Sussex Inlet, St Georges Basin, Swan Lake and Berrara Creek CMP – Stage 2

Coastal Management Committee presentation

4 May 2022

This project is being supported with funding from the NSW Government's – Coastal and Estuary Grants Program.

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Acknowledgement of Country

We would like to acknowledge the Traditional Custodians of the land in which we gather upon today. We acknowledge their continuing connections to the land, culture and community. We pay respect to Elders past, present and future.

Presentation outline

- Vision and Purpose of the CMP
- What has been covered in Stage 2?
  - Tidal Inundation and sea level rise
  - Navigation and safety
  - Erosion
  - Cultural and social
  - Ecological environment
  - Water quality
- What have we heard from our consultation so far?
- Next Steps

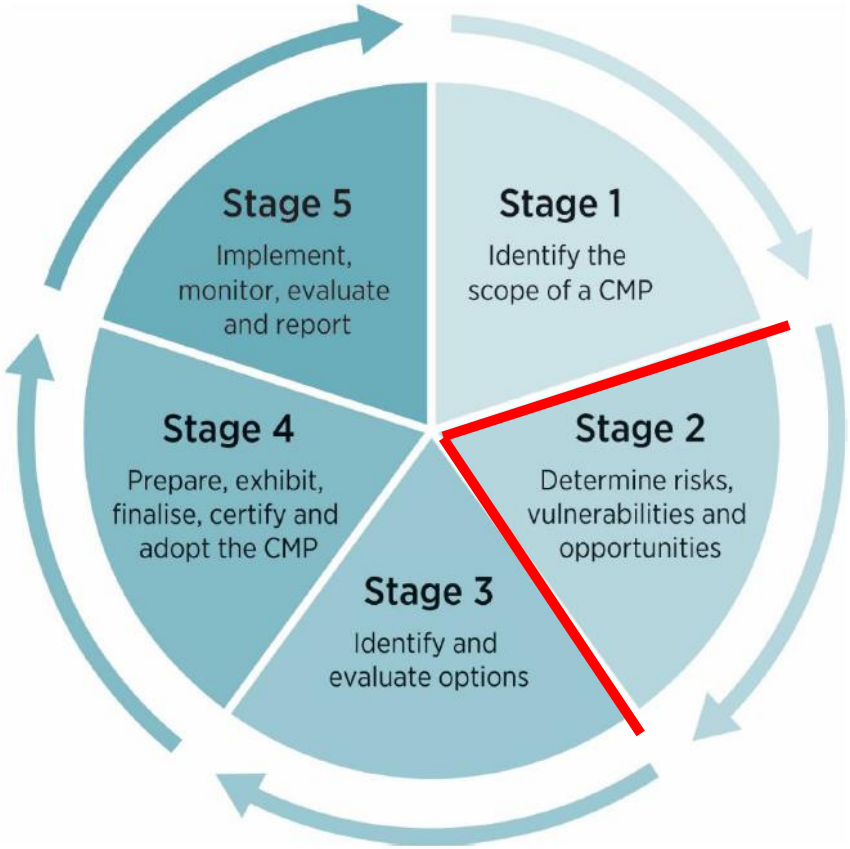
Vision and Purpose of the St Georges Basin, Sussex Inlet, Swan Lake and Berrara Creek CMP

Vision: *We care for and protect St Georges Basin, Sussex Inlet, Swan Lake and Berrara Creek so that current & future generations continue to be refreshed & inspired by their coastal experience.*

Purpose: *"to develop a plan for the future management of St Georges Basin, Sussex Inlet, Swan Lake and Berrara Creek in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the Shoalhaven".*

What has been covered in Stage 2?

- Specialist studies to determine key risks and issues
- Individual studies to assess in detail
  - Tidal Inundation and sea level rise
  - Navigation and safety
  - Erosion
  - Cultural and social
  - Ecological environment
  - Water quality
- How can we best manage the estuaries into the future?

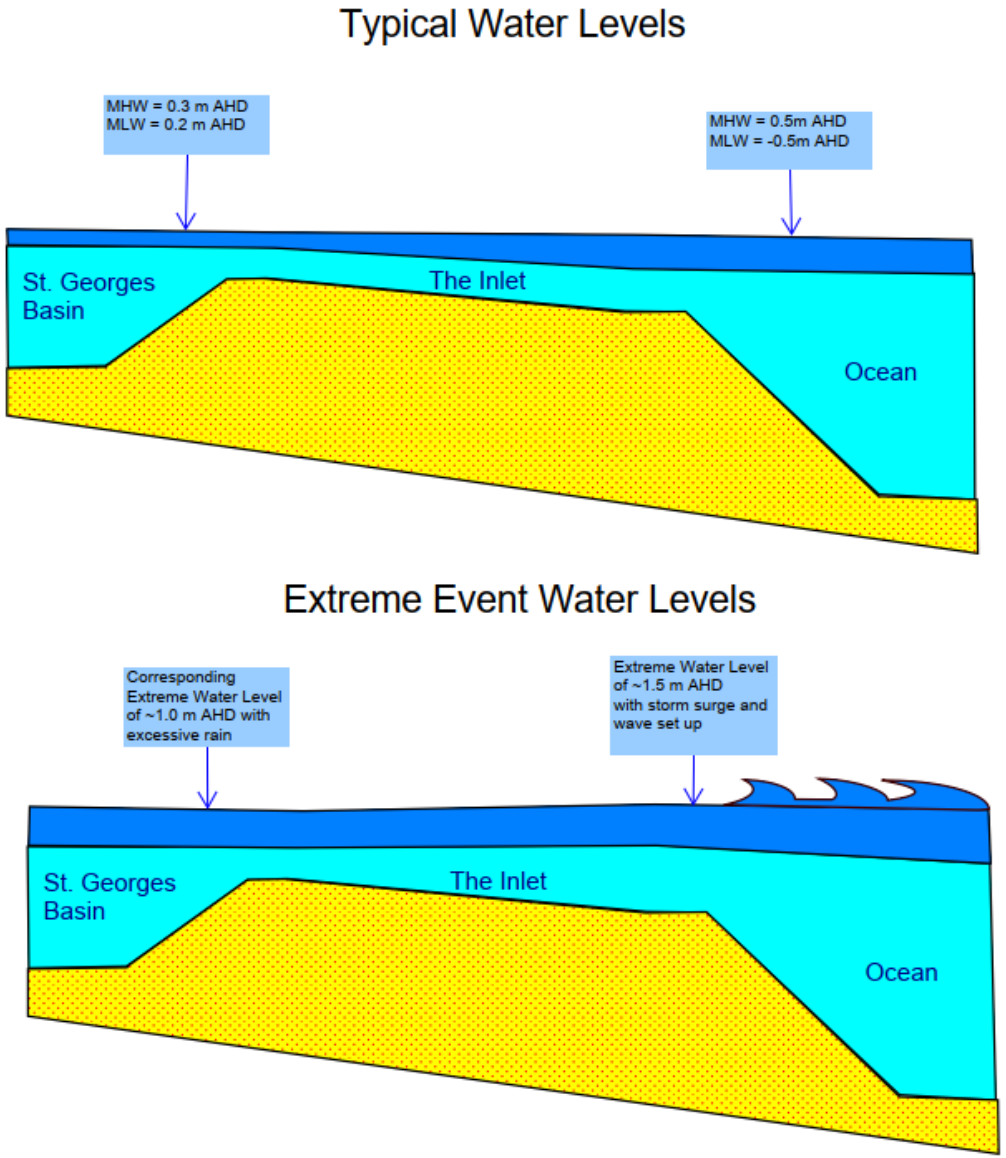


(WE ARE HERE)

Inundation and sea level rise

What Is Tidal Inundation?

- Tidal inundation refers to inundation of the low-lying land surrounding the waterways that occurs due to oceanic tides
- Can occur independently of rainfall events that cause catchment-based flooding.
- A hydrodynamic model has been developed to quantify the risk



Inundation and sea level rise

Which areas are at risk?

- Sussex Inlet
- Northern foreshore of St Georges Basin.

What factors affect tidal inundation?

- High water levels on the ocean side of the estuary moving up the estuary from the ocean
- Channel bathymetry, wind speed and direction, wave action at the estuary mouth, astronomic tides.
- Risk expected to increase with future sea level rise.

Hydrodynamic Model – Sussex Inlet

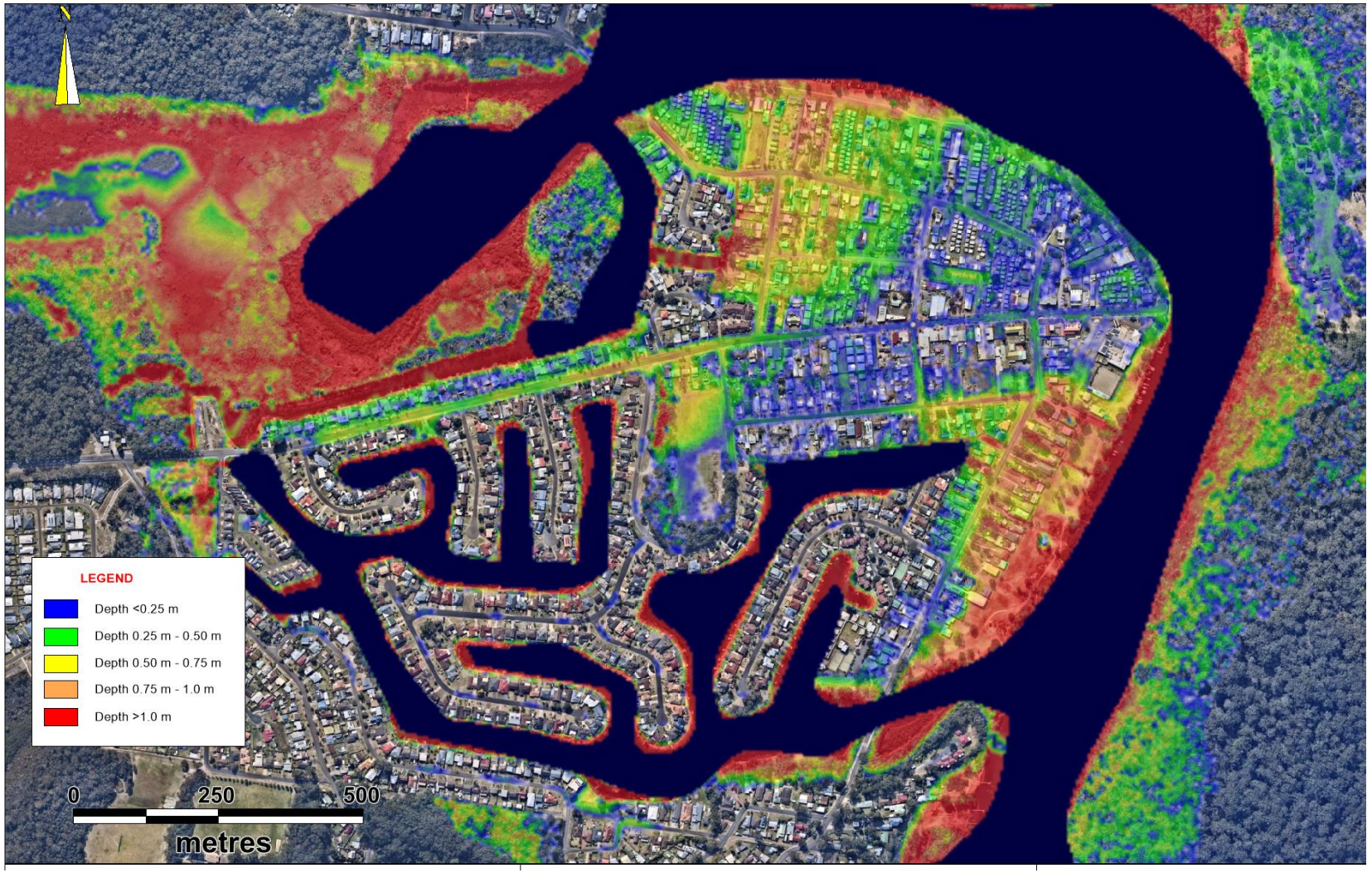
Considering different combinations of:

- Sea level rise
- Estuary entrance bathymetry
- Wind speeds/directions
- Ocean water levels

Present Day

(20 year Average Recurrence Interval ARI event)

- Southerly wind 32m/s

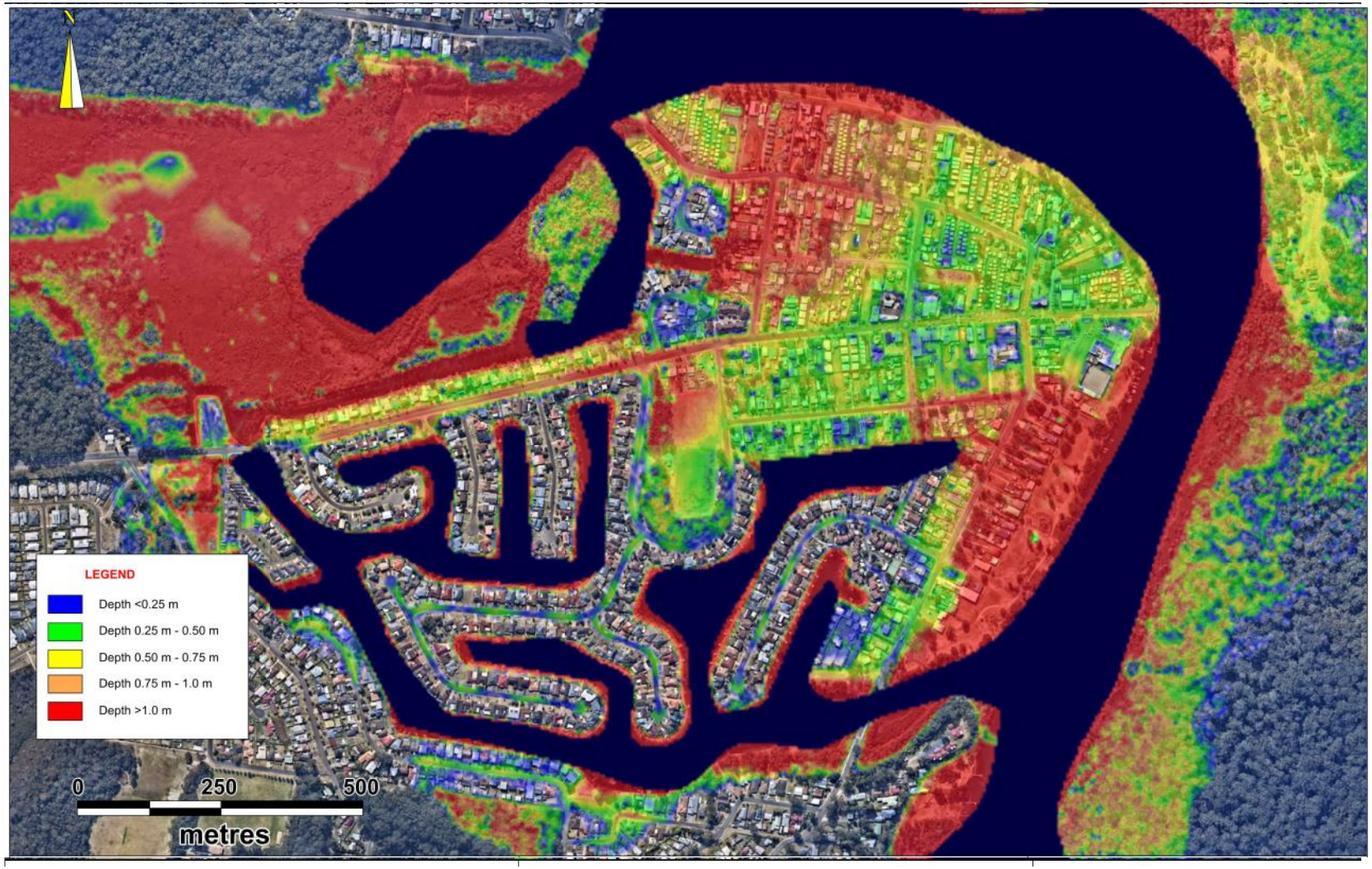


Hydrodynamic Model – Sussex Inlet

0.36m SLR

(20 year Average Recurrence Interval ARI event, 0.36m SLR)

- Southerly wind 32m/s

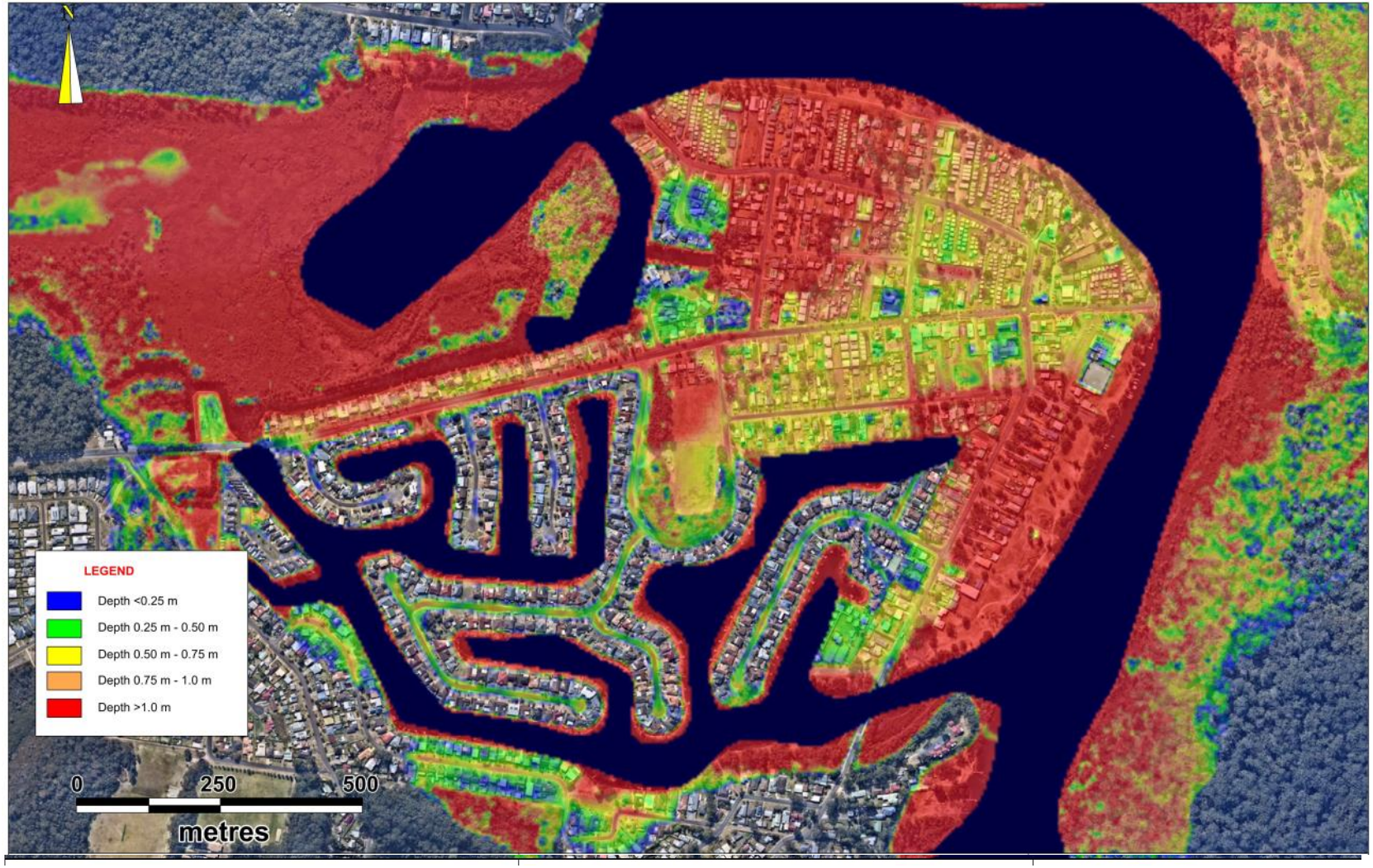


Hydrodynamic Model – Sussex Inlet

0.6m SLR

(20 year Average Recurrence Interval ARI event, 0.6m SLR)

