RBR

rbr-global.com

Product Overview: RBR*duet*³ TD

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Business Development Manager (Asia-Pacific)

Loggers

OEM

Sensors

Systems

RBR

RBRcoda
RBRconcerto³
RBRmaestro³
RBRconcerto³
RBRbrevio³
RBRsolo³

RBR

RBRcervello
RBRsolo
RBRduet
RBRvirtuoso
RBRduo
RBRconcerto
RBRfermata
RBRfermette
RBRssm
RBRquartz
RBRcoda
RBRmaestro
RBR

RBR*duet*³ T.D

Compact temperature and depth logger (self contained memory + battery)

Range: 0 to 20, 50, 100, 200, 500, 750 dbar (1000, 2000, 4000, 6000, 10 000 dbar in titanium)

±0.05% FS accuracy

<0.001% resolution

1Hz sampling = ~294 days / ~25 million readings on a single AA battery

2Hz sampling = ~57 days / ~10 million readings on a single AA battery

5s sampling = 3.7 years / ~24 million readings on a single AA battery

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Compact temp and depth logger versions

- RBR*duet*³ T.D– shallow (1,000m) with ≦2Hz sampling

- RBR*duet*³ T.D |fast8 (16Hz or 32Hz) – shallow with fast sampling
- RBR*duet*³ T.D |tide16 or |wave16 – with tide and/or wave averaging
- RBR*duet*³ T.D |deep – deep (10 000m) with above options

- Options of standard (~1s) or fast (~0.1s) thermistor

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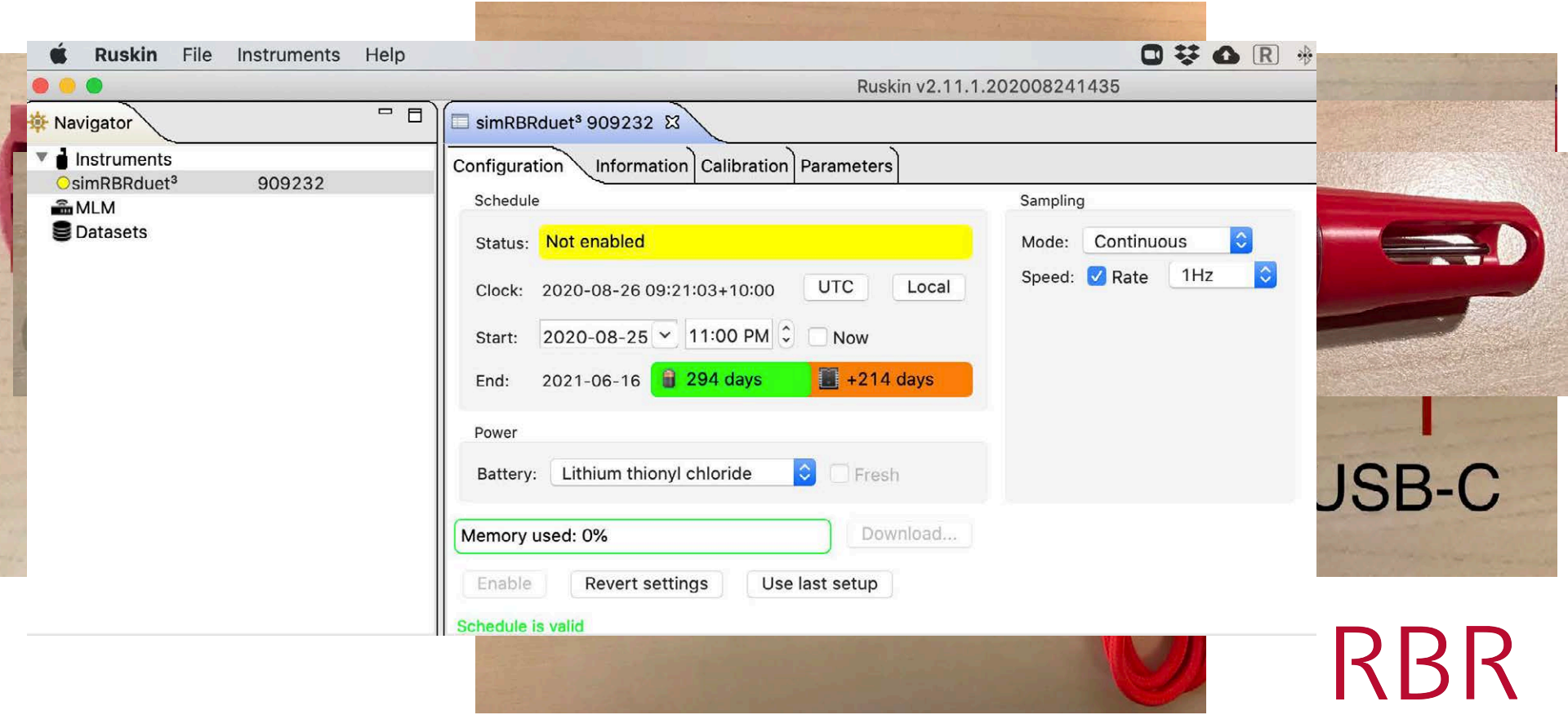
Inside the RBR*duet*³ T.D



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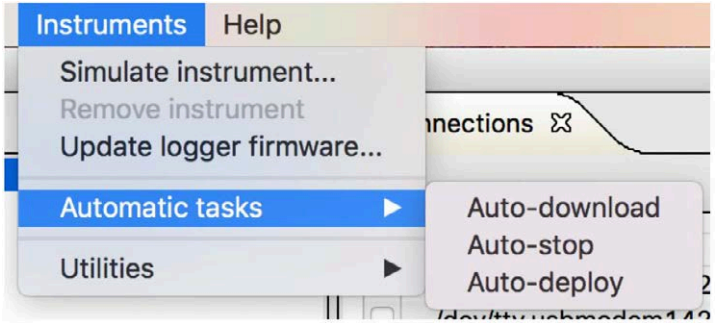
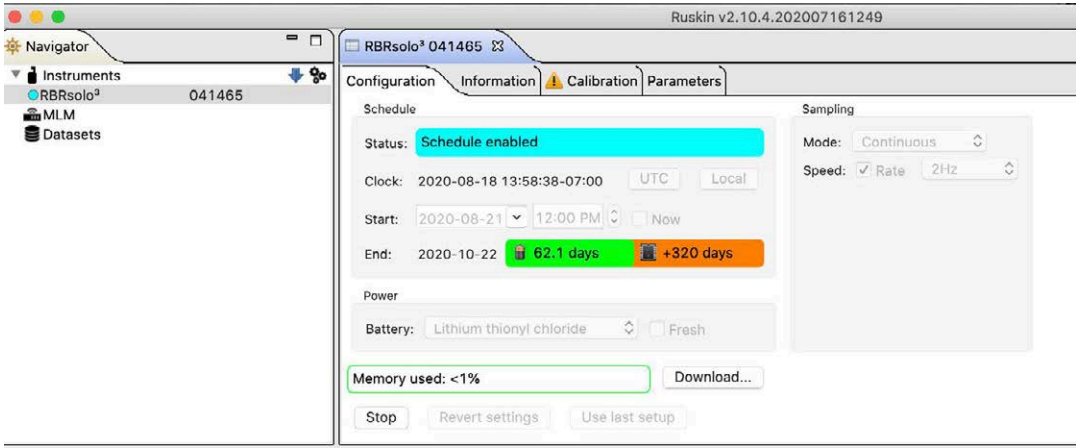
Standard Logger

- **RBRvirtuoso³ D**
- **RBRduo³ T.D**
  - 8x AA batteries
  - ~240 million readings
  - Twist Activation
  - WiFi ready
  - External communications options

