**Supplementary Information for:**

**Model-based Impact Analysis of Climate Change and Land-use**

**Intensification on Trophic Networks**

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The data supporting the results of this study, and the code used to perform the simulations and analysis are openly available in our repository (Madingley\_CC\_LU) at https://anonymous.4open.science/r/Madingley\_CC\_LU-CCCD/README.md.

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# Supplementary Note 1: Climate data

## Preprocessing of the climate data

'MadingleyR' requires gridded spatial data with a resolution of 0.5 degrees. The default climate input data includes gridded data for available water capacity in mm, terrestrial net primary productivity in gC/m-2/d-1, surface temperature in °C, precipitation in mm/month, ground frost frequency in days/month and diurnal temperature range in °C. Available water capacity and ground frost frequency have not been replaced. To replace the default spatial input provided by 'MadingleyR', historical and future climate data were obtained from the World Climate Research Programme (WCRP) CMIP6 climate data store, hosted by the Earth System Grid Federation (ESGF). The variables npp (net primary production on land as carbon mass flux), tas (near-surface air temperature), tasmax (maximum near-surface air temperature), tasmin (minimum near-surface air temperature) and pr (precipitation) were obtained at a monthly resolution, with a spatial resolution of 0.5 degrees. Each variable was obtained for the historical (Voldoire 2019a), the SSP1-2.6 (Voldoire 2019b) and the SSP5-8.5 (Voldoire 2019c) scenarios. A brief description of each dataset can be found in Table 1 (Supplementary Note 1.2).

The climate data were preprocessed using Climate Data Operators (CDO), version 2.0.0, from the Max Planck Institute of Meteorology (Schulzweida 2022). The 359 Gaussian grid (360 x 720 latitude/longitude) of the netCDF files was remapped to a regular longitude/latitude grid (720 x 360) using bilinear interpolation. Each variable was converted into 'MadingleyR' compatible units. Npp was converted from kgC/m-2/s-1 to gC/m-2/d-1, pr was converted from kg/m-2/s-1 to mm/month and the temperature variables were converted from K to C°. As we only used the terrestrial realm of 'Madingley', a topographical grid was created, to mask all oceanic areas of the climate data. To calculate the diurnal temperature range, tasmin was subtracted from tasmax.

The resulting netCDF files for npp, pr, tas and diurnal temperature range were further processed using RStudio version 4.1.2 (R Core Team 2023). MadingleyR requires 12 monthly raster files for each climate variable, thus the monthly bands of the netCDF raster files were extracted and converted to the TIFF file format. For each climate scenario, 30-year averages were calculated, i.e., 1984-2014 for the historical climate and 2070-2100 for the two future climate scenarios. This accounts for climate variability and averages single extreme events. The resulting TIFF files were used to replace the data in MadingleyR with the monthly bands of the years 2014 (historical dataset) and 2100 (SSP1-2.6, SSP5-8.5) for the different simulation scenarios.

## Description of the climate data

**Table 1:** Description of the climate data sets (Historical, SSP1-2.6, SSP5-8.5) (Voldoire 2019a, b, c). The variable abbreviation pr stands for precipitation, npp for net primary production as carbon mass flux, tasmax for maximum near-surface air temperature, tasmin for minimum near-surface air temperature and tas for near-surface air temperature.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | **Institute** | **Variable** | **Exp. ID** | **Grid label** | **Unit** | **Doi** | **Licence** |
| CNRM-CM6-1-HR | CNRM-CERFACS | pr | historical | gr | kg m-2 s-1 | <https://doi.org/10.22033/ESGF/CMIP6.4067> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | npp | historical | gr | kg m-2 s-1 | <https://doi.org/10.22033/ESGF/CMIP6.4067> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tasmax | historical | gr | K | <https://doi.org/10.22033/ESGF/CMIP6.4067> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tasmin | historical | gr | K | <https://doi.org/10.22033/ESGF/CMIP6.4067> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tas | historical | gr | K | <https://doi.org/10.22033/ESGF/CMIP6.4067> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | pr | ssp126 | gr | kg m-2 s-1 | <http://doi.org/10.22033/ESGF/CMIP6.4185> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | npp | ssp126 | gr | kg m-2 s-1 | <http://doi.org/10.22033/ESGF/CMIP6.4185> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tasmax | ssp126 | gr | K | <http://doi.org/10.22033/ESGF/CMIP6.4185> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tasmin | ssp126 | gr | K | <http://doi.org/10.22033/ESGF/CMIP6.4185> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tas | ssp126 | gr | K | <http://doi.org/10.22033/ESGF/CMIP6.4185> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | pr | ssp585 | gr | kg m-2 s-1 | <http://doi.org/10.22033/ESGF/CMIP6.4225> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | npp | ssp585 | gr | kg m-2 s-1 | <http://doi.org/10.22033/ESGF/CMIP6.4225> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tasmax | ssp585 | gr | K | <http://doi.org/10.22033/ESGF/CMIP6.4225> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tasmin | ssp585 | gr | K | <http://doi.org/10.22033/ESGF/CMIP6.4225> | CC BY-NC-SA 4.0 |
| CNRM-CM6-1-HR | CNRM-CERFACS | tas | ssp585 | gr | K | <http://doi.org/10.22033/ESGF/CMIP6.4225> | CC BY-NC-SA 4.0 |

# Supplementary Note 2: Impacts on the biomass by functional group

## 2.1 Climate change

**Table 2:** Percentage change in biomass and bootstrapped 95 % confidence intervals for each functional group and region for the climate scenarios SSP1-2.6, and SS5-8.5, using historical climate as a control. End. denotes endotherm and ect. denotes ectotherm functional groups. Lower and upper CI show the lower and upper confidence interval.

| **Region** | **Climate** | **Functional Group** | **Percentage Change** | **Lower CI** | **Upper CI** |
| --- | --- | --- | --- | --- | --- |
| Brazil | SSP1-2.6 | End. Herbivores | 0.14 | 0.12 | 0.17 |
| Brazil | SSP1-2.6 | End. Carnivores | 0.01 | -0.02 | 0.04 |
| Brazil | SSP1-2.6 | End. Omnivores | 0.12 | 0.05 | 0.18 |
| Brazil | SSP1-2.6 | Ect. Herbivores | -0.74 | -0.84 | -0.63 |
| Brazil | SSP1-2.6 | Ect. Carnivores | -1.12 | -1.16 | -1.07 |
| Brazil | SSP1-2.6 | Ect. Omnivores | -0.51 | -0.56 | -0.45 |
| Brazil | SSP1-2.6 | Overall Biomass | -0.26 | -0.29 | -0.24 |
| Brazil | SSP5-8.5 | End. Herbivores | 0.02 | 0 | 0.05 |
| Brazil | SSP5-8.5 | End. Carnivores | -0.34 | -0.37 | -0.31 |
| Brazil | SSP5-8.5 | End. Omnivores | -0.19 | -0.25 | -0.13 |
| Brazil | SSP5-8.5 | Ect. Herbivores | -2.89 | -3 | -2.78 |
| Brazil | SSP5-8.5 | Ect. Carnivores | -3.33 | -3.37 | -3.29 |
| Brazil | SSP5-8.5 | Ect. Omnivores | -2.07 | -2.14 | -2 |
| Brazil | SSP5-8.5 | Overall Biomass | -1.15 | -1.18 | -1.12 |
| Namibia | SSP1-2.6 | End. Herbivores | -0.11 | -0.15 | -0.07 |
| Namibia | SSP1-2.6 | End. Carnivores | -0.86 | -1.05 | -0.68 |
| Namibia | SSP1-2.6 | End. Omnivores | 0.04 | -0.01 | 0.09 |
| Namibia | SSP1-2.6 | Ect. Herbivores | -3.75 | -3.91 | -3.59 |
| Namibia | SSP1-2.6 | Ect. Carnivores | -1.07 | -1.22 | -0.91 |
| Namibia | SSP1-2.6 | Ect. Omnivores | -0.45 | -0.61 | -0.29 |
| Namibia | SSP1-2.6 | Overall Biomass | -0.87 | -0.94 | -0.79 |
| Namibia | SSP5-8.5 | End. Herbivores | -0.49 | -0.55 | -0.44 |
| Namibia | SSP5-8.5 | End. Carnivores | -2.14 | -2.32 | -1.96 |
| Namibia | SSP5-8.5 | End. Omnivores | -0.16 | -0.21 | -0.11 |
| Namibia | SSP5-8.5 | Ect. Herbivores | -5.56 | -5.81 | -5.31 |
| Namibia | SSP5-8.5 | Ect. Carnivores | -3.12 | -3.27 | -2.97 |
| Namibia | SSP5-8.5 | Ect. Omnivores | -7.16 | -7.37 | -6.95 |
| Namibia | SSP5-8.5 | Overall Biomass | -2.13 | -2.22 | -2.05 |
| France | SSP1-2.6 | End. Herbivores | -0.3 | -0.39 | -0.22 |
| France | SSP1-2.6 | End. Carnivores | -0.89 | -1.12 | -0.65 |
| France | SSP1-2.6 | End. Omnivores | -0.17 | -0.31 | -0.03 |
| France | SSP1-2.6 | Ect. Herbivores | -0.98 | -1.73 | -0.25 |
| France | SSP1-2.6 | Ect. Carnivores | -0.33 | -0.87 | 0.2 |
| France | SSP1-2.6 | Ect. Omnivores | -3.59 | -4.24 | -2.95 |
| France | SSP1-2.6 | Overall Biomass | -0.47 | -0.54 | -0.4 |
| France | SSP5-8.5 | End. Herbivores | -0.27 | -0.34 | -0.19 |
| France | SSP5-8.5 | End. Carnivores | -0.65 | -0.87 | -0.43 |
| France | SSP5-8.5 | End. Omnivores | 0.24 | 0.1 | 0.37 |
| France | SSP5-8.5 | Ect. Herbivores | -7.42 | -8.16 | -6.67 |
| France | SSP5-8.5 | Ect. Carnivores | -2.56 | -3.07 | -2.05 |
| France | SSP5-8.5 | Ect. Omnivores | -6.76 | -7.35 | -6.19 |
| France | SSP5-8.5 | Overall Biomass | -0.65 | -0.72 | -0.58 |
| Finland | SSP1-2.6 | End. Herbivores | 0.12 | -0.15 | 0.4 |
| Finland | SSP1-2.6 | End. Carnivores | 0.25 | -0.17 | 0.69 |
| Finland | SSP1-2.6 | End. Omnivores | -0.04 | -0.28 | 0.2 |
| Finland | SSP1-2.6 | Ect. Herbivores | -1.1 | -1.68 | -0.52 |
| Finland | SSP1-2.6 | Ect. Carnivores | -0.68 | -1.37 | 0.02 |
| Finland | SSP1-2.6 | Ect. Omnivores | -0.53 | -1.1 | 0.05 |
| Finland | SSP1-2.6 | Overall Biomass | 0.03 | -0.14 | 0.2 |
| Finland | SSP5-8.5 | End. Herbivores | -0.65 | -0.92 | -0.37 |
| Finland | SSP5-8.5 | End. Carnivores | -0.41 | -0.84 | 0.01 |
| Finland | SSP5-8.5 | End. Omnivores | -1.29 | -1.53 | -1.06 |
| Finland | SSP5-8.5 | Ect. Herbivores | 1.75 | 1.16 | 2.33 |
| Finland | SSP5-8.5 | Ect. Carnivores | -0.94 | -1.6 | -0.25 |
| Finland | SSP5-8.5 | Ect. Omnivores | 0.03 | -0.54 | 0.61 |
| Finland | SSP5-8.5 | Overall Biomass | -0.61 | -0.78 | -0.44 |

## 2.2 Current land use

**Table 3:** Percentage change in biomass and bootstrapped 95 % confidence intervals for each functional group and region for the climate scenarios SSP1-2.6, and SS5-8.5, using the no land use climate scenarios as a control. End. denotes endotherm and ect. denotes ectotherm functional groups. Lower and upper CI show the lower and upper confidence interval.

