A review of current practice in integrated ecosystem assessments and summary of best practice recommendations using three case studies

Susanne Altvater,
Katriona McGlade,
Franziska Stuke
Elena von Sperber

Ecologic Institute

Outline

- Aim of the study
- Methodology
- Results

Aim of the study

- For the German Environmental Protection Agency (UBA; observer: U. Claussen, V. Leujak), finished Nov 2011
- Political requirements within the MSFD
- Questions:
  - Which obligations have to be fulfiled by a comprehensive assessment concept?
  - Which aspects of the WFD assessment process could be applied?
- Aim: comprehensive overview of the up to date knowledge regarding IEAs

Methodology

- Three groups of sources:
  - Scientific literature
  - Integrated assessment reports / fully integrated assessments
  - Expert interviews
- Selection of case studies and factsheets

Central questions

- What management approach does the assessment take?
- Which (biological quality) components are addressed in the assessment?
- Which anthropogenic pressures are included?
- How are the biological characteristics and human pressures integrated into one overall status assessment?
- Are cumulative effects taken into consideration and if so, how?

1. Step: Desk Study

- Assessment of Scientific Literature
  - Ecosystem Approach/Integrated Ecosystem Assessment
  - Review of Working Groups (WGECO, ICES; Assessment of Assessments; European Marine Monitoring and Assessment; MSFD Management Group; SEAMBOR)
  - Review of tools (Decision-Trees, Risk-Analysis..)

2. Step: Interviews

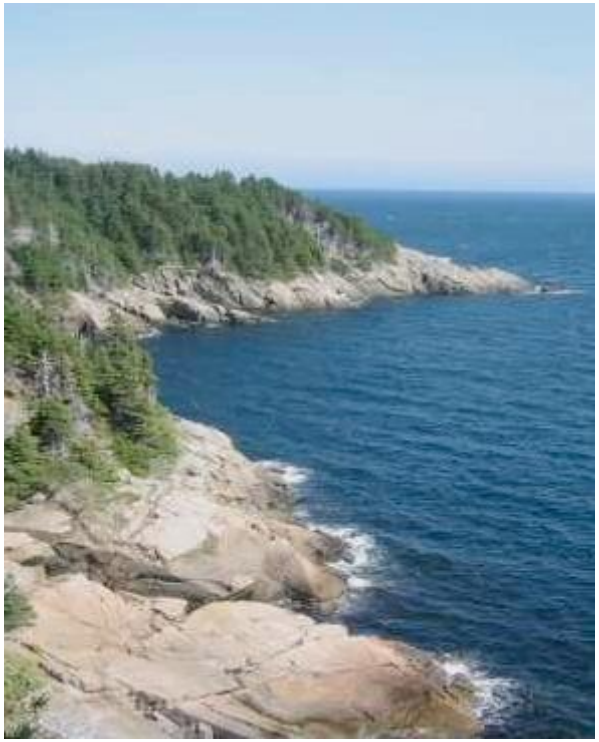
- Conducting12 interviews with

  practicioners (e.g. from Spain, Portugal,Canada, Australia, US)

- Task: additional information on the background and the implementation of IEAs worldwide
- Helpful for:
  - The selection of IEA examples
  - The elaboration of factsheets for practical examples
  - Overview of „Best Practices“ and „bad examples“

3. Step: Selection of case studies

HELCOM	Baltic Sea
OSPAR	North-East Atlantic
REGNS	North Sea
UK Charting Process	UK
Eastern Scotian Shelf Integrated Management (ESSIM)	Canada
Puget Sound Partnership	USA
Chesapeake Bay	USA
Great Barrier Reef	Australia
Indonesia	Indonesia
Ocean Health Index	Global
ERAEF	Australia
ASSETS	USA



(Source: http://www.cmep.ca/images/shelfhome.jpg)

Factsheet

Evaluation

Relevance
Transparency
Accessibility
Transferability

->

Overview table of Factsheets
(all used indicators, parameters, monitoring systems)

Key elements of an IEA

- Indicators
- Human pressure indicators
- Socio-economic indicators
- Fisheries impacts
- MSFD descriptors
- Integration / Overall status
- And: Cumulative effects, future trends, risk analysis, treatment of uncertainty, transparency of methods, scientific rigour, stakeholder involvement


