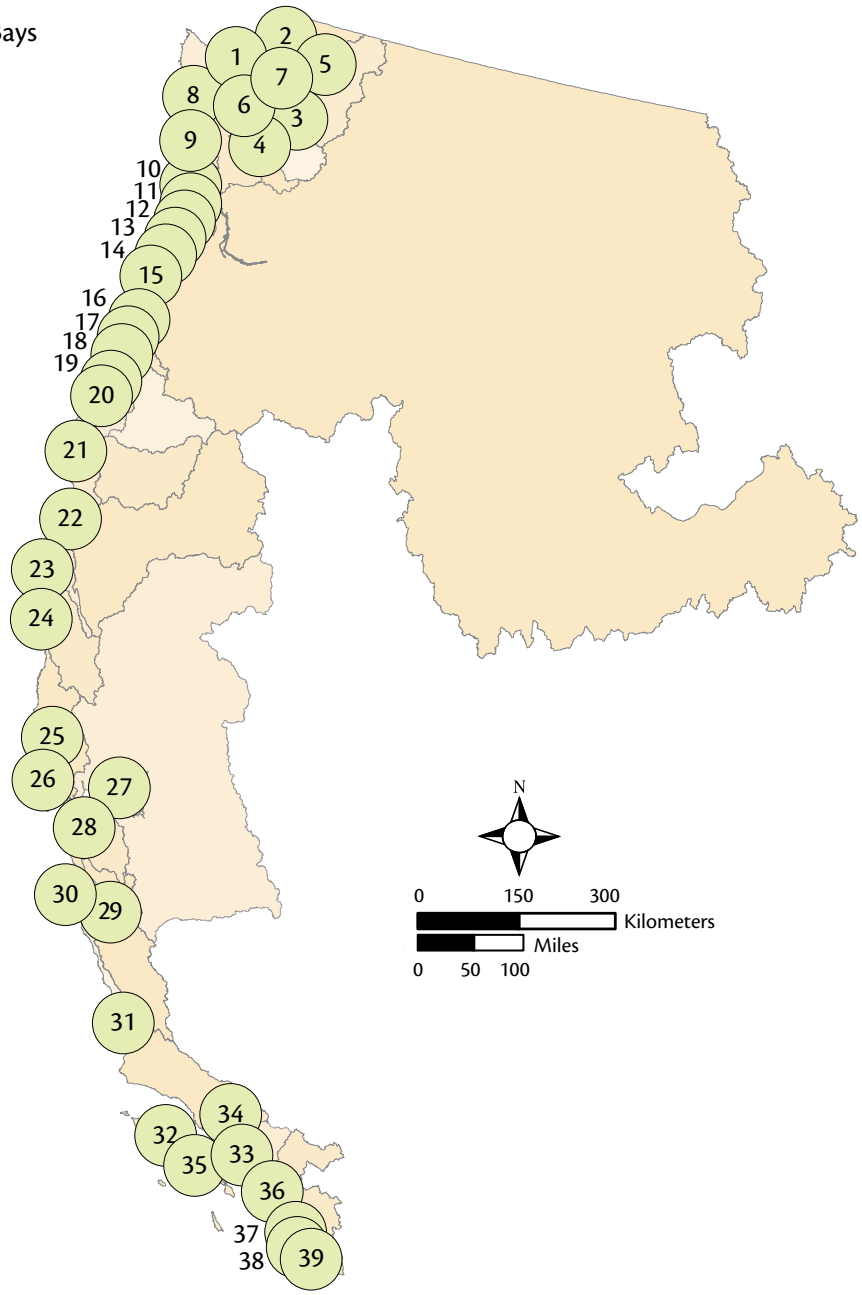
THE PACIFIC COAST REGION

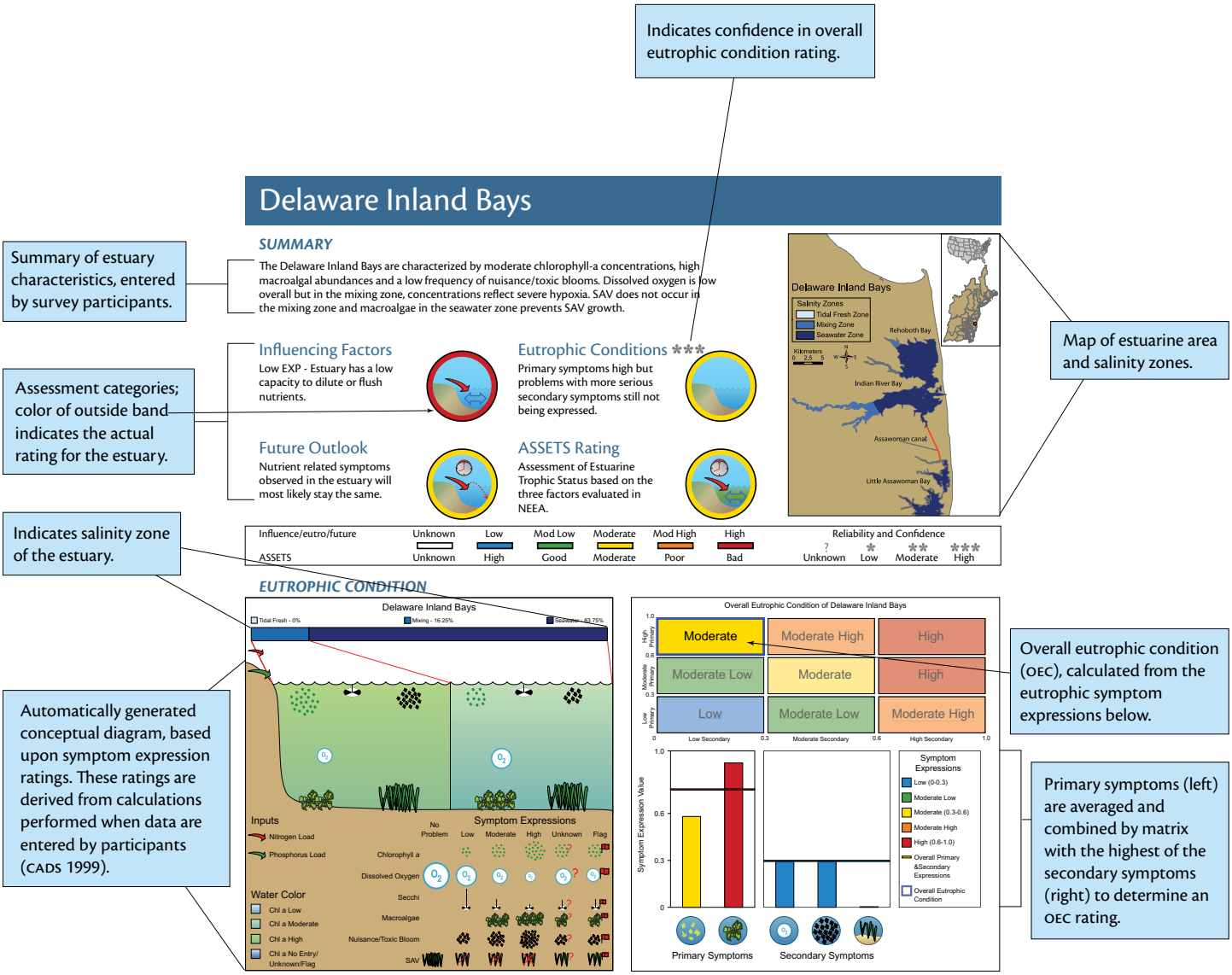
1. Sequim/Discovery Bays
2. Bellingham/Padilla/Samish Bays
3. Port Orchard System
4. South Puget Sound
5. Skagit Bay/Whidbey Basin
6. Hood Canal
7. Puget Sound
8. Grays Harbor
9. Willapa Bay
10. Columbia River
11. Nehalem River
12. Tillamook Bay
13. Netarts Bay
14. Siletz Bay
15. Yaquina Bay
16. Alsea River
17. Siuslaw River
18. Umpqua River
19. Coos Bay
20. Coquille River
21. Rogue River
22. Klamath River
23. Humboldt Bay
24. Eel River
25. Tomales Bay
26. Drakes Estero
27. San Francisco Bay North
28. San Francisco Bay South
29. Elkhorn Slough
30. Monterey Bay
31. Morro Bay
32. Santa Monica Bay
33. Anaheim Bay
34. Alamitos Bay
35. San Pedro Bay
36. Newport Bay
37. Mission Bay
38. San Diego Bay
39. Tijuana Estuary



ESTUARY SUMMARIES

This appendix contains one-page summaries for the 141 systems included in the study which include the status and trends of eutrophic conditions, a salinity zone map, and data describing watershed and estuary characteristics. They are organized by region (North, Mid and South Atlantic, Gulf of Mexico and Pacific) and are listed alphabetically within the region. These summary pages are produced automatically from the NEEA online survey and are accessible for download at http://ian.umces.edu/neea.

Figure A1: Example of an estuary summary page; after data and summary texts are entered by survey participants, symptom expressions for each indicator are calculated and incorporated in to a summary.



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This appendix contains one-page summaries for the 141 systems included in the study which include the status and trends of eutrophic conditions, a salinity zone map, and data describing watershed and estuary characteristics. They are organized by region (North, Mid and South Atlantic, Gulf of Mexico and Pacific) and are listed alphabetically within the region. These summary pages are produced automatically from the NEEA online survey and are accessible for download at http://ian.umces.edu/neea.

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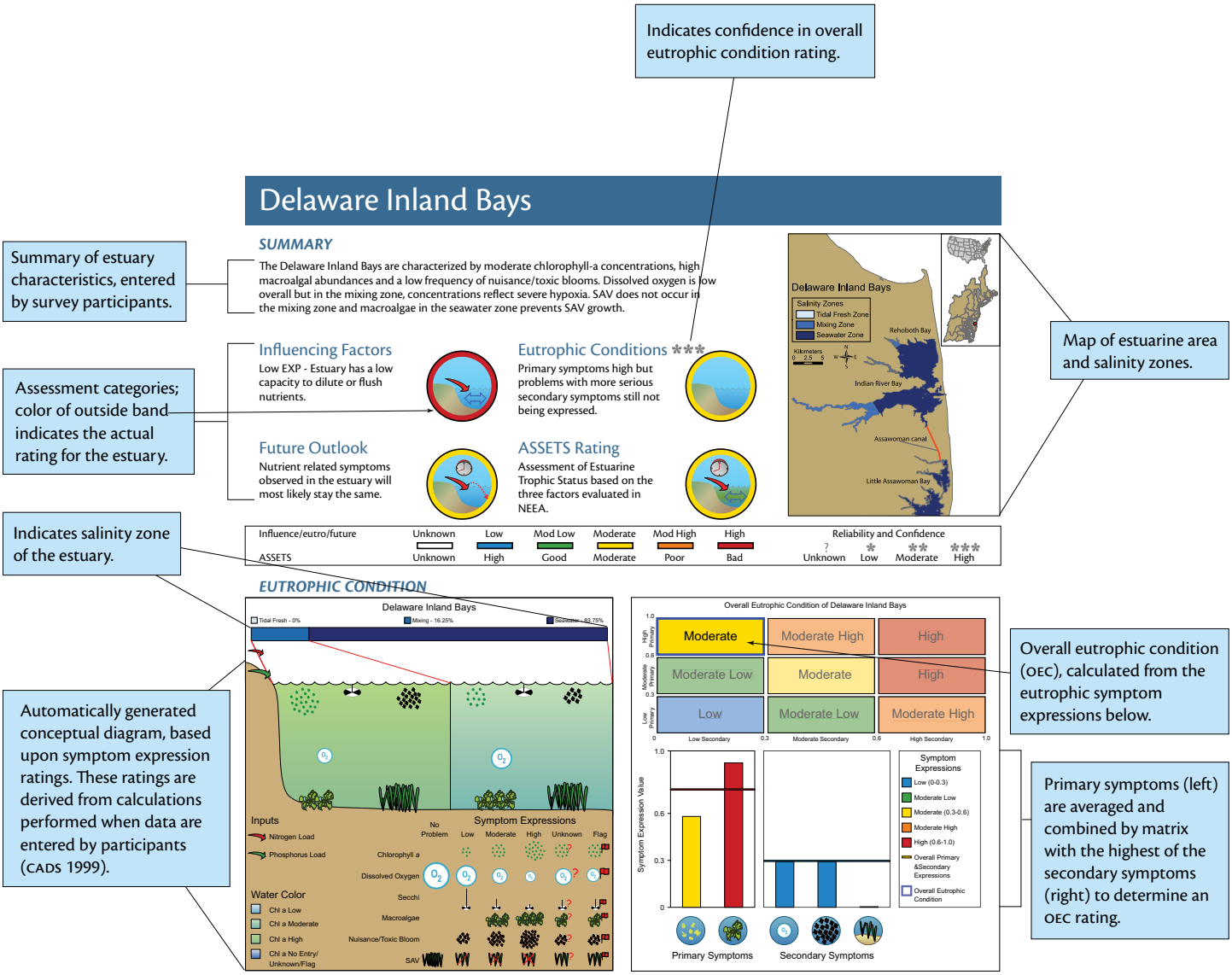
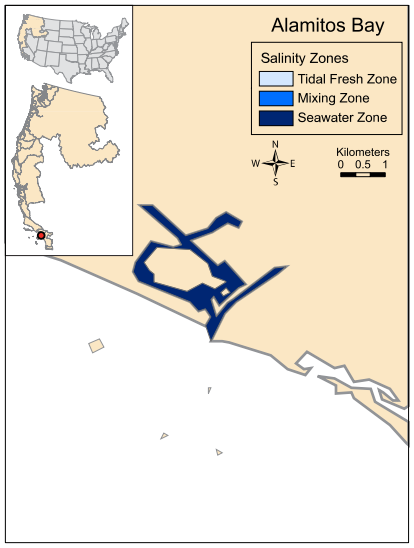


Alamitos Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of Alamitos Bay. In the 1999 assessment, eutrophic conditions in the bay were low overall based on moderate dissolved oxygen symptom expression and low occurrence of nuisance/toxic blooms.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

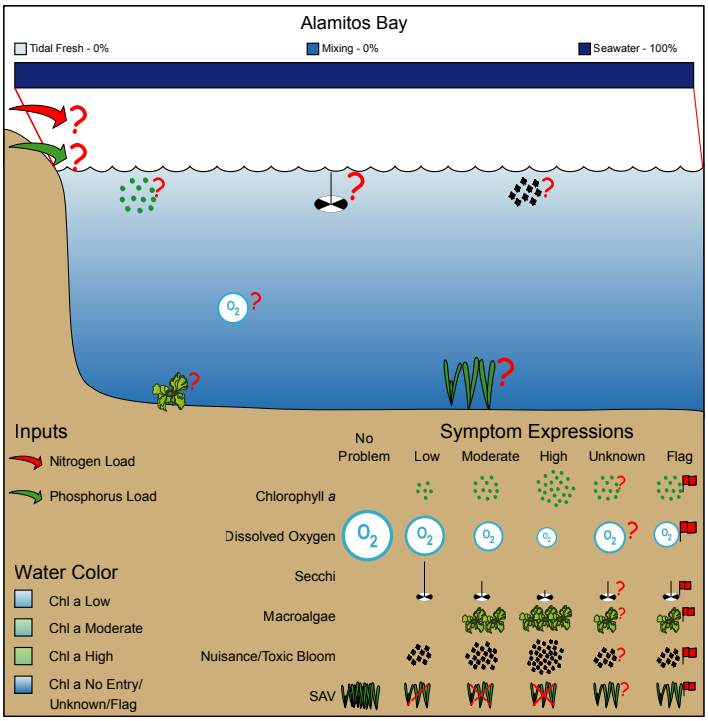
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

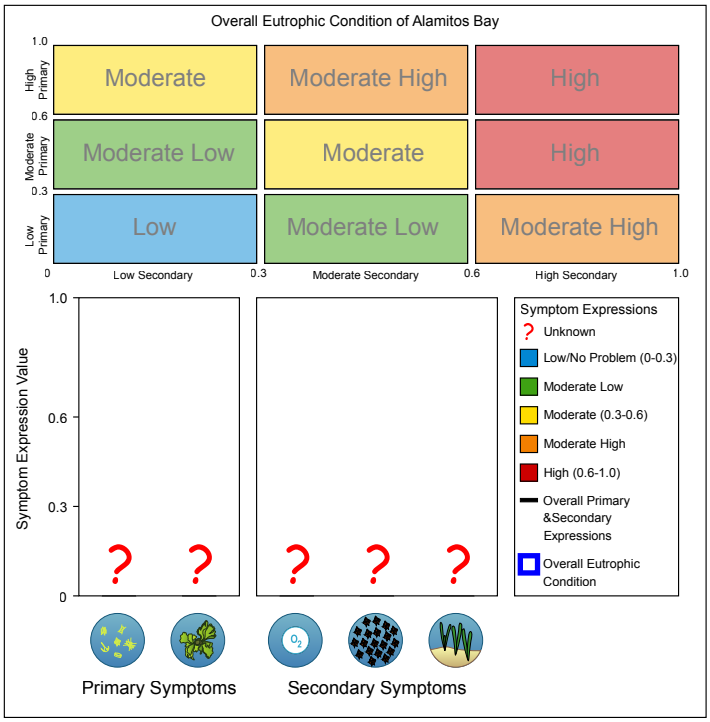
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	✻ Low	✻✻ Moderate	✻✻✻ High

EUTROPHIC CONDITION





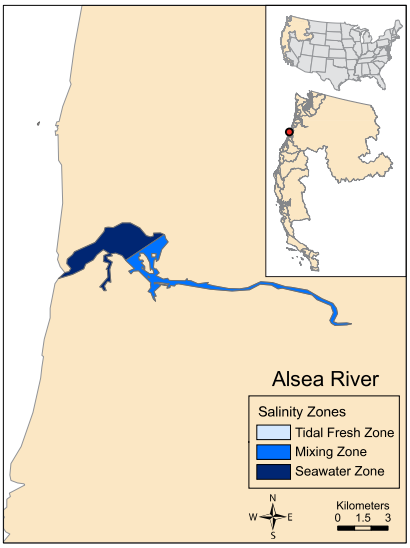
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	2	Urban (km^2)	197 (100%)	Area (km^2)	74
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	0 (0%)	Mean elevation (m)	12
Mixing zone area (km^2)	0	Forest (km^2)	0 (0%)	Max. elevation (m)	30
Saltwater zone area (km^2)	2	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	37.0
Volume (1,000 x m^3)	4,120	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	3,250
Depth (m)	2.06	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.91	Total (km^2)	197 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	3	Population	157,331	TSS/est. area (tonne km^{-2} y^{-1})	1,625
		Popn: est. area ratio	78,666	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Alsea River

SUMMARY

The data provided for the Alsea River characterize the estuary with a moderate chlorophyll-a and low dissolved oxygen symptom expression. However, the low confidence level and unknown frequency of occurrence of the data make any conclusions highly uncertain.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Primary symptoms beginning to indicate possible problems but still very few secondary symptoms expressed.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

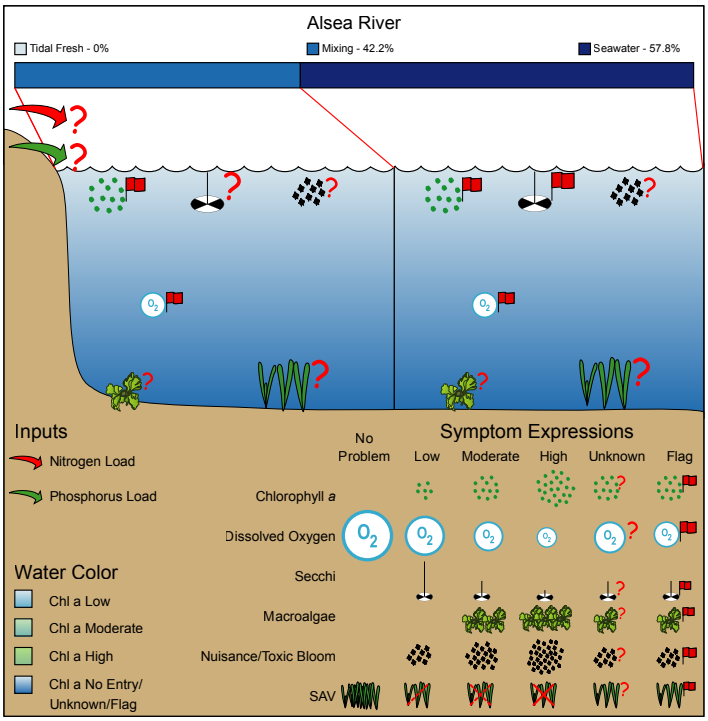
ASSETS Rating

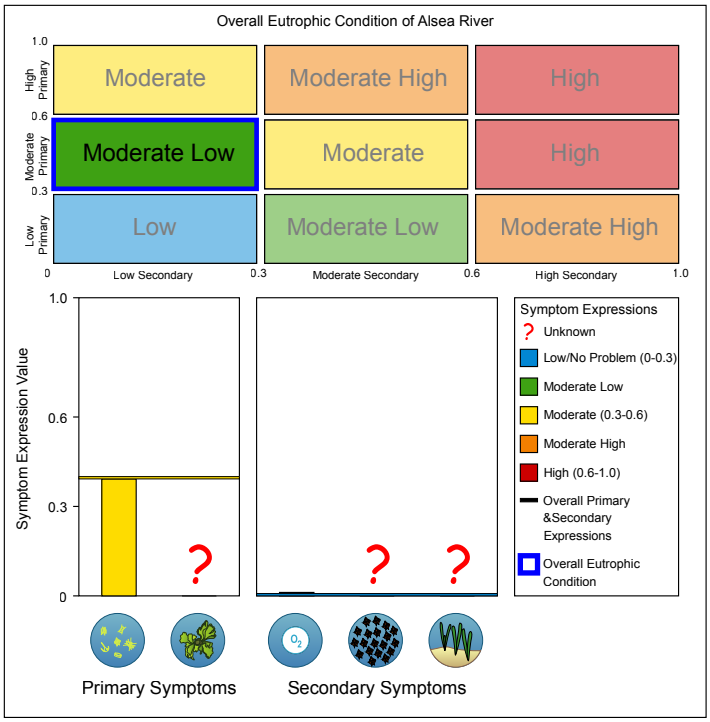
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





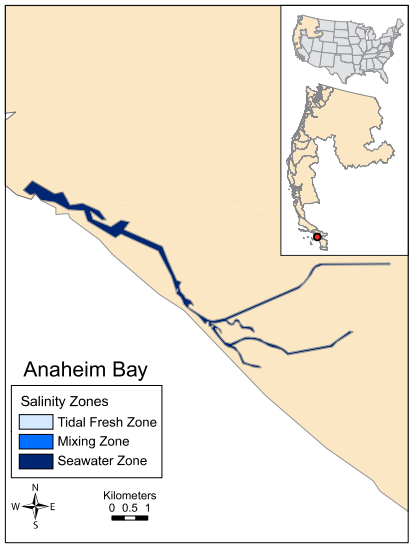
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	9	Urban (km^2)	5 (0.4%)	Area (km^2)	1,216
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	23 (1.9%)	Mean elevation (m)	309
Mixing zone area (km^2)	4	Forest (km^2)	1,184 (97.4%)	Max. elevation (m)	1,003
Saltwater zone area (km^2)	5	Wetland (km^2)	3 (0.2%)	Watershed: estuary ratio	135.1
Volume (1,000 x m^3)	18,720	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	168,000
Depth (m)	2.08	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.77	Total (km^2)	1,215 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	4,398	TSS/est. area (tonne km^{-2} y^{-1})	18,667
		Popn: est. area ratio	489	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Anaheim Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of Anaheim Bay. In the 1999 assessment, the bay was characterized by a moderate overall eutrophic condition, stemming from high symptom expression for macroalgae and low symptom expressions for nuisance/toxic blooms and dissolved oxygen.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

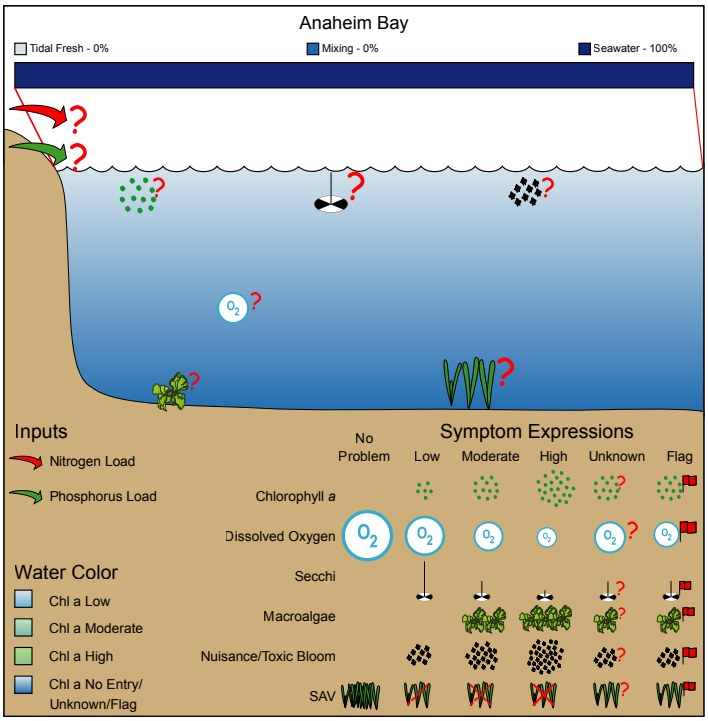
ASSETS Rating

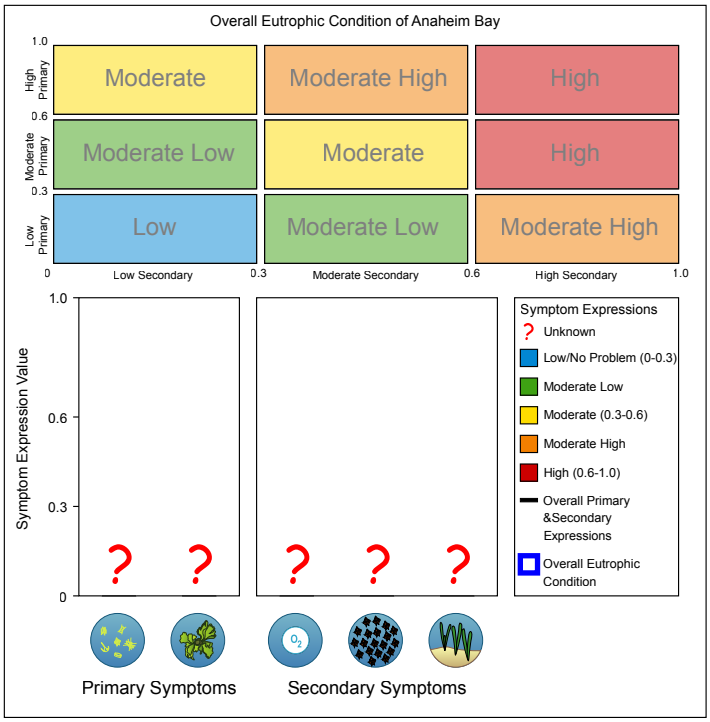
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





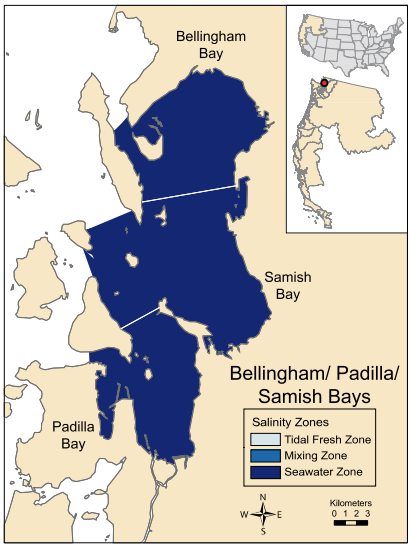
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	5	Urban (km^2)	73 (100%)	Area (km^2)	198
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	0 (0%)	Mean elevation (m)	17
Mixing zone area (km^2)	0	Forest (km^2)	0 (0%)	Max. elevation (m)	52
Saltwater zone area (km^2)	5	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	39.6
Volume (1,000 x m^3)	29,200	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	3,530
Depth (m)	5.84	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.04	Total (km^2)	73 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	16	Population	562,676	TSS/est. area (tonne km^{-2} y^{-1})	706
		Popn: est. area ratio	112,535	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Bellingham/Padilla/Samish Bays

SUMMARY

The data provided for Bellingham/Padilla/Samish Bays show high chlorophyll-a and moderate dissolved oxygen and macroalgal symptom expressions. Symptom expressions for nuisance/toxic blooms and SAV are low, however, the overall eutrophic condition rating for this system is moderate high. It is not possible to determine changes since the 1999 study.

