From Science-Policy to Data-Policy Interfaces: Unpacking Biodiversity Monitoring Data Practices

OOSC Presentation

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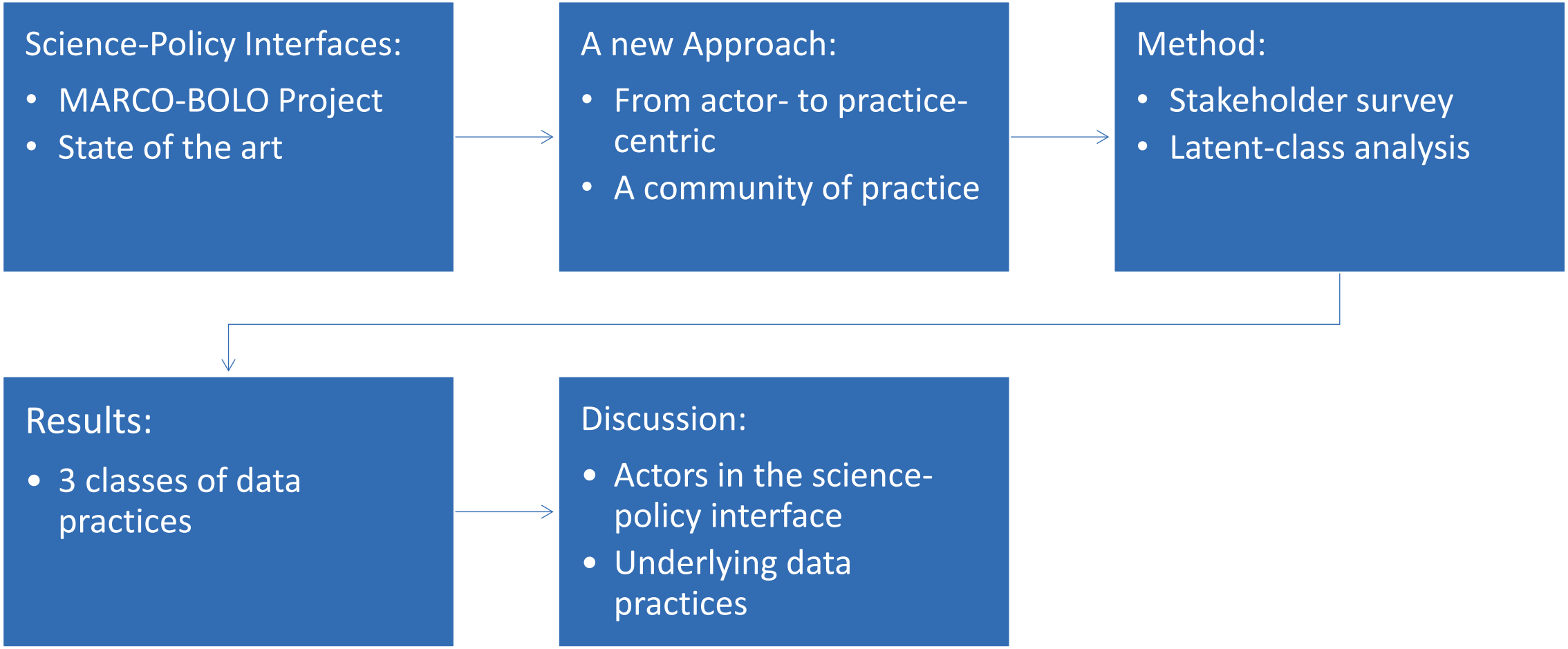
A research conducted as part of the MARCO-BOLO Project

Structure


Science-Policy Interfaces:
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• State of the art
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• A community of practice
Method:
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• Latent-class analysis
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• Actors in the science-policy interface
• Underlying data practices

Science-Policy Interfaces – Project Context:

MARCO-BOLO
STRENGTHENING BIODIVERSITY OBSERVATION IN SUPPORT OF DECISION MAKING

Who: MARCO-BOLO – 28 different partners from research, industry, government and the not-for-profit sectors across Europe

