OPERAs

36 Month Periodic Report

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and the Project Management Team

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Ecosystem Science for Policy & Practice

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Periodic report: 1st 2nd X 3rd 4th

Period covered: from 1st June 2014 to 30th November 2015

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Contents

1. Project objectives for the period

The overall objective of the OPERAs project is to improve understanding of how ecosystem services/natural capital (ES/NC) contribute to human well-being in different social-ecological systems in inland and coastal zones, in rural and urban areas, related to different ecosystems including forests and fresh water resources. The OPERAs research will establish whether, how and under what conditions the ES/NC concepts can move beyond the academic domain towards practical implementation in support of sustainable ecosystem management. This will be achieved through the following **seven specific objectives**:

O1. To **improve understanding** of how multiple drivers and existing and future ecosystem management under EU regulatory frameworks change ES/NC.

O2. To **explore, demonstrate and validate** mechanisms, instruments and best practices to maintain and enhance a sustainable flow of ecosystem services while preserving ecological value and biological diversity.

O3. To **qualify and quantify** the trade-offs and synergies between the ecosystem traits and functions associated with ES/NC and their social and economic values in Europe and globally.

O4. To **improve and modify** existing integrated decision support tools and instruments to better capture and represent the concepts of ES/NC.

O5. To **provide transparent and clear guidelines** on improved effective and cost-efficient, multi-level ES/NC governance structures and practical management measures to policymakers and stakeholders.

O6. To **develop, apply and test protocols** to generate ES/NC datasets and policy indicators that are consistent and coherent across time and space and sensitive to biophysical and socio-economic change.

O7. To **ensure the long-term perennity of key databases** and other major products of the research.

The practical implementation of these objectives is being achieved through four scientific work packages (WPs) plus WPs on management and dissemination. The objectives of each WP for the second reporting period are described below.

1.1 WP1: Project Management

Specific objectives for WP1 during the second reporting period were:

- To organise the Project Management Team meetings
- To organise two full project meetings (Dublin and Aix en Provence)
- To manage the communication between project partners and the European Commission
- To complete and submit the second Periodic Report

1.2 WP2: Practice

Specific objectives for WP2 during the second reporting period were:

- To report on standardized metrics/indicators for monitoring the efficiency of ES/NC based measures
- To report from progress in the exemplars, partly through a Second and Third Blue Print
- To design a database to compile lessons learned across WP
- To develop a process towards guidance for selecting instruments for maintaining and protecting ES
- To elaborate an iteratively process to elicit lessons learned from Meta-Analysis and Exemplars

1.3 WP3: Knowledge

Specific objectives for WP3 during the second reporting period were:

- To present the state-of-the-art in economic valuation of ES/NC (D3.2)
- To report on existing and potential governance modes for ES/NC, including a framework for ES/NC integration at different levels of governance (D3.3)
- To establish a set of recommendations for integration of ES/NC in existing accounting and reporting formats (D3.4)
- To present and overview of strategies and methods for social valuation of ES/NC (D3.5)
- To test and compare methods for ES modelling and assessment in various exemplars.

1.4 WP4: Instruments

Specific objectives for WP4 during the second period were:

- To analyse the operational potential needs, and demands for ES/NC concepts in policy development and implementation
- To develop new and improved information tools that include ES/NC concepts
- To improve and further develop existing decision-support tools that include the ES/NC concept, including multi-criteria decision support tools, various types of Environmental Assessments, social cost-benefit analysis, and scenario and foresight tools
- To develop and apply new and improved implementation management and appraisal tools and instruments to support the implementation and uptake of ES/NC concepts
- To guide the development, choice and application of instruments that include ES/NC concepts both within and beyond the OPERAs project

1.5 WP5: Resource Hub

Specific objectives for WP5 during the second reporting period were:

- To develop the demonstration model of Oppla
- To begin work on the Business Plan and Governance Structure for Oppla to ensure sustainability
- To launch the ‘ Ask Oppla’ function of the Oppla web interface
- Organisation of 2 Userboard workshops
- Coordination of stakeholder engagement activities within 4 exemplars (European, French Alps, Dublin, Scotland)
- Set-up and maintenance of Monitoring and Corrective Action Mechanism for stakeholder engagement

1.6 WP6: Outreach and dissemination

Specific objectives for WP6 during the second reporting period were:

- To disseminate project results
- To promote Oppla
- To commence organisation of an OPERAs summer school
- To commence organisation of an OPERAs conference

2. Work Progress and achievements during this period

2.1 WP1: Project Management

See Section 5

2.2 WP2: Practice

2.2.1 Task Objectives

Task 2.1 – Meta-analysis

1. Set-up a database to characterise ES/NC assessments based on published case studies (T 2.1.1), (UFZ, ALU, UBO, PU)
2. Assess the evidence-base for methods used in ES/NC assessments (T 2.1.2) (UFZ, ALU, UBO, PU)
3. Develop efficiency indicators for the instruments used in ES/NC assessments (T 2.1.3) (UFZ, ALU, UBO)
4. Conduct a meta-analysis of existing case studies (T 2.1.4) (UFZ, ALU, UBO)
5. Identify the knowledge gaps based on the analysis of the database (T 2.1.5) (UFZ, ALU, UBO)

Task 2.2 – Exemplars

1. Launch of OPERAS cooperation, identification of stakeholder needs for different tools and instruments in each exemplar and optimisation of study design (T 2.2.1)
2. Regular reporting and evaluation of the process of tool and instrument testing (T 2.2.2)
3. Iterative learning processes between end-users, stakeholders, researchers and developers of tools and instruments (T 2.2.3)
4. Subtask 2.2.4: Final reporting and critical evaluation of the process as a contribution to the Resource Hub

Task 2.3 – Practice design and synthesis

1. Elaboration of the Blue Print Protocol (Sub task 2.3.1) UEDIN, UFZ, ALU, UBO, VU-IVN, UP, ULUND
2. Synthesis of Lessons Learned (Sub task 2.3.2) UEDIN, UFZ, ALU, UBO, VU-IVN, UP, ULUND, WCMC
3. Design of a suite of decision trees (Sub task 2.3.3) UEDIN, UFZ, ALU, UBO, VU-IVN, UP, ULUND, WCMC

2.2.2 Progress towards objectives

Task 2.1 – Meta-analysis

Subtask 2.1.1. Set-up a database to characterise ES/NC assessments based on published case studies (UFZ, ALU, UBO, PU). This subtask was completed in the first reporting period. The so called SynES (Database for Synthesis of information on Ecosystem Services) summarizes data on the methodological approaches used by ES case studies as well as information on the practical implementation. SynES was discussed within the OPERAs User Board Webinar (June 2015) and will be provided via the Resource Hub OPPLA (see WP3 list: Contributions to Resource Hub).

Subtask 2.1.2. Assess the evidence-base for methods used in ES/NC assessments (UFZ, ALU, UBO, PU). As reported in the first reporting period an evidence assessment tool to identify the reliability of ecosystem services case studies was developed. In the second period effort concentrated on publishing the tool[2] Further, the tool is applied to the research question: Investigating the influence of forest management on water quality. The meta-analysis addressing this question compiles approx. 100 research studies from temperate forests and aims at identifying a best management practice and assessing the evidence base of this management recommendation. This research is still ongoing and no results are available yet.

Subtask 2.1.3. Develop efficiency indicators for the instruments used in ES/NC assessments (UFZ, ALU, UBO). Based on the work done in the first reporting period *D2.2 Report on standardized metrics/indicators for monitoring the efficiency of ES/NC based measures* was compiled and submitted (December 2014). Findings of the D2.2 were used for further in-depth analysis of characteristics that make an ES study effective. Forward steps on how to improve the evidence of the effectiveness of ES studies for ecosystem management were presented at the IALE World Congress 2015 in Portland, Oregon (USA). Moreover, we examined the relevance of ES studies and projects for decision making by facing the information supply provided by major ES databases to the information demand for policy making instruments of safeguarding biodiversity and in business governance (Fig. 1). Results were presented at the ESP Conference 2014, at the OPERAs Consortium Meeting in Dublin (March 2015) and in the first OPERAs User Board Webinar (June 2015).

[2] Mupepele A-C, Walsh JC, Sutherland WJ, and Dormann CF. (under review in Ecol Appl). An evidence assessment tool for ecosystem services and conservation studies.

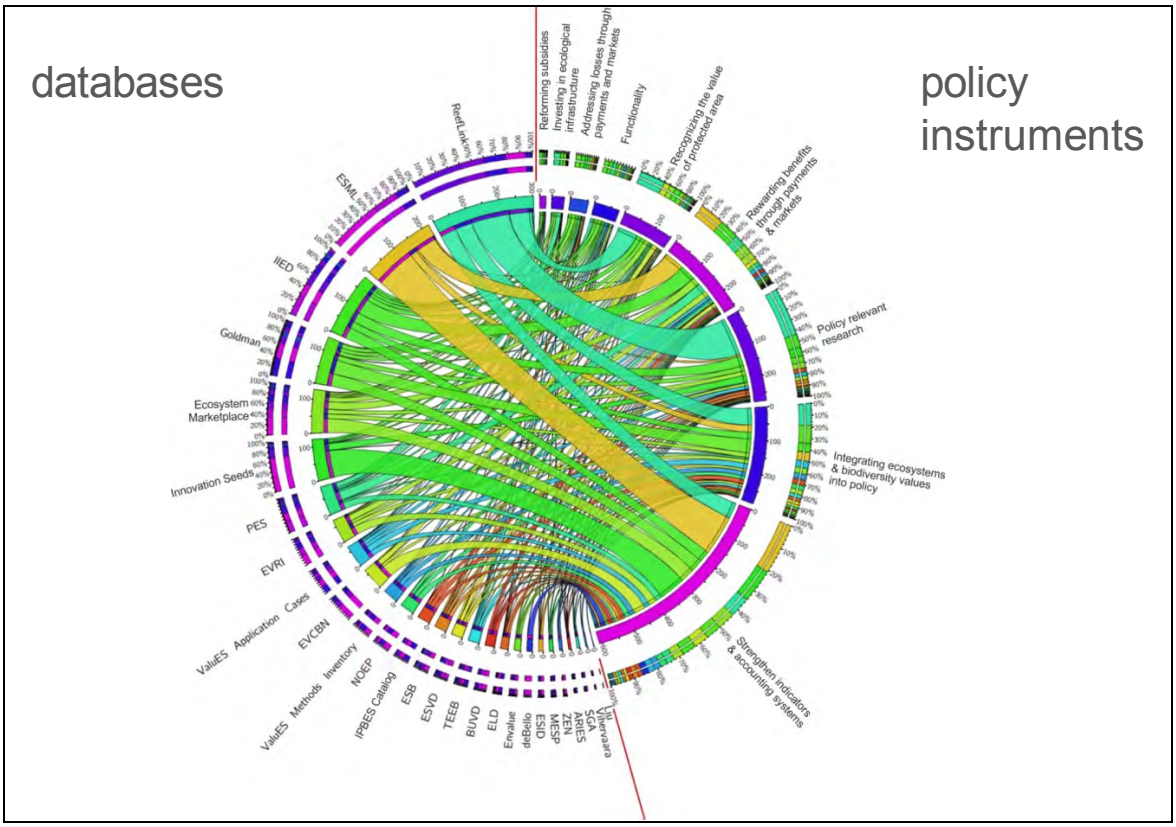

Figure 1.The. chord diagram shows information supply from 27 databases (left half) against 9 information demand categories from policy instruments and actions (right half).The percentage values of outer two segments of stacked bars indicate the relative contribution while the inner monochrome segment represents the total number of database entities that may inform policy instruments (ribbons).

Subtask 2.1.4 Conduct a meta-analysis of existing case studies (UFZ, ALU, UBO). The general meta-analysis already reported on in the first reporting period was extended by additional 40 studies and by stakeholder and land use specific input by VU-IVM.

The work was augmented by a meta-analysis on relationships between ecosystem services and results submitted for publication3. In addition, in cooperation with the Mediterranean exemplar a specific meta-analysis was started to investigate the effects of agricultural practices on ecosystem services in the Mediterranean. In this study, we aim at quantifying trade-offs among ecosystem services according to management practice changes in agricultural fields. Furthermore, sustainable farming practices in the Mediterranean region will be investigated by minimising trade-offs among multiple ecosystem services. The results will supplement the modelling work in the Mediterranean exemplar.

[3] Lee, H. Lautenbach, S. (under review). A quantitative review of relationships between Ecosystem Services, *Ecological indicators*

Results from the meta-analysis were provided as input for work on synthesis at UEDIN. Information for UEDIN focused on studies with specific recommendations and supported work of UEDIN on decision trees.

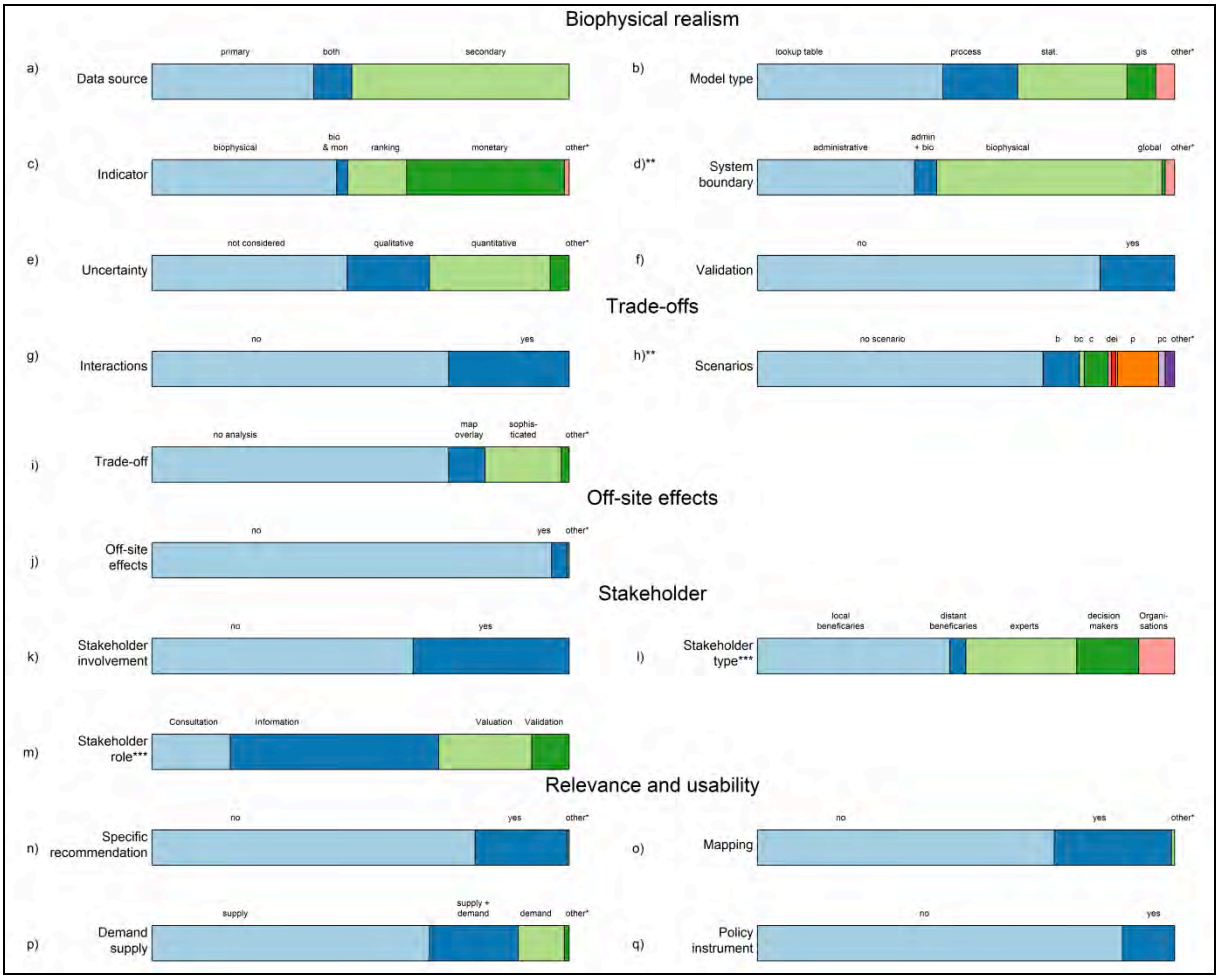

Figure 2. Percentage of the studies that belong to the specified factor level. The factor level 'other' refers to cases in which insufficient information to assign the article to a factor was given in the article. For scenarios the following types have been distinguished: : b -behavioural changes, c -climate change, d- demographic changes, e- economic changes, I - invasive species, p -policy changes, two letter combinations represent a combination of several scenario types in the same case study.
** System boundary and scenarios belong not exclusively to one category.
*** For stakeholder role and stakeholder type the percentage refers only to the number of studies that involved stakeholders.

Subtask 2.1.5. Identify the knowledge gaps based on the analysis of the database (UFZ, ALU, UBO). Based on the identified knowledge gaps reported in the first reporting period a manuscript

on blind spots in ecosystem service research was compiled and submitted[4]. Results on the identified knowledge gaps were provided to UP. Joint work with UP focused on how far exemplars were aiming at existing knowledge gaps. Information for UEDIN was provided with respect to studies with specific recommendations.

Task 2.2 – Exemplars

Subtask 2.2.1. Launch of OPERAS cooperation, identification of stakeholder needs for different tools and instruments in each exemplar and optimisation of study design. This subtask has been completed through the Exemplar study design Milestone 2.6 and Deliverable 2.1, and the Exemplar studies are proceeding well, as seen by the diverse and numerous publications, presentations, and dissemination materials produced.

Subtask 2.2.2. Regular reporting and evaluation of the process of tool and instrument testing. This subtask is currently underway. The Exemplar Interim Report (Milestone 2.11, June 2015) summarized progress to date in the Exemplars in short, public-facing presentations that are being made available on the OPERAs website and will appear on the OPPLA Resource Hub. The Exemplar Interim Report takes up questions regarding the successes and challenges in the Exemplars in the areas *Research & Training*, *Stakeholder Engagement* and *Collaboration in the Work Processes*. Contributions of Exemplars to fill existing research gaps could be identified as a result from the Blueprint Reporting (Task 2.3 – Synthesis) and the Gap Analysis (conducted in Task 2.1 – Meta Analysis) (see Box 1).

Box 1. Contributions of Exemplars to fill existing research gaps

[4] Lautenbach,S. A.-C. Mupepele, C. F. Dormann, H. Lee, S. Schmidt, S. S.K. Scholte, R. Seppelt, A. J.A. van Teeffelen, W. Verhagen, M. Volk (under review): Blind spots in ecosystem services research and implementation, submitted to *Ecological Indicators*

Box 2. Contributions of Exemplars to fill existing research gaps

How do the exemplars meet recent research gaps?

The inputs to the Exemplar reporting through the Blueprint Protocol have been analysed and then – where appropriate – compared to the results of Milestone 2.3 on research gaps. Inputs from 10 of the 12 Exemplars were available at the time of analysis.

- Each exemplar investigates a multitude of ES, which are relatively well distributed between provisioning, regulating and also cultural ES. Only some very rarely investigated ES are not addressed in the exemplars, such Ornamental Species and Genetic Resources.
- Policy instruments are investigated by 50% of the Exemplars. This is four times the proportion derived from earlier studies through the systematic review (13%).
- The same tools, instruments and methods (TESSA, Our Ecosystem, EIA-ToSIA) are used in several Exemplars, which allows testing them for strength and weaknesses in several case study contexts.
- Trade-offs and synergies between Ecosystem Services are investigated in 60% of the Exemplars.
- All Exemplars integrate stakeholders, compared to 38% in earlier studies investigated in the systematic review.
- Scenario analysis to investigate alternative management options is conducted in 70% of the Exemplars, compared to 31 % in the systematic review.
- Uncertainties are intended to be quantified in 60 % of the Exemplars, with 10% planning to indicate them at least qualitatively. These rates compare to 30% for quantitative and 20% for qualitative documentation of uncertainty in the systematic review.

The upcoming Milestone 2.14 (January 2016) will focus on stakeholder engagement in the Exemplars. Exemplar Task Lead Heather Schoonover (Lund University) has conducted interviews with each Exemplar lead, and is drafting a manuscript on successes and challenges in stakeholder engagement in ecosystem services research and practice, in collaboration with exemplar partners.

Subtask 2.2.3. Iterative learning processes between end-users, stakeholders, researchers and developers of tools and instruments. This subtask is currently underway. It will culminate in the Final Exemplars conference (Milestone 2.19), planned for January 2017. We have recently discussed the possibility to move this conference earlier and integrate it with the Ecosystem Services Partnership conference scheduled for September 2016, in order to take advantage of opportunities for cross-pollination with partners beyond OPERAs. This is providing an opportunity for reflection among the Exemplars to build on for the remainder of the project.

Further, Work Package Leads are discussing collaborative opportunities to continue to link across the focus on practice and tools/instruments, including in a paper being led by Claire Brown

(WCMC) on the overall project design of OPERAs, and in Exemplar working groups, such as the Aquatic cluster, which is currently working on a manuscript on meeting stakeholder demand for ecosystem services in freshwater, coastal, and marine systems.

The UserBoard is also an important learning opportunity between researchers, tool developers, and stakeholders. Mapping tools, policy analyses, and stakeholder engagement processes have been presented at these meetings and received valuable feedback.

