



GLOBAL ECONOMIC DYNAMICS AND THE BIOSPHERE

THE ROYAL SWEDISH ACADEMY OF SCIENCES

The Erling-Persson Family Academy Programme



REPORT 2015

Remarks by the Executive Director

This is the 2015 Annual Report of the Global Economic Dynamics and the Biosphere programme, at the Royal Swedish Academy of Sciences. In October 2015 the programme underwent an external review to assess its progress. For this purpose an extensive overview of the achievements until September 2015 was conducted (GEDB Progress Report 2013-2015). As a result, and to reduce redundancy, the 2015 annual report only contains the complete lists of publications, conferences and other relevant activities for the calendar year of 2015, as well as the financial report for the same period.

For a more detailed account of the research activities conducted under the programme for 2015 we refer to the GEDB Progress Report 2013-2015, available on our webpage <http://www.gedb.se/>

Stockholm 16 March 2016



Beatrice Crona
Executive Director
Global Economic Dynamics and the Biosphere
The Royal Swedish Academy of Sciences

Appendix

STAFF

Eny Buchary	<i>Early career academy researcher</i>
Beatrice Crona	<i>Executive programme director</i>
Gretchen Daily	<i>Visiting Professor</i>
Carl Folke	<i>Director</i>
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Johan Gars	<i>Early career academy researcher</i>
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Cecilia Repinski	<i>Science impact advisor</i>
Johan Rostedt	<i>Research assistant</i>
Mark Sanctuary	<i>Early career academy researcher</i>
Evelyn Strombom	<i>Research assistant</i>
Agneta Sundin	<i>Communications officer</i>
Max Troell	<i>Associate professor, researcher</i>
Tracy Van Holt	<i>Senior academy researcher</i>
James E. Wilen	<i>Visiting professor</i>

ADVISORY BOARD

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Bonnie McCay	<i>Rutgers University</i>
Stephen Polasky	<i>University of Minnesota</i>
Marten Scheffer	<i>Wageningen University</i>

JOURNAL ARTICLES PUBLISHED

Blenckner, T., M. Llope, C. Mollmann, R. Voss, M. F. Quaas, M. Casini, M. Lindegren, C. Folke, and N. Chr. Stenseth. 2015. Climate and Fishing Steer Ecosystem Regeneration to Uncertain Economic Futures. *Proceedings of the Royal Society B: Biological Sciences* 282:20142809–20142809.

Bratman, G.N., G.C. Daily, B.J. Levy, and J.J. Gross. 2015. The Benefits of Nature Experience: Improved Affect and Cognition. *Landscape and Urban Planning* 138:41–50.

Borgström, S., Ö. Bodin, A. Sandström, B. Crona 2015. Developing an analytical framework for assessing progress toward ecosystem-based management. *Ambio* 44, Supplement 3, pp 357–369

Cao, L., R. Naylor, P. Henriksson, D. Leadbitter, M. Metian, M. Troell, and W. Zhang. 2015. China's Aquaculture and the World's Wild Fisheries. *Science* 347:133–135.

Carpenter, S.R., W. Brocks, C. Folke, E. van der Nees, and M. Scheffer. 2015. Allowing Variance may Enlarge the Safe Operating Space for Exploited Ecosystems. *Proceedings of the National Academy of Sciences* 112 (46).

Conversi, A., V. Dakos, A. Gårdmark, S. Ling, C. Folke, P. Mumby, C. Greene, M. Edwards, T. Blenckner, M. Casini, A. Pershing, and C. Möllmann. 2015. A holistic view of marine regime shifts that spans multiple ecosystems and stressors. *Philosophical Transactions of the Royal Society London, Biological Sciences* 370 (1659).

Champetier, A., D. Sumner, and J.E. Wilen. 2015. The Bioeconomics of Honey Bees and Pollination. *Environmental and Resource Economics* 60(1):143–164.

Crépin, A.-S. and C. Folke. 2015. The economy, the biosphere, and planetary boundaries: Towards biosphere economics. *International Review of Environmental and Resource Economics* 8:57–100.

Crona, B., T. Van Holt, M. Petersson, T.M. Daw and E. Buchary. 2015. Using social-ecological syndromes to understand impacts of international seafood trade on small-scale fisheries. *Global Environmental Change* 35:162–175.

Crona, B., T.M. Daw, W. Swartz, A.V. Norström, M. Nyström, M. Thyresson, C. Folke, J. Hentati-Sundberg, H. Österblom, L. Deutsch, and M. Troell. 2015. Masked, Diluted and Drowned out: How Global Seafood Trade Weakens Signals from Marine Ecosystems. *Fish and Fisheries*.

