



*In Pursuit of Artificial Ponds, Puddles,
and Transiently Damp Patches*

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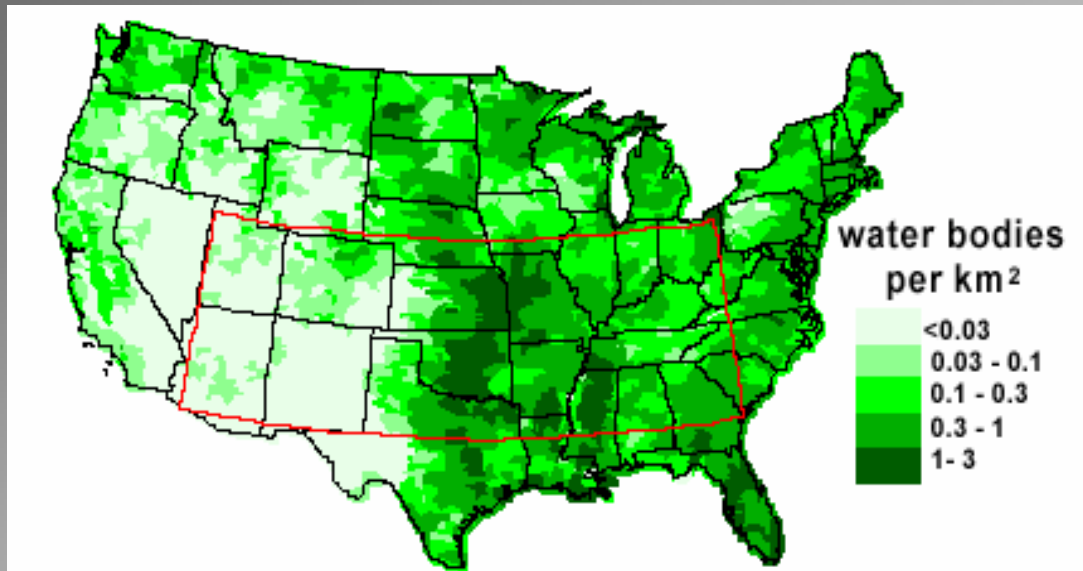
Preview

- Why are we studying ponds?
- A little pond history
- History through imagery
- Modern toys
- At which scales can we see what?
- Closing thoughts

Why are we studying ponds?

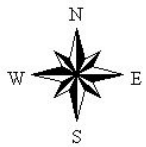
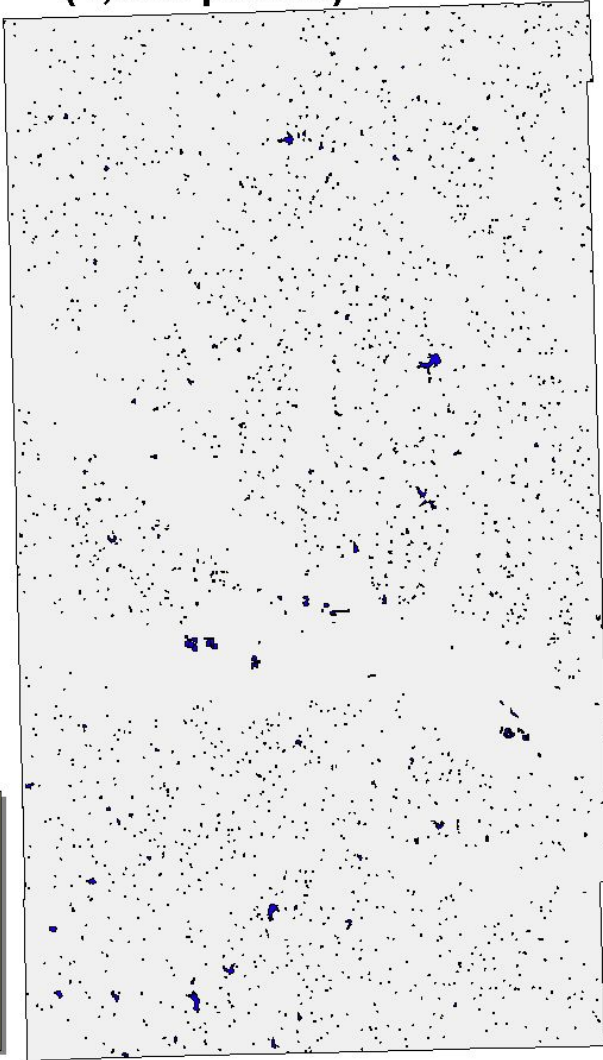
- They are numerous and nearly ubiquitous.
- They trap sediment.
 - Potentially large carbon sink
 - How much sediment do they trap?
- They interrupt runoff and store water.
- They may represent a significant increase in ecological complexity

How many ponds are there?



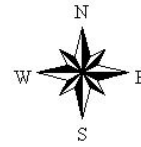
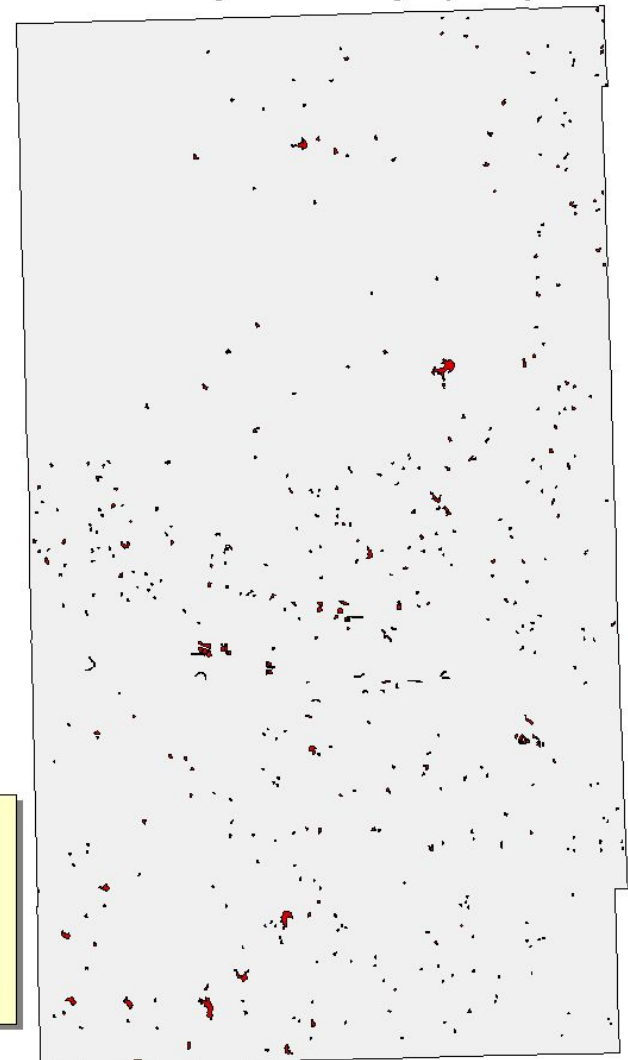
Data Set	Water bodies (10 ³)
<i>DLG</i>	<i>9000</i>
Modified LULC	2600
Tiger	75
NID	43
NA	5

Lyon County Ponds (4,360 ponds)

