

2019 Plan of Operations for the Centre for Environmental and Climate Research (CEC)

Mission

CEC's mission is to initiate, support and conduct education and research on society's impact on the natural environment and on societal challenges and possible solutions concerning the environment, climate and sustainable development. CEC is to promote interdisciplinary research and education within climate and environmental issues, highlight and communicate research findings and serve as a link to key stakeholders within its area of operations. CEC activities are therefore of an interdisciplinary nature, based on cooperation between departments across faculty boundaries, and characterised by collaboration with community stakeholders. CEC activities are based on research at the faculty's departments, while CEC adds further value to the departments' research.

Vision

As an innovative and vibrant forum of interdisciplinary research, education and interaction between research and society, the Centre for Environmental and Climate Research is to be an engine for sustainable local, regional and global development in the field of the environment and climate. The centre brings added value and leverage for subject-specific research at Lund University, is a springboard for new generations of researchers and professionals trained in interdisciplinary approaches and makes evidence-based knowledge that contributes to solutions in the field of environmental and climate research. The overall result is an increased scientific understanding and ability to manage the conditions for sustainable development.

Strategy

Achieving sustainable development and attaining the global sustainability goals requires society to tackle a series of major challenges, such as the loss of biodiversity, over-exploitation of natural resources, environmentally harmful emissions and climate change. Managing these complex challenges requires the decisions that affect our future to be supported by knowledge from many different scientific disciplines.

Basic research at Lund University creates scientific understanding of natural processes and systems and how they are affected by humans as well as an understanding of the socioeconomic driving forces behind society's environmental problems. Based on disciplinary research, CEC's strategy is to support and conduct interdisciplinary research and education in dialogue with wider society, to help achieve the objectives of sustainable development. CEC accomplishes this by being a *coordinator* for strategic environmental and climate research and infrastructure investments, a *research actor* that, in close collaboration with different departments, stimulates and conducts integrated environmental and climate research, a dynamic and creative *meeting place* for researchers who want to tackle current and future research and societal challenges, a *hub for talent management* by training future professionals in the field, and a *knowledge bank* for innovative collaboration between research and wider society.

CEC supports, develops and conducts interdisciplinary environmental and climate research by

- supporting, developing, coordinating and conducting research in the fields of the environment and climate, including strategic research areas and strong research environments,
- creating an internationally prominent interdisciplinary environment which, in close collaboration with existing departments, stimulates research on biodiversity, ecosystem services and climate,
- stimulating and supporting the use of the ICOS Sweden, ACTRIS and MAX IV infrastructures in environmental and climate research.

CEC supports, develops and conducts first-, second- and third-cycle education in the field of environmental and climate studies to form inter-disciplinarily trained professionals by

- conducting cross-disciplinary first-, second- and third-cycle education in environmental science and environmental and health protection, as well as in strategic climate work,
- conducting interdisciplinary third-cycle education in environmental science,
- supporting third-cycle education in the field of the environment and climate by offering two interdisciplinary graduate schools.

CEC highlights research results and creates dialogue with societal stakeholders in the field of the environment and climate by

- creating, developing, and engaging in dialogue between societal stakeholders and researchers to stimulate the development of environmental and climate research, and to ensure that the results can be used,
- making environmental, climate and sustainability research at Lund University known to wider society,
- actively attending relevant social arenas and policy contexts in order to communicate knowledge based on research, and provide expert advice and other decisional support.

CEC faces a particular challenge insofar as its operations are based on activities within the departments which integrate through interdisciplinary research, education and collaboration. For this purpose, CEC is a centre with the ability to initiate, coordinate and conduct interdisciplinary research and education initiatives. Therefore, CEC has staff who are specifically assigned to coordinate its initiatives and contribute with their expertise in interdisciplinarity and collaboration, and teaching staff and researchers from a number of different departments at various faculties who are involved in these activities. CEC hosts the Lund University's Sustainability Forum, Lund University's hub within Climate-KIC, the ICOS Sweden research infrastructure, and the university-wide strategic research areas of BECC and MERGE, as well as the graduate schools Agenda 2030, ClimBEco and Bioeconomy, and therefore takes broad responsibility for activities related to the environment, climate and sustainability research wherever it is carried out at the University. CEC's first-, second- and third-cycle programmes and graduate schools are based on a close collaboration with different departments and the research efforts coordinated by CEC.

