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

Dr Rashmin Gunasekera

Workshop on Comparative Genetics of Cities

21st May 2010

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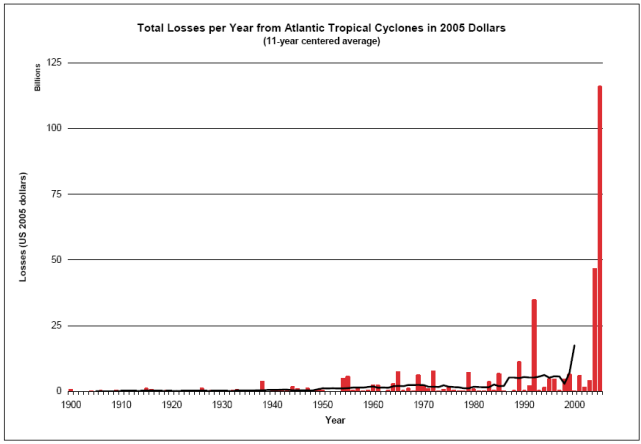
Challenges of risk analysis

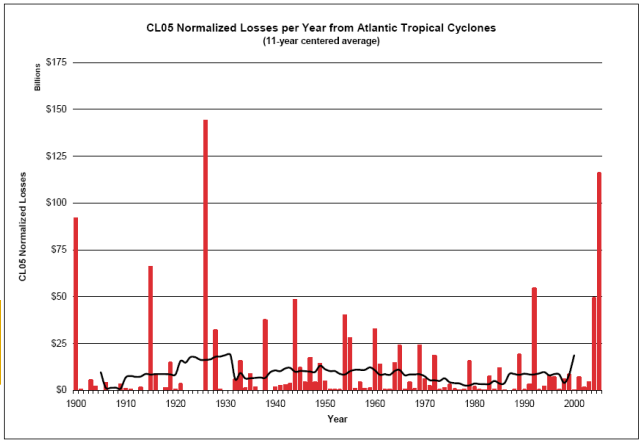
Insurance claims data is insufficient to determine scale and frequency of future loss potential

- 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)



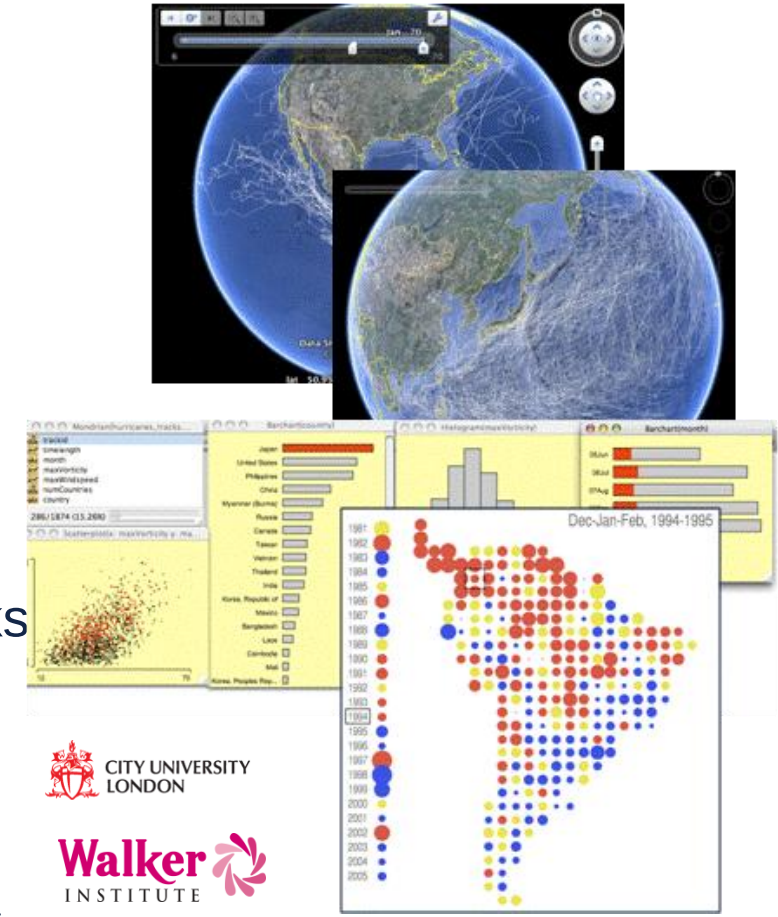


Source: Normalized Hurricane Damages in the United States: 1900-2005
Pielke et al Natural Hazards Review