What: optimize and harmonize methods, and technologies for European marine, coastal and freshwater biodiversity observations

With which goal: harmonize and standardize biodiversity monitoring data formats and protocols, make biodiversity monitoring data more policy-making usable

Funded by the European Union

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MARCO-BOLO – Our Role

- Technical WPs 1-5
- Uni Vienna contributor to WP 6 on Stakeholder Engagement
- Stakeholder survey, profiling report and engagement
- Create and mobilize a Community of Practice (CoP) for stakeholders across the marine biodiversity knowledge value chain

-> Address the science-policy interface from biodiversity monitoring data collection to use in policy-making

Science-Policy Interfaces – State of the Art

- There is a gap between scientific knowledge and policy-making processes (A. Borja et al., 2016)
- Deeply rooted assumption of different actor groups such as policymakers, practitioners and scientists (Rose et al., 2018)
- Naturally disconnected groups of people (Lubchenco et al., 2019).
- All about bridging between these two groups (Turnhout, Stuiver, Klostermann, Harms, & Leeuwis, 2013)
- View of scientists needing to communicate their results (Turnhout et al., 2013)
- Quite linear view (other approaches see it more as a network)

-> “actor-centric” (“institution”/ “affiliation” – centric)

A new Approach

From actor-centric to practice-centric

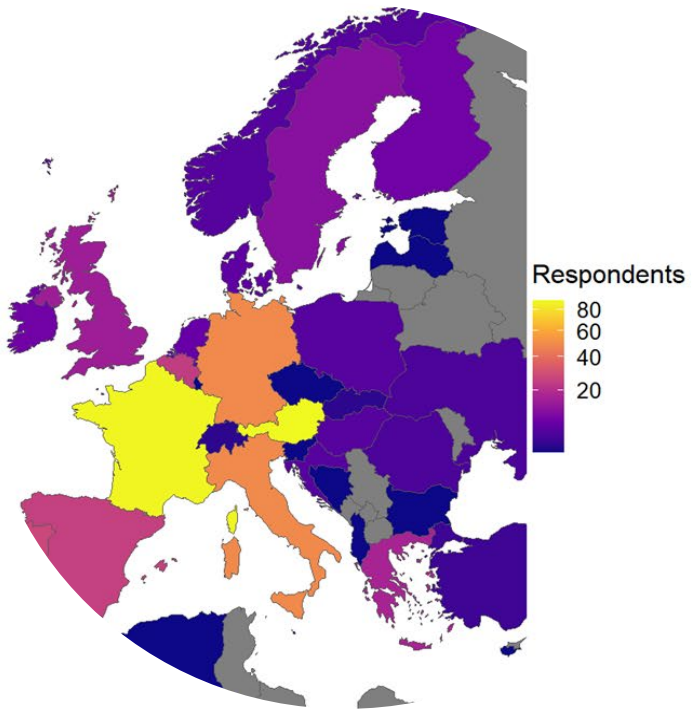
- The case of biodiversity monitoring data is a special case: monitoring data (including automatic and regular, sampling) are expected to feed constantly into the policy-circle
- Away from communicating individual results to ensuring the applicability of data and models in policy-making
- Monitoring systems, repositories, and research infrastructures are proliferating, but little knowledge about data practices (Rose et al. 2019)

-> Shifts the focus: practices are performed by individuals, not necessarily by institutions

A community of practice idea:

- common practice as basis for knowledge sharing and social learning (Matsuo & Aihara, 2022)

Method - Stakeholder Survey



- **A survey addressing: the community** (i.e. what are the profiles of stakeholders), **the practice** (i.e. how do these stakeholders work and operate with biodiversity data) and **the needs and challenges** (i.e. what do different stakeholders require when working with biodiversity data)

- **Sample:** 561 respondents from universities, national or local governmental institutions, other research institutions, NGOs & IGOs, EU agencies and business

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Method – Latent Class Analysis

- Identify number of latent classes (subgroups) based on item responses

- Describe characteristics of those subgroups
- Predictors and consequences of group membership

→Subgroups not dependent on affiliation (or other pre-defined quality) but on responses to survey questions

→Construct a complex concept like ‘practices’ from different survey items

→Compare with theoretically assumed subgroups = science-policy divide?

