

# Assessing societal benefits and economic impacts of earth observation data in the arctic area

## Abstract:

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The use of earth observation data and services yields extensive benefits to the society, environment, and economy. Especially actors in the Arctic region are going to be more dependent on earth observation services in the future, as the Arctic is changing rapidly due to climate change. There is a growing need to quantify the benefits from earth observation services to justify investments made into earth observation technologies and to defend research budgets against competing priorities. This study aims to determine the most suitable tools for the assessment of benefits of earth observation data and services in the Arctic area.

A literature study was conducted to review the most essential benefit assessment tools. The applicability of cost-benefit analysis, benefit transfer, value chains, Value Tree Analysis, Weather Service Chain Analysis, and Spatineo Impact were reviewed. Finally, a case study assessing benefits from a lake ice service was performed. The case study applied Spatineo Impact and Value Tree Analysis.

By comparing methods in the literature study, Value Tree Analysis combined with cost-benefit analysis is concluded to be the best approach for assessing the socioeconomic impact of earth observing data in the Arctic. This approach supports the representation of various benefits originating from several earth observing systems. In addition, Spatineo Impact proved to be a useful tool for revealing the realized benefits from the usage of a service. This information is especially valuable to providers of open spatial data.

The case study emphasized that the results of a benefit assessment are highly dependent on the availability of data and on the time frame the study is conducted. Whenever possible, comprehensive interviews and surveys with end-users should be conducted when assessing the socioeconomic impact of an earth observation service.

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