Project: **961**
Project title: **BINGO**
Project lead: **Uwe Ulbrich**
Report period: **2019-01-01 to 2019-12-31**

Status of work (simulations and analyses) proposed for 2019 (up to 23.10.2019):

Our proposed work for 2019 focused mainly on analysis of simulations already performed within the BINGO project, and associated data processing. This has resulted in two new publications and a further paper in review. In the first publication, we used a convection-permitting model to identify diurnal variability in the future scaling of extreme precipitation [1]. In the second, we studied the sensitivity of a medicane to sea surface temperature variability [2]. In the third, currently in review, we evaluated the realism of subhourly precipitation in a convection-permitting model [3].

In our application for 2019, we additionally proposed performing ensemble sensitivity simulations of the extremal episodes we simulated during 2018, i.e. those used in [4]. This task was unfortunately not realised. We instead used the designated node hours to extend the simulations underlying our evaluation study of subhourly modelled precipitation (paper in review) [3], thus ensuring more robust results. This only became possible after we received extended observational data via our partners within the BINGO project. We would like to revisit the proposed study in the future, however no longer within the scope of the BINGO project. As of 23.10.2019, we have used 95% of our allocated node hours for 2019.

[1] Meredith, EP, Ulbrich, U & Rust, HW (2019). **The Diurnal Nature of Future Extreme Precipitation Intensification**. *Geophysical Research Letters*, 46(13):7680–7689, https://doi.org/10.1029/2019GL082385.

[2] Noyelle, R, Ulbrich, U, Becker, N & Meredith, EP (2019). **Assessing the impact of sea surface temperatures on a simulated medicane using ensemble simulations**, *Natural Hazards and Earth System Sciences*, 19, 941–955, https://doi.org/10.5194/nhess-19-941-2019

[3] Meredith, EP, Ulbrich, U & Rust, HW (2019). **Subhourly rainfall in a convection-permitting model.** *Environmental Research Letters* (in review).

[4] Meredith, EP, Rust, HW & Ulbrich, U (2018). **A classification algorithm for selective dynamical downscaling of precipitation extremes**. *Hydrology and Earth System Sciences*, 22(8):4183-4200. doi: 10.5194/hess-22-4183-2018. https://www.hydrol-earth-syst-sci.net/22/4183/2018/.

Status of data archiving proposed for 2019 (HPSS Doku):

Archiving of simulation data proposed for 2019 has mostly been completed and will certainly be completed this year. The simulation data underlying publications [1,2,4] have been fully transferred to DOKU, while the simulations underlying [3] are currently in HPSS ARCH, but transfer to DOKU will be completed this year.