DEQ Department of Environmental Quality

A Strategic Environmental Quality Monitoring Program for Michigan's Surface Waters: Chemical Trends in Sediments

Selected Results for

MICHIGAN STATE UNIVERSITY

Higgins Lake

Basic Data

Date sampled	5 August 1999
Location of lake	Roscommon County
Sampling site on lake	44°29.629'N 84°45.588'W
Surface area of lake	9600 acres
Water depth at	

sampling site	136 feet
Depth of core into sediment	41 cm
Sedimentation rate	232 $g/m^2/y$
Age of oldest section	1729
Focusing factor	2.02

Comments

There are four major processes controlling chemical loading to Higgins Lake :

1. Changes in atmospheric input, effected by environmental legislation and industrial activities (lead),
2. Changes in sediment input, effected by land use change and changes in erosion (aluminum, barium, and magnesium),
3. Biogeochemical dynamics, effected by redox remobilization – movement of metals after they are deposited (arsenic, iron and manganese),
4. Direct anthropogenic inputs (cadmium, chromium, copper and zinc)

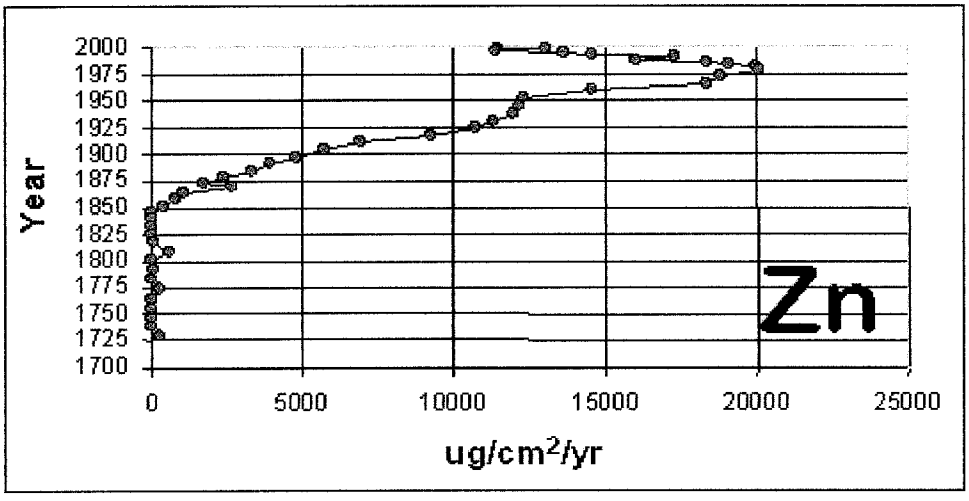
Selected Data

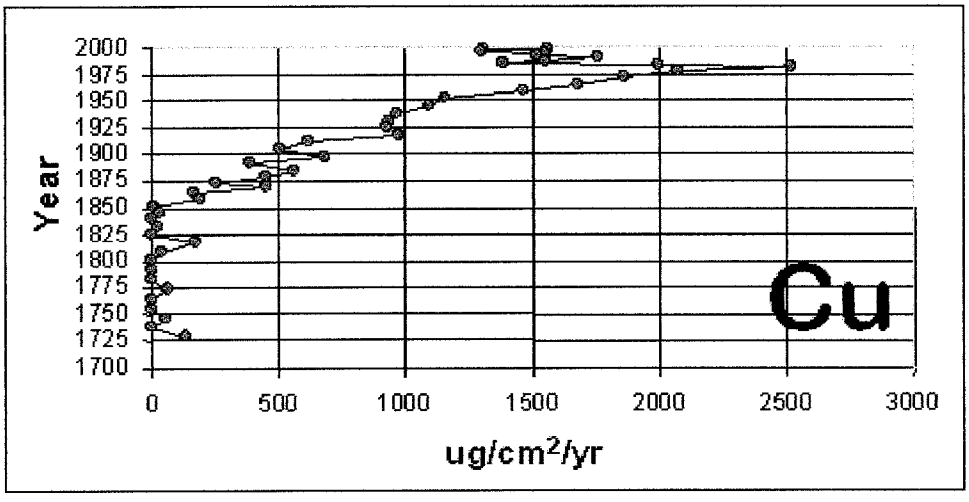
	Surface conc.	Background conc.	Trends
Arsenic (ppm)	9.89	5.66[1]	redox
Cadmium (ppm)	1.25	0.25	decreasing
Copper (ppm)	21.62	15.00	decreasing
Lead (ppm)	115.55	8.15	decreasing
Zinc (ppm)	128.04	48.00	decreasing
Total PCBs (ppb)	0.32		decreasing
Total PAHs (ppb)	119		increasing
Total Pesticides (ppb)	1.53		decreasing
DDTs (ppb)	1.41		decreasing