Subtask 2.2.4. Final reporting and critical evaluation of the process as a contribution to the Resource Hub. The work of the Exemplars will be well prepared for final reporting (Deliverable 2.3, due February 2017) thanks to following the reporting with the Blueprint Protocol and now with Oppla, so the information needed is being collected through the Exemplar research underway.

Figure 3. Summary of tasks, milestones, and deliverables for Task 2.2, Exemplars. The partners engaged in these tasks includes Lund University (Task Leads Kimberly Nicholas and Heather Schoonover) along with UP, UEDIN, VU-IVN, KIT, UCD, CNRS, ETH, WWF Bulgaria, WWF, Romania, SGM, FFCUL, CIFOR, and CSIC. Completed tasks are shown in green, with tasks in progress in yellow.

Task number	Task description	Milestone/ Deliverable	Due Date & Status
Subtask 2.2.1	Launch of OPERAS cooperation, identifi- cation of stakeholder needs for different tools and instruments in each exemplar and optimisation of study design	MS 2.6: Draft description of exemplars study design, stake-holder needs and tested tools/instruments	Nov 2013 - COMPLETED
		D2.1: Description of Study Design: exemplars, SH needs, tools, instruments	Feb 2014 - COMPLETED
Subtask 2.2.2	Regular reporting and evaluation of the process of tool and instrument testing	MS 2.11: Exemplars Interim report	Jun 2015 - COMPLETED
		MS 2.14: Evaluation of processes in each exemplar with potential adaptation to the work plan	Jan 2016 – in progress, current draft manuscript on stake-holder engagement based on Exemplar leads interviews.
Subtask 2.2.3	Iterative learning processes between end-users, stakeholders, researchers and developers of tools and instruments.	MS 2.19: Final Operas Exemplar Conference	Jan 2017- Early planning has begun. Discussing whether to combine with September 2016 European Ecosystem Services conference.
Subtask 2.2.4	Final reporting and critical evaluation of the process as a contribution to the Resource Hub	D2.3: Compilation of reporting of all exemplars for further evaluation and synthesis	Feb 2017 – Currently coordinating with Oppla leaders to align Exemplar work with their needs.

Task 2.3 – Practice design and synthesis

Subtask 2.3.1. Elaboration of the Blueprint Protocol (UEDIN, UFZ, ALU, UBO, VU-IVN, UP, ULUND) The first version of the blueprint report has been completed and uploaded to our owncloud in 2014 (including spreadsheet data and various presentations of the BP findings). Feedback on the blueprint V1 from OPERAs members was compiled and analysed[5] to inform further development. This helped towards the design of the second version of the OPERA's Blueprint Protocol (BP), which has been live since May 2015. The results from the exemplars are now available as internal report (Milestone 2.9). The BP was designed to elicit responses from the exemplar teams on key aspects including study purpose and design, stakeholder involvement, OPERAs member involvement, tool uptake, ecosystem services assessed, geographical elements, policy and regulatory aspects, foresight, analysis and monitoring. In V2, the data were gathered via Google's online forms.

The results from the exemplars show that the most popular reasons for the exemplar study purpose included 'helping raise public awareness of the roles and importance of nature for society' (8 exemplars), 'identify how ecosystem services can help enhance and develop sectoral policies' (9), 'understanding global/regional/local policy directions and pressures on ecosystem services (9), 'Assess alternative futures of ecosystem service provision' (9) and to 'develop methods for calculating ES based on model' (8). The majority of study designs are based on valuation approaches (8) or a 'Before-After-Control-Impact impact assessment' (8). Most exemplars (9) engage stakeholders for participation (for example data collection) and they were 'discovered' through focus groups (9) and contacted personally (10). Provisioning ecosystem services varied considerably across the exemplars but 'ground water for non-drinking purposes' (9), and biomass from plant-based (9) and animal-based resources (9) were the most popular. Several regulating ES stood out in the BP: mediation of wastes through 'micro-organisms, algae, plants, and animals' (7) and 'mediation of smell/noise/visual impacts' (7) maintaining nursery populations and habitats (6) for natural lifecycle, disease control (7) and 'global climate regulation by reduction of greenhouse gas concentrations' (7). For cultural ES, the response was varied with most exemplars studying physical and intellectual interactions with biota, ecosystems, and land-/seascapes (with 'heritage (9) and aesthetic (9) the most popular). The size of the exemplars study areas varies from under 1km2 to over 100,000 km2; the land cover types include all the main classifications with arable, pastures, forests, wetlands and water bodies the most popular. The most common land use transition in the exemplars is abandonment with conversion to agriculture from semi-natural habitat also well represented. EU policy frameworks are well represented throughout the exemplars with most biodiversity frameworks impacting on the all the exemplars; similarly, and not surprisingly, the CAP is also the most widely found in seven exemplars; for water policy, the Water

[5] LaRocca, L. 2014. Do we speak the same language? Evaluating a blueprint protocol and its use in the application of ecosystem services. MSc Dissertation, The University of Edinburgh

Framework Directive is an important policy in five exemplars. The knowledge, tools and instruments used in the exemplars fairly well represent those available to them in the OPERAs project although monetary and social valuation methods and TESSA are the most popular (6 each). Several exemplars have already begun to think about the monitoring aspects of their study although for most it is too early to provide concrete approaches; monitoring indicators were perhaps best explored by the exemplars but some also have planned the design of their monitoring system.

The report on the last Blue Print (3.0) protocol is due for Sept 2016 and will include indicators or KPIs of 'operationalisation' success.

Subtask 2.3.2. Synthesis of Lessons Learned (UEDIN, UFZ, ALU, UBO, VU-IVN, UP, ULUND, WCMC). A lessons-learned typology (derived from articles selected as part of the Meta-analysis database) was created to help towards the synthesis of lessons learned[6]. This analysis also links lessons learned to contextual factors, from which a conceptual framework for synthesis of lessons learned was created.

Lessons learned derived from the exemplars' empirical work are now being compiled through the use of questionnaires. Preliminary results and analyses should emerge in Spring 2016, and lead to Deliverable 2.4: Targeted Synthesis: Lessons Learned from Meta Analysis and Exemplars, due in April 2017.

Subtask 2.3.3. Design of a suite of decision trees (UEDIN, UFZ, ALU, UBO, VU-IVN, UP, ULUND, WCMC) Decision trees or decision guidance? The terminology for this objective has changed following the results of a stakeholder survey. This survey elicited views on guidance (incl. what is needed, what format is preferred by stakeholders etc.). This objective is now referred to as *design of decision guidance*.

Optimal tool for guidance provision:

An inter-comparison study of decision guidance tools available was conducted[7], and the tools were scored based on a suite of selection criteria. These criteria were defined by the needs of stakeholders and the literature. Out of 6 dominant decision support tools, Multi-criteria analyses and Bayesian Belief networks scored highest.

[6] Oelze, J. 2015. Guidance on Ecosystem Service Implementation - An initial empirically grounded conceptual framework for lessons learned and associated contextual factors. MSc Dissertation, The University of Edinburgh

[7] Keller Fin, S. 2015. The OPERAs Ecosystem Services Guidance Tool - An Exploratory Study of How Best to Provide Guidance to Practitioners and Policy-Makers. MSc Dissertation, The University of Edinburgh

Creating synergy between OpenNESS and OPERAs

A working group was formed to synchronise and take forward work on guidance tools/decision trees within OpenNESS and OPERAs and to discuss how this work can be integrated in to Oppla. Members of this group cover all WPs involved in the design of guidance tools/decision trees and ensure that the information/decisions made in this group trickle down to the relevant teams.

Building guidance

A guidance matrix is currently being constructed, which lists potential questions/filters (or nodes in the BBN) leading to the selection of a given tool or instrument. This matrix will serve as backbone for designing the structure of the guidance tool. The matrix entails all the tools and instruments evaluated and designed as part of the OPERAs and OpenNESS projects. Across the top rows is a list of 42 questions which helps understand the context within which these are selected/applied. The matrix is currently under review by the decision guidance working group.

The remaining activities for this objective are as follow:

8 January 2016: Draft design of (or set of proposals on) how the guidance tools/decision trees fit within Oppla to input to the Scoping document deliverable. This will form an input to the Oppla Strategy Working Group meeting on 14-15 January 2016.

June 2016: Working version of the suite of guidance tools/decision trees for implementation by the Oppla technical team into the prototype due in September 2016.

December 2016: Final deadline for all guidance tools/decision trees to be fully operational, tested and implemented within Oppla.

April 2017: Submission of Deliverable 2.5: Suite of decision trees to assist users to decide on ES/NC based on instruments and tools.

2.2.3 Deviations

Task 2.1 – Meta Analysis

No deviations to report

Task 2.2 – Exemplars

No deviations to report.

Task 2.3 – Synthesis

It is worth noting that most milestones have been shifted by 12months to reflect the task lead's maternity leave in 2013. This does not affect the timeline for deliverables. The task lead is going on maternity leave from January 2016.

2.2.4 Use of Resources

See Table – Work Package Person Months per Partner

2.3 WP3: Knowledge

2.3.1 Task Objectives

Task 3.1 – Ecosystem function and quantification

1. Provide operational means to link ecosystem function, biodiversity and ES provision (T. 3.1.1).
2. Apply process-based modelling frameworks to derive metrics usable in the operational ES/NC domain (T 3.1.2)
3. Explore the temporal and spatial dimensions of the ES/NC concept (T 3.1.3).
4. Evaluate methods and metrics to assess uncertainty in EC/NC quantification (T 3.1.4).

Task 3.2 – Social and cultural values

1. To develop new methods to measure social and cultural values attached to ES especially in cases where existing economic valuation methods are less effective. To demonstrate the relationship with economic and individual values/motivations.
2. To integrate values with ES function quantification and economic valuation to support the development of new instruments.

Task 3.3 – Market and non-market valuation

1. Provide a review of the state-of-the-art of environmental valuation techniques (Sub task 3.3.1);
2. Expand existing and/or creating new meta-analysis databases with socio-economic and biophysical data, and testing and validating the improved environmental value functions in several of the exemplars (Sub task 3.3.2);
3. Provide a critical review of existing accounting techniques and ways to integrate economic ES values in accounting frameworks (Sub task 3.3.3);
4. Use ES value estimates in cost-benefit analyses or other instruments (preferably in exemplars) and assessing the potential effectiveness and efficiency of mixing different policy instruments (Sub task 3.3.4).

Task 3.4 – Institutional structures and governance systems

1. Provide a theoretically informed typology of governance modes of ES/NC based on the nature of the services (subtask 3.4.1);
2. Make a more detailed investigation of the role of property rights in relation to selected ES/NC in the context of the exemplars (subtask 3.4.2);
3. Study existing and potential policy integration examples in EU (subtask 3.4.3); and

4. Analyze cross-scale and cross-jurisdiction aspects of selected ES/NC governance (subtask 3.4.4).

Task 3.5 – Trade-offs and synergies in ES/NC and alternative valuation perspectives

1. Coordination of knowledge transfer across WP3 and to/from WP2 and WP4 (Task 3.5.1).
2. Assess and enhance the operational potential of methods for assessing trade-offs and synergies in ES/NC quantification (T3.5.2).
3. Develop novel assessment methods that integrate various ES valuation methods (T3.5.3)
4. Analyze patterns of synergies/trade-offs across exemplars (T3.5.4)

2.3.2 Progress towards objectives

During this reporting period WP3 has been making considerable progress in terms of scientific advances (see task descriptions and publications), but also in terms of work towards the operationalization of these findings. In this regard, WP3 has collated a substantial list of joint and individual provisions for the OPPLA resource hub. Information on content, type and format was input to the process of setting up the OPPLA user guidance and the evaluation of overlaps with contributions from the OpenNESS consortium.

Besides efforts on the individual tasks/topics, WP3 has concentrated on the integration of its work in T3.5, for example through a dedicated WP meeting in Edinburgh in Dec 2014, where also the ongoing work in Scotland was presented to approximately 100 stakeholders from policy and practice. Follow up meetings were held in Dublin and Aix-en-Provence during the General Assembly meetings of OPERAs, to ensure the delivery of no less than four deliverables during this reporting period:

- D3.2 Monetary and social valuation: state-of-the-art (led by VU-IVM)
- D3.3 Report on existing and potential governance modes for various ES/NC
- Towards a framework for assessing current level of and future opportunities for ES/NC integration at different levels of governance (led by IEEP)
- D3.4 Recommendations for integration of ES/NC in existing accounting and reporting formats (led by IEEP)
- D3.5 Strategies and methods for social valuation of ES/NC (led by UCD)

Given the progress made during this reporting period, WP3 appears well-geared for the upcoming tasks in the next reporting period.

Task 3.1 – Ecosystem function and quantification

During the 2nd reporting period, the research efforts within T 3.1 have focussed on the coordinated implementation of joint and individual ES research applications. Here, the OPERAs exemplars were important ground for testing and implementation.

In subtask 3.1.1 the concept of plant functional traits was applied to refine models of ES provision across landscapes. Work has been done on mainstreaming ES and biodiversity approaches into regional land planning and management in the French Alps Exemplar. A plant growth phenology-based model was developed for crop production; this model enables taking inter-annual variability of crop rotations into account by using MODIS imagery (Lasseur et al. in review). The Recreation Opportunity Model was enhanced by incorporating landscape diversity and community-based GPS tracks; the resulting model was validated by a web survey (Byczek et al. in review). Also with regard to temporal dynamics, frameworks were established towards the assessment of ES resilience based on plant functional traits and landscape diversity (Kohler et al. submitted; Lavorel et al. in prep.), and for the identification of climate adaptation services (i.e. the benefits that ecosystems and their biodiversity provide for social adaptation to climate change – Lavorel et al. 2015, Colloff et al. 2016) and their integration into climate adaptation pathways (Colloff et al. in preparation).

For marine ES, the role of coastal marine vegetation, i.e. seagrass, salt marshes and mangrove forests, for global climate change adaptation is being assessed though an extensive compilation of available published data. Similarly, data on nutrient stocks and burial in coastal marine vegetated habitats are being compiled globally to quantify the importance and value of these ecosystems as nutrient coastal filters. The importance of seagrass restoration programmes as catalysers of ecosystem structure and function recovery was evaluated (Marbà et al., 2015; van Katwijk et al., *in press*). In the context of the Balearic Exemplar, the relationship between changes in human pressure/activity (constraining seagrass stability and/or coastal eutrophication), and seagrass carbon sequestration for the last century has been examined (Mazarrasa et al., submitted a, b). Similarly, erosion of historical carbon deposits, and subsequent increased risk of carbon atmospheric emissions, after seagrass loss has been documented (Marbà et al., 2015).

In subtasks 3.1.2 and T 3.1.3 process-based modelling frameworks were used to quantify ecosystem responses to changes in the environment. ES supply and improved ES metrics were quantified on the global scale (linked with the OPERAs Global Exemplar) and the regional scale (linked to OPERAs Scottish and Mediterranean Exemplars). The agro-ecosystem model LPJmL was used in order to assess the provisioning of ES from Mediterranean agro-ecosystems. Work (conducted, in part, also for other projects) has focused on model improvement to, i) include the representation of perennial crops which are an important component of Mediterranean landscapes and contribute to the delivery also of cultural services, ii) represent the impact of changing agricultural management through soil conservation farming practices. On the basis of these

changes, the model was used to test the impact of different farming practices on the delivery of ES and other indicators of economic conditions in the Mediterranean. Currently, by simulating cereal production, soil carbon sequestration, and irrigation water consumption (Fig. 1a), we can illustrate the trade-offs between these three ES or indicators of economic conditions (also T 3.1.3). As an example, Fig.1b shows the nature of results that can be quantified at different spatial scales and under different climate scenarios in order to determine the most sustainable (or the least vulnerable) system under specific conditions (e.g. water use restriction). This work is still under development and has not yet been published.

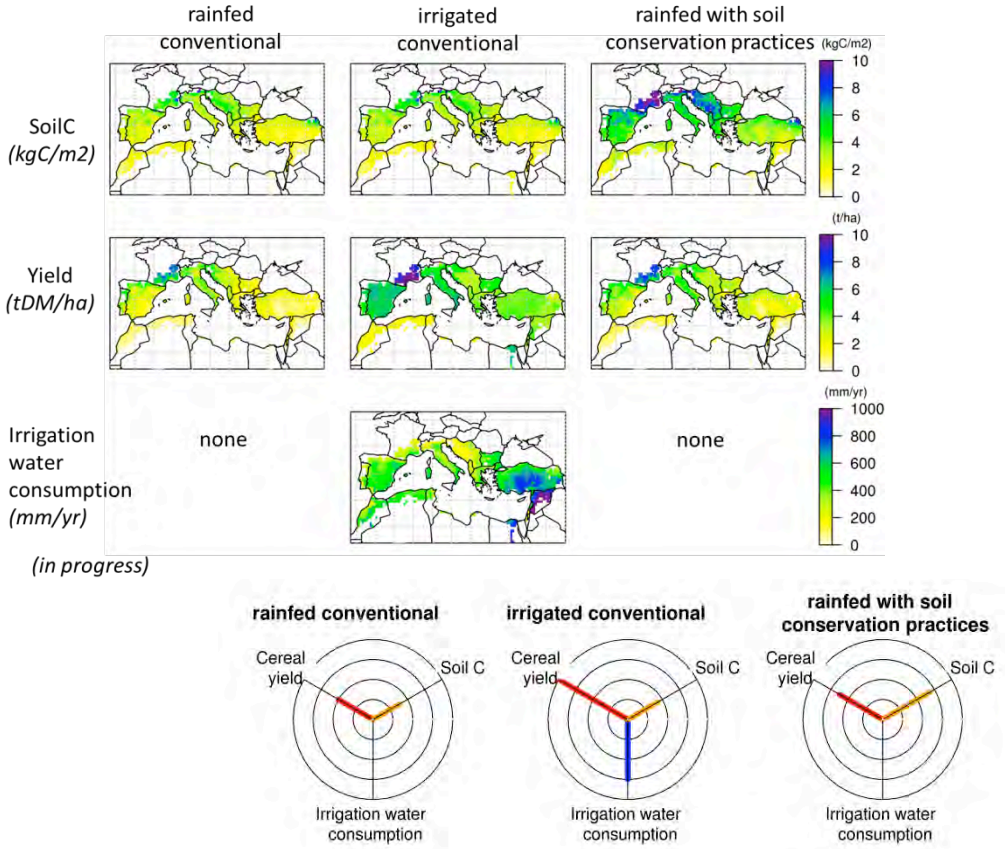

Fig. 3. LPJmL simulations of soil carbon, cereal yields, and irrigation water consumption (a) and basin-scale normalized trade-offs between these three ES for different agricultural managements (present time).

A global study on an ES metric that accounts for the full implications of biogeochemical carbon sequestration and forms a basis for monetary valuation, the Greenhouse Gas Value (GHGV) was finalized (Bayer et al., 2015). The contribution of CO_2 to GHGV was, for the first time, quantified in its spatio-temporal variability depending on three environmental drivers (see Fig. 2, also T 3.1.3). The work's outcomes were translated into an online application (see https://operas-ghgv.ourecosystem.com) to allow for easy access of the information also as part of the resource platform OPPLA. This application was presented at the OPERAs User Board Workshop in November 2015, feedback was acquired and the application was adjusted accordingly.

