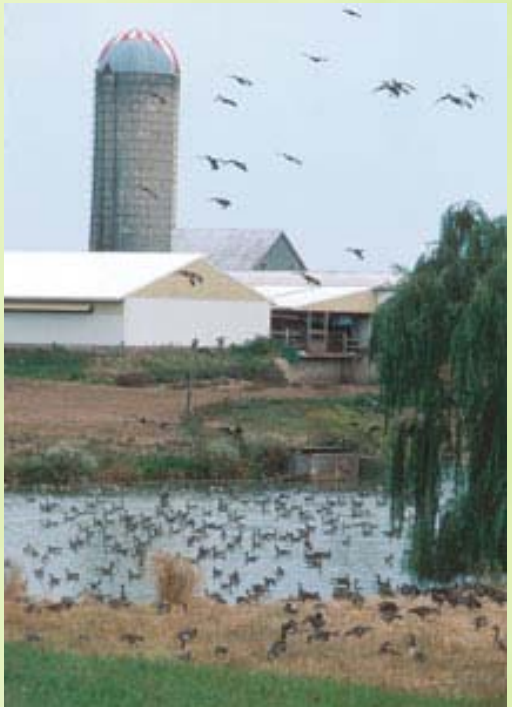
Restoring and creating wetlands

- Creation: turning an upland or deep area into a wetland
- Restoration:
  - re-creating a wetland that previously existed; or,
  - enhancing recovery of a degraded wetland



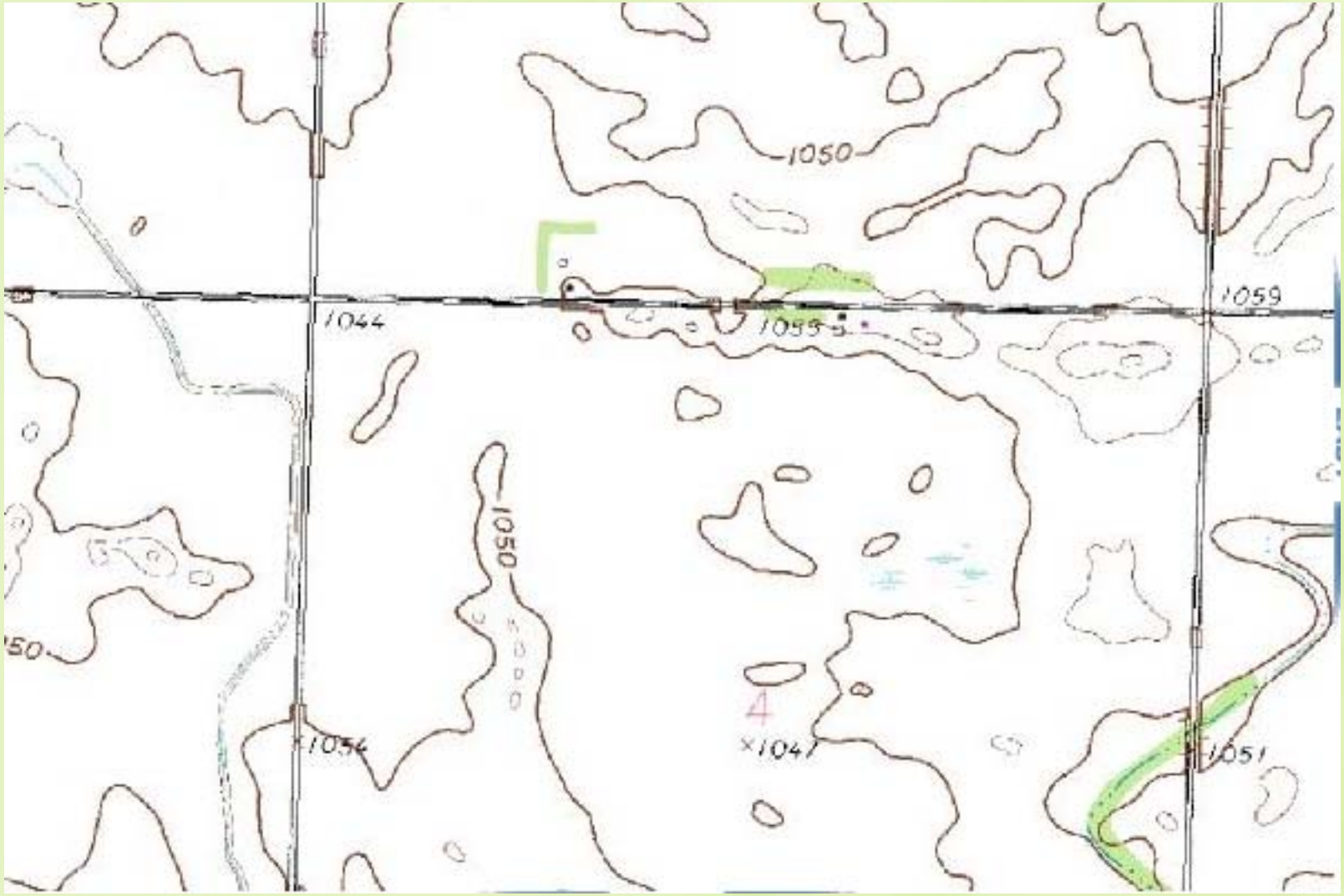
How to restore/create

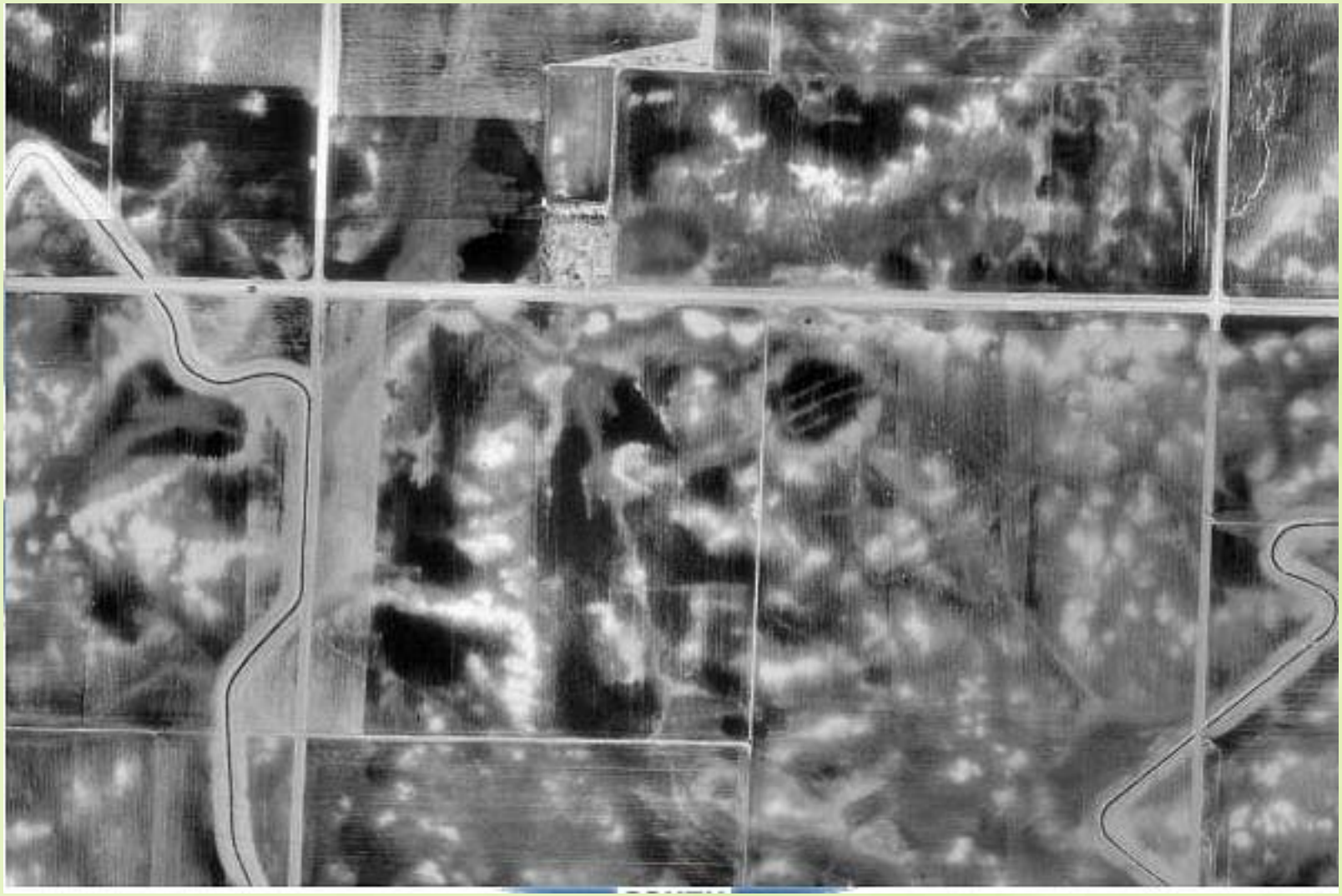
- Location, location, location
- Basin
- Hydrology
- Soils (& residual toxins, fertilizers)
- Vegetation (seed source)
- Fertilizer?
- Animals?
- Buffer?

