Pacific Coast
NEEA update breakout group report

CA, OR, WA*

*does not include AK and HI
Conceptual Diagrams

• Fjord
  – deep, stratified, sill/restricted flushed, steep-sided

• Coastal Lagoon (closed and open)
  – shallow, some bar dynamics regulated, limited FW, alternate extremes, wet/dry

• Embayments
  – ocean forcing, diffuse inputs, stormwater

• Drowned River Valley/River Mouth
  – watershed/ocean, horizontal stratification, wet/dry (& seasonal pulses), urban slobber
Conceptual Diagrams

• Fjord
  – deep, stratified, sill/restricted flushed, steep-sided, low DO, SAV, Macro

• Coastal Lagoon (closed and open)
  – shallow, some bar dynamics regulated, limited FW, alternate extremes, wet/dry, Macro, SAV

• Embayments
  – ocean forcing, diffuse inputs, stormwater, HABS

• Drowned River Valley/River Mouth
  – watershed/ocean, horizontal stratification, wet/dry (& seasonal pulses), urban slobber, all
<table>
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<th>Scenario</th>
<th>Key features</th>
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<th>Indicator variables</th>
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<td>River Mouths</td>
<td>Watershed &amp; oceanic, horizontal stratif., pulsed, wet/dry</td>
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West coast estuaries/bays

• Added some systems in all states
• Some do not have adequate data, but we feel it is important to list them as “?”s
  – prioritization based on susceptibility or where impending management need
• Re-classified (lumped) some systems
  – Will focus on representative system within category
• May need to nest assessments in bigger systems
Status

• S. CA: need to get data in order to input; data gaps; opportunity to incorporate NEEA indicators to Regional Monitoring Program
• C. CA: needs to happen
• OR: intends to add new data on 11 estuaries
• WA: Seagrass and macroalgae data ready to be input; WQ data there, but time to analyze needed
Case Studies

• Newport Bay: load reduction but no corresponding response improvement
• SFB: chl is increasing but unclear why; could be light limitation lifting. Does this increase in chl represent a problem?
• Yaquina Bay/Coos Bay: in development
• Hood Canal: DO problem increasing, but complicated as to why
• San Juan Is: significant seagrass loss and cause unknown
Problems

- Flushing is variable within estuary location and defines status…scaling issue, sub-basin scale
- Disconnect between pressure and state, not capturing that “bad not as bad” but “good not as good”…
- Temporal aliasing due to climate variation
Salinity zones

• Why do this???
  – N v P ?
  – Sense of flushing ?
  – Proximity to source, linear model ?

• Should this be re-visited??
  – We think so, especially for 3 of 4 West Coast systems
  – Need justification for this “baggage” for angst:payoff ratio
Revise eutrophication conc. model

• Nutrient loads
  – N:P ratios; nutrient form; micronutrient; C

• Transport and storage
  – groundwater role
  – pulses and hydrologic alteration:
    – flashy urban yet steady dams)
  – urban slobber (persistent anthrop. trickle)

• Complicating/synergistic factors
  – food-web alterations, exotic species; top predator alterations; pharmaceutical etc loads
    – i.e., SFB with Asian clams…less chl but big problems
  – climate change -- hardened shorelines
Human drivers changing

- Population vs. housing
- Urban more diffuse
  - septic in exurbs
- Ag more concentrated
- Sewage treatment upgrades
- Atmospheric loading & deposition
  - less NOx more NH3
- Ag/suburban land use
  - fragmentation and impervious surfaces
Recommendations

• Monitoring
  – Better loading estimates (#1)
  – Use of forecasting models for prioritization
  – Data collection over the year, assess multi-year avgs, evaluate on decadal scale
  – Tie-in to IOOS
  – Integrate sampling technologies
  – Assess variation within current indicators
  – Restoration effectiveness measures
  – Enhance and endorse web-based approach
Recommendations

• Research
  – Refine our understanding of issues in “revised eutrophication conceptual model” slide and the mechanisms involved (#1)
  – Development of operational forecasting models (#1)
  – Better techniques for load estimates
  – Better technologies for flushing estimates
  – Refine/define a susceptibility index
Recommendations

• Management
  – Evaluate impacts in “changing human drivers” slide & determine management responses
  – Integration of EPA (regulatory) and NOAA & USGS (assessment) approaches
    • e.g., 305(b) vs. NEEA
  – Utilize State v. Pressure analysis