Title

Modelled Hillslope Erosion over New South Wales

Abstract

This landing page is a collection of data packages and reports which supports the Modelled Hillslope Erosion over New South Wales.

Hillslope Erosion

Soil erosion by water includes sheet and rill erosion (also referred to as hillslope erosion) is a major form of land degradation in NSW landscapes. Hillslope erosion was calculated using the revised universal soil loss equation (RUSLE) which estimates soil loss (t ha-1 yr-1) by runoff. Rainfall-runoff erosivity (R) factor (MJ mm ha-1 hr-1 yr-1) in RUSLE was estimated using a daily rainfall erosivity modelling for NSW and long-term rainfall records (Yang and Yu 2015). The soil erodibility (K) factor (t ha h ha-1 MJ-1 mm-1) was estimated from digital soil mapping products and soil profile data (Yang et al 2017). Slope length and steepness (LS, unitless) factor was calculated, on catchment basis, from hydrologically corrected digital elevation model (SRTM DEM-H) based on comprehensive algorithms considering cumulative overland flow length (Yang 2015). The time series groundcover products (the latest version, V310) from Moderate Resolution Imaging Spectroradiometer (MODIS) were used to estimate groundcover and RUSLE cover and management (C, unitless) factor (Yang 2014). Time-series hillslope erosion datasets and maps were produced on monthly and annual bases from 2000 to present. The state and trends of hillslope erosion across New South Wales are summarised in Yang (2020). The relevant references are below:

Cover Erosion

This occurs when there is vegetation or ground cover, like grasses, shrubs or leaf litter, on the slope. The cover helps protect the soil from direct raindrop impact, reduces the velocity of surface runoff, and increase infiltration. As a result, erosion rates tend to be lower because the cover acts as a natural barrier that holds soil in place.

Bare Soil Erosion

This takes place on slopes with exposed soil, lacking any form of vegetation or cover. Bare soil is more vulnerable to erosion because there's nothing to cushion the impact of rainfall or slow down water flow. The lack of cover results in higher runoff velocity, which intensifies erosion processes, leading to greater soil displacement, sediment transport and potentially faster degradation of the slope.

1. Yang, X., Gray, J., Chapman, C., Zhu, Q., Tulau M., McInnes-Clarke, S. (2017). Digital mapping of soil erodibility for water erosion in New South Wales, Australia. Soil Research. 56(2), 158-170. https://doi.org/10.1071/SR17058.

2. Yang X (2015) Digital mapping of RUSLE slope length and steepness factor across New South Wales. Soil Research 53, 216-225. https://doi.org/10.1071/SR14208.

3. Yang X, Yu B (2015) Modelling and mapping rainfall erosivity in New South Wales, Australia. Soil Research. 53, 178-189. https://doi.org/10.1071/SR14188.

4. Yang X (2014) Deriving RUSLE cover factor from time-series fractional vegetation cover for soil erosion risk monitoring in New South Wales. Soil Research 52, 253-261. https://doi.org/10.1071/SR13297.

5. Yang X (2020) State and trends of hillslope erosion across New South Wales, Australia. Catena 186, 104361. https://doi.org/10.1016/j.catena.2019.104361.

Interactive Map

To view the Hillslope bare soil and cover erosion annual layers via SEED map 'Click Here'

The 'Show on SEED map link will load some of the data due to its complexity. To load more layers please go to the Layer Catalogue and add them. Get help on using the Layer Catalogue 'Click Here'

Resource locator

Show on SEED Web Map

Name: Show on SEED Web Map

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

	Display dataset on SEED's map Function: download
Data Quality Statement	Name: Data Quality Statement Protocol: WWW:DOWNLOAD-1.0-http--download Description: Data quality statement for Modelled Hillslope Erosion over New South Wales Function: download
NSW Environment Land and Soil - Soil Degradation	Name: NSW Environment Land and Soil - Soil Degradation Protocol: WWW:DOWNLOAD-1.0-http--download Description: NSW Environment Website - Soil Degradation Function: download
Modelling and mapping rainfall erosivity in NSW, Australia	Name: Modelling and mapping rainfall erosivity in NSW, Australia Protocol: WWW:DOWNLOAD-1.0-http--download Description: Publication Function: download
Digital mapping of soil erodibility for water erosion in NSW	Name: Digital mapping of soil erodibility for water erosion in NSW Protocol: WWW:DOWNLOAD-1.0-http--download Description: Publication Function: download
RUSLE slope length and steepness factor across NSW, Australia	Name: RUSLE slope length and steepness factor across NSW, Australia Protocol: WWW:DOWNLOAD-1.0-http--download Description: Publication Function: download
RUSLE cover factor from time-series fractional vegetation cover in NSW	Name: RUSLE cover factor from time-series fractional vegetation cover in NSW Protocol: WWW:DOWNLOAD-1.0-http--download Description: Publication Function: download
Slope and Steepness (LS-factor)	Name: Slope and Steepness (LS-factor) Protocol: WWW:DOWNLOAD-1.0-http--download Description: Slope and Steepness (LS) factor for NSW (unitless) Function: download
Soil Erodibility (K-factor)	Name: Soil Erodibility (K-factor) Protocol: WWW:DOWNLOAD-1.0-http--download Description: The soil erodibility (K) factor for NSW in unit (t.ha.h.ha-1.MJ-1.mm-1)

	Function: download
Web Map Service	Name: Web Map Service Protocol: WWW:DOWNLOAD-1.0-http--download Description: Annual Hillslope Erosion (WMS) Function: download

Unique resource identifier

Code	aea6e148-2c60-4de3-8233-2bc7ade4b4d2

Presentation form	Map digital
Edition	2
Dataset language	English

Metadata standard

Name	ISO 19115
Edition	2016

Dataset URI	https://datasets.seed.nsw.gov.au/dataset/aea6e148-2c60-4de3-8233-2bc7ade4b4d2
Purpose	Data for land management and environment monitoring
Status	On going
Spatial representation type	grid

Spatial reference system

Code identifying the spatial reference system	4283

Spatial resolution	100 m

Topic category

Keyword set

keyword value	SOIL-Erosion
Originating controlled vocabulary	
Title	ANZLIC Search Words
Reference date	2008-05-16

Geographic location

West bounding longitude	140.737
East bounding longitude	153.673
North bounding latitude	-37.576
South bounding latitude	-28.139

Vertical extent information

Minimum value	-100
Maximum value	2228
Coordinate reference system	
Authority code	urn:ogc:def:cs:EPSG::
Code identifying the coordinate reference system	5711

Temporal extent

Begin position	2018-03-20
End position	N/A

Dataset reference date

Resource maintenance

Maintenance and update frequency	As needed
Contact info	
Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

Lineage

Monthly hillslope erosion was estimated from monthly groundcover and rainfall erosivity since March 2000 to current, and the static K and LS factors. Annual hillslope erosion was estimated from annual mean groundcover and rainfall erosivity from 2000 to 2017, and the static K and LS factors. The mean annual hillslope erosion is the average annual erosion between 2000 and 2017. Similarly, monthly and annual hillslope erosion from 2000 to 2017 was also estimated for bare ground (where groundcover = 0 or C factor = 1).

Limitations on public access

Responsible party

Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
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Metadata date

2025-02-24T02:46:51.066540

Metadata language