12.1 MINUTES - BRUNGLE FLOODPLAIN RISK MANAGEMENT COMMITTEE - 8 APRIL 2025 - ATTACHMENTS

Attachment Titles:

1. Minutes - Brungle Floodplain Risk Management Committee - 8 April 2025 & Presentation provided by WMA Water - Brungle Flood Study
2. DRAFT Brungle Flood Risk Management Committee Terms of Reference - SVC-TofR-044-01

Attachment 1 - 20250408 - Minutes - Brungle Floodplain Risk Management Committee

Snowy Valleys Council

Notice of Meeting

BRUNGLE FLOODPLAIN RISK MANAGEMENT COMMITTEE

Tuesday, 08 April 2025 at 3:00 PM
Gundagai Room / Via Video Link

MINUTES

1. COMMENCING AT:

The Brungle Flood Risk Management Committee commenced at 3.04pm.

2. PRESENT:

Cr Trina Thomson - Chairperson and Councillor Delegate

Mayor Julia Ham

Erin Askew - Director/Consultant - WMA Water

Kajah Melhan - Engineer - WMA Water

Steve Manwaring - Senior Natural Resource Officer (Floodplain Management) - Department of Climate Change, Energy, the Environment and Water

Jon Gregory - District Manager Rural Fire Service - Community Representation

Ben Lavender - Superintendent/Deputy Zone Commander - NSW SES - Southern Zone

Nicholas Wilton - Acting Director Community, Corporate & Development (SVC) - Project Sponsor

Mark Kirton - Co-ordinator Growth and Development (SVC) - Project Manager

Amruta Oak - Graduate Assessment Planner (SVC)

Andrew Vaz - Co-ordinator Road Survey and Design (SVC)

Sam Machell - Project Officer (SVC) - Minute Taker

3. ACKNOWLEDGEMENT TO COUNTRY

An acknowledgement of the traditional custodians of the land was delivered by Cr Trina Thomson.

4. APOLOGIES:

Leanne Gregory - Unit Commander Tumut - NSW SES - Southern Zone

Joshua Stanbury - Inspector/Coordinator - NSW SES - Southern Zone

5. DECLARATION OF PECUNIARY INTEREST:

Nil

6. MINUTES OF PREVIOUS MINUTES:

This was the first Brungle Flood Risk Management meeting.

7. BUSINESS ARISING:

Nil

8. AGENDA ITEMS:

8.1. BRUNGLE FLOODPLAIN RISK MANAGEMENT COMMITTEE - MATTERS - APRIL 2025

BFRMC01/25 RESOLVED:

THAT THE COMMITTEE:

1. Received the report on Brungle Floodplain Risk Management Committee matters on 8 April 2025;
2. Endorsed the Brungle Flood Risk Management Committee Terms of Reference; and
3. Approved the Committee name change to the Brungle Flood Risk Management Committee to be consistent with the Flood Risk Management Manual (2023).

Moved: Jon Gregory / Seconded: Cr Trina Thomson

RECOMMENDATION TO COUNCIL:

1. Adopt the Brungle Flood Risk Management Committee Terms of Reference.

CARRIED UNAMINOUSLY

RECOMMENDATION TO COUNCIL:

1. Change the name of Committee to the Brungle Flood Risk Management Committee, to be consistent with the Flood Risk Management Manual (2023)

CARRIED UNAMINOUSLY

9. GENERAL BUSINESS:

The following WMA Water presentation was presented at the meeting.

WMA are waiting on survey results from Rivland Surveyors who will be commencing this work in the coming week.

10. NEXT MEETING:

There being no further business to discuss, the meeting was closed at 4.10pm.

The next meeting will be held to synchronize with WMA timelines, data and findings.

BRUNGLE FLOOD STUDY

Floodplain Management Committee Meeting #1

8th April 2025

www.wmawater.com.au

Meeting Overview

- Introductions – Who is the Project Team?
- Why this study, why now?
- Flood risk in Brungle
- Objectives
- Study Approach
- Calibration

Flooding in Brungle

Source : *SES NSW*

www.wmawater.com.au

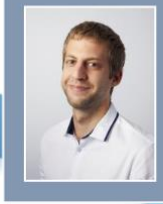
WMAwater Project Team

Richard Dewar
Technical Director
Peer Review

Erin Askew
Technical Director
Project Director/Manager

Michael Reeves
Principal
Technical Project Manager

Snowy Valleys Council



Fabien Joly
Senior Engineer

Kajal Malhan
Project Engineer

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- WMAwater has been in operation since 1983 and has undertaken studies for a number of Councils across the state
- Project Team
  - Rural and Big River Experience
  - Floodplain Risk Management Experience
  - Specialist Hydraulic Modelling Experience
  - Specialist Consultation Experience

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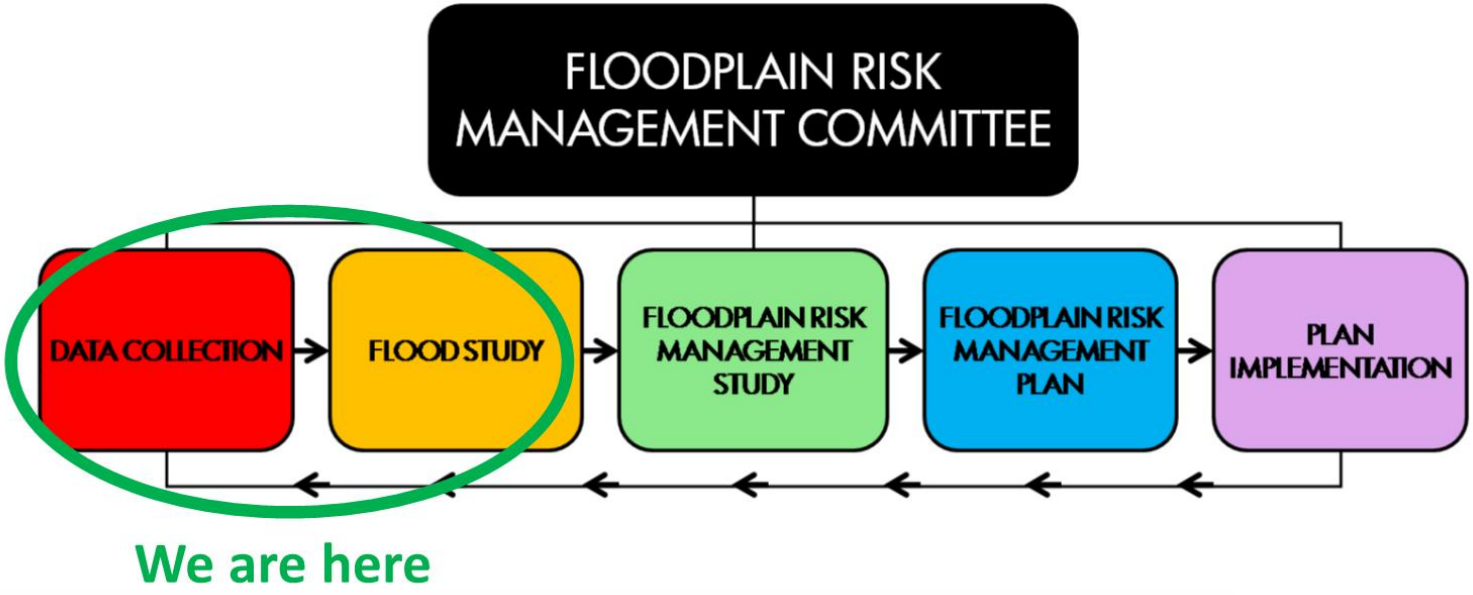
Floodplain Risk Management Process



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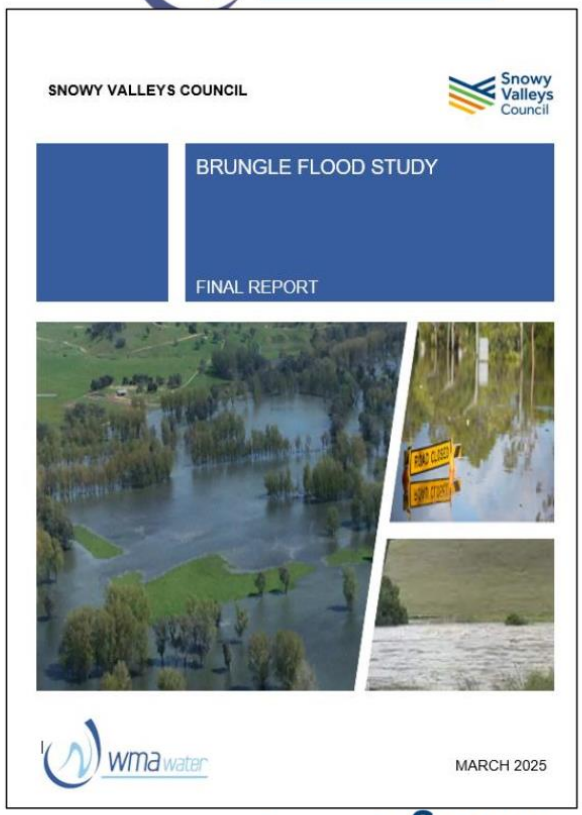
Why Now ?

- Need for a Flood Study to provide an understanding of the full range of flood behaviour and consequences in the study area.
- Recent Flood events.



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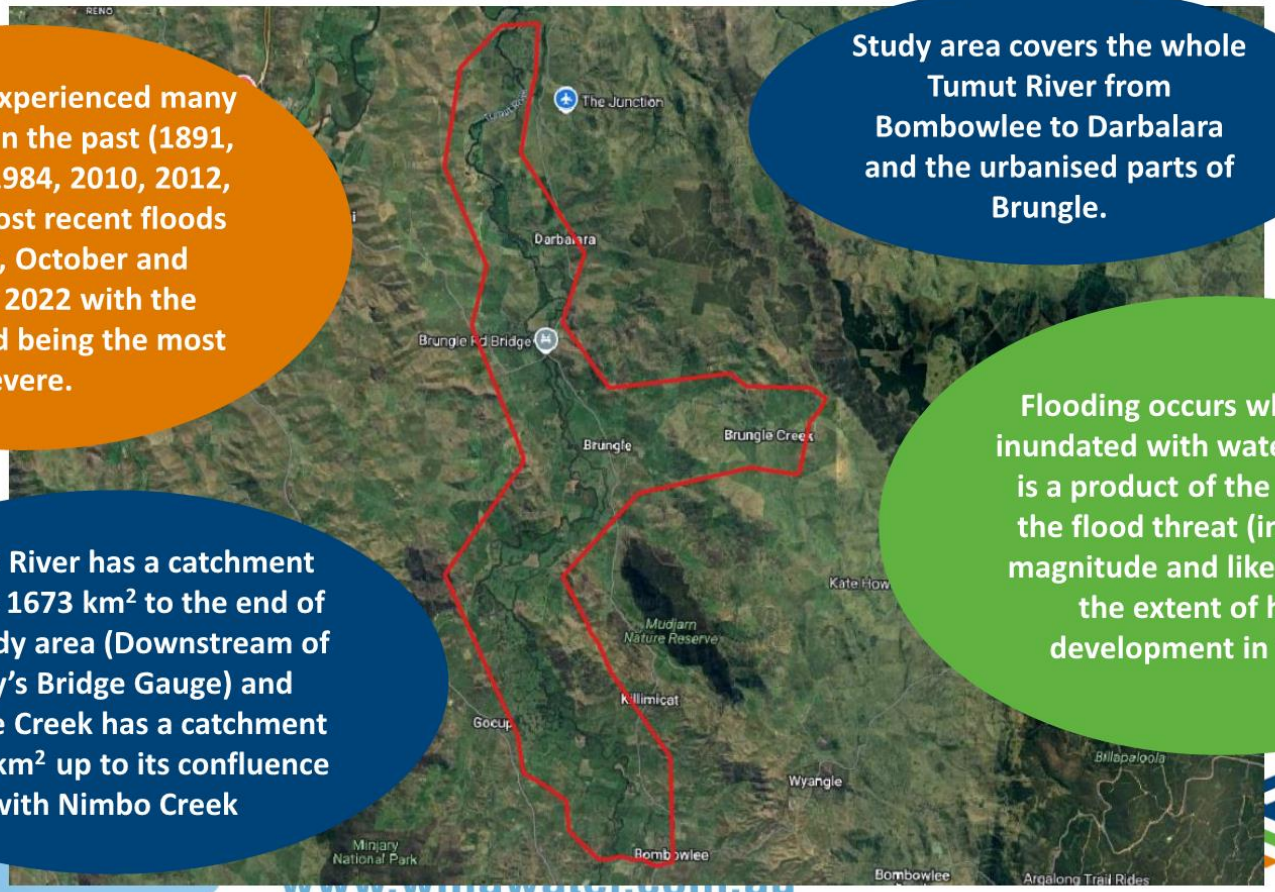
Study Area



Brungle has experienced many flood events in the past (1891, 1903, 1970, 1984, 2010, 2012, 2021 with most recent floods in January, October and November 2022 with the January flood being the most severe.

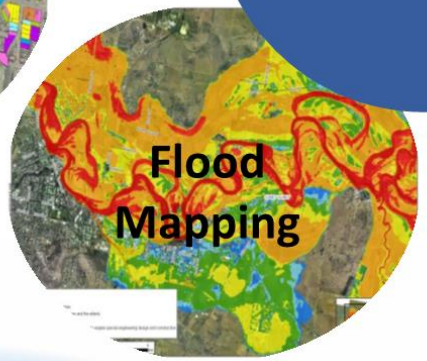
Study area covers the whole Tumut River from Bombowlee to Darbalara and the urbanised parts of Brungle.