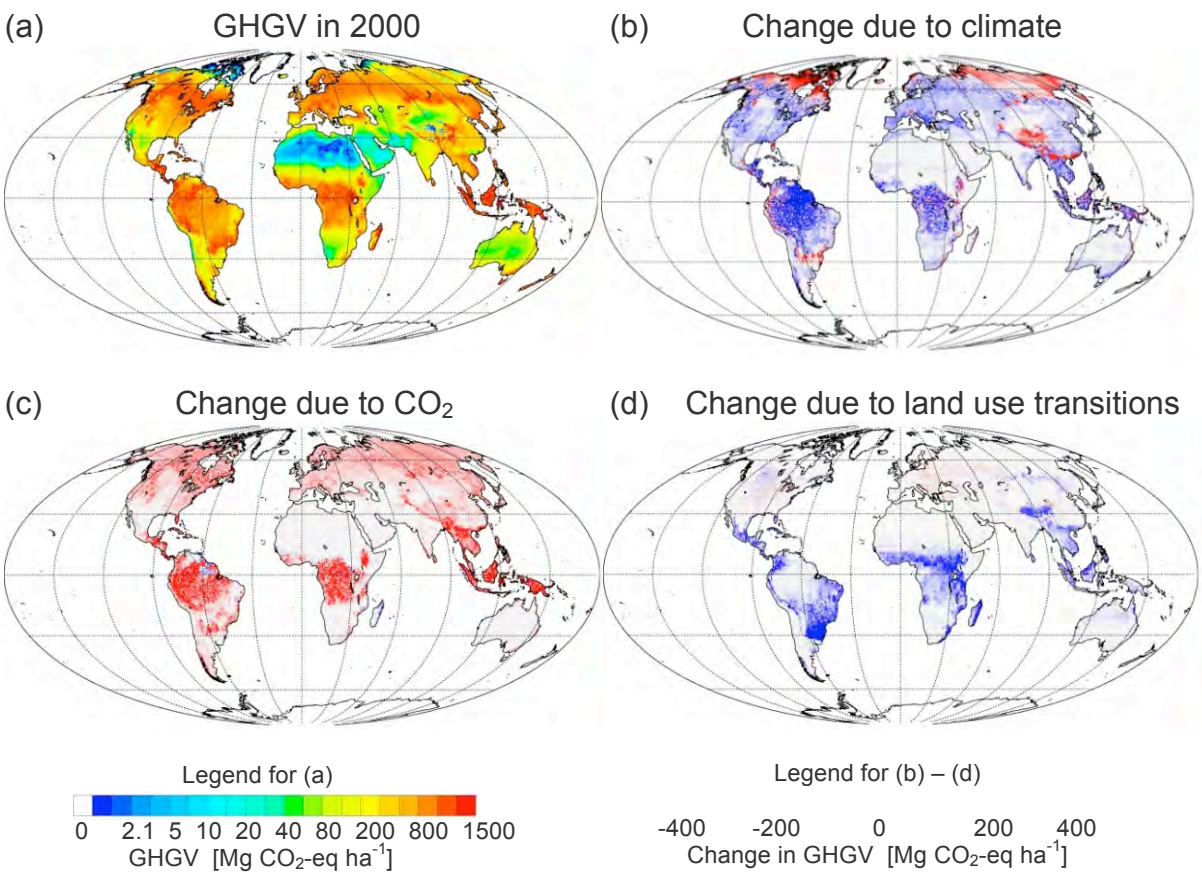

Fig. 4. The Greenhouse Gas Value (Anderson-Teixeira and DeLucia, 2011) is an example for an ES metric that accounts for the full biogeochemical implications of carbon sequestration. The value quantifies the benefit in terms of greenhouse gases of preserving an ecosystem over a multi-year time frame by accounting for the greenhouse gases stored in an ecosystem, sequestered on an annual basis and the probability of the ecosystem to be destroyed by e.g. fire or insects. Here, the contribution of CO_2 to Greenhouse Gas Value was quantified with the LPJ-GUESS ecosystem model for year 2000 [Mg CO_2-eq ha^{-1}] (a) and the change in GHGV for future periods (2000-2100) was attributed to the environmental drivers climate (b), atmospheric CO_2 mixing ratio (c), and land use (d) (figures from Bayer et al., 2015).

Selected ES (carbon sequestration, water supply and food provisioning) were quantified with the LPJ-GUESS model for current climatic conditions and trade-offs between them were explored for different global land use patterns. An optimization study is being conducted (see also task T 3.5). In terms of ES quantification, further indicators were developed for Pollination and Wild food in Europe (Schulp et al., 2014a, 2014b) and spatial and temporal dynamics of regulating services were assessed for Europe, in the context of past and future land use change (Stürck et al., 2015; T3.1.3 and T3.5.4).

In cross-over of subtasks 3.1.3, T 3.1.4 and T 3.5.4, the database SynES (Database for Synthesis of information on Ecosystem Services) was developed, summarizing for recent case studies data on the methodological approaches used as well as information on the practical implementation. Indicators for uncertainty and efficiency are included. Pairwise relationships between ecosystem

services (synergy, trade-off, no-effect, mixed results) across scales and across land system archetypes were analyzed in a quantitative review.

In regard to subtask 3.1.4 and going along with the SynES database, an evidence assessment tool to identify the reliability of ES case studies was developed (Mupepele et al., 2015).). Further work on uncertainty in ES/NC quantification was conducted for Europe (Schulp et al., 2014c) and for Scotland (Verhagen et al, in review), who quantified the importance of landscape configuration and heterogeneity in ES provision for five services.

Task 3.2 – Social and cultural values

The principal objective was to complete Deliverable D3.5 on Strategies and Methods for Social Valuation, which is due in Month 36. Input is being provided by several researchers from University College Dublin, VU University Amsterdam and the University of Potsdam. It is our intention to demonstrate a range of methods available for socio-cultural valuation and to explore innovative approaches for future socio-cultural valuation and potential integration with economic valuation methods and governance. Work is on-going in this respect, and the deliverable will be supplemented over time by further results.

Milestone 3.4 involved preparation of a discussion paper on definitions for social cultural valuation. This was completed and circulated early in 2014 and added to the OPERAs intranet for reference particularly by the research teams working on the exemplars.

Milestone 3.10 involved a coordinated plan for the application of social valuation methods in selected exemplars. To this end a questionnaire was distributed to all exemplars in 2013 which included questions about the issues at hand in each exemplar, the nature of the stakeholders, the proposed approach, etc. In response to the questionnaire, guidance was forwarded to each of the exemplars on how they may wish to pursue either socio-cultural valuation or stakeholder participation. The latter is being followed in most of the exemplars, but with specific socio-cultural valuation being undertaken in Scotland (Firth of Forth, Pentlands, and East Lothian), the Danube, and to lesser extents in the French Alps, Montado and the Balearics.

A further Milestone, MS3.21, will be a paper on the application of novel social valuation methods being due in November 2017.

Four researchers are contributing directly on this work task with input from colleagues in their respective institutions. In addition, input is being provided by researchers on governance methods.

University College Dublin (UCD) has led the delivery of the above deliverable and milestones and has pursued the engagement with exemplars. UCD also has specific responsibility for the Fingal (Dublin) coastal exemplar which is directed at uncovering the socio-cultural values associated with the coastline in this county through the use of a series of workshops with local community stakeholders. Continuing input and advice is being provided to the Firth of Forth and Balearics exemplars. UCD has a particular interest in the development of integrated socio-cultural

and economic valuation methods and the application of such methods to advance environmental management and spatial planning.

Researchers from UCD contributed to a meeting on social valuation (development of TESSA model) organised by WCMC in Cambridge in June 2014. They have also represented OPERAs and presented to OpenNESS consortium meetings (i.e. Budapest 2014) and have represented OPERAs and OPPLA in special conference sessions detailed below. Representatives from OPERAs are also contributing to the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), specifically contributing to the drafting of the report on diverse conceptualisation of values including through attendance at the meetings in Bonn (July 2014) and Budapest (June 2015). In addition, we are contributing socio-cultural and ecosystem services expertise to the EU COST action ToBeWell.

In connection to this specific work task, UCD is also contributing to the research and deliverables in economic valuation and ecosystem service accounting (T 3.3).

VU University Amsterdam (VU) has written a review paper (Scholte et al. 2015a) that presented a theoretical framework and methodological guidelines for studying socio-cultural values for ecosystem services. In addition, we have conducted two case studies to better understand socio-cultural values for ES in the context of ecological restoration. Our first case study was in collaboration with WWF and focused on wetland restoration in Bulgaria (Scholte et al. 2015b). We interviewed local farmers, fishermen and residents to see how their use and knowledge of wetland ecosystems influenced the importance they assigned to wetland ecosystem services. Our second case study took place in East Lothian, Scotland, and focused on the potential of woodland restoration to compensate for the loss of ecosystem goods and services due to urban development in the rural countryside. We investigated whether, in a rapidly urbanizing area, local residents were willing to allow higher levels of residential development in return for environmental compensation.

University of Potsdam (UP) has been exploring alternative socio-cultural valuation methods. UP conducted an on-site and online visitor survey in the Scottish exemplar in June/July 2014, testing non-monetary rating and weighting values of ecosystem services and the landscape preferences of visitors as applied to a Regional Park in the vicinity of Edinburgh. Results present differences in explanatory value of the three techniques, suggesting the inclusion of trade-offs in future socio-cultural valuation exercises. The results were presented at the OPERAs Full Project Meeting in Dublin (March 2015) and the Mountains of Our Future Earth Conference in Perth (October 2015). UP further started organisation of a workshop with stakeholders from the Regional Park, which aims to assess socio-cultural values of ecosystem services using a deliberative approach (planned for 2016).

Task 3.3 – Market and non-market valuation of ES/NC

Research efforts within T3.3 were focused on research for and finalising deliverables 3.2 and D3.4. First, deliverable D3.2 (task 3.3.1) contains research results by all partners involved in T3.3. In summary, it provides an overview of economic valuation methods (Ch2), an overview of socio-cultural valuation methods (Ch3), novel methods of and insights into ES values and ES valuation (Ch4), an overview and application of an integrated assessment model (Ch5), and developments in natural capital accounting (Ch6). Second, deliverable 3.4 (task 3.3.3) will be finalised shortly, and will contain chapters on national accounting and the integration of natural capital and ecosystem services (Ch1), the use of biophysical indicators to integrate natural capital and ecosystem services (Ch2), the use of monetary valuation for natural capital and ecosystem service accounting (Ch3), which social values can be reflected in natural capital and ecosystem service accounting (Ch4), and the policy benefits of ecosystem service and natural capital accounting (Ch5).

Other substantive research efforts within this task were:

(1) Work on hypothetical bias in economic value estimates (task 3.3.1). This study argues and shows that value estimates obtained from choice experiments suffer from hypothetical bias, caused by part of the respondents ignoring the payment vehicle in making their choices. Moreover, it shows that the effects are larger for compensations than for payments, i.e., are larger for WTA than for WTP value estimates. When controlling for this using attribute non-attendance models, ES value estimates decrease substantially, and are a better reflection of true values (see also D3.2).

(2) The meta-analysis database (task 3.3.2) was finalised, and contains several hundred observations on forest values from studies around the globe. Work was furthermore done on adding spatially explicit information to each observation in the database. Specifically, we collected information on income, population density, size of the forest area, supply of other forests (measure for scarcity), distance of the population to the forest area, and forest fragmentation by infrastructure. Work on this is still in progress, and we expect first results in the first quarter of 2016 (see also milestones 3.3 and 3.17).

(3) The work on national accounting and the integration of natural capital and ecosystem services (task 3.3.3) has been exploring how the tools can integrate natural capital in biophysical terms (as stocks, changes in stocks and ecosystem service flows) and in monetary terms and where accounts offer potential for policy utility. This latter question looked at a range of policy areas (e.g. climate change, water, agriculture, biodiversity) as well as across steps in the policy cycle (from problem identification to policy tool selection, implementation, and review) and whether accounts (and which type of accounts – see Figure 3) are now fit for purpose, or could expected to be in the future if further developed. The work looks not only at the opportunities, but also at the risks of using the tool, so as to provide balance guidance to operationalise natural capital in accounting. It builds on a literature review, focused questionnaire to countries developing accounts, discussions at expert meetings and workshops and individual interviews with experts and policy makers. This last step is ongoing at the time of reporting.

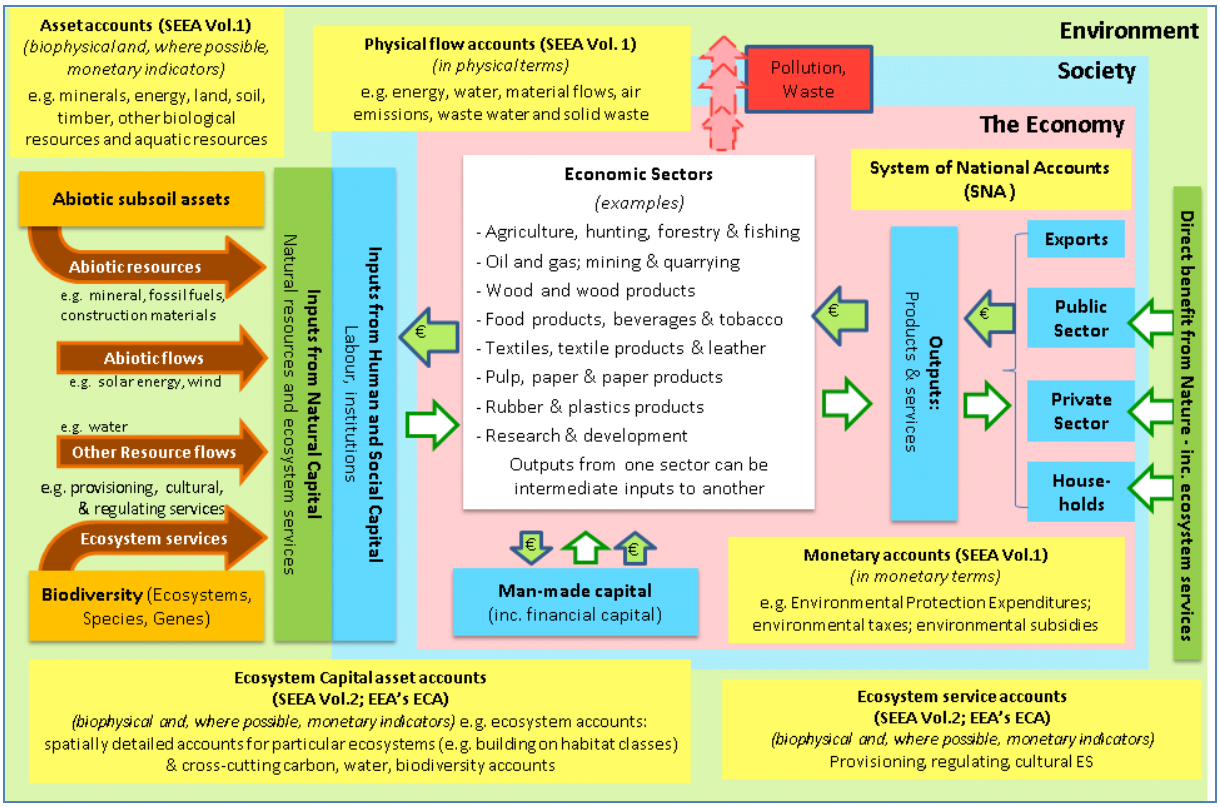

Figure 5. Source: own representation, Patrick ten Brink and Daniela Russi

(4) Cooperation between WP1, WP 3.2 and WP3.3 on designing and performing an extensive economic and socio-cultural valuation study in the Inner Forth area in Scotland (task 3.3.4). From October to December 2015 data will be collected using a regular choice experiment format, and using a workshop format, in which additional information will be provided and deliberation between participants is possible. By performing the choice experiment before and after information and deliberation, the study will provide insight into the complementarity of socio-cultural and economic valuation methods (see also milestone 3.9).

(5) Cooperation between WP2 and WP3.3 on designing and performing an extensive economic valuation study on values of the Montado Exemplar in Portugal (task 3.3.4). A contingent valuation study at the local scale aims to reveal use values for the various ecosystem services provided by the Montado, and for different stakeholders. A contingent valuation study at the national scale aims to provide insight into the cultural heritage (non-use) value of the Montado. Data collection is ongoing and first results are expected in the first half of 2016 (see also milestone 3.9).

Finally, work on various milestones has been done. Milestone 3.3 was finalised and provides the research design for incorporating spatial heterogeneity in meta-analysis and value transfer functions. Milestone 3.9 provides on coordinated plan for applying economic valuation in selected exemplars. Milestone 3.11 provides an update of milestone 3.9, based on meetings between WP3.3 and the selected Exemplars.

Task 3.4 – Institutional structures and governance systems

Deliverable 3.3 on ES/NC integration at different levels of governance was finalized in 2014, This Deliverable was developed in close cooperation with WP4 Deliverable 4.1 and it explored and discussed the development of a common framework for assessing the current level of and future opportunities for the integration of ecosystem services and natural capital at different levels of governance. It concluded that integration of ecosystem services and natural capital into different sectoral policies plays a key role in the transition to a truly 'green' green economy. A systematic and comprehensive assessment of the integration of ecosystem services across relevant policy sectors therefore offers a logical starting point for the transition to a green economy. In addition to providing information on the current level of integration, such an assessment can help to identify the needs for policy coherence between sectors and identify 'win-win' opportunities between different policy objectives underpinning green economy. Finally, looking at the foreseen future developments under different sectoral policies, it can also help to identify windows of opportunity and possible bottlenecks for the transition.

Building on the outcomes of the Deliverable, an OPERAs Ecosystem Service Policy Integration (ESPI) assessment framework will be developed in 2016. The aim of this tool is to help to assess the state-of-play in ecosystem service integration across all relevant policy sectors and, based on that, identify concrete opportunities for improved integration. ESPI is foreseen to help the decision-makers to see where ecosystem services related information is needed and where concrete tools (e.g. as developed under OPERAs) are best suited to respond to given policy issues and opportunities.

Parts of the Deliverable are published in ten Brink, P. and Kettunen, M. (2015): 'A policy perspective to ecosystem services' in Potschin, M., Haines-Young, R., Fish, R. and Turner, R.K. (eds) Routledge Handbook of Ecosystem Services. Routledge, London and New York.

Under task 3.4, we have so far completed the following two Milestones:

1) Milestone 3.6 "Set of generic questions sent to selected exemplars regarding salient characteristics of ES/NC and stakeholders". This Milestone was written with the support of ETH. It has been sent out to the Montado Exemplar, the Inner Forth Scotland Exemplar, the French Alps exemplar and the Mallorca Exemplar and we received their answers, which helped us to incorporate the information into the second Milestone.
2) Milestone 3.7 "Assessing ES/NC policy integration for green economy: wireframe for a toolkit for practitioners" Milestone 3.7 was an integral part of the Deliverable 3.3, developed in close cooperation with WP4 Deliverable 4.1. MS3.7 outlined the foreseen wireframe for an operational toolkit for assessing the level of ES/NC integration into policy and governance.
3) The second Milestone, MS 3.25 "Identification of policy integration needs, Cross-jurisdiction issues, PR arrangements" was written with the input from EEP and ETH and distributed among the OPERAs partners in October 2014.

Furthermore, we are currently in the progress of completing Milestone MS 3.35 “First test of the portfolio of ideal types in some exemplars” which we expect to be ready by mid-December 2015. This Milestone is a pre-cursor to the deliverable D3.6 “A portfolio of ideal types of (public and private) governance modes for selected ES/NC” due in November 2016. We are currently in contact with the Inner Forth Scotland Exemplar, the French Alps Exemplar and the Mallorca Exemplar, which will be used as examples in MS 3.35 and further on also in D3.6 as the selected exemplars for testing the ideal types.

In July 2015 we visited the French Alps exemplar for the second time and had a short visit to the study site in Grenoble and surrounding.

Currently, we are planning personal visits and fieldwork for 2016 in two exemplars.

1) The Scotland Exemplar (Inner Forth region, and potentially also the Pentland Hills).
2) The Balearic exemplar.

These visits have to objective to talk to stakeholders (apart from the involved OPERAs partners), conduct interviews with government and civil society representatives in order to collect data to be used in the Deliverable 3.6.

Task 3.5 – Trade-offs and synergies in ES/NC and alternative valuation perspectives

During the 2nd reporting period task 3.5 facilitated the interaction between Tasks 3.1-3.4 and with WP2 and WP4 (T3.5.1; T3.5.3), conducted multiple studies on synergies and trade-offs (T3.5.4) and actively sought advancements in operationalising methods on ES quantification (T3.5.2). To enhance collaboration, a dedicated work package meeting was held in Edinburgh on 2-3 December 2014. This meeting comprised:

1) A 2-day science meeting, where WP3 members presented their work in progress with space for questions and discussion which helped to formulate potential joint work as envisioned under T3.5.
2) A 3h symposium for Scottish stakeholders (organised by UEDIN), where WP3 presented its work in Scotland to approximately 100 stakeholders from policy and practice.

The work in Scotland as a joint case study has been kept high on the agenda (reported in MS3.5), and is resulting in various initiatives at the National scale and in the Firth of Forth, which were discussed for example at the OPERAs meeting in Dublin, March 2015. To date, results are under way to be published from socio-cultural valuation work at the regional scale (Scholte et al. (VU) and Schmidt et al (UP)) and biophysical quantification work at the national scale (Verhagen et al. (VU)). Together with anticipated other work on biophysical quantification, economic valuation and governance (UEDIN, UEA, ULUND, VU, IEEP, KIT), multiple lines of work are expected to provide material for assessment under T3.5. To further enhance collaboration between WP3 and other

exemplars, MS3.8 was completed in Oct 2014 by UP, providing a summary of exemplars needs from WP3.

In addition to the work in Scotland that can feed into T3.5, considerable insight is gained in terms of synergies and trade-offs in ES science. For example, VU-IVM explored trade-offs among ES and regions in the EU in terms of meeting goals of no net loss, in a range of policy scenarios. The authors show what mechanisms in land use change and ES provision shape the effectiveness of no net loss policy options (Fig 6). Moreover VU researchers developed ES models for urban green space, and mapped these onto the city of Rotterdam. This spatial assessment gave insight into the synergies and trade-offs in ES provision as a consequence of the type of urban green space, and gives operational guidance on how cities can be made more resilient, to climate change for example (Derkzen et al., 2015; T3.1 and T3.5). Trade-offs over time are also being explored, for example by Stürck et al., (2015) for Europe, who quantify spatio-temporal dynamics of regulating services as a consequence of past and future land use change.

