



High latitude atmosphere-ocean coupling in sea-level records

A. Hibbert (1), H. Leach (1), P.L. Woodworth (2), C.J. Hughes (2)

(1) Department of Earth and Ocean Sciences, University of Liverpool, UK (2) Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory, Liverpool

Sea-level measurements from bottom pressure recorders and tide gauges in the Southern and Arctic Oceans are used to investigate the existence in the ocean, of counterparts to atmospheric modes of variability, such as the Southern Annular Mode and the Arctic Oscillation.

In the Southern Ocean, 19 relatively short time series (<15years) of high temporal resolution are detided by band-pass filtering and then subjected to statistical and empirical orthogonal function (EOF) analysis in order to identify recurring and propagating sea-level patterns upon seasonal to interannual timescales. Correlations of these patterns are then made with climate indices, to determine the extent to which they correspond and thereby help to identify the driving mechanisms for sea-level fluctuations.

A similar technique is applied to Arctic Ocean sea-level measurements, which, given the greater length and lower temporal resolution of the time series, lend themselves to the study of atmosphere-ocean analogues upon seasonal to decadal timescales.