Top Tip#1 : Auto Deploy and Auto Download





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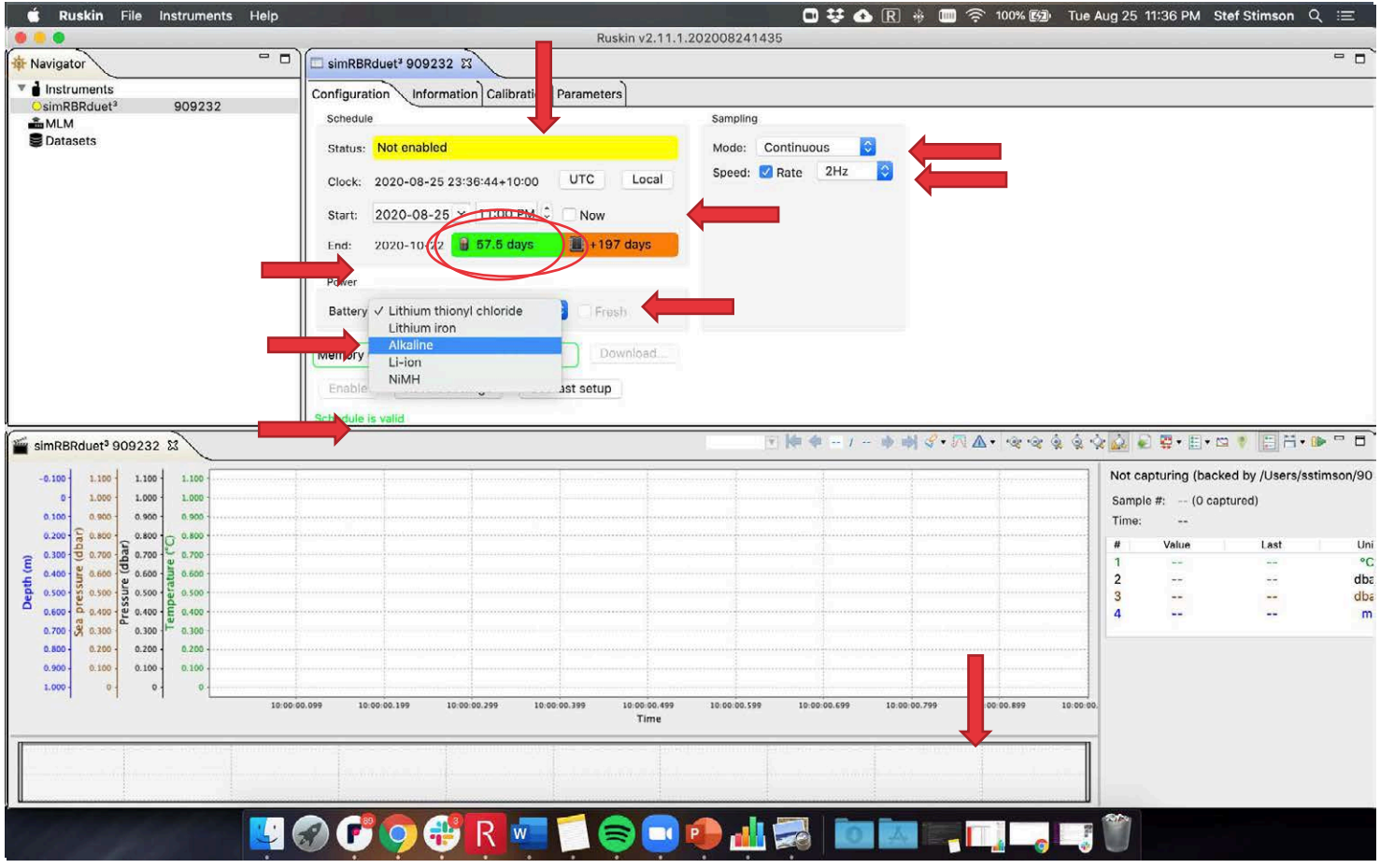
Top Tip#2 : Using Ruskin As A Planning Tool



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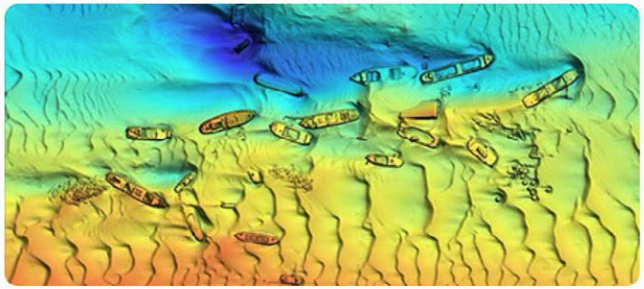
Upcoming Webinars

Future Webinars

Observing beach breaching in Carmel, CA

Mara Orescanin (Naval Postgraduate School)

September 2, 2020 at 12PM EDT (GMT-4)



Tidal measurements to support hydrographic operations in Queensland

Giles Stimson (Port of Brisbane Ltd)

September 3, 2020 at 11AM AEST (GMT+10)

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Thank You

Contact Us

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Surf zone monitoring at the Palm Beach artificial reef

Evan Watterson, Heiko Loehr, Michael Thompson (UQ) and James Lewis

Contact: evan@bcoast.com.au; +61 477 477 232

Overview

Todays discussion will cover:

- Palm Beach artificial reef
- Motivation for the monitoring
- Surf zone monitoring and modelling
- Highlights of on-going work

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Palm Beach artificial reef

- **Palm Beach Shoreline Project**
  - Sand nourishment placed in 2017
  - Artificial reef constructed in 2019
- **Objectives of artificial reef:**
  - Reduced vulnerability to coastal hazards (No 1)
  - Increase surf amenity (‘must have’)

Aerial photo of the artificial reef construction

Image 1 of 2

Ecological aspects

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Objective of monitoring exercise

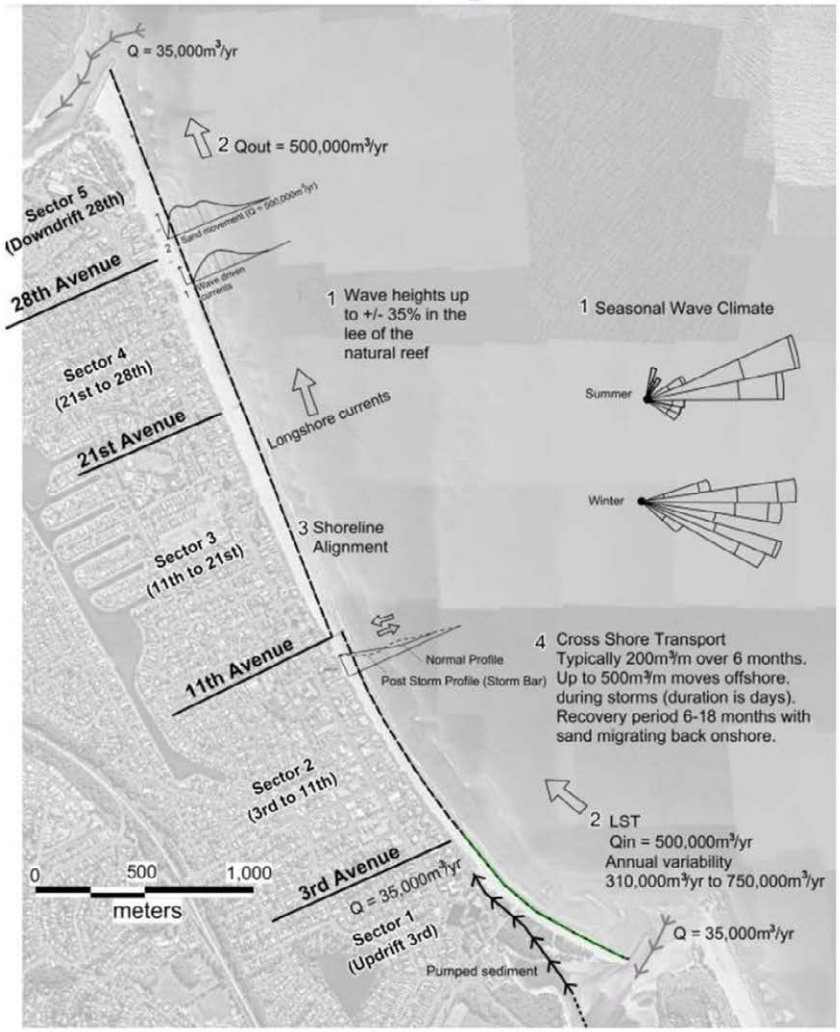
Motivation for the monitoring exercise:

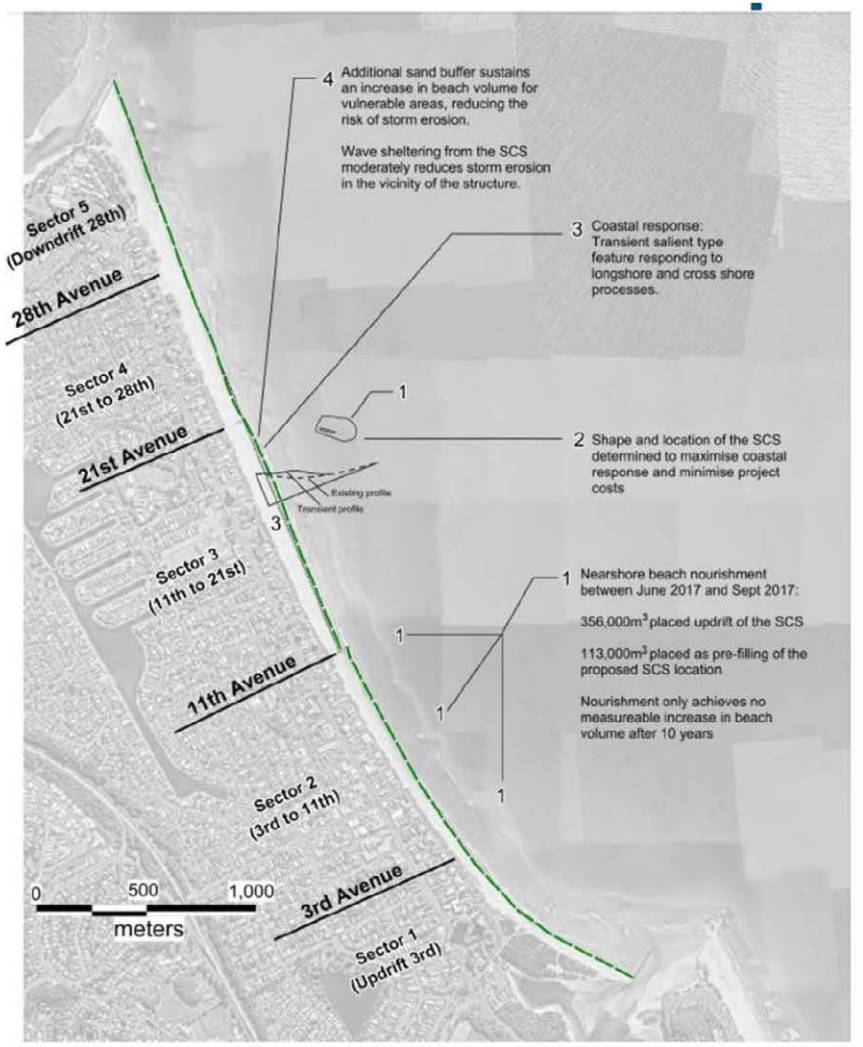
- Bluecoast R&D project to inform the detailed design of the Albany Artificial Surf Reef
  - Wave attenuation performance
  - Circulation patterns
  - Surf amenity performance
- University of Queensland – testing ground for novel approach to tracking breaking waves

Objective of monitoring exercise

Key features of artificial reef

- Wave shadow
- Circulation patterns – interplay with alongshore current
- Wave breaking over the artificial reef design for surfing





Surf zone monitoring

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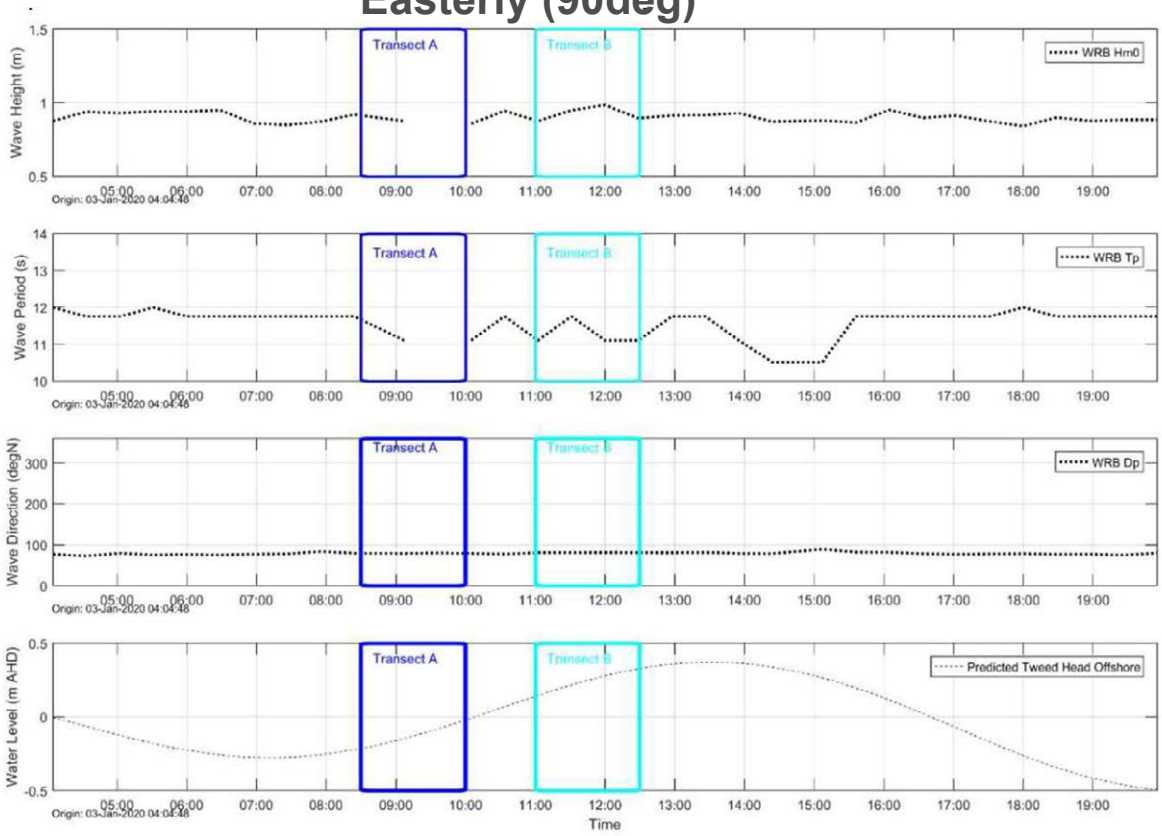
Scope of surf zone monitoring

- One-off exercise, completed on 3rd January 2020
- Wave measurements in the lee of the artificial reef
- Current measurements
- Wave tracking analysis (University of Queensland)

Hs = 0.9m
Tp = 11s
Easterly (90deg)



