A Framework for Making Qualities of Indicators Transparent

Why Transparency is Important

- Transparency is a basic requirement in science to allow for testing and validation of a scientific result.
- Transparency makes it easier for people with different backgrounds to participate in discussions concerning scientific knowledge and advice. However, this transparency is of another kind. A list of data and equations may be sufficient to make transparent a researcher within that specific field. Non-experts, on the other hand, need other means for transparency; like information about the underlying assumptions, how these assumptions affect the indicator and its associated threshold level.

In policy questions with conflicting interests, uncertain knowledge can result in lack of trust in scientific advice.

Transparency concerning uncertainties, how it affects advice and how it affects management may increase credibility.

Transparency and a proper uncertainty assessment will increase the relevance of advice based on indicators.

Sufficient transparency may help understanding scientific disputes.

Lack of transparency may make complex issues look simple and managers and stakeholders may have false expectations of the indicator.

Communication

Possibility of Underlying Assumptions in Threshold Cause-effect in Threshold

A Framework for Making Qualities

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The Uses of the Framework

- **Selecting indicators.** The framework may serve as a method for systematically comparing qualities in the suggestions to find a suitable set of indicators to measure the state of the Barents Sea ecosystem, the desolation makers have numerous time series from many fields of science to choose from. A non-specialist may have limited insight in how well the indicator reflects the issue, how well founded the knowledge in this field is and the like. This framework provides a transparency that may be helpful when discussing the possible indicators.

- **Increasing awareness among scientists.** The framework will call attention to different uncertainty perspectives that a scientist may not (or trained) to communicate or reflect on. The framework may clarify whether advice can be made more relevant, like expressing it in a different manner or by carrying out a sensitivity analysis. Scientists may have a tendency to speak about their science in a rather confident way. The ACPM report (Advisory Committee on Fishery Management) is an example of this. Annual advice on quotas is expressed as if the precision level in the knowledge basis is higher than it actually is.

- **Communicating to users.** In ecosystem based management a manager has to relate to indicators with very differing qualities. Scientific advice is often presented as resulting from a black box. This framework opens up this black box helping to clarify uncertainty characteristics associated with an indicator. A user may more easily judge the relevance of the indicator, the uncertainties, its limits and its strengths.