

# 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.



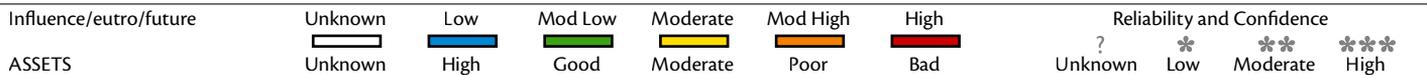
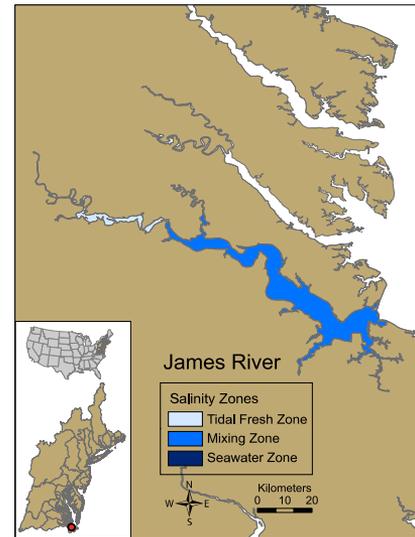
## Future Outlook

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

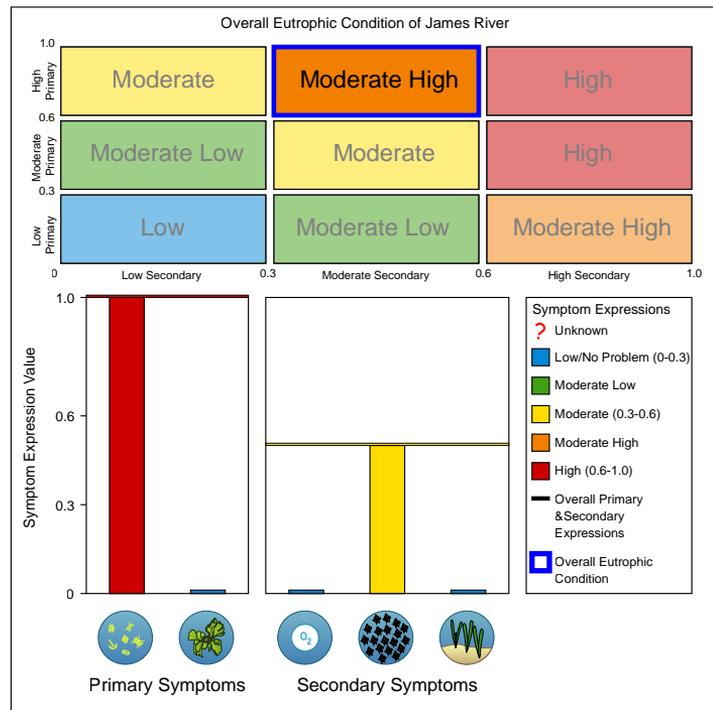
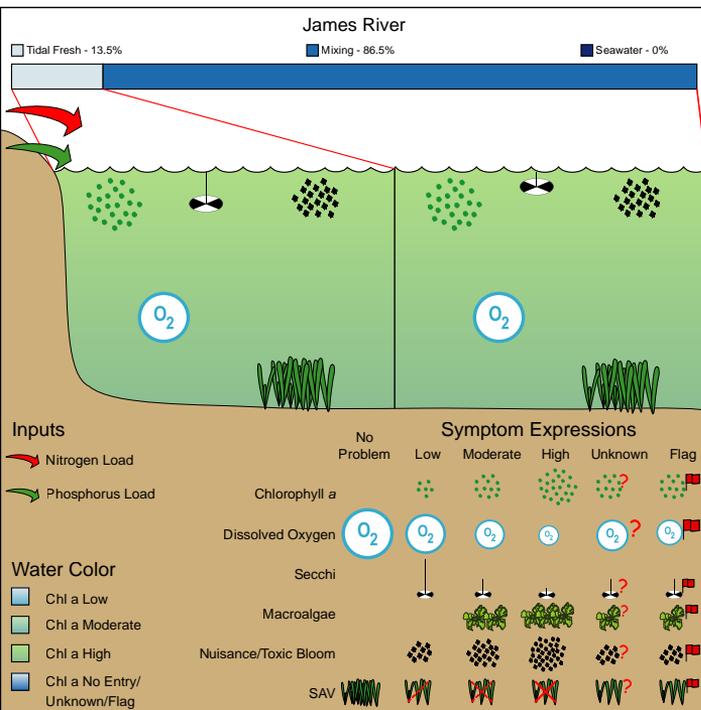


## ASSETS Rating

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



## EUTROPHIC CONDITION



## WATERSHED AND ESTUARY CHARACTERISTICS

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