- Southerly wind 32m/s

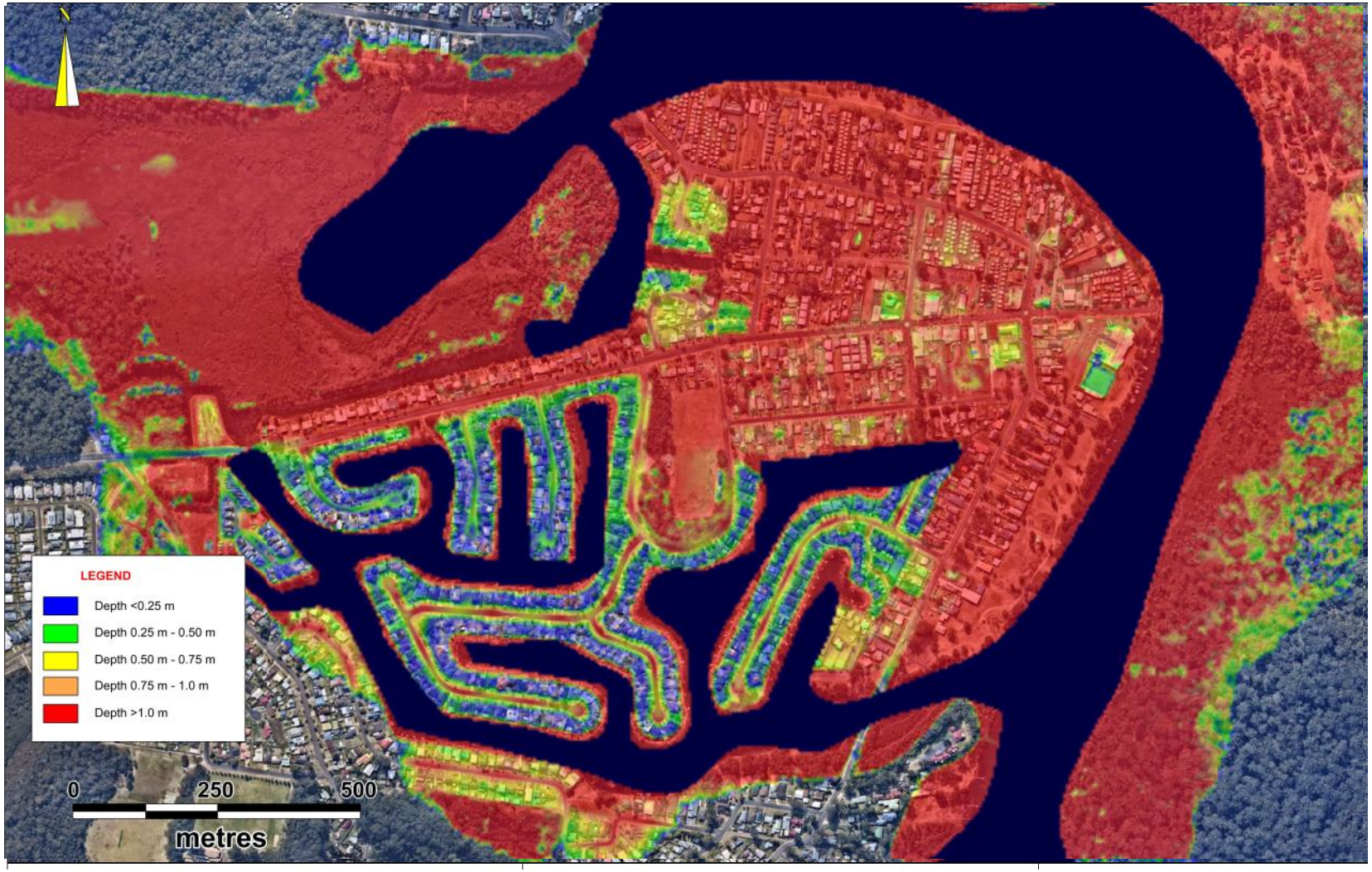


Hydrodynamic Model – Sussex Inlet

0.9m SLR

(20 year Average Recurrence Interval ARI event, 0.9m SLR)

- Southerly wind 32m/s

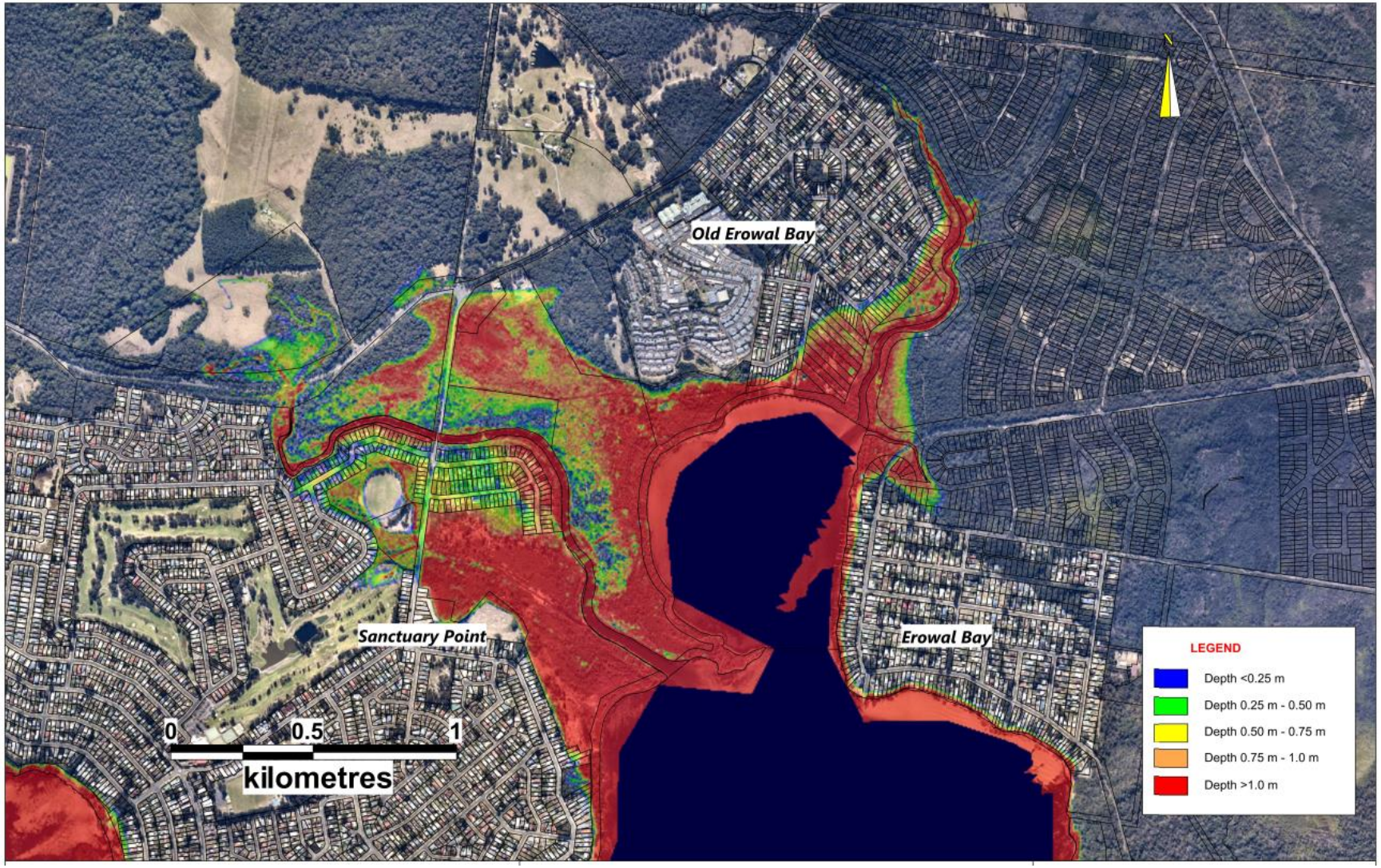


Hydrodynamic Model – St.Georges Basin

Present Day

(20 year ARI event)

- Southerly wind 32m/s



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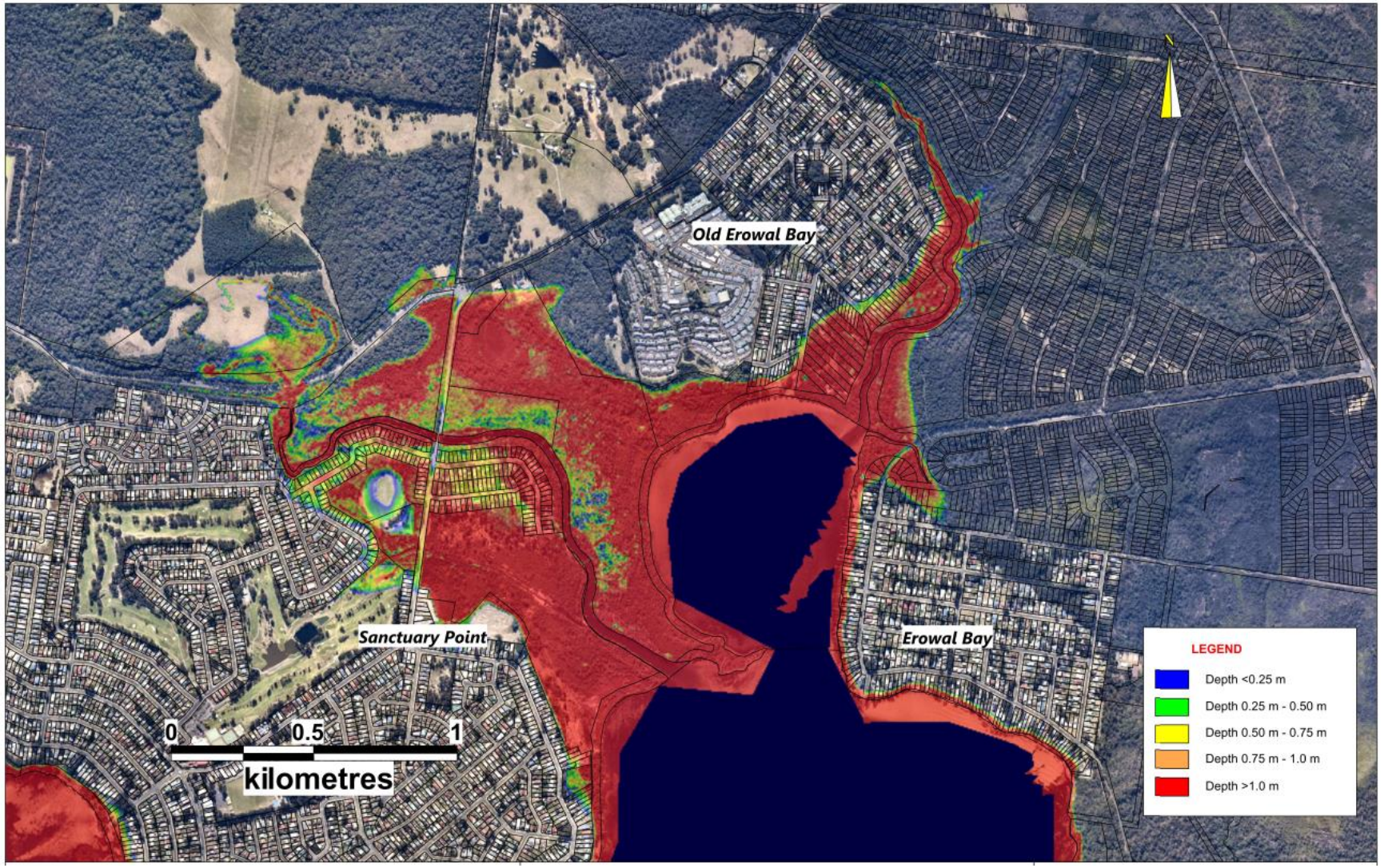

