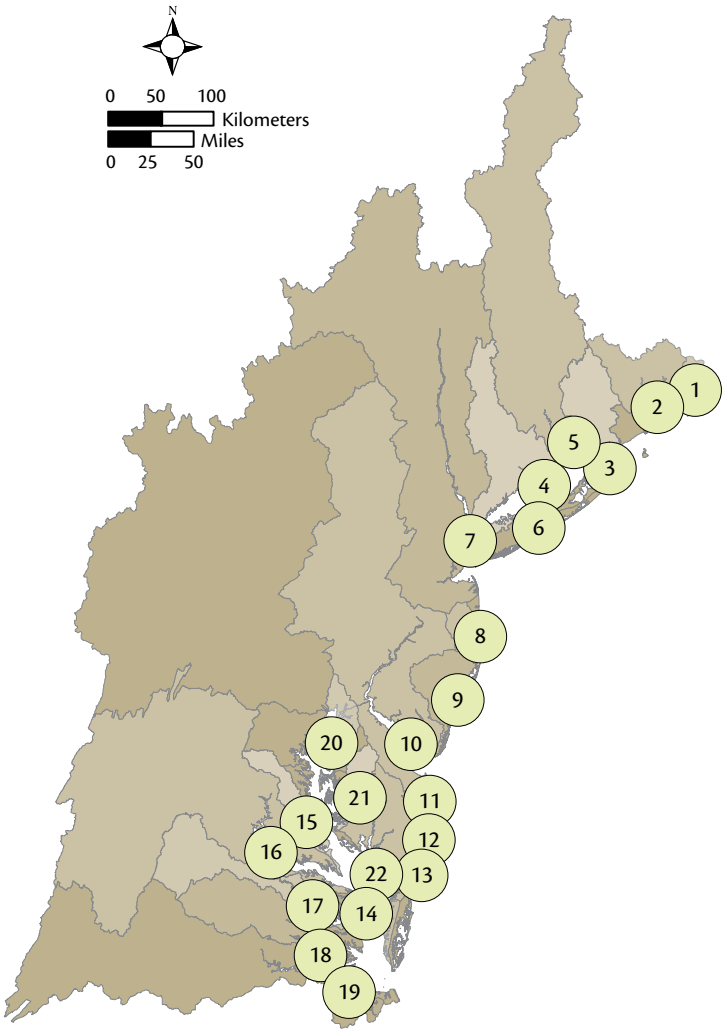
THE MID-ATLANTIC REGION

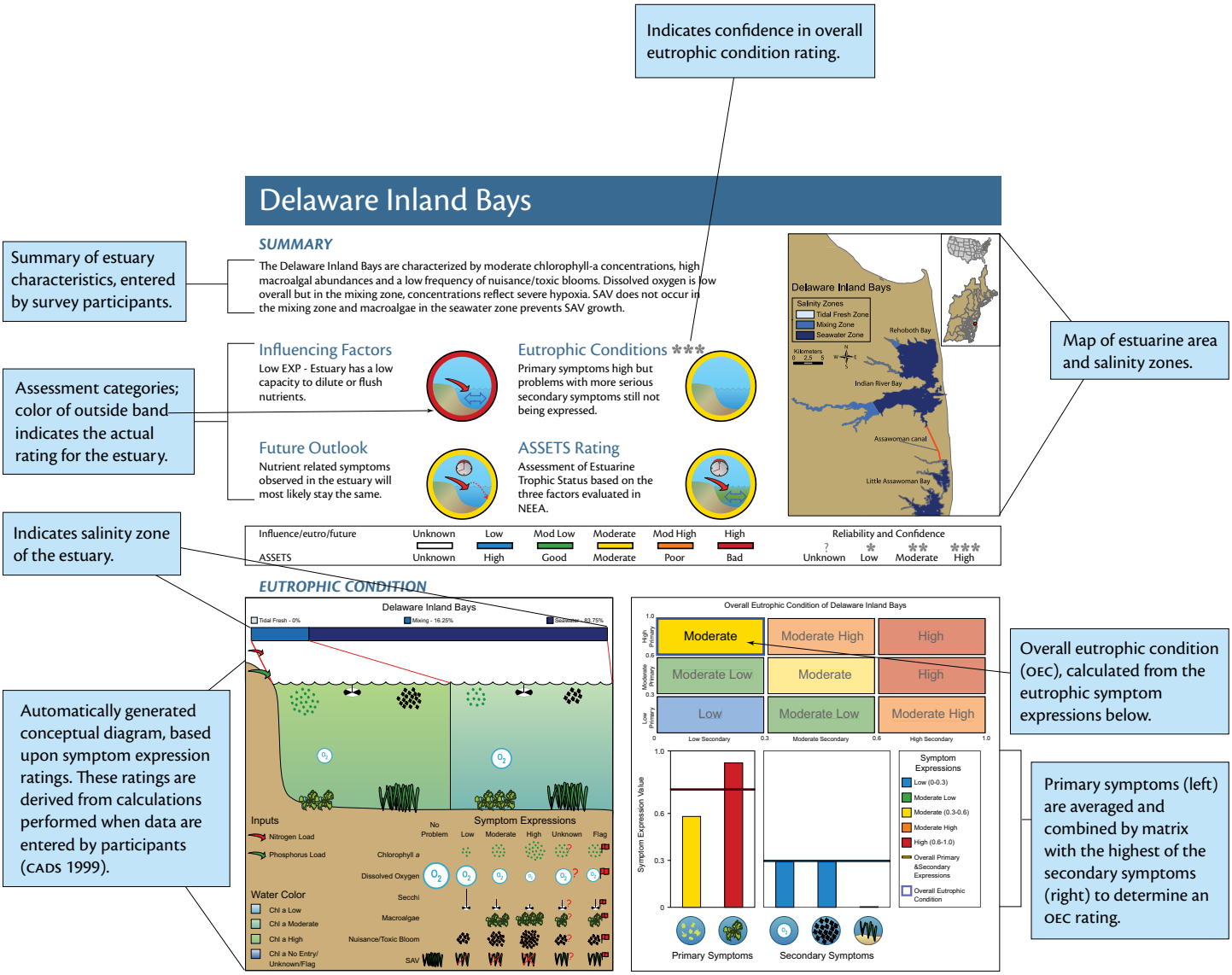


1. Buzzards Bay
2. Narragansett Bay
3. Gardiners Bay
4. Long Island Sound
5. Connecticut River
6. Great South Bay
7. Hudson River/Raritan Bay
8. Barnegat Bay
9. New Jersey Inland Bays
10. Delaware Bay
11. Delaware Inland Bays
12. N. Maryland Coastal Bays (Isle of Wight/Assawoman)
13. S. Maryland Coastal Bays (Chincoteague/Sinepuxent)
14. Chesapeake Bay Mainstem
15. Patuxent River
16. Potomac River
17. Rappahannock River
18. York River
19. James River
20. Chester River
21. Choptank River
22. Tangier/Pocomoke Sounds

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.

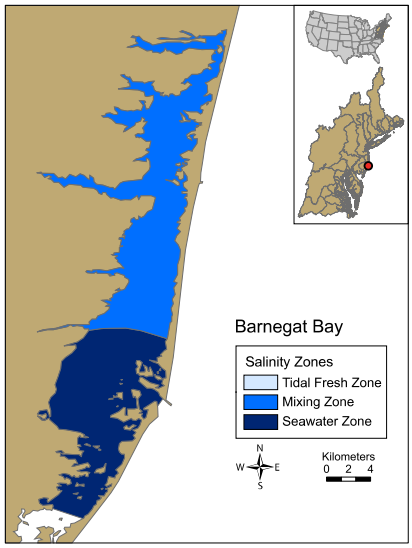
Figure A1: Example of an estuary summary page; after data and summary texts are entered by survey participants, symptom expressions for each indicator are calculated and incorporated in to a summary.



Barnegat Bay

SUMMARY

Increasing watershed development and associated increases in non-point source nitrogen loads to Barnegat Bay have led to a higher eutrophic condition since 1999. Problem areas include high chlorophyll-a, low dissolved oxygen in some areas, nuisance/toxic algal blooms, epiphytic algal growth, declining seagrass habitat, and highly reduced fisheries.

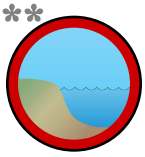


Influencing Factors

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 improve somewhat.

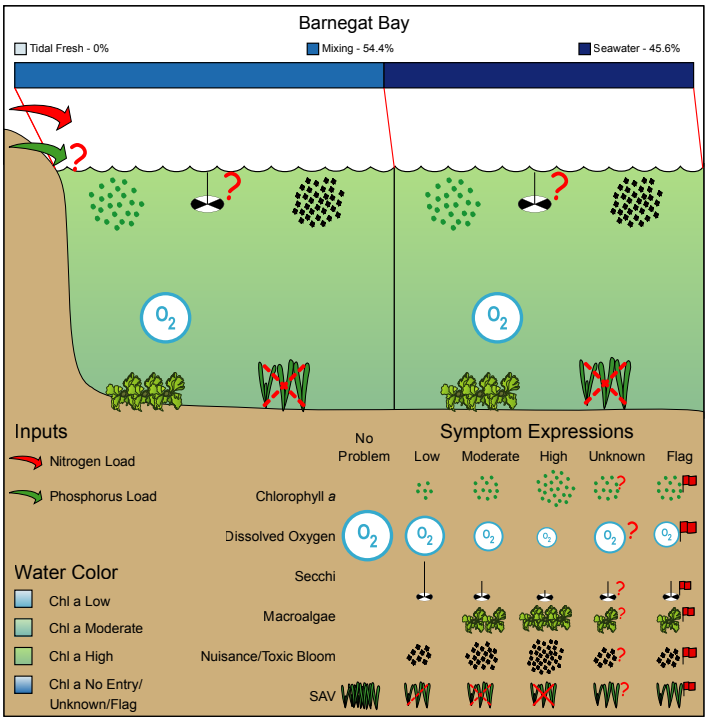
ASSETS Rating

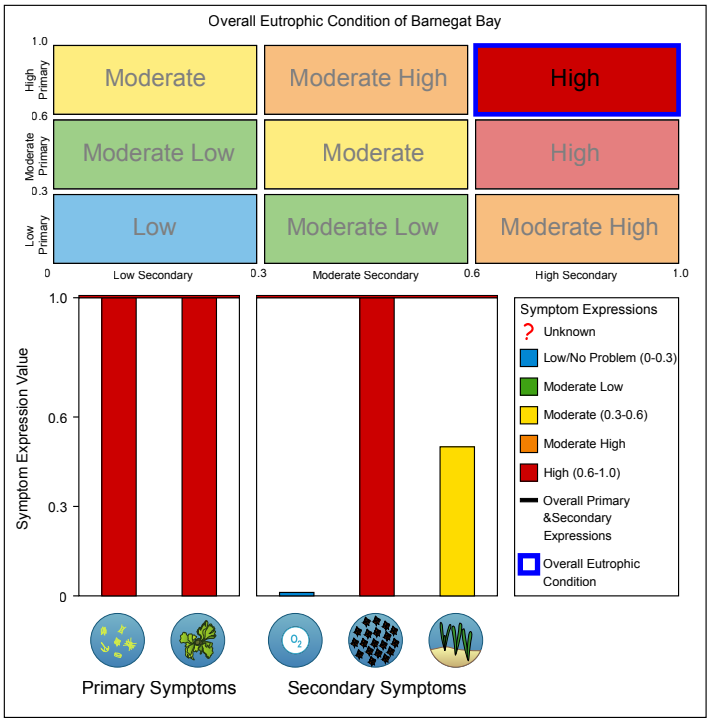
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





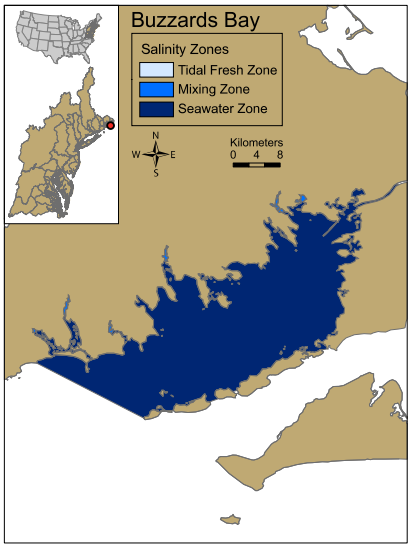
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	182	Urban (km^2)	515 (37.6%)	Area (km^2)	1,399
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	73 (5.3%)	Mean elevation (m)	27
Mixing zone area (km^2)	99	Forest (km^2)	609 (44.4%)	Max. elevation (m)	66
Saltwater zone area (km^2)	83	Wetland (km^2)	174 (12.7%)	Watershed: estuary ratio	7.7
Volume (1,000 x m^3)	118,300	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	74,000
Depth (m)	0.65	Barren (km^2)	0 (0%)	TN (kg y^{-1})	790,000
Tide Height (m)	0.24	Total (km^2)	1,370 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	4	Population	402,358	TSS/est. area (tonne km^{-2} y^{-1})	407
		Popn: est. area ratio	2,211	TN/est. area (kg km^{-2} y^{-1})	4,341
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Buzzards Bay

SUMMARY

Buzzards Bay is characterized by low chlorophyll-a and moderate macroalgal symptom expressions. The system experiences some low dissolved oxygen events, moderately frequent nuisance/toxic algal blooms, and some loss of SAV. The overall eutrophic condition expression is moderate.



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 substantially worsen.

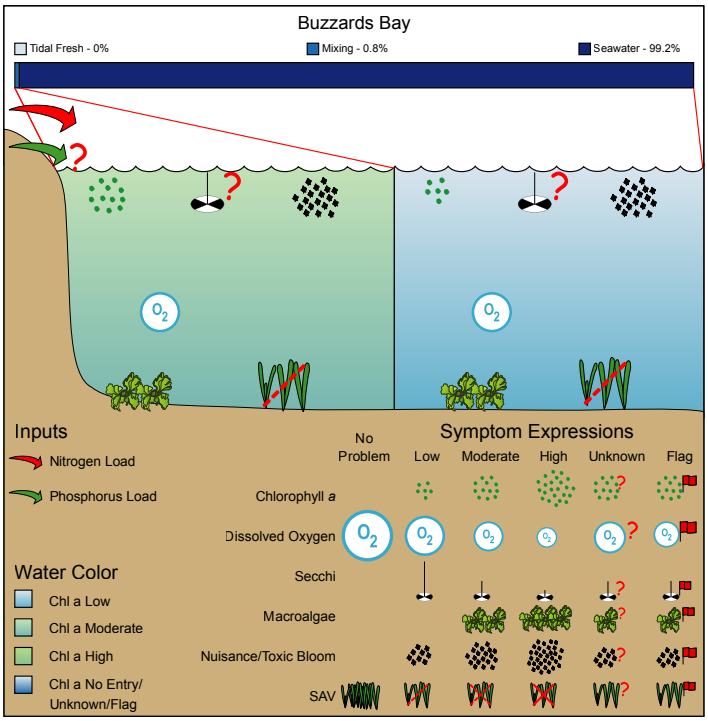
ASSETS Rating

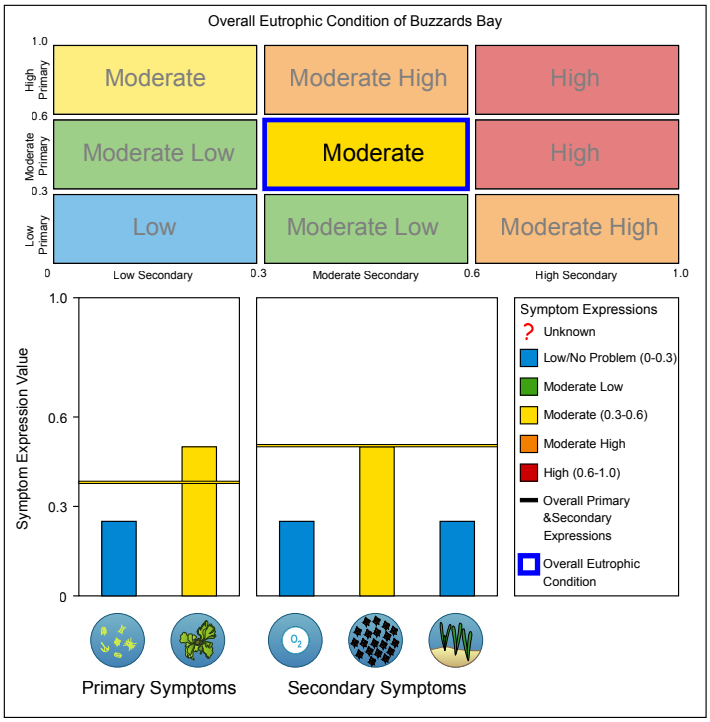
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