| **Region** | **Climate** | **Functional Group** | **Percentage Change** | **Lower CI** | **Upper CI** |
| --- | --- | --- | --- | --- | --- |
| Brazil | Historical | End. Herbivores | 0.22 | 0.2 | 0.25 |
| Brazil | Historical | End. Carnivores | 0.09 | 0.05 | 0.12 |
| Brazil | Historical | End. Omnivores | -0.69 | -0.77 | -0.62 |
| Brazil | Historical | Ect. Herbivores | -1.7 | -1.84 | -1.57 |
| Brazil | Historical | Ect. Carnivores | -0.58 | -0.63 | -0.53 |
| Brazil | Historical | Ect. Omnivores | -1.21 | -1.26 | -1.15 |
| Brazil | Historical | Overall Biomass | -0.58 | -0.62 | -0.55 |
| Brazil | SSP1-2.6 | End. Herbivores | 0.33 | 0.31 | 0.36 |
| Brazil | SSP1-2.6 | End. Carnivores | 0.26 | 0.23 | 0.29 |
| Brazil | SSP1-2.6 | End. Omnivores | -0.7 | -0.77 | -0.64 |
| Brazil | SSP1-2.6 | Ect. Herbivores | -0.77 | -0.87 | -0.66 |
| Brazil | SSP1-2.6 | Ect. Carnivores | -0.46 | -0.5 | -0.42 |
| Brazil | SSP1-2.6 | Ect. Omnivores | -2.27 | -2.34 | -2.2 |
| Brazil | SSP1-2.6 | Overall Biomass | -0.53 | -0.56 | -0.51 |
| Brazil | SSP5-8.5 | End. Herbivores | 0.6 | 0.58 | 0.62 |
| Brazil | SSP5-8.5 | End. Carnivores | 0.32 | 0.3 | 0.35 |
| Brazil | SSP5-8.5 | End. Omnivores | -0.5 | -0.55 | -0.45 |
| Brazil | SSP5-8.5 | Ect. Herbivores | -0.16 | -0.26 | -0.06 |
| Brazil | SSP5-8.5 | Ect. Carnivores | -0.23 | -0.27 | -0.2 |
| Brazil | SSP5-8.5 | Ect. Omnivores | -2.19 | -2.26 | -2.12 |
| Brazil | SSP5-8.5 | Overall Biomass | -0.17 | -0.2 | -0.15 |
| Namibia | Historical | End. Herbivores | 0.26 | 0.22 | 0.29 |
| Namibia | Historical | End. Carnivores | 0.89 | 0.69 | 1.09 |
| Namibia | Historical | End. Omnivores | 0.49 | 0.43 | 0.54 |
| Namibia | Historical | Ect. Herbivores | -1.51 | -1.64 | -1.37 |
| Namibia | Historical | Ect. Carnivores | -0.91 | -1.09 | -0.74 |
| Namibia | Historical | Ect. Omnivores | -0.49 | -0.63 | -0.35 |
| Namibia | Historical | Overall Biomass | -0.12 | -0.19 | -0.05 |
| Namibia | SSP1-2.6 | End. Herbivores | -0.05 | -0.09 | -0.01 |
| Namibia | SSP1-2.6 | End. Carnivores | 0.75 | 0.58 | 0.92 |
| Namibia | SSP1-2.6 | End. Omnivores | 0.48 | 0.43 | 0.52 |
| Namibia | SSP1-2.6 | Ect. Herbivores | -0.52 | -0.69 | -0.35 |
| Namibia | SSP1-2.6 | Ect. Carnivores | -0.8 | -0.93 | -0.67 |
| Namibia | SSP1-2.6 | Ect. Omnivores | 0.17 | -0.01 | 0.34 |
| Namibia | SSP1-2.6 | Overall Biomass | 0.06 | -0.02 | 0.13 |
| Namibia | SSP5-8.5 | End. Herbivores | -0.17 | -0.25 | -0.1 |
| Namibia | SSP5-8.5 | End. Carnivores | 0.41 | 0.24 | 0.57 |
| Namibia | SSP5-8.5 | End. Omnivores | 0.32 | 0.26 | 0.38 |
| Namibia | SSP5-8.5 | Ect. Herbivores | -0.33 | -0.65 | -0.01 |
| Namibia | SSP5-8.5 | Ect. Carnivores | -0.57 | -0.7 | -0.45 |
| Namibia | SSP5-8.5 | Ect. Omnivores | 0.72 | 0.46 | 0.99 |
| Namibia | SSP5-8.5 | Overall Biomass | -0.02 | -0.13 | 0.09 |
| France | Historical | End. Herbivores | -1.05 | -1.11 | -0.99 |
| France | Historical | End. Carnivores | -1.65 | -1.83 | -1.46 |
| France | Historical | End. Omnivores | -1.92 | -2.02 | -1.81 |
| France | Historical | Ect. Herbivores | -7.99 | -8.58 | -7.39 |
| France | Historical | Ect. Carnivores | -1.69 | -2.21 | -1.16 |
| France | Historical | Ect. Omnivores | -5.17 | -5.76 | -4.58 |
| France | Historical | Overall Biomass | -1.58 | -1.65 | -1.51 |
| France | SSP1-2.6 | End. Herbivores | -0.54 | -0.62 | -0.46 |
| France | SSP1-2.6 | End. Carnivores | -1.56 | -1.79 | -1.34 |
| France | SSP1-2.6 | End. Omnivores | -1.41 | -1.55 | -1.27 |
| France | SSP1-2.6 | Ect. Herbivores | -7.54 | -8.13 | -6.94 |
| France | SSP1-2.6 | Ect. Carnivores | -1.19 | -1.68 | -0.7 |
| France | SSP1-2.6 | Ect. Omnivores | -2.57 | -3.09 | -2.03 |
| France | SSP1-2.6 | Overall Biomass | -1.12 | -1.17 | -1.06 |
| France | SSP5-8.5 | End. Herbivores | -0.63 | -0.7 | -0.56 |
| France | SSP5-8.5 | End. Carnivores | -1.47 | -1.67 | -1.26 |
| France | SSP5-8.5 | End. Omnivores | -1.51 | -1.64 | -1.39 |
| France | SSP5-8.5 | Ect. Herbivores | -3.15 | -3.83 | -2.48 |
| France | SSP5-8.5 | Ect. Carnivores | -1.18 | -1.65 | -0.71 |
| France | SSP5-8.5 | Ect. Omnivores | -1.4 | -1.9 | -0.9 |
| France | SSP5-8.5 | Overall Biomass | -0.96 | -1.01 | -0.91 |
| Finland | Historical | End. Herbivores | -0.05 | -0.32 | 0.22 |
| Finland | Historical | End. Carnivores | -0.12 | -0.53 | 0.31 |
| Finland | Historical | End. Omnivores | -0.26 | -0.48 | -0.04 |
| Finland | Historical | Ect. Herbivores | -1.59 | -2.15 | -1.03 |
| Finland | Historical | Ect. Carnivores | -0.74 | -1.42 | -0.06 |
| Finland | Historical | Ect. Omnivores | -1.05 | -1.62 | -0.49 |
| Finland | Historical | Overall Biomass | -0.19 | -0.35 | -0.03 |
| Finland | SSP1-2.6 | End. Herbivores | 0.09 | -0.15 | 0.33 |
| Finland | SSP1-2.6 | End. Carnivores | 0.26 | -0.14 | 0.65 |
| Finland | SSP1-2.6 | End. Omnivores | -0.07 | -0.29 | 0.15 |
| Finland | SSP1-2.6 | Ect. Herbivores | -0.89 | -1.49 | -0.31 |
| Finland | SSP1-2.6 | Ect. Carnivores | -0.64 | -1.29 | 0.04 |
| Finland | SSP1-2.6 | Ect. Omnivores | -0.87 | -1.44 | -0.28 |
| Finland | SSP1-2.6 | Overall Biomass | 0.01 | -0.13 | 0.16 |
| Finland | SSP5-8.5 | End. Herbivores | 0.58 | 0.34 | 0.81 |
| Finland | SSP5-8.5 | End. Carnivores | 0.59 | 0.2 | 0.97 |
| Finland | SSP5-8.5 | End. Omnivores | 0.31 | 0.07 | 0.55 |
| Finland | SSP5-8.5 | Ect. Herbivores | -2.44 | -3 | -1.86 |
| Finland | SSP5-8.5 | Ect. Carnivores | -0.4 | -1.03 | 0.25 |
| Finland | SSP5-8.5 | Ect. Omnivores | -1.62 | -2.19 | -1.05 |
| Finland | SSP5-8.5 | Overall Biomass | 0.34 | 0.19 | 0.5 |

## 2.3 Maximum land use

**Table 4:** Percentage change in biomass and bootstrapped 95% confidence intervals for each functional group and region for the historical, SSP1-2.6 and SS5-8.5 climate scenarios under maximum land use, using the current land use climate scenarios as a control. End. denotes endotherm and ect. denotes ectotherm functional groups. The lower and upper CI shows the lower and upper confidence interval.

| **Region** | **Climate** | **Functional Group** | **Percentage Change** | **Lower CI** | **Upper CI** |
| --- | --- | --- | --- | --- | --- |
| Brazil | Historical | End. Herbivores | -2.36 | -2.38 | -2.34 |
| Brazil | Historical | End. Carnivores | -6.85 | -6.88 | -6.83 |
| Brazil | Historical | End. Omnivores | -3.32 | -3.37 | -3.26 |
| Brazil | Historical | Ect. Herbivores | -7.17 | -7.28 | -7.06 |
| Brazil | Historical | Ect. Carnivores | -4.97 | -5 | -4.93 |
| Brazil | Historical | Ect. Omnivores | -10.75 | -10.79 | -10.71 |
| Brazil | Historical | Overall Biomass | -4.71 | -4.73 | -4.69 |
| Brazil | SSP1-2.6 | End. Herbivores | -2.52 | -2.54 | -2.5 |
| Brazil | SSP1-2.6 | End. Carnivores | -7.3 | -7.33 | -7.28 |
| Brazil | SSP1-2.6 | End. Omnivores | -3.39 | -3.43 | -3.35 |
| Brazil | SSP1-2.6 | Ect. Herbivores | -9.36 | -9.42 | -9.3 |
| Brazil | SSP1-2.6 | Ect. Carnivores | -5.23 | -5.26 | -5.21 |
| Brazil | SSP1-2.6 | Ect. Omnivores | -9.03 | -9.08 | -8.98 |
| Brazil | SSP1-2.6 | Overall Biomass | -4.67 | -4.69 | -4.65 |
| Brazil | SSP5-8.5 | End. Herbivores | -2.72 | -2.73 | -2.71 |
| Brazil | SSP5-8.5 | End. Carnivores | -7.61 | -7.63 | -7.59 |
| Brazil | SSP5-8.5 | End. Omnivores | -3.67 | -3.71 | -3.64 |
| Brazil | SSP5-8.5 | Ect. Herbivores | -2.3 | -2.37 | -2.23 |
| Brazil | SSP5-8.5 | Ect. Carnivores | -5.56 | -5.59 | -5.53 |
| Brazil | SSP5-8.5 | Ect. Omnivores | -5.14 | -5.18 | -5.1 |
| Brazil | SSP5-8.5 | Overall Biomass | -3.44 | -3.45 | -3.42 |
| Namibia | Historical | End. Herbivores | -3.44 | -3.5 | -3.38 |
| Namibia | Historical | End. Carnivores | -14.45 | -14.57 | -14.32 |
| Namibia | Historical | End. Omnivores | -20.47 | -20.53 | -20.41 |
| Namibia | Historical | Ect. Herbivores | -3.11 | -3.21 | -3.01 |
| Namibia | Historical | Ect. Carnivores | -4.34 | -4.47 | -4.21 |
| Namibia | Historical | Ect. Omnivores | -4.86 | -4.96 | -4.76 |
| Namibia | Historical | Overall Biomass | -4.7 | -4.76 | -4.64 |
| Namibia | SSP1-2.6 | End. Herbivores | -5.72 | -5.78 | -5.65 |
| Namibia | SSP1-2.6 | End. Carnivores |  |  |  |
| Namibia | SSP1-2.6 | End. Omnivores |  |  |  |
| Namibia | SSP1-2.6 | Ect. Herbivores | 0.38 | -3.21 | -3.01 |
| Namibia | SSP1-2.6 | Ect. Carnivores | -5.48 | -4.47 | -4.21 |
| Namibia | SSP1-2.6 | Ect. Omnivores | -4.45 | -4.58 | -4.33 |
| Namibia | SSP1-2.6 | Overall Biomass | -5.16 | -5.23 | -5.1 |
| Namibia | SSP5-8.5 | End. Herbivores | -20.47 | -20.54 | -20.4 |
| Namibia | SSP5-8.5 | End. Carnivores |  |  |  |
| Namibia | SSP5-8.5 | End. Omnivores |  |  |  |
| Namibia | SSP5-8.5 | Ect. Herbivores | -0.79 | -1.01 | -0.58 |
| Namibia | SSP5-8.5 | Ect. Carnivores | -18.03 | -18.11 | -17.94 |
| Namibia | SSP5-8.5 | Ect. Omnivores | -2.06 | -2.24 | -1.88 |
| Namibia | SSP5-8.5 | Overall Biomass | -9.04 | -9.12 | -8.95 |
| France | Historical | End. Herbivores | -3.46 | -3.51 | -3.41 |
| France | Historical | End. Carnivores | -8.45 | -8.57 | -8.32 |
| France | Historical | End. Omnivores | -5.32 | -5.41 | -5.24 |
| France | Historical | Ect. Herbivores | -0.89 | -1.35 | -0.43 |
| France | Historical | Ect. Carnivores | -5.9 | -6.3 | -5.5 |
| France | Historical | Ect. Omnivores | -0.89 | -1.33 | -0.44 |
| France | Historical | Overall Biomass | -4.17 | -4.24 | -4.1 |
| France | SSP1-2.6 | End. Herbivores | -2.49 | -2.55 | -2.43 |
| France | SSP1-2.6 | End. Carnivores | -10.51 | -10.65 | -10.37 |
| France | SSP1-2.6 | End. Omnivores | -5.89 | -6 | -5.79 |
| France | SSP1-2.6 | Ect. Herbivores | -0.03 | -0.47 | 0.41 |
| France | SSP1-2.6 | Ect. Carnivores | -9.24 | -9.58 | -8.89 |
| France | SSP1-2.6 | Ect. Omnivores | 0.03 | -0.36 | 0.44 |
| France | SSP1-2.6 | Overall Biomass | -3.53 | -3.6 | -3.47 |
| France | SSP5-8.5 | End. Herbivores | -3 | -3.06 | -2.94 |
| France | SSP5-8.5 | End. Carnivores | -9.34 | -9.47 | -9.2 |
| France | SSP5-8.5 | End. Omnivores | -6.36 | -6.45 | -6.26 |
| France | SSP5-8.5 | Ect. Herbivores | 0.16 | -0.28 | 0.59 |
| France | SSP5-8.5 | Ect. Carnivores | -17.49 | -17.82 | -17.16 |
| France | SSP5-8.5 | Ect. Omnivores | -0.71 | -1.11 | -0.3 |
| France | SSP5-8.5 | Overall Biomass | -4.02 | -4.09 | -3.96 |
| Finland | Historical | End. Herbivores | -2.57 | -2.76 | -2.39 |
| Finland | Historical | End. Carnivores |  |  |  |
| Finland | Historical | End. Omnivores | -12.37 | -6.45 | -6.26 |
| Finland | Historical | Ect. Herbivores | 2.24 | -0.28 | 0.59 |
| Finland | Historical | Ect. Carnivores | -7.28 | -7.73 | -6.82 |
| Finland | Historical | Ect. Omnivores | 0.84 | 0.39 | 1.29 |
| Finland | Historical | Overall Biomass | -4.04 | -4.18 | -3.91 |
| Finland | SSP1-2.6 | End. Herbivores | -2.15 | -2.33 | -1.97 |
| Finland | SSP1-2.6 | End. Carnivores |  |  |  |
| Finland | SSP1-2.6 | End. Omnivores | -12.9 | -13.06 | -12.74 |
| Finland | SSP1-2.6 | Ect. Herbivores | 2.3 | 1.81 | 2.77 |
| Finland | SSP1-2.6 | Ect. Carnivores | -7.5 | -7.96 | -7.04 |
| Finland | SSP1-2.6 | Ect. Omnivores | 0.76 | 0.29 | 1.23 |
| Finland | SSP1-2.6 | Overall Biomass | -3.78 | -3.91 | -3.64 |
| Finland | SSP5-8.5 | End. Herbivores | -1.39 | -1.58 | -1.21 |
| Finland | SSP5-8.5 | End. Carnivores |  |  |  |
| Finland | SSP5-8.5 | End. Omnivores | -10.69 | -13.06 | -12.74 |
| Finland | SSP5-8.5 | Ect. Herbivores | 0.67 | 0.24 | 1.12 |
| Finland | SSP5-8.5 | Ect. Carnivores | -8.3 | -8.72 | -7.88 |
| Finland | SSP5-8.5 | Ect. Omnivores | 0.46 | 0.01 | 0.9 |
| Finland | SSP5-8.5 | Overall Biomass | -3.08 | -3.22 | -2.94 |

# Supplementary Note 3: Impact on the abundance-body mass relationship for non-aggregated functional groups

## 3.1 Combined spatial autoregressive models

To analyze the power-law relationship between body mass and abundance (Blackburn and Gaston 1999, White et al. 2007, Lewis et al. 2008), we extracted the model output for cohort abundance and body mass for the last year of each simulation experiment. We then generated sample sizes by averaging abundance and body mass across replicates, grid cells and functional groups to generate an average for each functional group within a grid cell. First, we used linear regression with abundance as the dependent variable and body mass of each functional group as the explanatory variable. Body mass was converted to kg in a previous step. Both variables were log10 transformed. To check for autocorrelation, a spatial weight object was first created using the 'spdep' package version 1.3.3 (Pebesma and Bivand 2023). The object was created for each region based on its spatial extent (minimum longitude, maximum longitude, minimum latitude, maximum latitude). The grid dimensions were therefore calculated using the following equation:

In this equation Dimensionsx,y denote the grid dimensions for x and y, maxx,y and minx,y represent the minimum and maximum latitude/longitude respectively. Cell size denotes the resolution of the grid cells, which in this study was set to 0.5°. Based on these dimensions, a neighbourhood object was created assuming queen adjacency. For some regions, grid cells were missing in the dataset (when a functional group didn't appear in the specific grid cell), in these cases we subset the neighbourhood object using the 'spdep' package to meet the datasets dimensions (Pebesma and Bivand 2023). Furthermore, we excluded data with samples including only 5 grid cells left for a particular functional group and scenario.

