

# Historical Point Source Discharges to the St. Croix River

**Issue:** How have permitted point source discharges contributed to nutrient loading in the St. Croix?

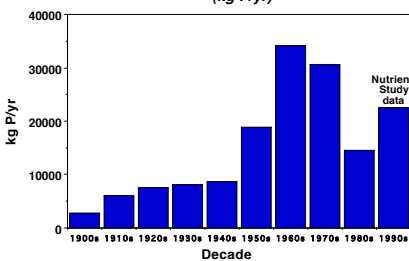
## Nutrient loading

- ✓ Compared to many Midwest rivers, the St. Croix River is perceived to be a relatively pristine and healthy ecosystem
- ✓ 150 years of landuse changes, including logging, agriculture, and urbanization, have impacted the St. Croix River with increased nutrient and sediment loads. Settlement brought minor changes; however, nutrient loads have increased dramatically in the last 50-60 years
- ✓ One source of nutrient loading to the St. Croix River has been point source dischargers, the municipal, industrial, and agricultural facilities permitted to release effluent into the St. Croix River and its watershed.

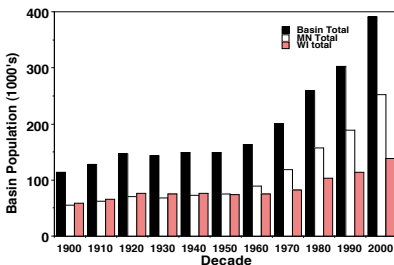
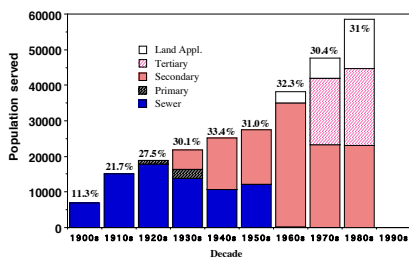
## Our research shows

- ✓ There have been as many as 160-180 permitted point source dischargers including municipal, industrial, and agricultural facilities in the St. Croix Valley since 1905
- ✓ A population of 150,000 lived in the St. Croix Valley from 1900 to 1950, but has since steadily increased to nearly 400,000 in the 2000 census. Over 500,000 residents are predicted by 2020. About 1/3 of the population is served by wastewater treatment
- ✓ Early wastewater management typically discharged untreated sewage; technological advances had secondary treatment in place at most facilities by the 1960s and much of the population served by tertiary treatment in the 1990s
- ✓ We used records of treatment technology, demographics, estimates of per capita P production, and discharge data to estimate historical point source loading
- ✓ Peak nutrient discharges from point sources occurred in the 1960s-1970s. We estimate 1990s point source loadings at 48 metric tons P per year. This represents about 11% of the total phosphorus loading to the basin
- ✓ Without additional controls, we estimate by 2020 annual point source phosphorus loading to be 70 metric tons or 13% of the total loading
- ✓ However, if we account for natural or background P loading to the St. Croix (166 tons/yr), point sources contribute nearly 20% of the current and future phosphorus load

Phosphorus from Minnesota Municipal Point Sources (kg P/yr)



Wastewater Treatment in the St. Croix Basin-Minnesota



## Funding Partners

National Park Service  
Science Museum of Minnesota

April 01, 2005

## Contact

Mark B. Edlund, Ph.D.  
St. Croix Watershed Research Station  
16910 152<sup>nd</sup> St. N  
Marine on St. Croix, MN 55047

