VICTORIAN COASTAL MONITORING PROGRAM NEWSLETTER

July 2020

WELCOME

Hello VCMP Citizen Scientists, and welcome to the second edition of the VCMP newsletter. Unfortunately, COVID-19 restrictions have increased in both Greater Melbourne and Regional Victoria. Earlier this week, you received an email informing all VCMP Citizen Scientists that all community group operations are suspended until the Victorian Government's update on 13 September.

Our top priority is the safety and wellbeing of our community members, and we hope that all our Citizen Scientists are staying safe and healthy at this time. A few of our more remote Citizen Scientist groups were able to briefly resume mapping in July, and while they once again have stopped operations, we thank them for their continued efforts and support of the VCMP.

Despite the challenges of COVID-19, we are still managing to collect data. Both Karina and I have been busy conducting field work under strict restrictions on how we operate. On the bright side, each location I map is providing some much-needed exercise. I am averaging 20,000+ steps over the 4-5 hours it takes to complete the mapping independently, and while the mornings are cold, it is nice to get away from the computer for a while.

While in Apollo Bay on July 24th, we saw the beach renourishment works in action, and I took a couple of photos, which you can see above and below.

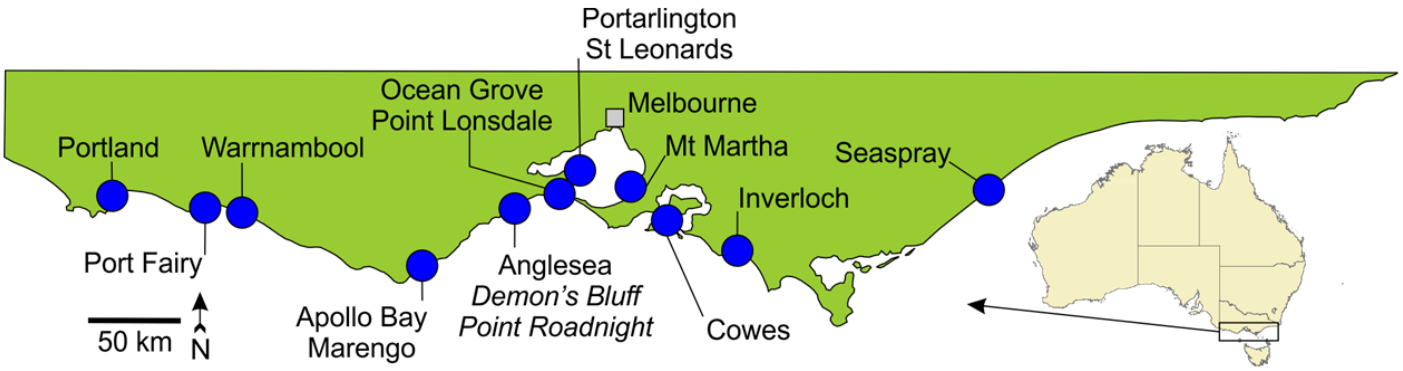
As I mentioned in the last email, the PropellerAero data portal is still live, and this extended home confinement is an ideal time to explore the data. Instructions on how to access the data in a view-only manner are available on our website (www.marinemapping.org/vcmp-citizen-science). If your group would like the ability to create measurements, please let me know (email address) and I will create a log-in for your group with a higher level of access. We were developing training in the PropellerAero Portal when COVID-19 restrictions began, and as the restrictions continue, we are looking at methods of delivering this training virtually. I will let all Citizen Scientists know when we have further developments on this.

I know many of you are keen to resume mapping and/or training, and we are very grateful to all of you for your patience and understanding during these times.

- Dr Blake Allan
  UAV Citizen Science Co-ordinator

PROGRESS

The data collection continues to grow despite all the current challenges! Citizen Scientists have collected 221 datasets across 17 sites, and 228 datasets if we include Wild Dog Creek. We have encountered some issues with the AeroPoint corrections at Anglesea Point Roadknight, but these have now been resolved with PropellerAero and we will have the last few mapping events online soon. The image below lists the VCMP sites and the number of datasets collected.



