Neff, B., C. Kummli, A. Stickler, J. Franke, and S. Brönnimann (2013) An analysis of the Galveston Hurricane using the 20CR data set. In: Brönnimann, S. and O. Martius (Eds.) *Weather extremes during the past 140 years*. Geographica Bernensia G89, p. 27-34, DOI: 10.4480/GB2013.G89.03

Abstract

The Twentieth Century Reanalysis (20CR) is an atmospheric dataset consisting of 56 ensemble members, which covers the entire globe and reaches back to 1871. To assess the suitability of this dataset for studying past extremes, we analysed a prominent extreme event, namely the Galveston Hurricane, which made landfall in September 1900 in Texas, USA. The ensemble mean of 20CR shows a track of the pressure minimum with a small standard deviation among the 56 ensemble members in the area of the Gulf of Mexico. However, there are systematic differences between the assimilated "Best Track" from the International Best Track Archive for Climate Stewardship (IBTrACS) and the ensemble mean track in 20CR. East of the Strait of Florida, the tracks derived from 20CR are located systematically northeast of the assimilated track while in the Gulf of Mexico, the 20CR tracks are systematically shifted to the southwest compared to the IBTrACS position. The hurricane can also be observed in the wind field, which shows a cyclonic rotation and a relatively calm zone in the centre of the hurricane. The 20CR data reproduce the pressure gradient and cyclonic wind field. Regarding the amplitude of the wind speeds, the ensemble mean values from 20CR are significantly lower than the wind speeds known from measurements.