



The Lake of the Woods

****NOTE: Presentation slides are annotated: place cursor over comment bubble to toggle on or off ****

The Lake of the Woods: Diverse wildlife

Home to species that are absent/rare in the rest of Ontario, Canada, and the world.

Some examples include:

- White-tailed Jack Rabbit
- Franklin's Squirrel
- American White Pelican
- Piping Plover
- Green-faced clubtail dragonfly



The Lake of the Woods: Some history

- LoW remnant of glacial Lake Agassiz- largest lake in N. America during the last deglaciation
- Mud Portage petroglyphs: evidence for 1st inhabitants, late Paleo or Plano people ~9,300 yr BP
- ~2,200 yr BP: arrival of Early Woodland people including the Laurel people
 - harvested, cooked & stored wild rice
- ~AD 1688 first European to sight LoW: Jacques De Noyen
- 18th & 19th centuries: LoW a hub for fur traders and missionaries
- 1850: Gold discovered



Source: Windows to the Universe, at <http://www.windows.ucar.edu/>



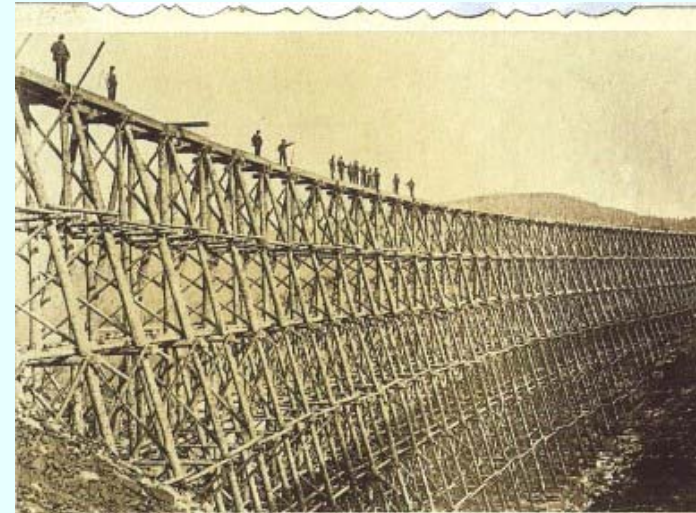
Source: Robertson and McCracken 2003



Source: Robertson and McCracken 2003

The Lake of the Woods: Some history

- ~1877: Canadian Pacific Railway in the region
- Late 1800s – early 1900s- Rat Portage (now Kenora) major lumber industry centre
- 1872: 1st steamship on the LoW
- ~1887 to ~1900: dams built at northern outlets to the Winnipeg R.
 - average water level rises by ~2m
- ~1890-1900: Sturgeon fishing frenzy: caviar
 - within a decade unregulated sturgeon fishery went from boom (350,000 kilos/year) to bust
- Today LoW is still a major tourist attraction



