Impact of Urban-ness in Re/Insurance decision-making

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Workshop on Comparative Genetics of Cities

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Challenges of risk analysis

Insurance claims data is insufficient to determine scale and frequency of future loss potential

- Transient (vehicles, population)
- Sparse
- Short period – not representing length scales of natural event cycles

The alternative is to use catastrophe loss models

- Hazard (geophysical)
- Exposure (built environment, infrastructure, land cover, populations)
- Vulnerability (damage functions, loss potential)

Source: Normalized Hurricane Damages in the United States: 1900-2005
Pielke et al Natural Hazards Review
The need for data and clarity

Risk decisions are increasingly reliant on quantitative analytical tools to represent range of possible events

- Frequency, severity & impact of extreme events within a dynamic climate environment
- Natural hazards drive majority of global risks & cat losses
- Most of the affected areas are in Urban areas.
- However, what constitutes an urban area is poorly defined – A core area of research of WRN
Planning Policy impacts on Risk and Insurance Vulnerability – Thames Gateway

- Study the dynamic and temporal variability of vulnerable areas to flooding such as Thames Gateway from a policy and planning perspective.
- Current work: Evaluate the current PPGs and potential impact to the insurance industry
- Next Step: Consider effect of alternative PPG from other countries and what effect that would have insurance industry
Urban typological discriminators (unsupervised segmentation)

Segment the urban fabric according to morphology

Examples of morphologies in the centre of L’Aquila, Italy – Studies from WRN and Uni. of Cambridge
Conflagration

- **Hazard modelling:**
  - Thermal effects
  - Atmospheric parameters
  - Pollution

- **Scenarios:**
  - Time element
  - Transportation risks: impact on a network
  - Domino effects
  - Probabilistic modelling

WRN and Ambiental high resolution terrorism model
Geospatial

- New geospatial visualisation methods – e.g. Google Earth
- Techniques for complex multidimensional data visualisation and display – e.g. Willis Model Sensitivity Analysis (MSA)
- WRN will develop a new, strategic blueprint for remote sensing application across the insurance market
- Create a central focus and thought leadership between re/insurance industries and the remote sensing communities – academic, aerospace, commercial technological, data

WRN collaboration with City University in London. Also Thames Flood scenario using Willis Thames flood model and Address Layer property locations. Reproduced with permission from Ordnance Survey data.

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