Using this object as spatial weights and the data set of each regression, we calculated Global Morans I (Cliff et al. 1981, Pebesma and Bivand 2023) for the dependent variable. We also calculated Morans I for spatial autocorrelation of the residuals (Cliff et al. 1981, Pebesma and Bivand 2023). Based on these results, we found a high number of autocorrelations in the dependent variables and in the residuals, which varied across all models. A summary of the results of the autoregression tests can be found in our GitHub repository (<https://anonymous.4open.science/r/Madingley_CC_LU-CCCD/README.md>) in the subfolder Autoregression\_Diagnostics of the output folder. To take account of the autocorrelation, we performed spatial regression. We tested a spatial error, a spatial lag and a combined spatial autoregressive model (Ord 1975, Cliff et al. 1981, Anselin 1988, Pebesma and Bivand 2023) . Since Raos score (Anselin 1988, Anselin et al. 1996) and the AIC values (Sakamoto et al. 1986) were different for each model (indicating either a spatial error or a spatial lag model), we decided to use a combined spatial autoregressive model. This can be further justified by the simulations of the 'MadingleyR' model. Based on these, we can assume autocorrelation in the dependent variable (caused by the dispersion of cohorts between different grid cells) as well as in the residuals (because we have small regions consisting of homogeneous spatial background information, which is even more homogeneous in the simulation experiment of land use intensification) (Harfoot et al. 2014, Hoeks et al. 2021). This may not be the best solution, but we have concluded that our intention to interpret changes in slopes and significance values across all models and scenarios allows for this simplification.

Nevertheless, caution should therefore be exercised when interpreting our results, particularly with regard to spatial impacts. Keep in mind that we are only interpreting the differences in estimates between the models (slope, p-value), to understand the broader spatial effects rather than a direct comparison of coefficients, the impacts (indirect, direct, total effect) should be considered (Bivand and Piras 2015).

## 3.2 Slope heatmap for non-aggregated functional groups



**Figure 1:** Heatmap of the slopes of the combined spatial autoregressive model for each region, functional group, climate scenario and simulation experiment. The nine functional groups of the model are divided into endotherm and ectotherm, while the ectotherm functional groups are further divided into iteroparous (it.) and semelparous (s.) reproductive types. A negative slope indicates decreasing body mass with increasing abundance, and a positive slope indicates increasing body mass with decreasing abundance. Asterisks denote significance levels: \* indicates significance with p-values <0.05, \*\* indicates very significant p-values <0.01, and \*\*\* indicates highly significant p-values <0.001.

## 3.3 Regression results for climate simulation T

**Table 5:** Results of the combined spatial autoregressive models for each region, climate, and functional group for the climate simulation experiment for all functional groups. Ectotherm functional groups are further separated by reproduction type in iteroparous (i.), and semelparous (s.) functional groups. Asterisks in the column Significance Level denote significance levels: \* indicates significance with p-values <0.05, \*\* indicates very significant p-values <0.01, and \*\*\* indicates highly significant p-values <0.001.

| **Functional Group** | **Region** | **Climate** | **Scenario** | **Intercept** | **Slope** | **Std. Error** | **Z. Stat** | **P Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ectotherm Carnivores (i.) | Brazil | Historical | Climate | 7.3 | -1.12 | 0.83 | -1.35 | 0.18 |  |
| Ectotherm Carnivores (i.) | Brazil | SSP1-2.6 | Climate | 9.92 | 0.57 | 0.77 | 0.74 | 0.46 |  |
| Ectotherm Carnivores (i.) | Brazil | SSP5-8.5 | Climate | 4.63 | 0.6 | 0.5 | 1.2 | 0.23 |  |
| Ectotherm Carnivores (s.) | Brazil | Historical | Climate | 5.91 | -0.5 | 0.19 | -2.6 | 0.0093 | \*\* |
| Ectotherm Carnivores (s.) | Brazil | SSP1-2.6 | Climate | 2.98 | -0.57 | 0.17 | -3.37 | 0.00074 | \*\*\* |
| Ectotherm Carnivores (s.) | Brazil | SSP5-8.5 | Climate | 8.19 | -0.5 | 0.18 | -2.73 | 0.0063 | \*\* |
| Ectotherm Herbivores (i.) | Brazil | Historical | Climate | 8.89 | 1.04 | 0.51 | 2.03 | 0.042 | \* |
| Ectotherm Herbivores (i.) | Brazil | SSP1-2.6 | Climate | 6.53 | -0.01 | 0.34 | -0.04 | 0.97 |  |
| Ectotherm Herbivores (i.) | Brazil | SSP5-8.5 | Climate | 5.87 | 0.6 | 0.52 | 1.15 | 0.25 |  |
| Ectotherm Herbivores (s.) | Brazil | Historical | Climate | 12.9 | -0.18 | 0.48 | -0.39 | 0.7 |  |
| Ectotherm Herbivores (s.) | Brazil | SSP1-2.6 | Climate | 8.88 | -0.36 | 0.45 | -0.78 | 0.43 |  |
| Ectotherm Herbivores (s.) | Brazil | SSP5-8.5 | Climate | 9.93 | -0.35 | 0.59 | -0.59 | 0.55 |  |
| Ectotherm Omnivores (i.) | Brazil | Historical | Climate | 8.84 | 0.87 | 0.68 | 1.28 | 0.2 |  |
| Ectotherm Omnivores (i.) | Brazil | SSP1-2.6 | Climate | 6.82 | -0.14 | 0.64 | -0.22 | 0.82 |  |
| Ectotherm Omnivores (i.) | Brazil | SSP5-8.5 | Climate | 5.85 | 0.02 | 0.51 | 0.04 | 0.97 |  |
| Ectotherm Omnivores (s.) | Brazil | Historical | Climate | 9.72 | 0.1 | 0.41 | 0.23 | 0.81 |  |
| Ectotherm Omnivores (s.) | Brazil | SSP1-2.6 | Climate | 14.39 | -0.28 | 0.39 | -0.71 | 0.48 |  |
| Ectotherm Omnivores (s.) | Brazil | SSP5-8.5 | Climate | 9.16 | 0.42 | 0.52 | 0.8 | 0.42 |  |
| Endotherm Carnivores (i.) | Brazil | Historical | Climate | 10.64 | -0.55 | 0.46 | -1.21 | 0.23 |  |
| Endotherm Carnivores (i.) | Brazil | SSP1-2.6 | Climate | 10.02 | -1.6 | 0.47 | -3.37 | 0.00076 | \*\*\* |
| Endotherm Carnivores (i.) | Brazil | SSP5-8.5 | Climate | 4.74 | -0.42 | 0.31 | -1.38 | 0.17 |  |
| Endotherm Herbivores (i.) | Brazil | Historical | Climate | 3.28 | 0.12 | 0.18 | 0.68 | 0.49 |  |
| Endotherm Herbivores (i.) | Brazil | SSP1-2.6 | Climate | 5.98 | 0.29 | 0.27 | 1.07 | 0.28 |  |
| Endotherm Herbivores (i.) | Brazil | SSP5-8.5 | Climate | 6.79 | 0.16 | 0.45 | 0.35 | 0.72 |  |
| Endotherm Omnivores (i.) | Brazil | Historical | Climate | 4.25 | 0.68 | 0.54 | 1.26 | 0.21 |  |
| Endotherm Omnivores (i.) | Brazil | SSP1-2.6 | Climate | 6.57 | 0.33 | 0.98 | 0.33 | 0.74 |  |
| Endotherm Omnivores (i.) | Brazil | SSP5-8.5 | Climate | 5.76 | 0.65 | 0.9 | 0.72 | 0.47 |  |
| Ectotherm Carnivores (i.) | Finland | Historical | Climate | 2.14 | -0.27 | 0.14 | -1.96 | 0.05 |  |
| Ectotherm Carnivores (i.) | Finland | SSP1-2.6 | Climate | 5.84 | -0.07 | 0.26 | -0.26 | 0.8 |  |
| Ectotherm Carnivores (i.) | Finland | SSP5-8.5 | Climate | 0.56 | 0.11 | 0.08 | 1.39 | 0.16 |  |
| Ectotherm Carnivores (s.) | Finland | Historical | Climate | 6.28 | -0.24 | 0.18 | -1.34 | 0.18 |  |
| Ectotherm Carnivores (s.) | Finland | SSP1-2.6 | Climate | 7.66 | -0.15 | 0.14 | -1.07 | 0.28 |  |
| Ectotherm Carnivores (s.) | Finland | SSP5-8.5 | Climate | 0.58 | -0.26 | 0.17 | -1.53 | 0.13 |  |
| Ectotherm Herbivores (i.) | Finland | Historical | Climate | 0.29 | -0.16 | 0.07 | -2.2 | 0.028 | \* |
| Ectotherm Herbivores (i.) | Finland | SSP1-2.6 | Climate | 2.03 | -0.23 | 0.12 | -1.86 | 0.062 |  |
| Ectotherm Herbivores (i.) | Finland | SSP5-8.5 | Climate | 9.72 | -0.24 | 0.23 | -1.02 | 0.31 |  |
| Ectotherm Herbivores (s.) | Finland | Historical | Climate | 6.09 | -0.16 | 0.3 | -0.53 | 0.6 |  |
| Ectotherm Herbivores (s.) | Finland | SSP1-2.6 | Climate | 9.2 | -0.71 | 0.25 | -2.86 | 0.0042 | \*\* |
| Ectotherm Herbivores (s.) | Finland | SSP5-8.5 | Climate | 2.54 | -0.44 | 0.55 | -0.8 | 0.42 |  |
| Ectotherm Omnivores (i.) | Finland | Historical | Climate | 1.76 | -0.3 | 0.14 | -2.21 | 0.027 | \* |
| Ectotherm Omnivores (i.) | Finland | SSP1-2.6 | Climate | 3.16 | -0.12 | 0.09 | -1.27 | 0.2 |  |
| Ectotherm Omnivores (i.) | Finland | SSP5-8.5 | Climate | 0.61 | 0.14 | 0.1 | 1.36 | 0.17 |  |
| Ectotherm Omnivores (s.) | Finland | Historical | Climate | 7.65 | -0.19 | 0.15 | -1.27 | 0.2 |  |
| Ectotherm Omnivores (s.) | Finland | SSP1-2.6 | Climate | 3.29 | 0.04 | 0.14 | 0.28 | 0.78 |  |
| Ectotherm Omnivores (s.) | Finland | SSP5-8.5 | Climate | 15.01 | 0.18 | 0.21 | 0.88 | 0.38 |  |
| Endotherm Carnivores (i.) | Finland | Historical | Climate | 2.91 | -0.11 | 0.09 | -1.2 | 0.23 |  |
| Endotherm Carnivores (i.) | Finland | SSP1-2.6 | Climate | 1.42 | -0.06 | 0.07 | -0.85 | 0.39 |  |
| Endotherm Carnivores (i.) | Finland | SSP5-8.5 | Climate | 1.28 | -0.16 | 0.07 | -2.24 | 0.025 | \* |
| Endotherm Herbivores (i.) | Finland | Historical | Climate | 1.8 | 0.17 | 0.13 | 1.33 | 0.18 |  |
| Endotherm Herbivores (i.) | Finland | SSP1-2.6 | Climate | 2.76 | 0.28 | 0.23 | 1.24 | 0.22 |  |
| Endotherm Herbivores (i.) | Finland | SSP5-8.5 | Climate | 1.2 | 0.22 | 0.12 | 1.74 | 0.081 |  |
| Endotherm Omnivores (i.) | Finland | Historical | Climate | 9.19 | 0.23 | 0.29 | 0.81 | 0.42 |  |
| Endotherm Omnivores (i.) | Finland | SSP1-2.6 | Climate | 8.83 | 0.56 | 0.38 | 1.47 | 0.14 |  |
| Endotherm Omnivores (i.) | Finland | SSP5-8.5 | Climate | 5.18 | 0.09 | 0.35 | 0.25 | 0.81 |  |
| Ectotherm Carnivores (i.) | Namibia | Historical | Climate | 13.42 | -7.13 | 0.54 | -13.12 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (i.) | Namibia | SSP1-2.6 | Climate | 9.57 | -1.98 | 0.33 | -5.98 | 2.2e-09 | \*\*\* |
| Ectotherm Carnivores (i.) | Namibia | SSP5-8.5 | Climate | 11 | -4.13 | 0.36 | -11.36 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (s.) | Namibia | Historical | Climate | 2.39 | -1.36 | 0.14 | -9.97 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (s.) | Namibia | SSP1-2.6 | Climate | 1.95 | -1 | 0.19 | -5.33 | 9.6e-08 | \*\*\* |
| Ectotherm Carnivores (s.) | Namibia | SSP5-8.5 | Climate | 1.41 | -0.54 | 0.13 | -4.28 | 1.8e-05 | \*\*\* |
| Ectotherm Herbivores (i.) | Namibia | Historical | Climate | 15.14 | -8.12 | 1.18 | -6.9 | 5.1e-12 | \*\*\* |
| Ectotherm Herbivores (i.) | Namibia | SSP1-2.6 | Climate | 10.26 | -0.62 | 0.42 | -1.46 | 0.14 |  |
| Ectotherm Herbivores (i.) | Namibia | SSP5-8.5 | Climate | 10.77 | -5.83 | 0.68 | -8.54 | 2e-16 | \*\*\* |
| Ectotherm Herbivores (s.) | Namibia | Historical | Climate | 5.55 | -2.15 | 0.3 | -7.22 | 5.3e-13 | \*\*\* |
| Ectotherm Herbivores (s.) | Namibia | SSP1-2.6 | Climate | 2.4 | -2.74 | 0.69 | -3.94 | 8e-05 | \*\*\* |
| Ectotherm Herbivores (s.) | Namibia | SSP5-8.5 | Climate | 2.85 | -1.29 | 0.35 | -3.65 | 0.00026 | \*\*\* |
| Ectotherm Omnivores (i.) | Namibia | Historical | Climate | 12.87 | -7.19 | 0.91 | -7.9 | 2.9e-15 | \*\*\* |
| Ectotherm Omnivores (i.) | Namibia | SSP1-2.6 | Climate | 10 | -0.58 | 0.38 | -1.55 | 0.12 |  |
| Ectotherm Omnivores (i.) | Namibia | SSP5-8.5 | Climate | 9.14 | -4.37 | 0.54 | -8.11 | 4.4e-16 | \*\*\* |
| Ectotherm Omnivores (s.) | Namibia | Historical | Climate | 1.13 | -1.95 | 0.48 | -4.04 | 5.4e-05 | \*\*\* |
| Ectotherm Omnivores (s.) | Namibia | SSP1-2.6 | Climate | -0.43 | -2.32 | 0.83 | -2.79 | 0.0053 | \*\* |
| Ectotherm Omnivores (s.) | Namibia | SSP5-8.5 | Climate | 0.89 | -2.13 | 0.46 | -4.66 | 3.2e-06 | \*\*\* |
| Endotherm Carnivores (i.) | Namibia | Historical | Climate | 21.51 | -9.56 | 0.55 | -17.24 | 2e-16 | \*\*\* |
| Endotherm Carnivores (i.) | Namibia | SSP1-2.6 | Climate | 7.05 | -0.86 | 0.3 | -2.91 | 0.0036 | \*\* |
| Endotherm Carnivores (i.) | Namibia | SSP5-8.5 | Climate | 15.22 | -6.14 | 0.48 | -12.79 | 2e-16 | \*\*\* |
| Endotherm Herbivores (i.) | Namibia | Historical | Climate | 17.7 | -6.19 | 1.1 | -5.61 | 2e-08 | \*\*\* |
| Endotherm Herbivores (i.) | Namibia | SSP1-2.6 | Climate | 0.73 | 0.11 | 0.09 | 1.15 | 0.25 |  |
| Endotherm Herbivores (i.) | Namibia | SSP5-8.5 | Climate | 12.65 | -3.29 | 0.76 | -4.33 | 1.5e-05 | \*\*\* |
| Endotherm Omnivores (i.) | Namibia | Historical | Climate | 12.36 | -5.36 | 0.66 | -8.12 | 4.4e-16 | \*\*\* |
| Endotherm Omnivores (i.) | Namibia | SSP1-2.6 | Climate | 1.5 | 0.18 | 0.22 | 0.83 | 0.41 |  |
| Endotherm Omnivores (i.) | Namibia | SSP5-8.5 | Climate | 12.02 | -4.21 | 0.51 | -8.28 | 2.2e-16 | \*\*\* |
| Ectotherm Carnivores (i.) | France | Historical | Climate | 8.47 | -2.08 | 0.49 | -4.23 | 2.3e-05 | \*\*\* |
| Ectotherm Carnivores (i.) | France | SSP1-2.6 | Climate | 6.37 | -1.39 | 0.36 | -3.89 | 1e-04 | \*\*\* |
| Ectotherm Carnivores (i.) | France | SSP5-8.5 | Climate | 6.17 | -0.66 | 0.33 | -2.01 | 0.044 | \* |
| Ectotherm Carnivores (s.) | France | Historical | Climate | 2.3 | -1.44 | 0.29 | -4.91 | 9e-07 | \*\*\* |
| Ectotherm Carnivores (s.) | France | SSP1-2.6 | Climate | 3.1 | -0.84 | 0.27 | -3.15 | 0.0017 | \*\* |
| Ectotherm Carnivores (s.) | France | SSP5-8.5 | Climate | 4.91 | -0.75 | 0.25 | -2.93 | 0.0034 | \*\* |
| Ectotherm Herbivores (i.) | France | Historical | Climate | 3.52 | -2.65 | 0.59 | -4.49 | 7e-06 | \*\*\* |
| Ectotherm Herbivores (i.) | France | SSP1-2.6 | Climate | 2.3 | -1.37 | 0.41 | -3.3 | 0.00098 | \*\*\* |
| Ectotherm Herbivores (i.) | France | SSP5-8.5 | Climate | 3.73 | -1.47 | 0.51 | -2.88 | 0.004 | \*\* |
| Ectotherm Herbivores (s.) | France | Historical | Climate | 1.87 | -2.01 | 0.83 | -2.43 | 0.015 | \* |
| Ectotherm Herbivores (s.) | France | SSP1-2.6 | Climate | 4.73 | -3.36 | 1.2 | -2.81 | 0.005 | \*\* |
| Ectotherm Herbivores (s.) | France | SSP5-8.5 | Climate | -1.09 | -2.08 | 0.62 | -3.35 | 0.00082 | \*\*\* |
| Ectotherm Omnivores (i.) | France | Historical | Climate | 1.54 | -2.12 | 0.67 | -3.17 | 0.0015 | \*\* |
| Ectotherm Omnivores (i.) | France | SSP1-2.6 | Climate | 1.91 | -1.05 | 0.44 | -2.36 | 0.018 | \* |
| Ectotherm Omnivores (i.) | France | SSP5-8.5 | Climate | 3.58 | -0.91 | 0.65 | -1.41 | 0.16 |  |
| Ectotherm Omnivores (s.) | France | Historical | Climate | -0.16 | -2.3 | 0.53 | -4.35 | 1.4e-05 | \*\*\* |
| Ectotherm Omnivores (s.) | France | SSP1-2.6 | Climate | 2.14 | -0.55 | 0.41 | -1.33 | 0.18 |  |
| Ectotherm Omnivores (s.) | France | SSP5-8.5 | Climate | 7.23 | -0.72 | 0.33 | -2.14 | 0.032 | \* |
| Endotherm Carnivores (i.) | France | Historical | Climate | 3.58 | -0.67 | 0.29 | -2.36 | 0.018 | \* |
| Endotherm Carnivores (i.) | France | SSP1-2.6 | Climate | 3.33 | -0.67 | 0.25 | -2.73 | 0.0064 | \*\* |
| Endotherm Carnivores (i.) | France | SSP5-8.5 | Climate | 2.61 | -0.31 | 0.23 | -1.33 | 0.18 |  |
| Endotherm Herbivores (i.) | France | Historical | Climate | 2.73 | -0.29 | 0.17 | -1.72 | 0.085 |  |
| Endotherm Herbivores (i.) | France | SSP1-2.6 | Climate | 6.51 | -0.27 | 0.57 | -0.48 | 0.63 |  |
| Endotherm Herbivores (i.) | France | SSP5-8.5 | Climate | 5.6 | -0.18 | 0.55 | -0.33 | 0.74 |  |
| Endotherm Omnivores (i.) | France | Historical | Climate | 6.68 | 0.06 | 0.4 | 0.14 | 0.89 |  |
| Endotherm Omnivores (i.) | France | SSP1-2.6 | Climate | 7.92 | 1.05 | 0.49 | 2.13 | 0.033 | \* |
| Endotherm Omnivores (i.) | France | SSP5-8.5 | Climate | 9.27 | 2.11 | 0.54 | 3.88 | 0.00011 | \*\*\* |

