# LANDIS-II Biomass Output v4.0 Extension User Guide

Robert M. Scheller[1]

[1]North Carolina State University

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# 1   Introduction

This document describes the Biomass Output extension for the LANDIS-II model.  Readers should read the *LANDIS-II Model User Guide* prior to reading this document.

## 1.1   Extension description

The output module described herein is fairly simple and produces two types of map:

- Aboveground live biomass (**g m$^{-2}$**) for individual species (assuming that the Biomass Succession extension ANPP inputs are **g biomass m$^{-2}$**).

- Total aboveground live biomass for all species.

## 1.2   Major Releases

### 1.2.1   Version 4.0 (August 2024)

Updated to be compatible with Core v8.0.

### 1.2.2   Version 3.0 (August 2018)

Biomass Output is compatible with Core v7.

### 1.2.3   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.

### 1.2.4   Version 2.1 (May 2014)

Added compatibility with other succession extensions that support the cohort interfaces from Biomass Cohorts through the new dependency on the Biomass Library.  Any succession extension that uses a cohort structure that supports the interfaces from Biomass Cohorts should be able to be compatible with this version.

### 1.2.5   Version 2.0

Biomass Output is compatible with Core v6.0.

Cleared up confusing naming convention for total aboveground biomass maps.  Previously, the names for total biomass maps were generated by substituting "`all`" for the "`{species}`" variable in the

map-name template (see section 2.5).  Now, the "{species}" variable is replaced with "TotalBiomass".

Also, the total biomass maps are now produced even if individual species are not indicated. Because maps are no longer limited to 65,000 integers, maps are output with the same units as the inputs. Assuming that the Biomass Succession extension (or similar) is operating at g m-2, then the outputs are also g m-2.

## 1.3   Minor Releases (this Major Release)

## 1.4   Acknowledgements

Funding for the development of LANDIS-II has been provided by the North Central Research Station (Rhinelander, Wisconsin) of the U.S. Forest Service.  Valuable contributions to the development of the model and extensions were made by Brian R. Sturtevant, Eric J. Gustafson, and David J. Mladenoff.

## 2   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*.

**By default, a combined total of aboveground biomass for all species will be output.**

### 2.1   LandisData

The first parameter is the title of the input file:

LandisData          "Output Biomass"

### 2.2   Timestep

The second parameter is the time step in years.  For example:

Timestep  15

### 2.3   MakeTable

This parameter determines whether a table of all species mean aboveground biomass (g m$^{-2}$) by ecoregion will be produced.  The parameter must be:  yes, no, Y, or N.

MakeTable          yes

### 2.4   Species List

First is an optional species list of the desired species from which to create maps.  There is a List parameter, Species, followed by a list of one to many species.  Alternatively, the keyword **all** can be used to indicate biomass should be output for every species.  If **all** is indicated, do not list any species.  For example:

Species    pinubank

      pinuresi

      pinustro

      poputrem

      piceglau

## 2.5   Aboveground Live Biomass Map Names

The next parameter, MapNames, describes where output maps are placed and their format.  The first portion lists the directory where the maps should be placed, relative the location of the scenario text file (e.g., `agemaps/`).  The second portion includes two variables for creating file names.  `{species}` will be replaced with the species name.  `{timestep}` will be replaced with the output time step.  Other characters can be inserted as desired.  A meaningful file extension (e.g., `.img`) should also be included.  For example:

MapNames  output/biomass/bio-{species}-{timestep}.img

**Note:  Biomass output maps are not compatible with the .gis map output type.**

## 2.6   Dead Pool List

Next is a list of the desired dead pools from which to create maps.  There is a parameter keyword, DeadPools, followed by an input keyword.  There are only three options for this keyword:  woody, non-woody, or both.  Examples:

DeadPools  woody

OR

DeadPools both

## 2.7   Dead Biomass Map Names

Finally, a second MapNames parameter describes where dead biomass output maps are placed and their format.  The first portion lists the directory where the maps should be places, relative the location of the scenario text file (e.g., `agemaps/`).  The second portion includes two variables for creating file names.  `{pool}` will be replaced with the dead pool name ("woody" or "non-woody").  `{timestep}` will be replaced with the output time step.  Other characters can be inserted as desired.  A meaningful file extension (e.g., `.img`) should also be included.  For example:

MapNames  output/biomass/{pool}-{timestep}.img

**Note:  Dead biomass output maps are not compatible with the .gis map output type.**