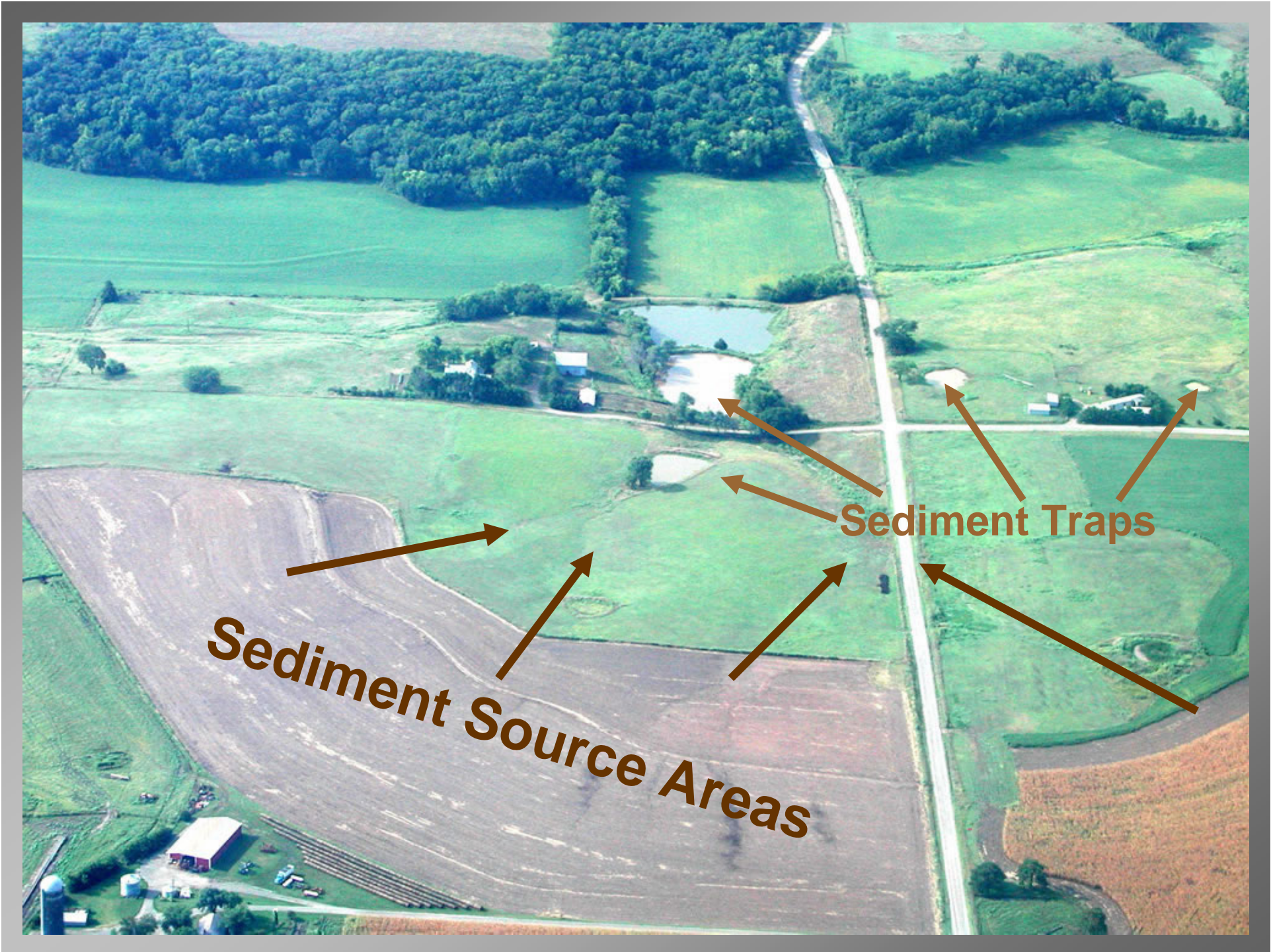


Ponds in Lyon Co. digitized using the 1991 Digital Ortho Quarter Quads (DOQQs), published by the U.S. Geological Survey.

Surface Waters Information Management System (SWIMS) Pond Data for Lyon County (474 ponds)



Ponds network downloaded from DASC for Lyon Co. from the 1996 SWIMS database.

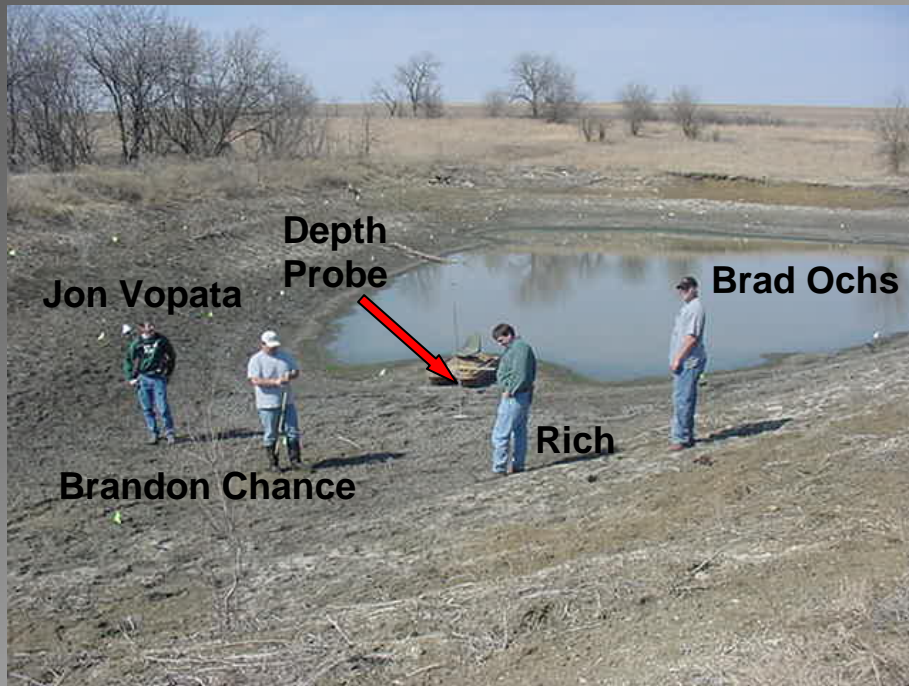


Sediment Source Areas

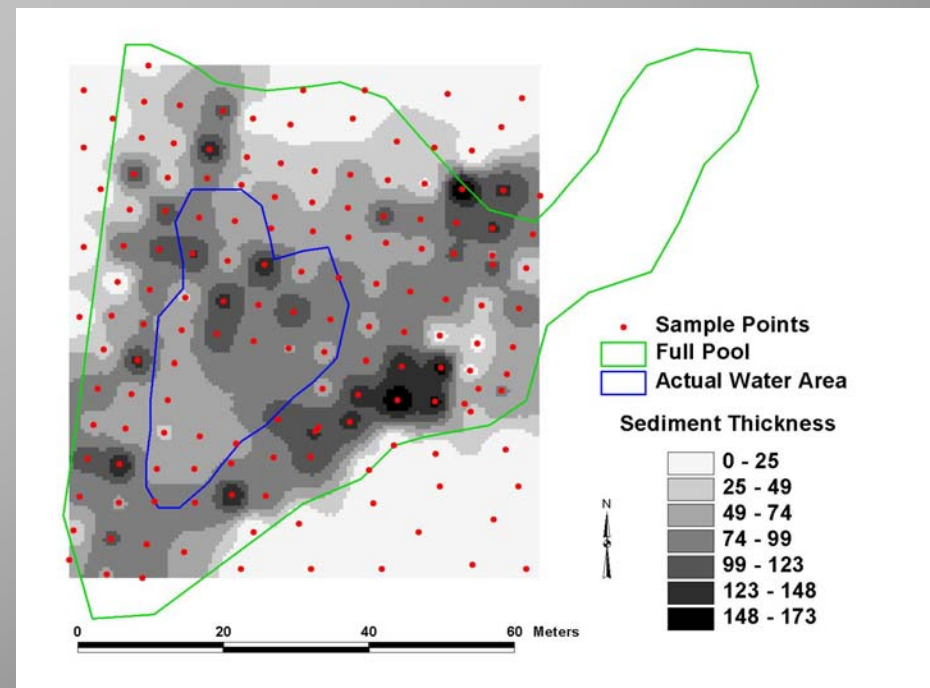
Sediment Traps

How much sediment do they trap?