Flooding occurs when land is inundated with water. Flood risk is a product of the severity of the flood threat (including its magnitude and likelihood) and the extent of human development in the area

Tumut River has a catchment area of 1673 km^2 to the end of the study area (Downstream of Oddy's Bridge Gauge) and Brungle Creek has a catchment of 137 km^2 up to its confluence with Nimbo Creek

Flood Risk in Brungle

Risk is probability of damage or harm



Historic Flood Marks & Extents

Identified by Council, SES

Community Experiences & Photos

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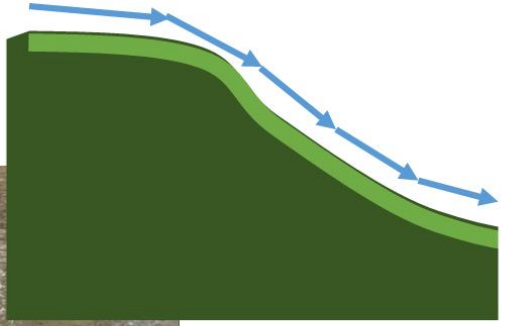
Flood Risk in Brungle

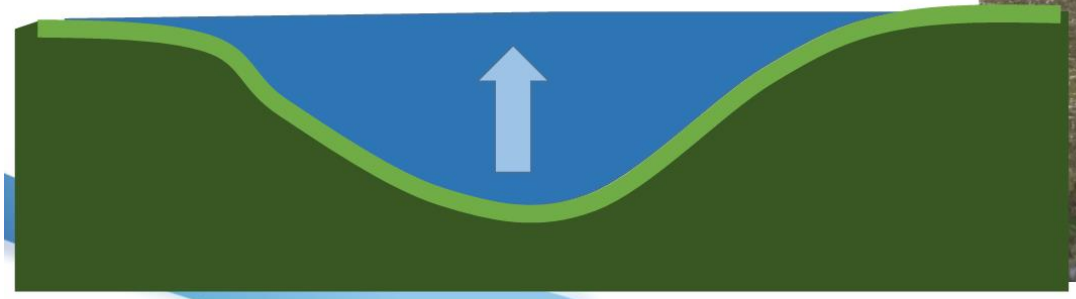
Mainstream Flooding:

- Tumut River
- Nimbo Creek
- Brungle Creek
- Blind Creek

Overland Flow:

- Catchment runoff





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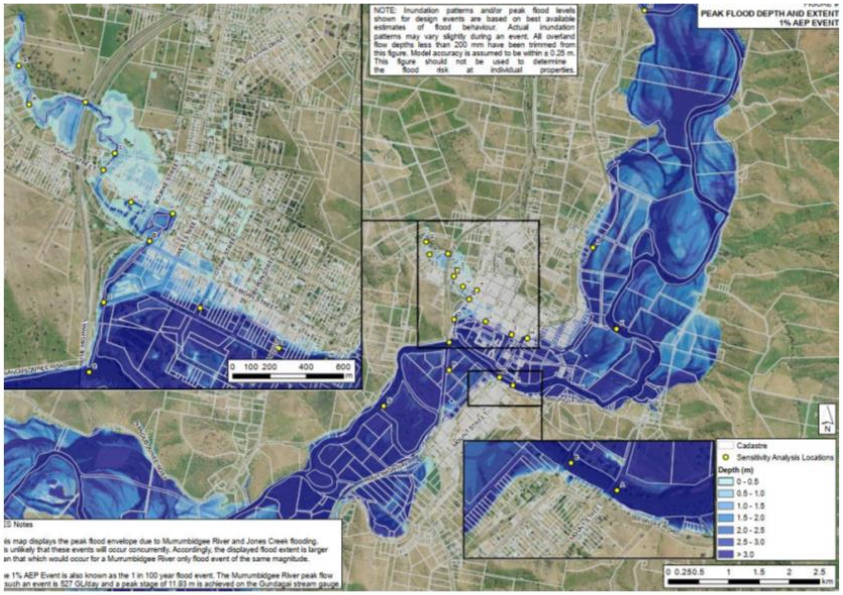
Objectives of the Study



Define Design Flood Behaviour within the Study Area

Basis for Floodplain Risk Management Study + Plan

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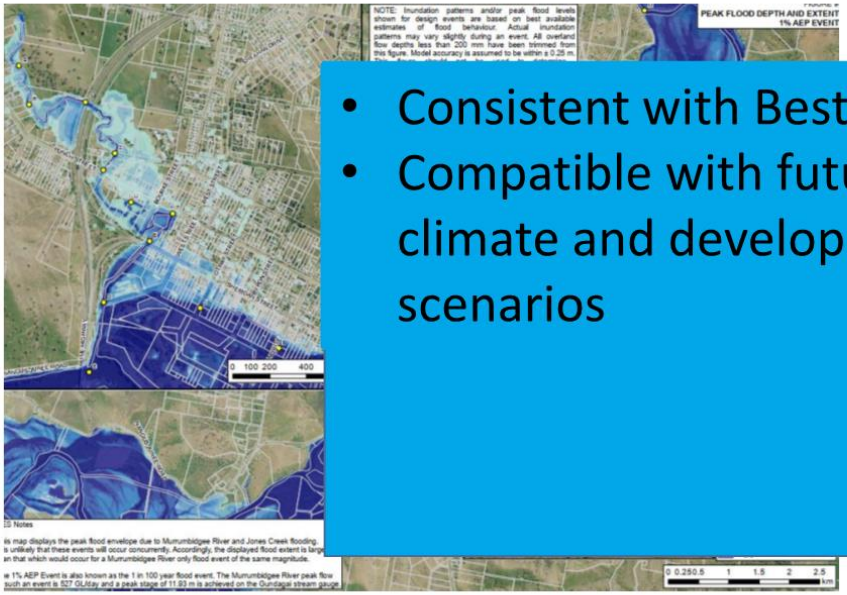
Objectives of the Study



- Consistent with Best Practice
- Compatible with future climate and development scenarios

Define Design Flood Behaviour in the Study Area

Basis for Floodplain Risk Management Study + Plan

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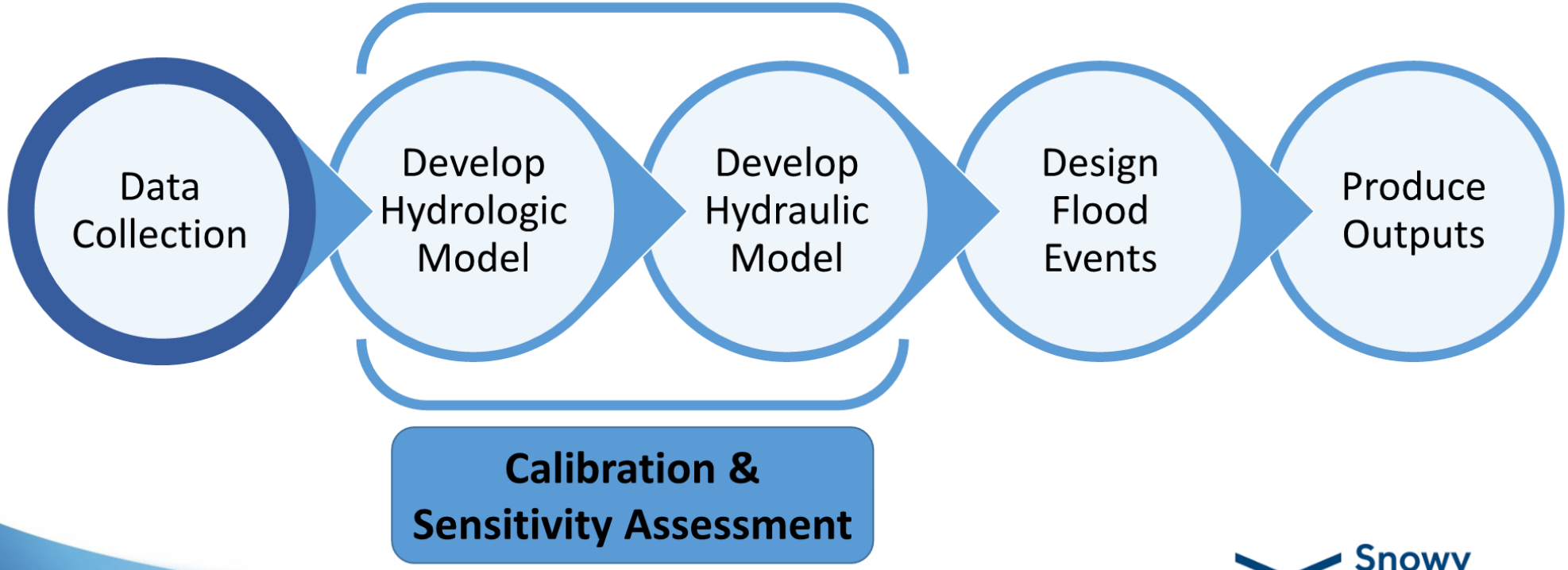
Study Approach



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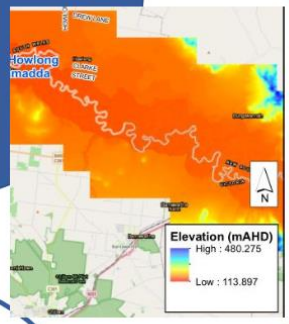
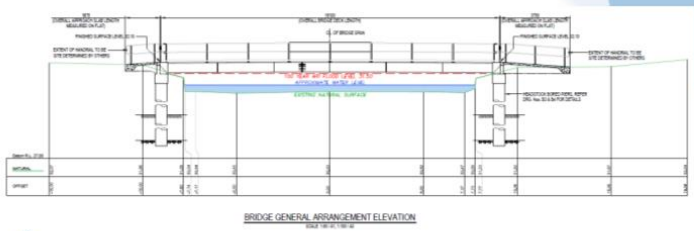
Data Collection

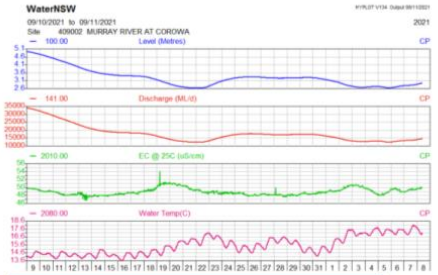
Topographic Data



Detailed Survey/ Drawings



Land Use Zones



Gauge Data Stream Rainfall

Historic Flood Marks & Extents

Previous Reports

Community Experiences & Photos

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Community Consultation

- A vital component of the floodplain management process
- Aim to:
  - Inform the community
  - Gather local knowledge about flooding
  - Identify community concerns
- Tools:
  - Media release
  - Questionnaire
  - Information sessions (2)
  - Public Exhibition presentation
  - FRMC meetings

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Data Collection

Community Consultation

The consultation period ran from 26th August – 30th September 2024.

- Newsletter and Questionnaire available online and hardcopies at Council offices. 5 responses were received.
- Drop- session was conducted on the 4th September 2024 at Brungle Memorial Hall. The session was well attended. The community is relatively flood aware.

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Community Consultation Outcomes

The following concerns we raised by the community:

- Frequent Road Inundation;
- Capacity of Stormwater Network;
- In-bank vegetation and debris deposits;
- Information on past flood events;
- Ideas for mitigation of flood risk.

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Data Collection

Hydraulic Structures

Buildings
(Validated against the Aerial Imagery)

Bridges
(Survey Brief included 5 structures, 4 on Brungle Creek and 1 on Tumut River)

**Some small bridges on Nimbo Creek were provided by DECCEW (RRC)*

Culverts
12 Structures, measured by WMAwater on a field trip

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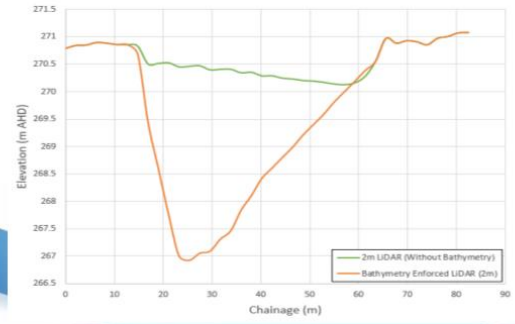
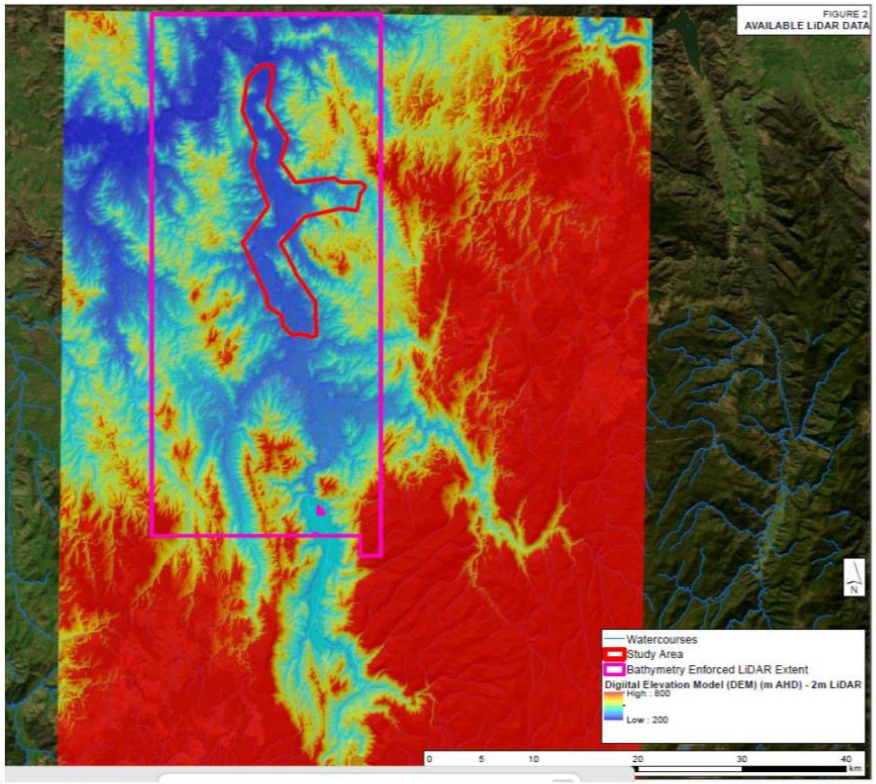
Data Collection

