

From CO₂ in situ measurements to carbon balance maps as a tool support to national carbon accounting

The course is run by [Department of Physical Geography and Ecosystem Science](#) at Lund University with input from ICOS Carbon Portal and ICOS Sweden. The course is supported by ClimBEco Graduate Research School and is included in the ClimBEco course program ([Centre for Environment and Climate Science](#), Lund University, Sweden).

Course period:

2 – 6 September 2024: Full time on-campus week at Lund University, Dept. of Physical Geography and Ecosystem Science.

Preparatory reading is required before campus time. Material and links will be sent out by latest 20 August 2024.

An assignment follows the on-campus week with submission deadline 14 September 2024.

Course description:

The course introduces the concept of assessing the carbon balance of a geographical region by utilizing in-situ measurements and how this can be used as a tool to support national carbon accounting. The course will focus on the user perspective and different ways of upscaling the carbon dioxide exchange to assess the carbon budget of a larger region (e.g. Sweden). This will include scientific motivation of the different types of analyses that are used in the different steps to assess the (terrestrial) carbon balance and knowledge about their uncertainties and limitations. An important part of the course is the need for transparency in the data used and how to handle uncertainty in research results.

The course starts with background theory on flux data measurements including a field visit to the ICOS measurement station Hyltemossa. This is followed by lectures on data processing and includes FAIR principles on science data management and stewardship and introduction to Jupiter Notebook and measurement data acquisition to be used in the following exercises.

Basic theory of different up-scaling methods such as inverse modelling, vegetation modelling, and remote sensing are introduced and how the results can be used for national carbon accounting. The students perform exercises to assess possibilities and limitations of the different methods.

During campus time, the students will work on a reflection/learning diary. The students present their reflection/learning diary during the last day of the campus week and discuss the results with lecturers and involved teachers. After presentation and feedback on their reflection, the students

write a two-page summary that, together with participation in the campus activities, is the base for approval of the course.

Course points:

4 points. To pass the course, the student must participate in the lectures and exercises, and write and present the diary. The written reflection + presentation will be examined with the score pass/fail.

Application:

The registration link is:

<https://www.cec.lu.se/form/phd-course-co2-situ-measurements-carbon-balance-maps-tool-support-national-carbon-accounting>

Deadline for application is 1 April 2024.

Eligibility and course fee:

The course is open free of charge for PhD-students. ClimBEco PhD students and PhD students at INES are prioritized. External PhD students may participate if there is space. (Please note that travel and accommodation is not included in the course.)

More information:

The course will be announced and information will be updated continuously at the ClimBEco homepage. <https://www.cec.lu.se/education/postgraduate-studies/climbeco>

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