Stockholm Resilience Centre
Research for Governance of Social-Ecological Systems

Stockholm University

Stockholm Resilience Centre
Annual Report 2012

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Stockholm Resiliance Centre Annual Report 2012

Chair's preface

Professor Arild Underdal,
Chair of the Board

THE STOCKHOLM RESILIENCE CENTRE (SRC) not only advances sustainability science and solutions, it also stands as a significant experiment in how universities can pursue interdisciplinary research across disciplines and faculties, while still attracting young scholars, providing good career pathways and generating good academic results in science and education. Similar efforts at universities around the world of setting up "sustainability centres" are often virtual institutions, with a small coordinating unit surrounded by a wide network of scientists based at the disciplinary "home" departments.

The Stockholm Resilience Centre is an attempt of applying a different strategy. Here the idea of Mistra, the core funder of the centre, was to invest in a critical mass of scientists from the natural and social sciences who would operate under one roof in a common organization with the aim of creating a new research environment for the advancement of integrated sustainability science. To mark the cross-faculty character of the centre and to stimulate a truly interdisciplinary evolution, the centre was placed outside of the faculty structure.

This placement has had its pros-and-cons, and in 2012 a decision was taken to move the SRC inside the Stockholm University structure. With the support of the university leadership and the university board, this move has now been made in a way that provides excellent opportunities for SRC to continue, just as before, to pursue cross-faculty research and education in the pursuit of integrated sustainability research. From 1 January 2013 the SRC is part of the Faculty of Science at the university. It will maintain all its organizational structures, from an international governing board to the ability to recruit scientific staff and students from all disciplines. At the same time SRC can now contribute more actively to the development of interdisciplinary research and education at the university.

This organizational transition has occurred during a year when the centre has also been preparing for its large external evaluation.

ARILD UNDERDAL

This organizational transition has occurred during a year when the centre has also been preparing for its large external evaluation. The original Mistra decision to support the SRC consisted of a start-up phase (2007–2009), after which the centre was evaluated by Professor William C. Clark at Harvard University. After this followed the first ordinary phase of support (2010–2013). To secure a 2nd phase in line with the original decision, the SRC will now go through an international evaluation to qualify for core support from Mistra for the period 2014–2018. Some of the highlights from the SRC's achievements from 2007–2012, which will form a basis for this evaluation, are presented in this annual report. The full progress report for 2007–2012 will be available on the SRC's website.

Professor Arild Underdal,
Chair of the Board

Vision & Mission

The *vision* of the Stockholm Resilience Centre is a world where social-ecological systems are understood, governed and managed, to enhance human well-being and the capacity to deal with complexity and change, for the sustainable co-evolution of human civilizations with the biosphere.

The *mission* of Stockholm Resilience Centre is to advance research for governance and management of social-ecological systems to secure ecosystem services for human well-being and resilience for long-term sustainability. We apply and further develop the scientific advancements of this research within practice, policy and academic training.

Directors' view

WE APPLY A social-ecological systems approach and resilience thinking in our research. A diversity of theories and methods from different disciplines are applied to solve complex problems and advance new insights. This requires inter-disciplinary learning from natural sciences, social sciences and the humanities, and transdisciplinary approaches through co-production of knowledge with practitioners and other stakeholders.

Over the years we have gradually refined this framework. We depart from the strategic role of advancing new knowledge on biosphere stewardship and innovation in the Anthropocene, with a strong emphasis on ecosystem services and human well-being. We see nature and society as truly interdependent, complex and adaptive social-ecological systems, subject to cross-scale and dynamic interactions. Three challenges are of particular interest in our work:(i) the existence of potential thresholds and regime shifts and what they imply for societies, (ii) the adaptive capacity to deal with rising uncertainty and surprise, (iii) the capacity, in situations of crisis, to ensure that social-ecological systems can sustain and enhance ecosystem services and human well-being.

Our scientific approach has, we believe, served us well. The results of our scientific achievements from 2007-2012 reveals, encouragingly, relevance and impact, with 525 publications in scientific journals and books.

We also place a strong emphasis on creating a seamless continuum between research, teaching and training, dialogues and communication, administration and working environment.

In 2012, we applied some resilience thinking to our own organization as we went through the important process of clarifying our placement within Stockholm University (see Chair's View). We also started preparing our long-term action plan with regards to funding and strategic directions. Our group of senior research and teaching staff continues to grow, with five full professors and eight docents (associate professors) as of early 2013. The middle of 2012 also marked the point when Johan Rockström stepped down as head of SEI to engage full-time as Director of the centre.

Our integration into the Science Faculty from 1 January 2013 also included two important developments in our institutional set-up. The first is that the Natural Resource Management (NRM) group at the Department of Systems Ecology, which has been collaborating closely with us over the years, has formally become a part of the centre from 1 January 2013. This will not only boost our staff but also complete our research school with our own PhD education in Sustainability Science. We are very proud and excited to welcome all our NRM colleagues to the SRC!

Furthermore, after six years together, a large part of the Baltic Nest modeling team (BNI) moved out from SRC to help form the new Stockholm University Baltic Sea Centre. This centre is an important integration of scientific strength at the university, and we wish our colleagues the best of luck in this new endeavour!

Overall, 2012 was about building our own institutional resilience and defining our research challenges and priorities for the coming years. Given the continued recognition of resilience thinking, we look forward to continue being a provider of knowledge for change at the frontier of sustainability thinking.

Johan Rockström,
Centre director

Carl Folke,
Science director

Olof Olsson,
Deputy director

Our funders

Since the launch of the Stockholm Resilience Centre, the support from our funders has been a determining factor for our success. We would like to express our gratitude to the following funders that have supported the centre:

Formas – The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning

Kungl. Vetenskaps-Akademien – The Royal Swedish Academy of Sciences

Funded by MISTRA – The Swedish Foundation for Strategic Environmental Research

Sida – Swedish International Development Cooperation Agency

Vetenskapsrådet

The Nippon Foundation

Svenska Postkod Stiftelsen

Stordalen Foundation

Swedish Agency for Marine and Water Management

In edition to Stiftelsen Futura and Ebba och Sven Schwartz stiftelse

A TRUE PIONEER

In 2012, the world lost one of the most inspirational and important individuals for the development of social-ecological research. Elinor Ostrom died 12 June from pancreatic cancer at the age of 78 years

OSTROM TAUGHT THE world that the commons is not such a tragic place after all. She countered the conventional wisdom that only private ownership or top-down regulation could prevent "the tragedy of the commons," a scenario where users would inevitably destroy the resources that they held in common.

Through an interdisciplinary approach that combined theory, field studies and laboratory experiments, "Lin", as she was called among friends and colleagues, showed that people are capable of creating rules and institutions that allow for the sustainable and equitable management of shared resources.

"Pioneers always have a hard time with the conventional. Lin struggled without losing vision or focus, tirelessly and with deep commitment. She was incredibly impressive in breaking through many barriers on her way to a remarkable set of life achievements," said centre scientific director Carl Folke.

Curious till the end

Ostrom was always open for new findings and new thinking. She was deeply engaged in research on social-ecological systems and resilience thinking. She was excited about learning and rethinking earlier views, and expand frameworks and understanding across the sciences. It was never about defending turf but all about collaboration.

At Indiana University, she was senior research director of the Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis, Distinguished Professor and Arthur F. Bentley Professor of Political Science in the College of Arts and Sciences, and professor in the School of Public and Environmental Affairs.

Ostrom provided groundbreaking insights on sustainable collective action, ranging from the institutional dimensions of sustainability to the effectiveness of urban police departments. She was instrumental in the development of the International Association for the Study of the Commons, and her work on common pool resource management has been truly influential with the well-known 1990 book Governing the Commons: the Evolution of Institutions for Collective Action.

As the first woman ever, Professor Elinor Ostrom received the 2009 Prize in Economic Sciences in memory of Alfred Nobel "for her analysis of economic governance, especially the commons" and groundbreaking research on how people organize themselves to manage resources.

An intellectual sharpness

In April 2012, she was among Time magazine's annual list of the 100 most influential people in the world. She was a member of the American Academy of Arts and Sciences, the US National Academy of Sciences and the American Philosophical Society.

"Lin's cooperative spirit and enthusiasm, and her intellectual sharpness combined with curiosity and excitement about new ideas was simply unique. She inspired, interacted and collaborated with numerous colleagues throughout the world and her true interest and engagement with young people supporting their pathways was exemplary," Carl Folke said.

She received numerous international awards, including honorary doctorates from universities in India, France, Germany, Sweden, Canada, the Netherlands, Switzerland, Norway and the United States. She served on the editorial boards of more than two dozen academic journals and is the author of hundreds of articles and chapters and more than two dozen books.

Her imprint will continue to inspire, influence and guide researchers and decision-makers worldwide.

Lin's cooperative spirit and enthusiasm, and her intellectual sharpness combined with curiosity and excitement about new ideas was simply unique.

CARL FOLKE *centre scientific director*

Our research framework

The core focus of the Stockholm Resilience Centre is to advance research on the frontier of sustainability science, applying a social-ecological approach and resilience thinking

THE SOCIAL-ECOLOGICAL approach emphasizes humanity as an embedded part of the biosphere, depending on the generation of ecosystem services for human well-being, while simultaneously shaping it from local to global scales. Resilience thinking is about complex dynamics, how periods of gradual changes interact with abrupt changes, and the capacity to adapt or even transform into new development pathways in the face of dynamic change.

All SRC research rests on the worldview that the biosphere forms the critical life-support system underpinning human and social development. Humanity is an integral part of this biosphere, dependent for human well-being upon ecosystem services that it provides, but also transforming its structure and function at unprecedented speed and scale. The SRC's organizational design is to 'frame creativity' through this articulated worldview, guiding and defining a problem space in which creativity and innovation are allowed to flourish. The SRC's overarching mission has, from its inception, been to mobilize and integrate diverse expertise in pursuit of research capable of addressing this challenge. Achieving such a mission requires developing and implementing research strategies, organizational structures, and team-building processes that enable, support and stimulate creativity, innovation, and cutting-edge research, ranging from disciplinary to interdisciplinary to transdisciplinary.

The SRC's research efforts are thematically organized (see figure). The six themes, Regime shifts and their implications in social-ecological systems, Multilevel and adaptive governance, learning and transformation ("Stewardship" in the figure), Global dynamics and cross-level dynamics in the Anthropocene, Urban social-ecological systems, Water, food and ecosystem services in social-ecological landscapes ("Landscapes"), and Coastal and marine social-ecological systems ("Marine") are broadly reflective of the diverse skill sets contained within the SRC and the complexity of current social-ecological challenges. The themes operate as collaborative learning platforms wherein researchers with a variety of skills and backgrounds can discuss, compare and amalgamate findings and develop new research ideas. Significant time, energy, and resources have been devoted to encouraging cross-theme interaction to stimulate sharing of ideas in the frontier of sustainability science and resilience thinking and the emergence of meta-synthetic insights across themes.

