

A new remote sensing method for high-resolution quantification of submersion regimes in wave exposed shores

Flores, G., Aguilera, J. C., Almar, R., Cienfuegos, R., & Navarrete, S. A. (2016). A new remote sensing method for high-resolution quantification of submersion regimes in wave exposed shores. *Limnology and Oceanography: Methods*, 14(11), 736-749. <10.1002/lom3.10133> Accessed 23 Dec 2020.

Abstract

The importance of the submersion regime for the physiology, behavior and ecology of intertidal organisms, as well as limitations of available measurement methods, motivated us to develop a new remote sensing method. This new method is based on video monitoring of visual references installed at interest positions in the intertidal zone. Video imagery processing algorithms discriminate between states of submersion and emersion. The signal is based on the fluctuation in the color contrast between the visual reference and the adjacent rock. Our remote sensing method was validated favorably by comparing with direct field observations of submersion time series and comparison of different submersion metrics, including submersion percentage and maximum emersion duration. Since the remote sensing method captures and stores imagery remotely, obtaining long records of high temporal resolution is facilitated and the risk of discontinuity of time series is reduced in comparison to the use of sensors at the zone of wave impact. The high temporal resolution is critical for environments with high exposure to waves and allows for reliable estimates of a wide variety of relevant submersion metrics. This low cost remote sensing method should encourage quantification of submersion regimes of organisms inhabiting rocky intertidal zones, as well as the exploration of physiological, behavioral and ecological consequences of these regimes. Identifying the character of the forces underlying submersion regimes, together with critical environmental variables, such as temperature and solar radiation, will allow better hindcasts and forecasts of the ecological consequences of past and future climate change on these communities..