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?

Roles of wetlands
- Habitat
- Ecosystem services such as ?
- $ 
- Peat
- Global climate change

Distribution of global wetlands

Mitsch & Gosselink (2000)

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%)

Peat cut and dried from a Scottish peat bog; also see Fig. 5.2
Hydrogeomorphic classification of wetlands

- **HGM**
- Wetland type is a function of:
  - **Geomorphologic setting**
    - Landscape topography
  - **Water source and transport**
    - Precipitation, surface flow, groundwater
  - **Hydrodynamics**
    - Water in motion and its capacity to do work

Isolated wetlands classified by:

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

Some types of freshwater wetlands

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

Tidal freshwater marsh

<table>
<thead>
<tr>
<th>Description</th>
<th>Distribution</th>
<th>Vegetation</th>
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<tbody>
<tr>
<td>Wetland close enough to coast to experience tidal influence but above the reach of oceanic saltwater</td>
<td>Mid to high latitude, in regions with a broad coastal plain</td>
<td>High plant diversity including algae, macrophytes, and grasses</td>
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</tbody>
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Table 5.2

Carolina bays

Horry County as globally important according to Ralph Tiner

Isolated wetlands (2)

[Map of the United States with Carolina bays highlighted]

After Mitsch and Gosselink (1993)
Freshwater marsh

Description: 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.

Distribution: Worldwide

Vegetation: Reeds such as Typha and Phragmites; other grasses such as Panicum and Cladium; sedges (e.g., Cyperus and Carex); broad-leaved monocots (Sagittaria spp.); and floating aquatic plants.

Table 5.2

Northern wetland

Description: Bogs and peatlands characterized by low pH and peat accumulation

Distribution: Cold temperate climates of high humidity, generally in Northern Hemisphere

Vegetation: Acidophilic vegetation, particularly mosses, but also sedges, grasses, and reeds

Table 5.2

Deepwater swamp

Description: Freshwater most or all of the season, forested

Distribution: Southeast United States

Vegetation: Bald cypress-tupelo or pond cypress-black gum

Table 5.2

Riparian wetland

Description: Wetland adjacent to rivers

Distribution: Worldwide

Vegetation: High diversity of terrestrial plants

Table 5.2

The Everglades

- South Florida Water Management District
- Link

The Everglades National Park

Pythons!

“road surveys totaling 56,971 km from 2003 – 2011 documented a 99.3% decrease in the frequency of raccoon observations, decreases of 98.9% and 87.5% for opossum and bobcat observations, respectively, and failed to detect rabbits.”

PNAS (2012)