VICTORIAN COASTAL MONITORING PROGRAM NEWSLETTER

April 2020

WELCOME

Hello VCMP Citizen Scientists, and welcome to the first edition of the VCMP newsletter. We worked hard to get this first edition out at a time of such disturbance due to COVID-19, as we believe that now, more than ever, it is important to come together as a community and celebrate the amazing work which has been completed since this program began.

Historic perspective on erosion

Cowes East Foreshore Preventative Action Group, Leon Sweeney and Meredith Lynch (back), received their first drone tutorial last week from Melbourne University researcher Karina Sorrell (sitting, front), to collect data on beach erosion. Data will be collected as part of a three-year project to understand the rate of beach erosion on Phillip Island. Since mid-2018, university researchers have been visiting Cowes every second month to take about 800 photos, from a drone at 100 metres altitude. The photos cover a 2.1km stretch of beach, from Erehwon Point to almost the end of Silverleaves residential area, at low tide from the dunes to the water line. The photos will be compared to historical photos, and also build a 3D surface model to calculate the volume of sand moved. Full story on page 3.

A newspaper article featured in the Phillip Island & San Remo Advertiser

As you are no doubt aware, we have temporarily suspended the citizen science drone program due to the pandemic. This is in alignment with the government's advice on non-essential gatherings. Once it is safe to do so, we will resume our data collection. We will be offering assistance and refresher training to any and all groups who would find it useful when we resume, and continuing or commencing the training of our new members in Ocean Grove and Anglesea.

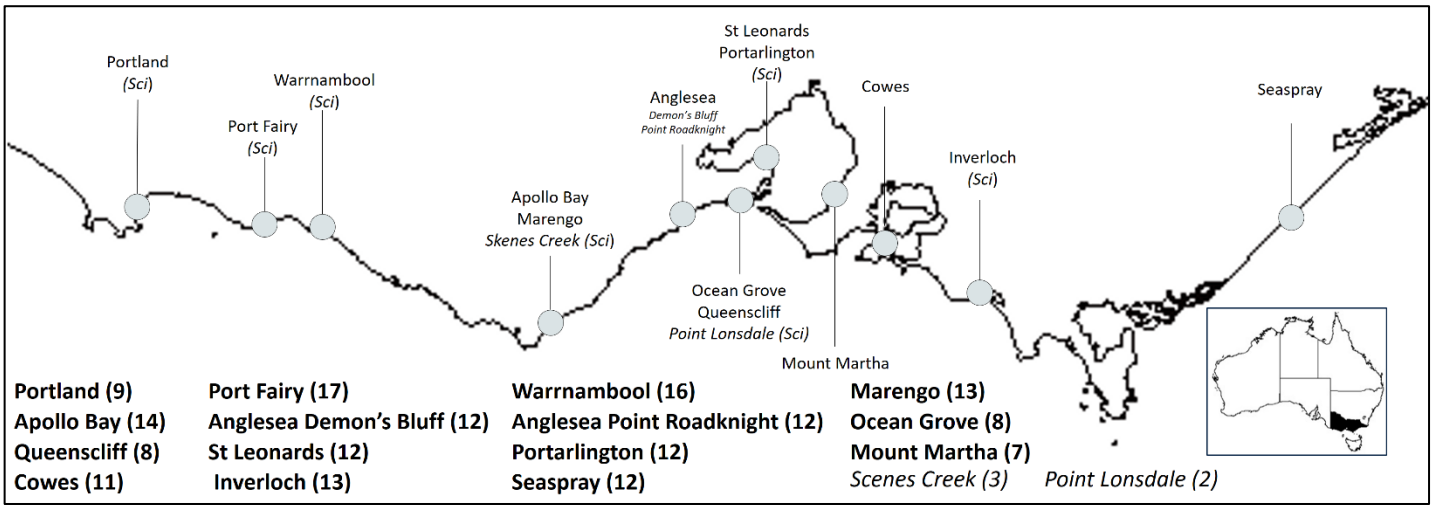
On a more positive note, we have some good news regarding the time-series mapping. We have contracted a commercial UAV operator to map the sites in the coming weeks. The contractor is able to work as a single-operator, maintaining all requirements for social distancing, and the isolation restrictions currently in place in Victoria. This will ensure we don't have any large gaps in our on-going dataset. We currently envisage this to be a one-off operation necessitated by the conditions of social-distancing, which will get us through to June, when we can hopefully start mapping again.