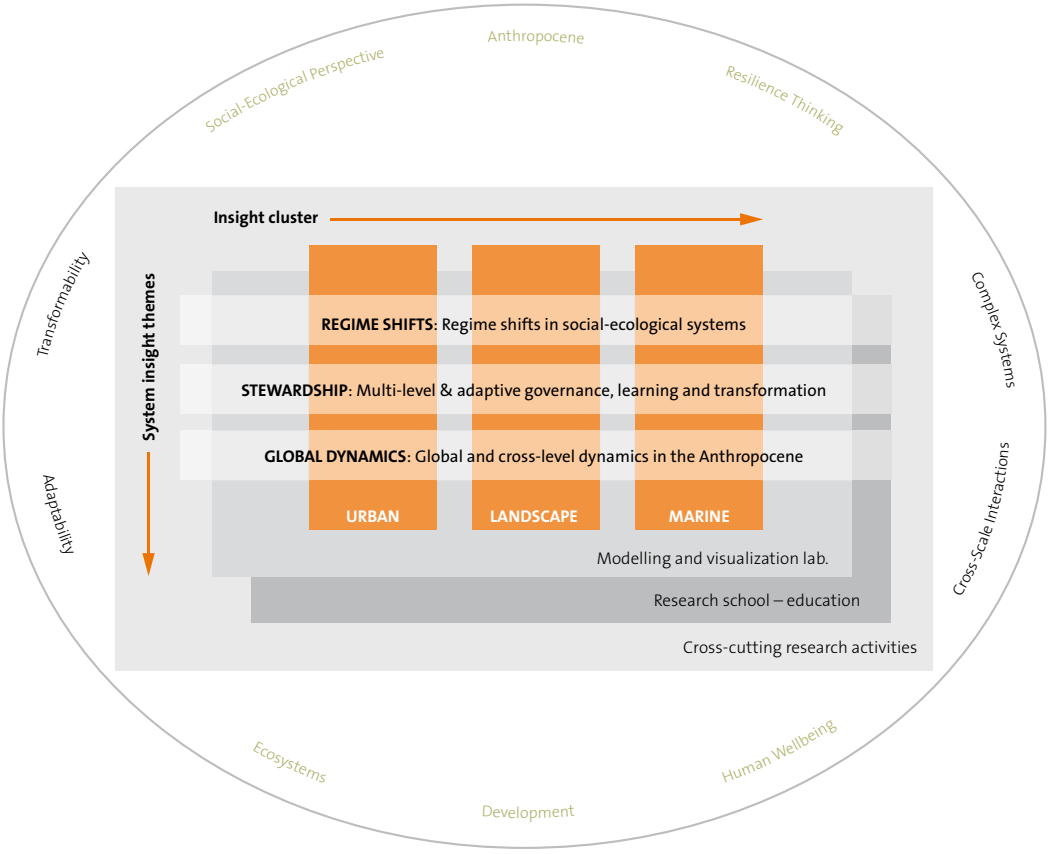


Figure: The research themes of the SRC operating in the context of framed creativity and applying resilience thinking as a lens to capture the dynamics of complex social-ecological systems.

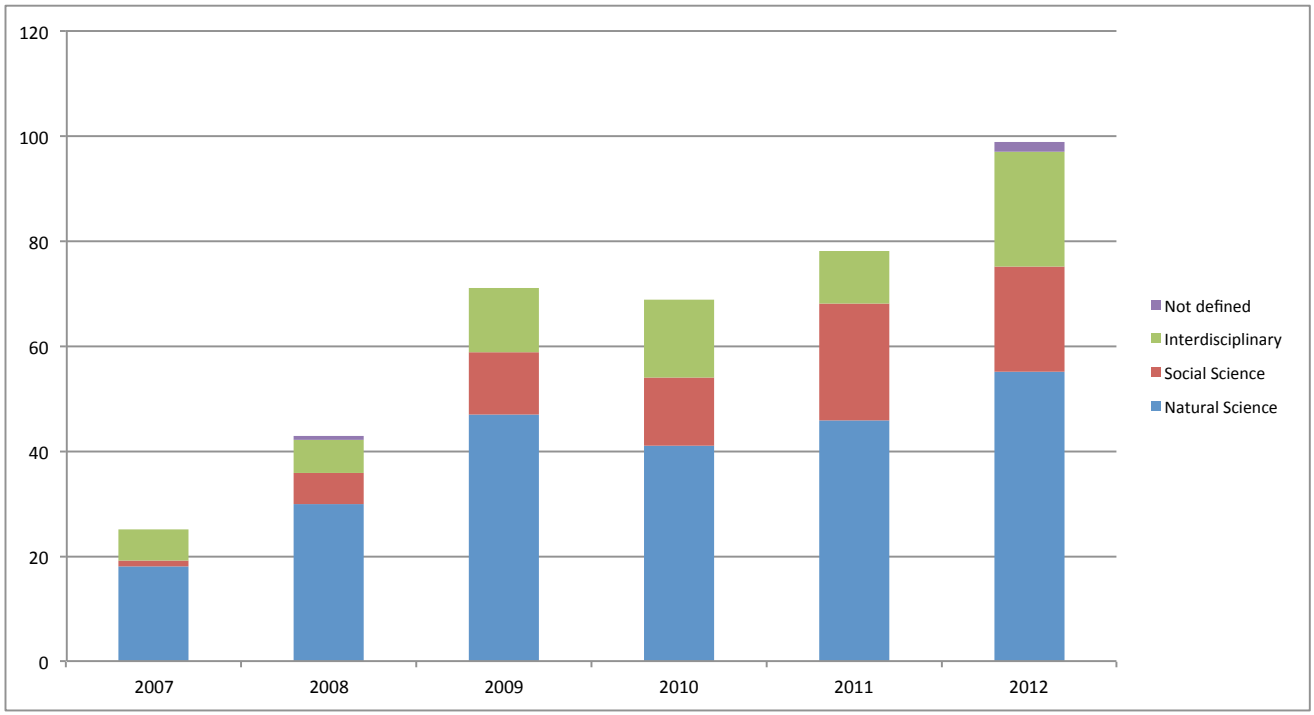
Research highlights

Since its launch in 2007, more than 525 centre publications have appeared in scientific journals and books

THE FOCUS OF these publications ranges from theoretical contributions to findings from field work and case studies and reflect a wide spectrum of inductive and deductive work, practice and theory. SRC researchers have published in 150 different journals, particularly Agricultural Water Management, Ambio, Current Opinion in Environmental Sustainability, Ecological Economics, Ecology and Society, Environmental Education Research, Global Environmental Change, Journal of Marine Systems, Marine Policy, Proceedings of the National Academy of Sciences, USA (PNAS), Science, and Trends in Ecology and Evolution (TREE).

This year alone produced 99 journal publications plus 12 reported online in 2012 (officially published in 2013), two new books and 15 book chapters (see Appendix for further details). The centre has published in high-ranked journals such as the Annual Review of the Environment and Resources, Frontiers in Ecology and the Environment, Global Environmental Change, PNAS, Science and also the new Nature-associated journals Nature Climate Change and Nature Communication.

There were two special journal issues edited by members of the centre in 2012. Victor Galaz led a special issue in Ecological Economics, "Global environmental governance and planetary boundaries". This issue explored a range of theoretical approaches as diverse as international regime theory, network approaches, institutional and policy analysis, theories on polycentric governance, and resilience thinking, with governance associated with 'planetary boundaries' ranging from ocean acidification, to climate change, biodiversity loss, freshwater availability, and land use. The other issue, "Urban ecological and social-ecological research in the City of Cape Town", which appeared in Ecology and Society, was edited by Thomas Elmqvist.



The distribution of SRC articles in natural sciences, social sciences/humanities journals as classified by Web of Science.

Centre researcher Maja Schlüter receives 1,3 million Euro starting grant to study social-ecological linkages and their implication for dynamics and governance of SES

The project, entitled SES-LINK, will develop simulation models to explore the co-evolution of social-ecological systems in a range of different environments such as river basins, land use and marine systems. The project will further look at how dynamic interactions between actors, institutions and ecosystems influence adaptation and change and ultimately the governance of such coupled systems.

PHOTO: A. LÖF/AZOTE

PHOTO: J. HANSEN/AZOTE

Building the Southern African Programme on Ecosystem Change and Society (SAPECS)

In collaboration with leading South African and international scientists, Stockholm Resilience Centre plans to establish a Southern African Programme on Ecosystem Change and Society (SAPECS). The programme aims to strengthen and build a collaborative regional research community that focuses on social-ecological systems and ecosystem services research in southern Africa, and will involve both regional and international researchers and practitioners working in the southern African region.

SAPECS forms one of several case studies around the world linked to the international Program on Ecosystem Change and Society (PECS), a 10-year research initiative within the ICSU global change programmes.

Gretchen Daily awarded 2012 Volvo Environment Prize

Centre board member and long-time partner, Professor Gretchen Daily, was awarded the 2012 Volvo Environment Prize for her pioneering work on quantifying and valuing natural capital. Professor Daily of Stanford University is one of the world's foremost experts on the valuation of natural capital. She is convinced that the only way to create longterm welfare is to quantify the value of ecosystems. A seminar was organised 21 November 2012 in honour of Daily's work, exploring key challenges and research frontiers when moving from theory to real-world application in achieving more sustainable land management practices.

PHOTO: "GRETCHEN-DAILY"

Planet under Pressure

Over the course of three days in March, some 3000 delegates, including a large contingent from the Stockholm Resilience Centre, gathered in London to discuss the state of the Earth

The conference ended with a State of the Planet Declaration which was welcomed by UN Secretary-General Ban Ki-moon. Based on the insights generated from the conference, the declaration contained several far-reaching recommendations on how to generate a large-scale political mind shift on global sustainability:

– Global sustainability must be part of the bedrock of nation states and the fabric of societies.

– Our increasingly interconnected and interdependent economic, social, cultural and political systems is both the problem and the solution to the challenges we are facing.

– Existing international arrangements are not dealing quickly enough with current global challenges such as climate change and biodiversity loss.

– The international scientific community calls for a framework for regular global sustainability analyses that link existing assessments that build on the foundations of the Intergovernmental Panel on Climate Change, Intergovernmental Platform on Biodiversity and Ecosystem Services and other ongoing efforts.

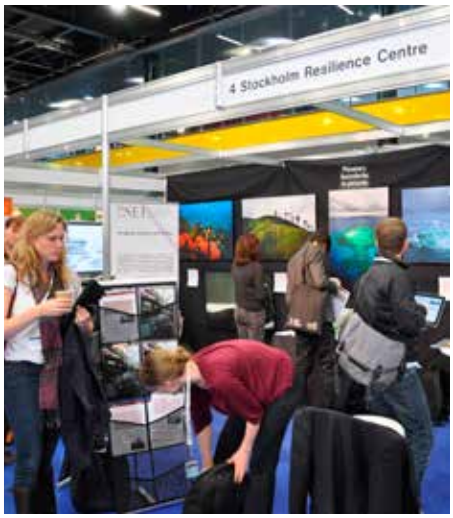
– A greater commitment to fund and support capacity-building in science and education globally, and particularly in developing countries.

– Current understanding supports the creation of a Sustainable Development Council within the UN system to integrate social, economic and environmental policy at the global level.

– Non-monetary values of public goods such as ecosystem services, education, health and global common resources such as the oceans and the atmosphere must be properly factored into management and decision-making frameworks.

The centre contributed with five papers to the special conference issue published in Current Opinion in Environmental Sustainability.

Centre director Johan Rockström presented the progress on the new Future Earth programme, a 10-year initiative by ICSU, ISSC, the Belmont Forum, various funders of global environmental change research, together with UNEP, UNU and UNESCO, and WMO.



The Stockholm Resilience Centre exhibition stand was one of the most popular at the conference.

Among the many centre-organised sessions, centre researcher Henrik Österblom co-convened a session on how to translate the Planetary Boundaries framework into policy and governance.

Scientific publications

PHOTO: O. HENRIKSSON/AZOTE

A matter of principle

Seven policy-relevant principles for resilient ecosystem services.

Biggs, R., Schlüter, M., Biggs, D., Bohensky, E.L., Burn Silver, S., Cundill, G., Dakos, V., Daw, T.M., Evans, L.S., Kotschy, K., Leitch, A.M., Meek, C., Quinlan, A., Raudsepp-Hearne, C., Robards, M.D., Schoon, M.L., Schultz, L., West, P.C. 2012. Toward principles for enhancing the resilience of ecosystem services. Annual Review of Environment and Resources, 37, 421-448

PHOTO CORAL TRIANGLE INITIATIVE

Triangle cooperation

How ecosystem-based management emerged in the Coral Triangle.

Rosen, F., Olsson, P. 2012. Institutional entrepreneurs, global networks, and the emergence of international institutions for ecosystem-based management: The Coral Triangle Initiative. Marine Policy, 38, 195-204

PHOTO D. KARLSSON / AZOTE

Don't forget Darwin

Anthropogenic climate change will affect biodiversity, but not without evolution playing its part.

