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

HGM at work

- Isolated wetlands classified by:
  - **Geomorphologic setting** = depressional
  - **Water source and transport** = precipitation
  - **Hydrodynamics** = vertical fluctuation in water table

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Distribution</th>
<th>Vegetation</th>
</tr>
</thead>
<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>
</tr>
</tbody>
</table>

Table 5.2
Freshwater marsh

<table>
<thead>
<tr>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>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</td>
<td>Worldwide</td>
<td>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.</td>
</tr>
</tbody>
</table>

Table 5.2

Northern wetland

<table>
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<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Bogs and peatlands characterized by low pH and peat accumulation</td>
<td>Cold temperate climates of high humidity, generally in Northern Hemisphere</td>
<td>Acidophilic vegetation, particularly mosses, but also sedges, grasses, and reeds.</td>
</tr>
</tbody>
</table>

Table 5.2

Deepwater swamp

<table>
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<th>Vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater most or all of the season, forested</td>
<td>Southeast United States</td>
<td>Bald cypress-tupelo or pond cypress-black gum</td>
</tr>
</tbody>
</table>

Table 5.2

Riparian wetland

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</tr>
</thead>
<tbody>
<tr>
<td>Wetland adjacent to rivers</td>
<td>Worldwide</td>
<td>High diversity of terrestrial plants</td>
</tr>
</tbody>
</table>

Table 5.2

The Everglades

- South Florida Water Management District
- Link

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)