

Effect of wind and waves on a nearshore brine discharge dilution in the east coast of Spain

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ABSTRACT

Two desalting plants discharge brine through a shared open channel directly to the nearshore at the Alicante coast (south east Spain). The plant managers have to dilute the brine with seawater before being discharge to keep the salinities values low at a nearby protected *Posidonia oceanica* meadow. This setup provides a unique scenario to further understand the effect of wind and waves on nearshore brine mixing process. In this study, two field campaigns under non storm condition with dilution rates of 1:3 and 1:8 have been done. At a fixed point located outside the surf zone, wind, waves, current and salinity has been measured twice per hour since December 2008. An increase on the dilution rate proportionally reduces salinity values outside the surf zone, makes the plume more horizontally homogeneous and increases the vertical variability. Near bottom current is mainly driven by the bottom topography while wind and waves has little effect on it. Near bottom and surface salinity and temperature have shown to be highly variable at different time scales. Wave action has shown to reduce near bottom salinity. Not only wave height but also duration of the storm seems to play an important role on near bottom salinity.

Keywords: Reverse osmosis; Monitoring; Kriging; Currents; Automated system for desalination dilution control

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