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Dispersion of brine discharge from seawater reverse osmosis desalination plants

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ABSTRACT

Desalination of seawater has been considered as a potential solution for the water shortage problem in coastal areas and the number of projected and constructed desalination plants has significantly increased in recent years. The challenge of the desalination industry is to produce new water resources without increasing the pressure on the marine environment. Environmental impact of SWRO desalination plants is mainly associated with the discharge into the sea of the brine produced. To estimate the area of influence of the brine several models have been proposed, but validation with real data is needed. The objective of this paper is to present the results of the monitoring of the brine effluent emanating from several SWRO desalination plants in the western Mediterranean Sea in order to estimate the area of influence of the hypersaline plume. We also illustrate how the behavior of these brine discharges can differ significantly according to discharge characteristics. This information may be useful to predict effluent distribution in order to minimize the harmful effects of brine discharges into the sea.

Keywords: Desalination discharge; Monitoring; Plume dispersion; Brine dilution

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