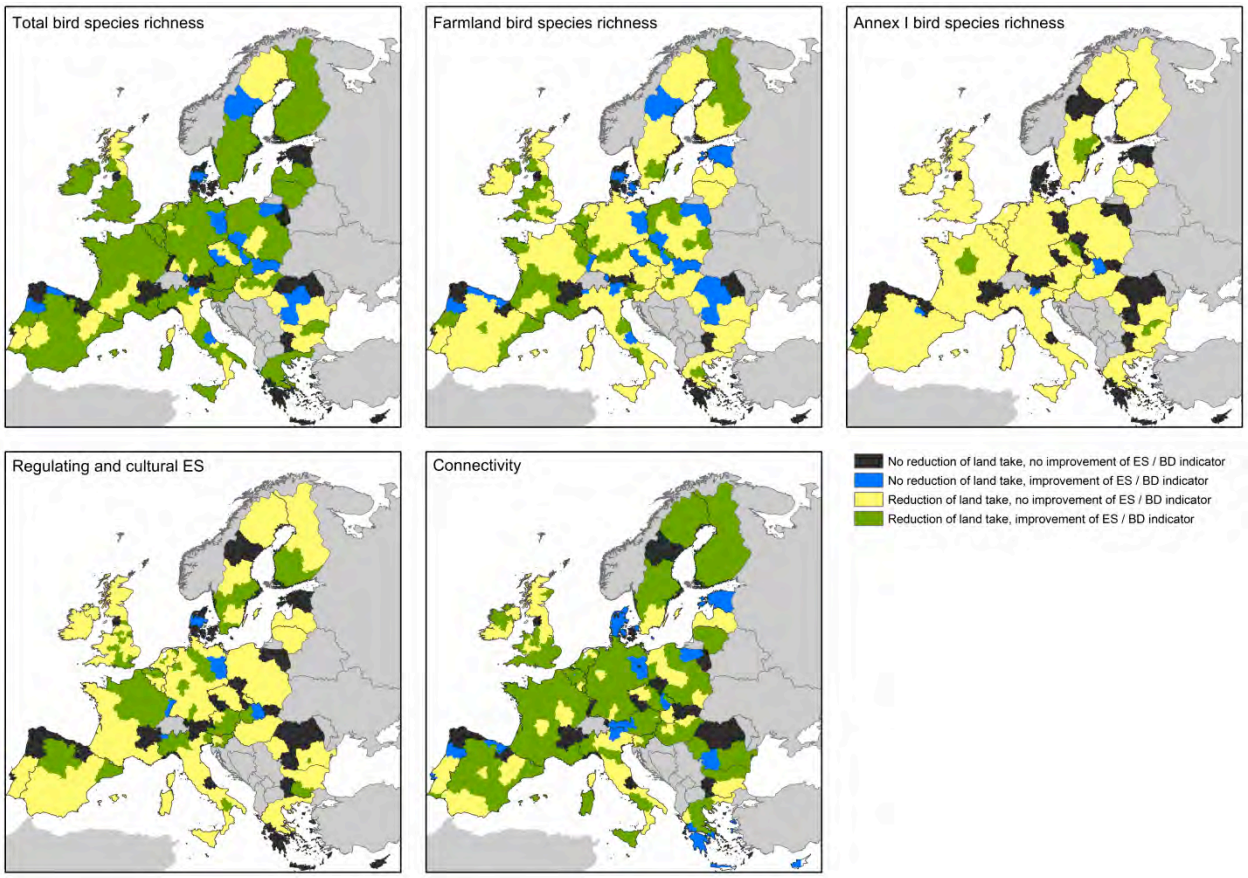

Figure 6: Comparison of land take reduction and improvements of biodiversity (bird species richness, connectivity) and regulating and cultural ecosystem services in the strictest no-net-loss policy

scenario relative to the Business as Usual scenario, calculated per NUTS2 region. Schulp et al (in review for Land Use Policy).

The University of Bonn (UBO) contributed to task 3.5 by reporting on meta-analysis results and by work on trade-offs based on Pareto-optimal land use options. UBO reported the results from meta-analysis at the WP3 meeting in Edinburgh, Dec 2014. Results provided information on: (i) pair wise relationships between ecosystem services (synergy, trade-off, no-effect, mixed results) across scales and across land system archetypes, (ii) the methods used to quantify relationships between ecosystem services, (iii) the frequency with which an ecosystem service has been studied in trade-off/synergy analysis. In addition, results on blind spots in ecosystem service research were reported with respect to biophysical realism, stakeholder involvement, off-site effects and relevance of results (Lautenbach et al. with input from UFZ, ALU, and VU). UBO further worked on the analysis of trade-offs based on Pareto-optimal solutions. In addition to work on trade-offs on water-quality as well as food, water and bioenergy provisioning UBO worked together with KIT on global trade-offs between food and water provisioning as well as carbon sequestration (Fig. 7).

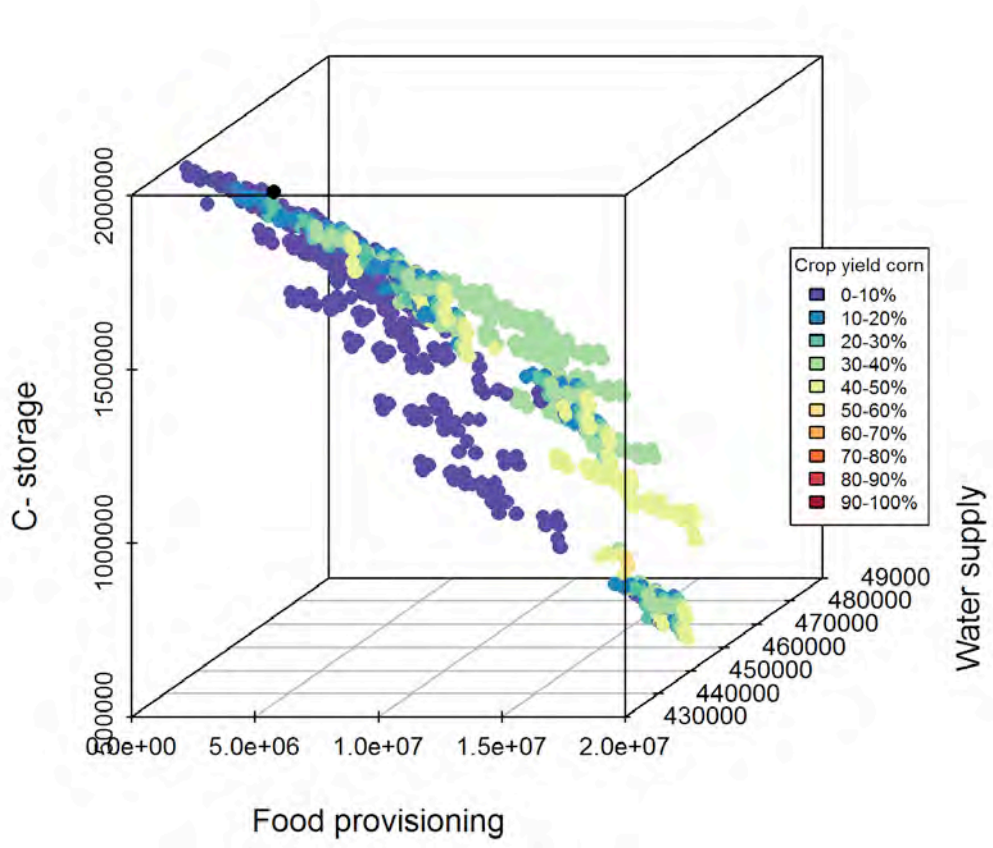

Figure 7. Trade-offs between carbon storage, food and water provisioning at the biome level. Each point represents the results of a LPJ-GUESS model run for a unique global land use allocation. The management options per 1° grid cell were potential natural vegetation, wheat, corn, tropical roots,

soybean and rice. In protected areas only potential natural vegetation was allowed. The points have been coloured by the realized amount of possible global corn yield.

In terms of operationalization of ES methods (T3.5.2), CNRS contributed work, for example in the context of regional planning and land management where they studied the contribution of an ecosystem service network approach in the French Alps (Bierry et al., 2015). Other work includes the enhancement and mainstreaming of ecosystem-based climate adaptation, through the development of concepts and operationalising climate adaptation services, and addressing the values and governance barriers that need to be overcome for their implementation into climate adaptation pathways (Lavorel et al., 2015, Colloff et al., 2016).

Deliverable 3.7 (due November 2016) and associated milestones

During the OPERAs meeting in Aix-en-Provence, Oct 2015, the outline for D3.7 was discussed. Agreements were made for next steps towards the timely delivery of the deliverable, which is entitled: Synthesis, documentation and user guidance for new methods and decision trees. As part of this, Milestones 3.15 and 3.16 are under way, which are a discussion paper reporting on the trade-off analysis performed for at least 3 different exemplars (MS3.15, led by CNRS) and a synthesis framework for documentation and user guidance for new methods and the decision trees (MS3.16, led by KIT). As there is an overarching OPERAs/OpenNESS process under way on OPPLA and decision trees (WP2), WP3 leads are participating in this process (Anita Bayer, Astrid van Teeffelen) to ensure that WP3 is able to efficiently feed its results into the joint-project operationalization process. In this context, WP3 also actively sought, and will continue to seek, feedback from the User Board, through webinars (a first one was held in June 2015), and through the User Board meeting in 2015 and 2014, where WP3 presented findings and methods (2014) and consulted feedback on particular ways of representing WP3 results though OPPLA (2015).

2.3.3 Deviations

Minor deviations were observed, none of them having implications as regards the overall progress of the WP or individual tasks. Deviations included:

Deliverable D3.2 under task T3.3 experienced a delay, although this does not affect progress towards objectives of the WP. The final version was delivered in May 2015 instead of December 2014. Main reason was that the coordinator of this deliverable (Mark Koetse) unexpectedly had to coordinate and finalise other projects due to significant reductions in personnel at VU-IVM.

Deliverable D3.3 under Task 3.4 experienced minor delay that was caused by the main author of the Deliverable (Marianne Kettunen) contributing to and attending a major conference in November 2014. The final version was delivered in 4 February 2015 instead of November 2014. The delay had no implications as regards the overall progress of the WP.

Task 3.4 experiences a deviation in terms of PM allocation. ETH has not been able to dedicate the required PMs to this task and hence contributed only marginally to MS3.6 and MS3.25. The person

in charge of this task at ETH is no longer employed, and replacement within ETH is not available. ULUND is able to take over the tasks of ETH in task 3.4, if the associated PMs are transferred to ULUND. The institutes, together with the project lead, are in the process of re-arranging the tasks and the associated person months from ETH to ULUND. Thanks to this transfer no deviations are expected to the content of the work in T3.4.

2.3.4 Use of resources

See Table– Work Package Person Months per Partner

2.4 WP4: Instruments

2.4.1 Task Objectives

Specific objectives for WP4 during the second reporting period

To analyse the operational potential, needs, and demands for ES/NC concepts in policy development and implementation

- To analyse demands and potentials from both 'top-down' and 'botton-up' perspectives, including in respect to policies for biodiversity conservations, sustainable use of natural resources, and environmental protections
- To identify and assess sector-specific and stakeholder-specific needs for the application and integration of ES/NC into key policy instruments and their implementations
- To identify and assess opportunities for ES/NC integration in key emerging issues, including the green eceonomy and trade sustainability

To develop new and improved information tools that include EX/NC concepts

- To develop novel data capture tools to enhance the ES/NC data pool:
- To improve existing indicator-based information tools and develop new ones with ES/NC utility
- To improve information tools as input to accounting and ratings systems with ES/NC relevance
- To improve ES/NC data and information storage and presentation for improved data and information exchange

To improve and further develop existing decision-support tools that include the ES/NC concept, including multi-criteria decision support tools, various types of Environmental Assessments, social cost-benefit analysis, and scenario and foresight tools

- To secure the inter-oprability of decision-support tools and methods, allowing information transfer between them
- To develop interactive user-interfaces in improved decision support tools, such as collaborative platforms siwht GIS-based 3D visulaisations and smart phone applications
- To define the necessary institutional and policy frameworks to facilitate the embedding of integrated decision-support tools into actual decision-making processes

To develop and apply new and improved implementation management and appraisal tools and instruments to support the implementation nand uptake of ES/NC concepts

- To appraise different approaches to implementation in a range of contexts

- To understand factors in the choice and combination of instruments, and the implications of choices for cost-structures (including transactions costs), implementation impacts, and outcomes

- To propose scheme modifications to reduce implementation costs, enhance cost effectiveness increase transparency, overcome obstacles, avert risks, and improve policy outcomes

To guide the development, choice and application of instruemnts that include ES/NC concepts both within and beyond the OPERAs project

- To coordinate instrument development in T4.2.4 ensuring innovations meet demands specified in T4.1 and that the work is interfaced with T2.1.3

- To synthesise the portential for opernational ES/NC instruments and develop a road map for application of different instgruments and tools

- To elaborate good practice guidelines for choice and application of ES/NC instruments as input to the Resource Hub/Oppla (WP5)

2.4.2 Progress towards objectives

Tasks 4.1 to 4.5 were active during the second 18 months reporting period, with Task 4.1 linking to policy needs and work in WP3, tasks 4.2 to 4.4 being active and applied in WP2 Exemplars, and Task 4.5 working on targeting further development for instruments and tools (D1.2, D1.3, MS42, MS43, MS46), and linking Tasks 4.1 to 4.4 in WP4 decision tree as well as with WP2 (exemplars), WP3 (knowledge), WP5 Oppla and strategic exchange with Userboard and openness project

Task 4.1 Demand for ES/NC instruments (task lead: IEEP)

The analysis carried out under Task 4.1 (Sub-task 4.1.1in particular) has lead to the development of Ecosystem Service Policy Integration (ESPI) assessment framework. The development of the ESPI framework is a joint venture between WP4 and WP3. For further information on ESPI framework, please see WP3 Task 3.4.

In addition, work under Task 4.1 has focused on assessing the demands and needs for ES/NC instruments by key stakeholders. This work has been carried out in cooperation with a range of OPERAs partners including ALU, OBU, Denkstatt, WWF and Biotope and it will be reported in the context of Deliverable D4.2.

The insights provided by this stakeholder oriented work originate from a number stakeholder oriented studies and assessments carried out under OPERAs WP4. These include the following:

- Exemplar: ecosystem service integration into sectoral policies in the Lower Danube Basin

- Exemplar: ecosystem service integration into conservation and landuse planning in the French Alps

- Case study: ecosystem service integration into land use planning and climate change adaptation strategies in Germany
- Case study: integration of ecosystem services in the context of European marine conservation
- Case study: ecosystem service integration into sectoral policies in Scotland

Stakeholder groups addressed by the above exemplars and case studies include: (i) public stakeholders – e.g. city administrators (procurement, planning and investment departments) as well as permitting authorities, inspectorates and law courts; (ii) private - e.g. regional business, such as rating agencies, insurance companies, ethical investment funds and auditors as well as business stakeholder groups (e.g. agriculture, forestry); (iii) academia and other professions – e.g. evaluation communities; and (iv) communities (e.g. fishing communities) and citizens (e.g. via NGOs).

As for Sub-tasks 4.1.3 and 4.1.4, these elements are being carried out as integral part of the work described above. In particular, they will feature as part of the ESPI assessment framework.

Task 4.2 ES/NC information tools (task lead: WCMC)

Sub task 4.2.1 Enhancement and development of innovative data capture tools (UEDIN, EFI, WCMC). This task focuses on under-developed means of capturing information from stakeholders, including the public, on social and cultural values of ES/NC,.. A new module for TESSA (Toolkit for Ecosystem Service Site-based Assessment) on Cultural Ecosystem Services has been developed and are being tested in at least two exemplar (Dublin and Scotland). The whole TESSA toolkit has also been enhanced, to improve its user friendliness. The toolkit has been converted from its original Word format into an interactive PDF, and is being tested by at least two exemplars (Montado and Peru, Global). Another tool that has made progress is the STREAMLINE canvas tool, adapted from the online canvas tool (developed in the VOLANTE project) using crowd-sourcing methods. This tool can now be used in face-to-face interactions to structure and guide semi-structured interviews and deliberative approaches around ecosystem services futures. It is being tested in the Scottish exemplar. ToSIA is another tool that has been enhanced by improving the data feeding and work is ongoing to connect the tool with other tools uch as MCA, LCA, OE and the Scenario tool. ToSIA is being tested in three exemplar (Montado, Wine and Peru, Global). For further information on the tools and their progress please see MS report 54-55.

Sub task 4.2.2 Enhancement of selected indicator-based tools and development of new indicator-based tools (WCMC, Biotope, EFI, ETH, Tiamasg). Collaboration with both users (exemplars and feedback from Userboard II and III) and instrument developers within OPERAS, opportunities for strengthening existing indicator-based tools have been identified and further followed. Development and testing of appropriate indicators and indices (with protocols) for characterizing and quantifying ES/NC on the basis of measured biophysical attributes of ecosystems (the “supply” side) and/or on the basis of socio-economic data on “benefits” that incorporate ES/NC (the “demand” side) is ongoing. UNEP-WCMC developed and published an ES indicator framework and guidance to aid the process of developing ES indicators, EFI and denkstatt work on quantitative and operations ES indicators as well as on an eco-label and certification review to extract suitable ES indicators. This includes the development of spatially explicit indicators to quantify and map ES (within Ecometrica Mapping Tool which istested in several exemplars), drawing on the methods developed in T3.1. Indicators are developed and tested in the context of

European and global policy and strategy instruments, in private sector reporting and assessment frameworks (links to T4.3 and 13) and trialled in T2.2.

Sub task 4.2.3 Enhancement of information tools to support accounting and ratings systems (Denkstatt, WCMC, LUND, ECM). Businesses increasingly require an understanding of their impact on ES/NC, and many aspire to be recognized against common social and environmental standards. Accounting systems such as life-cycle assessment (LCA), together with standards and certification schemes (e.g. for eco-labeling and/or elaborating on existing EPD's (Environmental Product declaration) product category rules (PCR) rules) criteria) both need to reflect ES/NC considerations. The use of practical LCA-based tool, an Eco-label review, and sustainability Impact Assessment (SIA method) will be explored for the assessment of hot-spots and indicators selection to evaluate ES with respect to vineyards management. Further, assessment results will be elaborated with the aim to communicate environmental information (e.g. EPD, etc.) of a consumer oriented product within the wine and Montado exemplar.

This task reviews and refines criteria for a range of standards, certification and ratings schemes, and will explore the potential to further elaborate existing and develop new LCA-based tools to incorporate ES/NC. The use of LCA for EPD criteria setting and its effectiveness as a communication tool will be trialled in the wine industry exemplar (T2.2) with anEcosystem services labels and certificates review with respect to vineyards, this includes:

- Review on LCA advances to account for land-use and land-use change
- Review of existing software solutions
- Review of eco-labels for wine to communicate performance
- Stakeholder consultation (e.g. questionnaire elaboration, meetings)

Sub task 4.2.4 Improve data and information storage and presentation including web-based visualization interfaces (Tiamasg, WCMC, ECM, Biotope, EFI). This task draws together and make accessible data and information for use in decision-making tools that are enhanced and developed in T4.3. Information tools in T4.2 are examined and tested with regard to their usability as DS tools and modes of information transfer will be proposed to avoid common problems such as data and model availability biases for ES/NC assessments. This includes metadata descriptions and user guidance for each tool/instrument including a description of data transfer and translation interfaces, user requirements, development of databases and metadata standards, together with web-based visualization interfaces for data access and review, which will be made available via Oppla (T5.1). Examples of database development will include a database structure for characterizing NC restoration and enhancement in the context of investment in green infrastructure and the no-net-loss initiatives put forward by the European Commission. As one finalised product Link to new Interactive TESSA: http://tessa.tools/ has been created.Task 4.3 ES/NC Decision Support Tools (Task lead ETH)

Task 4.3 ES/NC Decision Support Tools (Task lead ETH)

Sub task 4.3.1 Multicriteria decision analysis (EFI, Biotope, ETH, ALU, OBU). Work in this task has concentrated on integrating and adapting existing approaches. The principal strengths of MCDA in multi-dimensional analyses of sensitivity, trade-offs, and uncertainties to the ES/NC concepts in elaborate tools and testing these tools within heterogeneous decision environments among the Exemplars. The integration of human health, safety, social, economic or health

indicators into the ToSIA framework has begun and progress has been made in linking the tool to LCA perspectives and scenario tools (Subtasks 4.3.3 and 4.3.4). ETH has designed and successfully implemented a novel decision-support tool, BackES, based on a backcasting approach in the Swiss Alps Exemplar to interregional and national policy strategies for matching ES supply and demand as information for decision-makers. A paper describing the workflow and summarizing the results has been published recently. Work in the Exemplar is at different stages: while in the Swiss Exemplar, results from the backcasting analysis were made available to policy-makers and concrete policy strategies have been discussed with regional decision-makers, work in other Exemplars is ongoing (Peru/global Exemplar) or has just started (Cork Exemplar, Wine Exemplar, Danube Exemplar, Barcelona Exemplar).

Sub task 4.3.2 Cost-Benefit Analyses (IODINE, EFI) - Work in this task is still in the setup phase. A first CBA design has been set up for the Balearic Exemplar including valuation evidence by Iodine and work will be intensified in the forthcoming months on producing a CBA of seagrass protection under different scenarios. Application in the Circum-Med Exemplar is in discussion. Furthermore, Iodine has been working with EFI on comparison of CBA and MCDA, exploring the potential of comparing these approaches in the Balearic Exemplar and perhaps in some others. This report has advanced on exploring the relative strengths and weaknesses of CBA, MCA and economic impact assessment methods, with assessment of the conditions under which these decision-support methods can be useful individually or in combination. Assessment focuses on the differences in approaches to key features including assumptions about commensurability and comparability of costs and benefits, treatment of future impacts and discounting, treatment of distributional impacts and treatment of uncertainty and sensitivity analysis. Links are made to valuation methods and accounting tools (WP3). A comparison of CBA and MCA applied in exemplar is being developed by Iodine for the Balearic Islands and circum-Mediterranean exemplars. In the next reporting period the reporting will be extended to cover the use of CBA and MCA across all exemplars using these methods, leading to a scientific paper on the applicability and usefulness of these tools.