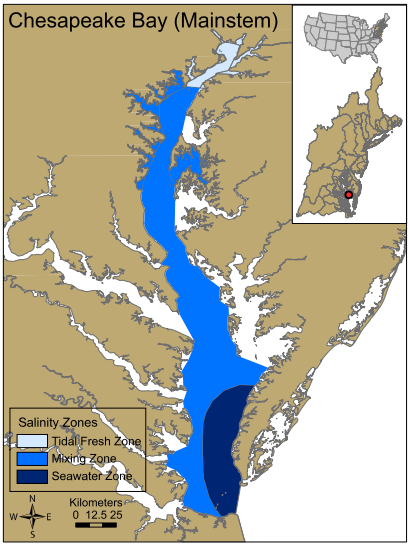
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	639	Urban (km^2)	264 (22.6%)	Area (km^2)	1,257
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	88 (7.5%)	Mean elevation (m)	28
Mixing zone area (km^2)	5	Forest (km^2)	754 (64.5%)	Max. elevation (m)	91
Saltwater zone area (km^2)	634	Wetland (km^2)	52 (4.4%)	Watershed: estuary ratio	2.0
Volume (1,000 x m^3)	6,421,950	Range (km^2)	10 (0.9%)	TSS (tonne y^{-1})	34,400
Depth (m)	10.05	Barren (km^2)	0 (0%)	TN (kg y^{-1})	2,180,000
Tide Height (m)	1.11	Total (km^2)	1,168 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	42	Population	246,157	TSS/est. area (tonne km^{-2} y^{-1})	54
		Popn: est. area ratio	385	TN/est. area (kg km^{-2} y^{-1})	3,412
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Chesapeake Bay Mainstem

SUMMARY

The Chesapeake Bay Mainstem shows annually variable regional impacts and recovery. Anoxia/hypoxia plague deep waters and nearshore zones, limiting habitat and promoting fish kills. Mid-Bay chlorophyll-a remains relatively high. Some SAV recovery was observed in the northern part of the bay. Nuisance/toxic blooms remain annual events.

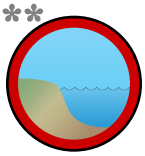


Influencing Factors

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 improve somewhat.

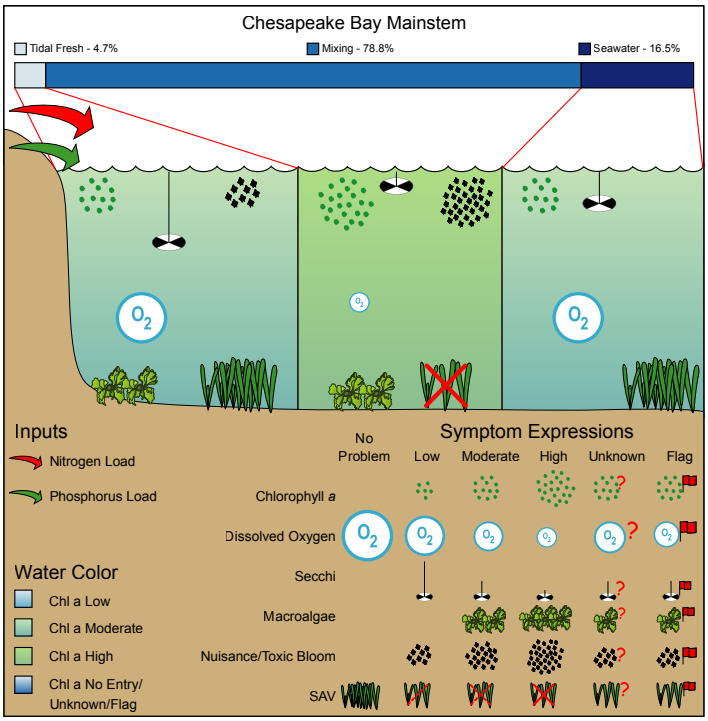
ASSETS Rating

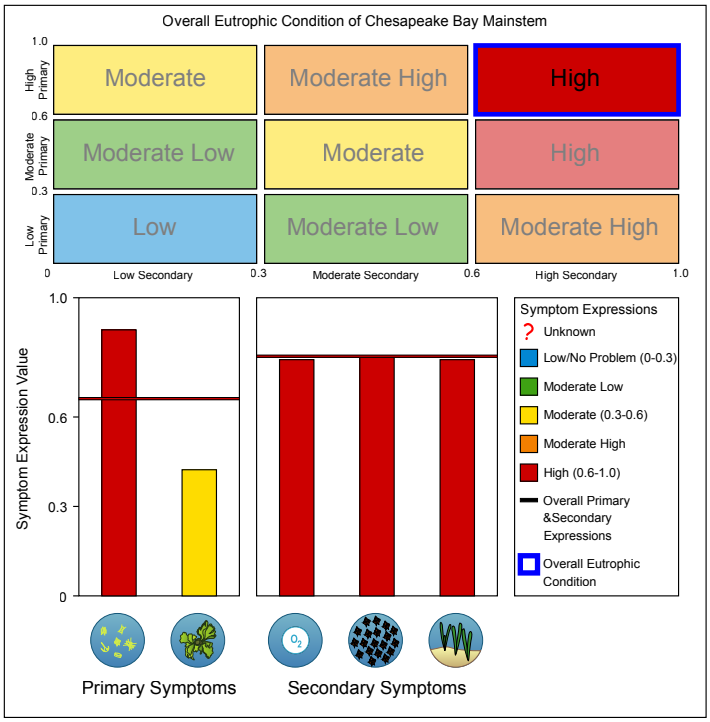
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





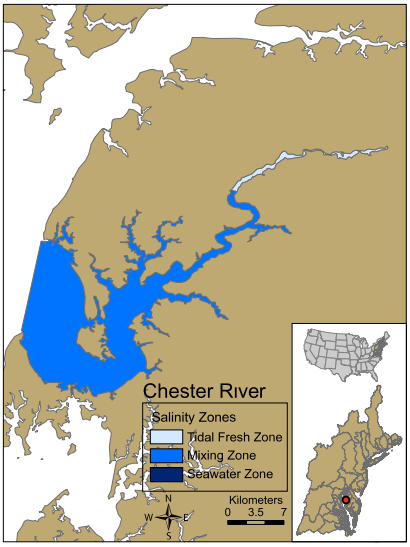
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	6,974	Urban (km^2)	15,201 (9.2%)	Area (km^2)	79,584
Tidal fresh zone area (km^2)	328	Agriculture (km^2)	54,825 (33.2%)	Mean elevation (m)	361
Mixing zone area (km^2)	5,496	Forest (km^2)	92,869 (56.3%)	Max. elevation (m)	935
Saltwater zone area (km^2)	1,151	Wetland (km^2)	1,891 (1.1%)	Watershed: estuary ratio	11.4
Volume (1,000 x m^3)	51,119,420	Range (km^2)	251 (0.2%)	TSS (tonne y^{-1})	1,480,000
Depth (m)	7.33	Barren (km^2)	0 (0%)	TN (kg y^{-1})	98,101,856
Tide Height (m)	0.45	Total (km^2)	165,037 (0%)	TP (kg y^{-1})	4,396,457
Residence Time (d)	105	Population	6,408,536	TSS/est. area (tonne km^{-2} y^{-1})	212
		Popn: est. area ratio	919	TN/est. area (kg km^{-2} y^{-1})	14,067
				TP/est. area (kg km^{-2} y^{-1})	630

Chester River

SUMMARY

The overall eutrophic condition in the Chester River is high, but conditions in the tidal fresh zone have improved. This system is characterized by a high chlorophyll-a symptom expression, leading to frequent low dissolved oxygen events. However, macroalgae in this system is not a problem. In some areas, there has been an increase in SAV.

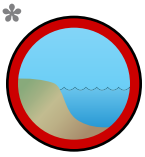


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

Eutrophic Conditions **

High primary and secondary symptom levels indicate serious eutrophication problems.



Future Outlook

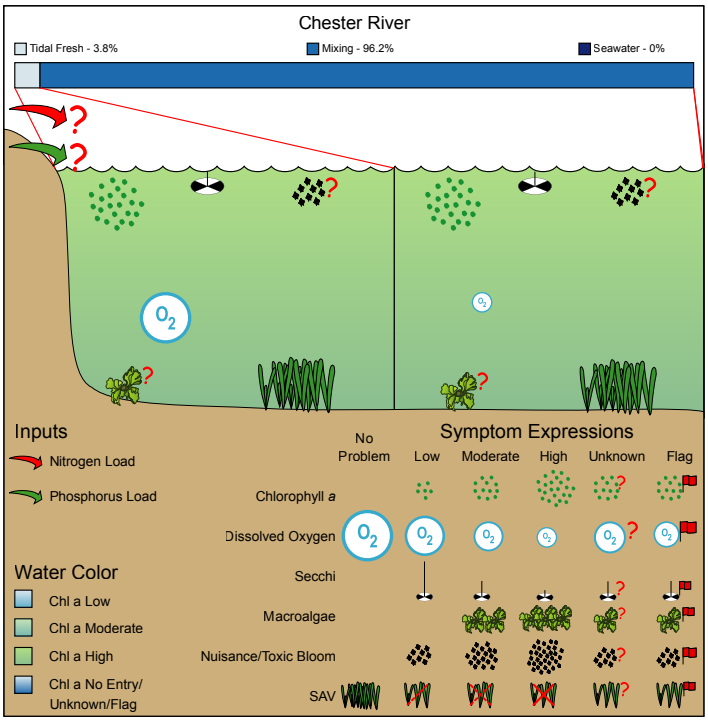
Nutrient related symptoms observed in the estuary are likely to improve somewhat.

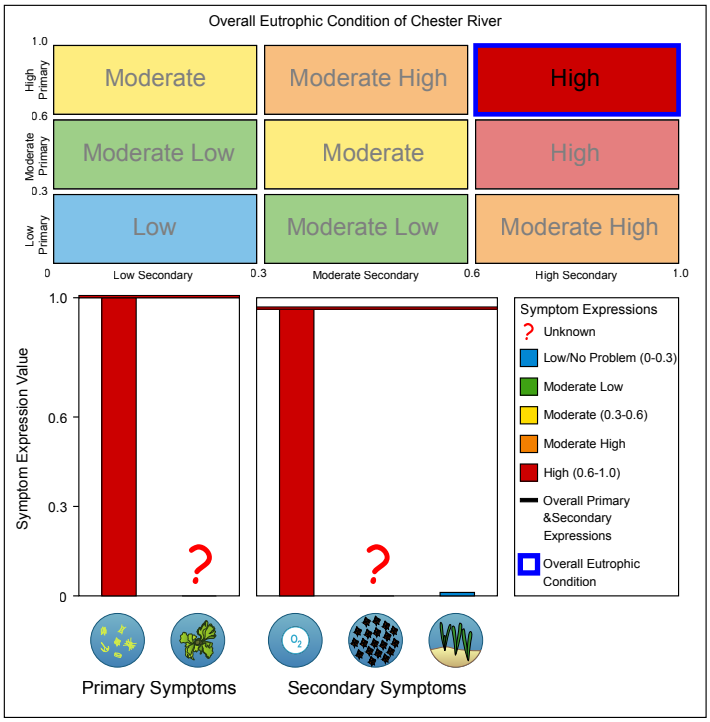
ASSETS Rating

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





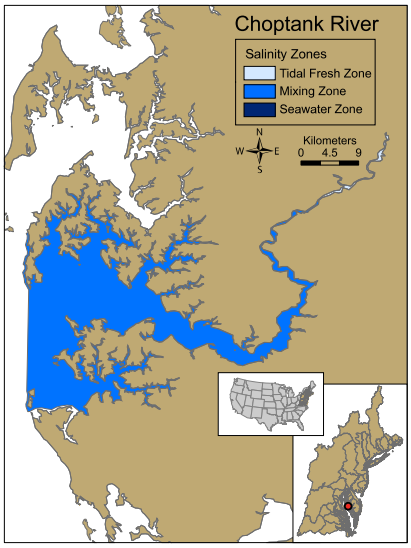
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	196	Urban (km^2)	31 (3.2%)	Area (km^2)	1,008
Tidal fresh zone area (km^2)	7	Agriculture (km^2)	681 (69.4%)	Mean elevation (m)	12
Mixing zone area (km^2)	189	Forest (km^2)	228 (23.2%)	Max. elevation (m)	23
Saltwater zone area (km^2)	0	Wetland (km^2)	41 (4.2%)	Watershed: estuary ratio	5.1
Volume (1,000 x m^3)	680,120	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	54,300
Depth (m)	3.47	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.48	Total (km^2)	982 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	27	Population	27,873	TSS/est. area (tonne km^{-2} y^{-1})	277
		Popn: est. area ratio	142	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Choptank River

SUMMARY

The overall eutrophic status of the Choptank River is high, due to high chlorophyll-a symptom ratings, periodic hypoxic dissolved oxygen levels, and recurring harmful algal blooms (P. minimum). Despite these poor water quality conditions, SAV has increased since 1999.

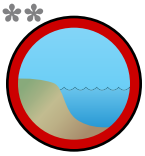


Influencing Factors

Low to moderate nitrogen input and moderate to high susceptibility (moderate ability to dilute and flush 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 improve somewhat.

