

IWRA – XVth World Water Congress, Edinburgh 25-29 May 2015

Urban Flood Risk Management: towards a holistic approach

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Newcastle University (Dr Vedrana Kutija, Vassilis Glenis)
Scottish Water (Dawn Lochhead)

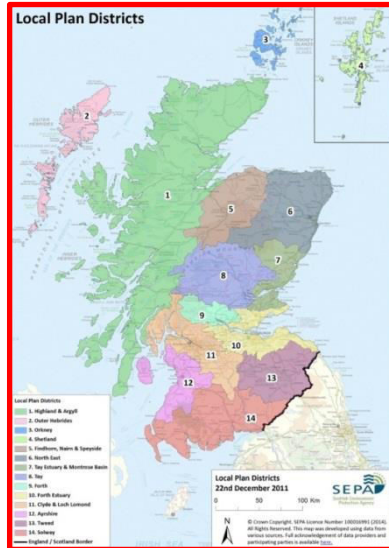


Introduction: Flood Risk Management in Scotland

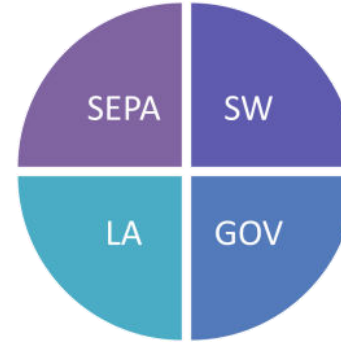
Flood Risk Management
(Scotland) Act 2009



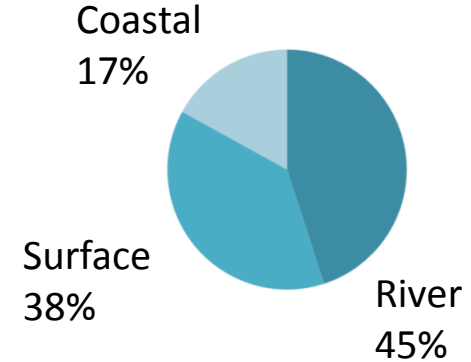
2011: National Flood Risk
Assessment



Key authorities



Result of NFRA



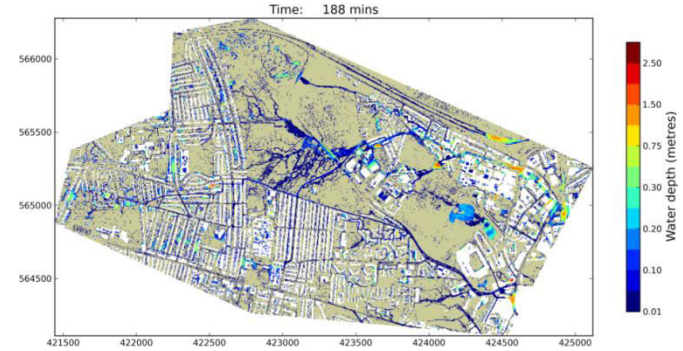
14 Flood Risk Management
Strategies & Plans

Reviewing the current situation – challenges

Individual vs. Integrated assessment



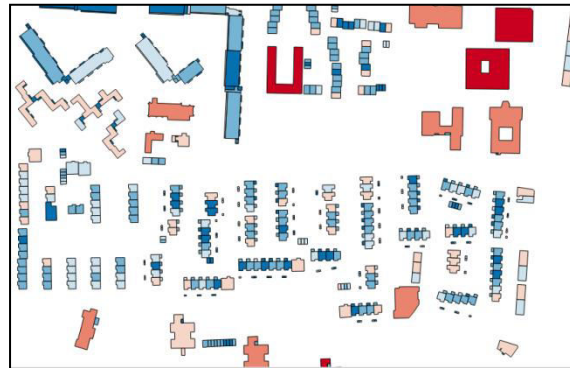
Scoping for planning purposes



Communication & Visualisation



Properties at risk and significance of impact



Delineation of flood mitigation schemes



Research Questions

- Are the current arrangements fit for purpose?
- How can FRA be done in a more purpose driven way?
- How can we get the most from the information obtained from hydrodynamic modelling?
- How can we incorporate alternative applications and modelling tools into strategic asset planning?

