SOCIO-ECONOMIC BENEFITS OF METEOROLOGICAL AND HYDROLOGICAL SERVICES

CASE STUDIES

Flow Routing/Flood Forecasting – Case Study

ITEM	DESCRIPTION
Sector	Water – Emergency Management
Sub-sector	Flood and flow forecasting
Case Study Name	An innovative flood forecasting system for the Demer basin: A case study
Case Study Description	This project involved the development and operation of the new flood forecasting system for the Demer basin in Belgium, which has suffered severe flooding problems for many years. The system takes telemetry data from a large number of hydrological, meteorological, and hydraulic observation sites across the basin, along with radar rainfall forecasts. These data are fed through a network of complex hydrological and hydrodynamic models.
Location	Demer River Basin, Belgium
Tools employed	A network of complex hydrological and hydrodynamic models
Description of application	Scheduled runs of the system take place at frequencies determined by the level of alert; runs are performed on a cluster of server computers, then results are available on client computers in the control room and via remote access. This gives operational basin managers fast, accurate, real-time flood forecasting and flood mapping based on high-resolution digital ground model information, enabling identification of those streets and areas affected by flooding. The basin managers have several options for diverting flood waters in order to avoid or mitigate the effects of flood events in key areas. The forecast results underpin a decision-support system, giving basin managers the information they need to make informed judgements for disseminating flood warnings and altering their management of the river controls.
Outcomes of application	Enhanced computer power and modelling capability allow basin managers and engineers to carry out fast and accurate simulation of the key elements of the future behaviour of river, channel and coastal systems. This supports mobilisation of emergency responses and provision of public flood warnings.
Cost/Benefits	Flood risk can never be eradicated, but its impacts can be reduced. Timely warnings and effective management of river basins by informed flood risk managers can help prevent some of the physical and psychological impacts of flooding. Resilient flood risk management strategies consider measures to reduce the impacts of flooding (e.g. the use of off-line flood storage reservoirs, man-made breaches in river banks), methods of dissemination of flood warnings, and evacuation procedures. Increases in computer processing power and networking abilities mean that flood forecasting tools are becoming invaluable parts of the decision making process.
Characteristics of the Case Study	This complex flood forecasting system consists of a range of elements, supplied by various Belgian and British contractors.

	The first priority was to update existing meteorological and hydrological gauging infrastructure in order to obtain sufficient, high quality telemetry data to underpin the system forecast runs. These data are complemented by rainfall forecasts from two sources, enabling longer lead times with more accurate flood forecasts.
Consultation mechanisms	None
Structural interface	Direct contact to meteorological service for data/information.
Delivery mechanism	Provided in electronic format
Feedback mechanism	None
Review Mechanism	None
Other	
Lessons learnt	Looking to the longer term, while we might expect more flooding as our climate changes, it is not a simple matter to predict the extent of flooding. Further, flooding is not just a winter issue. There may be a higher frequency of sudden, intense summer storms, causing urban flooding, as well as a greater risk of sustained winter rain causing river basin flooding. The urban summer flooding is largely an issue for collection systems, while the winter rains give problems for managing river systems. Integration of such models is a key requirement for providing a holistic approach to flood risk management.
Best Practise Advice	Good example of current best practise
Possible future advances	See above
Comments	
URL	http://www.wallingfordsoftware.com/files/demer.pdf http://www.catchment.crc.org.au/archive/pubs/1000073.html http://www.catchment.crc.org.au/archive/pubs/1000078.html http://www.springerlink.com/content/p3162511l1p43138/
Others	