

Temperature, precipitation, birch and fireweed chemistry, and moose (*Alces alces*) calf mass in northern Sweden

SND-ID: 2022-245-1. **Version:** 1. **DOI:** <https://doi.org/10.5878/j1fh-8w11>

Download data

DataWeatherVegMoose.tsv (27.11 KB)

output_examples.zip (4.2 KB)

R_code_piecewise_SEM_log.txt (7.47 KB)

R_code_piecewise_SEM.r (6.58 KB)

sites_no.tsv.tsv (561 bytes)

Associated documentation

Key_DataWeatherVegMoose.tsv (2.15 KB)

Readme_columns__coefficients_and_SEM_overview.txt (1.37 KB)

Download all files

2022-245-1-1.zip (~49.43 KB)

Citation

Holmes, S., Danell, K., Ball, J., & Ericsson, G. (2023) Temperature, precipitation, birch and fireweed chemistry, and moose (*Alces alces*) calf mass in northern Sweden (Version 1) [Data set]. Swedish University of Agricultural Sciences. Available at: <https://doi.org/10.5878/j1fh-8w11>

Creator/Principal investigator(s)

[Sheila Holmes](#) - Swedish University of Agricultural Sciences, Wildlife, fish and environmental studies

[Kjell Danell](#) - Swedish University of Agricultural Sciences, Wildlife, fish and environmental studies

[John Ball](#) - Swedish University of Agricultural Sciences, Wildlife, fish and environmental studies

[Göran Ericsson](#) - Swedish University of Agricultural Sciences, Wildlife, fish and environmental studies

Research principal

[Swedish University of Agricultural Sciences](#) - Wildlife, fish and environmental studies

Principal's reference number

SLU.vfm.2022.4.4-108

Description

Data and R code used in piecewise structural equation modelling for a study that compared the direct and indirect impacts of temperature and precipitation on moose calf mass in northern Sweden. The study was initiated in 1988 in an effort to examine the impacts of climate change on common forage species of the economically and culturally important moose in Sweden. It ran until 1997 and was re-started in 2017.

Temperature and precipitation variables are derived from SMHI weather station data. Average moose calf mass for study sites is derived from data from the Swedish Hunter's Association and individual hunting teams. Both weather and moose calf mass represent mean values within a 50km radius of each study site. Nitrogen and neutral detergent fibre measures are the result of near-infrared spectroscopy modelling, using 50 samples to calibrate the model. Samples were collected from 1-ha sites and included material from 30 individuals of either downy birch or fireweed.

The dataset contains the following files.

DataWeatherVegMoose.tsv is the data itself (TSV format, 236 rows × 10 columns). This includes the following variables:

Total precipitation (mm) from the start of the growing season, defined as the first day of the first four consecutive days each calendar year that each have a mean daily temperature greater than or equal to 5 degrees C, to July 17 of that year. This is an average value for all SMHI weather stations within a 50 km radius of a site.

Mean daily average temperature from the start of the growing season, defined as the first day of the first four consecutive days each calendar year that each have a mean daily temperature greater than or equal to 5 degrees C, to July 17 of that year. This is an average value for all SMHI weather stations within a 50 km radius of a site.

Proportion of days from the start of the growing season, defined as the first day of the first four consecutive days each calendar year that each have a mean daily temperature greater than or equal to 5 degrees C, to July 17 of that year, when the maximum daily temperature was greater than or equal to 20 degrees C. This is an average value for all SMHI weather stations within a 50 km radius of a site.

Neutral detergent fibre content of downy birch leaves at the site, based on a representative sample and calculated using Near Infrared Spectroscopy

Neutral detergent fibre content of fireweed stems, leaves, and flowers at the site, based on a representative sample and calculated using Near Infrared Spectroscopy

Nitrogen content of downy birch leaves at the site, based on a representative sample and calculated using Near Infrared Spectroscopy

Nitrogen content of fireweed stems, leaves, and flowers at the site, based on a representative sample and calculated using Near Infrared Spectroscopy

Mean date-adjusted moose calf slaughter weight for calves reportedly shot within 50km of the site. Values must represent the mean weight of at least 10 calves to be included.