Overview over model

Survey items related to data practices

Q4.2 What applies to you? Do you produce/manage/use biodiversity data?

Q6.3 How much time do you spend on dealing with data in general?

Q45 What type of biodiversity-related data do you use?

Q6.1 For what purpose do you use biodiversity data?

Q6.9 To what extent do you use Essential Variables in your work?

Q7.3 How often do you use the following data repositories?

Q6.6 What data products and tools do you need most urgently?

Q6.7 What challenges do you experience when using biodiversity data?

43 binary questions

Dimension 1: Level of data engagement
1. Do you spend 50% or more on dealing with data in general?
2. Do you use biodiversity data?
3. Do you manage biodiversity data?
4. Do you produce biodiversity data?

Dimension 2: Types of data used
Do you use the following types of biodiversity-related data:
1. Geological data?
2. Socio-economic data?
3. Acoustic data?
4. Fishery data?
5. Satellite data?
6. Pollution data?
7. Physical data?
8. Chemical data?
9. Numeric data?
10. Visual data?

Dimension 3: Purposes of data use
Do you use biodiversity data for the following purposes:
1. Reporting?
2. Spatial planning?
3. Environmental impact assessment?
4. Conservation measures?
5. Policy evaluation?
6. Policy-making?
7. Decision-making?
8. Scientific research?
9. Education?
10. Communication?
11. Product development?
12. Protected area management?
13. Indicator development?

Dimension 4: Level of engagement with essential variables and repositories:
Do you use the following data repositories or essential variables regularly or more:
1. EOVs & EBVs ?
2. EMODnet?
3. OBIS?
4. GBIF?
5. National repositories?
6. Project based repositories?

Dimension 5: Data tools and products needed
Do you need the following data products and tools most urgently:
1. Maps?
2. Scenarios?
3. Models?
4. Graphs?
5. Tools to integrate data?

Dimension 6: Challenges experienced
Do you experience the following challenges half of the time or more:
1. Data consistency?
2. Lack of metadata?
3. Data interpretation?
4. Access to data?
5. Interoperability of data?

3 latent classes

1) Scientific data providers (~45%)
2) Applied data users (~26%)
2) Data engagers (~29%)