Topography





7 cross-sections requested to be surveyed on Brungle Creek

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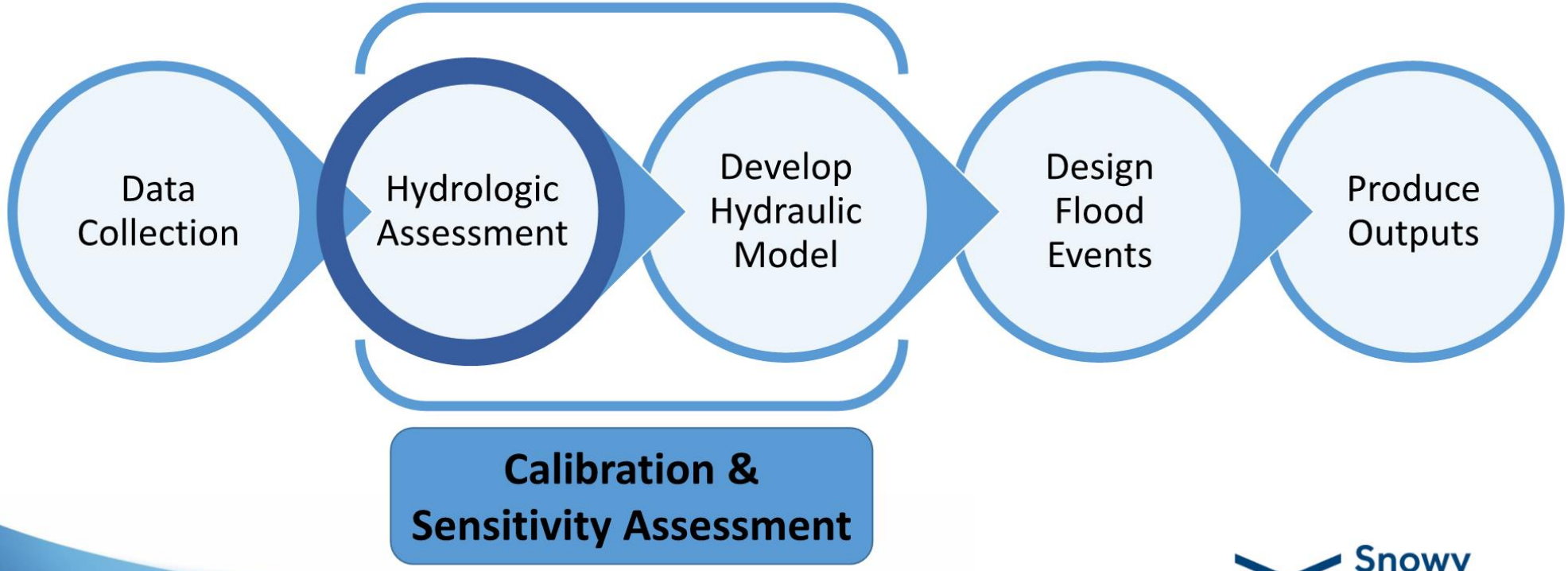
Study Approach



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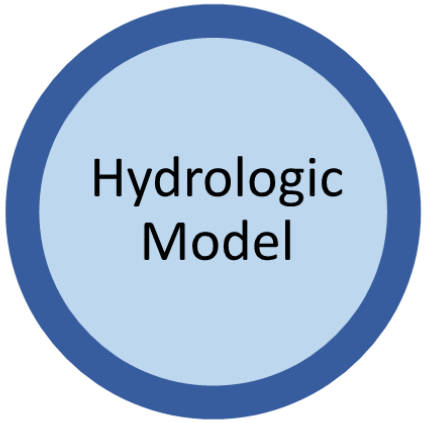

- **Hydrologic models 'turn rainfall into runoff'**
- Primary Purpose: generate inflow hydrogaphs for the hydraulic model
  - Upstream boundary inflows
  - Inflows on a subcatchment level within the hydraulic model boundary
- Recommend 'WBNM'
  - Suited to implementation of ARR 2019
  - Commonly used in the industry
  - WMAwater has many in house tools that improve efficiency of set up and output usage

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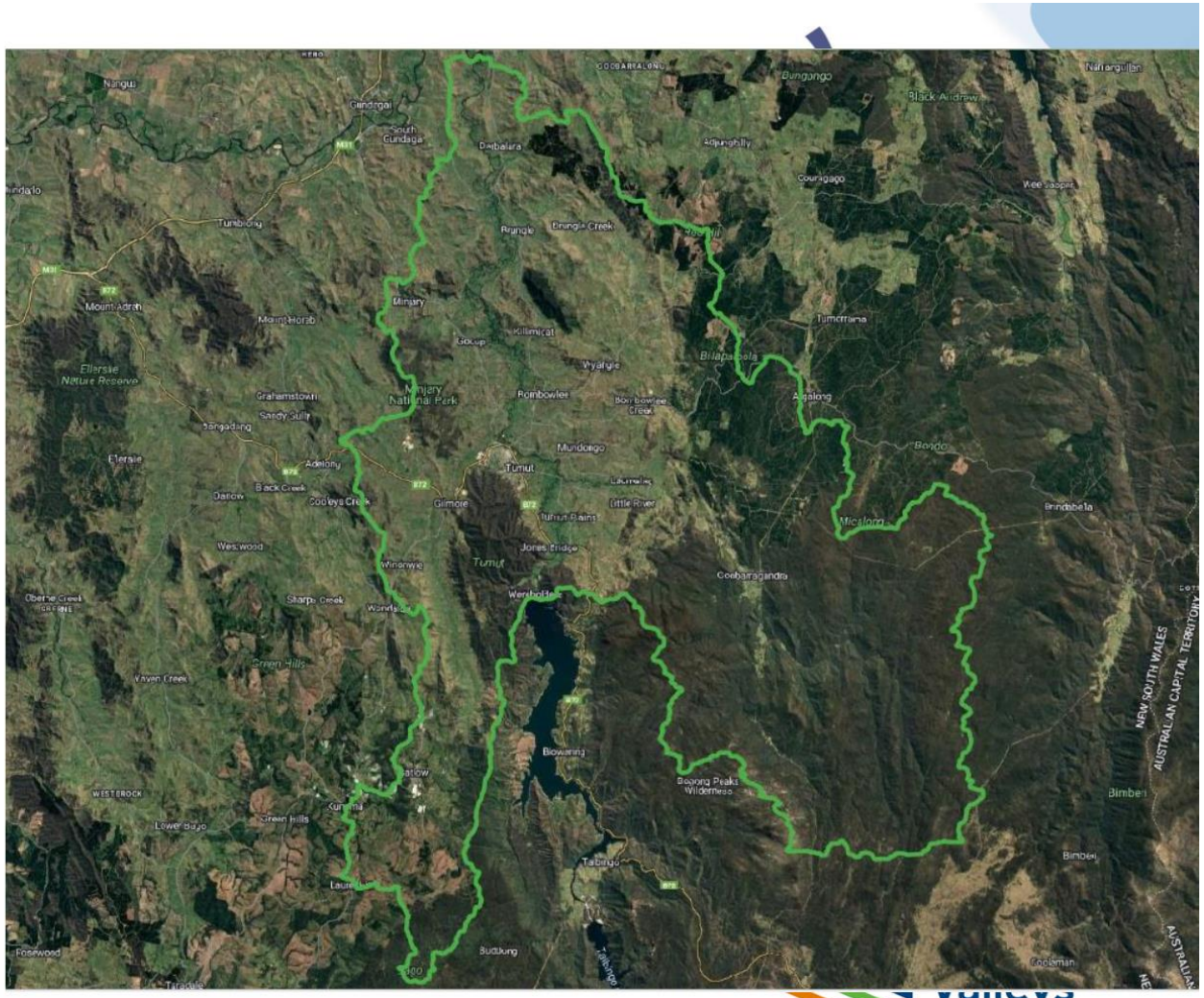
Hydrological Model Build

Catchment Boundary

Approx 1673 km²

(Downstream of Blowering Dam)

Catchment Upstream of Blowering Dam is approximately 1630 km²



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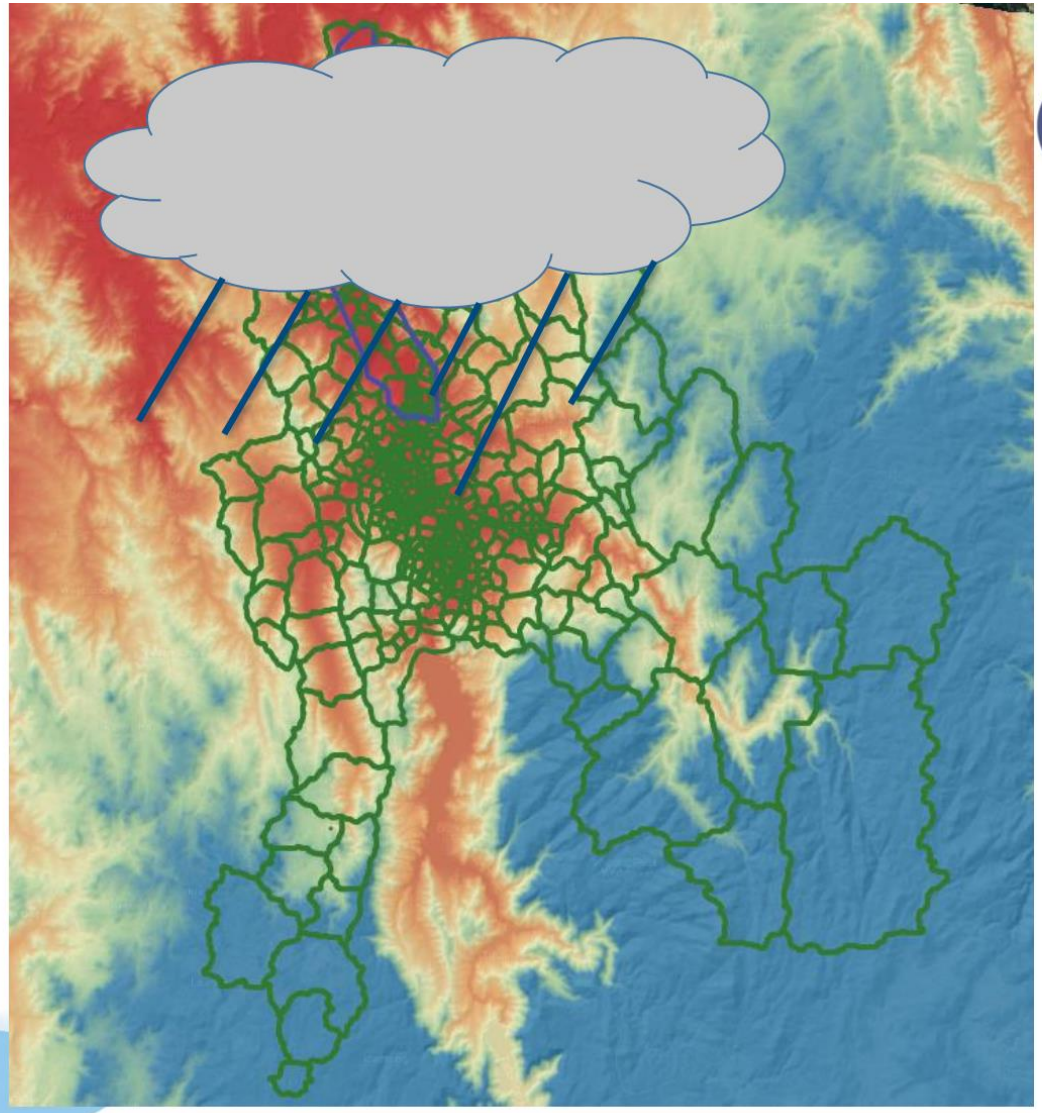
Hydrological Model Build



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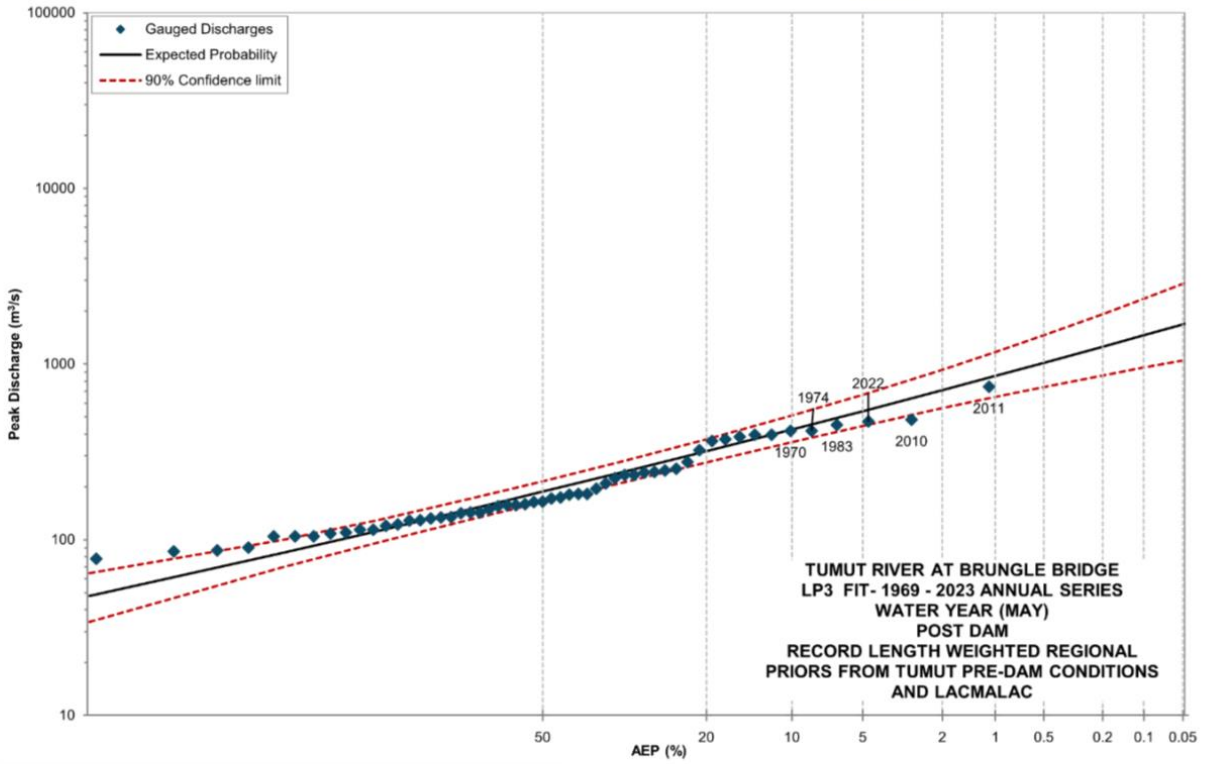
Flood Frequency Analysis