The documentation file Key_DataWeatherVegMoose.tsv contains detailed information about the variables in the dataset.

The documentation file sites_no.tsv contains codes for the different sites where data was collected. It corresponds with the variable Site in the dataset DataWeatherVegMoose.tsv.

R_code_piecewise_SEM.r is the R script used to calculate the piecewise structural equation models linking weather to moose calf mass directly and via forage chemistry.

R_code_piecewise_SEM_log.txt is output of the script with session information. If R , with the packages nlme and piecewiseSEM, is installed, it can be generated by running this from a shell:
Rscript R_code_piecewise_SEM.r > R_code_piecewise_SEM_log.txt

Data contains personal data

No

Language

[English](#)

Time period(s) investigated

1988 - 1997

2017 - 2019

Data format / data structure

[Numeric](#)

[Text](#)

Species and taxons

[Alces alces \(linnaeus, 1758\)](#)

[Epilobium l.](#)

[Betula pubescens ehrh.](#)

[Epilobium angustifolium](#)

Geographic spread

Geographic location: [Sweden](#)

Geographic description: Västerbotten and Norrbotten counties in northern Sweden. A .tsv file (sites_no.tsv.tsv) with sites where the data has been collected is available under data and documentation. Data has been collected approximately 50 km from the specified sites in the list.

Responsible department/unit

Wildlife, fish and environmental studies

Contributor(s)

Robert Spitzer - Swedish University of Agricultural Sciences, Wildlife, fish and environmental studies

Julien Morel - Swedish University of Agricultural Sciences

Joris Cromsigt - Swedish University of Agricultural Sciences, Wildlife, fish and environmental studies

Sabrina Dressel - Wageningen University & Research

Fredrik Widemo - Swedish University of Agricultural Sciences, Wildlife, Fish and Environmental Studies

Navinder Singh - Swedish University of Agricultural Sciences

Funding 1

- Funding agency: Swedish Environmental Protection Agency
- Funding agency's reference number: NV-01337-15/NV-03047-16/NV-08503-18

Funding 2

- Funding agency: Kempe Foundation
- Funding agency's reference number: JCK-1914

Funding 3

- Funding agency: Swedish Research Council for Environment Agricultural Sciences and Spatial Planning
- Funding agency's reference number: 2018-02875

Research area

[Natural sciences](#) (Standard för svensk indelning av forskningsämnen 2011)

[Biological sciences](#) (Standard för svensk indelning av forskningsämnen 2011)

[Ecology](#) (Standard för svensk indelning av forskningsämnen 2011)

Keywords

[Deer/moose](#), [Leaf nitrogen concentration](#), [Temperature](#), [Precipitation amount](#), [Downy birch](#), [Fireweed](#), [Fibre content](#), [Elk](#)

Publications

Holmes, S.M., Dressel, S., Morel, J., Spitzer, R., Ball, J.B., Ericsson, G., Singh, N.J., Widemo, F., Cromsigt, J.P.G.M. & Danell, K.. (2023). Increased summer temperature is associated with reduced calf mass of a circumpolar large mammal through direct thermoregulatory and indirect, food quality, pathways. *Oecologia*. 201, 1123–1136. <https://doi.org/10.1007/s00442-023-05367-0>

DOI: <https://doi.org/10.1007/s00442-023-05367-0>

Polygon (Lon/Lat)

20.873465, 68.208801

18.238312, 67.7807

17.272089, 67.140631

16.218028, 66.588129

14.98829, 65.843834

14.900451, 65.225074

14.549097, 64.666806

16.832897, 63.749098

18.853181, 63.514888

21.049142, 63.942802

21.664011, 64.816817

22.015365, 65.771799

23.157264, 66.165506

20.873465, 68.208801

Accessibility level

Access to data through SND

Data are freely accessible

Use of data

[Things to consider when using data shared through SND](#)

Versions

Version 1. 2023-01-18

Download metadata

[DataCite](#)

[DDI 2.5](#)

[DDI 3.3](#)

[DCAT-AP-SE 2.0](#)

[JSON-LD](#)

[PDF](#)

[Citation \(CSL\)](#)

[File overview \(CSV\)](#)

Published: 2023-01-18

Last updated: 2023-08-07