Sub task 4.3.3 Environmental assessments (Biotope, ETH, EFI, DENKSTATT)–
Work to integrate ES/NC representation in impact assessment tools (including sustainability assessments, SEA, and EIA) is in progress. Denkstatt has worked on indicator development for operationalizing the ES/NC concept in LCA in the frame of ToSIA. The improved assessment will be tested in the Wine Exemplar to evaluate potential impacts of different management practices and customer/retailer preferences on selected ecosystem services and to develop a system for improved environmental reporting and marketing. Biotope conducted an analysis of how ES/NC could be taken into account in urban development plans, a network of protected areas and environmental impact assessments (in the French Alps Exemplar). They have finalized a preliminary report on ES in an EIA for large scale flood-mitigation works on the Isère river and published their results in a paper in a French journal targeting practitioners. They have also finalized a preliminary report on ES in protected area planning by French Département. Biotope has also conducted work on methodologies to include losses and gains of ES and biodiversity (i.e. metrics) into the application of the ‘mitigation hierarchy’ to development projects (EIA) and spatial

planning (SEA). Two peer-reviewed publications, 3 book chapters, and several publications targeting practitioners have been produced.

Subtask4.3.4 Scenario and foresight tools (UEDIN, ETH). Work in this subtask will improve the many general scenarios that are not tailored to ES/NC and integrate the ES/NC concept into techniques that are used to support scenario generation, which is especially relevant for the tested decision-support systems. UEDIN developed a novel web-based scenario toolbox allowing stakeholders to collaboratively develop scenarios. Testing of the toolbox will star soon in the Wine Exemplar as a method of exploring the future of the wine sector in Sweden. Work to add a formatted section for a link to ToSIA (Subtask 4.3.1) is in progress, linking ToSIA and the scenario toolbox with testing in wine exemplar (Montado region).

Subtask 4.3.5 Improving existing and developing innovative user interfaces (ETH, Biotope, TIAMASG, PU). In this task, interfaces are developed that foster the use of decision-support tools and methods to better and more accurately include information on ES/NC into decision-making processes. TIAMASG improved the mDSS desktop decision support software instrument by creating a web interface and translating a first part of the existing mDSS instrument into a web based instrument named mDSSweb. Application in the Danube Exemplar and the Barcelona Exemplar is currently being discussed. ETH has tested different versions of a collaborative web-platform with improved visualisation and communication of ES information in the Swiss Alps and finalised recommendations on how to visualise and communicate ES information in different decision contexts. In an eye-tracking study, ETH furthermore investigated how user demands and behaviours differ between ES information users with and without connection to case study region and how this characteristic influenced the cognitive process and therefore decision-making process. Currently, based on the results and feedback in user a toolbox is developed that allows a generic producing of landscape visualisations process.

|Task 4.4 Implementation and uptake of ES/NC concepts (Task lead ULUND)

Subtask 4.4.1 Design and ‘success’ criteria in implementing NC/ES concepts (ULUND). Work has focused on developing a contextual characterisation and diagnostics tool for helpin gdesing implementations that are fit for context and purpose. The tool takes the form of a set of templates that provide for aspects of implementation context, design, and performance (outcomes) and the relations between these to be described and explored as a basis for understanding the significance and implication of contextual factors for implementation design and performance and for developing guidance for selecting and designing implementation projects that are sensitive to context and needs. The tool has been developed to a level enabling it to be used for consistent description, analusis and appraisal of past implementations (sub-tasks 4.4.3 – 4.4.5). IN the next phase it will be tested in OPERAs exemplars: eg. For its usefulness in designing and managing implementation projects, in improving gproject selection and desing, and in making decisions about

implementation choices transparent. Links with the Blueprint and co-testing opportunitites are being explored.

Sub-task 4.4.2 Design of analytical methods and protocols to assess implementation (IODINE, ULUND)Substantial advance was made in this sub-task, which has included comprehensive inventorying, review, characterisation, and documentation of available economic assessment tools and methods for the assessment of ecosystem services and the development and application of criteria to appraise the potential of different tools and methods for impact and cost assessment in different implementation contexts e.g. whether tools are open-access, versatile, have a spatial dimension, are able to account for cumulative impacts, etc. Work is ongoing to test implementation-specific modifications and improvements to assessment tools and combinations in the context of the Mediterranean-Balearic and Global exemplars and to develop guidance for the context-sensitive selection and use of assessment tools.

Sub-task 4.4.3 Implementation of market-based approaches (IEEP, IVM, IODINE, EFI, WWF-Bulgaria, ULUND, BIOTOPE, and CIFOR)The tool developed in sub-task 4.4.1 has been used to describe and characterise PES and Offsets as broad types of market-based implementation instruments as well as to analyse and appraise specific PES and Offset implementation projects illustrating implementation contexts of different type and character. Feedback developed from experience with using the tool is being used to improve the tool. Relationships between aspects of context, project design, and project performance were explored during the reporting period and lessons and guidance was developed from meta-analysis of specific implementations of PES projects. Work to develop guidance on Offsets is on-going. Guidance will be refined through the Mediterranean, Alps, and Pan-European exemplars. Results feed into T4.5 and 5.1.

Sub-task 4.4.4 Implementation of approaches based on spatial planning, permitting, and direct investment, including Green Infrastructure (GI): (ULUND, IVM, IEEP, and UCD).. The tool developed in sub-task 4.4.1 has been used in this period to explore the integration of NC/ES concepts into regimes and instruments for physical and spatial planning and decision making, project plans, and development control. The focus during the reporting period has been on examining the integration of multi-functionality, connectivity, no-net-loss and related criteria in physical and spatial planning processes and projects at different spatial scales and concepts that embed these, such as Green Infrastructure. The sub-task links with the Pan-European and Greater Dublin exemplars. There is synergy with 4.4.3, since 4.4.4 explores the integration of a no-net-loss principle into physical and spatial planning, permitting, and project funding. Results feed into T4.5 and 5.1.

Sub-task 4.4.5 Implementations in Green Business and Finance (Denkstatt, WCMC, IODINE, WWF-Bulgaria, ULUND, EFI). The tool developed in 4.4.1 has been used in this period to describe and characterise implementations of the NC/ES concepts in a suite of related instruments and schemes, including standards, certificates, labels, reporting, and disclosure, and to analyse and appraise the take-up status of the concepts in specific schemes across diverse contexts and

sectors: agriculture, livestock, forestry products, bio-fuels, fisheries, extractives. The descriptions developed in this period will be used in the next period to explore the relationship between implementation context, design, and performance and to identify opportunities to increase the use made and contributions of these instruments to the green economy and the greening of finance. This sub-task links with the Montado and Wine exemplars. Results feed into T4.5 and 5.1.

Task 4.5 Guidance on Choice and Application of Instruments (Task lead: EFI)

Sub task 4.5.1 Coordinating Instruments Development (EFI, ULUND) - Both WP4-internal and cross-WP2-5 cooperation is ongoing and developing improved ES/NC tools and instruments that fit the demands from policy making and practice while incorporating the latest scientific methods and approaches. This task facilitates the interaction between WPs by (i) participating in WP3+2+5 workshops and having an ongoing exchange, (ii) by establishing cross-WP task groups and individual connections between exemplars, knowledge and instruments, (iii) by working in a cross project (OPERAS-OPENness) working group on harmonising guidance and filters to link between WP and between decision tree elements. For that purpose regular online and physical meetigns, and information exchange has been taking place, to ensure that at the end of the project, the developed tools and instruments will be made available through Oppla(T5.1).

Sub task 4.5.2 Synthesizing operational potentials (EFI, IEEP, ULUND, WCMC) - This task connects the demand for operational ES/NC instruments from T4.1 with the insights from the development of the broad range of tools and instruments in T4.2-4 and combines them in a synthesis of the operational potential of improved existing and innovative new instruments. The tools and instruments are being presented both in generic categories (decision tree that can be run bottom-up and top-down; describing timing and links between instruments) as well as in clusters for different types of end-uses.

Sub task 4.5.3 Recommendations and good practice guidelines (EFI, ULUND, IEEP, ETH, WCMC, PU, ALU, OBU) - Recommendations for the choice of instruments (metadata on resourced needed to run tools) and detailed good practice guidelines and training materials for the application of alternative tools and instruments developed in T4.2-4.4 is being developed for each tool. Outcomes from the uptake analysis of T4.4 are synthesized and integrated by performing a meta-analysis that accounts for feedbacks from experiments in the Exemplars (T2.2), the meta-analysis (T2.1) and the synthesis of the Exemplars (T2.3) to propose generic and context-specific guidance for the design of effective implementation and uptake schemes for market creation and support based on existing, improved and new instrument combinations. This is achieved in close cooperation with T5.1, where oppla functionality and structure is designed and with T2.3 where a lessons-learned database is compiled based on the results of the Exemplars. Results of T2.1 and T4.1 will be used to identify information needs for different stakeholder types, and help identify tailoring needs with respect to a diversity of use and implementation. To date 18 tools and instruments have been described as factsheets, with metadata and categories for Oppla guidance tree, with 13 tools being already included in the Oppla test version.

Any particular issues relevant to each task/subtask

To date 18 tools and instruments have been described with short descriptions, factsheets, SWOT analysis and 13 of those integrated into the Oppla-system. For each tool or instrument guidance for using the tool is being developed. Depending on the tool that aid function is a manual, interactive pdf, online user aid or other tooltips.

In addition work in synthesising WP4 work to lead users in a userfriendly way to needed tools / instruments is ongoing. this includes extensive metadata for each instrument, as well as the development of a joint decision tree/guidance which is developed in cooperation with OPERAs WPs 2-5, as well as with Openess.

2.4.3 Deviations

MS62 (MS4.11Documentation of work design of implementation tool approach against criteria, focus on Certification) was due in month 25 and was iteratively expanded to a full draft until Mont 36. This did not cause deviations for other work tasks.

MS65 (MS4.14 Emerging needs workshop (EU level)) was changed from a workshop in Brussels to an online survey, due to lacking participants signing up for the workshop. With that the implementation was changed from month 32 to 36. The survey is out and results are being collected.

MS66 (MS4.15 Updated report on testing of information tools for ES/NC data capture, storage, presentation) was merged with **MS67** (MS4.16 Trialing new and enhanced data capture, indicator - based, and information tools within exemplars) due to its similar content and closeness in time. In terms of content it was enlarged to include not only information tools from T4.2 but also decision support tools from T4.3.

D4.2 A report on lessons learned and recommendations for taking account ES/NC in key policy instruments was submitted as a draft outline, with the request of a 1.5 month extension. the delay was due to delayed submission of inputs by partners. Furthermore, the survey on MPAs was delayed due to the suitable timing for distributing it among the EU DG ENV Marine Expert Group (MEG) members.

2.4.4 Use of resources

See Table – Work Package Person Months per Partner[8]

8

2.5 WP5: Resource Hub

2.5.1 Task Objectives

Task 5.1 – Resource Hub development

1. To identify communities of practice and user needs (T5.1.1)
2. To design the structure of the Resource Hub (T5.1.2)
3. To construct the Resource Hub (T5.1.3)
4. To ensure maintenance and perennity of the Resource Hub (T5.1.4)

Task 5.2 – Stakeholder engagement and facilitation

1. To develop a stakeholder analysis and engagement plan (T5.2.1)
2. To set-up and manage the OPERAs UserBoard (T5.2.2)
3. To facilitate stakeholder engagement in selected exemplars (T5.2.3)
4. To monitor stakeholder engagement (T5.2.4)

2.5.2 Progress towards objectives

Task 5.1 - Resource Hub development

This task is carried out in collaboration with OpenNESS.

Subtask 5.2.1 To identify communities of practice and user needs. Addressing user needs associated with Oppla is an ongoing process, associated with the User Board workshops (see task 5.2.2). During the last User Board workshop, Communities of Practice was comprehensively discussed as well as in the OPERAs consortium meeting in November 2015. During these meetings participants discussed issues around what kinds of communities of practice would they join, what scale and what theme etc. Feedback has been gathered and will be examined in the next Strategic Working Group meeting for Oppla in January 2016 to discuss a plan for developing communities of practice for Oppla.

Market research associated with Oppla will be carried out in 2016 by a Master Student from the University of Cambridge in conjunction with WCMC.

Subtask 5.1.2 To design the structure of the Resource Hub. During the visionary development of the website three sequential design steps were followed:

1. *Sketch screens* – on paper and white board to analyse how to structure what content and with what layout to display it. Screen sketching includes determining the responsive logic within a single screen as well as the relationship between screens.
2. *Wire frame* the sketches to find out how the designs fit the actual screen sizes (e.g. in pixels on different platforms).

3. Include *aesthetics* like colours, fonts, imagery which highly impact how a website is experienced.

Further information including wireframes are set out in Milestones 5.1 and 5.3.

Subtask 5.1.3 To construct the Resource Hub. The demonstration model for Oppla was developed in 2015 (deliverable 5.2). A report associated with the deliverable is available, Following development of the demonstration model, feedback from users along with further development of the Oppla vision, a new site map and home page for the beta version of Oppla were developed. An updated report and beta version are due in 2016 and are currently on track.

Ask Oppla – a service which allows users to ask experts questions around ecosystems and natural capital has been launched and is currently being trialled. Results of the trial will be available in Deliverable 5.3 due in 2016.

Subtask 5.1.4 To ensure the maintenance and perennity of the Resource Hub. The deliverables associated with this task are not due until the end of the project. However, feedback is currently being sort on a draft governance structure and business plan from the User Board and members of the OPERAs and OpenNESS Consortia. An update of thinking will be presented in deliverable 5.3 due in 2016

Task 5.2 – Stakeholder engagement and facilitation

Sub-task 5.2.1 Stakeholder analysis and engagement plan: completed during last reporting period

Sub-task 5.2.2: Setting up and managing the OPERAs UserBoard: During this reporting period the OPERAs UserBoard was further expanded and physically met two more times: 6-7 November 2014 in Lisbon and 25-26 November 2015 in Edinburgh. Both meetings were strongly linked to the work in OPERAs exemplars, the Portuguese Montado exemplar and the Scottish exemplar, allowing for a direct translation from theoretical knowledge to practical application.

The second workshop gathered 17 UserBoard members, of which 9 have attended the first workshop in Brussels. Whereas the first UserBoard workshop in 2013 was used to identify stakeholder's needs for operationalizing ES/NC in their work, the aim of the second UserBoard meeting was to assess and give feedback on the progress registered by the OPERAs work packages and to see how the identified needs were being covered by OPERAs in the knowledge, instruments and practices under development.

The third workshop gathered 17 Userboard members, of which 6 had attended both previous workshops (3 on individual, 3 on organisational level) and 3 had attended either the first or second

workshop. Building on the previous two workshops and the progress in the project, it was decided that the third workshop should focus on the detailed feedback to three selected OPERAs tools and products as well as the development of the OPPLA platform.

In both workshops all relevant stakeholder groups were covered (government, civil society, business, research and policy-making) and both workshop managed to bring in some representative from the exemplars, although improvement on this aspect is envisioned for the final workshop. The UserBoard members positively highlighted the wealth of different perspectives represented by the attending stakeholders, and encouraged the participation of additional representatives from other business sectors, as well as land owners. They appreciated the opportunity to reach across and outside one's usual professional network, and particularly stress the practical value of the field trips to the exemplars. In additional, participants favourable assessed the structure of the meeting, which provided enough time and space for opinion sharing, and the high quality organisation and facilitation of the meetings. They particularly appreciated the constant engagement with stakeholder in this ambitious project and (again) expressed their willingness to participate in subject-specific engagement with the project team in between the annual UserBoard meetings.

The last physical UserBoard workshop will be held in October/November 2016.

In addition to the physical UserBoard workshops, the project has also set-up an online UserBoard platform, which provides access to documents and discussion forums to all members. Moreover, This reporting period saw the first online engagement activities in form of a webinar on ecosystem databases (9 June 2015) and a survey on needs and wants of stakeholders regarding guidance on ecosystem services (open from 29 May to 12 June 2015). More of the online engagement is planned for the next reporting period.

Sub-task 5.2.3 Facilitation of stakeholder engagement in selected exemplars: Based on the needs assessment done with the exemplar leaders during the first reporting period, the second 18 months were used to work more concretely with a large number of the exemplars. In detail the engagement looked as follows:

- Co-design and facilitation of one scenario workshop in the French Alps exemplar (data)
- Design and implementation of stakeholder workshop on cultural ecosystem services in Fingal County, Ireland (22 October 2014)
- Design, facilitation and organisation of European level stakeholder workshop on No-net loss in Montpellier, France (7 August 2015)
- Assistance in the set-up and design of four workshop in the Scottish exemplar, including the co-facilitation of one workshop (10 October 2015)

Furthermore ad-hoc advice was given to the global and the wine exemplar.

Sub-task 5.2.4 Monitoring and corrective action for stakeholder engagement: Based on the developed plan for the monitoring of stakeholder engagement activities in OPERAs, a total of stakeholder events have been evaluated:

- 1st UserBoard workshop (17 respondents)
- Stakeholder workshop in Fingal county, Ireland (9 respondents)
- 2nd UserBoard workshop (16 respondents)
- Stakeholder workshop on No-net loss (13 respondents)
- Stakeholder workshop in French Alps exemplar (4 respondents)
- Stakeholder workshop in Scottish exemplar (6 respondents)
- 3rd UserBoard workshop (16 respondents)

Each of these events was evaluated with the help of a written (online) questionnaire that consisted of 6 standard questions, plus – if desired – additional questions specific to the individual workshop. Overall, the evaluations have been very positive and stakeholders have expressed their content with the way the interactions were designed and how their input has been taken up. Many stakeholders recognise the challenge of operationalizing ecosystem services and natural capital and are unclear, if OPERAs will achieve this goal. As a corrective action this point has been brought to the attention of the Project Management Team and measures are taken to adapt activities and events towards achieving a better and more visible integration between science and practice.

2.5.3 Deviations

Not for T5.2

2.5.4 Use of resources

See Table – Work Package Person Months per Partner

2.6 WP6: Outreach & Dissemination

2.6.1 Task Objectives

Task 6.1 – Constituency building, outreach and project dissemination

1. To disseminate project outcomes to science, policy and practice (T6.1.1)
2. To reach out and build stakeholder constituencies around OPERAs (T6.1.2)
3. To organise and OPERAs summer school (T6.1.3)
4. To organise an OPERAs peer-to-peer exchange conference (T6.1.4)

2.6.2 Progress towards objectives

Over the second reporting period WP6 has focused on implementing the dissemination plan (D6.1). In addition to academic dissemination at conferences and in journal articles, emphasis was placed on developing a social-media presence on Twitter, and communicating activities through videos on the OPERAs website (including D6.2). Constituency building activities are now focused around Oppla, the joint resource hub developed in collaboration with the OpenNESS project. Oppla branding and Oppla policy brief (D6.3) has been used to explain our ambitions to a wide audience.

The OPERAs project has dissemination and outreach written into the project design, throughout the work packages. The WP6 activities cannot be seen in isolation from activities in other work packages, particularly WP4 (Instruments) and WP5 (Resource Hub), and the overarching OPERAs research design. Specific examples of the latter include the extensive stakeholder engagement in WP2 (Practice) and WP5. As such there were few meeting or activities that can be solely attributed to WP6, although clearly there has been a lot of dissemination. The work completed by WP6 in this reporting period has been driven by the aims identified in the Dissemination Strategy and Plan (D6.1):

- To connect with target audiences
- To promote OPERAs and establish an Ecosystem Services Community
- To disseminate project results to the scientific community
- To promote the resource hub
- To commence organisation of an OPERAs summer school
- To commence organisation of an OPERAs conference

Task 6.1 – Constituency building, outreach and project dissemination

Sub-task 6.1.1 Project dissemination: After 3 years the OPERAs website is currently under-going a refresh, changing the emphasis form explaining the project ambitions to communicating results. To appeal to as wide a group as possible, the website incorporates various different media types,

including videos, blogs, twitter and standard text. Considerable effort was placed in developing films that explain core concepts of ecosystem services concept and its benefits, to describe the work in the exemplars, and to introduce Oppla. As well as these, all flash talks, debates and conferences that have been held in relation to OPERAs have been filmed and archived on the OPERAs youtube channel.