Statistical analysis of river gauge records – flow and volume

Used to validate hydrologic model



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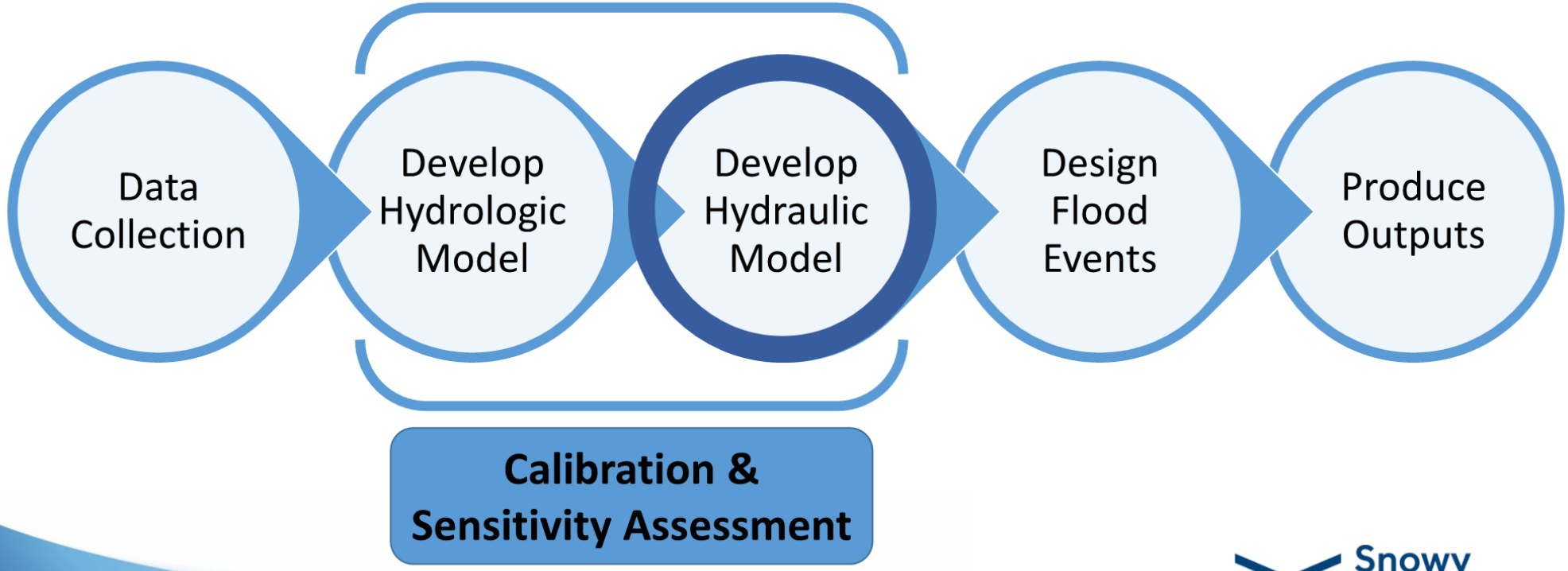
Study Approach



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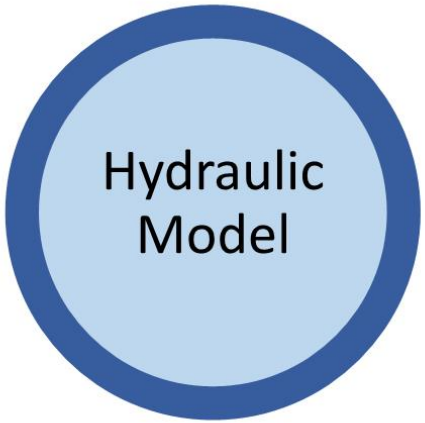

- **Hydraulic models broadly 'turn runoff into flood levels'**
- Recommend 1D/2D TUFLOW hydraulic model
  - Industry standard software
  - Represents hydraulic structures (e.g. culverts, bridges)

  (particularly important in overland flow areas)
  - Readily apply modifications to test mitigation options (in subsequent FRMS)

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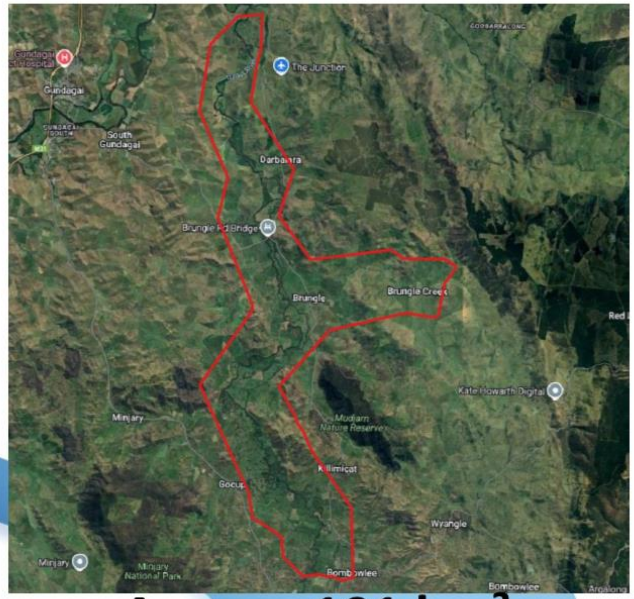
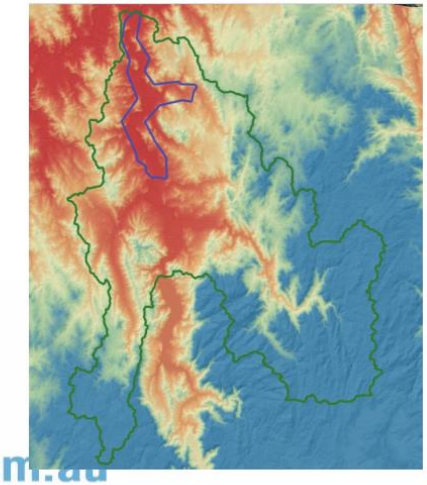
Hydraulic Model Build

- Define hydraulic model extent
- Select model grid size
  - Balance level of detail with model run times
- Apply terrain
- Apply upstream boundary flows from FFA and local catchment flows within the model boundary



Approx 101 km²



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Hydraulic Model Build

- Define hydraulic roughness (Manning's 'n') across study area
- Digitise building footprints
- Insert hydraulic structures

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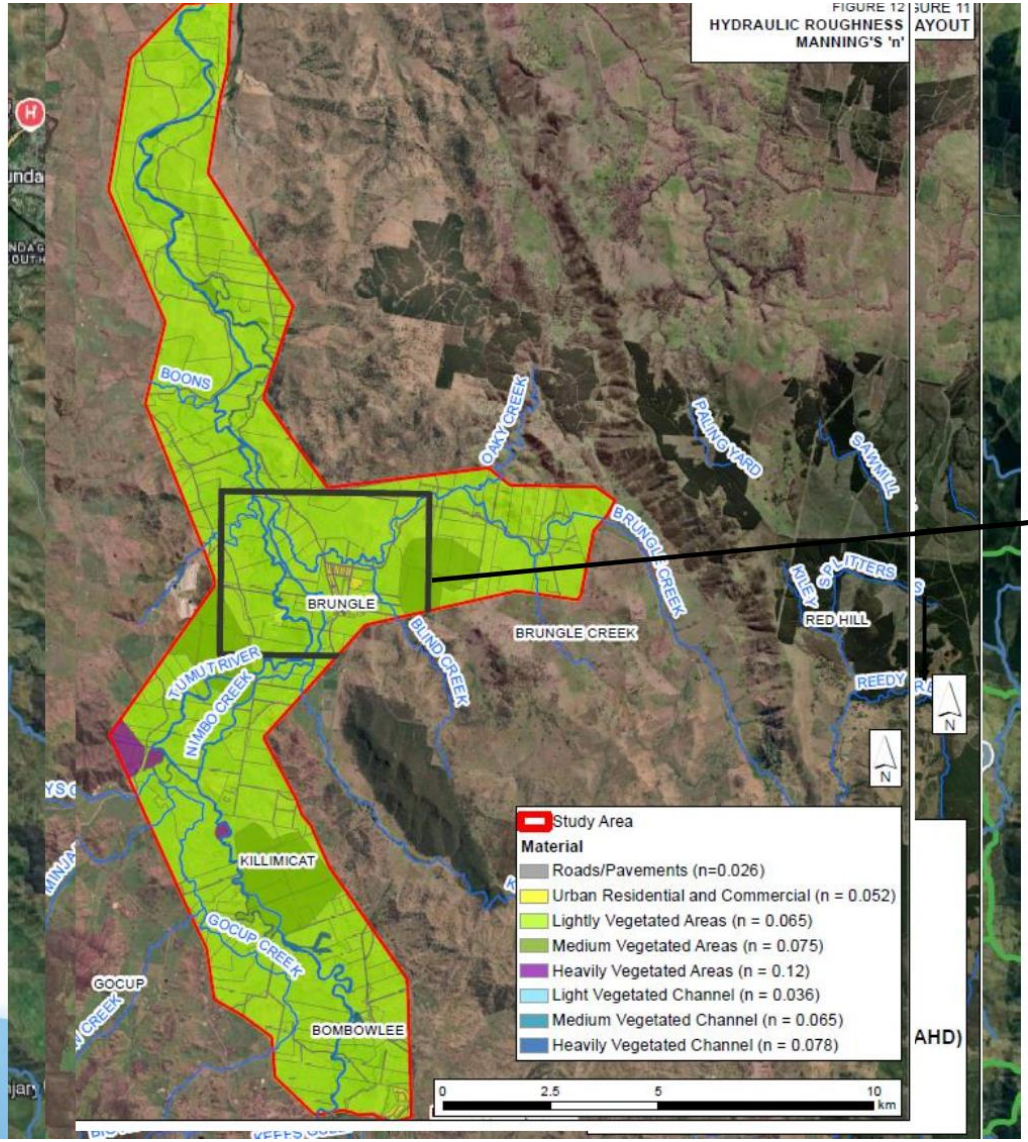
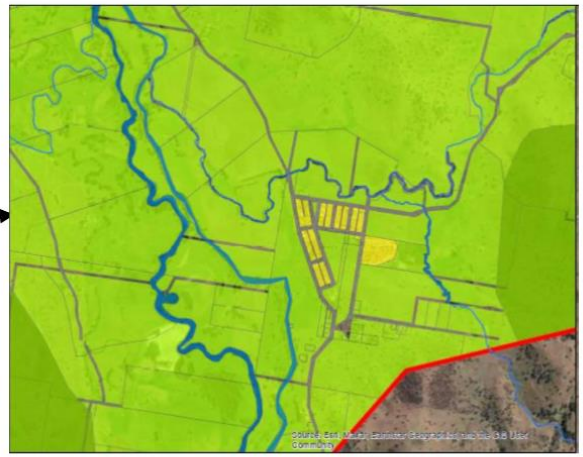
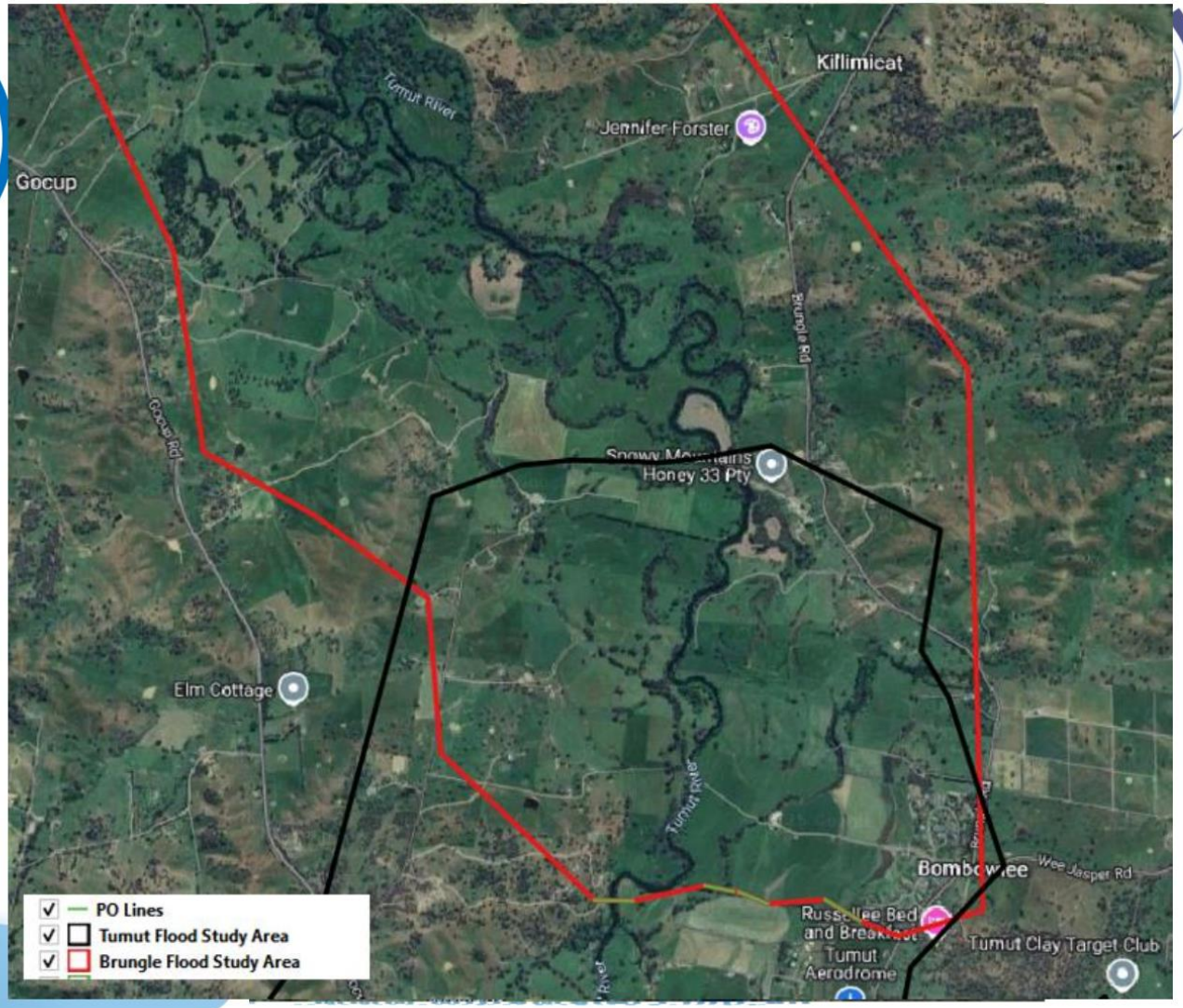
Hydraulic Model Build

