

GLOBAL WARMING AND THE EFFICIENCY OF ENERGY TRANSFER IN AQUATIC ECOSYSTEMS

Master project in Biology (30-60 credits)

This project aims to resolve how warming of water bodies changes the efficiency of energy transfer from primary producers to fish (i.e. food web efficiency, FWE), and how this may be modified by concurrent change in other environmental drivers. The thesis project will be part of a larger project aiming to identify strategies to maintain ecosystem services in face of multiple environmental stressors, with the goal to maintain the ability of aquatic ecosystems to act as carbon sinks and uphold high production of fish biomass in the future.

BACKGROUND

Along with warming, many freshwater and coastal ecosystems are becoming greener and browner (caused by excess humic substances and nutrients). The key factors (temperature, light, nutrients) that control basal energy production in aquatic ecosystems are thus changing. Even though the link between nutrients, light, temperature and algal growth is more or less established, the flow of energy produced by these primary producers to higher trophic levels such as fish is less predictable. The latter is especially true for the combined impact of these environmental drivers on FWE.

METHODS

The student (one or several) will set up tank experiment(s) with phytoplankton, zooplankton and fish at our coastal experimental field site in Forsmark to test how warming may change FWE, as well as the potential for browning and/or greening of waters to modify those responses. The detailed set-up and more specific study questions will be decided after discussions between the student and supervisors. You will learn skills such as experimental design, sampling of plankton and fish, identification of aquatic organisms, statistics and scientific writing. Preferred project start would be sometime in the period May-July 2023.

Not only will you gain new knowledge and skills by doing your own project, but you will also become an integrate member of our research group [Fish in food-webs](#), where you will join group meetings and seminars at campus Ultuna in Uppsala. There may also be opportunities for paid part-time work helping out in the field or lab while doing your project and to contribute to a scientific publication.



Contact:

Magnus Huss, Associate Professor, Department of Aquatic Resources, SLU
magnus.huss@slu.se, 010-478 41 27

Benjamin Mooney, PhD student, Department of Aquatic Resources, SLU
benjamin.mooney@slu.se, 010-478 41 55