



The Importance Of Water Quality and Eutrophication Models:

Understanding the Causes of Improving And Degrading Water Quality

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01 February 2019

Water Quality Models

What are they?



Water Quality Models

What are they?

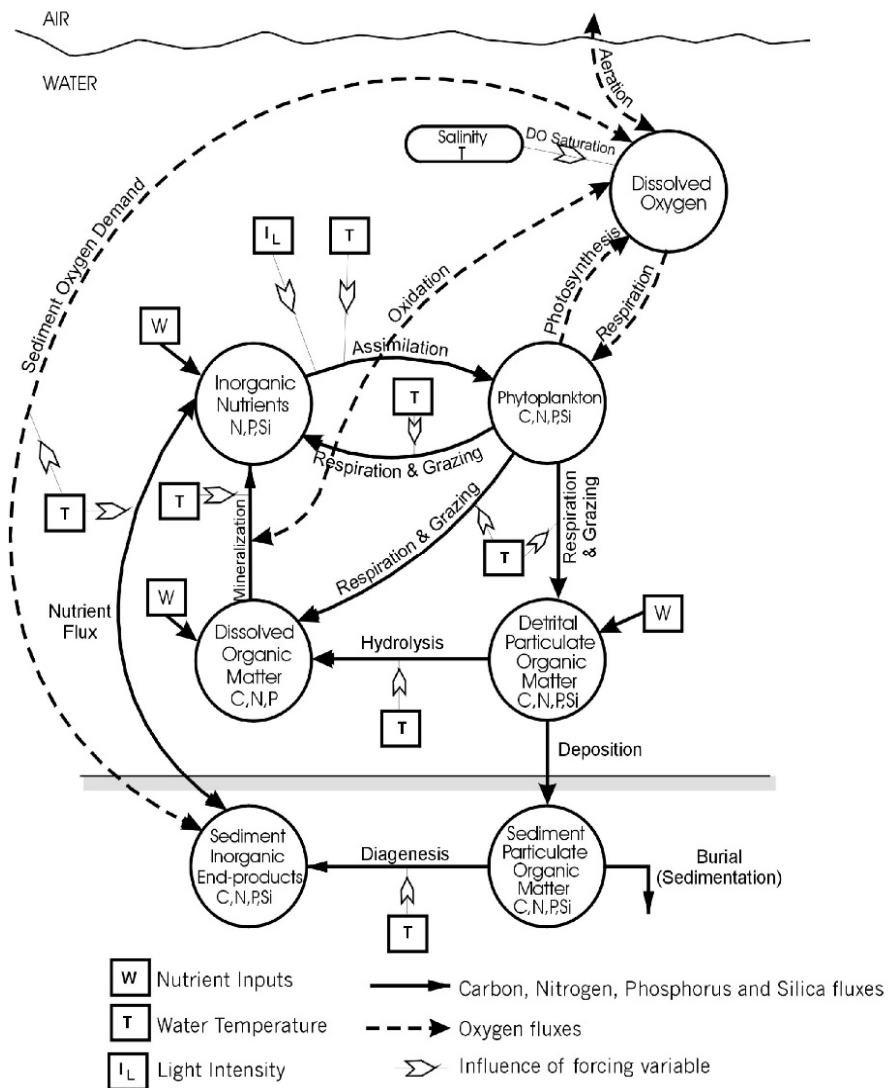


Expert Chemist