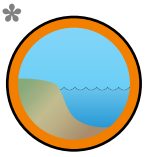


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms high and substantial secondary symptoms becoming more expressed, indicating potentially serious problems.



Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

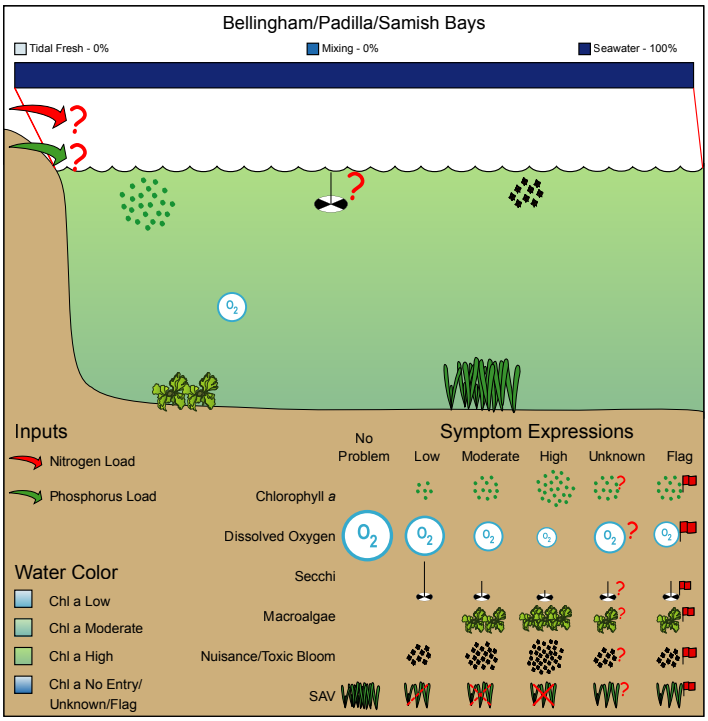
ASSETS Rating

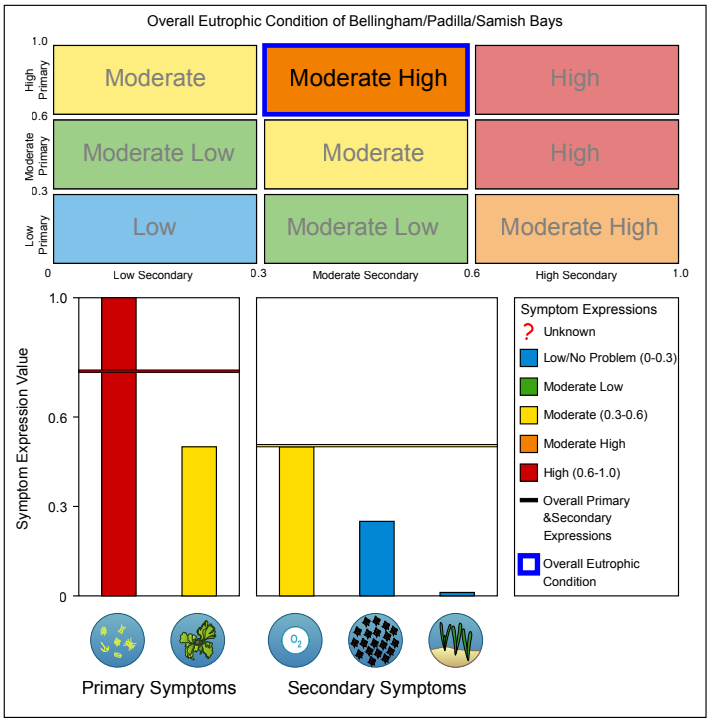
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; * Low; ** Moderate; *** High

EUTROPHIC CONDITION





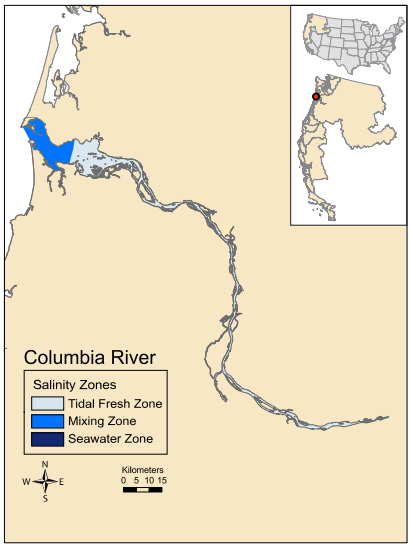
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	350	Urban (km^2)	0 (0%)	Area (km^2)	0
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	0 (0%)	Mean elevation (m)	0
Mixing zone area (km^2)	0	Forest (km^2)	0 (0%)	Max. elevation (m)	0
Saltwater zone area (km^2)	350	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	0.0
Volume (1,000 x m^3)	0	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	0
Depth (m)	0.00	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.00	Total (km^2)	0 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	0	TSS/est. area (tonne km^{-2} y^{-1})	0
		Popn: est. area ratio	0	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Columbia River

SUMMARY

No data were available to assess the eutrophic condition of the Columbia River. In the 1999 assessment, the river was characterized by high levels of chlorophyll-a, healthy levels of dissolved oxygen, low frequency of nuisance/toxic blooms, leading to a moderate low overall eutrophic condition.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

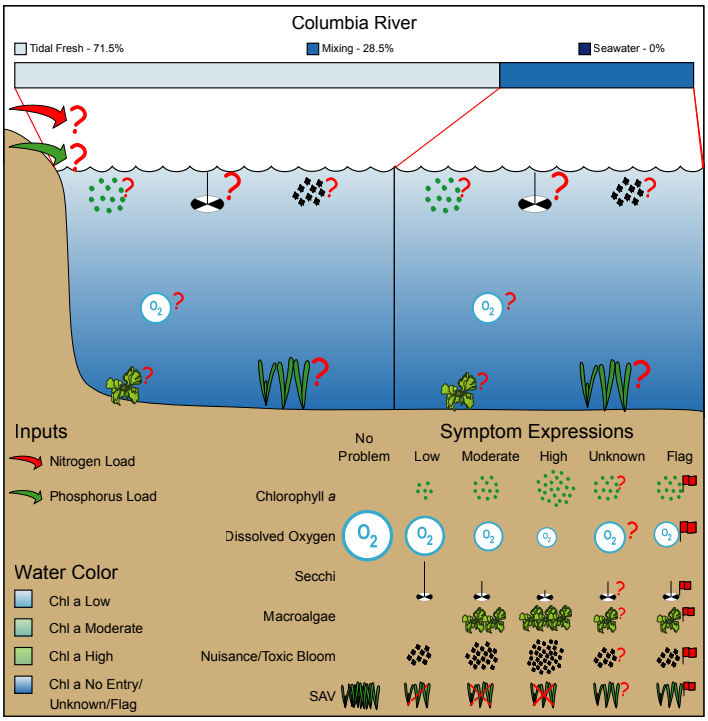
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

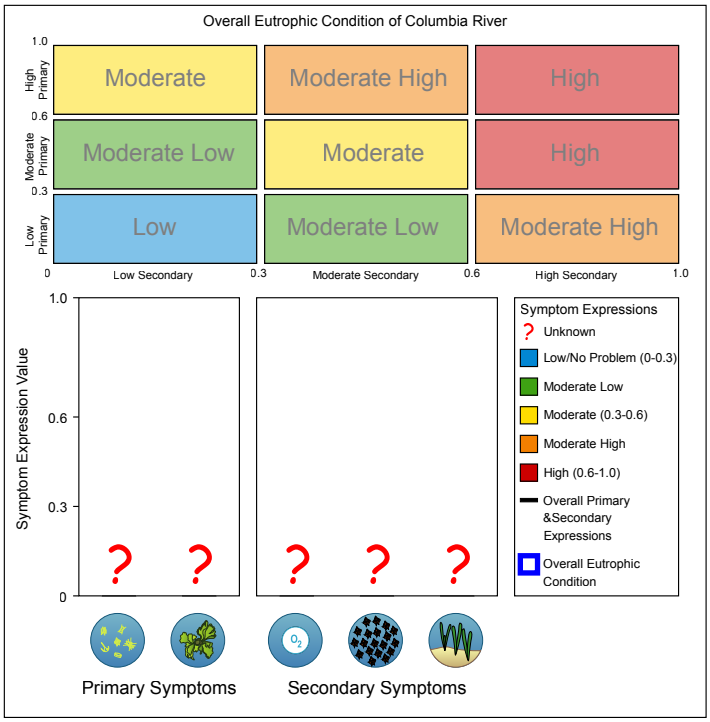
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	✻ Low	✻✻ Moderate	✻✻✻ High

EUTROPHIC CONDITION





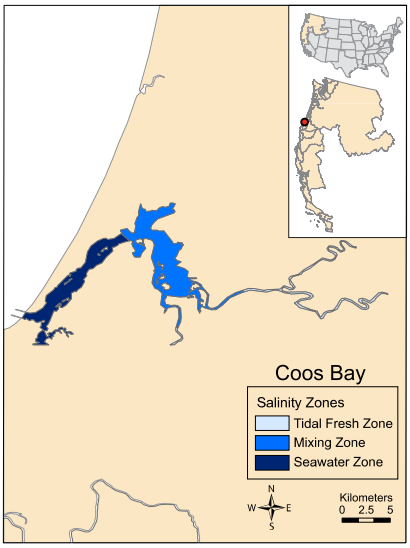
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	615	Urban (km^2)	12,877 (2.3%)	Area (km^2)	658,726
Tidal fresh zone area (km^2)	440	Agriculture (km^2)	87,834 (16%)	Mean elevation (m)	1,316
Mixing zone area (km^2)	175	Forest (km^2)	274,842 (50.1%)	Max. elevation (m)	4,295
Saltwater zone area (km^2)	0	Wetland (km^2)	1,761 (0.3%)	Watershed: estuary ratio	1,071.1
Volume (1,000 x m^3)	2,847,450	Range (km^2)	171,563 (31.3%)	TSS (tonne y^{-1})	1,180,000
Depth (m)	4.63	Barren (km^2)	5 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.32	Total (km^2)	548,883 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	3	Population	6,597,793	TSS/est. area (tonne km^{-2} y^{-1})	1,919
		Popn: est. area ratio	10,728	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Coos Bay

SUMMARY

The data available for Coos Bay suggest a moderate chlorophyll-a symptom expression for all zones, but as the frequency of occurrence is unknown, data confidence is low. For the tidal fresh and mixing zones, dissolved oxygen levels are healthy, reflecting no change since the 1999 assessment.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Primary symptoms beginning to indicate possible problems but still very few secondary symptoms expressed.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

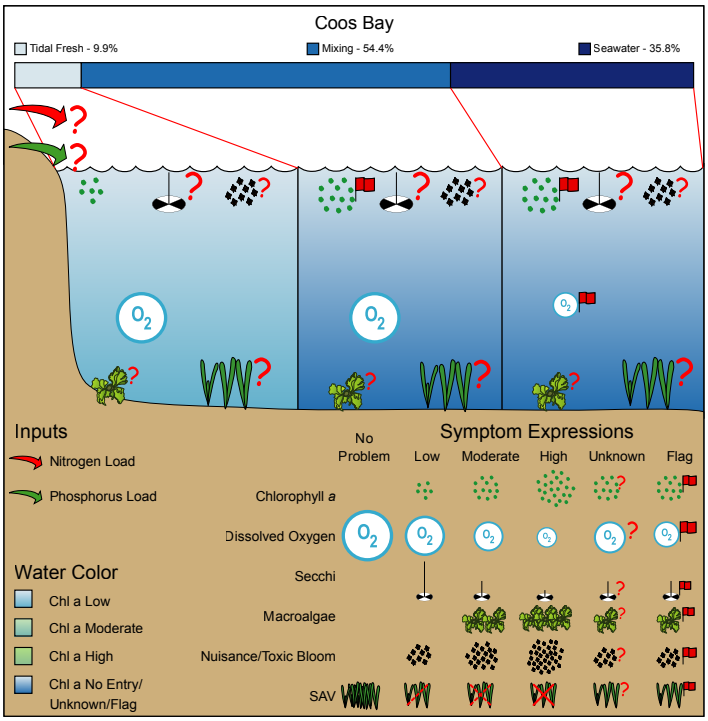
ASSETS Rating

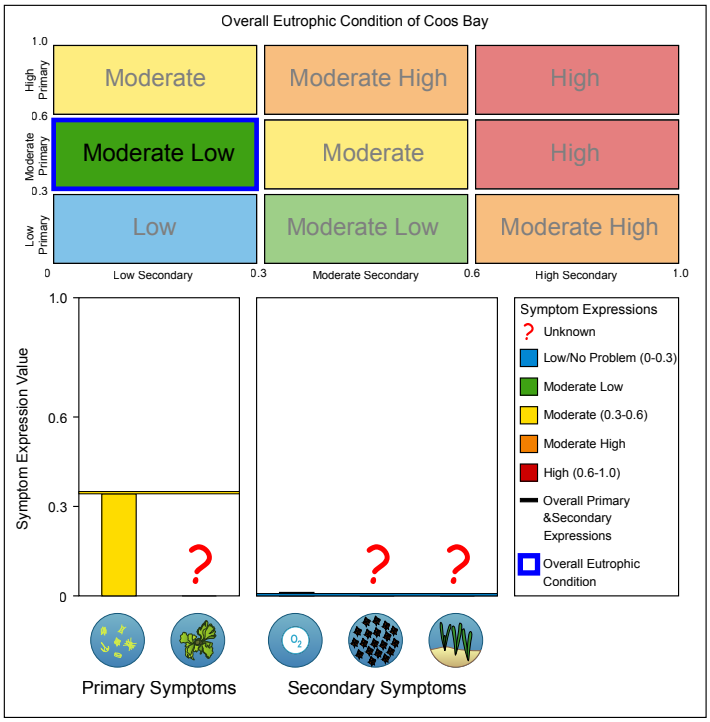
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





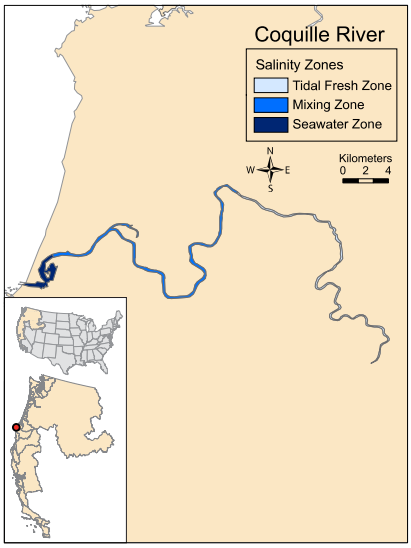
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	44	Urban (km^2)	70 (4.8%)	Area (km^2)	1,479
Tidal fresh zone area (km^2)	4	Agriculture (km^2)	21 (1.4%)	Mean elevation (m)	299
Mixing zone area (km^2)	24	Forest (km^2)	1,373 (93.3%)	Max. elevation (m)	889
Saltwater zone area (km^2)	16	Wetland (km^2)	5 (0.4%)	Watershed: estuary ratio	33.6
Volume (1,000 x m^3)	206,800	Range (km^2)	3 (0.2%)	TSS (tonne y^{-1})	649,000
Depth (m)	4.70	Barren (km^2)	0 (0%)	TN (kg y^{-1})	Unknown
Tide Height (m)	1.65	Total (km^2)	1,471 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	4	Population	20,889	TSS/est. area (tonne km^{-2} y^{-1})	14,750
		Popn: est. area ratio	475	TN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Coquille River

SUMMARY

The Coquille River estuary has formerly been and remains an area in need of a more complete data set in order to assign an accurate rating. However, the current data suggests unchanged, non-problematic dissolved oxygen levels and a slight increase in chlorophyll-a concentration since the 1999 assessment.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Primary symptoms beginning to indicate possible problems but still very few secondary symptoms expressed.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

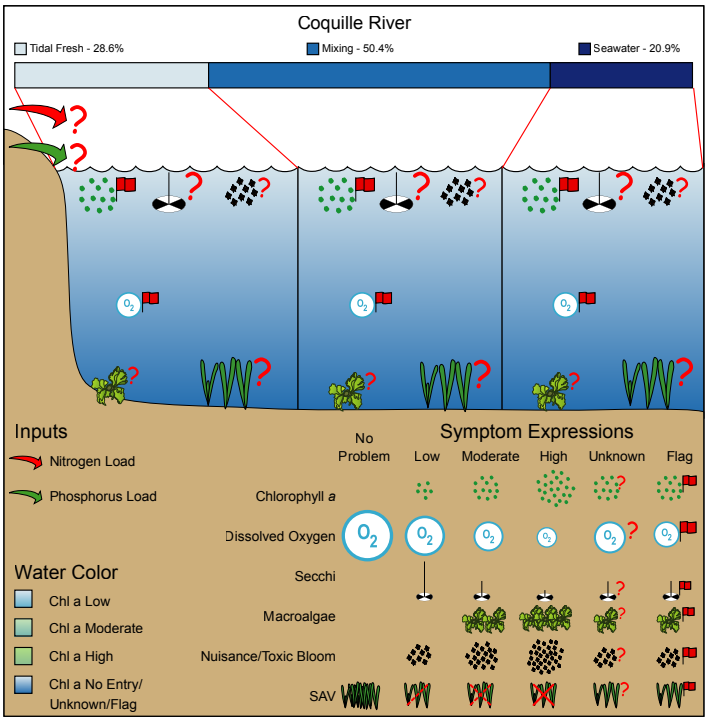
ASSETS Rating

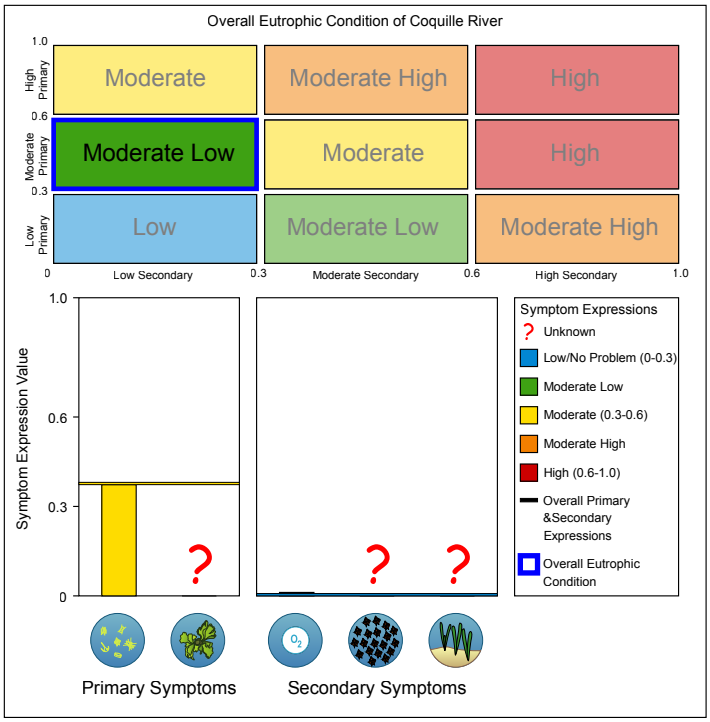
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





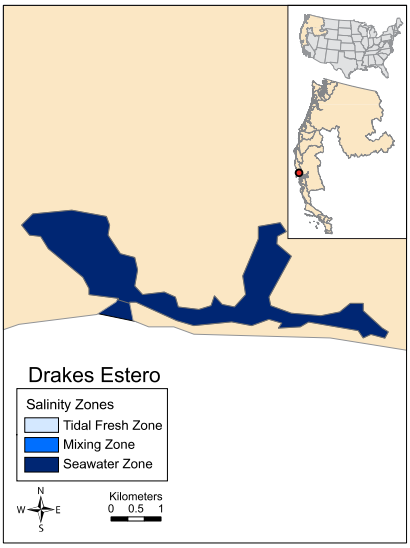
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	9	Urban (km^2)	39 (1.4%)	Area (km^2)	2,722
Tidal fresh zone area (km^2)	3	Agriculture (km^2)	135 (5%)	Mean elevation (m)	361
Mixing zone area (km^2)	5	Forest (km^2)	2,510 (92.3%)	Max. elevation (m)	1,158
Saltwater zone area (km^2)	2	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	302.4
Volume (1,000 x m^3)	33,570	Range (km^2)	36 (1.3%)	TSS (tonne y^{-1})	1,280,000
Depth (m)	3.73	Barren (km^2)	0 (0%)	TN (kg y^{-1})	Unknown
Tide Height (m)	1.58	Total (km^2)	2,719 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	2	Population	15,128	TSS/est. area (tonne km^{-2} y^{-1})	142,222
		Popn: est. area ratio	1,681	TN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Drakes Estero

SUMMARY

Data were unavailable to assess the eutrophic condition of Drakes Estero in both the 1999 and the 2004 assessments.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

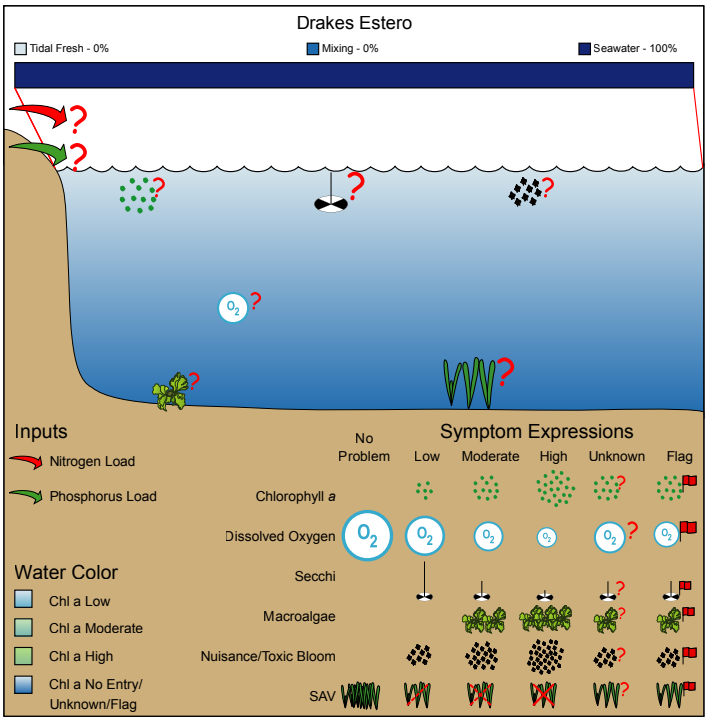
ASSETS Rating

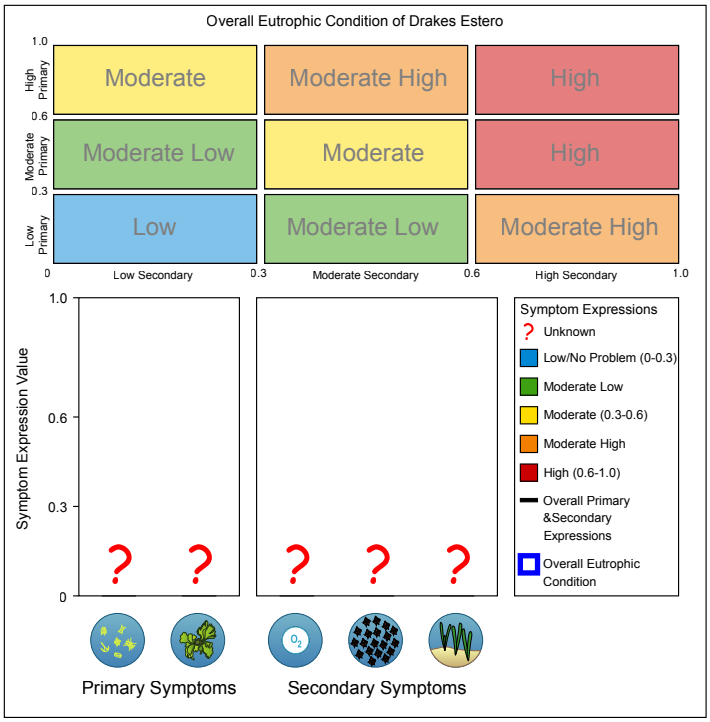
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





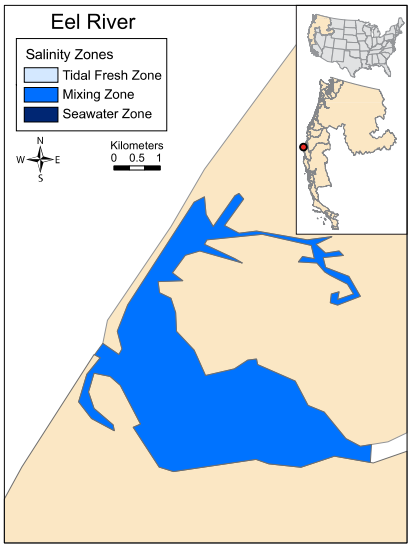
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	4	Urban (km^2)	0 (0%)	Area (km^2)	73
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	28 (44%)	Mean elevation (m)	76
Mixing zone area (km^2)	0	Forest (km^2)	10 (16%)	Max. elevation (m)	366
Saltwater zone area (km^2)	4	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	18.3
Volume (1,000 x m^3)	7,680	Range (km^2)	26 (40%)	TSS (tonne y^{-1})	272,000
Depth (m)	1.92	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.91	Total (km^2)	65 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	2	Population	675	TSS/est. area (tonne km^{-2} y^{-1})	68,000
		Popn: est. area ratio	169	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Eel River