Da, C.T., L.H. Phuoc, H.N. Duc, M. Troell, and H. Berg. 2015. Use of Wastewater from Striped Catfish (*Pangasianodon Hypophthalmus*) Pond Culture for Integrated Rice–Fish–Vegetable Farming Systems in the Mekong Delta, Vietnam. *Agroecology and Sustainable Food Systems* 39:580–597.

Engström, G and Gars, J. 2015. Optimal Taxation in the Macroeconomics of Climate Change. *Annual Review of Resource Economics* Vol. 7: 127–150

Eriksson, H, H. Österblom, B. Crona, M. Troell, N. Andrew, J. Wilen, and C. Folke. 2015. Contagious Exploitation of Marine Resources. *Frontiers in Ecology and the Environment* 13: 435–440

Galaz V., J. Gars, F. Moberg, B. Nykvist, and C. Repinski. 2015. Why ecologists should care about financial markets. *Trends in Ecology and Evolution* 30, Issue 10, p571–580.

Gould, R.K., S.C. Klain, N.M. Ardoin, T. Satterfield, U. Woodside, N. Hannahs, G.C. Daily, and K.M. Chan. 2015. A Protocol for Eliciting Nonmaterial Values through a Cultural Ecosystem Services Frame. *Conservation Biology* 29(2):575–586.

Homer-Dixon, T., B. Walker, R. Biggs, A.-S. Crépin, C. Folke, E. F. Lambin, G. D. Peterson, J. Rockström, M. Scheffer, W. Steffen, and M. Troell. 2015. Synchronous failure: the emerging causal architecture of global crisis. *Ecology and Society* 20(3):6

Jouffray, J.B., M. Nyström, A.V. Norström, I.D. Williams, L.M. Wedding, J.N. Kittinger, and G.J. Williams. 2015. Identifying multiple coral reef regimes and their drivers across the Hawaiian archipelago. *Philosophical Transactions of the Royal Society B: Biological Sciences* 370(1659):20130268.

Krause, G., C. Brugere, A. Diedrich, M.W. Ebeling, S.C.A. Ferse, E. Mikkelsen, J.A. Pérez Agúndez, S.M. Stead, N. Stybel, and M. Troell. 2015. A revolution without people? Closing the people-policy gap in aquaculture development. *Aquaculture* 447:44–55.

Marín, A., Ö. Bodin, S. Gelcich, B. Crona. 2015. Social capital in post-disaster recovery trajectories: Insights from a longitudinal study of tsunami-impacted small-scale fisher organizations in Chile. *Global Environmental Change* 35:450–462

Miller, A.E., B.J. Brosi, K. Magnacca, G.C. Daily, and L. Pejchar. 2015. Pollen Carried by Native and Nonnative Bees in the Large-Scale Reforestation of Pastureland in Hawai'i: Implications for Pollination. *Pacific Science* 69(1):67–79.

Möllman, C., C. Folke, M. Edwards, and A. Conversi. 2015. Marine regime shifts around the globe: Theory, drivers and impacts. *Philosophical Transactions of the Royal Society London, Biological Sciences* 370(1659):20130260.

Sandström, A., Ö. Bodin, and B. Crona. 2015. Network Governance from the top – The case of ecosystem-based coastal and marine management. *Marine Policy* 55:57–63.

Scheffer, M., J. Bascompte, T. K. Bjordam, S. R. Carpenter, L. B. Clarke, C. Folke, P. Marquet, N. Mazzeo, M. Meerhoff, O. Sala, and F. R. Westley. 2015. Dual thinking for scientists. *Ecology and Society* 20(2):3.

Scheffer, M., S. Barrett, S. R. Carpenter, C. Folke, A. J. Green, M. Holmgren, T. P. Hughes, S. Kosten. I.A. van de Leemput, D.C Nepstad, E.H.van Nes, E.T.H.M. Peeters, and B. Walker. 2015. Creating a Safe Operating Space for Iconic Ecosystems. *Science* 347(6228):1317–1319.

Steffen, W., K. Richardson, J. Rockström, S. Cornell, I. Fetzer, E. Bennett, R. Biggs, S.R. Carpenter, W. de Vries, C.A. de Wit, C. Folke, D. Gerten, J. Heinke, G.M. Mace, L.M. Persson, V. Ramathanan, B. Reyers, and S. Sörlin. 2015. Planetary Boundaries: Guiding Human Development on a Changing Planet. *Science* 347(6223):1259855.