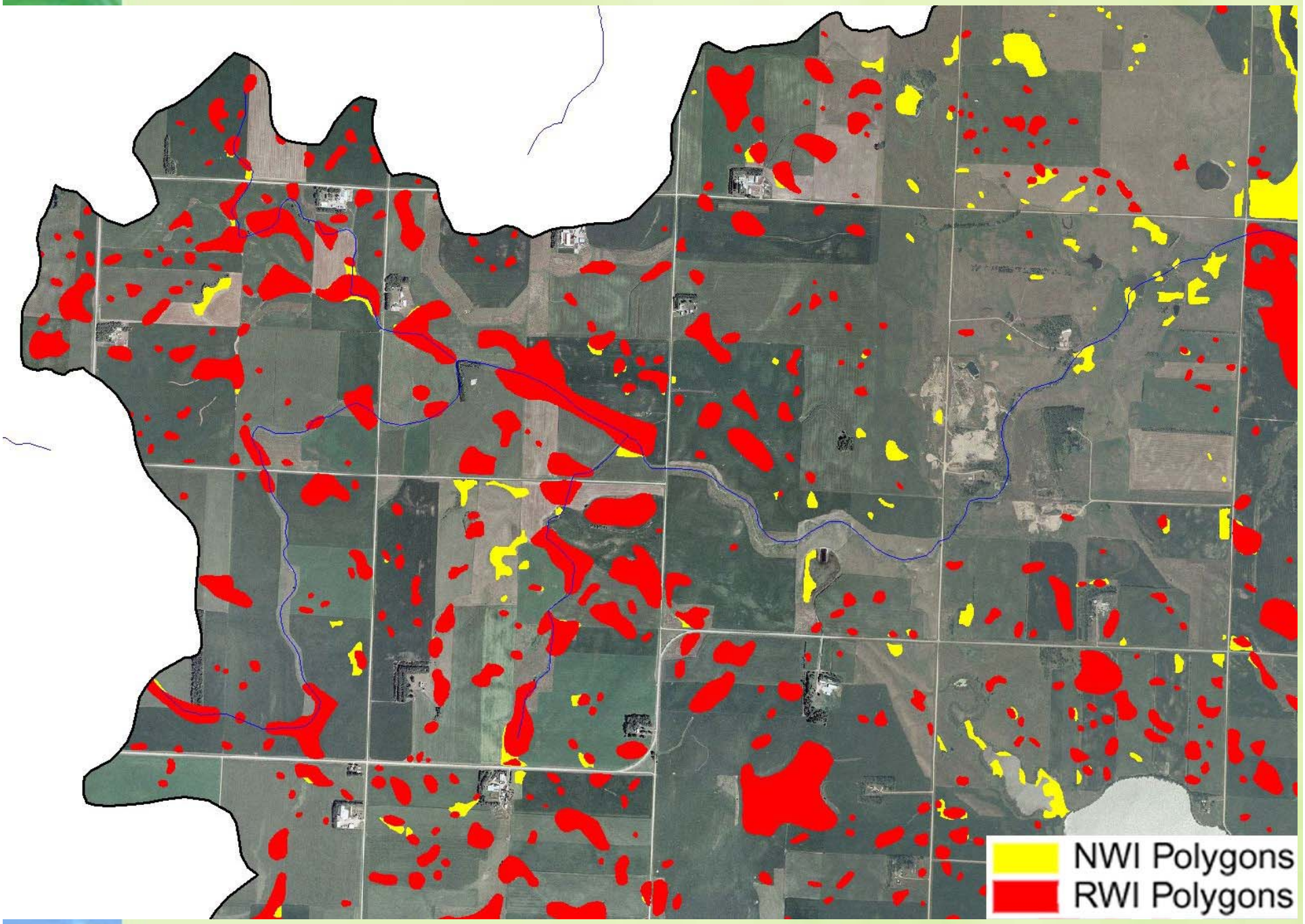
Goal:

It should take care of itself and not require repeated human intervention to remain a wetland of the appropriate type.

Location

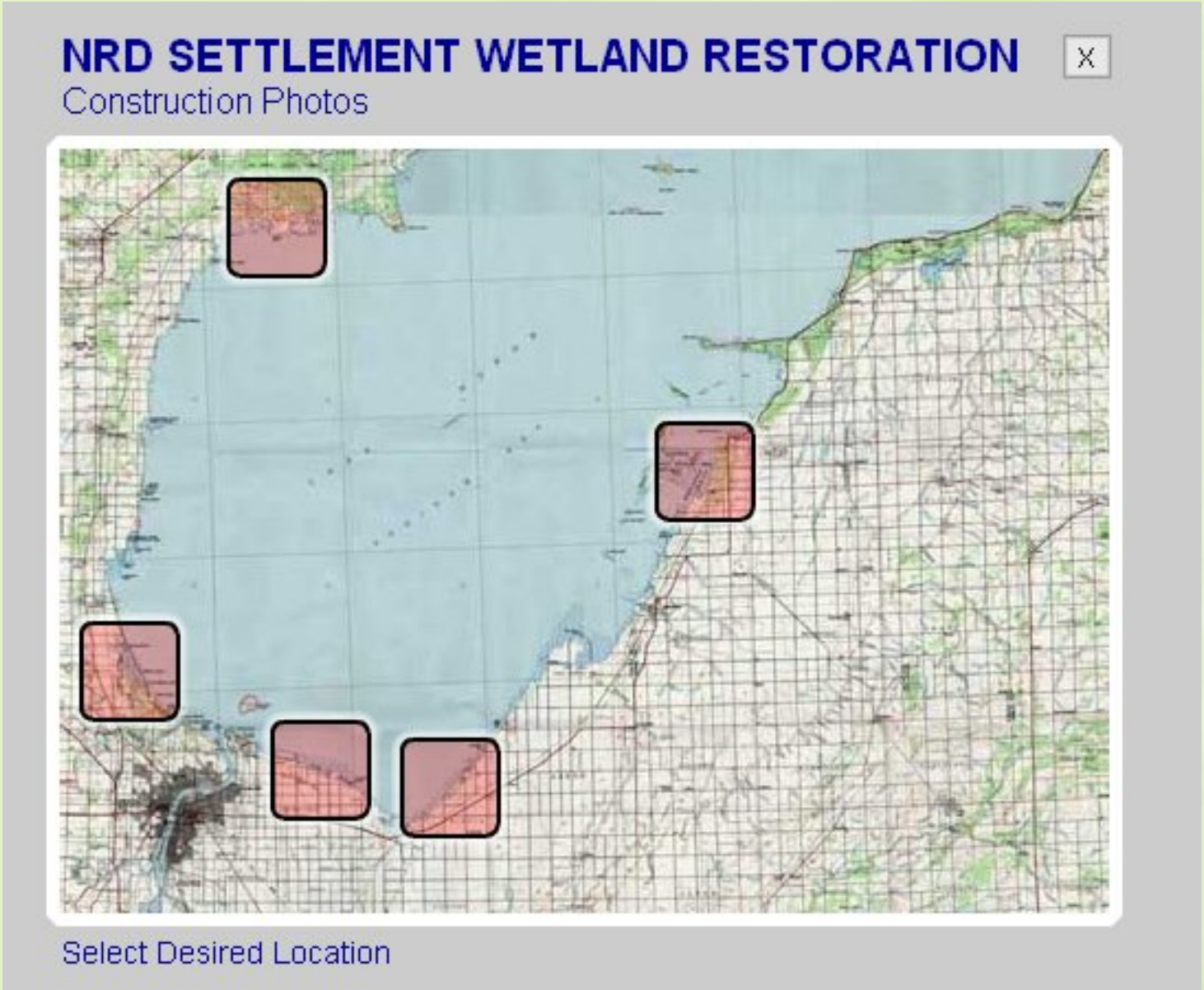


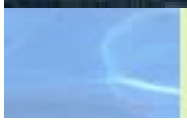



NWI Polygons
RWI Polygons

Conservation Reserve Program

Restoration of farmed wetlands





http://www.fws.gov/midwest/SaginawNRDA/restore.html

Saginaw Bay coastal wetlands

- Typical FWS restoration activities on 1300 acres of coastal wetland or lakeplain prairie:
  - breach dike by bay and raise dikes by neighbors
  - fill ditch adjacent to dike
  - enhance site topography for habitat benefits
  - remove pumps and disconnect drains
  - establish native vegetation in upland area
  - demolish structures and remove utility poles


CIVIC

Site Badour 2 on SW side of Saginaw Bay

Before

EAST BERM

Middle of East Berm looking South.

X

April 10, 2001

Thumbnails | Back | N

After

EAST BERM

North End of East Berm looking South.

