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Coastal aquifer groundwater dynamics and salt intrusion: Monitoring system of river Neretva delta

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River Neretva delta is located in southern part of Croatia and creates a complex surface- groundwater system influenced by tidal forces characteristic for Adriatic Sea and river Neretva whose discharge varies from 70 – 2700 m3/s over the year. From agricultural point of view, area is used widely for fruit production which implies existence and functionality of complex drainage system consisted of a net of lateral channels and pumping station plants with the capacity of app. 25 m3/s. Area of interest covers app 3500 ha and is bounded by river Neretva from North and Adriatic sea from West. Southern and eastern boundaries are dominantly karstic hills. Lover aquifer is confined with app depth of 65 m, made of fine gravel. Aquitard is a 15 m height layer of clay. Upper aquifer in unconfined with depth of app 10-20 m. Inside the area of interest there are 8 wells installed (each aquifer 4) measuring piezometric head on hourly/daily temporal scale. Sea level measurements are also made capturing for long term tidal oscillations. Discharge measurements are made few km downstream from hydropower plant Mostar (Bosnia and Herzegovina), while three meteorological stations for rainfall measurements are located at the area boundaries. Salt water concentration, pH and resistivity values have been measured locally, app 6 times per year for last 10 years. Results imply confined aquifer is dominantly influenced by the sea level while tidal effects are noticed 9 km upstream the river Neretva with delay of 9-12 minutes compared to sea level. Salt water cline inside the river is related to tidal effects and river discharge, with potential presence at distances of more than 15 km upstream from the sea. Salt water intrusion dominantly occurs through confined aquifer while vertical transport of salt is supposed to be enhanced by the effects of drainage system.