

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. Fieldwork is carried out in a diversity of locations, including the estuary [Roskilde Fjord](#) and the bay [Sønderborg Bugt](#) (see picture below). An example of fieldwork is available [here](#). Student guidance covers study planning, data collection, 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.

Further projects available at:

<https://projektbank.dtu.dk/en-us/Pages/BulletinView.aspx?EntityId=77f569e7-15ed-e811-811e-005056a057de>

<https://projektbank.dtu.dk/en-us/Pages/BulletinView.aspx?EntityId=b8b55fde-622d-e811-8116-005056a057de>



Fieldwork in Sønderborg Bugt in 2018. Students are from the Faroe Islands, the Netherlands, the UK and France.

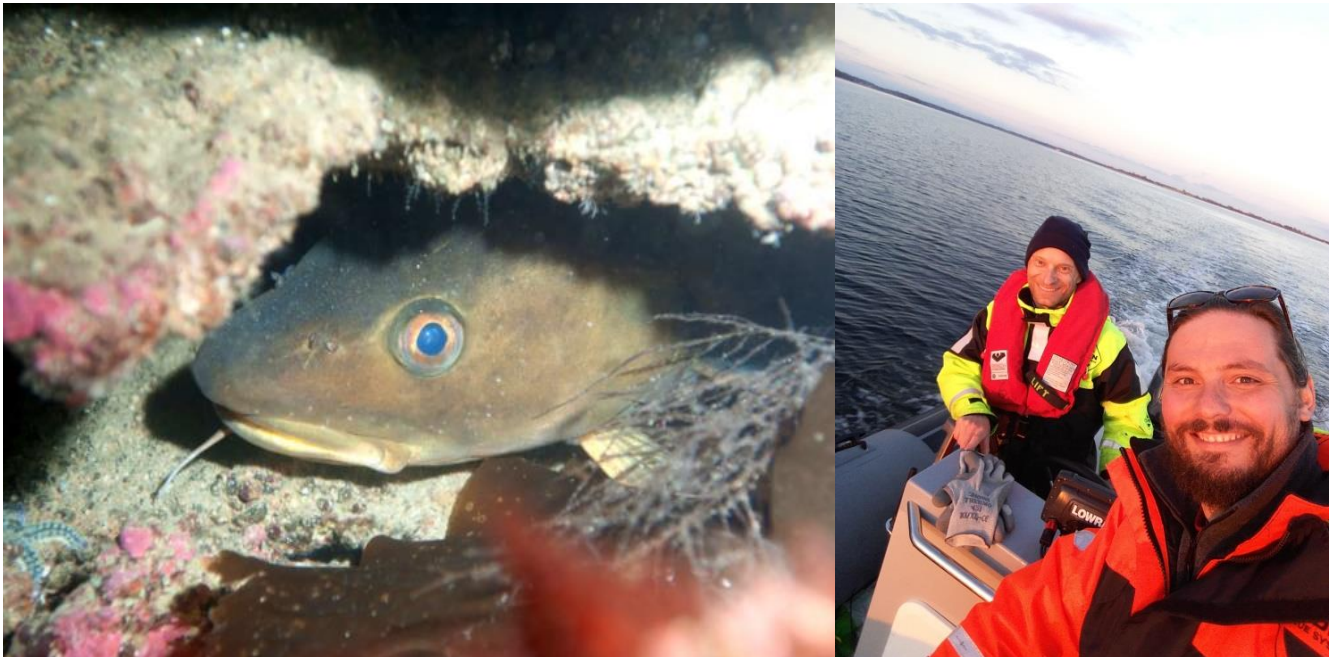
Restoration of marine boulder reefs: addressing the single large or several small (SLOSS) debate in relation to marine habitat restoration.

Aim:

The aim is to identify types of restored boulder reefs that maximize fish abundance and diversity. Specifically, the project will compare fish abundance and diversity in two types of restored boulder reefs: 1) a single large boulder reef, and 2) several small boulder reefs. Equivalent amounts of boulders are used for the two reef designs. It is hypothesized that several small boulder reefs host the highest fish abundance and diversity per volume of boulders. A project film is available [here](#).

Background:

Human impact on marine habitats is a global problem, particularly in Northwestern Europe, East Asia, North America; and the Mediterranean and East Caribbean Seas. Approximately 85% of the European coastlines are degraded. In Denmark, large quantities of boulders have been extracted from coastal zones to provide building material for constructions, including piers and jetties. The extraction of marine boulders ceased in 2010; and boulder reefs are now being restored to meet the requirements of the EU Habitat Directive. However, boulder reefs can be constructed in many different ways, and the optimal construction type for fish abundance and diversity is not known.



Atlantic cod (*Gadus morhua*) sheltering in a cavernous boulder reef, and Jon and Zachery doing fieldwork in the Sønderborg Bugt area.

Content:

Restored boulder reefs will be examined using underwater cameras, and then fish abundance and fish diversity on each reef will be quantified using video analyses. Fieldwork has been carried out during the spring and summer of 2016 and 2018, and sites will be revisited in 2020 and 2022, in which students have the opportunity to participate. The study provides data to identify the optimal type of restored boulder reef. These data will provide guidelines for future restoration projects aimed at improving fish abundance and fish diversity. Further information is available [here](#) and [here](#).

Duration:

Data collection will take 2-4 months over the summer, followed by 2-4 months of video analyses. Statistics and writing up will take another 1-4 months.

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