



Yangtze future climates from resampled weather analogues

B. Orlowsky (1), O. Bothe (2), K. Fraedrich (2), F.-W. Gerstengarbe (3), and X. Zhu (4)

(1) Swiss Fed. Inst. of Technology Zürich, ETH, Institute for Atmosphere and Climate, Zürich, Switzerland

(boris.orlowsky@env.ethz.ch), (2) Meteorological Institute, University of Hamburg, Germany, (3) Potsdam Institute for Climate Impact Research, Potsdam, Germany, (4) Max Planck Institute for Meteorology, Hamburg, Germany

The Yangtze river running through all climatological sub-regions of central China provides a test-bed for a new statistical analogue resampling (STAR) scheme for future regional climate projections. STAR provides a large ensemble of day-to-day time series of single station weather variables at low computational cost. Time series are generated by mapping time-sequences from the observed past (1961 to 2000) into the future (2001 to 2040), being constrained only by a prescribed linear temperature trend. Results obtained for the projected future climates along the Yangtze include climatological profiles along the Yangtze, annual cycles and other weather related phenomena (e.g. floods, droughts, monsoon, typhoons): *(i)* The annual mean temperature and, associated with that, precipitation increases. *(ii)* The annual cycle shows an extension of the Asian summer monsoon season with increasing rainfall linked to a small summer temperature reduction in the Yangtze lower reaches. *(iii)* Coupling between monsoon circulation and monsoon rainfall strengthens. *(iv)* While drought occurrence is reduced, Yangtze floods do not change considerably. *(v)* The number statistics of typhoon days in the East China Sea show a reduction of about 25%. Cross validation, using the observed data set, and GCM scenario simulations, which show similar results, support the plausibility of the statistical analogue resampling.