Norberg, J., Urban, M.C., Vellend, M., Klausmeier, C.A., Loeuille N. 2012. Eco-evolutionary responses of biodiversity to climate change. Nature Climate Change, 2, 747-751

PHOTO LEMONTJOLIEN/DESTINATION

We need to talk

Improved collaboration between different management groups can boost the governance of shared watersheds.

Rathwell, K.J., Peterson, G.D. 2012. Connecting Social Networks with Ecosystem Services for Watershed Governance: a Social-Ecological Network Perspective Highlights the Critical Role of Bridging Organizations. Ecology and Society, 17, 24

PHOTO M. TROELL/AZOTE

Single-track sustainability 'solutions' threaten people and planet

Fostering grassroots innovations and empowering the creativity of marginalized groups can boost sustainability.

Leach, M., Rockström, J., Raskin, P., Scoones, I., Stirling, A.C., Smith, A., Thompson, J., Millstone, E., Ely, A., Arond, E., Folke, C., Olsson, P. 2012. Transforming innovation for sustainability. Ecology and Society, 17, 11

PHOTO AUSTRALIAN CUSTOMS AND

Many interests, one enemy

Different stakeholders join forces to curb illegal fishing in the Southern Ocean.

Österblom, H., Bodin, Ö. 2012. Global cooperation among diverse organizations to reduce illegal fishing in the Southern Ocean. Conservation Biology, 26, 638-648

PHOTO O. HENRIKSSON/AZOTE

Avoiding the tragedy of overfishing

Why management at community level can dramatically curb overfishing and benefit local resource users.

Cinner, J.E, McClanahan, T.R., MacNeil, M.A., Graham, N.A.J., Daw, T.M., Mukminin, A., Feary, D.A., Rabearisoa, A.L., Wamukota, A., Jiddawi, N., Campbell, S.J., Baird, A.H., Januchowski-Hartley, F.A., Hamed, S., Lahari, R., Morove, T., Kuange, J. 2012. Co-management of coral reef social-ecological systems. Proceedings of the National Academy of Sciences, USA (PNAS), 109, 5219-5222

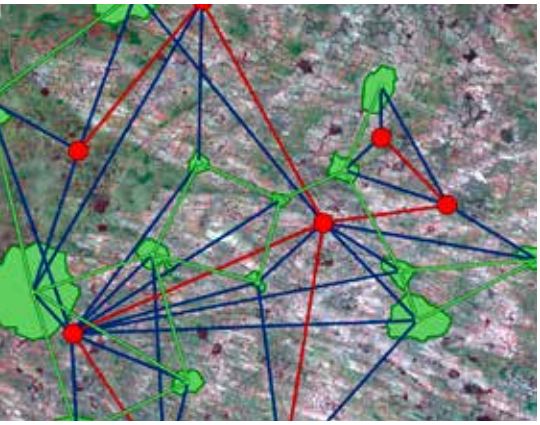


PHOTO Ö. BODIN

Cracking the social-ecological code

New model disentangles interdependencies between social and ecological systems. *Bodin, Ö., Tengö, M. 2012. Disentangling intangible social-ecological systems. Global Environmental Change, 22, 430-439*

PHOTO A. MASLENNIKOV/AZOTE

Lock, stock and too many feedbacks

New research looks at how to unlock feedbacks that keep marine ecosystems in undesired states.

Nyström, M., Norström, A.V., Blenckner, T., Torre-Castro, M., Eklöf, J.S., Folke, C., Österblom, H., Steneck, R.S., Thyresson, M., Troell, M. 2012. Confronting Feedbacks of Degraded Marine Ecosystems. Ecosystems 15, 695-710

PHOTO R. KAUTSKY/AZOTE

Governing within the planetary boundaries

Developing the scientific concept is one thing, coming up with appropriate governance strategies is quite another.

Galaz, V., Biermann, F., Crona, B., Loorbach, D., Folke, C., Olsson, P., Nilsson, M., Allouche, J., Persson, Å., Reischl, G. 2012. 'Planetary boundaries'-exploring the challenges for global environmental governance. Current Opinion in Environmental Sustainability, 4, 80-87

PHOTO R. KAUTSKY/AZOTE

A roadmap for the Anthropocene

Time to bolster global sustainability governance and give UNEP more influence, scientists say.

Biermann, F., Abbott, K., Andresen, S., Backstrand, K., Bernstein, S., Betsill, M. M., Bulkeley, H., Cashore, B., Clapp, J., Folke, C., Gupta, A., Gupta, J., Haas, P. M., Jordan, A., Kanie, N., Kluvankova-Oravska, T., Lebel, L., Liverman, D., Meadowcroft, J., Mitchell, R.B., Newell, P., Oberthur, S., Olsson, L., Pattberg, P., Sanchez-Rodriguez, R., Schroeder, H., Underdal, A., Camargo Vieira, S., Vogel, C., Young, O.R., Brock, A., Zondervan, R. 2012. Navigating the Anthropocene: Improving Earth System Governance. Science, 335, 1306-1307

PHOTO T. DAHLIN/AZOTE

Keep an eye on the cod

Cod plays a key role as regulator of Baltic Sea ecosystems

Casini, M., Blenckner, T., Mollmann, C., Gardmark, A., Lindegren, M., Llope, M., Kornilovs, G., Plikshs, M., Stenseth, N. C. 2012. Predator transitory spillover induces trophic cascades in ecological sinks. Proceedings of the National Academy of Sciences, USA (PNAS), 109, 8185-8189

PHOTO N. DESAGHER/AZOTE

Getting the whole historic picture

IHOPE project maps records of biophysical and human system changes over the past millennia

Costanza, R., van der Leeuw, S., Hibbard, K., Aulenbach, S., Brewer, S., Burek, M., Cornell, S., Crumley, C., Dearing, J., Folke, C., Graumlich, L., Hegmon, M., Heckbert, S., Jackson, S.T., Kubiszewski, I., Scarborough, V., Sinclair, P., Sörlin, S., Steffen, W. 2012. Developing an Integrated History and future of People on Earth (IHOPE). Current Opinion in Environmental Sustainability, 4, 106-114

PHOTO H. ERIKSSON

Scuba-diving bandits

Sea cucumber harvesting in the Western Indian Ocean needs better management.

Eriksson, H., de la Torre-Castro, M., Olsson. P. 2012. Mobility, expansion and management of a multi-species scuba diving fishery in East Africa. PLoS ONE, 7, e35504

PHOTO P. TURANDER/AZOTE

Like a bridge over troubled governance

Assessing current concepts and methods on how bridging organizations can contribute to improved resource governance

Crona, B.I., Parker, J.N. 2012. Learning in support of governance: theories, methods and a framework to assess how bridging organizations contribute to adaptive resource governance. Ecology and Society, 17(1), 32

PHOTO R. KAUTSKY/AZOTE

The more the merrier?

Polycentric governance can boost governance of planetary boundaries, but beware of pitfalls.

Galaz, V., Crona, B., Osterblom, H. et al. Polycentric systems and interacting planetary boundaries – Emerging governance of climate change-ocean acidification-marine biodiversity. 2012. Ecological Economics, 81, 21-32

PHOTO O. HENRIKSSON/AZOTE

What goes up must come down

New method tracks path of water, from where it starts as evaporation to where it falls as rain

Keys, P. W., van der Ent, R. J. , Gordon, L. J. , Hoff, H. , Nikoli, R., Savenije, H. H. G. 2012. Analyzing precipitationsheds to understand the vulnerability of rainfall dependent regions. Biogeosciences, 9, 14

PHOTO T. DAHLIN/AZOTE

Shift happens

Reflections on managing social–ecological systems in light of potential regime shifts

Crépin, A-S., Biggs, R., Polasky, S., Troell, M., de Zeeuw, A. 2012. Regime shifts and management. Ecological Economics, 84, 15-22

Necessary uncertainties

Including model uncertainties is necessary to alleviate ecological surprises in marine ecosystem management

Niiranen, S., Blenckner, T. Hjerne, O. et al. 2012. Uncertainties in a Baltic sea food-web model reveal challenges for future projections. AMBIO, 41, 6, 613-625.

PHOTO J. UDDEN/AZOTE

PHOTO B. MASLENNIKOV/AZOTE

Look beyond city limits

Sustainable cities must also account for imported goods and services

Seitzinger, S.P., Svedin, U., Crumley, C.L., Steffen, W., Abdullah, S.A., Alfsen, C., Broadgate, W.J., Biermann, F., Bondre, N.R., Dearing, J.A., Deutsch, L., Dhakal, S., Elmqvist, T., Farahbakhshazad, N., Gaffney, O., Haberl, H., Lavorel, S., Mbow, C., McMichael, A.J., deMorais, J.M. F., Olsson, P., Pinho, P.F., Seto, K.C, Sinclair, P., Stafford Smith, M., Sugar, L. 2012. Planetary Stewardship in an urbanizing world: Beyond city limits. Ambio, 41, 787-794

PHOTO D. KARLSSON/AZOTE

Spilt nitrogen

Researchers identify possible threshold for net anthropogenic nitrogen input from watersheds to rivers

Howarth, R., Swaney, D., Billen, G., Garnier, J., Hong, B., Humborg, C., Johnes, P., Morth, C-M., Marino, R. 2012. Nitrogen fluxes from the landscape are controlled by net anthropogenic nitrogen inputs and by climate. Frontiers in Ecology and the Environment, 10, 37-43

PHOTO PETER TURANDER/AZOTE

Clarifying confusion

With adaptive comanagement becoming an emergent governance approach, researchers deals with confusion and imprecision about the concept

Plummer, R., Crona, B., Armitage, D.R., et. Al. 2012. Adaptive Comanagement: a Systematic Review and Analysis. Ecology and Society, 17, 3:11.

PHOTO J. UDDEN/AZOTE

Bouncing back?

Researchers discover first sign of recovery from eutrophication in Kattegat

Lindegren, M., Blenckner, T., Stenseth, N.C. 2012. Nutrient reduction and climate change cause a potential shift from pelagic to benthic pathways in a eutrophic marine ecosystem. Global Change Biology 18, 3491-3503

PHOTO N. KAUTSKY/AZOTE

Trading with coral reef resilience

Difficult trade-off between parrotfish trade and protecting crucial ecological functions

Thyresson, M., Crona, B., Nyström, M., de la Torre-Castro, M., Jiddawi, N. 2012. Tracing value chains to understand effects of trade on coral reef fish in Zanzibar, Tanzania. Marine Policy, 38, 246-256

PHOTO C. DAHLIN/AZOTE

Wordfeud

Clearing up some confusing terms on the dynamics of ecosystems and social–ecological systems

Walker, B.H., Carpenter, S.R., Rockstrom, J., Crépin, A-S., Peterson, G.D. 2012. Drivers, "slow" variables, "fast" variables, shocks, and resilience. Ecology and Society 17(3), 30

PHOTO S. ZEEF/AZOTE

What it means to think resilient

A practitioners' perspective in urban planning

Wilkinson, C. 2012. Urban resilience: What does it mean in planning practice? Planning Theory and Practice 13, 319-324.

PHOTO T.H. SNICKARS/AZOTE

Parting water

The potential water conflict between using it for carbon sequestration and increasing food production

Rockström, J., M. Falkenmark, M. Lannerstad, L. Karlberg. 2012. The planetary water drama: Dual task of feeding humanity and curbing climate change. Geophysical Research Letters 39, 8pp

A centre with an impact

The SRC not only scores high on producing interdisciplinary environmental research, its publications are also among the most cited

If the mission of Stockholm Resilience Center is to advance interdisciplinary research on social-ecological systems, it is on the right track. According to an analysis done by University of Sussex and University of Leiden, the centre has an exciting record when it comes to bibliometric indicators for 2007–2012.

