## 13 Terrestrial Biodiversity

### 13.1 Experiments

**Table 34:** Experiment summary for terrestrial-biodiversity models.

<table>
<thead>
<tr>
<th>Climate Data</th>
<th>Scenario</th>
<th>Human influences, land use (LU)</th>
<th>Other settings (sens-scenario)</th>
<th># runs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical runs</td>
<td>EWEMBI</td>
<td>hist</td>
<td>nat</td>
<td>no CO2</td>
</tr>
</tbody>
</table>

### 13.2 Sector-specific input

**Table 35:** Biodiversity-specific input data used for building our models.

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Description</th>
<th>More info</th>
<th>Dates</th>
<th>Scale</th>
<th>Variables included</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWEMBI</td>
<td>Bioclimatic variables</td>
<td>30-year monthly means of minimum temperature (tasmin), maximum temperature (tasmax) and total precipitation (pr) were calculated and used to derive 19 bioclimatic variables; see (Hijmans, Cameron, Parra, Jones, &amp; Jarvis, 2005)</td>
<td>30-yr averages of 1980 – 2009 (1995)</td>
<td>global, 0.5° (EWEMBI)</td>
<td>Bio4 (temperature seasonality), Bio5 (max temperature of warmest month), Bio12 (annual precipitation) and Bio15 (precipitation seasonality), Bio18 (precipitation of warmest quarter) and Bio19 (precipitation of coldest quarter)</td>
</tr>
</tbody>
</table>

### 13.3 Output data

**Table 36:** Output variables to be reported by terrestrial-biodiversity sector models.

<table>
<thead>
<tr>
<th>Variable (long name)</th>
<th>Variable name</th>
<th>Units (NetCDF format)</th>
<th>Frequency</th>
<th>Comment</th>
</tr>
</thead>
</table>

## Essential outputs

<table>
<thead>
<tr>
<th>Species probability of occurrence</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphibian species probability of occurrence</td>
<td>amphibianprob</td>
<td>Probability of occurrence per cell(^1)</td>
<td>30-year period centered around 1995 (1980 – 2009)</td>
</tr>
<tr>
<td>Terrestrial bird species probability of occurrence</td>
<td>birdprob</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terrestrial mammal species probability of occurrence</td>
<td>mammalprob</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summed probability of occurrence</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphibian summed probability of occurrence</td>
<td>amphibiansumprob</td>
<td>Summed probability of occurrence per cell(^1)</td>
<td>30-year period centered around 1995 (1980 – 2009)</td>
</tr>
<tr>
<td>Terrestrial bird summed probability of occurrence</td>
<td>birdsumprob</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terrestrial mammal summed probability of occurrence</td>
<td>mammalsumprob</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Endemic summed probability of occurrence</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Summed probability of endemic amphibian species(^3)</td>
<td>endamphibiansumprob</td>
<td>Summed probability of occurrence per cell(^1)</td>
<td>30-year period centered around 1995 (1980 – 2009)</td>
</tr>
<tr>
<td>Summed probability of endemic terrestrial bird species(^3)</td>
<td>endbirdsumprob</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summed probability of endemic terrestrial mammal species(^3)</td>
<td>endmammalsumprob</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threatened summed probability of occurrence</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Summed probability of threatened amphibian species(^4)</td>
<td>thramphibiansumprob</td>
<td>Summed probability of occurrence per cell(^1)</td>
<td>30-year period centered around 1995 (1980 – 2009)</td>
</tr>
<tr>
<td>Summed probability of threatened terrestrial</td>
<td>thrbirdsumprob</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bird species(^4)</td>
<td>Summed probability of threatened terrestrial mammal species(^4)</td>
<td>thrmammalsumprob</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Species richness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amphibian species richness</td>
<td>amphibiansr</td>
<td>Estimated number of species (species richness) per cell</td>
<td></td>
</tr>
<tr>
<td>Terrestrial bird species richness</td>
<td>birdsr</td>
<td>30-year period centered around 1995 (1980 – 2009)</td>
<td></td>
</tr>
<tr>
<td>Terrestrial mammal species richness</td>
<td>mammalsr</td>
<td>Results from macroecological richness models</td>
<td></td>
</tr>
</tbody>
</table>

1 For the Maximum Entropy (MaxEnt) model algorithm the output is not probability, but habitat suitability/relative occurrence probability. Values also range between 0 and 1.
2 No dispersal assumes that species can only be present where they are actually present according to the IUCN and BirdLife range maps.
3 Endemic (range-restricted) species are the smallest ranging 15% of all species.
4 Threatened species are all species that are either (i) critically endangered, (ii) endangered or (iii) vulnerable according to their IUCN red list status.
References


https://www.esrl.noaa.gov/gmd/ccgg/trends/gl_data.html


Lange, S. (2019a). WFDE5 over land merged with ERA5 over the ocean (W5E5). V. 1.0. doi:10.5880/pik.2019.023


Lange, S. (2019c). Trend-preserving bias adjustment and statistical downscaling with ISIMIP3BASD (v1.0). Geoscientific
**Model Development**, 12, 3055–3070.