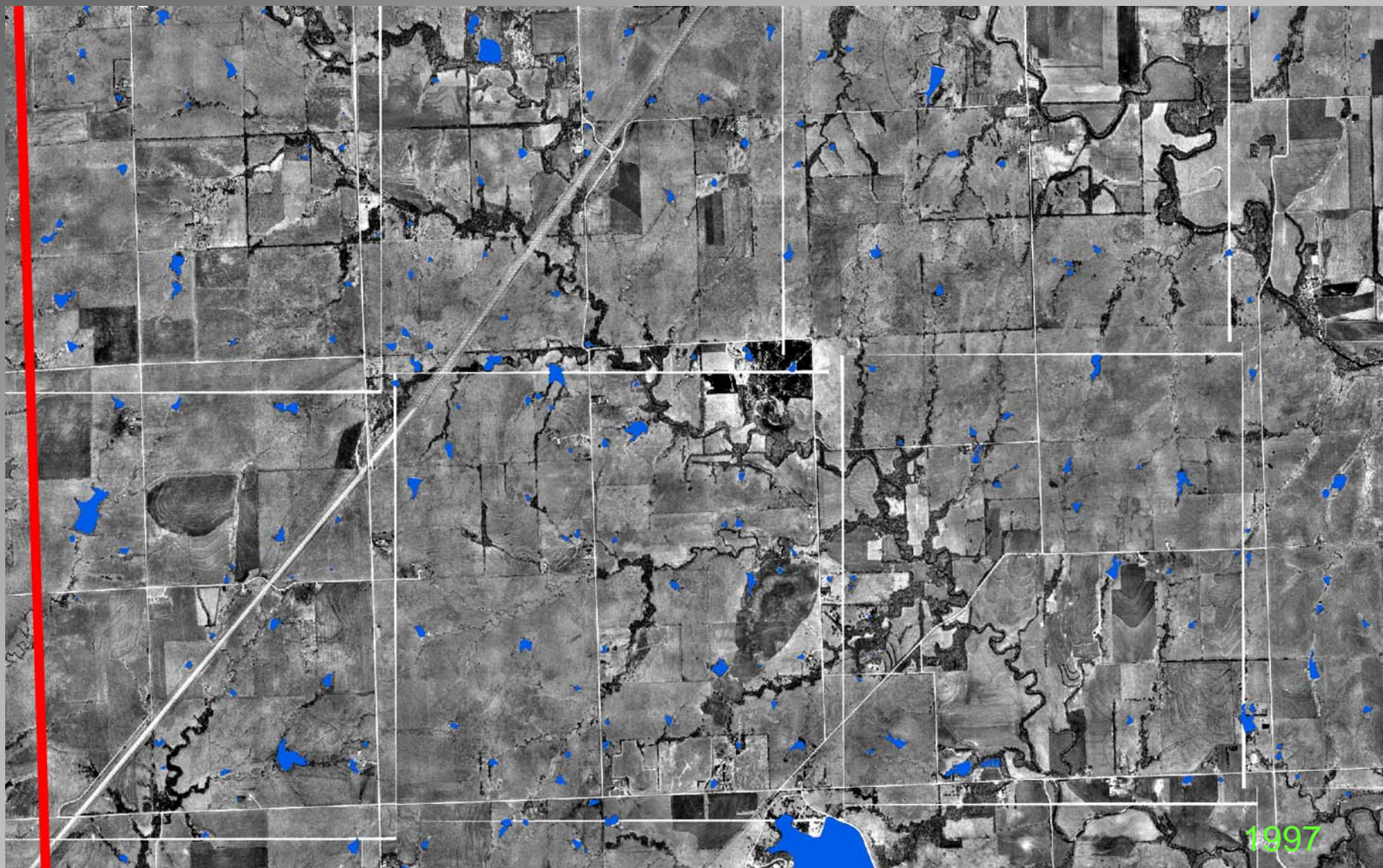
- 1) Sediment thickness varied from 0 to 1.73 meters
- 2) Organic-rich (Lots of Carbon Storage)
- 3) Water storage highly variable.







Interruption of Runoff and Storage of Water



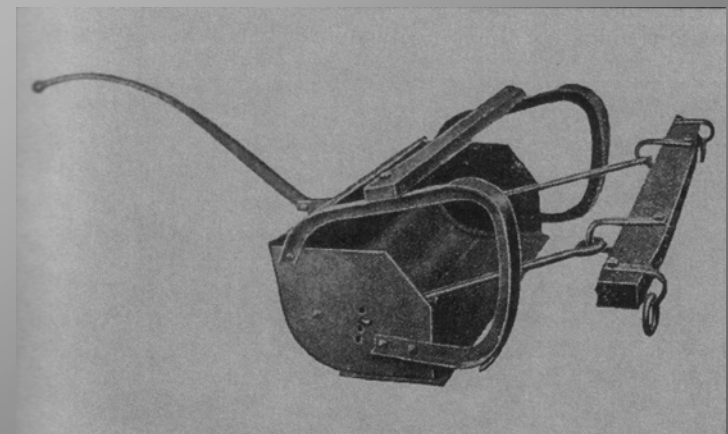
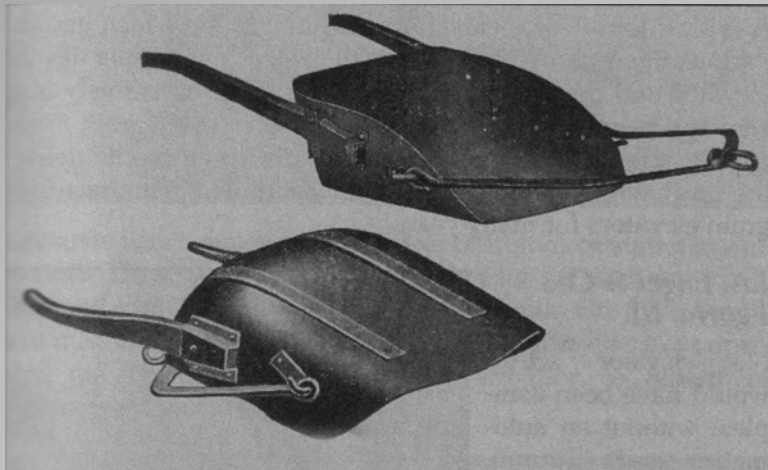
Increased Ecological Complexity?



