Paleolimnology a Decision Making Tool

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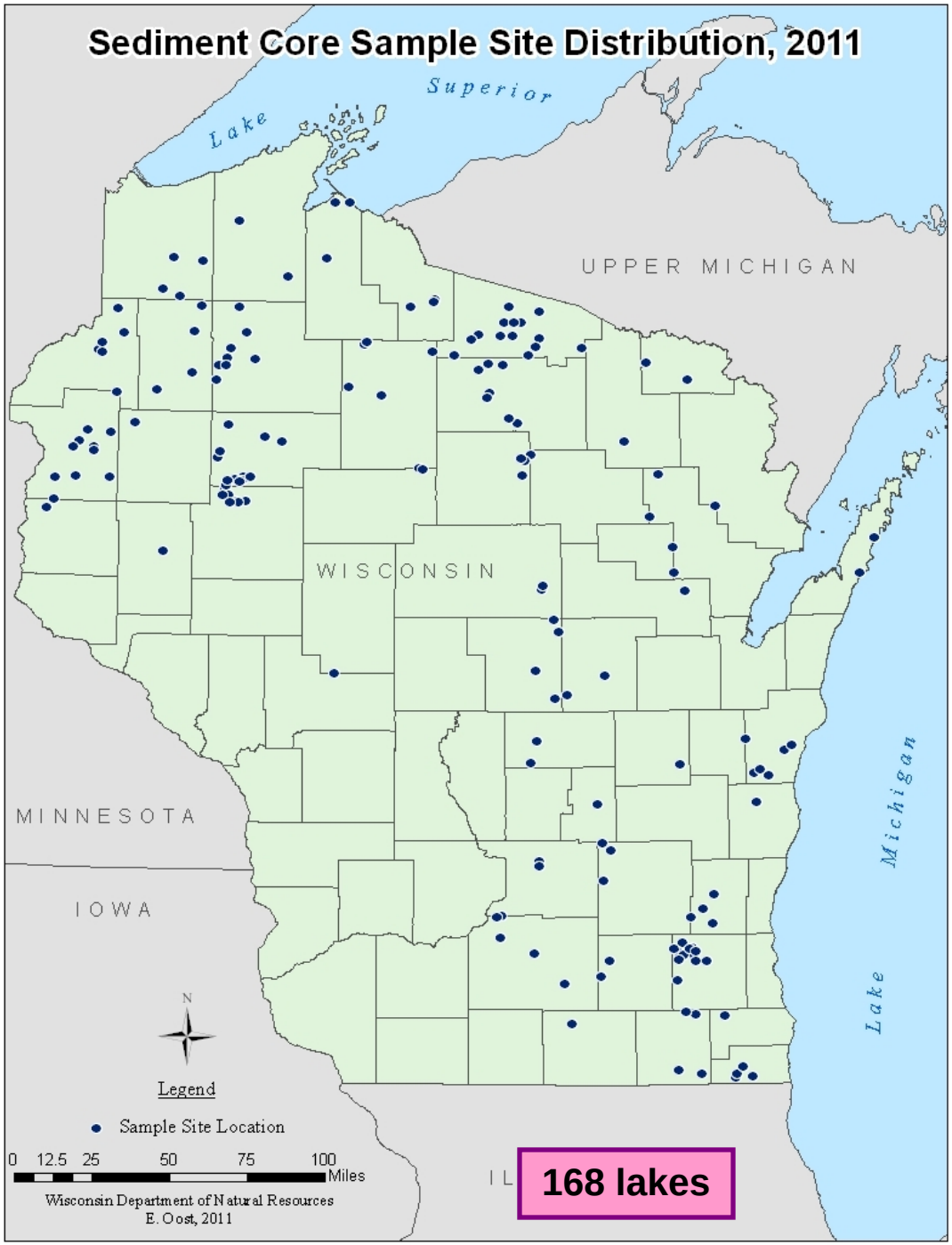
Wisconsin Department of Natural Resources

Wisconsin Department of Natural Resources
FISHERIES and AQUATIC SCIENCES RESEARCH

HOW DO YOU COLLECT SEDIMENT CORES?

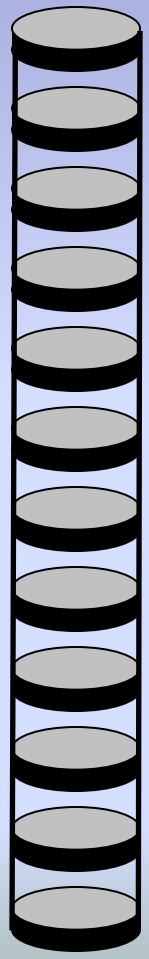
Gravity Corer

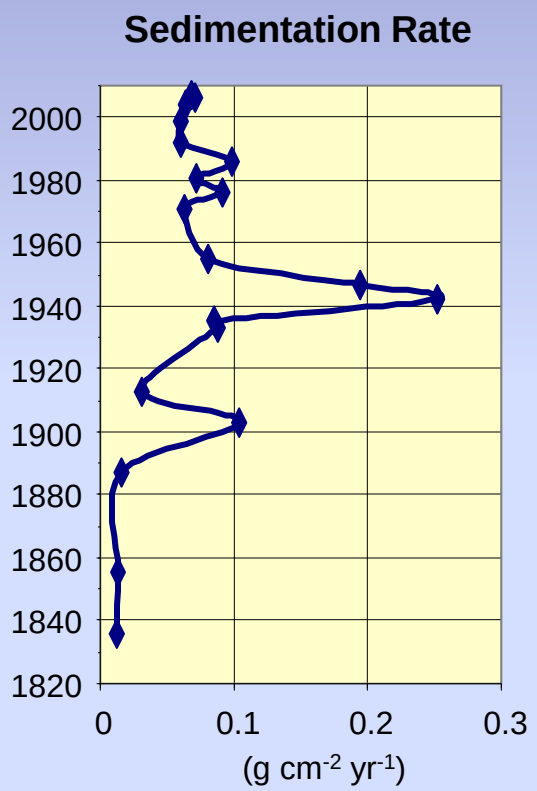
Piston Corer


Sediment Core Sample Site Distribution, 2011
Lake Superior
UPPER MICHIGAN
WISCONSIN
MINNESOTA
IOWA
IL
Lake Michigan
N
Legend
Sample Site Location
0 12.5 25 50 75 100
Miles
Wisconsin Department of Natural Resources
E. Oost, 2011
168 lakes

