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Ecohydrological characterisation of wetlands of the border counties of the Republic of Ireland and Northern Ireland

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Wetland habitats are protected through national and international legislation and provide essential ecosystem services at global, national and local scales. In Ireland, the biodiversity value of wetlands has been estimated to be worth € 385 million per year to the Irish economy. Irish wetlands are estimated to cover over 600,000 hectares and while extensive research has been conducted on the ecology of specific wetland habitats, there remains a limited understanding of the link between the hydrological, hydrogeological and ecological characteristics of the range of wetland habitats that occur throughout the border counties of the Republic of Ireland and Northern Ireland. A general paucity of baseline data for Irish wetlands, particularly with regard to wetlands without specific conservation designation, combined with a general mono-disciplinary approach to assessing wetlands, highlights the need for multidisciplinary studies to support conservation and management actions.

The geophysical and geochemical surveys of the Tellus and Tellus Border projects will result in seamless maps of key physical properties of soil and surface water chemistry across the border area of Ireland. These data will support research into the characterisation and management of border county wetlands. The Tellus Border Wetland Project is combining the geophysical and geochemical survey data with data collected from five wetland sites that are representative of the wetland habitats of the border counties of the Republic of Ireland and Northern Ireland. This is being done in order to investigate the water delivery mechanisms and water requirements for these wetland sites. The synthesis of hydrological and ecological methodologies is leading to a holistic understanding of ecosystem function at the five wetland sites, which include a ranch of habitats types comprising, lakes, inter-drumlin fen, cut-over blanket bog and transition mire. Hydrochemistry analyses show significant differences between the wetland habitats, particularly with regard to alkalinity and conductivity. The identification of indicator species from key biotic groups (vegetation, macroinvertebrates, zooplankton and phytoplankton), along with variations in hydrochemistry and hydological parameters will be used to identify limits of acceptable change for the five wetland habitat types. This ecohydrological characterisation will inform conceptual models that will assist in the management and conservation of wetland habitats throughout the border regions of the Republic of Ireland and Northern Ireland.