(GC) and high-resolution/accurate-mass (HRAM) Orbitrap mass spectrometry



Expert Modeler





The Dilemma of Controlling Cultural Eutrophication of Lakes

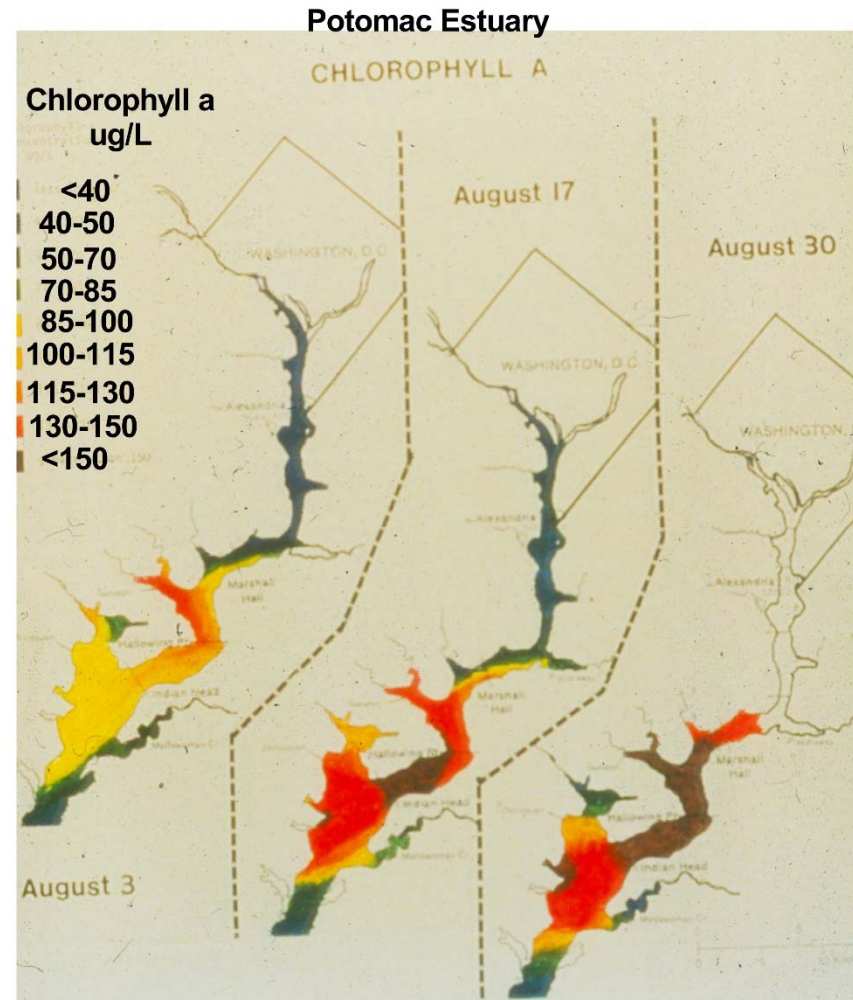
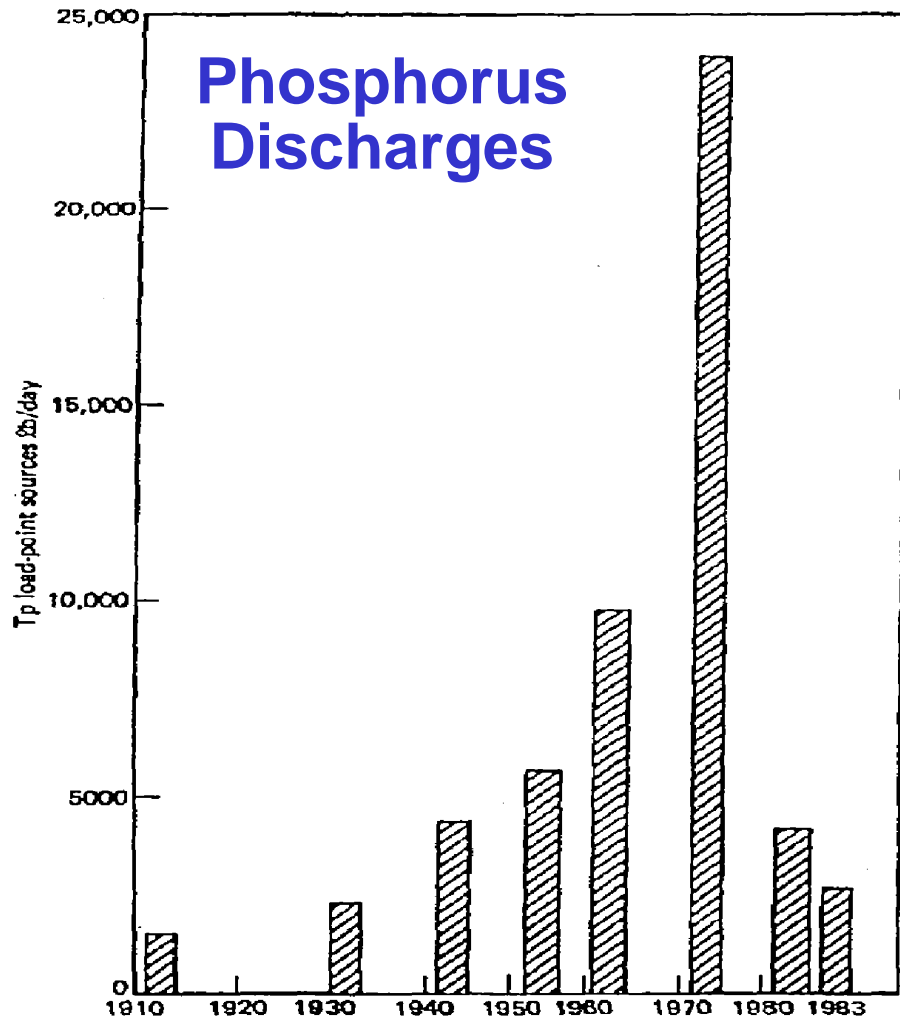
David W. Schindler*

“After decades of debate, there is still controversy about how to reduce eutrophication of estuaries.”