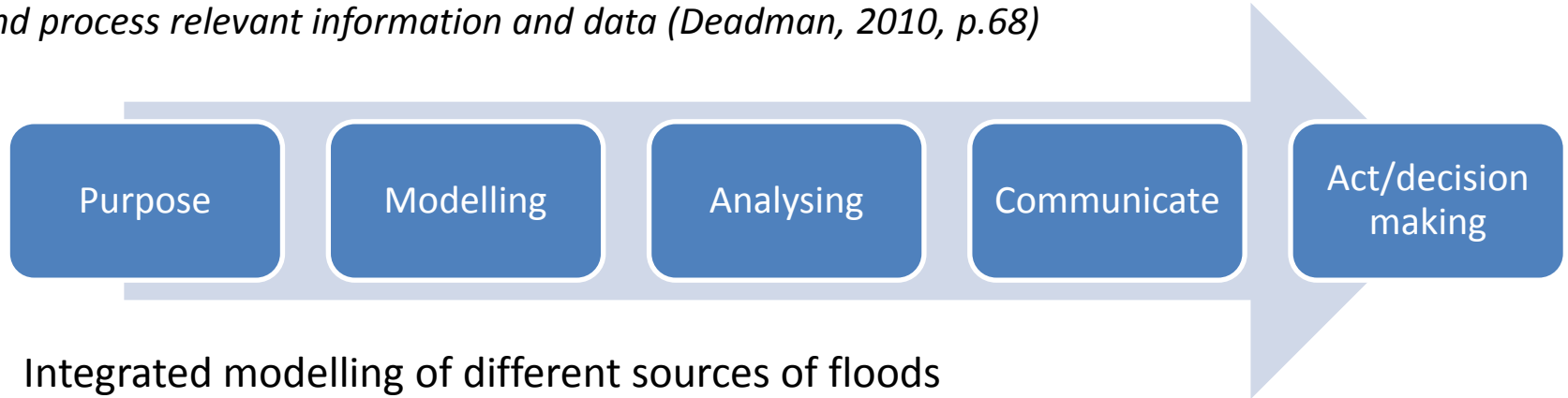
Aim

Develop a decision making support methodology based on a more holistic strategy of FRA & FRM.

Conceptual outline I

FRA & FRM for strategic asset planning

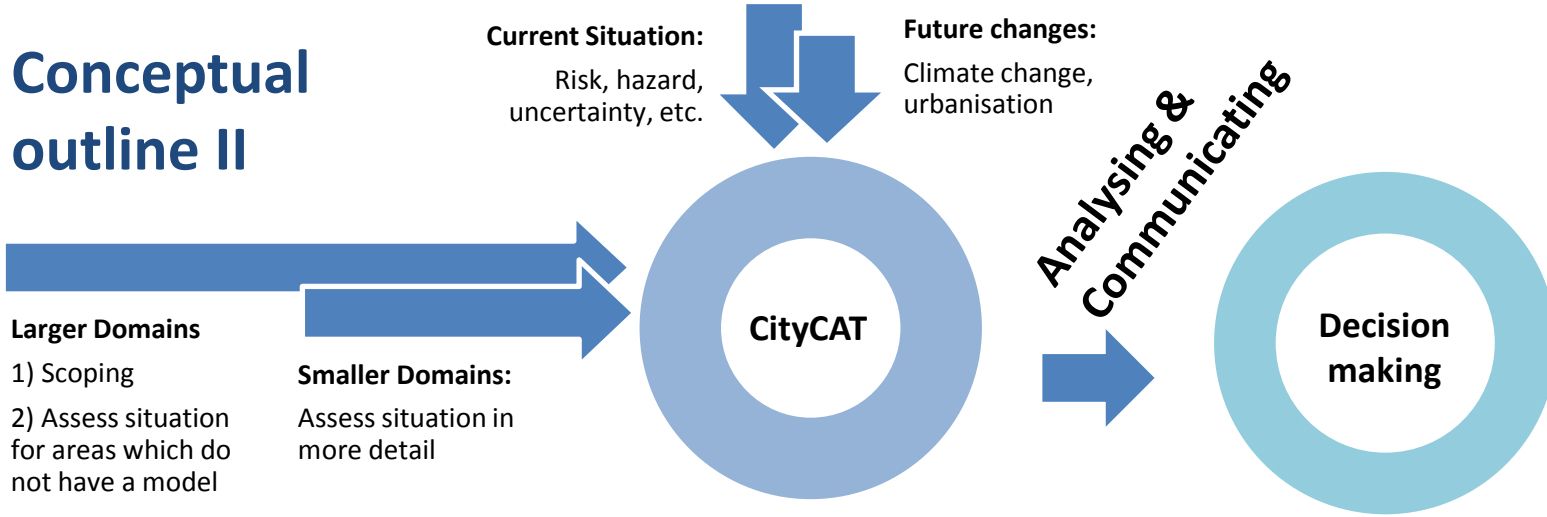
As we seek to deliver value and service, a key challenge for all organisations is to collect and process relevant information and data (Deadman, 2010, p.68)



- Integrated modelling of different sources of floods
- Assessment on different spatial and temporal scales
- Helping to understand route of water: source-pathway-receptor
- Modelling on demand – cloud computing
- Efficient and effective communication of findings require unified language

Always keep the purpose in mind!!!

