

MarBEF Theme 2: Marine Biodiversity and Ecosystem Functioning

Measuring Biodiversity and Ecosystem Function in Estuarine Systems (a MarBEF-supported workshop)

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The workshop 'Measuring Biodiversity and Ecosystem Function in Estuarine Systems' was carried out for a second year at St Andrews University (5-9th June 2006), as part of the MarBEF Core Strategic Programme.



Workshop participant (Sabine) gaining experience in various techniques, including spectral reflectance.

Researchers examining depositional systems employ a variety of techniques but often have little guidance as to how to balance their aims with requirements, capabilities and costs. The workshop integrated the theory and practice of assessing ecosystem function in estuarine systems, and was aimed at early stage researchers (PhD and early post-doctoral researchers) or scientists returning/changing to estuarine study who wished to develop their understanding from a functional perspective and be introduced to the most recently developed methods. As such, participants were given the chance to learn techniques carried out by **SERG (Sediment Ecology Research Group)** in the Gatty Marine Laboratory (University of St Andrews, Scotland).

The recently completed EU project HIMOM (Hierarchical Monitoring Methods) produced a toolbox of techniques designed for the sampling of tidal flats. The methodology, as well as experiences gained from road-testing the techniques, formed a key component of the workshop. All participants were given the HIMOM CD-ROM, which includes a book of protocols with advice in local application, case studies and video demonstrations.

The first day consisted of introductory presentations on estuarine systems and ecosystem function, the hierarchical

monitoring method concept, biodiversity measurements, EPS and the role of microphytobenthic mats in estuarine systems, and PAM fluorescence. Introductions to equipment, followed by guided use in the laboratory to familiarise participants with the techniques, was provided, along with any background or specialist knowledge required. Further presentations were given throughout the week on various topics such as microphytobenthic identification, low-temperature scanning electron microscopy, macrofauna identification, and community analysis.

Guest lectures were presented by Dr Rupert Perkins (University of Cardiff) on 'PAM fluorescence,' Dr Anuradha Bhat (University of St Andrews) on 'Introduction to biodiversity measurements,' and Dr Martin Solan (University of Aberdeen) on 'Measuring biodiversity and ecosystem function in the marine benthos,' and were well received by the participants, who found them informative and useful.

Fieldwork took place on the afternoon of the second day and provided an opportunity for participants to carry out techniques *in situ*, as well as providing the chance to carry out fieldwork in estuarine systems to those with no prior experience. All participants expressed

how useful they found this experience as it helped put the techniques into context. Throughout the week, participants were provided with laboratory facilities to carry out a suite of measurements from samples they collected in the field:

- Water content
- Wet bulk density
- Colloidal-S carbohydrate
- Organic content
- Pigment analysis using spectrophotometry
- Fluorescence using a field fluorometer
- Sediment stability using the cohesive strength meter and shear vane
- Macrofaunal taxonomy
- Microphytobenthic composition using microscopy
- Sediment surface analysis using low-temperature scanning electron microscopy

At the end of the course, participants presented the data they had produced to the rest of the group and SERG members. The discussion which followed consisted of well-thought-out comments and arguments explaining the data collected.

Feedback from the course was collected and all of the participants enjoyed the workshop and found it fulfilled all the course requirements. A great week was had by all and SERG would like to thank all the participants for their enthusiasm throughout the workshop.

List of participants

Sonia Massa (Algarve University, Portugal)
Francisco Arenas (Interdisciplinary Centre for Marine and Environmental Research)
Ana Filipa de Moura Queirós (University of Bangor, Wales)
Sabine Gebersdorf (Institute of Hydraulic Engineering, Germany)
Marie Nordstrom (Åbo Akademi University, Finland)
Fredrick Larson (University of Gothenburg, Sweden)
Christian Alsterberg (University of Gothenburg, Sweden)

Acknowledgments

This workshop was supported by funding from the MarBEF Core Strategic Programme, for which we are very grateful. I would also like to thank the guest lectures (Dr Rupert Perkins, Dr Martin Solan and Dr Anuradha Bhat) for their valuable input, and the SERG team for their support throughout the week.