“Despite recent claims that reducing nitrogen is essential to curbing estuarine eutrophication, there is no documented case history of where this has been successful”

*Proceedings: Biological Sciences, Vol. 279, No. 1746 2012

Potomac Estuary



Potomac Estuary Model

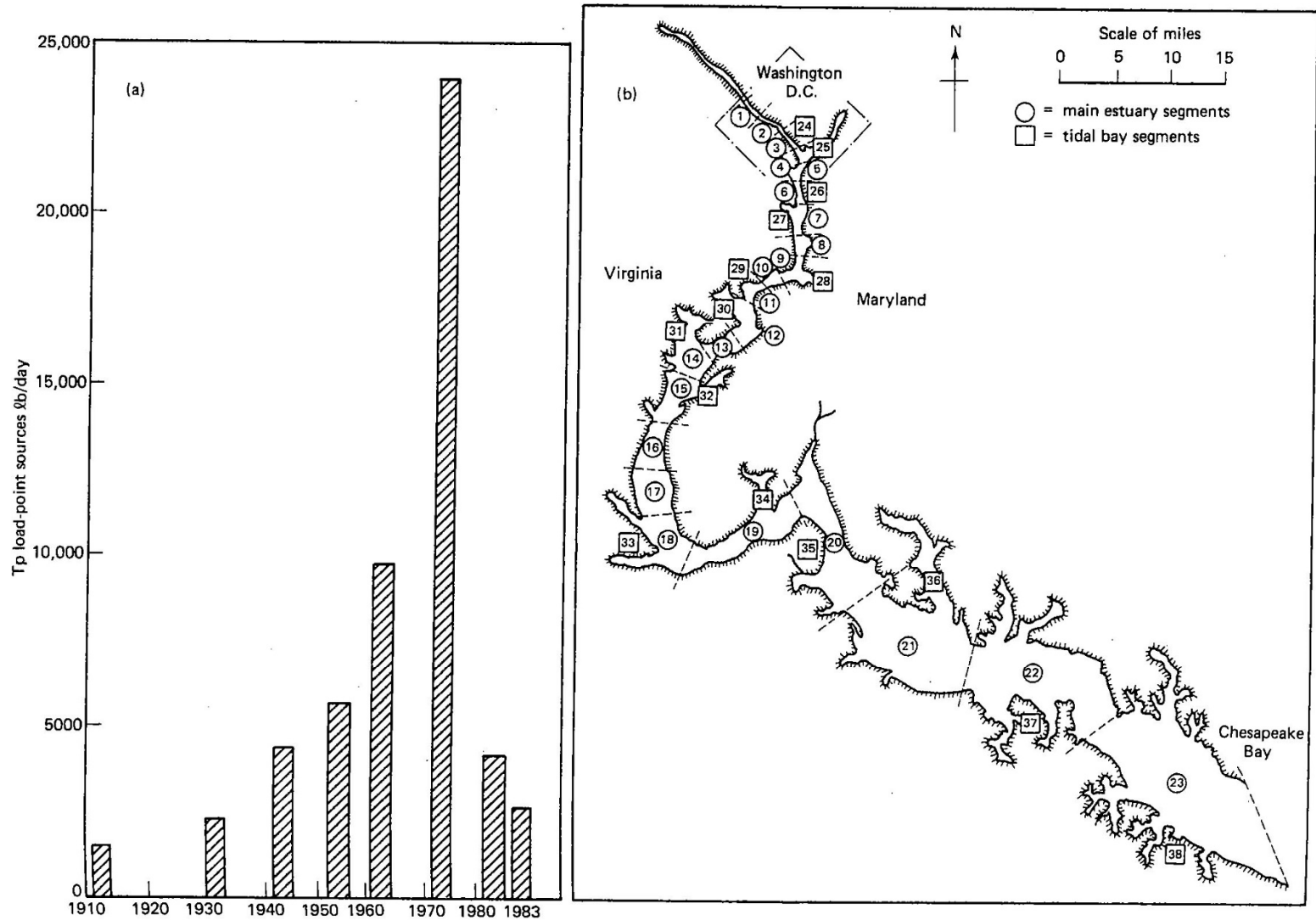


Figure 7.44 (a) Point source total phosphorus loadings for selected years. (b) Segmentation for Potomac eutrophication model (PEM). (a) From Jaworski et al. (1971); Thomann et al. (1985). (b) From Thomann and Fitzpatrick (1982).