X

June 4, 2002

Thumbnails | Back | Next | Home

Basin

Hydrology

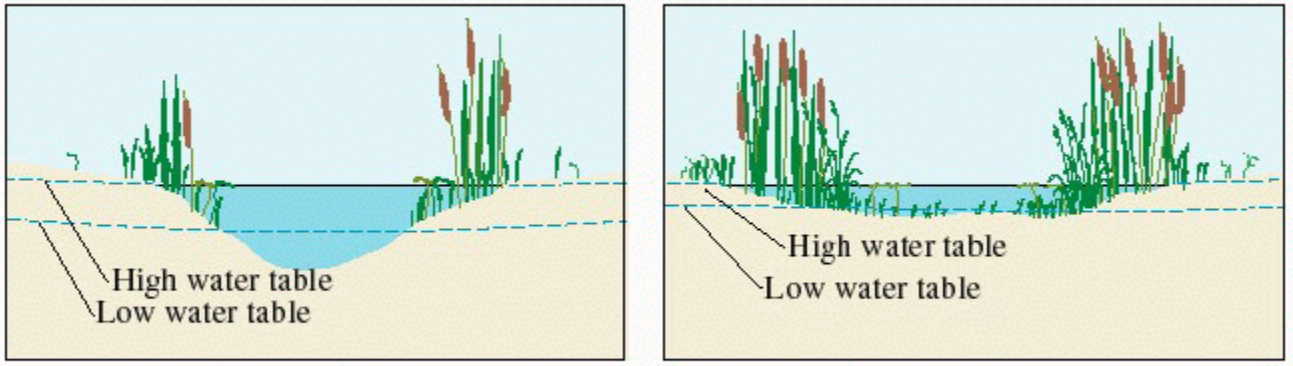
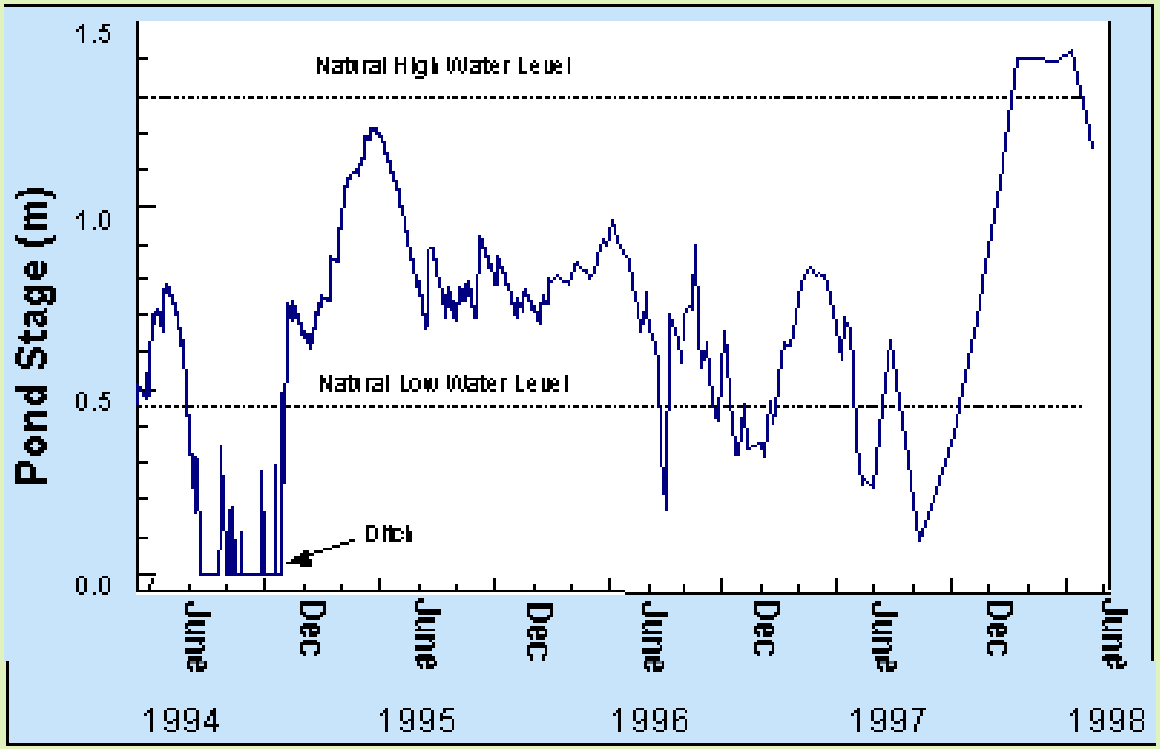


Figure 53. The relative position of a basin substrate, the water table, and differences in vegetation resulting from the degree of basin slope.



Bay 93 Experimental Restoration Variables

Hydrology
- restored, plugged ditch
- variable

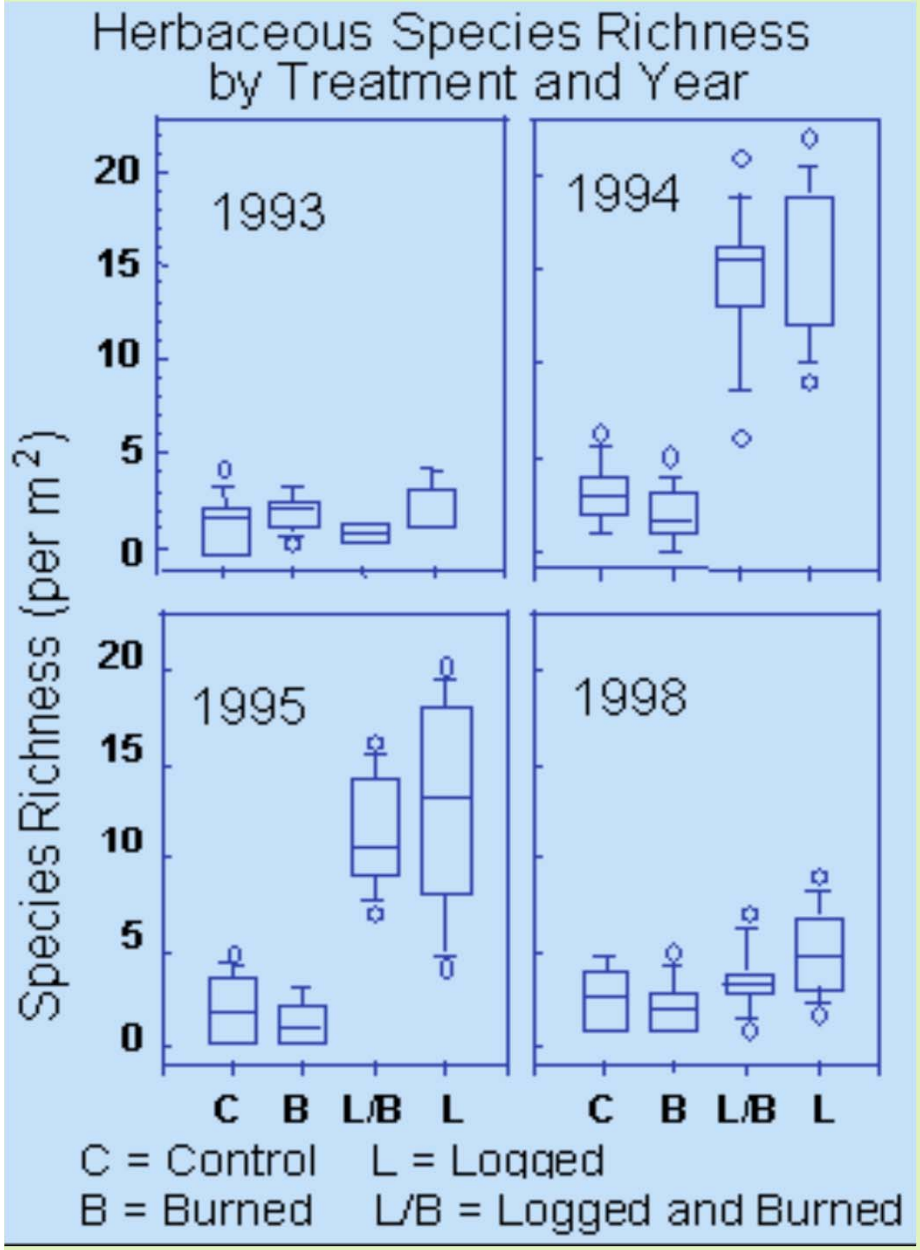
Substrate
- removed litter (burning)
- disturbed (logging)

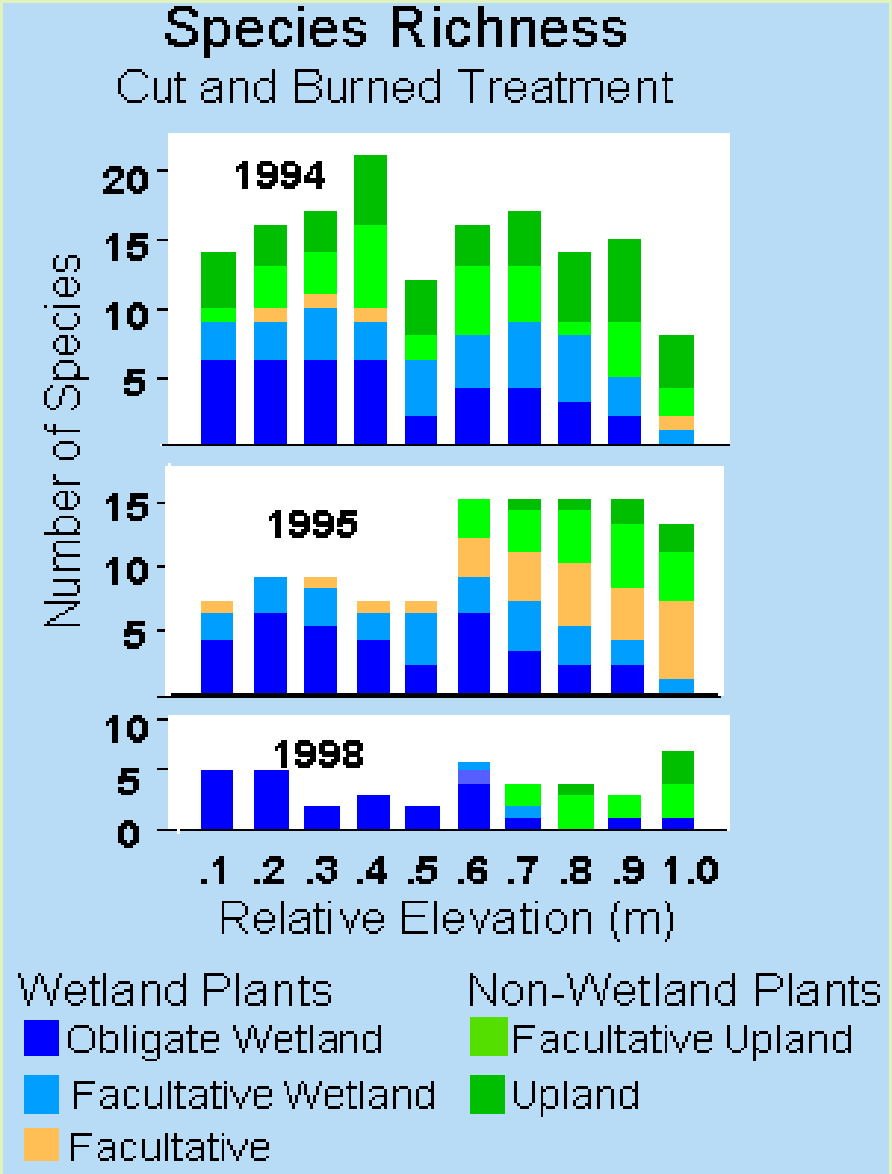
Vegetation
- removed non-wetland (clearcut)
- used existing colonizing source (seed bank)