This period of isolation is not however delaying our exploration of the data you have all been diligently collecting. The scientific team has been developing some ground breaking techniques for analyzing your data and initial testing show them to be of great benefit for measuring shoreline dynamics and success rates of interventions such as renourishment activities for example. The PropellerAero Portal remains active, and we will be making a new series of videos and instructions to help you get the best results from the online data. Access instructions can be found at: https://www.marinemapping.org/vcmp-citizen-science. Please contact me (b.allan@deakin.edu.au) if your group would like to be able to save the measurements you make in the portal and export data. If you have used the data for any presentations, reports or stories, please let us know. We'd love to know how the community is engaging with the data and the portal. Thank you all, and I hope you and your family & friends are safe and well in these very unusual times.

- Dr Blake Allan
  UAV Citizen Science Co-ordinator

PROGRESS

The data collection to-date is nothing short of monumental! Citizen Scientists have collected 181 datasets across 17 sites. We are still finalizing the data processing on the last few, but almost all the data is online. The image below lists the VCMP sites and the number of datasets collected.



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. Skenes Creek and Point Lonsdale are 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 Skenes Creek and Point Lonsdale, locations not mapped by Citizen Science Groups. Currently, Science Team flights have contributed to 31 datasets.

COASTSNAP

We are excited to announce that we have begun to develop a network of CoastSnap stations across Victoria, expanding our citizen-science coastal monitoring initiative. The CoastSnap project was developed at the Water Resources Laboratory at the University of New South Wales and in collaboration with them, in December 2019 we installed the very first station in Victoria, at Inverloch.

CoastSnap Inverloch Station

CoastSnap uses photos taken by Citizen Scientists to record short and long-term beach change. Photos are taken with a smart phone held on the CoastSnap station's fixed cradle and sent to the team, who process the images to detect changes in the shoreline position and beach width over time. Since the station was installed in Inverloch, we have received an average of 1 photograph per day at the site and even more on those hot summer days when everyone is at the beach. This is a great result!

Whilst we have had to pause CoastSnap monitoring and the installation of further stations for the time being, we look forward to being able to continue with this project when it is safe to do so. To find out more about this project, email CoastSnapVIC@gmail.com, visit facebook.com/CoastSnapVIC or follow the link to our news article:https://pursuit.unimelb.edu.au/articles/how-you-can-help-scientists-monitor-our-beaches.

MEET A VCMP RESEARCHER

Nicolas Pucino, PhD Candidate, Deakin University

Dear Citizen –Scientists,

Figure 1: Me, taking hyperspectral signatures of sand from the dune in Warrnambool beach.

My name is Nicolas Pucino and I am a 31 year-old PhD student at Deakin University. I am originally from Italy but I grew up in Switzerland, where I studied physical geography (Lausanne, French Switzerland) before migrating to Australia to obtain my Master in coastal management and planning (Wollongong, New South Wales). Today, I am interested in remote sensing of the coasts. Basically, I derive information about sand grains, beach states and shoreline evolution using sensors that I bring to the field (Figure 1), you fly in the air and governments put into space. With your help, one of my PhD chapters aims at testing the quality of Citizen Scientist data, quantifying and comparing beach erosion and accretion in Victoria and providing local managers with beach-specific sand dynamics maps (Figure 2).

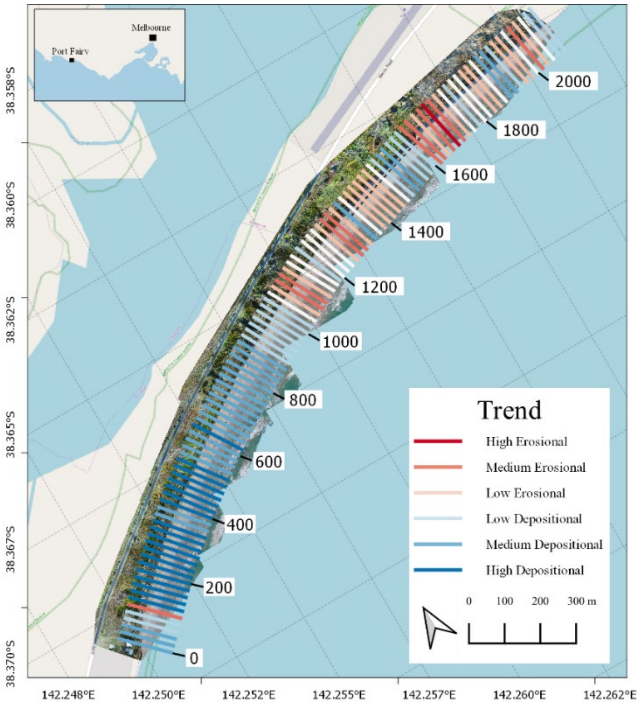


Figure 2 Map of volumetric trends in Port Fairy, based on all the UAV surveys obtained by Citizen Scientists from 5th June '18 to 7th June '19. Here we can see that the lower part of the beach is more likely to gain sediment, while in the northern part, erosion is dominant.

