**MINUTES WORLD CAFÉ**

**Discussed questions:**

* What means multi (i.e. how many)? What are the limitations?
* Effect of multi on downscaled spread: current and future climate
* Is there an optimal configuration of multi? Selection instead of “only” multi?
* Equality of datasets within each “M” (incl. uncertainties)

**Multiple observations**

* Different observational datasets exist
	+ Coverage: continental vs national datasets
	+ Spatial representativeness: Gridded (from observations) vs. station datasets
	+ Different models: Reanalysis datasets (numerical models) vs. gridded observational datasets (statistical interpolation)
	+ Different measurement: in-situ vs. remote sensing data (satellite, radar) and combination (e.g. radar- rain gauge combination)
* Uncertainty
	+ Modelled data (i.e. re-analysis datasets and gridded observations) strongly depend on which data are assimilated during simulation (re-analysis datasets) or which statistical methods were used to interpolate station data (gridded observations)
	+ Gridded data represent average information for an entire grid cell. Representativeness problems may occur for regions with complex topography, coastal regions etc.
	+ The use of regional ensembles of re-analysis datasets with different members and different assimilation schemes may help to quantify the uncertainty related to re-analysis datasets.
* Limitations
	+ Gridded observational data do not necessarily correctly represent temporal trends and auto-correlation structures as well as inter-variable consistency is not maintained, since often individual variable are gridded independently.
	+ Gridded observational datasets and re-analysis datasets are both based on models
	+ Availability of data (i.e. national station and gridded observational data)
* Choice of observational dataset
	+ Statistical downscaling method should be applied to same observational dataset, that is used for the calibration of the impact model.

**Multiple statistical downscaling methods**

* Different classes of SD methods
	+ Perfect prog (PP)
	+ Model output statistics (MOS)
	+ Weather generators (WG)
	+ Linear vs. non-linear transfer functions
	+ deterministic vs. stochastic methods
* Uncertainty
	+ Does the incorporation of multi SD methods really gives a “true” picture of the uncertainty
	+ Ensemble of opportunities
* Limitations
	+ End-users might have practical and computational limitations in processing large amounts of downscaled data.
* Choice of SD method
	+ Tailored to what impact users need/ look at
	+ Depends on impact study, region, variable
	+ Needs intermediate consultant for end-users
	+ Is the SD method selection comparable to climate model selection in terms of uncertainty
	+ Are there differences in the selection when downscaling is applied to a GCM compared to when it is applied to a RCM?
	+ bias correction vs downscaling step.
* Equality
	+ Data derived with MOS technique might be different from data derived with PP, since different information from climate models were used.
	+ Different MOS techniques use same climate change signal and will probably show similar results in the mean??

**Multiple climate simulations**

* Many types of different ensembles of climate simulations exist
	+ GCM-RCM ensembles
	+ Perturbed physics ensembles 🡺 parametrization uncertainty
	+ Perturbed initial condition ensemble 🡺 internal variability
* Limitations
	+ Sparse model matrix
	+ End-users often only use 1-4 climate models
* Choice of climate models
	+ Depends on region and impact study
	+ Only use “independent” models, without being overconfident
	+ Only models that capture governing processes relevant for impact studies
* Equality
	+ Climate models share same code