Regional and global sea level change since 1900 estimated from tide gauges and altimetry

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We will present an update of the results from the paper Wenzel and Schroeter (2010)in which we demonstrated the applicability of Neural Networks to fill gaps in time series (e.g. in tide gauge records). 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 an improved training procedure that can deal with arbitrarily distributed missing values even during the training phase. 178 tide gauges are selected from the PSMSL data set that have at least 30 annual mean values given for the period 1950 onwards. To fill these gaps the neural network is used.

The global sea level anomaly fields are reconstructed from these completed tide gauge records for the time range 1900 to 2009. This is done by estimating the projection onto the principal components of the EOF decomposition of the altimetry data. We find an average trend of 1.55 mm/yr for the global mean sea level, while local sea level trends range from -5 to 7.5 mm/year.