Conceptual outline II



CityCAT *City Catchment Analysis Tool* (Vassilis Glenis, Newcastle University)

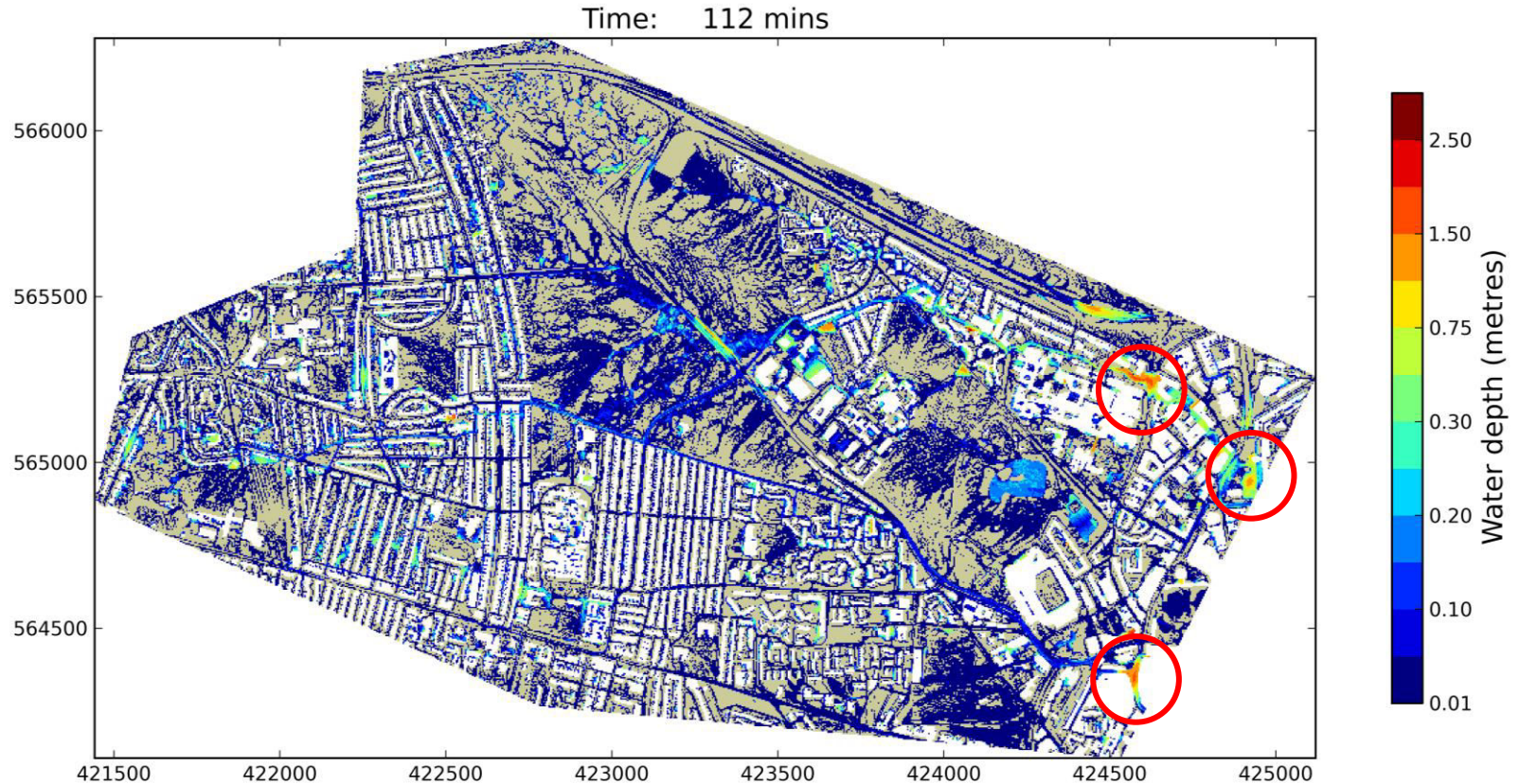
- *1D/2D*
- *Efficient numerical schemes based on FV*
- *Shock capturing schemes*
- *Applies standard datasets*
- *Captures infiltration*
- *PC, server & cloud compatible*
- *Buildings treated specially*

Strategic asset planning

- *Stakeholder engagement*
- *ICS*
- *SWMP*
- *FRMS & FRMP*
- *Flood mitigation schemes (SUDS)*
- *Validation*
- *Increase efficiency towards resources required*