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*



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WILLIS RESEARCH NETWORK AS AT MARCH 2010

Willis Research Network

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Birkbeck University of London
Università di Bologna
University of Bristol
British Geological Survey
University of Cambridge
Cambridge Architectural Research Limited
City University London
Colorado University of Colorado at Boulder
Durham University
ETH
EUCENTRE
University of Exeter
Fluvius Floodplain Ecology and River Basin Management
GFZ Helmholtz Centre Potsdam
GNS Science
Imperial College London
KIT
Kyoto University
Met Office
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NCAR
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NUS National University of Singapore
Ordnance Survey
University of Oxford
Princeton University
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Worldwide Reinsurance Awards The Review 2009

Thames Gateway & SA Hail

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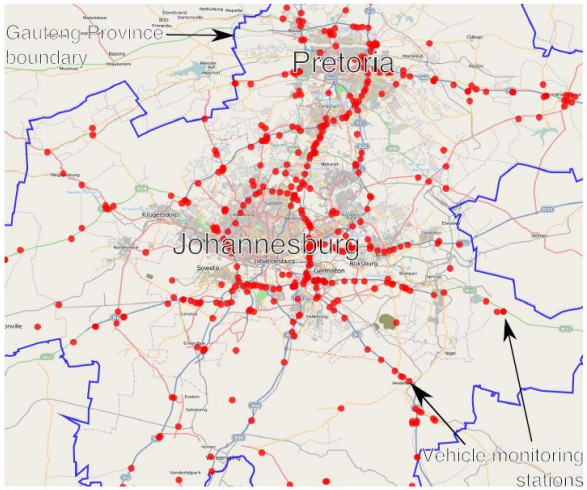
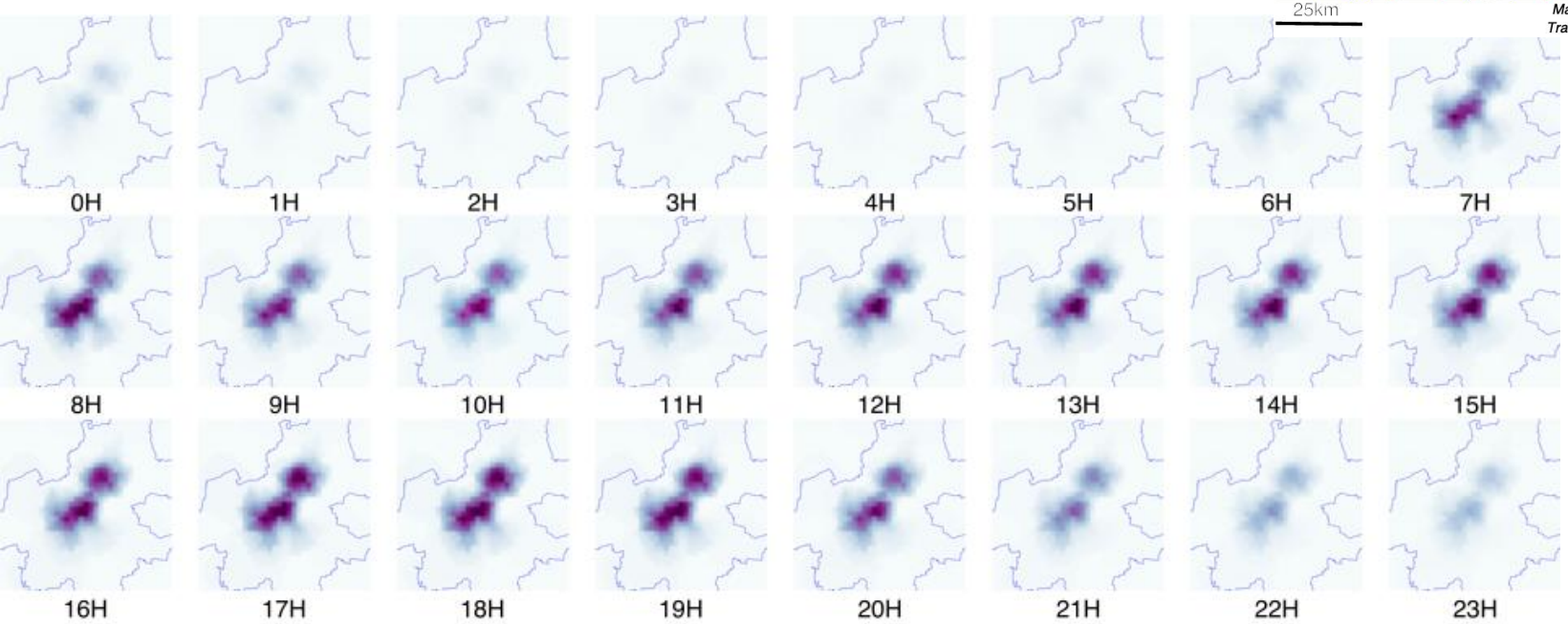
Planning Policy impacts on Risk and Insurance Vulnerability – Thames Gateway