## 3.4 Regression results for current land use simulation

**Table 6:** Results of the combined spatial autoregressive models for each region, climate, and functional group for the current land use simulation experiment for all functional groups. Ectotherm functional groups are further separated by reproduction type in iteroparous (i.), and semelparous (s.) functional groups. Asterisks in the column Significance Level denote significance levels: \* indicates significance with p-values <0.05, \*\* indicates very significant p-values <0.01, and \*\*\* indicates highly significant p-values <0.001.

| **Functional Group** | **Region** | **Climate** | **Scenario** | **Intercept** | **Slope** | **Std. Error** | **Z. Stat** | **P Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ectotherm Carnivores (i.) | Brazil | Historical | Current Land Use | 8.15 | -0.13 | 0.77 | -0.17 | 0.86 |  |
| Ectotherm Carnivores (i.) | Brazil | SSP1-2.6 | Current Land Use | 9.21 | -1.58 | 0.56 | -2.81 | 0.0049 | \*\* |
| Ectotherm Carnivores (i.) | Brazil | SSP5-8.5 | Current Land Use | 7.18 | -0.3 | 0.48 | -0.63 | 0.53 |  |
| Ectotherm Carnivores (s.) | Brazil | Historical | Current Land Use | 3.55 | -0.69 | 0.15 | -4.57 | 4.8e-06 | \*\*\* |
| Ectotherm Carnivores (s.) | Brazil | SSP1-2.6 | Current Land Use | 6.06 | -0.54 | 0.14 | -3.73 | 0.00019 | \*\*\* |
| Ectotherm Carnivores (s.) | Brazil | SSP5-8.5 | Current Land Use | 9.49 | -0.3 | 0.12 | -2.56 | 0.01 | \* |
| Ectotherm Herbivores (i.) | Brazil | Historical | Current Land Use | 6.22 | -0.29 | 0.76 | -0.38 | 0.7 |  |
| Ectotherm Herbivores (i.) | Brazil | SSP1-2.6 | Current Land Use | 5.09 | 0.19 | 0.49 | 0.39 | 0.69 |  |
| Ectotherm Herbivores (i.) | Brazil | SSP5-8.5 | Current Land Use | 3.8 | 0.19 | 0.35 | 0.54 | 0.59 |  |
| Ectotherm Herbivores (s.) | Brazil | Historical | Current Land Use | 3.39 | -0.28 | 0.26 | -1.05 | 0.29 |  |
| Ectotherm Herbivores (s.) | Brazil | SSP1-2.6 | Current Land Use | 13.46 | -0.79 | 0.26 | -2.98 | 0.0028 | \*\* |
| Ectotherm Herbivores (s.) | Brazil | SSP5-8.5 | Current Land Use | 8.69 | -0.5 | 0.47 | -1.06 | 0.29 |  |
| Ectotherm Omnivores (i.) | Brazil | Historical | Current Land Use | 8.99 | 0.74 | 0.59 | 1.26 | 0.21 |  |
| Ectotherm Omnivores (i.) | Brazil | SSP1-2.6 | Current Land Use | 5.8 | 0.07 | 0.81 | 0.09 | 0.93 |  |
| Ectotherm Omnivores (i.) | Brazil | SSP5-8.5 | Current Land Use | 5.06 | 0.47 | 0.57 | 0.82 | 0.41 |  |
| Ectotherm Omnivores (s.) | Brazil | Historical | Current Land Use | 12.18 | 0.1 | 0.36 | 0.27 | 0.79 |  |
| Ectotherm Omnivores (s.) | Brazil | SSP1-2.6 | Current Land Use | 7.41 | 0.07 | 0.4 | 0.17 | 0.86 |  |
| Ectotherm Omnivores (s.) | Brazil | SSP5-8.5 | Current Land Use | 8.38 | -0.95 | 0.33 | -2.87 | 0.0041 | \*\* |
| Endotherm Carnivores (i.) | Brazil | Historical | Current Land Use | 5.81 | -0.34 | 0.37 | -0.92 | 0.36 |  |
| Endotherm Carnivores (i.) | Brazil | SSP1-2.6 | Current Land Use | 5.07 | -0.27 | 0.28 | -0.96 | 0.34 |  |
| Endotherm Carnivores (i.) | Brazil | SSP5-8.5 | Current Land Use | 8.06 | -0.57 | 0.25 | -2.25 | 0.024 | \* |
| Endotherm Herbivores (i.) | Brazil | Historical | Current Land Use | 5.98 | 0.16 | 0.33 | 0.48 | 0.63 |  |
| Endotherm Herbivores (i.) | Brazil | SSP1-2.6 | Current Land Use | 6.74 | -0.29 | 0.33 | -0.87 | 0.38 |  |
| Endotherm Herbivores (i.) | Brazil | SSP5-8.5 | Current Land Use | 1.42 | 0.14 | 0.1 | 1.4 | 0.16 |  |
| Endotherm Omnivores (i.) | Brazil | Historical | Current Land Use | 5.36 | 0.58 | 0.98 | 0.59 | 0.55 |  |
| Endotherm Omnivores (i.) | Brazil | SSP1-2.6 | Current Land Use | 4.51 | 0.03 | 0.7 | 0.04 | 0.96 |  |
| Endotherm Omnivores (i.) | Brazil | SSP5-8.5 | Current Land Use | 2.18 | 0.5 | 0.38 | 1.29 | 0.2 |  |
| Ectotherm Carnivores (i.) | Finland | Historical | Current Land Use | 1.44 | -0.18 | 0.08 | -2.2 | 0.028 | \* |
| Ectotherm Carnivores (i.) | Finland | SSP1-2.6 | Current Land Use | 6.4 | -0.22 | 0.17 | -1.25 | 0.21 |  |
| Ectotherm Carnivores (i.) | Finland | SSP5-8.5 | Current Land Use | 0.31 | 0.09 | 0.05 | 1.82 | 0.069 |  |
| Ectotherm Carnivores (s.) | Finland | Historical | Current Land Use | 7.81 | -0.31 | 0.13 | -2.33 | 0.02 | \* |
| Ectotherm Carnivores (s.) | Finland | SSP1-2.6 | Current Land Use | 9.57 | -0.08 | 0.13 | -0.62 | 0.54 |  |
| Ectotherm Carnivores (s.) | Finland | SSP5-8.5 | Current Land Use | 0.33 | -0.34 | 0.1 | -3.39 | 7e-04 | \*\*\* |
| Ectotherm Herbivores (i.) | Finland | Historical | Current Land Use | 10.78 | -0.29 | 0.12 | -2.47 | 0.013 | \* |
| Ectotherm Herbivores (i.) | Finland | SSP1-2.6 | Current Land Use | 2.08 | -0.22 | 0.1 | -2.22 | 0.026 | \* |
| Ectotherm Herbivores (i.) | Finland | SSP5-8.5 | Current Land Use | 12.36 | -0.14 | 0.17 | -0.87 | 0.39 |  |
| Ectotherm Herbivores (s.) | Finland | Historical | Current Land Use | 3.17 | -0.41 | 0.19 | -2.22 | 0.026 | \* |
| Ectotherm Herbivores (s.) | Finland | SSP1-2.6 | Current Land Use | 7.99 | -0.32 | 0.21 | -1.55 | 0.12 |  |
| Ectotherm Herbivores (s.) | Finland | SSP5-8.5 | Current Land Use | 0.3 | -0.74 | 0.28 | -2.69 | 0.0071 | \*\* |
| Ectotherm Omnivores (i.) | Finland | Historical | Current Land Use | 1.6 | -0.25 | 0.1 | -2.39 | 0.017 | \* |
| Ectotherm Omnivores (i.) | Finland | SSP1-2.6 | Current Land Use | 4.68 | -0.39 | 0.13 | -2.87 | 0.0041 | \*\* |
| Ectotherm Omnivores (i.) | Finland | SSP5-8.5 | Current Land Use | 0.18 | 0.07 | 0.05 | 1.32 | 0.19 |  |
| Ectotherm Omnivores (s.) | Finland | Historical | Current Land Use | 4.29 | -0.15 | 0.11 | -1.38 | 0.17 |  |
| Ectotherm Omnivores (s.) | Finland | SSP1-2.6 | Current Land Use | 1.62 | -0.02 | 0.08 | -0.24 | 0.81 |  |
| Ectotherm Omnivores (s.) | Finland | SSP5-8.5 | Current Land Use | 1.07 | -0.3 | 0.13 | -2.3 | 0.022 | \* |
| Endotherm Carnivores (i.) | Finland | Historical | Current Land Use | 3.84 | -0.09 | 0.15 | -0.61 | 0.54 |  |
| Endotherm Carnivores (i.) | Finland | SSP1-2.6 | Current Land Use | 2.13 | 0.06 | 0.05 | 1.15 | 0.25 |  |
| Endotherm Carnivores (i.) | Finland | SSP5-8.5 | Current Land Use | 1.64 | -0.12 | 0.08 | -1.6 | 0.11 |  |
| Endotherm Herbivores (i.) | Finland | Historical | Current Land Use | 4.79 | -0.08 | 0.28 | -0.29 | 0.77 |  |
| Endotherm Herbivores (i.) | Finland | SSP1-2.6 | Current Land Use | 3.94 | 0.21 | 0.43 | 0.49 | 0.63 |  |
| Endotherm Herbivores (i.) | Finland | SSP5-8.5 | Current Land Use | 5.07 | 0.63 | 0.7 | 0.91 | 0.36 |  |
| Endotherm Omnivores (i.) | Finland | Historical | Current Land Use | 7.22 | -0.05 | 0.26 | -0.19 | 0.85 |  |
| Endotherm Omnivores (i.) | Finland | SSP1-2.6 | Current Land Use | 8.11 | -0.17 | 0.36 | -0.48 | 0.63 |  |
| Endotherm Omnivores (i.) | Finland | SSP5-8.5 | Current Land Use | 4.78 | 0.02 | 0.19 | 0.09 | 0.93 |  |
| Ectotherm Carnivores (i.) | Namibia | Historical | Current Land Use | 17.46 | -8.43 | 0.6 | -13.95 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (i.) | Namibia | SSP1-2.6 | Current Land Use | 5.65 | -1.62 | 0.36 | -4.51 | 6.3e-06 | \*\*\* |
| Ectotherm Carnivores (i.) | Namibia | SSP5-8.5 | Current Land Use | 11.74 | -4.84 | 0.44 | -10.92 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (s.) | Namibia | Historical | Current Land Use | 1.48 | -1.05 | 0.15 | -7.18 | 6.9e-13 | \*\*\* |
| Ectotherm Carnivores (s.) | Namibia | SSP1-2.6 | Current Land Use | 1.09 | -0.28 | 0.16 | -1.75 | 0.079 |  |
| Ectotherm Carnivores (s.) | Namibia | SSP5-8.5 | Current Land Use | 2.54 | -0.93 | 0.19 | -5.02 | 5.2e-07 | \*\*\* |
| Ectotherm Herbivores (i.) | Namibia | Historical | Current Land Use | 15.99 | -8.31 | 1.1 | -7.57 | 3.8e-14 | \*\*\* |
| Ectotherm Herbivores (i.) | Namibia | SSP1-2.6 | Current Land Use | 9.18 | -1.2 | 0.51 | -2.34 | 0.019 | \* |
| Ectotherm Herbivores (i.) | Namibia | SSP5-8.5 | Current Land Use | 10.44 | -4.49 | 0.72 | -6.23 | 4.6e-10 | \*\*\* |
| Ectotherm Herbivores (s.) | Namibia | Historical | Current Land Use | 4.28 | -1.65 | 0.26 | -6.27 | 3.5e-10 | \*\*\* |
| Ectotherm Herbivores (s.) | Namibia | SSP1-2.6 | Current Land Use | 6.87 | -0.91 | 0.57 | -1.6 | 0.11 |  |
| Ectotherm Herbivores (s.) | Namibia | SSP5-8.5 | Current Land Use | 1.14 | -0.65 | 0.21 | -3.15 | 0.0016 | \*\* |
| Ectotherm Omnivores (i.) | Namibia | Historical | Current Land Use | 13.95 | -5.84 | 0.8 | -7.33 | 2.4e-13 | \*\*\* |
| Ectotherm Omnivores (i.) | Namibia | SSP1-2.6 | Current Land Use | 6.49 | -0.68 | 0.41 | -1.65 | 0.099 |  |
| Ectotherm Omnivores (i.) | Namibia | SSP5-8.5 | Current Land Use | 9.49 | -3.94 | 0.52 | -7.52 | 5.4e-14 | \*\*\* |
| Ectotherm Omnivores (s.) | Namibia | Historical | Current Land Use | 1.67 | -1.25 | 0.42 | -2.99 | 0.0028 | \*\* |
| Ectotherm Omnivores (s.) | Namibia | SSP1-2.6 | Current Land Use | 0.14 | -1.43 | 0.56 | -2.57 | 0.01 | \* |
| Ectotherm Omnivores (s.) | Namibia | SSP5-8.5 | Current Land Use | 1.68 | -0.81 | 0.36 | -2.27 | 0.023 | \* |
| Endotherm Carnivores (i.) | Namibia | Historical | Current Land Use | 21.97 | -8.26 | 0.61 | -13.49 | 2e-16 | \*\*\* |
| Endotherm Carnivores (i.) | Namibia | SSP1-2.6 | Current Land Use | 5.62 | -0.72 | 0.36 | -2.02 | 0.043 | \* |
| Endotherm Carnivores (i.) | Namibia | SSP5-8.5 | Current Land Use | 18.41 | -5.24 | 0.57 | -9.12 | 2e-16 | \*\*\* |
| Endotherm Herbivores (i.) | Namibia | Historical | Current Land Use | 17.18 | -4.47 | 1.05 | -4.27 | 1.9e-05 | \*\*\* |
| Endotherm Herbivores (i.) | Namibia | SSP1-2.6 | Current Land Use | 4.68 | 0.03 | 0.25 | 0.1 | 0.92 |  |
| Endotherm Herbivores (i.) | Namibia | SSP5-8.5 | Current Land Use | 12.95 | -3.28 | 0.8 | -4.11 | 3.9e-05 | \*\*\* |
| Endotherm Omnivores (i.) | Namibia | Historical | Current Land Use | 15.24 | -5.43 | 0.62 | -8.69 | 2e-16 | \*\*\* |
| Endotherm Omnivores (i.) | Namibia | SSP1-2.6 | Current Land Use | 5.76 | 0.27 | 0.41 | 0.66 | 0.51 |  |
| Endotherm Omnivores (i.) | Namibia | SSP5-8.5 | Current Land Use | 12.94 | -4.61 | 0.54 | -8.62 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (i.) | France | Historical | Current Land Use | 1.64 | -0.79 | 0.31 | -2.55 | 0.011 | \* |
| Ectotherm Carnivores (i.) | France | SSP1-2.6 | Current Land Use | 3.89 | -0.98 | 0.37 | -2.64 | 0.0084 | \*\* |
| Ectotherm Carnivores (i.) | France | SSP5-8.5 | Current Land Use | 4.38 | -1.03 | 0.29 | -3.58 | 0.00035 | \*\*\* |
| Ectotherm Carnivores (s.) | France | Historical | Current Land Use | 1.54 | -0.96 | 0.2 | -4.84 | 1.3e-06 | \*\*\* |
| Ectotherm Carnivores (s.) | France | SSP1-2.6 | Current Land Use | 1.71 | -0.53 | 0.15 | -3.48 | 5e-04 | \*\*\* |
| Ectotherm Carnivores (s.) | France | SSP5-8.5 | Current Land Use | 5.07 | -0.62 | 0.14 | -4.54 | 5.7e-06 | \*\*\* |
| Ectotherm Herbivores (i.) | France | Historical | Current Land Use | 2.39 | -1.92 | 0.39 | -4.89 | 1e-06 | \*\*\* |
| Ectotherm Herbivores (i.) | France | SSP1-2.6 | Current Land Use | 2.59 | -1.88 | 0.36 | -5.22 | 1.8e-07 | \*\*\* |
| Ectotherm Herbivores (i.) | France | SSP5-8.5 | Current Land Use | 2.03 | -0.97 | 0.35 | -2.78 | 0.0054 | \*\* |
| Ectotherm Herbivores (s.) | France | Historical | Current Land Use | 0.53 | -2.56 | 0.41 | -6.21 | 5.4e-10 | \*\*\* |
| Ectotherm Herbivores (s.) | France | SSP1-2.6 | Current Land Use | -1.2 | -2.21 | 0.34 | -6.49 | 8.5e-11 | \*\*\* |
| Ectotherm Herbivores (s.) | France | SSP5-8.5 | Current Land Use | 2.39 | -0.73 | 0.25 | -2.99 | 0.0028 | \*\* |
| Ectotherm Omnivores (i.) | France | Historical | Current Land Use | 1.27 | -1.66 | 0.4 | -4.12 | 3.8e-05 | \*\*\* |
| Ectotherm Omnivores (i.) | France | SSP1-2.6 | Current Land Use | 1.6 | -1.68 | 0.32 | -5.21 | 1.9e-07 | \*\*\* |
| Ectotherm Omnivores (i.) | France | SSP5-8.5 | Current Land Use | 2.94 | -0.86 | 0.34 | -2.53 | 0.011 | \* |
| Ectotherm Omnivores (s.) | France | Historical | Current Land Use | 0.52 | -1.79 | 0.4 | -4.48 | 7.4e-06 | \*\*\* |
| Ectotherm Omnivores (s.) | France | SSP1-2.6 | Current Land Use | 0.46 | -0.93 | 0.26 | -3.64 | 0.00027 | \*\*\* |
| Ectotherm Omnivores (s.) | France | SSP5-8.5 | Current Land Use | 4.36 | 0 | 0.15 | 0 | 1 |  |
| Endotherm Carnivores (i.) | France | Historical | Current Land Use | 4.45 | -0.8 | 0.25 | -3.22 | 0.0013 | \*\* |
| Endotherm Carnivores (i.) | France | SSP1-2.6 | Current Land Use | 3.52 | -0.52 | 0.22 | -2.4 | 0.016 | \* |
| Endotherm Carnivores (i.) | France | SSP5-8.5 | Current Land Use | 3.09 | -0.38 | 0.27 | -1.39 | 0.16 |  |
| Endotherm Herbivores (i.) | France | Historical | Current Land Use | 2.38 | -0.45 | 0.23 | -1.92 | 0.055 |  |
| Endotherm Herbivores (i.) | France | SSP1-2.6 | Current Land Use | 1.99 | -0.39 | 0.16 | -2.45 | 0.014 | \* |
| Endotherm Herbivores (i.) | France | SSP5-8.5 | Current Land Use | 8.88 | -1.03 | 0.28 | -3.74 | 0.00018 | \*\*\* |
| Endotherm Omnivores (i.) | France | Historical | Current Land Use | 5.83 | 0.58 | 0.48 | 1.21 | 0.23 |  |
| Endotherm Omnivores (i.) | France | SSP1-2.6 | Current Land Use | 0.85 | -0.28 | 0.23 | -1.22 | 0.22 |  |
| Endotherm Omnivores (i.) | France | SSP5-8.5 | Current Land Use | 6.45 | 1.12 | 0.51 | 2.17 | 0.03 | \* |

