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Keynote

Utility of Coastal Science

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For creating a framework to review the societal utility of science we suggest a list of categories of such utilities, and use examples from the practice of the HZG institute of Coastal Research In Geesthacht, Germany.

1. **"Making sense"** refers to the scientific understanding of complex phenomena, and its use for supporting societal framing and decision making. Examples are consequences of eutrophication or the separation of the effect of different drivers, from global climate change to changing morphology. A significant constraint is that science is not the sole supplier of such understanding, but other knowledge brokers are active as well.
2. **"Marine Spatial Planning (MSP)"** describes the "public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process". MSP needs in particular contributions from social science for understanding structures, perceptions, interests and power balances of the involved actors.
3. **"Monitoring"** aims at the assessment of the current status of the coastal environment and short term trends based on observation and related data analysis. This includes making data and assessments available for intermediate or final users. Examples refer to routine analysis and short-term forecasts of current environmental states.
4. **"Hazard, risk and opportunities"** assessments are needed for almost any kind of onshore and offshore operation. For the assessment of negative outlooks and positive perspectives comprehensive and homogeneous data are needed. Our example demonstrates how to prepare such assessments in cases when observed data are unavailable.
5. **"Scenarios"** provide a useful tool in assessing consequences of possible future developments, sketching related uncertainties or identifying developments with predetermined properties. Our examples deal with the development of coastal protection or the expected impacts of climate change.

Even though not independent, the different categories address different stakeholder groups; the first, "making sense" addresses mainly the general public, scientists, and media. In the other categories, numbers are produced, which may guide short term decisions.