About GeoBene

Global earth observations may be instrumental to achieve sustainable development, but to date there have been no integrated assessments of their economic, social and environmental benefits. The objective of the EU funded project “Global Earth Observation – Benefit Estimation: Now, Next and Emerging” (GeoBene) is to develop methodologies and analytical tools to assess societal benefits of GEOSS in the domains of: Disasters, Health, Energy, Climate, Water, Weather, Ecosystems, Agriculture and Biodiversity. The assessment will be carried out using quantitative and qualitative methods and data. The project led by IIASA’s Forestry program aims at defining policy conclusions from the modeling exercise for supporting the implementation of international agreements. The project consortium consists of 12 international partner organisations.

“ An ambitious international project to unite the planet’s Earth-observing systems is under way. But getting everyone on board is no easy task.”

Naomi Lubick (Nature, 14 Jul. 2005)

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GEOBENE

Global Earth Observation Benefit Estimation NOW AND NEXT EMERGING

Assessing the economic, social and environmental benefits of the GEO domains

FURTHER INFORMATION:
www.geo-bene.eu

Courtesy: ESA

GEOBENE PROJECT PARTNERS

IIASA · eawag aquatic research · UH · CSIR · PIK · KTL · felis · BOKU · vrije Universiteit amsterdam / IVM · NIES

www.geo-bene.eu

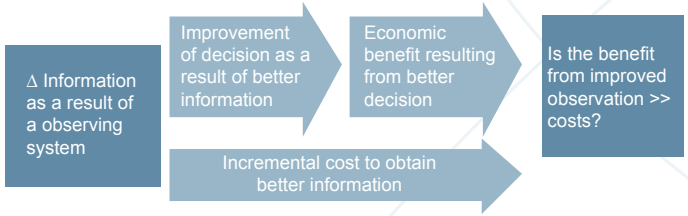
INFO

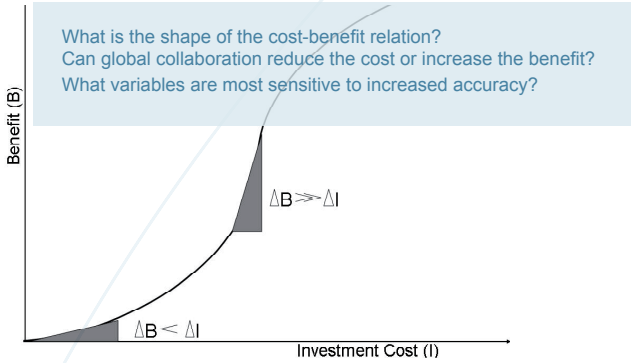
General Concept

The principle approach of GeoBene is the estimation of primary benefit levels by using geographically explicit models. In order to quantify the benefit, methods such as stakeholder surveys, modeling tools, decision theory and meta-analysis are used.

Benefit Chain

The GeoBene project has developed a 'benefit chain' concept as a framework for the benefit assessment. In the benefit chain concept, benefits as well as costs must be considered. The concept looks at incremental changes of costs and benefits with respect to the already existing observing system (e.g. national).





Benefit Chain Concept (Fritz et al., 2007)

Outlook

A model cluster comprising all 9 Societal Benefit Areas has been built and is successively applied. Preliminary results indicate that investment into enhanced and better coordinated future earth observation systems (e.g. data collection and sharing) can lead to cost reductions as well as to significant social and environmental benefits.

RESULTS

Results Disasters

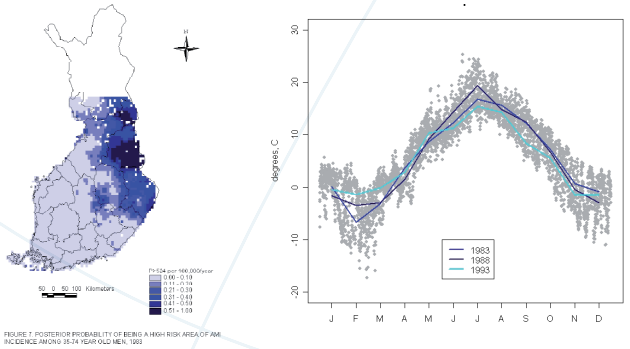
As a result of international collaboration, better and hence higher resolution data can become available, informed by in-situ meteorological observations. It is possible to model the stochastic process of fire spread, and thus to estimate how much burnt area can be saved if the fire is detected quickly. A coarse versus fine grid (GEOSS) scenario is simulated.

Summary of the forest fire simulations (average values)			
	Rough grid	Fine grid	Improvement
Burnt area, ha	107,417	85,248	20.64%
Number of patrols	45,404	43,772	3.62%
Total fire duration, h	64,650	49,405	23.58%

Forest Fire Modeling (Khabarov et al., 2007)

Results Health

By using improved weather forecasts combined with better knowledge on the relationship between Acute Myocardial Infarction and climate variables, lives can be saved, considering that transit time to hospital is crucial.



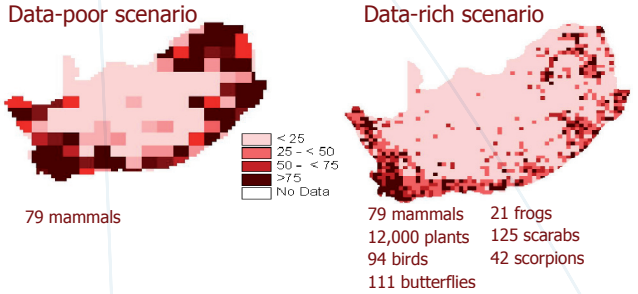
Weather and Acute Myocardial Infarction in Finland (Moltchanova et al., 2007)

Defining the baseline for GEOSS

An important issue when undertaking a benefit assessment of GEOSS is to define the appropriate baseline. Since GEOSS is not an entirely new system, its aim is to link existing and independent systems into an integrated network that will appear, from the user's perspective, as if it were a single system. It is a natural extension to what has already been achieved between international organizations in terms of data sharing cooperation (Lubick, 2005). GEOSS is about connecting the dots - linking current existing national programs into a global system of systems, and then filling the gaps that become apparent.

Results Biodiversity

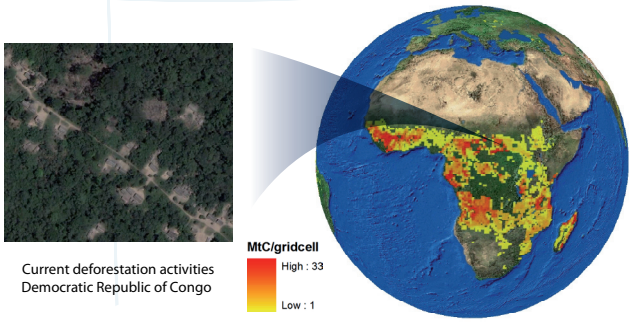
By using higher resolution data, opportunity costs for species protection can be reduced significantly.



Species protection (Jonas et al., 2005)

Results Ecosystems

Current observation systems are able to detect deforestation activities, but not the actual biomass losses and the remaining stocks. Knowledge about the biomass stock of threatened tropical forests is vital to understand the impacts of deforestation and to design appropriate policy measures to avoid deforestation.



MtC-grid cell saved when carbon price set at 12$-ton (Kindermann et al., 2007)