

National Estuarine Nutrient Criteria

US EPA Office of Science and Technology

Thoughts about input from National Estuaries Experts Workgroup

Jonathan Sharp

MAC Meeting 20 February 2006

National Estuaries Experts Workgroup

EPA – Ifey Davis, Tiffany Crawford, Ed Dettmann, Amie Howell, Jan Kurtz, Jim Lattimore, many others

NOAA – Jawed Hameedi, Suzanne Bricker

Processes Group:

Jon Sharp – U. Delaware Ted Smayda – U Rhode Island

Hans Paerl – U North Carolina Mike Kennish – Rutgers U

Walt Boynton, Pat Glibert – U Maryland

Jim Cloern – USGS Dick Dugdale – San Francisco State U

Chris Madden – SFWMD Marty Lebo – Weyerhaeuser

Jim Hagy – EPA Pensacola Cheryl Brown – EPA Corvallis

Dave Flemer – EPA retired

Subgroups of Workgroup

Processes Group – Jon Sharp, Chair

- **Evaluate ecosystem response of nutrients**

Typology Group – Chris Madden (South Florida Water Management District), Effectively Chair

- **Differentiate estuarine types for different expressions**

Database Group – Cindy Heil (State of Florida) - Chair

- **Identify and develop estuarine databases**

Report from Workgroup

Advanced draft to be completed in spring of 2007

Ready for various levels of review in summer-fall 2007

EPA with criteria recommendations to states by winter 2007

Strong suggestions from Workgroup:

- **Should manage estuaries on ecosystem basis**
- **Should use responses (chlorophyll, dissolved oxygen), not uniform nutrient concentrations for criteria**
- **Should recognize differences in estuaries**

