



## **Global Earth observation – benefit estimation**

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Global Earth Observations are instrumental to attain sustainable development goals and are major drivers of how the society–technology–environment system is managed. An integrated economic, social and environmental assessment of the nine benefit areas as specified by Global Earth Observation Systems of Systems (GEOSS) has not yet been carried out. These benefit areas are: Disaster, Health, Energy, Climate, Water, Weather, Ecosystems, Agriculture and Biodiversity. In order to support the international negotiation processes connected to these areas and for the development of good policies, the “Global Earth Observation – Benefit Estimation: Now, Next and Emerging” (GEO-BENE) 6<sup>th</sup> Framework Program project’s objective is to develop methodologies and analytical tools to assess societal benefits of GEO and to perform benefit assessments. The assessment will be carried out using quantitative and qualitative methods and data. Benefit assessment tools are centered around spatially explicit information applying deterministic and stochastic approaches. The various model structures will be applied to global data sets assessing benefit functions using harmonized socio-economic and technology scenarios. Concise policy conclusions from the modeling exercise will aim at supporting the implementation of international agreements.

Scientists and practitioners around the globe are searching for options to perfect management systems in the nine benefit areas identified by GEO. Both in the EU as well as internationally there is a shortage of analytical tools to quantify reliably and in an integrated manner economic, social and environmental effects of GEOSS. Therefore, the impact of this project on both long- and short-term planning of Earth system policies can be considered substantial. It is thus the prime objective of the proposed research to develop an operational cluster of models to support the international policy processes associated with the nine benefit areas. The application and the development of the models should directly lead to robust policy conclusions pertinent to measures, in particular their implementation schedule, in the affected economic and social sectors

vis-à-vis measures taken to improve earth system management based on an improved GEOSS.

The presentation will describe initial results of case studies associated with each of the nine GEOSS benefit areas. Example case studies such as: risk augmented global economy modeling and the macro-benefit of GEO; heart disease and improved weather forecasting; hurricanes and refinery management; earthquake risk and financial vulnerability management; geo-spatial bioenergy production planning; water use efficiency estimates in agriculture at various spatial resolutions; crop management/precision farming; globally optimal wetland conservation and monitoring etc., will be described specifically focusing on what value added EO could bring about. All of these varied topics will be tied together under the common theme of global earth observation.