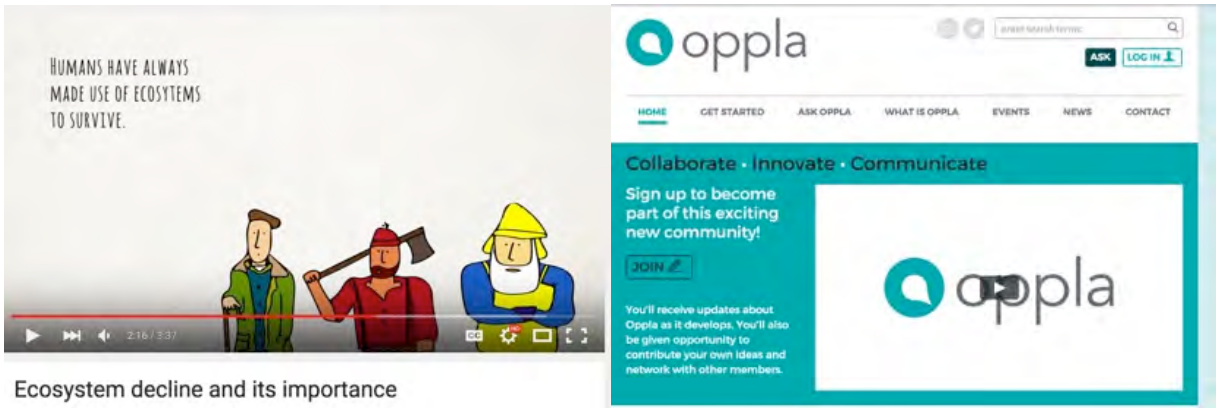

Figure 8. Exmaples of two videos produced to explain the ecosystem services concept and to introduce Oppla.

Priority for the remainder of the project will be to increase dissemination of project outcomes as they become available. We have started including popular summaries of OPERAs deliverables on the website, which are also promoted through social media. We also plan to adapt the internal project newsletter for external circulation.

Sub-task 6.1.2 Outreach and constituency building: As described in section 2.5, OPERAs collaborates closely with OpenNESS on developing the Resource Hub Oppla. As part of this activity target audiences have been identified and future joint activities (including those described below and under WP5) will target these groups. Support in establishing the Ecosystem Services Community Scotland provided some first insights.

The social media strategy has been streamlined to focus on frequent project videos, written articles (blogs). Twitter has proved to be the most successful social media platform, and is used successfully to communicate web-content and project activity in general. Our followers have grown from <300 in July 2014 to about 2000 in January 2016. Section 4.6 provides a detailed overview of specific dissemination activities.

Currently plans are in development to start a series of bi-monthly webinars explaining key research outcomes in an accessible format to a wide range of audiences. These webinars are likely to be hosted on Oppla to help built its community, and will focus on OPERAs contribution to Oppla (i.e. tools and instruments) as well as increasing understanding of a number of key methodologies.

Sub-task 6.1.3 OPERAs summer school: Rather than organising a single OPERAs summer school agreement has been reached that both OPERAs and OpenNESS will contribute to the existing

Alter-NET summer schools throughout the project. Summer school towards the end of OPERAs would have a greater focus on OPERAs results. OPERAs contributions to the 2016 summer school are currently being discussed, and OPERAs PhD students have been encouraged to attend this event.

Sub-task 6.1.4 OPERAs conference: In consultation with OpenNESS and the Ecosystem Services Partnership we agreed to jointly organise the first European Ecosystem Services Conference in September 2016 (http://www.esconference2016.eu). Although this earlier than our originally envisaged conference, we realised greater impact would be had by a single event. We're still considering whether OPERAs should organise some final event focusing specifically on the project's results, or whether efforts are better places promoting Oppla.

2.6.3 Deviations

The main deviations result form greater collaboration with the OpenNESS project in the summer school and conference organisation. This has meant that greater resource could now be given to the promotion of Oppla and the development of its constituency. It has also enabled the planned webinar series.

2.6.4Use of resources

See Table 7 – Work Package Person Months per Partner

3. Deliverables and Milestones

Table 1 Project Deliverables in this period

Del. no.	Deliverable name	Version	WP no.	Lead beneficiary	Nature	Dissemination level[9]	Delivery date from Annex I (project month)	Actual / Forecast delivery date Dd/mm/yyyy	Status	Comments
D1.4	Updated Research Implementation Plan	1	1	UEDIN	Report	PU	36	30/11/15	Received	
D2.2	Report on standardized metrics/indicators for monitoring the efficiency of ES/NC based measures	1	2	ALU	Report	PU	24	30/11/14 (17/12/14)	Received	
D3.2	Monetary and social valuation:state of the art	1	3	VU	Report	PU	24	30/11/14 (19/05/15)	Received	

D3.3	**Report on existing and potential governance modes for various ES/NC**	**1**	**3**	**IUEEP**	**Report**	**PU**	**24**	**30/11/14 (08/03/15)**	**Received**	
D3.4	**Recommendations for integration of ES/NC accounting and reporting formats**	**1**	**3**	**UEA**	**Report**	**PU**	**36**	**30/11/15 (03/12/15)`**	**Received**	
D3.5	**Stategies and methods for social valuation of ES/NC**	**1**	**3**	**UCD**	**Other**	**PU**	**36**	**30/11/15 (08/12/15)**	**Received**	
D6.3	**Policy brief Resource Hub**	**6**	**6**	**WCMC**	**Report**	**PU**	**32**	**31/07/15**	**Received**	

Milestones in the second reporting period

The new numbering from the OPERAs DoW List of Milestones has been used in the table below. The system does not allow for decimal points so all milestones had to be renumbered and will appear within an updated DoW as per first column. **The working number given to each milestone is within the title.**

Table 2 Project Milestones in this period

Milestone no.	Milestone name	Work package no	Lead beneficiary	Delivery date from Annex I	Achieved Yes/No	Actual / Forecast achievement	Comments
MS5	MS1.5 4th Consortium Assembly to evaluate progress (Task 1.3)	WP1	UEDIN	26	yes	28	
MS6	MS1.6 5th Consortium Assembly to evaluate progress (Task 1.3)	WP1	UEDIN	34	yes	35	
MS24	MS2.16 Decision tree workshops in collaboration with MA and EX	WP2	UEDIN	28	No	40	
MS18	MS2.10Interim decision trees for selecting instruments for maintaining and protecting ES	WP2	UEDIN	29	Yes	29	
MS16	MS2.8 Database designed to compile lessons-learned across the WP (Task 2.3)	WP2	UEDIN	30	Yes	22	
MS17	MS2.9 Report on Second Blue Print (2.0) revisit each 18 month reporting period	WP2	UEDIN	30	Yes	22	

MS19	MS2.11 Exemplars interim report	WP2	ULUND	31	yes	31	
MS20	MS2.12 Workshops to elaborate iteratively lessons learned from Meta Analysis and Exemplars	WP2	UEDIN	32	Yes	33	
MS21	MS2.13 Report on Third Blue Print (3.0)	WP2	UEDIN	33	Yes	34	
MS30	MS3.3 Discussion paper on the design of a conceptual framework on incorporating spatial complexity in value transfer functions	WP3	VU-IVM	19	yes	22	
MS36	MS3.9 coordinated plan for the application of monetary valuation in selected exemplars (T3.3)	WP3	UEA	20	yes	29	
MS38	MS3.11teleconf/workshop with exemplars: economic valuation in existing accounting & reporting formats(T3.3)	WP3	VU-IVM	30	yes	various	not telecon, individual discussion
MS37	MS3.10 coordinated plan for the application of social valuation in selected exemplars(T3.2)	WP3	UCD	32	yes	32	

MS39	MS3.12 Draft guidelines with best practice reccomendations on the use of economic valuation methods provided to resource hub	WP3	IEEP	33	yes	27	
MS40	MS3.13 paper submitted: Framework for model-based quantification of ES and their uncertainty(T3.1)	WP3	CNRS	36	No	43	
MS41	MS3.14 First test of the portfolio of ideal types in some exemplars (T3.4)	WP3	ETH	36	yes	38	
MS42	MS3.15 Discussion paper:trade-off analysis performed for at least 3 different exemp(input for MS3.16	WP3	CNRS	36	No	44	
MS63	MS4.12 Partner Feedback (Task 4.1.2 bottom-up analysis) on existing and emerging practical needs fo	WP4	IEEP	24	yes	32	
MS64	MS4.13 Selection of specific instruments, sectors and stakeholders for in-depth assessment	WP4	IEEP	24	yes	32	
MS62	MS4.11Documentation of work design of implementation tool approach against criteria, focus on Certif	WP4	ULUND	25	yes	36	

MS59	MS4.8 DELETED	WP4	IEEP	30			deleted
MS65	MS4.14 Emerging needs workshop (EU level)	WP4	IEEP	32	yes	36	changed into survey (Nov 2015)
MS66	MS4.15	WP4	WCMC	38	Yes	36	Merged with MS4.16
MS67	MS4.16 Trialling new and enhanced data capture, indicator -based, and information tools within exemp	WP4	WCMC	36	yes	36	merged with MS4.15; expanded to cover decision support tools
MS69	MS5.1 Drafts wire frames based on information gathered through the different stakeholder consultation	WP5	WCMC	22	Yes	22	
MS70	MS5.2 OPERAs User Board	WP5	Prospex	24	yes	24	
MS71	MS5.3 Wire frames developed further to take into account feedback from users	WP5	WCMC	27	yes	27	
MS72	MS5.4 OPERAs Userboard meeting	WP5	Prospex	36	yes	36	
MS77	MS6.4 Launch of first short film clip (Task 6.1)	WP6	UEDIN	30	yes	30	
MS78	MS6.5 Second flyer, following first policy brief (task 6.1)	WP6	UEDIN	32	yes	33	

4. Project Management

4.1 Consortium management Tasks and Objectives

Central management within the OPERAs project is undertaken by the Daily Management Team (DMT) based at the University of Edinburgh (which includes the Coordinator, the Deputy Coordinator and the Project Manager).

The Project Management Team (PMT) supports the Coordinator in fulfilling obligations towards the Commission and has overall responsibility for liaison between the project partners, for analysing and approving the results and for proper administration of the project. Management of the different components of the project rests with the co-leaders of each work package, who are responsible for the WP deliverables. Along with the PMT, they ensure that the WPs are effectively integrated and eliminate any duplication of effort.

The consortium management tasks of the DMT and PMT in the first reporting period of the project are summarised below

- Overall administrative, legal and financial management of the OPERAs project, including administering the 18-month period payment from the European Commission regarding its allocation between partners in accordance with the grant agreement without unjustified delay.
- Organising two project meetings (see Table 5.1).
- Writing up minutes and actions for all project meetings and circulating them to all partners.
- Attending WP meetings as necessary to promote integration across WPs (see Table 5.2)
- Collaboration with our sister project OpenNESS including the development of OPPLA
- Attending meetings with representatives from the different Commission policy DGs and relevant external organisations

Table 5.2 Details of Project Meetings: physical, skype/telecon

WP	Meeting	Date	Location	Attendees
WP1	PMT teleconference	7.10.14	Gotomeeting	PMT members
	PMT Physical meeting	10-11.02.15	Amsterdam	PMT members
	PMT Physical meeting	11.03.15	Dublin	PMT members
	Full Consortium meeting	10-12.03.15	Dublin	Consortium
	PMT Physical meeting	27.10.15	Aix en Provence	PMT members
	Full Consortium meeting	28-30.10.15	Aix en Provence	Consortium
WP2				
	WP2 Leads	17.08. 2015	Skype	UP: Ariane Walz UEDIN: Meriwether Wilson ULUND: Kim Nicholas, Heather Schoonover
	WP2 Leads + Prospex	24 .08.2015	Skype	ULUND: Kim Nicholas, Heather Schoonover PROSPEX: Martin Watson
	WP2 Leads	27.08.2015	Skype	UP: Ariane Walz UEDIN: Meriwether Wilson ULUND: Kim Nicholas, Heather Schoonover
	WP2 Task Leads	17.09.2015	Skype	UP: Ariane ULUND: Heather Schoonover UEDIN: Genevieve Patenaude, James Paterson UBO: Heera Lee ALU: Carsten Dormann, Anne Mupepele UFZ: Ralf Seppelt, Stefan Schmidt

				ALU: Anne Mupepele
	WP2 Leads	29.10.2015	Skype	UP: Ariane Walz UEDIN: Meriwether Wilson ULUND: Kim Nicholas
	WP2 Task Leads	20 .11.2015	Skype	UP: Ariane WalzULUND: Kim Nicholas, Heather SchoonoverUEDIN: Genevieve Patenaude, James Paterson, Meriwether WilsonUBO: Sven Lautenbauch, Heera Lee ALU: Anne Mupepele
WP3				
	WP3 Meeting	2-3.12.2014	Edinburgh, UK	VU-IVM: Astrid van Teeffelen, Mark Koetse KIT: Almut Arneth, Anita Bayer UCD: Craig Bullock ULUND: Torsten Krause CNRS-LECA: Sandra Lavorel Ecometrica: Karin Viergever UP: Ariane Walz, René Sachse IEEP: Patrick ten Brink UBO: Sven Lautenbach Iodine: Rob Tinch UEdin: Mark Rounsevell, Marc Metzger EFI: Diana Tuomasjukka
	What is OPERAs doing in Scotland? – WP3 work presented to ~100 stakeholders.	3.12.2014	Edinburgh, UK	Presentations by IEEP: Patrick ten Brink KIT: Anita Bayer UP: Ariane Walz ULUND: Torsten Krause VU-IVM: Mark Koetse VU-IVM: Astrid van Teeffelen (on behalf of Willem Verhagen and Samantha Scholte)

	WP3 Meeting	27.10.2015	Aix-en-Provence	VU-IVM: Astrid van Teeffelen, Peter Verburg KIT: Anita Bayer UCD: Craig Bullock ULund: Lennart Olsson CNRS-LECA: Clémence Vannier UBO: Sven Lautenbach, Heera Lee UFZ: Stefan Schmitt IEEP: Marianne Kettunen CSIC: Nuria Marba
	WP3 leads teleconference: Updates, status of MS/D, planning of WP3 Meeting	19.9.2014	teleconference	VU: Peter Verburg, Mark Koetse KIT: Almut Arneth, Anita Bayer UCD: Craig Bullock ULUND: Torsten Krause
	Teleconference on how to achieve synergies in WP3	18.11.2014	teleconference	VU: Peter Verburg, Astrid van Teeffelen, Mark Koetse KIT: Anita Bayer UCD: Craig Bullock
	Webinar with User Board	5.6.2015	Webinar	UFZ: Stefan Schmidt Prospex: Martin Watson KIT: Anita Bayer VU: Astrid van Teeffelen
	Participation in meetings on decision trees, organized by WP2.	23.9.2015 24.9.2015	teleconference	KIT: Anita Bayer (24.9) VU: Astrid van Teeffelen (23.9)
	WP3 task leads teleconference: Updates, status of MS/D, planning of WP3 pre-meeting	25.9.2015	teleconference	VU: Peter Verburg, Astrid van Teeffelen, Mark Koetse KIT: Almut Arneth, Anita Bayer UCD: Craig Bullock ULund: Lennart Olsson, Torsten Krause CNRS-LECA: Sandra Lavorel
WP4				
	Meeting to discuss collaboration ToSIA and OE in the OPERAS Global exemplar	9 March 2015	Dublin, before project meeting	Diana Tuomasjukka & Karin Viergever

	Peru case			(Ecometrica)
	Wine exemplar meeting	10 March 2015	Dublin	Wine exemplar partners, including Karin Viergever (Ecometrica)
	Userboard II	6-7/11/2014	Lisbon, Portugal	Userboard, EFI
	Userboard III meeting	25-26/11/2015	Edinburgh, UK	Userboard, EFI
	Montado + wine exemplar: ToSIA meeting	5/11/2014	Lisbon, Portugal	EFI, FFCUL
	WP3 meeting; representing WP4	2-3/12/2014	Edinburgh, UK	WP3, EFI
	link OE + ToSIA	4/12/2014	Edinburgh, UK	Ecometrica, EFI
	PMT meeting	10-11/2/2015	Amsterdam, NL	EFI, PMT
	PMT meeting	7/10/2014	online	EFI, PMT
	WP4 meeting, in connection to OPERAS PM	10/3/2015	Dublin, IE	WP4
	T4.2, ToSIA-LCA-MCA meeting, ES indicator meeting	9/3/2015	Dublin, IE	EFI, BOKU, Denkstatt, UNEP-WCMC
	T4.2 meeting	18/9/2014	Skype	EFI, UNEP-WCMC
	T4.4 meeting	6/2/2015	Skype	EFI, ULUND
	T4.4 meeting	20/11/2015	Skype	EFI, ULUND
	T4.4 meeting	16/10/2015	Skype	EFI, ULUND
	OPERAS PM	10-12/3/2015	Dublin, IE	WP4
	WP4 meeting in connection OPERAS PM	28/10/2015	Aix, France	WP4
	OPERAS PM	29-30/10/2015	Aix, France	WP4
	T4.4 + T4.2 meeting, wine exemplar	28+29/10/20	Aix, France	

	meeting, decision tree/guidance meeting	15		
	WP3 meeting, WP4 representation	28/10/2015	Aix, France	EFI, ULUND, WP3
	8th WP4 taskleader meeting 24102014	24/10/2014	Skype	WP4 task leader
	9th WP4 taskleader meeting OPERAS_12122014	12/12/2014	Skype	WP4 task leader
	cross-project Guidance meeting	25/11/2014	Skype	EFI, UE, KIT, OPENNESS
	cross-project Guidance meeting	24/9/2015	Skype	EFI, UE, KIT, OPENNESS
	cross-project Guidance meeting	4/11/2015	Skype	EFI, UE, KIT, OPENNESS
	Ecolabel review	24/5/2015	Skype	EFI, denkstatt
	Ecolabel review	10/4/2015	Skype	EFI, denkstatt
	Ecolabel review	2/11/2015	Skype	EFI, denkstatt
	Peru exemplar	24/7/2015	Skype	EFI, CIFOR, CI
	Peru exemplar	10/7/2014	Skype	EFI, CIFOR, CI
	Peru exemplar	11/11/2015	Skype	EFI, CIFOR, CI
	Peru exemplar	17/6/2015	Skype	EFI, CIFOR, CI
	Peru exemplar	1/10/2014	Skype	EFI, CIFOR, CI
	Peru exemplar	20/8/2014	Skype	EFI, CIFOR, CI
	Barcelona Exemplar	30.loka.15	Aix, France	Jose Lascurain, Gloria Feliu, U. Edinburgh, WCMC
	Wine exemplar	27.loka.15	Aix, France	U.Lund, U. Edinburgh, EFI, WCMC
	Scottish exemplar	2.syys.15	Skype	U. Edinburgh, WCMC
	Dublin Exemplar	14.syys.15	Skype	U. Dublin , WCMC
	Dublin Exemplar	13.loka.15	Skype	U. Dublin , WCMC
	TESSA and Scottish exemplar	2.loka.14	Skype	Prospex, U.Edinburgh, WCMC
	Peru, Global Exemplar	7.loka.14	Skype	CIFOR, WCMC
	TESSA and Scottish exemplar	29.loka.14	UNEP-WCMC, Cambridge, UK	Prospex, WCMC, U. Edinburgh, Birdlife International

	Dublin Exemplar	5.marras.14	Skype	U.Dublin, WCMC
	Dublin Exemplar	12.elo.14	Skype	U.Dublin, WCMC
	Dublin Exemplar	22.heinä.14	Skype	U.Dublin, WCMC
	Montado Exemplar	1.loka.14	Skype	U.Lisbon, WCMC
	Indicators working group	3.marras.14	Skype	EFI, Denkstatt, WCMC
	Scottish exemplar	9.maalis.15	Dublin, Ireland	U. Edinburgh, WCMC
	Dublin Exemplar	10.maalis.15	Dublin, Ireland	U.Dublin, WCMC
	Scottish exemplar	10.maalis.15	Skype	U. Edinburgh, WCMC
	Dublin Exemplar	10.kesä.15	Skype	U.Dublin, WCMC
	8th OPERAs Taskleaders meeting	24.loka.14	Skype	WP4 task leaders
WP5	Oppla Full Team Meeting	20-21 October 2014	Brussels	Mark Rounsevell, Marc Metzger, George Cojocaru. Ana Aldescu, Claire Brown, Tim Wilkinson, Paul Mahoney, Jonathan Porter, Matthew Brown Plus people from OpenNESS
	Oppla Full Team Meeting	23-25 February 2015	Amsterdam	Mark Rounsevell, Marc Metzger, George Cojocaru. Ana Aldescu, Claire Brown, Tim Wilkinson, Paul Mahoney, Jonathan Porter, Matthew Brown Plus people from OpenNESS
	Oppla SWG Meeting	31 March – 1 April 2015	Edinburgh	Mark Rounsevell, Paul Mahoney, Plus people from OpenNESS
	Oppla SWG Meeting	30-21 July 2015	Cambridge	Mark Rounsevell, Claire Brown, Paul Mahoney, Plus people from OpenNESS
	Oppla Full Meeting	23-25 September 2015	Edinburgh	Mark Rounsevell, Marc Metzger, George Cojocaru. Ana Aldescu, Claire Brown, Paul Mahoney, Jonathan Porter, Plus people from OpenNESS
WP6	Dissemination and outreach was discussed in all WP1 meetings, and in many WP specific meetings. There were no dedicated Outreach meetings.			