Wamukota, A., B. Crona, K. Osuka, and T.M. Daw. 2015. The Importance of Selected Individual Characteristics in Determin-

ing Market Prices for Fishers and Traders in Kenyan Small-Scale Fisheries. *Society and Natural Resources* 28:959–974.

Österblom H, J.B. Jouffray, C. Folke, B. Crona, M. Troell, A. Merrie, and J. Rockström. 2015. Transnational Corporations as 'Keystone Actors' in Marine Ecosystems. *PLoS ONE* 10(5):e0127533. 3,234

Österblom, H. and C. Folke. 2015. Globalization, marine regime shifts and the Soviet Union. *Philosophical Transactions of the Royal Society London, Biological Sciences* 370(1659):20130278.

JOURNAL ARTICLES IN PRESS

Béné, C., R. Arthur, H. Norbury, E. H. Allison, M.C.M Beveridge, S. Bush, L. Campling, W. Leschen, D. Little, D. Squires, S. Thilsted, M. Troell and M. William. In press. Contribution of fisheries and aquaculture to food security and poverty reduction: assessing the current evidence. *World Development*.

Bodin, Ö., A. Sandström and B. Crona. In press. Collaborative Networks for Effective Ecosystem-Based Management: A Set of Working Hypotheses. *Policy Studies Journal*.

Caspersen, J., T. Van Holt, and J.C. Johnson. In press. Measuring agreement in participatory mapping. *Field Methods*.

Crona, B.I., X. Basurto, D.Squires, S. Gelcich, T.M. Daw, A. Khan, E. Havice, V. Chomo, M. Troell, E.A. Buchary and E. H. Allison. In press. Towards a typology of interactions between small-scale fisheries and global seafood trade. *Marine Policy*.

Mathevet, R., J.D. Thompson, C. Folke, and S. Chapin III. In press. Protected Areas and Their Surrounding Territory: Social-Ecological Systems in the Context of Ecological Solidarity. *Ecological Applications*.

BOOK CHAPTERS

Brock, W. A., G. Engström, and A. Xepapadeas. 2015. Energy Balance Climate Models, Damage Reservoirs and the Time Profile of Climate Change Policy. In: Bernard, L. and Semmler, W. (ed.). *The [Oxford] Handbook of the Macroeconomics of Climate Change*, Oxford University Press

Gars, J. 2015. Förnybara resurser (Swedish). *Cambridge University Press* Cambridge, UK

WORKING PAPERS AND OTHERS

Ferguson, S. and J. Gars, 2015. Productivity Shocks, International Trade and Pass-Through: Evidence from Agriculture. *Conference proceeding from the 29th ICAE (International Conference of Agricultural Economists)*.

Gars, J. and Engström, G. 2015. Climatic tipping points and optimal fossil fuel use. *Beijer Discussion Paper* no. 250

Gars, J., C. Olovsson 2015. Fuel for Economic Growth. *S-WoPec Working paper* no. 299

CONFERENCES, WORKSHOPS AND PRESENTATIONS

Sustainable Markets and the Biosphere: collaboration workshop, Beijer Institute, GEDB, and the Stockholm School of Economics (MISUM). Sigtuna, 1-2 June 2015. Approximately 25 researchers from both institutions participated and worked to identify a set of mutually interesting research areas and to develop preliminary steps for how to jointly pursue research within these areas.

Buchary, E. 2nd World Small-Scale Fisheries Congress, CINVESTAV and Too Big To Ignore Project. Merida, Mexico. September 2014. Presentation: Perceptions of small-scale inland fishers on the state of fisheries in Central Kalimantan, Indonesia.

Buchary, E. Fair Trade USA Fisheries Advisory Council Meeting, Fair Trade USA. Boston, USA. March 2015. Participant.

Buchary, E. Global Conference on Inland Fisheries, Food and Agricultural Organisation, United Nations. Rome, Italy. January 2015. Presentation: A Fuzzy Logic Approach to Explore the Dynamic of Changes that Affect Inland Fisheries in Central Kalimantan, Indonesia.

Buchary, E. POWLINA's 2nd stage preparation meeting for the European Union's H2020-WATER-2015-two-stage Call, Institut National De La Recherche Agronomique (INRA). Grignon, France. June - July 2015. Participant.

Crona, B. Spaces workshop, Durban, South Africa. 21-25 October. Participant.

