

Hydrology and physiography of wetlands



Lecture outline

- The basics
- HGM
- Types of wetlands



When is a wetland a wetland?

- Difficult to define (see Sidebar 5.1)
- Want a job? Learn how to 'delineate wetlands'
- Typically use presence of
 - _____,
 - _____, and
 - _____.
- Why consider all three?



Distribution of global wetlands



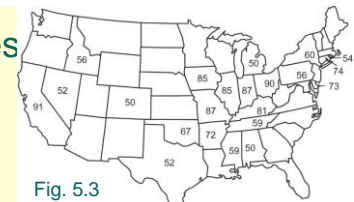
Roles of wetlands

- Habitat
- Ecosystem services such as ?
- \$
- Peat
- Global climate change

Peat cut and dried from a Scottish peat bog; also see Fig. 5.2



Wetland losses



- 70% of US riparian wetlands lost from 1940 to 1980
- 50% of prairie potholes gone
- Half of Everglades drained
- US losses primarily driven by agriculture
- Wetlands loss by country: United States (54%), Cameroon (80%), New Zealand (90%), Italy (94%), Australia (95%), Thailand (96%), Vietnam (>99%)

Hydrogeomorphic classification of wetlands

● HGM

● Wetland type is a function of:

- **Geomorphic setting**
 - Landscape topography
- **Water source and transport**
 - Precipitation, surface flow, groundwater
- **Hydrodynamics**
 - Water in motion and its capacity to do work

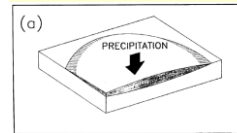


Mark Brinson
1943 – 2011

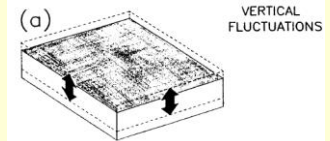
HGM at work

● Isolated wetlands classified by:

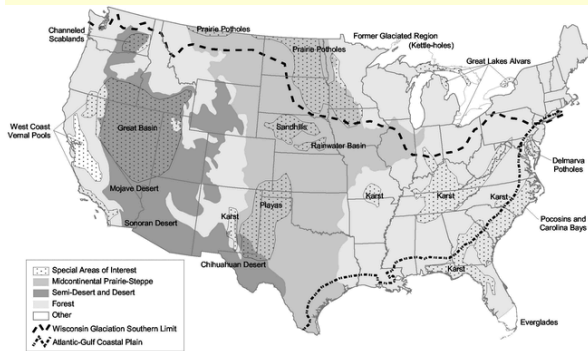
- **Geomorphic setting** = depressional
- **Water source and transport** = precipitation
- **Hydrodynamics** = vertical fluctuation in water table



Brinson (1993)

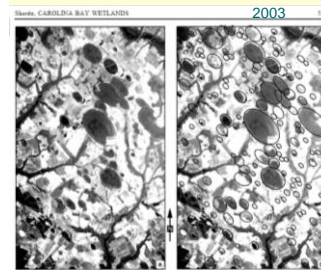


Isolated wetlands (2)



Tiner (2003)

Carolina bays

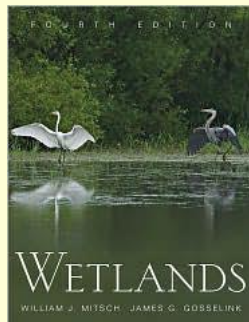


Horry County as globally important according to Ralph Tiner



Some types of freshwater wetlands

- Tidal freshwater marsh
- Freshwater marsh
- Northern wetland
- Deepwater swamp
- Riparian wetland



After Mitsch and Gosselink (1993)

Tidal freshwater marsh

Description	Distribution	Vegetation
Wetland close enough to coast to experience tidal influence, but above the reach of oceanic saltwater	Mid to high latitude, in regions with a broad coastal plain	High plant diversity including algae, macrophytes, and grasses

Table 5.2



Freshwater marsh

Description	Distribution	Vegetation
A diverse group of inland wetlands dominated by grasses, sedges, and other emergent hydrophytes; includes important types such as prairie potholes, playas, and the Everglades	Worldwide	Reeds such as <i>Typha</i> and <i>Phragmites</i> ; other grasses such as <i>Panicum</i> and <i>Cladium</i> , sedges (e.g., <i>Cyperus</i> and <i>Carex</i>); broad-leaved monocots (<i>Sagittaria</i> spp.); and floating aquatic plants



Table 5.2

Northern wetland

Description	Distribution	Vegetation
Bogs and peatlands characterized by low pH and peat accumulation	Cold temperate climates of high humidity, generally in Northern Hemisphere	Acidophilic vegetation, particularly mosses, but also sedges, grasses, and reeds

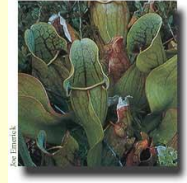


Table 5.2

Deepwater swamp

Description	Distribution	Vegetation
Freshwater most or all of the season, forested	Southeast United States	Bald cypress-tupelo or pond cypress-black gum



Table 5.2

Congaree National Park

Riparian wetland

Description	Distribution	Vegetation
Wetland adjacent to rivers	Worldwide	High diversity of terrestrial plants

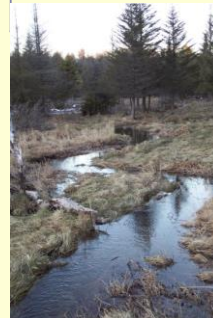
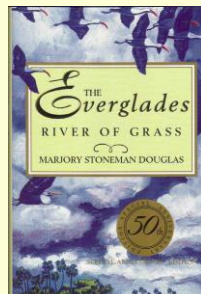
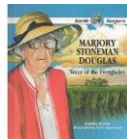


Table 5.2

The Everglades

- South Florida Water Management District
- [Link](#)



Pythons!



Severe mammal declines coincide with proliferation of invasive Burmese pythons in Everglades National Park

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