Notes for the "ICRC-CORDEX 2019 International Conference On Regional Climate"
Session: D7 Climate Services developments in the frame of CORDEX and their transferability
Day and time: Thursday 17th of October 2019, 2PM to 4PM
Chair(s): Claas Teichmann and Armelle Reca Remedio
Convener(s): Claas Teichmann, Armelle Reca Remedio, Peter Hoffmann, Gaby Langendijk
Rapporteur: Benjamin Harrison (benjamin.harrison@metoffice.gov.uk)

Highlights

1. Participants proposed the following ideas for advancing the status of climate services
    1. Improve the accessibility of climate projection and observation datasets. This includes developing multiple entry points for different user groups, to enable intermediaries and professionals from other disciplines to quickly obtain data and perform exploratory analysis.
    2. Develop institutional capacities by developing programs for training the skilled intermediaries necessary for transferring science to services. This includes 'training the trainer' to facilitate the transfer of skills within countries and communities.
2. Session featured examples where CORDEX data had helped to implement national climate policy. For example, CORDEX data was used to help the Peruvian Ministry of Environment implement United Nations Development Plan (UNDP) Nationally Determined Contributions (UNDC) for Peru. (Stephanie Gleixner, PIK – East Africa Peru India Climate Capacities project)
3. Session demonstrated the potential for successful climate services to scaled-up or extended to other regions due to degree of consistency provided by CORDEX across different domains. Divergence between different CORDEX domains in terms of resolution and variables could hinder this process.
4. Data portals like the Copernicus Data Store (CDS) can help overcome the technical and knowledge barriers faced by professionals from other disciplines, while also providing stable data access for the science community. CORDEX Europe data is available through CDS and other domains are expected to be added.

Additional Notes and Takeaways

Introductory Exercise (Claas Teichmann and Armelle Reca Remedio)

- Opening Exercise directed participants to an online survey tool providing answers in real-time. The tool was used to facilitate discussions on the different regions the participants work on and their experiences with regional climate model data.
- For example, the opening question asked participants which regions they analyze. (See figure 1 question left, responses right)
- The next question asked: "Do you think CORDEX datasets are appropriate for climate service products and what are the major challenges?"
- There was a general feeling that CORDEX outputs were appropriate for certain applications but there will always be a demand for more detailed information (higher spatial and temporal resolution). It was also noted that the model resolutions vary across CORDEX domains. CORDEX Europe features 12km data (soon to be supplemented by 4km data from the Met Office UKCP18 project), while for CORDEX South Asia only 50 km data is available.
- Recognition that for some applications data will need to be supplemented by statistically downscaled data and sector specific impact models (e.g. hydrological assessments over complex terrain)

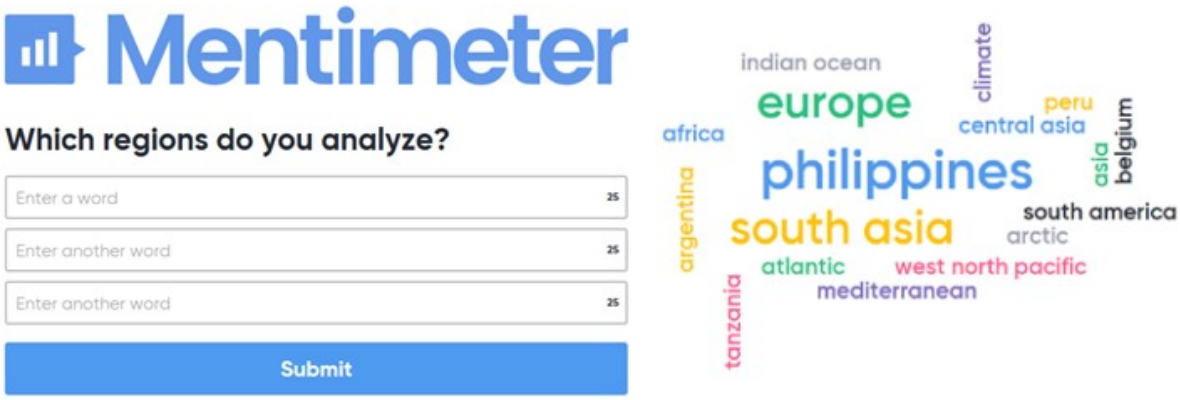

Fig 1 – Introductory Exercise opening question (left) with participant responses (right)