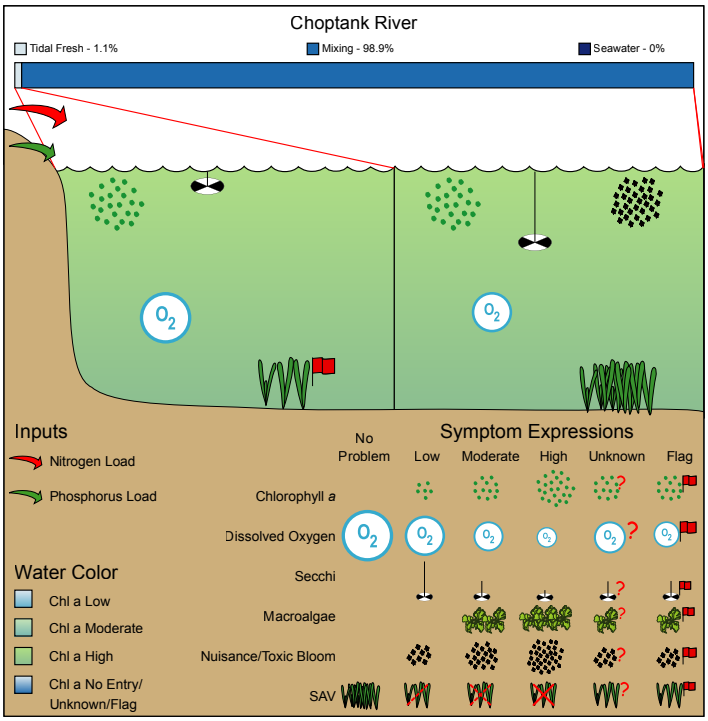
ASSETS Rating

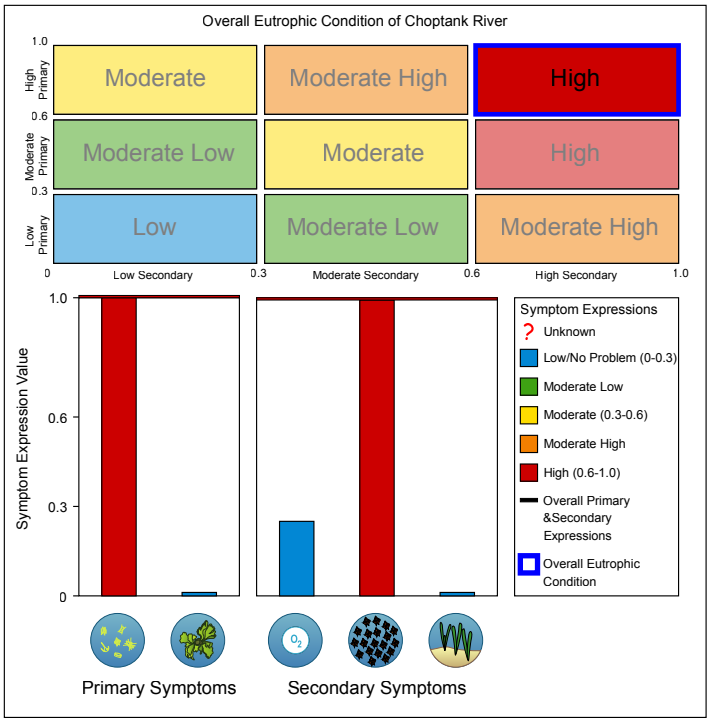
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





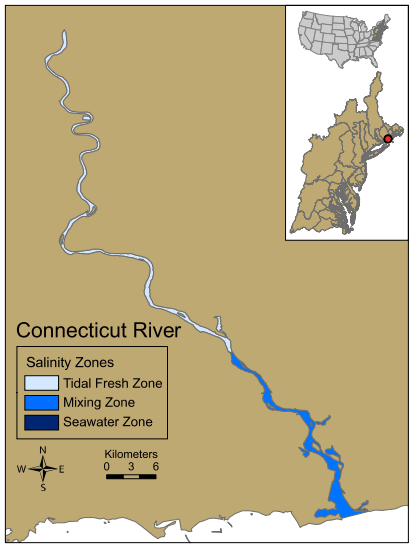
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	411	Urban (km^2)	101 (4.9%)	Area (km^2)	1,888
Tidal fresh zone area (km^2)	5	Agriculture (km^2)	1,176 (57.2%)	Mean elevation (m)	10
Mixing zone area (km^2)	406	Forest (km^2)	567 (27.6%)	Max. elevation (m)	33
Saltwater zone area (km^2)	0	Wetland (km^2)	212 (10.3%)	Watershed: estuary ratio	4.6
Volume (1,000 x m^3)	1,269,990	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	40,200
Depth (m)	3.09	Barren (km^2)	0 (0%)	TN (kg y^{-1})	267,007
Tide Height (m)	0.50	Total (km^2)	2,056 (0%)	TP (kg y^{-1})	22,333
Residence Time (d)	19	Population	49,527	TSS/est. area (tonne km^{-2} y^{-1})	98
		Popn: est. area ratio	121	TN/est. area (kg km^{-2} y^{-1})	650
				TP/est. area (kg km^{-2} y^{-1})	54

Connecticut River

SUMMARY

The Connecticut River's very low eutrophic condition is likely due to high flushing. Large loads of nitrogen and phosphorus enter the estuary and the river is an important source of nutrients to Long Island Sound. Dissolved oxygen is at healthy levels and there are no problems with macroalgae or toxic blooms. SAV has been absent for many years.

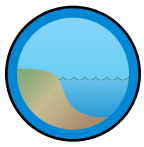


Influencing Factors

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 minimal.



Future Outlook

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

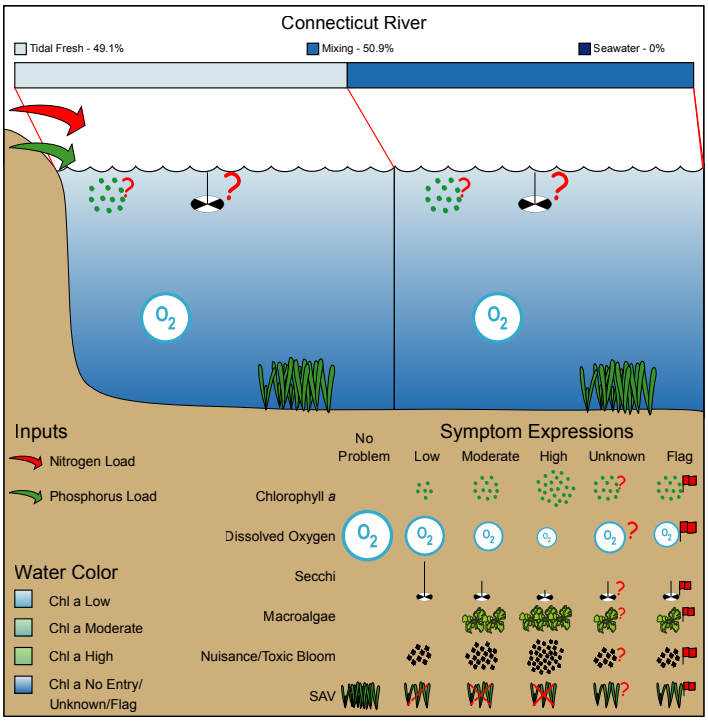
ASSETS Rating

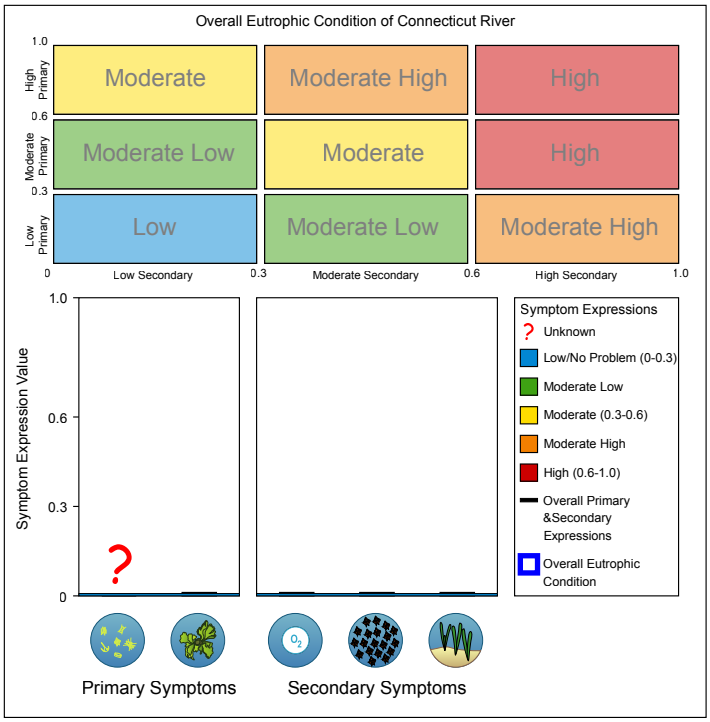
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





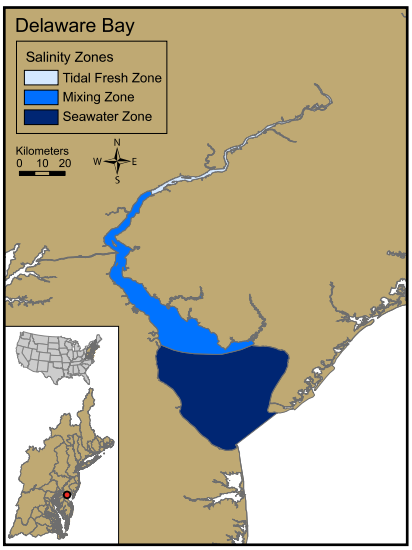
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	42	Urban (km^2)	2,681 (9.5%)	Area (km^2)	28,891
Tidal fresh zone area (km^2)	21	Agriculture (km^2)	3,092 (10.9%)	Mean elevation (m)	351
Mixing zone area (km^2)	21	Forest (km^2)	22,077 (77.9%)	Max. elevation (m)	1,646
Saltwater zone area (km^2)	0	Wetland (km^2)	497 (1.8%)	Watershed: estuary ratio	687.9
Volume (1,000 x m^3)	93,240	Range (km^2)	10 (0%)	TSS (tonne y^{-1})	87,700
Depth (m)	2.22	Barren (km^2)	0 (0%)	TN (kg y^{-1})	15,562,000
Tide Height (m)	0.82	Total (km^2)	28,358 (0%)	TP (kg y^{-1})	1,790,000
Residence Time (d)	1	Population	2,189,287	TSS/est. area (tonne km^{-2} y^{-1})	2,088
		Popn: est. area ratio	52,126	TN/est. area (kg km^{-2} y^{-1})	370,524
				TP/est. area (kg km^{-2} y^{-1})	42,619

Delaware Bay

SUMMARY

Delaware bay is an historically turbid system due to resuspension. Nutrient loads and chlorophyll-a concentrations are high with no marked eutrophication symptoms. Past hypoxic levels in the tidal fresh zone have been relieved with reductions of primary biochemical oxygen demand. There has been no SAV in the saline portion within recent history.



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 will most likely stay the same.

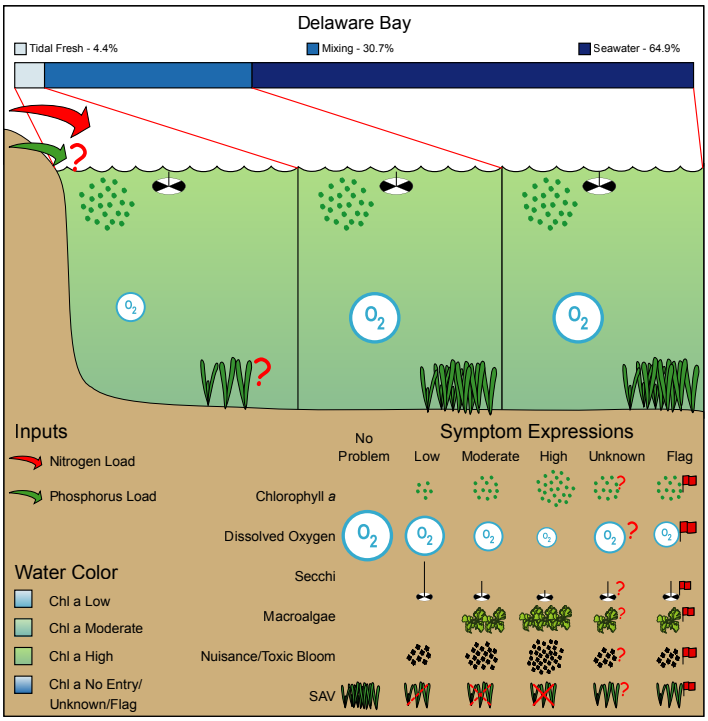
ASSETS Rating

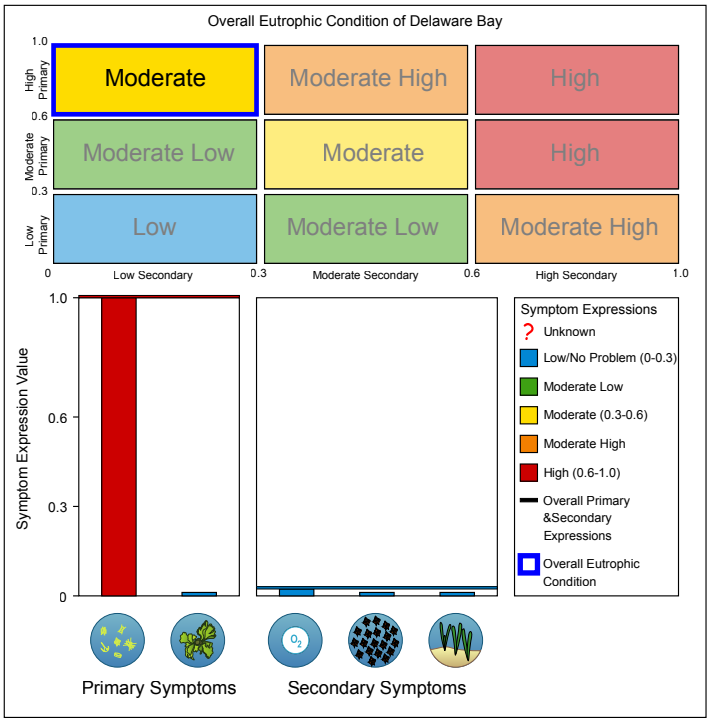
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





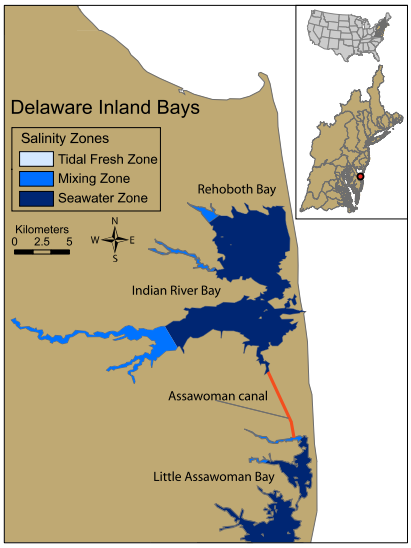
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	2,070	Urban (km^2)	6,496 (19.9%)	Area (km^2)	33,254
Tidal fresh zone area (km^2)	91	Agriculture (km^2)	10,482 (32.1%)	Mean elevation (m)	243
Mixing zone area (km^2)	635	Forest (km^2)	14,520 (44.4%)	Max. elevation (m)	1,101
Saltwater zone area (km^2)	1,343	Wetland (km^2)	1,101 (3.4%)	Watershed: estuary ratio	16.1
Volume (1,000 x m^3)	12,668,400	Range (km^2)	83 (0.3%)	TSS (tonne y^{-1})	439,000
Depth (m)	6.12	Barren (km^2)	0 (0%)	TN (kg y^{-1})	45,540,000
Tide Height (m)	1.56	Total (km^2)	32,681 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	8	Population	7,209,581	TSS/est. area (tonne km^{-2} y^{-1})	212
		Popn: est. area ratio	3,483	TN/est. area (kg km^{-2} y^{-1})	22,000
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Delaware Inland Bays

SUMMARY

The Delaware Inland Bays are characterized by moderate chlorophyll-a concentrations, high macroalgal abundances and a low frequency of nuisance/toxic blooms. Dissolved oxygen is low overall but in the mixing zone, concentrations reflect severe hypoxia. SAV does not occur in the mixing zone and macroalgae in the seawater zone prevents SAV growth.



Influencing Factors

Low to moderate nitrogen input and moderate to high susceptibility (moderate ability to dilute and flush nutrients).

Eutrophic Conditions ***

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

Future Outlook

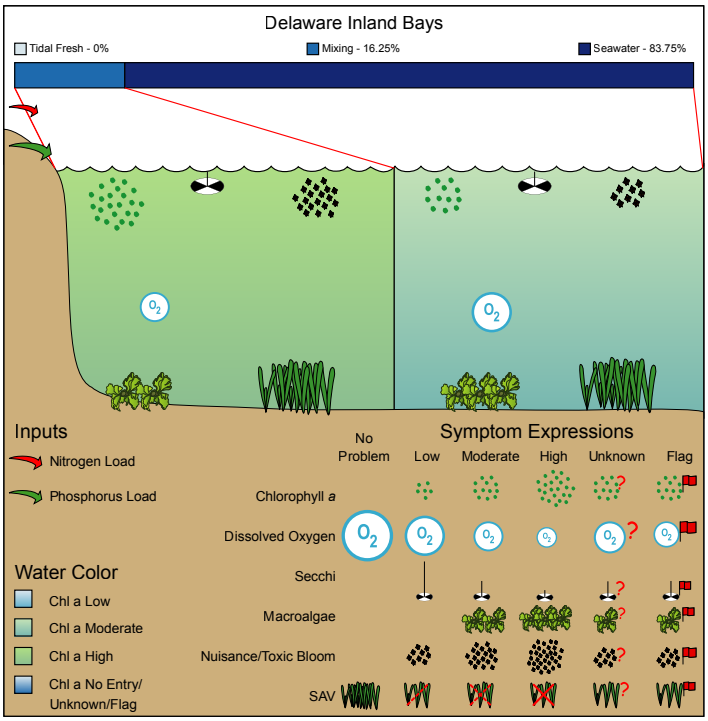
Nutrient related symptoms observed in the estuary will most likely stay the same.

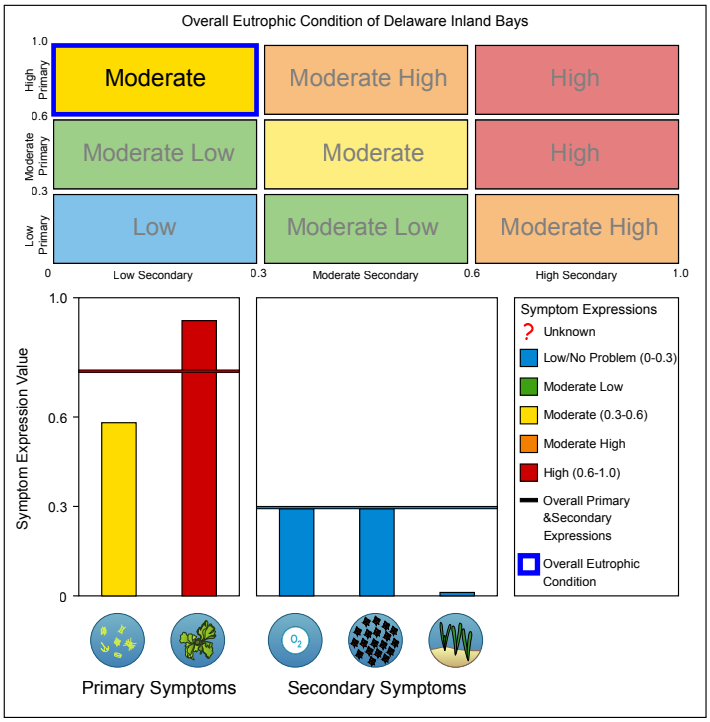
ASSETS Rating

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





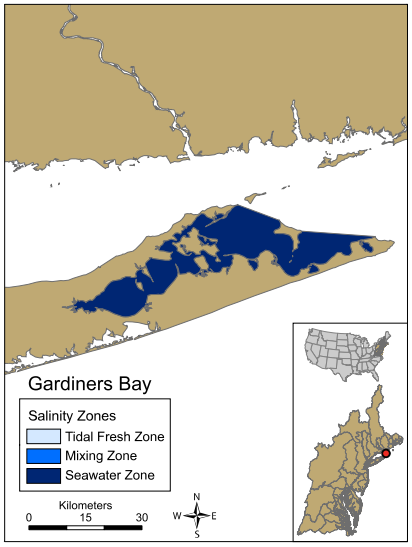
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	80	Urban (km^2)	145 (19.3%)	Area (km^2)	750
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	287 (38.3%)	Mean elevation (m)	22
Mixing zone area (km^2)	13	Forest (km^2)	152 (20.3%)	Max. elevation (m)	60
Saltwater zone area (km^2)	67	Wetland (km^2)	137 (18.3%)	Watershed: estuary ratio	9.4
Volume (1,000 x m^3)	160,000	Range (km^2)	17 (2.3%)	TSS (tonne y^{-1})	2,643
Depth (m)	2.00	Barren (km^2)	12 (1.6%)	TN (kg y^{-1})	486
Tide Height (m)	0.22	Total (km^2)	750 (1.6%)	TP (kg y^{-1})	10,011
Residence Time (d)	39	Population	68,992	TSS/est. area (tonne km^{-2} y^{-1})	33
		Popn: est. area ratio	862	TN/est. area (kg km^{-2} y^{-1})	6
				TP/est. area (kg km^{-2} y^{-1})	125

Gardiners Bay

SUMMARY

Gardiners Bay is much improved since the 1999 assessment, due to decreasing nitrogen and chlorophyll-a levels. Currently, there are low levels of chlorophyll-a and no macroalgal problems. There are no low dissolved oxygen events and few nuisance/toxic algal blooms. The loss of SAV is unknown for the system.

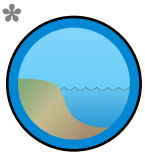


Influencing Factors

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 will most likely stay the same.

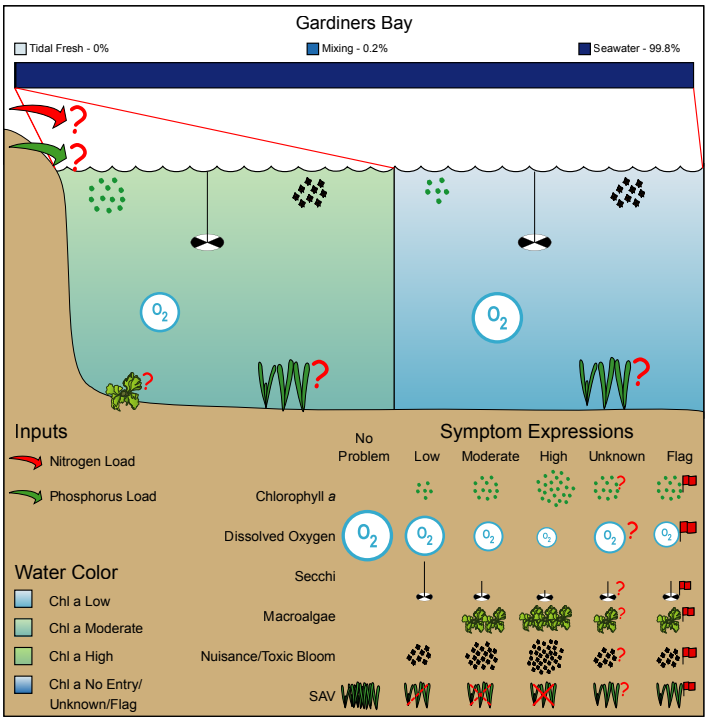
ASSETS Rating

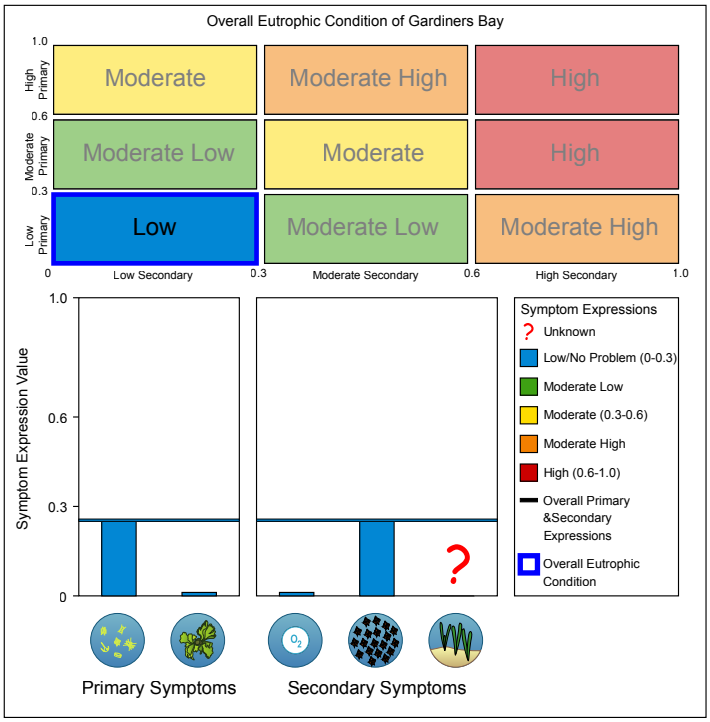
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





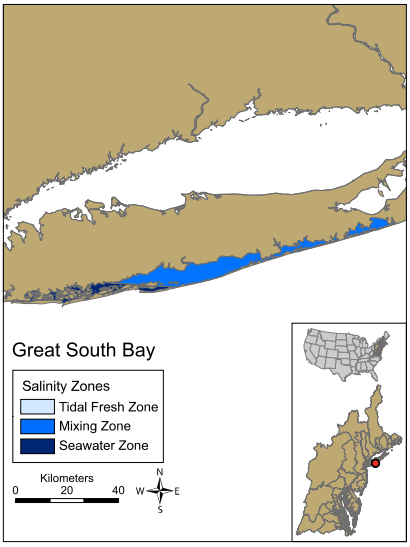
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	512	Urban (km^2)	231 (34.2%)	Area (km^2)	709
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	161 (23.8%)	Mean elevation (m)	20
Mixing zone area (km^2)	1	Forest (km^2)	259 (38.5%)	Max. elevation (m)	76
Saltwater zone area (km^2)	511	Wetland (km^2)	10 (1.5%)	Watershed: estuary ratio	1.4
Volume (1,000 x m^3)	3,271,680	Range (km^2)	13 (1.9%)	TSS (tonne y^{-1})	72,400
Depth (m)	6.39	Barren (km^2)	0 (0%)	TN (kg y^{-1})	Unknown
Tide Height (m)	0.75	Total (km^2)	673 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	37	Population	73,273	TSS/est. area (tonne km^{-2} y^{-1})	141
		Popn: est. area ratio	143	TN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Great South Bay

SUMMARY

Great South Bay?s moderate high eutrophic expression has not changed since the last survey. The bay is characterized by high chlorophyll-a symptom expression and high macroalgal abundance. There are no dissolved oxygen problems, but some nuisance/toxic algal blooms. Changes in SAV are unknown.

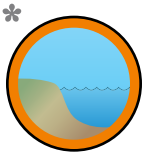


Influencing Factors

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

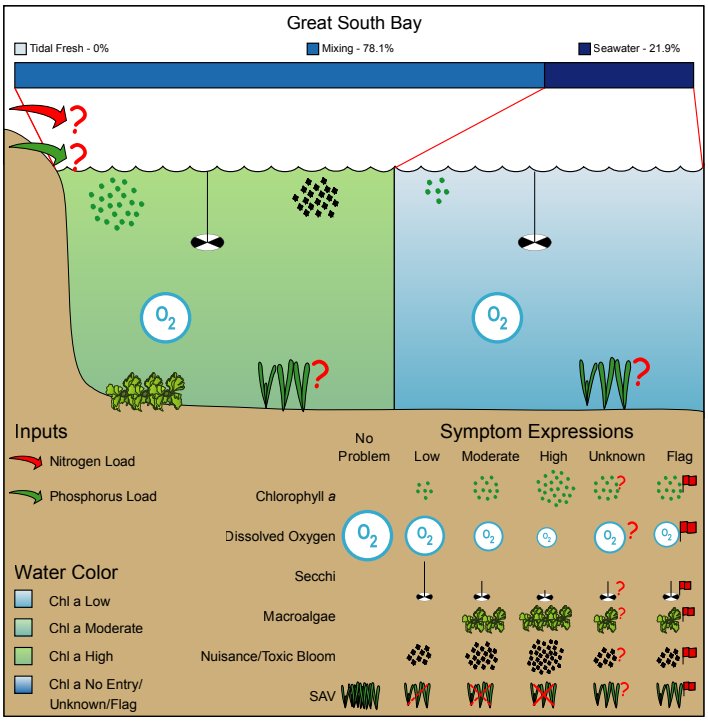
Nutrient related symptoms observed in the estuary will most likely stay the same.

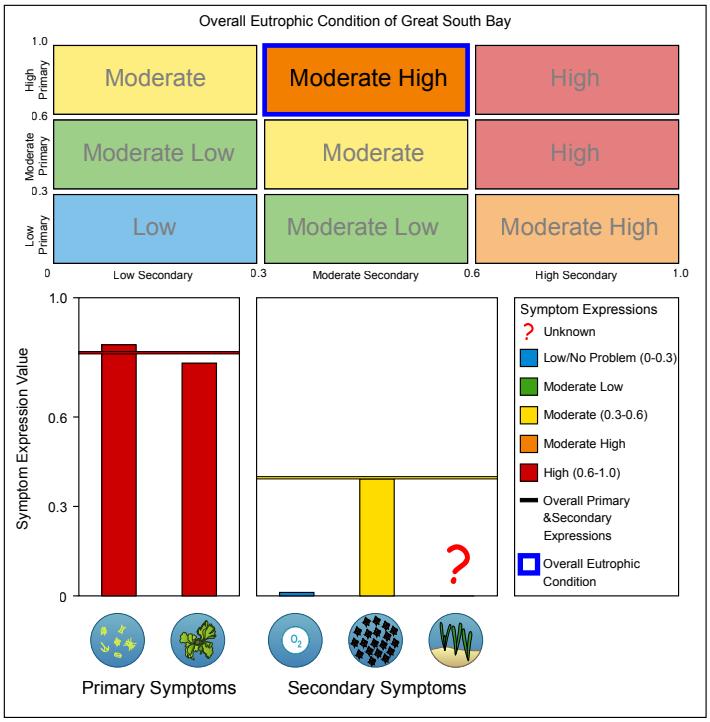
ASSETS Rating

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





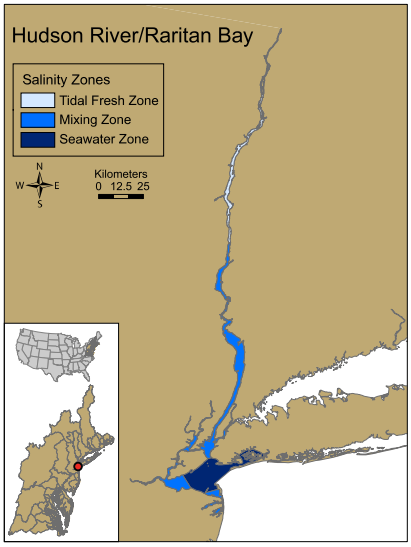
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	383	Urban (km^2)	1,557 (92.5%)	Area (km^2)	1,733
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	16 (0.9%)	Mean elevation (m)	27
Mixing zone area (km^2)	299	Forest (km^2)	70 (4.2%)	Max. elevation (m)	101
Saltwater zone area (km^2)	84	Wetland (km^2)	41 (2.5%)	Watershed: estuary ratio	4.5
Volume (1,000 x m^3)	421,300	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	153,000
Depth (m)	1.10	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.57	Total (km^2)	1,683 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	2	Population	2,084,075	TSS/est. area (tonne km^{-2} y^{-1})	400
		Popn: est. area ratio	5,441	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Hudson River/Raritan Bay

SUMMARY

Hudson River/Raritan Bay is characterized by high chlorophyll-a expression, a rating unchanged since the 1999 assessment. There are some dissolved oxygen events. However, levels have improved from a moderate to a low symptom expression since 1999.



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.

