The Physical Properties of Lakes

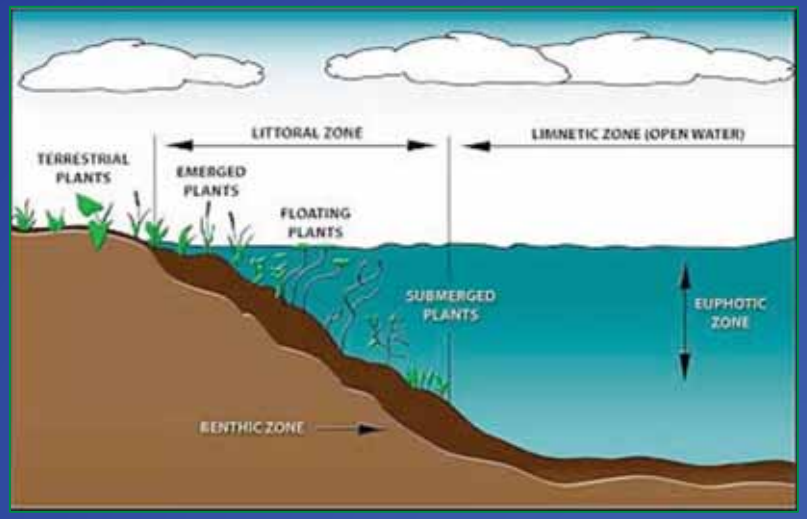
A Brief Overview of the Types of Lakes and how they Differ in Terms of Size, Depth, Watershed, Sedimentation, Residence Time and Flushing Rate

By Peter Berrini

Types of Lakes

- Glacial – Depressions, Ice Blocks, etc.
- Tectonic – Basins from Geologic Processes
- Reservoirs – Dams on Rivers and Streams
- Oxbows – Remnant River Channels
- Modified Glacial – Water Levels Altered
- Groundwater – Gravel Pits, Strip Mines, etc.
- Backwater – River Connectivity
- Other – Beaver Dams, Karst, Excavated, etc.