## 3.5 Regression results for maximum land use simulation

**Table 7:** Results of the combined spatial autoregressive models for each region, climate, and functional group for the maximum land use simulation experiment for all functional groups. Ectotherm functional groups are further separated by reproduction type in iteroparous (i.), and semelparous (s.) functional groups. Asterisks in the column Significance Level denote significance levels: \* indicates significance with p-values <0.05, \*\* indicates very significant p-values <0.01, and \*\*\* indicates highly significant p-values <0.001.

| **Functional Group** | **Region** | **Climate** | **Scenario** | **Intercept** | **Slope** | **Std. Error** | **Z. Stat** | **P Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ectotherm Carnivores (i.) | Brazil | Historical | Maximum Land Use | 6.34 | -0.8 | 0.19 | -4.23 | 2.3e-05 | \*\*\* |
| Ectotherm Carnivores (i.) | Brazil | SSP1-2.6 | Maximum Land Use | 7.6 | -1.3 | 0.21 | -6.2 | 5.8e-10 | \*\*\* |
| Ectotherm Carnivores (i.) | Brazil | SSP5-8.5 | Maximum Land Use | 7.26 | -1.8 | 0.2 | -9.13 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (s.) | Brazil | Historical | Maximum Land Use | 5.1 | -0.69 | 0.07 | -9.79 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (s.) | Brazil | SSP1-2.6 | Maximum Land Use | 4.38 | -0.23 | 0.07 | -3.13 | 0.0018 | \*\* |
| Ectotherm Carnivores (s.) | Brazil | SSP5-8.5 | Maximum Land Use | 3.5 | 0.37 | 0.22 | 1.7 | 0.09 |  |
| Ectotherm Herbivores (i.) | Brazil | Historical | Maximum Land Use | 10 | -1.11 | 0.18 | -6.21 | 5.2e-10 | \*\*\* |
| Ectotherm Herbivores (i.) | Brazil | SSP1-2.6 | Maximum Land Use | 9.5 | -1.01 | 0.16 | -6.24 | 4.2e-10 | \*\*\* |
| Ectotherm Herbivores (i.) | Brazil | SSP5-8.5 | Maximum Land Use | 8.3 | -1.07 | 0.15 | -7.01 | 2.4e-12 | \*\*\* |
| Ectotherm Herbivores (s.) | Brazil | Historical | Maximum Land Use | 3.94 | -0.25 | 0.09 | -2.77 | 0.0056 | \*\* |
| Ectotherm Herbivores (s.) | Brazil | SSP1-2.6 | Maximum Land Use | 7.89 | -0.56 | 0.09 | -6.1 | 1.1e-09 | \*\*\* |
| Ectotherm Herbivores (s.) | Brazil | SSP5-8.5 | Maximum Land Use | 3.29 | -0.13 | 0.04 | -3.06 | 0.0022 | \*\* |
| Ectotherm Omnivores (i.) | Brazil | Historical | Maximum Land Use | 7.63 | -1.53 | 0.16 | -9.59 | 2e-16 | \*\*\* |
| Ectotherm Omnivores (i.) | Brazil | SSP1-2.6 | Maximum Land Use | 6.77 | -1.86 | 0.15 | -12.55 | 2e-16 | \*\*\* |
| Ectotherm Omnivores (i.) | Brazil | SSP5-8.5 | Maximum Land Use | 7.11 | -0.73 | 0.13 | -5.8 | 6.8e-09 | \*\*\* |
| Ectotherm Omnivores (s.) | Brazil | Historical | Maximum Land Use | 5.77 | -0.28 | 0.1 | -2.84 | 0.0046 | \*\* |
| Ectotherm Omnivores (s.) | Brazil | SSP1-2.6 | Maximum Land Use | 5.48 | -0.33 | 0.08 | -4.2 | 2.6e-05 | \*\*\* |
| Ectotherm Omnivores (s.) | Brazil | SSP5-8.5 | Maximum Land Use | 5.44 | -0.15 | 0.05 | -3.29 | 0.001 | \*\* |
| Endotherm Carnivores (i.) | Brazil | Historical | Maximum Land Use | 6.87 | -0.96 | 0.13 | -7.22 | 5.2e-13 | \*\*\* |
| Endotherm Carnivores (i.) | Brazil | SSP1-2.6 | Maximum Land Use | 7.65 | -0.88 | 0.15 | -5.81 | 6.2e-09 | \*\*\* |
| Endotherm Carnivores (i.) | Brazil | SSP5-8.5 | Maximum Land Use | 6.73 | -1.23 | 0.15 | -8.45 | 2e-16 | \*\*\* |
| Endotherm Herbivores (i.) | Brazil | Historical | Maximum Land Use | 9.35 | -0.63 | 0.06 | -10.16 | 2e-16 | \*\*\* |
| Endotherm Herbivores (i.) | Brazil | SSP1-2.6 | Maximum Land Use | 9.11 | -0.68 | 0.07 | -9.96 | 2e-16 | \*\*\* |
| Endotherm Herbivores (i.) | Brazil | SSP5-8.5 | Maximum Land Use | 10.25 | -0.88 | 0.08 | -11.34 | 2e-16 | \*\*\* |
| Endotherm Omnivores (i.) | Brazil | Historical | Maximum Land Use | 6.03 | -0.73 | 0.12 | -5.97 | 2.4e-09 | \*\*\* |
| Endotherm Omnivores (i.) | Brazil | SSP1-2.6 | Maximum Land Use | 6.18 | -1.45 | 0.11 | -12.72 | 2e-16 | \*\*\* |
| Endotherm Omnivores (i.) | Brazil | SSP5-8.5 | Maximum Land Use | 7.19 | -1.44 | 0.12 | -11.61 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (i.) | Finland | Historical | Maximum Land Use | 6.94 | -1.34 | 0.19 | -7.04 | 1.9e-12 | \*\*\* |
| Ectotherm Carnivores (i.) | Finland | SSP1-2.6 | Maximum Land Use | 6.48 | -1.26 | 0.16 | -7.94 | 2e-15 | \*\*\* |
| Ectotherm Carnivores (i.) | Finland | SSP5-8.5 | Maximum Land Use | 6.91 | -1.43 | 0.17 | -8.41 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (s.) | Finland | Historical | Maximum Land Use | 0.93 | -0.35 | 0.15 | -2.38 | 0.017 | \* |
| Ectotherm Carnivores (s.) | Finland | SSP1-2.6 | Maximum Land Use | 1.88 | -0.39 | 0.11 | -3.61 | 0.00031 | \*\*\* |
| Ectotherm Carnivores (s.) | Finland | SSP5-8.5 | Maximum Land Use | 5.57 | -0.31 | 0.11 | -2.95 | 0.0032 | \*\* |
| Ectotherm Herbivores (i.) | Finland | Historical | Maximum Land Use | 4.49 | -1.02 | 0.15 | -6.94 | 4e-12 | \*\*\* |
| Ectotherm Herbivores (i.) | Finland | SSP1-2.6 | Maximum Land Use | 8.2 | -1.13 | 0.13 | -8.99 | 2e-16 | \*\*\* |
| Ectotherm Herbivores (i.) | Finland | SSP5-8.5 | Maximum Land Use | 8.49 | -1.3 | 0.14 | -9.29 | 2e-16 | \*\*\* |
| Ectotherm Herbivores (s.) | Finland | Historical | Maximum Land Use | 8.77 | -0.75 | 0.12 | -6.12 | 9.6e-10 | \*\*\* |
| Ectotherm Herbivores (s.) | Finland | SSP1-2.6 | Maximum Land Use | 10.68 | -0.54 | 0.1 | -5.38 | 7.6e-08 | \*\*\* |
| Ectotherm Herbivores (s.) | Finland | SSP5-8.5 | Maximum Land Use | 10.43 | -0.89 | 0.22 | -3.98 | 6.9e-05 | \*\*\* |
| Ectotherm Omnivores (i.) | Finland | Historical | Maximum Land Use | 9 | -1.15 | 0.2 | -5.66 | 1.5e-08 | \*\*\* |
| Ectotherm Omnivores (i.) | Finland | SSP1-2.6 | Maximum Land Use | 7.01 | -1.34 | 0.17 | -7.88 | 3.1e-15 | \*\*\* |
| Ectotherm Omnivores (i.) | Finland | SSP5-8.5 | Maximum Land Use | 3.57 | -1.26 | 0.1 | -12.56 | 2e-16 | \*\*\* |
| Ectotherm Omnivores (s.) | Finland | Historical | Maximum Land Use | 1.16 | -0.16 | 0.06 | -2.83 | 0.0046 | \*\* |
| Ectotherm Omnivores (s.) | Finland | SSP1-2.6 | Maximum Land Use | 10.78 | -0.29 | 0.09 | -3.1 | 0.002 | \*\* |
| Ectotherm Omnivores (s.) | Finland | SSP5-8.5 | Maximum Land Use | 9.78 | -0.15 | 0.1 | -1.55 | 0.12 |  |
| Endotherm Herbivores (i.) | Finland | Historical | Maximum Land Use | 1.09 | -0.13 | 0.06 | -2.07 | 0.038 | \* |
| Endotherm Herbivores (i.) | Finland | SSP1-2.6 | Maximum Land Use | 2.75 | -0.26 | 0.09 | -2.93 | 0.0034 | \*\* |
| Endotherm Herbivores (i.) | Finland | SSP5-8.5 | Maximum Land Use | 1.49 | -0.16 | 0.07 | -2.17 | 0.03 | \* |
| Endotherm Omnivores (i.) | Finland | Historical | Maximum Land Use | 4.54 | -2.06 | 0.46 | -4.44 | 9e-06 | \*\*\* |
| Endotherm Omnivores (i.) | Finland | SSP1-2.6 | Maximum Land Use | 3.42 | -1.41 | 0.39 | -3.61 | 0.00031 | \*\*\* |
| Endotherm Omnivores (i.) | Finland | SSP5-8.5 | Maximum Land Use | 3.61 | -1.59 | 0.38 | -4.16 | 3.2e-05 | \*\*\* |
| Ectotherm Carnivores (i.) | Namibia | Historical | Maximum Land Use | 6.91 | -2.24 | 0.36 | -6.18 | 6.5e-10 | \*\*\* |
| Ectotherm Carnivores (i.) | Namibia | SSP1-2.6 | Maximum Land Use | 4.67 | -0.81 | 0.26 | -3.09 | 0.002 | \*\* |
| Ectotherm Carnivores (i.) | Namibia | SSP5-8.5 | Maximum Land Use | 3.88 | 0.18 | 0.23 | 0.79 | 0.43 |  |
| Ectotherm Carnivores (s.) | Namibia | Historical | Maximum Land Use | 3.74 | -0.56 | 0.16 | -3.53 | 0.00041 | \*\*\* |
| Ectotherm Carnivores (s.) | Namibia | SSP1-2.6 | Maximum Land Use | 4.37 | -0.35 | 0.36 | -0.97 | 0.33 |  |
| Ectotherm Herbivores (i.) | Namibia | Historical | Maximum Land Use | 10.77 | -3.72 | 0.5 | -7.38 | 1.5e-13 | \*\*\* |
| Ectotherm Herbivores (i.) | Namibia | SSP1-2.6 | Maximum Land Use | 9.89 | -1.37 | 0.16 | -8.68 | 2e-16 | \*\*\* |
| Ectotherm Herbivores (i.) | Namibia | SSP5-8.5 | Maximum Land Use | 5.01 | -0.6 | 0.24 | -2.47 | 0.013 | \* |
| Ectotherm Herbivores (s.) | Namibia | Historical | Maximum Land Use | 1.49 | -0.63 | 0.11 | -5.96 | 2.6e-09 | \*\*\* |
| Ectotherm Herbivores (s.) | Namibia | SSP1-2.6 | Maximum Land Use | 1.97 | -0.41 | 0.13 | -3.03 | 0.0025 | \*\* |
| Ectotherm Herbivores (s.) | Namibia | SSP5-8.5 | Maximum Land Use | 0.85 | -0.54 | 0.19 | -2.88 | 0.0039 | \*\* |
| Ectotherm Omnivores (i.) | Namibia | Historical | Maximum Land Use | 9.09 | -3.47 | 0.33 | -10.63 | 2e-16 | \*\*\* |
| Ectotherm Omnivores (i.) | Namibia | SSP1-2.6 | Maximum Land Use | 9.81 | -1.43 | 0.14 | -9.86 | 2e-16 | \*\*\* |
| Ectotherm Omnivores (i.) | Namibia | SSP5-8.5 | Maximum Land Use | 5.2 | -1.6 | 0.29 | -5.56 | 2.8e-08 | \*\*\* |
| Ectotherm Omnivores (s.) | Namibia | Historical | Maximum Land Use | 2.41 | -0.54 | 0.13 | -4.34 | 1.4e-05 | \*\*\* |
| Ectotherm Omnivores (s.) | Namibia | SSP1-2.6 | Maximum Land Use | 1.92 | -0.52 | 0.11 | -4.99 | 6.1e-07 | \*\*\* |
| Ectotherm Omnivores (s.) | Namibia | SSP5-8.5 | Maximum Land Use | 5.37 | -0.65 | 0.16 | -4.2 | 2.7e-05 | \*\*\* |
| Endotherm Carnivores (i.) | Namibia | Historical | Maximum Land Use | 7.33 | -1.31 | 0.3 | -4.37 | 1.2e-05 | \*\*\* |
| Endotherm Herbivores (i.) | Namibia | Historical | Maximum Land Use | 7.4 | -0.99 | 0.13 | -7.77 | 8.2e-15 | \*\*\* |
| Endotherm Herbivores (i.) | Namibia | SSP1-2.6 | Maximum Land Use | 4.4 | -0.68 | 0.16 | -4.37 | 1.2e-05 | \*\*\* |
| Endotherm Herbivores (i.) | Namibia | SSP5-8.5 | Maximum Land Use | -0.82 | 0.41 | 0.15 | 2.71 | 0.0066 | \*\* |
| Endotherm Omnivores (i.) | Namibia | Historical | Maximum Land Use | 2.59 | -1.16 | 0.31 | -3.81 | 0.00014 | \*\*\* |
| Ectotherm Carnivores (i.) | France | Historical | Maximum Land Use | 6.63 | -2.82 | 0.26 | -10.75 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (i.) | France | SSP1-2.6 | Maximum Land Use | 5.68 | -2.47 | 0.24 | -10.31 | 2e-16 | \*\*\* |
| Ectotherm Carnivores (i.) | France | SSP5-8.5 | Maximum Land Use | 4.51 | -2.48 | 0.3 | -8.25 | 2.2e-16 | \*\*\* |
| Ectotherm Carnivores (s.) | France | Historical | Maximum Land Use | 4.66 | -0.4 | 0.13 | -3.13 | 0.0017 | \*\* |
| Ectotherm Carnivores (s.) | France | SSP1-2.6 | Maximum Land Use | 3.75 | -0.52 | 0.24 | -2.16 | 0.031 | \* |
| Ectotherm Herbivores (i.) | France | Historical | Maximum Land Use | 2.09 | -1.01 | 0.24 | -4.12 | 3.7e-05 | \*\*\* |
| Ectotherm Herbivores (i.) | France | SSP1-2.6 | Maximum Land Use | 3.14 | -1.19 | 0.23 | -5.17 | 2.4e-07 | \*\*\* |
| Ectotherm Herbivores (i.) | France | SSP5-8.5 | Maximum Land Use | 4.1 | -1.31 | 0.24 | -5.5 | 3.8e-08 | \*\*\* |
| Ectotherm Herbivores (s.) | France | Historical | Maximum Land Use | 1.25 | -0.82 | 0.16 | -5.15 | 2.5e-07 | \*\*\* |
| Ectotherm Herbivores (s.) | France | SSP1-2.6 | Maximum Land Use | 1.71 | -0.69 | 0.17 | -4.19 | 2.7e-05 | \*\*\* |
| Ectotherm Herbivores (s.) | France | SSP5-8.5 | Maximum Land Use | 5.24 | 0.1 | 0.35 | 0.28 | 0.78 |  |
| Ectotherm Omnivores (i.) | France | Historical | Maximum Land Use | 1.71 | -1.3 | 0.28 | -4.69 | 2.7e-06 | \*\*\* |
| Ectotherm Omnivores (i.) | France | SSP1-2.6 | Maximum Land Use | 2.94 | -1.59 | 0.26 | -6.05 | 1.4e-09 | \*\*\* |
| Ectotherm Omnivores (i.) | France | SSP5-8.5 | Maximum Land Use | 5.85 | -1.35 | 0.23 | -5.94 | 2.9e-09 | \*\*\* |
| Ectotherm Omnivores (s.) | France | Historical | Maximum Land Use | 1.72 | -0.29 | 0.12 | -2.35 | 0.019 | \* |
| Ectotherm Omnivores (s.) | France | SSP1-2.6 | Maximum Land Use | 1.3 | -0.62 | 0.18 | -3.4 | 0.00066 | \*\*\* |
| Ectotherm Omnivores (s.) | France | SSP5-8.5 | Maximum Land Use | 5.99 | -0.27 | 0.21 | -1.28 | 0.2 |  |
| Endotherm Carnivores (i.) | France | Historical | Maximum Land Use | 4.96 | -1.27 | 0.31 | -4.09 | 4.3e-05 | \*\*\* |
| Endotherm Carnivores (i.) | France | SSP1-2.6 | Maximum Land Use | 7.68 | -2.1 | 0.51 | -4.14 | 3.5e-05 | \*\*\* |
| Endotherm Carnivores (i.) | France | SSP5-8.5 | Maximum Land Use | 5.3 | -1.2 | 0.25 | -4.73 | 2.3e-06 | \*\*\* |
| Endotherm Herbivores (i.) | France | Historical | Maximum Land Use | 8.8 | -1.1 | 0.12 | -9.03 | 2e-16 | \*\*\* |
| Endotherm Herbivores (i.) | France | SSP1-2.6 | Maximum Land Use | 8.48 | -0.84 | 0.09 | -8.99 | 2e-16 | \*\*\* |
| Endotherm Herbivores (i.) | France | SSP5-8.5 | Maximum Land Use | 8.19 | -1.01 | 0.14 | -7.5 | 6.3e-14 | \*\*\* |
| Endotherm Omnivores (i.) | France | Historical | Maximum Land Use | 8.02 | -2.17 | 0.15 | -14.19 | 2e-16 | \*\*\* |
| Endotherm Omnivores (i.) | France | SSP1-2.6 | Maximum Land Use | 9.3 | -2.56 | 0.22 | -11.42 | 2e-16 | \*\*\* |
| Endotherm Omnivores (i.) | France | SSP5-8.5 | Maximum Land Use | 8.56 | -2.2 | 0.2 | -10.99 | 2e-16 | \*\*\* |

# Supplementary Note 4: Impact on the abundance-body mass relationship for aggregated functional groups

## 4.1 Regression results for climate simulation

**Table 8:** Results of the combined spatial autoregressive models for each region, climate, and functional group for the climate simulation experiment for aggregated functional groups. Ectotherm functional groups are aggregated by their feeding guild. Asterisks in the column Significance Level denote significance levels: \* indicates significance with p-values <0.05, \*\* indicates very significant p-values <0.01, and \*\*\* indicates highly significant p-values <0.001.