4.2 Cooperation with other projects/programmes

The collaboration between the two groups has progressed well during the second reporting period. A joint working group was established to monitor and progress the joint areas of work between the two projects, which are (from the DoW):

- The two projects will have a common start date
- Organise joint project meetings to include: a) at least 2 policy meetings in Brussels (e.g. lunch debates), b) at least 1 project meeting elsewhere to plan collaboration (at an early stage of the work), c) ad hoc project meetings to implement collaboration
- Organise jointly at the end of the projects an Open Science Conference
- Produce joint Special Issue publications during the projects, linked also to the final conference
- Produce a joint stakeholder engagement and monitoring plan (to avoid overlap of individuals contacted)
- Communicate ideas/insights about protocols, methods and synthesis of exemplars/case studies - partner participation in workshops on a) method development (early on), and b) synthesis and comparison of results (later on)
- Explore options for collaboration in the Lower Danube exemplar/case study, to avoid redundancy and replication and compare results and lessons-learned (at the synthesis workshop, above)
- Coordinate communication and dissemination strategies and plans
- Compare the project policy briefs, and avoid confusion where differences in messages arise
- Ensure a high degree of inter-operability of the OPERAs Resource Hub and the OpenNESS Clearinghouse through a common platform (OPPLA)
- Ensure the perennity of the OPPLA
- Develop a joint business plan with the aim of commercialising the OPPLA
- Coordinate Summer School(s) and other training elements
- Include common members within the project Advisory groups, especially the coordinators

A sub-set of this working group has been established specifically to manage the development of the ‘Common Platform’ (now known as OPPLA). This includes the development of the business plan in support of the perennity of OPPLA. The joint working group and the OPPLA development team have now met on several occasions throughout the reporting period.

This has included meetings involving European Commission staff (DG RTD and DG Environment) and the European Environment Agency. An outcome of this process has been the harmonisation of deliverables that relate to OPPLA across the two projects. See section 2.5, for a description of progress on OPPLA.

The two projects have also collaborated on the establishment of stakeholder databases and are organising stakeholder meetings jointly.

Attendance at one other project's general project meetings continues, as does OPERAs representation on the OpenNESS Advisory Board.

Two external Advisors Dr Elena Bennet and Dr Albert Norstrom have been appointed, both of whom joined us for a consortium meeting in Dublin March 2015 and gave invaluable feedback.

4.3 Changes in the Consortium or legal status of the beneficiaries

A number of changes have been proposed and an amendment session has been open. Although many changes have been made within the system we have been unable to make a final submission due to one change taking a long time to resolve. It is anticipated that these amendements will be acknowledged within the next reporting period.

- EFI third party agreement with BOKU
- UEA to be replaced in project by University of Exeter due to staff move
- ETH to pass over PMs and associated funds to LUND for work in WP3
- WP5 deliverables have been updated to reflect shared deliverables with OPENness
- Renumbering of all WP milestones
- Adjustment of PMs for Bonn (no reallocation)
- Adding Swiss exemplar
- BIOTOPE subcontracting personnel to complete research (PhD staff based at Universite de Provence)

4.4 Development of the Project Website

The project website continues to develop and evolve with a current focus on showcasing project results and outcomes. Short films describing issues have been added to the website and have proved very popular. Project outputs are hosted on the site in public resources, and internal document (requires login)

4.5 Deviations from planned milestones and deliverables

There have been no major changes to the deliverables.

In the previous period changes were made in some of the milestones to better enable to manage the project progress effectively and to reflect changes in the Deliverables arising from the joint OPERAs OpenNESS work on OPPLA. These changes will be reflected in the updated DoW which will be finalised during month 38. The new numbering from the OPERAs DoW List of Milestones has been used in the table 3. The NEF amendment system does not allow for decimal points so

all milestones had to be renumbered and will appear within an updated DoW as per first column. **The working number given to each milestone is within the title.**

These changes are documented in Table 1 (above).

4.6 Dissemination activities in this period

Presentations at workshops and conferences

WP2

Bierry, A. and Lavorel, S. 2015. Les services écosystémiques, clé de lecture du développement territorial: Application au cas du territoire du SCoT Grenoblois. 52ème conférence de l'Association de Science Régionale de Langue Française. Montpellier, France.

Bondeau, A, Cramer C., Decock S., Fader M., Geijzendorfer I., Shi S, and Trabucchi M. 2014. Assessing multiple ecosystem services from agricultural landscape around the Mediterranean, based on a process-based ecosystem model. 2014 Global Land Project Open Science Meeting, March 19th – 21st , 2014, Berlin, Germany.

Bondeau, A. 2014. Un point de vue scientifique: changement climatique et avenir des agro-éco-systèmes. Séminaire régional AFD-MED « Intégration environnementale en Méditerranée », 3rd-4th July 2014, Marseille, France.

Bondeau, A., Geijzendorfer I., Decock S., Fader M., García-Nieto A.P., Shi S. and Cramer C. 2014. Scenarios for sustainable futures of Mediterranean agriculture based on ecosystem services supply - Modelling study. 7th Annual ESP Conference September 8th – 12th 2014, San José, Costa Rica.

Bondeau, A., Cramer C., Decock S., Fader M., García-Nieto A.P. and Geijzendorfer I. 2015. Scenarios for sustainable futures of Mediterranean agriculture based on ecosystem services supply - Modelling study. 5th International Symposium for Farming Systems Design, September 7th – 10th, 2015, Montpellier, France

Bondeau, A. 2015. Scenarios for sustainable futures of Mediterranean agriculture based on ecosystem services supply - Modelling study. AMSE/GREQAM Environmental Economics Workshop November 13th, 2015, Marseille, France.

Brunner, S.H., Huber, R. and Grêt-Regamey, A. 2015. Inferring regional policy strategies for desirable mountain ecosystem services provision under global change – a backcasting approach. Mountains of Our Future Earth, Perth, Scotland, 4-8 October 2015.

Brunner, S.H. and Grêt-Regamey. A. 2014. Backcasting: Massnahmenbündel für die resiliente Entwicklung einer erwünschten Berglandschaft. IALE-DE, Bozen, 14-16 October 2014.

Bullock, C. 2015. Ecosystem services sustainability, policy and the private sector. National Sustainability Summit, Dublin, Ireland, November.

Bullock, C. 2015. Stakeholder views on ecosystem services, social values and participation. European Society of Ecological Economics. Leeds, UK, 29-30 July 2015.

Bullock, C. 2015. Practical applications of socio-cultural valuation to spatial planning policy. International Association of Landscape Ecology, Portland, Oregon USA, 6-9 July 2015.

Byczek, C., Longaretti, P.Y. and Lavorel S. 2015. A GPS-based model of recreation ecosystem services for the Grenoble urban area, French Alps. World conference on Natural Resource Modeling. Bordeaux, France.

Collier, M. 2015. Novel ecosystems and social-ecological resilience. SER2015: 6th World Congress on Ecological Restoration, Manchester, UK, 23-27 August 2015. Session Chair.

Cramer, W. 2014. Reflective remarks on ecosystem services. ESCOM Launch, Edinburgh, 30 April 2014.

Cramer, W. 2015. Changement climatique: Conséquences pour la région PACA. Café 3C, 13 May 2015, Aix-en-Provence, France.

Cramer, W. and Guiot J. 2015. Le climat a l'AMU: Recherche, communication et soutien aux acteurs sociétaux – 26 May 2015, Aix-Marseille Université, France.

Cramer, W. 2015. Global impacts of climate change on biodiversity and ecosystem service supply. Our Common Future Under Climate Change, 7-10 July 2015, Paris, France. https://www.youtube.com/watch?v=uL1KiV5ns6A

Cramer, W., Bondeau A., Garcia Nieto A.P., Geijzendorffer I., Fader M., Verburg P. and Maleg Z. 2015. The Mediterranean Exemplar – Flash Talk at OPERAs Annual Meeting, 28 October 2015, Aix-en-Provence, France.

Fedele, G., Locatelli B. and Djoudi H. 2015. Enhancing community resilience to climate variability through ecosystem services from forest and trees in Indonesia. Communication at: Eight International Ecosystem Services Partnership Conference 2015: Ecosystem Services for Nature, People, and Prosperity. 9-13 November 2015 Stellenbosch, South Africa

Fedele, G., Locatelli B. and Djoudi H. 2015. Interactions between ecosystem management and people's vulnerability to climate variations in two Indonesian forest landscapes. Communication at: PECS 2015 conference, 3-5 November 2015, Stellenbosch, South Africa

García-Nieto, A.P., Geijzendorffer I., Bondeau A. and Cramer W. 2014. Mapping ecosystem services: synergies and tradeoffs (1st year Phd). Presentation at the Journée des Doctorants, 9rd of July 2014, Aix-Marseille Université, France.

García-Nieto, A.P., Geijzendorffer I., Bondeau A. and Cramer W. 2015. Mapping ecosystem services: synergies and tradeoffs (2nd year Phd). Presentation at the Journée des Doctorants, 10th of June 2014, Aix-Marseille Université, France.

García-Nieto, A.P., Geijzendorffer I., Bondeau A, and Cramer W. 2015. Mapping ecosystem service tradeoffs and synergies in agro-ecosystems (WP2 Practice - Mediterranean Exemplar (Flash talk)). Presentation in OPERAs Project Consortium Meeting, UCD School of Geography, Planning and Environmental Policy University College Dublin 11th March, 2015.

García-Nieto, A.P., Geijzendorffer I., Bondeau A. and Cramer W. 2015. Assessing ecosystem services supply from Mediterranean farming systems: data sources and methods issue challenges. Presentation at the 8th ESP World Conference, Ecosystem Services for Nature, People and Prosperity, 9-13 November 2015, Stellenbosch, South Africa.

Gautier, D., Djoudi H., Locatelli B. and Zida M. 2015. Forest co-management policy and transformational adaptation in Burkina Faso. Communication at: Association of American Geographers (AAG) Annual Meeting Chicago, April 21 to April 25, 2015

Geijzendorffer, I., García-Nieto A.P., Roche P., Martín–López B., Bondeau A. and Cramer W. 2014. Mismatches in supply and demand: Urbanisation as a driver of changes in ecosystem services demand and supply in the Mediterranean basin. 7th Annual ESP Conference September 8th – 12th 2014, San José, Costa Rica.

Grêt-Regamey, A. and Brunner S.H. 2015. Planning pathways to resilient landscapes in collaborative platforms. IALE, Portland, 5-10 July, 2015.

Grigorova, Y. 2015. OPERAs project Lower Danube Exemplar update meeting in Ministry of Agriculture and Food and Executive Agency of Forest; presentation of project results and methods for economic valuation of ES with examples. WWF Bulgaria, 17 June 2015.

Hadzhiyska, D. and Seizov P. Life cycle assessment as a tool for communication and decision support.

Klein, T. M. and Grêt-Regamey A. 2014. About communicating ecosystems services' information - a user demand analysis. In: Book of abstracts of session: C4a-17 - Information technology to support ecosystem services research and practice. 7th Conference of the Ecosystem Service Partnership in Costa Rica, 8-12 September 2014.

Klein, T. M. and Grêt-Regamey A. 2015. Shedding light on the usability of ecosystem services information. In: Book of Abstracts, Session T9 "Ecosystem services to connect spatial planning and impact assessment approaches", 8th Conference of the Ecosystem Services Partnership in South Africa, 9-13 November 2015, p. 12.

Labrière, N., Laumonier Y. and Locatelli B. 2014. Ecosystem services in a multi-functional forested landscape of Borneo: focus on carbon, soil conservation and diversity. British Ecological Society and Société Française d'Ecologie Joint meeting, 9-12 December 2014, Lille, France

Lascurain, J. 2015. ES/NC based management as a way to boost Mediterranean urban dune ecosystems. IALE UK Seascape conference, Edinburgh, Scotland, 7-8 September 2015.

Lascurain, J. 2015. Enabling stakeholders to apply the Ecosystem Services concept in practice. XV International Summer School on Environment, Girona. Spain, October 2015.

Lascurain, J. 2015. Mimicking natural processes on urban dunes. ECOPLANTMED conference. Ecological use of native plants for environmental restoration and sustainable development in the Mediterranean region. Saint Joseph University, Beirut, Lebanon.

Lasseur, R. 2015. Caractérisation de l'utilisation des surfaces agricoles dans la région de Grenoble par télédétection. Colloque Zones Ateliers. Paris.

Lavorel, S. 2015. ESNET - Futur des réseaux de services écosystémiques dans la région urbaine de Grenoble. Journée FRB: Les scénarios de biodiversité à l'heure du changement climatique. Paris, France.

Lavorel, S. 2015. Les apports de l'écologie aux évaluations transdisciplinaires des services écosystémiques. Colloque des Zones Ateliers. Paris.

Lavorel, S., Colloff M., Dunlop M., Gabillet M., Martin-López B., Locatelli B. and Wise R. 2015. Transformative Climate Adaptation in mountain regions. Communication at: Perth III conference: Mountains of Our Future Earth, Scotland, 4-8 October 2015

Lasseur, R., Vannier C., Lefèbvre J., Longaretti P.Y. and Lavorel S. 2015. MODIS data utilization to determine spatial distribution of agricultural practices in the alpine Grenoble area. World conference on Natural Resource Modeling. Bordeaux, France.

Lavorel, S., Bertrand N., Bierry A., Byczek C., Cordonnier T., Lasseur R., Longaretti P.Y., Nettier B. and Vannier C. 2015. A transdisciplinary assessment of future trajectories of land use and ecosystem services in the Grenoble region. Mountains of Our Future Earth. Perth, Scotland.

Liski, A.H. and Wilson M. 2014. Update on Ecosystem Valuation in the Inner Forth. Coastal Zone Forum Annual Workshop, Crieff, Scotland

Liski, A.H. 2014. Coastal Realignment in the Inner Forth. OPERAS Scottish Activities Seminar.

Liski, A.H. 2015. In between the tides. Renaturalizing industrial seascapes through opportunity mapping. Geosciences Postgraduate Research Conference, University of Edinburgh.

Liski, A.H. 2015. Future visions for the Inner Forth coast. Social and cultural meanings of habitat restoration for the local communities. ialeUK annual conference.

Locatelli, B., 2014. Manejar los ecosistemas para enfrentar el cambio climático. Simposio Científico Cambio Climático y Seguridad Alimentaria en Perú: Impacto, Adaptación, Resiliencia, Lima, 16-17 Octubre del 2014

Locatelli, B. 2014. The role of ecosystems in adaptation to climate change. COP20 Side event on “Ecosystem-based Adaptation Effectiveness - Evidence from the field”, IUCN. December 3, 2014, Lima

Locatelli, B. 2015. Integrating Ecosystem-based Adaptation and Mitigation in Africa: Policy and Practice. Keynote in Regional Session L1.1 Africa, Global Science Conference on Climate-Smart Agriculture, 16-18 March 2015, Montpellier, France

Locatelli, B., Pramova E., Chazarin F. and Fedele G. 2015. Managing trade-offs in climate-smart landscapes: A global analysis at multiple. Communication at: Session L3.4 Climate-smart landscapes, watersheds and territories, Global Science Conference on Climate-Smart Agriculture, 16-18 March 2015, Montpellier, France

Locatelli, B., Lavorel S., Tappeiner U., Sloan S. and Geneletti D. 2015. Modelling temporal trajectories of ecosystem services resulting from land-use change and land intensification. Communication at: Eight International Ecosystem Services Partnership Conference 2015, 9-13 November 2015 Stellenbosch, South Africa

Locatelli, B., Di Gregorio M., Fatorelli L. and Pramova E. 2015. Do policy networks connect actors with different agendas related to local and global ecosystem services? Cases of Peru and Brazil. Communication at: PECS 2015 conference, 3-5 November 2015, Stellenbosch, South Africa

Lee, H. and Lautenbach, S. 2014. A quantitative review of relationships between Ecosystem Services, PES (Professorship for Ecological Services) Research Workshop, University of Bayreuth, Bayreuth, Germany, 29-30 September 2014

Lee, H. and Lautenbach S. 2014. A quantitative review of relationships between Ecosystem Services, ACES (A Community on Ecosystem Services Linking Science, Practice and Decision Making) Conference, Washington, D.C., USA 7-12 December 2014

Marin-Spiotta, E., Catterall C., Imbach P., Kumar C., Lasco R., Liao W., Locatelli B., Mercer B., Powers J., Schwartz N., Uriarte M. and Werden L. 2015. Tropical reforestation in a changing climate: opportunities and challenges for mitigation and adaptation. 52nd ATBC conference (Association for Tropical Biology and Conservation), 12-16 July, Honolulu, Hawaii

Mazarrasa, I., Marbà, N., García-Orellana, J., Masqué, P., Arias-Ortiz, A. and Duarte, C.M. Carbon sinks in seagrass (P.oceanica) meadows. Seascape Ecology Conference: Connecting Land, Sea & Society. Edinburgh, Scotland, 7-8 September 2015.

Mazarrasa, I., Marbà, N., García-Orellana, J., Masqué, P., Arias-Ortiz, A. and Duarte, C.M. The effect of wave exposure and human activity on long-term seagrass (P.oceanica) carbon sink capacity. ASLO 2015. Aquatic Science Meeting. Granada, Spain, 23-27 February 2015.

Mupepele, A.C. 2014. A plea for evidence in ecosystem services science: a framework and its application Presentation at the GFÖ 44th annual meeting

Mupepele, A.C. Evidence-based ecosystem services science Presentation in the ecology seminar at the university of Cambridge, 8th of October 2014

Mupepele, A.C. 2015. An evidence assessment tool for ecosystem services and conservation studies Presentation at the ICCB 27th International Congress for Conservation Biology, Symposium 91

Patenaude, G. and Paterson J. 2014. Decision forests within the OPERAs landscape. Oppla (openNESS and OPERAS workshop), 24 September 2015, Edinburgh, UK.

Patenaude, G. and Paterson J. 2014. Guidance for the selection of ES tools and instruments, ESCOM workshop, 7-8 May 2015 Edinburgh, UK

Patenaude, G. and Paterson J. 2015. Recent moves in Decision Guidance towards suitable tools and methods 28th October 2015. OPERAs annual meeting. WP2 flash talks. Aix en Provence, France.

Quétier, F. and van Teeffelen, A.J.A. 2015. Biodiversity management and development: challenges, opportunities and new directions. Symposium at the 27th International Conference of Conservation Biology, Montpellier, 2-6 August 2015.

Rosário, I.T., von Essen M., Nicholas K., Máguas C., Rebelo R. and Santos-Reis M. 2015. Quantificação de Serviços de Ecossistema em diferentes cenários de gestão de montado: a abordagem do projeto OPERA. Public session. Investigação Aplicada e Gestão Florestal na Companhia das Lezírias. Samora Correia, 11 May 2015.

Rosário, I.T., Máguas C., Rebelo R. and Santos-Reis M. 2015. Quantifying Ecosystem Services in the Montado under different management scenarios: the OPERA's Project Approach. Encontros Scientia – cE3c, Lisboa. 29 April 2015.

Sachse, R., Verburg P., Bayer A., Arneth A., Thonicke K. and Walz A. 2014. An example of

ecosystem servic6e trade-off analysis for global scenarios. OPERAs WP3 Workshop, 2-3 December 2014, Edinburgh, UK.

Sachse, R., Verburg P., Bayer A., Arneth A., Thonicke K. and Walz A. 2015. Analysing ecosystem service trade-offs by combined global-scale land change and ecosystem modelling. IALE World Congress, 5-10 July 2015, Portland, Oregon, USA.

Santos-Reis, M., Rosário I.T., von Esse, M., Nichola, K., Mágua, C., Vasconcelo, L. and Rebel, R. 2015. Operas Portuguese Approach. Ecosystem Services in Practice. Research Workshop. Lisboa. 1 October 2015.

Santos-Reis, M. 2014. LTER Networks – Redes de investigação de longo prazo: oportunidades para a investigação e formação. Encontro Scientia 26 November 2014.

Santos-Reis, M. 2014. Cadeias de valor de origem florestal – Ecossistemas Florestais. 1ª Conferência Anual da Rede Agro-Ulisboa. A Ciência Acrescenta Valor, Reitoria da Ulisboa, 13 October 2014.

Schmidt, S. and Seppelt, R. 2014. Mainstreaming ecosystem services in science, business and policy to enhance sustainable development - a review of global ecosystem service databases. ESP (Ecosystem Service Partnership, Local Action for the Common Good) Conference, San José, Costa Rica, 08.-12. June 2014

Schmidt, S. and Seppelt R. 2015. Standardized indicators for monitoring the efficiency of ES based measures. OPERAs Full Consortium meeting, Dublin, Ireland, 10-12 March 2015

Vallet, A., Locatelli B. and Levrel H, 2015. Ecosystem service tradeoffs and ecological-economic production possibilities frontier: a case study in Costa Rica. Communication at: PECS 2015 conference, 3-5 November 2015, Stellenbosch, South Africa

Vallet, A., Locatelli B., Levrel H., Brenes C., Imbach P., Estrada N., Manlay R. and Oszwald J. 2015. From forest transition to ecosystem services transition: Dynamics of ecosystem services in the Reventazón watershed in Costa Rica. Communication at: Eight International Ecosystem Services Partnership Conference 2015, 9-13 November 2015 Stellenbosch, South Africa

van Teeffelen, A.J.A., Schulp, C.J.E. and P.H. 2015. Verburg: Halting the loss of European biodiversity and ecosystem services? Quantifying gains, losses and trade-offs due to land use change under a range of EU policy scenarios. 27th International Conference of Conservation Biology, Montpellier, 2-6 August 2015.

van Teeffelen, A.J.A., Quétier, F., Tucker, G., Watson, M., Boiten, V. and Zellmer, K. 2015. Stakeholder workshop on the use of Ecosystem services in No Net Loss approaches. Montpellier, France, 7 August 2015. 17 international key experts from policy and practice participated in this 1-day event.