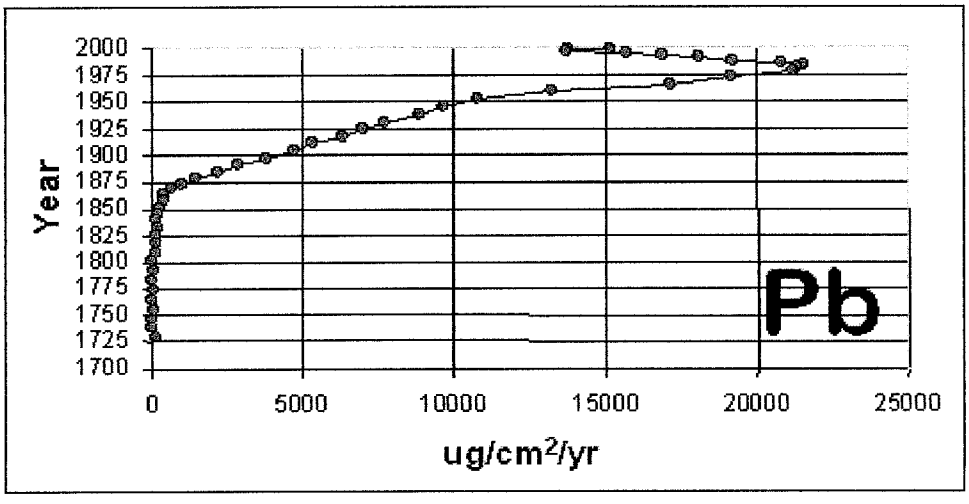
Example Trends for Higgins Lake

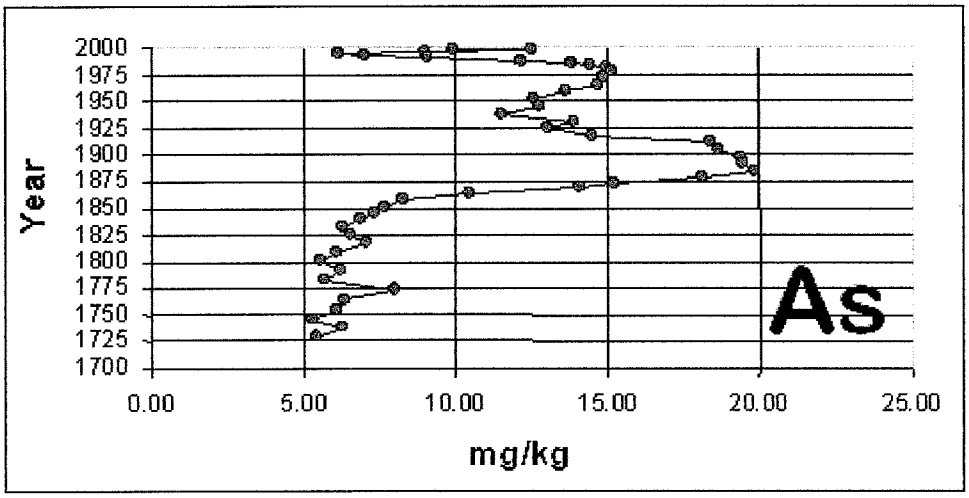
(note some plots are as anthropogenic accumulation rates while others are

simply elemental concentrations in sediment)








Year
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mg/kg
As