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A continental radon flux map for Australia

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The inert radioactive gases radon–222 and radon–220 are useful natural tracers for atmospheric mixing and transport studies. With a half–life of 3.8 days, the former has been widely used to verify the treatment of mixing in atmospheric models, commonly with the assumption of a uniform flux of $1\,\mathrm{atom\,cm^{-2}\,s^{-1}}$ from ice-free land. We present an improved representation of the surface flux of both radon–222 and radon–220, based on an observed empirical relationship between radon flux-chamber measurements and airborne gamma ray measurements, which have recently been produced on a calibrated Australia-wide grid. With the incorporation of additional environmental parameters, it is possible to produce a map of the spatial variability of surface radon flux at a continental scale.