LANDIS-II v

Extension User Guide

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# Introduction

This document describes the extension for the LANDIS-II model. For information about the model and its core concepts, see the *LANDIS‑II Conceptual Model Description.*

This extension produces a variety of output maps that are specific to age cohorts. Biomass cohort data can be summarized via other extensions. This extension produces maps of values as indicated by the user.

## Types of Statistics Available

The following statistics are available (abbreviation in parentheses):

Maximum (MAX)

Median (MED)

Average (AVG)

Standard Deviation (SD)

Richness (RICH) – the number of unique items.

Count (COUNT) – the number of items.

Evenness (EVEN) – a measure of the evenness of the items, based on the Shannon index of diversity (H’).

## Species Age Statistics

The user can list which statistic(s) to calculate for individual species. Richness and evenness are not options for species age statistics.

## Site Age Statistics

The chosen statistics are calculated based on ***all species*** present at a site..

## Site and Species Statistics

To date, only the **Richness** (the number of species at each site) statistic is an option..

## Major Versions

### Version 4.0 (August 2024)

Updated to be compatible with Core v8.0.

### Version 3.0 (August 2018)

The Age Cohorts Statistics extension is compatible with Core v7.0.

### Version 2.2 (June 2017)

Added compatibility with the Metadata library. The Metadata Library outputs metadata for all model outputs, allowing compatibility with visualization tools.

### Version 2.1

The site-age statistic richness reports the number of unique age classes at each site. The new COUNT statistic reports the total number of cohorts at a site.

### Version 2.0 (June 2012)

The Age Cohorts Statistics extension is compatible with Core v6.0.

## Acknowledgements

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# Input File

The input parameters for this extension are specified in one input file. This text file must comply with the general format requirements described in section 3.1 *Text Input Files* in the *LANDIS-II Model User Guide*.

## LandisData

This parameter’s value must be "Output Cohort Statistics".

## Timestep

This parameter is the extension’s timestep. Value: integer > 0. Units: years.

## SpeciesAgeStats

### MapNames

This file parameter is the template for the names of the age output maps. The parameter value must include the **three** variables “**species**”, “**statistic**” and “**timestep**” to ensure that the maps have unique names (see section 3.1.8.1 *Variables* in the *LANDIS-II Model User Guide*).

### Statistic List for Species

Each statistic (keywords: MAX, MIN, AVG, MED, SD) must be followed by a list list of one or more species for which the extension will create age statistic output maps. The species names must follow the parameter name on the same line.

## SiteAgeStats

### MapNames

This file parameter is the template for the names of the age output maps. The parameter value must include the **two** variables “**statistic**” and “**timestep**” to ensure that the maps have unique names (see section 3.1.8.1 *Variables* in the *LANDIS-II Model User Guide*).

### Statistic List for Sites

Each statistic (keywords: MAX, MIN, AVG, MED, SD, RICH, EVEN, COUNT) must be listed on a separate line.

## SiteSpeciesStats

### MapNames

This file parameter is the template for the names of the age output maps. The parameter value must include the **two** variables “**statistic**” and “**timestep**” to ensure that the maps have unique names (see section 3.1.8.1 *Variables* in the *LANDIS-II Model User Guide*).

### Statistic List for Sites

Each statistic (keywords: RICH) must be listed on a separate line.

# Example File

LandisData "Output Cohort Statistics"

Timestep 10

SpeciesAgeStats

MapNames output/cohort-stats/{species}-{statistic}-{timestep}.img

MAX querrubr pinustro << maximum age for each species

SiteAgeStats

MapNames output/cohort-stats/AGE-{statistic}-{timestep}.img

MAX << maximum age across all species on site

MED << median age across all species on site

SD << standard deviation age for all spp on site

RICH <<count of cohorts

EVEN <<evenness

SiteSpeciesStats

MapNames output/cohort-stats/SPP-{statistic}-{timestep}.img

RICH <<count of species