

Particle dynamics in coastal ecosystems

Teresa Serra

Department of Physics. University of Girona. Carrer de la Universitat de Girona, 4.
17003-Girona (Spain).

Coastal aquatic vegetation like seagrasses modify the vertical distribution of sediment particles; especially when particles come from allochthonous sources. River plumes, coastal runoff, and spontaneous resuspension are a few examples of the natural sources of the allochthonous sediment input. Seagrasses can capture suspended particles trapping them on their leaves, remaining in suspension within the canopy and enhancing the deposition onto the seabed. Seagrasses' ability to capture sediment particles was proved in laboratory studies carried out in a flume with a variety of hydrodynamic conditions and canopy densities that mirrored actual field conditions. Samples of suspended sediment were pipetted above and within the meadow for being measured with the Liss-100X. Also, at the end of experiments ten plants were gently removed from different evenly separated positions within the meadow and introduced into a beaker with a volume of 80 mL of water to remove particles deposited on their blades. The concentration of particles was then measured with the Liss-100X, from which the total mass of particles deposited on the blades could be calculated. Seagrasses decreased the amount of suspended sediment by capturing the sediment on the blades of the seagrass and by enhancing particle sedimentation on the seabed. However, particles trapped by the blades of seagrass in the whole canopy increased with canopy density and reduced the number of particles in suspension within the canopy. The ecological implications were noteworthy because a bottom covered with vegetation reduced the suspended sediment particles within the canopy, improving water clarity, in contrast to bare soil. Additionally, seabed sedimentation was facilitated by canopies as opposed to bare substrates, and the denser the canopy, more particles were deposited on the seabed.