

Review of Collins Creek Flood Study

Committee Presentation
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Introduction to CSS

- Catchment Simulation Solutions (CSS) established in 2005
- Six staff
- Specialising in hydrologic and hydraulic modelling / flooding investigations as well as engineering software development
- CSS has completed >30 Government funded flood and floodplain risk management studies over the last 8 years for 12 different local Councils

Introduction to CSS

- My background/qualifications:
 - Bachelor of Engineering (Civil) from the University of Wollongong with first class honours and the University Medal
 - 16 years for flood related experience
 - Director with CSS
 - Part of the consultants working group for the Floodplain Development Manual update


Study Area



Major Goals of the Study

- Review the 2011 flood study (and models)
- Quantify the impact that Council's revised blockage policy is predicted to have on flood behaviour
- Quantify the impact that development across each catchment is predicted to have on flood behaviour
- Quantify the impact that the 2016 version of Australian Rainfall & Runoff is predicted to have on flood behaviour

Study Stages

- **Stage 1** – Data Collection and Review of Existing Models
- **Stage 2** – Modelling and Mapping  **We're here**
- **Stage 3** – Review of Flood Study Report



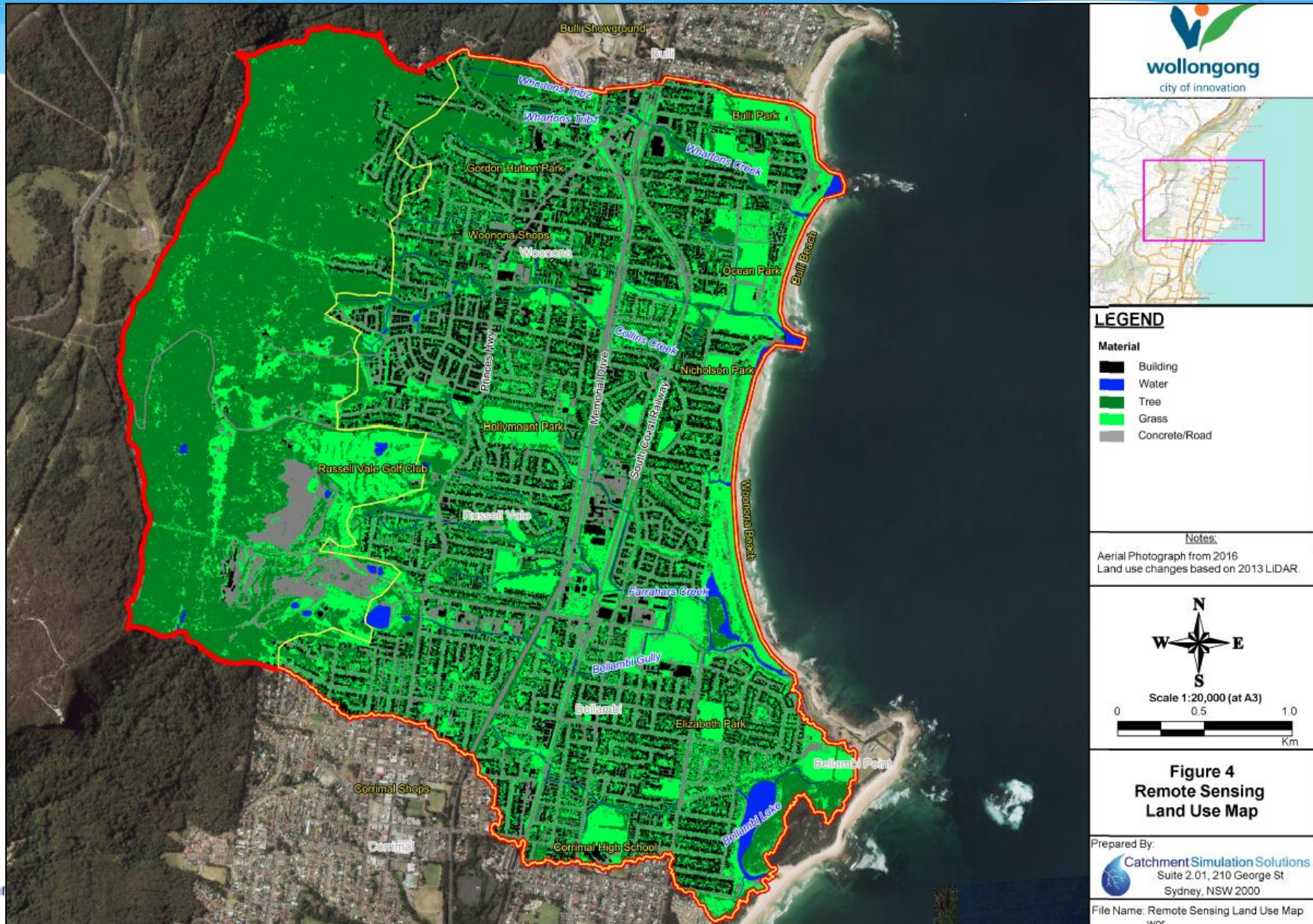
Stage 1
Data Collection and
Review of Existing Models