A Little Pond History

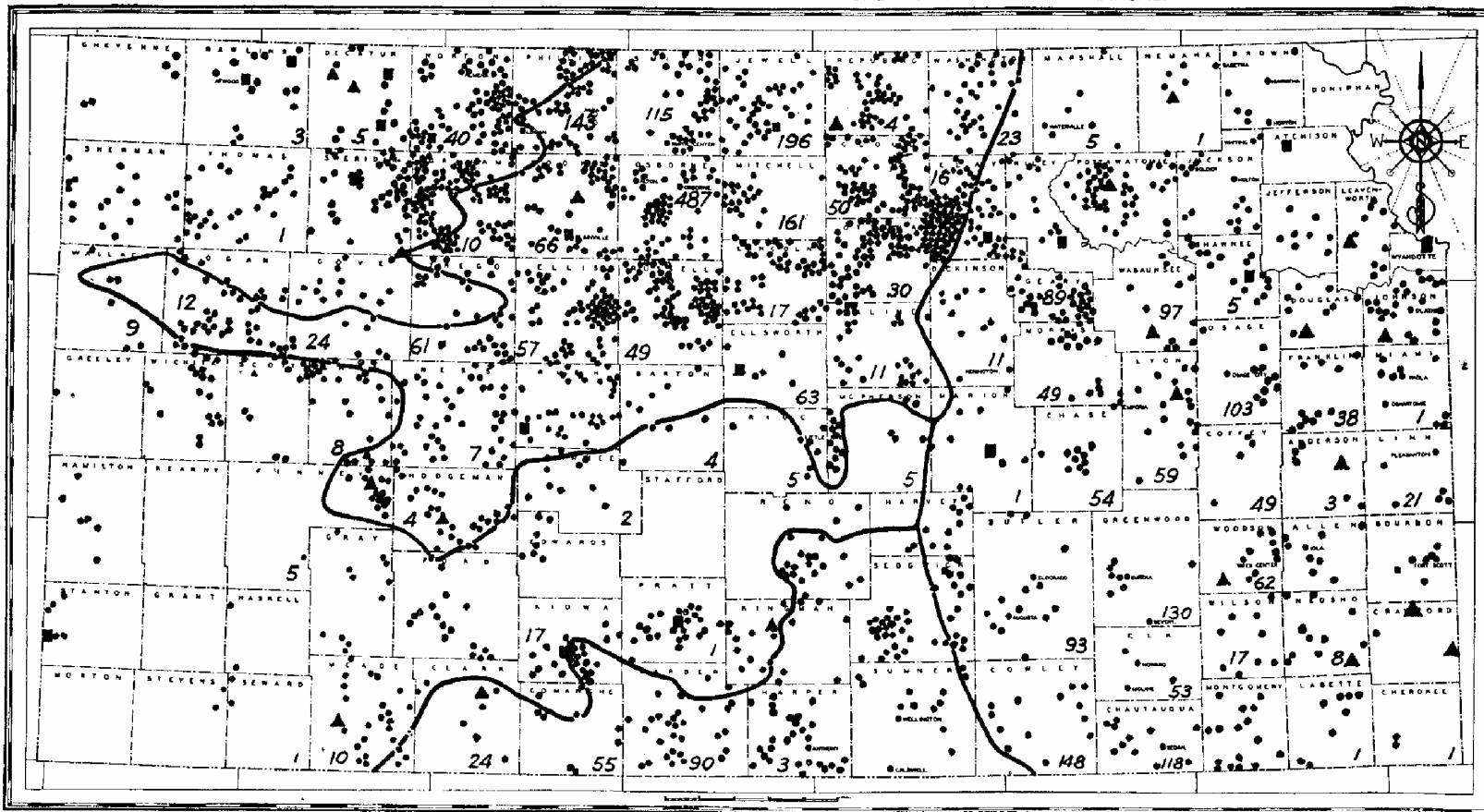
- Scrapers and mules to speedmovers and Cats
- KDA and tax breaks 1930s
- Rapid Increase in numbers after WWII
- Not just for stock anymore

Changing Technology





MAP SHOWING LOCATION OF LAKE AND POND PROJECTS IN KANSAS.



KANSAS STATE BOARD OF AGRICULTURE ——— DIVISION OF WATER RESOURCES
 LEGEND ▲ STATE LAKE ■ COUNTY LAKE □ TOWNSHIP LAKE ● CITY LAKE ○ FARM POND

Fig. 22. Map showing distribution of lakes and farm ponds that have a maximum depth of ten feet or more in Kansas (modified slightly from map published by the Division of Water Resources, State Board of Agriculture). Also indicated (by figures) is the distribution of more than 3,000 ponds that have a maximum depth of seven feet or more, constructed in 1938 and 1939 with aid of the Agricultural Adjustment Administration.