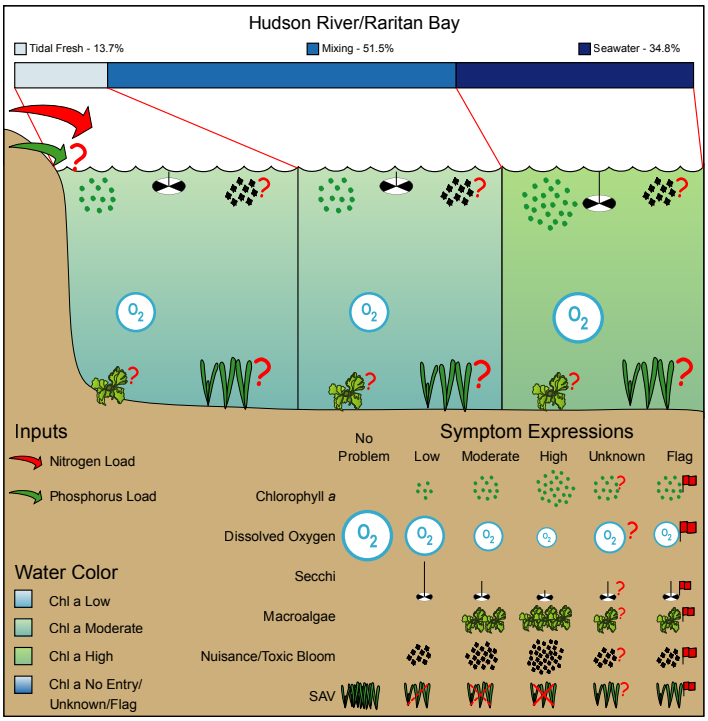
ASSETS Rating

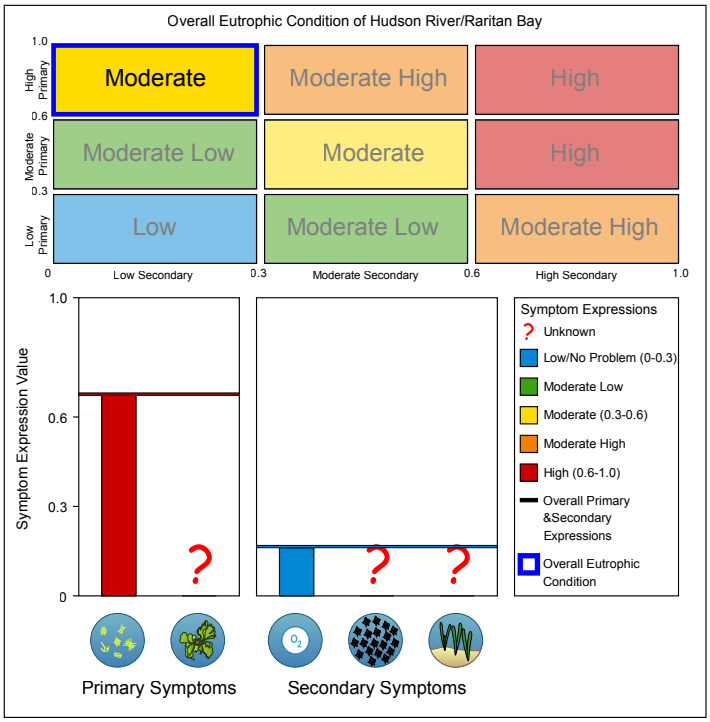
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





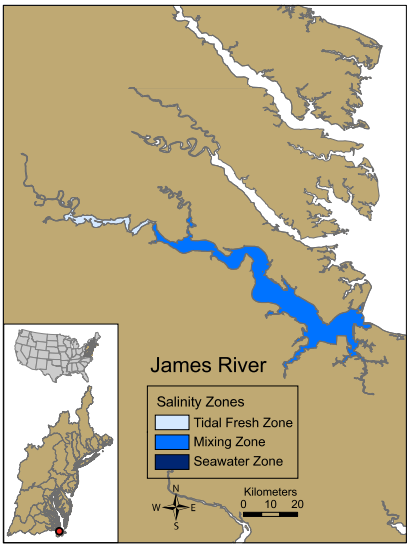
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	799	Urban (km^2)	7,814 (19.2%)	Area (km^2)	41,603
Tidal fresh zone area (km^2)	109	Agriculture (km^2)	9,653 (23.7%)	Mean elevation (m)	290
Mixing zone area (km^2)	411	Forest (km^2)	22,603 (55.5%)	Max. elevation (m)	1,387
Saltwater zone area (km^2)	278	Wetland (km^2)	456 (1.1%)	Watershed: estuary ratio	52.1
Volume (1,000 x m^3)	4,897,870	Range (km^2)	228 (0.6%)	TSS (tonne y^{-1})	2,030,000
Depth (m)	6.13	Barren (km^2)	0 (0%)	TN (kg y^{-1})	71,900,000
Tide Height (m)	1.39	Total (km^2)	40,753 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	9	Population	12,111,413	TSS/est. area (tonne km^{-2} y^{-1})	2,541
		Popn: est. area ratio	15,158	TN/est. area (kg km^{-2} y^{-1})	89,988
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

James River

SUMMARY

The James River is characterized by high chlorophyll-a expression and low macroalgal abundance. Total nitrogen loads show regional increases throughout the estuary. There are no low dissolved oxygen events and a slight gain in SAV. While no nuisance/toxic algal blooms were reported in 1999, they are now occurring in the system.

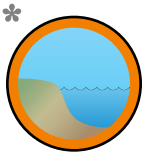


Influencing Factors

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

Nutrient related symptoms observed in the estuary will most likely stay the same.

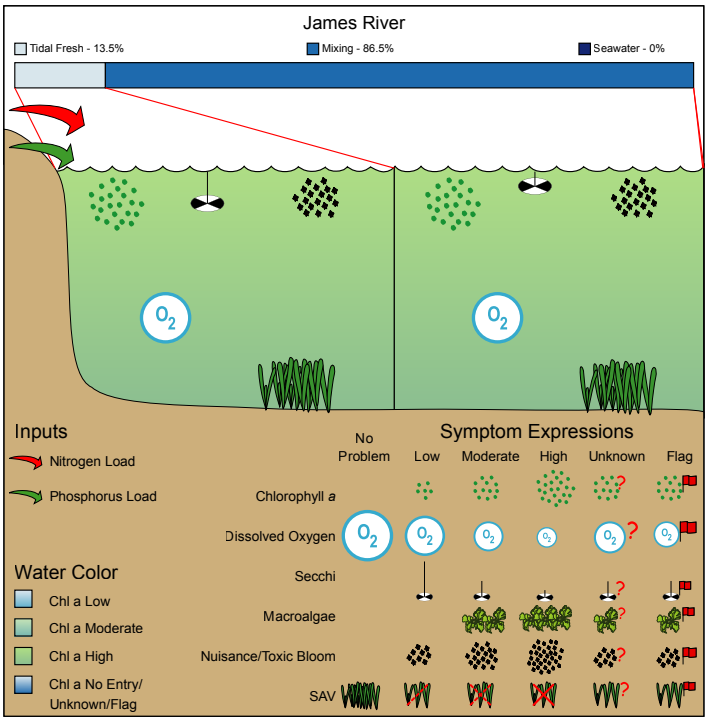
ASSETS Rating

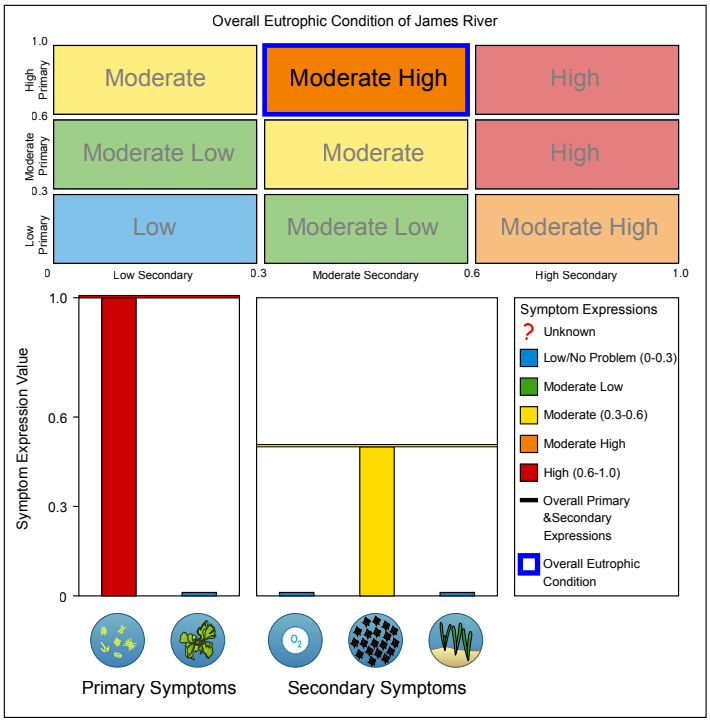
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





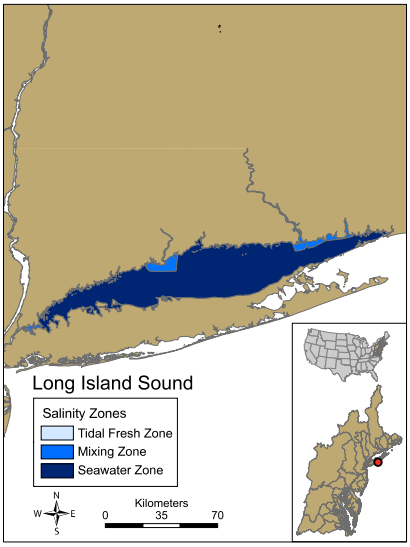
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	640	Urban (km^2)	2,981 (11.5%)	Area (km^2)	26,101
Tidal fresh zone area (km^2)	86	Agriculture (km^2)	5,255 (20.3%)	Mean elevation (m)	289
Mixing zone area (km^2)	554	Forest (km^2)	17,420 (67.3%)	Max. elevation (m)	1,317
Saltwater zone area (km^2)	0	Wetland (km^2)	228 (0.9%)	Watershed: estuary ratio	40.8
Volume (1,000 x m^3)	2,060,800	Range (km^2)	10 (0%)	TSS (tonne y^{-1})	309,000
Depth (m)	3.22	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	13,366,435
Tide Height (m)	0.80	Total (km^2)	25,895 (0%)	TP (kg y^{-1})	1,294,610
Residence Time (d)	8	Population	1,801,950	TSS/est. area (tonne km^{-2} y^{-1})	483
		Popn: est. area ratio	2,816	DIN/est. area (kg km^{-2} y^{-1})	20,885
				TP/est. area (kg km^{-2} y^{-1})	2,023

Long Island Sound

SUMMARY

Long Island Sound's developed watershed combined with summer stratification results in seasonal hypoxia. Dissolved oxygen concentrations below 3 mg/L typically cover at least 50% of the area, with anoxia occurring some years in the western Sound. Chlorophyll concentrations are also high.

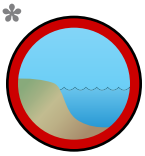


Influencing Factors

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 improve somewhat.

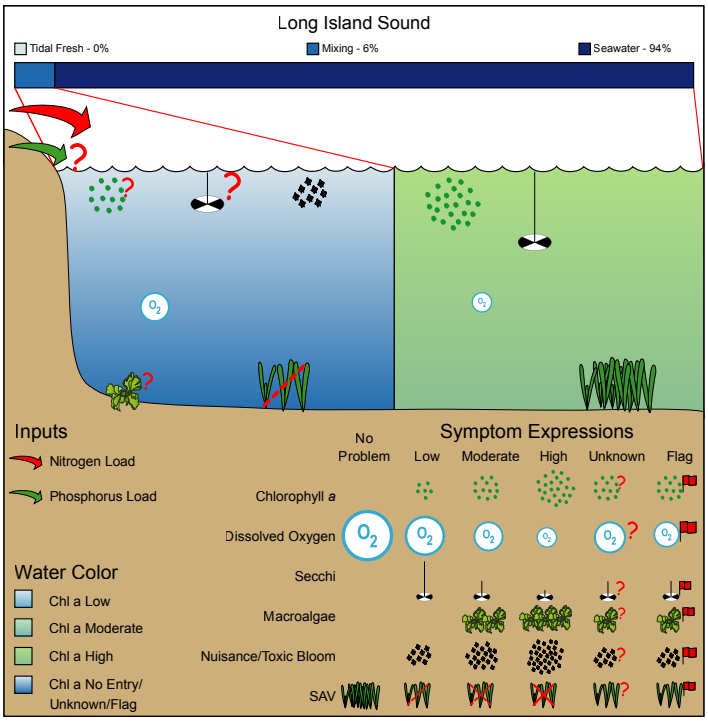
ASSETS Rating

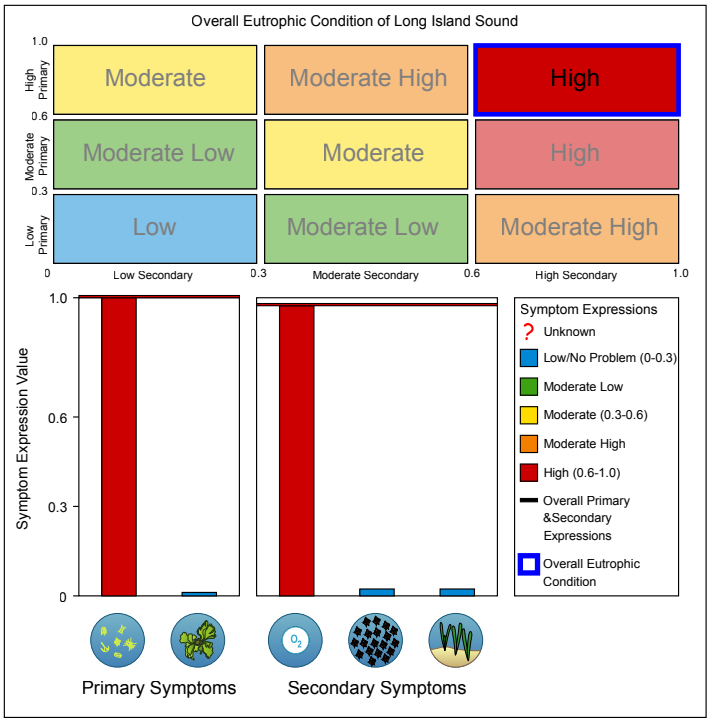
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





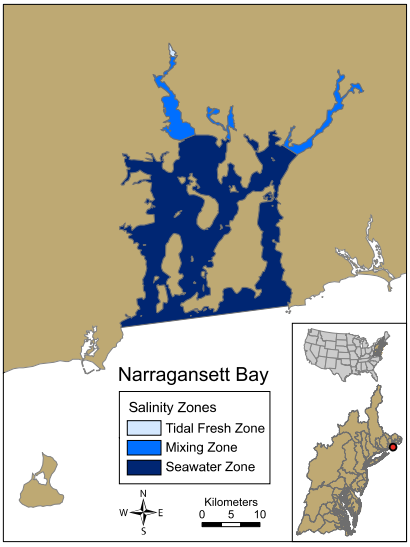
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	3,259	Urban (km^2)	6,649 (16.3%)	Area (km^2)	12,773
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	4,566 (11.2%)	Mean elevation (m)	178
Mixing zone area (km^2)	196	Forest (km^2)	28,858 (70.8%)	Max. elevation (m)	736
Saltwater zone area (km^2)	3,063	Wetland (km^2)	650 (1.6%)	Watershed: estuary ratio	3.9
Volume (1,000 x m^3)	63,452,730	Range (km^2)	31 (0.1%)	TSS (tonne y^{-1})	575,000
Depth (m)	19.47	Barren (km^2)	0 (0%)	TN (kg y^{-1})	50,000,000
Tide Height (m)	1.85	Total (km^2)	40,753 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	56	Population	4,914,605	TSS/est. area (tonne km^{-2} y^{-1})	176
		Popn: est. area ratio	1,508	TN/est. area (kg km^{-2} y^{-1})	15,342
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Narragansett Bay

SUMMARY

Narragansett Bay has a high eutrophic expression, worse than the moderate low rating in the 1999 assessment. Moderate chlorophyll-a expression and high macroalgal abundance mostly in the northern part of the bay has led to low dissolved oxygen events and some nuisance/toxic algal blooms in all salinity zones.

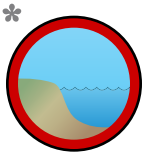


Influencing Factors

Low to moderate nitrogen input and moderate to high susceptibility (moderate ability to dilute and flush nutrients).

Eutrophic Conditions **

High primary and secondary symptom levels indicate serious eutrophication problems.



