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Ecosystem Science for Policy & Practice

WP3 Knowledge - Update -

User board meeting
Lisbon, 6-7 Nov 2014

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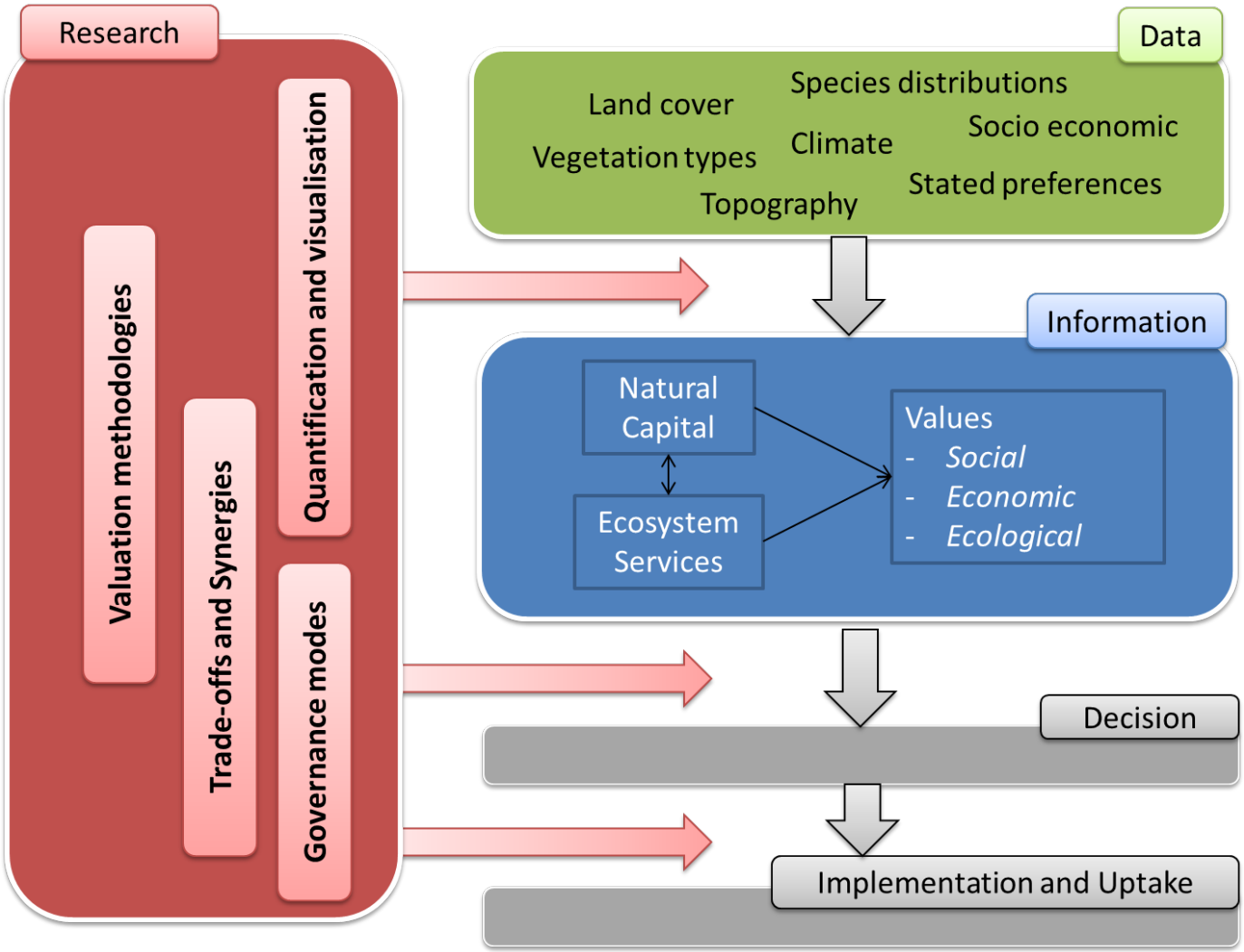
WP Knowledge



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Work package coordination:

- VU University Amsterdam (Peter Verburg, Astrid van Teeffelen)
- Karlsruhe Institute of Technology (Almut Arneth, Anita Bayer)

WP Knowledge – 5 tasks

1
Ecosystem function and quantification

2
Socio-cultural valuation

3
Market and non-market valuation

4
Governance & Institutions

5
Trade-offs and synergies in ES/NC
and between alternative valuation perspectives

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Knowledge needs from 1st User Board