- Together with the faculties, strive for stable and long-term organisation and funding of CEC

Operations

Research

In accordance with the intentions of Lund University's strategy for 2017–2026 and the research strategy for 2016–2021, CEC helps strengthen environmental and climate research at Lund University (LU) by initiating, coordinating, supporting and conducting research initiatives with a clear environmental or climate profile, often with researchers and doctoral students from several departments and faculties. Our activities are based on and take place in collaboration with various departments at different LU faculties. CEC complements the departments' research by developing interdisciplinary methods and processes which bring together existing research to respond to issues of relevance to society. For example, CEC develops methods for evidence-based evaluation, system models and ecological-economic modelling. CEC offers an administrative base for research investments, including platforms for communication, graduate schools and other similar activities.

A central part of our activities is coordinating the strategic research areas of *Biodiversity in a Changing Climate (BECC)* and *Modelling the Regional and Global Earth system (MERGE)*. The strategic research areas function as interdisciplinary platforms for research on climate, biodiversity and ecosystem services, while long-term efforts are underway to further develop this function. CEC also hosts the research infrastructure called *Integrated Carbon Observation System (ICOS Sweden)* and supports the development of *ACTRIS (Aerosol, Clouds, Trace gases Research InfraStructure)* and the

use of the MAX IV for environmental research. CEC is working to ensure long-term funding and to coordinate the Swetox network together with Örebro University, to continue the development of the collaboration on research and education in chemicals, health and the environment among the eleven universities included in Swetox. CEC is also working actively in collaboration with research groups and departments, to continue the development of ongoing research activities that are not included in the current strategic research areas, and to create opportunities for the development of more major interdisciplinary projects. Particular focus is placed on research initiatives that deal with the causes of and solutions to environmental issues, and projects that promote interdisciplinary activities. CEC is continuously developing the scientific and administrative expertise required to initiate, lead and support interdisciplinary research initiatives.

CEC develops interdisciplinary expertise and research to strengthen environmental and climate research at Lund University. This makes CEC an important actor in relation to society's need for decisional support and for future research on a national and international level.

CEC serves as a meeting place for interdisciplinary research by inviting visiting researchers and offering fixed-term salary funding for researchers from other LU departments to develop interdisciplinary research and synthesis within the area of climate and the environment. CEC creates forums for meetings between researchers from different disciplines, in order to stimulate creativity and interaction with the aim of supporting the emergence of new research projects and the development of ongoing investments at both CEC and the departments.

In addition, CEC coordinates a network of researchers in the field of, or with an interest in, environmental and climate research: CEC Fellows. The aim is to act as a forum for the exchange of ideas and knowledge to promote and enable new interdisciplinary research initiatives and to develop research activities, both at CEC and at their home departments. CEC Fellows facilitates the dissemination of information concerning research opportunities and initiatives between different research groups at Lund University. The group consists of over 130 professors, senior lecturers, researchers and postdocs within or with an interest in the field of the environment and climate research.

During 2019, CEC shall:

- develop and coordinate new interdisciplinary research collaborations within the University and together with various societal stakeholders on synergies and conflicts between the global sustainability goals, and regional environmental problems, such as those of the southern Baltic,
- continue the development and renewal of the interdisciplinary research areas of BECC and MERGE,
- coordinate the research infrastructure of ICOS Sweden, including applications for continued funding, and work to integrate the utilisation of ICOS in the research and education for which CEC is responsible,
- develop the Swetox network including the securing of long-term funding
- identify other relevant issues to stimulate strategic research development, e.g. in the form of applications, in consultation with the research groups concerned, and within the scope of CEC Fellows, CEC's academic team and CEC's collaborations,
- initiate proactive work to generate opportunities for major interdisciplinary research initiatives (funded for example by MISTRA and the EU framework programme)
- develop as an interdisciplinary meeting place, by continuing the development of CEC Fellows, and by engaging visiting researchers,
- stimulate research across subject boundaries at LU by organising workshops and seminars in close cooperation with research projects,
- facilitate the initiation and development of new research, and encourage new interdisciplinary projects and programmes coordinated from CEC, by more clearly offering support in researchers' funding applications, project coordination, client work and communication

