

COASTSNAP: A GLOBAL CITIZEN SCIENCE PROGRAM TO MONITOR CHANGING COASTLINES USING SMARTPHONES

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INTRODUCTION

CoastSnap is a low-cost community beach monitoring program that empowers local communities to collect quantitative measurements of coastline change using their smartphones. Underpinning CoastSnap is a stainless-steel smartphone cradle that is installed overlooking a beach in a location easily accessible to the public (Figure 1). Using the cradle for image positioning, passers-by simply take a photo of the coast and upload it to a centralized database, which in turn provides a crowd-sourced record of coastline change over time.

Behind this simple idea are advanced image processing algorithms that then enable the shoreline position (and other relevant coastal features) to be mapped from these community snapshots in a scientifically rigorous manner (see Harley et al, 2019 and Figure 2). First established in Sydney, Australia in May 2017, the network of CoastSnap stations has grown rapidly over the past five years to now encompass over 220 monitoring locations in 22 countries. This talk will provide a general overview of this unique global citizen science program and present latest results on community participation at the Australian CoastSnap sites. Future directions as well as recent innovations being incorporated into CoastSnap will then be discussed.



Figure 1 - A CoastSnap station at Wamberal Beach, Australia (photo: Chris Drummond)

RESULTS

Results from the 44 CoastSnap stations now operating in Australia indicate strong overall community participation, with over 10 000 images and 4000 community participants to date and an image submission frequency ranging from approximately weekly to daily (average = 2.6 images/station/week). Results also show substantial variation from station to station, with the most popular stations (> daily submissions) characterized by having a prominent and readily accessible coastal vantage point as well as an engaged community. Less popular sites (< weekly submissions) meanwhile are found to be in more remote locations, having an obstructed or distant vantage point and/or being a less dynamic site in terms of morphodynamics.

NEW COASTSNAP INNOVATIONS

With the establishment of CoastSnap infrastructure in over 22 countries worldwide, the focus has now shifted towards new technological and outreach innovations. These innovations include: automated timelapse generation and shoreline mapping directly from the community snapshot; use of CoastSnap in coastal erosion forecasting systems; and new primary/tertiary STEM education initiatives.

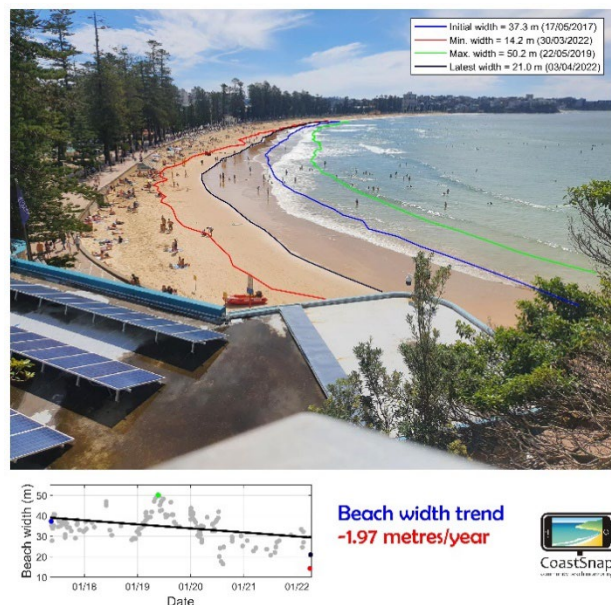


Figure 2 - Example CoastSnap shoreline trend output

REFERENCES

Harley, M. *et al.* (2019): Shoreline change mapping from crowd-sourced smartphone images, Coastal Engineering, ELSEVIER, vol. 150, pp. 175-189.