- Ecology: Explore impact chains & causalities; link between ecosystem and ES
  - supporting functions and processes
  - drivers (policies, economic, ecologic, …)
  - impacts of marginal changes
  - thresholds & tipping points
  - -> Improve science
  - -> Provide tools, models, software for this
- Information on trade-offs
  - between ES
  - between users
- Economics:
  - Assess economic benefits of ES
  - How to put a value on ES: Guidelines for accounting
  - Avoid giving everything a price tag

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Knowledge needs from 1st User Board

- Guidelines for social ES valuation
- Include scales:
  Space: global – regional – local, -> spatially specific
  Time: past – current – future
  -> Perspectives on ES taking into account long-term effects
- Transfering knowledge into practice
  e.g. best & worse case examples
  Different spatial levels, short- and long-term
  Evaluation of different approaches
  -> Translate into guidelines for procedures
- What drives action? What drives inaction?
  Linking biophysical changes to socio-economic consequences
  -> understanding ‘pathways’ to action
- Establish long-term continuity of knowledge

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Task 1

Ecosystem function and quantification

Progress in Task 3.1

Impact chains & causalities

long-term effects

Diff. Temporal + spatial scales

Tipping points, trade-offs

- Meta-analysis: Report on knowledge gaps in ES research
  Database available *(Lautenbach et al., 2014, MS2.3, MS3.2)*
- Improved metric for biogeochemical climate regulation *(Bayer et al., submitted)*
- Mapping and Modelling of ES provision (various groups, scales, foci)
- Methodical developments:
  - Identification of ecological tipping points of ES based on functional composition of communities
  - Forest ES: link remote sensing data with forest inventories
  - Explore contribution of landscape configuration to ES provision
  - Trade-offs between ES and biodiversity indicators
  - Current vs. optimal provision of ES
- Field experiments:
  - CO_2 emissions from historical seagrass carbon stocks

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Task coordination T3.1:
Karlsruhe Institute of Technology: Almut Arneth, Anita Bayer

Task 1

Ecosystem function and quantification

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  - Explore contribution of landscape configuration to ES provision
  - Trade-offs between ES and biodiversity indicators
  - Current vs. optimal provision of ES
- Field experiments:
  - CO_2 emissions from historical seagrass carbon stocks

➡ Presented at various conferences in 2014

➡ Application of methods in various exemplars, e.g., Scotland, French Alps, Global, Mediterranean

Practical examples

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Task coordination T3.1:
Karlsruhe Institute of Technology: Almut Arneth, Anita Bayer

