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The influence of tectonics on late Holocene relative sea-level changes from the central Adriatic coast of Croatia

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Geological records of relative sea-level (RSL) change in the Adriatic have illustrated the importance of tectonic activity on late Holocene RSL histories. Here, we compare RSL records with predictions of RSL evolution from the new ICE-7G_NA (VM7) global glacial isostatic adjustment model for the central-eastern Adriatic coast of Croatia to assess underlying driving mechanisms of RSL change during the last $\sim$ 2700 years. We combined local published sea-level index points (SLIPS) (n = 23) with a new salt-marsh based RSL reconstruction constrained vertically, by modern foraminiferal distributions (+ 0.12 m), and temporally, by radiometric analyses providing sub-century resolution within a Bayesian age-depth framework. We coupled these RSL data with local tide-gauge measurements and modelled changes in RSL using an Errors-In-Variables-Integrated-Gaussian-Process (EIV-IGP) model accounting for full uncertainty of the RSL data.

The previously established SLIPS show RSL rising from -1.48 m at 715 BCE to -1.05 m by $\sim$ 100 CE. Between $\sim$ 500 and $\sim$ 1000 CE, RSL was -0.7 m below present rising to -0.25 m at $\sim$ 1700 CE. The salt-marsh record shows RSL rose $\sim$ 0.28 m since the early 18th century at an average rate of 0.95 mm/yr. Magnitudes and rates of RSL change during the twentieth century are concurrent with long-term tide-gauge measurements, evidencing a rise of $\sim$ 1.1 mm/yr. A constant but subtle increase in the rate of RSL change supports previous findings for the lack of any significant modern sea-level acceleration in the Adriatic and wider Mediterranean region. Predictions of RSL change from the ICE-7G_NA (VM7) model are consistently higher than the observational RSL data (e.g., $\sim$ 0.25 m below present at 700 BCE) supporting an overarching influence of tectonic subsidence on the RSL history in the central-eastern Adriatic during the late Holocene.