Supplementary Materials for **“Projected vegetation distributions in response to 1.5 °C or 2 °C global warming on the Tibetan Plateau”**

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**Table S1.** Correspondence between BIOME4 biomes and vegetation types used in this study

|  |  |  |
| --- | --- | --- |
| No | Vegetation types in this study | Biomes in original BIOME4 model |
| 1 | Broad-leaved forest | Topical evergreen forest  Temperate deciduous forest  Warm mixd forest |
| 2 | Needle-leaved forest | Temperate conifer forest  Cool conifer forest  Mountainous Evergreen Coniferous Forest |
| 3 | Mixed needle-broad-leaved forest | Cool mixed forest  Cold mixed forest |
| 4 | Alpine shrub | Temperature broadleaved savanna  Alpine shrub |
| 5 | Alpine meadow | Alpine meadow |
| 6 | Alpine steppe | Steppe |
| 7 | Alpine sparse vegetation | Alpine shrub (if GDD0< 200)  Cushion forb tundra |
| 8 | Desert | Desert |
| 9 | Barren land | Barren |

**Notes:** GDD0 refers to the number of growing days on which the temperature exceeded 0°C.

**Table S2.** Limiting bio-climatic factors for each functional type in the modified BIOME4 model

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Plant Functional Type | Tc min.  (°C) | Tc max.  (°C) | Tmin min.  (°C) | Tmin max.  (°C) | GDD5  min. | GDD0  min. | Twm min.  (°C) | Twm max.  (°C) | Snow min.  (cm) |
| Tropical Evergreen Broad-leaved Forest |  |  | 0 |  |  |  | 15 |  |  |
| Temperate Evergreen Broad-leaved Forest |  |  | −8 | 5 | 1200 |  | 10 |  |  |
| Temperate Summer-green Broad-leaved Forest | 3 |  |  | −8 | 1200 |  |  |  |  |
| Temperate Evergreen Coniferous Forest | −2 |  |  |  | 900 |  | 10 |  |  |
| Mountainous Evergreen Coniferous Forest | −10 | −2 |  |  |  |  |  | 21 |  |
| Temperate Grass |  |  |  | 0 |  | 1500 |  |  |  |
| Desert Shrub |  |  | −45 |  | 500 |  | 10 |  |  |
| Alpine Shrub |  |  |  |  |  | 350 |  | 12 | 15 |
| Cold Grass |  |  |  |  |  | 0 |  | 12 |  |
| Forbs |  |  |  |  |  |  |  | 10 |  |

**Notes:** Tc refers to the mean temperature of the coldest month; Tmin, the absolute minimal temperature; GDD5, the number of growing days on which the temperature exceeded 5 °C; GDD0, the number of growing days on which the temperature exceeded 0 °C; Twm, the mean temperature of the warmest month; and, Snow, the number of days with snow coverage.

**Table S3.** Several physiological parameters for each functional type in the modified BIOME4 model

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Plant Functional Type | P | Gmin (mm s−1) | Emax (mm day−1) | R30 (%) | Lm (month) | K | T0 (°C) |
| Tropical Evergreen Broad-leaved Forest | 1 | 0.5 | 10 | 70 | 18 | 0.7 | 1 |
| Temperate Evergreen Broad-leaved Forest | 1 | 0.2 | 4.8 | 70 | 18 | 0.6 | 1 |
| Temperate Summer-green Broad-leaved Forest | 2 | 0.8 | 10 | 65 | 9 | 0.6 | 1 |
| Temperate Evergreen Coniferous Forest | 1 | 0.8 | 4.8 | 60 | 30 | 0.5 | 0.8 |
| Mountainous Evergreen Coniferous Forest | 1 | 0.5 | 4.5 | 75 | 24 | 0.6 | 1 |
| Temperate Grass | 3 | 0.8 | 6.5 | 90 | 8 | 0.4 | 1 |
| Desert Shrub | 1 | 0.1 | 1 | 53 |  | 0.3 | 1 |
| Alpine Shrub | 2 | 0.8 | 1 | 75 | 12 | 0.45 | -7 |
| Cold Grass | 2 | 0.8 | 1 | 95 | 7 | 0.3 | -5 |
| Forbs | 1 | 0.8 | 1 | 92 | 7 | 0.6 | -12 |

**Notes:** P refers to the physiological type (1, evergreen; 2, summer-green; 3, rain-green); Gmin, the minimal canopy conductance; Emax, the maximal daily exhalation rate; R30, the percentage of roots in the upper soil at 30 mm in depth; Lm, relative leaf live span; K, the extinction coefficient; T0, the minimal monthly mean temperature for photosynthesis