SUMMARY

Data were unavailable to assess the eutrophic condition of the Eel River. In the 1999 assessment, the overall eutrophic condition was low stemming from low symptom expressions were reported for chlorophyll-a and dissolved oxygen levels and no problems with macroalgae or losses of SAV.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

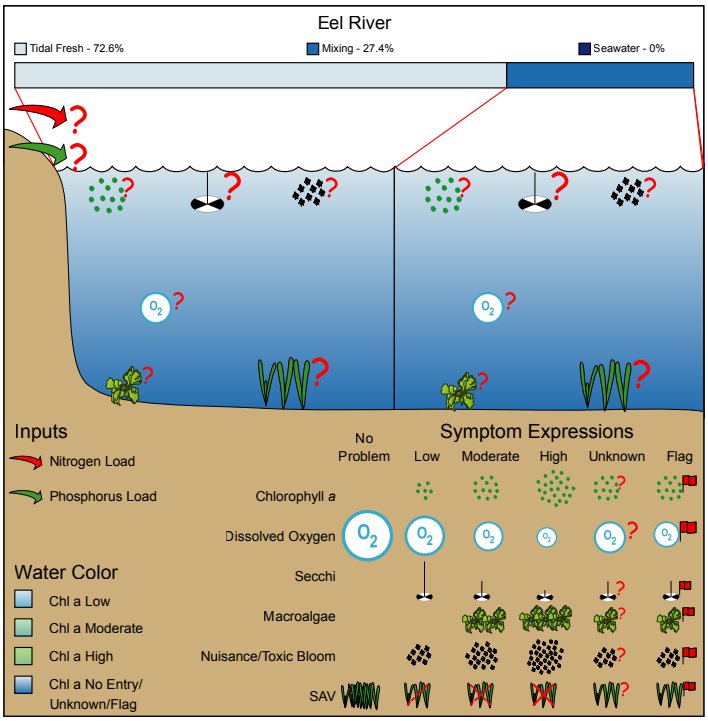
ASSETS Rating

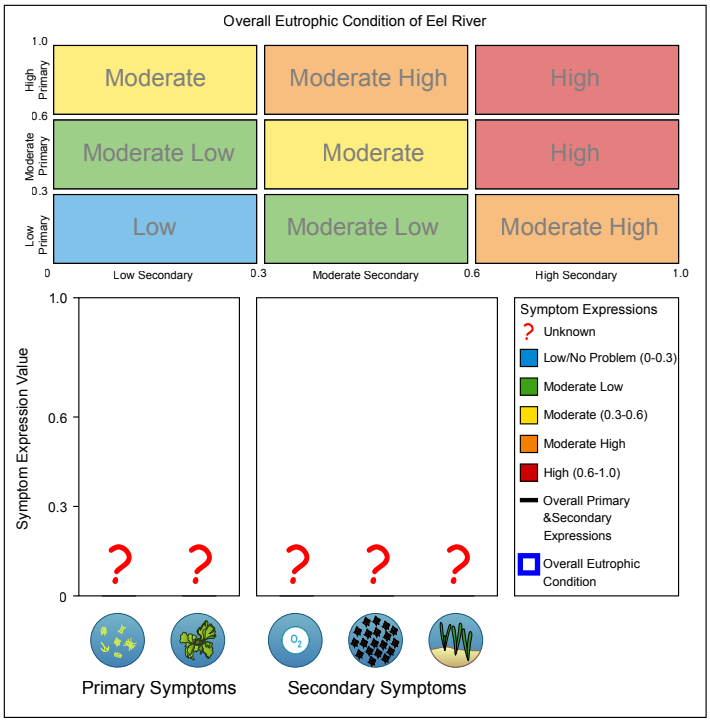
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





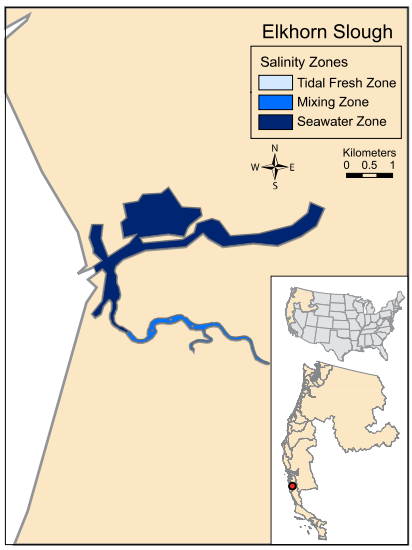
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	22	Urban (km^2)	93 (1%)	Area (km^2)	9,444
Tidal fresh zone area (km^2)	16	Agriculture (km^2)	233 (2.5%)	Mean elevation (m)	759
Mixing zone area (km^2)	6	Forest (km^2)	7,177 (76.4%)	Max. elevation (m)	2,160
Saltwater zone area (km^2)	0	Wetland (km^2)	3 (0%)	Watershed: estuary ratio	429.3
Volume (1,000 x m^3)	29,700	Range (km^2)	1,891 (20.1%)	TSS (tonne y^{-1})	1,230,000
Depth (m)	1.35	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.34	Total (km^2)	9,396 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	38,745	TSS/est. area (tonne km^{-2} y^{-1})	55,909
		Popn: est. area ratio	1,761	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Elkhorn Slough

SUMMARY

Elkhorn Slough is characterized by low symptom expressions for chlorophyll-a and dissolved oxygen, reflecting a reduction in symptom level since the 1999 assessment. The macroalgae symptom expression is high, and is known in to be a periodic problem. Conditions are expected to worsen in the future.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms high but problems with more serious secondary symptoms still not being expressed.

Future Outlook

Nutrient related symptoms observed in the estuary are likely to substantially worsen.

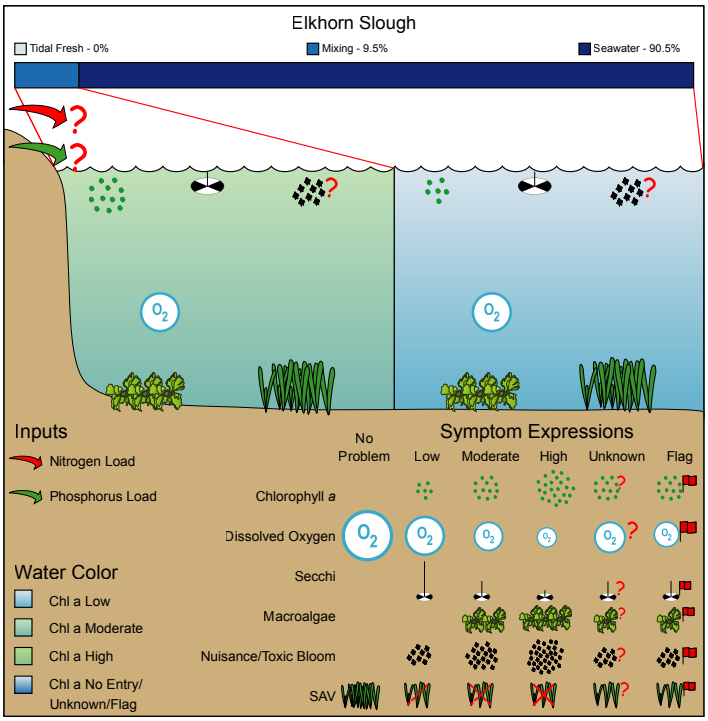
ASSETS Rating

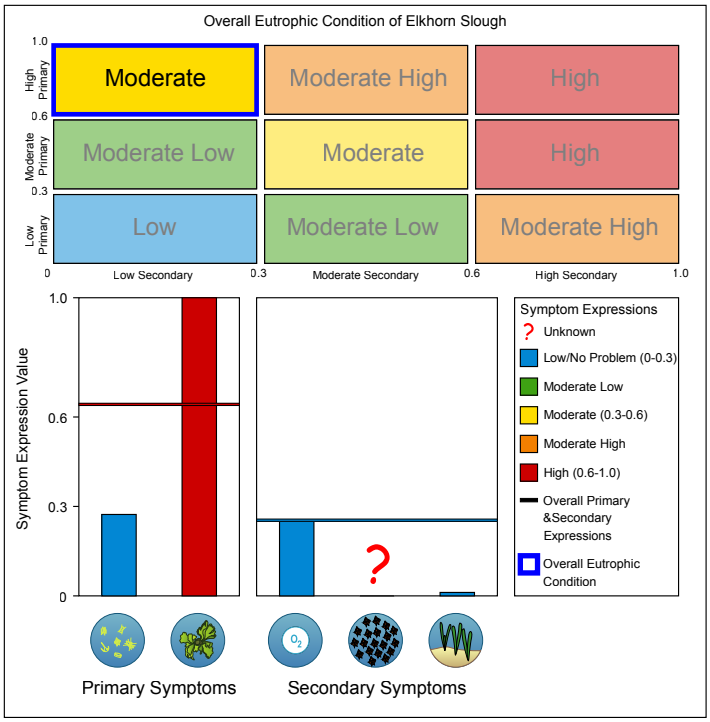
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; * Low; ** Moderate; *** High

EUTROPHIC CONDITION





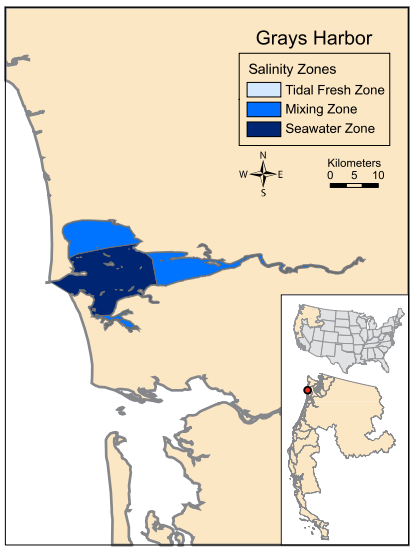
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	3	Urban (km^2)	127 (20.9%)	Area (km^2)	603
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	220 (36.3%)	Mean elevation (m)	123
Mixing zone area (km^2)	<1	Forest (km^2)	137 (22.6%)	Max. elevation (m)	805
Saltwater zone area (km^2)	3	Wetland (km^2)	8 (1.3%)	Watershed: estuary ratio	201.0
Volume (1,000 x m^3)	8,520	Range (km^2)	114 (18.8%)	TSS (tonne y^{-1})	130,000
Depth (m)	2.84	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.09	Total (km^2)	606 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	3	Population	118,195	TSS/est. area (tonne km^{-2} y^{-1})	43,333
		Popn: est. area ratio	39,398	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Grays Harbor

SUMMARY

Grays Harbor has an overall eutrophic condition of low, indicating few nutrient related problems, as a result of low symptom expression ratings for all indicators.

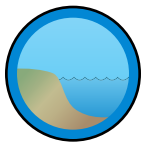


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Level of expression of eutrophic conditions is minimal.



Future Outlook

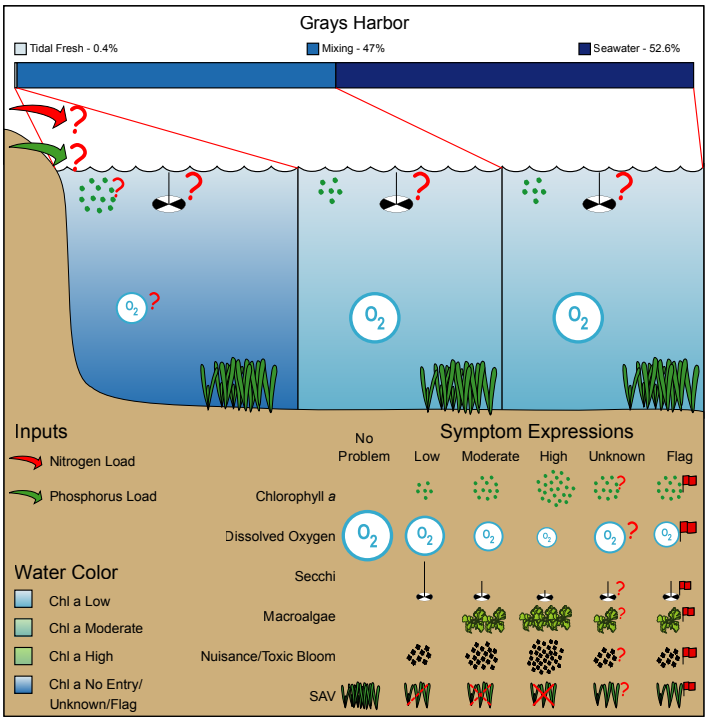
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

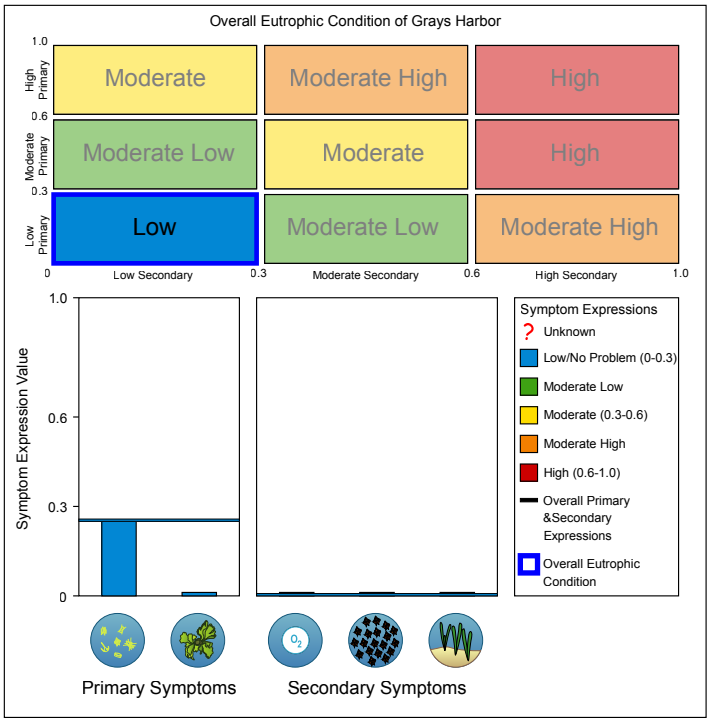
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	✻ Low	✻✻ Moderate	✻✻✻ High

EUTROPHIC CONDITION





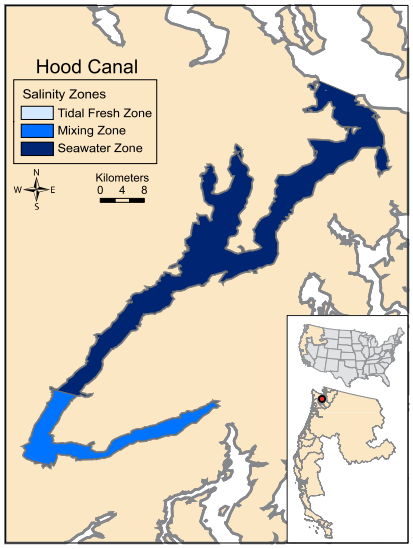
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	235	Urban (km^2)	938 (14.8%)	Area (km^2)	6,744
Tidal fresh zone area (km^2)	<1	Agriculture (km^2)	712 (11.2%)	Mean elevation (m)	203
Mixing zone area (km^2)	110	Forest (km^2)	4,525 (71.2%)	Max. elevation (m)	1,402
Saltwater zone area (km^2)	124	Wetland (km^2)	83 (1.3%)	Watershed: estuary ratio	28.7
Volume (1,000 x m^3)	465,300	Range (km^2)	93 (1.5%)	TSS (tonne y^{-1})	219,000
Depth (m)	1.98	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	2.29	Total (km^2)	6,351 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	129,172	TSS/est. area (tonne km^{-2} y^{-1})	932
		Popn: est. area ratio	550	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Hood Canal

SUMMARY

Hood Canal?s DO concentrations are at their lowest in recorded history, have become more persistent and have increased in area, spreading northwards. Many factors may be involved, including ocean conditions, watershed changes, and nutrient loading. The Hood Canal Dissolved Oxygen Program is modeling the conditions and its drivers.

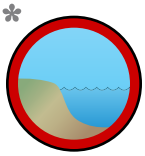


Influencing Factors

Moderate to high nitrogen input and moderate to high susceptibility (low ability for dilution and flushing of nutrients).

Eutrophic Conditions **

High primary and secondary symptom levels indicate serious eutrophication problems.



Future Outlook

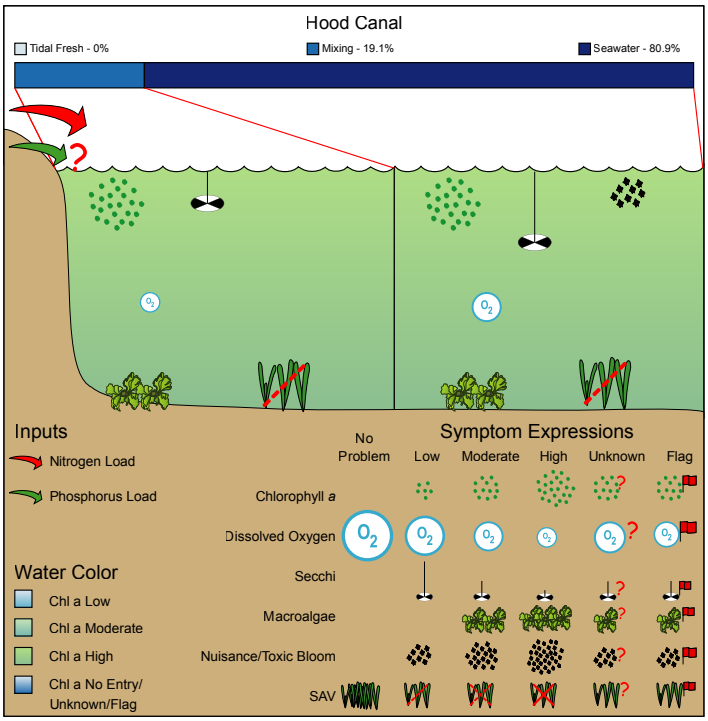
Nutrient related symptoms observed in the estuary are likely to substantially worsen.

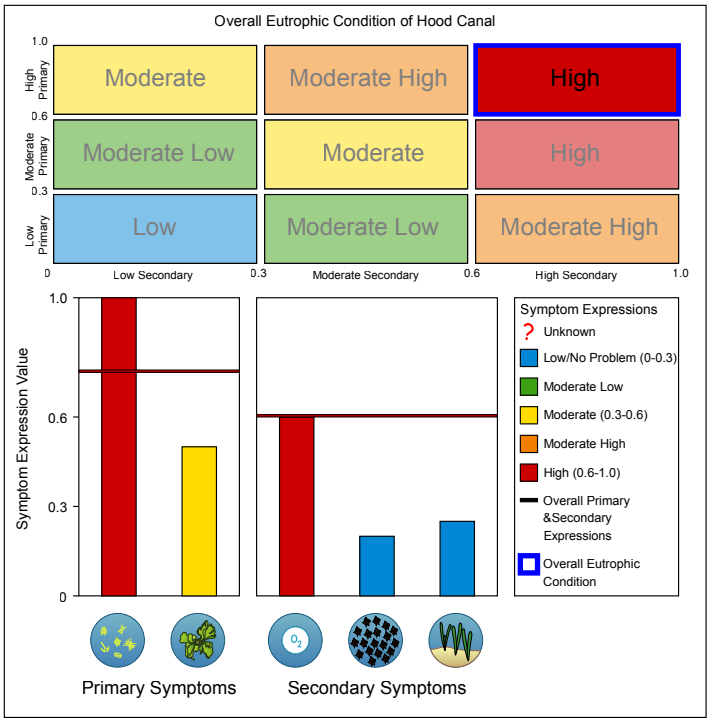
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown; * Low; ** Moderate; *** High

EUTROPHIC CONDITION





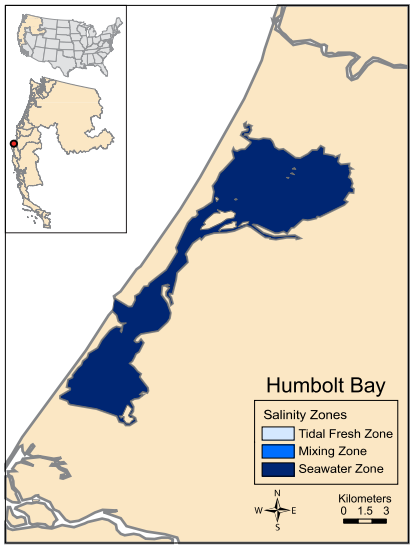
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	396	Urban (km^2)	181 (6.7%)	Area (km^2)	2,768
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	10 (0.4%)	Mean elevation (m)	564
Mixing zone area (km^2)	76	Forest (km^2)	2,450 (90.8%)	Max. elevation (m)	2,193
Saltwater zone area (km^2)	320	Wetland (km^2)	31 (1.2%)	Watershed: estuary ratio	7.0
Volume (1,000 x m^3)	26,912,160	Range (km^2)	26 (1%)	TSS (tonne y^{-1})	271,000
Depth (m)	67.96	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	20,505,000
Tide Height (m)	2.24	Total (km^2)	2,699 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	416	Population	34,910	TSS/est. area (tonne km^{-2} y^{-1})	684
		Popn: est. area ratio	88	DIN/est. area (kg km^{-2} y^{-1})	51,780
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Humboldt Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of Humboldt Bay. However, the overall eutrophic condition rating in the 1999 assessment was low based on low expressions for all symptoms, suggesting little to no evidence of eutrophication.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

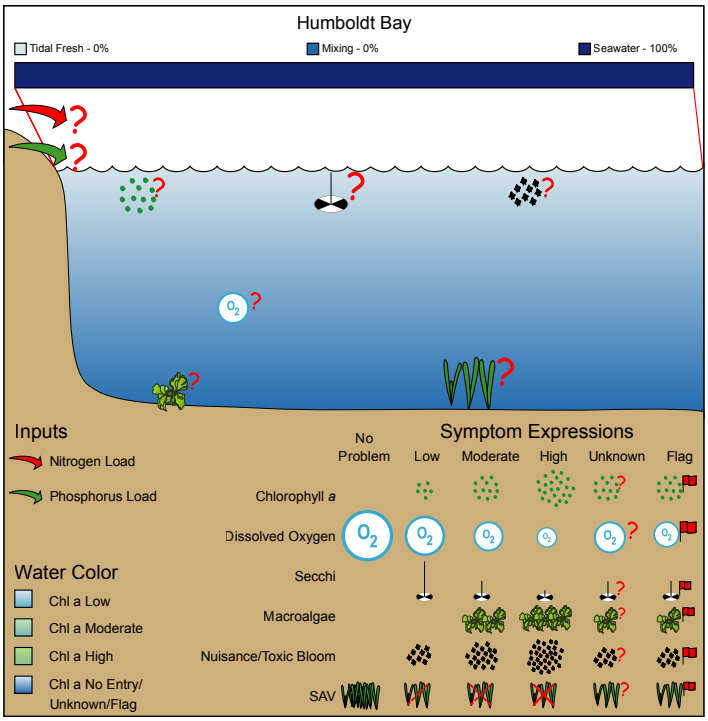
ASSETS Rating

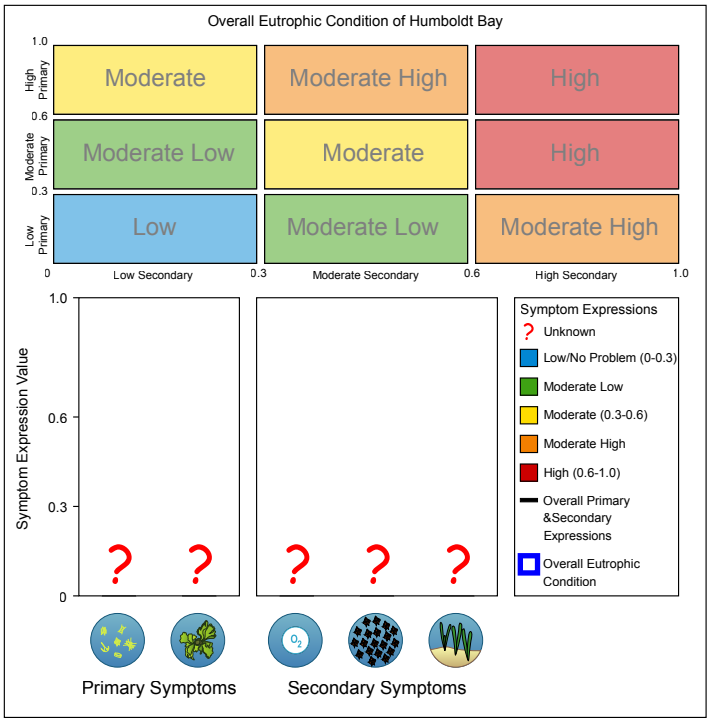
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





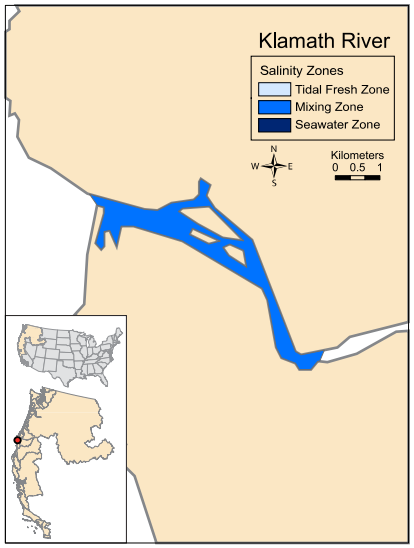
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	64	Urban (km^2)	60 (11.5%)	Area (km^2)	517
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	54 (10.5%)	Mean elevation (m)	192
Mixing zone area (km^2)	0	Forest (km^2)	373 (72%)	Max. elevation (m)	832
Saltwater zone area (km^2)	64	Wetland (km^2)	5 (1%)	Watershed: estuary ratio	8.1
Volume (1,000 x m^3)	221,440	Range (km^2)	26 (5%)	TSS (tonne y^{-1})	183,000
Depth (m)	3.46	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.52	Total (km^2)	518 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	3	Population	46,836	TSS/est. area (tonne km^{-2} y^{-1})	2,859
		Popn: est. area ratio	732	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Klamath River

SUMMARY

While water quality monitoring performed by the Yurok Tribe Environmental Program has indicated that upriver hydroelectric and diversion projects have reduced flow downstream and that forestry activities are prevalent in the area, there was insufficient data to assess eutrophic conditions in the Klamath River.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

