

4 Future climate change

4a. Skill of methods for describing regional climate futures (30-40 pages)

- Forecast and projections - the difference between them (~1 page, Joanna Wibig)
- Different emission scenarios (~1 page Joanna Wibig)
- Downscaling - what it is and why use this method? (~1 page Joanna Wibig)
- Dynamical downscaling - why we use RCMs, and what kind of improvements we can suspect, how different RCMs differ (~5 pages Philip Lorenz)
- Statistical downscaling:
 - Perfect prognosis methods: linear (multivariate regression models, canonical correlation analysis) and nonlinear (analogs, cluster analysis, neural nets) (~5 pages Rasmus Benestad)
 - Model Output Statistics (~5 pages Joanna Wibig)
 - Weather Generators (~3 pages ?)
- Evaluation techniques (~5 pages Douglas Maraun)
- Ensembles, how to use them, how to assess an error of projection? (~5 pages Erik Kjellström)
- Projections in impact studies (~4 pages ?)
- Regional climate futures based on analysis of driving factors (~4 pages ?)

short description what it is for, links to literature explaining details, concentrate on advantages, shortcomings and limitations shown on examples

I would like to start from some basic introduction: the difference between forecast and projections and relations between projections and emission scenarios. Then I would like to present a few most popular emission scenarios with assessment of related cumulated concentrations (SRES, business-as-usual, E1). At the end of introduction I would like to describe what downscaling is for.

A second part will be about dynamical downscaling - short presentation why we use RCMs, and what kind of improvements we can suspect.

A third part will be about statistical downscaling, divided into three parts:

first - perfect prognosis (PP) methods - what they are for, types, examples, advantages and shortcomings

second - model output statistics (MOS) methods - what they are for, types, examples, advantages and shortcomings

third - weather generators (WG) methods - what they are for, examples, advantages and shortcomings

A fourth part will be about evaluation of projections

Then I would like to describe idea of ensemble: why ensemble projection should be better than projection based on single RCM simulation and assessment of the quality of projections (range, standard errors,...). It is also a best place for description of the idea of weighting. I suspect discussion on reasons for using it and reasons for not using it shown on a few examples.

May be it should be also something about using projections in impact studies.

On the end I would like to describe also regional climate futures based on analysis of driving factors, I have the biggest problem with it. I do not know many papers about analysis of driving factors on regional or local scale in the Baltic Sea Basin.