Project title:

Effects of Trawling and Potting on Benthic Communities – Indicator Species Detection and Biological Traits Analysis

Supervisors:

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Key Research Gaps and Questions:

Addresses critical knowledge gaps for European policy indicators and local fisheries impacts:

- What impact are potters having on the biological trait composition of rocky reef communities?
- What impact are trawlers having on the biological trait composition of mud communities?
- Are there strong indicator species which can be used for monitoring potting impacts on rocky reef communities?
- Are there strong indicator species which can be used for monitoring trawling impacts on mud communities?

Project Rationale:

Bottom fishing is the dominant anthropogenic activity occurring on the seafloor globally. Trawling is a type of mobile bottom fishing gear whereby large weighted nets are dragged along the seabed, efficiently catching a wide variety of species. Potting is a type of passive static bottom fishing, whereby baited pots or traps sit on the seabed to lure and trap target animals.

Bottom fishery assessments have become increasingly important in recent years, with a diverse range of policy drivers from international to national and regional levels. Reported impacts include reduced diversity, richness, and abundance of benthic communities, altered community compositions, and habitat modifications. Localised impacts in North-East England are currently being assessed, but further work is needed to support regional fisheries management decisions.
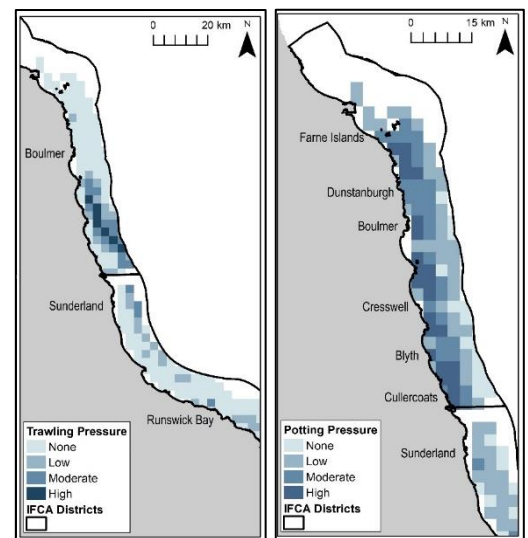
Fishing Pressure maps 2016-2019.

Project Description:

This research will investigate the impacts of potting and trawling fishing effort on the composition of traits within benthic communities and aim to identify indicator species to inform marine monitoring programmes. The project will be split into two focus habitats – mud for trawling impacts, and rocky reef for potting impacts.

Impacts will be assessed using fishing pressure maps produced using Inshore Fisheries and Conservation Authority sightings and patrol data from routine sea patrols, combined with biological data collected in 2019. Surveys targeted sites along fishing pressure gradients (pressure categories: none, low, moderate) for each habitat type and fishery. Underwater imagery was collected at rock sites, with biological data extracted via imagery analysis techniques. Grab surveys were conducted at mud sites, with macrofaunal data extracted by morphological techniques, and meiofaunal data by environmental DNA analysis. This data will be evaluated using in depth statistical methods, focussing on biological traits and indicator species.

Benthic imagery and macrofauna collected 2019.

Prerequisites:

Highly motivated with a keen interest in the ecology of benthic ecosystems and fisheries. You should hold at least an upper 2:1 BSc degree in a relevant subject. Experience using statistical software such as R would be highly advantageous, as would knowledge of indicators in marine monitoring, marine policy, and trait based analysis.

Course Details and Applications:

Visit https://www.ncl.ac.uk/postgraduate/courses/degrees/marine-ecosystems-governance-mres/#profile to find out more information about the course and to apply online. Applications consist of a personal statement, CV, and research project proposal. Proposals must be discussed with the supervisors prior to applying. For more information, please contact: ashleigh.tinlin@newcastle.ac.uk and/or clare.fitzsimmons@newcastle.ac.uk