Hydrograph of Bay 93. The drainage ditch was closed in October, 1994.

http://www.uga.edu/srel/ESSite/CBWWetland_restoration.htm

Vegetation: remove upland veg, plant wetland veg?





http://www.uga.edu/srel/ESSite/CBWWetland_restoration.htm

Restoring peatlands

http://www.fes.uwaterloo.ca/u/jsprice/price/JSP/Peatland%20Restoration.htm

Preparing former wetland

Field preparation

Collecting organic material from donor wetland

Donor material collection

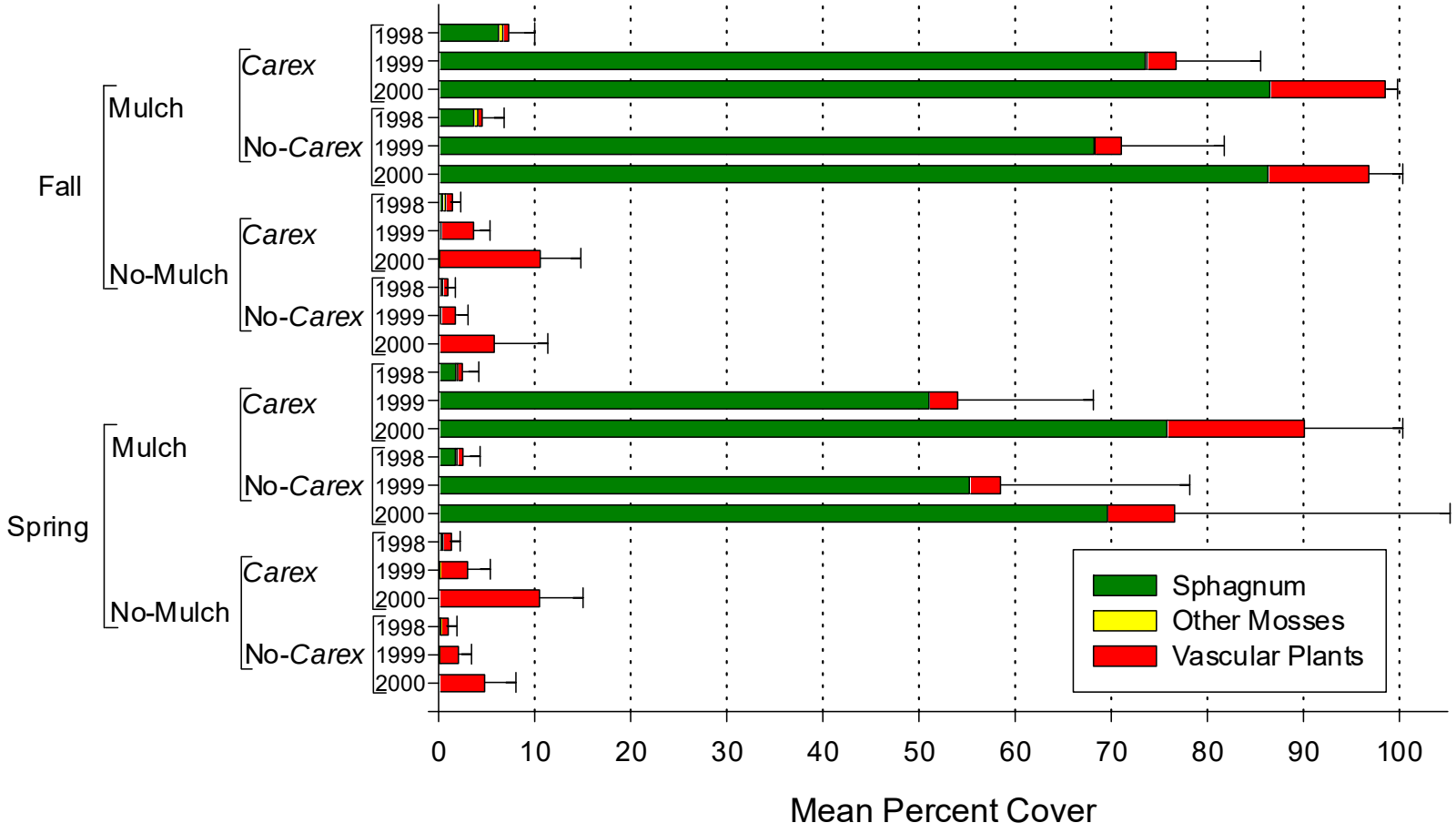
Spread donor material on restoration area

Donor material spreading

Apply hay mulch

Mulch application

1998, 1999, and 2000 Percent Cover
Planting Time/Mulch/Companion Species Study
Michigan Peat Study Site
(Mean + standard deviation, n = 6)



Restoring swamps

Restoring floodplain wetlands

Fig. 1.10a -- The three major components of a stream corridor in different settings.
In Stream Corridor Restoration: Principles, Processes, and Practices, 10/98
by the Federal Interagency Stream Restoration Working Group (15 Federal Agencies of the US)

Restoring tidal wetlands

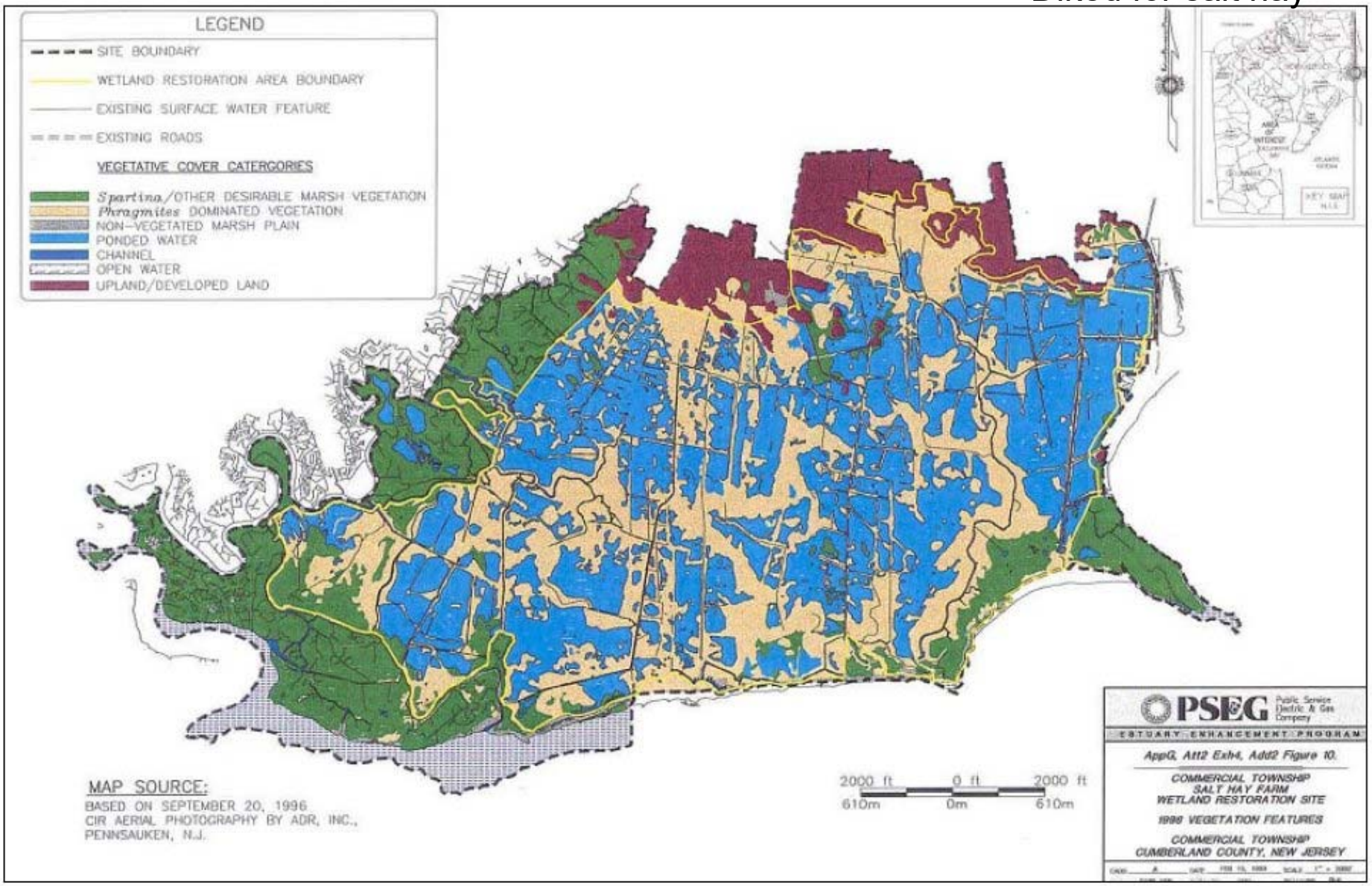
Delaware estuary enhancement

- 20,000 ha (32 sq miles)
- Restore areas diked for salt hay, invaded by Phragmites, & degraded by other impacts

(http://www.pseg.com/environment/estuary/overview.jsp)