Source: Robertson and McCracken 2003



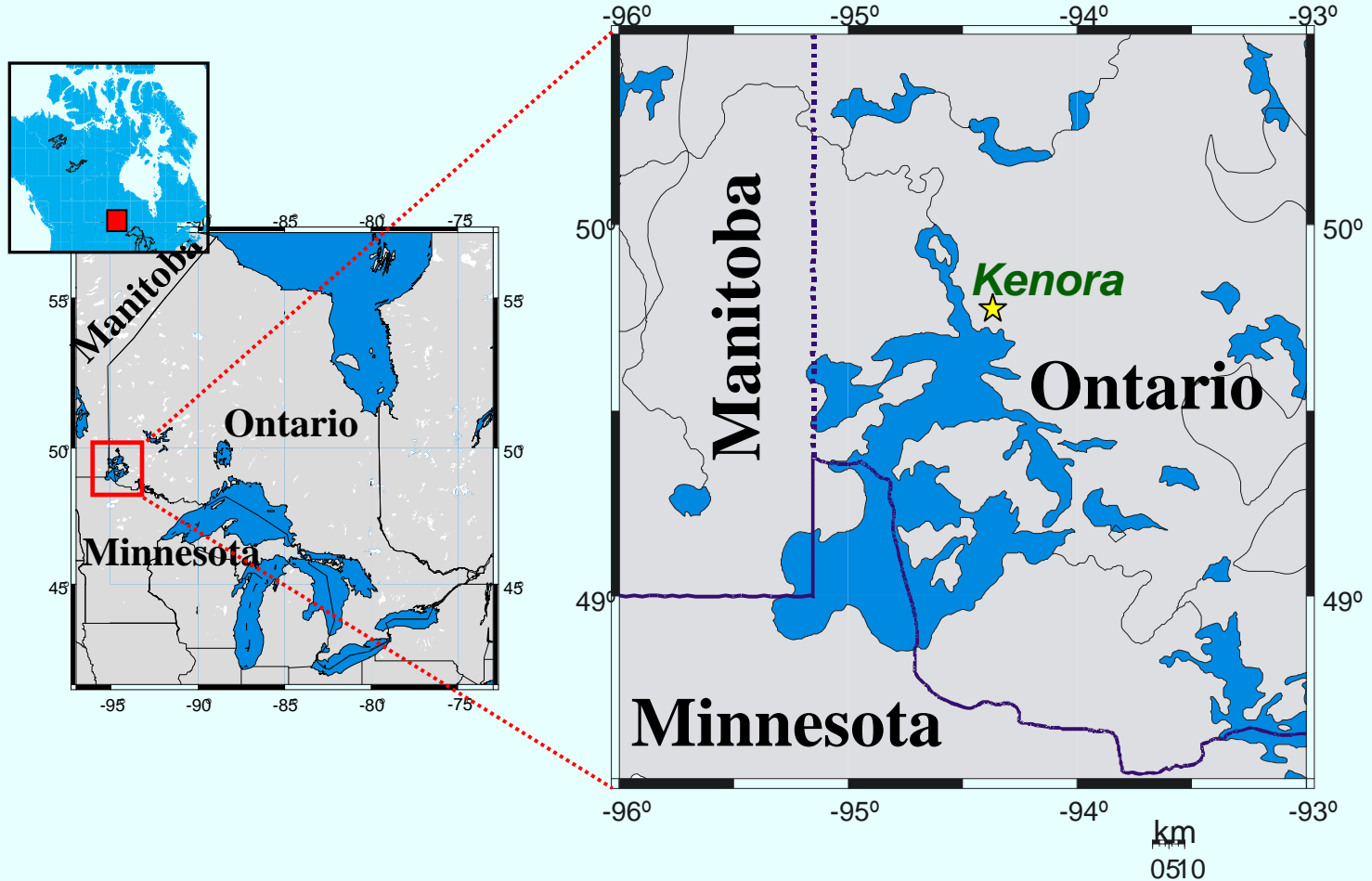
LAKE OF THE WOODS MUSEUM, KENORA / 986 68 2
Source: Robertson and McCracken 2003



The Lake of the Woods: A popular summer destination



The Lake of the Woods: an international waterbody



One of Ontario's largest inland lakes: ~385,000 ha (excluding Shoal Lake)