Future Outlook

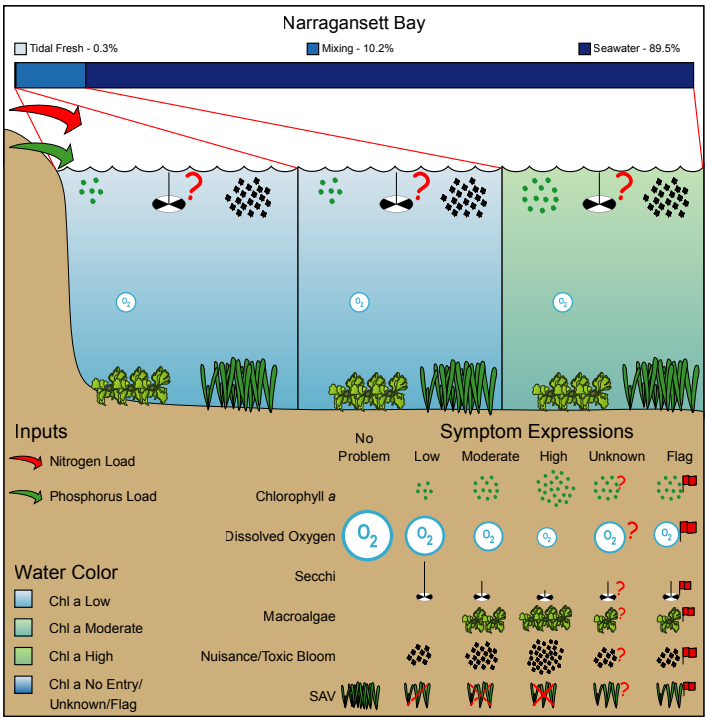
Nutrient related symptoms observed in the estuary are likely to improve.

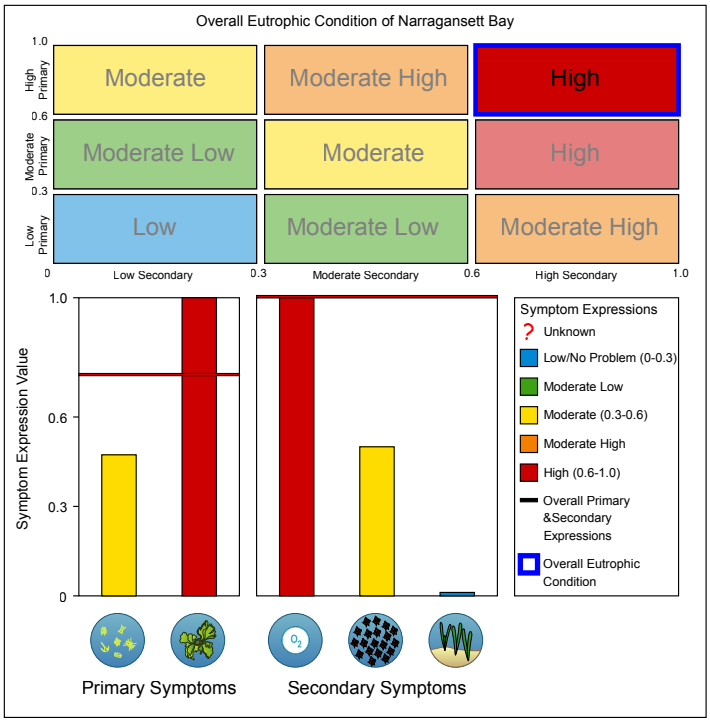
ASSETS Rating

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





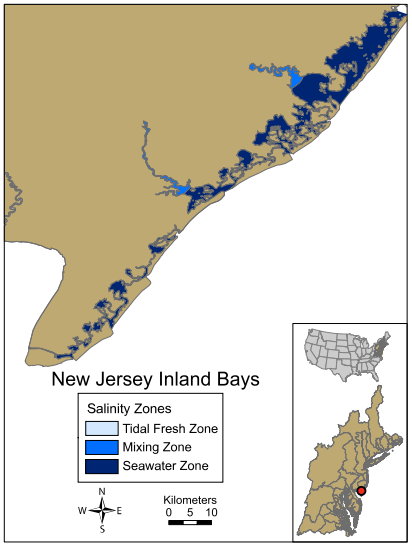
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	416	Urban (km^2)	1,715 (41.5%)	Area (km^2)	4,310
Tidal fresh zone area (km^2)	1	Agriculture (km^2)	225 (5.5%)	Mean elevation (m)	77
Mixing zone area (km^2)	42	Forest (km^2)	2,108 (51%)	Max. elevation (m)	400
Saltwater zone area (km^2)	372	Wetland (km^2)	70 (1.7%)	Watershed: estuary ratio	10.4
Volume (1,000 x m^3)	3,456,960	Range (km^2)	16 (0.4%)	TSS (tonne y^{-1})	116,000
Depth (m)	8.31	Barren (km^2)	0 (0%)	TN (kg y^{-1})	6,993,000
Tide Height (m)	1.19	Total (km^2)	4,134 (0%)	TP (kg y^{-1})	1,207,976
Residence Time (d)	24	Population	1,596,904	TSS/est. area (tonne km^{-2} y^{-1})	279
		Popn: est. area ratio	3,839	TN/est. area (kg km^{-2} y^{-1})	16,810
				TP/est. area (kg km^{-2} y^{-1})	2,904

New Jersey Inland Bays

SUMMARY

New Jersey Inland Bays are characterized by low chlorophyll-a and no problems with dissolved oxygen symptoms. But brown tides have been a problem particularly in the northern part of the system. Additional problems are a result of macroalgae completely covering extensive areas of the bay bottom during blooms which causes significant dieoff of SAVs.

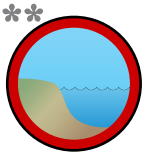


Influencing Factors

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.

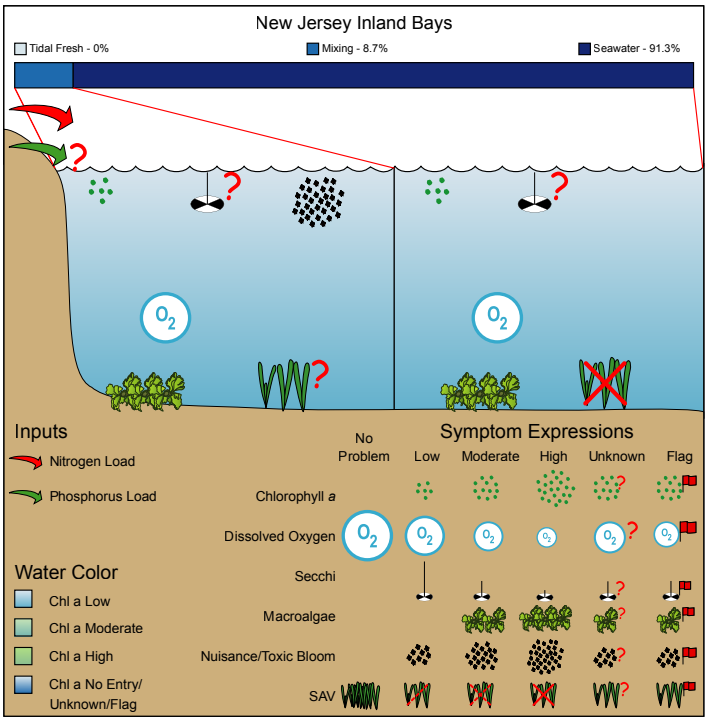
ASSETS Rating

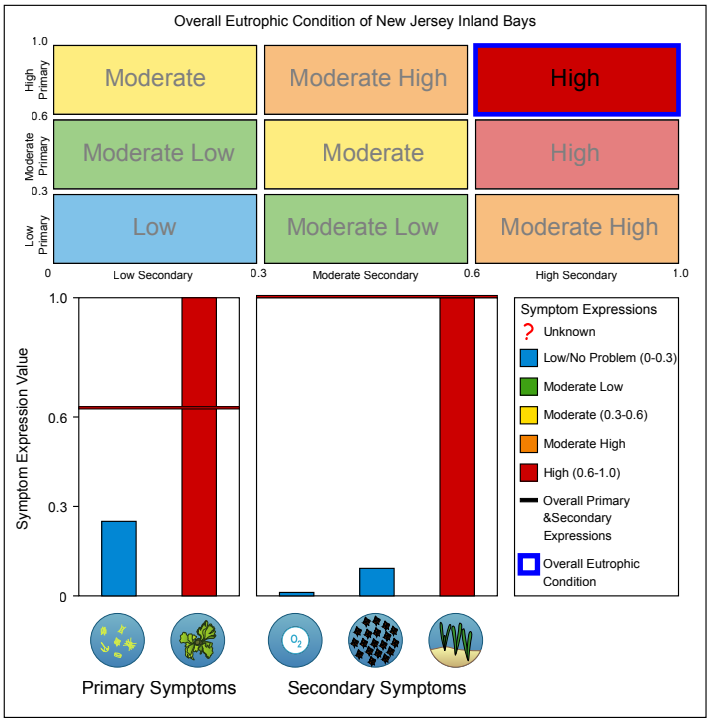
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





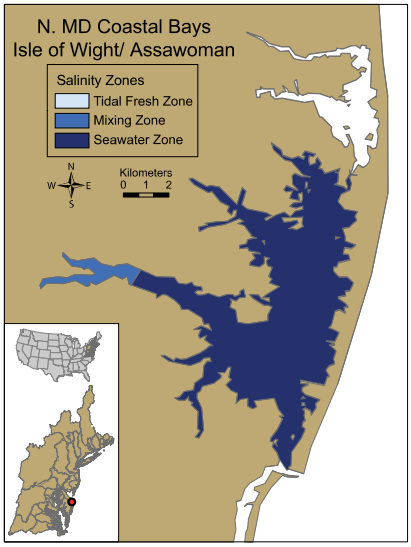
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	278	Urban (km^2)	642 (19.3%)	Area (km^2)	3,431
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	293 (8.8%)	Mean elevation (m)	18
Mixing zone area (km^2)	24	Forest (km^2)	1,567 (47%)	Max. elevation (m)	61
Saltwater zone area (km^2)	254	Wetland (km^2)	829 (24.9%)	Watershed: estuary ratio	12.3
Volume (1,000 x m^3)	308,580	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	99,800
Depth (m)	1.11	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	1,100,000
Tide Height (m)	1.00	Total (km^2)	3,331 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	1	Population	330,178	TSS/est. area (tonne km^{-2} y^{-1})	359
		Popn: est. area ratio	1,188	DIN/est. area (kg km^{-2} y^{-1})	3,957
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

N.MD Coastal Bays (Isle of Wight/ Assawoman)

SUMMARY

Overall eutrophic condition for the northern Maryland Coastal Bays is moderate. Primary symptoms indicate hyper-eutrophic chlorophyll-a levels and moderate macroalgal abundance. Secondary symptoms do not indicate degraded conditions. However, diurnal oxygen values are needed. SAV data reflects mixing zone losses and seawater zone slight gains.



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

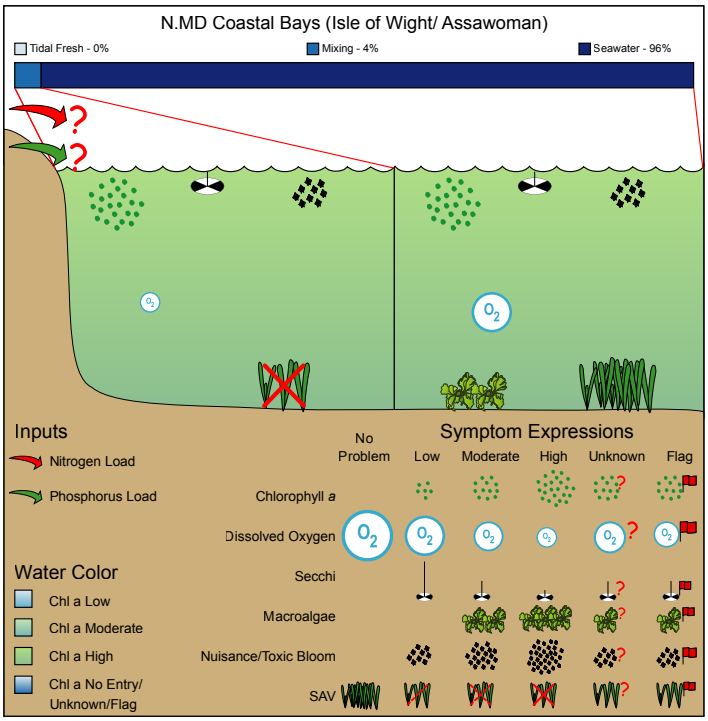
Nutrient related symptoms observed in the estuary are likely to substantially worsen.

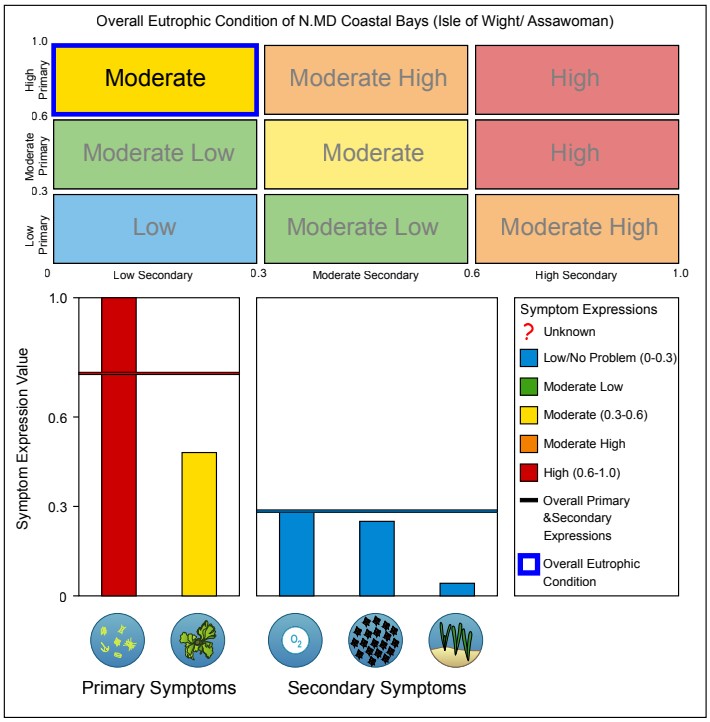
ASSETS Rating

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





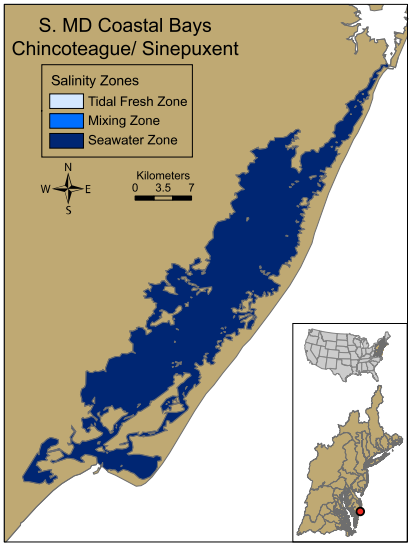
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	54	Urban (km^2)	41 (15.4%)	Area (km^2)	283
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	135 (50%)	Mean elevation (m)	5
Mixing zone area (km^2)	2	Forest (km^2)	78 (28.8%)	Max. elevation (m)	12
Saltwater zone area (km^2)	52	Wetland (km^2)	16 (5.8%)	Watershed: estuary ratio	5.2
Volume (1,000 x m^3)	103,680	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	1,880
Depth (m)	1.92	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.67	Total (km^2)	269 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	4	Population	15,166	TSS/est. area (tonne km^{-2} y^{-1})	35
		Popn: est. area ratio	281	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

S.MD Coastal Bays (Chincoteague/ Sinepuxent)

SUMMARY

The Southern Maryland Coastal Bays are characterized by low flushing and dilution capability, high chlorophyll-a expression, moderate macroalgal abundance, and frequent nuisance/toxic algal blooms. Daytime oxygen concentrations do not indicate severe problems. However, diel analyses are needed in non-stratified systems.

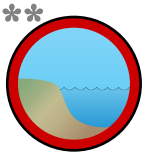


Influencing Factors

Nutrient load is unknown and influencing factors cannot be calculated.

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.

