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NANOSATELLITE PLATFORMS FOR GENERATION OF RESPONSIVE AND TARGETED DATASETS ON COASTAL DYNAMISM

Abstract

The intertidal zone is a region of the coast that is critical for studying the effects of climate change on coastal communities. Close to two fifths of the global population live at or near the coast, and the effects of sea level rise and increased storm activity are already apparent in many different continents. Up-to-date, regular measurements of coastal change are vital to making the right decisions on how to mitigate and adapt to these climate-driven risks. Shoreline positions offer a standardised and comprehensible measure of sea level and morphological change, but obtaining this data in the field is logistically difficult. Advances in satellite-derived coastal boundaries have recently opened up new opportunities for coastal monitoring and decision-making. However, the large file sizes of images from publicly available platforms such as Sentinel-2 and Landsat-8, combined with the long lead time associated with obtaining the data and post-processing to extract useful information, have led to limited adoption of these datasets. The increasing capability of nanosatellites can enable the generation of responsive and targeted data that can be readily maintained for use by researchers and policy makers. This paper details the current gaps in coastal datasets and current user requirements that could be met by nanosatellite missions such as the OirthirSAT platform. Datasets desired by end users are identified, and a comparison of current EO platforms to prospective missions is discussed. The design of a mission to generate data on UK coastal boundaries is presented, from which a more generic approach for nanosatellite platforms is laid out. By presenting the gaps in coastal monitoring data, future missions can better provide the information required to help address climate change driven hazards to our coastal communities.