Speaker 1: Andras Horanyi – European Centre for Medium Range Weather Forecasting (ECMWF) Copernicus Data Store (CS3)

- CS3 is European Union (EU) project that aims to provide a stable and trusted source of climate information. The service intends to build on national investments and complement the services provided by nationally mandated organizations.
- The service provides free and open access to climate data based on the best available science with free use support.
- Data products available cover the past (observations & reanalysis), present (climate indicators and sector impacts) and future (forecasts & projections)
- CS3 features a tool box which includes a set of data diagnostics. Users can add more complicated diagnostics build from this set of primitives.
- Mediterranean CORDEX domain to be added next year, with non-European domains to added at the end of 2020.

Speaker 2: Sarah Top – Regional climate simulations for the impact of climate change over the CAS-CORDEX (Central Asia) domain

- The presentation featured studies of potential ecosystem impacts from the Agriculture Forestry in Europe-Russia Turkey Region (AFTER) project.
- Presentation highlighted the differences between the overlapping EU and CAS CORDEX domain in terms of the number of RCMs available and the highest resolutions available (0.11° vs 0.44°)
- The RCMs ALADIN and REMO were used to supplement CORDEX-CAS with higher resolution data (to 0.22°) comparing 2006-2099 to baseline period 1976-2005.
- Project involved stakeholder interacting across a range of countries, allowing intermediaries and sector-impacts modelers to access climate data. The CAS-CORDEX data was not available the appropriate resolution for impact models.
- Highlights the need for consistency across CORDEX domains and risk of divergence in capabilities (e.g. number and resolution of models available)

Speaker 3: Ole B Christensen – The need for flexible selection of climate simulation sub-ensembles for impact assessment in a climate service

- Presentation discussed the process of selecting a subset of climate models from an initial multi-model ensemble, when conducting impact assessments.
- The selection process typically involves ranking the available models based on different metrics, then selecting the “best” performing models for the region and processes of interest.

- Metrics are often based on mean climate variables, but selections generated using these metrics will not necessarily produce sub-ensembles that represent the temporal variability.
- The selection process will also include some form of bias-correction, but present-day biases may not correlate with the climate change signal.
- Impact assessments may require different selection methods depending on problem or location. Flexible methods are required to systematically select models without removing valuable information about temporal variability or building in assumptions about the statistical stationarity of model biases.

Speaker 4: Stephanie Gleixner – Bridging the gap. How the EPICC project brings science to practice

- Discussed capacity development work covering; climate, hydrology & water resources, agriculture and migration.
- Featured enhanced scientific capabilities across multiple timescales, including sub-seasonal forecast for monsoon onset and withdrawal, seasonal forecasts data for hydrological models, annual ENSO forecast and future climate projections from CORDEX RCMs for long-term hydrology and agriculture assessments.
- Developed operational capabilities, including sector-specific services for finance (crop insurance for MunichRe), water resources (support Basin Management Boards) and policy (Peru Nationally Determined Contributions, joint migration reports with United Nations International Organization for Migration)

Speaker 5: Jan Polcher – Climate change estimations of fluvial discharge from the main Andean Rivers

- Jan presented a case study that used CORDEX-South America data to generate future projections for river discharge, by forcing the IPSL ORCHIDEE land surface model to represent the surface water processes and transport.
- The CORDEX data available was not compatible with the river-basin datasets.
- Newer versions of the models are required that can be prepared for use with the HydroSheds datasets.

General Discussion – Where should investment be targeted, in order to deliver enhanced climate services?

- Participants split into two groups, with one group placing more emphasis on the underlying scientific understanding and model capabilities, the other group suggested improvements to training and communication.
- Examples for improving the science included, high-resolution studies resolving complex terrain and convection, earth-system models including human and natural systems, more field campaigns taking advantage of developments in automation to reduce the costs of airborne data-collection in storms or hostile mountain environments.
- Example for improving the transfer of science to services included, development of global and climate modelling training, development of climate groups to train community leaders to transfer knowledge and skills beyond the science or government sectors. Finally, the availability of free data portals, with different entry points depending on the technical background of users.

Group picture of the D7 Climate Services session participants