Charting Progress 2:
The State of the UK Seas

UK Charting Progress

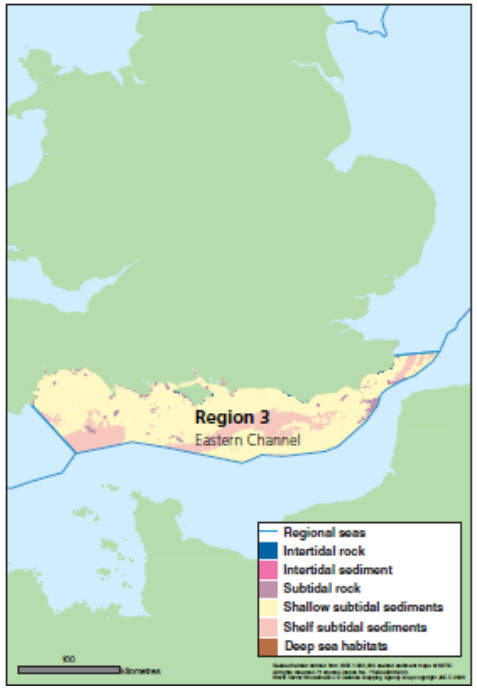
- **Name:** Charting Progress 2
- **Type of assessment and level of integration**:

  Integrative approach
- **Assessment framework:** DPSIR
- **Developed by:** UK Marine Monitoring and Assessment Strategy (UKMMAS) community
- **Relation to other assessments:** OSPAR

UK Charting Progress

Strength

- Inclusion of a broad range of anthropogenic pressures and socio-economic indicators
- All MSFD descriptors covered
- builds on a broad evidence base (extensive monitoring programmes)
- Results easily accessible and presented in maps with regional focus
- Stakeholder inclusion



Weakness

- No complete picture of the environmental status / an overall integrated status is missing
- No cumulative effects


State of the Sound 2009

Puget Sound

- **Name:** Puget Sound Integrated Ecosystem Assessment
- **Type of assessment and level of integration**: Integrative approach
- **Assessment framework:** Based on Levin's et al. (2009) 5-step method
- **Developed by:** NOAA's Ecosystem Science Program in collaboration with Puget Sound Partnership (PSP)
- **Relation to other assessments:** The same approach is an example for other regions in the US (e.g. California Current, Massachusetts Bay)

Condensed Factsheet Puget Sound

• „Experimental ground" für IEAs in the US: „If something works here, it will be expanded to other areas" (Levin, 2011)

•Strength

•Integration of stakeholders and management authorities from the very beginning (indicator selection)

• Structured yet flexible framework to select indicators (explicitly linked to societal goals)

• Clear communication of its methodology (PS Science Update)

• Easily understandable presentation of results to the public through a “dashboard“ of indicators

• Inclusion of land use and its effects on the marine environment to a large degree

•Weakness

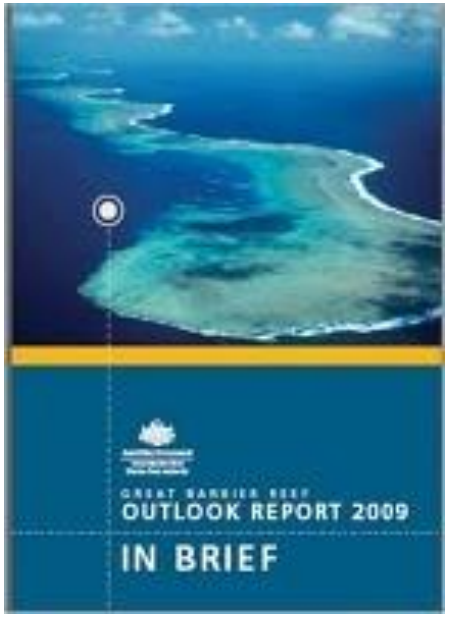
- No real integration of overall status
- No use of status categories for the results
- No cumulative effects
- Indicators not fully developed (human well-being indicators still not identified)
- Results of the assessment have not led to changes in management strategies


