



Analysis of large-scale ocean bottom pressure variability in the North Pacific

D. Chambers (1), J. Willis (2)

(1) Center for Space Research, The University of Texas at Austin (chambers@csr.utexas.edu),

(2) Jet Propulsion Laboratory, California Institute of Technology

Ocean Bottom Pressure (OBP) from different runs of an ocean model (JPL_ECCO), from the Gravity Recovery and Climate Experiment (GRACE), and from steric-corrected altimetry are examined in the North Pacific. Much previous work has been done on the seasonal cycle of OBP in the North Pacific. After showing that the large-scale patterns and phases of the seasonal cycle are well produced in both the model and the two independent observations, we will focus on the non-seasonal, low-frequency variations from January 2003 until August 2007. Both GRACE and the steric-corrected altimetry indicate significantly larger decreases in OBP in July-August of 2003 and 2004 than is predicted in JPL_ECCO, including a run that assimilates altimetry. GRACE and the steric-corrected altimetry also indicate significantly higher variability in OBP north of the Kuroshio Extension Current (KEC) than is predicted by the model. This appears to be due mainly to significant increase in OBP in the region over the 4.5-year period that is not reflected in the ocean model. We will examine various causes for the low-frequency OBP variations, including changes in the wind-stress curl and gyre circulation. Since GRACE and steric-corrected altimetry are completely independent observations of OBP, we conclude that OBP has significant low-frequency variations in the North Pacific and that these signals are underestimated by current numerical models.