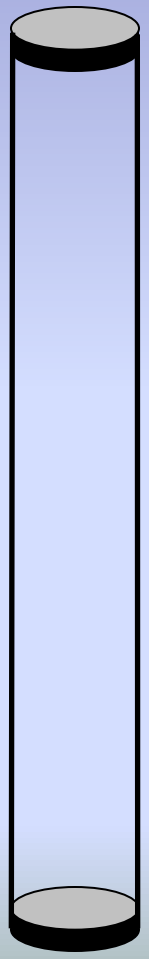
Types of Cores

Full core

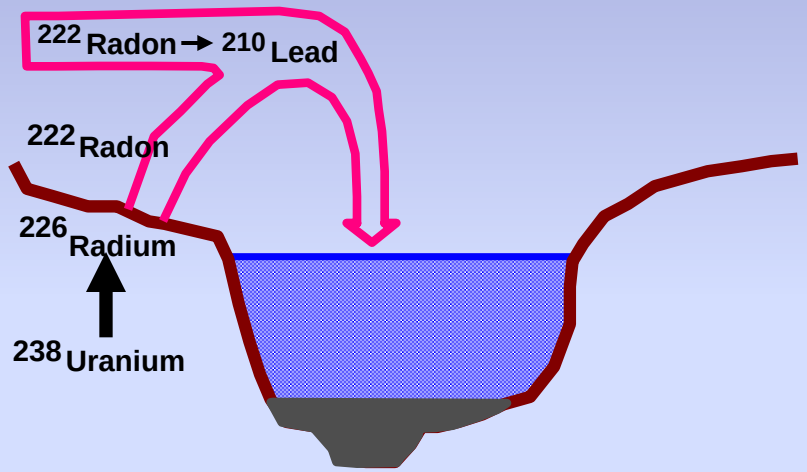




Top/Bottom



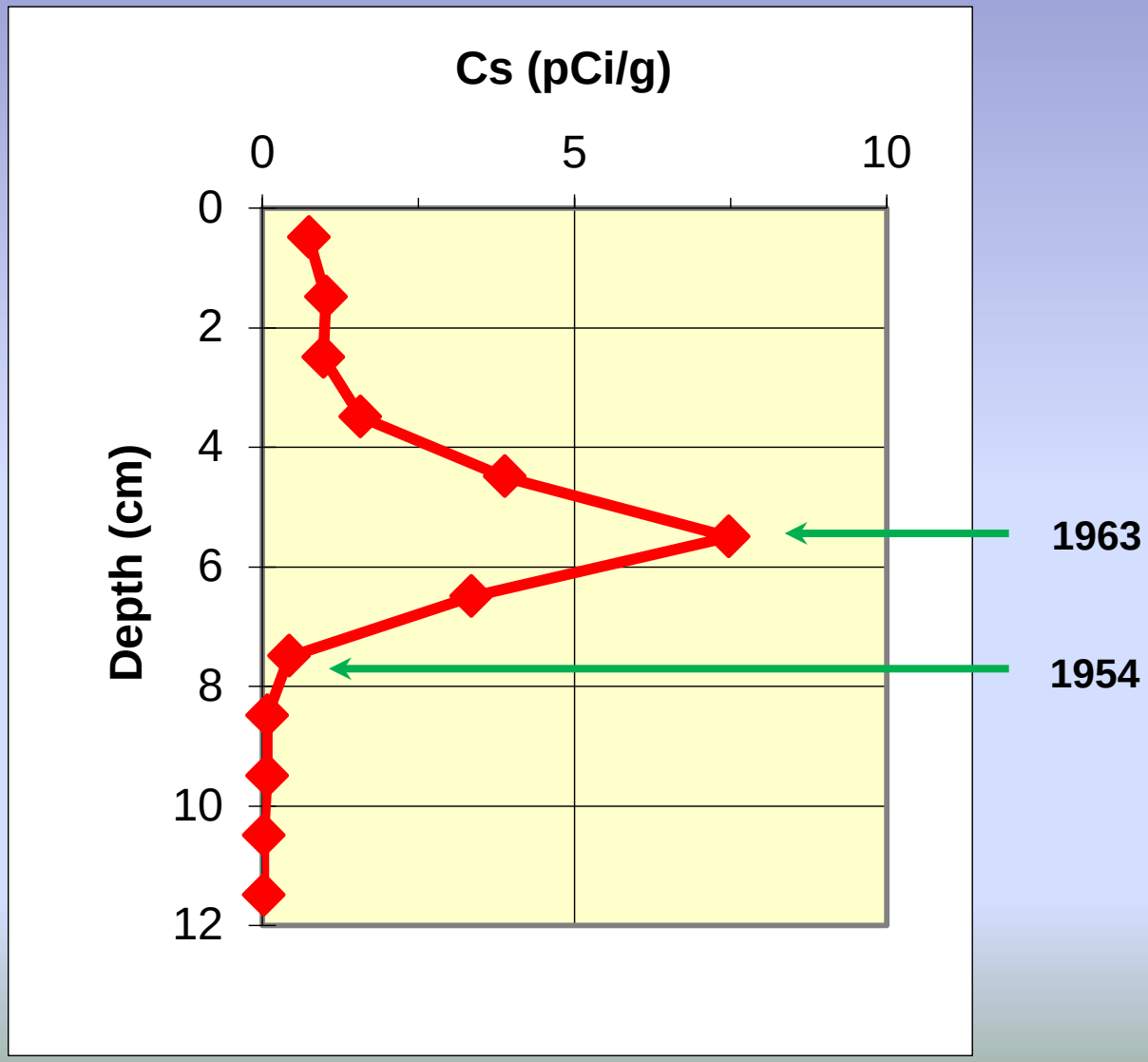
Lead-210 Dating



HALF LIVES

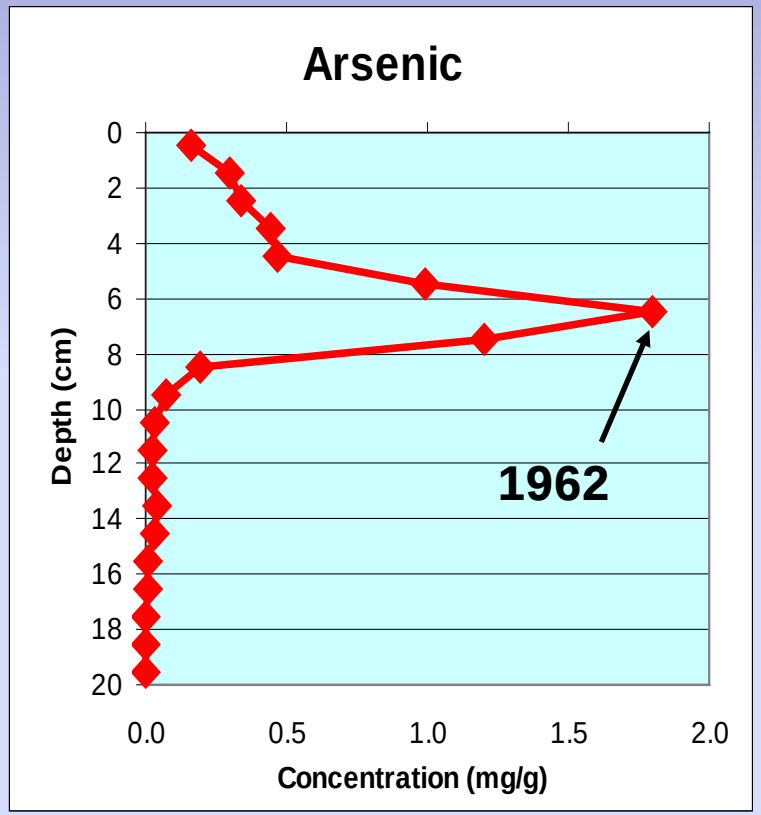
^{226}Radium	1024 yr
^{222}Radon	3.8 days
^{210}Lead	22.26 yr

