

**Professor Eugene Murphy**

Ecosystems Science Leader, British Antarctic Survey,  
Cambridge, UK

Chair of the Integrating Climate and Ecosystems Dynamics in  
the Southern Ocean Programme (ICED)

Vice-Chair of the Integrated Marine Biosphere Research  
Programme (IMBeR)

British Antarctic Survey, UK



Professor Eugene Murphy has led the ocean ecosystem research programme of the British Antarctic Survey (BAS) over the last two decades. He has a broad multidisciplinary research background and has published extensively in aspects of physical and biological oceanography and studies of population processes, food webs and whole ecosystems. He also has extensive experience in Southern Ocean field studies, including leading large scale multidisciplinary research projects and development of long term observations series. He has particular expertise in modelling ecological processes and systems and his current major research interests are in understanding the structure and functioning of ocean scale ecosystems and their responses to climate change and fisheries. He was an active scientist in CCAMLR scientific working groups for over 15 years and has continued to contribute to the development of CCAMLR science and policy through his role as the BAS Ecosystems Science Leader. Over the last 15 years he has led the development of the Integrating Climate and Ecosystem Dynamics in the Southern Ocean (ICED) programme, which has generated major advances in our understanding of the structure and functioning of Southern Ocean ecosystems and their responses to change. For more than a decade he has also been a leading scientist in the global ocean Integrated Marine Biosphere Research (IMBeR) programme, contributing to the development of analyses of global ocean ecosystems and the impacts of climate change and human activities.

***Modelling Southern Ocean ecosystems: developing understanding and informing decision making and policy***

Southern Ocean ecosystems contribute to the maintenance of globally important ecosystem services. They influence global biogeochemical cycles (including carbon budgets), maintain unique biological diversity, support fisheries that contribute to global food security and are increasingly important in supporting tourism activities. The Southern Ocean is also a region where, over the twenty-first century, major ecological changes are expected as a result of multiple climate-related impacts. Managing human activities and impacts in these ecosystems, while accounting for change, will be crucial for ensuring such activities are sustainable. Robust decision making and policy development will require an integrated understanding of how these ecosystems are affected by change, which also takes account of associated uncertainties. Models are the only tools available for synthesising understanding (including uncertainty) of the multiple processes that influence the structure, functioning and responses to change of Southern Ocean ecosystems. A range of models have been developed over the last decade for analyses of Southern Ocean species and ecosystems and to inform decision making for fisheries management and conservation. Analyses and models are also now being developed to generate projections of the impacts of future change and provide information that is useful for management and

conservation. These models could be used as part of a more systematic approach to model development for the evaluation of alternative conservation and management strategies (Management Strategy Evaluation, MSE). Such an approach could also inform the development of field and observation programmes to underpin decision making and will be crucial for utilising and assimilating the large volumes of data that will become available in the coming decades.



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