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# Monitoring, understanding and accompanying the impact of global changes on shorelines thanks to citizen monitoring programs of strand lines

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## Abstract

Monitoring, understanding and accompanying the impact of global changes on shorelines are crucial for biodiversity conservation. Coastal sand dune ecosystems that have high conservation and functional roles (trophic, erosion mitigation) are often dependent from seaweed and marine debris deposition. Those are expected to change in quantity and composition under global warming and eutrophication. We hypothesised that surveying strand line could i) inform on marine ecosystem changes (seaweed biomass and community composition) and ii) allow to better understand the impact of global changes on (socio)-ecosystem relationships (sand beaches). Citizen monitoring, in addition to provide data at large spatial and temporal scales, could facilitate the appropriation of conservation issues in management of shoreline ecosystems. We develop a citizen shoreline monitoring program "Plages vivantes" focusing on strand lines (seaweed biomass, composition, flora, associated fauna). The program is addressed to different volunteers. That raised the questions of the adaptation of protocols to scientific aims and to public motivations and constraints. We co-constructed the protocols with volunteers (NGO, scholar, outdoor sports, natural areas managers...) and tested their relevance to detect the effects of environmental changes. The study was conducted on 150 sampled sites along France Channel-Atlantic coastline in 2017-2018. First results on seaweed composition of the strand line highlighted the potentiality of such citizen monitoring programs to assess coastal biodiversity states and changes and to contribute to the connexion of volunteers with conservation issues in such ecosystems.

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