Joint BECC/MERGE Short Project Call

Introduction

The complementary expertise and methodologies used by MERGE and BECC scientists has the potential to make significant contributions to our understanding of climate change and its links to biodiversity and ecosystem services, and to inform national and international policy and assessments based on the best available science.

A series of stimulating discussions among our members at our 2020 joint BECC-MERGE Spring Meeting identified a number of knowledge gaps at the intersection of our Strategic Research Areas (SRAs), the filling of which will require joint activities and a commitment to facilitate these on the part of the SRA Boards. We summarise these topics and knowledge gaps in Appendix 1 below.

To stimulate the creation of such joint activities, BECC and MERGE announce this short project call.

Budget: 1.25 mSEK (50% each from BECC and MERGE) to fund up to 5 projects with a maximum budget of 250 tkr.

Funding for the projects will be made available from Lund University (500kkr from MERGE and 400 from BECC), and the University of Gothenburg (100kkr from MERGE and 250 from BECC). *Funding from LU and GU can only be spent at LU and GU, respectively.*

Money to be transferred before the end of 2023, with a final project date of Dec 31, 2024. Reporting by May 2024 in the form of a seminar open to BECC & MERGE members.

Timeline:

1 April	Call opens
25 June	Deadline
September	Evaluations complete and result announced

What can be applied for?

- Short, self-contained projects
- Pilot projects
- Workshops

Examples of expected outcomes:

- Review paper
- Research paper
- Scientific report from a pilot project that can lead to a larger grant application

Evaluation criteria:

- A funded project should fill a knowledge gap at the intersection of BECC and MERGE research areas, a filling which require joint activities of BECC and MERGE researchers. Such knowledge gaps were identified at the 2020 BECC-MERGE Spring Meeting (Appendix 1), but also other well motivated research gaps may be funded. The application should bring together participants active in BECC and MERGE. To provide an added value, we particularly

encourage applications that bring together researchers that do not already work together in already well established research collaborations.

The main applicant must be permanently employed at LU or GU (including BUL:s). In addition, BECC applicants should be BECC PIs and MERGE applicants must have been actively involved in the MERGE environment.

Application format:

3 pages, including budget and references, plus 2-page CVs from the main applicants.

The project description should clearly describe how it addresses the identified knowledge gaps in Appendix 1 (or other well motivated research gaps) and state the relevance for both BECC and MERGE. The budget should include overhead at the departments where resources are intended to be spent, and include a sum of the amount to be spent at Lund University and University of Gothenburg, respectively.

The CV should include information on

- Education
- Major employments
- Merits & awards (incl. docent, supervision, major grants and awards, board responsibilities, outreach, review assignments, etc)
- Bibliometric summary + 10 most relevant publications + link to full publication list

An evaluation group consisting of two members from MERGE and two from BECC will be appointed by the MERGE and BECC boards, respectively. The application will be evaluated based on scientific quality, relevance to the identified knowledge gaps and the development of BECC and MERGE, feasibility and the qualification of the applicants.

At the 2020 BECC-MERGE Spring Meeting our members identified the following knowledge gaps at the intersection of our two Strategic Research Areas (SRAs), the filling of which will require joint activities and a commitment to facilitate these on the part of the SRA Boards.

Evaluation of existing land use & management scenarios: What impact would the global land use scenarios employed by global ESMs have on Sweden's climate (CC), its air quality (AQ), its biodiversity (BD) and ecosystem services (ES)? Biodiversity and ecosystem service researchers, as well as related stakeholders (e.g. LU Land, BECC & MERGE SRG), are often either unaware of or largely unfamiliar with the land use and management scenarios used in climate models, even though they often contain very significant land-use changes in their study regions. BECC & MERGE could contribute to closing this gap, by communicating how these land-use scenarios are constructed and used, and what their limitations are. We could also do a novel, thorough analysis for what the land-use scenarios mean for Sweden's climate, AQ, BD, and ES.

Scenario building: How can we jointly develop integrated modelling/assessment approaches that account for the full range of climate/biodiversity/land use interactions relevant to a Swedish context? What impacts do local land-use scenarios developed using social-ecological modelling have on BD, CC, AQ and ES? Can indicators for analysis of scenarios be developed? Can benefits and trade-offs be assessed in a combined framework? Can such a framework be applied to study the interactions in different ecosystems, including agricultural land, forests, arctic-alpine ecosystems and wetlands? How do we then scale this up to the national level?? What is the best way to engage our SRGs in this effort?

Biofuels: What consequences will the increased cultivation and use of biofuels (crops and forests) have for CC, AQ, BD and ES? Can we identify how and where best to cultivate these crops in order to maximize any benefits and to minimize negative effects, considering multiple time horizons?

Wildfires: How big a role will wildfires play in the future development of Sweden's ecosystems and feedbacks to CC and AQ? How will BD and ES be affected in model-generated scenarios? Are there co-benefits for BD/ES and wildfire management of using mixed stands with a greater broadleaf fraction in forestry? Can we use historical records of fire occurrence to better constrain models? How do we integrate ICOS/ACTRIS observations associated with wildfires to constrain and calibrate our models?

Agriculture: How will climate change affect agricultural production in Sweden? How can we maintain BD in traditional agricultural landscapes, maintain or increase quantity/quality of yields, and simultaneously decrease the net climate forcing resulting from CO_2, CH_4 and N_2O emissions and biophysical impacts? Can we reduce NH_3 emissions and leaching, both for AQ (PM2.5) and eutrophication, respectively? How can we systematically use ICOS/ACTRIS observations made near agricultural land to constrain and calibrate our models?

Forestry practices: What alternative afforestation and forest management measures and strategies (mixing deciduous with evergreen species, reforestation of abandoned agricultural land, intensification, optimized thinning practices) are best for BD and ES provision, and still useful for climate mitigation, taking into account both biogeochemical and biogeophysical effects? How will AQ be affected by such choices? How do we integrate ICOS/ACTRIS observations to constrain and calibrate our models? How can BECC and MERGE devise a modelling and assessment framework across scales that can be used to inform policy and decision making based on this science?

Wetlands and their management: What impacts will climate change have on wetlands, including their BD and ES? How will CC and AQ affect and be affected by CO_2, CH_4 & N_2O emissions from wetlands? How will the rewetting of wetlands and/or wetland restoration affect BD, CC, AQ and ES?

Extreme events: How will the projected occurrence of extreme events (type, intensity, frequency and duration) impact the BD and ES provided by Sweden's ecosystems, including arctic-alpine environments? How do we integrate ICOS/ACTRIS observations associated with such events to constrain and calibrate our models? How should we account for the risk of extreme events in conservation strategies or efforts to benefit ecosystem services (which are often supported by models)?

Biodiversity impacts on local climate, incl. urban environments: Does biotic stress result from altered biodiversity? What effects do this stress have on climate, e.g. through altered albedo, BVOC emissions etc.?

Integrated Sustainability Assessment: Can an integrated sustainability assessment of Sweden's climate and biodiversity policies identify with confidence synergies and trade-offs between biodiversity conservation and climate change mitigation/adaption?