The report analysed Web of Science (WoS) covered publications of the centre with the aim to investigate the citation impact of interdisciplinary contributions. The publication and citation patterns were then compared to those of the Environmental Change Institute (ECI) at Oxford University and the Earth Institute at Columbia University (EI).

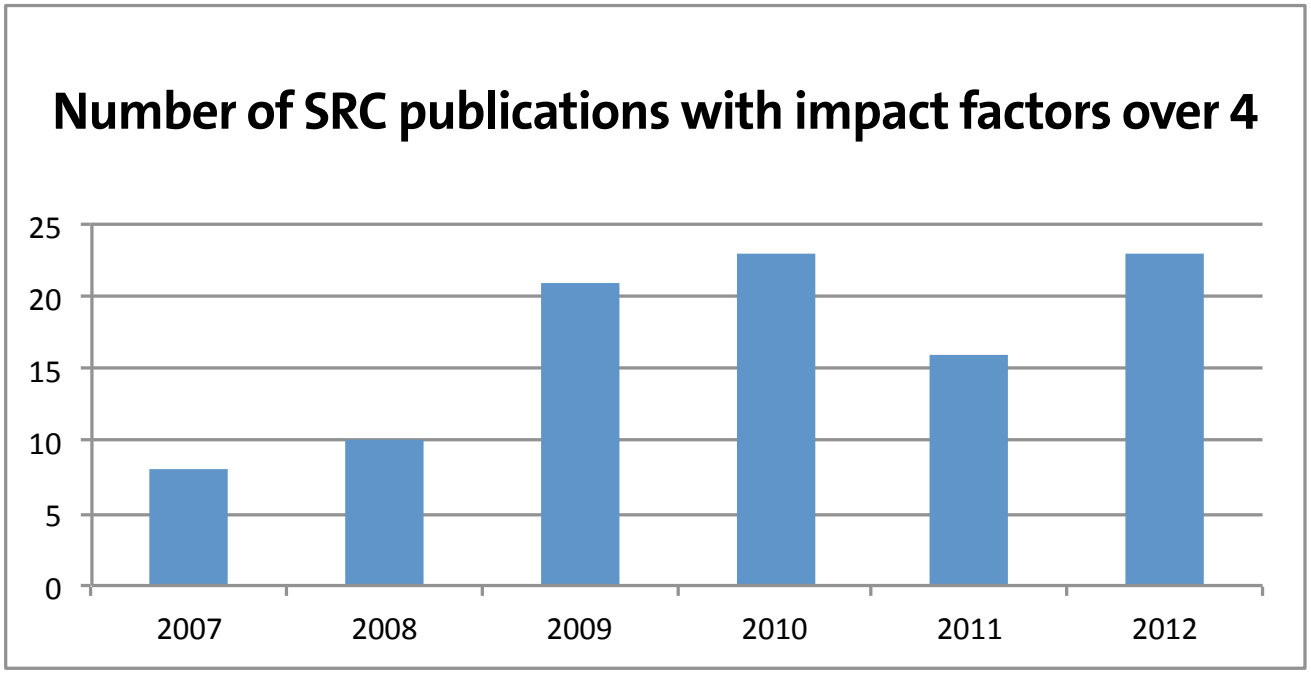
The report had three main findings: first, the Stockholm Resilience Centre had the highest degree of interdisciplinarity, in particular forging links between environmental (natural) sciences and the social sciences.

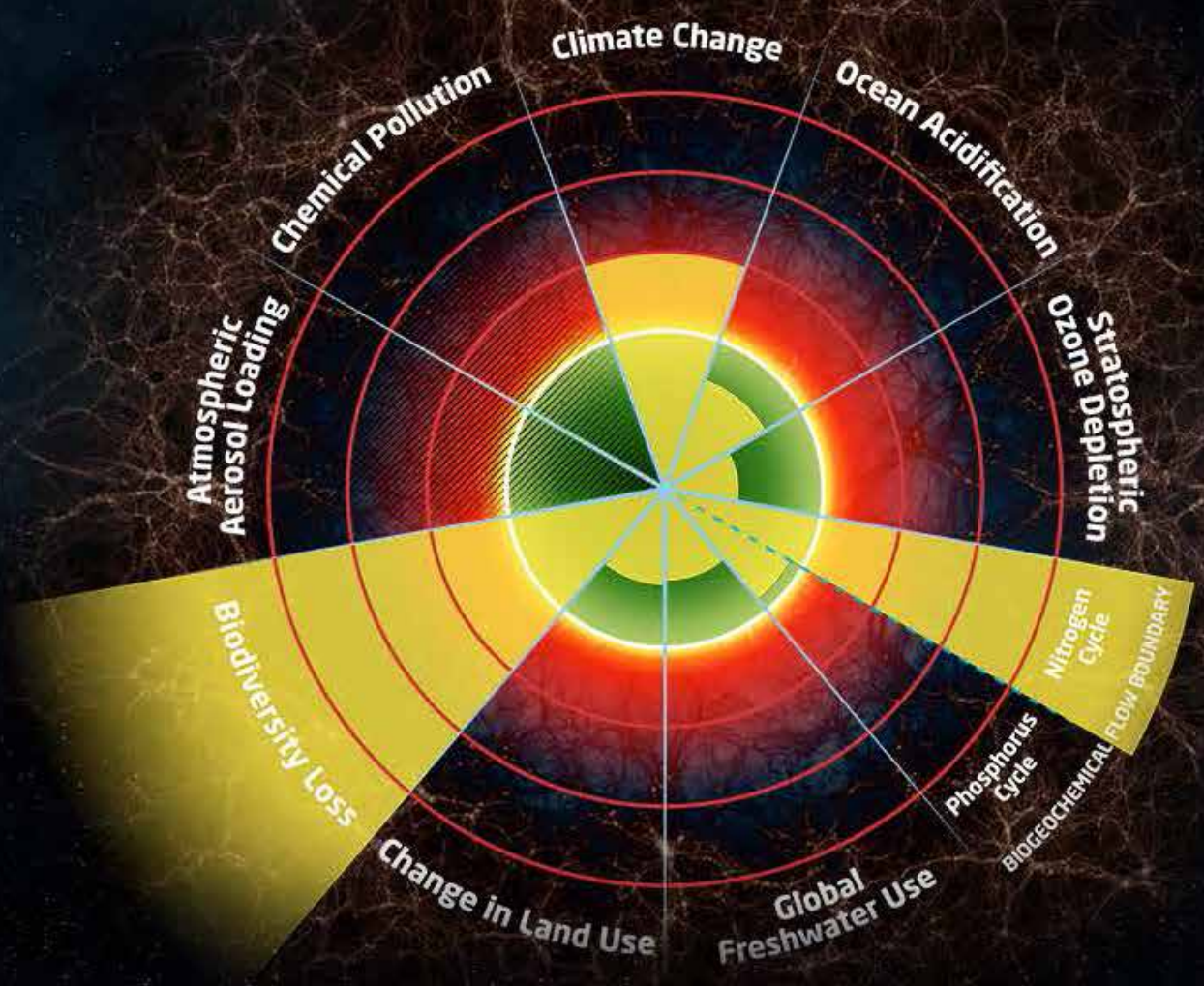
Second, the publications of the centre had an outstanding impact, above 2.5 times the average impact in the fields they publish. About 30% of the centre's publications were among the top 10% most cited in their fields compared to about 15% in the aggregate of leading universities such as Oxford. Third, the publication practices of the centre were considered to be very collaborative, demonstrated in 82% of all publications compared to 75% for ECI and EI. The majority of these collaborations were international (63%).

If the mission of Stockholm Resilience Center is to advance interdisciplinary research on social-ecological systems, it has certainly succeeded doing so during its first five years.

Science director Carl Folke is naturally pleased with the results.

"The analysis suggests that we are fulfilling our mission as an international and interdisciplinary centre that makes well received contributions in sustainability science and social-ecological research, engaging both natural and social sciences."





Planetary boundaries (PB) – addressing some key misconceptions

The planetary boundaries concept has, since its inception, appeared prominently in discussions on global sustainability. It has also triggered some criticism, which we welcome, but some of this have been based on key misconceptions.

The framework has been criticised for not being well adapted to policy. It is important to stress that the planetary boundaries research is first and foremost designed to advance Earth System science. We welcome policy related discussions, but only beyond the biophysical boundaries we are trying to identify. We sought to identify boundary positions beyond which we cannot exclude non-linear changes in one or several sub-systems on Earth. We have always stressed the fact that many of the PB definitions are tentative, but they all depart from an approach of identifying non-linear change/tipping points that can have dramatic impacts for humans. It is up to societies to choose where the boundary position is placed.

We chose to place it at the lower end of the uncertainty range in science as a measure of applying a precautionary principle (e.g., for climate change at 350 ppm (CO2)). One could also take a more risk prone approach, opting for the higher end of our analysis of uncertainty, in this case at 550 ppm (CO2). This is a social choice, but the range is based on an Earth System analysis. The PB research concludes, based on paleo-climatic evidence, that the environmental conditions during the Holocene is the only state that we know for certain can support the modern world we live in. It may be perceived as a normative statement, but it is above all a robust and evidence-based conclusion: human civilizations only started to develop after the onset of the long and relatively stable Holocene. Before the beginning of the Holocene, human numbers were much lower and we existed in hunter-gatherer societies only. Despite the criticisms, there seems to be a shared view that biophysical thresholds do exist and that resource constraints are a challenge for prosperity in the world.

The governance implications of the planetary boundaries concept is a research challenge in its own right. This is why the original framework cannot simply be taken off the shelf and translated directly to operational policy. However, it can be used as a framework to guide sustainable development goals in the Anthropocene.

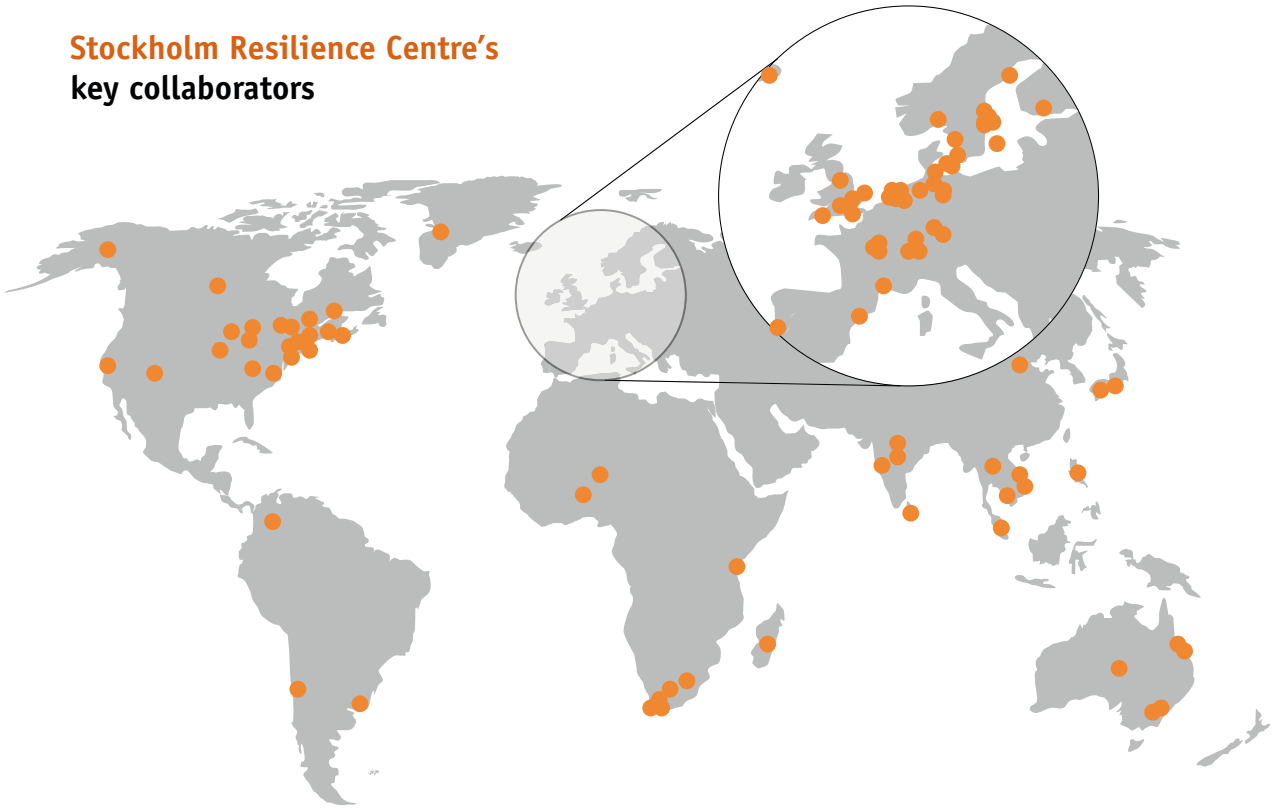
Read the full reply to the PB criticism at www.stockholmresilience.org/planetary-boundaries

Research projects and collaborations

Stockholm Resilience Centre continues to expand its collaboration with a global network of partners. Below is a selected list.

