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


1 week literature study, 1-week stay at a SITES (Swedish Infrastructure for Ecosystem Science) research center (16-20th of October 2023 at Norr Malma field station at Lake Erken, Norrtälje (pictures)), with daily workshops combined with practical field work and computer labs, followed by a 1 week individual project involving own research topics and related databases.

Course content: Focus is on methods for evaluating human impacts. Connecting a broader understanding of watersheds and their interconnectedness to environmental monitoring and assessment, using existing databases. 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.