Gross Ecosystem Product in macroeconomic modelling

Topic:
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Gross domestic product (GDP) shows the total value of output/income generated in a country. Commonly used as a main economic development indicator, GDP fails to capture fully the contributions of nature to economic activity and human well-being. The benefits provided by ecosystem services, such as crop pollination and water purification, are of great importance to any economy, both directly and indirectly. Nature inclusive decision-making requires that such benefits are taken into account in the economic decision-making process. Hence, Ouyang et al. (2013) proposed and further developed (e.g. Ouyang et al. 2020) the concept of Gross Ecosystem Product (GEP), which summarizes the value that ecosystem services provide to the economy in monetary terms. The Gross Ecosystem Product (GEP) is a measure that quantifies the contribution of final ecosystem goods and services to the economy. GEP highlights the importance of ecosystem services and allows overcoming the current bias in decision-making in favor of GDP growth.
This paper introduces the new GEP module in the macroeconomic model MAGNET. MAGNET is a GTAP-based global CGE model used to assess the policy impacts on the economy. MAGNETâ€™s endogenous land supply and forestry representation makes this model particularly suitable for this task, as does its international dimension. Built upon the INCA database on monetary value of ecosystem services, the new GEP module allows for comparison of the impact of different policies on both GDP and GEP in the European Union. The paper provides an example of the practical application of the GEP module. In particular, we apply a forward-looking policy scenario that assumes a significant change in consumption patterns. The results of preliminary simulations show that such an impact can significantly differ both between GDP and GEP and across particular ecosystem services.