URBES -
Urbanization, Biodiversity and Ecosystem Services
URBES is a three-year research project funded by BiodiversERsA that aims to bridge the knowledge gap on the links between urbanization, ecosystem services and biodiversity. URBES builds on case studies of four European cities: Berlin, Rotterdam, Salzburg and Stockholm. Some studies are also done on the cities of Barcelona, Helsinki and New York. The research consortium consists of 11 world-leading research institutes for social-ecological studies of urban areas, ten based in Europe and one in the USA (New York). Helsinki University and The New School (New York) participate as self-funded partners. URBES runs from 2012 to 2014.

Social-ecological dynamics of ecosystem services in the Norrström basin (SEEN)
This project will explore the dynamics that contribute to the reliable production of ecosystem services in social-ecological systems. It will be carried out in the Norrström drainage basin in Sweden, the most densely populated drainage basin in the country. It spans urban, agricultural, forest and wetland landscapes and includes two of Sweden's largest lakes. The project will assess the patterns of trade-offs and synergies among 6-12 key ecosystem services and will generate novel knowledge on ecosystem service governance in the region. The project is funded by Formas. Current partners include Eskilstuna municipality and Programme on Ecosystem Change and Society (PECS), but partnership will hopefully increase during the project. The project runs from 2013 to 2016.



Geographic location of SRC collaborators, including 18 MoUs, 38 agreements and 45 other collaborators.

Does moisture recycling matter for social-ecological resilience? An analysis of land use change impact on evaporation and precipitation at regional to global scales
This project will globally map changes in moisture recycling (the amount of evaporation from terrestrial systems that return as precipitation on the continents) that stem from past, present and future land-use changes. The aim is to understand where these changes have important effects on precipitation and social-ecological resilience. The project is funded by the the National Science Foundation (Vetenskapsrådet) and is a collaboration with the Delft University of Technology and the Potsdam Institute for Climate Impact Research (PIK). The project runs from 2012 to 2015.

GLEAN: A Global Survey of Learning, Participation and Ecosystem Management in Biosphere Reserves
The aim of this project is to analyse the effect of stakeholder participation in biodiversity conservation. The project will examine 146 UNESCO biosphere reserves in 55 countries and analyse long term interaction patterns between social and ecological systems, as well as generate new research questions that go beyond current theories of environmental management. The GLEAN project is funded by the National Science Foundation (Vetenskapsrådet) and will be carried out during 2012–2016.

Diagnosing processes and outcomes in social-ecological systems: A systematic, cross-case comparison of adaptive co-management initiatives
This project focuses on diagnosing processes and outcomes of adaptive co-management (ACM), through comparative studies in four UNESCO biosphere reserves (two in Sweden and two in Canada). We will follow governance processes and their results in these biosphere reserves during three years, investigating the relationships between learning, social networks, and social-ecological resilience (including specified resilience, general resilience, and transformability) in various contexts. Methods include surveys, interviews, concept mapping, network analysis and participatory resilience assessments. The project is the first step in building a more robust theory and conceptual basis for comparison of empirical findings from real-world cases of adaptive co-management. Is funded by the National Science Foundation (Vetenskapsrådet) and will run from 2013 to 2016.

Water Resources and Resilience in the agricultural landscape: A social-ecological systems analysis in the Upper Blue Nile
This project uses numerical models to investigate the impacts of different agricultural water interventions, with a special focus on water harvesting systems. The potential for enhancing resilience to drought in small scale farming systems by implementing water harvesting is assessed, as well as potential down-stream impacts. The project will study the difference between one large or many small-scale dams, as well as compare different locations of dams in the landscape. Moreover, it is anticipated that the project will shed light into how the rainfall runoff relationships can be represented in numerical tool in a way that provides accurate results of the hydrological cycle in tropical environments. The project is financed by the Swedish Research Council FORMAS and will run from 2012 to 2015.

PHOTO A. VOIGT

URBES case study: The Tempelhof Airport in Berlin has since its close-down three years ago become the home to one of Europe's largest urban gardens, managed by around 300 people growing fruits, vegetables and flowers. The airport covers an area nearly as big as the Central Park in New York.

Policy and practice

Welcome to the Anthropocene

One of the most significant communication impacts the centre had in 2012 was the screening of the "Welcome to the Anthropocene" video during UN Secretary-General Ban Ki-moon's official opening of the Rio+20 conference.

It was produced as part of the launch of the website bearing the same name, Welcome to the Anthropocene. The website is designed to improve our collective understanding of the Earth system and to inspire, educate and engage people about humanity's impact on Earth. Its unique combination of high-level scientific data and powerful imagery will help people visualize and better understand humanity's geographic imprint in recent time.

For more information, go to www.anthropocene.info.

Rich biodiversity can exist in cities

Centre launches world's first assessment of biodiversity and ecosystem services in cities

Global urbanization will have significant implications for biodiversity and ecosystems if current trends continue, with knock-on effects for human health and development, according to a new assessment produced by the UN Convention on Biological Diversity (CBD) in partnership with the Stockholm Resilience Centre and Local Governments for Sustainability (ICLEI). The assessment was officially launched during the UN CBD COP11 which took place in October in Hyderabad, India.

Much more to be built

The Cities and Biodiversity Outlook is the world's first global analysis of how projected patterns of urban land expansion will impact biodiversity and crucial ecosystems. The assessment is scientifically edited by centre researcher Thomas Elmqvist and draws on contributions from more than 120 scientists worldwide. It states that over 60 percent of the land projected to become urban by 2030 has yet to be built.

"This presents a major opportunity to greatly improve global sustainability by promoting low-carbon, resource-efficient urban development that can reduce adverse effects on biodiversity and improve quality of life," Thomas Elmqvist says.

A world's first assessment of urban biodiversity edited by centre researcher Thomas Elmqvist (left) demonstrates the enormous potential cities have in global sustainability.

A strong argument for better urban planning

The assessment states that urban expansion is occurring fast in areas close to biodiversity 'hotspots' and coastal zones. In rapidly urbanizing regions, such as large and mid-size settlements in sub-Saharan Africa, India and China, resources to implement sustainable urban planning are often lacking.

"More than half the global population already resides in cities. This number is projected to increase, with 60 percent of the population living in urban areas by 2030," says Achim Steiner, UN Under-Secretary General and Executive Director of the United Nations Environment Programme.

"This report makes a strong argument for greater attention to be paid by urban planners and managers to the nature-based assets within city boundaries, and shows how urbanizing areas represent major opportunities for reducing carbon emissions and creating a more sustainable and resource-efficient world," he added.

Important health benefits

Urban green spaces perform important ecosystem services, such as filtering dust, absorbing carbon dioxide from the air and improving air quality. Data from the United Kingdom show that a ten percent increase in tree canopy cover in cities may result in a 3-4°C decrease in ambient temperature, thus reducing energy used in air conditioning.

Urban biodiversity also delivers important health benefits. Studies have shown that proximity to trees can reduce the prevalence of childhood asthma and allergies. Sustainable urban planning, which addresses biodiversity issues along with other priorities such as poverty alleviation, employment, and housing, can bring positive effects for health and the environment.

"The Outlook provides an overview and response to knowledge gaps in how we understand processes behind urban social-ecological systems and how urbanization is shaping land use," says Professor Thomas Elmqvist.

Picking up where Rio left off

With Rio+20 ending in disappointment, centre is asked to contribute to developing new global sustainability goals

Ten points for trying, but it was never going to be easy. In a series of Nobel Laureates symposia held in Potsdam, London and Stockholm, the world's most renowned experts on global sustainability have strived to convey to world leaders the unequivocal scientific evidence that we are heading in the wrong direction. The UN summit on sustainable development in Rio was the perfect arena to get the message across once and for all.

The build-up

Organised simultaneously with the historic summit in Rio de Janeiro, a fourth symposium took place, this time joining forces with the UN Secretary-General's High-level Panel on Global Sustainability.

Centre Senior Research Fellow Will Steffen spoke during the closed high-level meeting on 17 June with Noble Laureates, global policy makers and world leading sustainability profiles.

In a series of events building up to the official round table discussions, the scientific support for policy action was discussed. A closed high-level meeting on 17 June with Nobel Laureates, global policy makers and world leading sustainability profiles was followed up with an open, high-level dialogue the day after. Inaugurated by His Majesty Carl XVI Gustaf, King of Sweden, panelists and audience discussed the need to develop Sustainable Development Goals that could succeed the Millennium Development Goals in 2015.

Many of the discussions focused on narrowing the gap between what is required at policy level and what is being done, largely at the grass roots level. On 21 June, leading economists such as Jeffery Sachs (Earth Institute), Armenio Farga (former president of the Central Bank of Brazil) and Pavan Sukhdev (TEEB) discussed how to reform the economy to support sustainable development.

The message

Supporting all these events, and confirming the significance and influence of the Symposia series, a statement was presented to the world's heads of states and governments at the formal discussions of the Rio summit. Nobel Laureates Yuan-Tseh Lee, Rajendra Pachauri, Muhammad Yunus and Carlo Rubbia delivered a clear message:

"We are concerned', it said. " We are on the threshold of a future with unprecedented environmental risks."

The Laureates called upon world leaders to "move beyond aspirational statements and exercise a collective responsibility."

The aftermath

Despite all efforts, the outcome of the Rio summit was criticised for lacking detail and ambition. However, one of the most significant outcomes from Rio 2012 was indeed the agreement to develop Sustainable Development Goals, a new set of goals to succeed the Millennium Development Goals. UN Secretary-General Ban Ki-moon was given the mandate to initiate appropriate work to support this process. He announced a high-level panel on the post-2015 agenda, led by Indonesia, Liberia, the UK and Sweden.

Furthermore, and important for the Stockholm Resilience Centre, Ban Ki-moon announced a parallel Sustainable Development Solutions Network. This network, consisting of research centres, universities and technical institutions will

Jeffrey Sachs

support the writing of the new Sustainable Development Goals and how to implement them on all levels including regional and local scales.

Taking part in the new network follows from the significant influence the centre had on the report by the Secretary-General's High-level Panel on Global Sustainability, entitled "Resilient People, Resilient Planet: A Future Worth Choosing".

"The fact that the centre has been asked to join the network shows how important our research is in pushing for a mind shift in global sustainability thinking," says centre director Johan Rockström.

From Rio to Stockholm

Following up from Rio and the launch of the Sustainable Development Solutions Network, its newly appointed leader, Professor Jeffrey Sachs from Columbia University, came to Stockholm to discuss the outcomes of Rio+20, particularly the formulation of the sustainable development goals.

The presentation by Sachs (pictured above) was followed by a panel debate including Gunilla Carlsson, Swedish Swedish Minister for International Development Cooperation.

The seminar was hosted by the Stockholm Environment Institute (SEI), together with the Stockholm Resilience Centre and the Beijer Institute of Ecological Economics, with support from the Swedish Postcode Lottery.

