

# Simulating Australian Soil Organic Carbon Sequestration

JUHWAN LEE<sup>1</sup>, RAPHAEL A. VISCARRA ROSSEL<sup>1</sup>

<sup>1</sup>Soil & Landscape Science, School of Molecular & Life Sciences, Faculty of Science & Engineering, Curtin University, Kent St, Bentley WA 6102, Australia

National initiatives to mitigate and adapt to climate change imply the need for enhancing carbon (C) sequestration in soils. Soil process models often render a C baseline hardly representative and its C sequestration potential questionable when initial soil C pools are not accounted. Here we use the soil process model Roth C to simulate site-specific soil C across 4431 sites in Australia. After matching the modelled and measured C pools at initial equilibrium, the model predicted C sequestration potentials in soils, coherent to changes among the pools, in response to soil inputs that represent soil and residue management. We show that the extent of C sequestration is constrained by C composition that is further influenced by climate and land use. Our results highlight the importance of improving and optimising climate change mitigation and adaptation based on soil C composition.