Tweed Valley Flood Study Update and Expansion – Technical Sub Committee

Update

- Data review complete
- Community consultation complete results being compiled
- Hydrology model updates complete
- Bathymetry complete
- DEM complete
- Hydraulic model setup mostly complete
- First pass calibration run complete

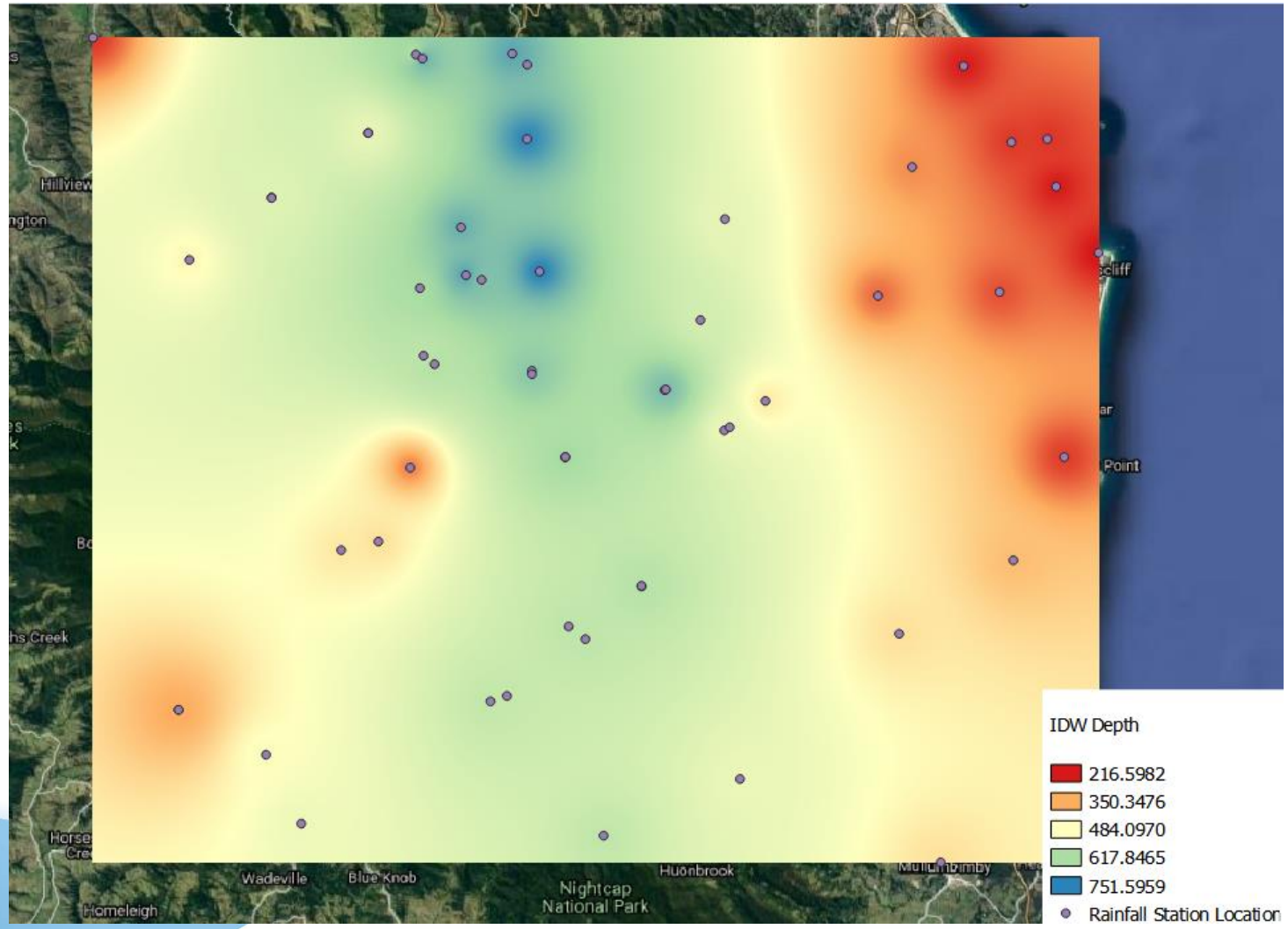
Community Consultation

- Initial phase was via digital medium, Leon identified that was not getting sufficient response in regional villages and subsequently a mailout to potentially affected persons was undertaken
- Over 100 responses provided
- Feedback to be provided shortly

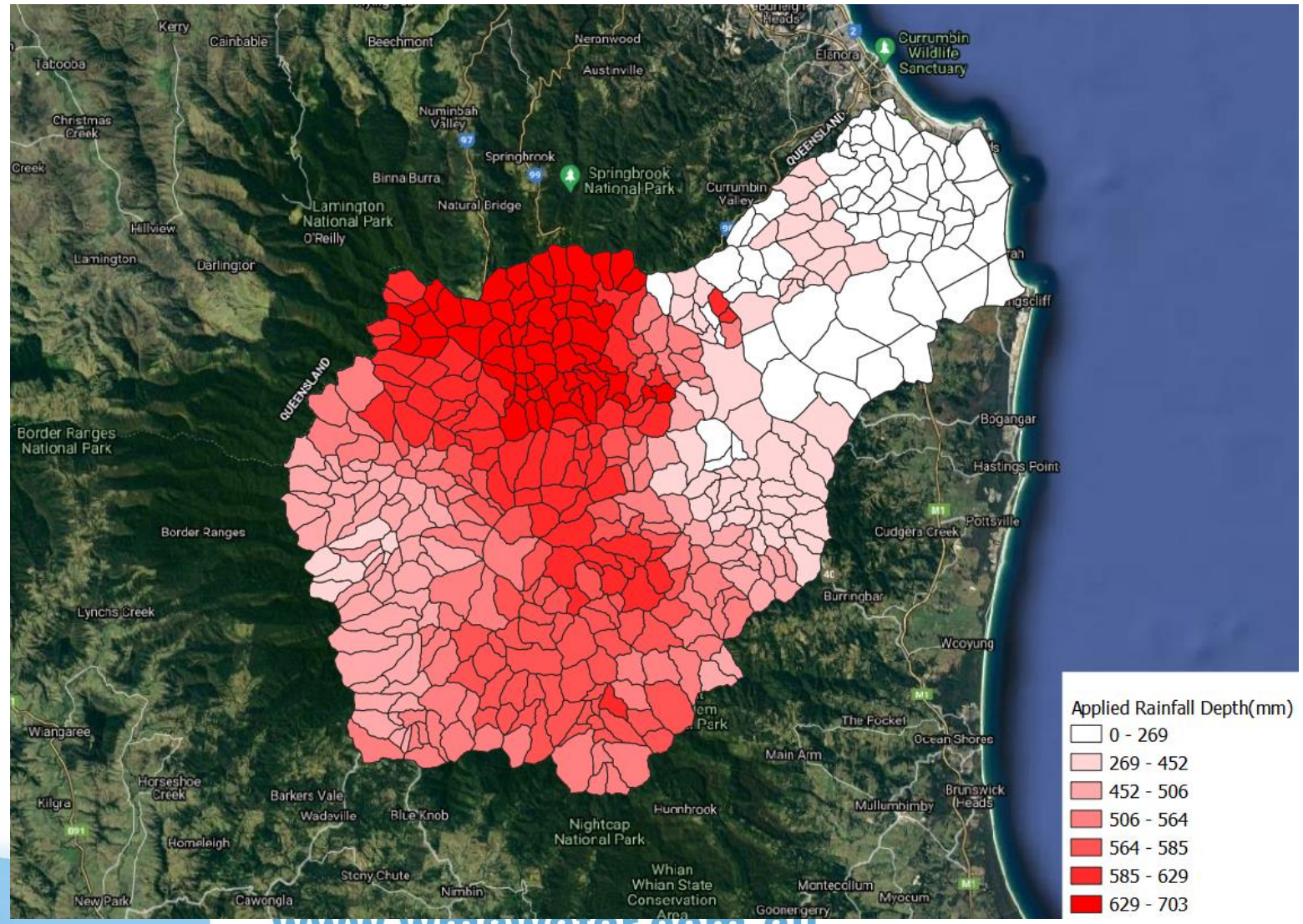
Hydrology

- Model Delineation Complete
- 2017 event model setup complete
- Other events primarily setup

2017 – Rainfall Depth Grid



Applied Rainfall Totals



Bathymetry

- Prior to the study detailed bathymetry of the Tweed River was undertaken
- This information provides a much higher resolution dataset compared to previous assessments and enables more accurate representation of flow characteristics in the channel

Bathymetry – Raw Dataset

Image 1. 2018 Bathymetry Survey (Raw Data)