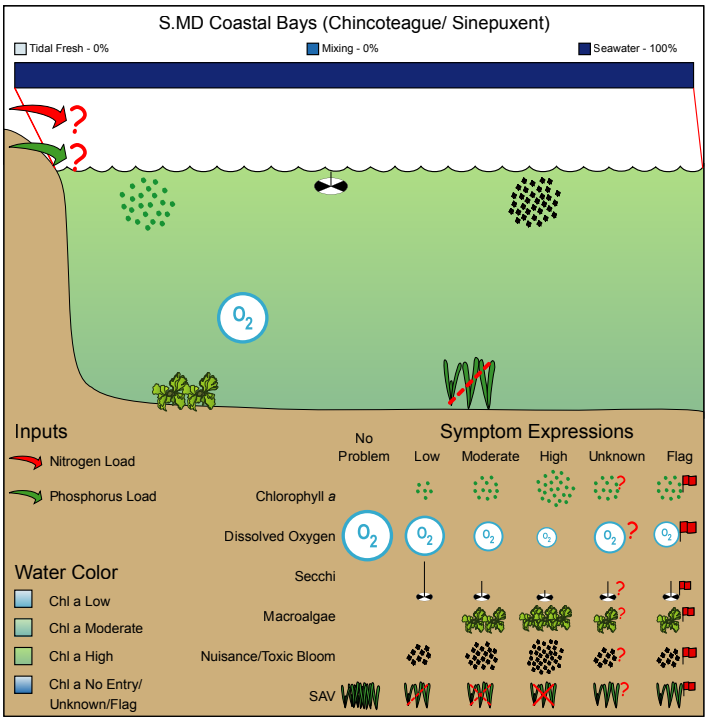
ASSETS Rating

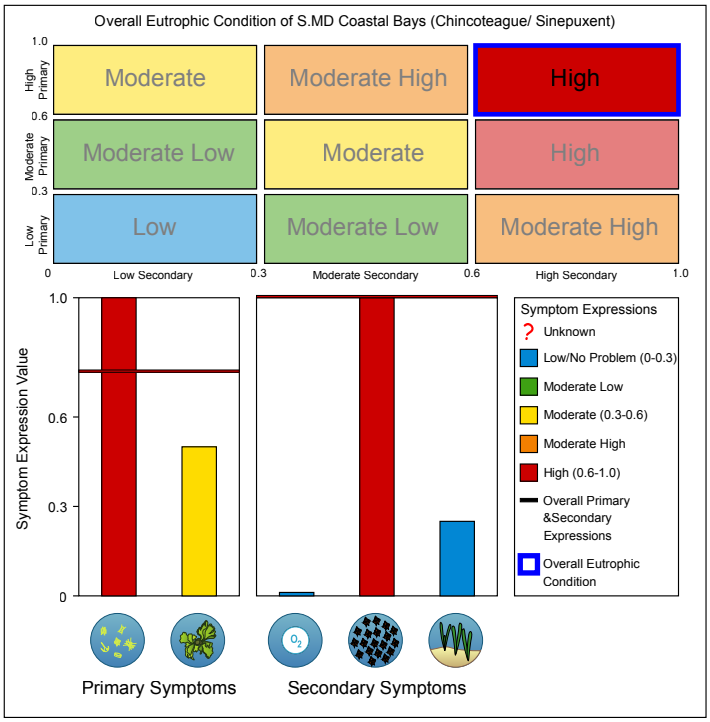
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





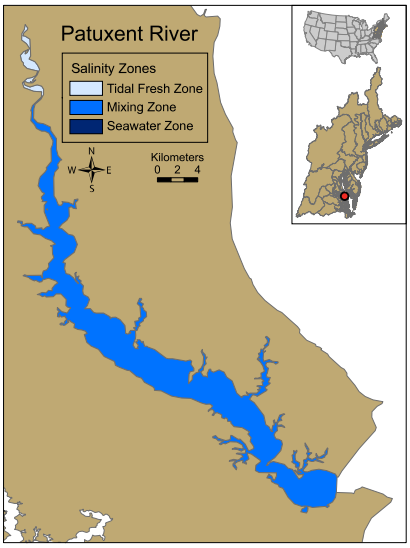
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	335	Urban (km^2)	36 (8.1%)	Area (km^2)	487
Tidal fresh zone area (km^2)	0	Agriculture (km^2)	140 (31.4%)	Mean elevation (m)	5
Mixing zone area (km^2)	0	Forest (km^2)	158 (35.5%)	Max. elevation (m)	13
Saltwater zone area (km^2)	335	Wetland (km^2)	111 (25%)	Watershed: estuary ratio	1.5
Volume (1,000 x m^3)	649,900	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	6,070
Depth (m)	1.94	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.50	Total (km^2)	445 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	8	Population	5,706	TSS/est. area (tonne km^{-2} y^{-1})	18
		Popn: est. area ratio	17	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

Patuxent River

SUMMARY

The Patuxent River's wastewater treatment plants are not meeting nutrient reductions due to population growth, contributing to a high eutrophic expression. It is a very turbid system due to sediments and high chlorophyll-a concentrations, leading to low dissolved oxygen events, some nuisance/toxic algal blooms and reduced light availability for SAV

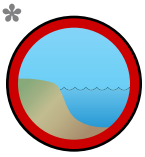


Influencing Factors

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.

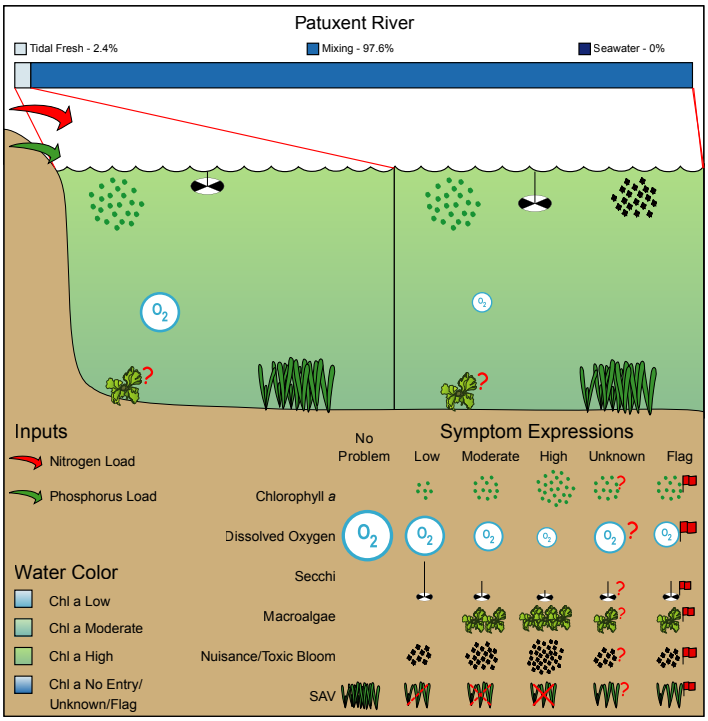
ASSETS Rating

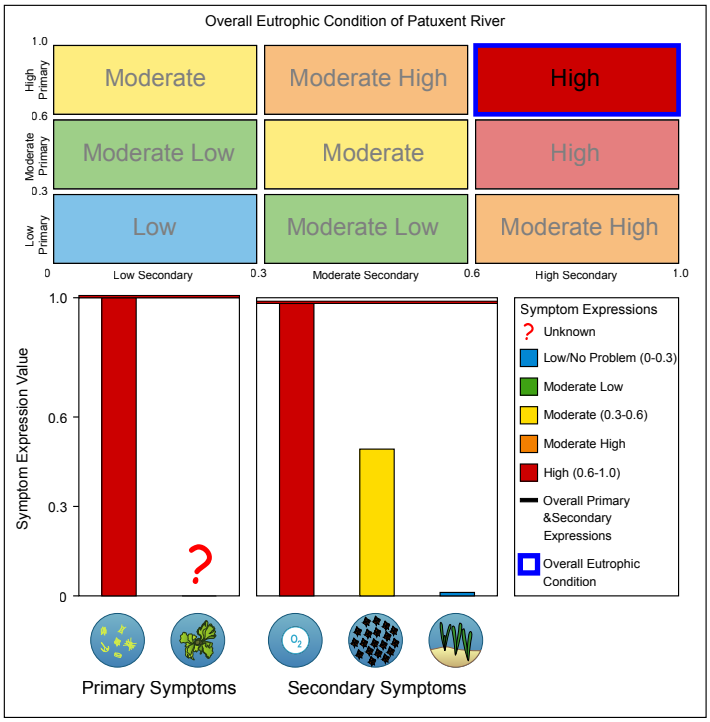
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





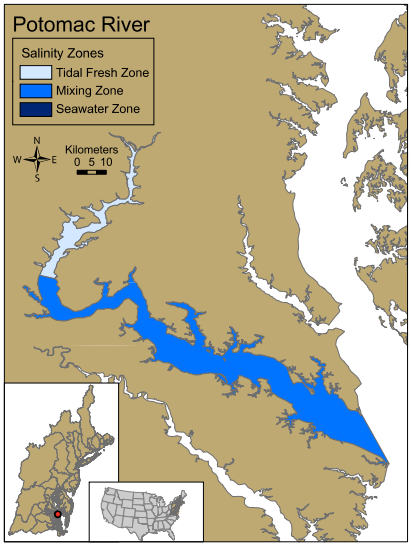
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	142	Urban (km^2)	746 (33.3%)	Area (km^2)	2,504
Tidal fresh zone area (km^2)	3	Agriculture (km^2)	699 (31.2%)	Mean elevation (m)	61
Mixing zone area (km^2)	139	Forest (km^2)	743 (33.2%)	Max. elevation (m)	259
Saltwater zone area (km^2)	0	Wetland (km^2)	52 (2.3%)	Watershed: estuary ratio	17.6
Volume (1,000 x m^3)	536,760	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	100,000
Depth (m)	3.78	Barren (km^2)	0 (0%)	TN (kg y^{-1})	908,974
Tide Height (m)	0.52	Total (km^2)	2,240 (0%)	TP (kg y^{-1})	69,938
Residence Time (d)	26	Population	454,111	TSS/est. area (tonne km^{-2} y^{-1})	704
		Popn: est. area ratio	3,198	TN/est. area (kg km^{-2} y^{-1})	6,401
				TP/est. area (kg km^{-2} y^{-1})	493

Potomac River

SUMMARY

The Potomac River has a high overall eutrophic condition expression and has not changed since the 1999 assessment. High chlorophyll-a symptom expression and frequent nuisance/toxic algal blooms have led to some low dissolved oxygen events. SAV has increased since the last survey but macroalgal abundance is unknown.

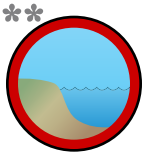


Influencing Factors

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.

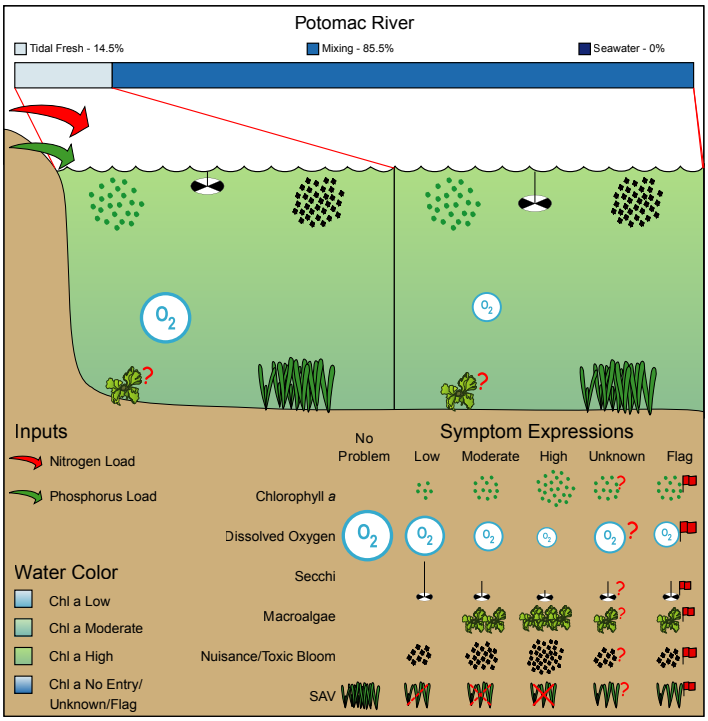
ASSETS Rating

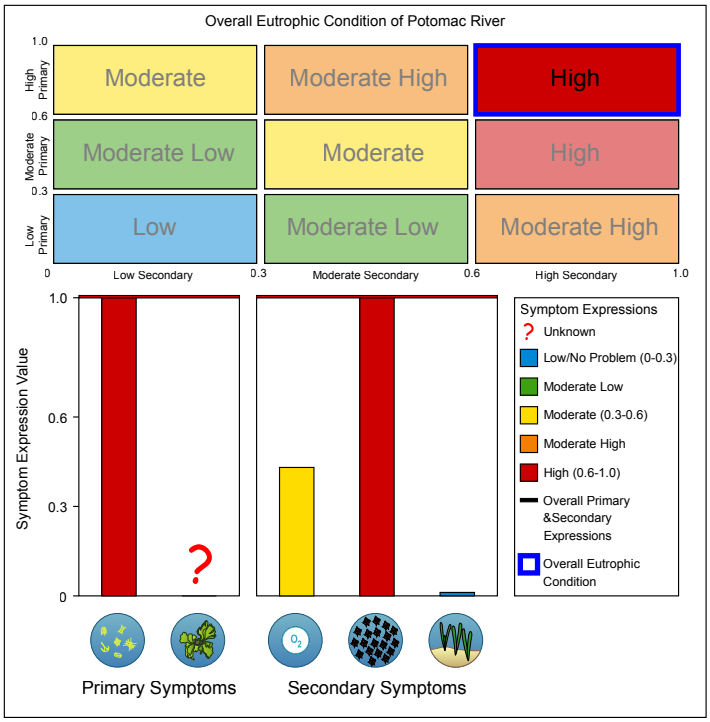
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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

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

EUTROPHIC CONDITION





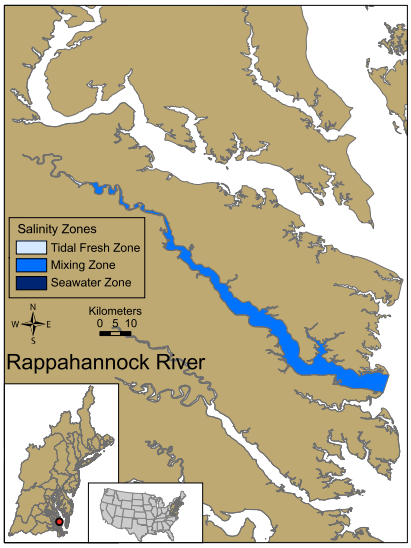
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	1,260	Urban (km^2)	4,206 (11.5%)	Area (km^2)	36,804
Tidal fresh zone area (km^2)	183	Agriculture (km^2)	13,248 (36.3%)	Mean elevation (m)	330
Mixing zone area (km^2)	1,077	Forest (km^2)	18,992 (52%)	Max. elevation (m)	1,433
Saltwater zone area (km^2)	0	Wetland (km^2)	93 (0.3%)	Watershed: estuary ratio	29.2
Volume (1,000 x m^3)	6,463,800	Range (km^2)	3 (0%)	TSS (tonne y^{-1})	305,000
Depth (m)	5.13	Barren (km^2)	0 (0%)	TN (kg y^{-1})	33,773,781
Tide Height (m)	0.55	Total (km^2)	36,542 (0%)	TP (kg y^{-1})	1,474,445
Residence Time (d)	36	Population	4,560,273	TSS/est. area (tonne km^{-2} y^{-1})	242
		Popn: est. area ratio	3,619	TN/est. area (kg km^{-2} y^{-1})	26,805
				TP/est. area (kg km^{-2} y^{-1})	1,170

Rappahannock River

SUMMARY

The Rappahannock River has a moderate eutrophic expression. While point and non-point sources of nutrients have decreased, the system remains highly susceptible. It has a high chlorophyll-a symptom expression, leading to some low dissolved oxygen events, some nuisance/toxic algal blooms and some loss of SAV. Macroalgae abundance is low.