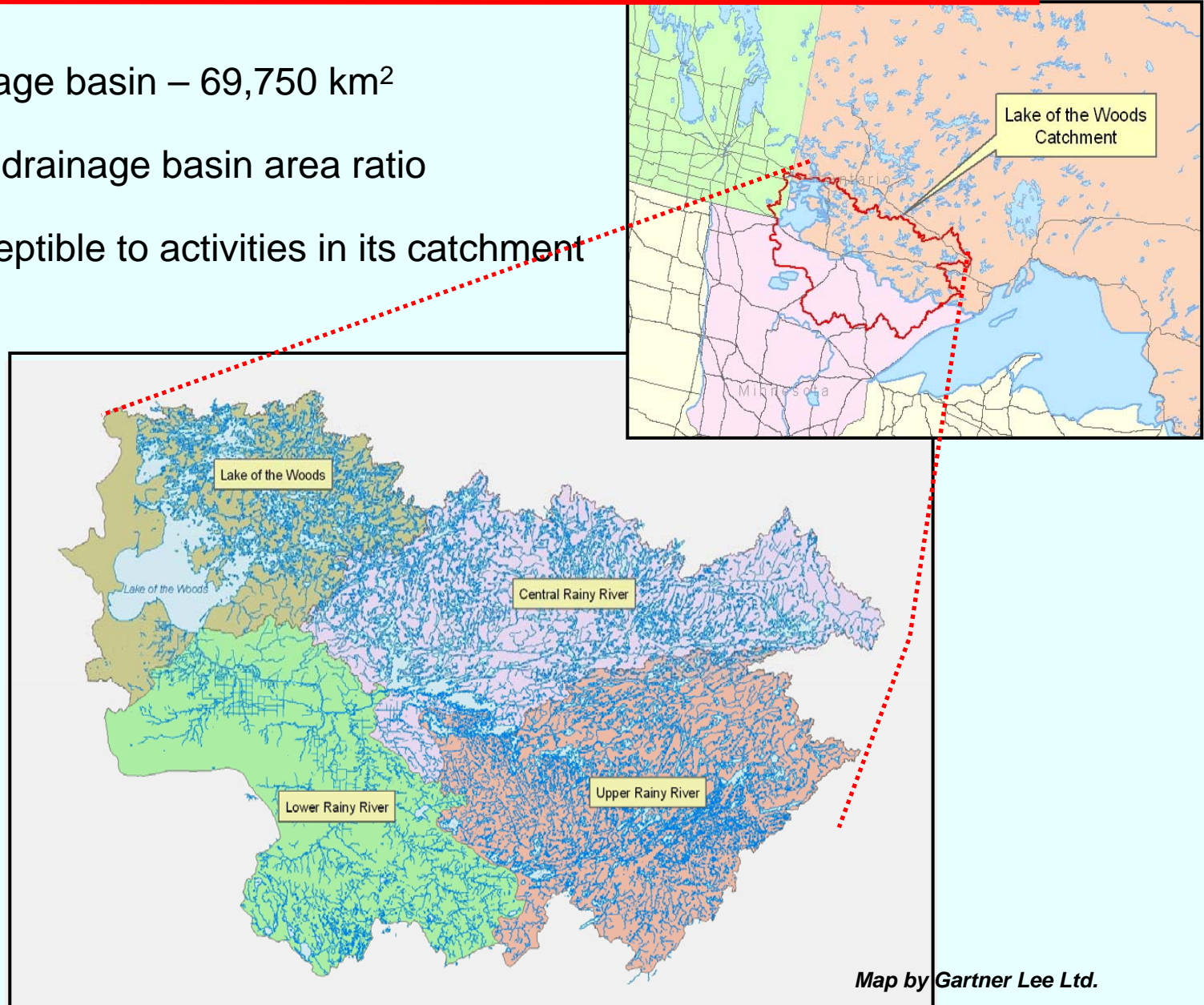
The Lake of the Woods: Morphologically complex

- Numerous depositional basins
- Hundreds of inlets and bays
- >14,500 islands



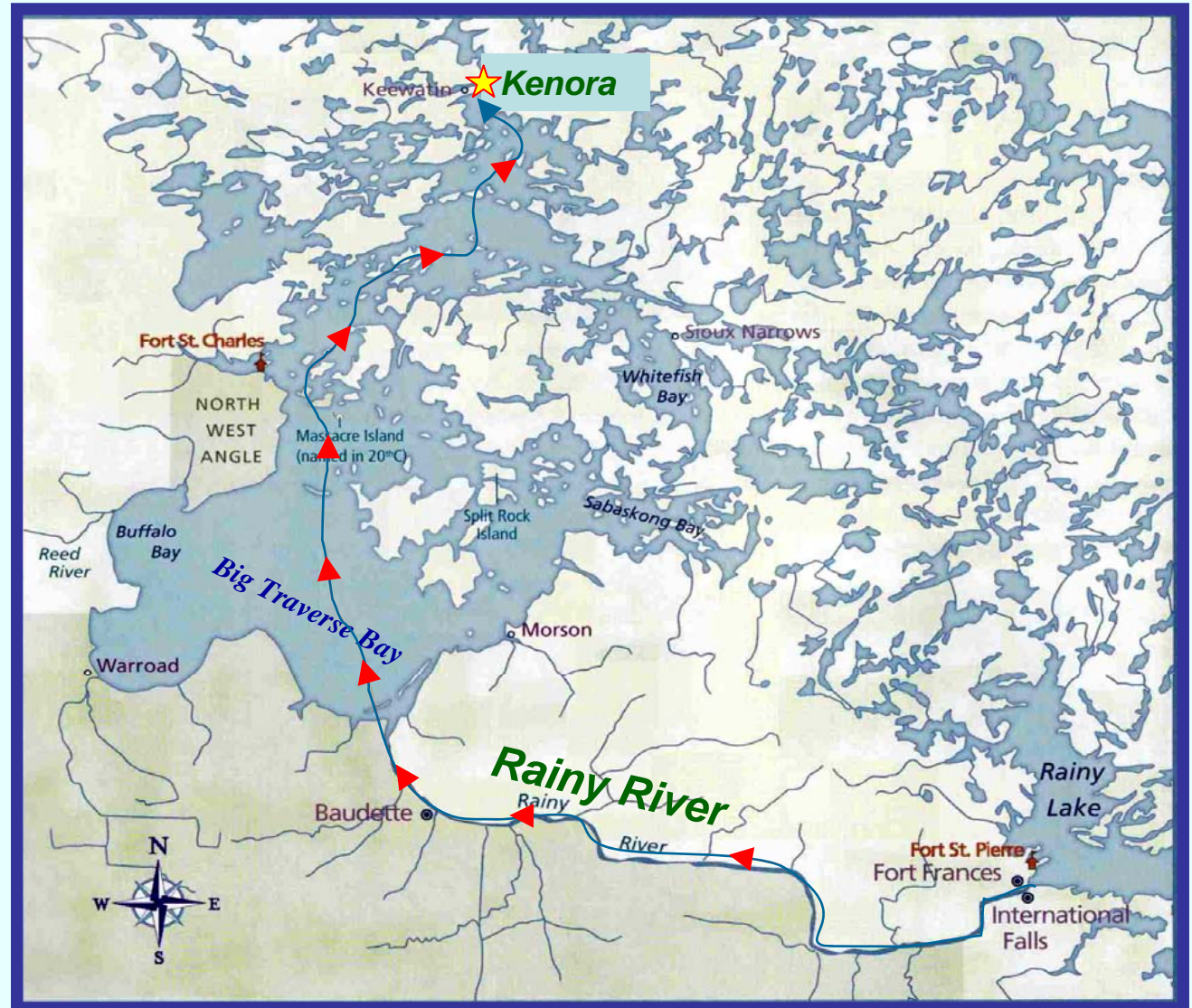
The Lake of the Woods: Hydrologically complex