Surf zone monitoring

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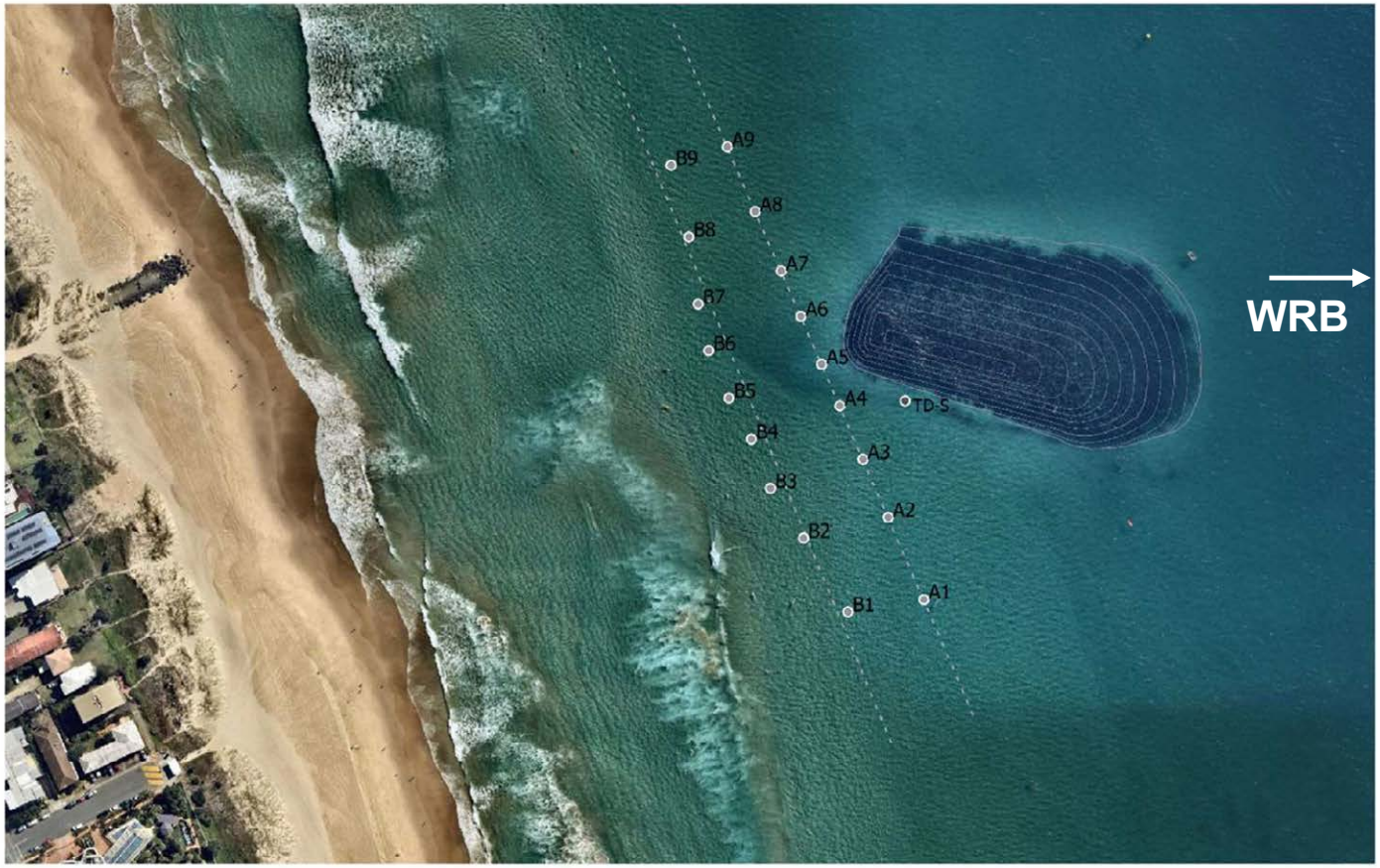

LEGEND

- Pressure transducer (PT)
- PT array line
- Tilt-Drag
- Artifical reef contours

0 50 100 m

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Surf zone monitoring

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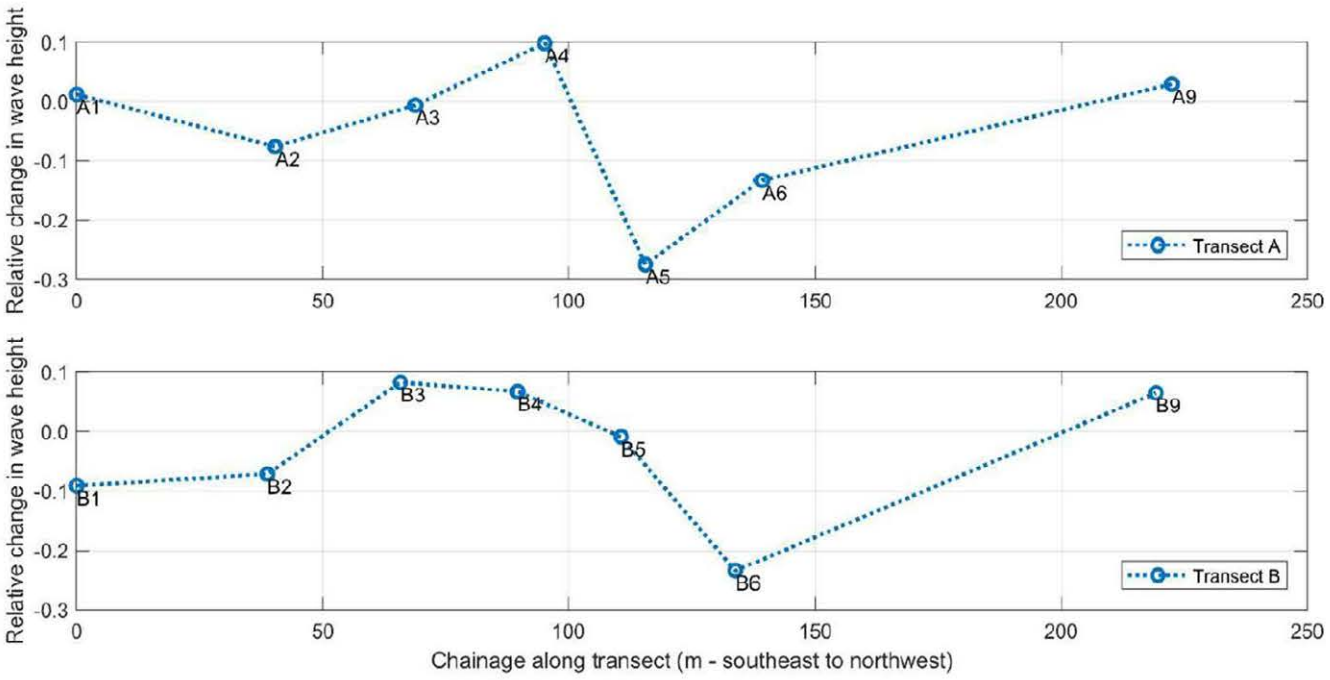
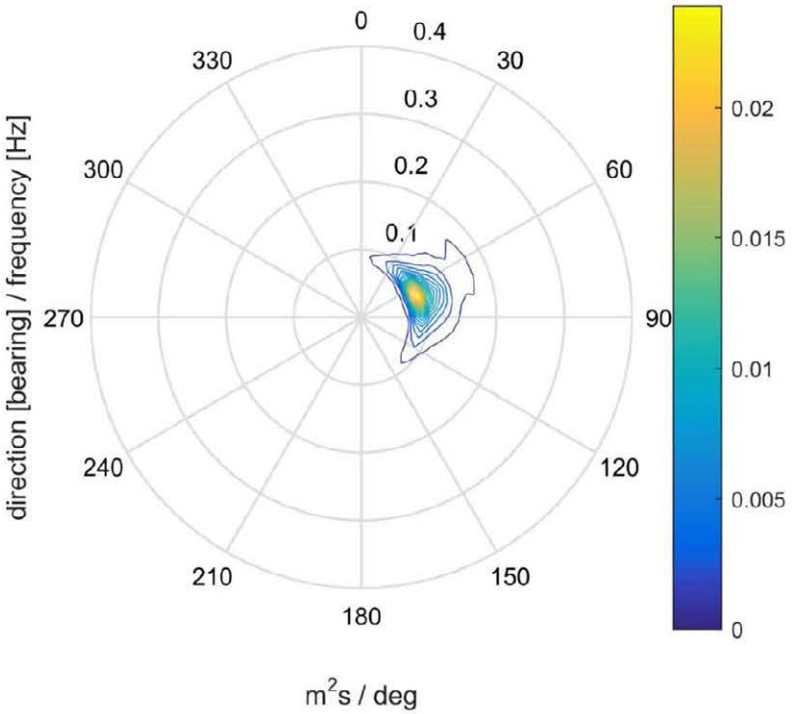