Hydrodynamic Model – St.Georges Basin

0.6m SLR

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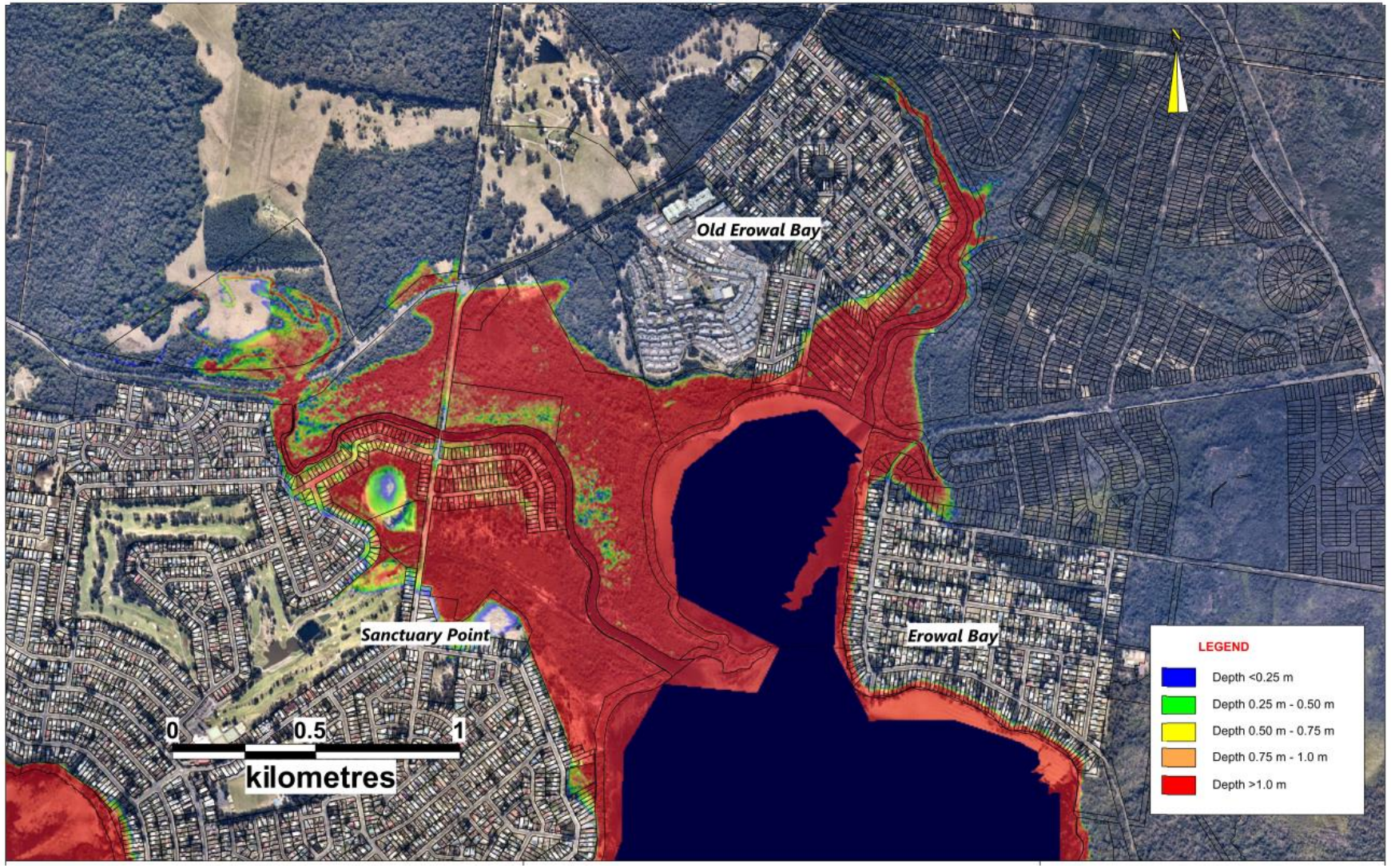

Hydrodynamic Model – St.Georges Basin

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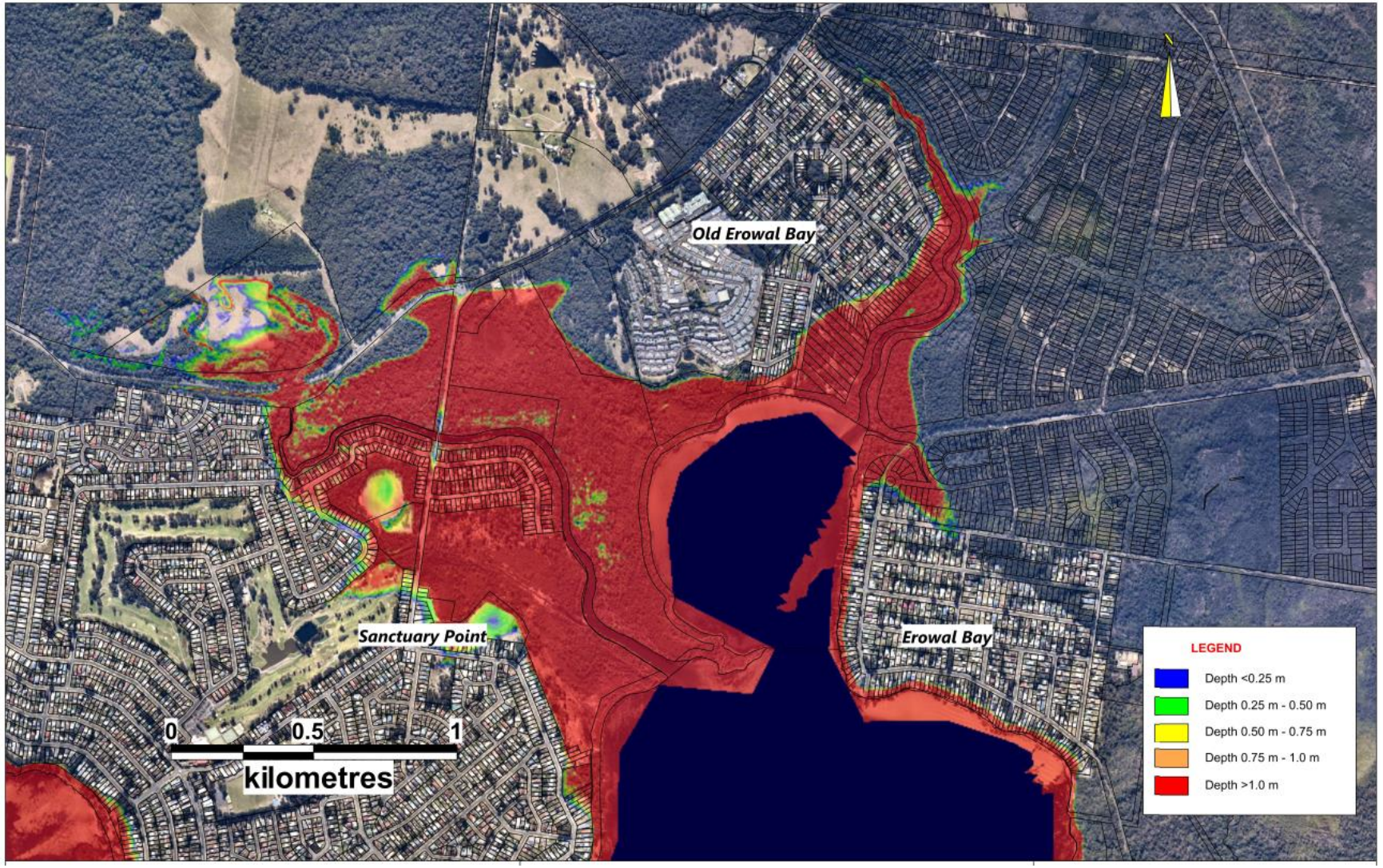
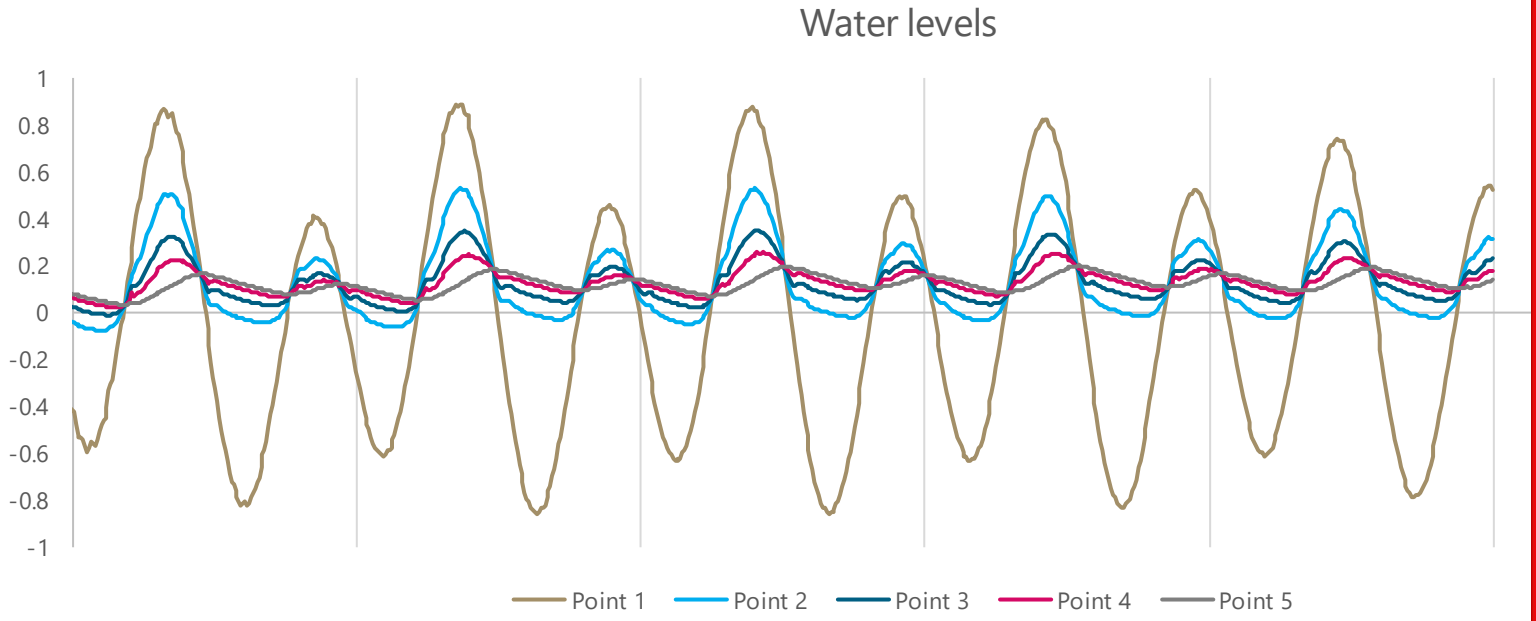
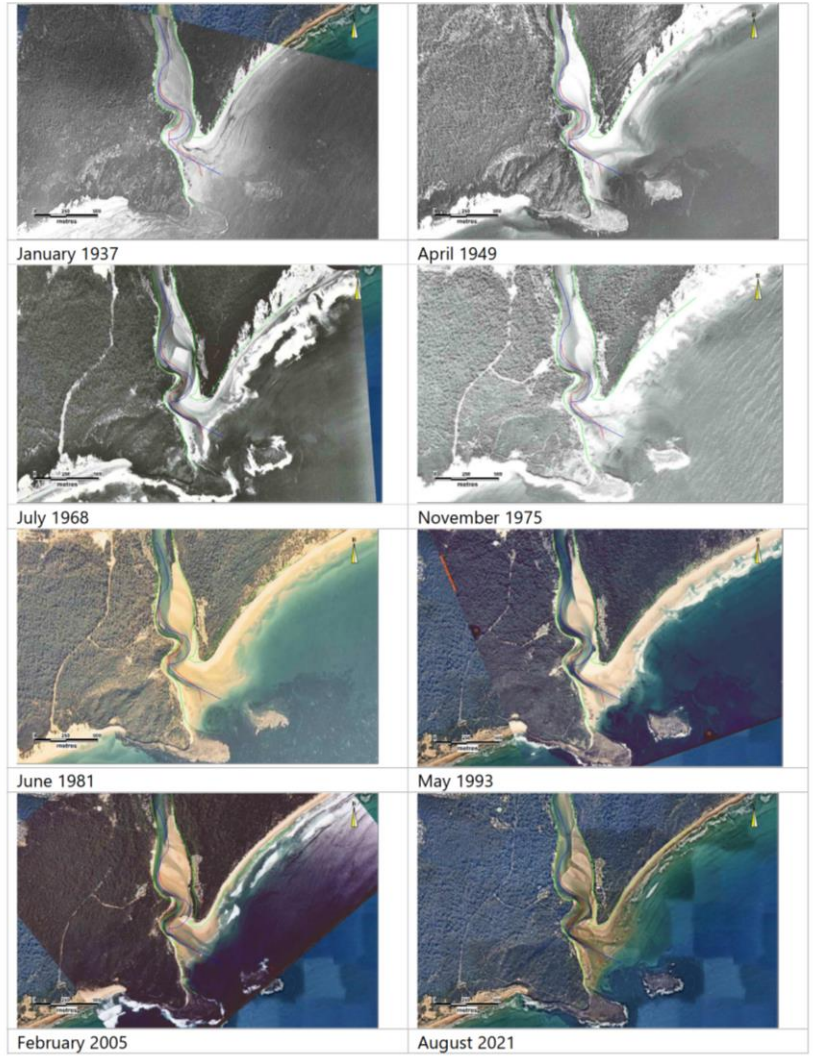
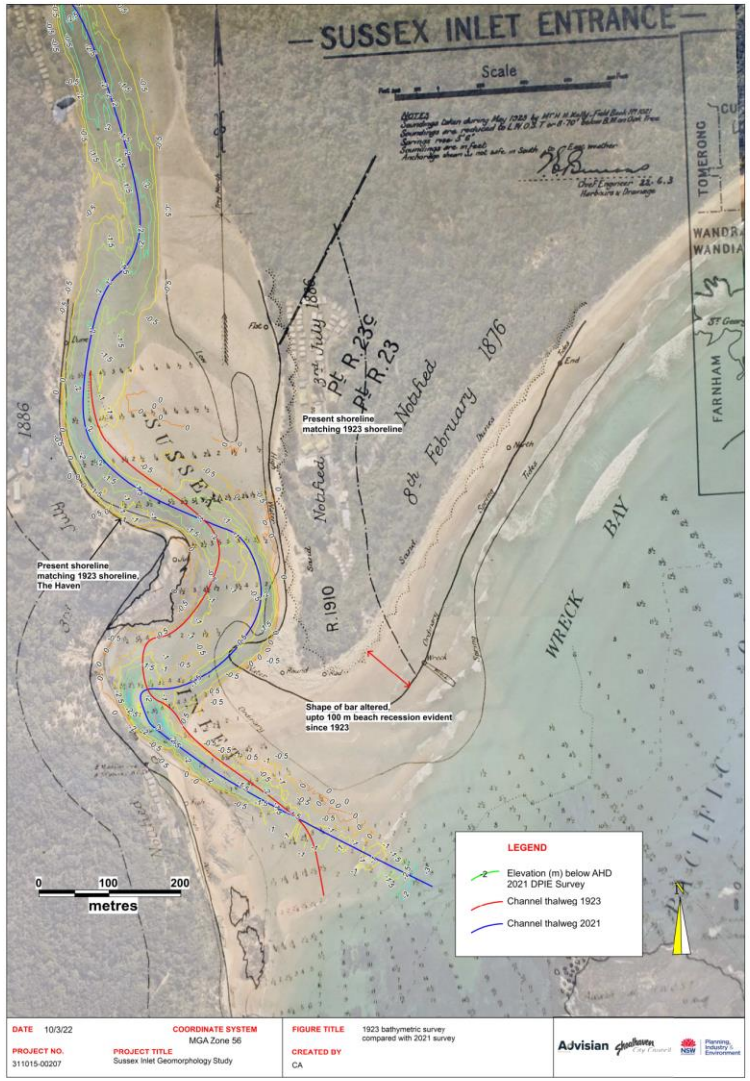