My analysis statistically proves that your data is as good as professional surveyor and researchers. Well done to everybody! I found that the monitored site in Inverloch eroded with a steadily accelerating pace from the 15th October '18 to 30th June '19. Also, in Apollo Bay, erosion is effectively slowed down by sand nourishment practices, but is ongoing in non-nourished sectors.

I am looking forward to the full 3-years dataset to obtain a wider temporal baseline to analyse seasonal and inter-annual sediment dynamics. The longer the timeseries, the more reliable the information will be.

In this regard, I really would like to thank you for the collective great effort you put into collecting the data. You are being pioneers with us in this World premiere. Your dedication, our analytical skills and the shared passion that connect us all is producing unprecedented data that directly helps coastal managers to understand our coast. In other words, you are directly contributing to making objective and evidence-based decisions in coastal planning.

Sincerely,
Nick

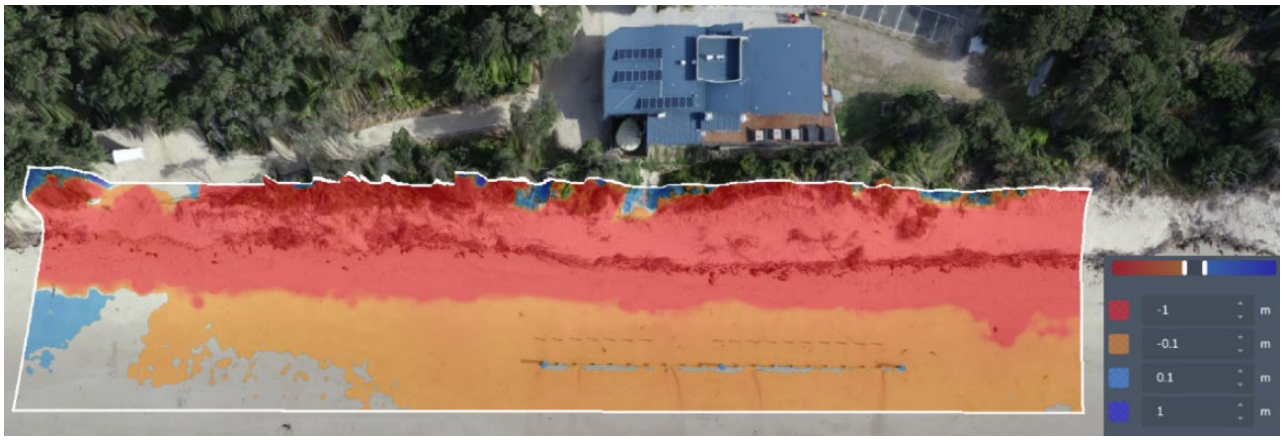
PhD Student in remote sensing of coastal morphodynamics

SITE SNAPSHOT - INVERLOCH

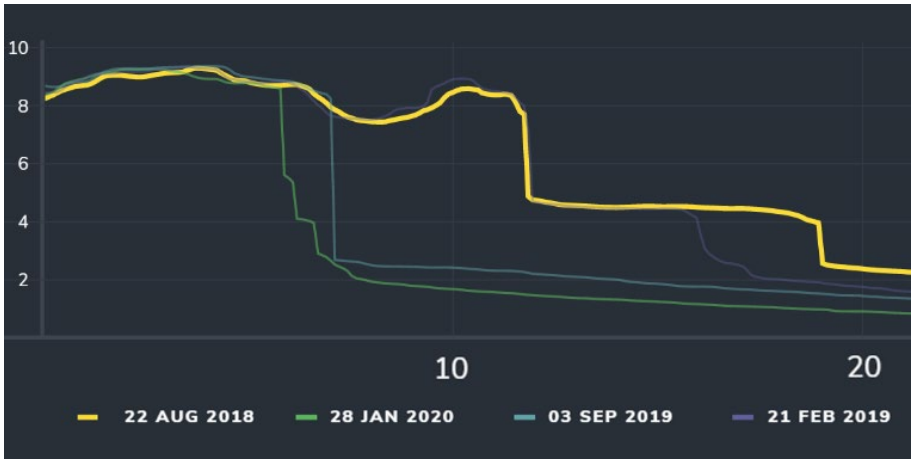
Every site we map is unique. In this section, we will highlight a different site in each issue of the VCMP newsletter. We will use the Propeller platform to produce both data analysis and images to help demonstrate how the platform can be used. The first site snapshot is of Inverloch!