Portland (11)	**Port Fairy (20)**	**Warrnambool (19)**	**Marengo (16)**
Apollo Bay (17)	**Anglesea Demon's Bluff (15)**	**Anglesea Point Roadknight (15)**	**Ocean Grove (11)**
Queenscliffe (11)	**St Leonards (14)**	**Portarlington (15)**	**Mount Martha (9)**
Cowes (13)	**Inverloch (15)**	**Seaspray (13)**	*Wild Dog Creek (7)* *Skenes Creek (4)* *Point Lonsdale (3)*

Map depicting all VCMP Citizen Science sites in Victoria. The table indicates the number of datasets collected. Sites marked with *Sci* are also mapped by the Science Team. Wild Dog Creek and Skenes Creek are collected sporadically. Point Lonsdale is only mapped by the Science Team.

At some of these sites, we have interspersed your Citizen Science collection with Science Team surveys. Science Team surveys often cover a longer distance, or in the case of Point Lonsdale, locations not mapped by Citizen Science Groups. Wild Dog Creek and Skenes Creek are beach renourishment sand sites for Apollo Bay, and are mapped when requested by the Department of Environment, Land, Water and Planning (DELWP).

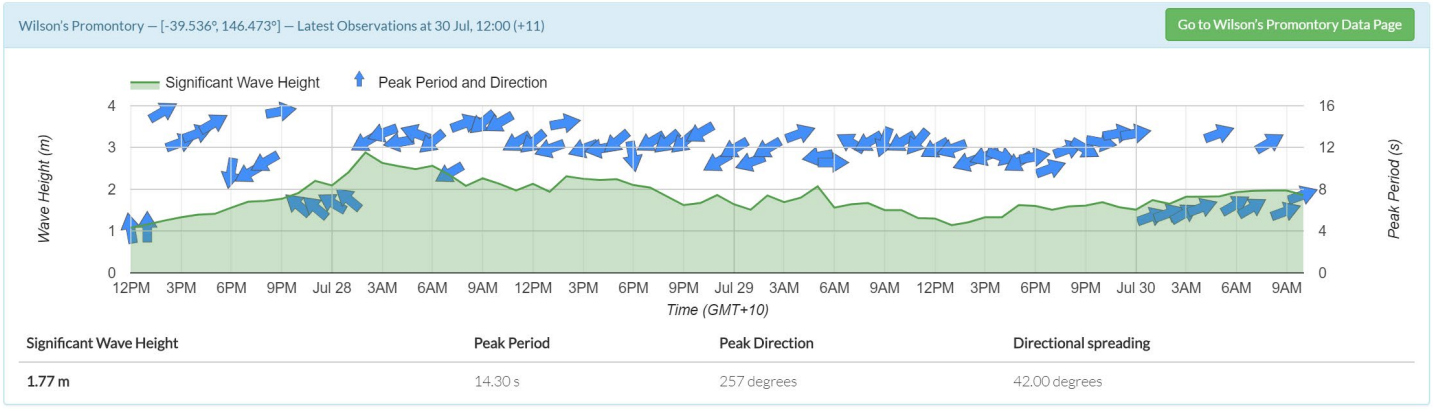
VICTORIAN WAVE BUOY NETWORK

The Victorian government, through the VCMP, has deployed a network of wave buoys across state waters.

The optimal placement of these buoys was determined through consultation between DELWP, expert oceanography partners, and marine scientists from Deakin University, the University of Melbourne, and advisors from CSIRO and Bureau of Meteorology.

The data provided by this network of buoys allows for real-time monitoring of waves and for downscaling of models to associate the wave climate with shoreline dynamics. The data will also be used to determine how climate change will affect Victoria's future wave climate as well as allowing surfers to find the best break!

All data from the Victorian wave buoy network can be accessed and downloaded from the website: www.vicwaves.com.au You can visualise the data for a time period of interest during the deployment of that buoy and download the data for your own analyses.



The wave network uses two different types of buoys. At Cape Bridgewater1 (west coast), Wilson's Promontory (central Bass Strait) and Lakes Entrance1 (east coast), large Triaxys buoys are deployed. These are 0.9 m in diameter and measure waves using accelerometers precisely calibrated to calculate height and period as the buoy rides up and down over each wave crest. These buoys also measure currents below the surface. Data are sent via mobile phone or satellite links.

At sites closer to shore, small SOFAR Spotter buoys are deployed. These buoys measure wave motion using GPS positioning and transmit their data via satellite. These nearshore buoys are being used to understand how the deep water waves are transformed as they approach the shore, as science still cannot fully predict how much energy will impact a beach as waves move from deep to shallow water. At Cape Bridgewater, both types of buoys are deployed side-by-side as an intercomparison test as part of a new technology proving program funded by the Integrated Marine Observing System (IMOS: www.imos.org.au).

