

Sydney Coastal Council Group and Surveying and Spatial Sciences Institute

Sydney's Integrated Spatial Future
Customs House — The Barnet Long Room
Wednesday 9 December 2009

FLOODING, FLOOD MODELLING AND FLOOD MAPPING

COMMUNICATION CHALLENGES

Sue Ribbons
Project Leader, Floodplain Management,
Pittwater Council

 PITTWATER COUNCIL



1

Overview

- Flood risk in NSW
- NSW Floodplain Risk Management Process
- What's involved in flood modelling and mapping:
 - collection, manipulation and presentation of vast amounts of spatial data
 - essential role of GIS:



 PITTWATER COUNCIL



Mona Vale, 1989



Avalon Shopping Centre 1976

2


Flood Risk in NSW

- Most costly natural disaster in Australia:
 - \$200–\$250 million in flood damage on average every year in NSW
 - 100,000 buildings at risk from flooding in NSW
- Most manageable of all natural disasters
 - we can work out where
 - we just don't know when.



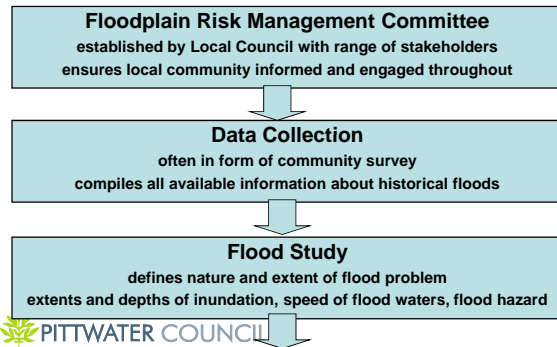
Maitland, 1955

\$700million in flood damage

 PITTWATER COUNCIL

3

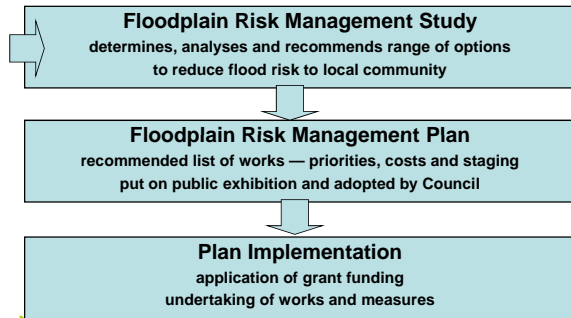
Floodplain Risk Management Process



 PITTWATER COUNCIL

4

Floodplain Risk Management Process



What's really involved in flood modelling and mapping

- Collection of vast amounts of spatial data
- Manipulation of vast amounts of data to create more technical data
- Presentation of vast amounts of technical data to wide range of audiences including local community.



Flooding in Western Sydney, late 1980s

The Essential Role of GIS

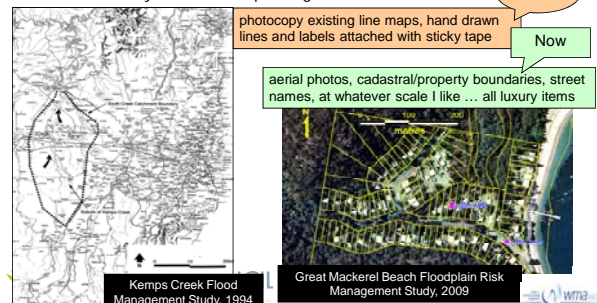
- essential role in all steps of Floodplain Risk Management process
- role is only going to increase
- many floodplain managers/engineers already GIS specialists:
 - two fields will become more intertwined in future.



Newcastle, 2007

Collection of Data — The Map

- first step — need map of catchment area and study area:
 - currently take GIS maps for granted:



Collection of Data — Community Information

- next step: often formation of committee and community survey:

- need address list of all properties in study area:

Then
Now
digital list manually extracted from Council data base

Imagin
if I could draw line around map of study area and have address list automatically generated for project

Imagin
if I could have questionnaire responses spatially linked to study area map:

- > digitally locating flood problems on a map instead of plotting by hand

Collection of Data — Spatial Data for Flood Studies

- topographical information and ground survey:



Kempa Creek Flood Management Study, 1994

- ground survey was luxury item
- only survey was creek cross-sections at say 50m–100m spacings
- no survey of floodplains or rest of catchment



Now
currently take LiDar, ALS and Photogrammetry of floodplain and all of catchment all taken for granted



Great Mackerel Beach Floodplain Risk Management Study, 2009

Collection of Data — Spatial Data for Flood Studies

- land use information:

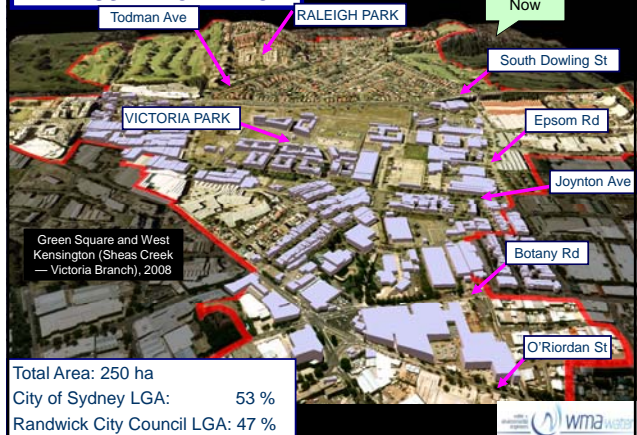
- location of buildings
- vegetation cover
- impervious and pervious surfaces
- location of stormwater drainage system.

Then
walking streets with camera and notebook
Now
walking streets lifting stormwater lids and climbing down pits

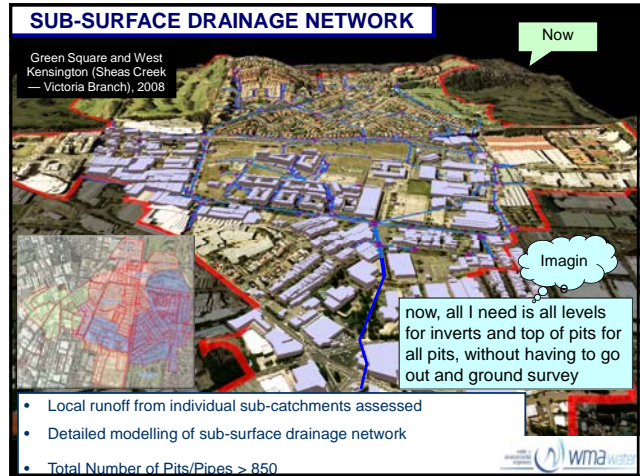
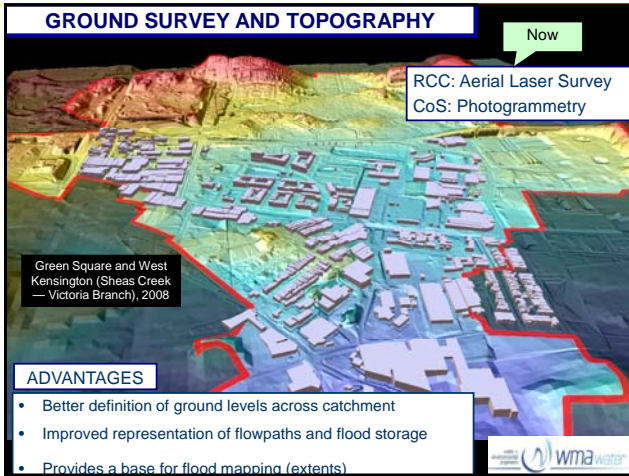


Wollongong, 1998

LAND USE INFORMATION



Total Area: 250 ha
City of Sydney LGA: 53 %
Randwick City Council LGA: 47 %



Presentation of Results

- technical report:
 - results presented as 2D maps
- community workshops:
 - through Floodplain Management Committee
- need to be able to show:
 - where water goes
 - how deep water gets
 - how fast water goes
 - which properties most at risk.

