M.Sc. projects in Zooplankton Ecology – Depth distributions and seasonal variation from Video Plankton Recorder data and net samples.

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The past several years we have collected extensive data sets on zooplankton using the Video Plankton Recorder in North Norwegian fjords and Arctic waters. Large portions of this material has been worked up, but much of it remains to be processed. We are also preparing for continued sampling in new projects.

The VPR is a kind of underwater microscope, which collects images of the water column and simultaneous CTD-data (temperature, salinity pressure/depth) and chlorophyll fluorescence (indicating phytoplankton). In post-processing, the image content is analyzed for zooplankton organisms and other particles, and this information is then combined with the environmental information. It is possible to find depth information for all parameter to an accuracy of a few centimeters. Furthermore, the instrument enables detection and enumeration of fragile organisms, some of them invasive species, which are destroyed by conventional sampling. We always take ordinary zooplankton net samples on the side when sampling with the VPR.

Several possibilities for projects using data from this instrument exist. Some examples are given below.

1) **Seasonal zooplankton distributions in Håkøybotn, a small bay near Tromsø**. We have monthly samples from July 2009 – June 2010 consisting of one plankton-net station and several VPR stations.

   Questions: (a) How are the vertical distributions of plankton changing with the seasons, in relation to algal blooms, changing mixing situations and occurrence of predator organisms? (b) An earlier seasonal series was taken at the same location 20 years earlier with plankton nets. How does the timing of seasonal events (phenology) compare over time?

   Methods: Analysing images from the VPR data sets using a computer and dedicated programs. We work primarily with Matlab. Much of the zooplankton net data has already been analyzed. It is possible to revisit the stations and collect fresh data for comparison and field experience.

Cont.

2) **Qualitative analysis of data from Video Plankton Recorder images**. Again, we have large quantities of images from both North Norwegian fjords and Svalbard waters that have been used for the study of depth distribution of major plankton groups and marine snow particles. Of special interest is the association between small copepod species (e.g. *Microsetella*) and decaying colonies of phytoplankton (diatoms and *Phaeocystis*) that can be observed in many images.

   Questions: (a) During which seasons, at which locations and at which depths do we observe these plankton-particle associations? (b) Is it possible to identify which type of particle attracts the copepods?

   Methods: Analyzing a subset of VPR images from North Norwegian fjords and coastal areas on a computer. It is also possible to combine this study with a field study during one or two short periods.

Please contact me by e-mail if you are interested in doing a MSc thesis on one of these themes, or a similar topic! Email: fredrika.norrbin@uit.no