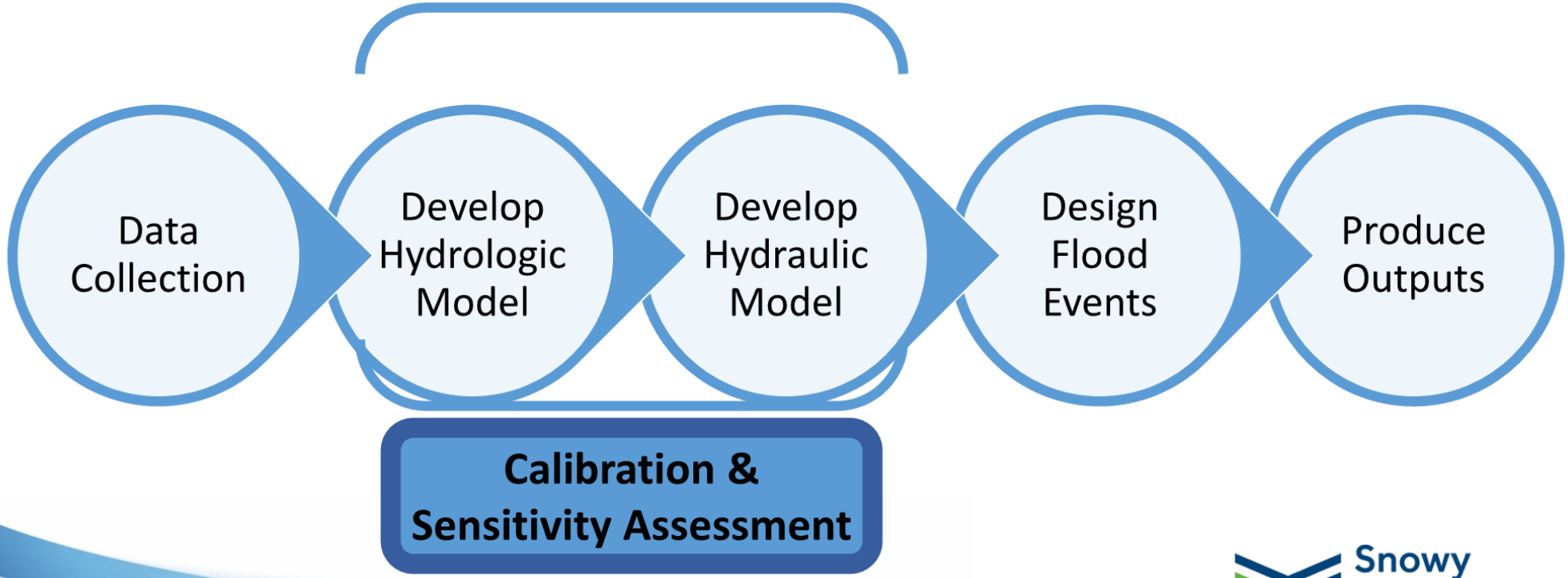




Hydraulic Model Build



Study Approach



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Calibration & Sensitivity Assessment

- Aim: ensure models are reproducing observed flood behavior
- Validate appropriate selection of parameters
- Aim to reproduce the flood behavior for October 2010, March 2012 and the floods of 2022
  - Compare levels, flows and volume at gauges
  - Compare with flood marks and observations
- Present results to Council prior to proceeding with design flood modelling

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Calibration & Sensitivity Assessment

- Upstream Gauges within the catchment
  - Tumut River @ Blowering Dam – Storage Gauge (410102) (Since 1954)
  - Tumut River @ Oddys Bridge (410073) (Since 1954)
  - Tumut River @ Tumut (410006) (Since 1892)
  - Tumut River @ U/S Nimbo Offtake (Since 1977)
  - Goobarragrandra River at Mac's Crossing (41000261) (Since 2012)
  - Goobarragandra River @ Lacmalac (410057) (Since 1944)
  - Gilmore Creek @ Wybalena (410106) (Since 1972)
  - Gilmore Creek @ Gilmore (410059) (Since 1994)
  - Killimicat Creek @ Wyangle (410114) (Since 1975)

  Use to validate outflows from the WBNM Hydrologic Model in upstream areas
- Other Gauges (Within the Hydraulic Model Extent)
  - Tumut River @ Brungle Bridge (410039) (Since 1932)
  - Brungle Creek at@ Red Hill No. 2 (41000269) (Since 2012)

  Use to compare general shape of hydrograph and flows/volume of historic events
- Rain Gauges Historic
- Flood Marks :
  - Good for localised behaviour, however sensitive to local surge, debris marks etc

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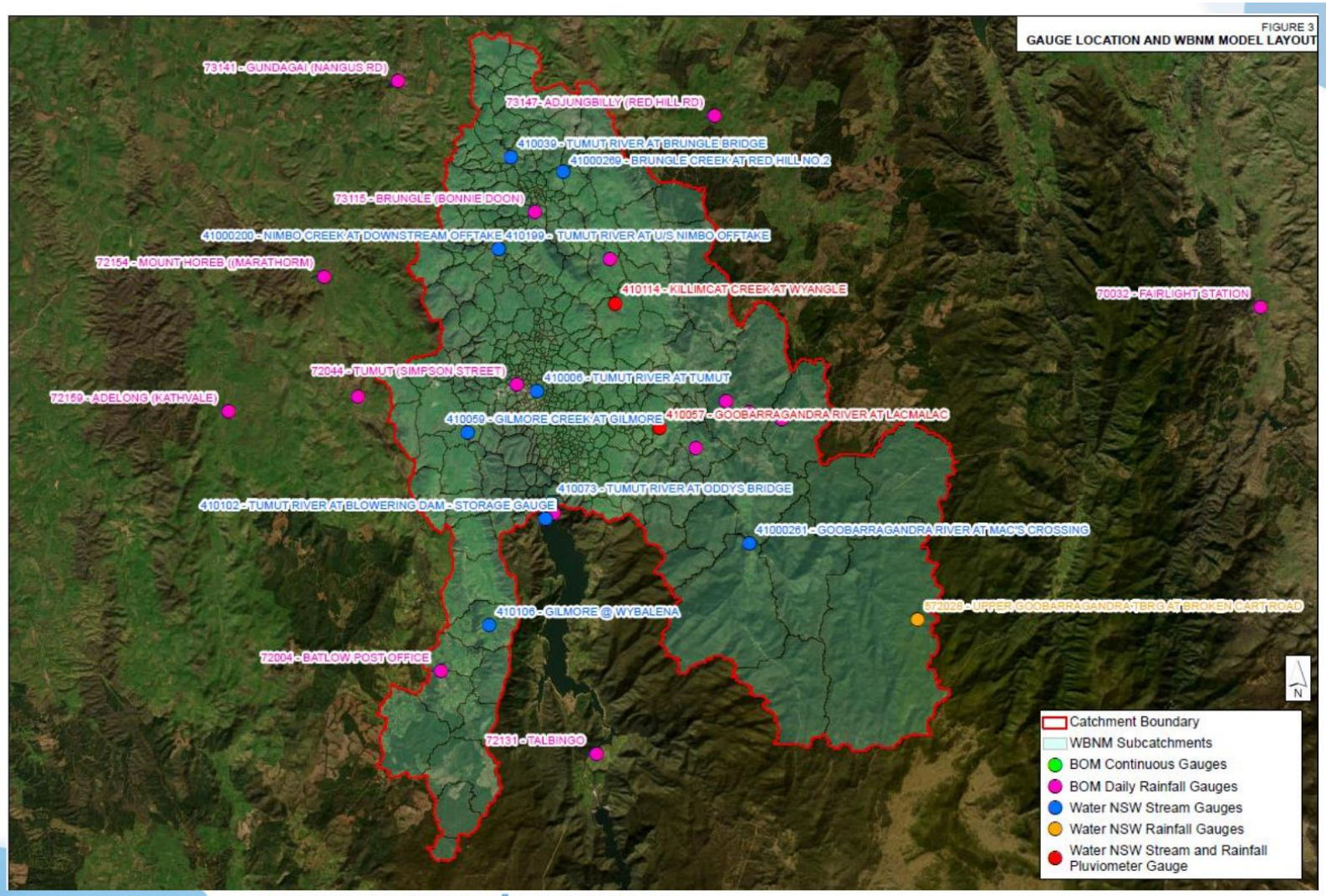
Model Calibration



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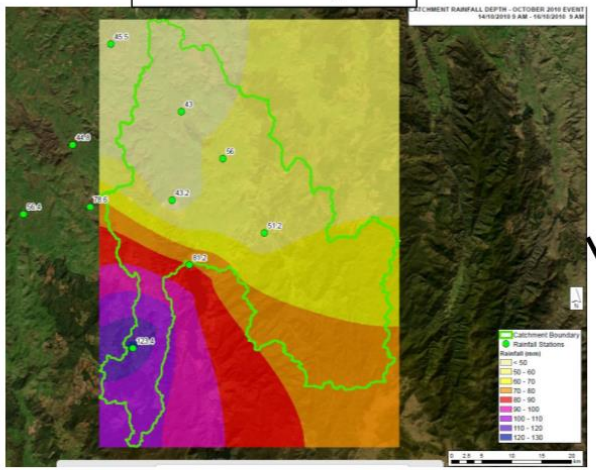
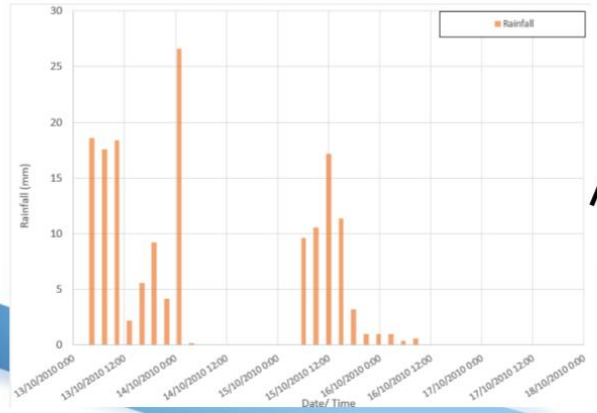
Rainfall Isohyets



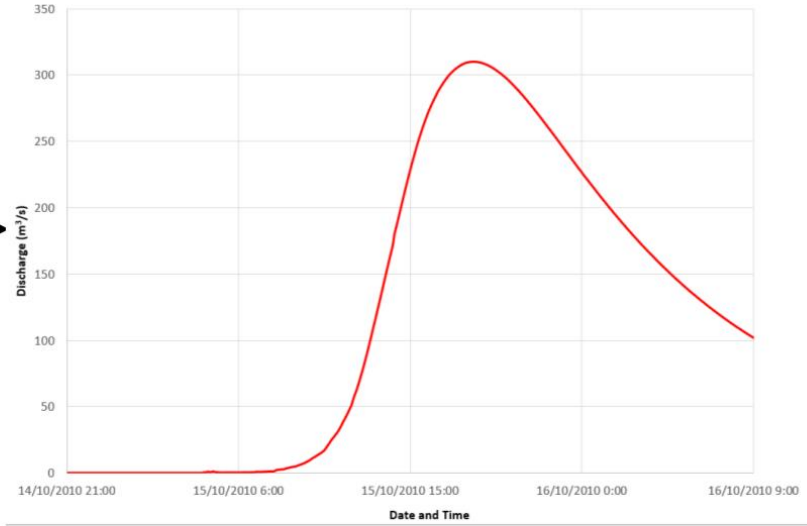
Rainfall Temporal Pattern



Recorded Hydrograph at Oddy's Bridge Gauge (410073)

WBNM (Hydrological Model)

Rainfall Losses



Flow Hydrograph
(For each sub catchment)

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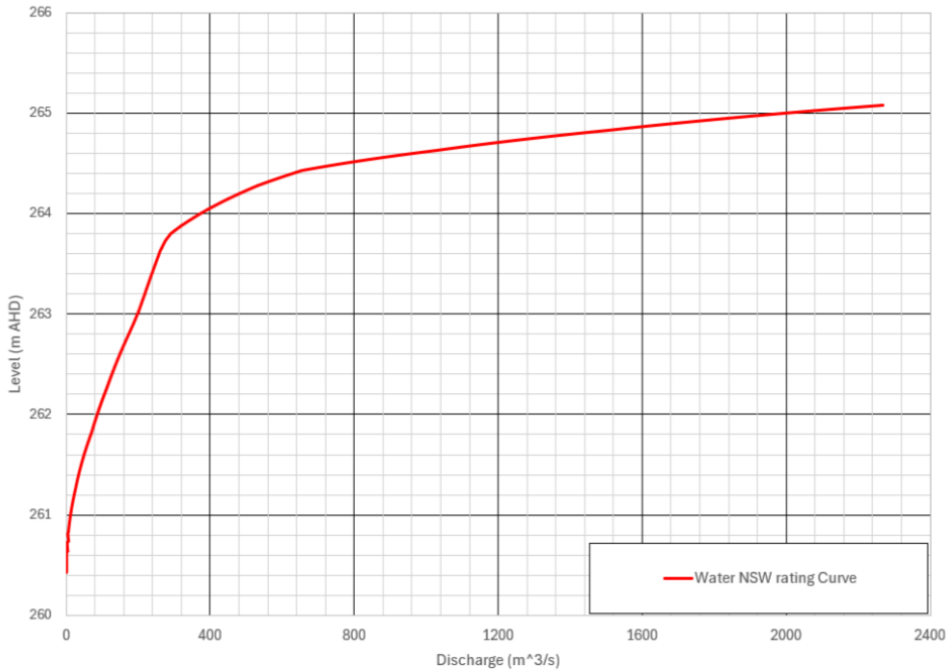
Rating Curves

- Rating curves define a relationship of height to flow at a gauge location. These are used to convert the recorded water level data at the stream gauges to flow which can be used to compare to the hydrological model.
- Rating curves are developed from velocity measurements (gaugings) during flood events which are converted to flows using the area of cross-section.

