

# Monitoring soil erosion risk in the agricultural landscapes of South Australia using calibrated satellite data

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A large proportion of soils in South Australia's agricultural zone are inherently susceptible to wind or water erosion. Over recent decades there has been substantial adoption of improved land management practices that reduce erosion risk, but it is still a major threat to the soil resource and sustainability of agricultural production in South Australia. The South Australian Department of Environment, Water and Natural Resources (DEWNR) has monitored the erosion protection status of agricultural soils using ground-based observational surveys since 1999.

Recent developments in remote sensing provide the potential for more cost effective and standardised methods to assess annual biomass stocks and soil erosion protection status in agricultural landscapes. Nine years of geo-located field survey data (i.e. four surveys per year by 5600 survey sites) and monthly MODIS Fractional Cover data was used to build new soil exposure and erosion risk models. To achieve adequate agreement between the satellite data and the field observations, soil and seasonal effects on the MODIS data were accounted for. A topographic wetness index together with mapped location of native vegetation was incorporated into the modelling, providing a 90 metre pixel resolution. These models evaluate the degree of soil exposure to wind and water erosion, at four critical times per year, throughout the landscape.

Maps and data of modelled soil erosion risk can be produced within a few weeks of the satellite passing over the state. This information is intended to be used by DEWNR for seasonal and long-term monitoring and reporting of soil erosion risk in South Australia.