Urban Flood Risk Management: towards a holistic approach

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Introduction: Flood Risk Management in Scotland

Flood Risk Management (Scotland) Act 2009

2011: National Flood Risk Assessment

Result of NFRA
- Coastal: 17%
- Surface: 38%
- River: 45%

Key authorities
- SEPA
- SW
- LA
- GOV

14 Flood Risk Management Strategies & Plans
Reviewing the current situation – challenges

Communication & Visualisation

Properties at risk and significance of impact

Delineation of flood mitigation schemes

Individual vs. Integrated assessment

Scoping for planning purposes

[Images and maps related to flood assessment and visualisation]
Aim
Develop a decision making support methodology based on a more holistic strategy of FRA & FRM.

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?
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!!!

Larger Domains
1) Scoping
2) Assess situation for areas which do not have a model

Smaller Domains: 
Assess situation in more detail

Current Situation: 
Risk, hazard, uncertainty, etc.

Future changes:
Climate change, urbanisation

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

Analyzing & Communicating
Decision making
Modelling for strategic asset planning I

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

Time: 112 mins
Modelling for strategic asset planning II

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