Limitations:

- Change in cross-section of river/creek over a period of time can significantly impact the rating curve
- Gaugings are available only up to a certain recorded level and beyond that, the rating curves are extrapolated.



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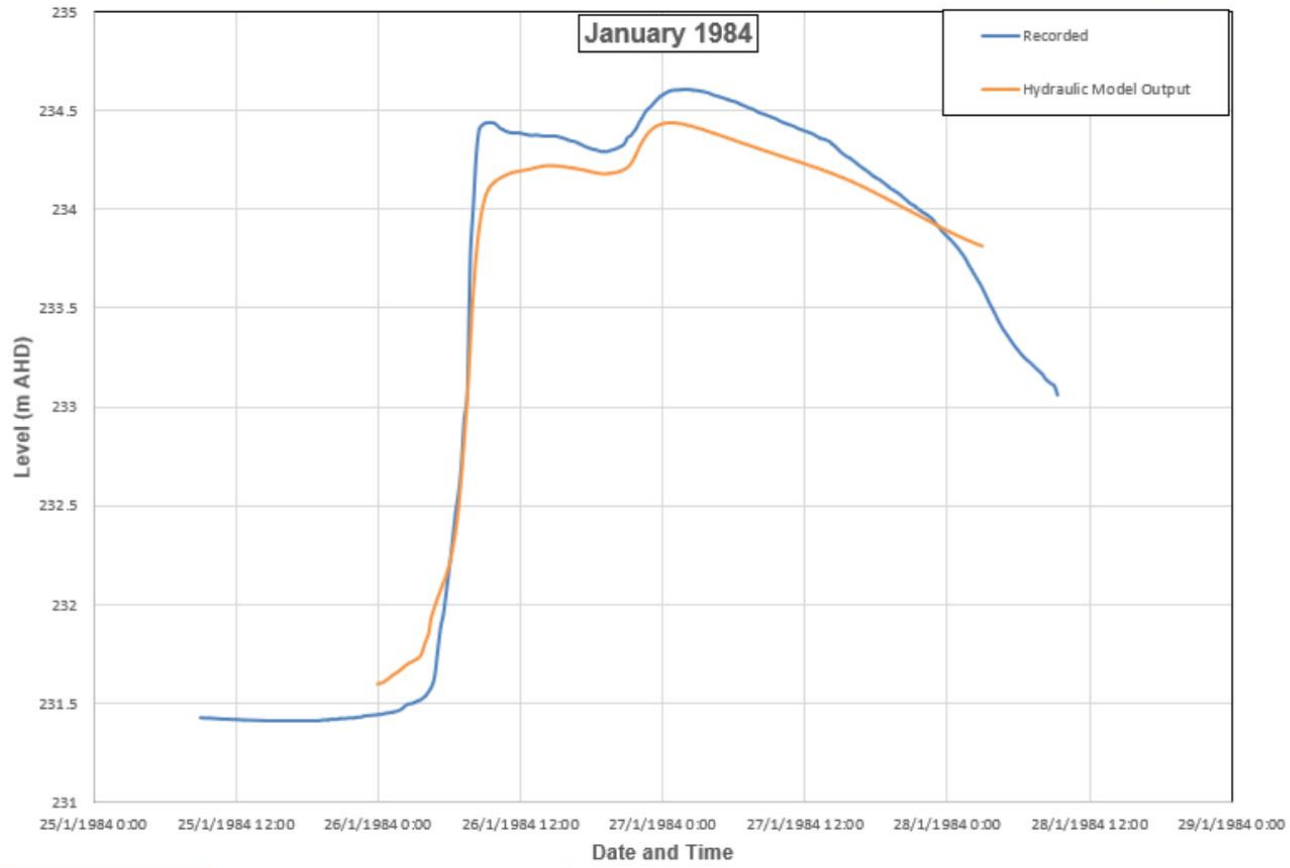
Preliminary Calibration Results



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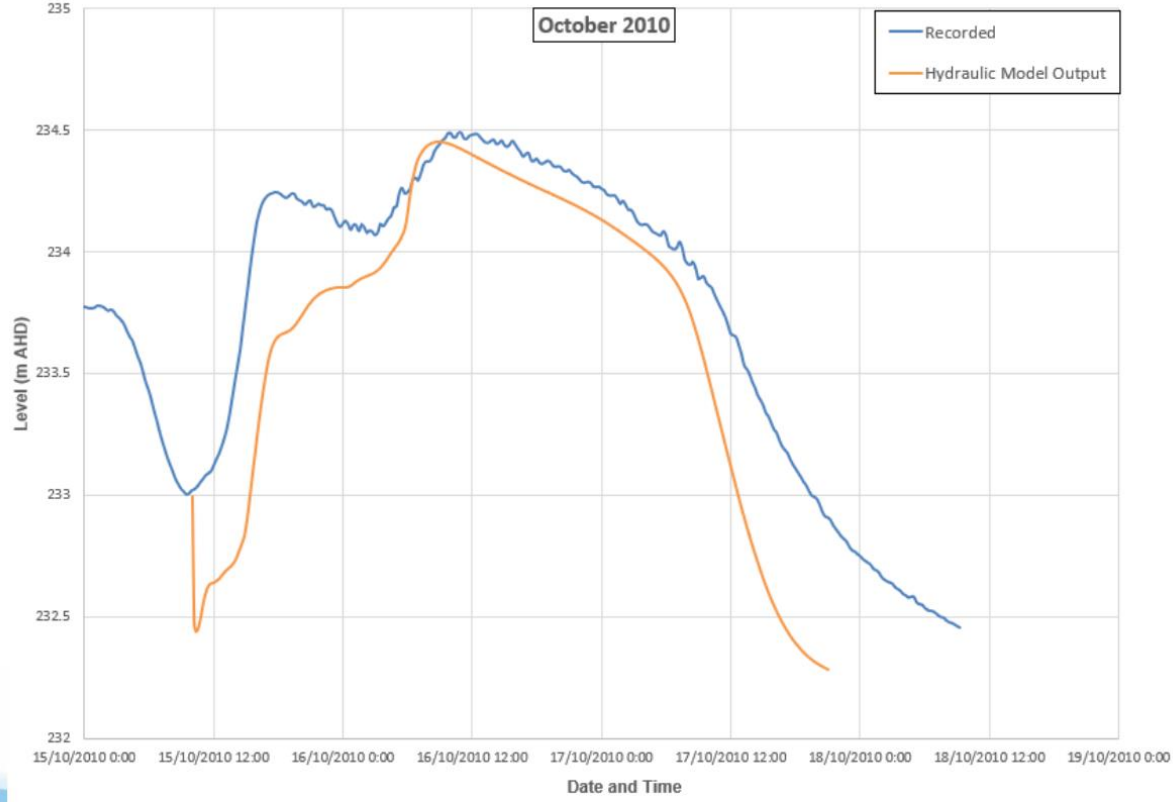

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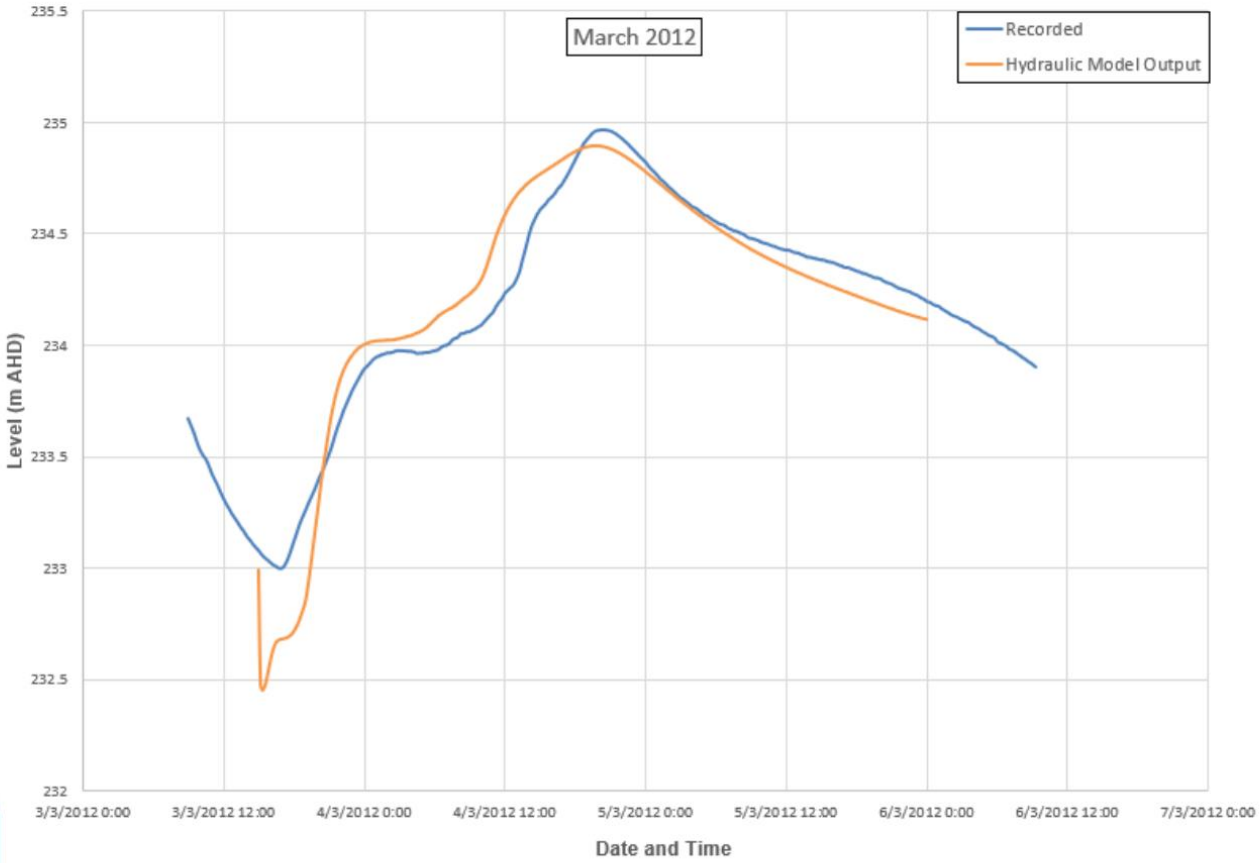
Preliminary Calibration Results



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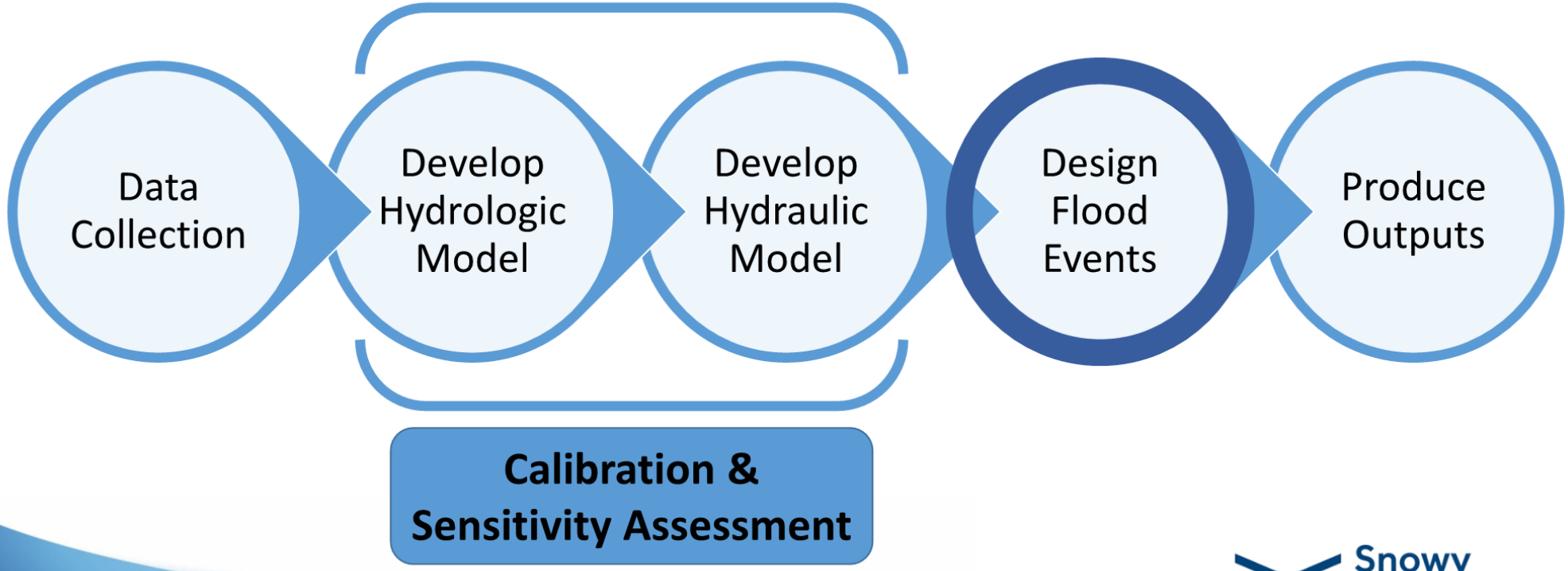
Study Approach



