



Model and scenario comparison of impacts of future global cropland expansion on biodiversity and carbon storage

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One of the greatest challenges of the 21st century is to meet society's growing food needs whilst reducing the environmental impact of agriculture. In order to meet future demands, some agricultural expansion is necessary. This poster shows global projections of cropland expansion for the integrated assessment model IMAGE 3.0 from 2010 - 2050. Three different socio-economic pathways are used and compared, representing sustainable and unsustainable scenarios as well as business as usual and the continuation of current trends. Furthermore, the business as usual scenario is compared to projections from another global model GloBIOM. The impacts of projected land use change from both models and the three scenarios on two important ecosystem services; biodiversity and carbon storage, are then examined.

The Alliance for Zero Extinction (AZE) sites are used as a proxy for biodiversity. These sites contain endangered and critically endangered species as identified by the International Union for Conservation of Nature (IUCN) Red List of threatened species. Assessment of carbon storage involves examining global carbon pools in above ground biomass and estimating carbon loss as a result of cropland expansion.

Substantial areas, particularly in the tropics, are predicted to experience conversion to cropland. Not only does this threaten many species due to habitat loss, but it also indicates high carbon storage losses. This is largely through loss of above ground biomass from deforestation as a direct result of land use change. By highlighting areas particularly at risk, policy can be developed to protect important habitats, reduce carbon emissions and prevent future biodiversity loss.