Variation in tidal range with distance upstream

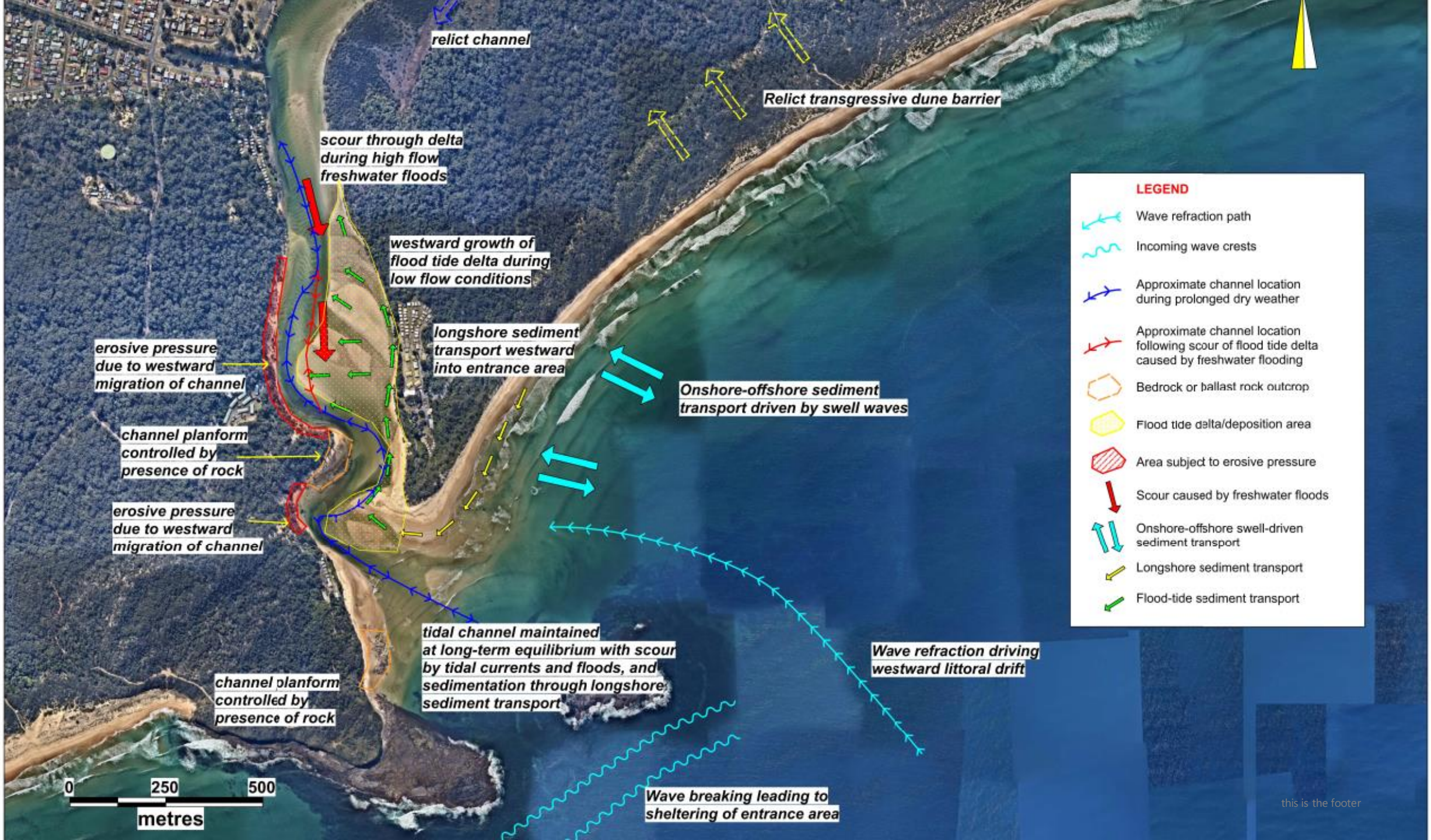


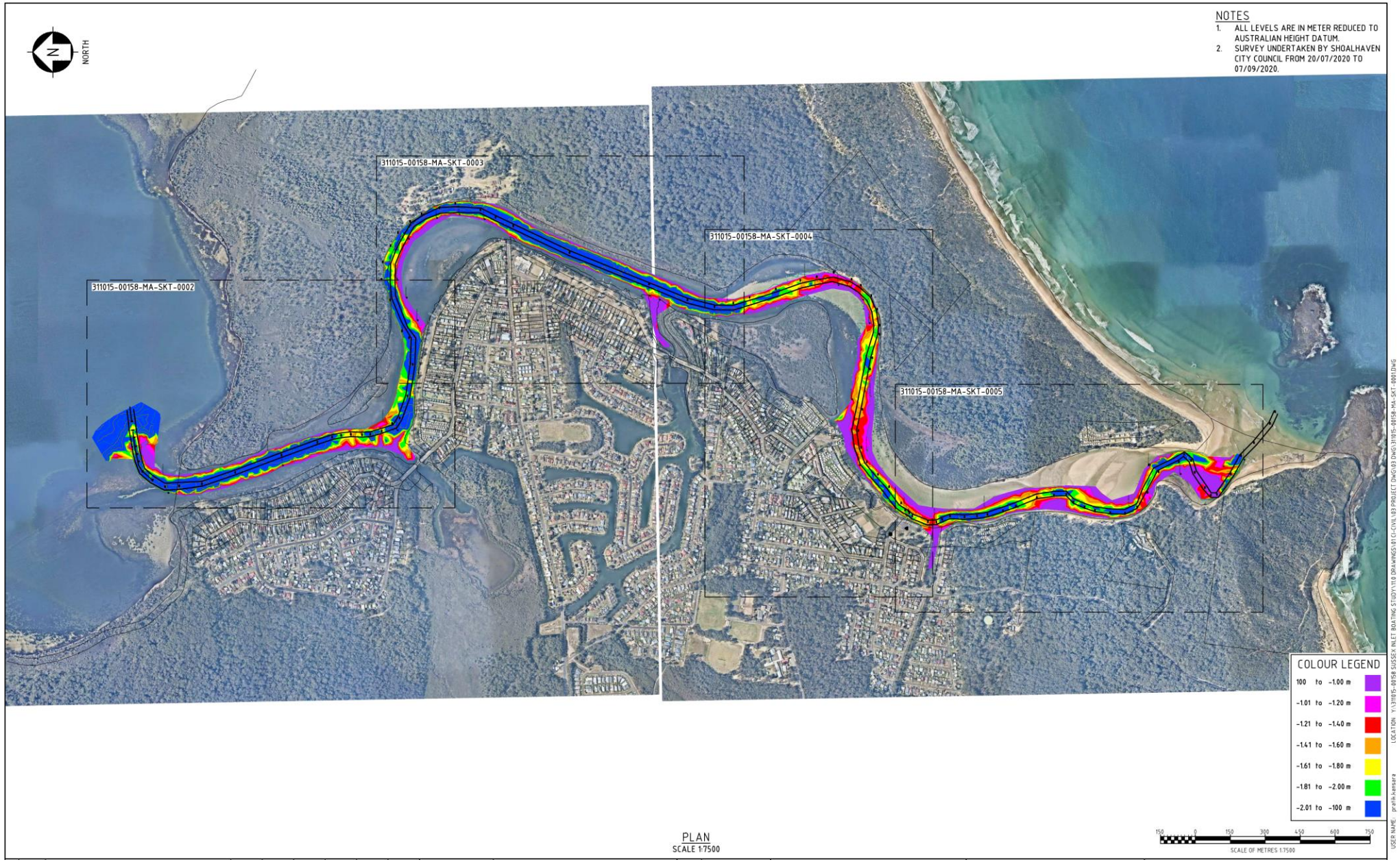
Sussex Inlet Geomorphology Assessment





- Effect of historical ballast rock
- Coastal processes
- Tidal inlet dynamics – stability of inlet and tidal bar