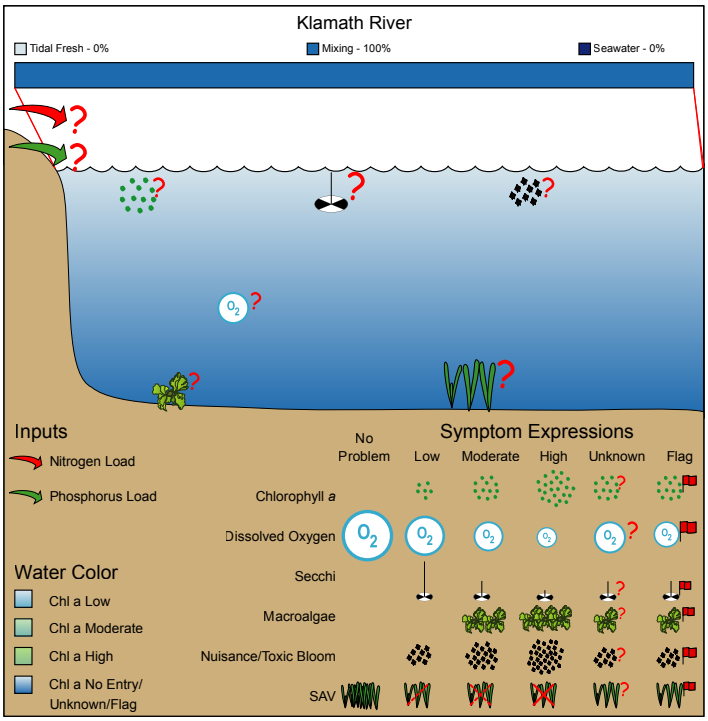
ASSETS Rating

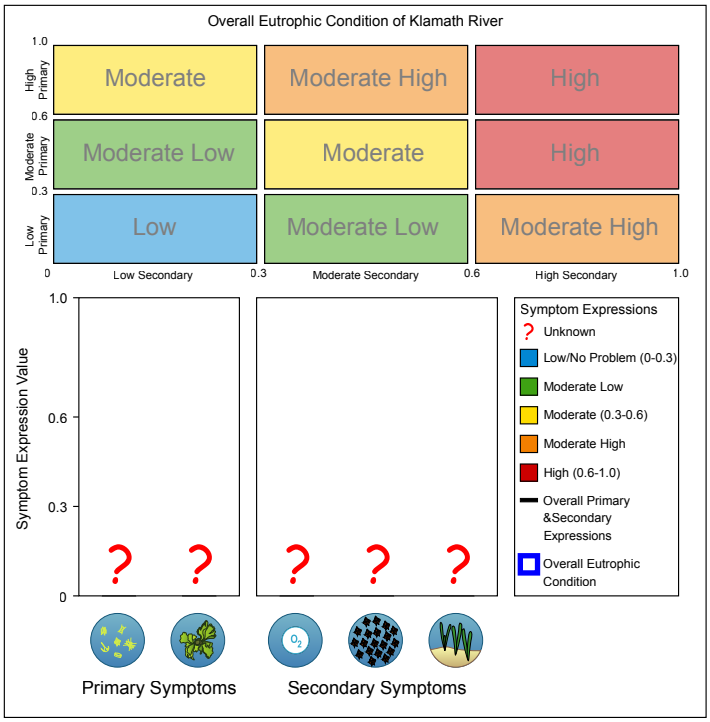
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence			
?	✻	✻✻	✻✻✻
Unknown	Low	Moderate	High

EUTROPHIC CONDITION





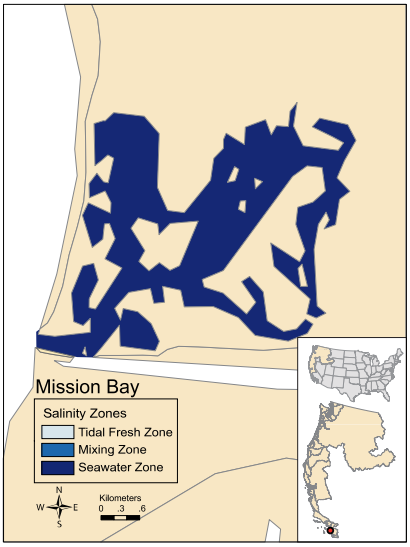
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	6	Urban (km^2)	285 (0.7%)	Area (km^2)	40,579
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	2,533 (6.3%)	Mean elevation (m)	1,318
Mixing zone area (km^2)	2	Forest (km^2)	30,865 (77.4%)	Max. elevation (m)	3,567
Saltwater zone area (km^2)	0	Wetland (km^2)	420 (1.1%)	Watershed: estuary ratio	6,763.2
Volume (1,000 x m^3)	16,860	Range (km^2)	5,791 (14.5%)	TSS (tonne y^{-1})	673,000
Depth (m)	2.81	Barren (km^2)	5 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.75	Total (km^2)	39,899 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	102,856	TSS/est. area (tonne km^{-2} y^{-1})	112,167
		Popn: est. area ratio	17,143	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Mission Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of Mission Bay. However, in the 1999 assessment, the bay was characterized by moderate low overall eutrophic conditions based on low symptom expressions for chlorophyll-a, macroalgae and nuisance/toxic blooms and no problematic low dissolved oxygen events.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

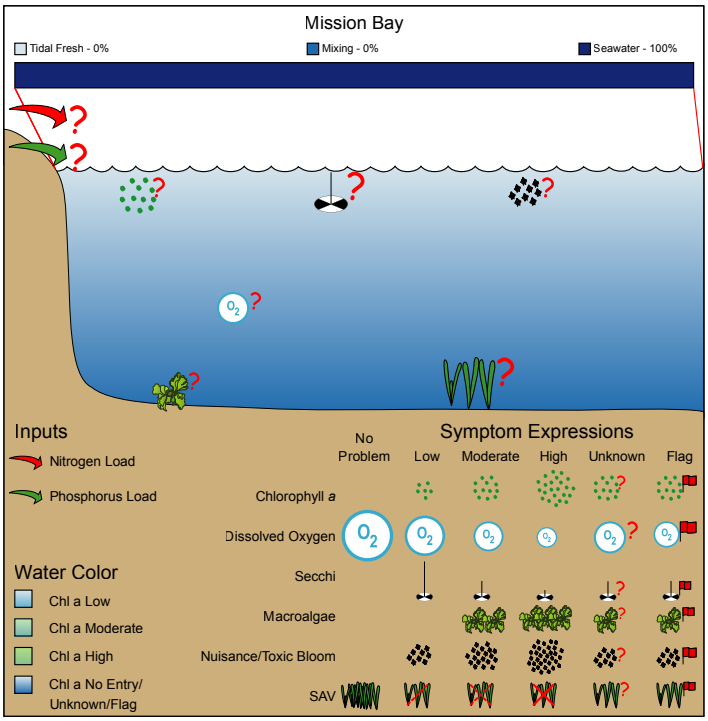
ASSETS Rating

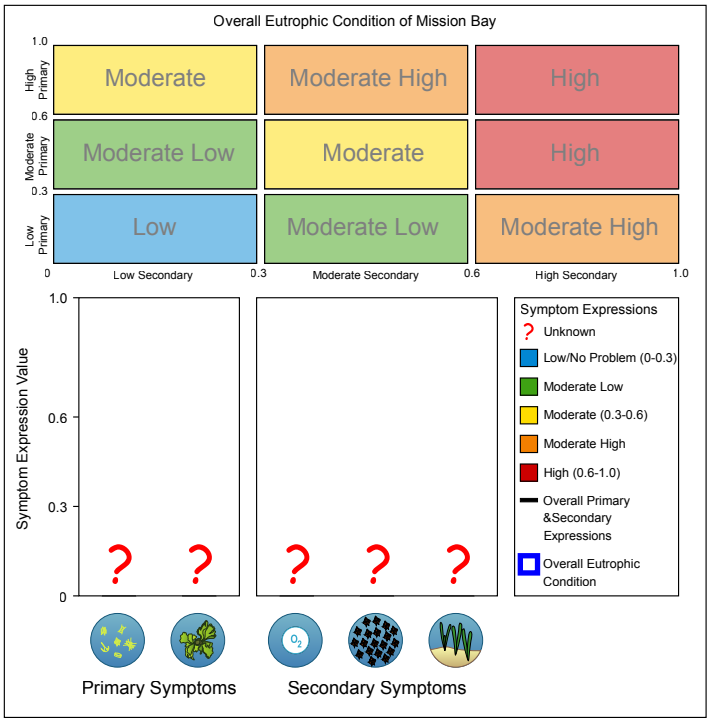
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





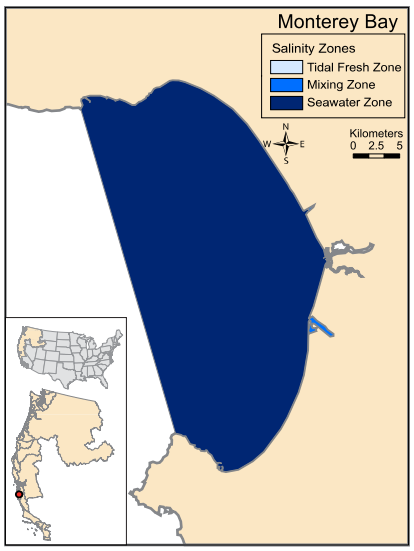
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	8	Urban (km^2)	111 (89.6%)	Area (km^2)	127
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	0 (0%)	Mean elevation (m)	114
Mixing zone area (km^2)	0	Forest (km^2)	0 (0%)	Max. elevation (m)	309
Saltwater zone area (km^2)	8	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	15.9
Volume (1,000 x m^3)	23,360	Range (km^2)	13 (10.4%)	TSS (tonne y^{-1})	59,000
Depth (m)	2.92	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.17	Total (km^2)	124 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	3	Population	161,950	TSS/est. area (tonne km^{-2} y^{-1})	7,375
		Popn: est. area ratio	20,244	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Monterey Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of Monterey Bay. In the 1999 assessment, the bay was characterized by a moderate low overall eutrophic condition, stemming from moderate symptom expressions of chlorophyll-a and nuisance/toxic blooms and low expressions for dissolved oxygen.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

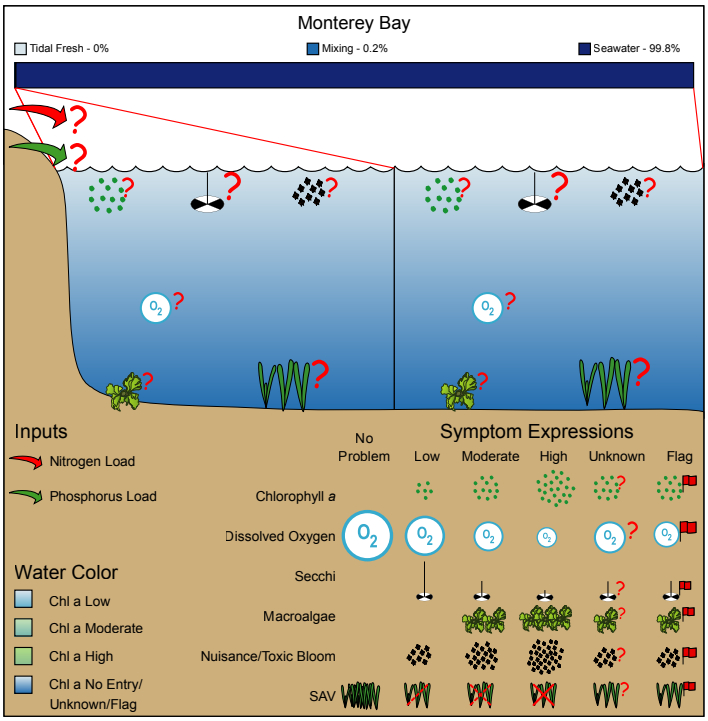
ASSETS Rating

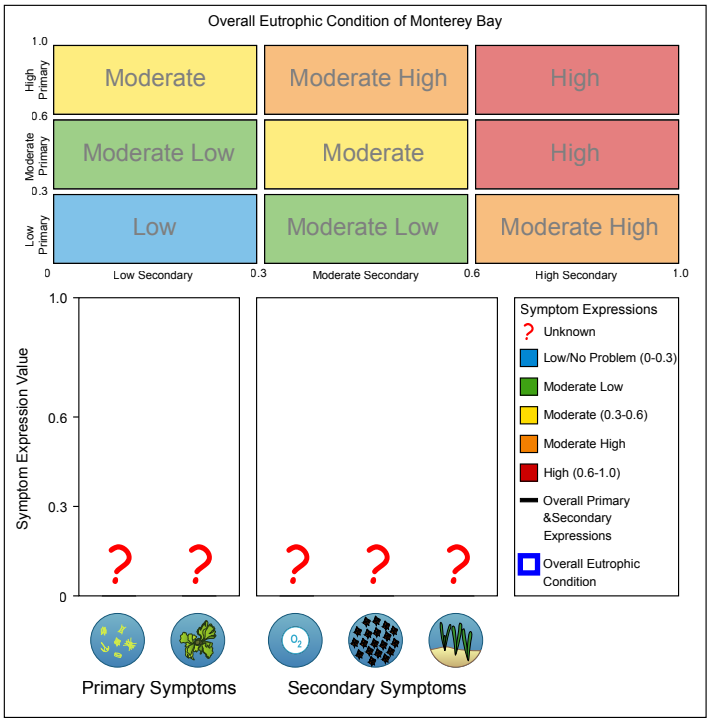
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





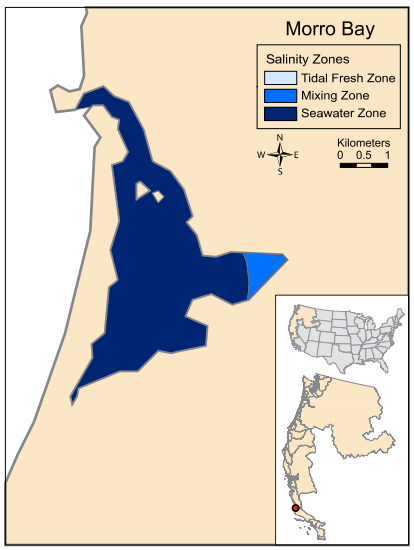
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	545	Urban (km^2)	756 (4.8%)	Area (km^2)	15,062
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	3,232 (20.7%)	Mean elevation (m)	448
Mixing zone area (km^2)	1	Forest (km^2)	6,024 (38.6%)	Max. elevation (m)	1,678
Saltwater zone area (km^2)	544	Wetland (km^2)	65 (0.4%)	Watershed: estuary ratio	27.6
Volume (1,000 x m^3)	45,643,750	Range (km^2)	5,532 (35.4%)	TSS (tonne y^{-1})	2,830,000
Depth (m)	83.75	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.08	Total (km^2)	15,610 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	2,769	Population	431,189	TSS/est. area (tonne km^{-2} y^{-1})	5,193
		Popn: est. area ratio	791	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Morro Bay

SUMMARY

Morro Bay is characterized by low symptom expressions for nuisance/toxic blooms, dissolved oxygen, SAV and macroalgae. A low overall eutrophic condition reflects improvements since the 1999 assessment. Nuisance/toxic blooms are most prevalent in the mixing zone of the estuary. Conditions are expected to improve due to sewage treatment upgrades.

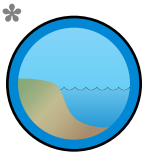


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Level of expression of eutrophic conditions is minimal.



Future Outlook

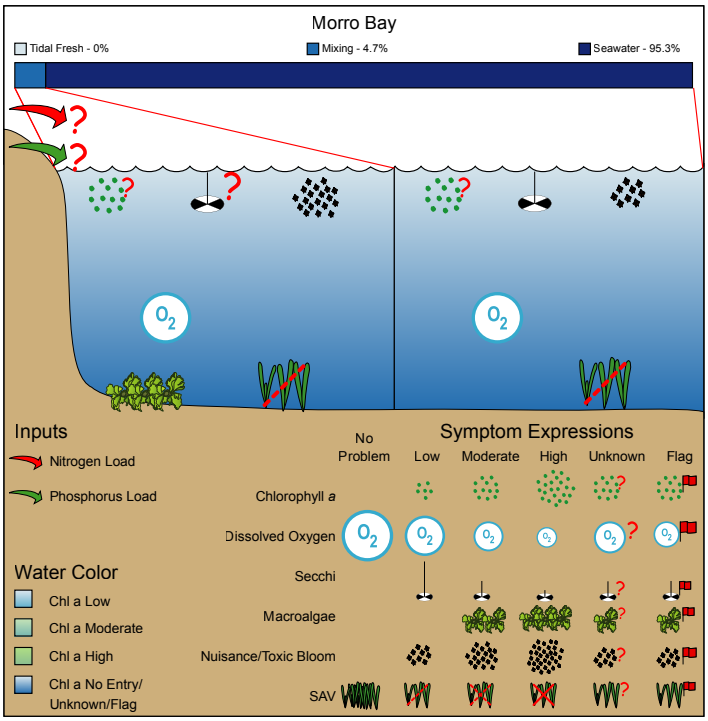
Nutrient related symptoms observed in the estuary are likely to improve somewhat.

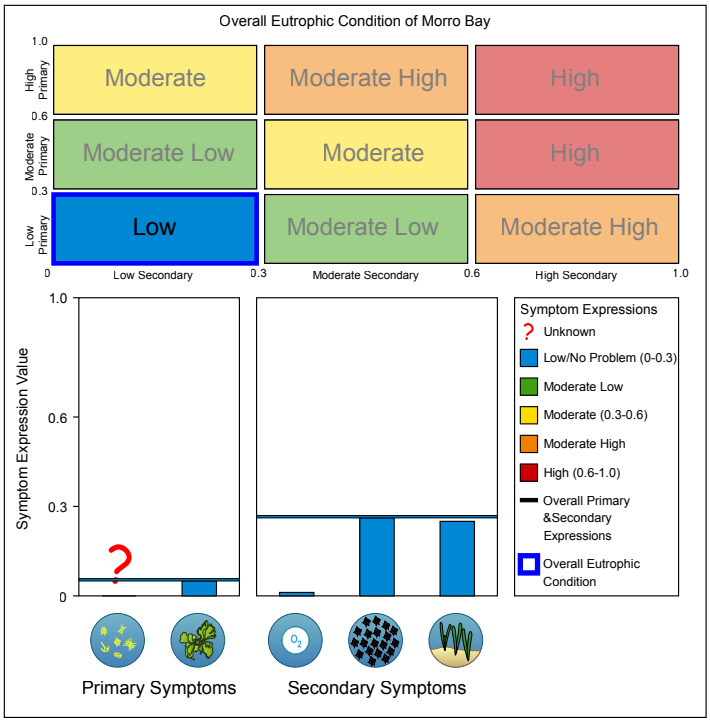
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	* Low	** Moderate	*** High

EUTROPHIC CONDITION





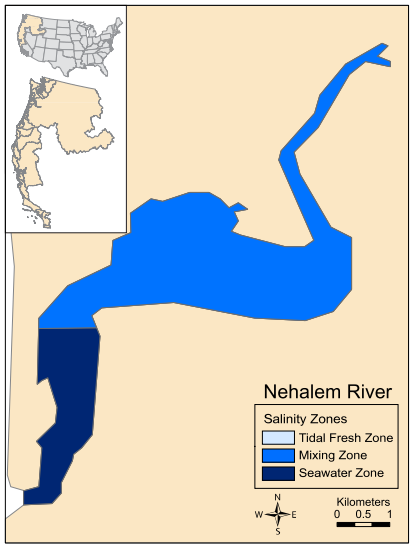
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	8	Urban (km^2)	26 (11.2%)	Area (km^2)	231
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	26 (11.2%)	Mean elevation (m)	182
Mixing zone area (km^2)	<1	Forest (km^2)	39 (16.9%)	Max. elevation (m)	787
Saltwater zone area (km^2)	8	Wetland (km^2)	3 (1.1%)	Watershed: estuary ratio	28.9
Volume (1,000 x m^3)	6,640	Range (km^2)	137 (59.6%)	TSS (tonne y^{-1})	87,100
Depth (m)	0.83	Barren (km^2)	0 (0%)	TN (kg y^{-1})	Unknown
Tide Height (m)	1.01	Total (km^2)	231 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	36,873	TSS/est. area (tonne km^{-2} y^{-1})	10,888
		Popn: est. area ratio	4,609	TN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Nehalem River

SUMMARY

Inadequate data were available to evaluate the eutrophic condition of the Nehalem River in both the 1999 and the 2004 assessments. In the 1999 assessment, chlorophyll-a symptom expression was low and there were no low dissolved oxygen problems suggesting that this system has minimal impacts from eutrophication.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

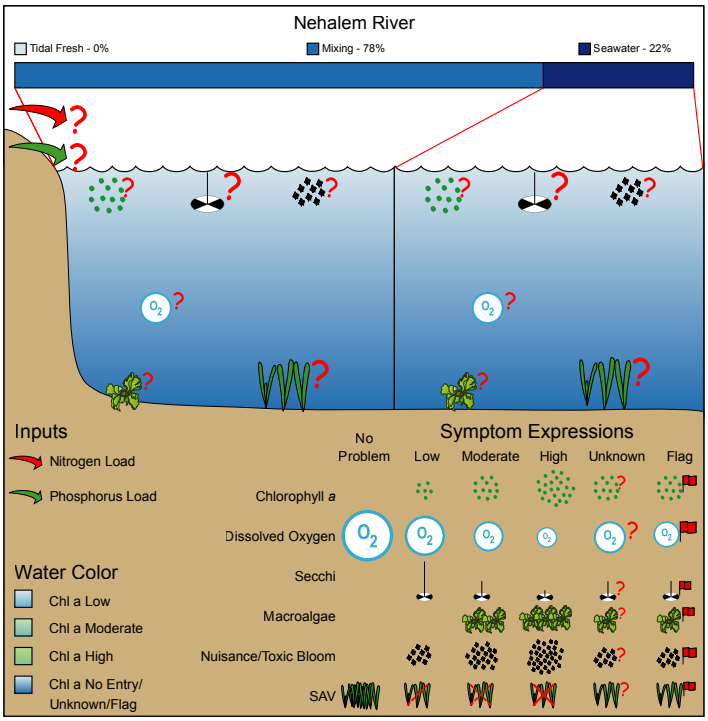
ASSETS Rating

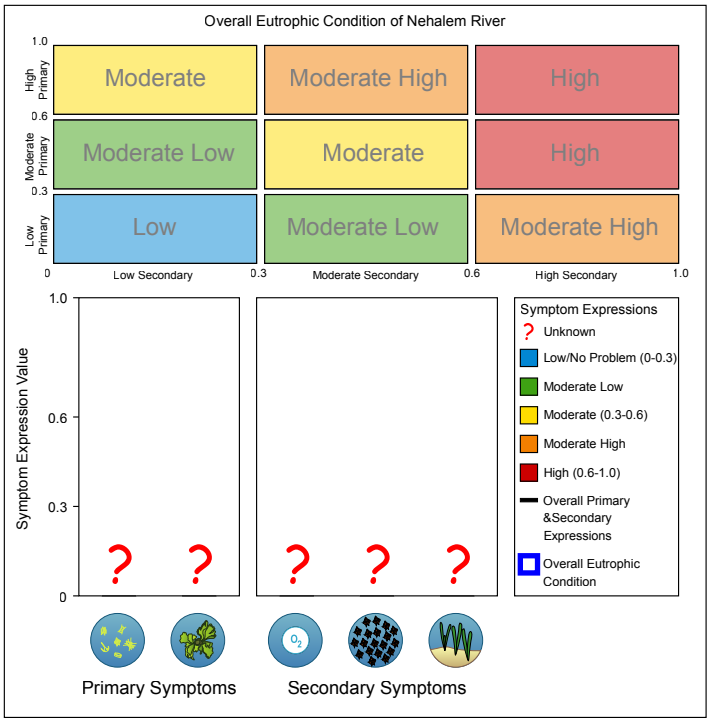
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





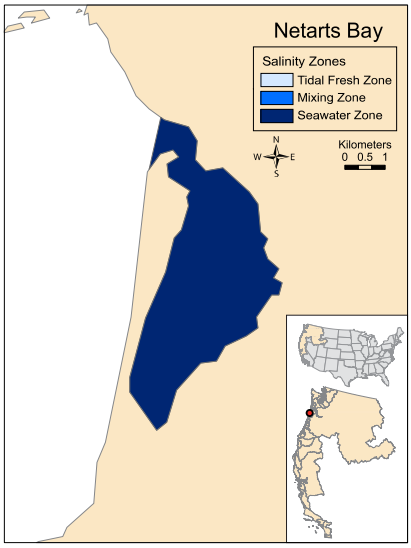
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	9	Urban (km^2)	10 (0.5%)	Area (km^2)	2,215
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	41 (1.9%)	Mean elevation (m)	338
Mixing zone area (km^2)	7	Forest (km^2)	2,157 (97.7%)	Max. elevation (m)	1,063
Saltwater zone area (km^2)	2	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	246.1
Volume (1,000 x m^3)	17,730	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	417,000
Depth (m)	1.97	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.75	Total (km^2)	2,209 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	7,687	TSS/est. area (tonne km^{-2} y^{-1})	46,333
		Popn: est. area ratio	854	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Netarts Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of Netarts Bay. In the 1999 assessment, the bay was characterized by a moderate chlorophyll-a and a low dissolved-oxygen symptom expression, though the overall eutrophic condition was unknown.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

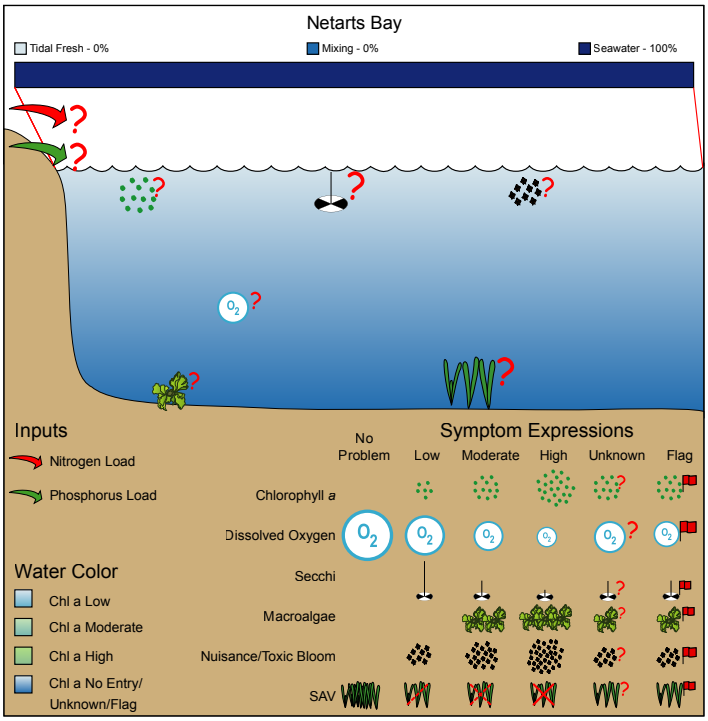
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

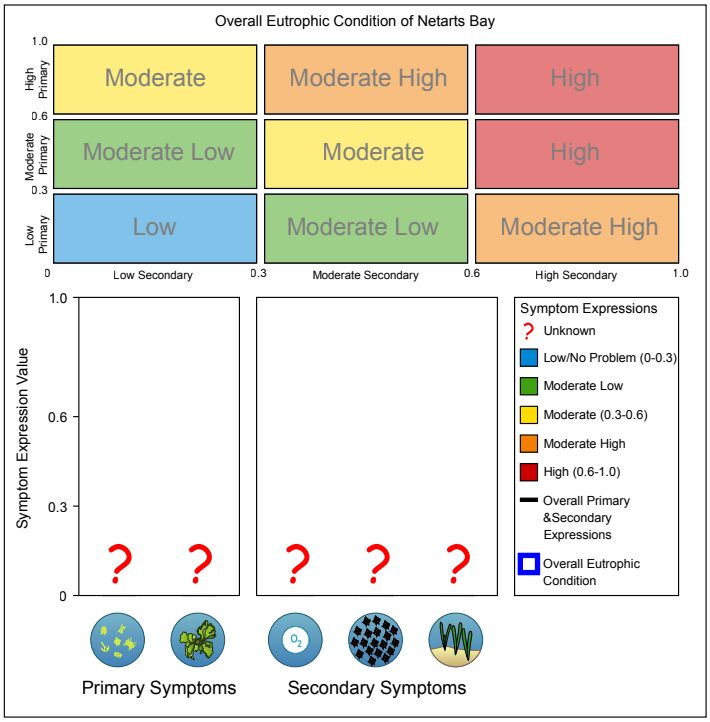
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	✻ Low	✻✻ Moderate	✻✻✻ High

EUTROPHIC CONDITION





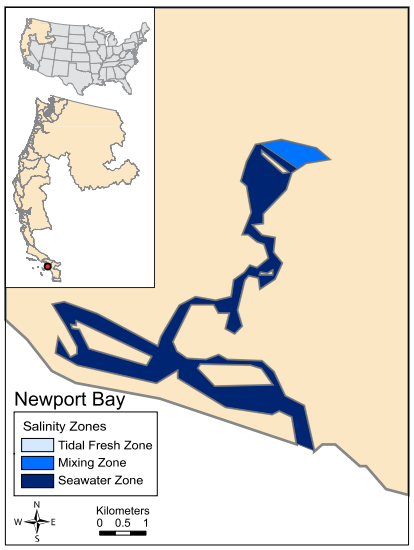
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	10	Urban (km^2)	3 (8.3%)	Area (km^2)	31
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	0 (0%)	Mean elevation (m)	97
Mixing zone area (km^2)	0	Forest (km^2)	26 (83.3%)	Max. elevation (m)	364
Saltwater zone area (km^2)	10	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	3.1
Volume (1,000 x m^3)	14,100	Range (km^2)	3 (8.3%)	TSS (tonne y^{-1})	12,700
Depth (m)	1.41	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.53	Total (km^2)	31 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	196	TSS/est. area (tonne km^{-2} y^{-1})	1,270
		Popn: est. area ratio	20	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Newport Bay

SUMMARY

In Newport Bay, very large macroalgae biomass has been recorded and is speculated to increase after heavy rainfall. Dissolved oxygen levels suggest some hypoxia, but low confidence in this parameter has led to a symptom expression of low. Nutrient levels are expected to decrease in the future due to diversion and treatment of stormwater.