Crona, B. WIOMSA (Western Indian Ocean Marine Science Association) workshop, Durban, South Africa. 26-29 October. Participant.

Crona, B. Utrikespolitiska Föreningen, Lunds Universitet. 1 December. Lecture: Governance in the context of ocean acidification: Global challenges and multi-level solutions

Daily, G. Conference on environment and sustainable development (Tillståndet i miljön 2015). Stockholm, Sweden. May. Keynote speaker: Valuing nature in business and policy.

Daily, G. Inter-Departmental Seminar, Uppsala Agricultural University. Uppsala, Sweden. January. Invited speaker: Integrating biodiversity and ecosystem services into decisions.

Daily, G. Inter-Departmental Seminar, Yale University. Yale, USA. January. Invited speaker by webex: The history and future of ecosystem service approaches.

Daily, G. Modelling Ecosystem Services. Leipzig, Germany. April. Organiser and keynote speaker in a related event: Challenges and opportunities for women in science.

Daily, G. Natural Capital Symposium. Stanford, USA.

March. Organiser and keynote speaker: Key frontiers in ecosystem service science.

Daily, G. Stockholm City Urban Planning Conference. Stockholm, Sweden. June. Keynote speaker: Ecosystem services in city planning.

Daily, G. Stockholm Summit on Natural Capital. Stockholm, Sweden. May. Organiser. Presentation: A shared action plan for driving innovation and uptake of natural capital and resilience approaches.

Engström, G. and Troell, M. ACCESS final general assembly, Universitat Politècnica de Catalunya Villanova. Barcelona, Spain. February. Participants.

Folke, C. Behaviour, Economics, and Nature Network Workshop: Living with Homo Economicus?, Beijer Institute of Ecological Economics. Stockholm, Sweden. June. Participant.

Folke, C. EAT Food Forum. Stockholm, Sweden. June. Chair of competence forum EAT Science, Jury of EAT Award.

Folke, C. Ebba and Sven Schwartz Foundation. Stockholm, Sweden. May, March. Participant.

Folke, C. Environmental Economics – Pathways to a Sustainable Future, Sida Development Talks Sida. Stockholm, Sweden. May. Presenter.

Folke, C. KU Leuven. Leuven Belgium. February. Honorary Doctor Lecture.

Folke, C. Insurance Value of Ecosystems, United Nations University (UNU). Tokyo, Japan. January. Presentation.

Folke, C. International Conference on Sustainability Science, United Nations University (UNU) Tokyo, Japan. January. Keynote presentation.

Folke, C. Policy Dialogue on Science and Technology for Sustainability, United Nations University (UNU). Tokyo, Japan. January. Participant

Folke, C. Welcome Trust visit, Stockholm Resilience Centre. Stockholm, Sweden. February. Presentation

Folke, C. symposium "Gröna omställningar – jordens chans för entreprenörer", Anders Wall's Foundation. Stockholm, Sweden. March. Invited speaker.

Folke, C. Rockefeller Global Fellowship Programme on Social Innovation. Stockholm, Sweden. May. Speaker.

Folke, C. Stockholm Summit on Natural Capital. Stockholm, Sweden. May. Organiser.

Folke, C. Board meeting United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS), Tokyo, Japan. October. Participant.

Folke, C. Linking Science and Policy for Implementing the 2030 Agenda for Sustainable Development, United Nations University and IAS, Tokyo, Japan, October. Speaker and Panelist.

Folke, C. Transformations 2015 Conference, Stockholm. October. Keynote speaker:

Galaz, V. PECS 2015 Conference, Stellenbosch, South Africa. November. Panel organizer: Financial markets and the biosphere – current debates and research frontiers

Gars, J. Annual Conference of the European Association of Environmental and Resource Economists (EAERE). Helsinki, Finland. June. Paper presentation: Fuel for Economic Growth?

Gars, J. Beijer Young Scholars workshop. Stockholm, Sweden. May. Participant.

Gars, J. International Conference of Agricultural Economists Milan, Italy. August. Presentation: Productivity Shocks, International Trade and Pass-Through: Evidence from Agriculture.

Jouffray, JB. Conference on Complex Systems (CCS'15), Tempe, USA. September. Presentation: Transnational Corporations as 'Keystone Actors' in Marine Ecosystems.

Jouffray, JB. NCEAS Ocean Tipping Point "All hands meeting", Santa Barbara, USA. September. Presentation: Regimes-Drivers Analysis.