relict channel
Relict transgressive dune barrier
scour through delta during high flow freshwater floods
westward growth of flood tide delta during low flow conditions
longshore sediment transport westward into entrance area
erosive pressure due to westward migration of channel
Onshore-offshore sediment transport driven by swell waves
channel planform controlled by presence of rock
erosive pressure due to westward migration of channel
tidal channel maintained at long-term equilibrium with scour by tidal currents and floods, and sedimentation through longshore sediment transport
Wave refraction driving westward littoral drift
channel planform controlled by presence of rock
Wave breaking leading to sheltering of entrance area
0
250
500
metres
LEGEND
Wave refraction path
Incoming wave crests
Approximate channel location during prolonged dry weather
Approximate channel location following scour of flood tide delta caused by freshwater flooding
Bedrock or ballast rock outcrop
Flood tide delta/deposition area
Area subject to erosive pressure
Scour caused by freshwater floods
Onshore-offshore swell-driven sediment transport
Longshore sediment transport
Flood-tide sediment transport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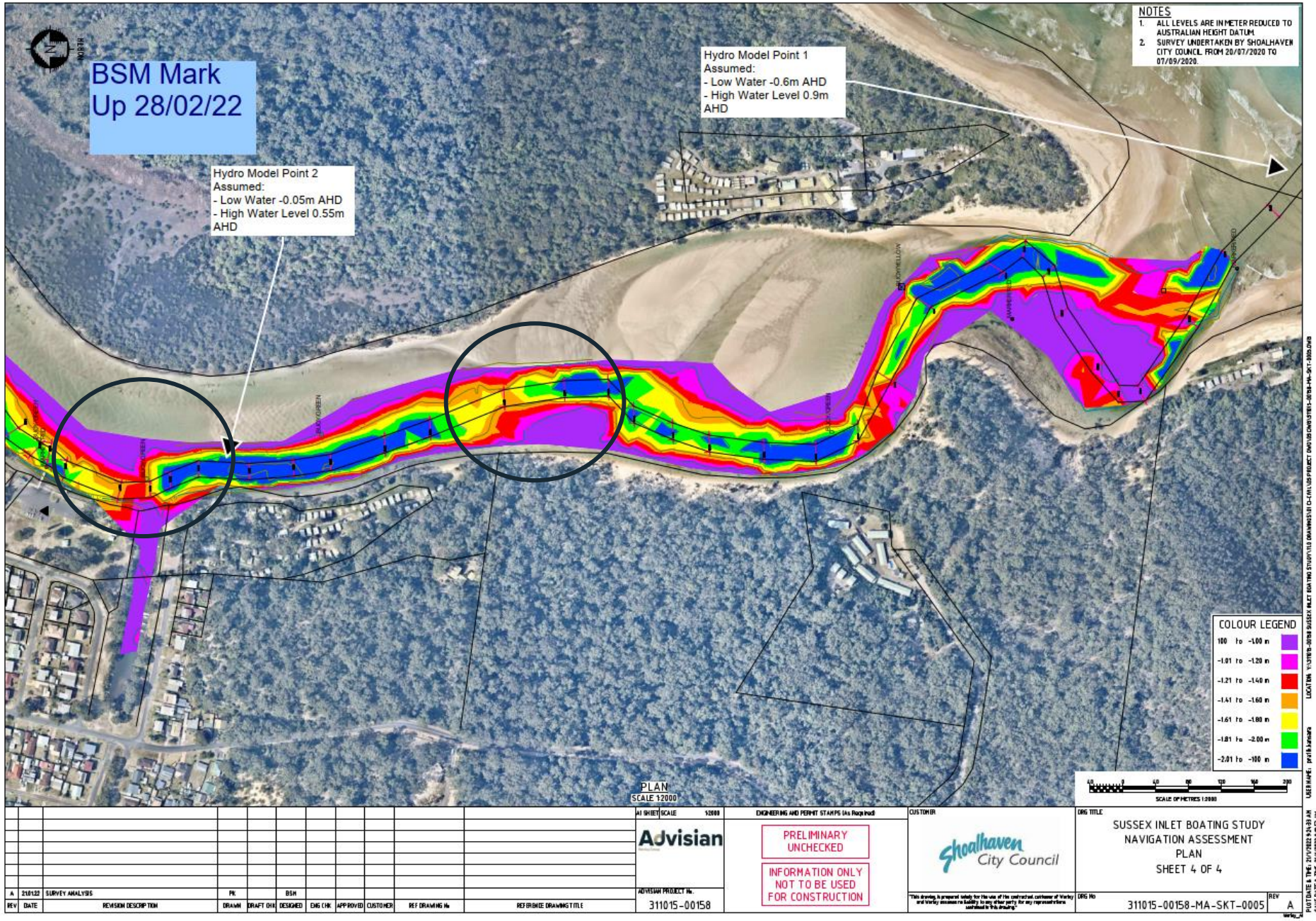
2. SURVEY UNDERTAKEN BY SHOALHAVEN CITY COUNCIL FROM 20/07/2020 TO 07/09/2020.
NORTH
311015-00158-MA-SKT-0002
311015-00158-MA-SKT-0003
311015-00158-MA-SKT-0004
311015-00158-MA-SKT-0005
COLOUR LEGEND
100 to -1.00 m
-1.01 to -1.20 m
-1.21 to -1.40 m
-1.41 to -1.60 m
-1.61 to -1.80 m
-1.81 to -2.00 m
-2.01 to -100 m
150 0 150 300 450 600 750
SCALE OF METRES 1:7500
PLAN
SCALE 1:7500


BSM Mark
Up 28/02/22
Hydro Model Point 1
Assumed:
- Low Water -0.6m AHD
- High Water Level 0.9m AHD
Hydro Model Point 2
Assumed:
- Low Water -0.05m AHD
- High Water Level 0.55m AHD
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-1.61 to -1.80 m
-1.81 to -2.00 m
-2.01 to -100 m
PLAN
SCALE 1:2000
SCALE OF METRES 1:2000
A1 SHEET SCALE 1:2000
ENGINEERING AND PERMIT STAMPS (As Required)
Advisian
PRELIMINARY UNCHECKED
INFORMATION ONLY NOT TO BE USED FOR CONSTRUCTION
CUSTOMER
Shoalhaven City Council
DRG TITLE
SUSSEX INLET BOATING STUDY
NAVIGATION ASSESSMENT
PLAN
SHEET 4 OF 4
ADVISIAN PROJECT No.
311015-00158
DRG No
311015-00158-MA-SKT-0005
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SURVEY ANALYSIS
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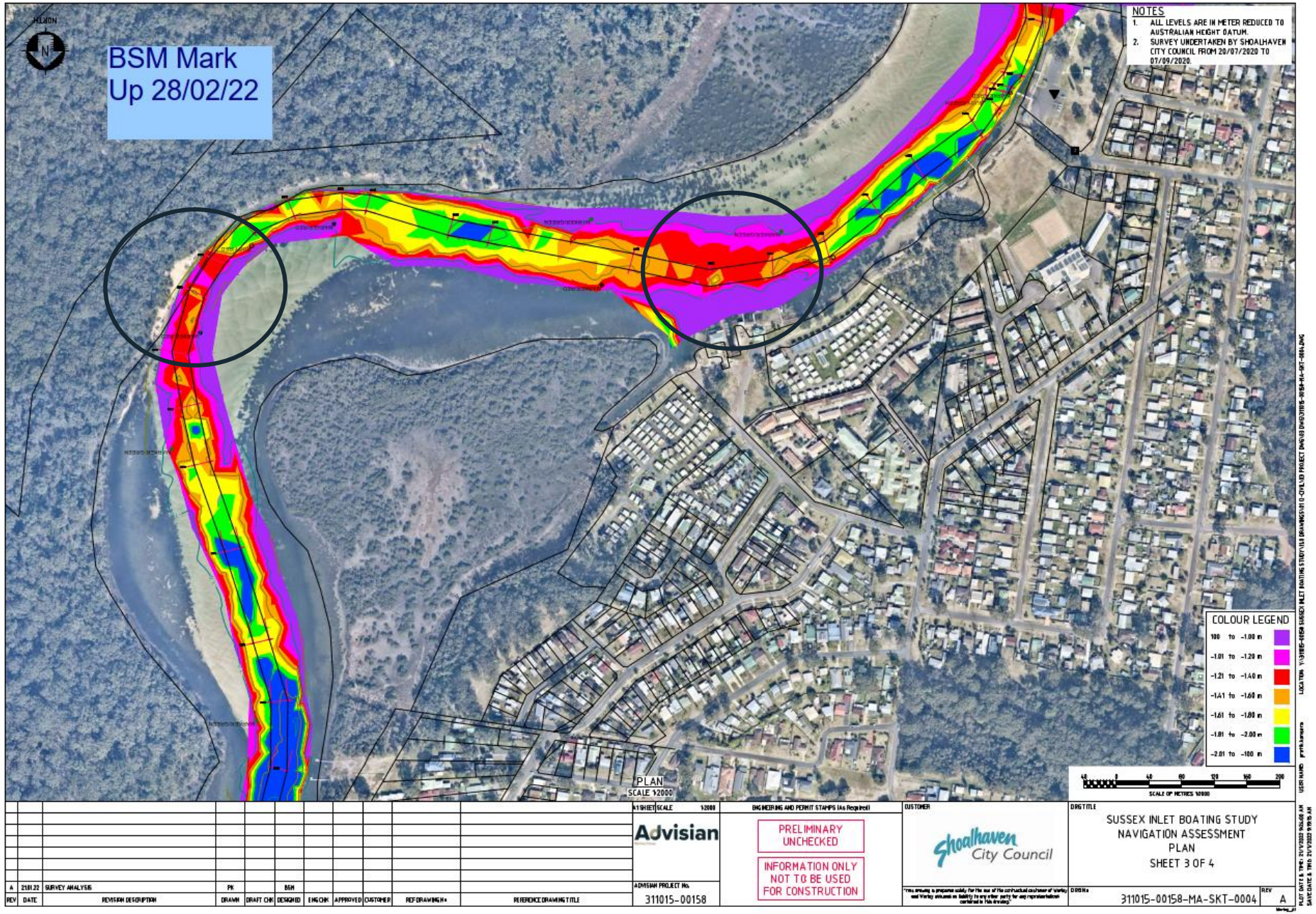
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SURVEY ANALYSIS
PK
BSH

Erosion

How have we assessed erosion?