Review of Existing Models

- Flood study and associated models were developed in accordance with best practice at the time
- Existing hydrologic model was reviewed and it was determined to be more efficient to develop a new hydrologic model “from scratch”
- This new model was expanded to include two areas that were excluded from the original study

Remote Sensing Land Use



Subcatchment Breakup

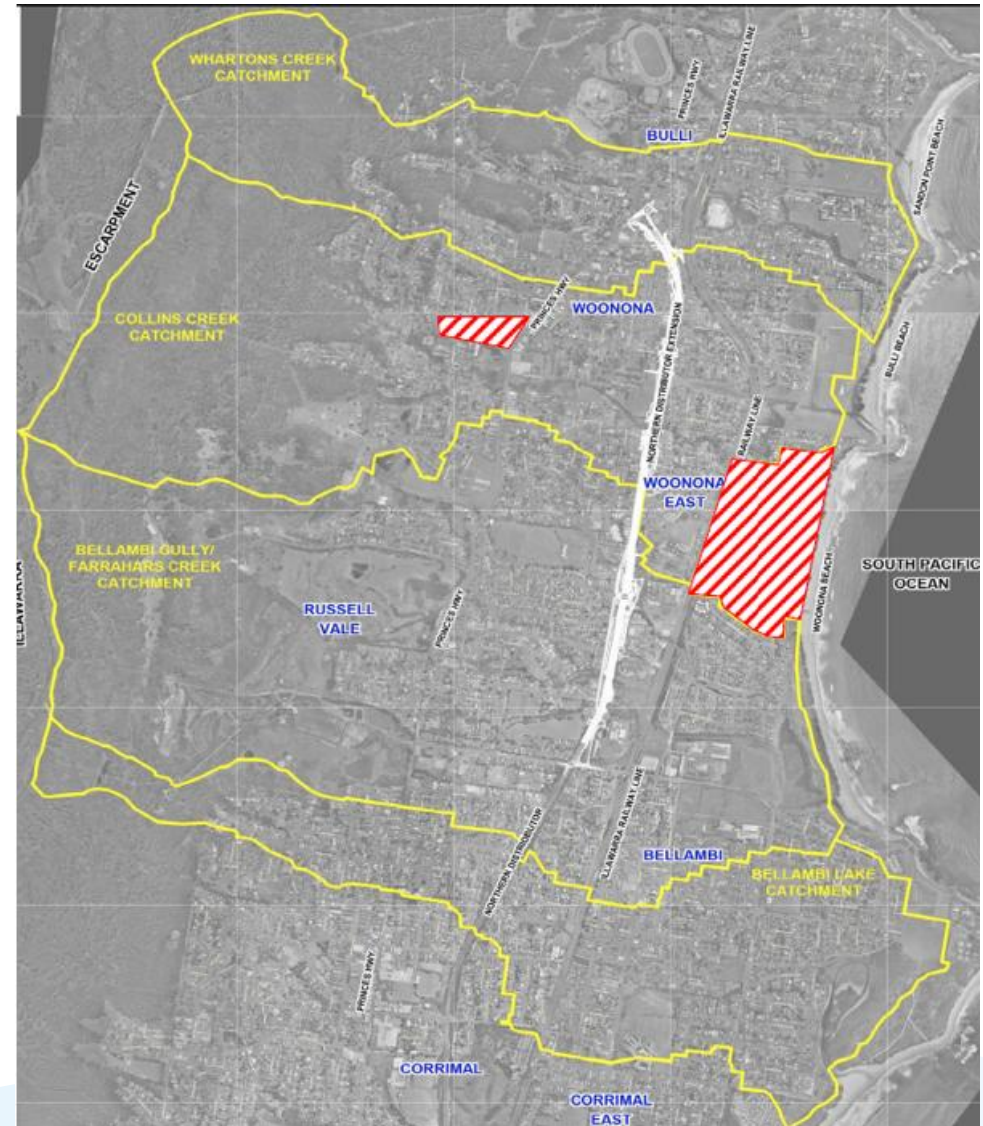


Review of Existing Models

- Suggested hydraulic model updates:
 - Smaller grid size (4m down to 2m)
 - Revised channel representation
 - Revised Manning's "n" roughness
 - Full stormwater system
 - Extend model to include two areas that were excluded from the original study

Additional Data Collection

- Additional survey collected:
 - 18 creek cross-sections
 - 2 bridges
 - 1 culvert