- reinforce the use of the research infrastructures by providing information about the opportunities available for use of the physical infrastructure and the data generated,
- strengthen the link between CEC's research and education at LU, by providing information about the opportunities to teach within existing courses, integrating teaching staff in several activities, creating new courses and offering opportunities for degree projects,
- prepare for future evaluation of research at LU (RQ20) and of the strategic research areas,
- strengthen CEC's visibility and attractiveness in the research community within and beyond LU.

Education

CEC conducts first-, second- and third-cycle education with the aim to train professionals in the field of the environment and climate, who can take on advanced assignments within higher education, industry and society, and, in the case of our research studies, PhD graduates able to conduct high-quality environmental research. Our education leads to expertise of a high international standard about the causes and consequences of environmental degradation within the subject area of the student, as well as knowledge of societal strategies to counteract these environmental problems.

CEC offers first-, second- and third-cycle programmes in the subject of environmental science. This subject includes scientific knowledge of anthropogenic environmental problems based on a fundamental understanding of natural processes. The subject is thus based in natural science, but is of an interdisciplinary nature as it also involves measures and strategies to prevent or solve environmental problems, and thereby contains knowledge within several social sciences subjects as well as law. CEC also runs two graduate schools and will take part in the University's collective initiative for an Agenda 2030 graduate school. These graduate schools offer doctoral students interdisciplinary perspectives on issues related to biodiversity, ecosystem services and climate (ClimBEco), bio-based economics (BIOECONOMY) or the global sustainability goals (Agenda 2030). Both the environmental science programmes and the graduate schools are based on close collaboration with the departments at the Faculty of Science as well as other faculties at Lund University.

First- and second-cycle study programmes

CEC offers Bachelor's and Master's programmes in environmental science which lead to science and interdisciplinary degrees. CEC is responsible for first- and second-cycle programmes with approximately 250 full-time equivalent students. The courses are conducted in-house or run by other departments, especially at the Faculty of Science, but also within departments at the Faculty of Social Sciences, the Faculty of Medicine, the School of Economics and Management, the Faculty of Engineering and the International Institute for Industrial Environmental Economics.

During 2019, CEC shall:

- strengthen its academic responsibility for first- and second-cycle education in environmental science by developing the ways in which teaching staff and supervisors from other departments, as well as visiting lecturers, are associated with CEC's educational activities in the long term,
- develop opportunities for links between first- and second-cycle education, third-cycle education and research within CEC's research fields, including our strategic research areas,
- strengthen the quality of study programmes by identifying and implementing a progression plan of learning outcomes within environmental science that runs through every study programme,
- prepare documentation for forthcoming self-evaluations of first and second cycle study programmes,
- complete the revision of the course and study programme syllabi, a task included in quality enhancement work,

- continue to work for an international Master's programme, taught in English, linked to the development of the strategic research areas through the allocation of new resources,
- develop a syllabus proposal for a Master's (60 credits) degree in environmental and health protection,
- investigate the possibilities of running Master's programmes in English,
- further develop alumni activities for students with a Bachelor's or Master's degree gained from CEC's first- and second-cycle study programmes.

Third-cycle education and graduate schools

CEC offers a PhD programme in environmental science. Doctoral students admitted to study environmental science may be based at CEC or at "host departments" at the Faculty of Science, which provide them with a physical workspace. CEC is responsible for the learning outcomes of the study programme while the host department is responsible for issues concerning doctoral studentships and research work. Study plans as well as joint courses and seminars are to ensure the development of the programme's interdisciplinary content. CEC offers its own courses for doctoral students in environmental science, but these can also be offered to doctoral students in other subjects with an interest in environmental science.