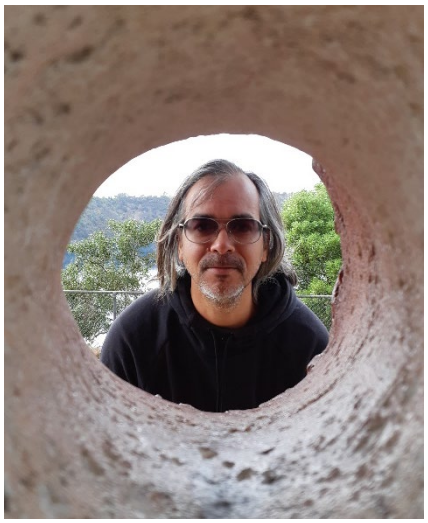
STORYMAPS

The VCMP team is in the process of developing "StoryMaps" which will provide more information about the VCMP findings to the public.

They will report on all the research and findings from the VCMP science team, including: the Citizen Science data, historical shoreline data, wave patterns, shoreline movement, sediment sampling, benthic assembly, and wave climate modelling.

The first StoryMap will focus on Port Fairy and is expected to be live in the next few months. More StoryMaps will then be developed for other key areas as we continue to gather and analyse data. We will let you all know as soon as Port Fairy's StoryMap is available.

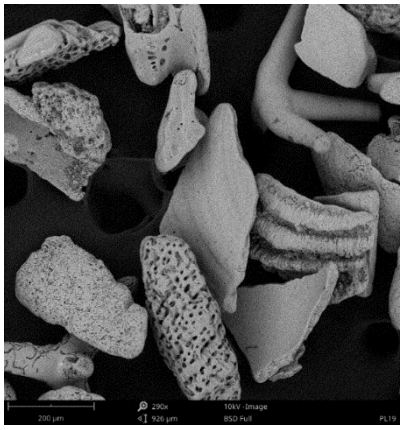
MEET A VCMP RESEARCHER



Dr. Rafael Carvalho*, Postdoctoral Research Fellow, Deakin University*

Dr. Rafael Carvalho is Coastal Geomorphologist with a research focus on siliciclastic and carbonate sediments, depositional environments, processes and Quaternary landscape evolution. Rafael obtained his Ph.D at the School of Earth and Environmental Sciences at University of Wollongong (UOW), and a Masters in Science (Coastal Geology) at the Federal University of Bahia (UFBA-Brazil).

Rafael is an emerging researcher in coastal and marine studies with more than 15 years of experience and 26 peer-reviewed scientific publications on different environments such as beaches, barriers, rock platforms, coral reefs, continental shelves and coastal catchments in Brazil, Spain, Australia, Malaysia, Indonesia, the USA, the Solomon Islands and the Cook Islands.



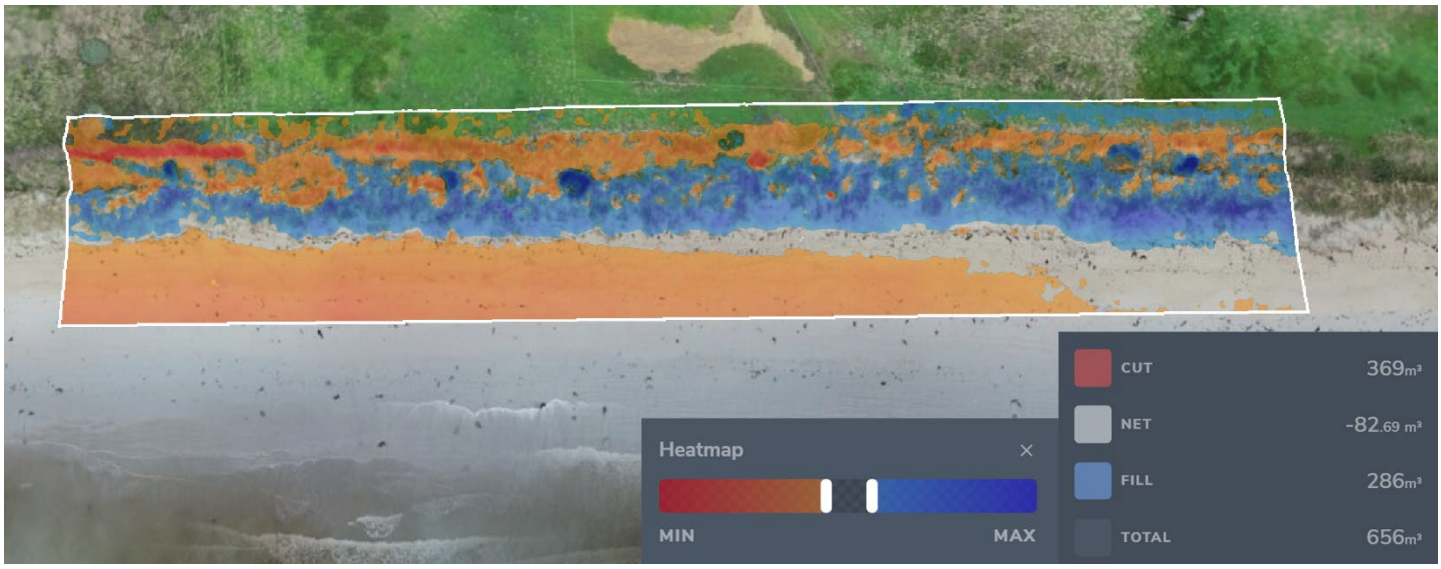
In Australia, Rafael has worked in remote places such as in the Capricorn Bunker Group and the low wooded islands of the Great Barrier Reef, and the Gulf of Carpentaria. However, the bulk of his research was conducted along the South Coast of New South Wales. He is also a past lecturer of Spatial and Environmental Sciences at UOW.

