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## Climate warnings' error margins

### ANALYSIS

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Ever more precise climate models require ever larger computing power

**Projections by the UK's Climate Impact Programme released on Thursday come with strict caveats about how they should be used and their margin for error.**

The Department for the Environment, Food and Rural Affairs (Defra) and the Met Office argue that, even though the projections are far from certain, they will be useful to help plan for climate change in the UK.

But others have warned that the uncertainties in the projections are too great to be of practical use.

Defra has produced projections of climate change and consequent weather using advanced computer modelling techniques.

Up until now, most projections have been at a sub-continental level - giving information at a regional level in squares of 300km on a side.

Defra's projections are among the first in the world to give information at a local level - to the scale of large cities of 25km square and, in some cases, projecting weather patterns to a village scale of 5km square.

### Planning for change

The UK's Climate Impacts Programme projections were explicitly designed to help local authority planners and businesses make investment decisions to adapt to the consequence of climate change.

But according to Dr Myles Allen of Oxford University, who was among those who carried out an independent review of the projections, said that they may not be reliable enough at this stage to make some of the most important policy decisions.

"If your decisions depend on what's happening at these very fine scales, you probably shouldn't be making irreversible investment decisions now," he said.

The review, published on Thursday, says that the projections are "credible" but does raise concerns that the statistical techniques used are untested and have not been published in a peer-reviewed journal.

The last assessment by a committee set up in 2007 by the Intergovernmental Panel on Climate Change (IPCC) concluded that these kinds of so-called "probabilistic" projections could only be applied reliably on a global scale - of 1000km square.

"The IPCC explicitly stepped back from making probabilistic projections on this sort of scale," said Dr Allen.

"The method that's been used to produce this projection is a very specific one.

"It's not been used before for this climate change approach and we thought that it would be helpful to provide a much more conservative method, something the IPCC would have used in 2007 just to provide users with a context and something to compare with so that they can see which aspects of these projections are robust."

Defra has not accepted the recommendation to provide an alternative set of projections by the independent review panel because officials felt that having two sets would be confusing.

Dr Leonard Smith of the London School of Economics' Grantham Institute says he cannot see how any planner could make decisions on probable climate outcomes that are so uncertain that they might change substantially in 20 years.

"It's very hard to find a rational way of using them," he said.

"If the numbers are used in a naive way, then you are very likely to design a power plant or reservoir that doesn't meet the needs of the population."

### Too far?

Many in the scientific community were particularly astonished that Defra published projections at a scale of 5km square - which are even more uncertain than the 25km square projections.

Among them was Professor Sir David King who was involved in commissioning the projections when he was the government's chief

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scientific advisor.

"If you include a 5km scale in your predictions, you are probably pushing things beyond what is realistic. So I'm a little surprised that scientists were prepared to go that far.

"If I was in the decision-making position in government, I would not have made the decision to publish those figures."

But Sir David backs Defra's decision to publish the figures at a 25km scale, despite the current uncertainties.

"There is the issue of saying to the local village council and the local city councils that this is an issue that affects you. I think that the driver was the need to get a message across to the people who make key decisions," he said.

"I believe we need the best we can get so that we can set in train a good adaptive process to protect the country from risk of flood whether from rivers or flash floods in cities or coastal floods."

That view was echoed by Professor Sir Brian Hoskins of the Grantham Institute in London, who chaired the independent review of the projections.

"[These projections] will help people make decisions about planning and designing structures now. That doesn't say that the guidance will be identical in three years' time.

"But for those making decisions now, I think this information and providing it is a good thing to do."

Sir Brian's independent review was completed in January and has been held back until the publication of the projections this morning; in fact, those involved with the review were required to sign non-disclosure agreements.

Sir David believes that officials at Defra may have been anxious to avoid fuelling an already heated debate among the climate modelling community.

"Scientific challenge is essential to the scientific process. Civil servants are very sensitive to scientists disagreeing in public, I would be much happier if everyone could be more mature.

"If we say it as it is, I think the public would get used to the way that scientists work."

**"If the numbers are used in a naive way, then you are very likely to design a power plant or reservoir that doesn't meet the needs of the population"**

Leonard Smith  
London School of Economics

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