Community Consultation

- Consultation with the community completed using the following:
 - Media release
 - Website
 - Newsletter and questionnaire
- Questionnaire
 - Sent to over 6,000 properties
 - Received 503 responses
- Key findings from responses:
 - 177 respondents reported being impacted by flooding (including 25 reporting above floor inundation)
 - Most respondents provided information on the 1998 flood. But information on more contemporary floods was provided

Community Consultation





Stage 2

Modelling and Mapping



Modelling Scenarios

- The following scenarios will be simulated:

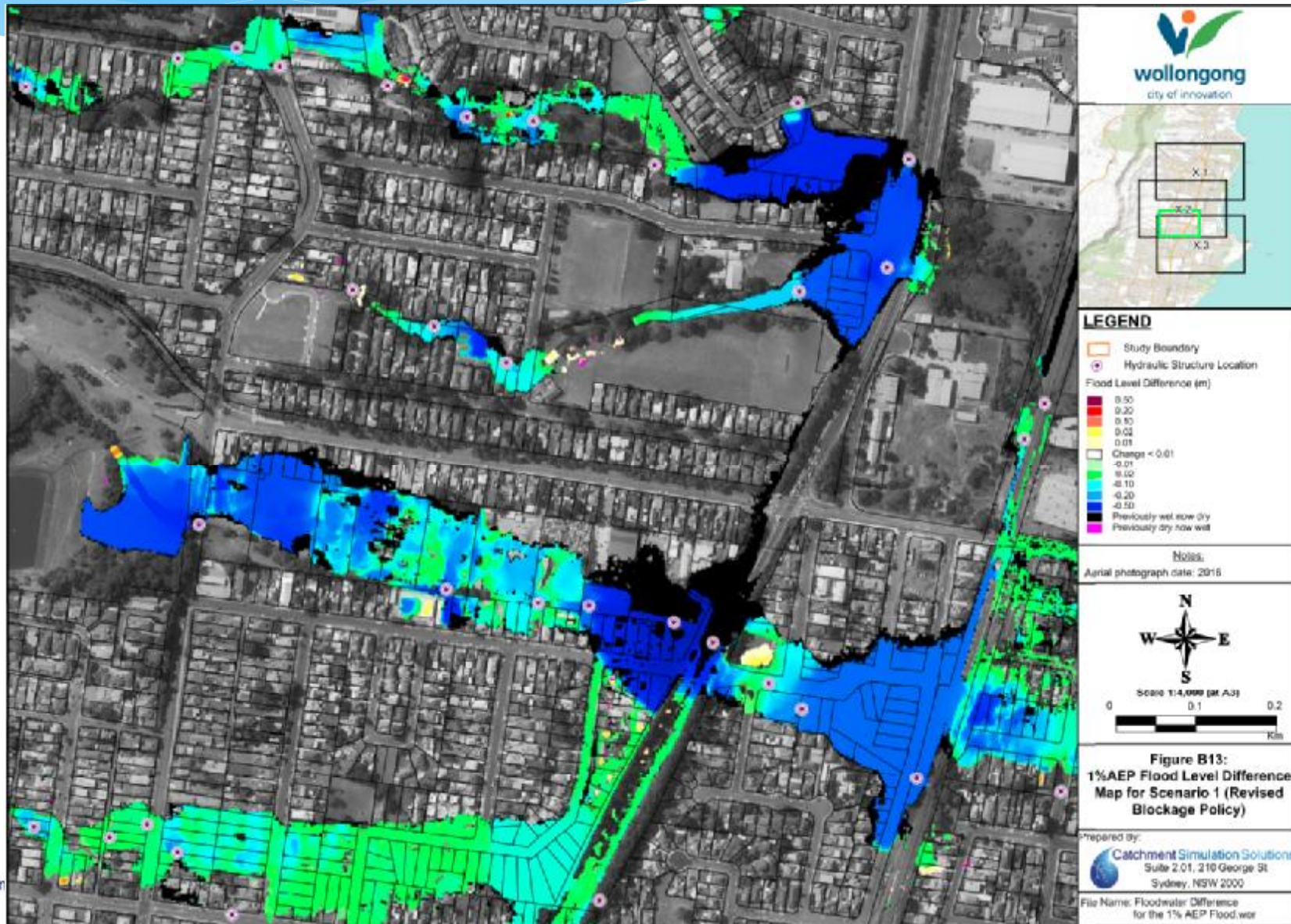
Base: 2011 catchment conditions with “old” blockage policy and ARR1987 hydrology

Scenario 1: 2011 catchment conditions with “revised” blockage policy and ARR1987 hydrology

