Swedish University of Agricultural Sciences

P000037, From source to sea: Methods for evaluating human impact in aquatic habitats with a focus on biota, and databases, 4.5 Hp

Syllabus

Finalized by: Steering group of Research School Focus on Soils and Water, 2023-02-13

Valid from: VT2023

Level within study regulation:

Third cycle

Subject:

- Environmental Assessment, Biology

Grading scale:

Pass / Failed

Course language:

Swedish

Entry requirements:

Enrolled as PhD student

Objectives:

Aquatic Sciences from land to see with a focus on methods for evaluating human impacts. Connecting a broader understanding of watersheds and their interconnectedness to environmental monitoring and assessment, using existing databases. Holistic introduction into

watershed science, and the ecological interactions between land, water, and biota. Overview about threats to water, and introduction to environmental monitoring and assessment to manage and mitigate the threats. Overview on national and international goals and legislation. Introduction into design and planning of monitoring programs, and large-scale assessment. Introduction to established monitoring methods, and to new and possible future ones, such as remote sensing and barcoding/molecular methods. Introduction into data management, environmental databases, and related error sources.

Expected learning outcomes

1. Be able to discuss how natural processes and human activities affect aquatic systems, organisms and food webs from source to sea in freshwater and marine systems;

2. Be able to describe the principles of environmental assessment, including identification of a problem, planning and performance of monitoring, sampling methods, data management, data analysis, evaluation and remedy action plans.

3. Be able to describe how environmental assessment is embedded in legislation and international agreements, and how evaluation criteria for streams, lakes and coastal/marine systems are developed and used for the assessment.

4. Be able to evaluate how own research relates to ecological processes along land-watershed-ocean;

5. Be able to describe how environmental (esp. biological) data are stored in databases, describe database challenges, and how databases contribute to a holistic view of watersheds and threats, and be able to use relevant databases for own research questions.

Content:

This course will combine theory and direct experiential learning through a hands-on work on environmental databases with the focus to learn how to collect high quality data for own usage from open databases.

1-week literature studies followed by 1 week of workshops and practical field work at a SITES station. After the week at the SITES station, each student will conduct a case-study linking gained knowledge during the course to the students' own research.

Suggested SITES station: Norr Malma field station at Lake Erken, Norrtälje.

Direct practical connection as teaching will be performed by experts working in everyday life with environmental monitoring and assessment in different aquatic fields, and by invited stakeholders. Connection between research and monitoring will be shown by introducing to SLU's Environmental Monitoring and Assessment (EMA), which meets society's need for

decision support in twelve programs, linked to Sweden's national environmental objectives and international environmental cooperation.

Modes of assessment:

Presentation of own project at end of course (in form of a seminar). Each student show how they acquired data from one or more databases that could be used to answer a research question related to their own research. Each student will share their experiences regarding the process of acquiring and evaluating data from the open source databases they used, identified limitations of the data source(s) and potential error sources. - If a student has failed an examination, the examiner has the right to issue supplementary assignments. This applies if it is possible and there are grounds to do so.

- The examiner can provide an adapted assessment to students entitled to study support for students with disabilities following a decision by the university. Examiners may also issue an adapted examination or provide an alternative way for the students to take the exam.
- If this syllabus is withdrawn, SLU may introduce transitional provisions for examining students admitted based on this syllabus and who have not yet passed the course.
- For the assessment of an independent project (degree project), the examiner may also allow a student to add supplemental information after the deadline for submission. Read more in the Education Planning and Administration Handbook.

Organisation:

Department of Aquatic Science and Assessment

Supplementary information

Other information:

- The right to participate in teaching and/or supervision only applies for the course instance the student was admitted to and registered on.
- If there are special reasons, students are entitled to participate in components with compulsory attendance when the course is given again. Read more in the Education Planning and Administration Handbook.