MSc and BSc projects or special courses:

Marine biology projects at the Technical University of Denmark (DTU Aqua) in 2020 - 2023

General information

Students are welcome to join ongoing research projects or start their own independent project. Students are expected to collect, analyse and interpret data and produce a manuscript draft that describes the study findings. All projects are designed to produce data for a peer reviewed publication that students will either first-author or co-author. Students are welcome to work in groups. Projects may be expanded, or combined, in case a single project (see below) provides insufficient work for a complete student project. In addition, most projects are flexible and may be modified (e.g. scope reduction) to meet student needs.

The work location is the Technical University of Denmark campus, north of Copenhagen in Denmark. Field work, however, is carried out in a diversity of locations, including the estuary Roskilde Fjord and the bay Sønderborg Bugt (see picture below). Student guidance covers study planning, data collection/acquisition, statistical analyses, results presentation and writing of the thesis/manuscript. In addition to the student guidance, the university offers a study location (desk, PC, access to library, software etc.), laboratory space, transportation, research equipment (boats, underwater cameras etc.) and a friendly and international work environment. Depending on the project, direct financial support may be available. The university will ensure that students learn how to carry out a research project and report the findings.

Projects are available at: https://projektbank.dtu.dk/en-us/Pages/default.aspx.

Field work in Sønderborg Bugt in 2018. Students are from the Faroe Islands, the Netherlands, the UK and France.
PROJECT 4: The importance of mussel reefs for the abundance and diversity of marine fishes – a field study.

Aim:
The objective of this field study is to examine the importance of mussel reefs for marine fishes. Specifically, it is hypothesised that mussel reefs host more abundant and diverse populations of marine fishes than neighbouring sand and mud habitats. The data are vital for management and conservation of abundant fish populations. Mussel reefs are termed biogenic reefs and are protected by the Habitat Directive of the EU. A film of related student work is available here.

Background:
Mussel reefs are degraded in many parts of the world, but the significance of the degradation for various fish species is largely unknown. Prior to projects restoring mussel reefs, it is important to know the fish species that will benefit directly from the restoration. Fish may benefit from mussel reefs in many ways, including improved foraging and sheltering, but few studies have estimated fish abundance quantitatively in habitats ranging from 0 % mussel coverage to 100 % mussel coverage.

Content:
This study will gather field data on the abundance and diversity of fishes in habitats with mussel reefs, and in habitats with the seabed consisting of sand or mud. Data collection will take place in Denmark. Data collection will be carried out using stereo baited remote underwater video systems (stereo BRUVS). In 2020 - 2023, stereo BRUVS will be placed on the seabed and allowed to record for 2 h. Stereo BRUVS will be positioned in benthic habitats with and without mussel coverage. The data collection will also cover restored mussel reefs. This fieldwork is expected to take 2-3 months, where researchers will be staying in the local area. Data on environmental variables including oxygen, salinity and temperature will be collected simultaneously. Subsequently, videos will be analysed to quantify fish abundance and diversity in the different marine habitats. The results will be used to recommend protective measures of benthic habitats and perform marine spatial planning in Denmark and abroad.

Duration:
Data collection is expected to take 2-3 months; followed by 1-3 months for video analyses, 1-3 months for statistical analyses, and 1-3 months for write-up. The scope of the project may be expanded or reduced, and the project duration may be adjusted to match certain study programs.

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