ClimBEco is an interdisciplinary graduate school on climate, biodiversity and ecosystem services, linked to the strategic research areas of BECC and MERGE, as well as to the Faculty of Science at Lund University. The graduate school offers a structured platform for doctoral students mainly at LU and the University of Gothenburg where doctoral students are offered opportunities for reflection on how various research fields can contribute to attaining the global sustainability goals and on the role of engagement with external societal stakeholders. Courses within *ClimBEco* are designed to develop interdisciplinary research, as well as to provide a more in-depth intradisciplinary understanding. *ClimBEco*'s annual meetings stimulate research exchange between doctoral students, supervisors and invited guests, thus creating an opportunity to establish networks that can contribute to the school's interdisciplinary content.

CEC also runs the *BIOECONOMY* graduate school, which focuses on bio-based economics. It is an interdisciplinary graduate school to promote the transition to a bio-economy. Its overall objective is to develop the participants' ability to adopt a system-based approach to identify and evaluate the technical, financial, social and ecological challenges and opportunities of the transition to a bio-based economy, and stimulate them to spearhead innovative trans/interdisciplinary research for a sustainable bio-economy. *BIOECONOMY* serves as a common platform at Lund University and enables researchers and doctoral students across LU to cooperate with external companies and authorities.

Both the research studies programme in environmental science and the graduate schools are to utilise the opportunities that will arise from the University's forthcoming collective investment in an Agenda 2030 graduate school.

During 2019, CEC shall:

- increase the visibility and attractiveness of research studies by working to reinforce the environmental science specialisation,
- work to increase the number of doctoral students by bolstering funding,
- systematically work to encourage interdisciplinary approaches within third-cycle programmes by developing the joint courses' content and learning outcomes,
- develop its own course and opportunities for doctoral students on the research studies programme to take part in courses within the University's Agenda 2030 graduate school
- strengthen collaboration between research studies and CEC's graduate schools when it comes to developing and running third-cycle courses,
- prepare documentation for forthcoming self-evaluations of research studies,

- run the **ClimBEco** graduate school and its mentoring programme to meet the need for third-cycle education in the fields of climate, biodiversity and ecosystem services,
- strengthen the **BIOECONOMY** graduate school, including the development of new courses,
- administrate, facilitate and develop the University's Agenda 2030 graduate school,
- coordinate and strengthen the administrative support for and cooperation between the third-cycle programme in environmental science and the ClimBEco, BIOECONOMY and Agenda 2030 graduate schools,
- develop alumni activities for CEC's doctoral students.

Communication and dialogue with wider society

One of the main tasks of CEC is to create and develop interfaces and dialogue with societal stakeholders within CEC's area of activity, and through a mutual knowledge transfer make sure that environmental and climate research and education is relevant and used to promote the sustainable development of society. CEC systematically develops contacts with society by means such as taking part in research projects including active participation from various societal stakeholders, meeting reference groups, organising targeted seminars and workshops, through dialogue with CEC alumni and by acting in an expert and advisory capacity for various stakeholders. External communication also takes place via syntheses, reports, fact sheets, websites, social media and through the use of various channels in the mass media.

CEC's external engagement and communication contributes to the strategic development of its operations by identifying issues of concern to societal stakeholders. This could lead to the identification of new research issues and the start of new research or education initiatives. CEC also conducts intelligence work within its area to identify when an issue is relevant in a policy process or public debate. CEC's contact with stakeholders also contributes to the development of appropriate channels and methods for dialogue. Support for external engagement and communication is provided to research projects at CEC, to the recruitment of first-, second- and third-cycle students and to contacts with alumni.

Lund University's Sustainability Forum is a university-wide umbrella organisation which links and supports the University's climate, energy and sustainability research. The forum represents a bridge between society and academia in these fields, both as a support for researchers and research teams with regard to contact with end users, but also as a path into the University for external contacts in search of collaboration, research support and information. An important part of the work is to improve the internal communication between researchers in the area of sustainability in order to promote interdisciplinary development.