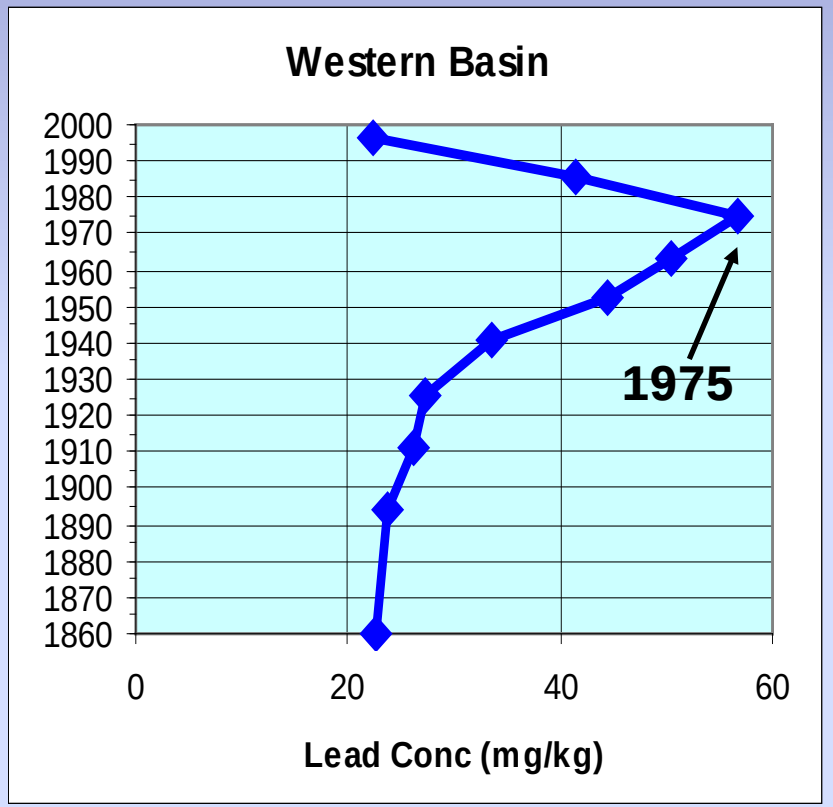
FALLOUT FROM ATMOSPHERIC BOMB TESTING



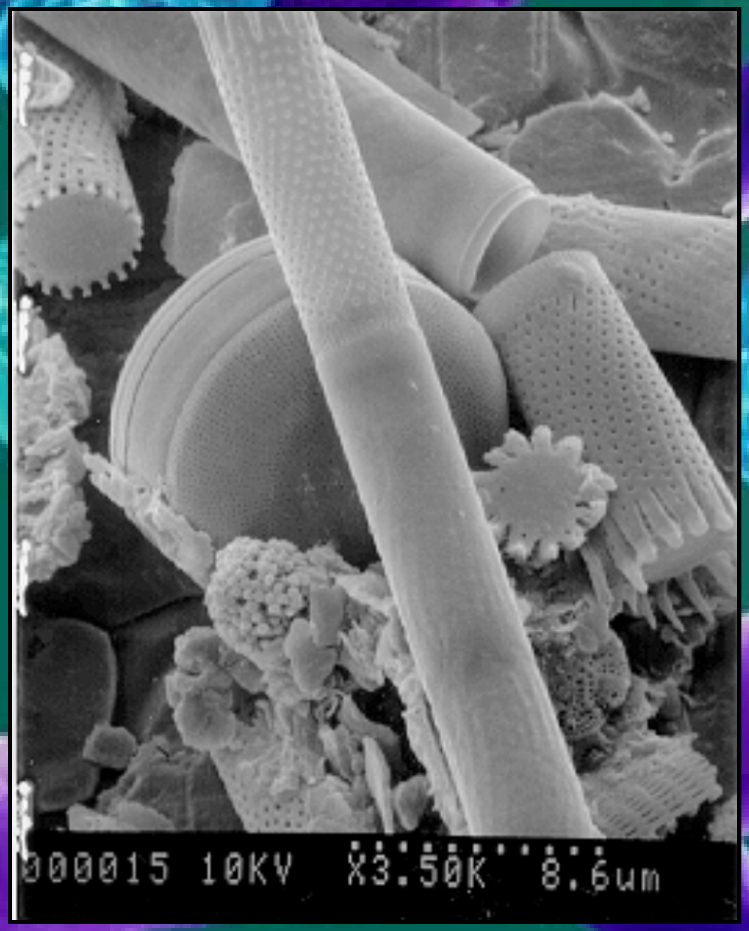
MACROPHYTE CONTROL

GASOLINE EMISSIONS

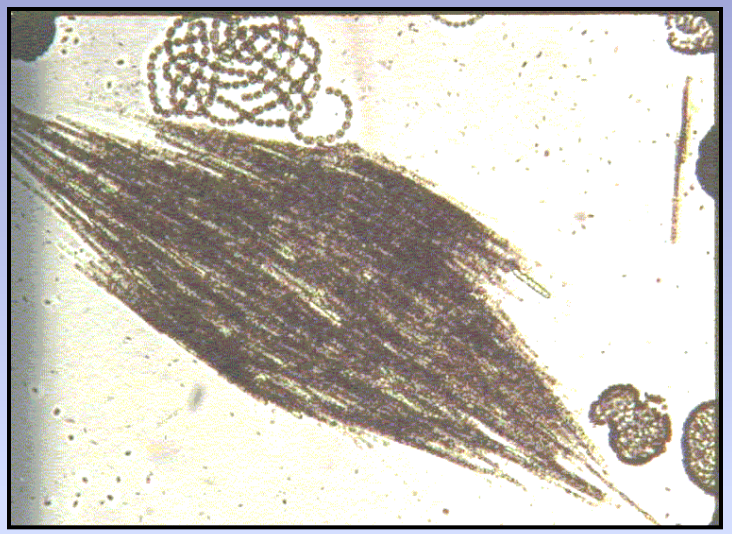


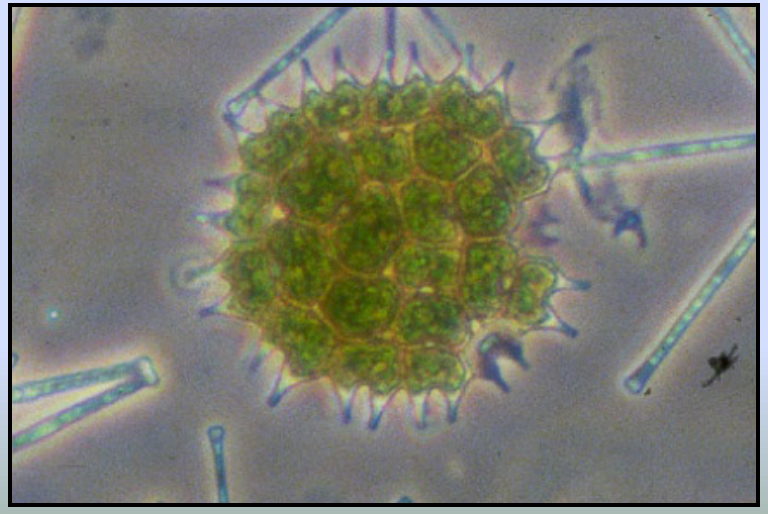


DIATOMS



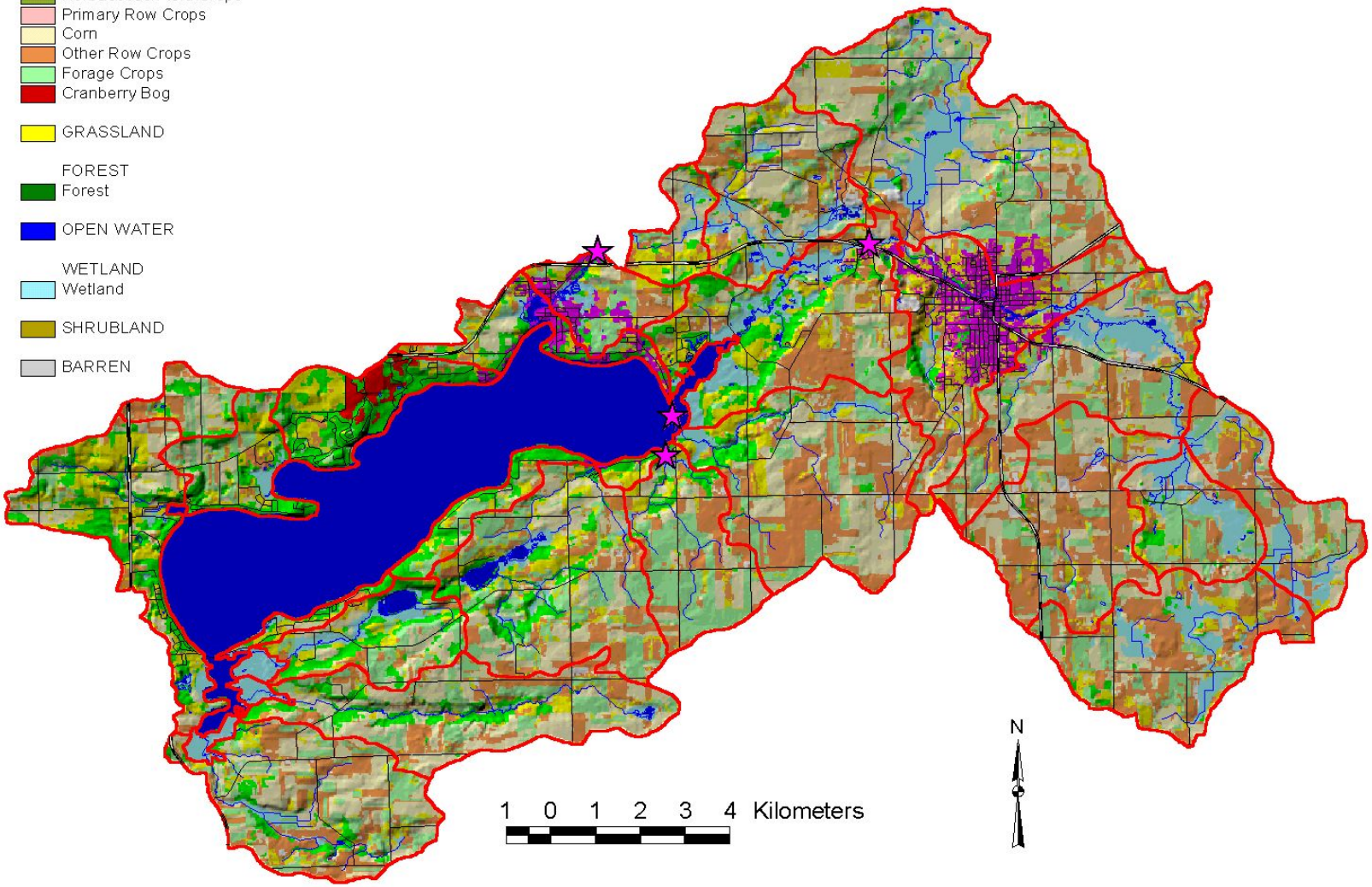
BLUE-GREEN and GREEN ALGAE



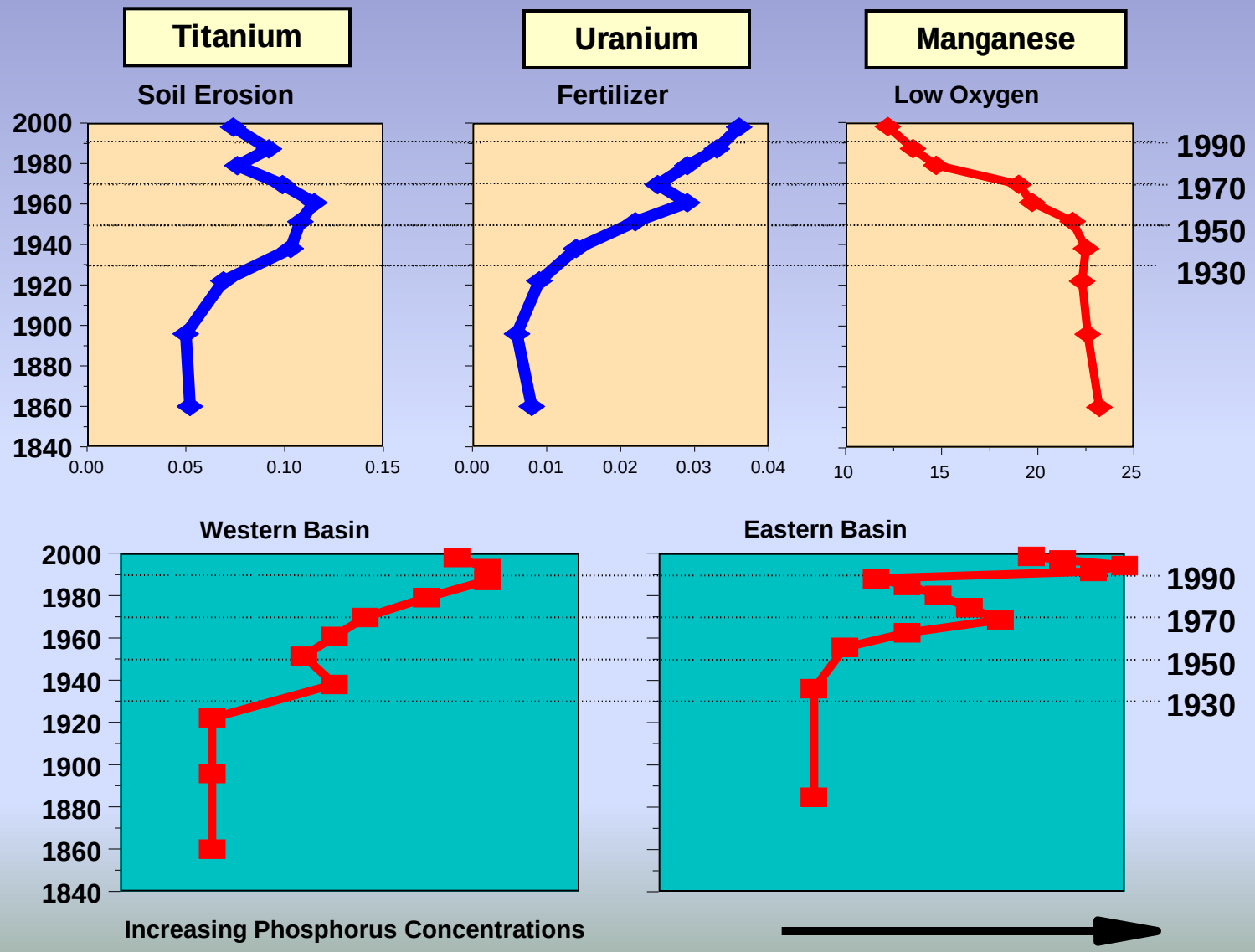