Citizen Science mapping region if Inverloch Surf Beach in August 22, 2018 and January 28, 2020.

Since we started mapping on August 22, 2018 the open-ocean beach at Inverloch has lost over 100,000 m^3 of sand and the coast has built out hundreds of metres in the entrance to Anderson Inlet. The erosion along their surf beach is now threatening the surf lifesaving club. A sand fence was built in an attempt to halt the shoreline retreat, but it was destroyed by the fierce storms last winter. A much sturdier sand-bag wall has recently been finished to try and maintain the position of the dune during the coming winter. The Citizen Science UAV mapping of this section of beach is crucial to monitoring this erosion and the effectiveness of the mitigation structures being built.



Surf Lifesaving Club Polygon (6,180 m^2) (image January 28, 2020). This section has recorded a net loss of 10,252 m^3 in the 17 months between August 22, 2018 and January 28, 2020



A retreat of 11.6 m was observed at the toe of the dune between August 22, 2018 and January 28, 2020

A cross-section comparison at one of the worst-impacted locations has measured a retreat of over 12 m to the dune face. Continued monitoring will help land managers to decide whether further mitigation measures are required.

Co-incident with the erosion on the open-ocean beach, a coastal plain with lagoon formed approximately 750 m east of the surf lifesaving club. In the past few years this sand has started to adjust its form with reworking of over 55 meters

between August 22, 2018 and January 28, 2020. The movement of sand in this area is complex and researchers in the wider VCMP project are currently working to understand how and why so much change has occurred over this period.

Inverloch is one of the most dynamic sites in the VCMP, and the Citizen Science UAV data is being used by engineers and government to assess the coastal changes and develop management strategies into the future.

Adjustment of the coastal plain approximately 750 m east of the surf lifesaving club between August 22, 2018 and January 28, 2020

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

If you, or your Citizen Science group would like to share your story or an article or photos about your group, we would love to include them in our next edition. Send your ideas and photos to vcmp@deakin.edu.au with the subject line "Content for VCMP newsletter" and we'll be in touch to include your content in the next newsletter.

THE VCMP IS NOMINATED FOR AWARDS

Awards are a great way to acknowledge the amazing work being done by our Citizen Scientists across the state, as well as spreading the word about the pioneering work we're undertaking. So, it's with great pleasure that we can announce that the VCMP has been nominated for two awards already this year! The two awards are:

The 2020 Victorian Marine and Coastal Award – This award is to recognise and celebrate outstanding achievements of individuals and organisations contributing to managing, protecting and enhancing Victoria's marine and coastal environments for the enjoyment of all. We have been nominated in the category of "Inspiring community engagement and education"

https://www.marineandcoastalcouncil.vic.gov.au/news-and-events/victorian-marine-and-coastal-awards

The 2020 Australian Museum Eureka Prize - the Eureka Prizes reward excellence in the fields of research & innovation, leadership, science engagement and school science, and raise the profile of science and science engagement in the community by celebrating outstanding achievement. We have been nominated in the category of "Innovation in Citizen Science".

https://australianmuseum.net.au/get-involved/eureka-prizes/

We will keep you informed as these nominations progress.

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:

UAV hovering about 1 m off the ground after survey but not landing – This occurs sometimes when there has been an air pressure change while flying. When the air pressure changes, the readings from barometer in the UAV change also. The barometer sets the height of the UAV above the ground, so we end up with a UAV that thinks it has descended to the ground, but hasn't quite made it yet. Don't worry, the UAV will not turn off, but it will just stay there hovering. The best thing to do is just gently push down on the throttle stick (left stick), like you would if you were landing manually, and the UAV should land and shut down.

UAV gets to the start of the survey and is just hovering – Unfortunately, I'm not sure why this occurs sometimes. If it stays there for more than 30 seconds, the best thing to do is use the right stick to move the UAV left of right a little, then stop and wait. This will usually snap it out of the problem. If it doesn't, take over manual control and bring it home.

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 not uploading data – We have found that the best method of uploading data is to sit the AeroPoint in the sun while doing so, and to only upload 2-3 AeroPoints at a time. Whenever you upload from the AeroPoints, please let us know via email (vcmp@deakin.edu.au), and we will confirm their upload with you.

Lastly, it'll probably be at least a month until we are able to fly again. 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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THE UNIVERSITY OF MELBOURNE