Future of Ecosystem Services

Research Center

(FuturES)

Annual Report 2015
FuturES: Future of Ecosystem Services

The concept of ecosystem services—the benefits derived from human interactions with, and appropriation of, the physical structures and processes occurring in (natural and human dominated) ecosystems—has emerged as one of the most important new paradigms of the environmental and sustainability sciences in the last fifteen years. The notion of ecosystem services has the potential to act as a boundary object, capable of bringing together various scientific domains of knowledge that study the interactions and interdependencies between human society and nature. Synthesising such knowledge may provide vital and encompassing understandings, and inform sustainable management, of social-ecological systems.

FuturES, founded in 2012, brings together the diverse expertise of researchers at Leuphana University of Lüneburg across a wide range of disciplines such as communication science, ecology, economics, ethics, political science and management. FuturES seeks to foster genuinely interdisciplinary collaboration between a broad spectrum of the natural and social sciences, and the active involvement of stakeholders and policy makers in shaping research goals and methods (transdisciplinary approach) within the broader conceptual framework and societal goal of sustainability.

FuturES expands on the existing research in the field of ecosystem services by relating the (largely) descriptive concept of ecosystem services to the explicitly normative concept of sustainability. A particular emphasis is on trade-offs and conflicts between multiple services and the uncertainties inherent in the generation and appropriation of ecosystem services. In doing so FuturES seeks to develop new management and governance strategies for the management of ecosystem services with explicit regard to the goal of sustainability.

FuturES is the first research center in Germany that takes a truly encompassing and integrated approach to ecosystem services. This approach places it among a small number of institutions worldwide, seeking not simply to use the concept of ecosystem services within established research approaches, but to actively strengthen the concept as a new tool in the search for sustainability solutions.
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Highlights

The most important events and developments of the past year for the FuturES research center included the following:

- In 2015 FuturES was joined by three new team members. Vicky Temperton was appointed the professorship for Ecosystem Functioning and Ecosystem Services at Leuphana University in April 2015 and shortly after took on the position as director of FuturES in place of Henrik von Wehrden. Dave Abson left FuturES to join the project “Leverage Points for Sustainability Transformation: Institutions, People, Knowledge” as a PI and his position as coordinator of FuturES was filled by Heike Zimmermann. The third new member of FuturES in 2015 is Berta Martín-López, who successfully applied for the new professorship for Sustainability Science at Leuphana in October 2015.

- In 2015 FuturES had over 50 members including 8 professors, more than 15 postdoctoral researchers and 29 PhD students, from a diverse range of scientific fields, providing a breadth of knowledge and understanding regarding many aspects of ecosystem services.


- During 2015, FuturES researchers worked on ecosystem services related research projects with a combined value of more than 6 million euros.

- Two members of FuturES were among five PIs from Leuphana university who successfully applied for a 1 million euro grant application on “Bridging the great divide in sustainability science: linking high-performance modelling and transition experiments to foster transformational change towards sustainability” due to start in 2016.

- In 2015, a group of FuturES members, including eight full professors and three early career researchers, made substantial progress in moving forward the proposal for a Research Training Group (DFG). A number of topic explorations during several meetings let to a common topic that is both innovative and engaging for all and would be ideal for a Research Training Group.

In this Annual Report, the various achievements of the past year are described in more detail.
Team

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Prof. Dr. Berta Martín-Lopéz  
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Research Projects

Basic funding for FuturES comes from Leuphana University of Lüneburg. In addition, FuturES research center members are undertaking externally funded research projects with a total value to Leuphana University of Lüneburg of approximately 5 million euros.

Externally Funded Projects Completed

<table>
<thead>
<tr>
<th>Project title</th>
<th>Principal Investigators (at Leuphana)</th>
<th>Period</th>
<th>Source of funding</th>
<th>Funding for Leuphana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fostering sustainable development in Eastern Europe: A case study of ancient agricultural landscapes in Central Romania</td>
<td>Fischer, J.</td>
<td>2010-2015</td>
<td>Sofja-Kovalevskaja Award / Alexander von Humboldt Foundation</td>
<td>€1,500,000</td>
</tr>
<tr>
<td>Plant growth and demography; SP2 in the BEF-China research unit</td>
<td>Härdtle, W.</td>
<td>2011-2014</td>
<td>German Research Foundation (DFG)</td>
<td>€150,000</td>
</tr>
<tr>
<td>Population genetics meets landscape ecology in the biodiversity exploratories: a case study on genetic differentiation of ground beetle populations (PopGeneLand)</td>
<td>Aβmann, T.</td>
<td>2011-2014</td>
<td>German Research Foundation (DFG)</td>
<td>€206,400</td>
</tr>
<tr>
<td>Functional effects of herbivores, predators and saproxylics (Subproject 8 of DFG research group BEF China)</td>
<td>Aβmann, T.  Härdtle, W.</td>
<td>2011-2014</td>
<td>German Research Foundation (DFG)</td>
<td>€46,800</td>
</tr>
<tr>
<td>Academic partnership for the conservation of biodiversity</td>
<td>Michelsen, G., Rieckmann, M., Adomßent, M</td>
<td>2011-2014</td>
<td>German Academic Exchange Service (DAAD)</td>
<td>€113,350</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>ca €2,366,550</td>
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</table>
# On-going Externally Funded Projects