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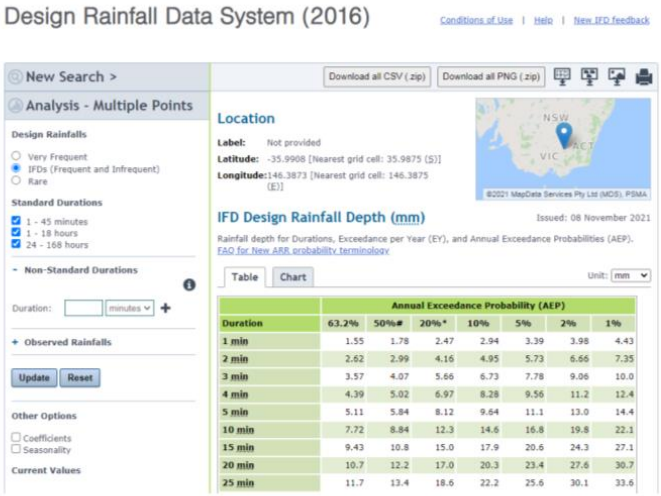
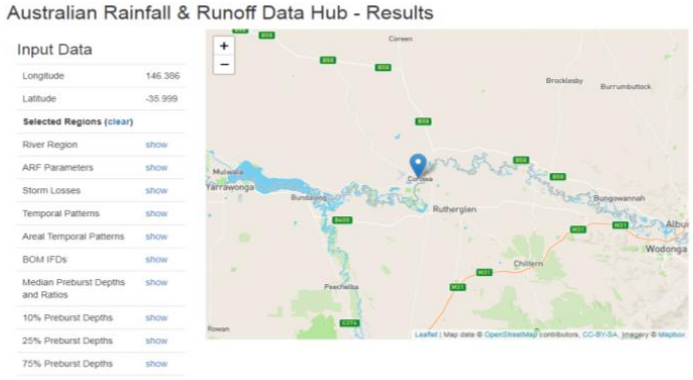
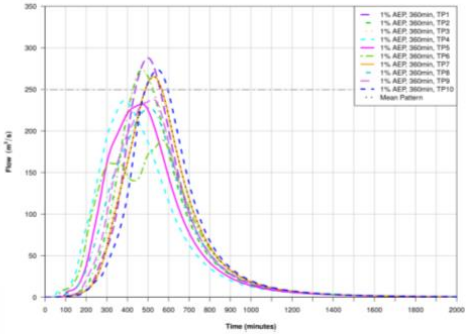
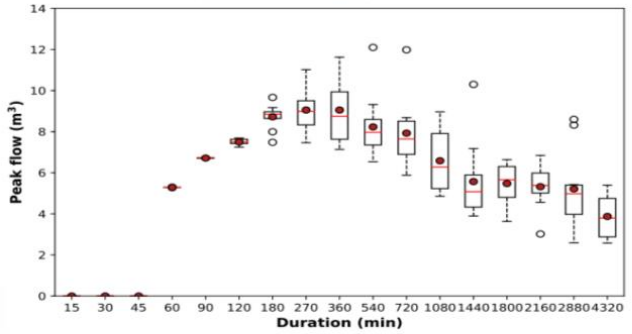
Design Flood Events

WBNM









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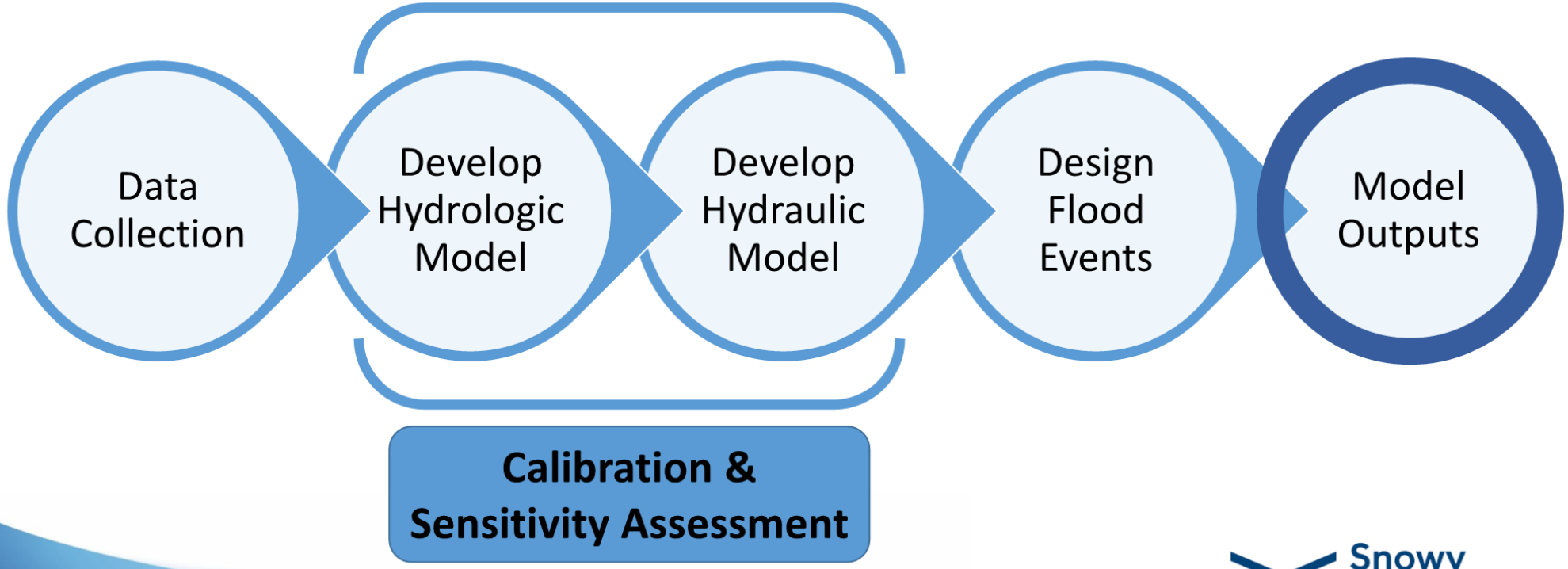
Study Approach



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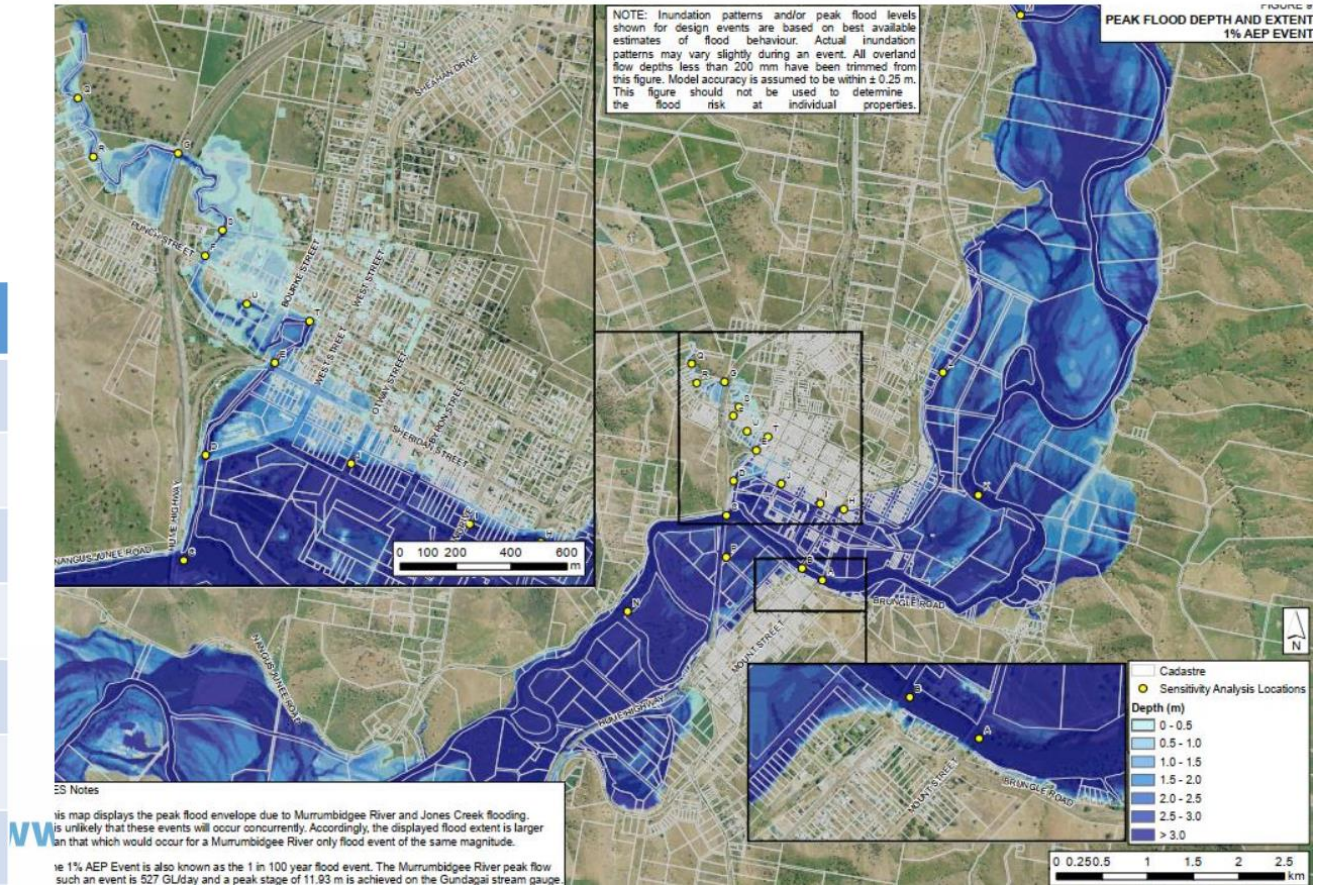
Model Outputs

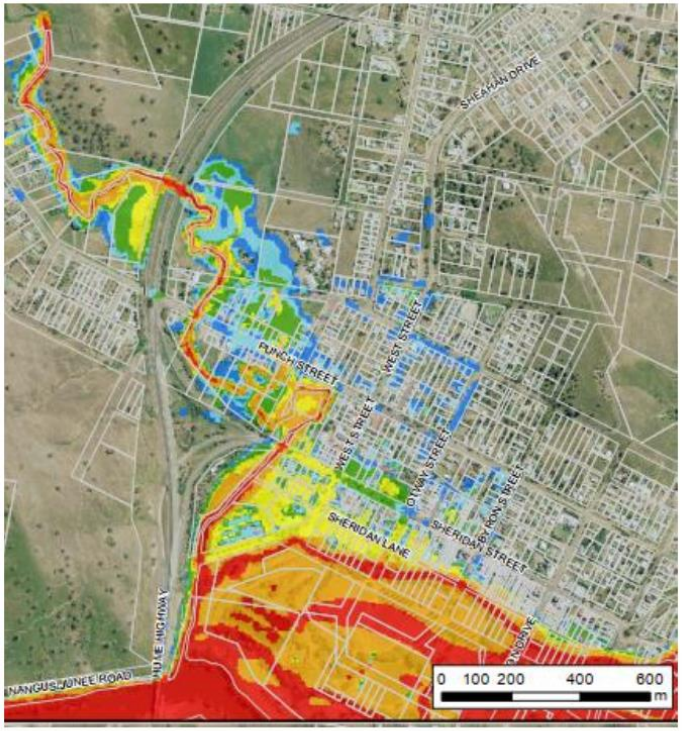
Depths, Levels, Extents

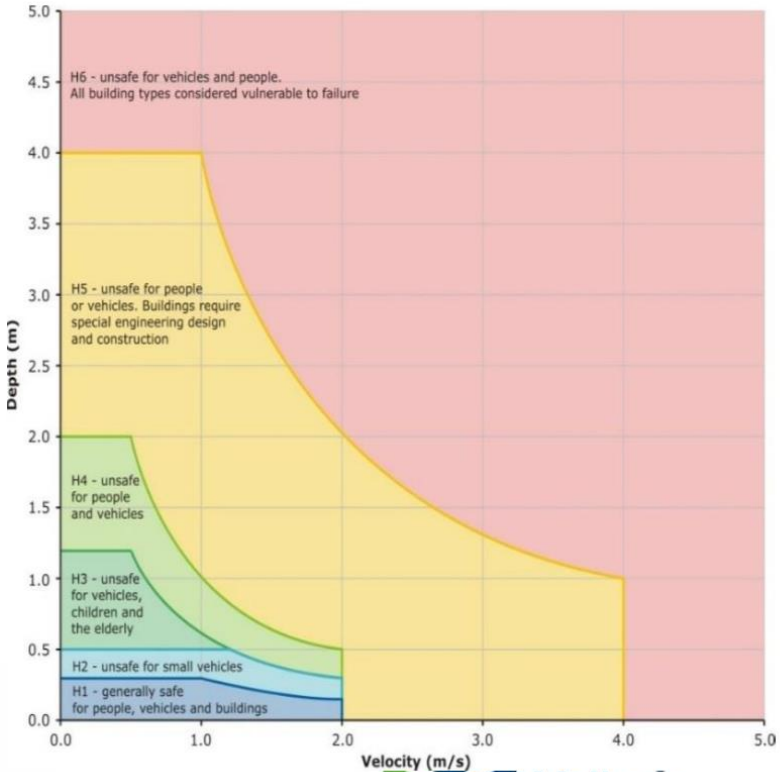
Event	Gauge Height (m)
0.2 EY	9.1
10% AEP	10.1
5% AEP	10.8
2% AEP	11.5
1% AEP	11.9
0.2% AEP	13.0
PMF	19.9