AGRICULTURE

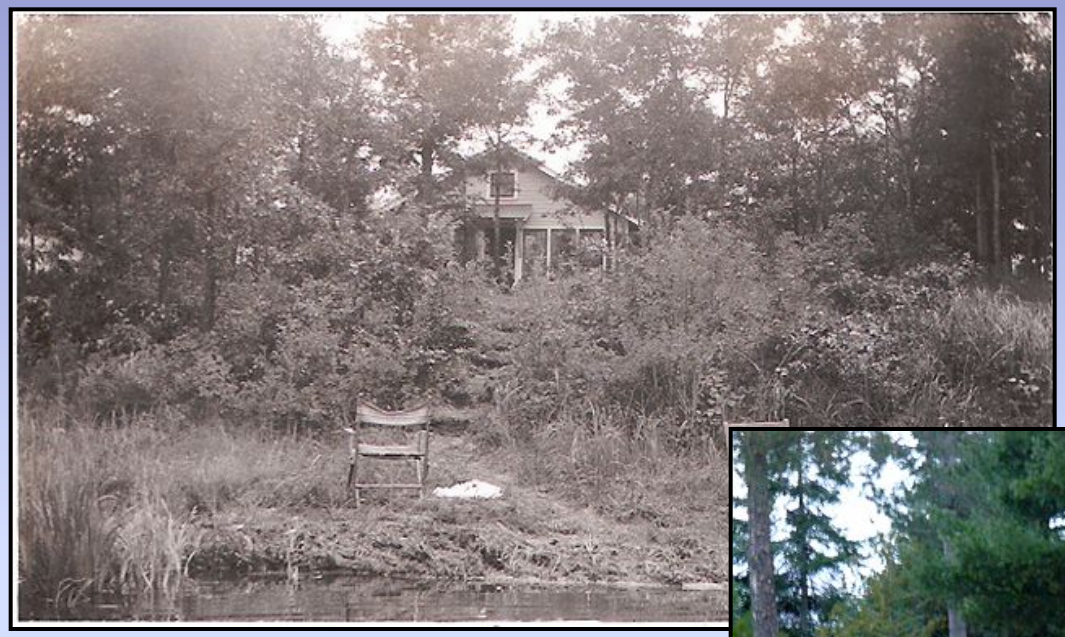
Big Green Lake Watershed Land Cover & Hillshade (WISCLAND 1992)



Green Lake


Titanium
Uranium
Manganese
Soil Erosion
Fertilizer
Low Oxygen
2000
1980
1960
1940
1920
1900
1880
1860
1840
0.00
0.05
0.10
0.15
0.00
0.01
0.02
0.03
0.04
10
15
20
25
1990
1970
1950
1930
Western Basin
Eastern Basin
Increasing Phosphorus Concentrations

