Notes: specs & downscaling

Common themes.
Take-home message.
Colin Jones: basic concepts. Bridge the spatial gaps. Principles of DS. Mathematical: across-scale transfer function (ESD & RCMs).3 types of ESD: weather generators, transfer functions, circulation scale.
RCMs: spectral nudging.
Variable resolution global models.
Strengths & weaknesses (internal-consistency).
Forecast calibration.
Bias-correction & MOS.

DS added-value: examples. Mean precip over Africa (AEW & TRMM). Variability. Increasing resolution. Tropical cyclones. Capture more Tcs with higher res. and need to include AEW and Africa.
Simulated precip is senstive to model res. Quantiles for 24-hr. Switzerland & Norway. IDF-curves better capruted for RCMs with normalised values according to convective activity.
Bias-correction of daily CDFs.
Ensemble initialised near-term predictions. Full vs anomaly initialisation & reduce forecast drift.

Esd the choice for seasonal forecasting
Likely also for inter-annual & decadal
RCMs still in suck-it-and-see – potential
All DS depend on large-scale predictability
Flexible & intelligent approach

Comments

Large scales may not be as important as local forcings?

Issues of increased predictability on seasonal-to-decadal scales.

Definition of skill.

Post-processing maight improve skill.

Care when presenting the forecasts to stake-holders.

Going for two forcing apparoach? ENSO states & full & anomaly initialisation.

Missing: DS – measurement error. True climate? Match to the real climate, not measurements. Observational errors.

Comments...

- Multi-model ensembles. Sample all of the models and then aggrigate the final impact. How to weight? Sample from a posterior-distribution. Monte-Carlo simulations.
- Reliability rather than resolution. RCMs – resolution not relevant for ESD.
- Micro-scale resolution. What does 25km resolution tell end-users? Model-evaluation.
- Grid-box -vs point-observations. Scaling issue.
- Ensembles for everything. More probabilistic forecasts for risk management.

Comments...

- Local forcings: orography & soil moisture. How important is the initialisation of the regional models? Hard to tell.
- Drift in models. Time scale for the drift to occur. Information from hindcasts. Often drift in SST occur over a 9-month period. Realistic ICs give a drift fairly immidiately. Soil moisture? Model dependent.
- Lots of open issues: e.g. bias in trends.
- Methods adapted to a stationary world.
- Stress test.

Comments...

- Better way than DS? Correct bias before RCM? Re-run GCMs with bias-corrected SSTs.
- Choice of domain important.
- Anomalies & reference levels. Need to account for trends. Uncertainties depend on base line. Avoid using anomalies.
- Next 4 years: decisions on how we make downscaling.
- Proposal open.

Synthesis

- Boundary conditions. Parallel integarations. Comparisons.
- Evaluations - coordinated.
- Bias-correction. Temerature and precipitation. Consistency between the two. Try to preserve consistency.
- Plan downscaling taking into account end-user needs. Hindcasts. Which simulations are to be used by end-users.
- Separate bias-correction from downscaling.

Synthesis...

- Ensemble members, downscaling, bias correction, & accrigation of information – in what sequence?
- Mostly ESD for end-users, but also some RCM for interesting cases.
- Combined seasonal forecasts in a 'probabilistic way'. Some need time series & story lines.
- Physical consistency.
- Downscale wrong models – preserve the errors.

Synthesis...

- Uncertainty on meteorological side and end-user side.
- Common set of hindcasts is a first step in the right direction.
- Number of strategies for bias-correction and model calibration.
- Urban downscaling. Multi-level high...
- CMIP5 decadal runs.
- EUPORIAS & SPECS: case studies and stake-holders. Not much to show them. Results from SPECS to show EUPORIAS.

Synthesis...

- Identify standard procedures for end-users. How to describe uncertainty. ESD for Africa? 'System 4' – 4 re-starts per year. Multi-level data: all 11 members or just selection of 5? 40-year period. Common set of data.
- Show state-holders what information we have now. Not prototype model set-up.
- Hindcast data sets.
- System-4 data available? Bias-correct SSTs for EC-Earth runs?

Synthesis...

- System-4: how far back in time? Which experiment and data will be available? Not clearly stated. Ask ECMWF about restrictions and availablity. One reference data-set. Only seasonal forecasts
- Establish ECMWF system-4 hindcasts as a reference data-set.
- Schedule and time line for results. Access data first.
- Access to data after the project. Climate services. Message to end-users: useful information.

Synthesis...

- Tool for ESD.
- System-4. Downscaled & bias-corrected results. Validated against EOBS. 6-9 months.
- Distribution list.
- Africa & Brazil: depends on available observations.