Case Study Chapter for Report

Narragansett Bay

New Jersey Coastal bays

Delaware Estuary

Chesapeake Bay

Maryland Coastal bays

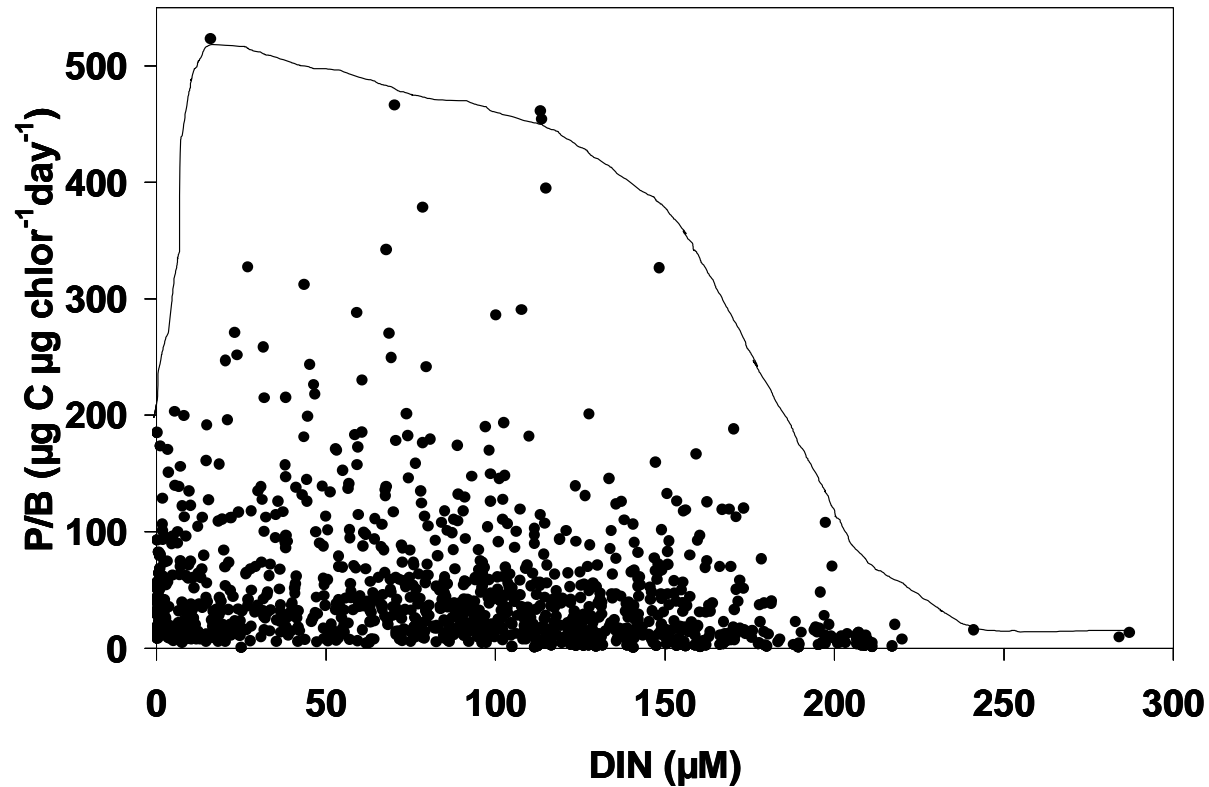
Neuse River Estuary

Pensacola Bay

Florida Bay

San Francisco Bay

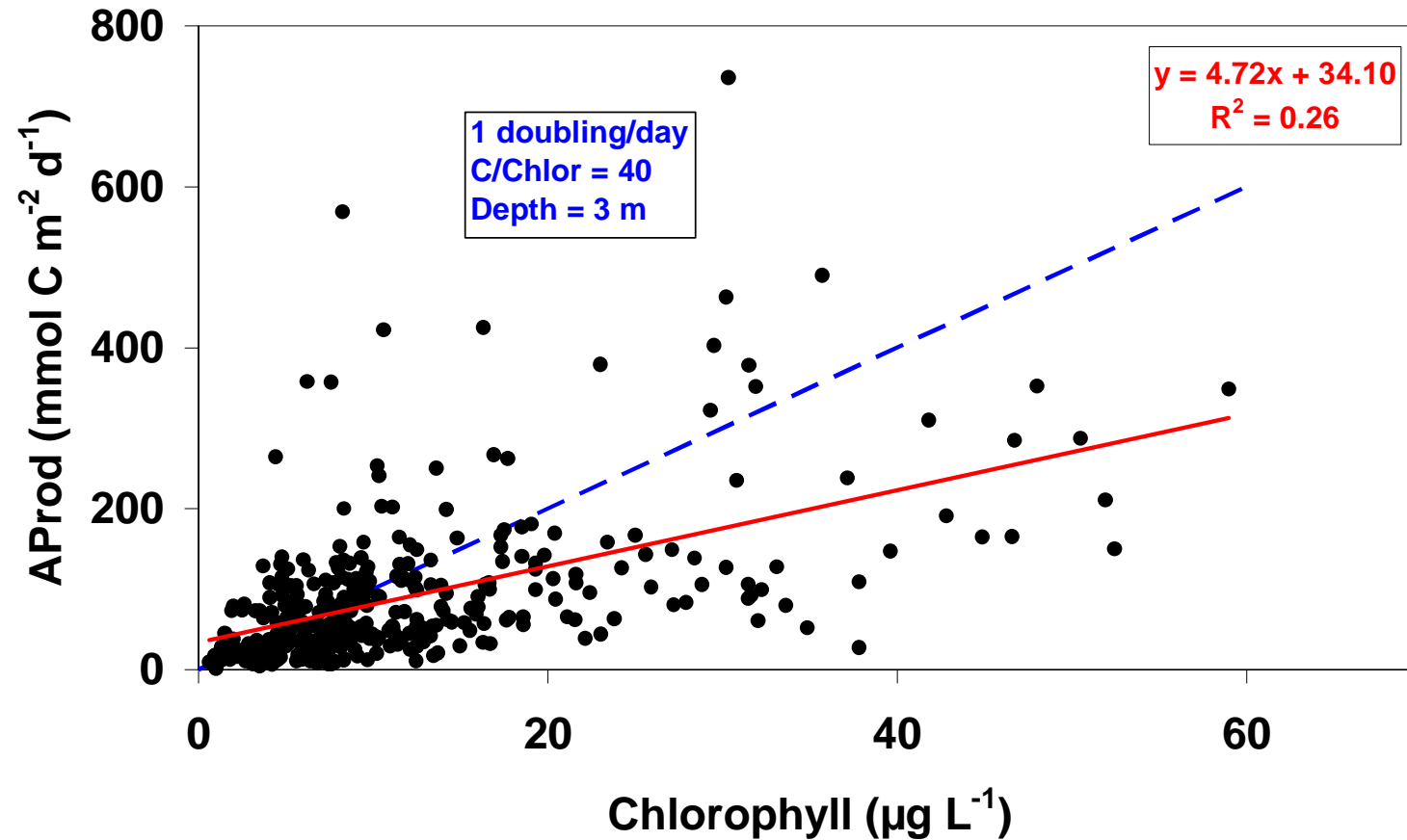
Yaquina Bay



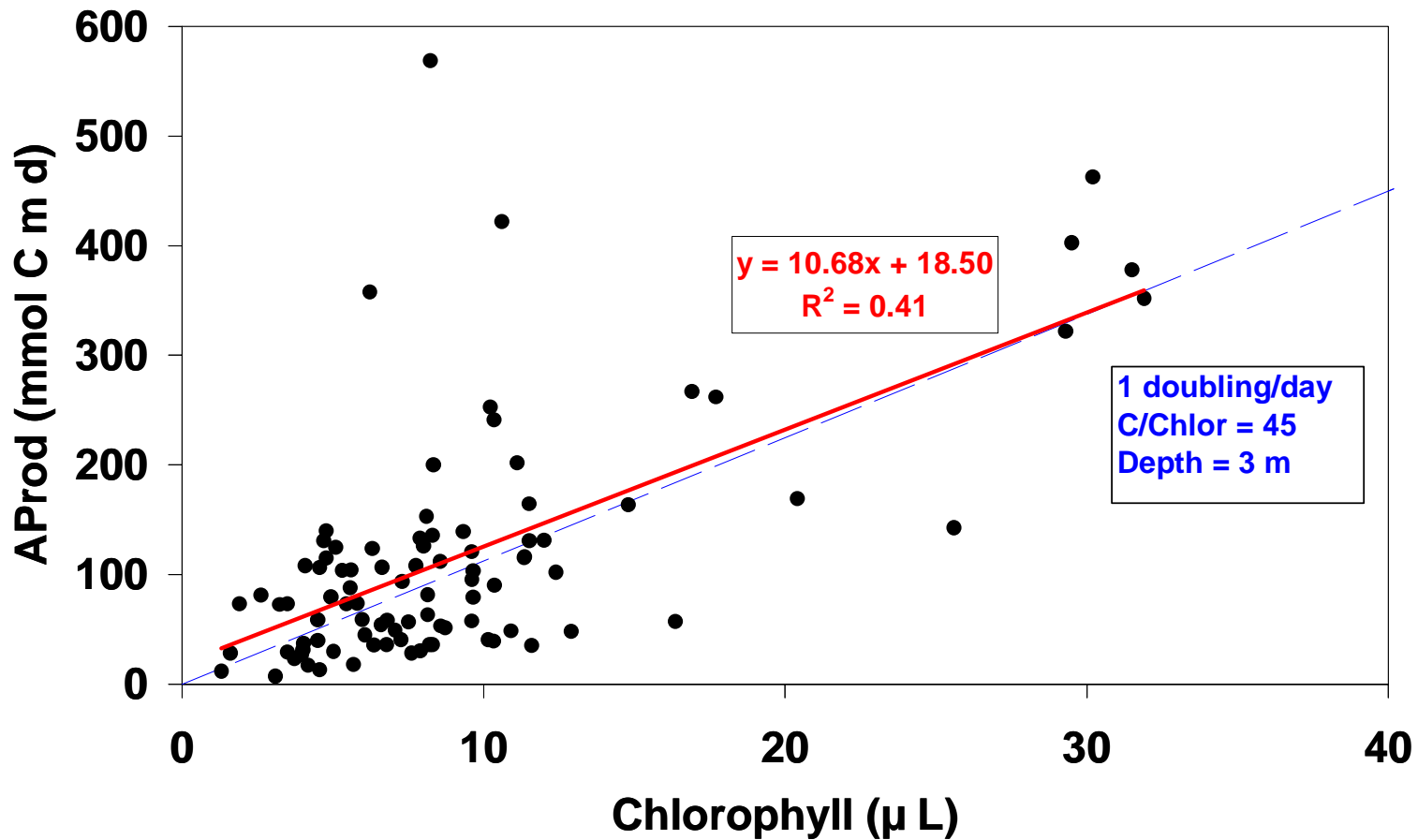
Production in the Delaware Estuary for all regions of the estuary for all seasons versus ambient total dissolved inorganic nitrogen (DIN) concentration. A threshold is reached and there is lower production at very high DIN concentrations.

Similar pictures for P/B or chlorophyll vs nutrients for Neuse, Barnegat Bay, Narragansett Bay, San Francisco Bay, Appalachicola Bay

Summer - All Regions



Poor correlation between chlorophyll and primary production for Delaware Estuary – similar poor correlation for Neuse (not examined in others).



For just mid-bay (area of year-round production maximum) with measured 1% light level around 3 m – good fit. Also good fits with appropriate light levels and C/chlor for lower bay (deeper light, lower C/chlor), urban river (2 m light level, very low C/chlor), poor correlation with any model for turbidity maximum region.

Conclusion

Combining monitoring data with research information, can develop metrics with which to assess impacts of nutrient inputs and then develop criteria appropriate for ecosystem results.