Rafael joined the VCMP in October 2018 as a Research Fellow at Deakin University. He is responsible for conducting research in sediment dynamics along six coastal compartments that extend from the South Australian border to Point Lonsdale. Rafael leads the shallow marine component of the shoreline system primarily using remotely sensed data from a range of marine and aerial platforms including multibeam sonar, sub-bottom profiler, LiDAR and drones. His latest publication in the scientific journal of Earth Surface Processes and Landforms (https://onlinelibrary.wiley.com/doi/10.1002/esp.4911) shows how historical aerial photographs can be used to quantify volumetric change at Lady Bay (Warrnambool) and East Beach (Port Fairy).

Rafael is also responsible for the collection, processing and analyses of beach and offshore sediment samples, a key component of VCMP. Analyses conducted with these samples, such as grain size, shape, mineralogy and chemical element composition, are used to characterise different deposits, their provenance (origin), history within the geological cycle, and to understand how sediments move along the coast. Acquisition of approximately 250 beach samples has recently been completed from Portland to Point Lonsdale. This will produce evidence-based predictions of sediment dynamics and help manage our Victorian beaches.

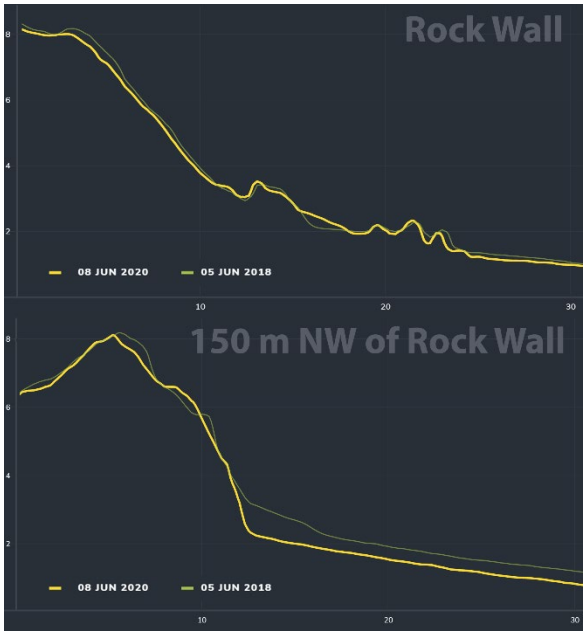
SITE SNAPSHOT - PORT FAIRY

This issues' Site Snapshot is Port Fairy. Port Fairy was our first VCMP Citizen Science group, and as such were the test case for the training and documentation. This program would not be as successful as it is without their patience and feedback through the process, and we thank all the Port Fairy members for the continued hard work and the collection of 20 datasets to date.



The VCMP teamed up with the Port Fairy Coastal Group, who were already conducting coastal monitoring using transect lines from permanent posts. The beach had been experiencing continued erosion and had exposed an old night soil dumping site, and tip site. Mitigation works had been conducted at both, with sand fences at the night soil site, and a rock wall and sand fences to halt erosion at the tip site.