<table>
<thead>
<tr>
<th>Project title</th>
<th>Principal Investigators (at Leuphana)</th>
<th>Period</th>
<th>Source of funding</th>
<th>Funding for Leuphana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying Social-Ecological System Properties Benefiting Biodiversity and Food Security</td>
<td>Fischer, J.</td>
<td>2014-2019</td>
<td>ERC Consolidator Grant</td>
<td>€1,800,000</td>
</tr>
<tr>
<td>Plant growth and demography; SP2 in the BEF-China research unit</td>
<td>Härdtle, W.</td>
<td>2014 - 2016</td>
<td>German Research Foundation (DFG)</td>
<td>€172,750</td>
</tr>
<tr>
<td>Multi-trophic plant-insect networks in a tree diversity experiment in China, SP9 in the BEF-China research unit</td>
<td>Aßmann, T.</td>
<td>2014 - 2016</td>
<td>German Research Foundation (DFG)</td>
<td>€21,780.00</td>
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<tr>
<td>Mechanisms of soil erosion, soil properties and Ecoscape analysis as a function of species richness and species composition in subtropical forests; SP6 in the BEF-China research unit</td>
<td>Aßmann, T.</td>
<td>2014-2016</td>
<td>German Research Foundation (DFG)</td>
<td>€24,359.00</td>
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<tr>
<td>Exploring priority effects over time for grassland restoration</td>
<td>Temperton, V.</td>
<td>2013-2016</td>
<td>Ciencia sem Fronteira (CNPq)</td>
<td>€99,000</td>
</tr>
<tr>
<td>Land-use responses of dung beetle communities and their ecosystem services</td>
<td>Aßmann, T.</td>
<td>2014-2017</td>
<td>German Research Foundation (DFG)</td>
<td>€23,600</td>
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<tr>
<td>Protection of the worldwide endangered species Gagea spathacea (WaldGloWan)</td>
<td>Härdtle, W.</td>
<td>2013-2019</td>
<td>BMBF</td>
<td>€432,000</td>
</tr>
<tr>
<td>Critical Loads for heathland ecosystems</td>
<td>Härdtle, W.</td>
<td>2012-2016</td>
<td>UBA</td>
<td>€170,000</td>
</tr>
<tr>
<td>Multi-agri: Multifunctional agricultural land-use</td>
<td>Newig, J., Fischer, J.</td>
<td>2013-2016</td>
<td>RURAGRI ERA-NET (EU FP7)</td>
<td>€300,000</td>
</tr>
<tr>
<td>Responses of plant performance and functional diversity along a climate and land-use gradient in Mongolia</td>
<td>von Wehrden, H.</td>
<td>2014-2017</td>
<td>DFG</td>
<td>€186,120</td>
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<tr>
<td>Increasing agricultural nutrient-use efficiency by optimizing plant-soil-microorganism interactions (INPLAMINT)</td>
<td>Temperton, V., von Wehrden, H.</td>
<td>2015-2018</td>
<td>BMBF</td>
<td>€147,198</td>
</tr>
<tr>
<td>Leverage Points for Sustainability Transformation</td>
<td>Lang, D., Newig, J., Fischer J., von Wehrden, H.</td>
<td>2015-2019</td>
<td>Volkswagen Stiftung</td>
<td>€2,700,000</td>
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</tbody>
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**Total** €6,076,807
PhD Research

In 2015 there were 29 PhD students associated with FuturES, engaging in very diverse research related to ecosystem services. The research undertaken ranges from ecosystem function through governance, economics, justice, food security and biodiversity conservation and leverage points in social-ecological systems.