Jouffray, JB. Stockholm Resilience Centre board meeting, Stockholm, Sweden. September. Presentation: Disentangling cross-scale driver interactions in marine social-ecological systems.

Käll, S. Transformations 2015 Conference, Stockholm, Sweden. October. Participant

Käll, S. and Van Holt, T. The Internet of the Seas Hackathon, Transformations Lab, Stockholm, Sweden. 30 September-1 October. Co-organisers.

Repinski, C. Conference on environment and sustainable development (Tillståndet i miljön 2015). Stockholm, Sweden. May. Participant.

Repinski, C. Framtidsforum. Seminar with the finance sector around sustainability, The Swedish AP (Pension) Fund Stockholm, Sweden. May. Participant.

Repinski, C. Nordic Conference on Green Investment, The Nordic Council of Ministers. Oslo, Norway. May. Participant.

Repinski, C. Seminar Greener finance sector, Haga Initiative. Stockholm, Sweden. May. Participant.

Repinski, C. Seminar Sustainable Business, The Ministry of Environment and the Swedish Association. Stockholm, Sweden. May. Participant.

Repinski, C. Stockholm Natural Capital Summit, Natural Capital and Global Economics and the Biosphere. Stockholm, Sweden. May. Co-organizer.

Søgaard Jørgensen, P. European macroecology conference, Copenhagen, Denmark. May. Workshop organizer.

Søgaard Jørgensen, P. Oresund sustainability symposium. Lund, Sweden and Copenhagen, Denmark. May. Organiser.

Søgaard Jørgensen, P. Oresund sustainability symposium, Lund, Sweden. May. Presentation: Zooming out: Toward a macro-socio-ecology for the natural resource use of nations.

Søgaard Jørgensen, P. European Ecological Federation, Rome, Italy. September. Symposium organizer: Critical innovation in ecology.

Søgaard Jørgensen, P. European Ecological Federation, Rome, Italy. September. Presentation: Applying evolutionary biology to address global challenges.

Søgaard Jørgensen, P. Annual meeting for environmental strategy – Denmark, Copenhagen, Denmark. November. Presentation: Development toward a social-ecological materially efficient economy: How well is Denmark doing?

Søgaard Jørgensen, P. Pan-european Common Bird Monitoring Scheme workshop, Mikulov, Czech Republic. November. Invited speaker: How bird monitoring data help us understanding global change effects: Integrating long- and short-term inference.

Troell, M. ACCESS Assembly Meeting, Villanova, Spain. February. Participant.

Troell, M. Framtidsakademien (Future academy), CEMUS, Uppsala University, Uppsala Library. Uppsala, Sweden. February. Presentation: Hav i förändring - hur möter vi det växande behovet av fisk och skaldjur (The changing sea – how to meet the growing demand for fish and shellfish).

Troell, M. Agricultural Productivity and the Environment Department of Agriculture. Washington D.C, USA. March. Invited speaker: Environmental implications of the growth of aquaculture.

Troell, M. Nordic workshop: Shrimp Fisheries and Management SP Food and Bioscience. Gothenburg, Sweden. March. Participant.

Troell, M. Environmental Economics - pathways to a sustainable future, SIDA, Stockholm, Sweden. May. Participant.

Troell, M. Sustainable Food, Svenskt Tenn. Stockholm, Sweden. May. Speaker and discussant.

Troell, M. Elsevier Symposium: Cutting Edge Science in Aquaculture, Montpellier, France. August. Key note speaker: Resilience in Aquaculture

Van Holt, T. Chatham House Workshop: Evaluating Interventions that Encourage Healthy and Sustainable Diets. London, UK. April. Speaker.

Van Holt, T., Crona, B, Kall, S. Sustainable Fisheries Workshop, Global Economic Dynamics and the Biosphere Programme. Stockholm Sweden. January. Organisers.

Wilén, J. Allied Social Science Association Conference, Boston, USA. January. Participant.

Wilén, J. 2015 North American Fisheries Economics Association Forum, Ketchikan, Alaska, USA. May. Presentation: Economic Costs of Ignoring Fishery-Induced Evolution

Wilén, J. 2015 AERE Conference, San Diego, USA. June. Presentation: Consequences of Fishery-Induced Evolution

Wilén, J. 2015 EAERE Conference, Helsinki, Finland. June. Keynote speaker: Economics of Spatial-Dynamic Processes

Wilén, J. Association of Applied Economists Conference, San Francisco, USA. July. Presentation. Accounting for Internal Organization and Spatial Scale in Spatial Property Rights Fisheries

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