Geophysical Research Abstracts
Vol. 20, EGU2018-5495, 2018
EGU General Assembly 2018

Did ocean circulation drive decadal northern European coastal sea level trends over the altimetry era?

Léon Chafik (1), Jan Even Øie Nilsen (2), Sönke Dangendorf (3), and Gilles Reverdin (4)

(1) Geophysical Institute, University of Bergen, and Bjerknes Centre for Climate Research, 5020 Bergen, Norway (leon.chafik@uib.no), (2) Nansen Environmental and Remote Sensing Center, and Bjerknes Centre for Climate Research, 5006 Bergen, Norway (jan.even.nilsen@nersc.no), (3) Research Institute for Water and Environment, University of Siegen, 57076 Siegen, Germany (soenke.dangendorf@uni-siegen.de), (4) LOCEAN, Sorbonne Universites, UPMC/CNRS/IRD/MNHN, Paris, France (gilles.reverdin@locean-ipsl.upmc.fr)

We here quantify the linkage between northern European decadal coastal sea level change and subpolar North Atlantic decadal climate reversals over the altimetry era (1993-2016). We find that decadal subpolar gyre cooling (warming), widening (shrinking) and strengthening (weakening) since mid-2000s (mid-1990s) as viewed from altimetry led to negative (positive) northern European coastal sea level trends as estimated from tide gauges. This relationship suggests that coastal sea level changes coincide with subpolar North Atlantic decadal steric trends driven by ocean circulation. We find no evidence that longshore or local wind stress could have led to the observed coastal sea level trends. We thus conclude that changes in the subpolar North Atlantic ocean circulation, rather than wind stress forcing, played a key role for the observed northern European decadal coastal sea level change over the altimetry era.