Great Barrier Reef Outlook Report 2009

Great Barrier Reef

- **Name :** Great Barrier Reef Outlook Report 2009
- **Type of assessment and level of integration**:
  fully integrated
- **Assessment :** decisions by a small task-force based on scientific data available; pressures and actual responses; forecast
- **Developed by:**

  Government of Australia, Great Barrier Reef Marine Park Authority
- **Relation to other assessments:** none



Australian Government
Great Barrier Reef Marine Park Authority

Great Barrier Reef

Strength

- Most developed assessment in the world; valuable features for the MSFD
- Draws clear conclusions on the status of various components (use of existing evidence if lack of data)
- A great deal of monitoring and scientific data already available
- Traditional knowledge and stakeholder inclusion

Weakness

- Lack of transparency when small task-force takes decisions
- No clear management plan for monitoring and reporting

3.6.2 Chemical processes

Assessment component	Summary	Assessment Grade
Nutrient cycling	Exposure to nutrients has increased for much of the Great Barrier Reef especially in inshore areas.	Poor
Pesticide accumulation	There are traces of pesticides in the Great Barrier Reef environment, the impacts of which are largely unknown.	?
Ocean acidity	The world's oceans are becoming more acidic affecting the growth of corals.	Good
Ocean salinity	The salinity of Great Barrier Reef waters is generally stable, with local short-term fluctuations after flood events, mostly close to the coast.	Very good
Chemical processes	For much of the Great Barrier Reef, the chemical environment has deteriorated significantly, especially inshore close to developed areas. This trend is expected to continue. Acidification of all Great Barrier Reef waters as a result of increased concentrations of atmospheric carbon dioxide is an emerging serious issue which is likely to worsen in the future.	Poor

Assessment Grade: Very good | Good | Poor | Very poor

GRADING STATEMENTS

Very good - There is no evidence of significant changes in chemical processes.

Good - Some chemical processes have changed in some areas, but not to the extent that the changes are significantly affecting ecosystem function.

Poor - Chemical processes have changed substantially in some areas to the extent that ecosystem function is significantly affected in some parts of the Region.

Very poor - Chemical processes have changed substantially and over a wide area. Ecosystem function is seriously affected in much of the Region.

Best practice examples (in relation to key elements)

- Indicators: -ESSIM/UK
- Human pressures: Pudget Sound
- Socio-economic indicators: ESSIM, Great Barrier Reef (Climate change; Coastal development; Catchment runoff; and Direct use)
- MSFD descriptors: UK, HELCOM
- Integration/Overall status: HELCOM, Chesapeake Bay, Assets, Great Barrier Reef, Ocean Health Index

Key Element: Integration

Expert judgement  quantitative method

Examples:

- Great Barrier Reef (no use of indicators, weighting and integration in a holistic manner)
- Assets (combination of indices, five grades for each index, combination of individual classifications)
- Ocean Health Index (identified indicators are categorized into 10 goals; different weights of indicators determine its importance to each goal)

Best practice examples (in relation to key elements)

- Risk analysis: ERAEF, Pudget Sound
- Transparency of methods used: OSPAR, Great Barrier Reef, HELCOM, Pudget Sound
- Stakeholders: Pudget Sound, Indonesia, Chesapeake Bay
- Management Measures: Chesapeake Bay