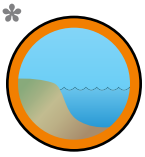


Influencing Factors

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

Nutrient related symptoms observed in the estuary will most likely stay the same.

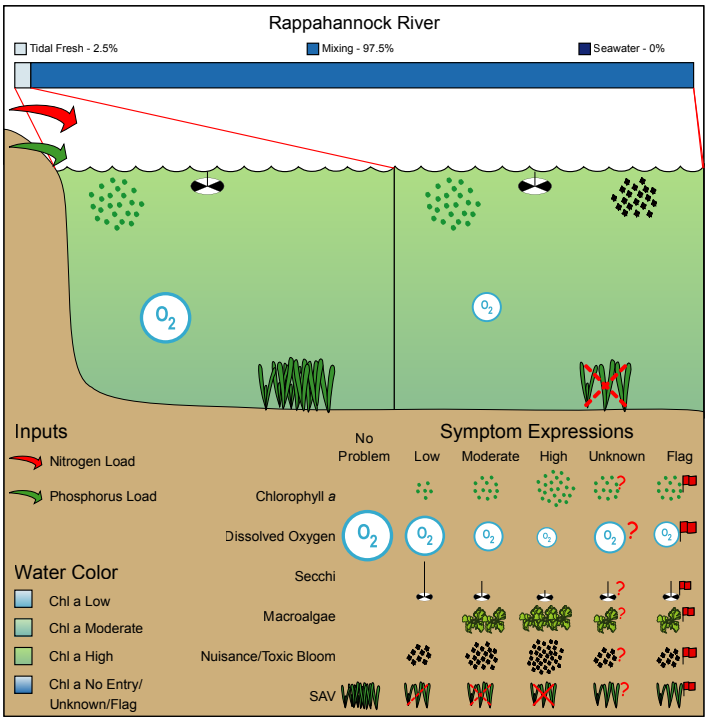
ASSETS Rating

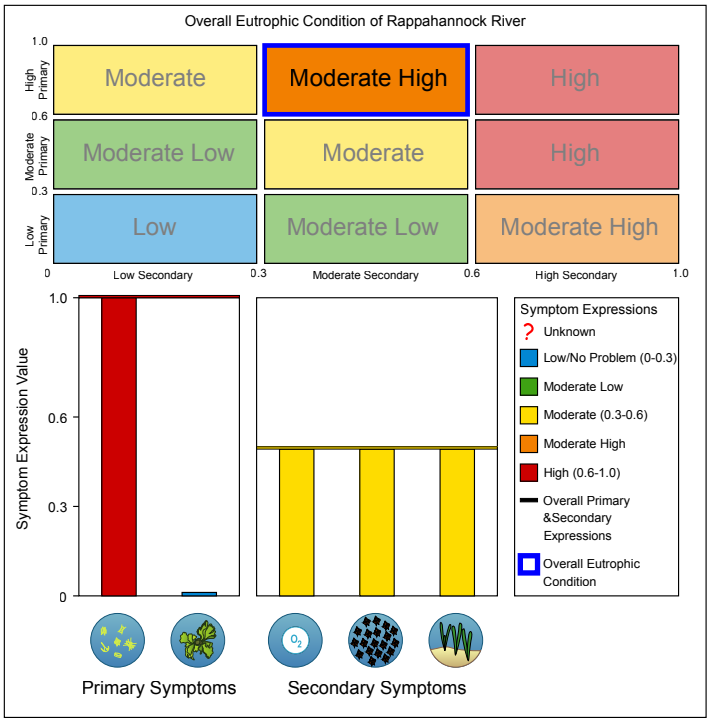
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





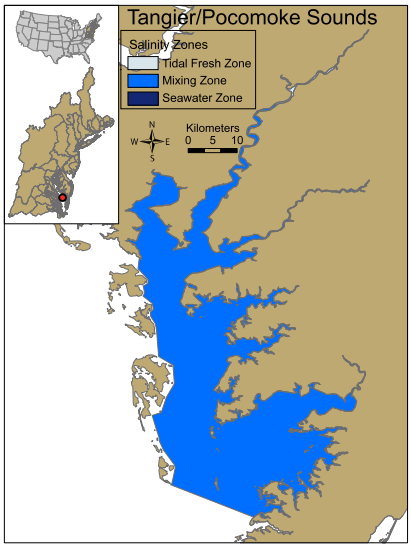
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	377	Urban (km^2)	386 (5.9%)	Area (km^2)	6,664
Tidal fresh zone area (km^2)	9	Agriculture (km^2)	2,481 (37.7%)	Mean elevation (m)	140
Mixing zone area (km^2)	368	Forest (km^2)	3,636 (55.2%)	Max. elevation (m)	1,158
Saltwater zone area (km^2)	0	Wetland (km^2)	80 (1.2%)	Watershed: estuary ratio	17.7
Volume (1,000 x m^3)	1,413,750	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	61,600
Depth (m)	3.75	Barren (km^2)	0 (0%)	TN (kg y^{-1})	2,536,254
Tide Height (m)	0.53	Total (km^2)	6,584 (0%)	TP (kg y^{-1})	281,402
Residence Time (d)	24	Population	181,861	TSS/est. area (tonne km^{-2} y^{-1})	163
		Popn: est. area ratio	482	TN/est. area (kg km^{-2} y^{-1})	6,728
				TP/est. area (kg km^{-2} y^{-1})	746

Tangier/Pocomoke Sounds

SUMMARY

While parts of Tangier and Pocomoke Sounds have improved other areas have worsened, leading to a moderate eutrophic expression with no change in overall conditions since 1999. The sounds are mainly affected by nutrient runoff from animal and agricultural sources. While low dissolved oxygen events are minimal, there have been moderate losses of SAV.

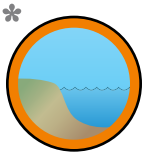


Influencing Factors

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

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

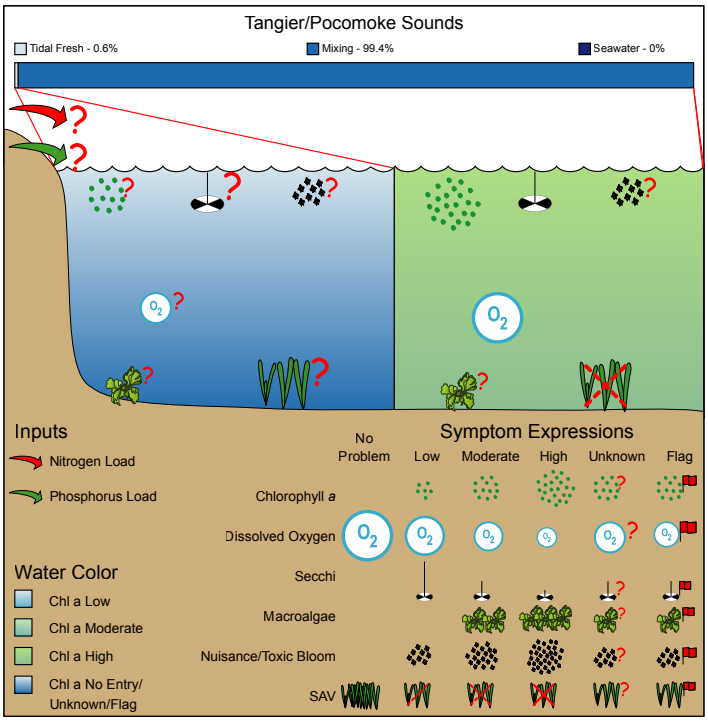
ASSETS Rating

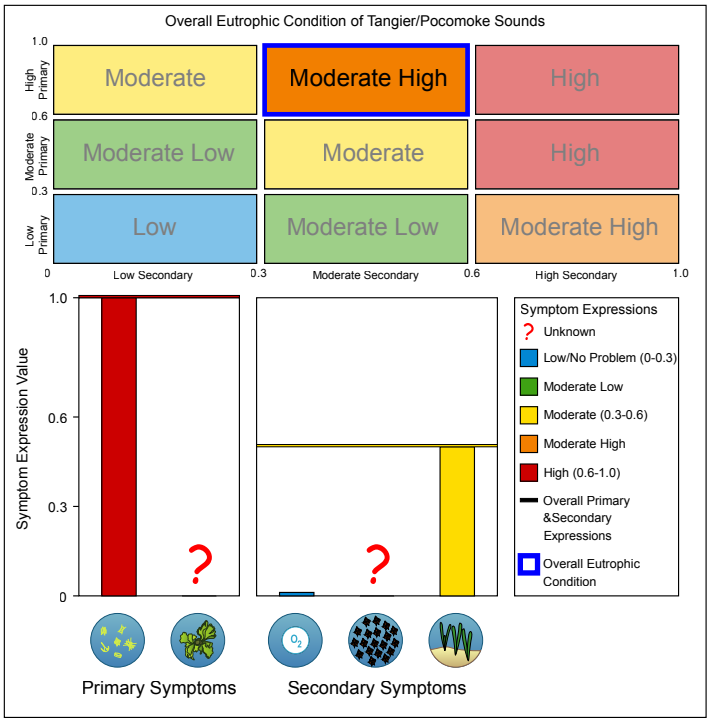
Assessment of Estuarine Trophic Status based on the three factors evaluated in NEEA.

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





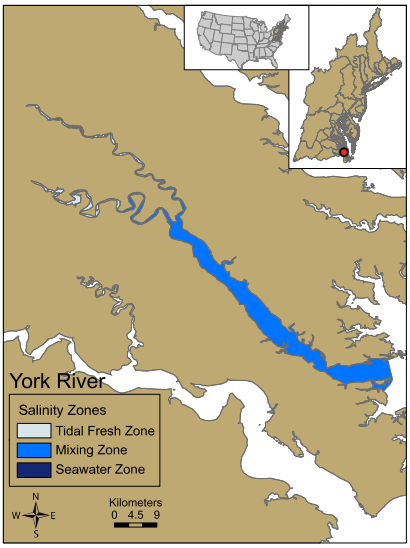
WATERSHED AND ESTUARY CHARACTERISTICS

Estuary		Landuse / Population		Watershed Details / Input Loads	
Area (km^2)	1,057	Urban (km^2)	249 (4.2%)	Area (km^2)	5,532
Tidal fresh zone area (km^2)	6	Agriculture (km^2)	2,359 (40%)	Mean elevation (m)	8
Mixing zone area (km^2)	1,051	Forest (km^2)	2,484 (42.1%)	Max. elevation (m)	30
Saltwater zone area (km^2)	0	Wetland (km^2)	803 (13.6%)	Watershed: estuary ratio	5.2
Volume (1,000 x m^3)	3,477,530	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	58,400
Depth (m)	3.29	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	Unknown
Tide Height (m)	0.67	Total (km^2)	5,895 (0%)	DIP (kg y^{-1})	Unknown
Residence Time (d)	12	Population	183,170	TSS/est. area (tonne km^{-2} y^{-1})	55
		Popn: est. area ratio	173	DIN/est. area (kg km^{-2} y^{-1})	Unknown
				DIP/est. area (kg km^{-2} y^{-1})	Unknown

York River

SUMMARY

The York River is characterized by a high chlorophyll-a symptom expression and moderate macroalgal symptom expression, leading to some dissolved oxygen problems and moderate level problems with nuisance/toxic blooms. There is little loss of SAV. There is a high variability in conditoins among tidal fresh, mixing and seawater zones.

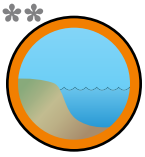


Influencing Factors

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

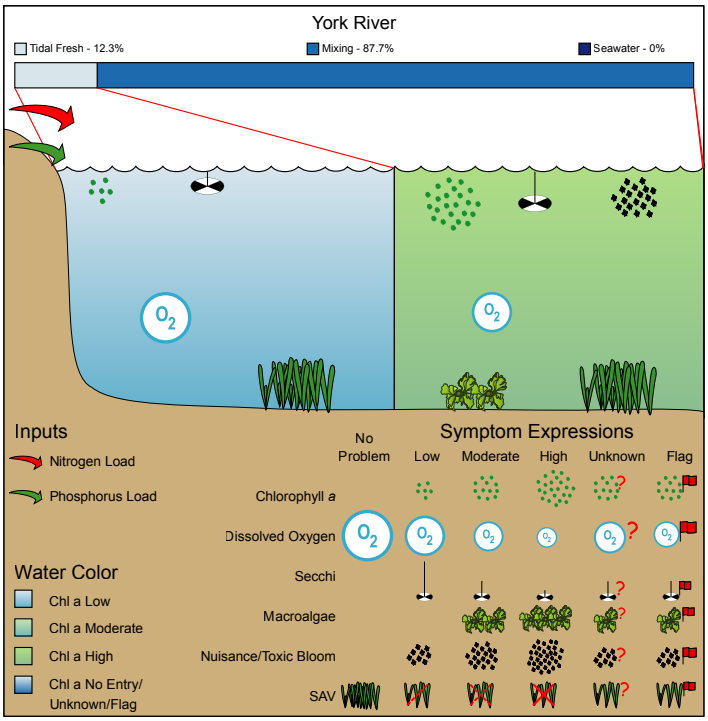
Nutrient related symptoms observed in the estuary will most likely stay the same.

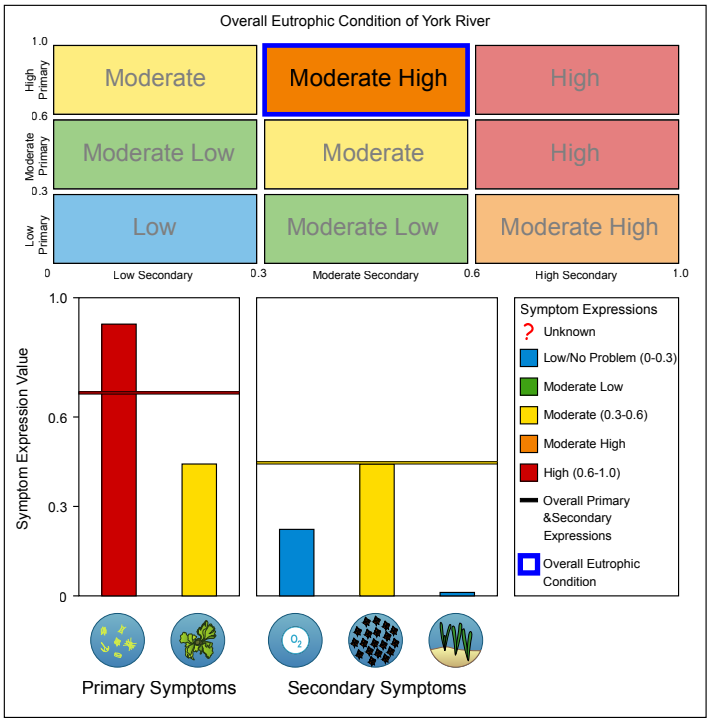
ASSETS Rating

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)	206	Urban (km^2)	306 (4.6%)	Area (km^2)	6,708
Tidal fresh zone area (km^2)	25	Agriculture (km^2)	1,595 (24.2%)	Mean elevation (m)	65
Mixing zone area (km^2)	181	Forest (km^2)	4,512 (68.5%)	Max. elevation (m)	392
Saltwater zone area (km^2)	0	Wetland (km^2)	171 (2.6%)	Watershed: estuary ratio	32.6
Volume (1,000 x m^3)	786,920	Range (km^2)	0 (0%)	TSS (tonne y^{-1})	148,000
Depth (m)	3.82	Barren (km^2)	0 (0%)	DIN (kg y^{-1})	1,378,692
Tide Height (m)	0.82	Total (km^2)	6,584 (0%)	TP (kg y^{-1})	196,099
Residence Time (d)	11	Population	163,697	TSS/est. area (tonne km^{-2} y^{-1})	718
		Popn: est. area ratio	795	DIN/est. area (kg km^{-2} y^{-1})	6,693
				TP/est. area (kg km^{-2} y^{-1})	952