Euro-limpacs

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Wetland component for functional indicator database

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1. The functional indicator database for wetlands

A comprehensive literature search was made in order to identify important research areas and findings of existing studies that have a bearing on the functioning of wetlands under scenarios of climate change. After subjecting the study papers obtained by this search to critical review, 68 papers met the criteria for quality and relevance, and were therefore considered suitable for inclusion in the meta-database. All the study reports and journal articles are available electronically using appropriate search software e.g. Web of Science.

Wetland functioning can be influenced by climate change in numerous ways, including direct temperature effects on soil and aquatic processes, indirect effects that come about through melting of ice, changed patterns of rainfall, and species distribution changes. Rates of primary production and respiration are likely to be affected by changes affecting temperature, hydrology, nutrient-flux and species distributions.

The range of publications comprising the database includes reviews of published works in the fields of hydrological, chemical and biological research that have a bearing on climate-related issues and which make considered judgements on factors that are likely to prove important for future research and decision-making. Following the reviews are sections on:

- physical and hydrological papers, which feature direct and indirect temperature related effects on soils, hydroperiod, flooding, drought, and permafrost, and probable changes in the ability of wetland soils to regulate water flows and clean polluted waters;

- hydrological-biogeochemical papers, which concentrate on chemical and biological responses to changes in hydrology, atmospheric deposition and influxes of carbon and nitrogen species, and their effects on soil biological and chemical processes, the loss of carbon stored as peat, and emissions of CO_2, CH_4, N_2O;

- biogeochemical-ecological papers, which discuss plant-mediated rates of emissions of carbon species important for climate change;

- ecological papers, which include those discussing changes in management following changes in important physico-chemical and biological variables, species distribution changes and social pressures caused by climate change. This section also includes direct habitat effects on species' life-cycles and survival e.g. fish spawning and food sources, bird migrations, ranges of plant distribution etc.

2. The database

The wetland functional indicator database has been incorporated into the (WP7-Task 1) meta-database on indicators of ecosystem health in relation to climate change (Meta-database on Indicators for Climate Change impacts on freshwater ecosystems - UDE, BOKU, ULIV).

The meta-database includes sections on rivers, lakes and wetlands, and can be viewed on the Eurolimpacs website at http://www.eurolimpacs.ucl.ac.uk/index.php This meta-database will be extended (under WP7-Task 5) to incorporate indicators from different disciplines, in an 'indicator selection tool'.