

The use of low-cost sensors for monitoring coastal climate hazards and developing early warning support against extreme events.

Tasneem Ahmed, Leo Creedon, Iulia Anton, and Salem Gharbia

- Institute of technology Sligo, Sligo, Ireland, tasneem.ahmed@mail.itsligo.ie.

Coastal areas are socially, economically, and environmentally intensive zones. Their risk to various natural coastal hazards like coastal flooding, erosion, and storm surges has increased due to climate-induced changes in their forcing agents or hazard drivers (e.g. sea-level rise). The increased exposure (e.g. dense population living near the coast) and vulnerability (e.g. insufficient adaptation) to these hazards in the coastal areas have complicated the adaptation challenges.

Thus, monitoring coastal hazards is essential to inform suitable adaptation to increase the climate resilience of the coastal areas. In monitoring coastal climate hazards to develop coastal climate resilience, both the forcing agents and the coastal responses should be observed.

As coastal monitoring is often expensive and challenging, creating a database through a systematic analysis of low-cost sensing technologies, like UAV photogrammetry for monitoring the hazards and their drivers would be beneficial to the stakeholders. Real-time information from these low-cost sensors in complement to the existing institutional sensors will facilitate better adaptation policies including the development of early warning support for building coastal resilience. In addition, it would also provide a valuable dataset for validating coastal numerical models and providing insights into the relationship between these hazards and forcing agents. Additionally, such low-cost sensors would also create opportunities for engaging citizens in the data collection process, for efficient data collection, and increasing scientific literacy amongst the general public. For instance, in the Sensing Storm Surge Project (SSSP), citizen science was used to collect technical data to characterise estuarine storm surges, generating data useable in peer-reviewed Oceanography journals. Coastal areas show complex morphological changes in response to the forcing agents over a wide range of temporal and spatial scales. Thus, monitoring the hazards with a sufficient temporal and spatial resolution is imperative to distinguish the changes in these hazards/drivers due to climate change from natural variability. This will not only help address the response strategies to these hazards but also adjust

these response strategies according to the changing vulnerability of a particular region.

The database of the low-cost sensors thus created is in no way exhaustive since those have been retrieved through a certain combination of keywords in databases like Scimedirect, Web of Science, and Scopus, nonetheless it is useful as these are the latest low-cost sensors available to monitor the major coastal hazards in the vulnerable coastal regions.

How to cite: Ahmed, T., Creedon, L., Anton, I., and Gharbia, S.: The use of low-cost sensors for monitoring coastal climate hazards and developing early warning support against extreme events. , EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-8825, <https://doi.org/10.5194/egusphere-egu22-8825>, 2022.