Requirements for IA concepts

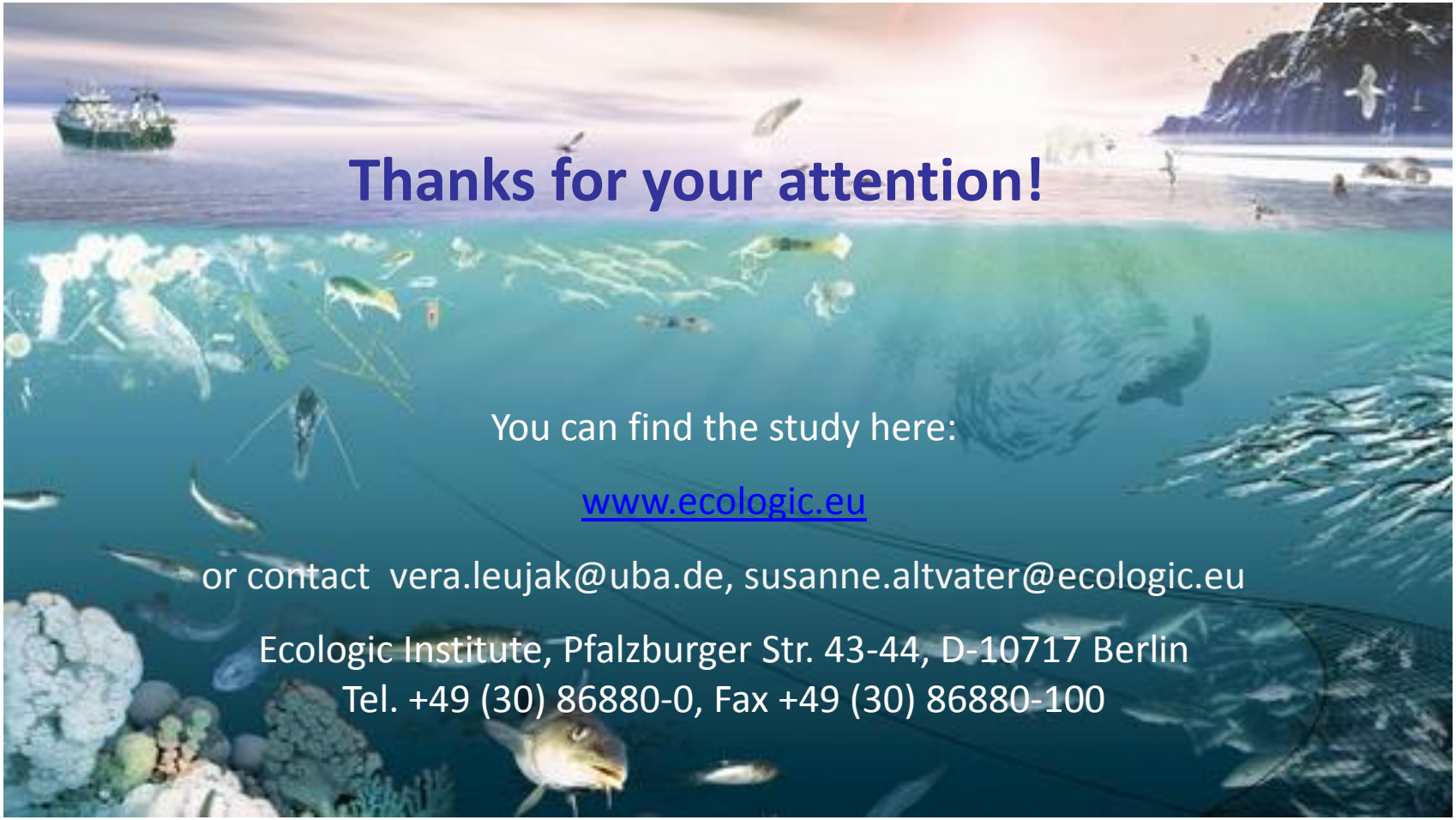
- **Example: Indicators**

- Make best use of indicators, monitoring programmes and expertise already in existence.
- Take resource restrictions and feasibility into consideration when selecting indicators.
- When developing new indicators, consult integrated approaches from other regions.
- Focus on strategic indicators which can act as a bellwether for underlying changes in the ecosystem.

Some recommendations of the interviewees:

- Do not write long reports
- Use regional grown indicators/programmes and complement them
- Provide criteria for the selection of indicators
- Include indicators on fisheries
- Consider socio-economic indicators
- A single index can derange the whole assessment
- Present results „policy friendly“

Stakeholder participation is key!



Thanks for your attention!

You can find the study here:

www.ecologic.eu

or contact vera.leujak@uba.de, susanne.altvater@ecologic.eu

Ecologic Institute, Pfalzburger Str. 43-44, D-10717 Berlin
Tel. +49 (30) 86880-0, Fax +49 (30) 86880-100