Influencing Factors

Moderate to high nitrogen input and moderate to high susceptibility (low ability for dilution and flushing of nutrients).

Eutrophic Conditions ✻

Primary symptoms high but problems with more serious secondary symptoms still not being expressed.

Future Outlook

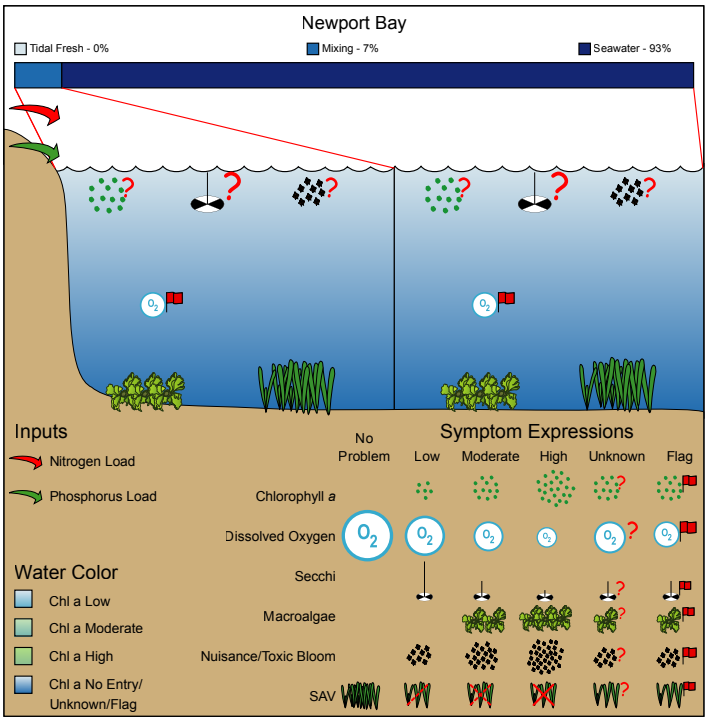
Nutrient related symptoms observed in the estuary are likely to improve somewhat.

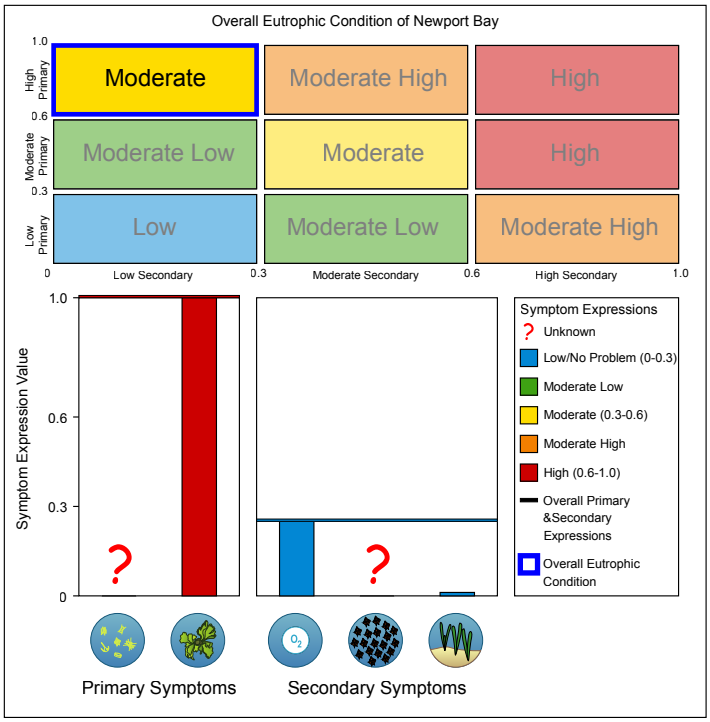
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown ✻ Low ✻✻ Moderate ✻✻✻ High

EUTROPHIC CONDITION





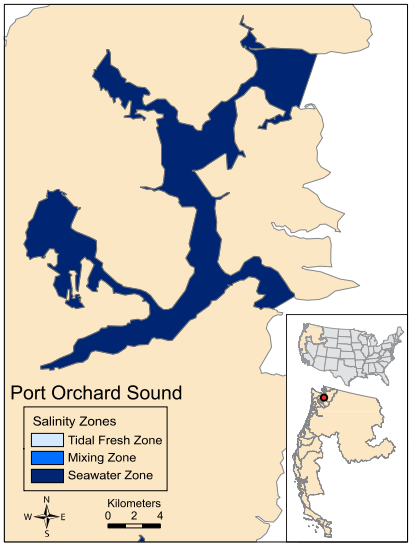
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	5	Urban (km^2)	303 (78.5%)	Area (km^2)	392
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	28 (7.4%)	Mean elevation (m)	98
Mixing zone area (km^2)	<1	Forest (km^2)	0 (0%)	Max. elevation (m)	484
Saltwater zone area (km^2)	5	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	78.4
Volume (1,000 x m^3)	12,900	Range (km^2)	54 (14.1%)	TSS (tonne y^{-1})	6,920
Depth (m)	2.58	Barren (km^2)	0 (0%)	TN (kg y^{-1})	60,000
Tide Height (m)	1.13	Total (km^2)	386 (0%)	TP (kg y^{-1})	54,000
Residence Time (d)	3	Population	363,901	TSS/est. area (tonne km^{-2} y^{-1})	1,384
		Popn: est. area ratio	72,780	TN/est. area (kg km^{-2} y^{-1})	12,000
				TP/est. area (kg km^{-2} y^{-1})	10,800

Port Orchard Sound

SUMMARY

While Port Orchard Sound is characterized by a high chlorophyll-a symptom expression, its dissolved oxygen, nuisance/toxic blooms and SAV symptoms are non-problematic. Together this leads to a moderate rating for overall eutrophic condition. It is not possible to determine changes since the 1999 assessment.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms high but problems with more serious secondary symptoms still not being expressed.

Future Outlook

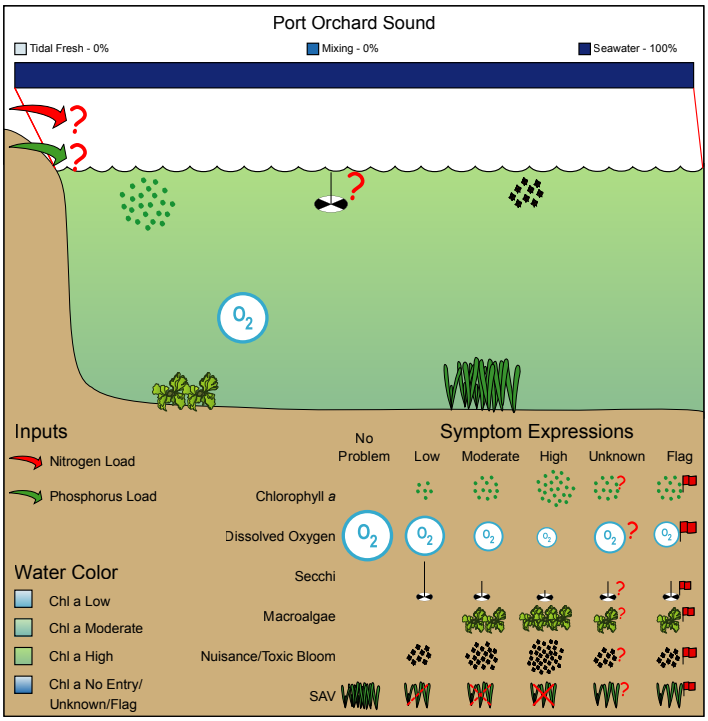
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

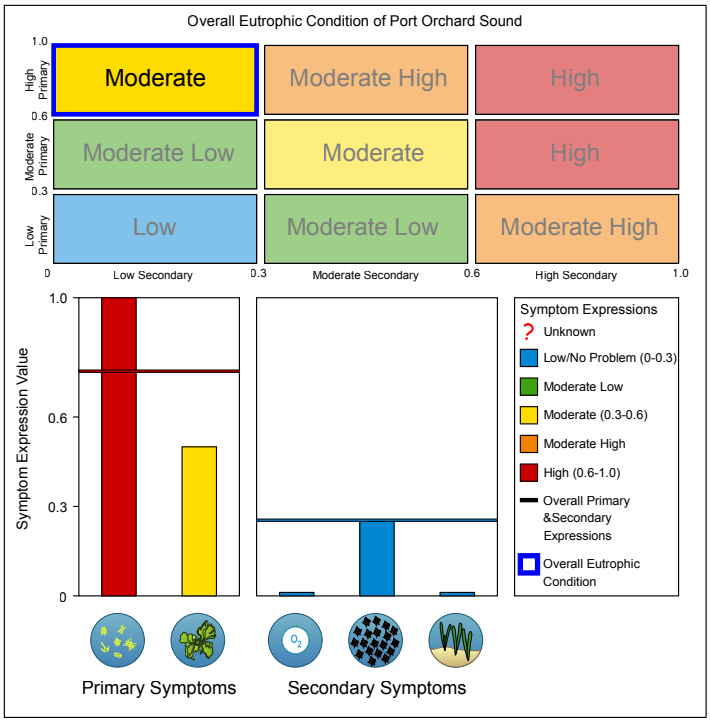
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	* Low	** Moderate	*** High

EUTROPHIC CONDITION





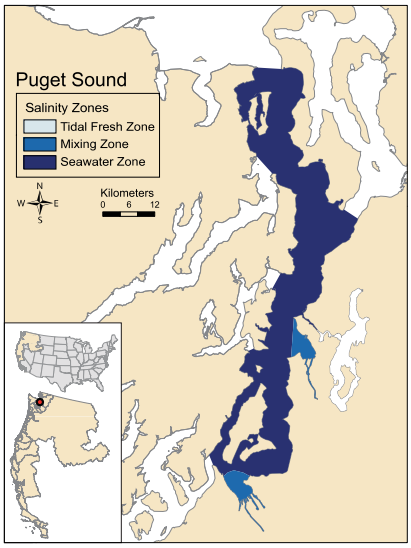
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	92	Urban (km^2)	124 (28.2%)	Area (km^2)	460
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	10 (2.4%)	Mean elevation (m)	91
Mixing zone area (km^2)	0	Forest (km^2)	303 (68.8%)	Max. elevation (m)	426
Saltwater zone area (km^2)	92	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	5.0
Volume (1,000 x m^3)	1,410,360	Range (km^2)	3 (0.6%)	TSS (tonne y^{-1})	5,680
Depth (m)	15.33	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	2.44	Total (km^2)	440 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	20	Population	105,525	TSS/est. area (tonne km^{-2} y^{-1})	62
		Popn: est. area ratio	1,147	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Puget Sound

SUMMARY

Puget Sound is characterized by a high symptom expression for chlorophyll-a and moderate for macroalgae but all secondary indicator (dissolved oxygen, nuisance/toxic blooms, SAV) symptom expressions are low. This leads to an overall eutrophic condition of moderate. It is not possible to determine changes since the 1999 assessment.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms high but problems with more serious secondary symptoms still not being expressed.

Future Outlook

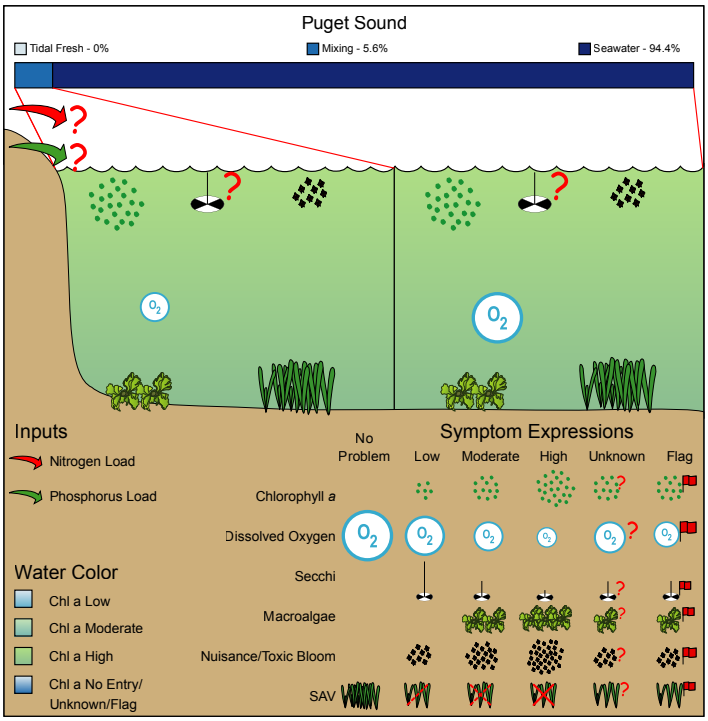
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

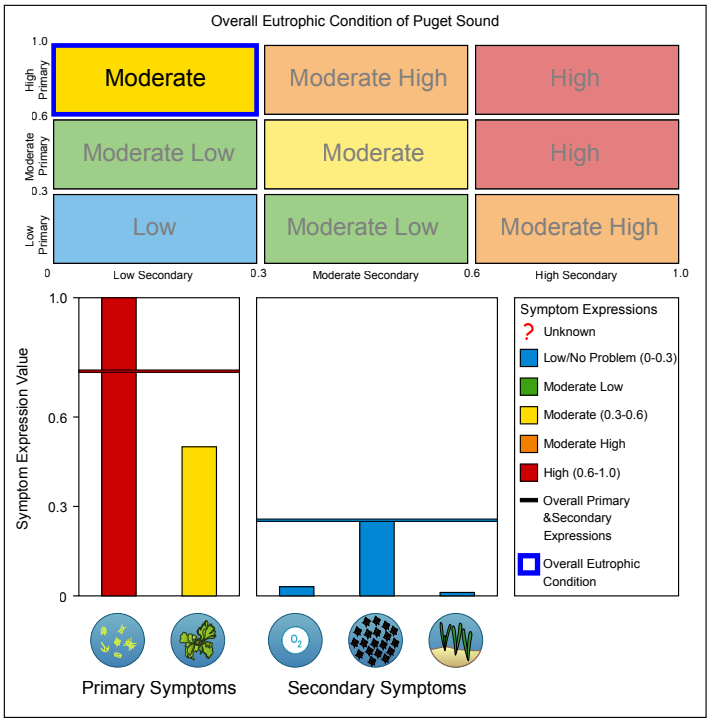
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	* Low	** Moderate	*** High

EUTROPHIC CONDITION





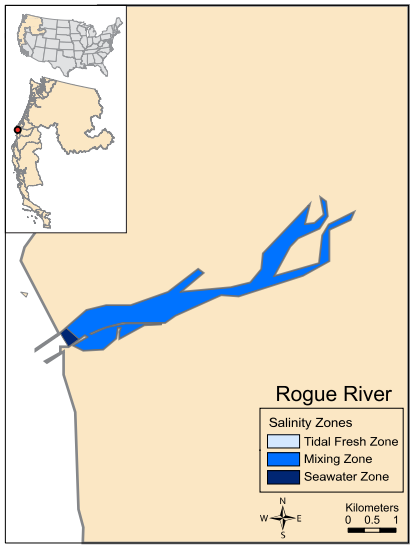
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	1,080	Urban (km^2)	3,007 (11.1%)	Area (km^2)	6,549
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	777 (2.9%)	Mean elevation (m)	537
Mixing zone area (km^2)	60	Forest (km^2)	22,370 (82.5%)	Max. elevation (m)	4,144
Saltwater zone area (km^2)	1,020	Wetland (km^2)	109 (0.4%)	Watershed: estuary ratio	6.1
Volume (1,000 x m^3)	98,452,800	Range (km^2)	847 (3.1%)	TSS (tonne y^{-1})	652,000
Depth (m)	91.16	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	2.15	Total (km^2)	27,109 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	815	Population	1,740,655	TSS/est. area (tonne km^{-2} y^{-1})	604
		Popn: est. area ratio	1,612	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Rogue River

SUMMARY

The Rogue River is largely uncharacterized by the data set, as the only parameters available for 2004 were chlorophyll-a and dissolved oxygen in the mixing zone. These suggest little to no change since the 1999 assessment, but more information is needed to accurately characterize the estuary.

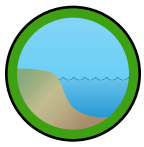


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Primary symptoms beginning to indicate possible problems but still very few secondary symptoms expressed.



Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

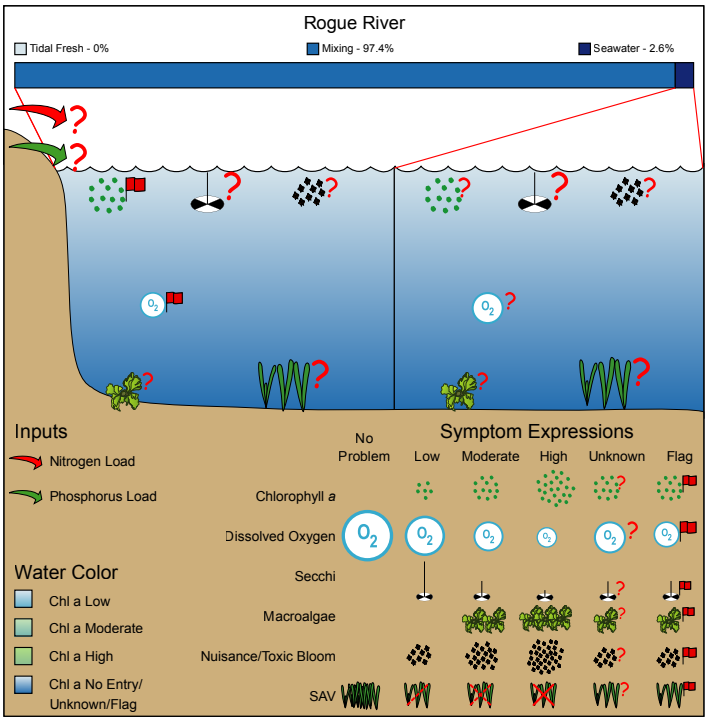
ASSETS Rating

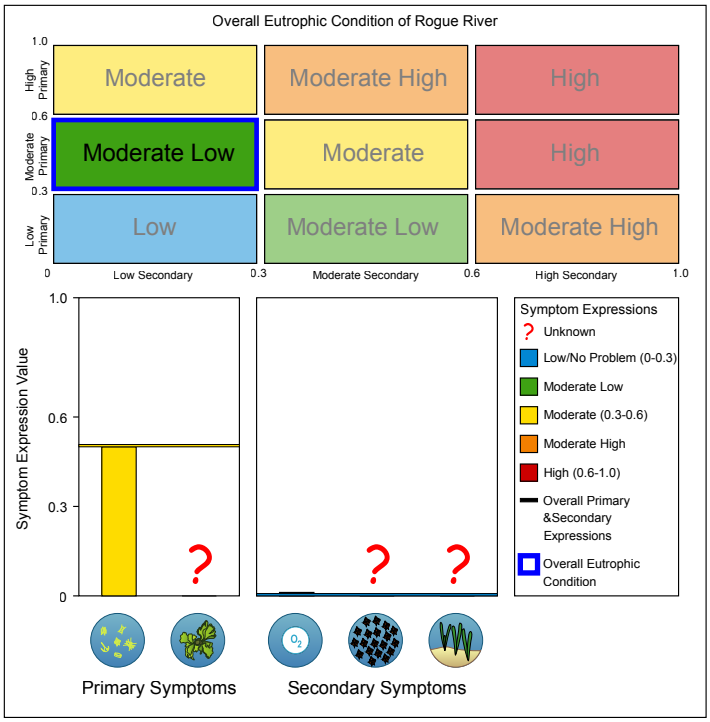
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





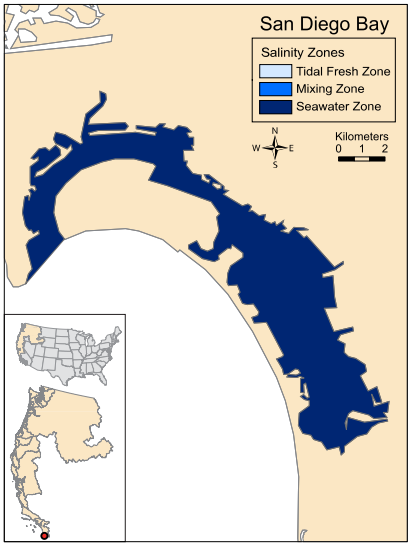
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	2	Urban (km^2)	404 (3%)	Area (km^2)	13,369
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	500 (3.7%)	Mean elevation (m)	888
Mixing zone area (km^2)	2	Forest (km^2)	12,290 (92%)	Max. elevation (m)	2,626
Saltwater zone area (km^2)	<1	Wetland (km^2)	16 (0.1%)	Watershed: estuary ratio	6,684.5
Volume (1,000 x m^3)	7,240	Range (km^2)	148 (1.1%)	TSS (tonne y^{-1})	366,000
Depth (m)	3.62	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.49	Total (km^2)	13,357 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	215,774	TSS/est. area (tonne km^{-2} y^{-1})	183,000
		Popn: est. area ratio	107,887	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

San Diego Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of San Diego Bay. However, in the 1999 assessment, the bay was characterized by a moderate overall eutrophic condition based on high symptom expression for macroalgae and low symptom expressions for both dissolved oxygen and nuisance/toxic blooms.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

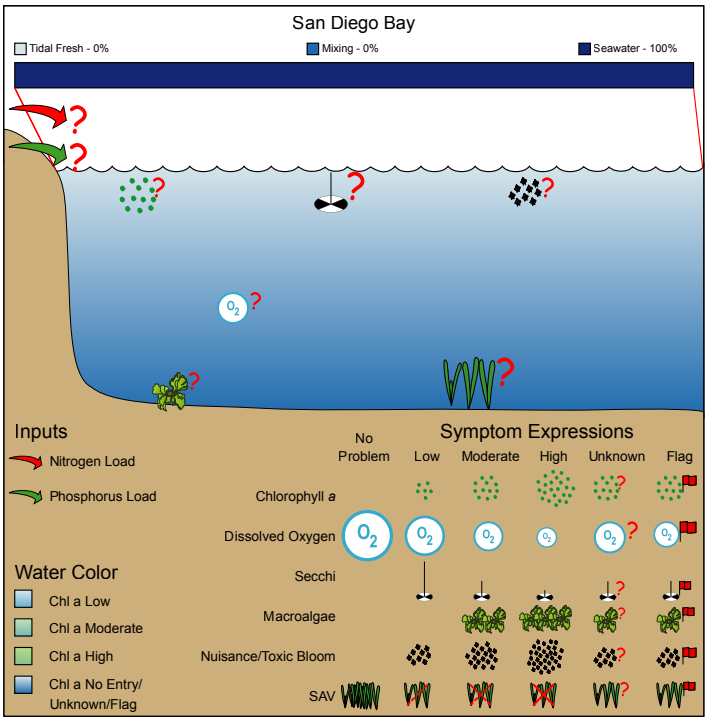
ASSETS Rating

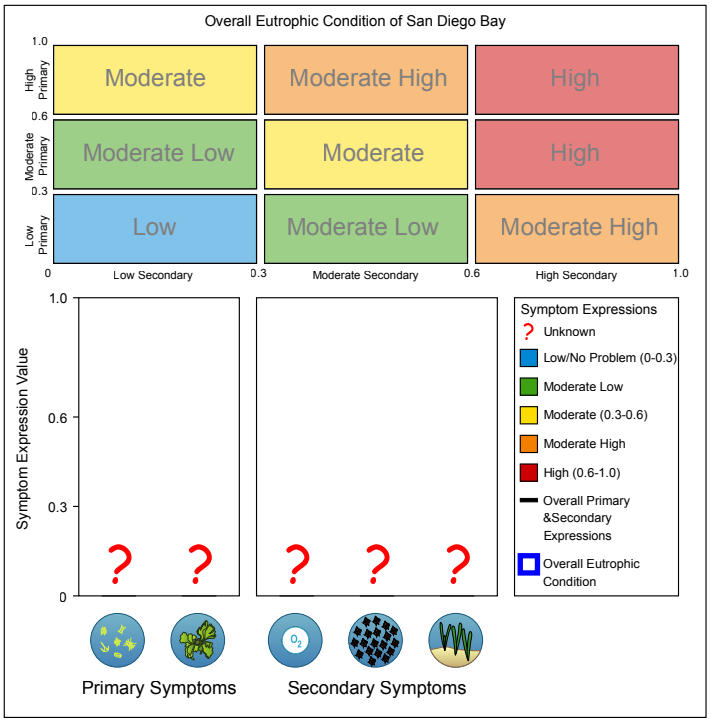
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





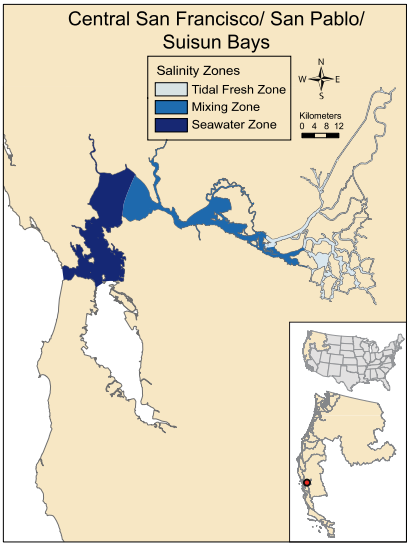
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	44	Urban (km^2)	420 (22.1%)	Area (km^2)	1,146
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	93 (4.9%)	Mean elevation (m)	407
Mixing zone area (km^2)	0	Forest (km^2)	96 (5%)	Max. elevation (m)	1,822
Saltwater zone area (km^2)	44	Wetland (km^2)	5 (0.3%)	Watershed: estuary ratio	26.0
Volume (1,000 x m^3)	104,280	Range (km^2)	1,285 (67.7%)	TSS (tonne y^{-1})	555,000
Depth (m)	2.37	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.21	Total (km^2)	1,898 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	2	Population	699,070	TSS/est. area (tonne km^{-2} y^{-1})	12,614
		Popn: est. area ratio	15,888	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Central San Francisco/San Pablo/Suisun Bays

SUMMARY

San Francisco Bay North has high symptom expression of chlorophyll-a but dissolved oxygen is low, remaining at healthy levels, and SAV cover has increased by 2,284 acres since 1987. In the tidal fresh zone there are persistent macroalgal blooms, and problematic occurrences of Microcystis when the wind is been calm enough to foster stratification.



