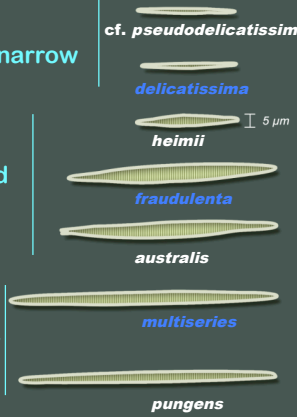
1. Collect plankton

2. Look for Pn

3. Test for toxin (sw & clams)

4. Test clams at DOH


Pseudo-nitzschia species, Washington State

1. Small and narrow

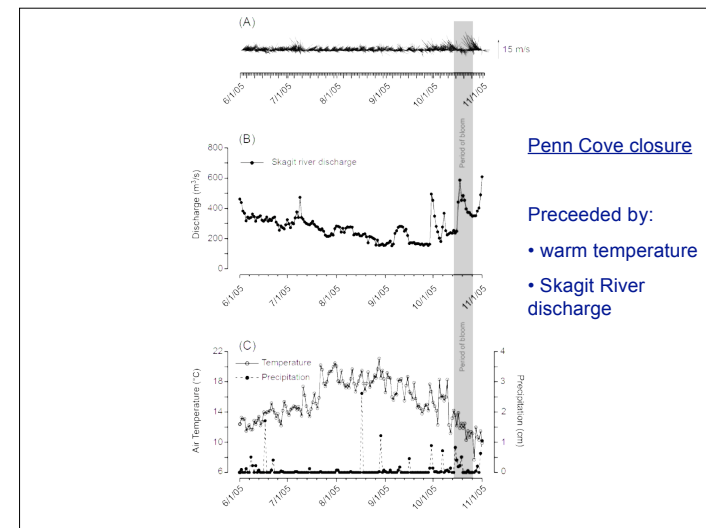
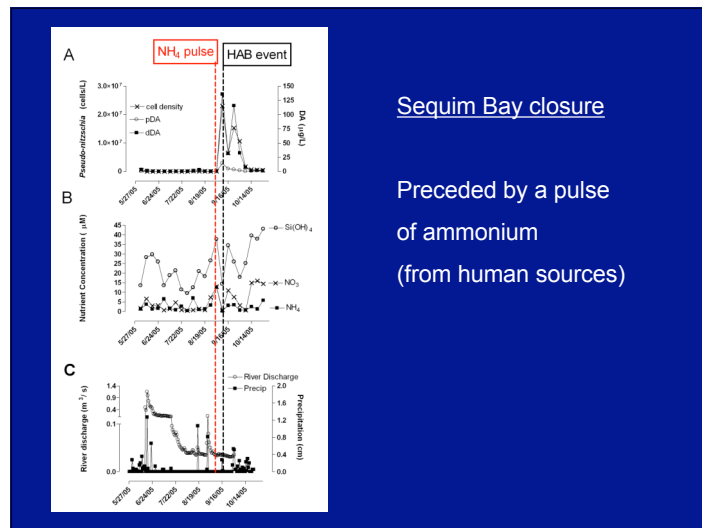
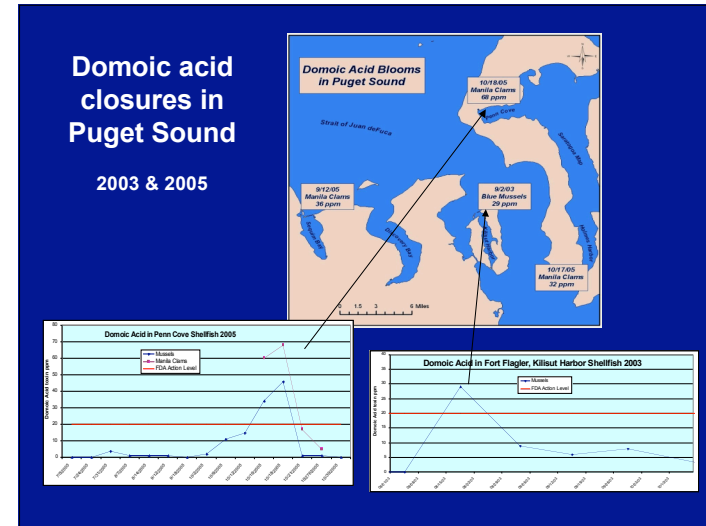
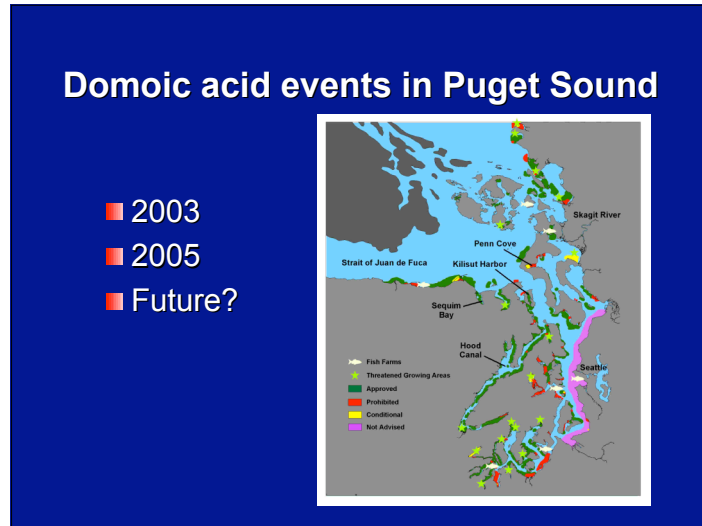
2. Short and broad