| **Functional Group** | **Region** | **Climate** | **Scenario** | **Intercept** | **Slope** | **Std. Error** | **Z. Stat** | **P Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ectotherm Carnivores | Brazil | Historical | Climate | 7.62 | -1.02 | 1.03 | -0.98 | 0.33 |  |
| Ectotherm Carnivores | Brazil | SSP1-2.6 | Climate | 3.07 | -1.17 | 0.7 | -1.67 | 0.094 |  |
| Ectotherm Carnivores | Brazil | SSP5-8.5 | Climate | 10.43 | -0.93 | 0.54 | -1.74 | 0.082 |  |
| Ectotherm Herbivores | Brazil | Historical | Climate | 12.81 | -2.99 | 2.73 | -1.1 | 0.27 |  |
| Ectotherm Herbivores | Brazil | SSP1-2.6 | Climate | 9.19 | -0.64 | 2.34 | -0.27 | 0.78 |  |
| Ectotherm Herbivores | Brazil | SSP5-8.5 | Climate | 7.75 | -5.28 | 3.56 | -1.48 | 0.14 |  |
| Ectotherm Omnivores | Brazil | Historical | Climate | 8.38 | 2.23 | 2.07 | 1.07 | 0.28 |  |
| Ectotherm Omnivores | Brazil | SSP1-2.6 | Climate | 4.88 | 2.31 | 1.81 | 1.28 | 0.2 |  |
| Ectotherm Omnivores | Brazil | SSP5-8.5 | Climate | 8.48 | 2.3 | 2.84 | 0.81 | 0.42 |  |
| Endotherm Carnivores | Brazil | Historical | Climate | 10.64 | -0.55 | 0.46 | -1.21 | 0.23 |  |
| Endotherm Carnivores | Brazil | SSP1-2.6 | Climate | 10.02 | -1.6 | 0.47 | -3.37 | 0.00076 | \*\*\* |
| Endotherm Carnivores | Brazil | SSP5-8.5 | Climate | 4.74 | -0.42 | 0.31 | -1.38 | 0.17 |  |
| Endotherm Herbivores | Brazil | Historical | Climate | 3.28 | 0.12 | 0.18 | 0.68 | 0.49 |  |
| Endotherm Herbivores | Brazil | SSP1-2.6 | Climate | 5.98 | 0.29 | 0.27 | 1.07 | 0.28 |  |
| Endotherm Herbivores | Brazil | SSP5-8.5 | Climate | 6.79 | 0.16 | 0.45 | 0.35 | 0.72 |  |
| Endotherm Omnivores | Brazil | Historical | Climate | 4.25 | 0.68 | 0.54 | 1.26 | 0.21 |  |
| Endotherm Omnivores | Brazil | SSP1-2.6 | Climate | 6.57 | 0.33 | 0.98 | 0.33 | 0.74 |  |
| Endotherm Omnivores | Brazil | SSP5-8.5 | Climate | 5.76 | 0.65 | 0.9 | 0.72 | 0.47 |  |
| Ectotherm Carnivores | Finland | Historical | Climate | 9.55 | -0.42 | 0.21 | -1.97 | 0.049 | \* |
| Ectotherm Carnivores | Finland | SSP1-2.6 | Climate | 6.71 | 0.09 | 0.29 | 0.33 | 0.74 |  |
| Ectotherm Carnivores | Finland | SSP5-8.5 | Climate | 1.12 | 0.24 | 0.13 | 1.87 | 0.061 |  |
| Ectotherm Herbivores | Finland | Historical | Climate | 6.03 | -0.34 | 0.5 | -0.69 | 0.49 |  |
| Ectotherm Herbivores | Finland | SSP1-2.6 | Climate | 3.3 | -0.43 | 0.31 | -1.4 | 0.16 |  |
| Ectotherm Herbivores | Finland | SSP5-8.5 | Climate | 4 | 0.55 | 0.81 | 0.69 | 0.49 |  |
| Ectotherm Omnivores | Finland | Historical | Climate | 7.85 | 0.02 | 0.35 | 0.07 | 0.95 |  |
| Ectotherm Omnivores | Finland | SSP1-2.6 | Climate | 3.82 | 0.12 | 0.16 | 0.76 | 0.45 |  |
| Ectotherm Omnivores | Finland | SSP5-8.5 | Climate | 13.81 | 1.63 | 0.53 | 3.06 | 0.0022 | \*\* |
| Endotherm Carnivores | Finland | Historical | Climate | 2.91 | -0.11 | 0.09 | -1.2 | 0.23 |  |
| Endotherm Carnivores | Finland | SSP1-2.6 | Climate | 1.42 | -0.06 | 0.07 | -0.85 | 0.39 |  |
| Endotherm Carnivores | Finland | SSP5-8.5 | Climate | 1.28 | -0.16 | 0.07 | -2.24 | 0.025 | \* |
| Endotherm Herbivores | Finland | Historical | Climate | 1.8 | 0.17 | 0.13 | 1.33 | 0.18 |  |
| Endotherm Herbivores | Finland | SSP1-2.6 | Climate | 2.76 | 0.28 | 0.23 | 1.24 | 0.22 |  |
| Endotherm Herbivores | Finland | SSP5-8.5 | Climate | 1.2 | 0.22 | 0.12 | 1.74 | 0.081 |  |
| Endotherm Omnivores | Finland | Historical | Climate | 9.19 | 0.23 | 0.29 | 0.81 | 0.42 |  |
| Endotherm Omnivores | Finland | SSP1-2.6 | Climate | 8.83 | 0.56 | 0.38 | 1.47 | 0.14 |  |
| Endotherm Omnivores | Finland | SSP5-8.5 | Climate | 5.18 | 0.09 | 0.35 | 0.25 | 0.81 |  |
| Ectotherm Carnivores | Namibia | Historical | Climate | 12.97 | -7.29 | 0.64 | -11.43 | 2e-16 | \*\*\* |
| Ectotherm Carnivores | Namibia | SSP1-2.6 | Climate | 5.63 | -2.37 | 0.64 | -3.71 | 2e-04 | \*\*\* |
| Ectotherm Carnivores | Namibia | SSP5-8.5 | Climate | 11.81 | -3.55 | 0.6 | -5.88 | 4.2e-09 | \*\*\* |
| Ectotherm Herbivores | Namibia | Historical | Climate | 19.06 | -13.22 | 3.33 | -3.96 | 7.3e-05 | \*\*\* |
| Ectotherm Herbivores | Namibia | SSP1-2.6 | Climate | 7.59 | -2.52 | 4.68 | -0.54 | 0.59 |  |
| Ectotherm Herbivores | Namibia | SSP5-8.5 | Climate | 16.93 | -9.59 | 2.42 | -3.96 | 7.4e-05 | \*\*\* |
| Ectotherm Omnivores | Namibia | Historical | Climate | 12.05 | -7.72 | 2.65 | -2.91 | 0.0036 | \*\* |
| Ectotherm Omnivores | Namibia | SSP1-2.6 | Climate | 3.9 | -5.01 | 2.57 | -1.95 | 0.051 |  |
| Ectotherm Omnivores | Namibia | SSP5-8.5 | Climate | 11.62 | -8.24 | 1.73 | -4.77 | 1.8e-06 | \*\*\* |
| Endotherm Carnivores | Namibia | Historical | Climate | 21.51 | -9.56 | 0.55 | -17.24 | 2e-16 | \*\*\* |
| Endotherm Carnivores | Namibia | SSP1-2.6 | Climate | 7.05 | -0.86 | 0.3 | -2.91 | 0.0036 | \*\* |
| Endotherm Carnivores | Namibia | SSP5-8.5 | Climate | 15.22 | -6.14 | 0.48 | -12.79 | 2e-16 | \*\*\* |
| Endotherm Herbivores | Namibia | Historical | Climate | 17.7 | -6.19 | 1.1 | -5.61 | 2e-08 | \*\*\* |
| Endotherm Herbivores | Namibia | SSP1-2.6 | Climate | 0.73 | 0.11 | 0.09 | 1.15 | 0.25 |  |
| Endotherm Herbivores | Namibia | SSP5-8.5 | Climate | 12.65 | -3.29 | 0.76 | -4.33 | 1.5e-05 | \*\*\* |
| Endotherm Omnivores | Namibia | Historical | Climate | 12.36 | -5.36 | 0.66 | -8.12 | 4.4e-16 | \*\*\* |
| Endotherm Omnivores | Namibia | SSP1-2.6 | Climate | 1.5 | 0.18 | 0.22 | 0.83 | 0.41 |  |
| Endotherm Omnivores | Namibia | SSP5-8.5 | Climate | 12.02 | -4.21 | 0.51 | -8.28 | 2.2e-16 | \*\*\* |
| Ectotherm Carnivores | France | Historical | Climate | 9.5 | -2.1 | 0.63 | -3.33 | 0.00086 | \*\*\* |
| Ectotherm Carnivores | France | SSP1-2.6 | Climate | 6.58 | -1.38 | 0.54 | -2.57 | 0.01 | \* |
| Ectotherm Carnivores | France | SSP5-8.5 | Climate | 6.76 | -0.62 | 0.5 | -1.24 | 0.21 |  |
| Ectotherm Herbivores | France | Historical | Climate | 2.24 | -6.19 | 3.08 | -2.01 | 0.044 | \* |
| Ectotherm Herbivores | France | SSP1-2.6 | Climate | 1.94 | -3.42 | 2.64 | -1.29 | 0.2 |  |
| Ectotherm Herbivores | France | SSP5-8.5 | Climate | 0.64 | -0.82 | 1.11 | -0.74 | 0.46 |  |
| Ectotherm Omnivores | France | Historical | Climate | -0.55 | -5.11 | 1.8 | -2.84 | 0.0046 | \*\* |
| Ectotherm Omnivores | France | SSP1-2.6 | Climate | 2.37 | -3.4 | 1.45 | -2.34 | 0.02 | \* |
| Ectotherm Omnivores | France | SSP5-8.5 | Climate | 6.2 | -3.27 | 1.14 | -2.87 | 0.0041 | \*\* |
| Endotherm Carnivores | France | Historical | Climate | 3.58 | -0.67 | 0.29 | -2.36 | 0.018 | \* |
| Endotherm Carnivores | France | SSP1-2.6 | Climate | 3.33 | -0.67 | 0.25 | -2.73 | 0.0064 | \*\* |
| Endotherm Carnivores | France | SSP5-8.5 | Climate | 2.61 | -0.31 | 0.23 | -1.33 | 0.18 |  |
| Endotherm Herbivores | France | Historical | Climate | 2.73 | -0.29 | 0.17 | -1.72 | 0.085 |  |
| Endotherm Herbivores | France | SSP1-2.6 | Climate | 6.51 | -0.27 | 0.57 | -0.48 | 0.63 |  |
| Endotherm Herbivores | France | SSP5-8.5 | Climate | 5.6 | -0.18 | 0.55 | -0.33 | 0.74 |  |
| Endotherm Omnivores | France | Historical | Climate | 6.68 | 0.06 | 0.4 | 0.14 | 0.89 |  |
| Endotherm Omnivores | France | SSP1-2.6 | Climate | 7.92 | 1.05 | 0.49 | 2.13 | 0.033 | \* |
| Endotherm Omnivores | France | SSP5-8.5 | Climate | 9.27 | 2.11 | 0.54 | 3.88 | 0.00011 | \*\*\* |

## 4.2 Regression results for current land use simulation

**Table 9:** Results of the combined spatial autoregressive models for each region, climate, and functional group for the current land use simulation experiment for aggregated functional groups. Ectotherm functional groups are aggregated by their feeding guild. Asterisks in the column Significance Level denote significance levels: \* indicates significance with p-values <0.05, \*\* indicates very significant p-values <0.01, and \*\*\* indicates highly significant p-values <0.001.

| **Functional Group** | **Region** | **Climate** | **Scenario** | **Intercept** | **Slope** | **Std. Error** | **Z. Stat** | **P Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ectotherm Carnivores | Brazil | Historical | Current Land Use | 9.53 | -3.35 | 1.27 | -2.65 | 0.0081 | \*\* |
