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The Southern Ocean Iron Release Experiment (SOIREE), Guest Edited by C. S. Law, P. W. Boyd, A. J. Watson

This volume is dedicated to the Southern Ocean Iron RElease Experiment (SOIREE), the first *in situ* iron fertilisation experiment performed in the polar waters of the Southern Ocean. SOIREE was an interdisciplinary study involving participants from six countries, and took place in February 1999 south of the Polar Front in the Australasian-Pacific sector of the Southern Ocean. Approximately 3800 kg of acidified $FeSO_4.7H_2O$ and 165 g of the tracer sulphur hexafluoride (SF_6) were added to a 65-m deep surface mixed layer over an area of ~50 km^2. Initially, mean dissolved iron concentrations were ~2.7 nM, but decreased to ambient levels within days, requiring subsequent additions of 1550-1750 kg of acidified $FeSO_4.7H_2O$ on days 3, 5 and 7 of the experiment. During the 13-day site occupation, there were iron-mediated increases in phytoplankton growth rates, with marked increases in chlorophyll a (up to 2 μgl^{-1}) and production rates (up to 1.3 $gCm^{-2}d^{-1}$). These resulted in subsequent changes in the pelagic ecosystem structure, and in the cycling of carbon, silica and sulphur, such as a 10% drawdown of surface CO_2. The SOIREE bloom persisted for >40 days following our departure from the site, as observed via SeaWiFS remotely sensed observations of Ocean Colour. Papers in this volume report in detail on aspects of this study, from the oceanographic setting of the experiment to a modelling simulation of the SOIREE bloom. A CD-ROM accompanies this volume and contains the main SOIREE datasets and ancillary information including the pre-experiment “desktop” database study for site-selection, and satellite images of the SOIREE bloom.