Bathymetry – Trimmed for Model

Image 2. 2018 Bathymetry Survey (Filtered Data)

Bathymetry – Detailed Training Lines

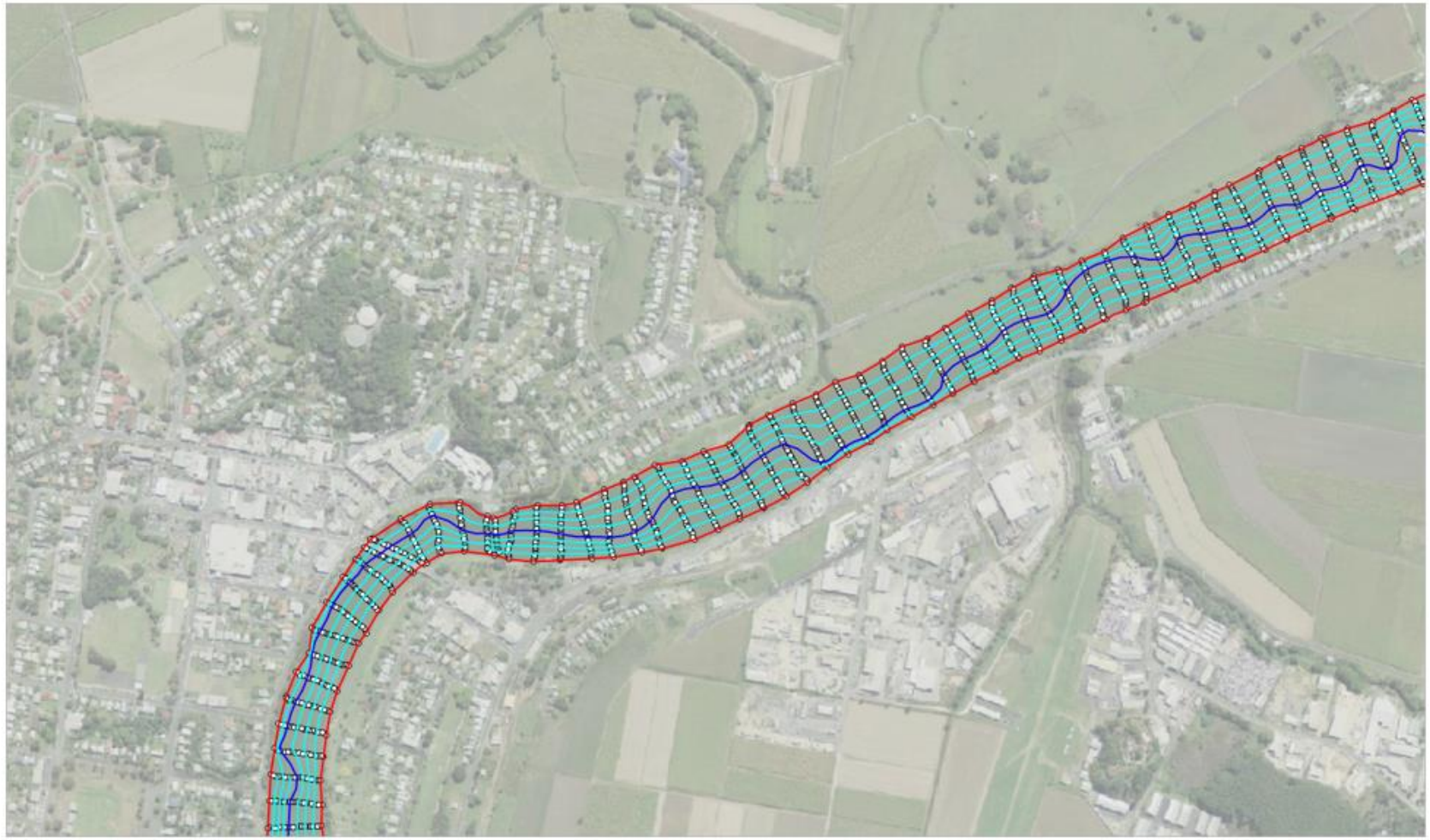


Image 3. Tweed River Bathymetry Model (Before Tinning)

Bathymetry

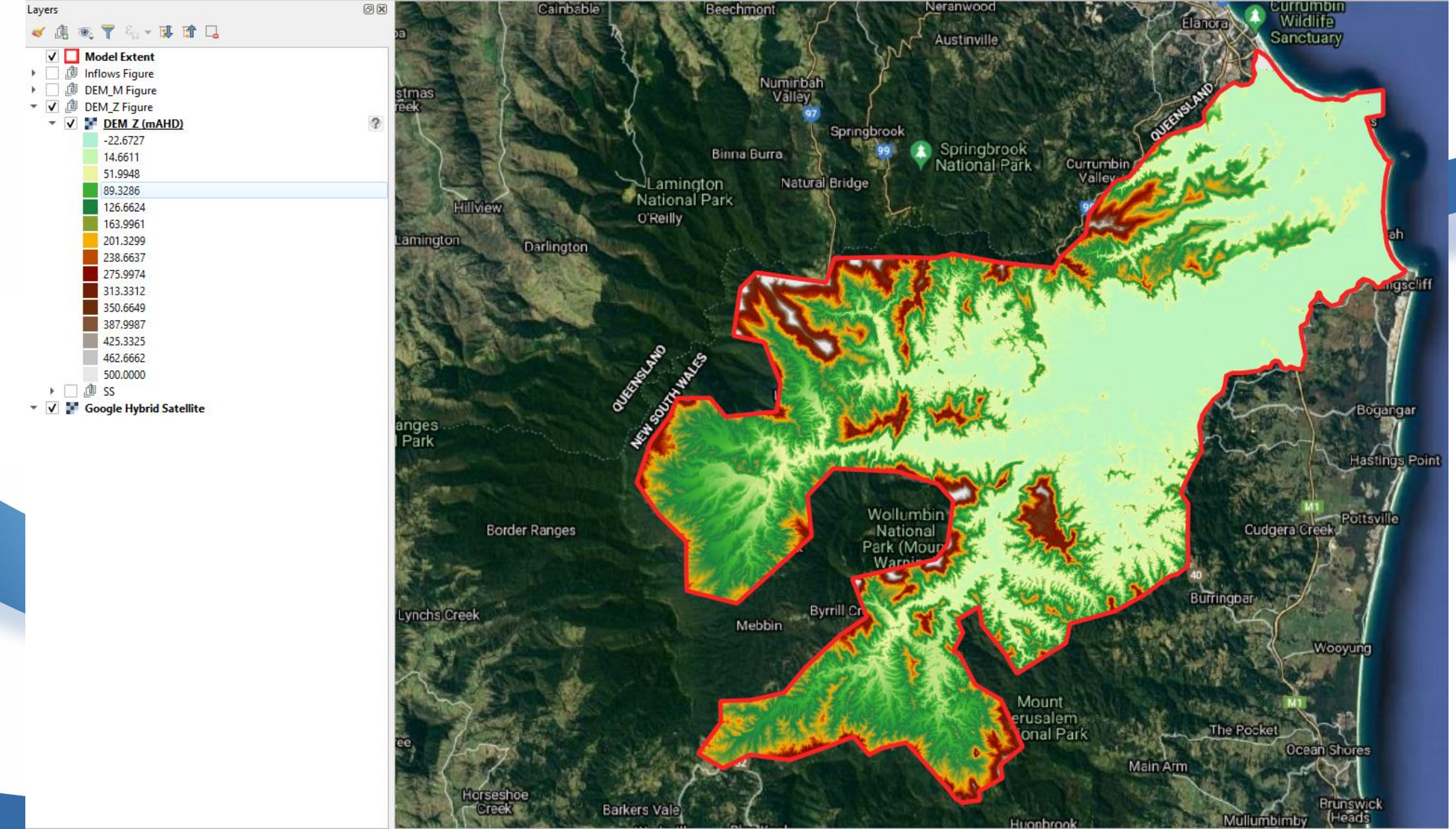
Image 4. Tweed River Bathymetry Model (After Tinning)

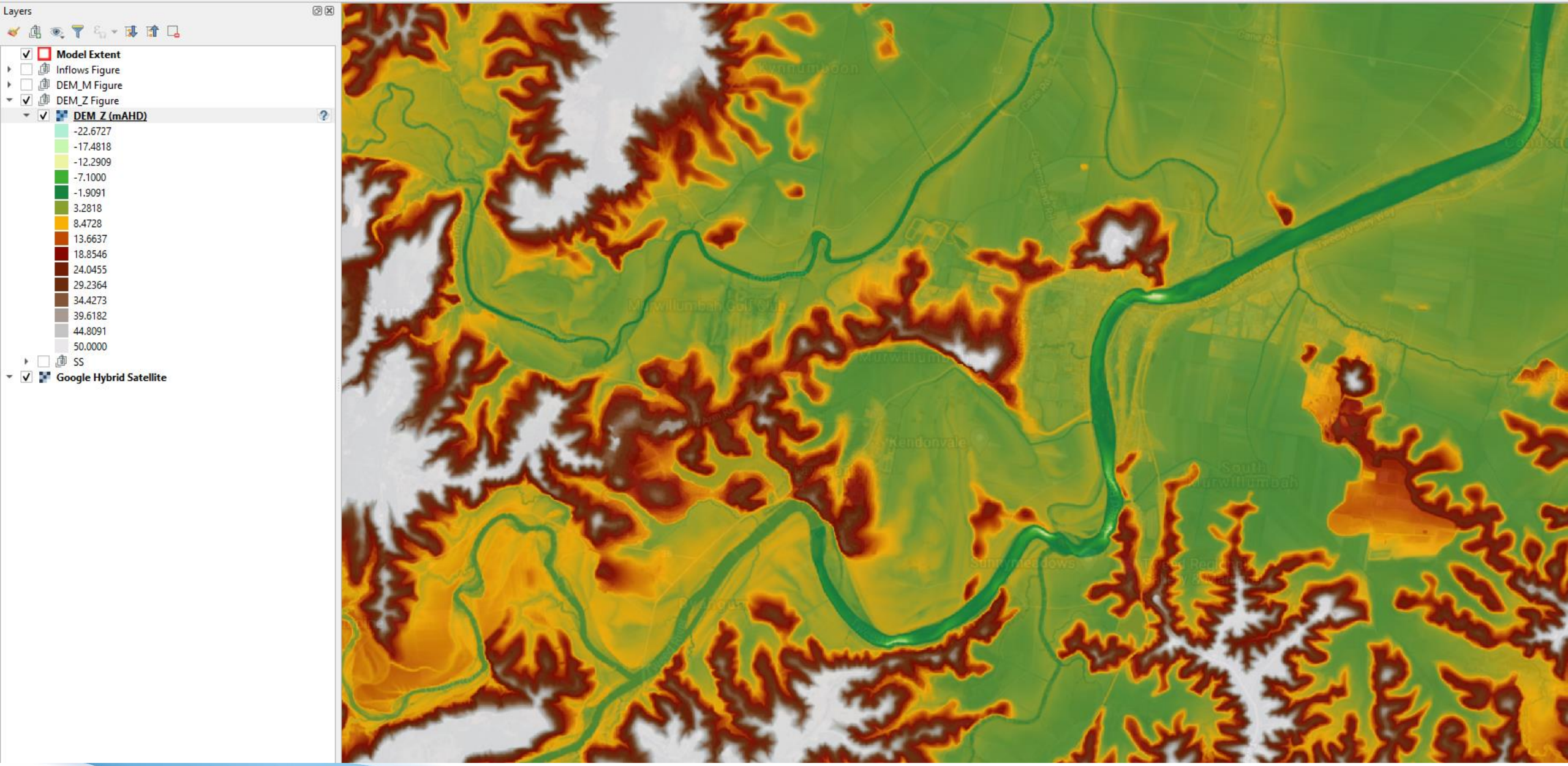
Bathymetry

Image 5. Original Tweed River Bathymetry Model

Hydraulic Model Setup

- First Model Build and Run Complete
- Current Model Setup Consists of 10 m grid for full area (previous model resolution was 40 m)
- Covers full extent of catchment (to the tree line)
- Calibration Process Underway
- Initial focus is 2017 event with 1989 and 2020 (smaller event) to follow
- 2020 is to make sure frequent event response is also reasonable (scalability of the model)


Layers
Model Extent
Inflows Figure
DEM_M Figure
DEM_Z Figure
DEM_Z (mAHD)
-22.6727
14.6611
51.9948
89.3286
126.6624
163.9961
201.3299
238.6637
275.9974
313.3312
350.6649
387.9987
425.3325
462.6662
500.0000
SS
Google Hybrid Satellite
Cainbable
Beechmont
Neranwood
Austinville
Elanora
Currumbin Wildlife Sanctuary
Numinbah Valley
Springbrook
Springbrook National Park
Binna Burra
Natural Bridge
Currumbin Valley
QUEENSLAND
Lamington National Park
O'Reilly
Hillview
Lamington
Darlington
QUEENSLAND
NEW SOUTH WALES
Border Ranges
Wollumbin National Park
Lynchs Creek
Mebbin
Byrrill Cr
Bogangar
Hastings Point
Pottsville
Cudgera Creek
Burringbar
Wooyung
Mount
The Pocket
Ocean Shores
Main Arm
Brunswick Heads
Mullumbimby
Horseshoe Creek
Barkers Vale


Layers
Model Extent
Inflows Figure
DEM_M Figure
DEM_Z Figure
DEM_Z (mAHD)
-22.6727
-17.4818
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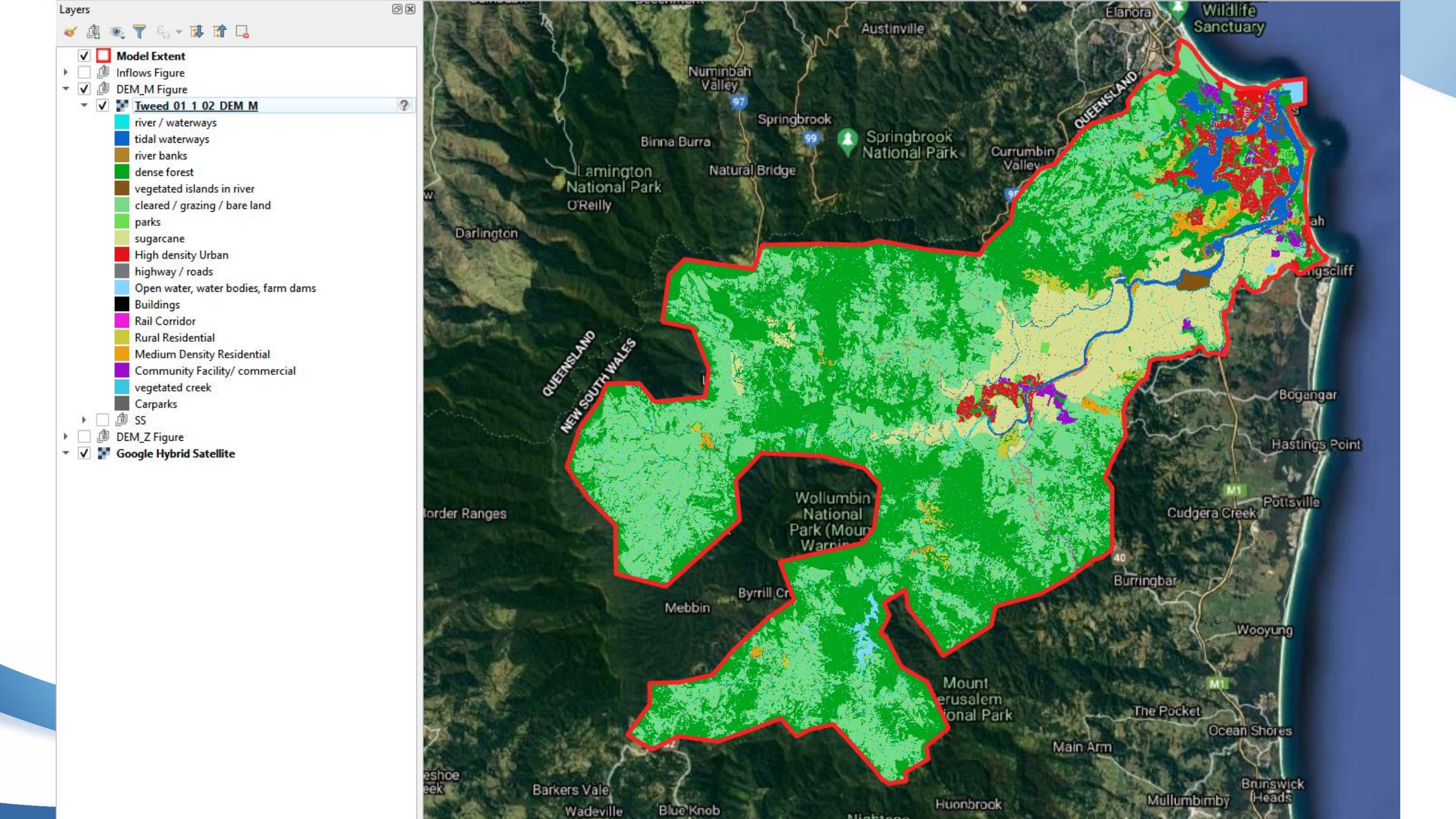
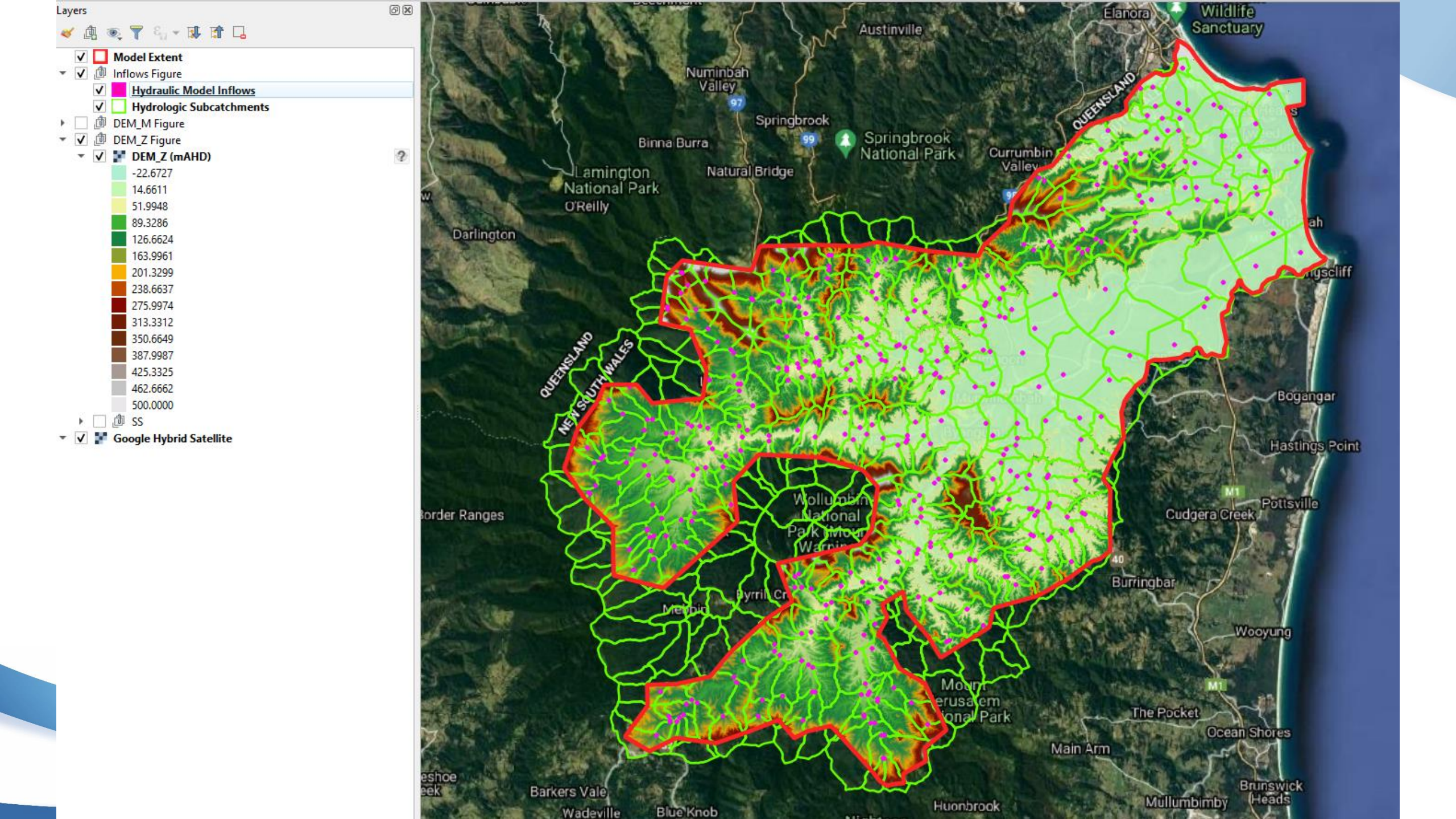
SS
Google Hybrid Satellite


Layers
Model Extent
Inflows Figure
DEM_M Figure
Tweed 01 1 02 DEM M
river / waterways
tidal waterways
river banks
dense forest
vegetated islands in river
cleared / grazing / bare land
parks
sugarcane
High density Urban
highway / roads
Open water, water bodies, farm dams
Buildings
Rail Corridor
Rural Residential
Medium Density Residential
Community Facility/ commercial
vegetated creek
Carparks
SS
DEM_Z Figure
Google Hybrid Satellite
Elanora
Wildlife Sanctuary
Austinville
Numinbah Valley
Springbrook
Springbrook National Park
Binna Burra
Natural Bridge
Currumbin Valley
QUEENSLAND
Lamington National Park
O'Reilly
Darlington
NEW SOUTH WALES
Wollumbin National Park
Mebbin
Byrrill Cr
Bogangar
Hastings Point
Pottsville
Cudgera Creek
Burringbar
Wooyung
Mount
The Pocket
Ocean Shores
Main Arm
Brunswick Heads
Mullumbimby
Huonbrook
Barkers Vale
Wadeville
Blue Knob


Layers
Model Extent
Inflows Figure
Hydraulic Model Inflows
Hydrologic Subcatchments
DEM_M Figure
DEM_Z Figure
DEM_Z (mAHD)
-22.6727
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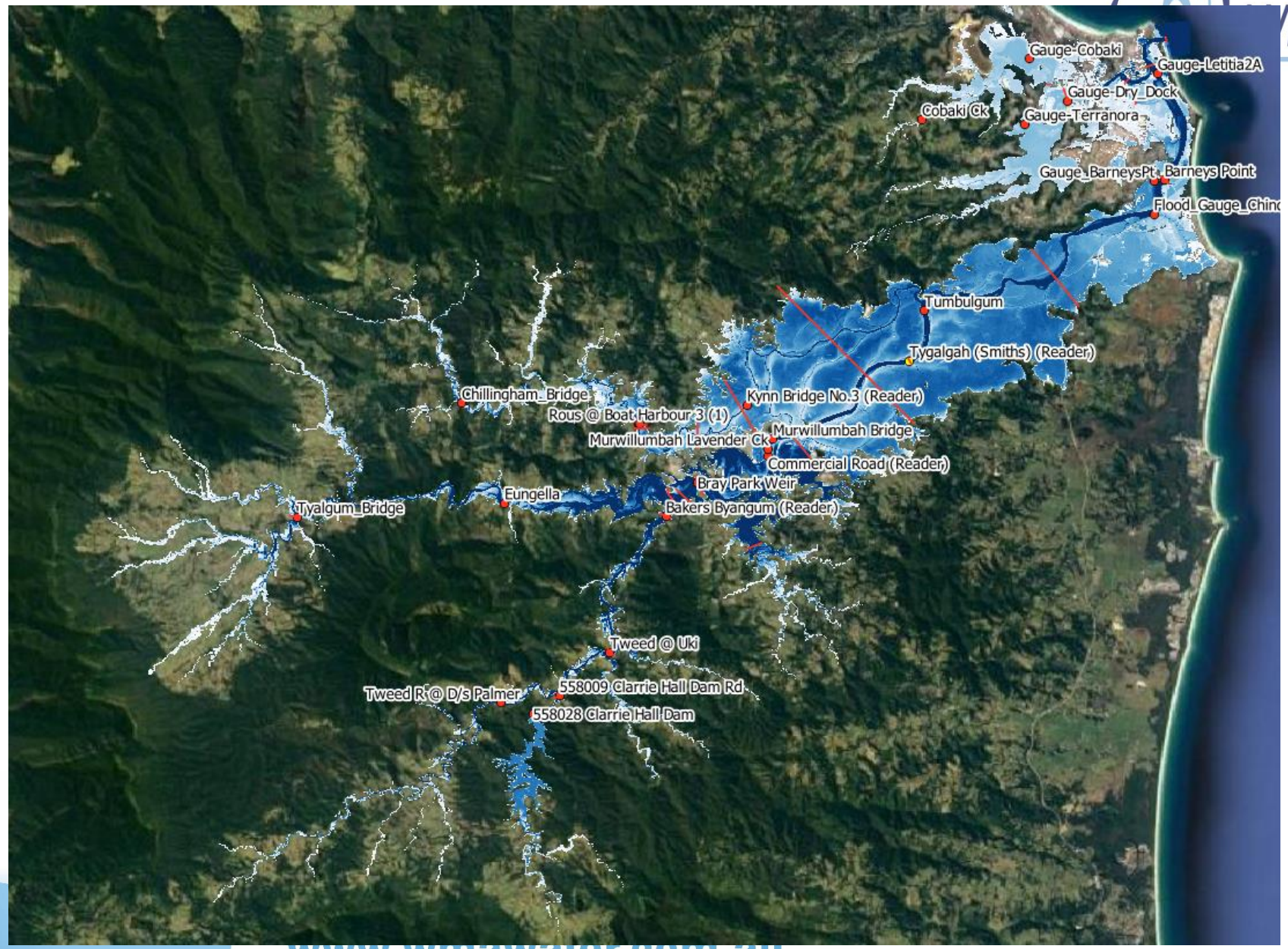
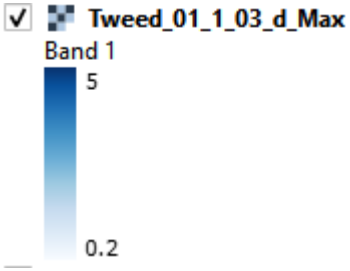
Huonbrook