- ❑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





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Collaboration between WRN and City University, London: Slingsby, Foote, Dykes, Wood, Gunasekera (2010)

Urban typological discriminators (unsupervised segmentation)

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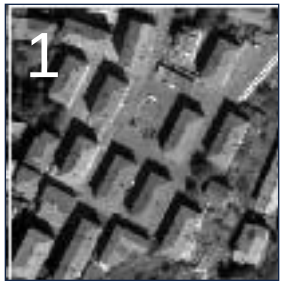
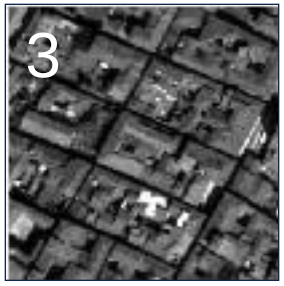
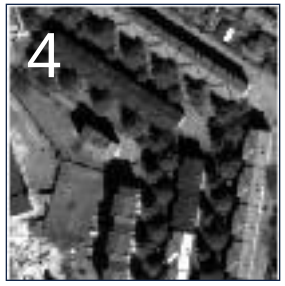
Segment the urban fabric according to morphology

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







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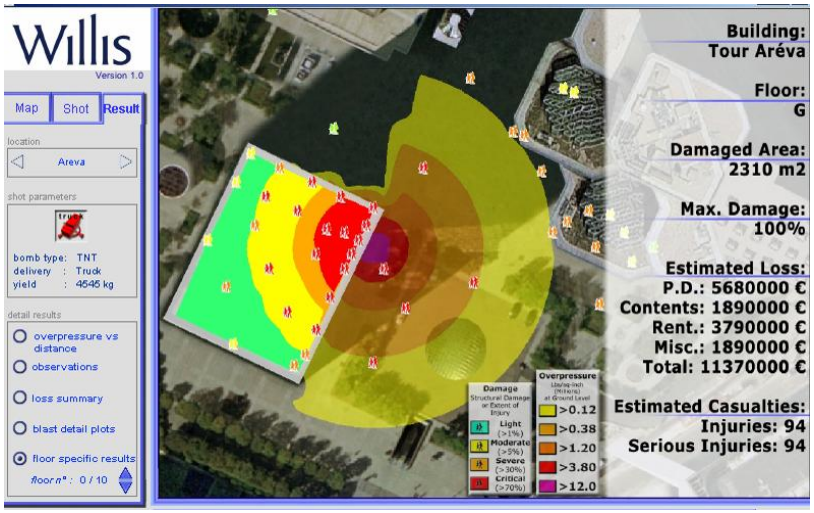
Conflagration

