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Irrigation impact on thermodynamics in weather forecast modelling

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By 2030, over 300 million hectares worldwide will be irrigated, constituting the second most significant anthropogenic influence on land use following urbanisation. Our study focuses on an irrigated Terrestrial Environmental Observatories (TERENO)/Integrated Carbon Observation System (ICOS) site in Germany, unveiling irrigation's immediate effects on soil moisture, latent heat flux, skin and soil temperature. As we strive to seamlessly integrate irrigation processes into the ECMWF Integrated Forecasting System (IFS), our investigation extends to an offline model, ECLand, including dynamical vegetation. Introducing a perturbed precipitation field offers a refined perspective of mimicking irrigation. The feedback provides us with insights into the coupling of simple irrigation representation on thermodynamic variables, ensuring optimal benefits for the IFS. After verification with remote sensing data, the next step involves coupling water fluxes to stomatal conductance via photosynthesis, shedding light on the preliminary influence of irrigation on enhanced vegetation growth. This aims to untangle irrigation effects of increased soil moisture and greening.