



Performance assessment of the Met Office convective permitting model

Why this is important: The UK needs to manage the growing risks from climate change. To adapt and build resilience, up-to-date information on climate change is needed to inform decision-making. UKCP18 (UK Climate Projections 2018) is the fourth generation of national climate projections for the UK and will provide users with the most recent scientific evidence on projected climate changes with which to plan. Within UKCP18 there are new local (2.2km resolution) projections, which for the first time provide national climate change information on a similar resolution to that of current operational weather forecasts. Termed “convection-permitting” (CPM) because strong storms, often associated with thunderstorms, are explicitly represented, they provide the most physically realistic projections of extremes in local areas for the coming decades, providing new capability for advice on projected changes at very fine spatial and temporal scales.



Boscastle, Cornwall, August 16, 2004 (credit: Camelford and Delabole Post)

What the UKCR programme is doing: The programme allowed further detailed analysis of the CPM projections to be undertaken, comparing output with those from the coarser resolution (12km resolution) driving model (RCM) and assessing their relative reliability by drawing on understanding of the representation of the underlying processes. The outputs were included alongside other analysis of the model results in a UKCP18 report which has been downloaded by many adaptation, academic and Government users.

Results so far: Overall, the analysis has shown that the CPM results reinforce the UKCP18 headline message of warmer wetter winters and hotter drier summers across the UK in future. The variables of temperature and precipitation have been a focus for the analysis, and for almost all metrics examined when compared with observations the CPM gives improved present-day simulation compared to the RCM. The CPM results also provide new information in terms of changes in heavy daily precipitation events in summer (which intensify more in the CPM) and hourly precipitation extremes as well as new higher estimates of changes in winter mean precipitation.

What is next? The results are available through UKCP18 deliverable channels for users to apply in their adaptation work. More than 200 people have already accessed the data on the user interface, with more downloading it from the CEDA data catalogue. Another UKCR project called Future-drainage is using the outputs to estimate the potential consequences for urban flooding. Future work within the UKCR programme will focus on understanding the model performance and projections over urban areas and feed directly into an Urban Climate Service pilot.

Reference: UKCP Convection-permitting model projections: Science report is [available here on the Met Office website](#)

Supported by:

