The Minimum Patch Size Scale for Seagrass Canopy Restoration

Authors : Aina Barcelona, Carolyn Oldham, Jordi Colomer, Teresa Serra

Abstract : The loss of seagrass meadows worldwide is being tackled by formulating coastal restoration strategies. Seagrass loss results in a network of vegetated patches which are barely interconnected, and consequently, the ecological services they provide may be highly compromised. Hence, there is a need to optimize coastal management efforts in order to implement successful restoration strategies, not only through modifying the architecture of the canopies but also by gathering together information on the hydrodynamic conditions of the seabeds. To obtain information on the hydrodynamics within the patches of vegetation, this study deals with the scale analysis of the minimum lengths of patch management strategies that can be effectively used on. To this aim, a set of laboratory experiments were conducted in a laboratory flume where the plant densities, patch lengths, and hydrodynamic conditions were varied to discern the vegetated patch lengths that can provide optimal ecosystem services for canopy development. Two possible patch behaviours based on the turbulent kinetic energy (TKE) production were determined: one where plants do not interact with the flow and the other where plants interact with waves and produce TKE. Furthermore, this study determines the minimum patch lengths that can provide successful management restoration. A canopy will produce TKE, depending on its density, the length of the vegetated patch, and the wave velocities. Therefore, a vegetated patch will produce plant-wave interaction under high wave velocities when it presents large lengths and high canopy densities.

Keywords : seagrass, minimum patch size, turbulent kinetic energy, oscillatory flow

Conference Title : ICPCPME 2021 : International Conference on Physical Coastal Processes, Management and Engineering **Conference Location :** Rome, Italy

Conference Dates : June 03-04, 2021