Commercial Twp Site - 1996

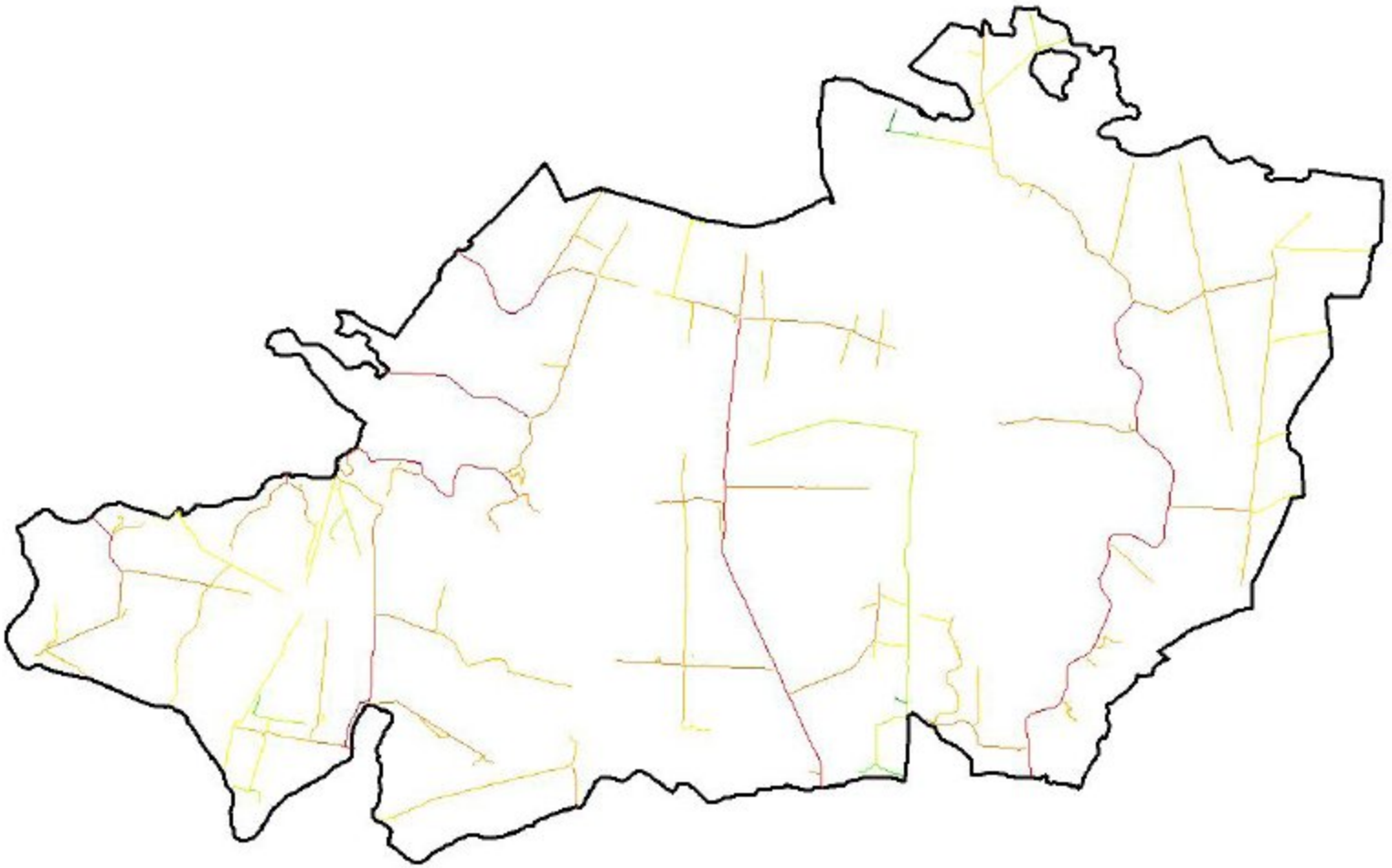
4000 ha
Diked for salt hay



Post

COMMERCIAL TOWNSHIP - 1997

Hydrologic Changes



N

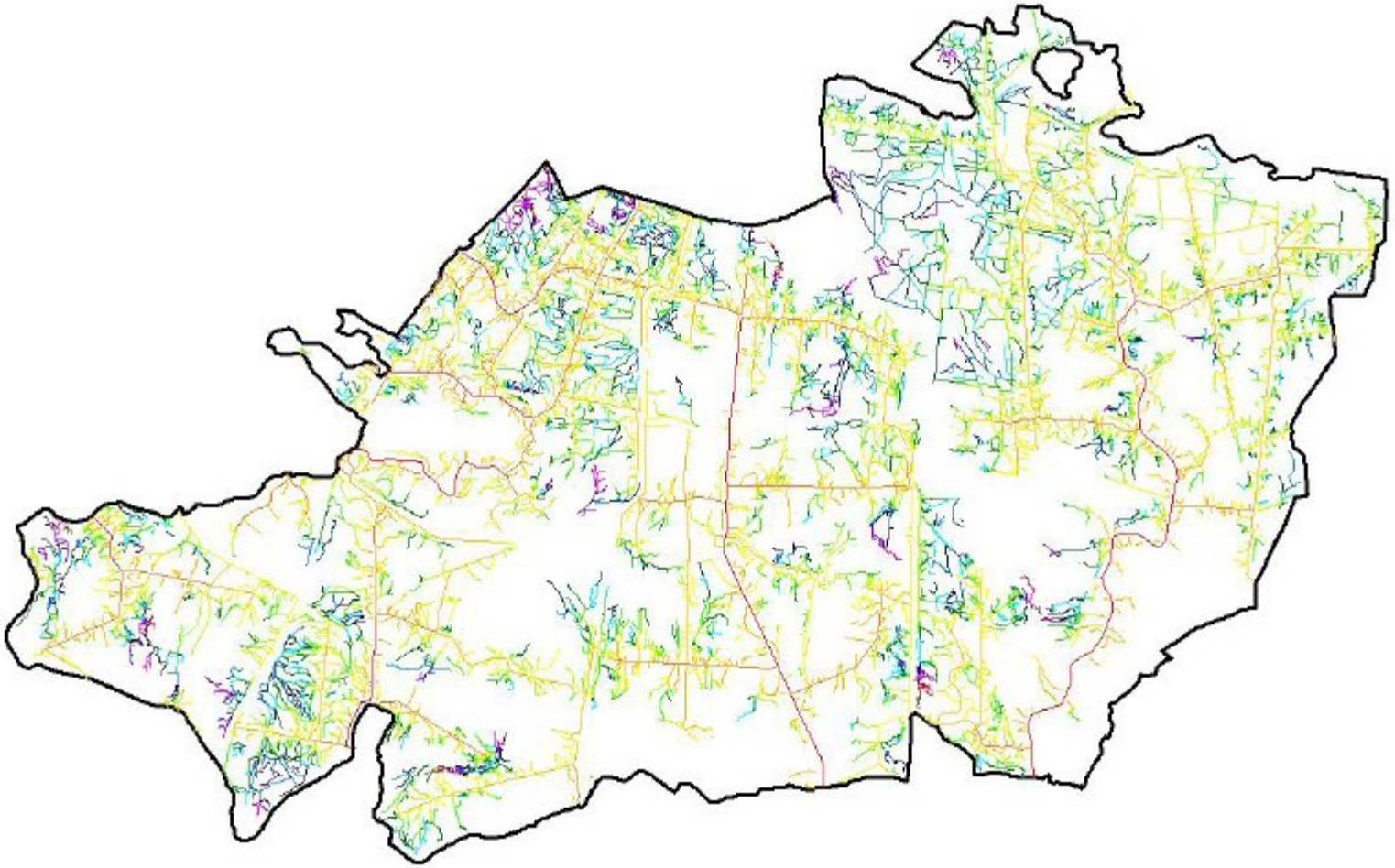
1:30000

0.3 0 0.3 0.6 Miles

URS

COMMERCIAL TOWNSHIP - 2002

Hydrologic Changes

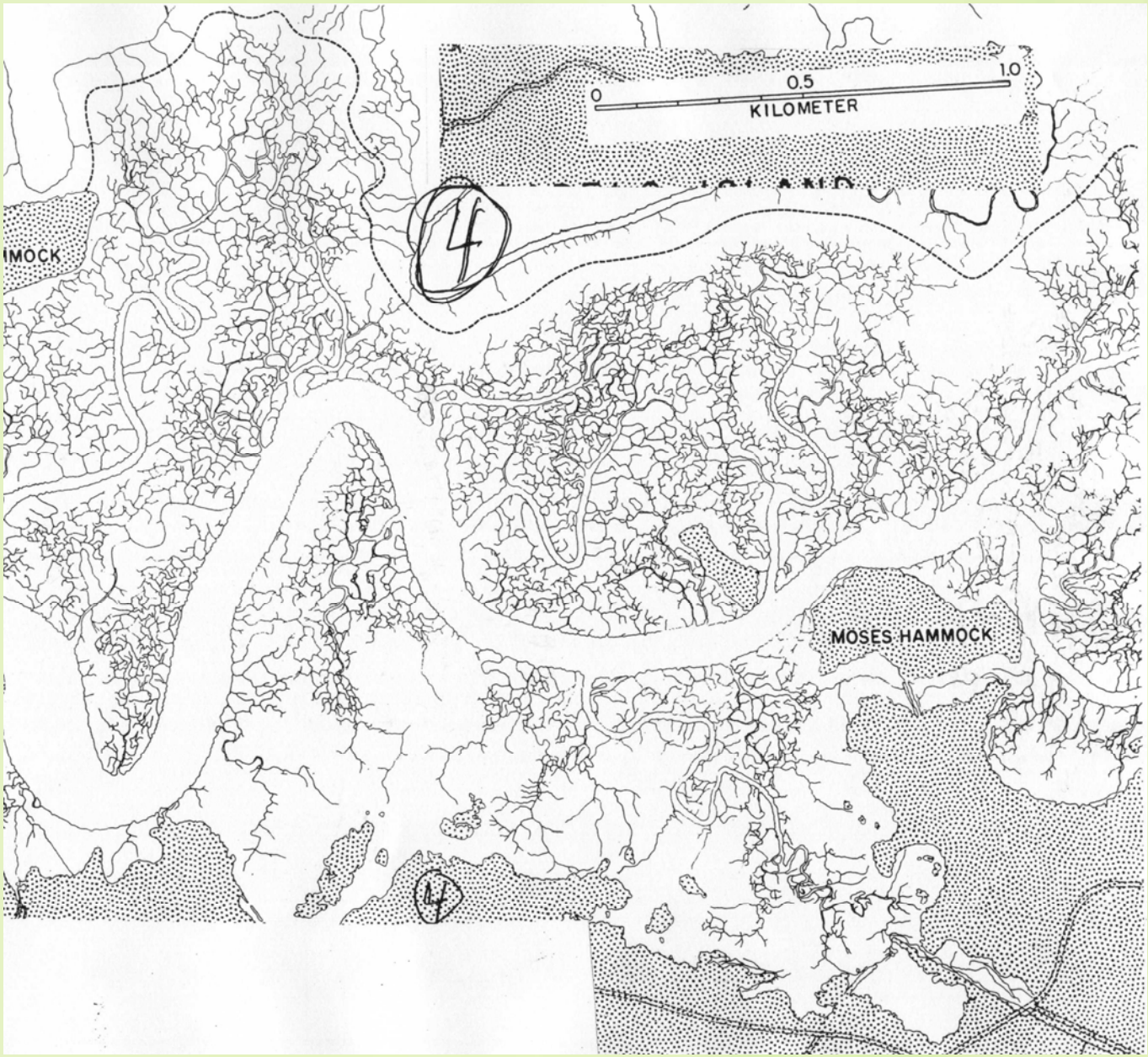


N

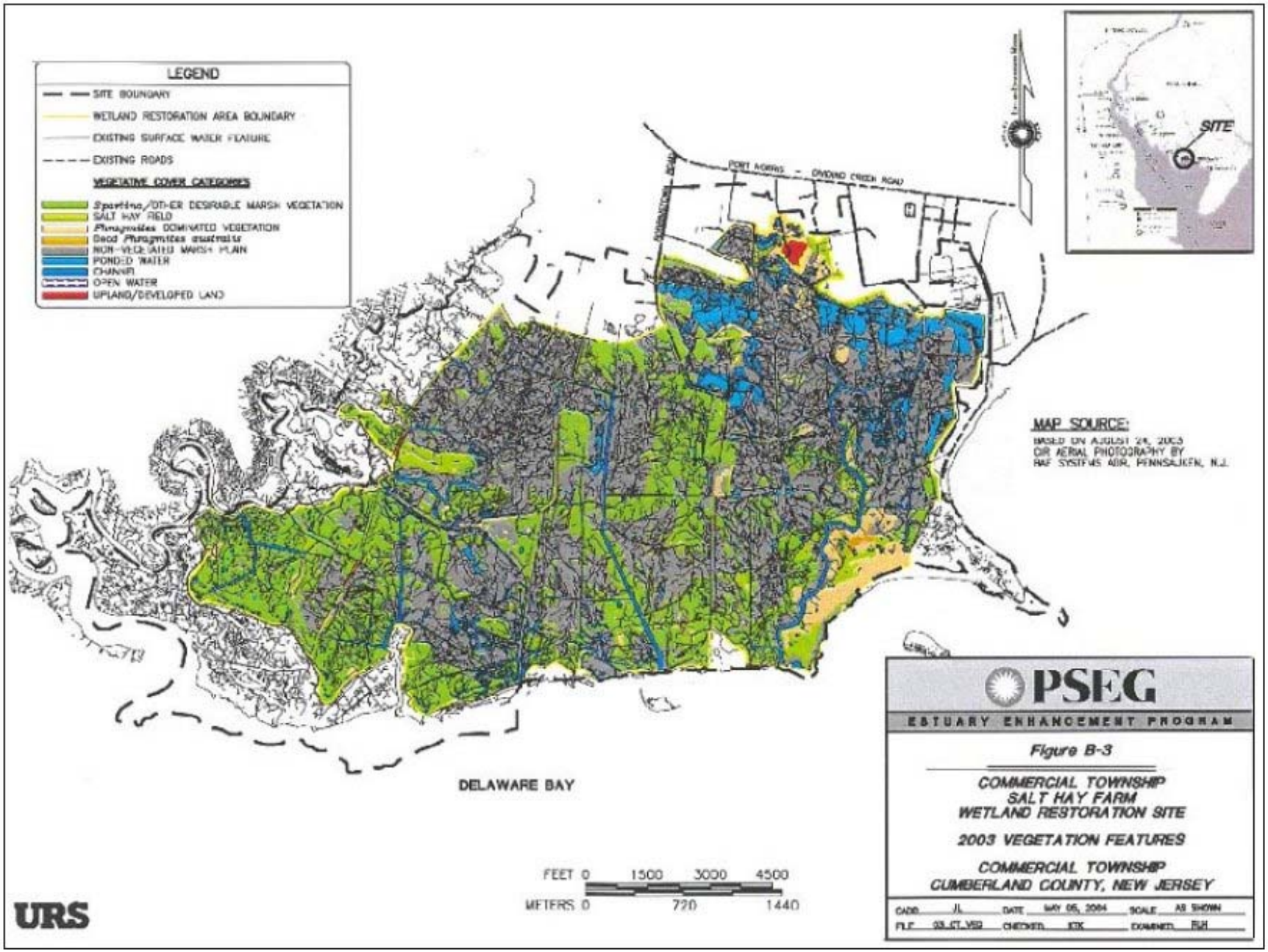