Physical modelling

Overview

As part of the detailed design of the Palm Beach artificial reef, physical modelling was completed at QGHL and WRL

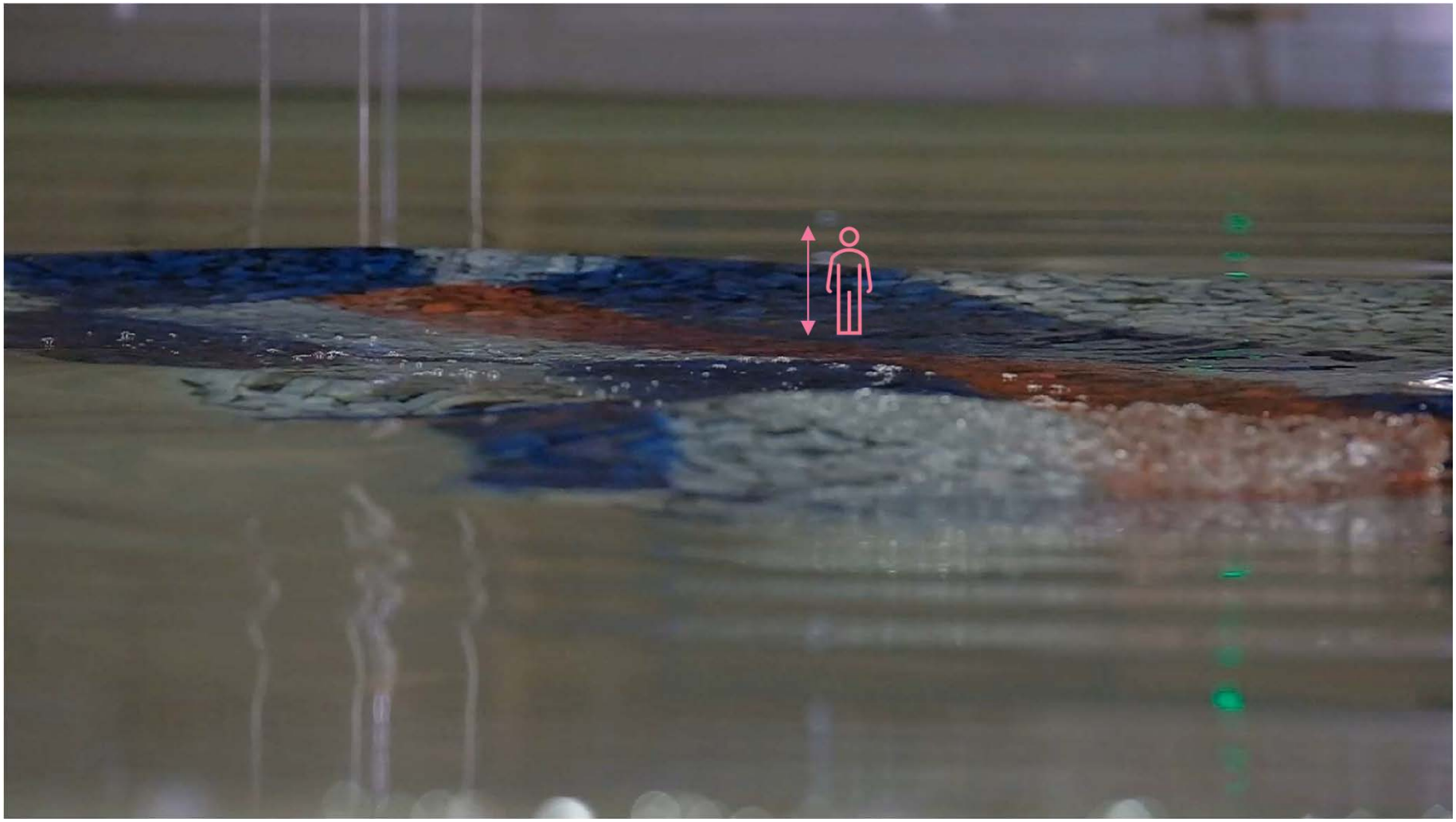
Objectives:

- Verify waves, currents and surf amenity outcomes of the design
- Determine stable rock armour design
- Sediment transport and shoreline change (WRL)

Scope of work:

- Planning and design of the testing program
- Construction of the scale model
- Testing

Physical modelling



Wave condition

- Scaled wave of 2m height
- Mid-tide
- Excellent conditions (~2x month)

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Surf zone monitoring

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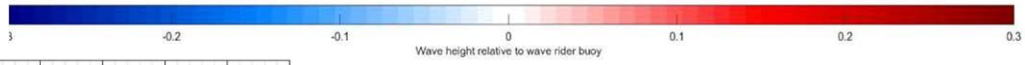
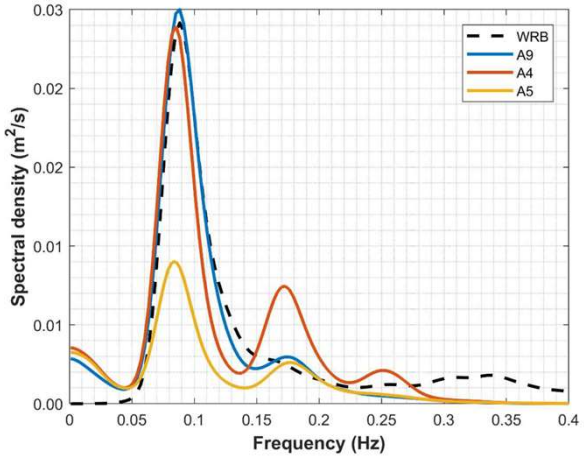
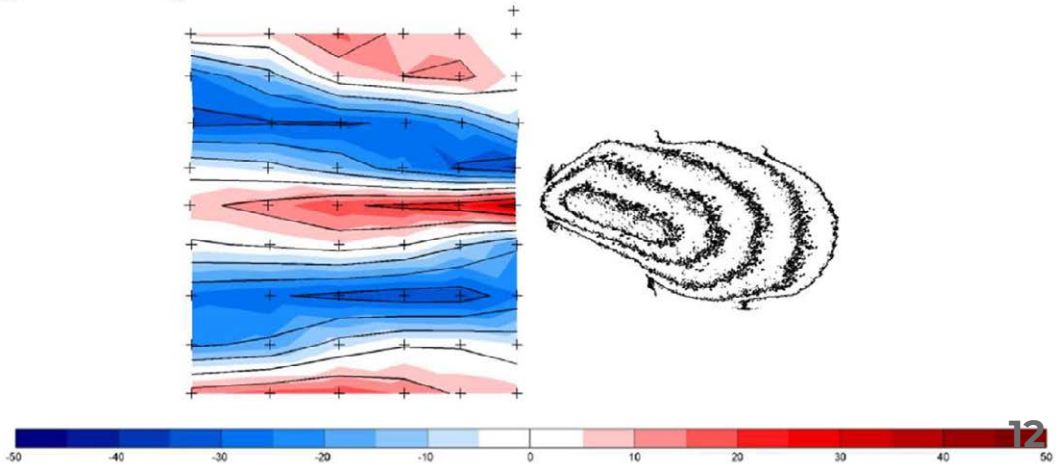
Real-world (1:1 model) results using RBR sensors