Influencing Factors

Any level nitrogen input and low to moderate susceptibility (good ability to dilute and flush nutrients).

Eutrophic Conditions ***

Level of expression of eutrophic conditions is substantial.

Future Outlook

Nutrient related symptoms observed in the estuary are likely to worsen only minimally.

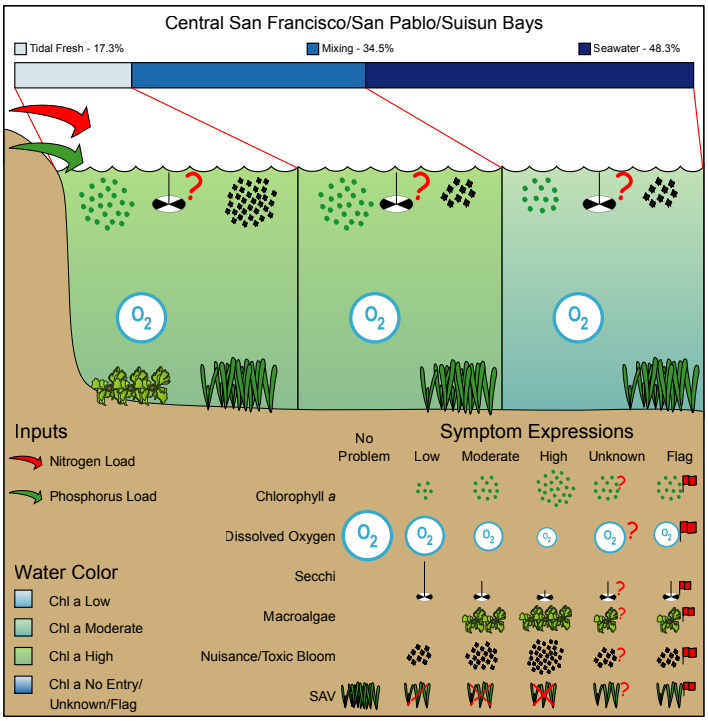
ASSETS Rating

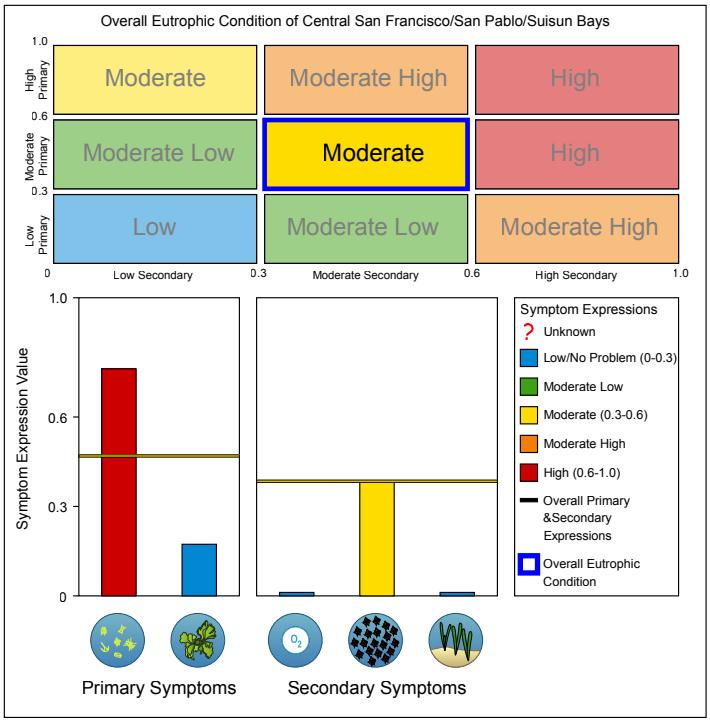
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; * Low; ** Moderate; *** High

EUTROPHIC CONDITION





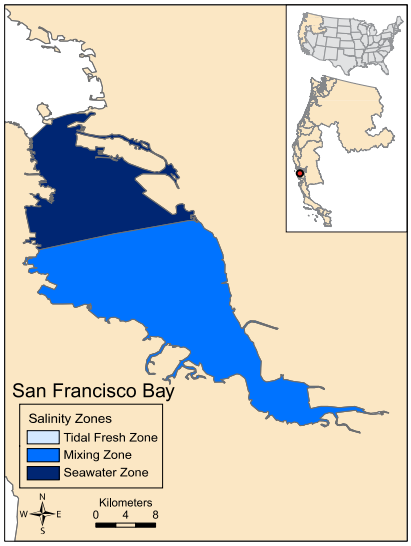
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	837	Urban (km^2)	5,258 (4.7%)	Area (km^2)	114,323
Tidal fresh zone area (km^2)	145	Agriculture (km^2)	24,380 (21.7%)	Mean elevation (m)	849
Mixing zone area (km^2)	289	Forest (km^2)	60,784 (54.1%)	Max. elevation (m)	4,059
Saltwater zone area (km^2)	404	Wetland (km^2)	1,158 (1%)	Watershed: estuary ratio	136.6
Volume (1,000 x m^3)	5,624,640	Range (km^2)	20,813 (18.5%)	TSS (tonne y^{-1})	10,800,000
Depth (m)	6.72	Barren (km^2)	3 (0%)	DIN (kg y^{-1})	50,000,000
Tide Height (m)	1.11	Total (km^2)	112,395 (0%)	TP (kg y^{-1})	10,000,000
Residence Time (d)	15	Population	5,250,350	TSS/est. area (tonne km^{-2} y^{-1})	12,903
		Popn: est. area ratio	6,273	DIN/est. area (kg km^{-2} y^{-1})	59,737
				TP/est. area (kg km^{-2} y^{-1})	11,947

San Francisco Bay

SUMMARY

San Francisco Bay South is characterized by an overall high symptom expression for chlorophyll-a and low symptom expression for dissolved oxygen. There are no problems with macroalgae or SAV. Nuisance/toxic blooms are a moderate problem that occur for weeks every year when the wind stops blowing.



Influencing Factors

Moderate to high nitrogen input and moderate to high susceptibility (low ability for dilution and flushing of nutrients).

Eutrophic Conditions ✱

Primary symptoms high and substantial secondary symptoms becoming more expressed, indicating potentially serious problems.

Future Outlook

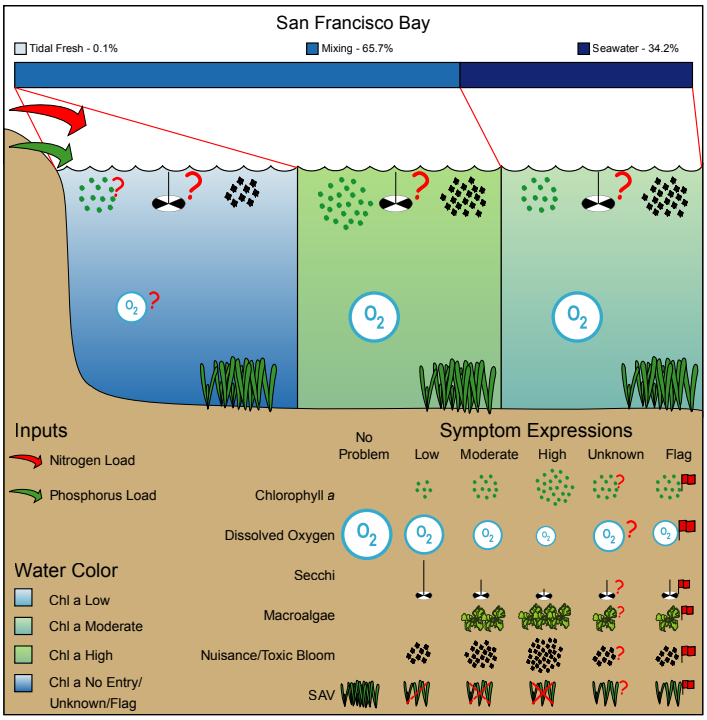
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

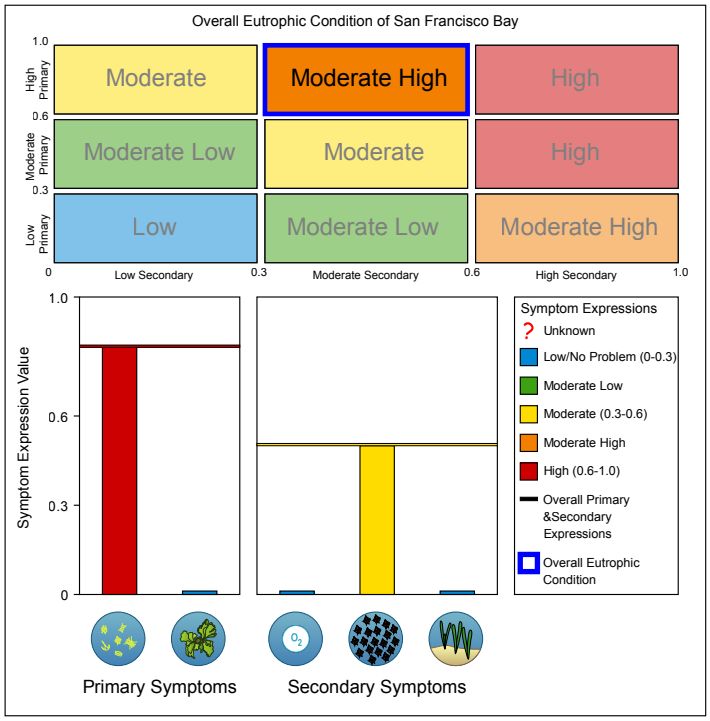
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	✱ Low	✱✱ Moderate	✱✱✱ High

EUTROPHIC CONDITION





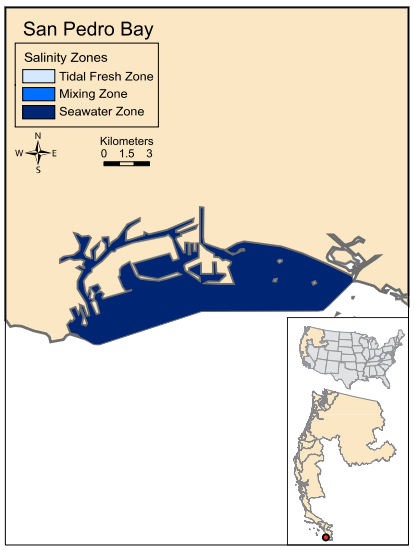
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	488	Urban (km^2)	7,319 (6.2%)	Area (km^2)	4,858
Tidal fresh zone area (km^2)	<1	Agriculture (km^2)	24,519 (20.9%)	Mean elevation (m)	321
Mixing zone area (km^2)	321	Forest (km^2)	62,313 (53.2%)	Max. elevation (m)	1,176
Saltwater zone area (km^2)	167	Wetland (km^2)	1,178 (1%)	Watershed: estuary ratio	10.0
Volume (1,000 x m^3)	2,137,440	Range (km^2)	21,865 (18.7%)	TSS (tonne y^{-1})	2,660,000
Depth (m)	4.38	Barren (km^2)	3 (0%)	TN (kg y^{-1})	20,000,000
Tide Height (m)	1.74	Total (km^2)	117,197 (0%)	TP (kg y^{-1})	1,000,000
Residence Time (d)	3	Population	3,084,385	TSS/est. area (tonne km^{-2} y^{-1})	5,451
		Popn: est. area ratio	6,321	TN/est. area (kg km^{-2} y^{-1})	40,984
				TP/est. area (kg km^{-2} y^{-1})	2,049

San Pedro Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of San Pedro Bay. In the 1999 assessment, the overall eutrophic condition was low based on low symptom expressions for all water body conditions, indicating miminal problems with eutrophication.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

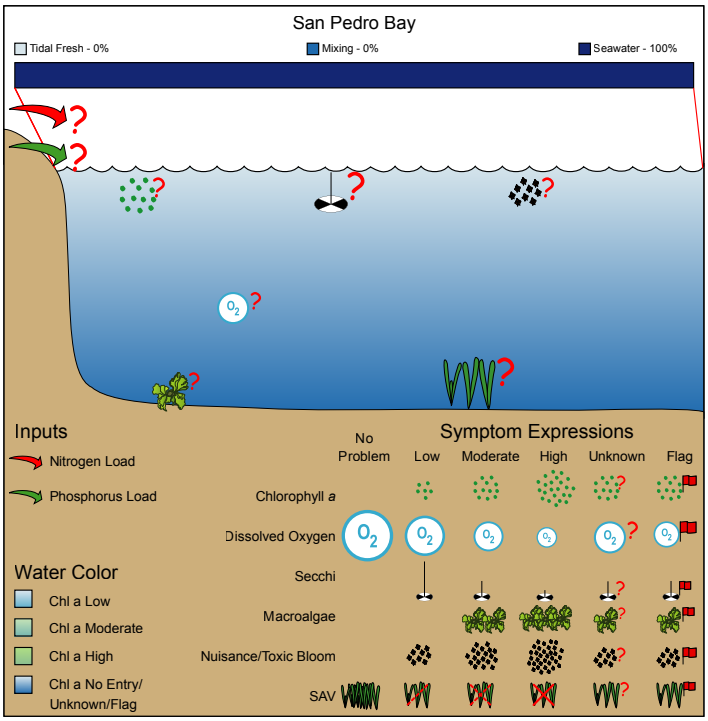
ASSETS Rating

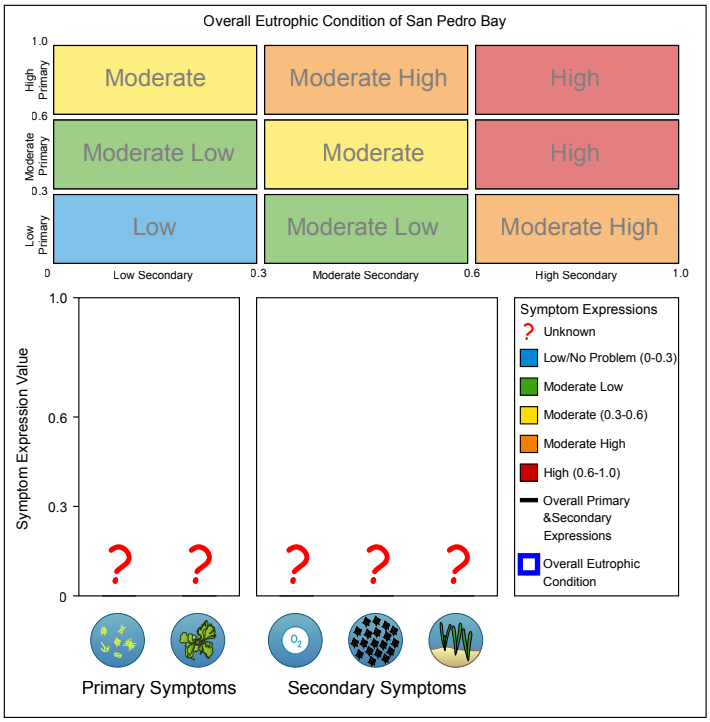
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





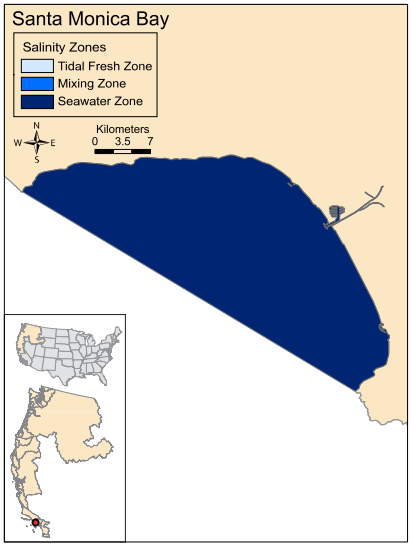
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	57	Urban (km^2)	3,064 (69.5%)	Area (km^2)	4,156
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	5 (0.1%)	Mean elevation (m)	516
Mixing zone area (km^2)	0	Forest (km^2)	443 (10%)	Max. elevation (m)	2,809
Saltwater zone area (km^2)	57	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	72.9
Volume (1,000 x m^3)	635,550	Range (km^2)	899 (20.4%)	TSS (tonne y^{-1})	190,000
Depth (m)	11.15	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.15	Total (km^2)	4,411 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	46	Population	6,517,505	TSS/est. area (tonne km^{-2} y^{-1})	3,333
		Popn: est. area ratio	114,342	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Santa Monica Bay

SUMMARY

Inadequate data were available to characterize the eutrophic condition of Santa Monica Bay in 1999 and 2004. However, occurrence of nuisance/toxic blooms in 2004 is rated as moderate. Malibu Creek TMDL's are expected to result in decreased point source nutrient loads to the bay, however atmospheric inputs will remain the same.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

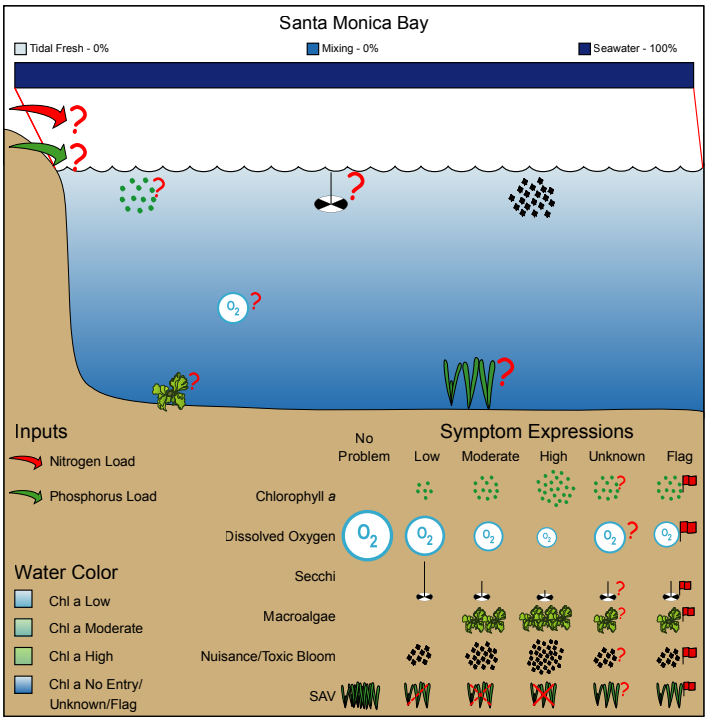
Nutrient related symptoms observed in the estuary are likely to improve.

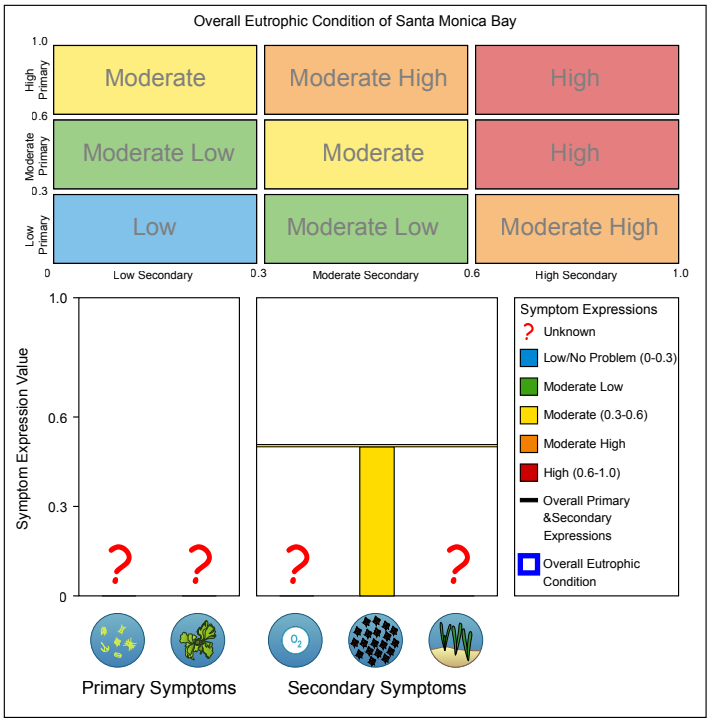
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





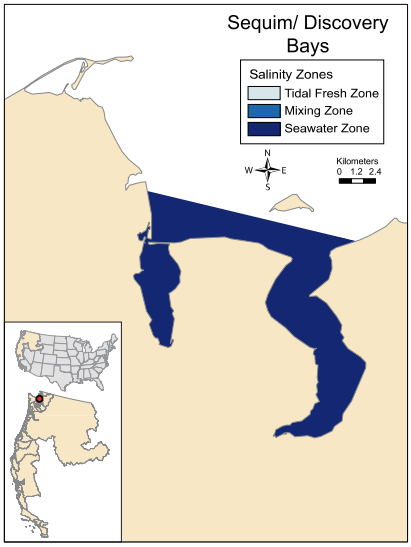
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	547	Urban (km^2)	673 (75.1%)	Area (km^2)	899
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	8 (0.9%)	Mean elevation (m)	225
Mixing zone area (km^2)	0	Forest (km^2)	5 (0.6%)	Max. elevation (m)	761
Saltwater zone area (km^2)	547	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	1.6
Volume (1,000 x m^3)	52,544,820	Range (km^2)	210 (23.4%)	TSS (tonne y^{-1})	62,600
Depth (m)	96.06	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.13	Total (km^2)	896 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	3,840	Population	2,401,110	TSS/est. area (tonne km^{-2} y^{-1})	114
		Popn: est. area ratio	4,390	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Sequim/Discovery Bays

SUMMARY

Sequim and Discovery Bays are characterized by high chlorophyll-a and moderate dissolved oxygen and nuisance/toxic bloom symptom expressions. Chlorophyll-a symptom expression has not changed since the 1999 assessment. Changes in other symptom expressions and in overall eutrophic condition since the 1999 assessment cannot be determined.

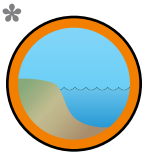


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms high and substantial secondary symptoms becoming more expressed, indicating potentially serious problems.



Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

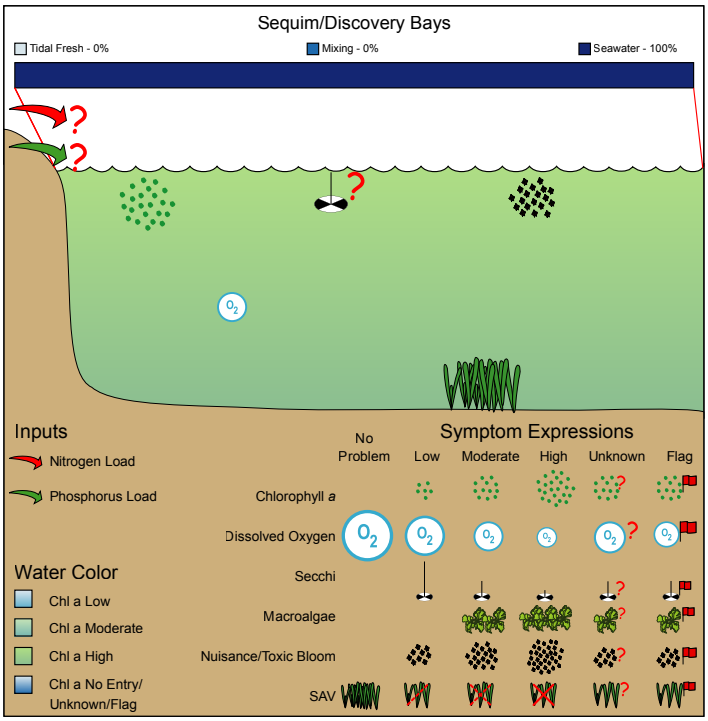
ASSETS Rating

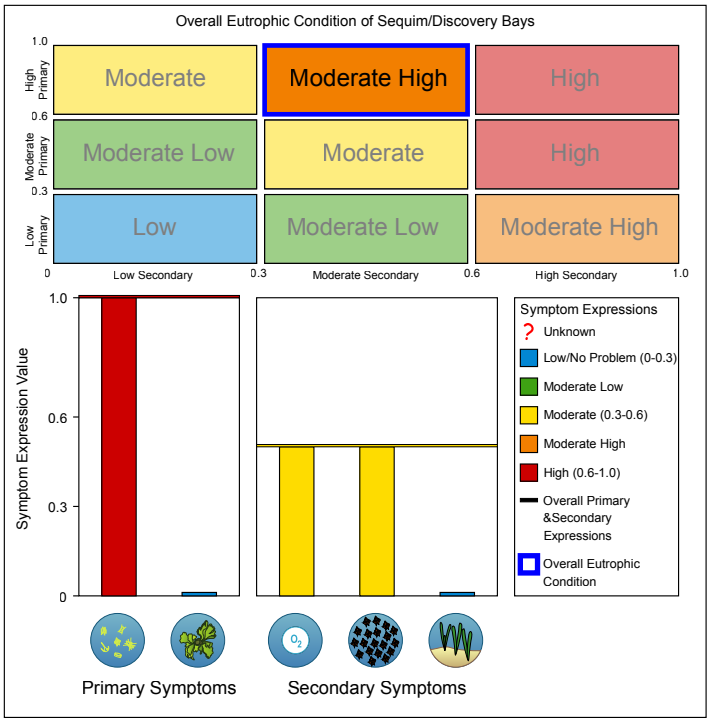
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; * Low; ** Moderate; *** High

EUTROPHIC CONDITION





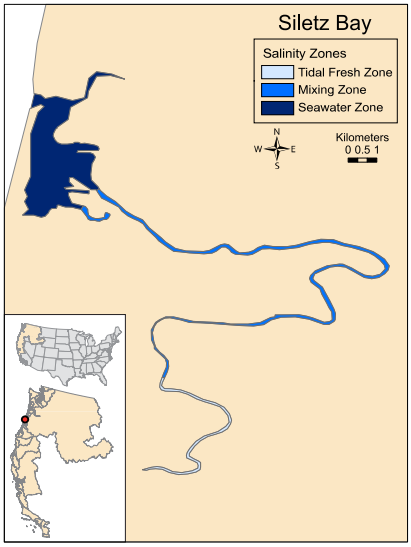
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	68	Urban (km^2)	0 (0%)	Area (km^2)	0
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	0 (0%)	Mean elevation (m)	0
Mixing zone area (km^2)	0	Forest (km^2)	0 (0%)	Max. elevation (m)	0
Saltwater zone area (km^2)	68	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	0.0
Volume (1,000 x m^3)	0	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	0
Depth (m)	0.00	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.00	Total (km^2)	0 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	0	TSS/est. area (tonne km^{-2} y^{-1})	0
		Popn: est. area ratio	0	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Siletz Bay

SUMMARY

Data were inadequate to assess the eutrophic condition of Siletz Bay in both 1999 and 2004.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

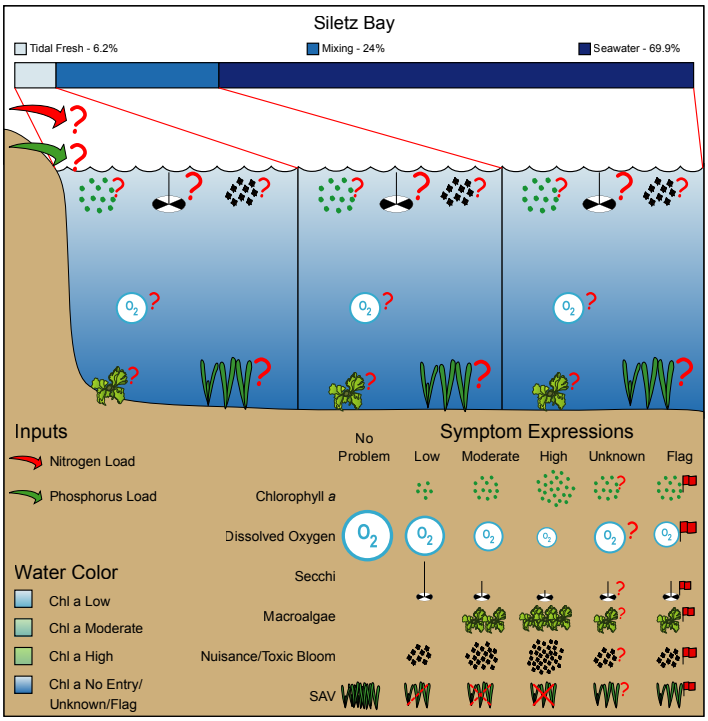
ASSETS Rating

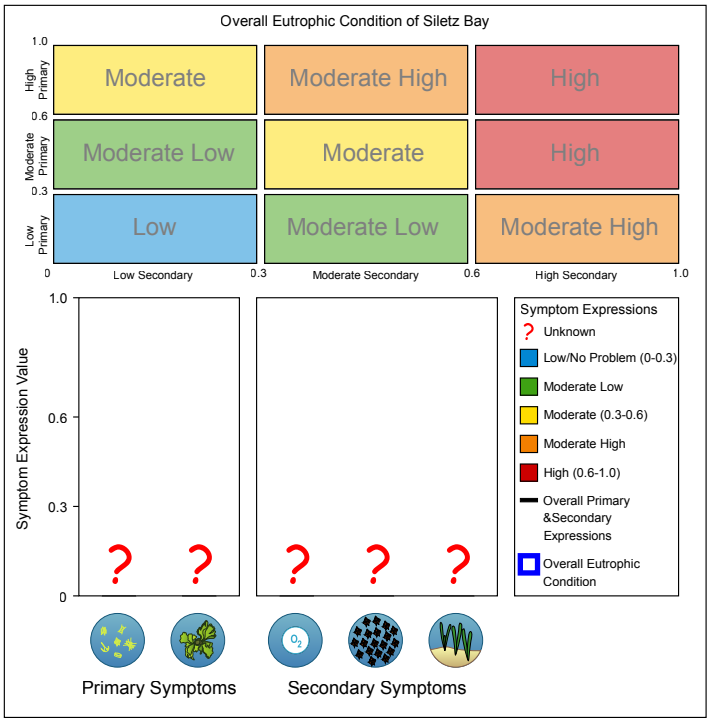
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence			
? Unknown	✻ Low	✻✻ Moderate	✻✻✻ High

EUTROPHIC CONDITION





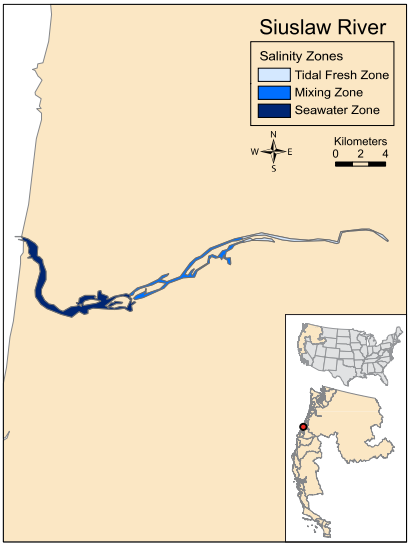
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	7	Urban (km^2)	8 (0.8%)	Area (km^2)	947
Tidal fresh zone area (km^2)	<1	Agriculture (km^2)	18 (1.9%)	Mean elevation (m)	315
Mixing zone area (km^2)	2	Forest (km^2)	917 (97%)	Max. elevation (m)	1,048
Saltwater zone area (km^2)	5	Wetland (km^2)	3 (0.3%)	Watershed: estuary ratio	135.3
Volume (1,000 x m^3)	18,340	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	183,000
Depth (m)	2.62	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.46	Total (km^2)	945 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	3,886	TSS/est. area (tonne km^{-2} y^{-1})	26,143
		Popn: est. area ratio	555	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Siuslaw River

SUMMARY

Data were unavailable to assess the eutrophic condition of the Siuslaw River in both the 1999 and 2004 assessments.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

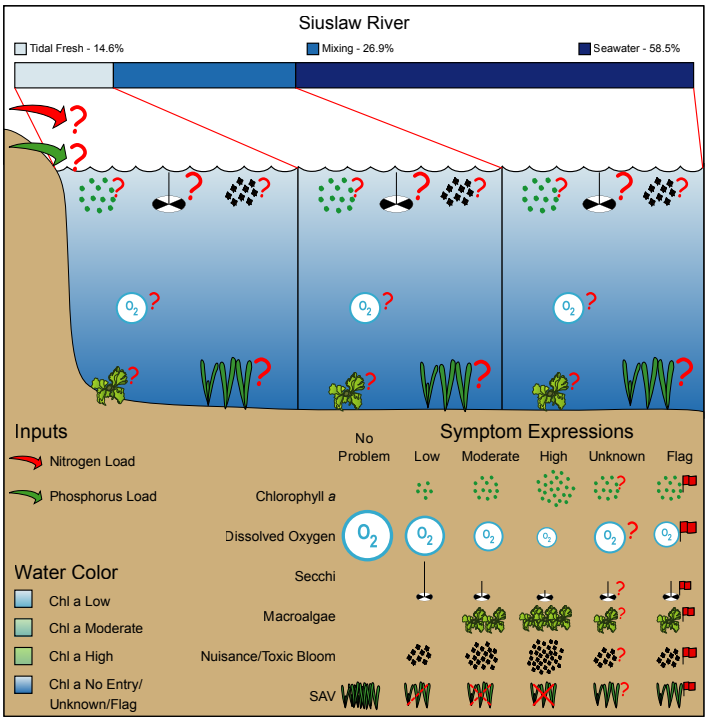
ASSETS Rating

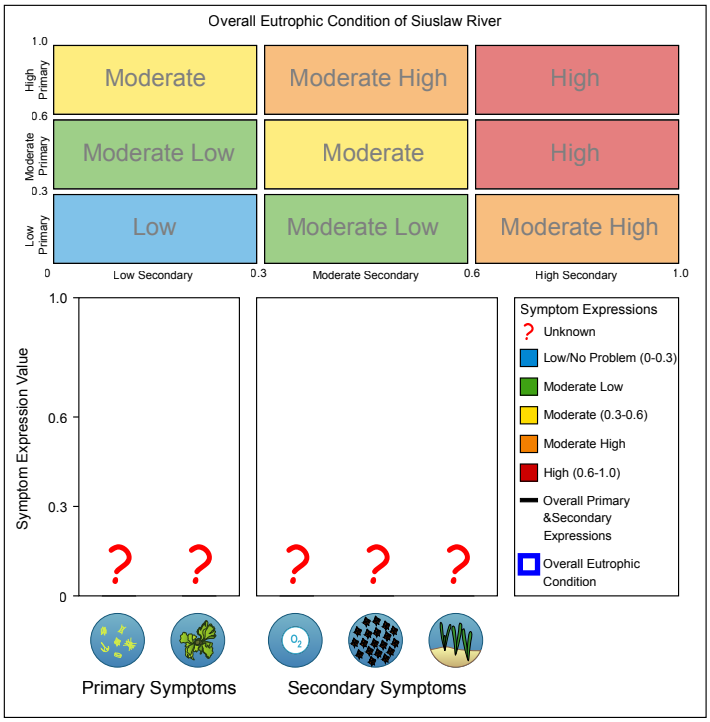
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





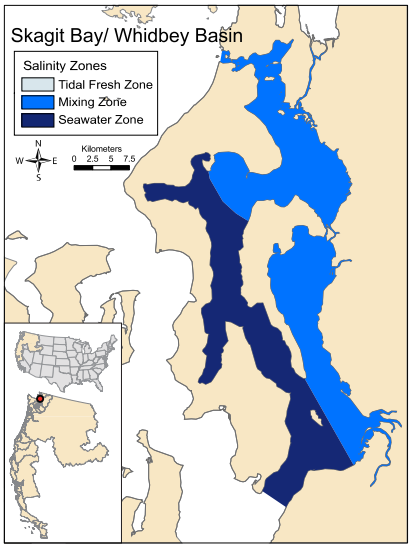
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	10	Urban (km^2)	28 (1.4%)	Area (km^2)	2,000
Tidal fresh zone area (km^2)	1	Agriculture (km^2)	31 (1.6%)	Mean elevation (m)	267
Mixing zone area (km^2)	3	Forest (km^2)	1,930 (96.9%)	Max. elevation (m)	975
Saltwater zone area (km^2)	6	Wetland (km^2)	3 (0.1%)	Watershed: estuary ratio	200.0
Volume (1,000 x m^3)	28,300	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	148,000
Depth (m)	2.83	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.60	Total (km^2)	1,992 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	9,183	TSS/est. area (tonne km^{-2} y^{-1})	14,800
		Popn: est. area ratio	918	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Skagit Bay/Whidbey Basin

SUMMARY

Skagit Bay/Whidbey Basin is characterized by a high chlorophyll-a and moderate macroalgal symptom expressions. The secondary symptoms, dissolved oxygen, nuisance/toxic blooms and SAV all have low symptom expressions resulting in an overall eutrophic condition of moderate. It is not possible to determine changes since the 1999 assessment.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms high but problems with more serious secondary symptoms still not being expressed.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

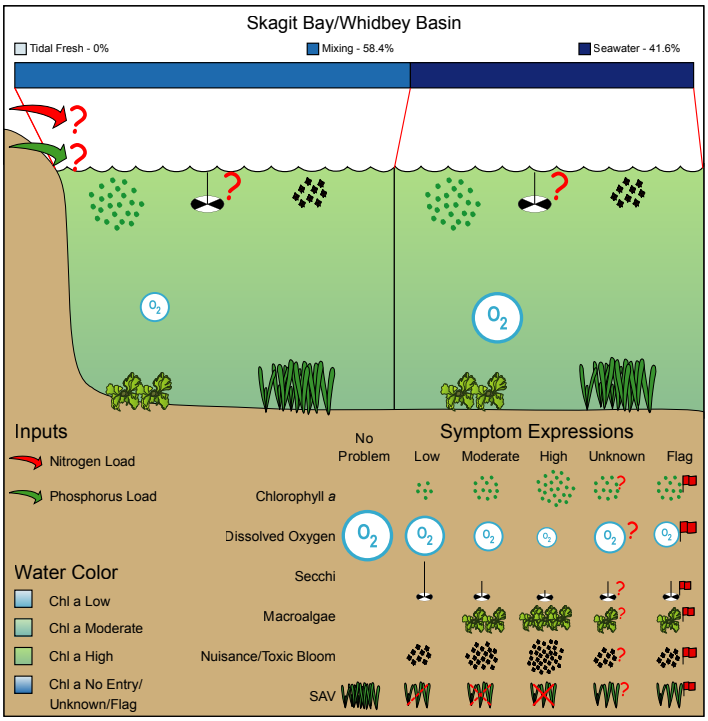
ASSETS Rating

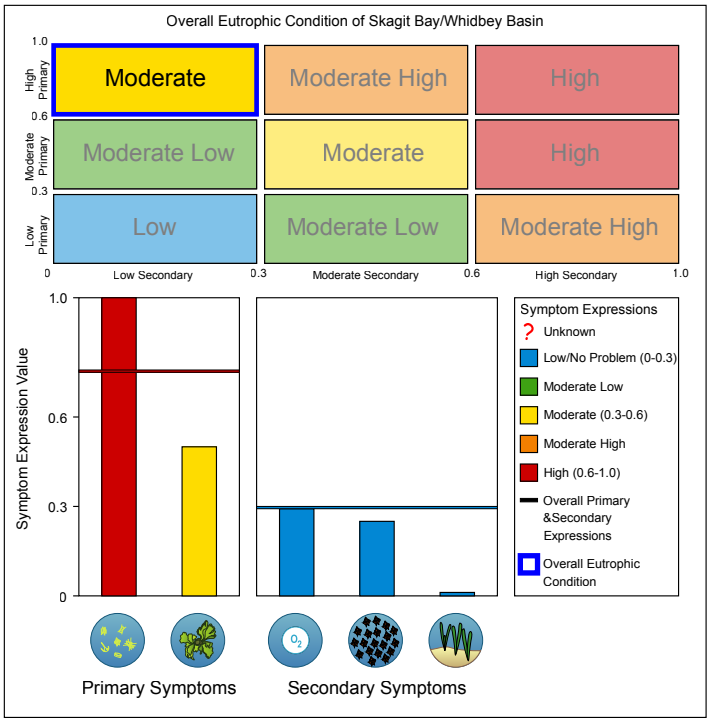
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; * Low; ** Moderate; *** High

EUTROPHIC CONDITION





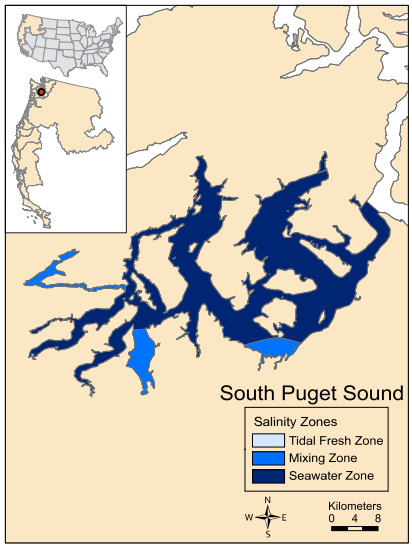
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	622	Urban (km^2)	536 (3.8%)	Area (km^2)	15,432
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	539 (3.8%)	Mean elevation (m)	860
Mixing zone area (km^2)	363	Forest (km^2)	12,352 (87.6%)	Max. elevation (m)	3,207
Saltwater zone area (km^2)	259	Wetland (km^2)	44 (0.3%)	Watershed: estuary ratio	24.8
Volume (1,000 x m^3)	28,842,140	Range (km^2)	622 (4.4%)	TSS (tonne y^{-1})	356,000
Depth (m)	46.37	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	2.16	Total (km^2)	14,092 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	147	Population	502,420	TSS/est. area (tonne km^{-2} y^{-1})	572
		Popn: est. area ratio	808	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

South Puget Sound

SUMMARY

South Puget Sound is characterized by high chlorophyll-a and moderate macroaglal symptoms expressions. The secondary indicators all have low symptom expression ratings leading to an overall eutrophic condition of moderate. It is not possible to determine changes since the 1999 assessment. Conditions are expected to worsen in the future.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms high but problems with more serious secondary symptoms still not being expressed.

Future Outlook

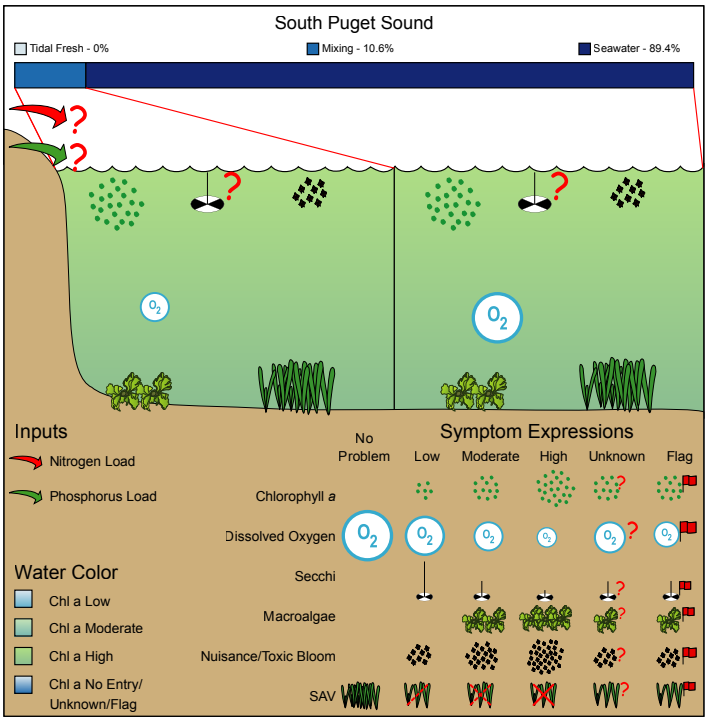
Nutrient related symptoms observed in the estuary are likely to substantially worsen.

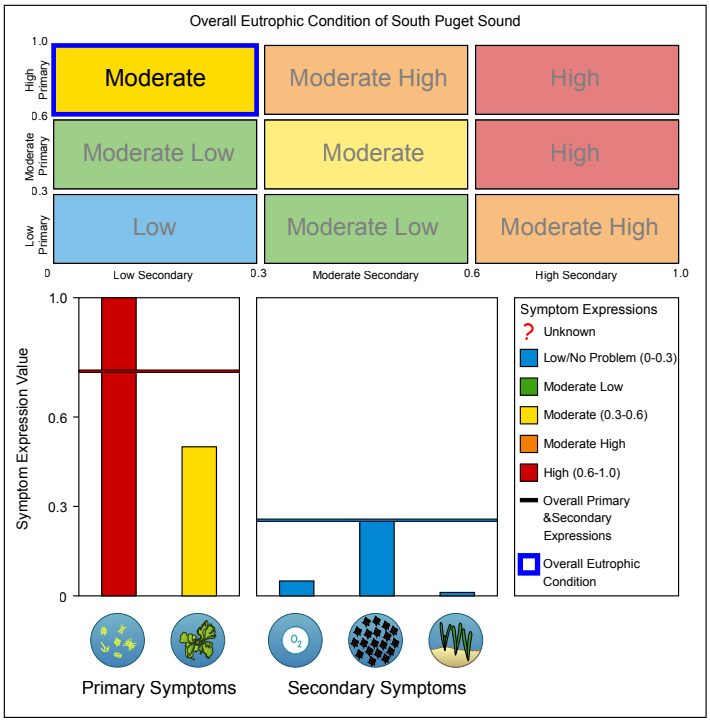
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	* Low	** Moderate	*** High

EUTROPHIC CONDITION





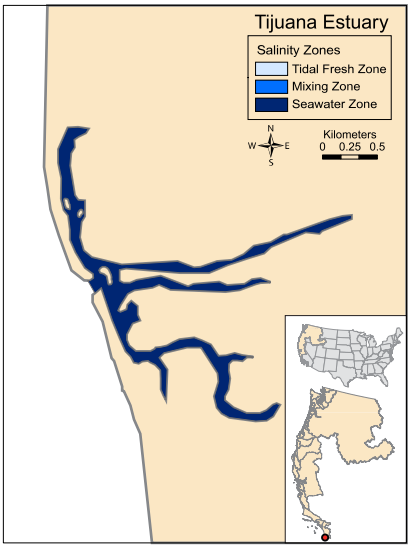
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	449	Urban (km^2)	272 (7%)	Area (km^2)	3,900
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	161 (4.1%)	Mean elevation (m)	332
Mixing zone area (km^2)	48	Forest (km^2)	3,354 (86.7%)	Max. elevation (m)	4,120
Saltwater zone area (km^2)	401	Wetland (km^2)	26 (0.7%)	Watershed: estuary ratio	8.7
Volume (1,000 x m^3)	17,645,700	Range (km^2)	57 (1.5%)	TSS (tonne y^{-1})	130,000
Depth (m)	39.30	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	3.02	Total (km^2)	3,869 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	85	Population	259,808	TSS/est. area (tonne km^{-2} y^{-1})	290
		Popn: est. area ratio	579	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Tijuana Estuary

SUMMARY

Tijuana estuary is characterized by moderate chlorophyll-a and macroalgae symptom expressions, both having decreased from a rating of high since the 1999 assessment. A local sewage treatment plant's capacity is often exceeded, leading to polluted conditions. This does not immediately translate into eutrophication, however, due to tidal flushing.

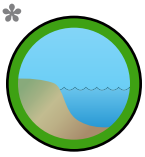


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

Primary symptoms beginning to indicate possible problems but still very few secondary symptoms expressed.



Future Outlook

Nutrient related symptoms observed in the estuary are likely to substantially worsen.