1:30000

0.3 0 0.3 0.6 Miles

URS


0
0.5
1.0
KILOMETER
MOSES HAMMOCK

Commercial Twp Site - 2003



Pre

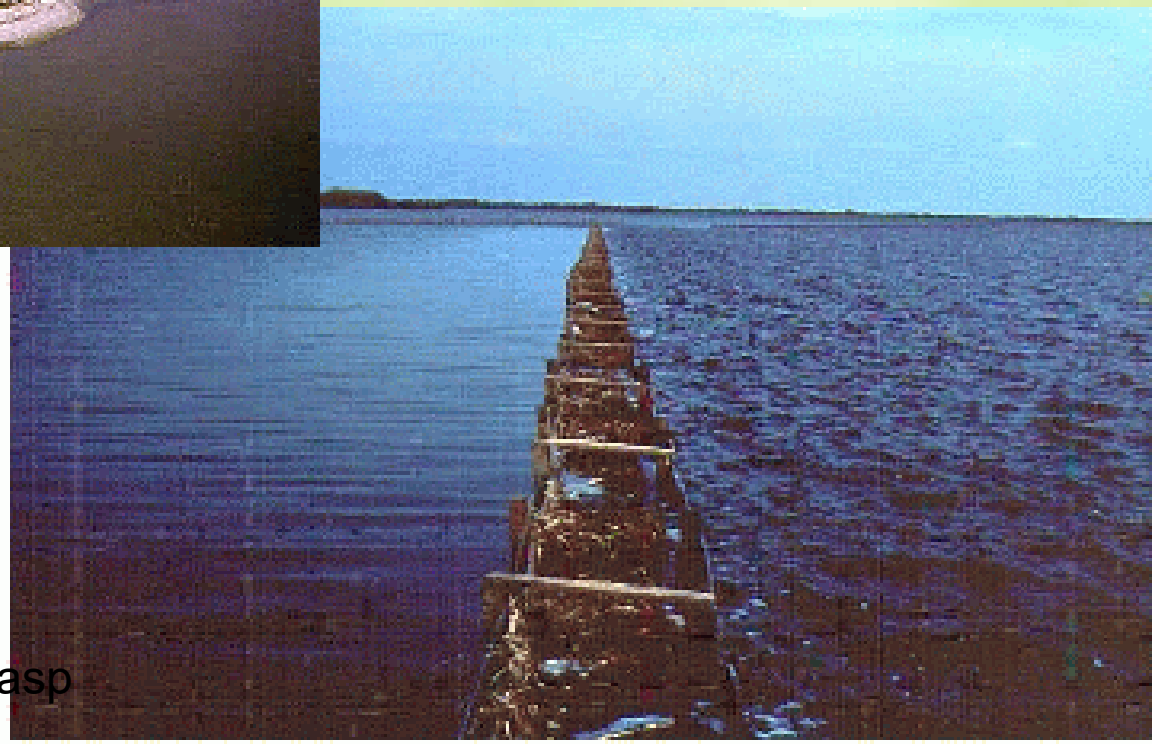
Taken in location 16 at bayfront - 2001

Taken in location 6 near bayfront - 2001

Take midway between location 9 & 10 - Cabin Road Region - 2003

Taken in location 12 near bayfront - 2003

Restoring Louisiana Delta wetlands

