



Arctic Ocean Circulation Patterns Revealed by GRACE

Cecilia Peralta-Ferriz (1), James H. Morison (1), John M. Wallace (2), Jennifer A. Bonin (3), and Jinlun Zhang (1)
(1) Polar Science Center, Applied Physics Lab., University of Washington, Seattle, WA, USA (ferriz@apl.washington.edu),
(2) Dept. of Atmospheric Sciences, University of Washington, Seattle, WA, USA, (3) College of Marine Science, University of South Florida, St. Petersburg, FL, USA

EOF analysis of non-seasonal, month-to-month variations in GRACE derived Arctic Ocean bottom pressure (OBP) yield three dominant modes. The first mode is a wintertime basin wide variation in mass associated with high atmospheric pressure (SLP) over Scandinavia. The second mode is a shift of mass from the central Arctic Ocean to the Siberian shelves due to low pressure over the basins, associated with the strength of the Arctic Oscillation. The third mode is a shift in mass between the Eastern and Western Siberian shelves, related to strength of the Beaufort High mainly in summer, and to eastward alongshore winds on the Barents Sea in winter. The PIOMAS and ECCO₂ modeled OBP are consistent with the form of these modes and provide context in terms of variations in sea surface height. The models are used to investigate the ocean dynamics associated with each mode of OBP variability.