- Bank inspections from the water and by foot.
- Foreshore erosion has been mapped as minor, moderate or severe.
- A Decision Support Tool has been developed to assess foreshore erosion

Erosion

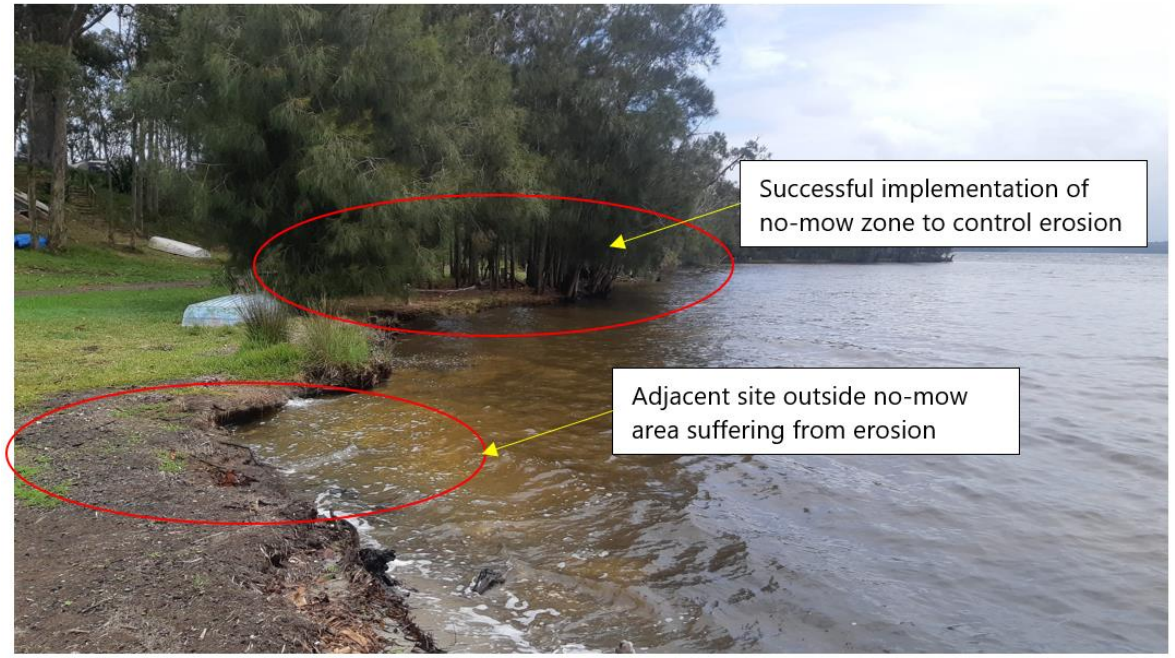
Which key areas are worst affected?

- St Georges Basin – northern foreshores
- Wandandian Creek
- Berrara Creek – northern foreshore
- Sussex Inlet - The Haven, Little Manly. Upstream of Christians Minde on the outside of a channel bend, at Alamein and within the Canals.

What are the causes of erosion?

- Wave action from ocean, wind or vessel waves
- Meandering of channels/tidal currents
- Slope instability
- Stock and public access to foreshore
- Lack of stabilising foreshore vegetation
- High water levels and winds

Management Actions



Bank segment ID	Erosion Severity	Environmental Impact	Infrastructure / commercial impact	Amenity / safety impact	Future Trajectory
S011 (Little Manly)	High	High	Low	Medium	Occurring and continuing
H01 (The Haven u/s)	High	Medium	Low	Medium	Occurring and continuing
H03 (Haven d/s)	High	Medium	Low	Medium	Occurring and continuing
S006 (u/s Christians Minde)	High	Medium	Negligible	Negligible	Occurring and continuing
S012 (Alamein)	Moderate	High	Medium	Medium	Occurring and continuing
S004 (u/s Nielson L)	Moderate	Medium	Low	Medium	Occurring and continuing
S010 (Chris Creek)	Moderate	Medium	Low	Low	Occurring and continuing
H05 (Croppers)	Moderate	Low	Low	Medium	Occurring and continuing
S005 (d/s Nielson L)	Moderate	Low	Low	Low	Occurring and continuing
H02 (Haven central)	Low	Low	Low	Low	Not occurring but likely
H04 (Haven u/s croppers)	Low	Low	Low	Low	Occurring and continuing
S001 (Fairview Cres)	Low	Low	Low	Low	Occurring and continuing
S003 (Badgee d/s bridge)	Low	Low	Low	Low	Occurring and continuing
S008 (River Rd)	Low	Low	Low	Low	Occurring and continuing
S009 (island in Quays)	Low	Low	Low	Low	Not occurring but likely
S007 (RSL foreshore)	Low	Negligible	Low	Low	Not occurring not likely
S002 (Badgee Lagoon)	Low	Low	Negligible	Negligible	Occurring and continuing

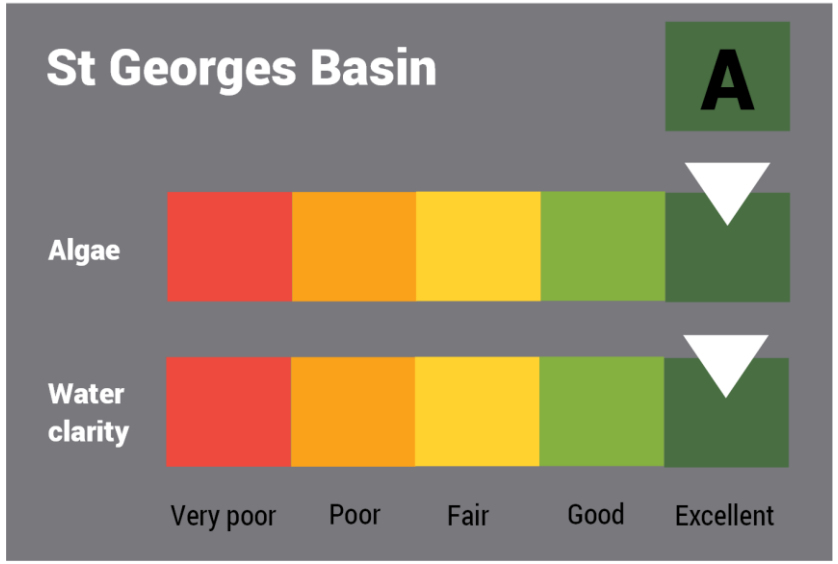
Cultural and Social

- Project Team had a site walkover at Berrara Creek with the local Jerrinja people
- A number of important issues, concerns and opportunities for the study area which has over 120 identified cultural sites was identified and condensed below.
- The main concerns and issues raised were:
  - Protection of cultural sites
  - Education to the broader community and its visitors
  - Collaboration with contractors and Government agencies when working on culturally sensitive land

Water quality

St Georges Basin

- Water quality is considered to be very good to excellent. There is sufficient flushing and dilution to maintain water quality.
- Estuary health for St Georges Basin was ranked in the highest category "A" Excellent by NSW DPIE based on 2020-2021 water quality monitoring.
- Occasional turbidity and low dissolved oxygen, poorer water quality in the tributaries, build up of seagrass wrack

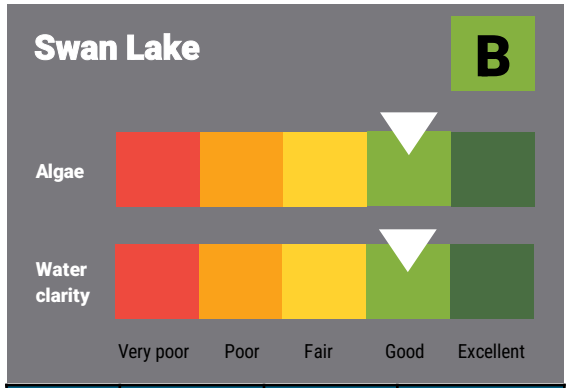


Year	Overall Grade	Algae	Water Clarity
2021	A	A	A
2019-20 Bushfires			
2010-11	B	B	B
2008-09	A	A	A

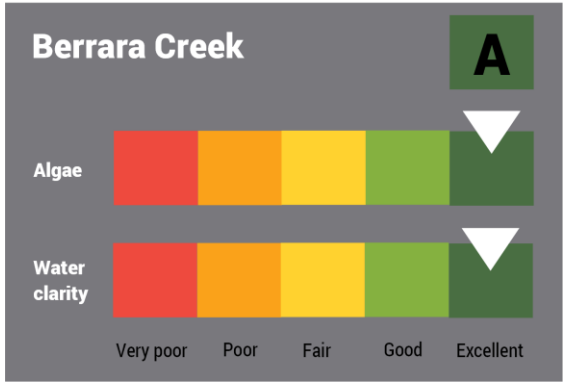
Water quality

Sussex Inlet, Swan Lake, Berrara Creek

- Overall, water quality within Berrara Creek is moderate to good. Water quality in Sussex Inlet and Swan Lake is very good to excellent for recreational quality.



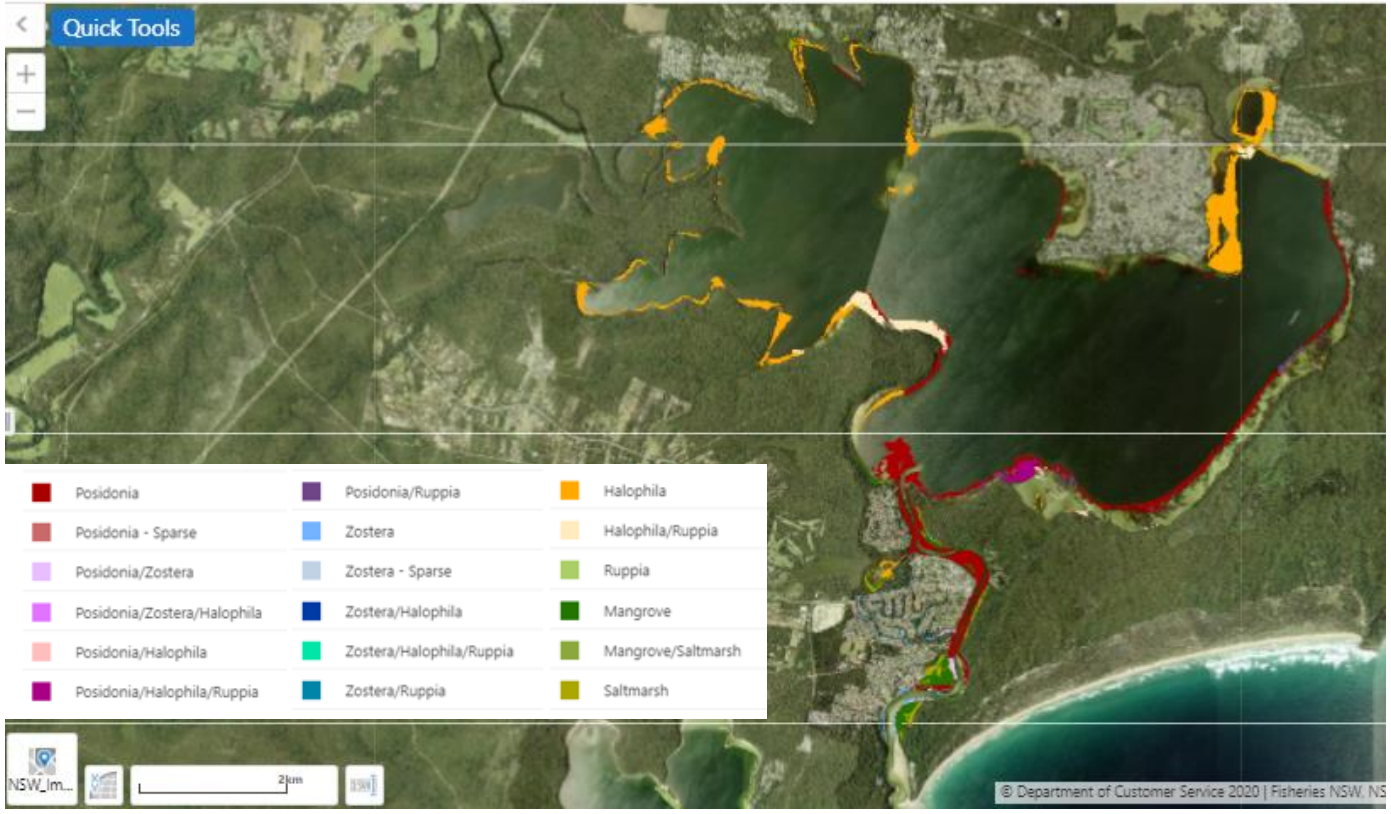
Year	Overall Grade	Algae	Water Clarity
2021	B	B	B
2019-20 Bushfires			
2014	A	A	B
2008-09	A	A	A



