



## Z4: Trophic interactions of copepods, euphausiids, chaetognaths and fish across the Mid-Atlantic Ridge

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### Aims:

1. Examine the organisation and trophic structure of the pelagic ecosystem over the Reykjanes Ridge from phytoplankton to fish as apex predators.
2. Estimate biomass at various trophic levels and energy flow through the ecosystem.
3. Determine diurnal changes in vertical distribution and feeding.
4. Relate patterns in primary productivity, distribution and diurnal migration of species to water mass characteristics and hydrography.



**Hypothesis:** *There is a change in the trophic structure of zooplankton across the MAR*

**Strategy:** Overall mapping along a transect running perpendicular to the Reykjanes Ridge. More detailed studies at five stations along the transect.

### Technology:

- **Multiple-opening-closing nets** (Multinet, Norwegian macroplankton trawl with three opening-closing cod-ends).
- **Midwater-trawl**
- **Hydroacoustics** (multi-frequency systems using hull and towed vehicle mounted transducers).
- **Optics** (OPC mounted on towed vehicle).
- **Nu-Shuttle** (towed vehicle equipped with CTD, light meter, fluorometer, OPC)
- **Egg production and gut fluorescence analysis**

### Deliverables:

- New information on **trophic structure** of the pelagic ecosystem over the Reykjanes Ridge, based on gut fluorescence and gut content analysis of copepods, euphausiids, chaetognaths and fish.
- New information on the processes of **vertical transport of energy** and material from the surface to deeper layers.
- Data on **abundance and distribution patterns** of mid-oceanic zooplankton based on a combined effort using state-of-the-art acoustics, optics and depth-stratified samplers.
- **Phytoplankton- and copepod productivity data** from the nursery and feeding area of the commercially important fish stock of redfish.
- **Papers** published in high-ranking science journals, and **popular presentations** (website, journals, press, books, exhibitions, school network)

**Schedule:** Preparation of field work: 2002-2003, Sampling and observation at sea: 2003, Analysis of environmental data: 2003; Analysis and dissemination of zooplankton data: 2004-2008.

**Commitments:** Ship time on Icelandic vessel (R/V "Arni Fridriksson") in 2003, labour and other costs.

**Additional needs:** Technicians, travel.

**Proposals accepted:** Marine Research Institute of Iceland (internal grant).

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