1982 Calibration

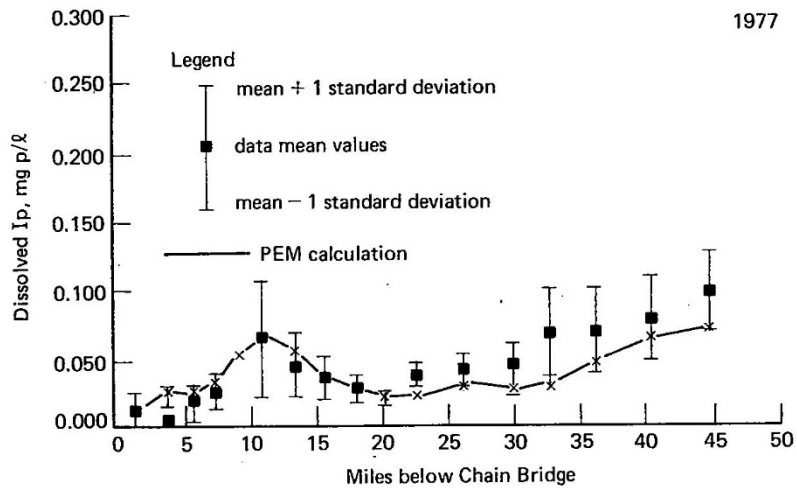
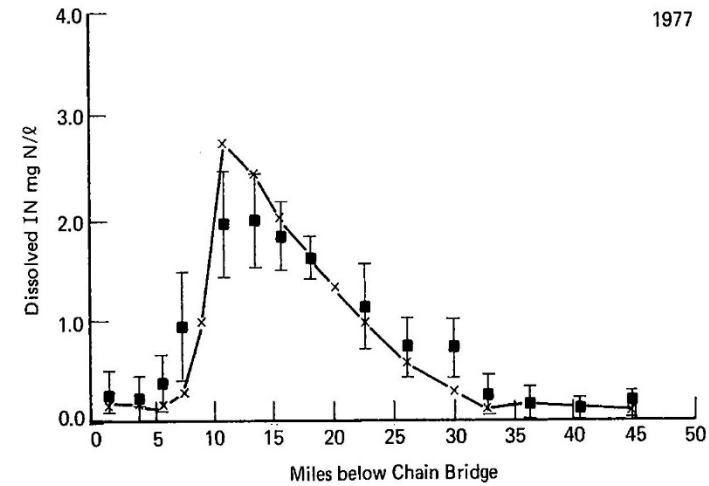
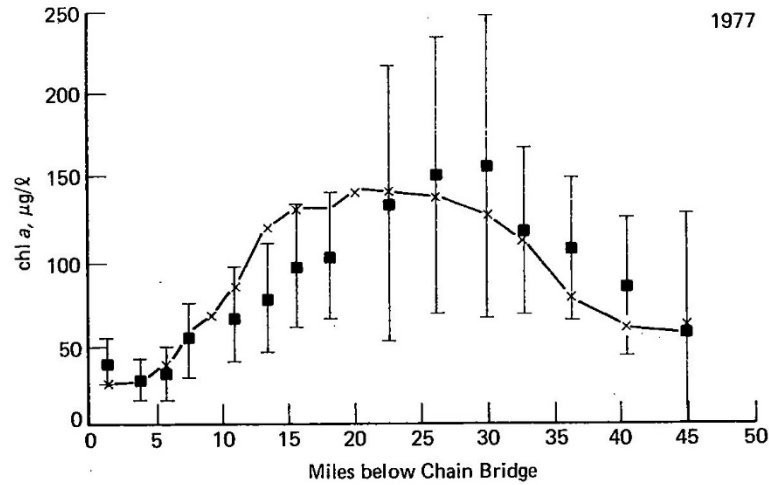
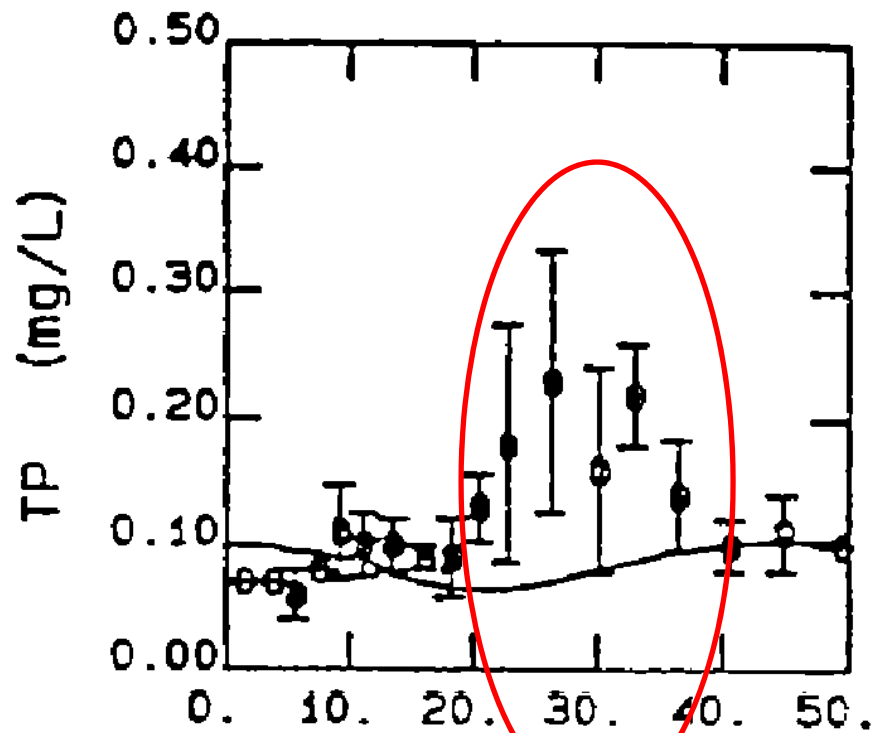