Centre signs partnership with World Business Council on Sustainable Development

THE WORLD BUSINESS Council for Sustainable Development (WBCSD) and the Stockholm Resilience Centre have announced an innovative collaboration to ensure future business solutions are based on the best scientific analysis. The WBCSD/SRC collaboration will connect resilience and sustainability science with business strategies. It will focus on aligning the Planetary Boundaries framework with the WBCSD's Vision 2050 framework.

As well as working with the WBCSD across its projects, the Stockholm Resilience Centre will carry out applied research on how the Planetary Boundaries framework can be adapted in order to make the information actionable at both corporate and sector levels.

UNEP visit to the centre

IN APRIL 2012, UNEP Executive Director Achim Steiner visited the centre to discuss issues related to the Rio+20 UN Conference on Sustainable Development, the role of UNEP and how the world must move forward.

Steiner argued that there is a need to "shorten the distance between science and policy". He also called for embedding the "green economy" into the sustainable-development dialogue. The visit was organized in collaboration with Stockholm Environment Institute (SEI).

Madagascar, music and sustainability

Malagasy music icon Hanitra Rasoanaivo visited the centre to discuss science, art and sustainability issues in Madagascar

At a seminar-cum-bar taking place at the centre in March, Hanitra Rasoanaivo, charismatic lead singer of Tarika Bé and an internationally renowned cultural personality, presented her work and discussed the integration of science, music, and practice with researchers from the Stockholm Resilience Centre.

Rasoanaivo is deeply engaged in using music and art to inform and influence environmental issues. In her work she combines the styles and instruments of many tribes with forceful, often political songwriting. She is also the founder of the Antshow Cultural Center, established to promote Malagasy arts and artists. The Stockholm Resilience Centre centre has a long history of transdisciplinary research on Madagascar, ranging from livelihoods and culture among agropastoralists and fishermen to the role of sacred rites protecting ”taboo” forests.

Research has also looked at unofficial land ownership agreements for regenerating large areas of tropical forest previously in decline.

The centre has previously been involved in projects working to integrate art, music, science and practice. This includes the art exhibition and jam session during the Resilience 2008 conference and the 2011 Coral Guardian concert and seminar on the world’s coral reefs.

Research has looked at unofficial land ownership agreements for regenerating large areas of tropical forest previously in decline.

PHOTO N. HALSTRÖM

Participants engaged in discussions during the Quito seminar 6-9 March 2012.

PHOTO M. KVARNSTRÖM

It's good to talk

Reaching targets for biodiversity requires formal negotiations, but informal gatherings for knowledge exchange and trust building are equally important

To prepare for challenging discussions about biodiversity financing mechanisms ahead of the COP11 negotiations in India October 2012, the centre's Resilience and Development Programme took the initiative to organise a dialogue seminar 6–9 March in Quito, Equador.

The intention of the seminar was not to draft formal recommendations, but to enhance understanding among participants to pave the way for the upcoming negotiations in India.

Some 80 participants from a range of governmental, non-governmental, scientific and private organisations shared their perspectives on financial resources mobilization for biodiversity. The dialogue seminar not only contributed to better understanding of differing viewpoints but also created new alliances. Several negotiators also referred to the Quito dialogue during the COP11 in India.

"This seminar shows that informal but carefully prepared dialogues can help understanding among a very diverse group of actors," says Maria Schultz, co-chair of the seminar and head of the Resilience and Development programme.

For more information, go to dialogueseminars.net.

Added values, crucial knowledge

Indigenous peoples and local communities recognised in new platform to curb biodiversity loss

After several years of negotiations, the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) was finally established in April 2012. The platform aims to bridge the distance between science and policy and hopefully improve the understanding of biodiversity loss and how it affects human well-being.

Prior to the launch, in an attempt to bridge the gaps between various knowledge systems, the Resilience and Development programme convened a workshop 10-13 April in the Panamanian indigenous autonomous region Comarca Guna Yala (pictured).

The workshop, entitled "Knowledge for the 21st Century: Indigenous Knowledge, Traditional Knowledge, Science and connecting diverse knowledge systems", was considered highly successful as it bolstered openness and support for indigenous knowledge and diverse knowledge systems in the work of IPBES.

People are willing to pay for a healthier Baltic Sea

A STUDY FROM the international research network BalticSTERN shows that people in the nine countries around the Baltic Sea are willing to pay in total some 3,800 million Euros per year for a healthier sea. With 10,500 people participating in the survey, the study captured large interest from both the public and the media. The results from the willingness to pay study will be included in a cost-benefit analysis to be published by the BalticSTERN research network early 2013.

BalticSTERN, which is coordinated by a secretariat based at the Stockholm Resilience Centre, combines socioeconomic and ecological models to make cost-benefit analyses and to identify cost-effective measures needed to meet the targets of HELCOM's Baltic Sea Action Plan, an ambitious programme to restore the good ecological status of the Baltic marine environment by 2021 and agreed upon by the nine countries around the sea.

PHOTO J. LOKRANTZ/AZOTE

A royal cup of tea

At the request of HRH The Prince of Wales, the centre, together with the Stockholm Environment Institute (SEI), hosted a visit 23 March 2012

Together with HM Carl XVI Gustaf of Sweden, The Prince of Wales was given an introduction to central aspects of the research conducted at the centre.

Research from SEI was also presented, including Fiona Lambe's research on the use of ethanol-fuelled cooking stoves (pictured) to reduce environmentally harmful fuel wood consumption and indoor smoke.

Lambe's presentation was followed by a round table discussion on energy and food security. Three short presentations set the scene and seeded further discussions: Sarah Cornell from the centre presented the Planetary Boundaries concept; Henrik Österblom presented research on the Baltic Sea and Louise Karlberg (SEI) presented issues related to water, energy and food security.

The participants in the round table discussion included centre director Johan Rockström, science director Carl Folke, Ben Moxham (the UK prime minister's advisor on climate and energy), Jan Agri (DeLaval), Erik Brandsma (Vattenfall), Måns Nilsson (SEI) and Justin Mundy (HRH Prince of Wales' advisor on sustainability).

A key message from the discussion was the importance of linking science with the private sector and to tap into the enormous innovative capacity and resources these two sectors have. HRH The Prince of Wales emphasized the importance of building environmental capital and social capital, and connecting the highest levels of the private sector with local communities.

Development goals for all

AT A SEMINAR hosted by SEI and the Stockholm Resilience Centre in November 2012, leading lights of Colombian politics and research discussed why a new set of develop goals is needed, how Colombia is developing the Sustainable Development Goals concept at a national level and the role of biodiversity and ecosystem services in SDGs.

One of the speakers, Alejandra Torres, Director of International Affairs, Ministry of Environment and Sustainable Development (pictured left) argued that SDGs should apply to all, not just to some. Thus the focus of the Millennium Development Goals (MDG) on poverty reduction would remain central to SDGs, but would be complemented by targets that could incentivize action on sustainable consumption and production.

Where science meant business

LEADING UP TO Rio+20, the centre, together with the Stockholm Environment Institute, the Stockholm School of Economics and the Stichting af Jochnick Foundation hosted in May 2012 a forum for Swedish business leaders.

The forum, entitled Sustainable Business in a Sustainable World, was a high-level science/business forum that brought together CEOs, corporate executive teams, leading scientists and policy-makers to explore how to implement and manage the transformation to sustainability.

A meeting place for leading thinkers from business, science and politics, the forum placed the latest science and megatrends in the context of today's corporate challenges.

"The transition to sustainability is an exciting but challenging journey. To develop relevant know-how and useful references is crucial. I hope and believe that this forum, due to its interesting combination of perspectives, will assist in that challenge," said Magnus Brännström, CEO of Oriflame Cosmetics, one of the core sponsors of the event.

Read more at www.sustainablebusinessworld.com.

PHOTO STOCKHOLM ENVIRONMENT INSTITUTE

PHOTO E. LINDVALL/GURINGO

SEMINAR AND EVENTS

Tipping point – an exhibition

Centre contributes to artistic exhibition on the close links between humans and nature

In an exhibition at Kulturhuset in Stockholm, science and art met to demonstrate the close interdependencies between humans and nature. With a range of curiously crafted installations, the exhibition "Tipping Point" provided visitors with the opportunity to feel, listen, play and discover what resilience, planetary boundaries, ecosystem services and biomimicry is all about.

Receiving more than 17,000 visitors, the exhibition took place from 17 March to 3 June 2012 and was a collaboration between the Stockholm Resilience Centre, the Stockholm Environment Institute, Munktell Science Park, the Swedish Weather & Climate Centre (SWC), Albaeco, Energimyndigheten, Länsstyrelsen i Stockholms län, SLL/Miljöbidraget,and Antonia Ax:son Johnsons Stiftelse för Miljö och Utveckling.

Stockholm Seminars

The Stockholm Seminars cover a broad range of perspectives on sustainability issues. The seminars are organized by Albaeco, Stockholm Resilience Centre, the Beijer Institute of Ecological Economics, the International Biosphere-Geosphere Programme (IGBP), Stockholm Environment Institute and the Swedish Secretariat for Environmental Earth System Sciences (SSEESS).

3 February
Tim Lynam
Making sense of climate change and adaptation

9 February
Karine Nyborg
The ethics and politics of environmental cost-benefit analysis

21 February
Henrik Österblom
Tipping points and why seabirds depend on access to one third of the world's fish

7 March
Oran Young
The effectiveness of international regimes: research opportunities

18 April
John Ingram
Food security and planetary boundaries

26 April
Jean-Marc Jancovici
Going carbon-free, a mere joke?

11 May
Mark Swilling
Is a just transition possible? – a southern perspective on the global polycrisis and what happens next

21 May
Rolph Payet
Climate change and sea level rise: can we adapt?

23 May
John Tanzer
Institutional entrepreneurs and the emergence of international institutions for ecosystem stewardship

29 May
Robert Costanza
Solutions for a sustainable and desirable future

31 May
Steve Lansing
Did a butterfly effect change the history of the Pacific?

7 June
Marianne Krasny
Civic ecology: social-ecological innovtions in human-nature connections in cities

12 June
François Bouquet
Collective action and conservation of identities

10 September
Scott Barrett
Climate negotiations and approaching catastrophes

14 September
Villy Christensen
Ecological networks — from who did it to future food webs

28 September
Cindi Katz
Resilience in a social field – response to transition

2 October
Anantha Duraiappah
Inclusive Wealth Report: Transition to sustainability

8 November
Charles Hall
Improving real productivity: from labour productivity to multidimensional measure of productivity

12 November
Lance Gunderson
The nature of change and the change of nature: obstacles and opportunities for building adaptive capacity

20 November
Brigitte Baptiste
Questions and challenges for the governance of biodiversity and ecosystem services in Colombia

PHOTO JERKER LOKRANTZ/AZOTE

Resilience dialogues

The Resilience dialogues are weekly internal seminars for staff and students. The purpose of the seminars is to create a space for reflection and exploration of frontier resilience research questions.

18 January
Johan Rockström
What should be our role in science-policy processes?

25 January
Maria Schultz
"Scaling up Biodiversity Finance" Ecuador 6-9th of March 2012

1 February
Sarah Cornell
How Resilience Science can underpin Sustainable Development Goals

8 February
Richard Klein, Stockholm Environment Institute, Terry Cannon and Chris Béné, UK Institute of Development Studies
How does one integrate disaster risk reduction, adoption to climate change and powerty reduction to improve resilience?

29 February
Cibele Queiroz
"Tell me where you are from, I will tell you about your research": Regional patterns found for scientific perspectives on agriculture and biodiversity worldwide

7 March
Sarah Cornell
Planetary Boundaries and Planetary Responsibilities

14 March
Carl Folke, Johan Rockström, Lisa Deutch
The SRC take on education: (Part 1) What is the vision and basic principles for our education?