1:42.5 scale model results





Surf zone monitoring and modelling

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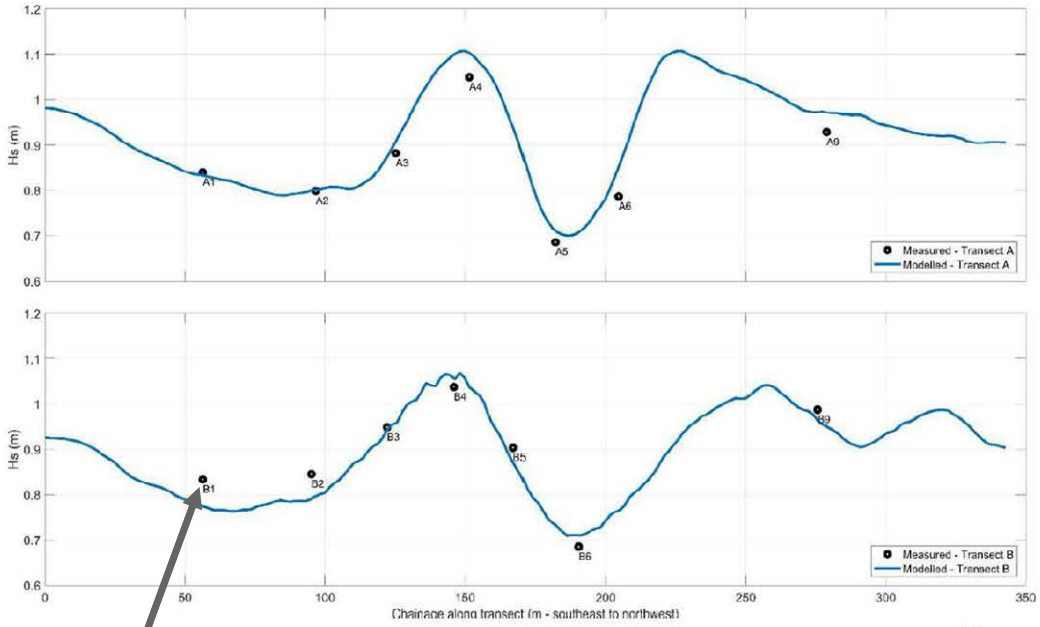
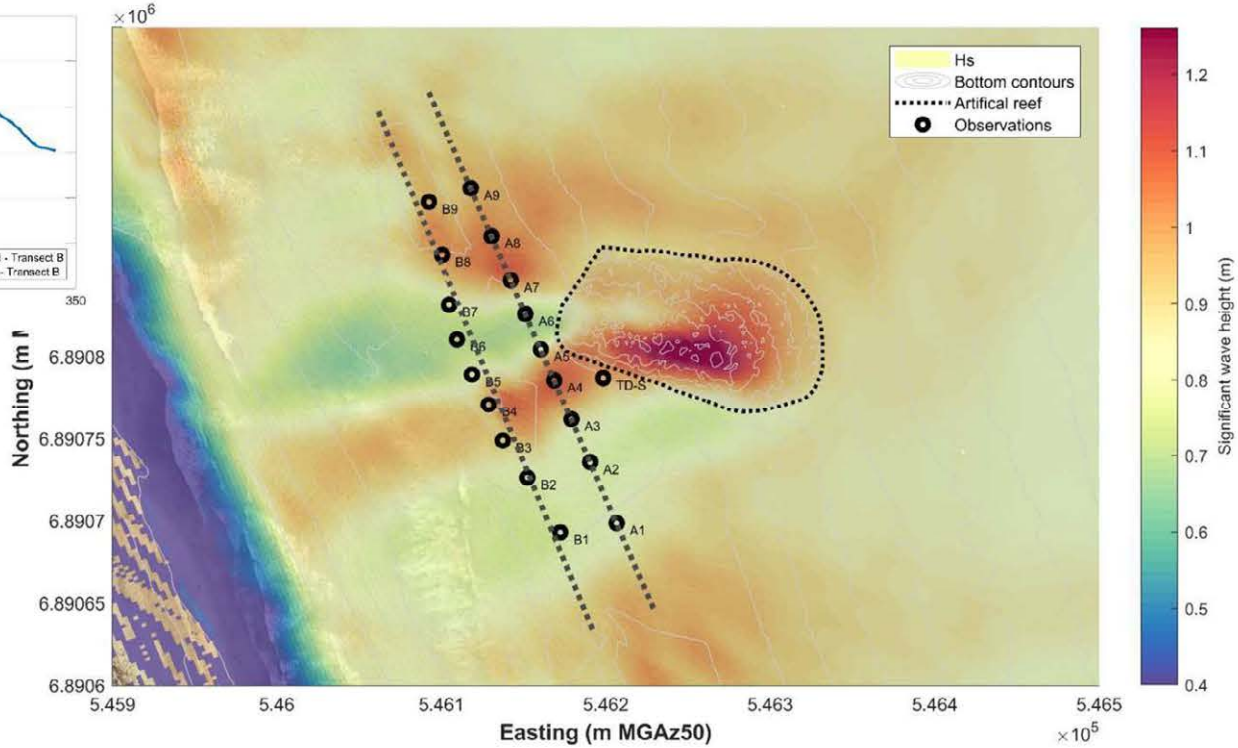


RBR measurements

Validated SWASH model as a tool for evaluating artificial surf reef designs



Surf zone monitoring and modelling

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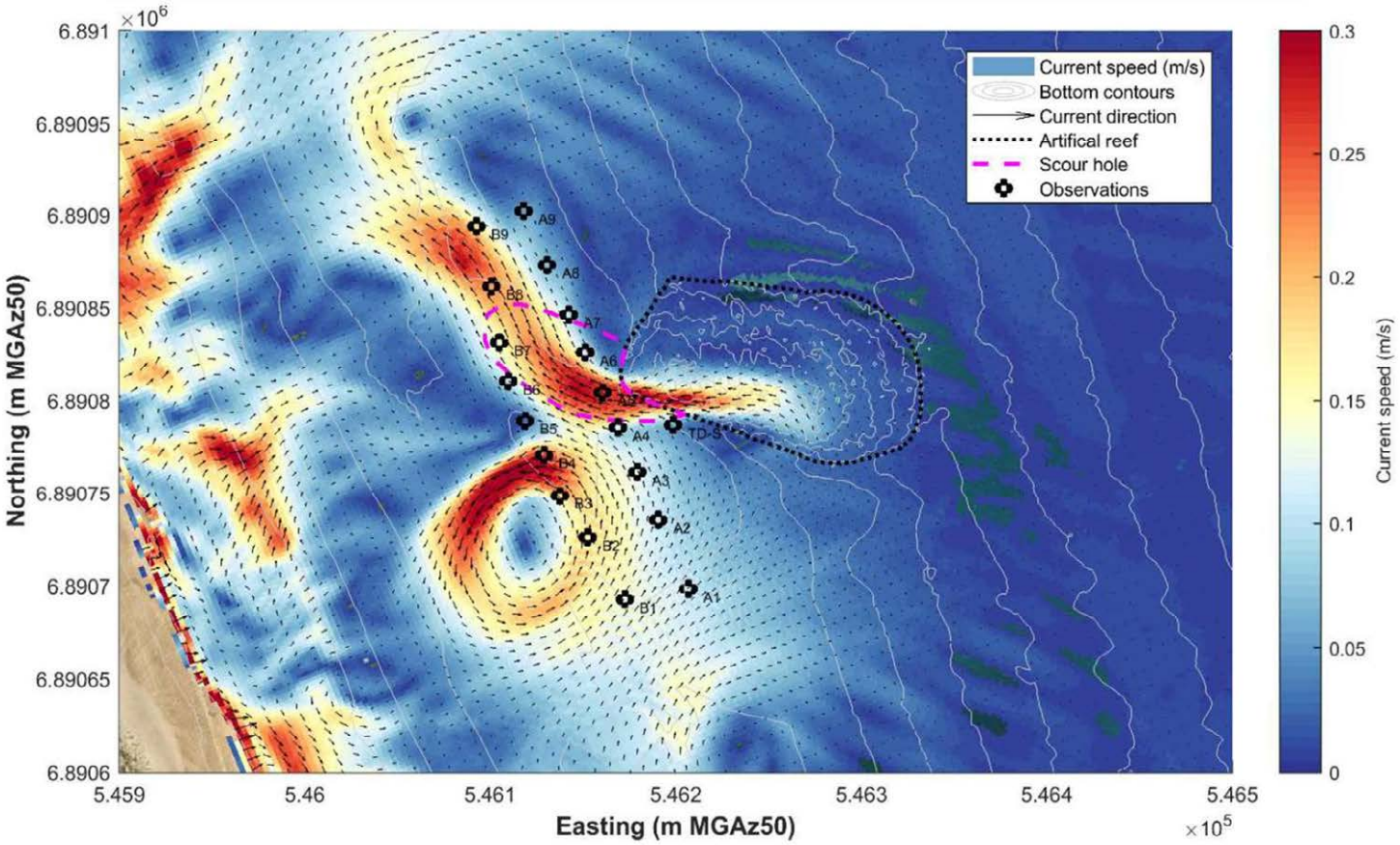
Wave driven currents

