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Marine Ecological Field

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Book review

Salvanes, A.G.V., Devine, J., Jensen, K.H., Hestetun, J.T., Sjøtun, K., Glenner, H., (2018). *Marine Ecological Field Methods*, Wiley and Sons, 218pp.

Marine Ecological Field Methods is a comprehensive and thorough guide to designing and conducting field sampling across temperate marine habitats. The book is particularly useful for undergraduate and graduate students as well as early career researchers. The text is an excellent resource for environmental and marine courses featuring practical elements as it contains guidance not only how to design a survey and collect samples, but also how to process and analyse samples, and then analyse the resultant data using R. Critically, the text is supported throughout by excellent figures and photographs.

The book starts with a thorough but succinct overview of temperate marine habitats, from the coastal realm to the deep sea, highlighting physical characteristics such as substrate composition and light regimes. The ecology and biology of common organisms in each habitat are also reviewed, enhanced by photographs and figures, as well as explanations of key ecological concepts such as zonation.

The introduction to the marine environment underpins the following chapters on planning field studies and selecting and using appropriate sampling gear. The authors clearly describe the process of planning field studies, from defining research objectives, to selecting sampling methodologies and equipment, to designing an appropriate survey. Detailed case studies for several habitats are included, providing the reader with worked examples of the sampling design, sample collection and research process.

The authors then present a comprehensive overview of the most common methods of field sampling and their application, from traditional plankton nets to ROVs and gliders, and compare the suitability of each method across habitat types. Methods for sampling the physical marine environment are also reviewed. Particularly important in this section are the figures and photographs demonstrating sampling equipment and its use.

Uniquely, *Marine Ecological Field Methods* comprehensively explains key aspects of sampling outside of data collection, such as fundamental steps like keeping a log, tracking metadata, and clearly labelling samples. This level of basic detail is helpful for students and early career researchers that may be designing a field sampling programme for the first time. The authors also present options for handling biological samples including detailed information on, for example, sorting and preserving zooplankton and fish survey samples. Several examples of sampling sheets, along with explanations for their use, are provided as is information on health and safety of using chemical fixatives. Again, this information is fundamental but critical, and not usually present in scientific papers.

A large portion of the text focuses on the question-driven numerical analysis of survey data, an essential step often omitted from practical guides. The book provides multiple data analysis examples using R, which is commonly used among marine and fisheries ecologists, and includes snippets of R code. The basic steps of setting up a working directory and importing data into R are outlined and more advanced procedures such as statistical testing and some multi-variate analyses are presented. While users are likely to need additional experience or support using R to comprehensively analyse their data, the guidance provided here is valuable, particularly for new R users.

Marine Ecological Field Methods is a well-designed, clearly presented, and thoughtfully illustrated review of field survey design, methods, and data analysis across temperate marine habitats. I enjoyed the book's comprehensive nature which is well-supported by case studies and illustrative examples. As a marine science lecturer, I will be recommending this text to my undergraduate, Masters, and PhD students. The book is an excellent guide to collecting the robust data required to answer questions around change in marine ecosystems.

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