Explanatory variables

Q2.3 Affiliation

Q2.4 Area of work

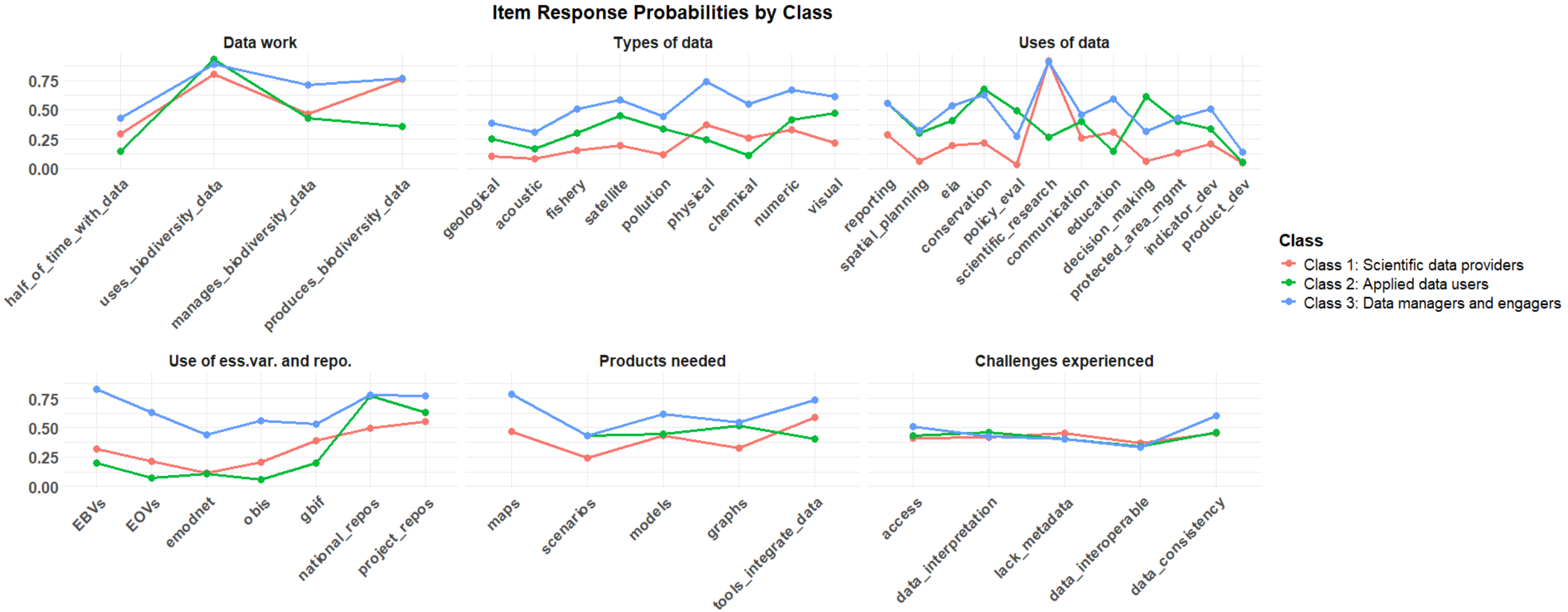
Q2.2 Country (recoded into regions)

Q2.5 Ecosystem

Q6.10 Data literacy

Q21 Does your institution encourage the use of biodiversity data?

Results: Three Latent Classes



Results: Three Latent Classes

Class	Work	Types	Uses	Essen. Var and Repos.	Products needed	Challenges
Scientific providers	Likely to "produce" data but not to "manage"	Unlikely to use most types of data	Likely to use data for "scientific research" but nothing else	Likely to use project based repositories	Likely to need „tools to integrate data"	Very similarly experienced challenges across classes
Applied users	Unlikely to "manage" and "produce" data but most likely to "use" data	Likely to use "satellite", "numeric" and "visual" data	Likely to use data for "decision-making" and "conservation"	Likely to use national repositories	Likely to need "maps"	Very similarly experienced challenges across classes
Managers	Likely to "manage" data, spend most time with data	Uses all types of data more compared to other groups	Likely to use data for "indicator development", "research" and "education"	Uses essential variables and int. repositories	Likely to need "tools to integrate" data and "maps"	Likely to experience "consistency" as a challenge

Discussion

1) Actors in the science-policy interface

- Not only two groups (scientists & policymakers)

- There is an often overlooked third class of data practices, namely data managers and engagers that make up roughly a quarter of the sample

2) Underlying data practices

- There are differences between different stakeholders that allows distinction between classes but the institutional affiliation (scientific vs. policy-making institution) does not explain membership in practice classes

- Biggest differences regarding the use of data and repositories

3) Assessing the existence of a community of practice

- Generally there is a surprising amount of similarities between classes (particularly in regards to experienced challenges)

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Environmental Politics Research Group

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Thank you

Ocean Data Survey

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Fill out our survey on data use in international ocean policy-making….

…and visit our side event on Digital Ocean Twins at

Institut de la Mer de Villefranche-sur-Mer

12 June 2025, 6 p.m.

Event:

ttps://mailchi.mp/14eac086c64f/making-the-digital-twin-of-the-ocean-fit-for-global-marine-governance

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