Toongabbie and Main Western Rail line, late 1980s

PITTWATER COUNCIL

15

Presentation of Results

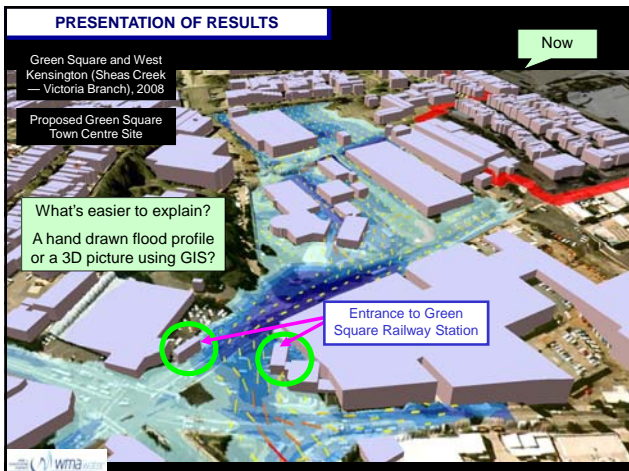
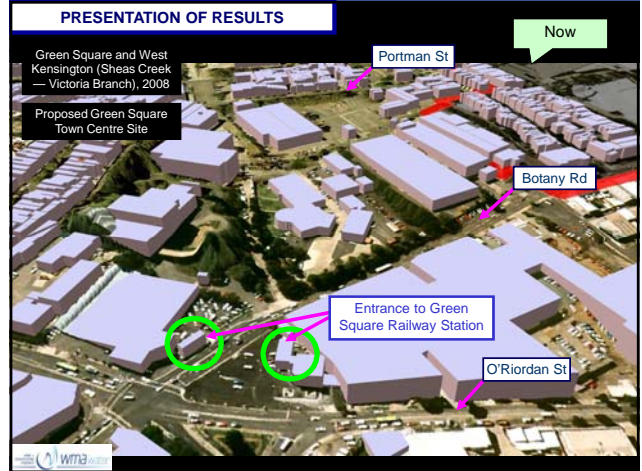
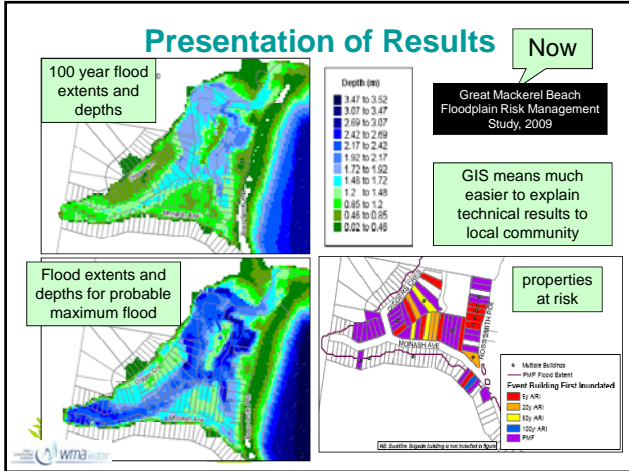
The

Kemps Creek Flood Management Study, 1994

- hand drawn maps, hand drawn flood extents, hand drawn flood profiles
- very difficult to explain technical outcomes to local community

PITTWATER COUNCIL

16



The Future of Flood Modelling and Mapping

Imagine ... when Flood Studies and Floodplain Risk Management Studies are not just 2D paper reports that sit on shelf ...

Imagine ... when essential output is GIS-based story of flood behaviour and solutions ...

Imagine ... when all information from project is compiled digitally ... in consistent format across NSW

Imagine ... what if I could have animated flood video for all my community meetings ...

Imagine ... what if I could click on watercourse to see animated flood waves for different sized floods flowing down the stream.

PITTWATER COUNCIL

20

The Future of Flood Modelling and Mapping

Imagine

... click on house to see photo, construction methods, flood levels, floor levels, flood depths and any flood history

Imagine

... click on any location to see flows, flood depths, flood levels, flow velocity, flood hazard, whether in floodway, any flood mitigation works proposed ...



House washed off foundations at Great Mackerel Beach 1989

Imagine

... there's probably so much more ...

The Future of Flood Modelling and Mapping

- to GIS specialists here today:
 - "Oh that's easy ... we can do that already!":
 - then we do have some communication challenges
 - we really need to start talking ... there's catching up to do
 - "Wow ... you've really laid down challenge ... how are we going to that?":
 - that's great ... we are working together towards common goal
- Regardless ...
 - future is bright
 - real opportunity to work together now and into future.



Thank you