PhD Theses Completed

Dorresteijn, I., The Future of birds and large carnivores in Romania, Transylvania
Gralla, F., Sustainable perspective on nuclear energy and possible challenges
Groeneveld, J. How oil plant cultivation should be designed to safeguard ecosystem services and biodiversity
Loos, J., The future of plants and butterflies in Transylvania
Li, Y., Tree growth and aboveground competition in subtropical forest ecosystem in southeast China
Milcu, A., Cultural ecosystem services and historical changes
Mikulcak, F., Fostering sustainable development in Eastern Europe
Schäckermann, S., Biodiversity and its role in the ecosystem services and dis-services concept in agricultural landscapes in Israel

PhD Theses On-going

Ahlborn, J. Biodiversity and community traits across a land use gradient in Mongolia
Bähring, A., Nitrogen (N) inputs in ecosystems endangered by eutrophication
Boutaud, E., Semi-open corridors: ground beetles
Derwort, P., Institutional change in energy systems
Dorninger, C., Biophysical human-nature connectedness
van Duijnen, R., Root properties in relation to nutrient supply
Dziedek, C., Interactive effects of nitrogen deposition and drought on forest ecosystems
Eggers, J., Fragmentation effect and traffic intensity on populations flightless beetle species

Ehlers, D., Semi-open corridors: spiders and stenotopoic vertebrates

Hess, C., Quantification of forests dynamics based on TLS (Terrestrial Laser Scanning)

Hülsmann, M., Faeces decomposition, biodiversity and ecosystem resilience

Jahn, S., Role of social sciences in inter- and transdisciplinary sustainability research (MONA)

John, B., Learning for transitions in urban areas

Laws, N., Tangible Sustainability Policy: Possibilities and constraints of the establishment of biodiversity as a cross-cutting issue on the German federal level

Lutz, L., Energy transition in Germany and the role of regions for the implementation of renewable energy

Manlosa, A., Livelihood strategies and food security of different social groups in Ethiopia

Marcus, T., The effects of land use type and intensity on genetic diversity of ground beetles

Mausolf, K., Ecological continuity

Oyundari, C., Sustainable use of oases in the Gobi desert

Rau, A-L, Temporal aspects of Ecosystem services

Rodrigues, P., Human-wildlife interactions and sources of conflict

Röllig, R., European Wood-pastures

Senbeto, T., Governance of food security and biodiversity in South Western Ethiopia

Shumi, G., Effects of land use changes (food production) on biodiversity and ecosystem services

Travers, E., Importance of semi-open corridors for habitat cross-linking

Weidlich, E., Exploring priority effects over time for grassland restoration

Zumstein, P., Decomposers and predators in the CSPs of BEF China
Publications

Research results of FuturES have been published in a wide range of books and academic journals — 64 publications altogether, including 61 articles in international peer-reviewed journals. Many interdisciplinary publications have been written with co-authors from other academic disciplines and institutions.

International Peer-reviewed Journal Publications


factors influencing decision quality and implementation in four case studies from Germany. Land Use Policy, 46, 211–222.


**Other Publications**


Services to the Scientific Community

Editorial Services

FuturES members edited, or were associate or subject editors for, the following international peer-reviewed journals:

- Conservation Letters (Fischer, J.)
- Diversity and Distributions (Fischer, J.)
- Environmental Policy and Governance (Newig, J.)
- Ecology and Society (Fischer, J. & Martín-López, B.)
- Frontiers in Plant Science (Temperton, V.)
- Restoration Ecology (Temperton, V.)
- Tuexenia (Härdtle, W.)
- ZooKeys (Aβmann, T.)

Advisory Services

FuturES members sat on the following scientific steering committees, advisory boards, etc:

- Härdtle, W., Beirat des Vereins Naturschutzpark Lüneburg Heide (VNP)
- Martín-López, B., ipbes review editor (3a chapter 5)
- Temperton, B., on the advisory board of the South Korean National Institute of Ecology
- Zimmermann, H., Steuerungsgruppe “ÖSL in Lehre und Umweltbildung” Innovationsnetzwerk Ökosystemleistungen Deutschland
Looking ahead

Our application for a Graduate School at the DFG (Research Training Group) has gained momentum. A group of FuturES members, including eight full professors and two early career researchers, are engaged to move forward the proposal on a common topic, approaching it from various disciplinary perspectives. The focus of a DFG Research Training Group is the supervision and training of PhD students on a novel topic within an interdisciplinary setting. To that end, Ecosystem Services present the perfect framework for an interdisciplinary setting and our group of applicants cover a broad range of disciplines. A kick-off workshop is planned with potential Mercator Fellows in summer 2016 to further gather and frame ideas on our Research Training Group. The Mercator Fellows will strengthen the international component of the group as well as contribute to gender balance.

In line with our Research Training group, FuturES is a member of steering committee “Teaching and Education” in the Ecosystem Service Partnership network Germany (ESP-DE) since November 2015. The aim of this network is to connect scientist working on the Ecosystem Service concept and to move the concept further into society. The steering committee “Teaching and Education” aims to be a knowledge hub for students and scholars on existing study programmes on Ecosystem Services, but will also initiate workshops and summer schools on Ecosystem Services as well as distribute training material.

The main strategic goal for 2016 will be to submit our proposal for the Research Training Group at the DFG. Therefore our main aim for the future of FuturES will be to move from a Research Centre into a Research Training Group.
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