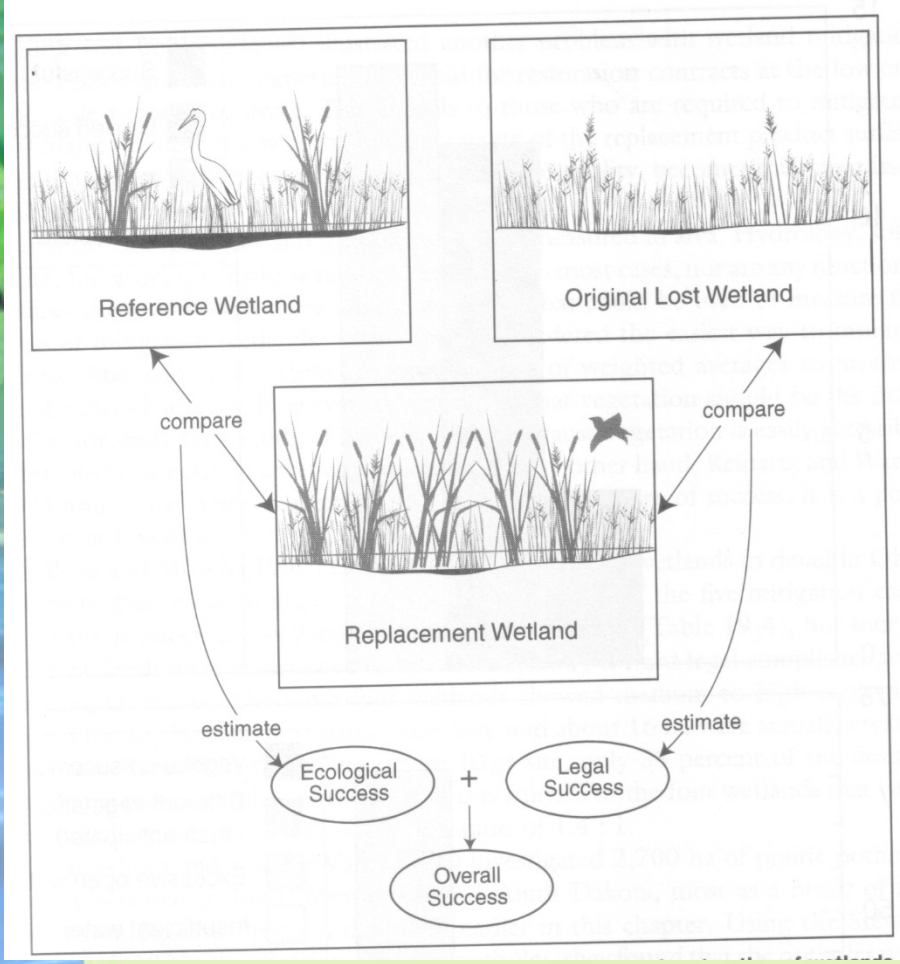


http://www.lacoast.gov/projects/list.asp

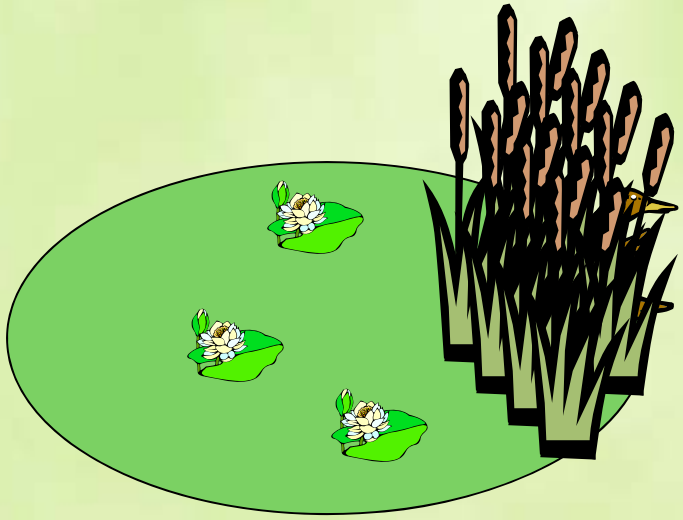
Restoring Louisiana Delta wetlands

http://www.lacoast.gov/projects/list.asp

Did it work?

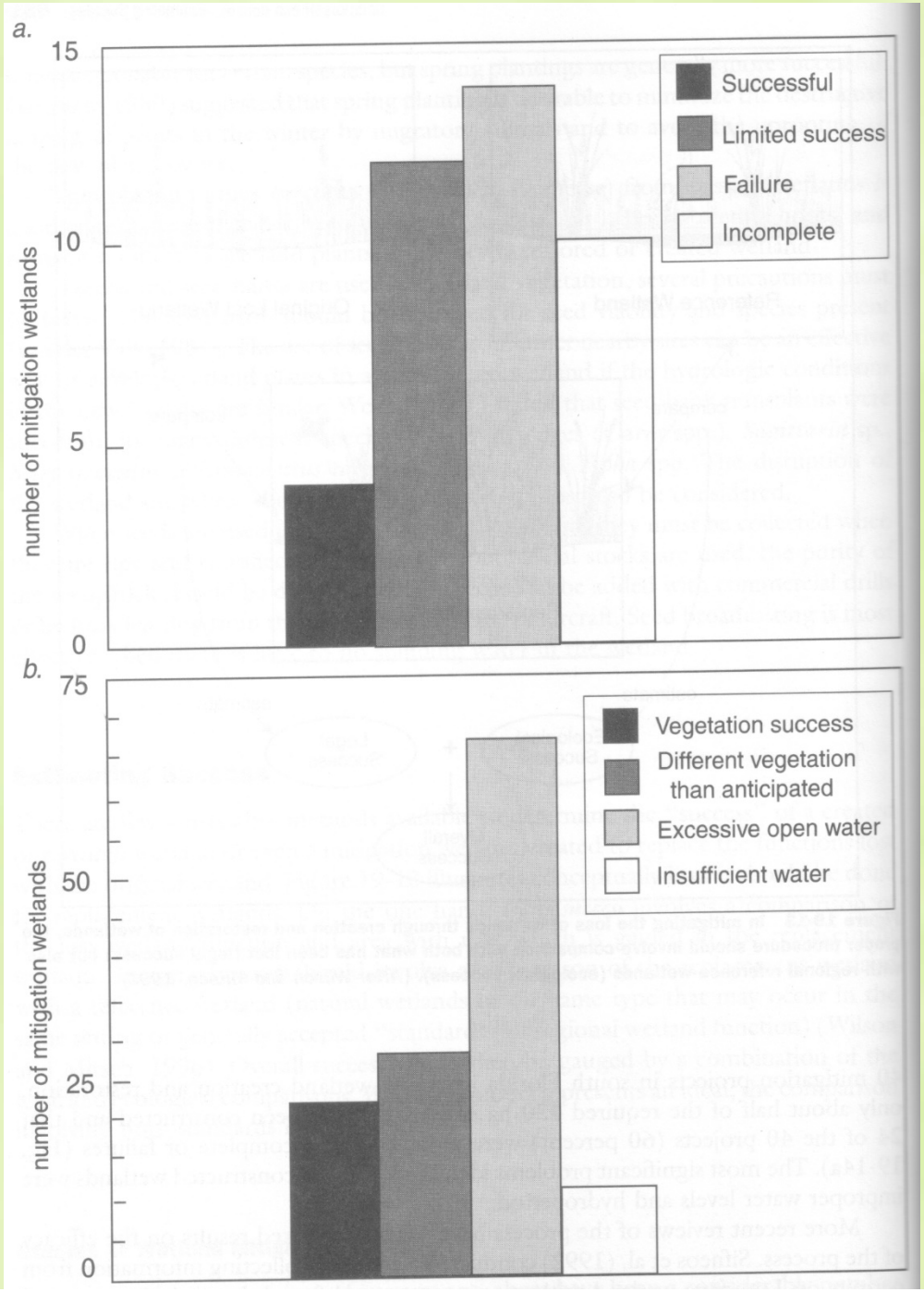


Is it, or will it become, a natural self-sustaining system of the appropriate wetland type?