Vannier, C., Lefèbvre J., Longaretti P.Y. and Lavorel S. 2014. Analyse spatiale des dynamiques paysagères sur le bassin d'emploi de la région de Grenoble entre 1998 et 2009. SAGEO. Grenoble.

Vannier, C. 2015. Modélisation prospective des changements d'usage des sols et de Services Ecosystémiques dans le bassin de vie de Grenoble Zone Atelier Alpes. Colloque des Zones Ateliers. Paris.

Vannier, C., Lasseur R., Longaretti P.Y. and Lavorel S. 2015. Prospective modelling of land use change in heterogeneous mountain region. Mountains of Our Future Earth. Perth, Scotland.

Walz, A., Paterson J., Schmidt S., Lautenbach S., Dormann C., Nicholas K., Patenaude G., Seppelt R. and Wilson M. 2015. How useful is the ESS concept for operational decision- and policy-making? Forward steps to improve robustness in case study based ecosystem services research. 9th IALE World Congress, Portland, Oregon, USA, 05.-10. July 2015

Winkler, K.J. and Nicholas, K.A. 2015. More than wine: Cultural ecosystem services in English and Californian Vineyard Landscapes. 2015. Bi-annual Conference of the European Society of Ecological Economics, Leeds, UK, July 2015.

WP3

Agarwala, M. (2015). Valuation: ecosystem services and natural capital. At Cambridge Institute for Sustainability Leadership (CISL) & University of Cambridge Doctoral Training Partnership (DTP): Value of Natural Capital. 16th March 2015.

Bayer, A., Lautenbach, S., Pugh, T., Arneth, A. (2015): Contrasting the current and potential optimal provision of Ecosystem Services. Ecosystem Service Partnership, 9.-13.11.2015, Stellenbosch, South Africa.

Bateman, I., Agarwala, M., Binner, A., Coombes, E., Day, B., Ferrini, S., Fezzi, C., Hutchins, M., Lovett, A., & Posen, P. (2015). Spatially explicit integrated modelling and economic valuation of climate-driven land use change and its indirect effects. Delivered by M. Agarwala at European Association of Environmental and Resource Economists (EAERE) Annual Conference. Helsinki, Finland. June 24th 2015.

Bateman, I., Agarwala, M., Binner, A., Coombes, E., Day, B., Ferrini, S., Fezzi, C., Hutchins, M., Lovett, A., & Posen, P. (2015). Spatially explicit integrated modelling and economic valuation of climate-driven land use change and its indirect effects. Delivered by M. Agarwala at Water Economics Policy and Governance Network (WEPGN) annual conference, Calgary, Alberta, Canada. September 4th 2015.

Bullock, C. Ecosystem services sustainability, policy and the private sector. National Sustainability Summit, Dublin, Nov 2015.

Bullock, C. Practical applications of socio-cultural valuation o spatial planning policy. Oppla session of Congress of International Association of Landscape Ecology. Portland, Oregon, July 2015.

Bullock, C. Stakeholder views on ecosystem services, social values and participation. Conference of the European Society of Ecological Economics, Leeds, UK, June 2015.

Collier, M. Novel ecosystems and social-ecological resilience. SER2015: 6th World Congress on Ecological Restoration. Manchester, UK, 23rd-27th August 2015 Session Chair

Collier, M. Socio-cultural ecosystem services. The Irish Sea: History, Culture, Environment, Dublin, 19th- 20th September 2014

Derkzen, ML Van Teeffelen, AJA, Verburg, PH. Quantifying urban ecosystem services based on high-resolution data of urban green space: an assessment for Rotterdam, the Netherlands. European Forum on Urban Forestry (EFUF), 3-7 June 2014, Lausanne, Switzerland.

Koetse, M. Spatial heterogeneity in ecosystem service valuation, presentation at the MAES Valuation Workshop, Brussels, Belgium, 1–2 July 2015.

Koetse, M. Effects of tax non-attendance in choice experiments on environmental value estimates and the WTA-WTP disparity, paper presented at the EAERE 2015 Conference, Helsinki, Finland, 24–27 June 2015.

Koetse, M. Willingness to donate for landscape development and biodiversity conservation, presented at the NWO Biodiversa 2015 Conference, Utrecht, the Netherlands, 9 April 2015.

Krause, T. , Brandstedt, E., Olsson, L. (2014). Can Market-Based Instruments Be Ethically Defended. IARU Conference – Global Challenges: Achieving Sustainanility. Copenhagen, Denmark. 22-24 October, 2014.

Krause, T., Ness, B. (2015). New agroforestry commodities to decrease tropical deforestation and support grower livelihoods in the western Amazon? A study of Ilex guayusa commercialization. Agri-4-Development Conference. Uppsala Sweden. 22-23rd September 2015.

Krause, T., Jung, S. (2015). Benefit Sharing Experience in National Level Conservation Incentives Programs in Ecuador and Peru. OECD Co-operative Research Programme Sponsored Conference - Linking Ecosystem Services To Livelihood Of Local Communities. Seoul National University, South Korea. 11-16 October 2015.

Lautenbach, Sven, Michael Strauch, Gerald Whittaker, Ralf Seppelt , Martin Volk, (2014): Trade-offs of biogas production: comparing crop rotations under different climate scenarios, 7th International Congress on Environmental Modelling and Software (iEMSs), June 15-19, 2014, San Diego, California, USA

Lautenbach, Sven, Martin Volk, Michael Strauch, Gerald Whittaker, Ralf Seppelt (2014): Trade-offs of increasing bio-fuel crop production in a German watershed, Global Land Project: 2014 Open Science MeetingMarch 19, 2014 - March 21, 2014 | Humboldt University - Berlin, Germany

Lautenbach, Sven, Martin Volk, Michael Strauch, Gerald Whittaker, Ralf Seppelt (2014): Water related trade-offs of different crop production schemes for biogas production in a German case study, Workshop “Biomass for energy – lessons from the Bioenergy Boom” (24-25 November 2014, Leipzig, Germany)

Lavorel, S., Colloff, M., Dunlop, M., Gabillet, M., Martin-López, B., Locatelli, B. & Wise, R. (2015) Transformative Climate Adaptation in mountain regions. Mountains of our Future Earth. Perth, Scotland.

Lavorel, S., Colloff, M., Dunlop, M., Gorddard, R. & Wise, R. (2015) Moving forward from Ecosystem-based Adaptation: Transformative climate adaptation. 27th International Congress for Conservation Biology. Montpellier, France.

Lavorel, S., Colloff, M., McIntyre, S., Doherty, M., Murphy, H., Metcalfe, D., Williams, D., Dunlop, M., Wise, R. & Williams, K. (2015) Adaptation Services: How biodiversity can support climate adaptation pathways. Our Common Future Under Climate Change. Paris, France.

Lavorel, S., Locatelli, B., Leitinger, G., Grigulis, K., Schirpke, U., Kohler, M. & Tappeiner, U. (2015) Land use and ecosystem service trajectories in mountain regions. Mountains of Our Future Earth. Perth, Scotland.

Olsson, L., Krause, T., Jerneck A. (2014). For a fairer distribution of ecosystem services: A typology for governing ecosystem functioning. Earth System Governance Conference (ESG). Norwich, UK. 1-3 July 2014.

Olsson, L., & Jerneck A., (2015). Can ecosystem services be governed, if so by whom, for whom and how. Invited seminar at Uppsala University, Centre for Sustainable Development. November 27 2015.

Marbà N. was a Co-chair of the special session “Advances Blue Carbon Research: The Role of Coastal Ecosystems in the Carbon Cycle”, ASLO Aquatic Sciences Meeting 2015, Granada (Spain), 22-27 February 2015.

Schmidt, K., Jones, I., Metzger, M. & Walz, A. (2015) Ecosystem services provided by mountain regions in the vicinity of cities compared to inner urban green spaces, the case of Edinburgh, Scotland. Mountains of Our Future Earth. Perth, Scotland.

Scholte, S.S.K. Public support for wetland restoration: What is the link with ecosystem service values? BIOMOT/BESAFE conference, Brussels, June 2015

Scholte, S.S.K. Social values of wetland ecosystem services. UNESCO-IHP Program Ecohydrology, Lyon, September 2015

ten brink, P. and Russi, D. Making natural capital accounts policy relevant – opportunities and challenges. Presentation to European Environment Bureau Biodiversity working group meeting - ‘EU bidi Strategy implementation & fitness check outcomes: risks & opportunities’ – Brussels, Belgium. 19 November 2015

ten brink, P. What is Natural Capital ? presentation at the seminar – Nature and the Wealth of Nations, Paris, France, 10 September 2015.

ten brink, P. Making natural capital accounts policy relevant – opportunities and challenges. Presentation at the MAES Expert Workshop, Brussels, 1-2 July 2015.

ten brink, P. and Russi, D. Making natural capital accounts policy relevant – opportunities and challenges. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27th & Wednesday 28th January 2015.

ten brink, P. Making natural capital accounts policy relevant – opportunities and challenges, presentation at Expert workshop on key issues in Natural Capital Accounting, Brussels, Belgium, 19 September 2014

ten brink, P. Natural Capital Accounting and Policy, presentation at MAES High Level Group meeting: Thematic Session 3. Natural capital Accounting, Brussels, 22 May 2014

ten Brink P., Lehmann M., Kretschmer B., Newman S., and L, Mazza (2014) ‘EHS and biodiversity’ in Oosterhuis F., and ten Brink P. (eds.), Paying the Polluter. Environmentally

Harmful Subsidies and their Reform. Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.

ten Brink P., Mazza L., Badura T., Kettunen M. and Withana S. (2014) 'Governance of the Transition to a Green Economy – Responding to the Values of Nature', In Nunes, P., Kumar, P., Dedeurwaerdere, T., (eds.) Handbook on the Economics of Biodiversity and Ecosystem Services

Van Teeffelen, AJA, C.J.E. Schulp & P.H. Verburg (2015) Halting the loss of European biodiversity and ecosystem services? Quantifying gains, losses and trade-offs due to land use change under a range of EU policy scenarios. 27th International Conference of Conservation Biology, Montpellier, 2-6 August 2015.

WP4

IALE world congress, Portland USA (5-10 Jul 2015)

Session S06: Operationalizing the Ecosystem Services Concept: Building a Resource Hub to Support a Growing Ecosystem Services Community of Practice.

Session S06-3: OPERAs exemplars on Our Ecosystem – a web platform for publishing, sharing and managing spatial data. (Karin Viergever, Ecometrica)

International Symposium on Northern Development, 25-27 February 2015, Québec City, Canada; Ecosystem services and green economy

World Parks Congress, 12 -19 November 2014, Sydney, Australia, session on fresh water; value of protected areas, water related ecosystem services

Posters

WP2

Ambros, P. 2015. Multifunctional land use as a means for preserving ecosystem services in estuary wetlands. SeaScape Ecology: Connecting land, sea, and society. UK International Association for Landscape Ecology. University of Edinburgh, Scotland. September 2015.

Drobnik, T., Brunner S.H. and Grêt-Regamey A. 2015. OPSOL: Matching soil functions and soil uses in space and time for sustainable spatial development and land management. 3rd NRP68 Programme Conference, Montreux, 13-14 November 2015.

García-Nieto A.P., Geijzendorffer I., Roche P., Martín–López B., Bondeau A. and Cramer W. 2014. Urbanisation as a driver of changes in ecosystem services demand and supply in the Mediterranean Region – Supply side. 3rd International Conference: Biodiversity and Food Security – From Trade-offs to Synergies, 29-31 October 2014, Aix-en-Provence, France.

García-Nieto, A.P., Geijzendorffer I., Roche P., Martín–López B., Bondeau A. and Cramer W. 2014. Mapping ecosystem services tradeoffs: Urbanisation as a driver of changes in ecosystem services demand and supply in the Mediterranean basin. 2nd OT-Med Progress Meeting: 27-28 November 2014, Carry-Le-Rouet, France.

Geijzendorffer, I., García-Nieto A.P., Roche P., Martín–López B., Bondeau A. and Cramer W. 2014. Urbanisation as a driver of changes in ecosystem services demand and supply in the Mediterranean Region – Demand side. 3rd International Conference: Biodiversity and Food Security – From Trade-offs to Synergies, 29-31 October 2014, Aix-en-Provence, France.

Geijzendorffer, I., García-Nieto A.P., Roche P., Martín–López B., Bondeau A. and Cramer W. 2014. Mismatches in supply and demand: Urbanisation as a driver of changes in ecosystem services demand and supply in the Mediterranean basin. 2nd OT-Med Progress Meeting: 27-28 November 2014, Carry-Le-Rouet, France.

Lee, H., García-Nieto A.P., Bondeau A., Lautenbach S., Cramer, W. and Geijzendorffer I. 2015. Trade-offs in Ecosystem Services (ES) in the Mediterranean region - a systematic review. Presentation in OPERAs Project Consortium Meeting, 10-12th March, 2015, UCD School of Geography, Planning and Environmental Policy University College Dublin, Ireland.

Liski, A.H. 2014. Coastal Realignment in the Inner Forth. Annual ialeUK 2014 Conference.

Nicholas, K.A. 2014. Illustrating Nature-Human Interactions in Ecosystem Services: The case of terroir in wine. American Geophysical Union, San Francisco, California, USA, December 2014.

Rosário, I.T., von Essen M., Nicholas K., Koetse M., Máguas C., Rebelo R., and Santos-Reis M. 2015. Valuing Ecosystem Services in the Montado Landscape: the OPERA's Project Approach. 1st Annual Meeting cE3c. Lisboa, 19-20 June 2015.

Rosário, I.T., von Essen M., Nicholas K., Koetse M., Máguas C., Rebelo R. and Santos-Reis M. 2015. Valuing Ecosystem Services in the Montado Landscape: the OPERA's Project Approach. 4º Encontro Ibérico de Ecologia. Coimbra, 16-19 June 2015.

Tegegne, Y.T. and Tuomasjukka D. 2015. Measuring trustworthiness of ecolabelling schemes. World Forestry Congress, Durban, South Africa, 7-11 September 2015.

Trabucchi, M., Cramer W., Bondeau A. and Decock S. 2014. The role of soils for sustainable ecosystem services in the Mediterranean Basin. GLP Open Science Meeting, Berlin, 19-21 March 2014.

Tuomasjukka, D., Tegegne Y.T. and Wolfslehner B. 2015. Measure to Manage: developing an indicator framework for quantifying ES/NC. World Forestry Congress, Durban, South Africa, 7-11 September 2015.

Winkler, K., Viers J.H., Rodd K. and Nicholas K.A. 2015. Ecosystem Services and Vineyards. 2015. World Congress on Wine and Vine, Mainz, Germany, July 2015.

WP3

Bayer, A., Arneth, A., Lautenbach, S.,Pugh, T. LPJ-GUESS for Ecosystem Service research. Dynamic global vegetation Modelling: towards a third generation, Workshop, Landskrona, Sweden, 11-13 May 2015.

Schmidt, K. (2015) Non-monetary methods for the valuation of ecosystem services : Comparing rating, weighting and trade-off results. Alter-NET summer school 2015. Peyresq, France.

WP4

2 posters at XIV World Forestry Congress (WFC) Durban, South Africa, 6-10/9/2015 (http://webapps.daff.gov.za/wfc2015/) :

ES indicators

Ecolabel review

Journal Papers published

WP2

Brändle, J.M., Langendijk G., Peter S., Brunner S.H. and Huber R. 2015. Sensitivity analysis of a land-use change model with and without agents to assess land abandonment and long-term reforestation in a Swiss mountain region. *Land*, 4: 475-512. URL: http://www.mdpi.com/2073-445X/4/2/475

Brunner, S.H., Huber R. and Grêt-Regamey A. 2015. A backcasting approach for matching regional ecosystem services supply and demand. *Environmental Modelling and Software*, in press: doi:10.1016/j.envsoft.2015.10.018.

Bullock, C. and O'Shea R. 2016. Prospects for estimating the social value of environmental damage remediation based on value estimates for ecosystem services. *Journal of Environmental Planning and Management*, forthcoming Jan 2016.

Bullock, C., Hawe J. and Little D. 2014. Realising the ecosystem service value of native woodland in Ireland. *New Zealand Journal of Forestry Science*, in press.

Bierry, A., Quétier F., Baptist F., Wegener L. and Lavorel S. 2015. Apports potentiels du concept de services écosystémiques au dialogue territorial. Sciences, Eaux & Territoires, in press.

Chazarin, F., Locatelli B. and Garay-Rodríguez M. 2014. Mitigación en la selva, adaptación en la sierra y la costa: ¿Oportunidades perdidas de sinergias frente al cambio climático en Perú? Ambiente y Desarrollo 18(35): 95-107. doi:10.11144/Javeriana.AyD18-35.msas

Collier, M.J. 2015. Novel ecosystems and social-ecological resilience. *Landscape Ecology,* 80(8) 1363-1369. URL: http://link.springer.com/article/10.1007%2Fs10980-015-0243-z

Collier, M.J. 2015. Novel ecosystems and the emergence of cultural ecosystem services. *Ecosystem Services* 9, 166-169. URL: http://www.sciencedirect.com/science/article/pii/S2212041614000606

Fader, M., Von Bloh W., Shi S., Bondeau A. and Cramer W. 2015. Modelling Mediterranean agro-ecosystems by including agricultural trees in the LPJmL model Geoscientific Model Development 8:3545-3561, doi: 10.5194/gmd-8-3545-2015

Gaveau, D.L.A., Salim M.A., Hergoualc'h K., Locatelli B. et al., 2014. Major atmospheric emissions from peat fires in Southeast Asia during non-drought years: evidence from the 2013 Sumatran fires. Nature Sci Rep 4:6112. doi:10.1038/srep06112

Gaucherand, S., Schwoertzig E., Clément J.C., Johnson B. and Quétier F. 2015. The cultural dimensions of freshwater wetland assessments: lessons learned from the application of US rapid assessment methods in France. *Environmental Management* 56(1), 245-259. URL: http://link.springer.com/article/10.1007%2Fs00267-015-0487-z#/page-1

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Table 3 Work Package Person Months per Partner

		WP1 PROJECT MANAGEMENT		WP2 PRACTICE		WP3 KNOWLEDGE		WP4 INSTRUMENTS		WP5 RESOURCE HUB		WP6 OUTREACH & DISSEMINATION		
		PERSON MONTHS		**PERSON MONTHS**		**PERSON MONTHS**		**PERSON MONTHS**		**PERSON MONTHS**		**PERSON MONTHS**		**SECOND PERIOD Participant total**
PARTICIPANT NAME		**SECOND PERIOD**	PROJECT TOTAL	**SECOND PERIOD**	PROJECT TOTAL	**SECOND PERIOD**	PROJECT TOTAL	**SECOND PERIOD**	PROJECT TOTAL	**SECOND PERIOD**	PROJECT TOTAL	**SECOND PERIOD**	PROJECT TOTAL	
1	**UEDIN**	**30.72**	44.00	**21.96**	41.00			**8.6**	21.00	**1.35**	15.00		12.00	62.63
2	**VU-IVM**	**3.6**	4.00		15.00	**31**	62.00		6.00					34.60
3	**KIT**	**1**	4.00	**3**	9.00	**14.2**	44.00							18.20
4	**UFZ**			**4**	10.00	**5**	6.00			**1**	2.00			10
5	**ULUND**	**6.1**	4.00	**7**	15.00	**11**	14.00	**8.9**	20.00		5.00		4.00	33
6	**EFI**	**0.61**	4.00					**17.36**	53.00	**0.58**	5.00			18.55
7	**PROSPEX**									**11.85**	20.00			11.85
8	**WCMC**		4.00					**10.79**	23.00	**4.24**	12.00	**1.1**	12.00	15.03
9	**TIAMASG**							**1.75**	16.00	**15.75**	25.00	**3**	12.00	20.05
10	**IEEP**					**7.57**	21.00	**7.57**	24.00	**0.1**	3.00			15.24
11	**UCD**			**16.2**	9.00	**12**	27.00		3.00					28.20
12	**CNRS**			**15.56**	32.00	**5.28**	34.00					**0.3**	9.00	21.14
13	**UP**		1.00	**12.3**	33.00	**6.75**	11.00		6.00					19.05
14	**ETH**				5.00	**0.44**	9.00	**13.46**	38.00				5.00	13.90
15	**WWF Bulgaria**			**5.02**	15.00	**1.24**	5.00	**5.49**	14.00				10.00	11.75
16	**WWF Romania**			**0.7**	5.00								3.00	0.70
17	**SGM**			**4.28**	12.00									4.28
18	**FFCUL**			**7.5**	12.00									7.50
19	**ECM**							**2.2**	6.00	**3.1**	7.00			5.3
20	**BIOTOPE**							**4.43**	29.00					4.43
21	**IODINE**					**2.3**		**8.6**	10.00					10.90
22	**DENKSTATT**				2.00			**4.9**	24.00		3.00			4.90
23	**CIFOR**				10.00				3.00		2.00			
24	**CSIC**			**2.5**	13.00	**2**	6.00							4.5
25	**UEA**					**7.14**	12.00							7.14
26	**ALU**			**6**	14.00			**5**	6.00	**7**	3.00			18
27	**UBO**			**9.7**	20.00	**2**	6.00	**3.5**	6.00	**1.36**	3.00			16.56
	Total Months		**65**		**272.00**		**257.00**		**308.00**		**105.00**		**67.00**	