



Arctic sea level changes and variability.

Olivier Henry (1), Pierre Prandi (2), and Anny Cazenave (1)

(1) Laboratoire d'Etudes en Géophysique et Océanographie Spatiales, UMR 5566, CNRS/CNES, Observatoire Midi-Pyrénées, 14 av. Edouard Belin, 31 400 Toulouse, France., (2) Collecte Localisation Satellites CLS, 8-10 rue Hermès, Parc technologique du Canal, 31 520 Ramonville St-Agne, France.

As a part of the European GMES MONARCH project and monitoring of essential climate variables, we have investigated sea-level variability and changes in the Arctic area over altimetry era and last 50 years. Firstly, we analyzed good quality data from 73 tide gauges along the Russian and Scandinavian coasts, over 1950 – 2010. Inverse Barometer and Post Glacial Rebound corrections have been applied. Results show positive sea-level trends over the whole period, with noticeable sea-level rise acceleration since 1980's for a half of the tide gauges. From one region to another, close tide gauges show good consistency in terms of trend and interannual. Secondly, we compared multisatellite altimetry-based sea-level (from 1993 to 2009) with tide gauge records. Over altimetry well-covered areas (mainly the Scandinavian area), we found good correlation (higher than 0.80), in terms of trend and interannual variability. On the contrary, regarding the Russian area, altimetric data are sparse. Finally, we explored the sea-level steric component from two ocean temperature databases (World Ocean Database 2009 and EN3 from the Met Office Hadley Centre). The steric sea-level computation was limited to areas where the spatial and temporal coverage of temperature profiles is good enough. We noticed a positive steric trend over the past 50 years. We also noticed large interannual to multidecadal variability, both in steric and observed sea level. Correlation with the NAO and AMO indices has been explored.