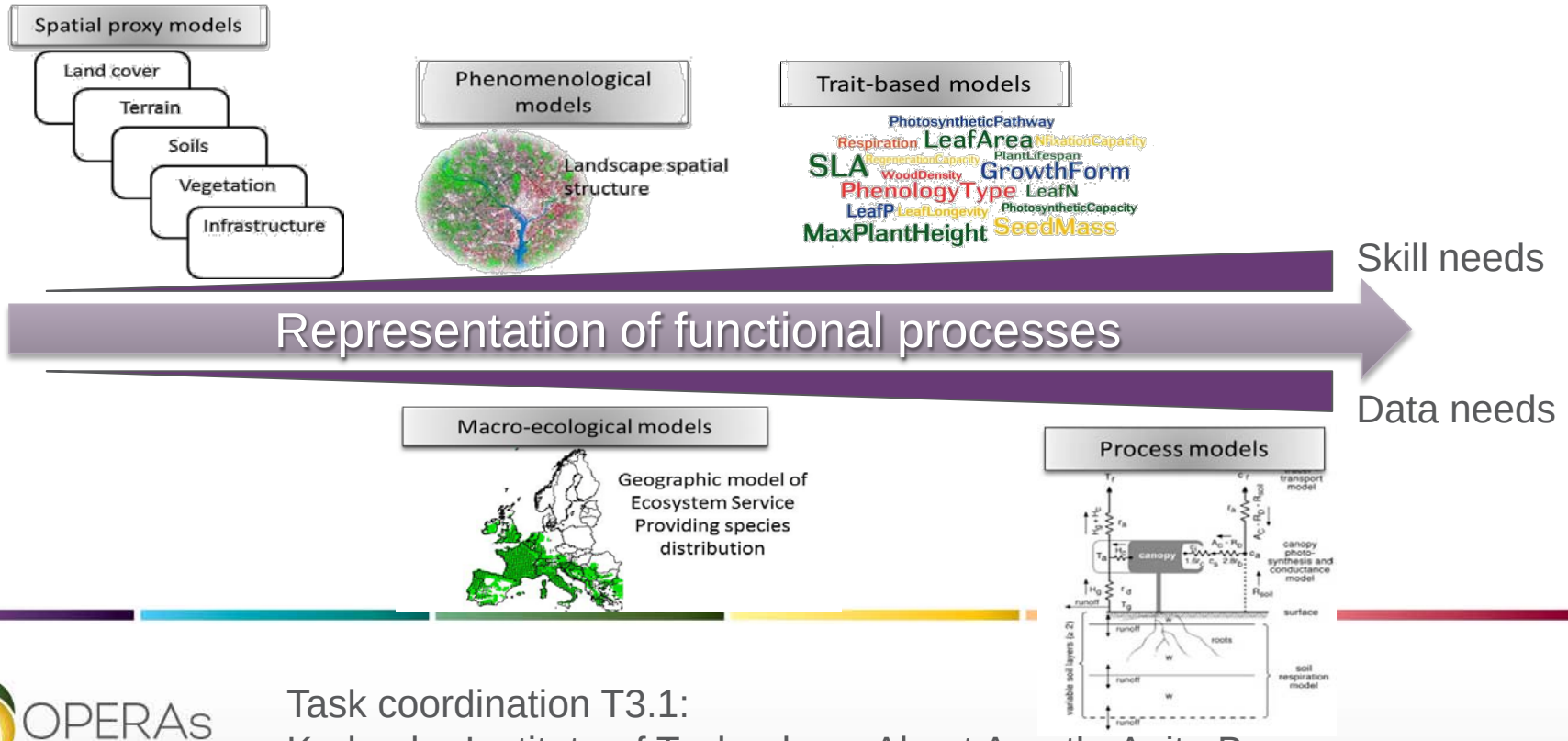
Task 1

Ecosystem function and quantification

Deliverable 3.1

“Transferable geo-referenced metrics and GIS based quantification functions”

- Short synthesis of potentialities of different modelling approaches
- Typology of models for the incorporation of biodiversity effects into ES models



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Task coordination T3.1:
Karlsruhe Institute of Technology: Almut Arneth, Anita Bayer

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Socio-cultural valuation

Progress in Task 3.2

Guidelines for social ES valuation

- Distributed guidelines or socio-cultural valuation and deliberation approaches (some collaboration with Openness)
- Developed strategy for socio-cultural valuation in Fingal Exemplar:
  - Urban-rural gradient Exemplar in Dublin area
  - Significant worsening of socio-economic circumstances after the economic collapse 2008
  - Workshop Oct '14

Practical examples

- Related efforts are underway in other Exemplars:
  - Balearics, Barcelona, Scotland & Bulgaria
- Working with other work-task leads on exemplars for which there is potential for the development of new tools/approaches of combined methods

Fingal workshop

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Task coordination T3.2:
University College Dublin: Craig Bullock

3

Market and non-market valuation

Progress in Task 3.3

Economic benefits of ES

Valuation methods

- Book chapters:
  Economic values of ES:
  why relevant, what is the economic value of ES
  Economic valuation methods for ES: available methods, their advantages and disadvantages, and when to apply which method
- Papers:
  S**tate-of-the-art economic valuation:** Insights on how to obtain more accurate value estimates
  Accounting
- **Framework** for creating **spatially explicit value function** (MS 3.3) and start with meta-analysis database
  Including spatially specific information in value transfer functions, aimed at improved prediction of ecosystem values

Scientific basis

4

Governance & Institutions

Progress in Task 3.4

Collaboration in Exemplars:

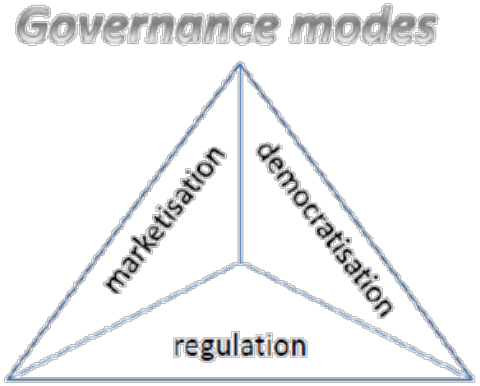
- Meetings and ongoing discussion about further collaboration
- Montado, French Alps, Scotland

Practical examples

Outreach:

- Publication: joint paper with OpenNESS (forthcoming in Ecological Economics)
- Representation of OPERAs and task 3.4 at various conferences
- Specification of questions on property right regimes, institutional structures, etc. for exemplars & first information at exemplar level collected (MS 3.6)
- Identification of policy integration needs, cross jurisdiction issues, PR arrangements (MS 3.25)
- Literature review of EU policies and studies on exemplars related to ES governance and, among others, role of property rights