Climate-KIC (Knowledge & Innovation Community) is a European innovations cooperation for new climate solutions, with CEC in charge of Lund University's membership. Climate-KIC aims to be a catalyst for turning research and development into practical use in industry and society. This is achieved through investments in innovations and entrepreneurs involving researchers and students at Lund University. At Lund University, there are a number of different research areas of relevance to Climate-KIC (e.g. research on energy, traffic, land use, and sustainable cities).

During 2019, CEC shall:

- use internal and external communication and collaborations to strengthen a common CEC identity and increase synergy within and between CEC's areas of operations,
- support environmental science education, ClimBEco and BIOECONOMY, the University's Agenda 2030 graduate school, the research conducted at CEC and the strategic research areas BECC and MERGE as well as the activities at ICOS Sweden, the Sustainability Forum and Climate-KIC through coordinated support in work involving communication and collaborations,
- maintain a dialogue with the client reference groups of the research areas BECC and MERGE,

- further develop the CEC alumni activities and carry out a mapping of the alumni's labour market and experience of the education offered at CEC,
- run the university-wide Sustainability Forum, which continuously compiles and updates information about sustainability-related research and research studies at LU and makes it available via various channels,
- administrate and facilitate LU's involvement in Climate-KIC, focusing on relevant activities and actors at LU,
- implement events during Sustainability Week in April, and during Kulturnatten in September,
- produce an annual report for the 2018 financial year.

CEC as a workplace

In order to initiate, support and conduct education, research and collaboration in the field of the environment and climate, CEC strives to become a venue and workplace characterised by diversity and creativity in meetings between researchers, teaching staff and students in different disciplines as well as stakeholders from different sectors of society.

The nature of CEC as an organisation places particular demands on its internal communication and common meeting places. CEC is characterised by relatively few staff members employed until further notice, whereas the extent of the activities is significant. The number of students is large in relation to the number of permanently employed lecturers. CEC has its own premises but the activities take place partly on the premises of the Department of Biology. Many employees are formally affiliated with other departments. This requires a well-managed organisation and internal communication. Internal communication takes place via the website, through newsletters and at regular staff meetings. CEC also organises events aimed at strengthening internal communication, including seminars, team meetings, CEC Fellows meetings and staff days.

A number of researchers and teaching staff at various LU departments are paid in part by CEC regarding their assignment at the centre as "funktionsansvariga". This role entails strengthening environmental research and education at their own departments and developing interdisciplinary environmental and climate research and collaborations. Together with the permanent teaching personnel at CEC they constitute CEC's academic teaching staff.

CEC is to be a workplace characterised by a positive work environment including equal treatment of all employees and students. In order to achieve an effective way of working with issues related to health, safety and environment (HSE), the centre coordinates its efforts as far as possible with the Department of Biology. Gender equality and equal opportunities related issues are addressed by an internal working group that promotes work for gender equality and equal opportunities as well as within the work environment in general. A gender equality and equal opportunities plan is in place.

During 2019, CEC shall:

work actively to develop a positive working environment at CEC by

- continuing to clarify CEC's common vision through providing information and promoting dialogue about CEC's activities, via channels such as newsletters, seminars, team meetings and staff meetings,
- continuing to develop the administrative organisation and adapting the formal organisation to best support CEC's common vision,
- developing a clearer process for introduction and termination as well as for the presentation of new employees,
- developing a programme for the career development of postdocs and junior researchers,
- continuing to work for a workplace with a positive work environment including gender equality and equal opportunities, including the working group's efforts,
- participating in the work of the HSE committee (together with the Department of Biology) and revising work environment plans concerning CEC's operations,

- initiating work on how CEC can minimise its environmental impact,
- collecting results from operations during 2018 in a joint operations report, in dialogue with CEC staff, further developing CEC's plan of operations prior to the next year of operations, 2020.