Model Outputs

Hydraulic Hazard





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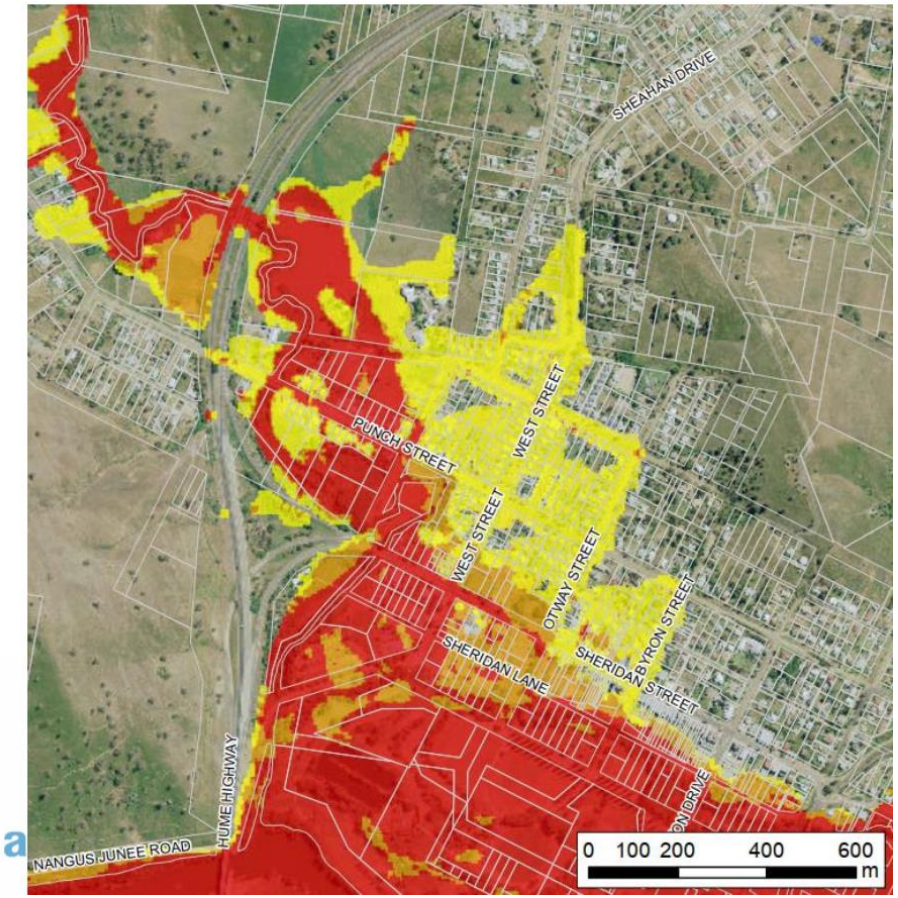
Model Outputs

Hydraulic Categories

Floodway

Flood Storage

Flood Fringe



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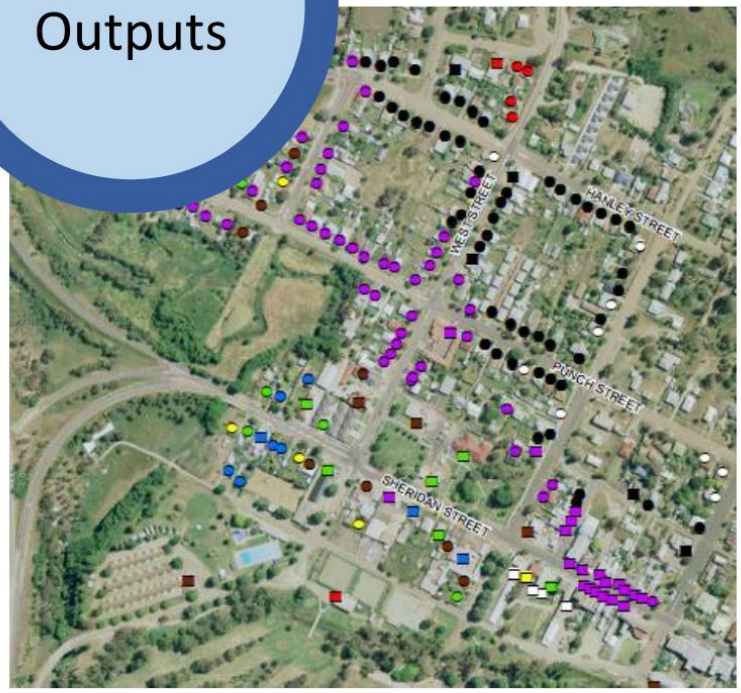
Flood Damages Assessment

Model Outputs



First Flooded Floor

- 0.2 EY
- 10% AEP
- 5% AEP
- 2% AEP
- 1% AEP
- 0.2% AEP
- PMF
- Not Flooded
- Commercial
- Residential

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Flood Damages Assessment

Model Outputs

First Flooded Floor

○ 0.2 EY

Table 8 Combined (Residential and Commercial/Industrial) Flood Damages for Gundagai

Event	No. Properties Affected[1]	No. Flooded Above Floor Level[2]	Total Damages for Event	% Contribution to AAD	Ave. Damage Per Flood Affected Property
0.2 EY	52	14	$ 1,255,333	24	$ 24,141
10% AEP	60	22	$ 2,213,251	22	$ 36,888
5% AEP	75	30	$ 3,121,191	17	$ 41,616
2% AEP	92	44	$ 4,807,761	15	$ 52,258
1% AEP	103	59	$ 6,876,474	7	$ 66,762
0.2% AEP	127	85	$ 11,761,843	9	$ 92,613
PMF	267	244	$ 38,236,225	6	$ 143,207
Average Annual Damages (AAD)			**$ 796,747**		**$ 2,984**

Model Outputs

Flood Planning Area

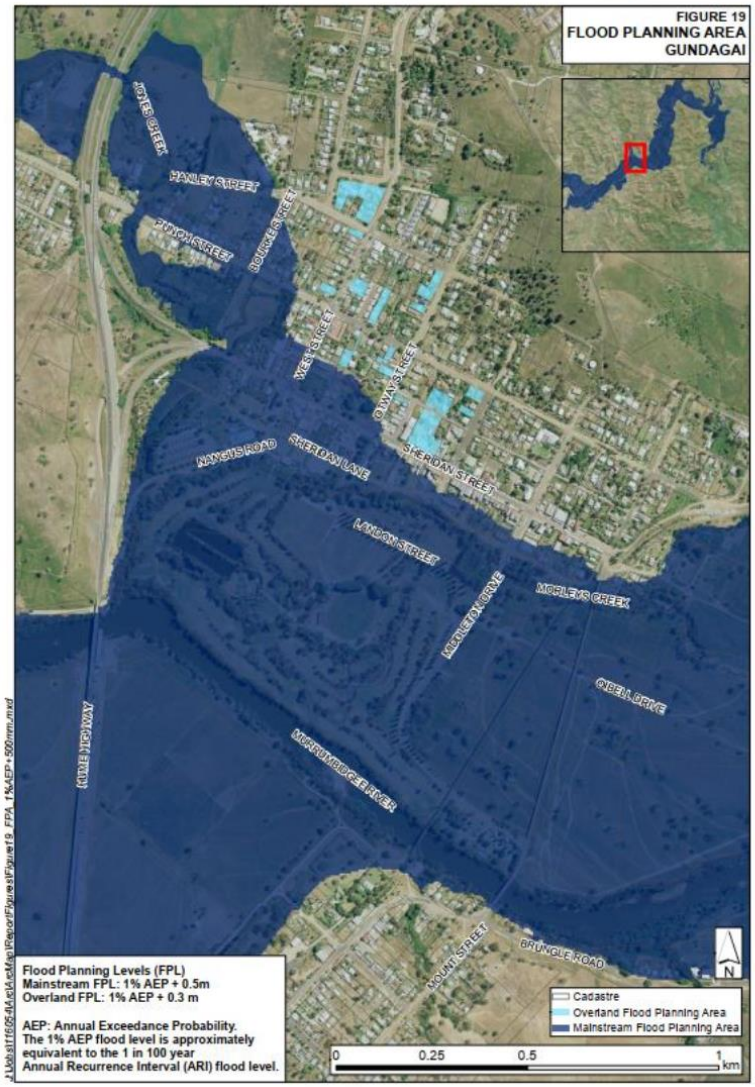
Tumut Shire COUNCIL

TUMUT SHIRE DEVELOPMENT CONTROL PLAN

April 2011

(Adopted 28th June 2011, motion 412)

Flood Related Development Controls



Attachment 2 - DRAFT Brungle Flood Risk Management Committee Terms of Reference - SVC-TofR-044-01

Brungle Flood Risk Management Committee
Terms of Reference

ToR No: SVC-TofR-044-01

1. NAME

The name of the committee is the Brungle Flood Risk Management Committee.

2. LEGAL STATUS

Council delegates its authority to the committee to act on its behalf in line with the Committee's *Terms of Reference.* As a result, legally, the committee is part of "Council" and any action the committee undertakes is conducted under Council's authority. Committees do not act in their own right and their actions are not legally independent of Council. Council delegates its authority to the committee to act on behalf of the Council and can withdraw this delegation at its discretion.

The committee cannot change this name and/or title without advising the Council of the intention to adopt a new name and/or title, nor can a committee merge with another party/committee without prior notice and input from Council.

Committee members must act in the interests of Council. This includes not:

- Acting contrary to any direction from Council, which includes a direction from the General Manager,
- Director, Manager or appointed delegate
- Acting contrary to Council's policies
- Advising any person that they may have a legal right or action against Council or any
- Councillors, Council employee or Council contractor exercising a function of Council
- Making any admission of liability or accepting liability on behalf of Council or the committee
- Acting contrary to Council's *Code of Conduct*
- Acting outside the limits of the committee's delegation
- Acting or presenting the committee as independent of Council.

3. DELEGATION

The Brungle Flood Risk Management Committee will provide advice, feedback, and support to Council in developing, implementing, and monitoring flood studies and flood risk management studies and plans and associated projects for Brungle and its environs.

4. PURPOSE

The purpose of the committee is to:

- Assist Council to develop a Flood Study and a Flood Risk Management Study and Plan for Brungle in accordance with the NSW Flood Risk Management Manual 2023 and adopted guidelines.
- Monitor and evaluate the implementation of the Brungle Flood Risk Management Plan.

- Assist in the development of suitable strategies to address floodplain management issues, communication and access to flood information and education by community members.
- Develop a better understanding of floodplains and identify issues that may be required to be addressed through development of strategies, studies, plans or works.

5. OBJECTIVES

The objective of the Brungle Flood Risk Management Committee is to support the completion of the Flood Risk Management Studies including the implementation and review of these studies where appropriate for catchments that impact on the Brungle Community within the Snowy Valleys Local Government Area.

6. MANAGEMENT AND OPERATION OF THE COMMITTEE

a) MEETINGS

The committee should meet on a regular basis quarterly as required. Meetings shall be held within the Local Government Area of the Snowy Valleys Council. To ensure ongoing accountability and accessibility meetings can be in person or via video link.

b) MEMBERSHIP

The membership shall consist of:

- A maximum of two (2) Councillors, one of which will be elected as the Chair by the elected Council.
- Council staff from engineering / planning / environmental disciplines to service the committee and oversee the technical requirements of the study.
- Representatives from State Government Departments and Agencies including the Department of Climate Change, Energy, the Environment and Water (DCCEEW), NSW State Emergency Service (NSW SES), WaterNSW, Transport for NSW and the Department of Planning, Housing and Infrastructure (DPHI).
- One (1) Representative from the community with knowledge of historical flood behaviour in the catchment.
- One (1) representative from flood action groups or neighbourhood forum groups.

Guest are deemed necessary to:

- Provide specialist advice outside of the capabilities of the committee members (for example the Bureau of Meteorology).
- Sharing of experiences of flood impacts (for example local residents or businesses that have been impacted by floods).

A quorum will normally consist of members equal to the number that is half the committee plus one. If a quorum is not present within half an hour after the appointed starting time, the meeting will be adjourned and rescheduled to a later date.

Voting rights should only be for Councillors and local community representatives on the committee. Council staff and external agencies are in attendance only in a technical/advisory capacity.

c) CHAIRPERSON

The elected Council shall resolve to appoint a chairperson to the committee being one of the two Councillors appointed to the committee. In the absence of the Chairperson, the other Councillor on the committee shall be the acting Chairperson for the duration of the absence of the Chair.

d) SECRETARIAT

A staff member from the Snowy Valleys Council shall perform the Secretariat duties for the committee.

e) PECUNIARY INTERESTS AND CONFLICTS OF INTEREST

Members of the Committee when becoming aware of a conflict of interest can arise when a member of the committee has other involvements or interests, which make it difficult for them to always remain impartial when involved in discussions and decision-making. If a conflict of interest arises, the Chairperson and staff delegate must be notified. In addition to the Code of Conduct there is the *'At a Glance' guide for Council Committee Members and Delegates'* guide published by the Office of Local Government that can be used as a reference.

Members of the Brungle Flood Risk Management Committee in performing their duties shall:

- Act honestly and in good faith
- Declare all actual and perceived conflicts of interest
- Perform their duties in a manner that ensures public trust in the integrity, objectivity and impartiality of the committee.
- Comply with Council's code of conduct

f) ATTENDANCE OF NON-MEMBERS

Staff and other professionals / members of the community may be invited to attend and participate at meetings as required.

g) CONFIDENTIALITY

Members of the Committee should appreciate that the working group may, from time to time, deal with sensitive matters of a confidential nature. The confidentiality of such information should be respected by all members.

7. AMENDING THE TERMS OF REFERENCE

Recommendations for amendments to the Terms of Reference can be made at any time. Any amendments to the Terms of Reference must be adopted by Council.

8. HISTORY TABLE

Version No	Approval Date	Resolution Number	Date to be Reviewed
SVC-Tof-044-01			