- Large drainage basin – 69,750 km²
- Low lake to drainage basin area ratio
- Highly susceptible to activities in its catchment



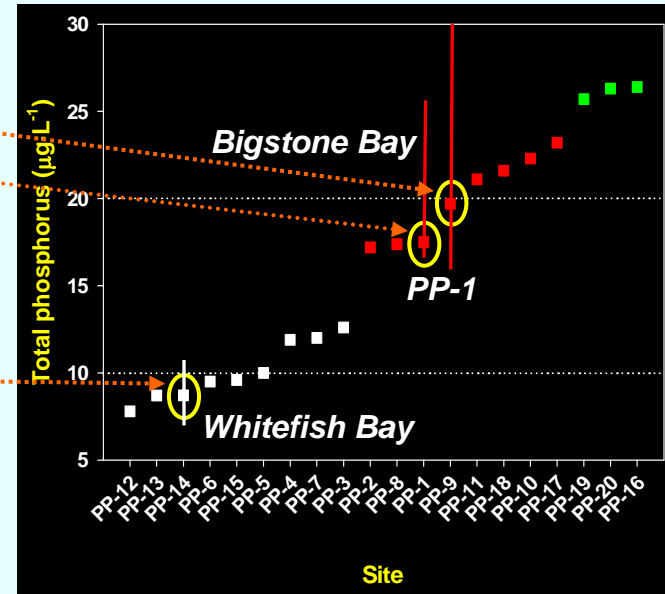
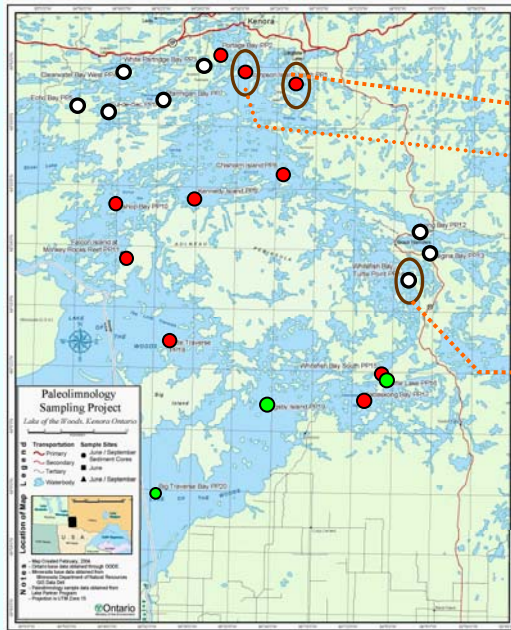
The Lake of the Woods: A complex system

