Reference levels and reference condition

Reference level is a value against which it is meaningful to compare the current value of a variable in order to derive an indicator. A reference level applies to an individual indicator and is likely to differ for different ecosystem types. Reference levels can be used in the normalization process necessary to generate aggregated indices of condition. Reference levels can also provide context for monitoring change in variables over time, and comparisons over space

Reference levels can be baselines, standards, thresholds, limits or benchmarks, and may refer to either or both an upper or lower level of the range of a condition variable.

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Reference condition is a consistent set of reference levels across several ecosystem types, which is applied to aggregate indices of condition. In the case of natural ecosystems, the set of reference levels correspond to the natural state for each ecosystem type, for example forest, savannah, grassland, wetland and river. In the case of artificial ecosystem types, the set of reference levels would need to be selected to represent an existing state.

What are the issues?

1. What are the benefits of using a natural state as a reference condition?
A natural state does not have to mean an ecosystem with no people.

2. Should reference levels and reference conditions be able to use target, desired or optimal states?

3. What guidance can be provided about appropriate reference levels?

4. When does a change in ecosystem condition result in a change in extent of an ecosystem type?

5. How to perform the aggregation?

6. Testing of the operationalisation of reference levels and reference condition is needed to demonstrate ecosystem condition accounts.

7. Can reference levels be set for the state of ecosystems within the Anthropocene?
How does a changing climate affect the setting of reference levels?

Recommendations

1. The concept of reference levels (defined indicator by indicator) is more general than the concept of reference conditions (defined for all indicators together), so any guidance from SEEA EEA should be formulated in terms of reference levels instead of reference conditions (as much as possible). Any instructions that can be expressed in terms of reference conditions can also be expressed in terms of reference levels.
2. Methods for selection of reference levels and reference conditions should be standardized (as much as possible), transparent and assumptions stated.
3. Ecosystem condition should be assessed against reference levels that are objective (e.g. scientifically based), and does not necessarily relate to an evaluation of good or bad, or the use of the ecosystem.
4. A subsequent assessment can be made against a target condition where the purpose and assumptions are clearly stated. Target conditions reflect a preference for a particular use of the ecosystem. Targets can be policy relevant but also subject to political bias, and hence may not be appropriate for use by national statistical agencies or for comparison between regions/countries.
5. Change assessed from the beginning of an accounting period should not be recommended because individual years are too subject to variability and inconsistency between indicators or regions of accounting.
6. Reference levels should be used consistently spatially within the accounting area, and temporally.
7. Measures of ecosystem condition may allow for consideration of the resilience of ecosystems and the relationships and dependencies between ecosystem assets, for example, the impact of thresholds for ecosystem characteristics.