Wetland Ecosystem Services in a Complex and Changing World

Session organizer and moderator:
Edward Maltby
Elements of new policy drivers

• Ecosystem approach

• Natural Capital

• Ecosystem services

  • Millennium Ecosystem Assessment (2005)
  • The Economics of Ecosystems & Biodiversity (2010)
  • UK National Ecosystem Assessment (2011)
Functional gradients

Carbon sequestration

Floodwater detention

Nutrient & contaminant transformation

Food chain support
# Ecosystem Services Derived from Inland Rivers, Lakes and Wetlands

<table>
<thead>
<tr>
<th>Provisioning Services</th>
<th>Cultural Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food (fish, game, fruit, grain etc)</td>
<td>Spiritual (well-being, religion)</td>
</tr>
<tr>
<td>Fresh water (storage, retention, provision)</td>
<td>Recreation (tourism, activities)</td>
</tr>
<tr>
<td>Fibre and Fuel (timber, fuel, peat, aggregates)</td>
<td>Aesthetic (appreciation)</td>
</tr>
<tr>
<td>Biochemicals (materials from living things)</td>
<td>Education (opportunities)</td>
</tr>
<tr>
<td>Genetic materials (medicine, resistance to pathogens, ornaments)</td>
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<table>
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<tr>
<th>Supporting Services</th>
<th>Regulating Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity (habitats)</td>
<td>Climate (GHGs, temp, rain, CO₂)</td>
</tr>
<tr>
<td>Soil formation (retention, accumulation)</td>
<td>Hydrology (recharge, discharge, storage)</td>
</tr>
<tr>
<td>Nutrient cycling (storage, processing)</td>
<td>Pollution (retention, removal, recovery)</td>
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<tr>
<td>Pollination (habitat and support)</td>
<td>Erosion (protection, retention)</td>
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<td></td>
<td>Natural Hazards (floods, storms)</td>
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</tbody>
</table>

N.B. Not always compatible
Links between Ecosystem Services and human wellbeing

Ecosystem services

- **Provisioning**
  - food
  - fresh water
  - wood and fibre
  - fuel

- **Regulating**
  - climate
  - floods
  - disease
  - clean water

- **Supporting**
  - nutrient cycling
  - soil formation
  - primary production

- **Cultural**
  - Aesthetic
  - spiritual
  - education
  - recreation

- **Biodiversity**

Constituents of well-being

- **Security**
  - personal safety
  - resource access
  - from disasters

- **Basic for life**
  - livelihoods
  - nutrition
  - shelter
  - goods

- **Health**
  - strength
  - feeling well
  - clean air
  - clean water

- **Social**
  - social cohesion
  - mutual respect
  - ability to help others

- **Freedom of choice and action**
  - satisfaction and opportunity for achievement

- **Thicker line** = Intensity of linkage between ES and human well-being

- **Darker line** = Increasing potential for socio-economic mediation

Adapted from Millennium Ecosystem Assessment

SWIMMER | University of Liverpool
Overview

• Final Goal:
  – Operational approach linking current knowledge to policy innovation

• Context:
  – Accelerated Interest
    • MEA (2005)
    • TEEB (2010)
    • UKNEA (2011)
    • Scientific Journals

• Session:
  – 7 papers + Panel
    • Agriculture landscapes (OECD)
    • European Wetlands
    • UKNEA
    • Coastal Law
    • Condition Assessment
    • Tropical Wetlands
    • Urban Wetlands

• Panel Discussion