21 March
Lisa Deutch, Carl Folke
The SRC Take on resilience and the future of Education (Part Two) Orienteering our way to excellence in transdisciplinary education

11 April
Victor Galaz
Geoengineering in the Anthropocene

18 April
Carl Folke, Oonsie Biggs, Thorsten Blenckner
SRC Surprising Insights: A journey into unexpected research findings, crystal clear ideas and resilience one-liners...

13 June
Per Olsson
Research on innovations & transformation in SES: Insights and ways forward

12 September
Oonsie Biggs, Tim Daw, Elin Enfors et. al.
Links between ecosystem servcies and human wellbeing

14 November
Örjan Bodin, Maja Schlüter
Resilience dialogue: strengthening the linkages between the conceptual and empirical basis of resilience

28 November
Fredrik Moberg, Anna Emmelin
Cooking the SRC narratives: How do we write and tell compelling place-based stories about our research and its implications?

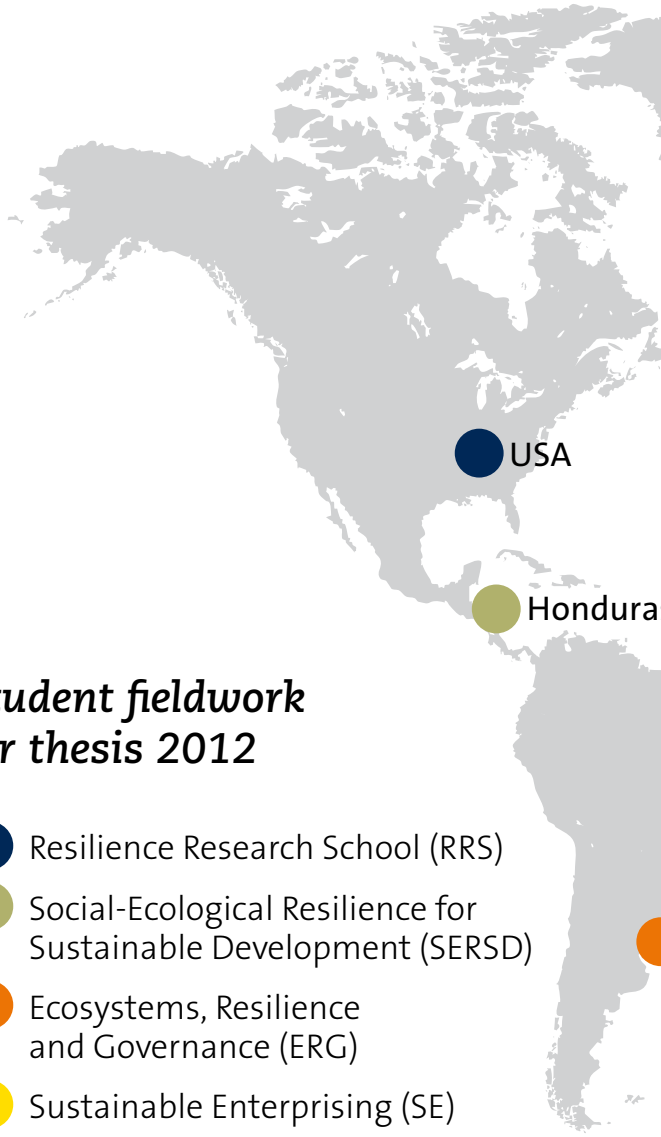
Theme leader retreat November 2012.

Education

2012 saw a continued increase in the role that education plays in not only bridging groups and activities at the centre but also contributing to research and capacity building

We enjoyed the company of Prof. Lance Gunderson from Emory University during his sabbatical in the autumn. Lance not only gave a course for the Resilience Research School (RRS) in adaptive management, he also made time to join the PhD book club in their discussion of his classic work Panarchy and lectured for the Master's students on the challenges of dealing with scale in ecosystem management - to everyone's delight!

In the spring, the course Conducting Resilience Assessments in Social-Ecological Systems brought together an exciting group of experts on resilience: Paul Ryan, a practitioner with international experience in resilience assessments, Brian Walker, one of resilience thinking's founders and Allison Quinlan, a Senior Research Fellow at the Resilience Alliance who helped develop the first Resilience Assessment Workbook together with centre researchers Lisen Schultz and Cathy Wilkinson. Together they provided a unique and hands-on course for researchers, practitioners, PhDs and Master students alike.

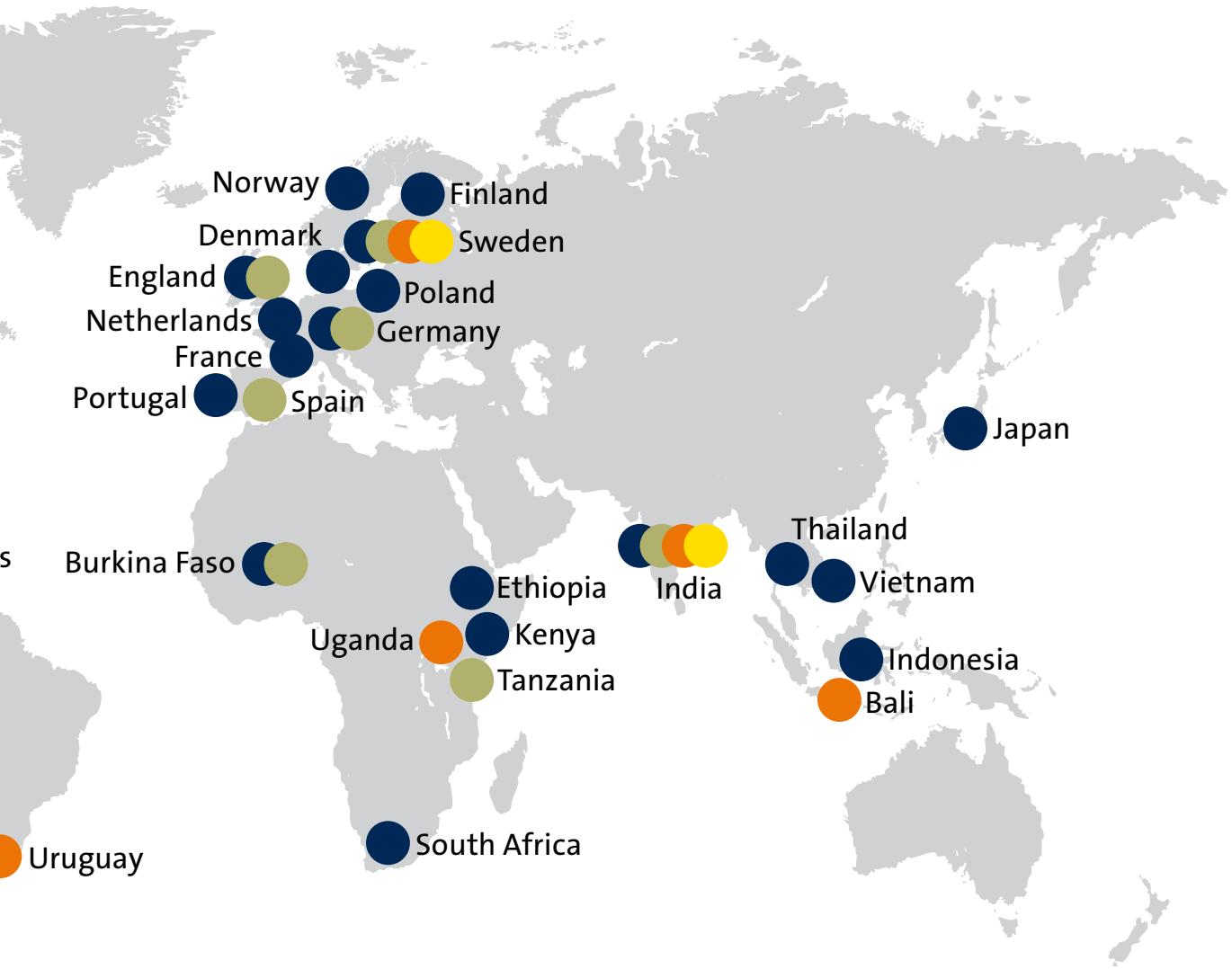


Student fieldwork for thesis 2012

- Resilience Research School (RRS)
- Social-Ecological Resilience for Sustainable Development (SERSD)
- Ecosystems, Resilience and Governance (ERG)
- Sustainable Enterprising (SE)

Världens Eko

Our Swedish undergraduate course on sustainable development, Världens eko, remains immensely popular. Initiated and driven by students, the course features some of Sweden's most qualified researchers and debaters on sustainable development.



The Resilience Research School (RSS)

The RRS provides a structure that allows a focus on resilience in sustainability science and also maintains the flexibility required to work with a diversity of departments from the natural and social sciences. Members receive an introduction to resilience research through courses and forge strong collaborations with PhD students based within other departments at SU and other Swedish universities.

In 2012, we started a seminar series exclusively for our PhDs called "How to be a SRC Scientist". These seminars helped strengthen academic and practical skills, including how to run effective meetings and write successful grant proposals. The topics of the seminars were chosen by the students themselves and given by SRC supervisors.

Our Master's Programme

The first year of our new Master's programme Social-Ecological Resilience for Sustainable Development (SERSD) was a great success according to both student and SRC faculty evaluations. In 2012, all programme students were fully integrated into SRC research for their thesis work, and two former programme students were recruited to pursue PhDs.

Furthermore, six scientific publications and a book chapter stemmed from our students' theses, and students also contributed to SRC research in coursework activities such as the Bali and urban sprawl cases in the Regime Shift Database (see www.regimeshifts.org).

More courses

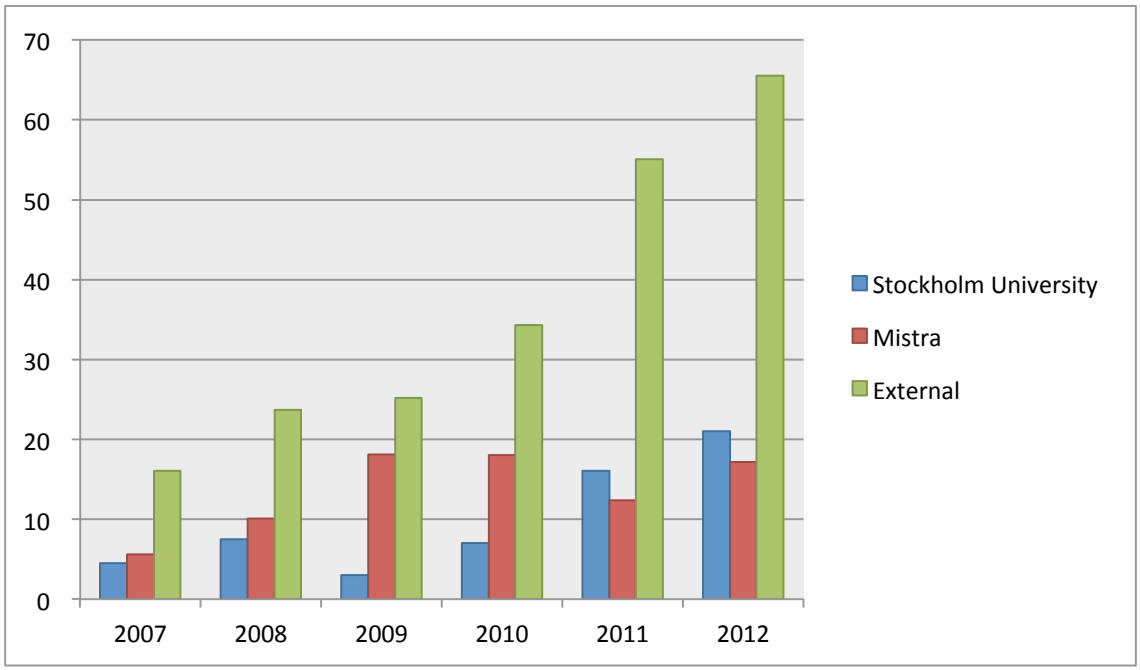
In 2013 the centre will merge with the Department of Natural Resources Management at Stockholm University. We will have our own PhD programme, expand our selection of courses and continue to develop the Resilience Research School.