If we examine the Night Soil site over the last 2 years (June 2018 to June 2020), there has been a small net loss of sand, but it is from the beach, not dune erosion. The dune face itself has gained sand. It is also growing vegetation, which will help to stabilise the dune form future erosion.



The results at the tip site are a little more complicated. This section of coastline has recorded a net loss of nearly 3,500 m^3 of sand along the 450m rock wall over the last 2 years. However, it is primarily either in front of the rock wall, or at the sand fences at either end. The height of the sand directly behind the rock wall has increased despite the heavy sand loss surrounding it. If we compare cross-sections at the rock wall vs 150 m north-west of the rock wall, there has been significantly less change at the rock wall, especially at the toe of the dune. This is a short time frame for coastal assessment, and calmer periods may deposit sand in this region.

Below are images shared by the Port Fairy Coastal Group, showing the recovery of the dunes since severe coastal erosion occurred in 2012 and 2013. The sand was 1.89 m below the top of the post in 2015, and now the post can only just be seen!

Overall, there is a strong pattern to the erosion and accretion along the 2 km length of Port Fairy coastline being monitored by the VCMP, and further study is required to identify any long-term trends.

ASK A RESEARCHER

In future editions of the VCMP Newsletter, we would like to provide an opportunity for you to engage with our research team and ask any questions you may have. If you have a question, please email it to vcmp@deakin.edu.au with the subject line "Ask a Researcher" and we'll do our best to answer them and include them in the next issue. Please indicate in the email if you would like to remain anonymous.

SHARE YOUR STORY

It's great to hear from VCMP groups which are continuing to practice their manual UAV flying skills during the COVID-19 lockdown. On the left is an image of the Port Fairy crew practicing before recommencing their mapping earlier this month.

For those of you who are keen to practice your skills, DJI (the UAV manufacturer) have a free flight simulator which you can download on your computer. Once downloaded, you can connect your Phantom 4's controller to your computer and fly a virtual UAV. Unfortunately, it is only available for Windows computers at this time, and you need a fairly recent Windows PC to run it properly. More information about the DJI Flight Simulator can be found here: www.dji.com/au/simulator

If your group is keen to use the simulator, Blake has made an instruction manual for installing the software, connecting the controller, and working the flight simulator. Please email b.allan@deakin.edu.au for a pdf copy of the instructions.

OTHER MARINE AND COASTAL NEWS

Interested in hearing more about the work being undertaken in marine and coastal management in Victoria? The quarterly 'DELWP marine and coasts newsletter' shares news about DELWP's work across the marine and coastal space, from policy and strategy to coastal protection projects. The newsletter also includes Coastcare Victoria's 'Coastline' publication.

For the latest issue and to subscribe visit marineandcoasts.vic.gov.au/newsletter.

CHALLENGES AND UPDATES

Working with cutting-edge technology also creates challenges, and this program is no exception. Below are a couple of challenges groups have mentioned:

AeroPoints Delaminating – Many of the newest AeroPoints (those starting 1446 or 003) have a problem with their glue, and the layers of the AeroPoints are separating, or delaminating.

PropellerAero have notified me that this is a manufacturing fault and will be replacing any AeroPoints which start with 003 or 1446 that are delaminating. If you have any of these, could you please email Blake Allan (b.allan@deakin.edu.au) with a photo of the separation, including the number of the AeroPoint (as image above).

AeroPoints not turning on – The AeroPoints are a great piece of new technology, but their very pioneering aspect means they have a couple of issues. If your AeroPoint won't turn on, please sit it outside in the sun for 2-3 days. If it still won't turn on after this time, please let us know via email (vcmp@deakin.edu.au).

AeroPoints with data interruption – The following 8 AeroPoints were interrupted during their last upload, and failed to upload all data successfully: 8339996, 338915, 2322147, 339653, 13016532, 2321005, 8364421, 8319222. If you have one of these, please let us know.

Lastly, if you have access to your equipment while in isolation, we have some suggestions to help with longevity of the equipment:

1) Please wipe down the UAV, iPad, controller, and batteries with a dry cloth to remove sand and salt
2) Please clean the solar panel on the AeroPoints with a damp cloth
3) Please switch your charger to "Storage" and place all the batteries into a storage charge
4) Please charge the controller and iPad to full, then switch off the iPad
5) Please sit the AeroPoints out in the sun for a day (turned off) every 3 weeks or so.

If you have experienced any other difficulties or challenges you would like to share, please contact us at vcmp@deakin.edu.au.

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