SHORELAND DEVELOPMENT

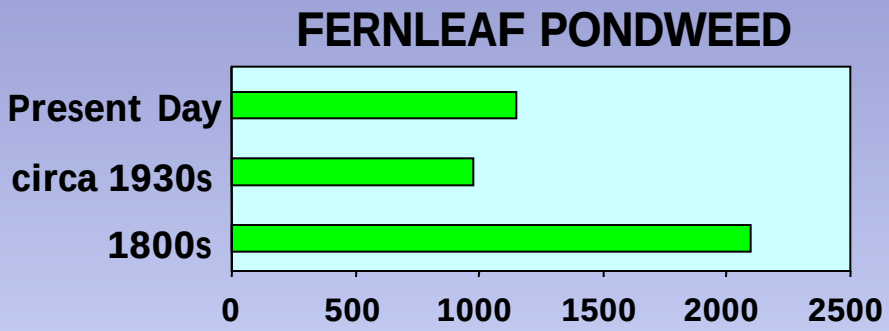


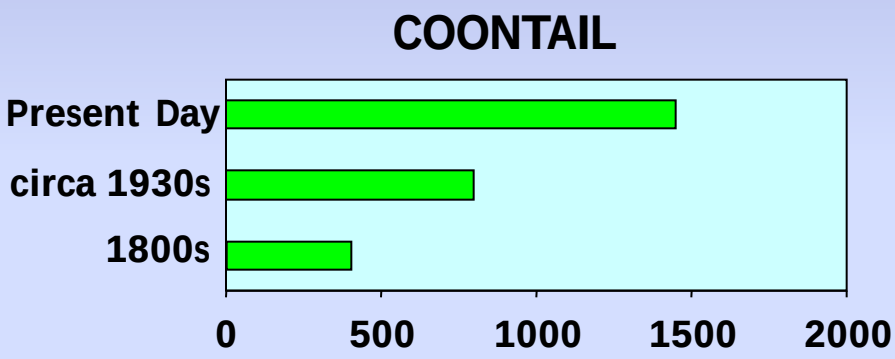
circa 1940

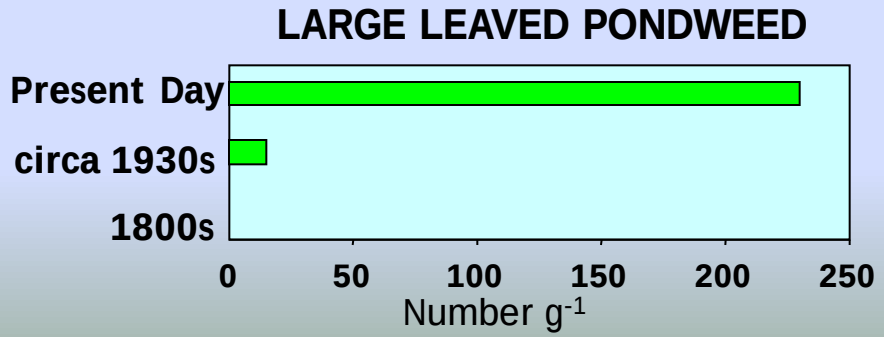
2009

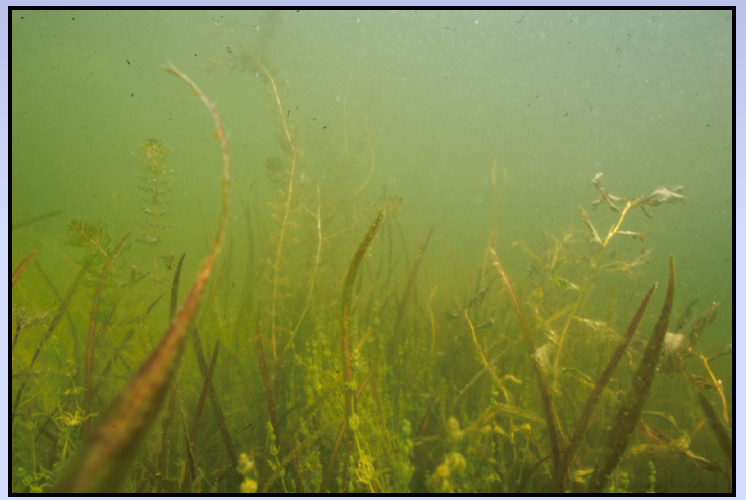

Little
Bearskin
Lake

Little Bearskin Lake









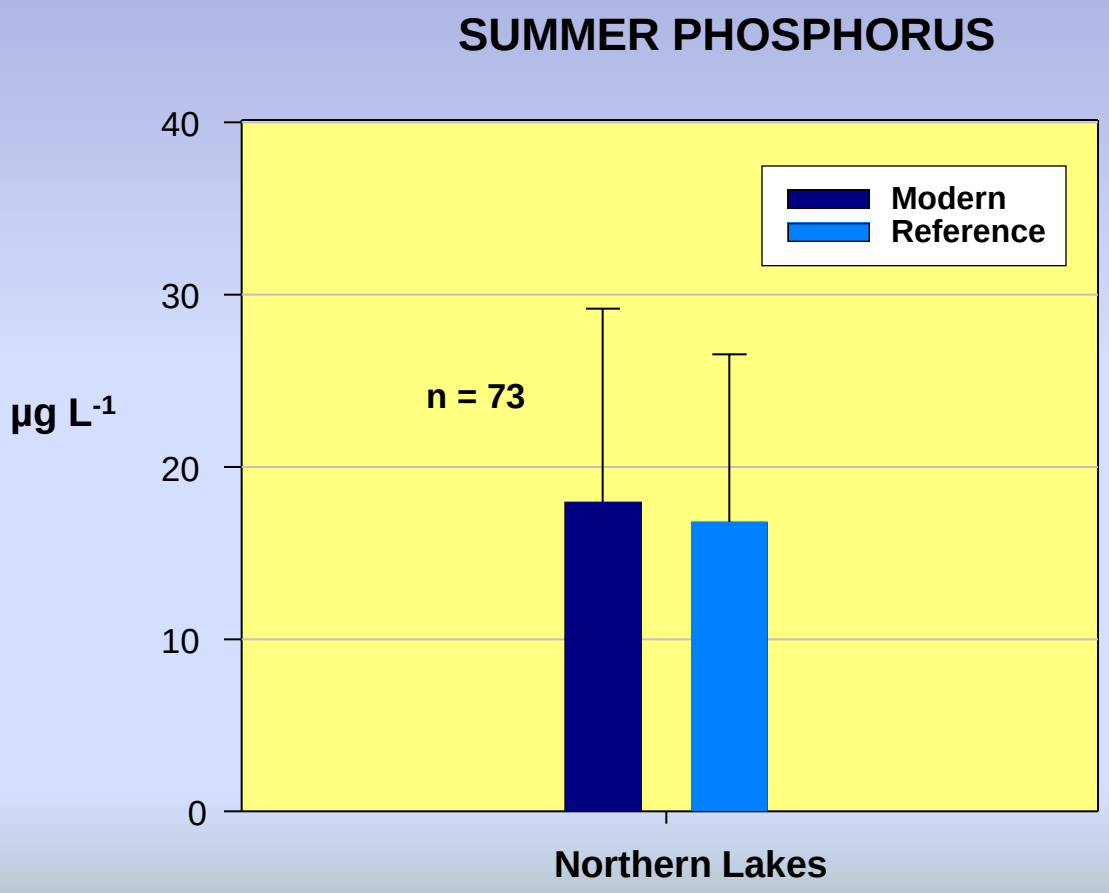
Shift in the ratio of isoetids to elodeids