1941



1954



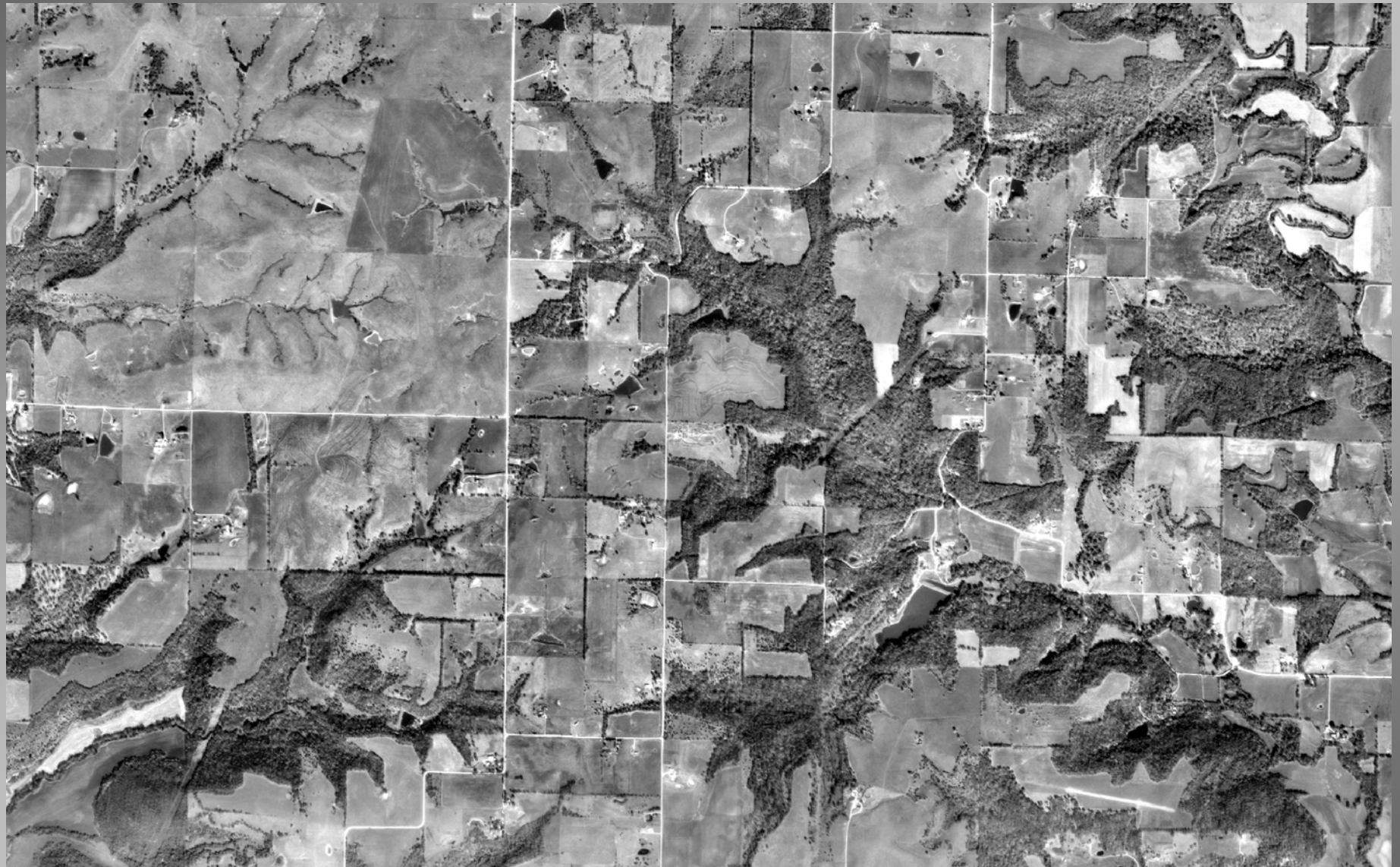
1966



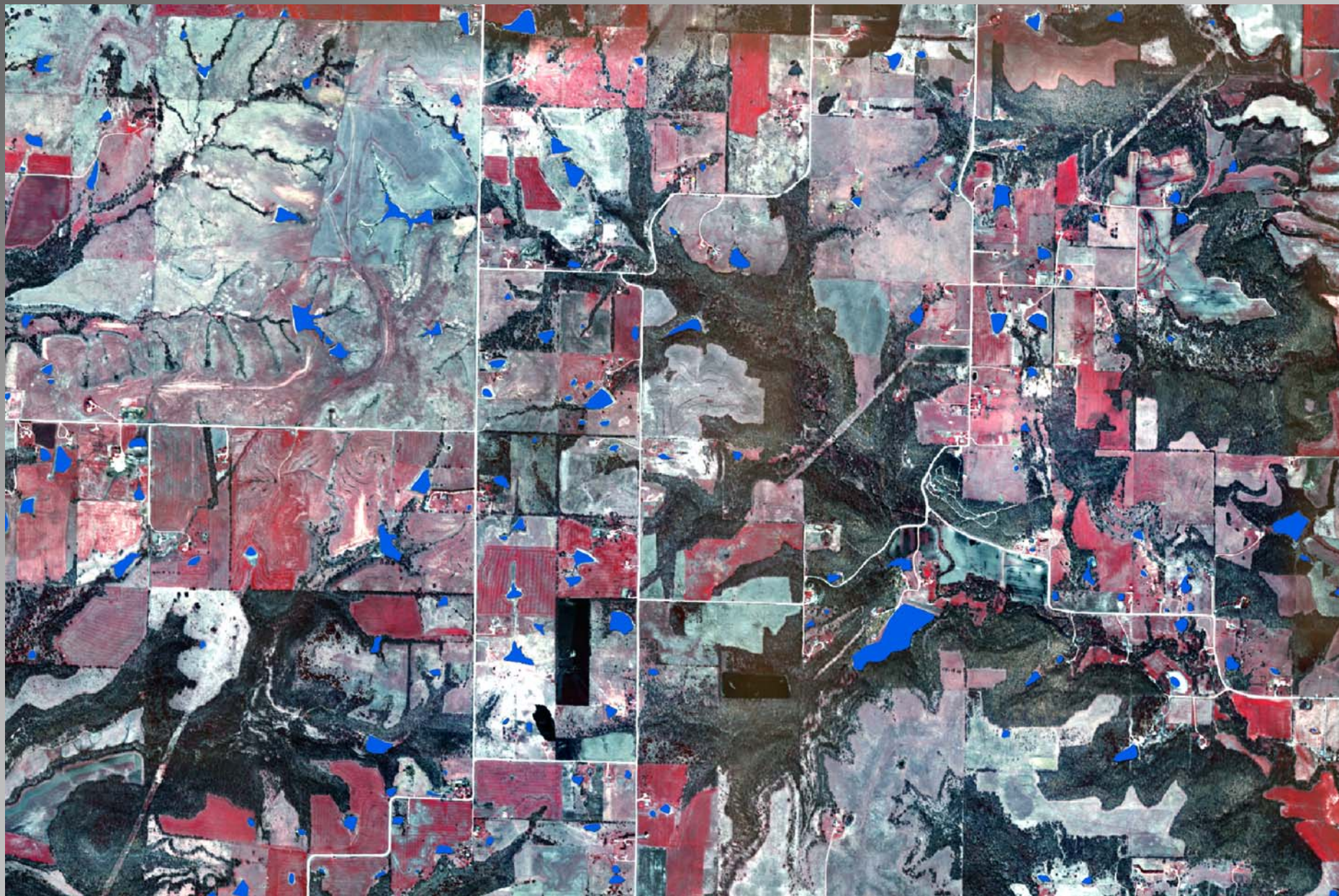
1976

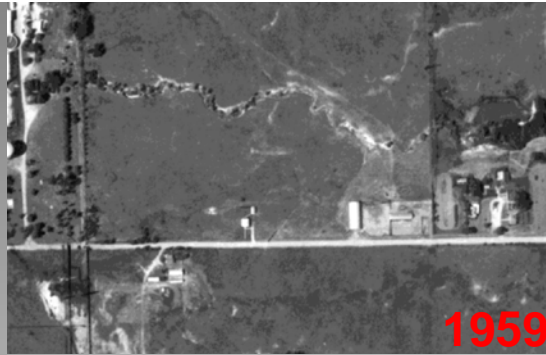
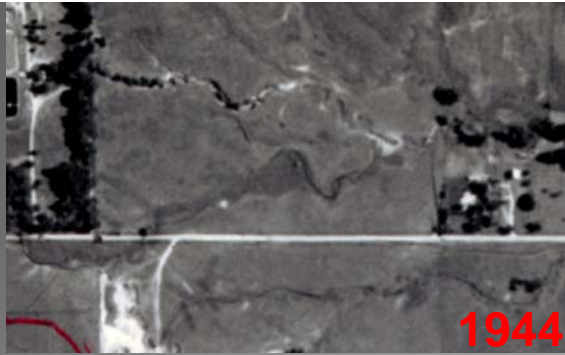