- Rainy River provides ~70% of inflow through LoW
- Water flows northward through main channel
- Major outlet is Winnipeg R. in the north

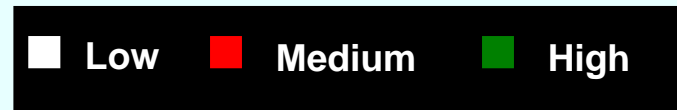


Modified from Robertson & McCracken 2003

Strong total phosphorus (TP) gradient from S to N



Summer total phosphorus (TP) measurements



- Long-term monitoring has shown LoW experiences significant inter-annual and spatial variability in nutrients with highest concentrations in late summer
- Strong TP gradient tracks direction of flow from the Rainy River (Pla et al. 2005)
- Higher TP concentrations along main channel and in the south end

Development of an Algal Bloom - 2003



(Terra MODIS images – G. McCullough, U. of Winnipeg)

Typically blooms occur in mid summer in the south end of the lake and in late summer to early fall, at the north end.

Algal blooms

There is a perception that water quality in the LoW has deteriorated in recent years due to a reported increase in the frequency and intensity of cyanobacterial algal blooms.



Interest in determining if this is true

Interest in understanding why

Algal blooms

- Total phosphorus (TP) important, limiting nutrient for algal growth
- Much interest in determining whether TP has changed historically



Has TP been historically high in LoW?

Has TP increased recently?

- Historical documents back to early 1820s describe algal blooms

Algal blooms: not new to the LoW

“The islands were numerous and crowded, the water shoal and foul, frequently with a green scum of vegetable matter”

- Major Joseph Delafield, July 30th, 1823

“...the water became tinged with green, derived from a minute vegetable growth”

- S. J. Dawson, Summer 1857

“...deposits of green vegetable matter” in the lake’s bays during the summer.

- objection to a proposal to use LOW to supply clean water to Winnipeg 1883

Although historical reports give important insights into past environmental conditions, they cannot provide us with answers to key lake management questions



Some Important Lake Management Questions:

- 1) What is the 'natural' or baseline condition of the lake?
- 2) Has the water quality changed since pre-development (or pre-industrial) times?
- 3) If so, when did these changes occur?
- 4) What is the direction and magnitude of this change?
- 5) What are the possible reasons for this change?

Answers to these questions can provide evidence for possible mechanisms underlying these changes.

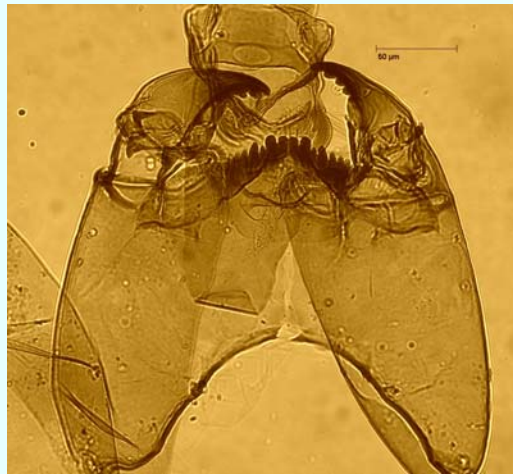
Paleolimnology: unlocking past environments

Our research on the Lake of the Woods examines the remains of biological assemblages preserved in lake sediments as a key to past environmental conditions.

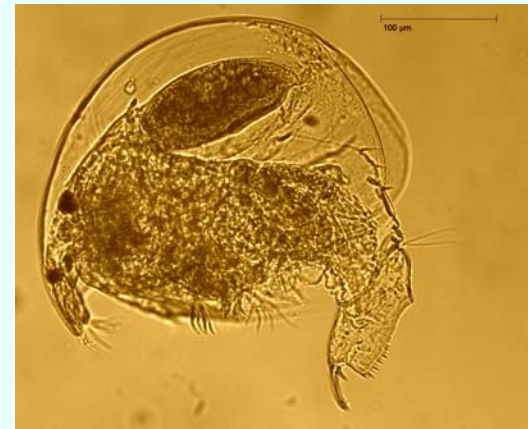
Some examples of remains preserved in lake sediments:



Diatoms: siliceous algae



Chironomids: non-biting midges



Cladocerans: water fleas

To learn more about **Paleolimnology** and our work on the Lake of the Woods, visit our slideshow “**Spotlight on Paleolimnology**” featured on our Home Page.