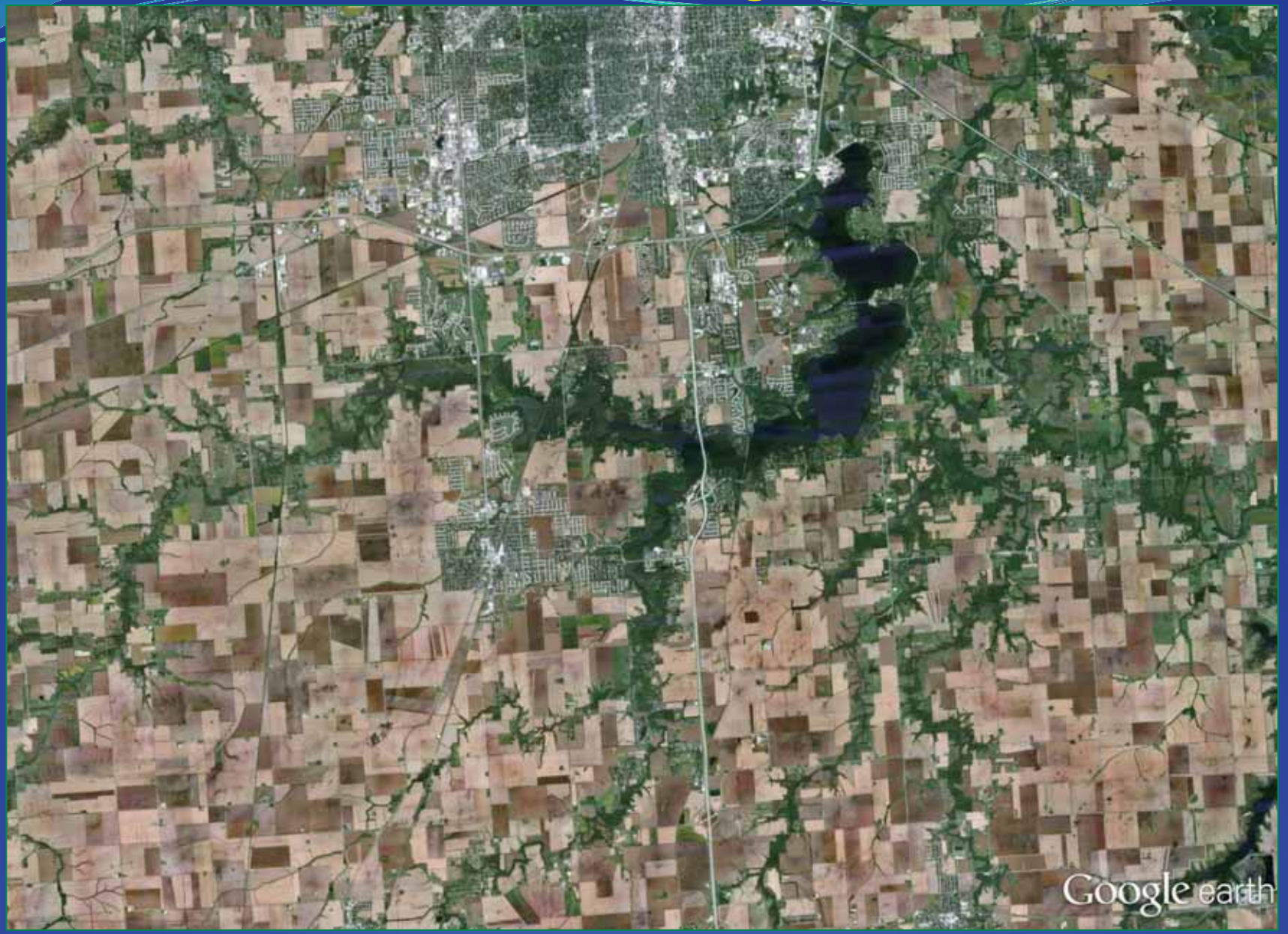
- Lakes In Illinois Include Small Farm Ponds, Reservoirs, Glacial and Modified Glacial Lakes, Strip Mine Lakes, Gravel Pit Lakes, Backwater Lakes, and one of the Great Lakes (Lake Michigan)
- Physical Characteristics such as Lake Size, Depth and Volume, along with Watershed Size, Slope and Surrounding Land Uses are Important Factors in Understanding Sedimentation Rates, Hydraulic Residence Time and Flushing, and the subsequent effects on Water Quality



