The CONVEX project:
Using Observational Evidence and Process Understanding to Improve Predictions of Extreme Rainfall Change

What is CONVEX?

It is possible that climate change will bring about changes to the intensity and frequency of climatic and hydrological extremes which will in turn have large impacts on our communities through increased risk of flooding. CONVEX is a 3½ year project funded by the Natural Environment Research Council which is seeking to identify which aspects of extreme rainfall are reliably simulated by climate and weather models. Further, the project will endeavour to improve the representation of rainfall extremes through the use of high resolution models and also try to gain a better understanding of what causes deficiencies in model simulation of these events.

A key focus is the representation of **CONV**ective **EX**tremes that are important contributors to summer flooding. By using models operating at different scales of space and time, the project aims to improve our understanding of key atmospheric processes and their representation in climate models and in turn improve our projections of extreme rainfall. It is envisaged that this knowledge will enable better projections of future flood risk.

What is the science behind CONVEX?

CONVEX brings together climate modellers, climate change impacts researchers and Numerical Weather Prediction (NWP) scientists to investigate the skill of models in the simulation of extreme rainfall with key objectives being:

• The first climate change run of a **1.5km resolution regional climate model (RCM)** over central and southern Britain. This is vital for improved understanding and estimation of possible changes to local scale convective rainfall. This model will allow the process of convection to be represented dynamically which was largely impossible with previous coarser models.

• Using observed data to improve our understanding of the atmospheric processes that contribute to extreme rainfall.

Initial results are already emerging from the 1.5km RCM simulation

• Assessing the influence of RCM and NWP model parameterisation (the numerical representation of complex physical processes) on extreme rainfall simulation to identify reasons for differences between models in their projected changes in rainfall.

• Combine new and existing model simulations to assess the influence of model resolution on the simulation of extreme rainfall. This will allow us to better use large scale forecasts and model simulations and also to provide recommendations for future model development.
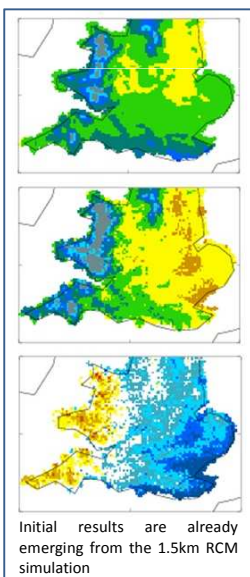
Who should be interested in the outputs from CONVEX?

CONVEX aims to start bridging the gap between the climate modelling community and the end users of climate information by assisting in the dialogue between these two groups.

The work undertaken in this project will be of benefit to practitioners engaged in building adaptive capacity to the risk of increased extreme rainfall and flooding. Increased understanding will also be of interest to insurance companies and those with responsibility for water resource planning and with obligations under the EU Floods Directive. Potential improvements in projections of future extreme rainfall that may arise from the project could also provide a more robust planning tool for organisations with statutory responsibilities during major events.

It is also envisaged that CONVEX will be of interest to the scientific community by yielding a better understanding of where model skill lies and where their deficiencies are. Those involved in the interface between scientists and practitioners might also engage with how results are best communicated from a policy-making and adaptation context.

CONVEX Workshop

CONVEX will be hosting a workshop on the 17th & 18th April 2012 at Reading University for potential users of the project outputs (see above) and climate scientists who are engaged in research into current and future extreme rainfall.

In particular, the workshop aims to allow both of these groups to engage with the process of ensuring project outputs are maximised in terms of providing improved information on future extreme rainfall. We will also discuss how information on the capabilities and limitations of climate model output can most usefully be communicated and used to inform users and model developers. The event will be split into two sessions with day 1 (11.00 -16.30) focussing on ensuring that CONVEX provides useful new outputs for the user community. Day 2 (11.00 - 16.30) will focus on maximising the scientific value from the project. However, it is envisaged that the two sessions will not be mutually exclusive and attendees are welcome to participate in either or both parts of the workshop. If you would like to join us for this event please register at http://forms.ncl.ac.uk/view.php?id=2391.

You can find out more on the CONVEX project website at http://research.ncl.ac.uk/convex/ or contact **Dr. Stephen Blenkinsop** (s.blenkinsop@ncl.ac.uk) for more information.

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