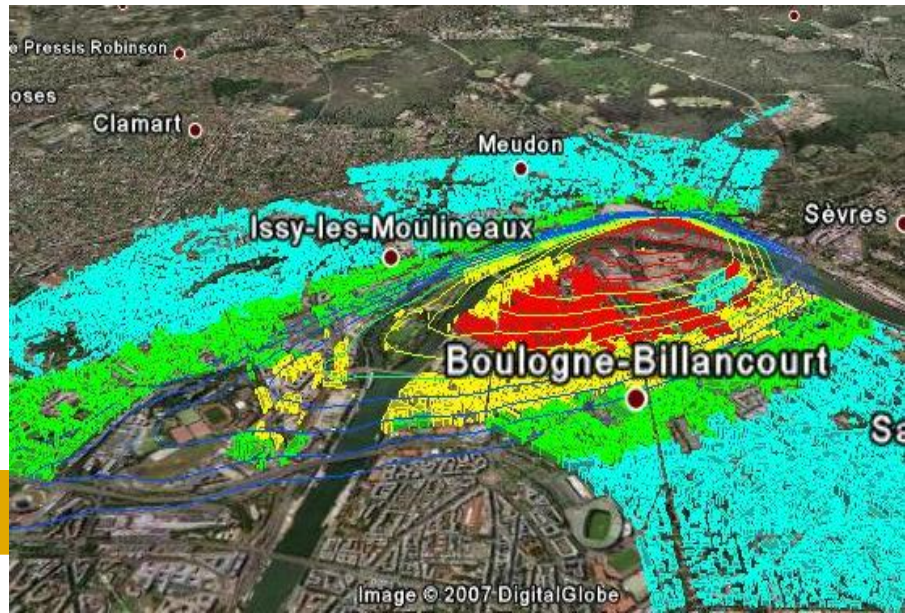
- Hazard modelling:
  - Thermal effects
  - Atmospheric parameters
  - Pollution



WRN and Ambiental high resolution terrorism model

ambiental
predicting · preventing · protecting

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



Geospatial

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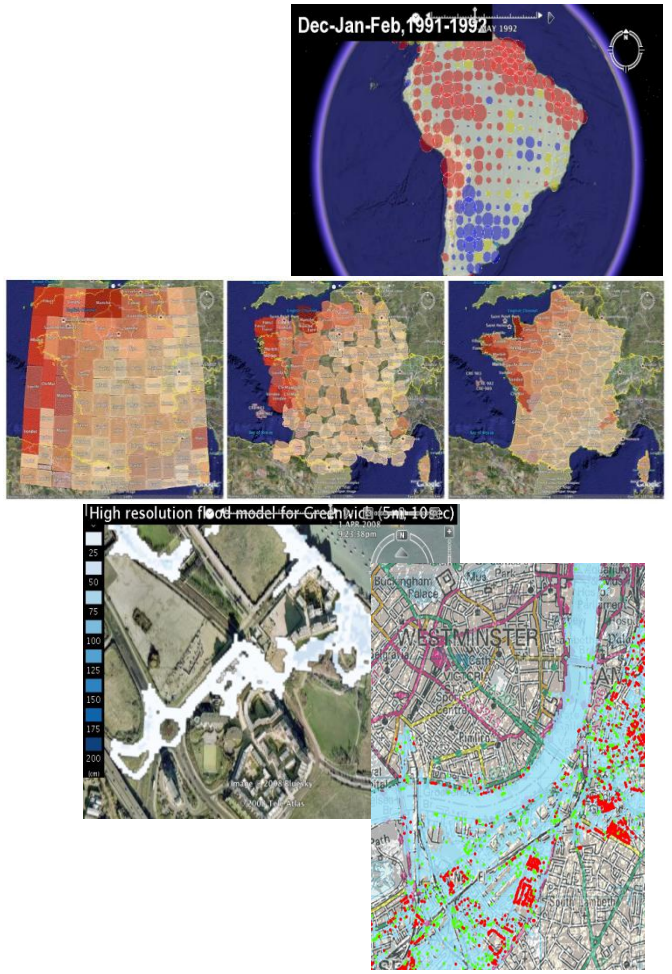
- New geospatial visualisation methods – e.g. Google Earth
- Techniques for complex multidimensional data visualisation and display – e.g. Willis Model Sensitivity Analysis (MSA)
- WRN will develop a new, strategic blueprint for remote sensing application across the insurance market
- Create a central 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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