

THE USE OF LIFE CYCLE MODELS OF CONVECTIVE SYSTEMS IN FORECASTING HEAVY RAINFALL

by

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ABSTRACT

The exact location and timing of the rapid development of convective systems are of primary importance in flash flood warning systems. Small spatial and temporal errors in forecasts may result in widely different actions being taken by flood hydrologists. The availability of radar, satellite and numerical model data in real-time offer the possibility of developing objective procedures which may improve forecasts of heavy rainfall. Indeed, over the last ten years or so there has been much activity in this field. Unfortunately the non-linearity of the development of convective systems has restricted improvements in forecasting the exact location and timing of these events, although there has been success in forecasting general areas of likely occurrence. In this paper we describe work being undertaken to objectively recognise the type of convective system which is occurring, the likely lead time to which the forecast will be useful and how that system might develop in the next few hours.

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Comment Bob Crabtree WRc

The 24th June may have been a big event in the rest of the UK but it did not rain in Derby. On a more serious note this type of prediction be used in UPM data collection

Question Cello Vitasovic Reid Crowther Consulting Inc.

What type of object oriented software did you use and what were it's properties ?

As far as on-line prediction is concerned our experience in Seattle showed that the travel times in the sewer were such that you did not have to predict that far ahead. The predictions for RTC were not that critical as the control system only iterated every 10 minutes and there was plenty of flow time in the sewer.

Answer

Our object oriented code approach is based upon structures developed by the Department of Cognitive Science, Sussex University. A conceptual model of the life cycle of convection is specified in terms of cell stages which are then characterised by vertical profiles of radar reflectivity. Convective development is allowed by defining the growth of daughter cells to the right of the cell motion. If you require further details I would be happy to pass more detailed papers to you.

For Salford we are looking minutes ahead certainly not hours.

Question Dave Walters M W Barber

The met office is 80% accurate 4 hours in advance., 20% accurate for 1 day in advance. We have a client in Belgium who will give us 1 hour warning of rain is this realistic ?

Answer

Yes but the information will be probabilistic and will certainly not be quantitative when rapid convective development is occurring.