

Assessing Soil Erosion Risk (I002463)

Course size *(nominal values; actual values may depend on programme)*

Credits 5.0

Study time 140 h

Contact hrs

40.0h

Course offerings and teaching methods in academic year 2022-2023

A (semester 1)

English

Gent

lecture

12.5h

seminar: coached exercises

7.5h

guided self-study

7.5h

seminar

12.5h

Lecturers in academic year 2022-2023

Heckrath, Goswin

AARHUS01 lecturer-in-charge

Offered in the following programmes in 2022-2023

crdts

offering

[International Master of Science in Soils and Global Change \(main subject Physical Land Resources and Global Change\)](#)

5

A

Teaching languages

English

Keywords

Position of the course

Soil erosion causes globally serious soil degradation on agricultural land, off-site infrastructure damage, and negative impacts on the aquatic environment. Population growth, climate change, and intensification of farming are drivers that exacerbate erosion risk. The course introduces students to the main forms and processes of soil erosion. Students learn to apply simple modelling tools for erosion risk assessment and targeted mitigation planning in a catchment context.

Contents

The course comprises three integrated parts. Initially, key processes driving water, wind and tillage erosion in different agro-environments are presented. This is followed by an introduction to different modelling concepts for assessing erosion risk. The quality of necessary input data and uncertainties associated with modelling are addressed. With the help of a simple empirical, GIS-based soil erosion modelling tool students will conduct their own erosion risk scenario analyses for a selected study site from northern Europe. Soil redistribution is investigated hands-on in the field by means of tracer studies, and the resulting data will form part of the modelling exercise. Finally, different measures for reducing erosion risk are discussed in landscape and socio-economic contexts. This will enable students to develop and assess targeted mitigation plans for their study catchments. As part of the modelling exercise and for report writing students will form small groups.

Initial competences

Some knowledge of soil science and basic experience with GIS

Final competences

At the end of the course the student should be able to:

- (i) Explain basic processes leading to different types of soil erosion
- (ii) Explain impacts of soil redistribution on crop production and the environment
- (iii) Conduct a GIS-based erosion risk assessment
- (iv) Develop targeted soil erosion mitigating plans

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Guided self-study, Seminar, Lecture, Seminar: coached exercises

Extra information on the teaching methods

The course combines theoretical lectures, laboratory/field exercises, data analyses and modeling exercises, and project report writing.

Learning materials and price

Learning material includes book chapters and articles will be made available to students.

References

1. Morgan, R.P.C. (2008) Soil Erosion and Conservation. 3rd ed. Blackwell Publishing, Oxford, UK.
2. Van Oost, K., Govers, G., Desmet, P.J.J. (2000) Evaluating the effects of changes in landscape structure on soil erosion by water and tillage. *Landscape Ecology*, 15, 577-589.
3. Govers, G., Vandaele, K., Desmet, P., Poesen, J., Bunte, K. (1994) The role of tillage in soil redistribution on hillslopes. *European Journal of Soil Science*, 45, 469-478.

Course content-related study coaching**Assessment moments**

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Oral examination

Examination methods in case of periodic assessment during the second examination period

Oral examination

Examination methods in case of permanent assessment

Report, Participation

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

Prerequisites for examination participation: approved participation in practical exercises and submitted project report

Calculation of the examination mark