Integrating socio-economic and environmental aspects into decision-making about DSM

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Content

- A brief introduction to MIDAS
- Socio-economic research in HERMES, and HERMIONE
- Some reflections on values, decision making, the broader picture, dilemmas and precaution
Project Objectives

- Identify scale and duration of possible impacts on deep-sea ecosystems of different types of resource extraction activities → **Impacts**
- Develop workable solutions and best practice codes for environmentally sound and socially acceptable mining activities → **Sustainable management**
- Work with policy makers in the European and international arenas to enshrine best practice in international and national regulations and overarching legal frameworks → **Governance**
Focus on 3 types of resources:
- DS Minerals from sea-floor massive sulphides, Mn nodules & Co-rich Fe-Mn crusts
- Rare earth elements
- Gas hydrates

Funded by the European Union’s FP 7 Research Programme under theme “Sustainable management of Europe’s deep sea and sub-seafloor resources” (Grant Agreement 603418)

Project duration 3 years, starting 1 November 2013

Budget € 12.5 million; EC contribution € 9 million

32 partners across 11 countries (UK, France, Germany, Portugal, Norway, Belgium, the Netherlands, Italy, Spain, Poland, Russia)

Expertise includes marine scientists, policy & legal experts, social scientists, technologists, EIA practitioners

www.eu-midas.net
Work Programme

Identifying the scale of the problem

- WP1 Geological impacts
- WP2 Plumes in a dynamic environment
- WP3 Ecotoxicology

Determining the impact and its duration

- WP4 Impact on species connectivity
- WP5 Impact on ecosystem function and services
- WP6 Ecosystem resilience and recovery

Sustainable management: working with industry to find workable solutions

- WP7 Industry management practice
- WP8 Developing protocols and standards

Working with policy to enshrine best practice in law

- WP9 Societal framework and legal instruments

WP10 New monitoring technology

Developing a science/industry interface to deliver new technology to facilitate scientific understanding, monitor impact and ensure compliance

WP11 Project management and coordination

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Field Programme

1. Hausgarten
2. Svalbard
3. North Atlantic hydrothermal area
4. Ranfjorden
5. Black Sea
6. Palinuro Smnt
7. Portman Bay
8. El Hierro
9. Lucky Strike
10. Snake Pit
11. TAG
12. MAR
13. DISCOL
14. Clarion Clipperton Zone
Other relevant research projects

Hotspot Ecosystems Research on the Margins of European Seas
www.eu-hermes.net

Hotspot Ecosystems Research and Man’s Impact on European Seas
www.eu-herminone.net
A scientific drive to discover and understand the ecosystems and the human impacts, combined to a recognition of the need for policy-relevant knowledge
Deep-sea biodiversity and ecosystems

- Mapping human activities
- Interfacing with policy and society
- Evidencing human impacts
- Governance and management tools
- Cataloguing and valuing Ecosystem Services
- Using value evidence for policy support
Why care about deep-sea ecosystems?

• **Usefulness** arguments
  – ecosystem goods and services concept, captures dependence of human well-being on natural capital and flow of services it provides.

• **Ethical** arguments
  – e.g. intrinsic value; rights of other species/mother nature; duty to preserve; stewardship; belonging…

Complementary justifications
Because they are threatened

**Human activities & impacts in the deep sea**

- Fishing
- Oil & gas industry
- Mining
- Bio-prospecting
- Submarine cables
- Dumping of waste
- Dumping of offshore structures
- Dumping of wrecks and ammunitions
- Military activities (submarines, noise)
- Scientific research
- Shipping
- Carbon sequestration
- Gas hydrate exploration/extraction

Pollution from land-based activities
Atmospheric deposition of elements and contaminants
Climate change
Ocean acidification

**Direct and Indirect impacts**

**Combined pressures**

- UNEP 2007
- Glover & Smith, 2003
- Thiel, 2003
- OSPAR QSR, 2000
- Benn et al. 2010
Because they are useful...

Deep-sea goods and services

Supporting services: Chemosynthetic primary production; nutrient cycling; resilience; habitat,...

Provisioning services: Fish; oil & gas; genetic resources and chemical compounds for industrial and pharmaceutical uses; waste disposal sites,...

Regulating services: Water circulation and exchange; Gas and climate regulation; Carbon sequestration and storage; Waste absorption and detoxification; Biological control of pests; ...

Cultural services: Educational; Scientific; Aesthetic; Spiritual;...

Goods and services provided by deep-sea ecosystems and the key roles they play in global biogeochemical and ecological processes are essential to the sustainable functioning of our biosphere and to human wellbeing.
It is not just monetary values

• Value is a philosophical and ethical concept, not just an economic concept.
• Values are implicit and/or explicit in everything we do.
• Values cannot and need not necessarily be express in quantitative, monetary terms.
• Values can be recognised in qualitative or quantitative terms, along various dimensions.