2017 Model Results (First Run)

- Response looking good in the upper areas, obviously areas to improve but first pass indicates reasonable replication
- Currently in the process of refining downstream, gridding issues joining datasets affected model


Gauge-Cobaki
Gauge-Letitia2A
Gauge-Dry_Dock
Cobaki Ck
Gauge-Terranora
Gauge_BarneysPt
Barneys Point
Flood_Gauge_Chinc
Tumbulgum
Tygalgah (Smiths) (Reader)
Chillingham_Bridge
Kynn Bridge No.3 (Reader)
Rous @ Boat Harbour 3 (1)
Murwillumbah Bridge
Murwillumbah Lavender Ck
Commercial Road (Reader)
Bray Park Weir
Eungella
Tyalgum_Bridge
Bakers Byangum (Reader)
Tweed @ Uki
558009 Clarrie Hall Dam Rd
Tweed R @ D/s Palmer
558028 Clarrie Hall Dam


Tyalgum_Bridge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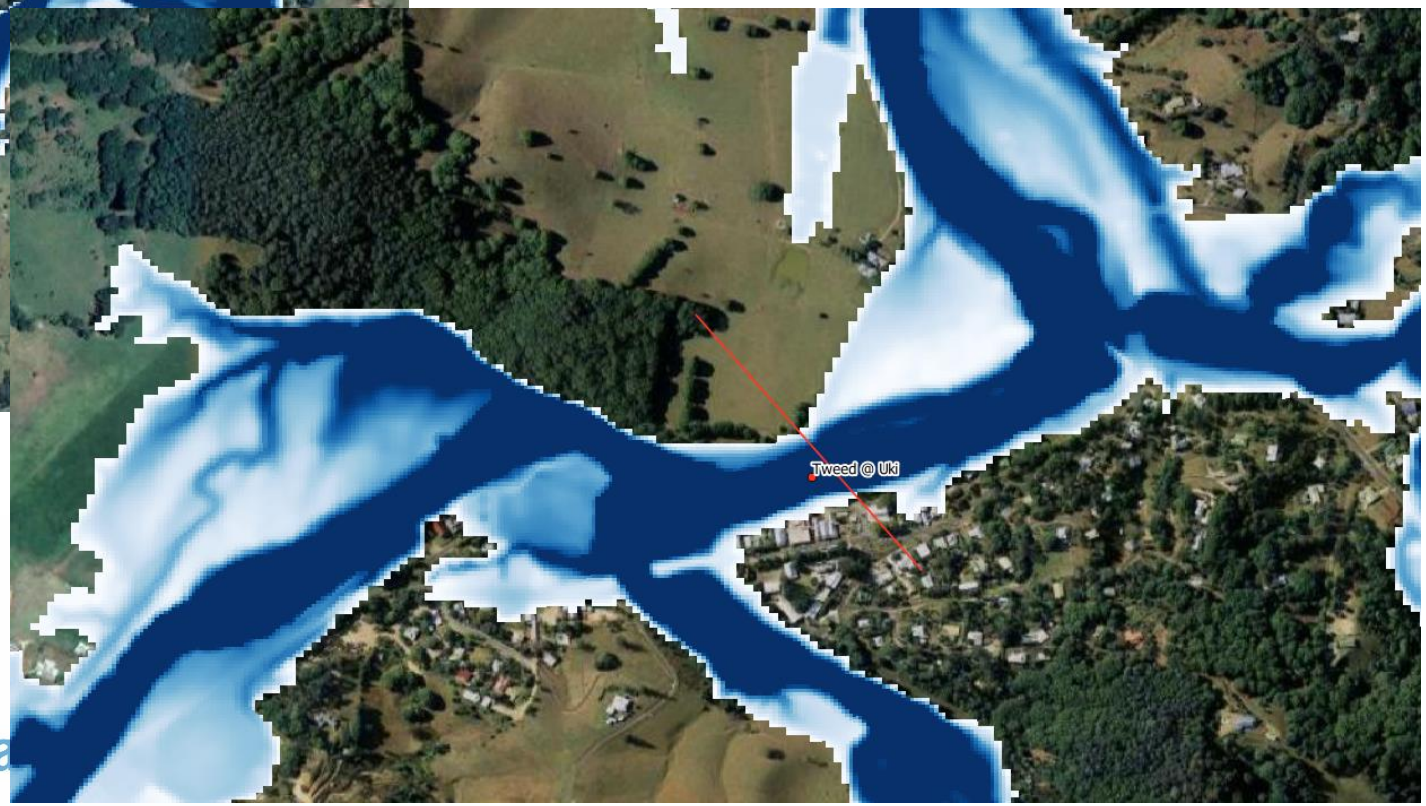
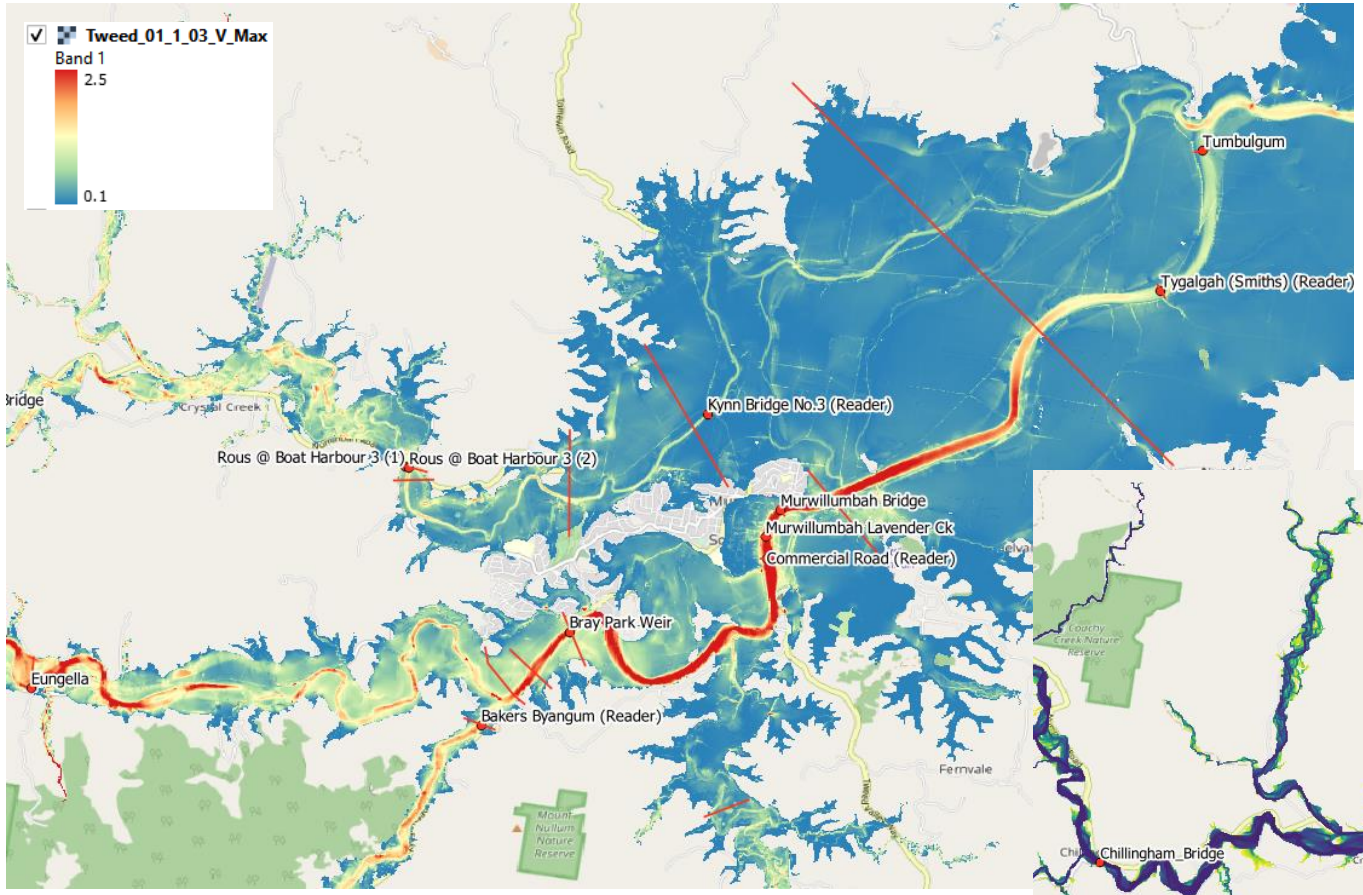
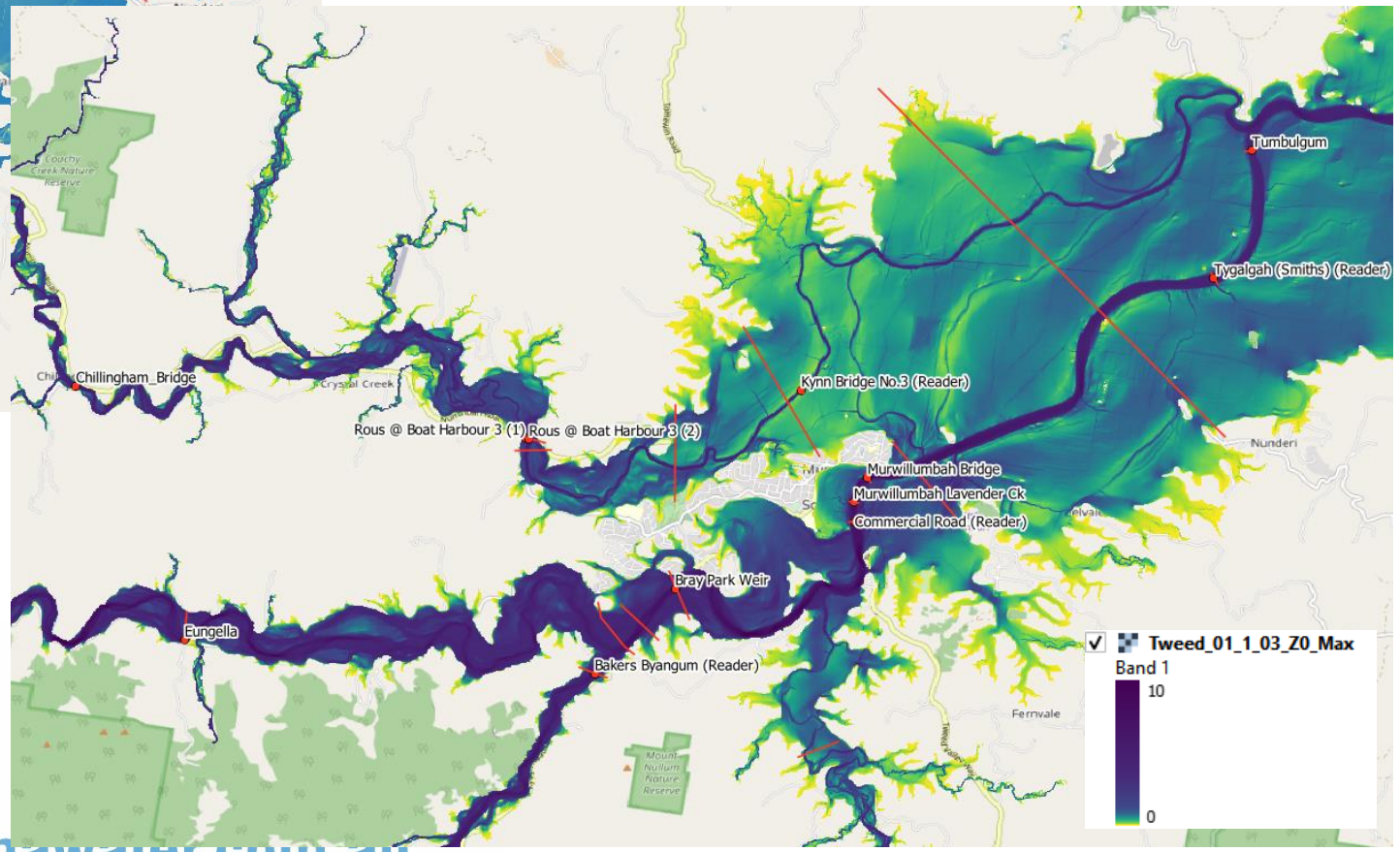
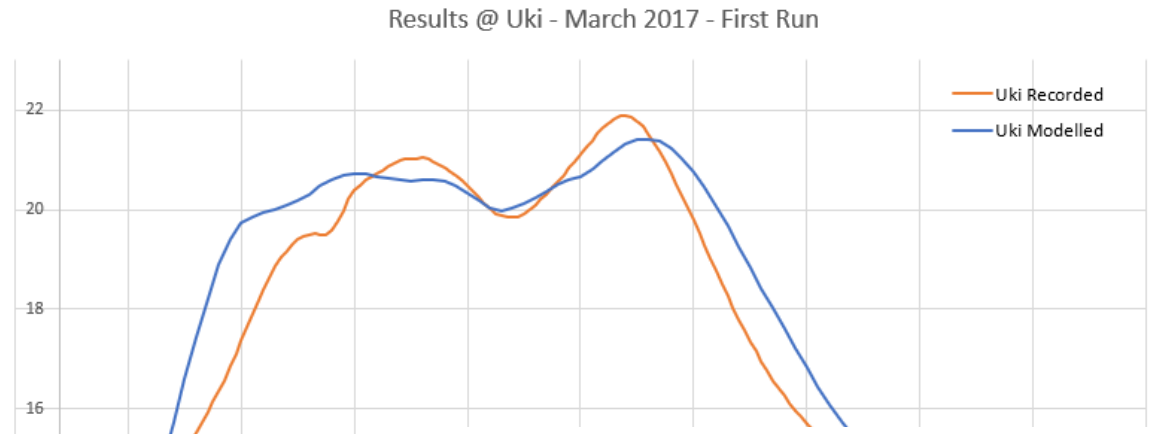
Band 1
5
0.2


Tweed @ Uki


Tweed_01_1_03_V_Max
Band 1
2.5
0.1
Tumbulgum
Tygalgah (Smiths) (Reader)
Kynn Bridge No:3 (Reader)
Rous @ Boat Harbour 3 (1)
Rous @ Boat Harbour 3 (2)
Murwillumbah Bridge
Murwillumbah Lavender Ck
Commercial Road (Reader)
Bray Park Weir
Eungella
Bakers Byangum (Reader)
Fernvale

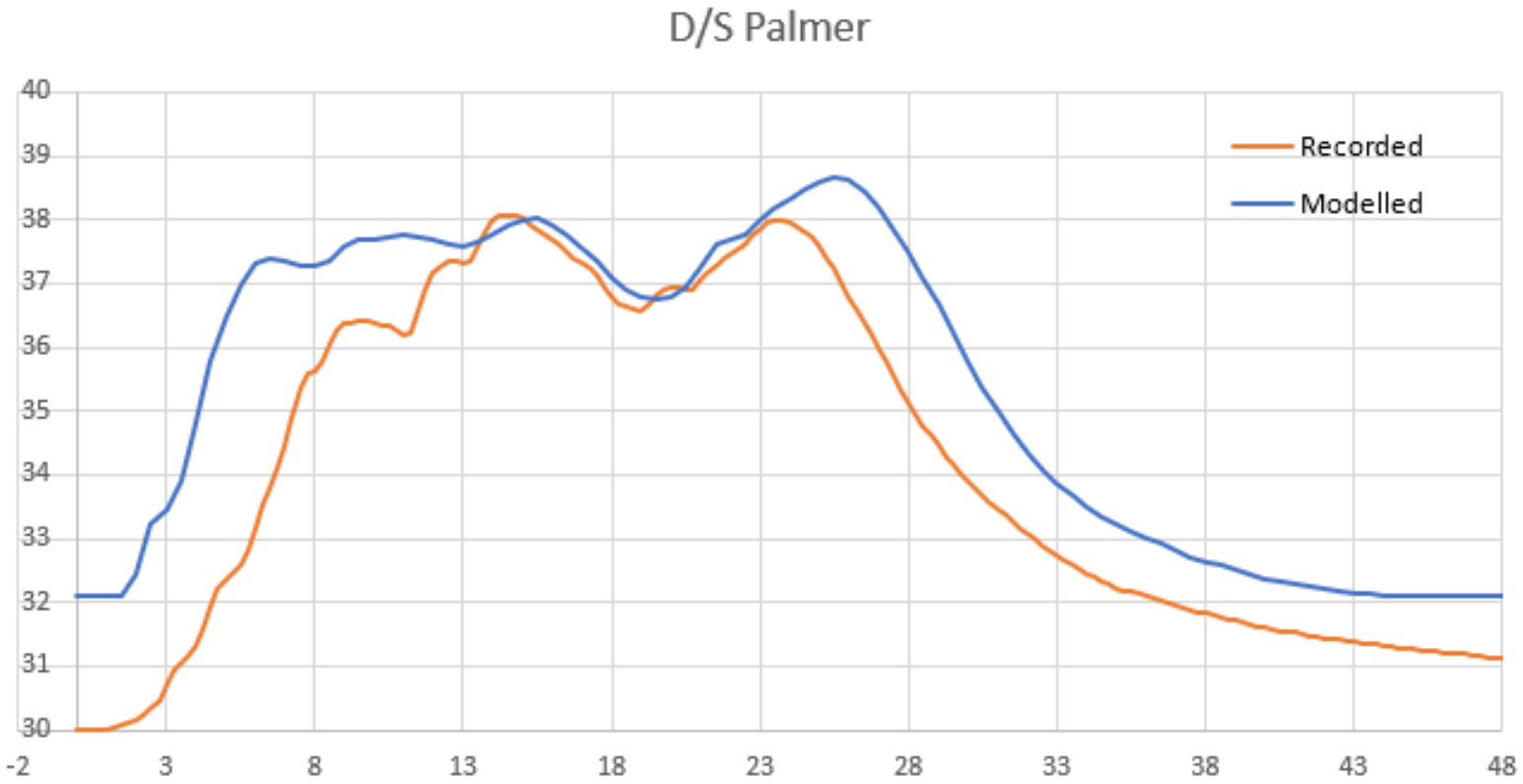

Tumbulgum
Tygalgah (Smiths) (Reader)
Chillingham_Bridge
Kynn Bridge No:3 (Reader)
Rous @ Boat Harbour 3 (1)
Rous @ Boat Harbour 3 (2)
Murwillumbah Bridge
Murwillumbah Lavender Ck
Commercial Road (Reader)
Bray Park Weir
Eungella
Bakers Byangum (Reader)
Fernvale
Tweed_01_1_03_Z0_Max
Band 1
10
0



Levels look good as do general response

Flows, similar to post event review are not well matched – rating curve issue likely

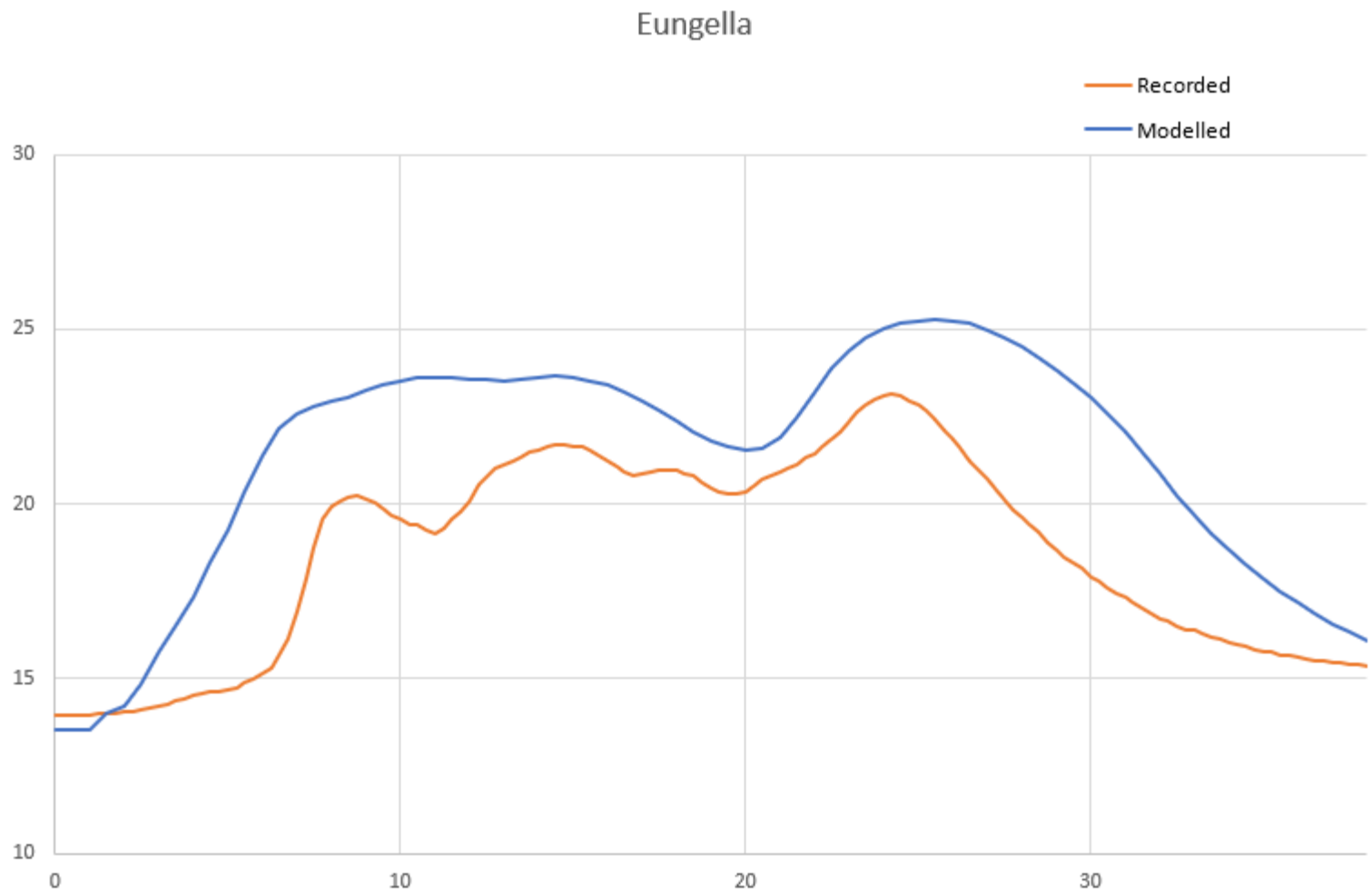
Will need to further review Clarrie Hall Dam Response to confirm appropriate



General Over Estimation of Level and Volume

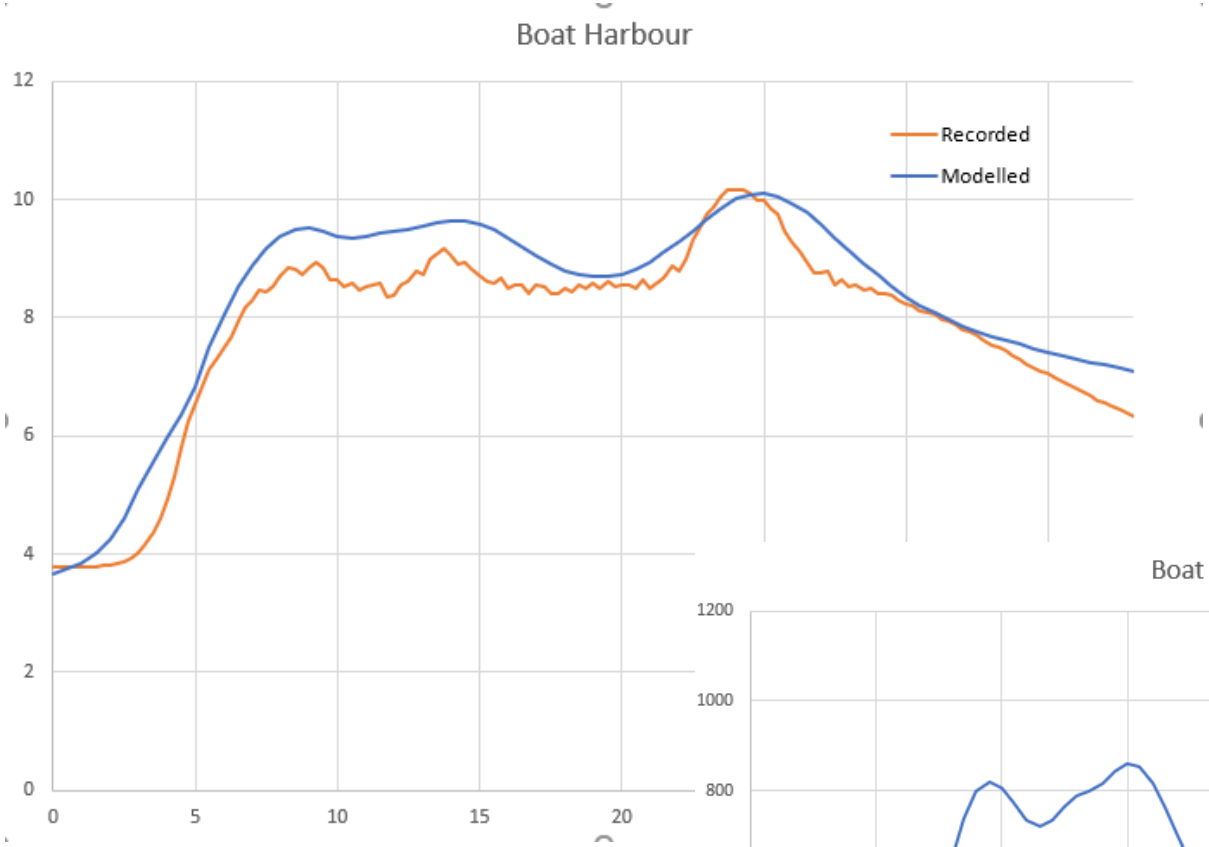
Additional initial loss required (or review of rainfall applied)