| Ectotherm Carnivores | Brazil | SSP1-2.6 | Current Land Use | 6.92 | -2.31 | 0.48 | -4.83 | 1.3e-06 | \*\*\* |
| Ectotherm Carnivores | Brazil | SSP5-8.5 | Current Land Use | 11.35 | -1.41 | 0.28 | -5.09 | 3.6e-07 | \*\*\* |
| Ectotherm Herbivores | Brazil | Historical | Current Land Use | 14.52 | -0.88 | 2.77 | -0.32 | 0.75 |  |
| Ectotherm Herbivores | Brazil | SSP1-2.6 | Current Land Use | 4.31 | 3.94 | 2.54 | 1.55 | 0.12 |  |
| Ectotherm Herbivores | Brazil | SSP5-8.5 | Current Land Use | 8.59 | -1.47 | 2.77 | -0.53 | 0.6 |  |
| Ectotherm Omnivores | Brazil | Historical | Current Land Use | 12.6 | 2.8 | 2.66 | 1.05 | 0.29 |  |
| Ectotherm Omnivores | Brazil | SSP1-2.6 | Current Land Use | 6.22 | 2.07 | 3.16 | 0.65 | 0.51 |  |
| Ectotherm Omnivores | Brazil | SSP5-8.5 | Current Land Use | 10.37 | 0.42 | 3.27 | 0.13 | 0.9 |  |
| Endotherm Carnivores | Brazil | Historical | Current Land Use | 5.81 | -0.34 | 0.37 | -0.92 | 0.36 |  |
| Endotherm Carnivores | Brazil | SSP1-2.6 | Current Land Use | 5.07 | -0.27 | 0.28 | -0.96 | 0.34 |  |
| Endotherm Carnivores | Brazil | SSP5-8.5 | Current Land Use | 8.06 | -0.57 | 0.25 | -2.25 | 0.024 | \* |
| Endotherm Herbivores | Brazil | Historical | Current Land Use | 5.98 | 0.16 | 0.33 | 0.48 | 0.63 |  |
| Endotherm Herbivores | Brazil | SSP1-2.6 | Current Land Use | 6.74 | -0.29 | 0.33 | -0.87 | 0.38 |  |
| Endotherm Herbivores | Brazil | SSP5-8.5 | Current Land Use | 1.42 | 0.14 | 0.1 | 1.4 | 0.16 |  |
| Endotherm Omnivores | Brazil | Historical | Current Land Use | 5.36 | 0.58 | 0.98 | 0.59 | 0.55 |  |
| Endotherm Omnivores | Brazil | SSP1-2.6 | Current Land Use | 4.51 | 0.03 | 0.7 | 0.04 | 0.96 |  |
| Endotherm Omnivores | Brazil | SSP5-8.5 | Current Land Use | 2.18 | 0.5 | 0.38 | 1.29 | 0.2 |  |
| Ectotherm Carnivores | Finland | Historical | Current Land Use | 5.86 | -0.16 | 0.2 | -0.8 | 0.42 |  |
| Ectotherm Carnivores | Finland | SSP1-2.6 | Current Land Use | 9.7 | -0.16 | 0.15 | -1.1 | 0.27 |  |
| Ectotherm Carnivores | Finland | SSP5-8.5 | Current Land Use | 0.73 | 0.21 | 0.1 | 2.01 | 0.045 | \* |
| Ectotherm Herbivores | Finland | Historical | Current Land Use | 2.4 | -0.29 | 0.21 | -1.38 | 0.17 |  |
| Ectotherm Herbivores | Finland | SSP1-2.6 | Current Land Use | 7.9 | -0.21 | 0.35 | -0.61 | 0.54 |  |
| Ectotherm Herbivores | Finland | SSP5-8.5 | Current Land Use | 13.7 | -1.04 | 0.7 | -1.49 | 0.14 |  |
| Ectotherm Omnivores | Finland | Historical | Current Land Use | 4.25 | -0.14 | 0.16 | -0.88 | 0.38 |  |
| Ectotherm Omnivores | Finland | SSP1-2.6 | Current Land Use | 1.72 | 0.04 | 0.07 | 0.6 | 0.55 |  |
| Ectotherm Omnivores | Finland | SSP5-8.5 | Current Land Use | 1.58 | 0.33 | 0.24 | 1.39 | 0.17 |  |
| Endotherm Carnivores | Finland | Historical | Current Land Use | 3.84 | -0.09 | 0.15 | -0.61 | 0.54 |  |
| Endotherm Carnivores | Finland | SSP1-2.6 | Current Land Use | 2.13 | 0.06 | 0.05 | 1.15 | 0.25 |  |
| Endotherm Carnivores | Finland | SSP5-8.5 | Current Land Use | 1.64 | -0.12 | 0.08 | -1.6 | 0.11 |  |
| Endotherm Herbivores | Finland | Historical | Current Land Use | 4.79 | -0.08 | 0.28 | -0.29 | 0.77 |  |
| Endotherm Herbivores | Finland | SSP1-2.6 | Current Land Use | 3.94 | 0.21 | 0.43 | 0.49 | 0.63 |  |
| Endotherm Herbivores | Finland | SSP5-8.5 | Current Land Use | 5.07 | 0.63 | 0.7 | 0.91 | 0.36 |  |
| Endotherm Omnivores | Finland | Historical | Current Land Use | 7.22 | -0.05 | 0.26 | -0.19 | 0.85 |  |
| Endotherm Omnivores | Finland | SSP1-2.6 | Current Land Use | 8.11 | -0.17 | 0.36 | -0.48 | 0.63 |  |
| Endotherm Omnivores | Finland | SSP5-8.5 | Current Land Use | 4.78 | 0.02 | 0.19 | 0.09 | 0.93 |  |
| Ectotherm Carnivores | Namibia | Historical | Current Land Use | 13.82 | -7.76 | 0.65 | -11.85 | 2e-16 | \*\*\* |
| Ectotherm Carnivores | Namibia | SSP1-2.6 | Current Land Use | 2.85 | -1.03 | 0.32 | -3.24 | 0.0012 | \*\* |
| Ectotherm Carnivores | Namibia | SSP5-8.5 | Current Land Use | 10.26 | -1.72 | 0.26 | -6.7 | 2e-11 | \*\*\* |
| Ectotherm Herbivores | Namibia | Historical | Current Land Use | 16.72 | -10.94 | 3.12 | -3.5 | 0.00046 | \*\*\* |
| Ectotherm Herbivores | Namibia | SSP1-2.6 | Current Land Use | 6.96 | -0.69 | 2.91 | -0.24 | 0.81 |  |
| Ectotherm Herbivores | Namibia | SSP5-8.5 | Current Land Use | 18.96 | -9.12 | 2.46 | -3.71 | 2e-04 | \*\*\* |
| Ectotherm Omnivores | Namibia | Historical | Current Land Use | 10.23 | -7.96 | 2.94 | -2.71 | 0.0068 | \*\* |
| Ectotherm Omnivores | Namibia | SSP1-2.6 | Current Land Use | 3.66 | -4.54 | 2.02 | -2.25 | 0.025 | \* |
| Ectotherm Omnivores | Namibia | SSP5-8.5 | Current Land Use | 9.75 | -8 | 1.84 | -4.35 | 1.4e-05 | \*\*\* |
| Endotherm Carnivores | Namibia | Historical | Current Land Use | 21.97 | -8.26 | 0.61 | -13.49 | 2e-16 | \*\*\* |
| Endotherm Carnivores | Namibia | SSP1-2.6 | Current Land Use | 5.62 | -0.72 | 0.36 | -2.02 | 0.043 | \* |
| Endotherm Carnivores | Namibia | SSP5-8.5 | Current Land Use | 18.41 | -5.24 | 0.57 | -9.12 | 2e-16 | \*\*\* |
| Endotherm Herbivores | Namibia | Historical | Current Land Use | 17.18 | -4.47 | 1.05 | -4.27 | 1.9e-05 | \*\*\* |
| Endotherm Herbivores | Namibia | SSP1-2.6 | Current Land Use | 4.68 | 0.03 | 0.25 | 0.1 | 0.92 |  |
| Endotherm Herbivores | Namibia | SSP5-8.5 | Current Land Use | 12.95 | -3.28 | 0.8 | -4.11 | 3.9e-05 | \*\*\* |
| Endotherm Omnivores | Namibia | Historical | Current Land Use | 15.24 | -5.43 | 0.62 | -8.69 | 2e-16 | \*\*\* |
| Endotherm Omnivores | Namibia | SSP1-2.6 | Current Land Use | 5.76 | 0.27 | 0.41 | 0.66 | 0.51 |  |
| Endotherm Omnivores | Namibia | SSP5-8.5 | Current Land Use | 12.94 | -4.61 | 0.54 | -8.62 | 2e-16 | \*\*\* |
| Ectotherm Carnivores | France | Historical | Current Land Use | 2.88 | -1.17 | 0.5 | -2.33 | 0.02 | \* |
| Ectotherm Carnivores | France | SSP1-2.6 | Current Land Use | 8.04 | -1.48 | 0.38 | -3.94 | 8.2e-05 | \*\*\* |
| Ectotherm Carnivores | France | SSP5-8.5 | Current Land Use | 6.16 | -1.35 | 0.4 | -3.37 | 0.00074 | \*\*\* |
| Ectotherm Herbivores | France | Historical | Current Land Use | 2.12 | -5.8 | 1.22 | -4.77 | 1.9e-06 | \*\*\* |
| Ectotherm Herbivores | France | SSP1-2.6 | Current Land Use | 0.79 | -3.07 | 0.73 | -4.18 | 3e-05 | \*\*\* |
| Ectotherm Herbivores | France | SSP5-8.5 | Current Land Use | 1.53 | -1.77 | 0.6 | -2.95 | 0.0032 | \*\* |
| Ectotherm Omnivores | France | Historical | Current Land Use | 0.27 | -4.77 | 1.33 | -3.59 | 0.00033 | \*\*\* |
| Ectotherm Omnivores | France | SSP1-2.6 | Current Land Use | 0.55 | -3.52 | 0.73 | -4.84 | 1.3e-06 | \*\*\* |
| Ectotherm Omnivores | France | SSP5-8.5 | Current Land Use | 2.27 | -1.32 | 0.63 | -2.09 | 0.037 | \* |
| Endotherm Carnivores | France | Historical | Current Land Use | 4.45 | -0.8 | 0.25 | -3.22 | 0.0013 | \*\* |
| Endotherm Carnivores | France | SSP1-2.6 | Current Land Use | 3.52 | -0.52 | 0.22 | -2.4 | 0.016 | \* |
| Endotherm Carnivores | France | SSP5-8.5 | Current Land Use | 3.09 | -0.38 | 0.27 | -1.39 | 0.16 |  |
| Endotherm Herbivores | France | Historical | Current Land Use | 2.38 | -0.45 | 0.23 | -1.92 | 0.055 |  |
| Endotherm Herbivores | France | SSP1-2.6 | Current Land Use | 1.99 | -0.39 | 0.16 | -2.45 | 0.014 | \* |
| Endotherm Herbivores | France | SSP5-8.5 | Current Land Use | 8.88 | -1.03 | 0.28 | -3.74 | 0.00018 | \*\*\* |
| Endotherm Omnivores | France | Historical | Current Land Use | 5.83 | 0.58 | 0.48 | 1.21 | 0.23 |  |
| Endotherm Omnivores | France | SSP1-2.6 | Current Land Use | 0.85 | -0.28 | 0.23 | -1.22 | 0.22 |  |
| Endotherm Omnivores | France | SSP5-8.5 | Current Land Use | 6.45 | 1.12 | 0.51 | 2.17 | 0.03 | \* |