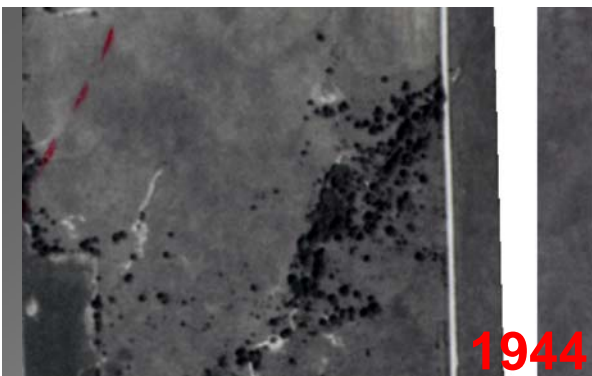
Midland Quad DOQQ 1991 BW



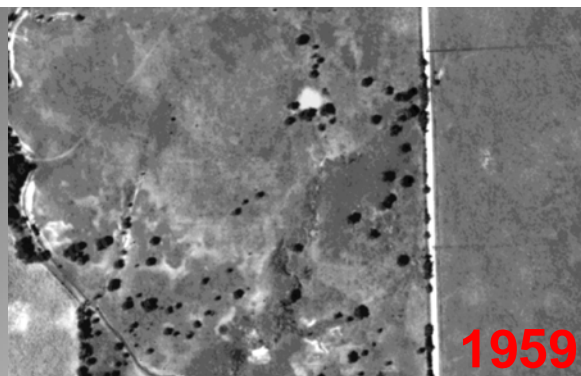
Midland Quad 2002 False Color



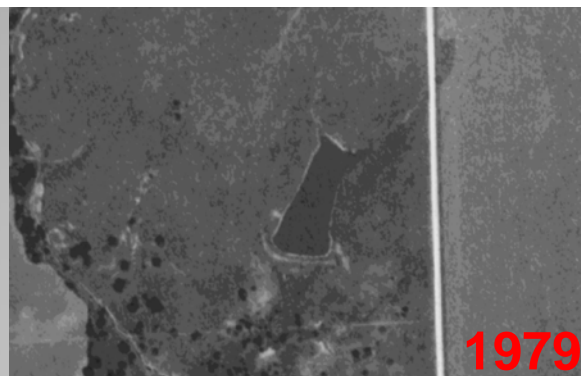




1944



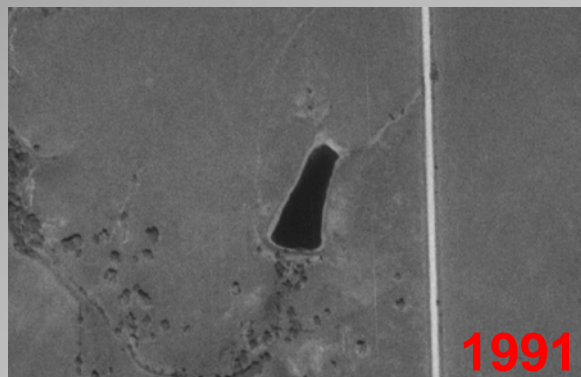
1959



1979



1980



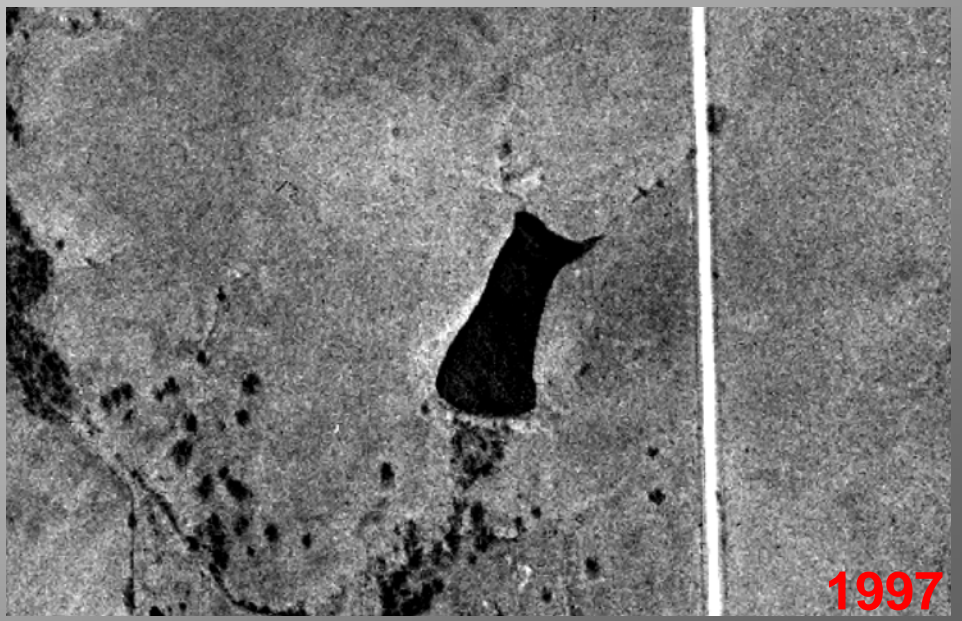
1991



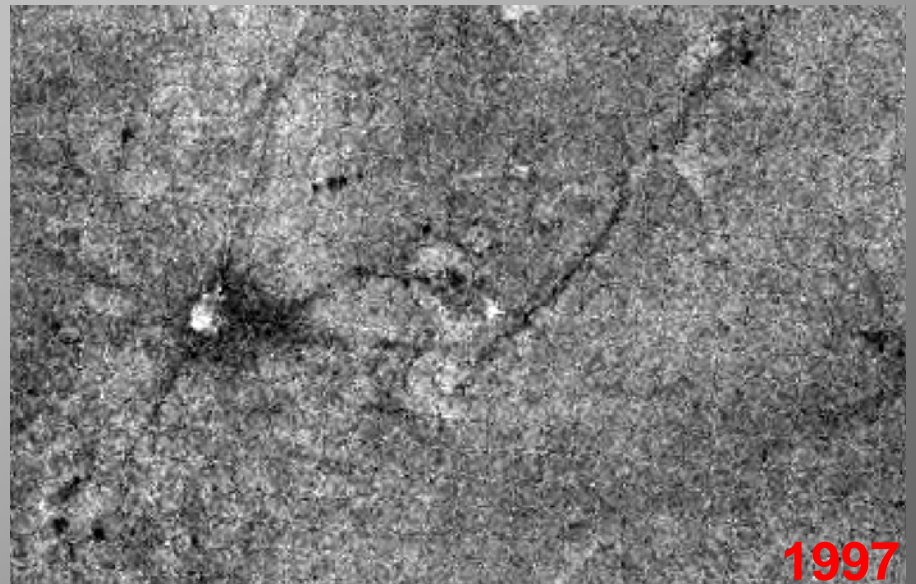
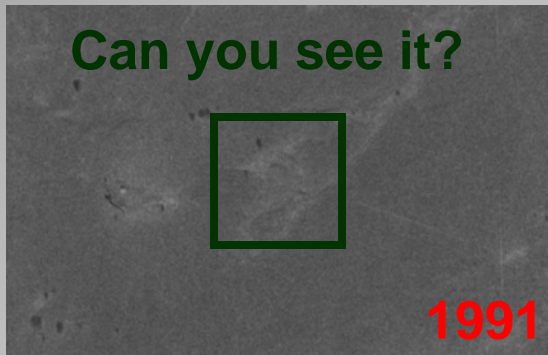
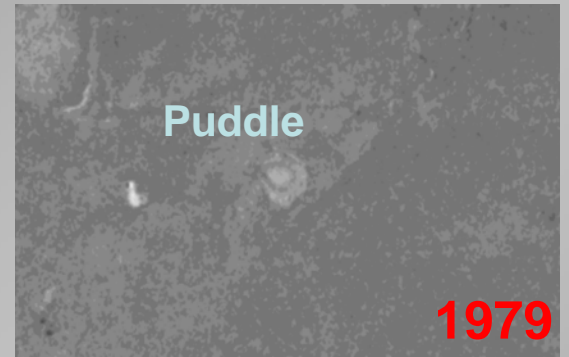
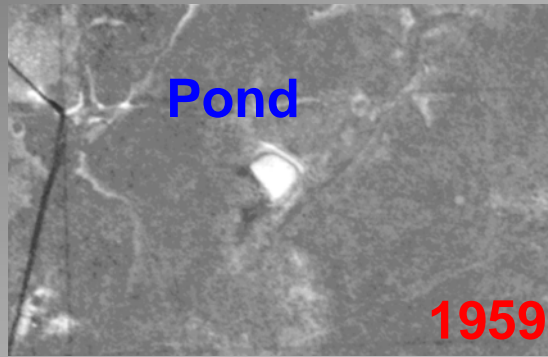
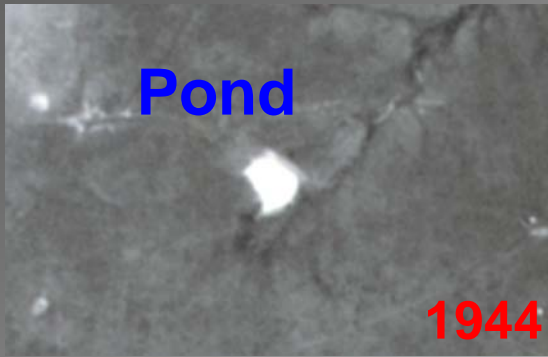
1993

