



Nitrate-nitrogen leaching from dairy livestock 2017

Title

Nitrate Nitrogen leaching from livestock 2017

Creator

Stats NZ

Date

2018

Date

2019-04

Description

Raster layer with 100m * 100m pixels, Each pixel represents the estimated nitrate-N leached in kg/ha/yr. This layer contains all nitrate leaching estimated from dairy cows.

Source

The map of nitrate-N leaching was produced by combining a map of animal numbers and estimates of nitrate leaching rates per animal type. Animal numbers were estimated by distributing region-level totals (Statistics New Zealand, 2017a) according to land use and stock-carrying capacity (Landcare Research 1992). We utilized the latest available AgriBaseTM (AssureQuality 2018) land use data from May 2018 and LCDB version 4.1 (Landcare Research 2015) land cover data from 2012 for our spatial modelling. In-house scripts and routines were implemented across the AgriBaseTM to remove errors and defects. Stocking rate normalization to national stock numbers was based on the Agricultural Production Census 2017 at the regional authority level (Statistics New Zealand 2017a). The census data were mapped to 2017 regional boundaries (Statistics New Zealand 2017b). Nitrate-N leaching rates per animal type were estimated for 100 unique soil and climate combinations in New Zealand (i.e. LENZ level II: Leathwick et al. 2003) using OVERSEER® (AgResearch 2011). We took into account two modifiers: • Shallow soils that have twice as much nitrate leached than deep soils. • Irrigated land that will have different nitrate leaching rates for dairy cows. To identify irrigated areas in our analysis, we rasterized the spatial data set prepared by Dark et al. (2017). In the absence of a more robust method, nitrate leaching on horticultural and arable land was set to one and two times that estimated for sheep at stock-carrying capacity respectively (Lilburne et al. 2010). AgResearch 2011. OVERSEER®. Available from www.overseer.org.nz. AssureQuality New Zealand Ltd, 2018. AgriBaseTM. Dark A, Birendra KC, Kashima A 2017. National Irrigated Land Spatial Dataset: Summary of methodology, assumptions and results. Ministry for the Environment, C17042-1. Christchurch, Aqualinc Research Limited. Landcare Research 1992. New Zealand Land Resource Inventory. Landcare Research 2015. LCDB v4.1 – Land Cover Database version 4.1, Mainland New Zealand. <https://iris.scinfo.org.nz/layer/48423-lcdb-v41-land-cover-database-version-41-mainland-new-zealand> (accessed 06/11/2017) Lilburne L, Webb T, Ford R, Bidwell V 2010. Estimating nitrate-nitrogen leaching rates under rural land uses in Canterbury. Report No R10/127. Christchurch, Environment Canterbury. 37 p. Statistics New Zealand 2017a. Agricultural production statistics: June 2017 (final). <https://www.stats.govt.nz/assets/Uploads/Agricultural-production-statistics/Agricultural->

production-statistics-June-2017-final/Download-data/agricultural-production-statistics-jun17-final-tables-v2.xlsx (accessed 21/05/2018) Statistics New Zealand, 2017b. Geographic boundary files.

http://archive.stats.govt.nz/browse_for_stats/Maps_and_geography/Geographic-areas/digital-boundary-files.aspx (accessed 06/11/2017) The models were run using in-house scripts implemented within the ERDAS Imagine GIS software suite. The results for the individual land-use types considered were added to derive the map of total nitrate-N leached at national scale.

Coverage

-47.328567 167.376964 -33.949210 179.625229

Type

grid

Language

eng

Subject

New Zealand

Subject

AGRICULTURE-Livestock

Subject

INDUSTRY-Primary

Subject

LAND-Use

Subject

POLLUTION-Water

Subject

WASTE-Sewage

Subject

WATER-Quality

Subject

WATER-Rivers

Subject

farming

Subject

inlandWaters

Subject

environment