CoastSnap: a novel community beach monitoring program using smartphones and coastal imaging technology

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The use of fixed video cameras as a remote sensing technique for monitoring coastal change has been established in the coastal engineering field for more than two decades. In recent years, the growth of smartphone technology has meant that mobile camera lenses are now of sufficient resolution and quality to be used for coastal imaging applications in a similar manner to that of the present video camera network. This study presents a novel community beach monitoring program known as CoastSnap that harnesses the wide availability of smartphones by the general public, with the duel aim of significantly expanding the spatial coverage of the current network of coastal monitoring and at the same time encourage community participation in the data collection process. CoastSnap stations comprise a durable and permanent camera cradle overlooking a coastal location that enables the community to take photos using their smartphone. The camera cradle controls the position and angle of the photo, and images are in turn uploaded and shared via social media platforms. Surveyed information within the beach image are subsequently used to obtain quantitative measurements of beach change from the community-sourced photo database, including shoreline position, rip-channel and sandbar locations and subtidal bathymetry. Two pilot CoastSnap stations installed at Manly and North Narrabeen Beach (within the Northern Beaches LGA) in May 2017 have been successful in terms of both community participation (average image upload rate = 1 photo/day) and also as a coastal monitoring tool for both visualising and measuring coastal change. The study will present an evaluation of this novel method as well as a comparison between community-derived data and concurrent beach surveys using traditional coastal monitoring techniques (RTK-GPS).