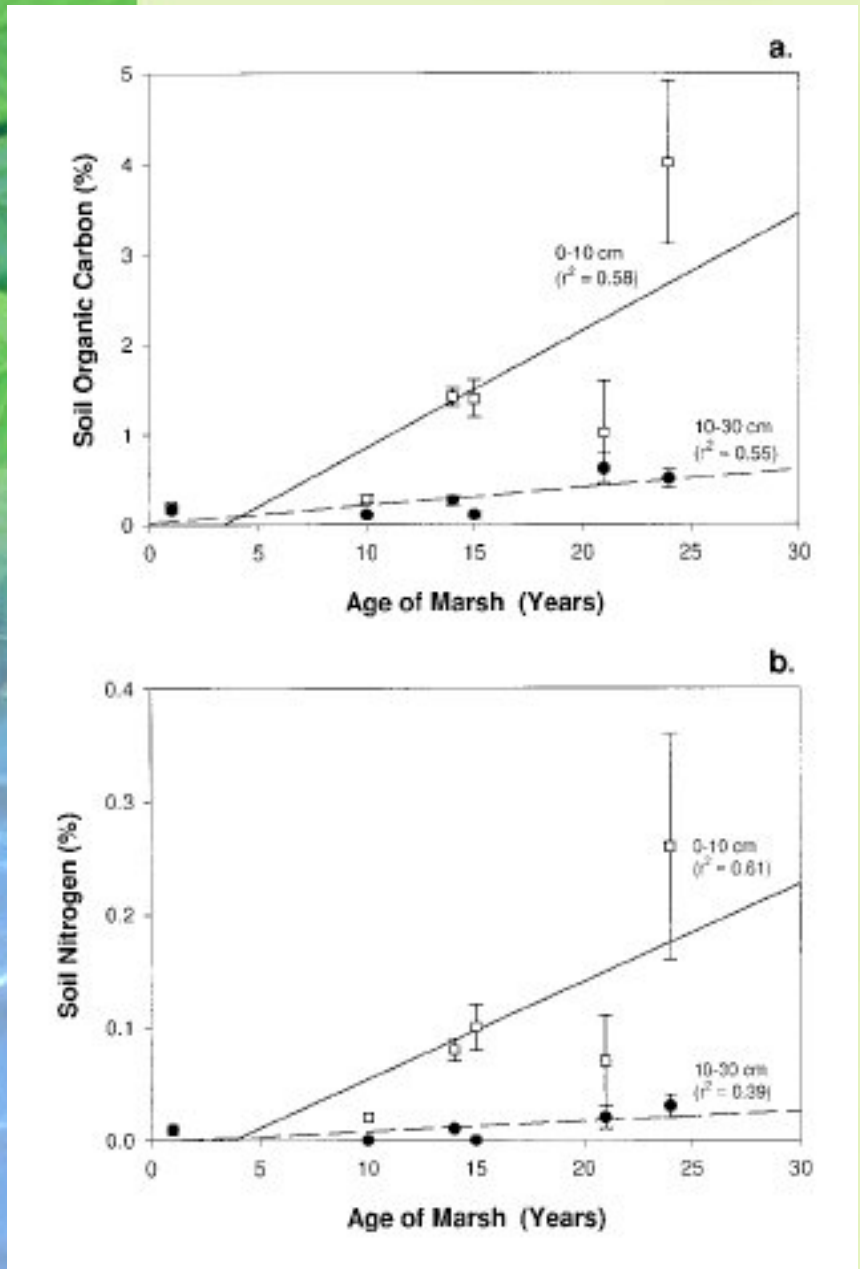


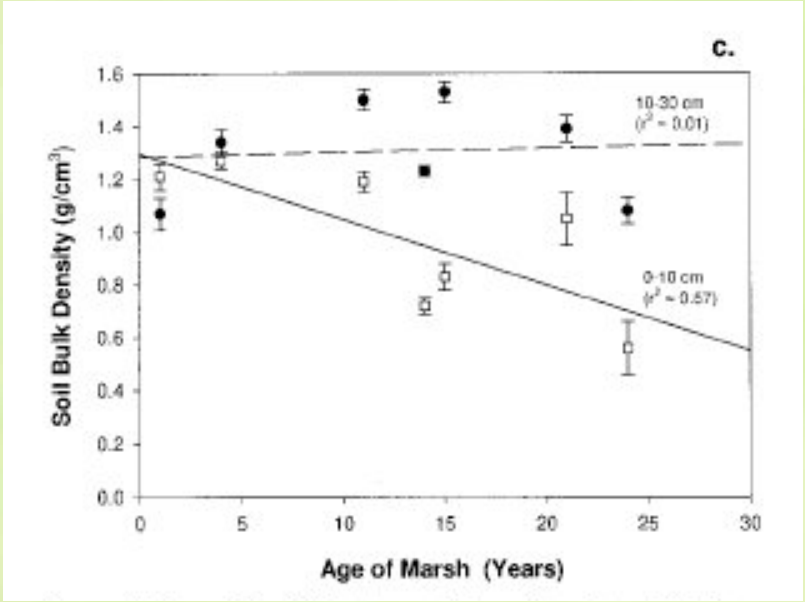
Success: hydrology

- Excess open water the most common cause of failure



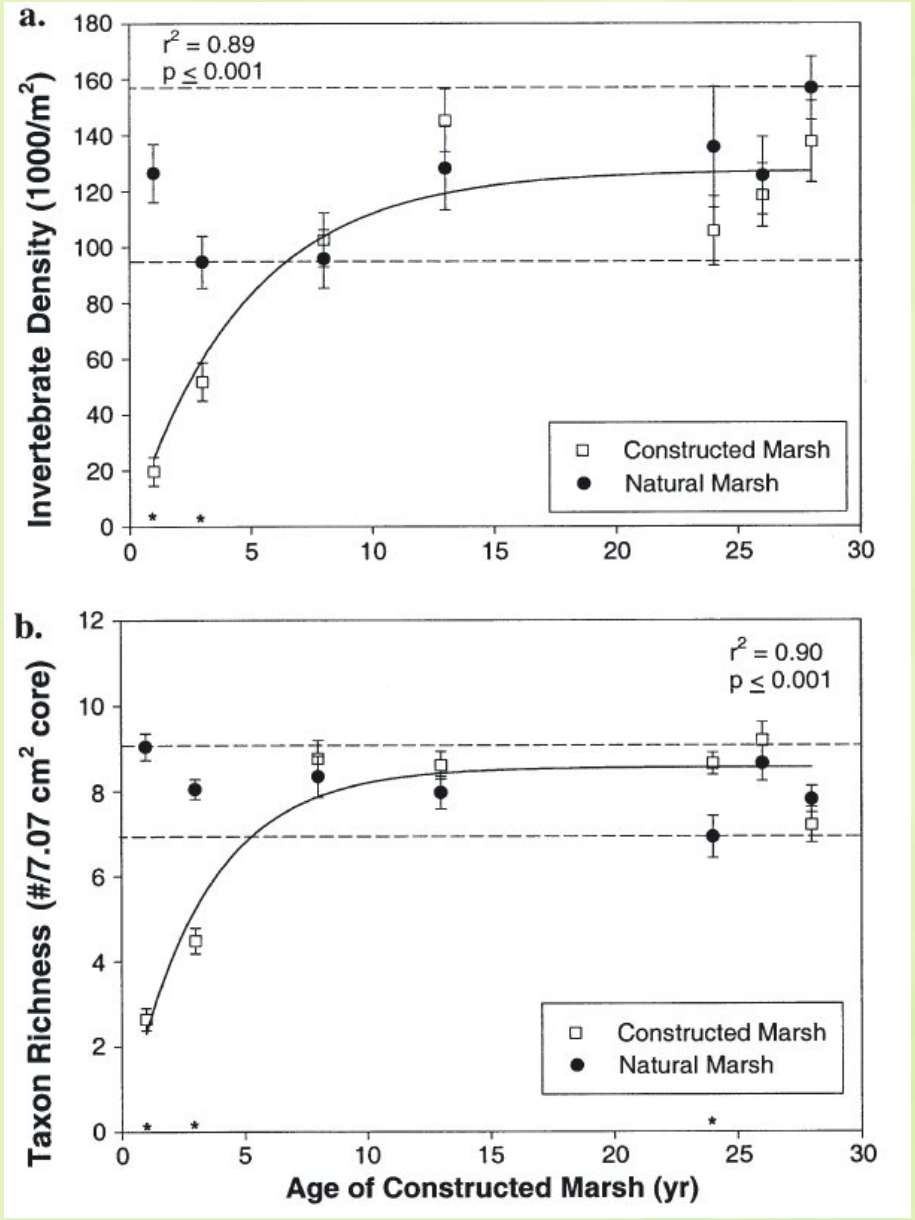
Success: soils





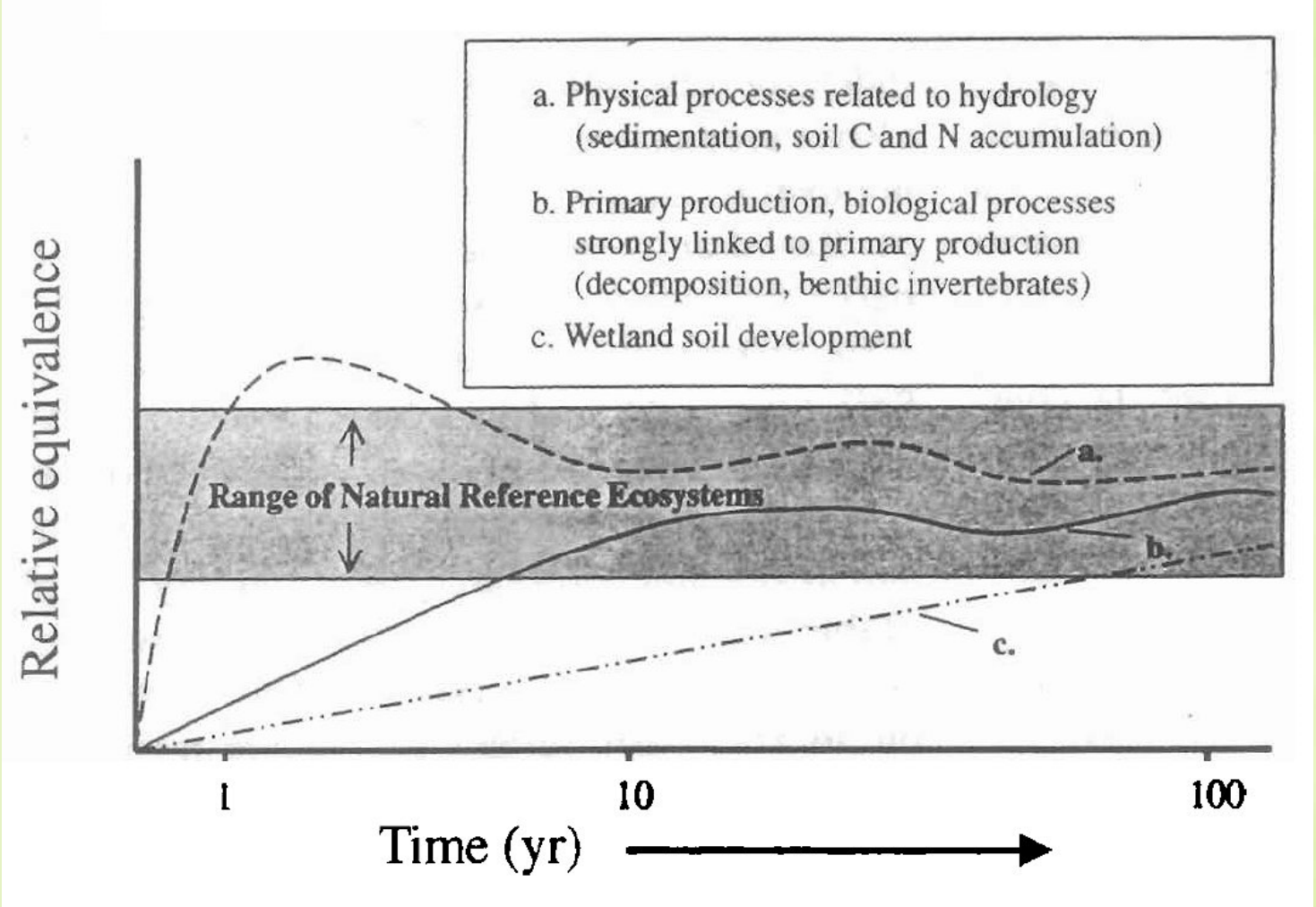
Success: vegetation

Success: animals



Craft and Sacco 2003

Success: functions



Craft et al. 2003