Appendix:
Finance and funding

Funding of SRC's activities and costs 2012:

2012 Total	**103,7**	**MSEK**
Stockholm University	**21**	**MSEK**
Allocated subsidy from Stockholm University	12,2	MSEK
External Formas funding via faculty	5	MSEK
Accumulated subsidy surplus	3,8	MSEK
MISTRA core grant*	**17,2**	**MSEK**
External grant total	**65,5**	**MSEK**
SwaM: the Swedish Agency for Marine & Water Management	12,2	MSEK
Formas	16,2	MSEK
SIDA	5,3	MSEK
SIDA (Swedbio)	18,8	MSEK
Futura	1,5	MSEK
Schwartz	1,5	MSEK
Nippon Foundation	1,5	MSEK
The Royal Academy of Sciences	1,2	MSEK
EU	3	MSEK
other	4,3	MSEK

**Allocated grant from Mistra 16,8 MSEK plus accumulated surplus 0,4 MSEK*



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Centre Staff 2012

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Olof Olsson *Deputy director*
Johan Rockström *Executive director*

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Johan Ahlenius *Financial & education administrator*
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Bengt Hall *IT-support*
Gunnar Jacobsson *IT-support*
Denise Kreppenhofer *Human resources administrator*
Karolina Krzyzanowska *Financial controller*
Therese La Monde *Office & financial administrator*
Christina Leijonhuvud *Affiliated administrator*
Cecilia Linder *Human resources*
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Stina Nieminen *Project controller*
Henrik Pompeius *Fundraiser*
Maria Schewenius *Project coordinator*
Agneta Sundin *Affiliated administrator*

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Marika Haeggman *Communication officer*
Sturle Hauge Simonsen *Deputy head of communications*
Ellika Hermansson Török *Project leader*
Cajsa Martinsson *Communication officer*
Fredrik Moberg *Senior strategic advisor*
Maria Schultz *Head of communcations and Swedbio*

Arvid Bergsten *Department service*
Fredrik Hannerz *Senior strategic advisor*
Mattias Klum *Affiliated senior advisor*
Marmar Nekoro *Communication and policy officer (BalticStern and BNI)*
Jeff Ranara *Department service*

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Emma Sundström *System developer*

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Håkan Berg *Senior researcher & advisor*
Pamela Cordero *Financial controller & administrator*
Sara Elfstrand *Project officer*
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Henrik Scharin *Officer*

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Lisa Deutsch *Director of studies (Senior lecturer)*
Eleonora Horn *Course assistant*
Miriam Huitric *Programme director*
Elin Sperber Ossiansson *Course assistant*

Research staff with main theme/programme association

Theme 1 Freshwater, food and ecosystem services
Jennie Barron *Affiliated researcher*
Elin Enfors *Postdoc*
Malin Falkenmark *Affiliated senior researcher*
Line Gordon *Senior researcher*
Tilman Hertz *Visiting researcher*
Louise Karlberg *Affiliated researcher*
Timothy Karpozoglou *Postdoc*
Patrick Keys *PhD student*
Steven Lade *Postdoc*
Mats Lannerstad *Affiliated researcher*
Olivia Murzabekov *PhD student*
Issa Oudraogo *Postdoc*
Claudia Pahl-Wostl *Affiliated senior researcher*
Angelina Sanderson Bellamy *Researcher*
Hanna Sinare *PhD student*

Theme 2 Urban social-ecological systems
Erik Andersson *Researcher*
Stephan Barthel *Affiliated researcher*
Sara Borgström *Postdoc*
Johan Colding *Affiliated senior researcher*
Thomas Elmqvist *Professor*
Henrik Ernstson *Researcher*
Marnie Graham *PhD student*
Åsa Green *Affiliated researcher*
Joshua Lewis *PhD student*
Cathy Wilkinson *Researcher*

Theme 3 Governance of coastal and marine systems
Simon Birnbaum *Researcher*
Wijnand Boonstra *Researcher*
Eny Buchary *Postdoc*
Beatrice Crona *Senior researcher*
Tim Daw *Researcher*
Jonas Hentati Sundberg *PhD student*
Martina Kadin *PhD student*
Andrew Merrie *PhD student*
Marc Metian *Postdoc*
Magnus Nyström *Senior lecturer*
Max Troell *Affiliated senior researcher*
Matilda Valman *PhD student*
Henrik Österblom *Associate senior lecturer*

Theme 4 Regime shifts
Oonsie Biggs *Researcher*
Thorsten Blenckner *Senior researcher (also theme 3 and BNI)*
Jamila Haider *PhD student*
Maike Hamann *PhD student*
Garry Peterson *Professor*
Juan Carlos Rocha Gordo *PhD student*

Theme 5 Global and cross-scale dynamics
Victoria Bignet *Project assistant*
Robert Constanza *Affiliated senior researcher*
Sarah Cornell *Researcher*
Ann-Sophie Crepin *Affiliated senior researcher*
Gustav Engström *PhD student*
Ingo Fetzer *Researcher*

Victor Galaz *Senior lecturer*
Johan Gars, *Affiliated researcher*
Therese Lindahl *Affiliated researcher*
Karl-Göran Mäler *Affiliated senior researcher*
Will Steffen *Affiliated senior researcher*
Brian Walker *Affiliated senior researcher*

Theme 6 Adaptive governance, networking and learning
Jenny Beckman *Researcher*
Örjan Bodin *Associate senior lecturer*
Andreas Duit *Affiliated Senior Lecturer*
Johan Enqvist *PhD student*
Diego Galafassi *PhD student*
Divya Gopal *PhD student*
Thomas Hahn *Researcher*
Stephen Lansing *Affiliated senior researcher*
Cecilia Lundholm *Affiliated senior researcher*
Vanessa Masterson *PhD student*
Björn Nyqvist, *Affiliated Postdoc*
Per Olsson *Researcher*
Ryan Plummer *Affiliated senior researcher*
Remberto Salazar *Project assistant*
Angelina Sanderson Bellamy *Postdoc*
Annica Sandström *Postdoc*
Åsa Swartling *Affiliated researcher*
Maria Tengö *Researcher*
Franciska von Heland *PhD student*
Jacob von Heland *PhD student*
Simon West *PhD student*
Frances Westley *Affiliated senior researcher*

Programme on Ecosystem Change and Society (PECS)
Ulf Molau *Visiting professor*
Albert Norström *Researcher*
Lisen Schultz *Researcher*

IHOPE
Carole Crumley *Senior researcher*
Uno Svedin *Affiliated senior researcher (also theme 5)*
Sverker Sörlin *Affiliated senior researcher*

Baltic Nest Institute (BNI)
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Hanna Eriksson Hägg *Researcher*
Bo Gustafsson *Managing director*
Erik Gustafsson *Researcher*
Bongghi Hong *Consultant*
Christoph Humborg *Director of BNI*
Bärbel Müller-Karulis *Researcher*
Carl-Magnus Mörth *Professor*
Susa Niiranen *PhD Student*
Saskia Otto *Postdoc*
Miguel Rodrigues Medina *Research engineer*
Oleg Savchuck *Researcher*
Erik Smedberg *Researcher*
Alexander Sokolov *Researcher*
Dennis Swaney *Consultant*
Maciej Tomczak *Researcher*
Johanna Yletuinen *PhD Student*
Fredrik Wulff *Affiliated senior researcher*

Centre researcher Beatrice Crona, an expert on marine resource governance, was in 2012 elected to the Young Academy of Sweden. The Academy was founded in May 2011 by the Royal Swedish Academy of Science.

In-house environmental action plan
Stockholm Resilience Centre is actively involved in the current Stockholm University process of becoming ISO 14001 certified. The environmental action plan was updated late 2012 and an internal university revision was carried out at the start of 2013. An external revision is planned for the autumn of 2013. The action plan will further be extended to include aspects related to good psychosocial work environment.

For the second year running, centre staff went on a three-day team building trip to Stora Karlsö, the world's second oldest nature reserve, known for its abundant bird life.








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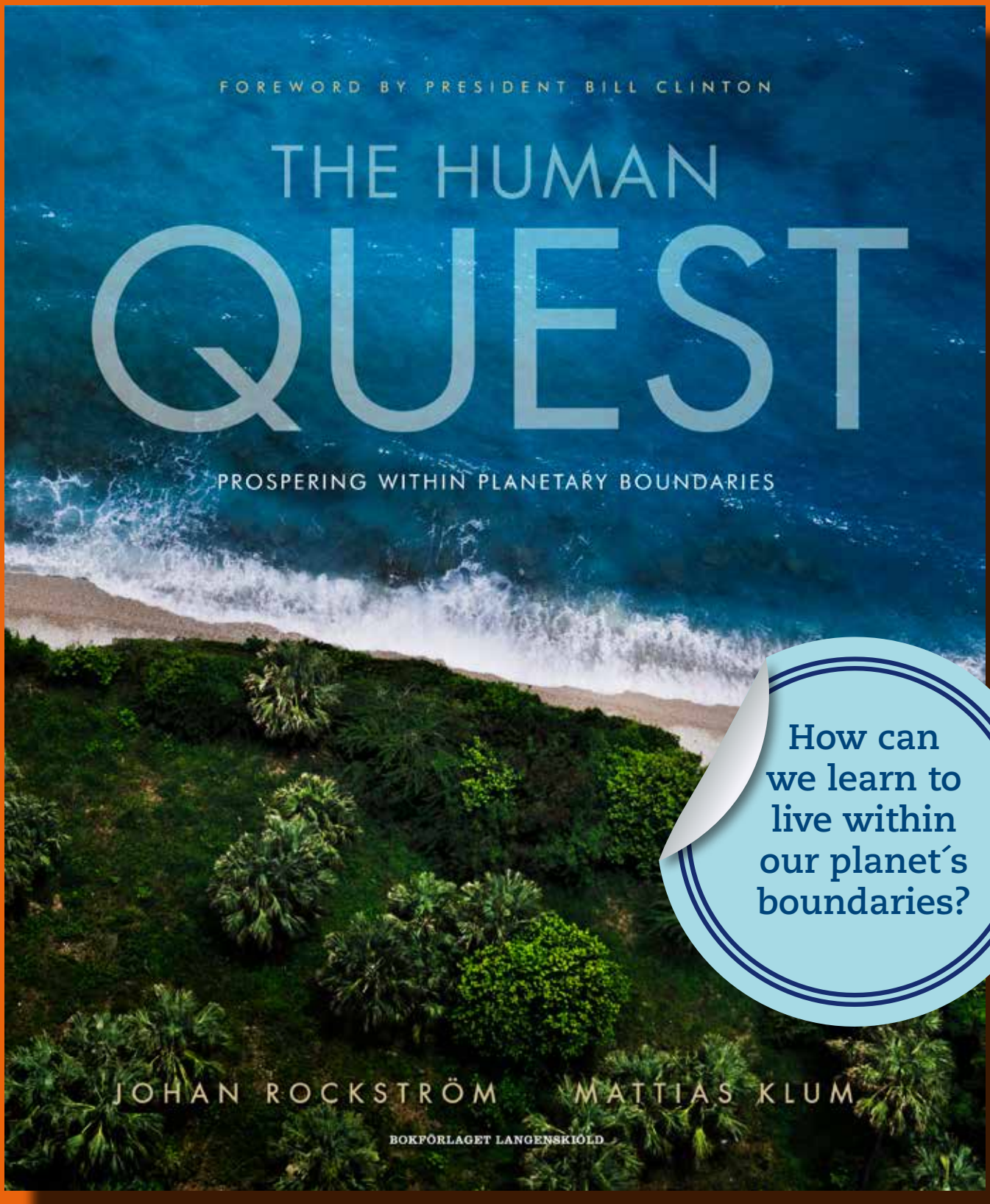

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