1930s: 50/50

2000s: 30/70

Susan Borman and Ray Newman-U. of Minnesota

CHANGE IN PHOSPHORUS

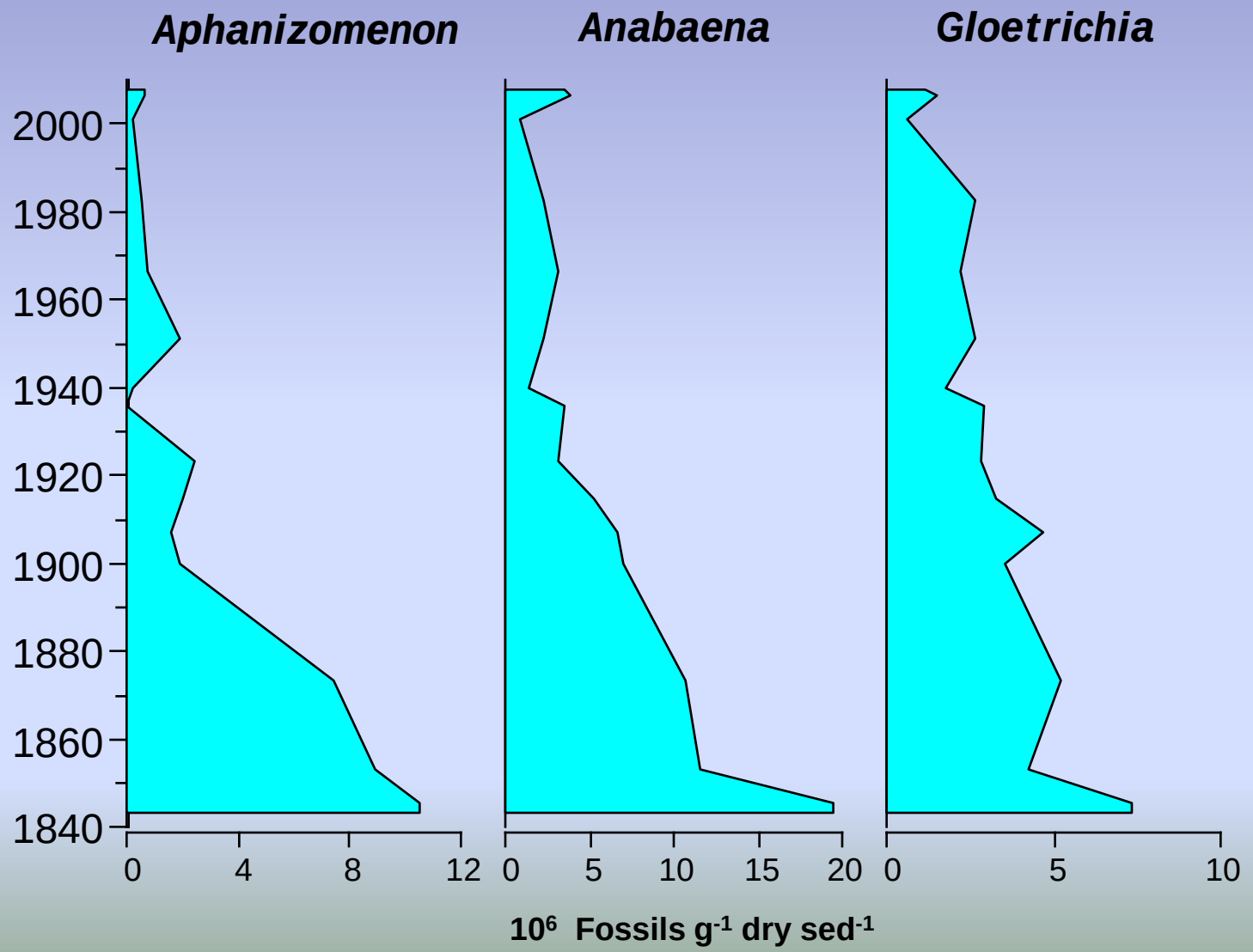


HABITAT CHANGE

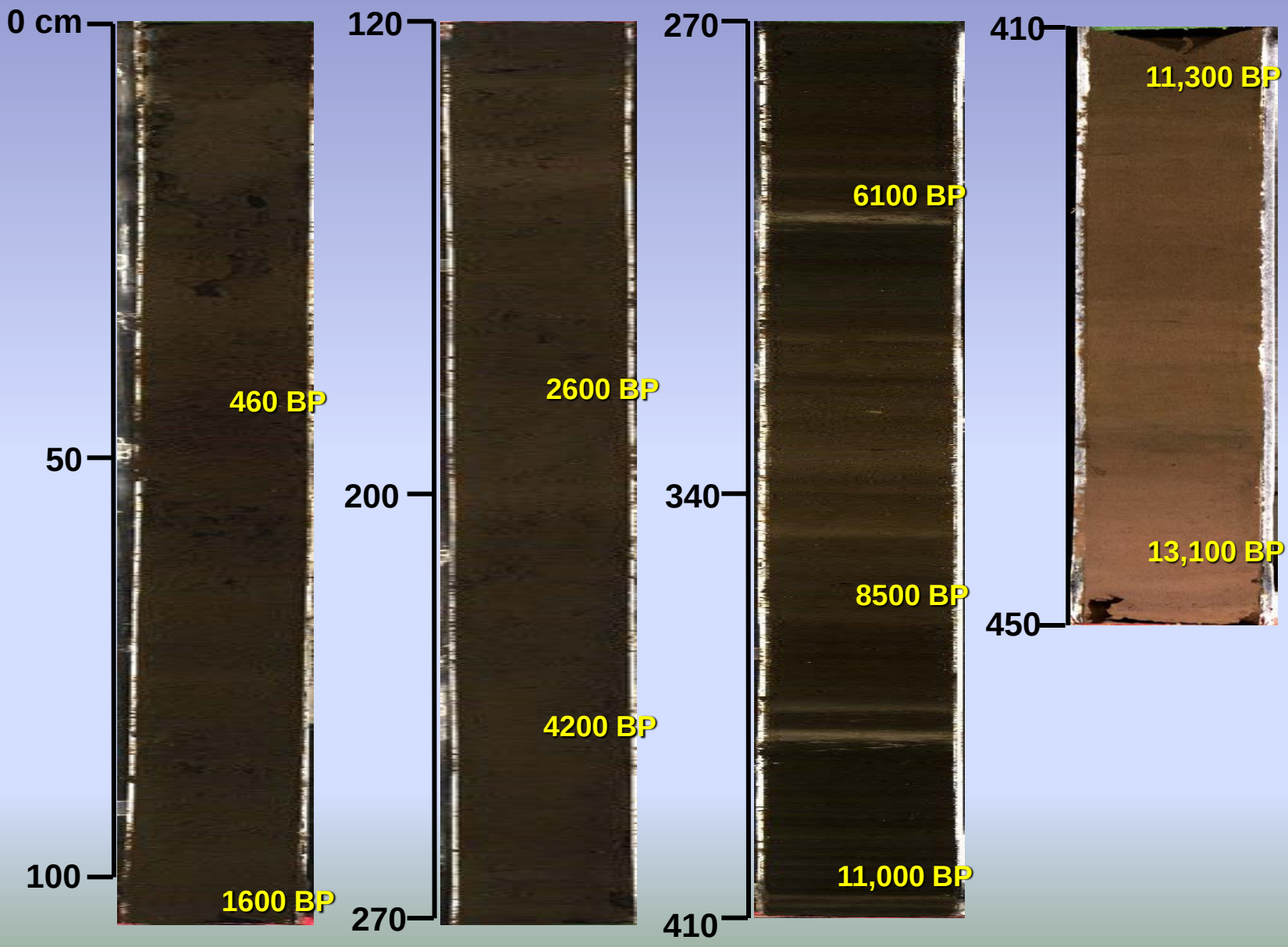
circa 1910


Lake
Chetac

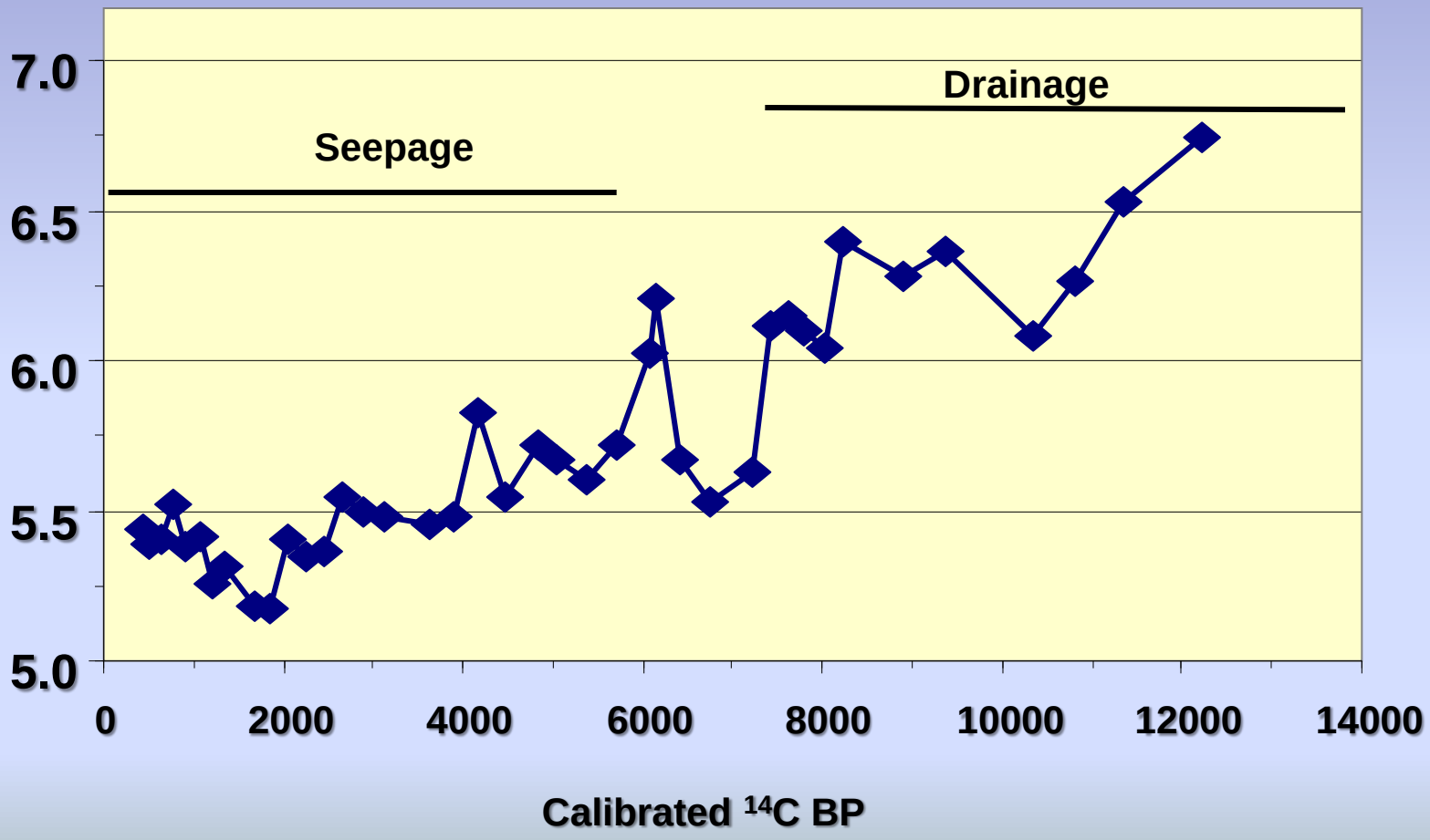
BLUE-GREEN ALGAE



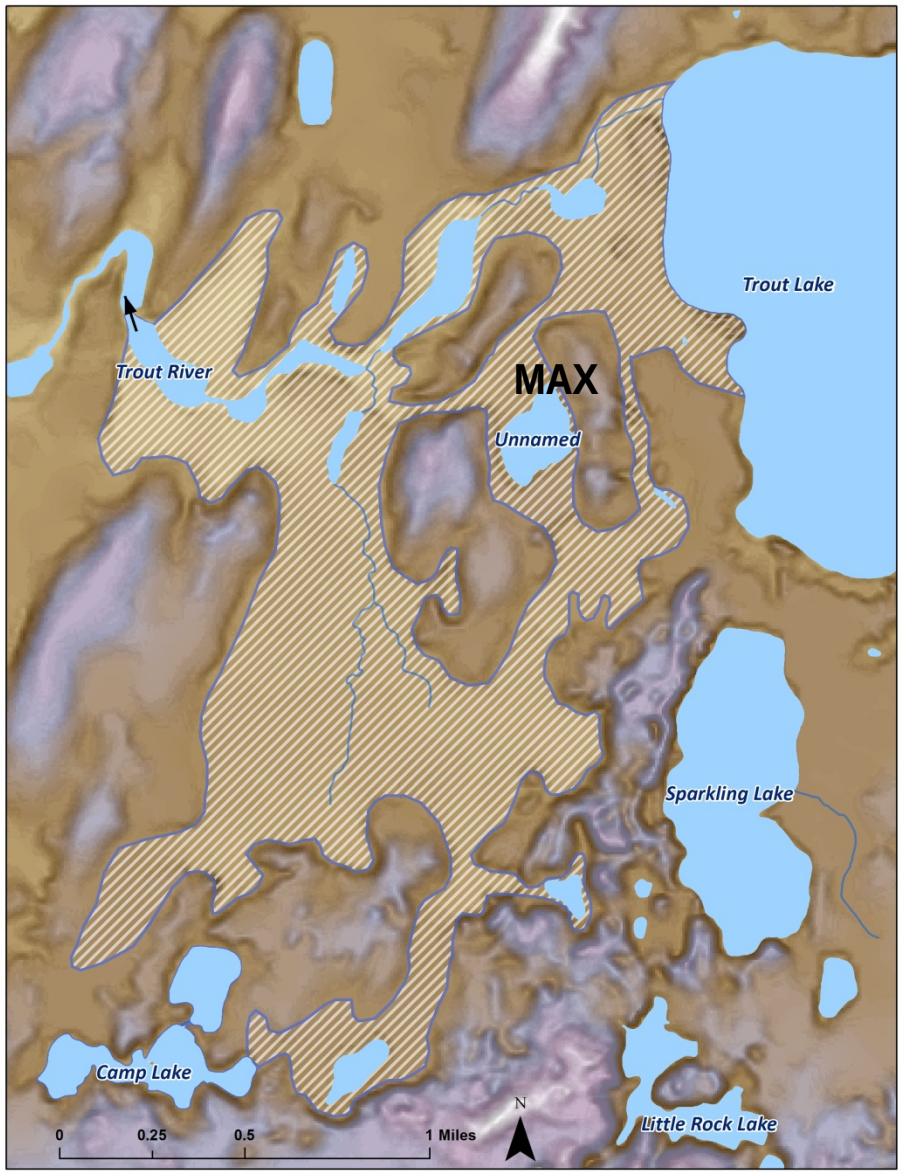
CLIMATE CHANGE


0 cm
50
100
120
200
270
270
340
410
410
450
460 BP
1600 BP
2600 BP
4200 BP
6100 BP
8500 BP
11,000 BP
11,300 BP
13,100 BP

pH


7.0
6.5
6.0
5.5
5.0
Seepage
Drainage
0
2000
4000
6000
8000
10000
12000
14000
Calibrated 14C BP

5,000-12,000 yrs BP

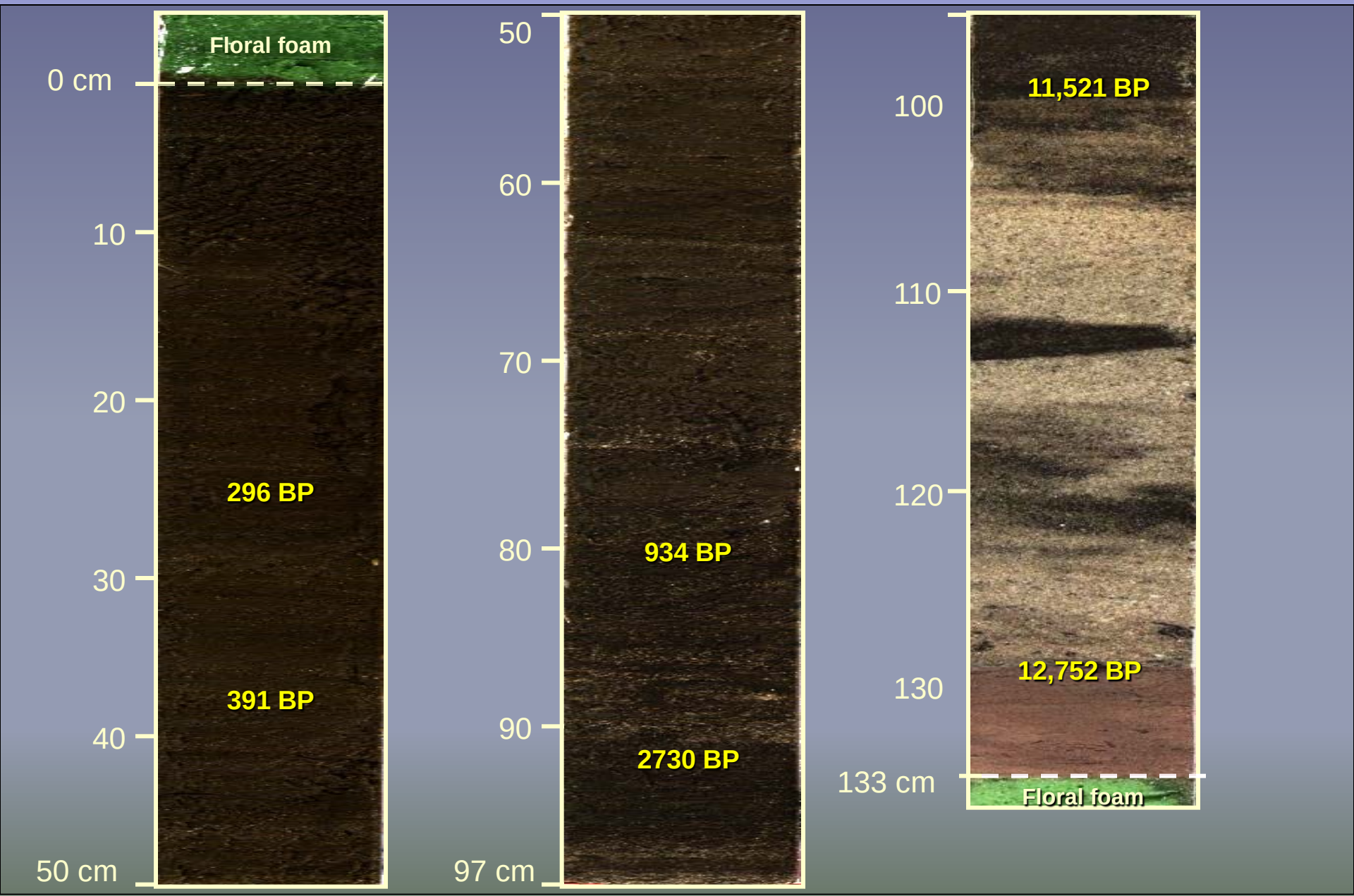


CHANGING WATER LEVELS

Berry Lake, Oconto County


Berry
Lake

Dr. Samatha Kaplan—
UW Stevens Point



LAKETIDES

Winter 2007

Paleolimnology
History in the Mucking

Lake folks often get into lively discussions over what the lake used to be like...more plants, fewer plants, clear water, murky water... Is there any way to really know for sure? Well, the answer is yes! In fact we can have a good idea of what lakes used to be like hundreds of years ago with a science called Paleolimnology.

Winter 2008

Paleolimnology
A Reflection of Our History

An article in Lake Tides *(vol. 32, no. 1), "Paleolimnology: History in the Mucking," discussed how sediment cores are taken and utilized to understand past changes in lakes. This article will take us on a historical journey that links changes on the landscape with environmental impacts to our lakes, which are revealed in the lake sediments.*

on the land. The opening of the forest allowed large amounts of sediments and nutrients to be exported from the land to the water.

Major events in the history of our country, like World War II, had definite impacts on our lakes. World War II marked another period in which agricultural practices intensified. To

QUESTIONS?