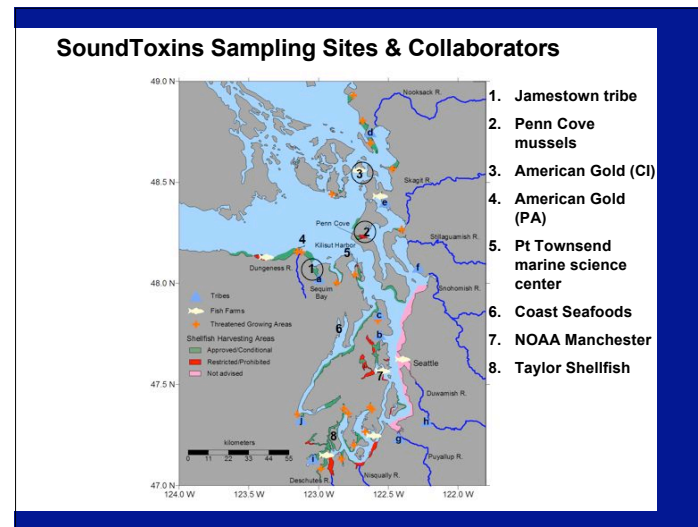
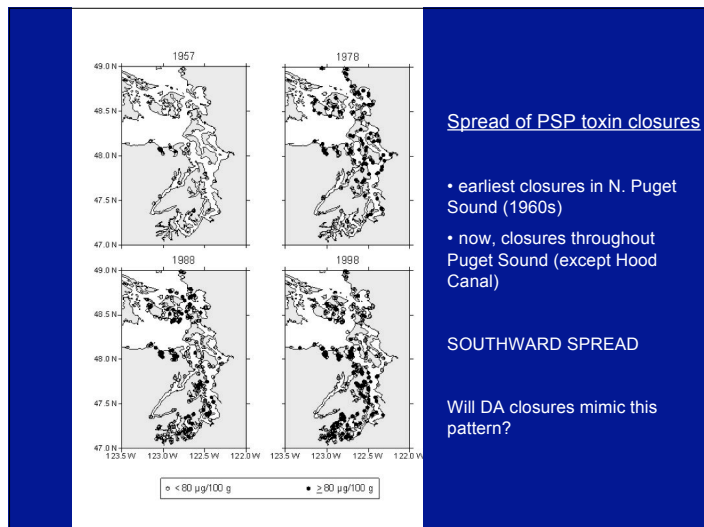
3. Long and narrow



- cf. *pseudodelicatissima*/ *cuspidata*
- delicatissima*
- heimii*
- fraudulenta*
- australis*
- multiseries*
- pungens*

- variable toxicity within a species
- different toxin levels between species
- all capable of producing toxin?





The key **SoundToxins objectives** are to:

1. Identify the best sampling sites for studying the early onset and establishment of HABs.
2. Identify the subset of environmental conditions that promote the onset & flourishing of HABs.

The **goal** of SoundHABs is to provide sufficient warning of HAB events to enable early or selective harvesting of shellfish in Puget Sound

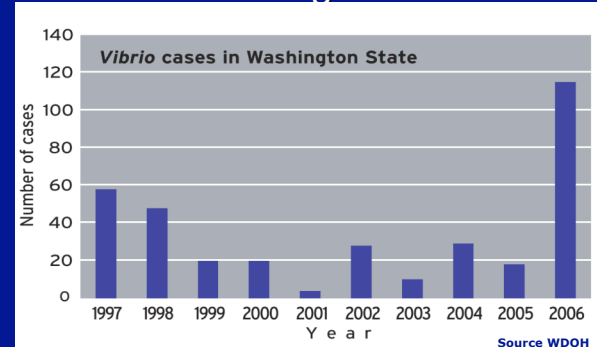
Additional monitoring of Vibrios

- Gram-negative, free living bacteria
- Natural inhabitants of marine and estuarine environments
- Persist in a wide range of temperatures and salinities
- Associate with aquatic flora- especially chitinous substrates

V. parahaemolyticus

- Most common non-cholerae disease causing *Vibrio*
- Accounts for 48% of reported *Vibrio* infections in the U.S.
- Infection by consumption of raw shellfish harboring the bacterium
- Gastrointestinal illness: usually self-limiting

V. parahaemolyticus outbreaks in Washington State



2006 *V. parahaemolyticus* outbreak

- Oysters harvested from Washington State implicated in 117 reported cases in WA
- 20 of 94 growing areas closed
- Levels of potentially pathogenic (*tdh+*) *Vp* below actionable levels (5 CFU/0.1g) or not detected

V. parahaemolyticus monitoring (collaborative project with WDOH)

Currently WDOH

- monitors concentrations of *Vp* in oysters

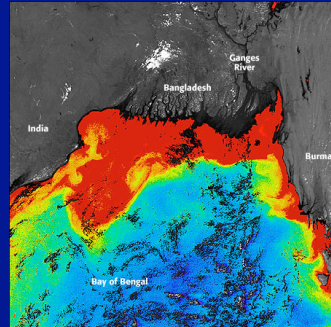
We wish to, through WCCOOH/NWFSC funding

- Compare the influence of a subset of environmental parameters on concentrations of potentially pathogenic *Vp* in oysters, in the growing water, and associated with plankton
- Characterize the association of *V. parahaemolyticus* with phytoplankton and zooplankton
 - Quantify *V. parahaemolyticus* populations associated with plankton
 - Quantify and differentiate phytoplankton and zooplankton populations from relevant sites

Intended outcome

Risk assessment

- Prediction of illness
- Correlation of environmental data to improve models for prediction of Vp concentrations using remote sensing technology



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