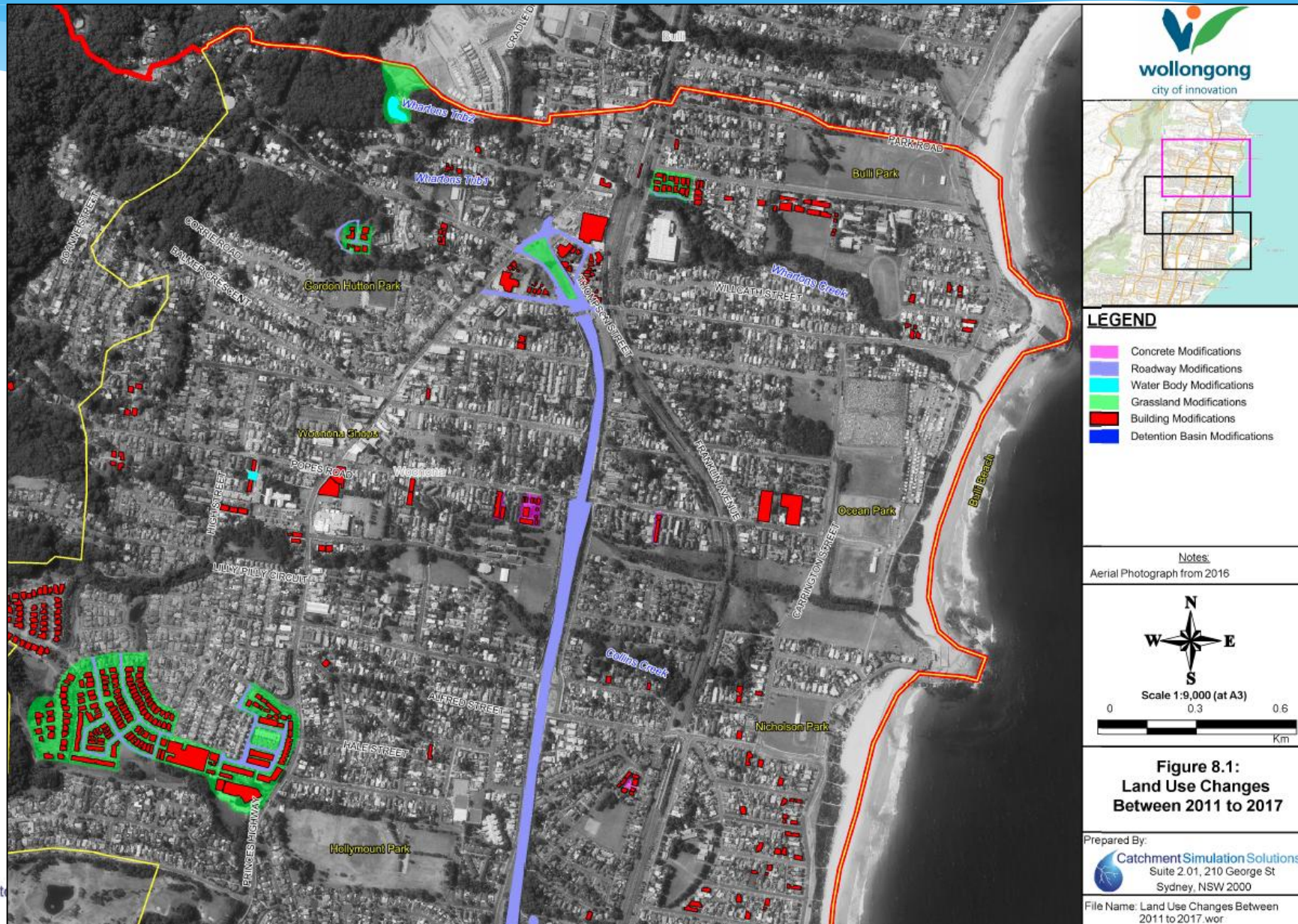
Scenario 2: 2017 catchment conditions with “revised” blockage policy and ARR1987 hydrology

Scenario 3: 2017 catchment conditions with “revised” blockage policy and ARR2016 hydrology

Example of 1% AEP difference map (Scenario 1 – Revised Blockage Policy Impacts)



Changes to reflect catchment modifications



Findings So Far...

- Scenario 1: Revised blockage policy is generally producing lower peak flood levels and flood extents (most notably upstream of structures)
- Scenario 2: Catchment development between 2011 and 2017 is predicted to generate very small increases in peak discharges (<1% on average)

Next Steps in Stage 2

- Scenario 2:
 - > Complete hydraulic modelling
 - > Prepare mapping
- Scenario 3:
 - > Finalise ARR2016 inputs / methodology
 - > Complete hydrologic modelling
 - > Complete hydraulic modelling
 - > Prepare mapping
- Stage 3: Preparation of a draft report

Questions

- Questions, comments or suggestions?