## 4.3 Regression results for maximum land use simulation

**Table 10:** Results of the combined spatial autoregressive models for each region, climate, and functional group for the maximum land use simulation experiment for aggregated functional groups. Ectotherm functional groups are aggregated by their feeding guild. Asterisks in the column Significance Level denote significance levels: \* indicates significance with p-values <0.05, \*\* indicates very significant p-values <0.01, and \*\*\* indicates highly significant p-values <0.001.

| **Functional Group** | **Region** | **Climate** | **Scenario** | **Intercept** | **Slope** | **Std. Error** | **Z. Stat** | **P Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ectotherm Carnivores | Brazil | Historical | Maximum Land Use | 8.39 | -1.95 | 0.19 | -10.43 | 2e-16 | \*\*\* |
| Ectotherm Carnivores | Brazil | SSP1-2.6 | Maximum Land Use | 4.61 | -0.32 | 0.14 | -2.34 | 0.019 | \* |
| Ectotherm Carnivores | Brazil | SSP5-8.5 | Maximum Land Use | 4.93 | 0.3 | 0.07 | 4.58 | 4.7e-06 | \*\*\* |
| Ectotherm Herbivores | Brazil | Historical | Maximum Land Use | 8.26 | -1.5 | 0.45 | -3.33 | 0.00088 | \*\*\* |
| Ectotherm Herbivores | Brazil | SSP1-2.6 | Maximum Land Use | 9.68 | -1.86 | 0.42 | -4.48 | 7.5e-06 | \*\*\* |
| Ectotherm Herbivores | Brazil | SSP5-8.5 | Maximum Land Use | 7.76 | -0.15 | 0.09 | -1.73 | 0.083 |  |
| Ectotherm Omnivores | Brazil | Historical | Maximum Land Use | 5.09 | -2.05 | 0.39 | -5.2 | 2e-07 | \*\*\* |
| Ectotherm Omnivores | Brazil | SSP1-2.6 | Maximum Land Use | 5.46 | -0.44 | 0.15 | -2.88 | 0.004 | \*\* |
| Ectotherm Omnivores | Brazil | SSP5-8.5 | Maximum Land Use | 4.75 | -0.08 | 0.06 | -1.32 | 0.19 |  |
| Endotherm Carnivores | Brazil | Historical | Maximum Land Use | 6.87 | -0.96 | 0.13 | -7.22 | 5.2e-13 | \*\*\* |
| Endotherm Carnivores | Brazil | SSP1-2.6 | Maximum Land Use | 7.65 | -0.88 | 0.15 | -5.81 | 6.2e-09 | \*\*\* |
| Endotherm Carnivores | Brazil | SSP5-8.5 | Maximum Land Use | 6.73 | -1.23 | 0.15 | -8.45 | 2e-16 | \*\*\* |
| Endotherm Herbivores | Brazil | Historical | Maximum Land Use | 9.35 | -0.63 | 0.06 | -10.16 | 2e-16 | \*\*\* |
| Endotherm Herbivores | Brazil | SSP1-2.6 | Maximum Land Use | 9.11 | -0.68 | 0.07 | -9.96 | 2e-16 | \*\*\* |
| Endotherm Herbivores | Brazil | SSP5-8.5 | Maximum Land Use | 10.25 | -0.88 | 0.08 | -11.34 | 2e-16 | \*\*\* |
| Endotherm Omnivores | Brazil | Historical | Maximum Land Use | 6.03 | -0.73 | 0.12 | -5.97 | 2.4e-09 | \*\*\* |
| Endotherm Omnivores | Brazil | SSP1-2.6 | Maximum Land Use | 6.18 | -1.45 | 0.11 | -12.72 | 2e-16 | \*\*\* |
| Endotherm Omnivores | Brazil | SSP5-8.5 | Maximum Land Use | 7.19 | -1.44 | 0.12 | -11.61 | 2e-16 | \*\*\* |
| Ectotherm Carnivores | Finland | Historical | Maximum Land Use | 8.7 | -2.16 | 0.4 | -5.43 | 5.7e-08 | \*\*\* |
| Ectotherm Carnivores | Finland | SSP1-2.6 | Maximum Land Use | 6.18 | -1.68 | 0.3 | -5.59 | 2.2e-08 | \*\*\* |
| Ectotherm Carnivores | Finland | SSP5-8.5 | Maximum Land Use | 6.11 | -1.89 | 0.31 | -6.13 | 8.8e-10 | \*\*\* |
| Ectotherm Herbivores | Finland | Historical | Maximum Land Use | 5.17 | -1.66 | 0.32 | -5.2 | 2e-07 | \*\*\* |
| Ectotherm Herbivores | Finland | SSP1-2.6 | Maximum Land Use | 8.76 | -2.27 | 0.27 | -8.39 | 2e-16 | \*\*\* |
| Ectotherm Herbivores | Finland | SSP5-8.5 | Maximum Land Use | 10.5 | -2.92 | 0.41 | -7.17 | 7.3e-13 | \*\*\* |
| Ectotherm Omnivores | Finland | Historical | Maximum Land Use | 10.95 | -1.83 | 0.31 | -5.91 | 3.4e-09 | \*\*\* |
| Ectotherm Omnivores | Finland | SSP1-2.6 | Maximum Land Use | 6.87 | -3.03 | 0.33 | -9.22 | 2e-16 | \*\*\* |
| Ectotherm Omnivores | Finland | SSP5-8.5 | Maximum Land Use | 8.75 | -1.97 | 0.29 | -6.8 | 1e-11 | \*\*\* |
| Endotherm Herbivores | Finland | Historical | Maximum Land Use | 1.09 | -0.13 | 0.06 | -2.07 | 0.038 | \* |
| Endotherm Herbivores | Finland | SSP1-2.6 | Maximum Land Use | 2.75 | -0.26 | 0.09 | -2.93 | 0.0034 | \*\* |
| Endotherm Herbivores | Finland | SSP5-8.5 | Maximum Land Use | 1.49 | -0.16 | 0.07 | -2.17 | 0.03 | \* |
| Endotherm Omnivores | Finland | Historical | Maximum Land Use | 4.54 | -2.06 | 0.46 | -4.44 | 9e-06 | \*\*\* |
| Endotherm Omnivores | Finland | SSP1-2.6 | Maximum Land Use | 3.42 | -1.41 | 0.39 | -3.61 | 0.00031 | \*\*\* |
| Endotherm Omnivores | Finland | SSP5-8.5 | Maximum Land Use | 3.61 | -1.59 | 0.38 | -4.16 | 3.2e-05 | \*\*\* |
| Ectotherm Carnivores | Namibia | Historical | Maximum Land Use | 4.62 | -1.26 | 0.2 | -6.32 | 2.7e-10 | \*\*\* |
| Ectotherm Carnivores | Namibia | SSP1-2.6 | Maximum Land Use | 5.17 | -0.9 | 0.2 | -4.48 | 7.6e-06 | \*\*\* |
| Ectotherm Carnivores | Namibia | SSP5-8.5 | Maximum Land Use | 3.88 | 0.18 | 0.23 | 0.79 | 0.43 |  |
| Ectotherm Herbivores | Namibia | Historical | Maximum Land Use | 10.49 | -2.24 | 0.65 | -3.46 | 0.00053 | \*\*\* |
| Ectotherm Herbivores | Namibia | SSP1-2.6 | Maximum Land Use | 11.84 | -1.31 | 0.31 | -4.22 | 2.4e-05 | \*\*\* |
| Ectotherm Herbivores | Namibia | SSP5-8.5 | Maximum Land Use | 8.33 | -1.71 | 0.4 | -4.29 | 1.8e-05 | \*\*\* |
| Ectotherm Omnivores | Namibia | Historical | Maximum Land Use | 9.89 | -3.87 | 0.46 | -8.47 | 2e-16 | \*\*\* |
| Ectotherm Omnivores | Namibia | SSP1-2.6 | Maximum Land Use | 9.29 | -2.41 | 0.25 | -9.63 | 2e-16 | \*\*\* |
| Ectotherm Omnivores | Namibia | SSP5-8.5 | Maximum Land Use | 7.99 | -1.9 | 0.42 | -4.57 | 4.8e-06 | \*\*\* |
| Endotherm Carnivores | Namibia | Historical | Maximum Land Use | 7.33 | -1.31 | 0.3 | -4.37 | 1.2e-05 | \*\*\* |
| Endotherm Herbivores | Namibia | Historical | Maximum Land Use | 7.4 | -0.99 | 0.13 | -7.77 | 8.2e-15 | \*\*\* |
| Endotherm Herbivores | Namibia | SSP1-2.6 | Maximum Land Use | 4.4 | -0.68 | 0.16 | -4.37 | 1.2e-05 | \*\*\* |
| Endotherm Herbivores | Namibia | SSP5-8.5 | Maximum Land Use | -0.82 | 0.41 | 0.15 | 2.71 | 0.0066 | \*\* |
| Endotherm Omnivores | Namibia | Historical | Maximum Land Use | 2.59 | -1.16 | 0.31 | -3.81 | 0.00014 | \*\*\* |
| Ectotherm Carnivores | France | Historical | Maximum Land Use | 2.48 | -1.51 | 0.38 | -4 | 6.3e-05 | \*\*\* |
| Ectotherm Carnivores | France | SSP1-2.6 | Maximum Land Use | 2.94 | -1.08 | 0.27 | -3.98 | 6.9e-05 | \*\*\* |
| Ectotherm Carnivores | France | SSP5-8.5 | Maximum Land Use | 4.57 | -2.32 | 0.28 | -8.41 | 2e-16 | \*\*\* |
| Ectotherm Herbivores | France | Historical | Maximum Land Use | 11.87 | 0.65 | 0.34 | 1.91 | 0.057 |  |
| Ectotherm Herbivores | France | SSP1-2.6 | Maximum Land Use | 1.22 | -0.53 | 0.33 | -1.61 | 0.11 |  |
| Ectotherm Herbivores | France | SSP5-8.5 | Maximum Land Use | 6.2 | -2.29 | 0.51 | -4.52 | 6.1e-06 | \*\*\* |
| Ectotherm Omnivores | France | Historical | Maximum Land Use | 1.22 | -1.25 | 0.44 | -2.83 | 0.0047 | \*\* |
| Ectotherm Omnivores | France | SSP1-2.6 | Maximum Land Use | 1.25 | -2.76 | 0.52 | -5.35 | 8.6e-08 | \*\*\* |
| Ectotherm Omnivores | France | SSP5-8.5 | Maximum Land Use | 2.08 | -2.29 | 0.37 | -6.25 | 4.1e-10 | \*\*\* |
| Endotherm Carnivores | France | Historical | Maximum Land Use | 4.96 | -1.27 | 0.31 | -4.09 | 4.3e-05 | \*\*\* |
| Endotherm Carnivores | France | SSP1-2.6 | Maximum Land Use | 7.68 | -2.1 | 0.51 | -4.14 | 3.5e-05 | \*\*\* |
| Endotherm Carnivores | France | SSP5-8.5 | Maximum Land Use | 5.3 | -1.2 | 0.25 | -4.73 | 2.3e-06 | \*\*\* |
| Endotherm Herbivores | France | Historical | Maximum Land Use | 8.8 | -1.1 | 0.12 | -9.03 | 2e-16 | \*\*\* |
| Endotherm Herbivores | France | SSP1-2.6 | Maximum Land Use | 8.48 | -0.84 | 0.09 | -8.99 | 2e-16 | \*\*\* |
| Endotherm Herbivores | France | SSP5-8.5 | Maximum Land Use | 8.19 | -1.01 | 0.14 | -7.5 | 6.3e-14 | \*\*\* |
| Endotherm Omnivores | France | Historical | Maximum Land Use | 8.02 | -2.17 | 0.15 | -14.19 | 2e-16 | \*\*\* |
| Endotherm Omnivores | France | SSP1-2.6 | Maximum Land Use | 9.3 | -2.56 | 0.22 | -11.42 | 2e-16 | \*\*\* |
| Endotherm Omnivores | France | SSP5-8.5 | Maximum Land Use | 8.56 | -2.2 | 0.2 | -10.99 | 2e-16 | \*\*\* |

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