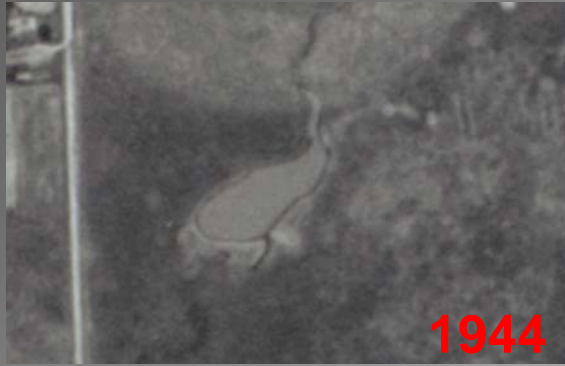


2003

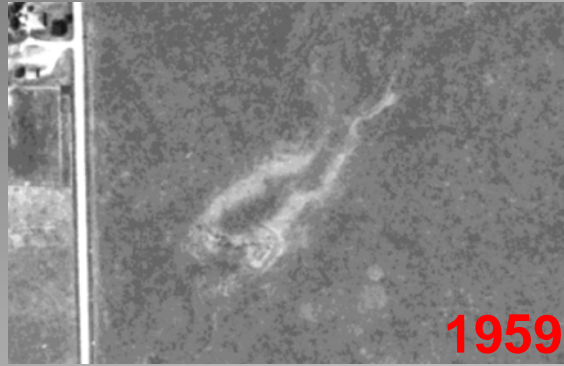


1997

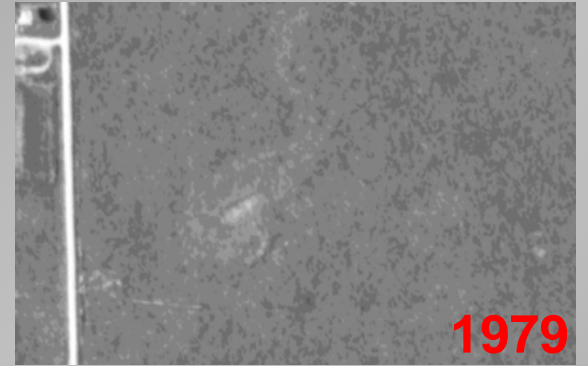




1944



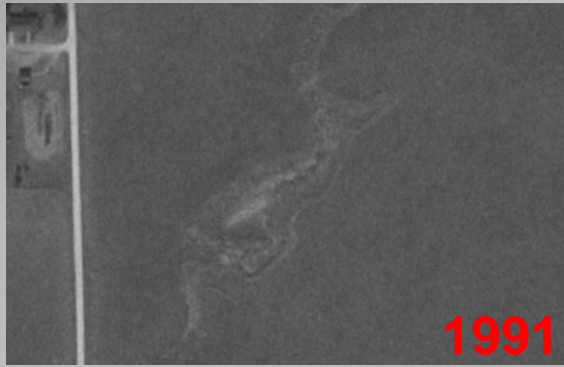
1959



1979



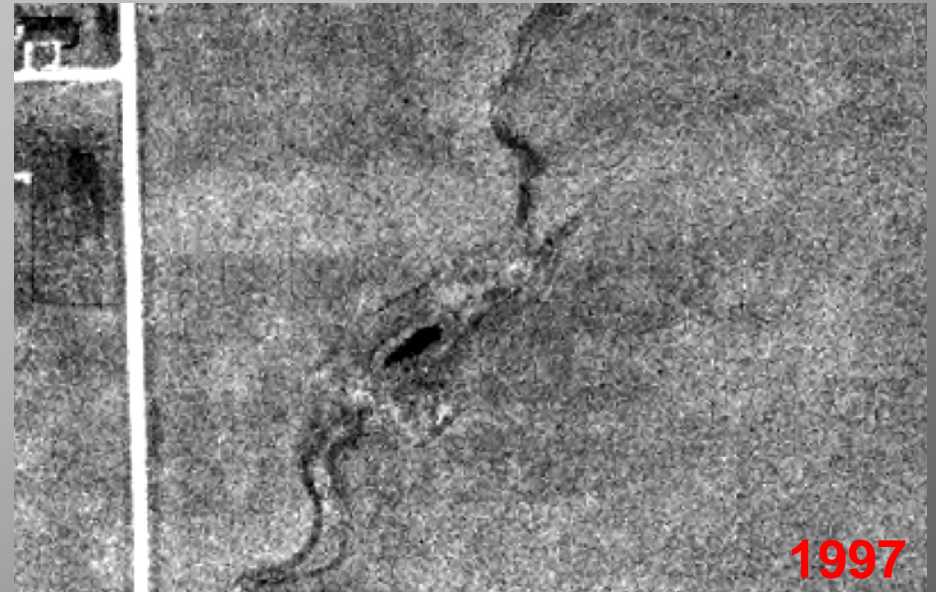
1980



1991



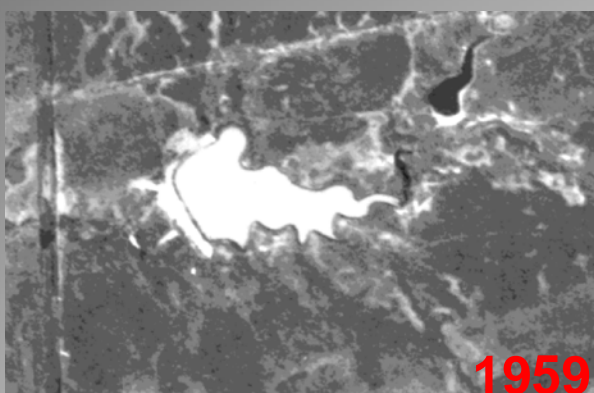
1993



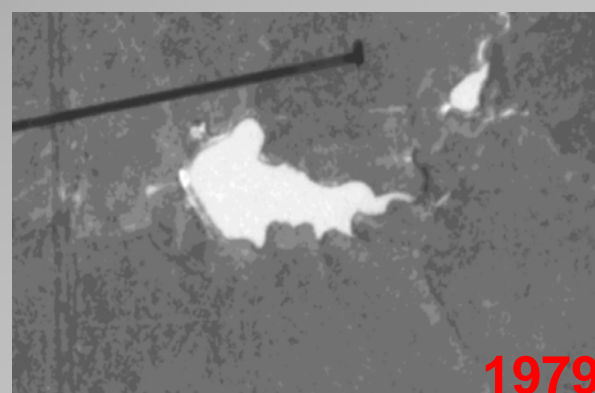
1997



1944



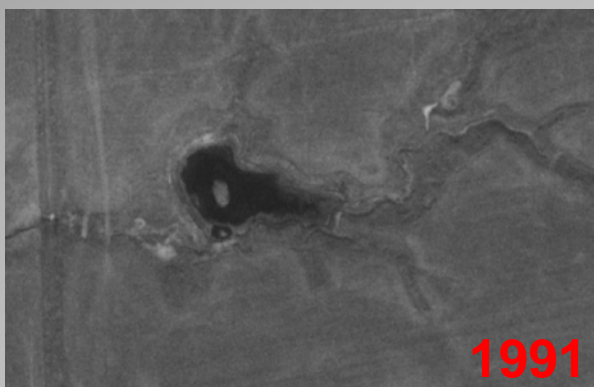
1959



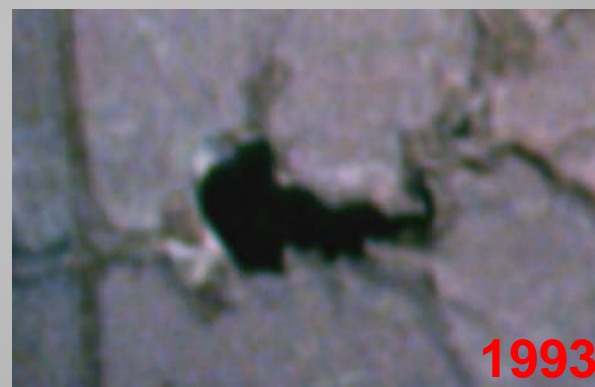
1979



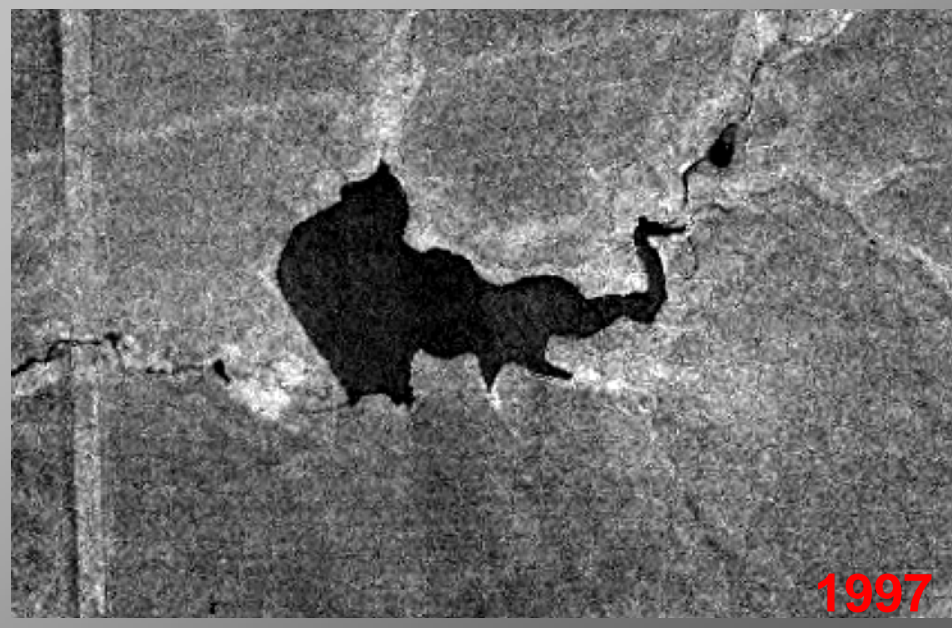
1980



1991

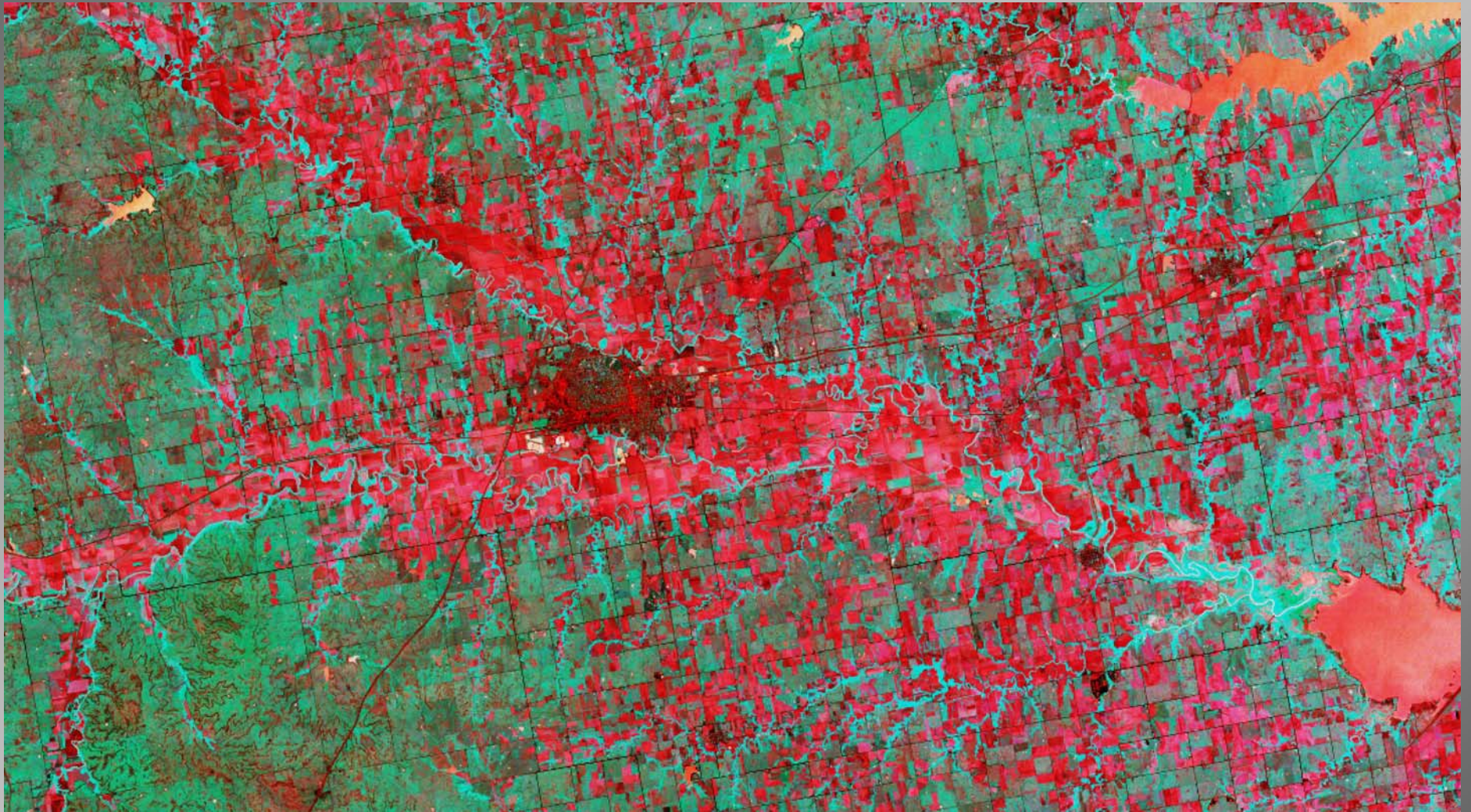


1993



1997

Landsat Thematic Mapper (June 1988)

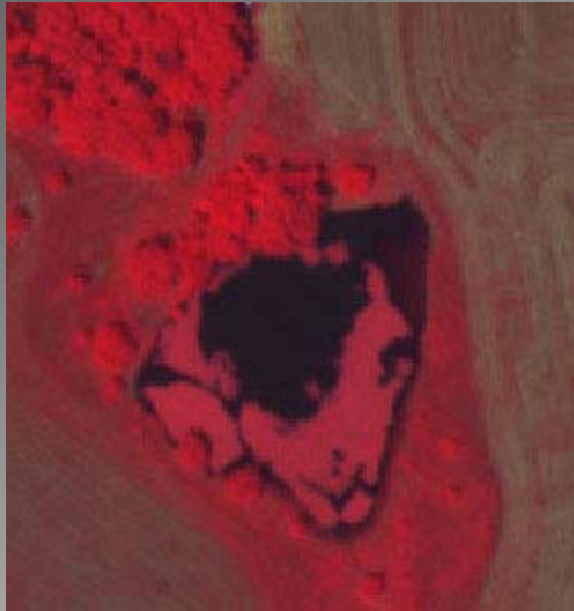


ASTER Imagery 2003



