Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02851, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02851
EGU General Assembly 2008

Global sea level reconstruction 1807-2002

S. Jevrejeva (1), A. Grinsted (2,3) , J. C. Moore (2,3) and S. Holgate (1)

(1) Proudman Oceanographic Laboratory, Liverpool, UK, sveta@pol.ac.uk, (2) Arctic Centre, University of Lapland, Rovaniemi, Finland, (3) Department of Geophysics, University of Oulu, Oulu, Finland

We present reconstruction of global sea level from 1023 tide gauge records. We have developed a new 'virtual station' method to overcome geographical bias and which can quantify the uncertainties due to representativity issues of the used stations. How good is the reconstruction? Our global sea level trend estimate of 2.4 ś 1.0 mm/yr for the period from 1993 to 2000 is comparable with the 2.6 ś 0.7 mm/yr sea level rise calculated from TOPEX/Poseidon altimeter measurements. However, we show that over the last 100 years the rate of 2.5 ś 1.0 mm/yr occurred between 1920 and 1945, is likely to be as large as the 1990s, and resulted in a mean sea level rise of 48 mm. What is new? We demonstrate that advanced statistical methods improve error estimations and reduce uncertainties for calculation of regional and global sea level rise. In contrast with linear trends, where the rate of mean sea level rise is constant, our results reveal the evolution of global and regional sea level rise during the past 200 years. We show as well that changes in sea level are not uniformed; smoothed by the 30 year SSA window, the trends from the different ocean regions show slightly dissimilar patterns and still demonstrate some low-frequency variability. We also show that variability in sea level records over periods 2-14 years has increased during the past 50 years for the most of the ocean basins. We provide evidence that this increase in 2.2-13.9 year variability is associated with the greater influence of the large scale atmospheric circulation represented by the Southern Oscillation, North Atlantic Oscillation, Arctic Oscillation and Pacific Decadal Oscillation indices.