

Regional and global sea level change since 1900 estimated with Neural Networks

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We will present an update of the results from the paper Wenzel and Schroeter (2010) in which we demonstrated the appropriability of Neural Networks to fill gaps in time series (e.g. in tide gauge records) and to compute regional mean sea level anomalies from thus completed tide gauge records. The monthly sea level anomalies for the period [1900-2007] of eight mean ocean regions (trop. Indian, ... South Atlantic) and for the global ocean are estimated from tide gauge values directly using the neural network approach. For this purpose 56 tide gauges are selected from the PSMSL data set. Although every tide gauge has more than 50 years of data, many values are missing, especially prior to 1950. To fill these gaps another neural network is used. For the global mean sea level we find an average trend of 1.56 ± 0.25 mm/yr. In the paper of Wenzel and Schroeter (2010) the network that fills the data gaps is trained using only time steps that have complete data. Here we present also an improved method that can deal with arbitrarily distributed missing values even during the training phase.