Improve science



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Trade-offs and synergies

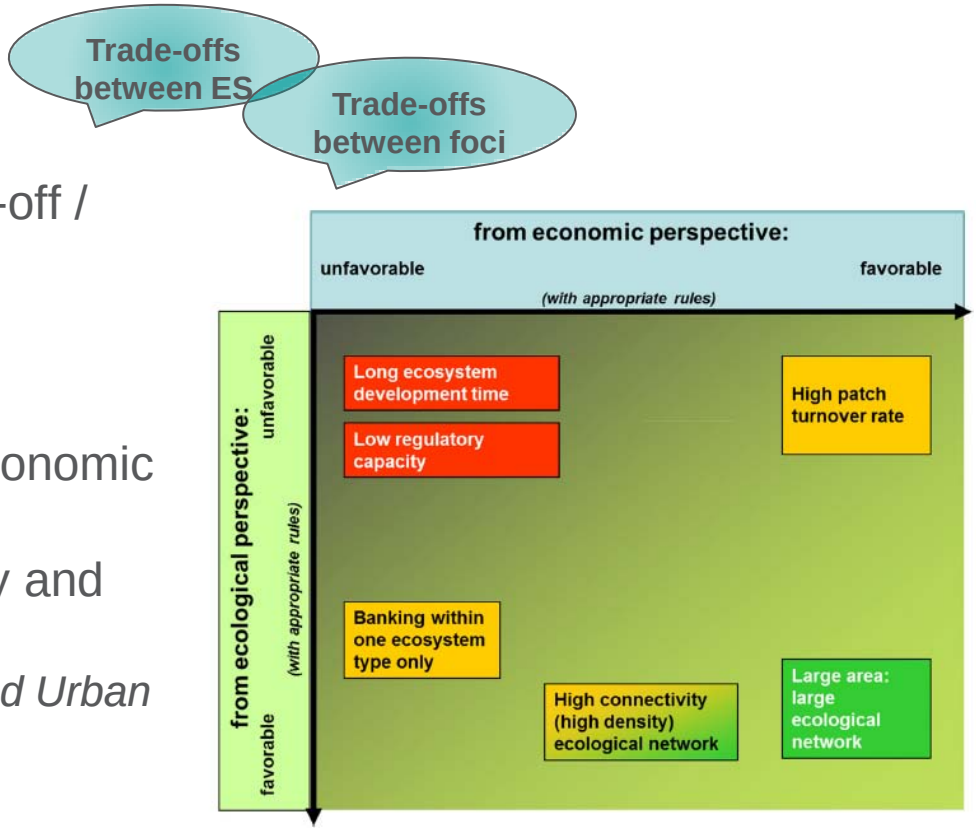
Progress in Task 3.5

A range of expertise exists and is being developed at the various partner institutes

Recent publications:

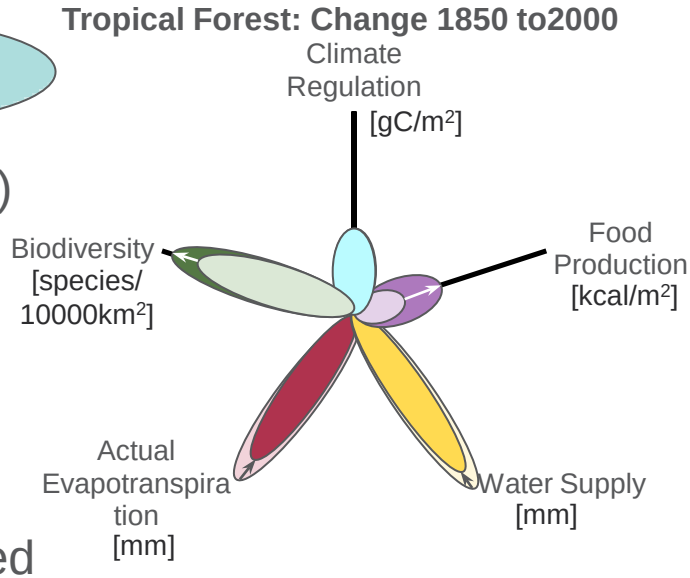
- Methods for the identification of trade-off / synergies between ES:
  Mouchet et al. (2014). Glob. Env. Change, 28, 298-308.

- Trade-offs between ecological and economic conditions for conservation banking (an instrument to maintain biodiversity and ES in spite of development):
  Van Teeffelen et al. (2014). Landscape and Urban Planning, 130, 64-72



Examples from Task 3.5

Trade-offs over time/space



Work in progress:

- Temporal ES trade-offs with global model (KIT)
- Meta-analysis of trade-offs between ES (Univ. Bonn et al.)

Setting up joint work:

- OPERAs WP3 work for Scotland was presented to stakeholders in the ESCOM meeting, April 2014
- A session on Trade-offs was held in Lisbon, May 2014
- Plans for synergized application of various methods from WP3 tasks in different Exemplars

Summary of progress in WP Knowledge

A lot of ongoing work on

- **Improve scientific basis + methods**
- **Link between valuation perspectives**
- **Transferring knowledge into practice**