

CRANIUM

Working with probabilistic climate change scenarios – the challenges for the users and developers

- Clare Goodess (CG) showed a slide with 3 pdfs (2020s, 2050s, 2080s, range widening with time), and asked whether attendees were comfortable with the presentation of this information. Is a plot like this useful?
- *All seemed broadly comfortable, but noted that some stakeholders could have difficulty understanding and making use of data in this format.*

Q. Are all models equal?

A. This question highlights a thorny issue surrounding weighting of ensemble members. This is being looked at in the ENSEMBLES project. Hadley are also devising a Climate Prediction Index to help them weight ensemble members. There is also tension between the modelling community and users – modellers will weight members based on performance, whereas some users would prefer weighting determined by their area of interest.

Q. Are pdfs the most appropriate way of representing the uncertainties?

A. Chris Saunders (CS) mentioned that some users would find binned data (in raw number format) more useful. This would be easier and more practical for some applications.

A. Rather than weighting distributions, Jim Hall (JH) suggested that the use of probability bounds was more robust in some circumstances. This approach addresses situations where there is uncertainty in the probability distribution itself. This method is less precise but focussed on the decision variable.

More general comments:

- John Blanksby (JB) commented that the emergence of more complex information and modelling conflicts with industry 'de-skilling'. We need to consider what level of information people can handle and use. Industry already copes with uncertainty. It will be important for industry users to be able to relate the information to their own experience. Some industry users don't necessarily want/need the full pdf – they are more interested in the predicted change in extreme events within their relevant time frame.
- Richard Ashley (RA) said that developers need to understand what drives decision-making processes within and between sectors. Information delivery must be tailored. For example: regulators are not interested in the subtleties of uncertainty, they do not demand that it is taken into account. Each user responds to different drivers that influence the way they make decisions.
- JB: the EA (national) deals with a few large-scale problems. Others (urban scale) deal with a larger number of problems over a smaller area.

Information must be presented very simply. “Everything’s in the presentation.”

- Suresh Surendran (SS): some decisions are local, others national. A standard, generic methodology for using probabilistic data will not meet everyone’s needs. The EA has a project on joint probabilities which allows a customised approach.
- Alan Pearman (AP): supported the idea of tailoring information to suit user needs. He was also wondered whether averaging ensembles into one pdf (as in session handout, right-hand column) is defensible.
- CG responded that all the RCMs share similar underlying parameterisation schemes – they are fundamentally the same type of model.
- Chris Kilsby (CK) would be more concerned about combining emissions uncertainty into a single pdf, as these represent distinct underlying storylines.
- JH mentioned the fact that, up to ~2050s, there is not much difference between the emissions scenarios. Emissions uncertainty is relatively low in the short term (compared against other sources of uncertainty).
- CG also mentioned STARDEX results showing that the choice of downscaling method matters more in the near term than the choice of emissions scenario.
- ?? said that time scales are a critical issue in the decision-making process. Rates of change are often more important than the change itself. If scenario information could help decision-makers determine how much time they have to make and implement a decision that would be very helpful.
- John Davis (JD) commented that users will want to use information that is relevant to the analysis/location/timescale of their decision.

CG mentioned that she is interested in working on case study examples to inform the use of probabilistic climate information. She requested responses to Key Questions by 16 January.