Proximity does not mean similarity – ponds come in a wide variety of sizes, shapes, colors, environments – and presumably, functions

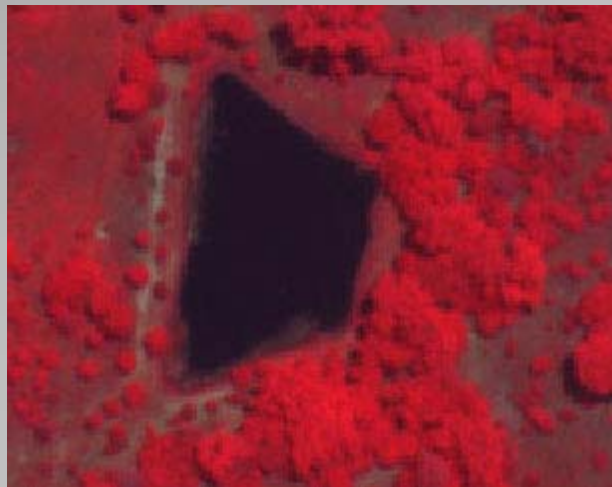




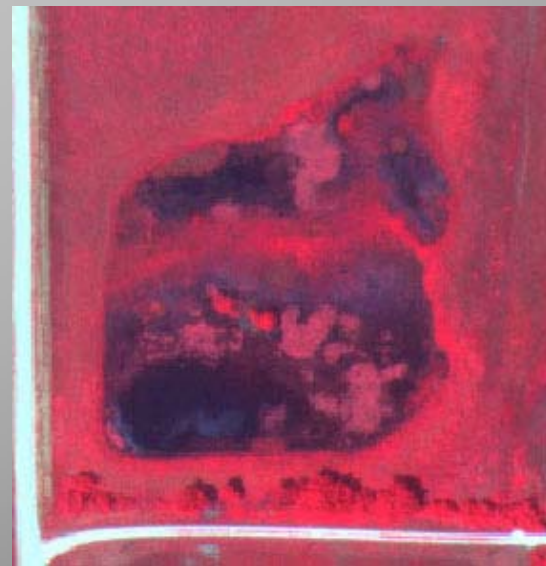
Relatively clear water pond with substantial aquatic vegetation.



Farm pond with turbid water and moderate aquatic vegetation



Relatively clear water pond with little or no aquatic vegetation.



Pond clogged with aquatic vegetation and sediment build-up

Closing Thoughts

- Just beginning to quantify the effects of ponds
 - Water storage and water balance
 - Sediment trapping and carbon storage potential
 - Ecological/habitat diversity
- Could they affect global climate?



Thanks to Jon