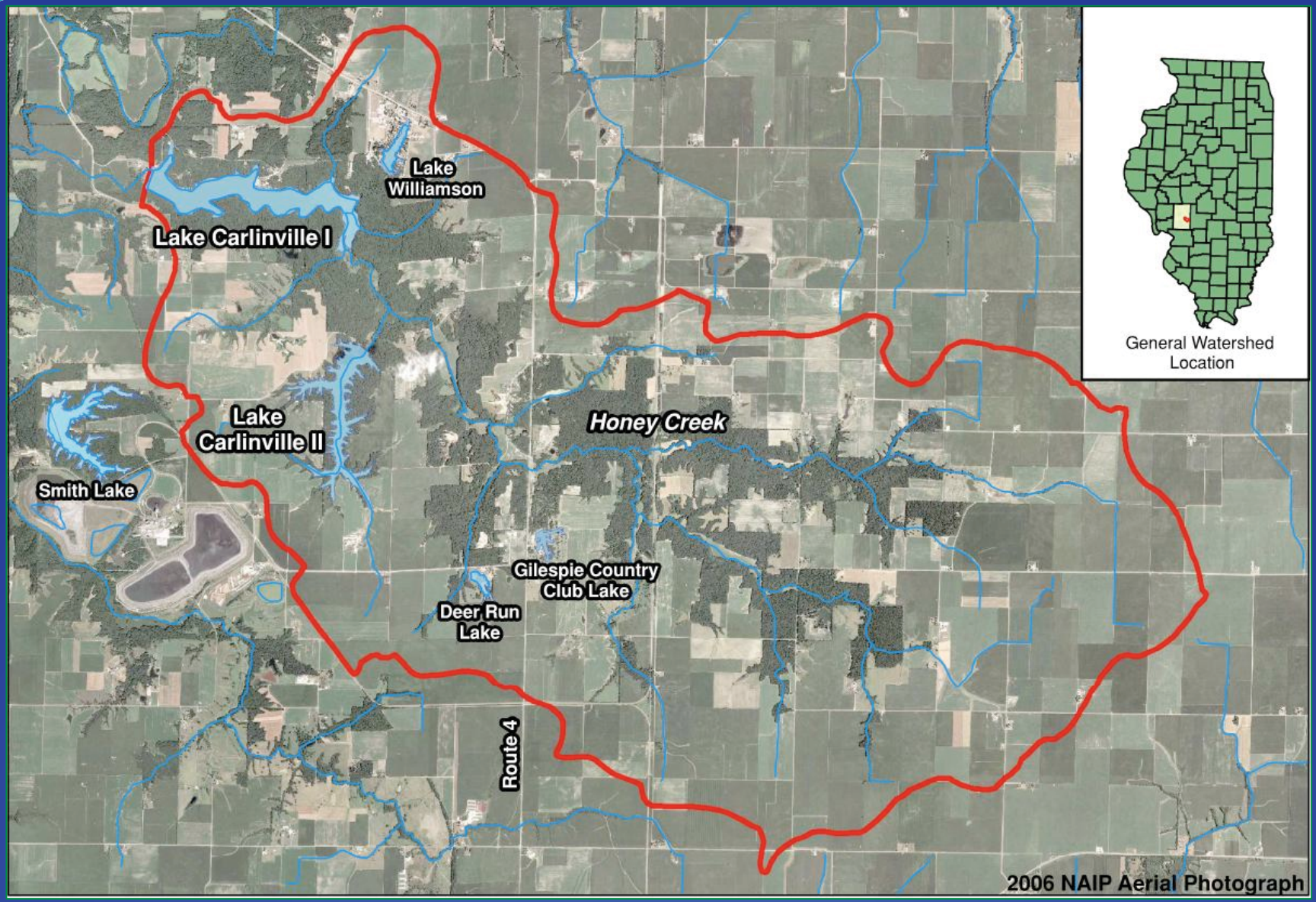
Glacial, Gravel Pit, Strip Mine & Backwater

Lakes with Small Watersheds

Reservoirs with Large Watersheds



Large Watershed = Lots of Inflow

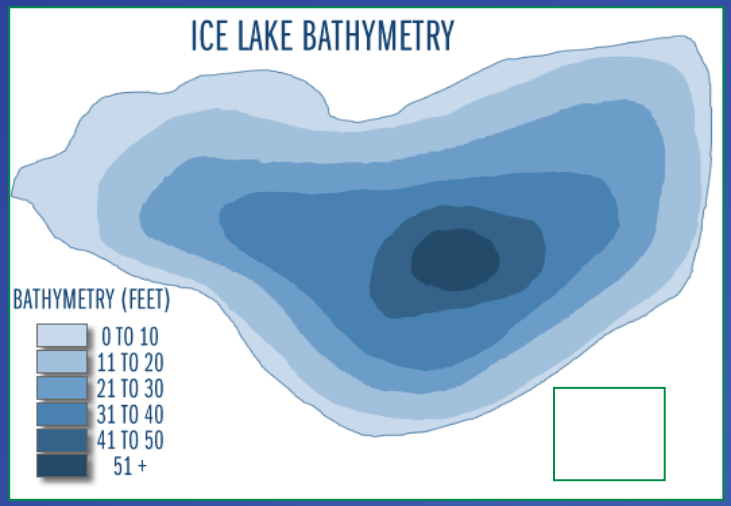


Hydraulic Residence Time

- Defined as the Time Required to Refill an Empty Lake with Natural Inflow

$$HRT = Lake\ Volume\ /\ Inflow$$

- A Large Deep Lake with Moderate Inflow has a Long Hydraulic Residence Time; whereas a Small, Shallow Lake with a Similar Inflow will have a Short residence Time



Inflow and Sedimentation

Inflow Eventually Becomes Outflow