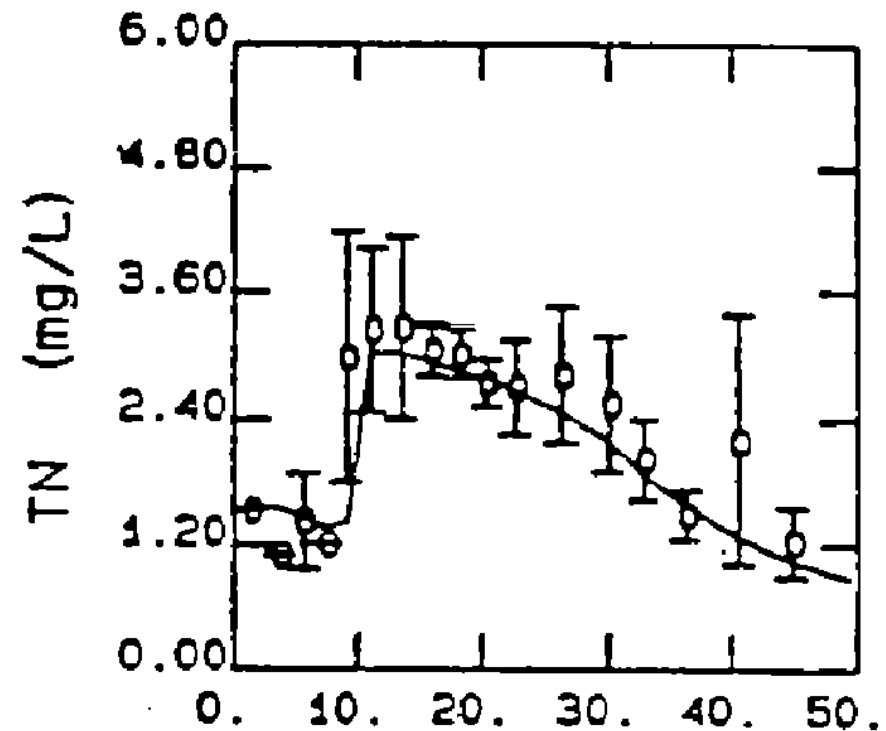
Figure 7.45 Summer mean chlorophyll (top), dissolved inorganic phosphorus (middle), and nitrogen (bottom) in Potomac Estuary. From Thomann and Fitzpatrick (1982).

Potomac Estuary Nutrients Model Results and Observations

Phosphorus



Nitrogen



Distance from Chain Bridge (mi)



Analysis of Recontamination of Completed Sediment Remedial Projects*

“Twenty completed sediment remediation projects,
which included both dredging and capping remedies,
have been identified as having become
recontaminated after remedial construction”

* snadeau@honigman.com

Using an Available Model

- Comparison of loading and observed WQ concentrations
- Unusual concentrations – Excess N & P, low DO
- Interpolating observed survey data
- Eliminating unnecessary stations