→ There are different types of value evidence and different potential applications of value evidence in deep-sea governance

Can we develop value articulation processes which take into account normative and ethical dimensions, and re-establish the role of intuition, common sense and ethics in environmental and social valuation?
Ecosystem goods and services of the deep sea
Claire W. Armstrong, Naomi Foley, Rob Tinch and Sybille van den Hove

How and why we value ecosystem goods and services, related challenges and recent developments

Contents lists available at Scopus ScienceDirect
Ecosystem Services
Journal homepage: www.elsevier.com/locate/ecoser

Services from the deep: Steps towards valuation of deep sea goods and services
Claire W. Armstrong, Naomi S. Foley, Rob Tinch, Sybille van den Hove

Policy demands for value evidence on deep-sea environments
Rob Tinch, Sybille van den Hove and Claire W. Armstrong

Very little work has been done to identify and characterise the goods and services of the sea, and even less for the deep sea. We present a first categorization and synthesis of deep sea ecosystem goods and services, and review the current state of human knowledge about these services, the possible methods of assessing them, and the potential of including these assessments in policy making for deep-sea environments.
Uncertainties, irreversibilities

• Huge gaps in knowledge and uncertainties about:
  – deep-sea biodiversity
  – ecology of systems
  – goods and services provided;
  – relationships between biodiversity, ecosystem functions, services;
  – human activities and impacts;
  – baselines

• Uncertainties and indeterminacies inherent to complex social-ecological systems

• Knowledge is growing more slowly than anthropogenic pressure

• Yet impacts can/could be (quasi)-irreversible (e.g. trawling, some forms of deep-sea mining,...)
Asymmetry between the 3 'pillars' of sustainability

Asymmetry stems from physical and biological limits and irreversibility

Useful to highlight trade-offs, yet reality is closer to

Source: EEA 2012

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Irreversibilities and precaution

- It is not the same to be wrong when impacts are reversible and when they are irreversible
- Reflect on pros and cons of being wrong
- Potential irreversibility and/or high stakes call for precautionary approaches:
  - Acknowledge the possibility of surprises
  - keep your options open
  - diversify to build resilience
  - avoid lock-ins
  - Revisit
  - Adapt
  - be humble ...
Acknowledging dilemmas, reflecting on aims

- Dilemma between (short term) profits/revenues and environmental + social risks/impacts
- Should we rush to exploit deep sea resources independently of the social and environmental risks and impacts?
- In "developed" countries, often justified by incantations to growth...
- In "developing" countries, by incantations to development...
  ... yet the questions "Growth: what for and how?", "Development: what for and how?" are seldom asked
- In the private sector, incantations to profit, yet often a confusion of means and ends: what should the goal of a company? Making profit or delivering a service to society with profit being a necessary means towards that end?

"Perfection of means and confusion of goals seem, in my opinion, to characterise our age"  A. Einstein (1941)
Going beyond the dilemmas

- Broaden the time horizon
  Short term thinking can lead to wrong decisions

- Broaden the interest range
  ⇒ broader set of values into the picture
  Do not look only at the financial benefits

- Ask the "what for" question

- Break free of lock-ins: technological, institutional, ideological

- Learn to live with uncertainty, ignorance, imperfect (or absent) evidence, high risks and irreversibility
  ⇒ Humility, Precaution, Imagination
Late lessons from early warnings: science, precaution, innovation
Towards more holistic governance approaches

- addressing the interconnectedness of issues
- building on concepts such as the ecosystem approach, integrated management, natural capital, ecosystem services, the precautionary principle, adaptive management, transformative capacity, ...
- allowing for progressive integration of information as it becomes available;
- and integration of different value judgement and logics;
- dynamic processes of capacity-building, aiming at innovative, flexible and adjustable answers (not all eggs in one basket, leave options open, avoid lock-ins, learn as you go).
Take home messages

- There is on-going research in Europe on deep-sea ecosystems and managing impacts of deep-sea resource exploitation → let's connect

- Decision-making on DSM should keep the broader picture in mind, including social and environmental aspects of sustainable development, alternative development paths, long-term and intergenerational issues, complexities,... → let's try not to repeat the errors from the past

- There is more to value than economic (monetary) value and there are limits to cost-benefit analysis → let's broaden our analysis of pros and cons

- Irreversibility (or quasi-irreversibility) of damages creates a fundamental asymmetry which, together with high stakes and uncertainties, calls for precautionary approaches
Meitaki
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