

# Implementing RAL3 in NZ – performance and plans

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NIWA runs a number of operational NWP workflows spanning multiple horizontal and vertical resolutions and an even wider variety of geographic domains and terrain types. In this presentation, we highlight key results from trials of RAL3 across these systems. Validation against current workflows that use both pre-RAL1 and RAL2 convective-scale science configurations will be presented.

A key feature of RAL3 is the shift to a 90-level vertical level set while retaining a 40km model top (L90\_40km). To ensure the best possible use of available satellite data over the NZ region, which is known to be key to ensuring good model performance over NZ, NIWA has traditionally reverted to the L70\_80km Global model level set, in its data assimilating NWP workflows instead of using the L70\_40km level set. This is the case for the 4.4km resolution NZLAM and 1.5km resolution NZCSM. Early versions of the newly assembled NZENS-DA, currently in test mode at 4.4km resolution and spanning the NZ, Tasman Sea and Eastern Australia region, also use the L70\_80km level set with the RAL2-M science configuration. In this presentation, we will provide some early commentary on the impacts changing the vertical level set has on model performance over NZ with RAL3 and how we plan to handle this key change in our future model updates.

Finally, we will outline our current RAL3 implementation plan accounting for NIWA's installation of a new HPC, due in early 2025, and the necessary work that entails for our NWP and downstream hazard models.