- Tilt-drag current meter deployed at TD-S
- Agreed with SWASH model results
- SWASH model provides circulation patterns nearby the artificial reef

Validated SWASH model as a tool for evaluating artificial surf reef designs

Table 4: Comparison of observed and modelled wave-driven currents on the 3 January 2020.

Parameter	Measured	Modelled
Average current magnitude (m/s)	0.14	0.12
Median current direction (°N)	300	290



Surf zone monitoring - survey

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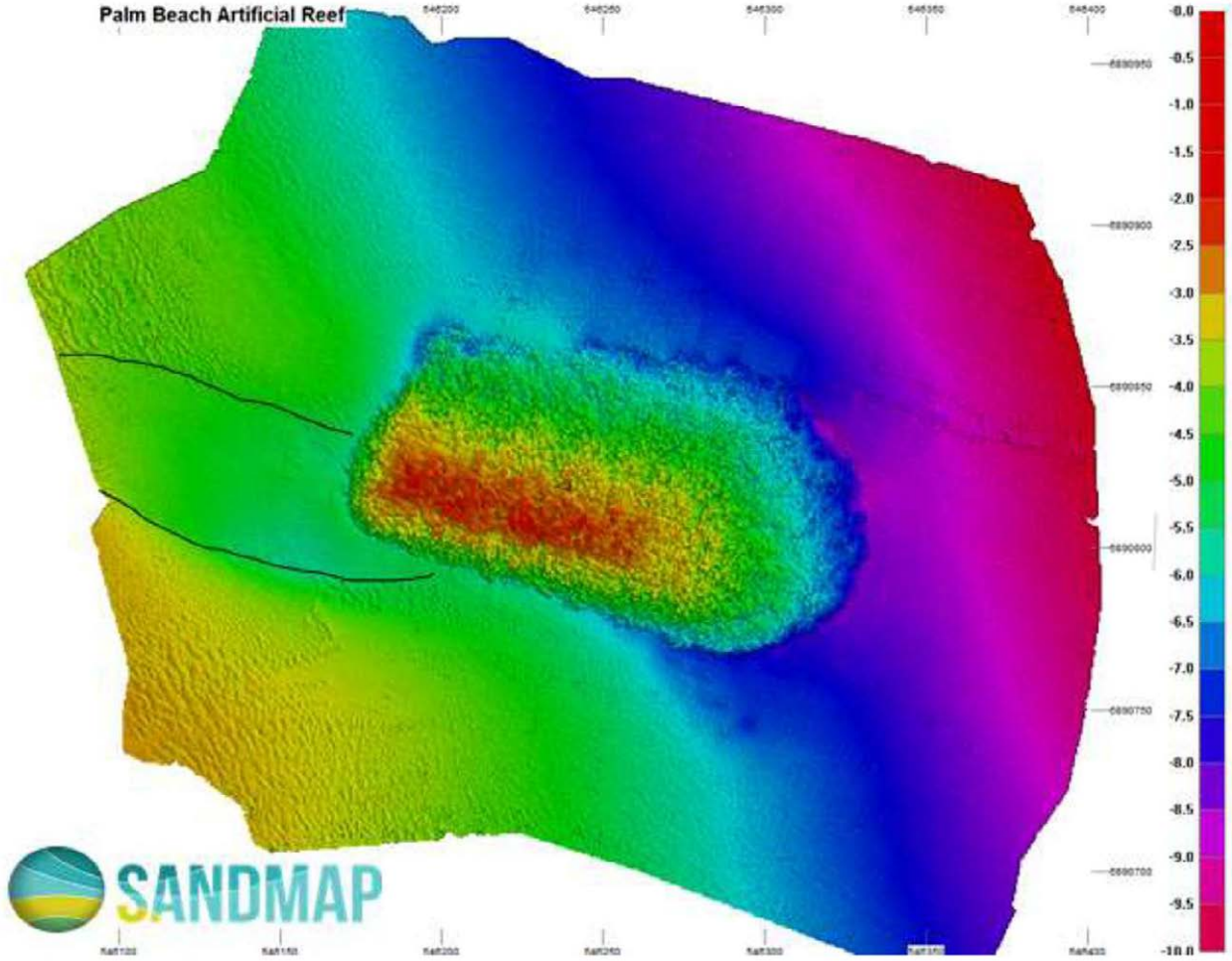
High resolution bathymetric survey undertaken by SANDMAP on the 18 February 2020

- Shortly after a large swell event associated with **TC Uesi**
- Scour hole observed in lee – as a result of wave driven current



Surf zone monitoring - survey

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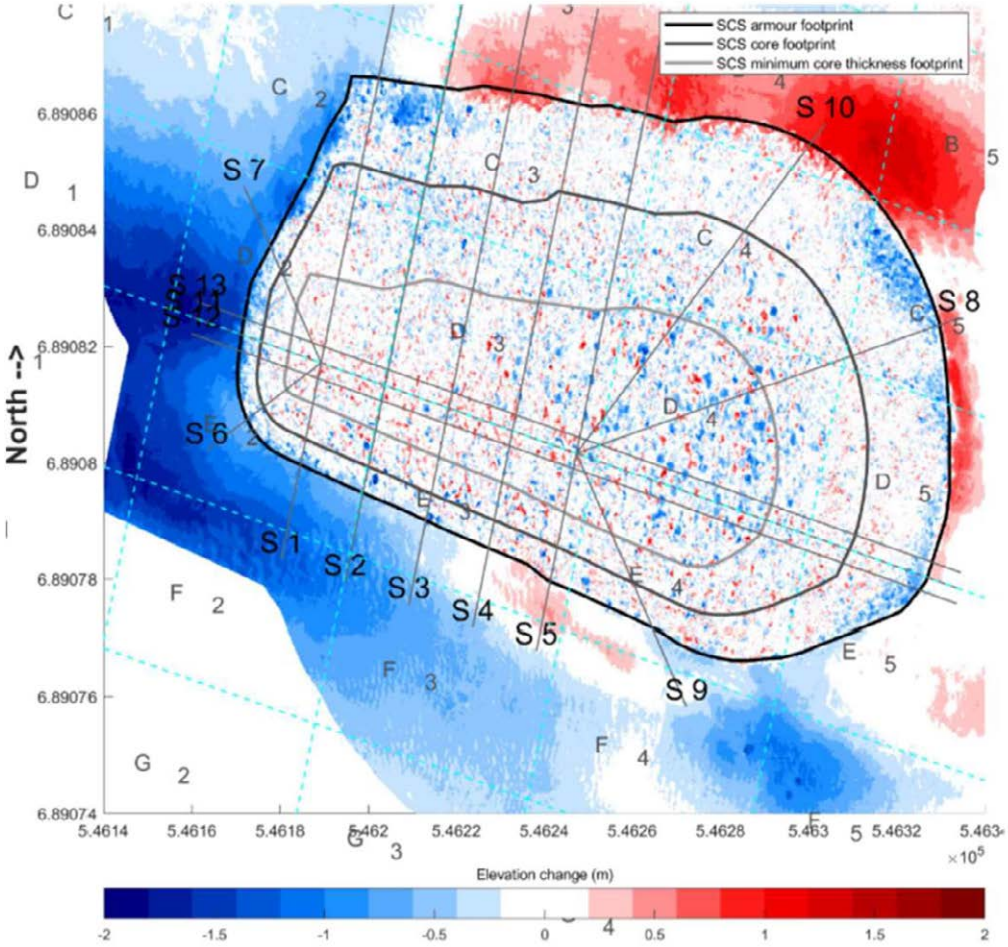

Figure 14: Elevation difference between the 18 February 2020 survey and the as-constructed survey (28th August 2019).