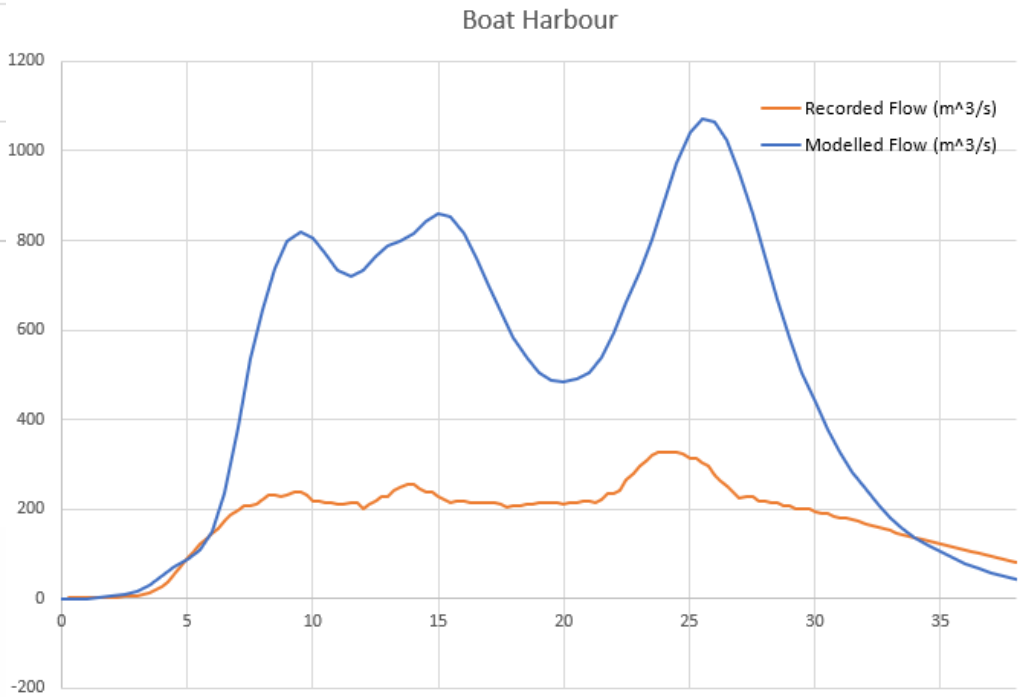
Work to be done



General Over Estimation of Level – not unexpected given the results at Palmer.

Revision of Losses Required to obtain better response

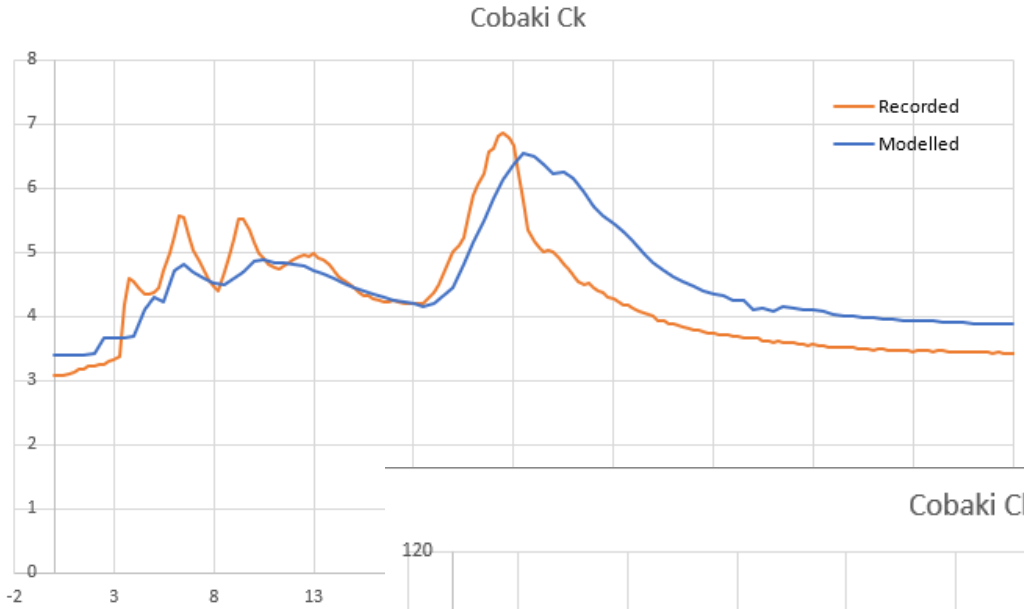


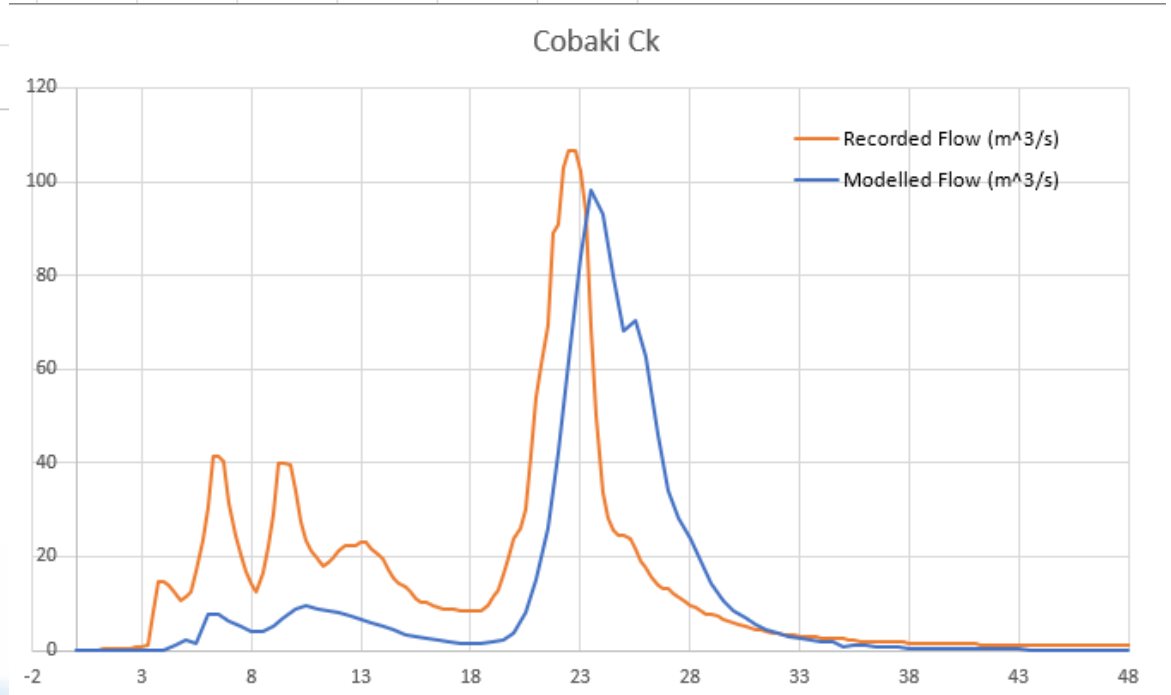


Generally good match to level

Flow results show poor correlation – known issue from previous assessments

Current study will improve council understanding of this issue





Generally good match to level and flow however general response is delayed

This is not unexpected given the regional parameters of the hydrology

Local validation will improve this result

Additional Calibration Steps

- We are currently comparing information at the other locations
- Flood survey points will be assessed to inform level validation away from gauges
- Review upper catchment response
- Refine roughness elements and parameters

Next Steps

- Incorporation of community consultation feedback into model setup and assessment
- Refine hydrologic parameters and hydraulic model
- Rating Curve Reviews at key gauges
- Running of other calibration events
- Begin setup of design event models