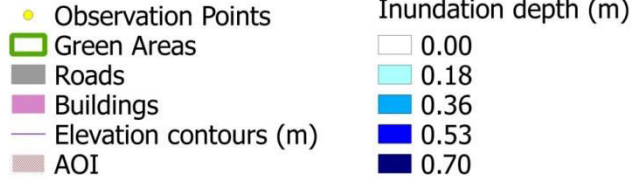
Modelling for strategic asset planning I

- Assess global situation
- Scoping
- Impact significance
- Multi layer analysis

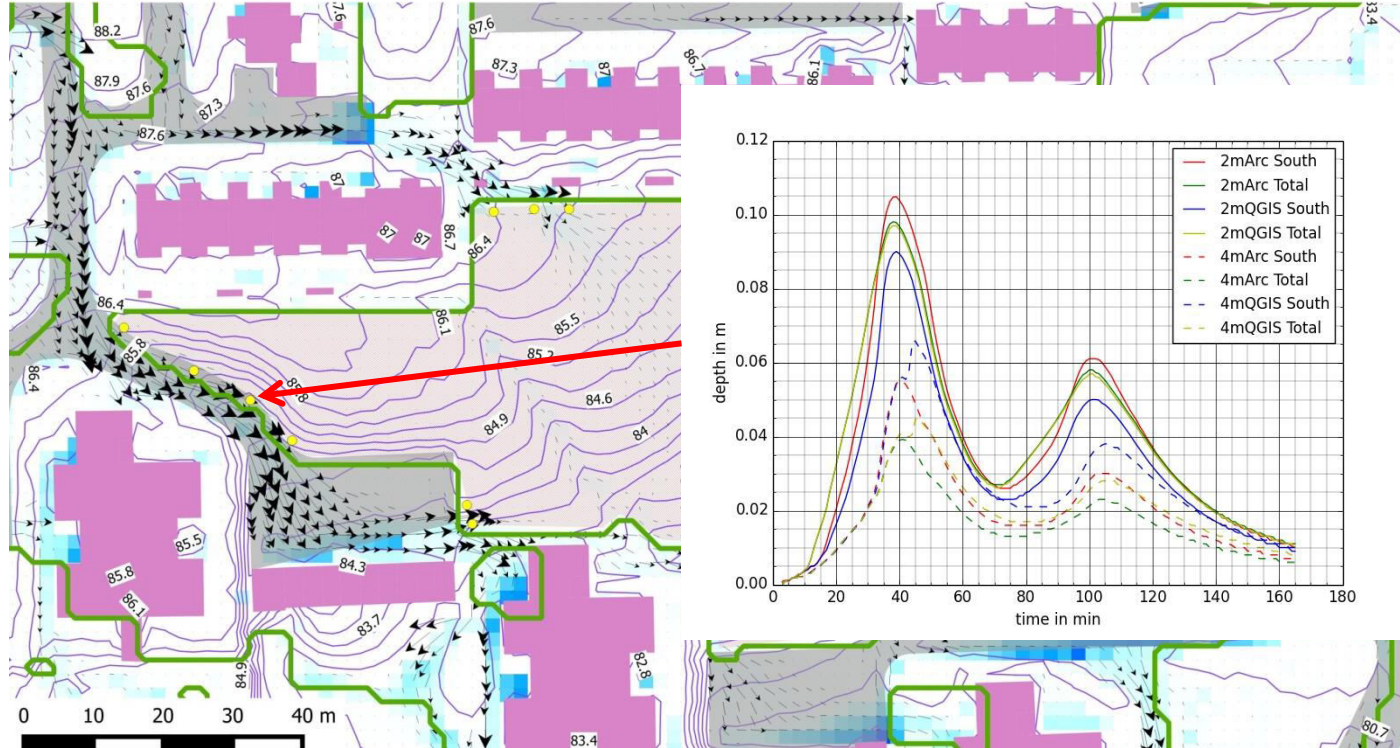


Modelling for strategic asset planning II

- Detailed assessment
- Multi layer analysis
- Planning purposes (e.g. SUDS)



CityCAT 2D, Vassilis Glenis (Newcastle University)
 Data sources:
 Terrain: Blue Sky/Newcastle University
 Mastermap: Edina Digimap/Newcastle University
 Robert Bertsch 2015



Summary

- Make use of the vast range of data available - Analysis
- Communicate the information and findings
- Holistic
 - Purpose driven
 - Modelling
 - Analysing
 - Communication
- Prepare for the future
 - Cloud Computing
 - Alternative approaches
 - Introduce flexibility
- Link research (CityCAT) & open-source with industrial application

Thank you for your attention

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