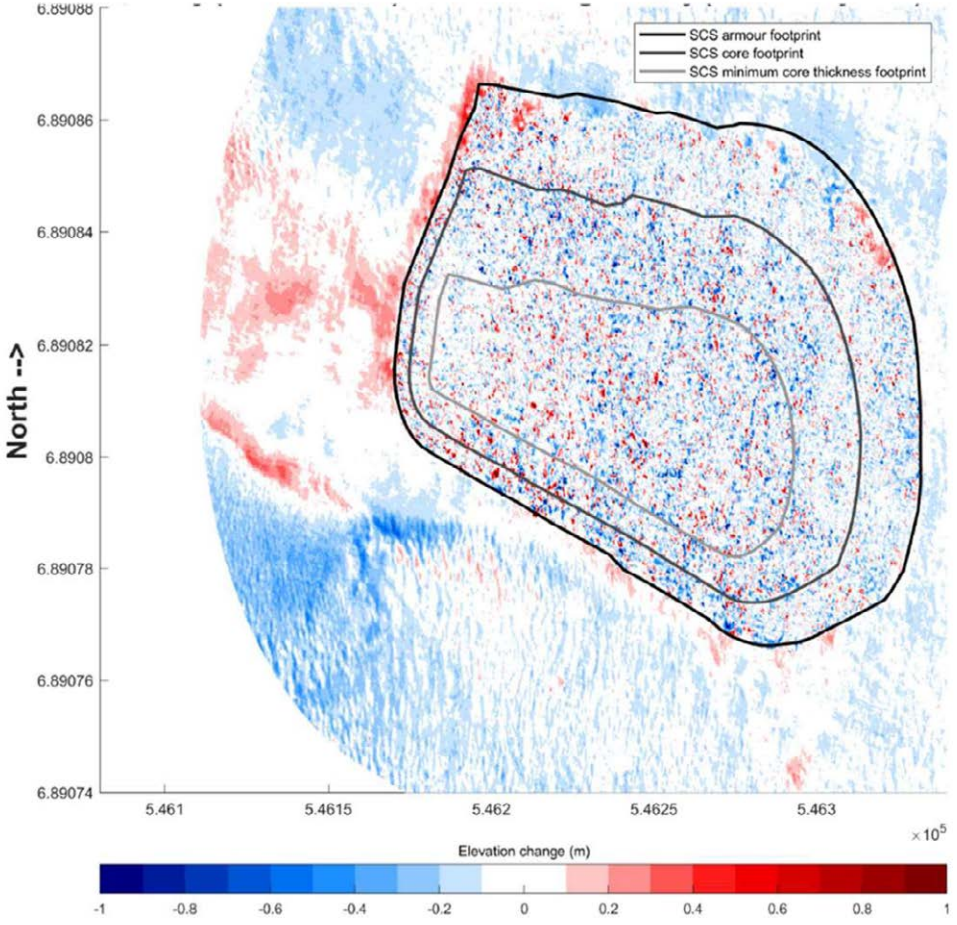

Figure 15: Elevation difference between the second monitoring survey (23 March 2020) and the 18 February 2020 monitoring survey.

Surf zone monitoring – wave breaking

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Surf zone monitoring – wave breaking

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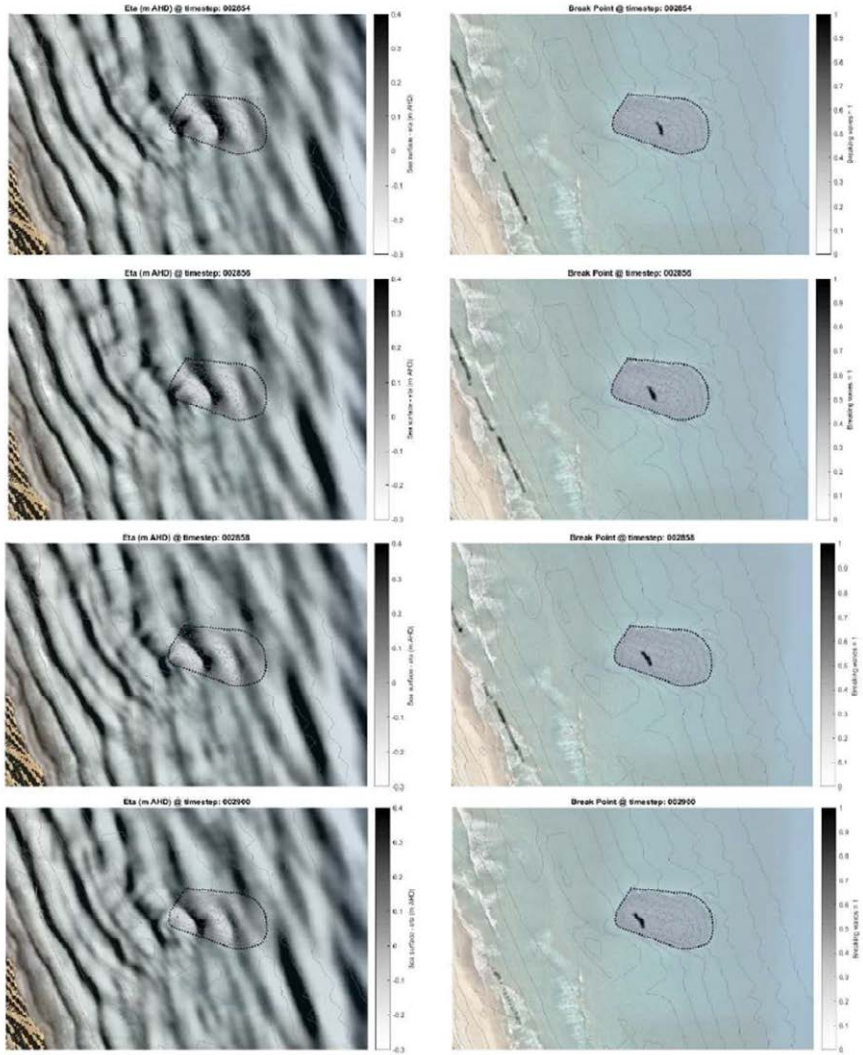
Wave breaking

- DJI Phantom 4 drone used to record video
- Wave tracking technique applied to derive wave breaking data
- Compared with SWASH model



Surf zone monitoring – wave breaking

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Parameter	Observed using video tracking software	Modelled using SWASH
Number of ridable waves per minute	2.1	1.9
Average wave breaking duration (s)	5.4	6.3
Average wave breaking length (m)	36.8	25.7
Maximum wave breaking length (m)	103.4	49.6
Average wave speed (m/s)	6.9	3.7
Average wave breaking direction (°N)	276	272

Wrap up

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Summary

- Surf zone monitoring used to:
- Validate numerical wave and flow model of artificial reef and nearshore area
- Assess the performance of the artificial surf reef for wave transmission, wave-drive currents and wave breaking/surf amenity

What next?

- On-going surf amenity assessment of
- Detailed design of the Albany ASR reef has now been completed: https://www.youtube.com/watch?v=yZWJj8_uE9Y&feature=youtu.be

Palm Beach's new surf camera

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Questions

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