Two Weeks Ago – PSMFC Annual Meeting 2016

“What can we do to enhance our current survey capabilities?”
Challenges (Opportunities) – High Level

• Dealing with the “unexpected” (e.g., marine heat wave)

• Linking observations with process studies (e.g., Puget Sound coho in 2016 – we missed)

• Research to Operations (e.g., Salish Sea Marine Survival Project, Newport Line)

• Harnessing the power of ‘omics’ (e.g., eDNA)
Successes – High Level (not all)

• PNW HABs

• Ocean Acidification

• Telemetry

• Acoustics

• Partnership
Near-real time offshore monitoring data → early warning of toxic HABs!

“Lab in a Can”
Ocean Acidification

- Effective, sustained collaboration

- 3 legged stool of Obs/Lab/Modeling

- Why effective the three Cs – Communication, Coordination, Collaboration

- Leads to leveraging existing resources

- Synergism from the close interactions among science teams
Acoustic Telemetry – Fish Tags

Rapid migration
Low survival (~20%)
Mortality ‘hot spots’
Acoustics – Seafloor Mounted

Biomass (kg)

×10^8


Year

survey
Moorings
Acoustics on gliders

Biological scattering layers (krill?) and discrete high intensity regions, thought to be fish schools.

Models: forward projections can provide adaptive sampling (predicted “optimal habitat” using SST, Chl and SSH)

Northward shift/extension of habitat, surveys and sampling in 2015
‘Omics – Biotech for Environmental Intelligence

• Understanding how organisms adapt under rapidly changing conditions.
  ✓ Genetic code has the information
  ✓ ‘Omics technologies are the tools

- Metabolomics
- Proteomics
- Phenomics
- Metagenomics & Metatranscriptomics
- Epigenetics
- Genetics & Genomics
Bioinformatics and enhancement of IT capabilities underpins the success of ‘omics
‘Omixs to Support Ecosystem Understanding

Analytical ‘omics – plankton community

Current – chlorophyll

2015 V9 18S rDNA

Winter | Spring | Summer | Fall

Chlorophyll (µg/L)
ORHAB – Partnership at Core And Challenges

- 10 years to get to a point could develop a operational HAB early warning system
- A source of funds for operations BUT not perfect
- Demonstrating power of ESP when coupled with NANOOS assets
- No clear path to operationalize ESP
WRAPPING UP
‘Wicked’ Challenges

• Perpetual challenge in moving from proof of concept to sustained operations

• Surmounting the barriers to sustained collaboration across agencies/entities

• ‘Boring is bad’ (real impact of flat budgets)

• Promise of Ecosystem Based Management – challenge is there is no single entity
MY PERSEPECTIVE

• Technology is not the issue

• The research is not the issue, most of the time

• The age old issue – putting the technology in place for sustained use/benefit

• Current fiscal conditions making harder?

• Is the shift permanent?