Year	Overall Grade	Algae	Water Clarity
2020-2021	A	A	A
2019-20 Bushfires			
2014-2015	B	A	B

Ecological environment

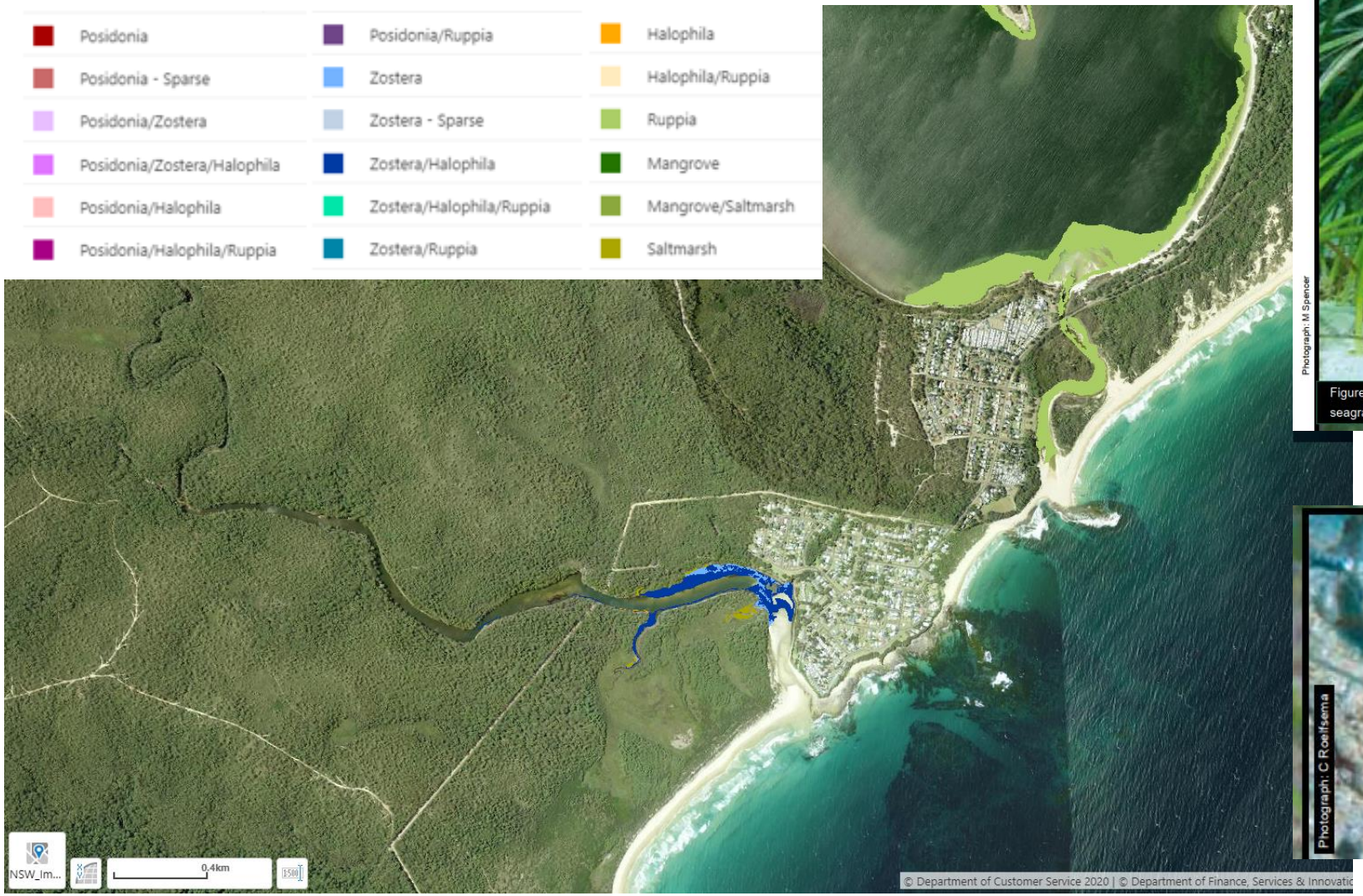
Mangroves and Zostera Seagrass



Hooded Plovers

Pied Oystercatcher

Ecological environment



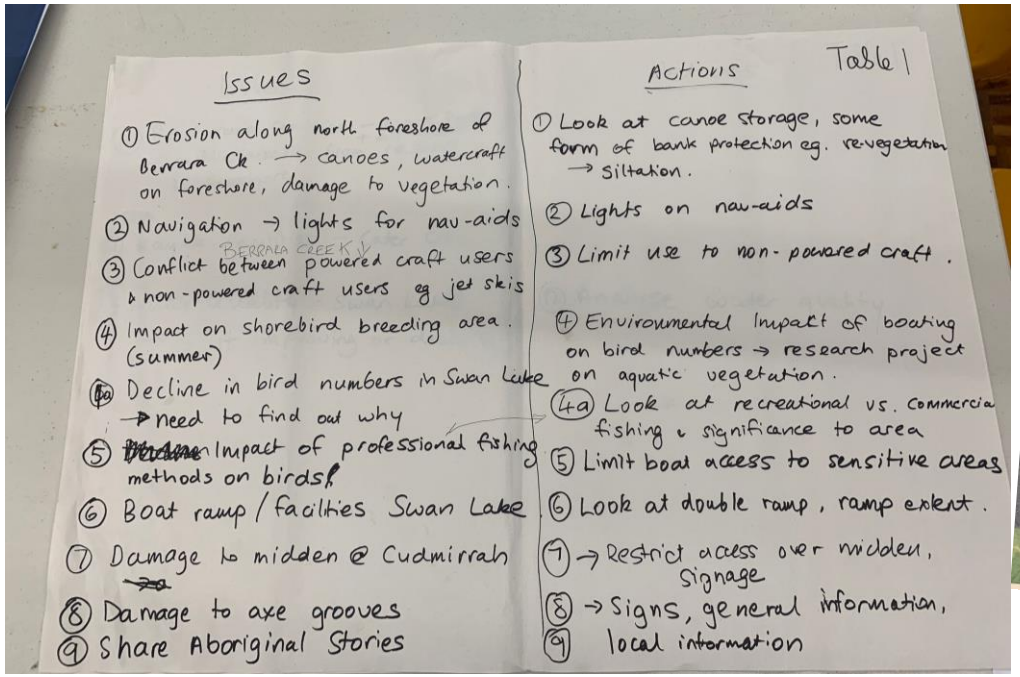
Posidonia

Zostera

Halophila

Community Engagement

- Community workshops held in March at Erowal Bay and Sussex Inlet
- A presentation on the CMP and studies completed to date by the Advisian CMP study team
- An interactive workshop session where participants were invited to discuss key issues and come up with solutions/mitigation measures for each concern
- Drop-in session with poster displays and factsheets



https://getinvolved.shoalhaven.nsw.gov.au/sussexinlet-stgeorgesbasin-berrara-swanlake-cmp?tool=map#tool_tab

Search...

Sussex Inlet, St Georges Bas...

NEWS FEED | QUESTIONS | WORKSHOP | MAP

What are your Values, Issues and Ideas for the Sussex Inlet, St Georges Basin, Swan Lake and Berrara Creek Area?

about 1 month

We want to know your values, issues and ideas for the Sussex Inlet, St Georges Basin, Swan Lake and Berrara Creek Area to help build our Coastal Management Program for the area.

📌 Pin a location and post a comment or photo onto the map that tells us what the issue that should be addressed in the CMP is as well as any ideas you have that could address the issue. Your input will help inform the actions in the CMP.

👉 Please note that your comments will be displayed publicly and may be used in the final documents as quotes, however, to protect your privacy, we will not use your name. We may also seek to use the image/s you post to the map. If so. we will contact vou via email to ask if this is okav.

Who's Listening

Nigel Smith

Coastal Coordinator

Shoalhaven City Council

Phone 02 4429 5501

Email nigel.smith@shoalhaven.nsw.gov.au

Lifecycle

Stage 1 - Identify Scope of CMP

August 2020

Stage 2 - Determine risks, vulnerabilities, and opportunities

Early 2022

- Boating Study (December 2021 - February 2022) - Survey closed

- Community Workshops (March 2022) and Interactive mapping

Key insights from engagement Sussex Inlet

- **Ecological Environment** - Monitoring and enforcement of illegal activities, threats to bird life, clearing of vegetation, greater protections for natural and cultural areas
- **Cultural and social -** Improving knowledge and understanding around Aboriginal and cultural sites, education of visitors, illegal fishing and overfishing.
- **Inundation and sea level rise -** Capacity of stormwater infrastructure, rising water levels at Swan Lake.
- **Erosion -** retaining wall along Sussex Inlet, erosion due to canoes and watercraft along the foreshores.
- **Navigation and safety -** Improvements to navigational aids, including lights; motorboats in Berrara Creek, boat ramp at Lions Park needs upgrading

Key insights from engagement St Georges Basin

- **Cultural and social -** lack of knowledge/understanding around Aboriginal sites
- **Erosion** along Tomerong Creek
- **Inundation and sea level rise** at Sanctuary Point shoreline.
- **Navigation and safety -** Improved navigational aids at Tomerong Creek, conflicts from motorboats and signage for speed limits, boat ramp damage and safety at St Georges Basin and Basin View.
- **Water quality -** Siltation and sedimentation from upstream development and runoff and around Boathaven Boat Ramp.
- **Ecological environment -** Protection of significant ecological zones including wildlife corridors and habitat, signage and monitoring. Illegal removal of trees and other vegetation in Tomerong Creek area.

Next steps

- Stage 2 Studies nearing completion to identify issues and opportunities
- Stage 3 of the CMP is to identify Management Actions
- Draft CMP to be developed mid 2023.


Thank you