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Farmland productivity under stress conditions: a field scale monitoring and modeling study on the Venice coastland, Italy

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The Venice coastland, Italy, is a precarious environment jeopardized by both natural and anthropogenic factors. Due to a land elevation below sea level and the presence of sandy paleo-channels, salinization of soil and shallow groundwater is posing a serious threat to the agricultural productivity of the region. In order to identify and quantify the impacts of the saltwater contamination on crop productivity an integrated monitoring and modeling approach is used. A representative 21 ha basin cultivated with maize crop has been extensively studied by soil sampling, geophysical surveys, continuous hydrological monitoring and crop yield distribution. Based on field observations a field-scale model of soil moisture dynamics coupled with plant transpiration, photosynthesis and growth has been developed and applied at the site.