

# Wetland Ecosystem Services in a Complex and Changing World

Session organizer and moderator:

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# 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

Groundwater-fed slope wetlands.

Carbon sequestration

Floodwater detention

Upland peat bogs.

Deepwater lake.

In-filled lake.

Floodplain modified for agriculture.

'Natural' river channel with levees.

Wooded river marginal (floodplain) wetlands.

Depressional (bottomland) wetlands in floodplain.

Reservoir

Lowland raised mire.

Shallow lake occupying depression.

Fenland.

Straightened channel.

Channel marginal wetlands.

Brackish water marsh.

Nutrient & contaminant transformation

Marshland with drainage channels.

Food chain support

Groundwater up-welling supporting reedbeds in estuary margin.



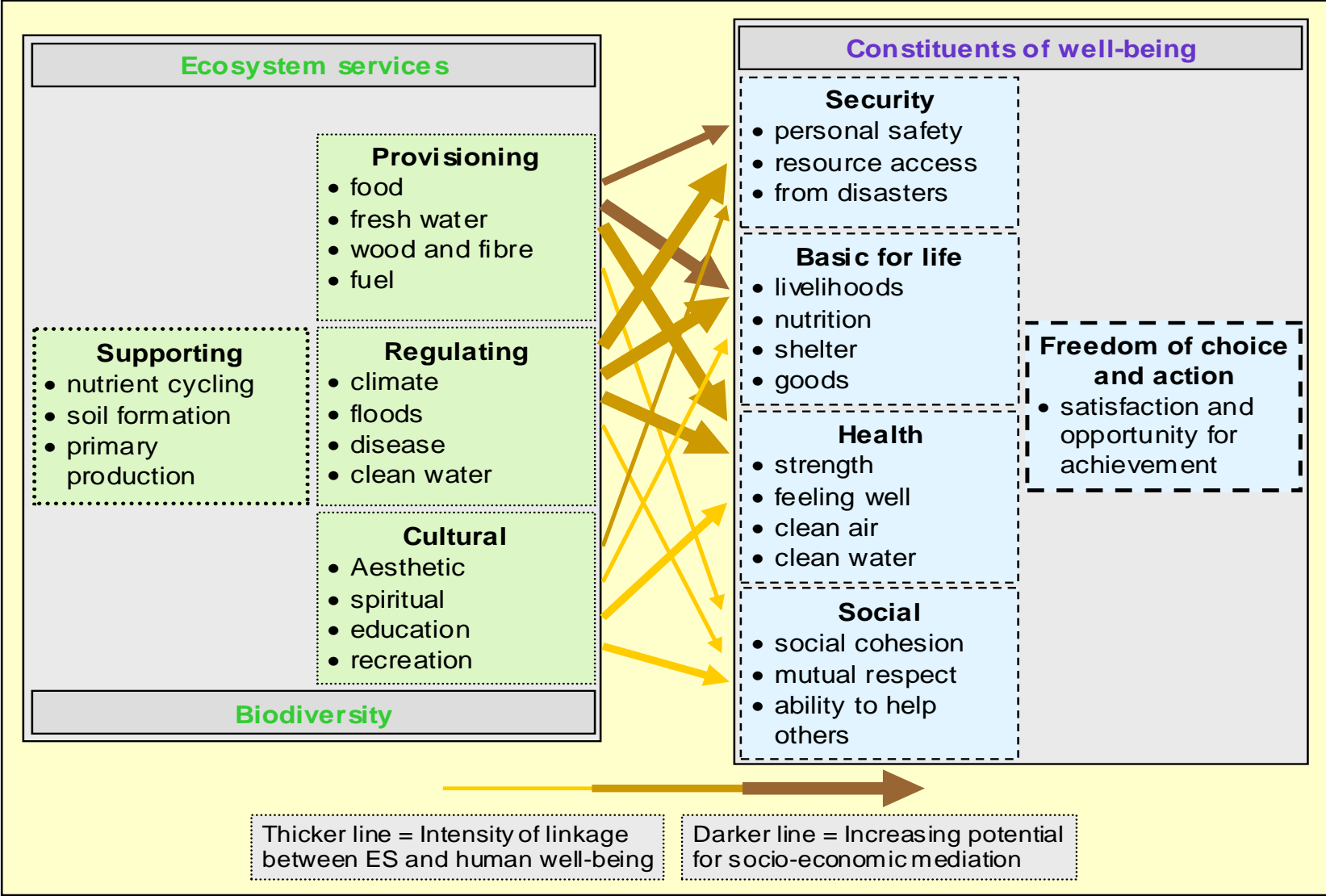
# Ecosystem Services Derived from Inland Rivers, Lakes and Wetlands

| Provisioning Services  | Cultural Services  |
|--|--|
| <p>Food (fish, game, fruit, grain etc)</p> <p>Fresh water ( storage, retention, provision)</p> <p>Fibre and Fuel (timber, fuel, peat, aggregates)</p> <p>Biochemicals (materials from living things)</p> <p>Genetic materials (medicine, resistance to pathogens, ornaments)</p> | <p>Spiritual (well-being, religion)</p> <p>Recreation ( tourism, activities)</p> <p>Aesthetic (appreciation)</p> <p>Education (opportunities)</p>  |
| Supporting Services  | Regulating Services  |
| <p>Biodiversity (habitats)</p> <p>Soil formation (retention, accumulation)</p> <p>Nutrient cycling (storage, processing)</p> <p>Pollination (habitat and support)</p>  | <p>Climate (GHGs, temp, rain, CO<sub>2</sub>)</p> <p>Hydrology (recharge, discharge, storage)</p> <p>Pollution (retention, removal, recovery)</p> <p>Erosion (protection, retention)</p> <p>Natural Hazards (floods, storms)</p> |

N.B. Not always compatible



# Links between Ecosystem Services and human wellbeing



Adapted from Millennium Ecosystem Assessment



# 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**