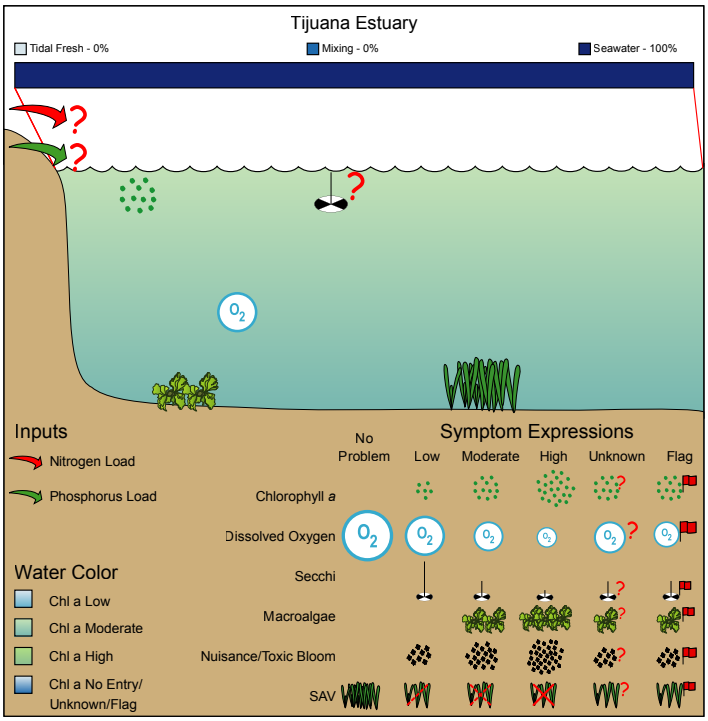
ASSETS Rating

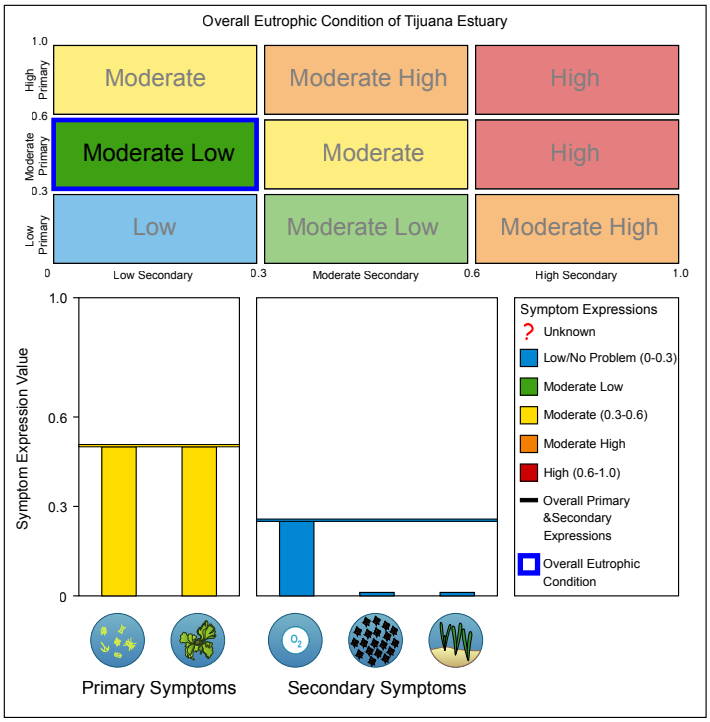
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; * Low; ** Moderate; *** High

EUTROPHIC CONDITION





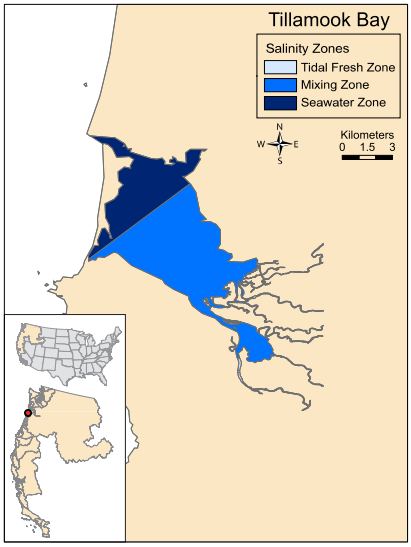
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	1	Urban (km^2)	47 (10.7%)	Area (km^2)	4,454
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	57 (13%)	Mean elevation (m)	869
Mixing zone area (km^2)	0	Forest (km^2)	3 (0.6%)	Max. elevation (m)	1,873
Saltwater zone area (km^2)	1	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	4,454.0
Volume (1,000 x m^3)	200	Range (km^2)	332 (75.7%)	TSS (tonne y^{-1})	208,000
Depth (m)	0.20	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.19	Total (km^2)	438 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	0	Population	971,481	TSS/est. area (tonne km^{-2} y^{-1})	208,000
		Popn: est. area ratio	971,481	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Tillamook Bay

SUMMARY

No data were available to assess the eutrophic condition of Tillamook Bay for both the 1999 and 2004 assessments.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

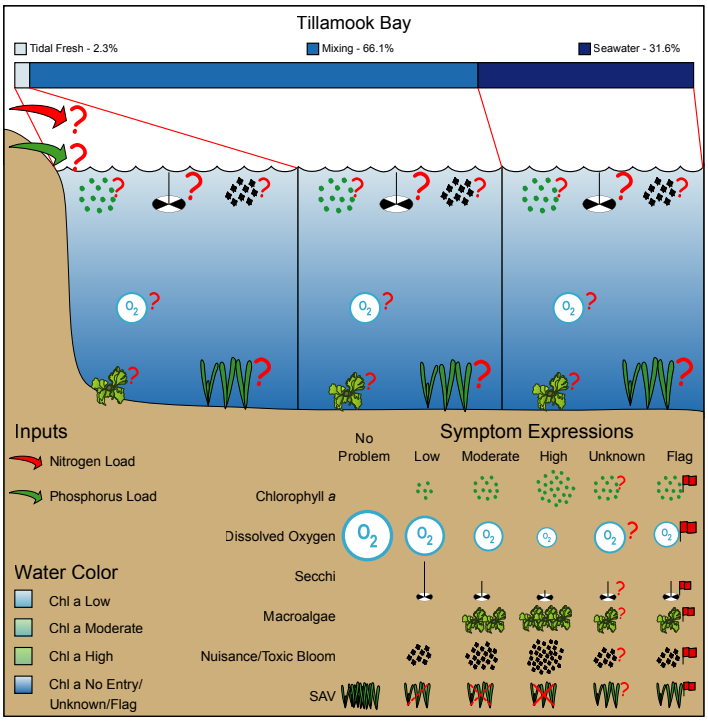
ASSETS Rating

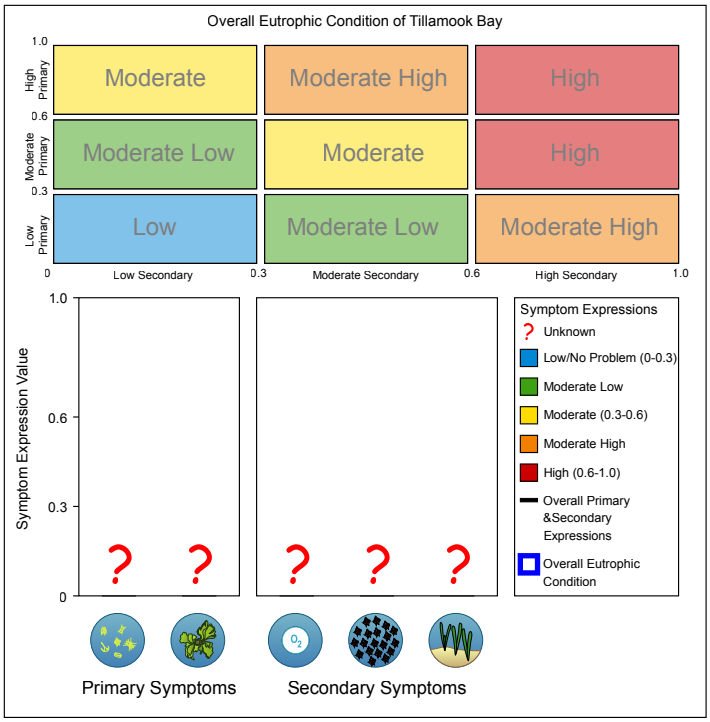
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





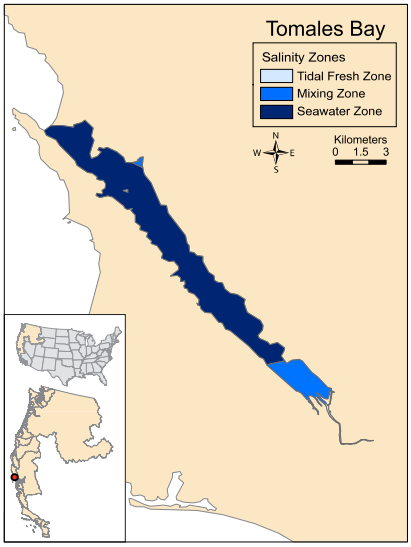
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	38	Urban (km^2)	18 (1.3%)	Area (km^2)	1,390
Tidal fresh zone area (km^2)	<1	Agriculture (km^2)	70 (5%)	Mean elevation (m)	390
Mixing zone area (km^2)	25	Forest (km^2)	1,292 (93.1%)	Max. elevation (m)	1,063
Saltwater zone area (km^2)	12	Wetland (km^2)	5 (0.4%)	Watershed: estuary ratio	36.6
Volume (1,000 x m^3)	69,920	Range (km^2)	3 (0.2%)	TSS (tonne y^{-1})	524,000
Depth (m)	1.84	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.69	Total (km^2)	1,388 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	8,541	TSS/est. area (tonne km^{-2} y^{-1})	13,790
		Popn: est. area ratio	225	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Tomales Bay

SUMMARY

Data were unavailable to assess the eutrophic condition of Tomales Bay. In the 1999 assessment, the bay was characterized by a moderate high overall eutrophic condition based on a high symptom expression of nuisance/toxic blooms but no problematic dissolved oxygen levels or macroalgae blooms. Data were unavailable for chlorophyll-a.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

An Unknown Overall Eutrophic Condition expression will occur if either the Primary or Secondary overall symptom expression is Unknown.

Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

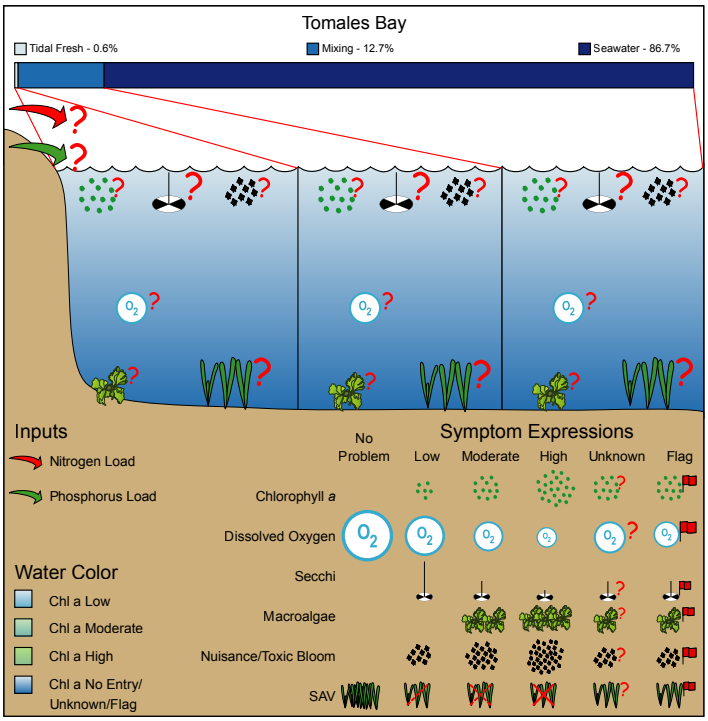
ASSETS Rating

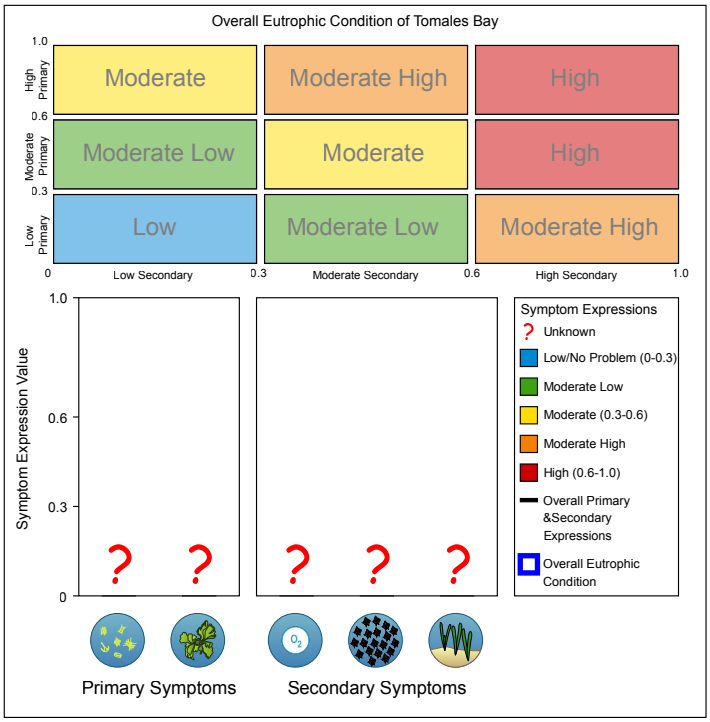
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





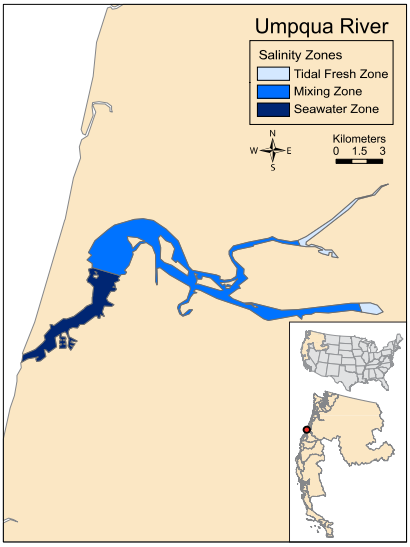
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	29	Urban (km^2)	8 (1.4%)	Area (km^2)	544
Tidal fresh zone area (km^2)	<1	Agriculture (km^2)	31 (5.7%)	Mean elevation (m)	170
Mixing zone area (km^2)	4	Forest (km^2)	254 (46.9%)	Max. elevation (m)	731
Saltwater zone area (km^2)	25	Wetland (km^2)	0 (0%)	Watershed: estuary ratio	18.8
Volume (1,000 x m^3)	78,590	Range (km^2)	249 (45.9%)	TSS (tonne y^{-1})	2,000,000
Depth (m)	2.71	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.10	Total (km^2)	541 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	3	Population	16,922	TSS/est. area (tonne km^{-2} y^{-1})	68,966
		Popn: est. area ratio	584	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Umpqua River

SUMMARY

A lack of data prevents accurate assessment of the eutrophic condition of the Umpqua River. Though with low confidence based upon the sampling frequency, chlorophyll a concentrations suggest a moderate symptom expression and dissolved oxygen levels appear to be healthy in the mixing and seawater zones of the estuary.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Primary symptoms beginning to indicate possible problems but still very few secondary symptoms expressed.

Future Outlook

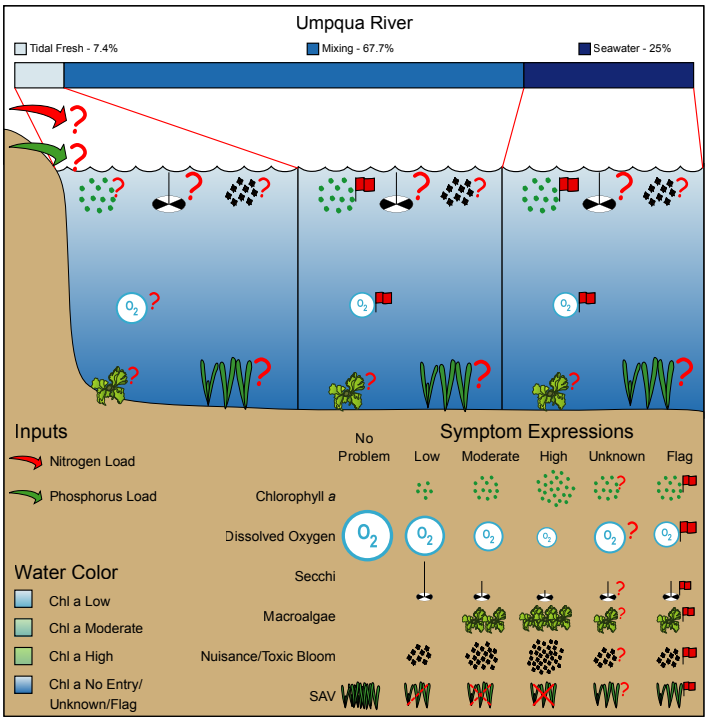
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

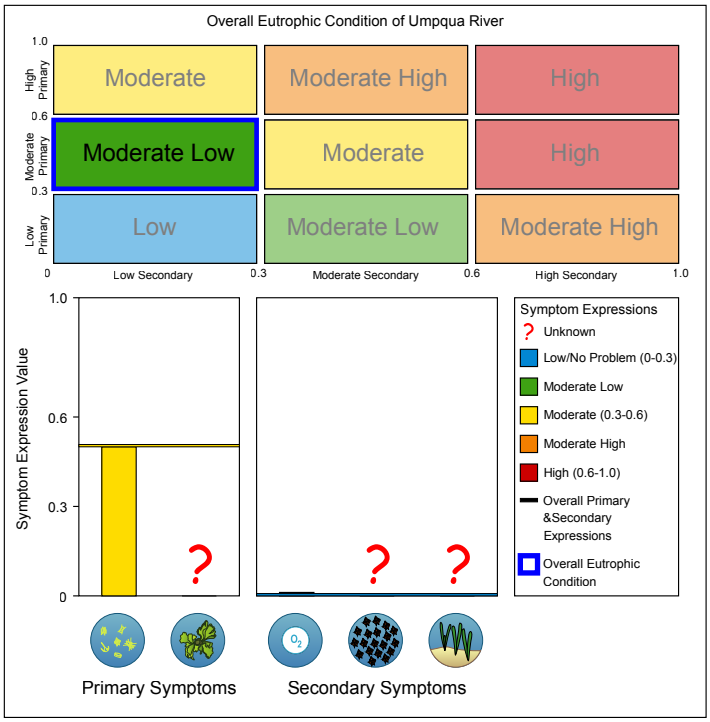
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	✻ Low	✻✻ Moderate	✻✻✻ High

EUTROPHIC CONDITION





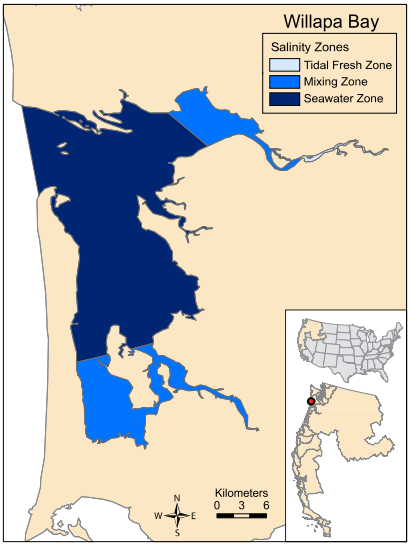
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	24	Urban (km^2)	205 (1.7%)	Area (km^2)	12,080
Tidal fresh zone area (km^2)	2	Agriculture (km^2)	417 (3.5%)	Mean elevation (m)	642
Mixing zone area (km^2)	16	Forest (km^2)	11,233 (93.4%)	Max. elevation (m)	2,412
Saltwater zone area (km^2)	6	Wetland (km^2)	3 (0%)	Watershed: estuary ratio	503.3
Volume (1,000 x m^3)	74,880	Range (km^2)	174 (1.4%)	TSS (tonne y^{-1})	680,000
Depth (m)	3.12	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.55	Total (km^2)	12,031 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	86,971	TSS/est. area (tonne km^{-2} y^{-1})	28,333
		Popn: est. area ratio	3,624	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Willapa Bay

SUMMARY

Data for all indicators in Willapa Bay have a low symptom expression leading to low overall eutrophic condition rating. This system has minimal nutrient related water quality problems.

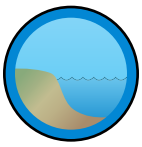


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Level of expression of eutrophic conditions is minimal.



Future Outlook

An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

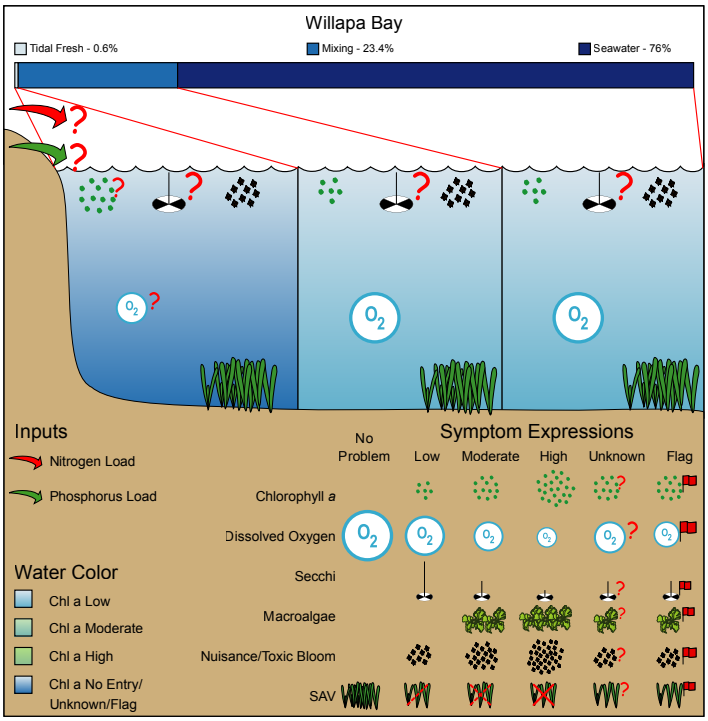
ASSETS Rating

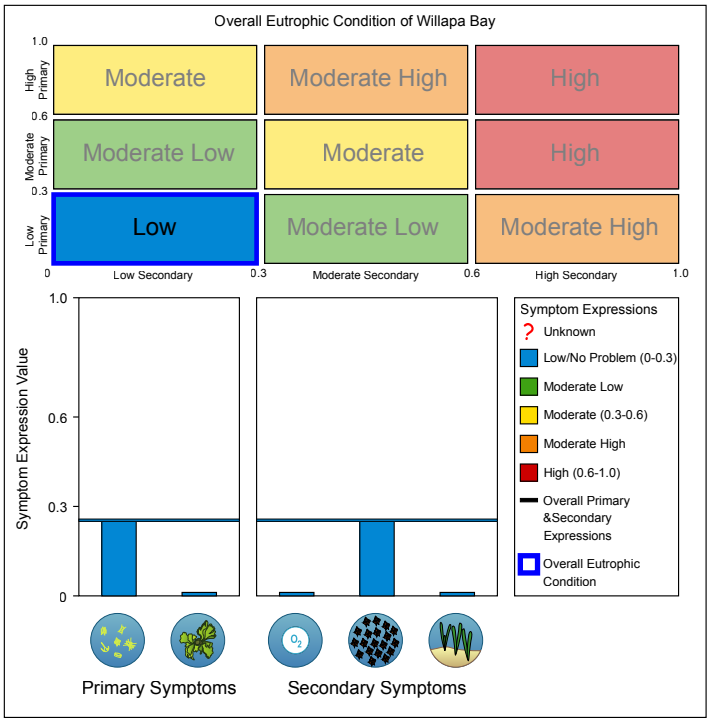
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High
ASSETS	Unknown	High	Good	Moderate	Poor	Bad

Reliability and Confidence: ? Unknown; ✻ Low; ✻✻ Moderate; ✻✻✻ High

EUTROPHIC CONDITION





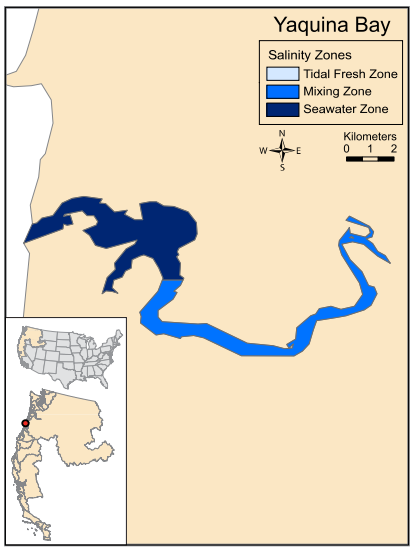
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	355	Urban (km^2)	36 (1.5%)	Area (km^2)	2,421
Tidal fresh zone area (km^2)	2	Agriculture (km^2)	65 (2.7%)	Mean elevation (m)	149
Mixing zone area (km^2)	83	Forest (km^2)	2,261 (94%)	Max. elevation (m)	670
Saltwater zone area (km^2)	270	Wetland (km^2)	36 (1.5%)	Watershed: estuary ratio	6.8
Volume (1,000 x m^3)	1,072,100	Range (km^2)	8 (0.3%)	TSS (tonne y^{-1})	283,000
Depth (m)	3.02	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	2.36	Total (km^2)	2,406 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	10,607	TSS/est. area (tonne km^{-2} y^{-1})	797
		Popn: est. area ratio	30	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Yaquina Bay

SUMMARY

There were inadequate data to accurately assess the eutrophic condition of Yaquina Bay. However, chlorophyll-a concentrations suggest a moderate symptom expression, consistent with the 1999 assessment. The data further suggests a low symptom expression for dissolved oxygen, also the same as the 1999 assessment results.



Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions ✻

Primary symptoms beginning to indicate possible problems but still very few secondary symptoms expressed.

Future Outlook

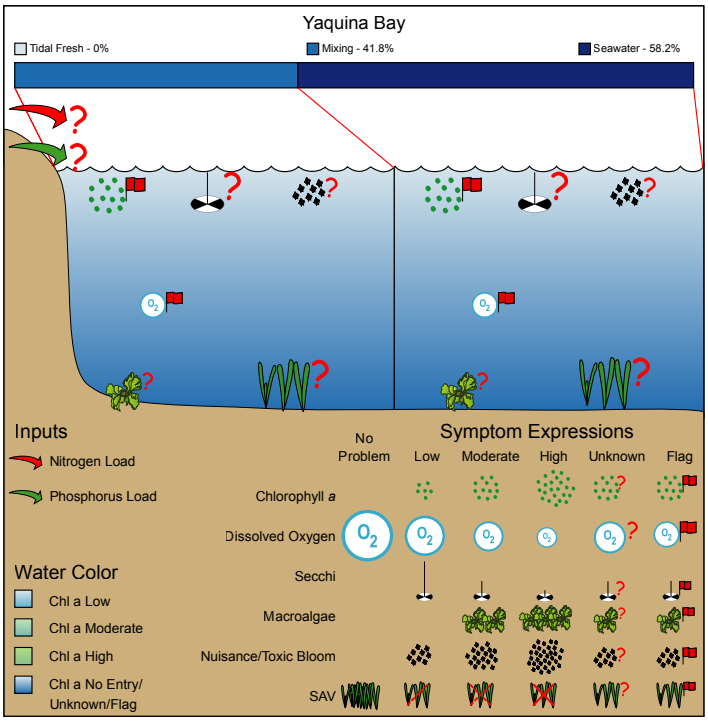
An Unknown Future Outlook expression will occur if the Expected Changes In Nutrient Load by 2020 is Unknown.

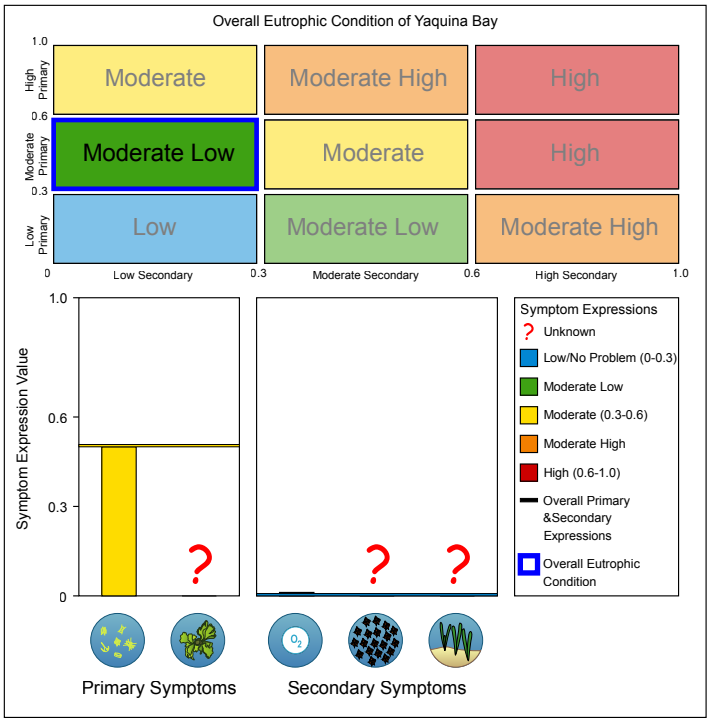
ASSETS Rating

Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

Influence/eutro/future	Unknown	Low	Mod Low	Moderate	Mod High	High	Reliability and Confidence			
ASSETS	Unknown	High	Good	Moderate	Poor	Bad	? Unknown	✻ Low	✻✻ Moderate	✻✻✻ High

EUTROPHIC CONDITION





WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	14	Urban (km^2)	16 (2.5%)	Area (km^2)	634
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	10 (1.6%)	Mean elevation (m)	166
Mixing zone area (km^2)	6	Forest (km^2)	601 (95.5%)	Max. elevation (m)	654
Saltwater zone area (km^2)	8	Wetland (km^2)	3 (0.4%)	Watershed: estuary ratio	45.3
Volume (1,000 x m^3)	29,820	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	159,000
Depth (m)	2.13	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	1.90	Total (km^2)	629 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	6,033	TSS/est. area (tonne km^{-2} y^{-1})	11,357
		Popn: est. area ratio	431	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown