SIS Biodiversity indicators

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| Daily precipitation annual mean  | ms-1 | Annual mean (of the daily mean) precipitation  |
| Yearly maximum daily precipitation | ms-1 | Annual maximum of daily precipitation |
| Yearly maximum temperature | K | Annual maximum (of the daily maximum) temperature at 2 m above surface |
| Yearly minimum temperature | K | Annual minimum (of the daily minimum) temperature at 2 m above surface |
| Temperature month mean | K | Monthly mean of the daily mean temperature at 2 m above surface |
| Temperature daily max month mean | K | Monthly mean of the daily maximum temperature at 2 m above surface |
| Temperature daily min month mean | K | Monthly mean of the daily minimum temperature at 2 m above surface |
| Temperature daily max year mean | K | Annual mean of the daily maximum temperature |
| Temperature daily min year mean | K | Annual mean of the daily minimum temperature |
| *Bioclimatic indicators as in WorldClim (19)* |
| Annual mean temperature (BIO01)  | K | Annual mean of monthly mean temperature |
| Mean diurnal range (BIO02) | K | Monthly mean of daily (max temp –min temp |
| Isothermality (BIO03) | K | (Monthly mean diurnal range / temperature annual range) \* 100 |
| Temperature seasonality (BIO04) | K | Standard deviation of monthly mean temperature \* 100 |
| Maximum temperature of the warmest month (BIO05) | K | Maximum daily temperature of the month with the highest monthly mean of daily mean temperature |
| Minimum temperature of the coldest month (BIO06) | K | Minimum daily temperature of the month with the lowest monthly mean of daily mean temperature |
| Temperature annual range (BIO07) | K | Max temperature of warmest month – min temperature of coldest month |
| Mean temperature of wettest quarter (BIO08) | K | The mean of monthly mean temperature during the wettest quarter, defined as the quarter with the highest monthly mean (of the daily mean) precipitation using a moving average of 3 consecutive months |
| Mean temperature of driest quarter (BIO09) | K | The mean of monthly mean temperature during the driest quarter, defined as the quarter with the lowest monthly mean (of the daily mean) precipitation using a moving average of 3 consecutive months |
| Mean temperature of warmest quarter (BIO10) | K | The mean of monthly mean temperature during the warmest quarter, defined as the quarter with the highest monthly mean (of the daily mean) temperature using a moving average of 3 consecutive months |
| Mean temperature of coldest quarter (BIO11) | K | The mean of monthly mean temperature during the coldest quarter, defined as the quarter with the lowest monthly mean (of the daily mean) temperature using a moving average of 3 consecutive months |
| Annual precipitation (BIO12) | ms-1 | Annual precipitation sum |
| Precipitation of wettest month (BIO13) | ms-1 | Maximum monthly precipitation sum |
| Precipitation of driest month (BIO14) | ms-1 | Maximum monthly precipitation sum |
| Precipitation seasonality (BIO15) | % | Annual coefficient of variation of the monthly precipitation sums |
| Precipitation amount in wettest quarter (BIO16) | ms-1 | The mean of monthly mean precipitation during the wettest quarter, defined as the quarter with the highest monthly mean (of the daily mean) precipitation using a moving average of 3 consecutive months |
| Precipitation amount in driest quarter (BIO17) | ms-1 | The mean of monthly mean precipitation during the driest quarter, defined as the quarter with the lowest monthly mean (of the daily mean) precipitation using a moving average of 3 consecutive months |
| Precipitation amount in warmest quarter (BIO18) | ms-1 | The mean of monthly mean precipitation during the warmest quarter, defined as the quarter with the highest monthly mean (of the daily mean) temperature using a moving average of 3 consecutive months |
| Precipitation amount in coldest quarter (BIO19) | ms-1 | The mean of monthly mean precipitation during the coldest quarter, defined as the quarter with the lowest monthly mean (of the daily mean) temperature using a moving average of 3 consecutive months |
| *Drought indicators (11)* |
| Aridity year mean | - | Monthly potential evaporation divided by the monthly mean precipitation averaged over the year  |
| Aridity coldest quarter | - | Monthly potential evaporation divided by the monthly mean precipitation averaged over the year averaged over the over coldest quarter |
| Aridity warmest quarter | - | Monthly potential evaporation divided by the monthly mean precipitation averaged over the year averaged over the over warmest quarter |
| Aridity wettest quarter | - | Monthly potential evaporation divided by the monthly mean precipitation averaged over the year averaged over the wettest quarter  |
| Aridity driest quarter | - | Monthly potential evaporation divided by the monthly mean precipitation averaged over the year averaged over the driest quarter  |
| Number of dry days | # days | Number of days within a year where total daily precipitation does not exceed 2 mm  |
| Maximum length of dry spells | # days | Maximum number of consecutive days of the dry spells within a year |
| Mean intensity of dry spells | # days  | Determine the consecutive dry days at each day in a year, then take the average of these daily values over the year  |
| Mean length of dry spells with min 5 days | # days | Mean length of dry spells with a minimum of 5 days within a year |
| Number of dry spells with min 5 days | #  | Number of dry spells with a minimum of 5 days that occur in a year |
| Summer days | # days | Number of days in a year for which the daily maximum temperature is not lower than 298.15 K (25°C) |
| *Evaporation indicators (10)* |
| Potential evaporation year mean | ms-1 | Yearly averaged amount of water that would evaporate and transpire if there is unlimited water supply |
| Potential evaporation coldest quarter | m | The amount of water that would evaporate and transpire if there is unlimited water supply, averaged for the coldest quarter |
| Potential evaporation warmest quarter | m s-1 | The amount of water that would evaporate and transpire if there is unlimited water supply, averaged for the warmest quarter  |
| Potential evaporation wettest quarter | ms-1 | The amount of water that would evaporate and transpire if there is unlimited water supply, averaged for the wettest quarter |
| Potential evaporation driest quarter | ms-1 | The amount of water that would evaporate and transpire if there is unlimited water supply, averaged for the driest quarter |
| Evaporative fraction year mean | - | Monthly surface latent heat divided by the monthly total sensible and latent heat flux, averaged over the year |
| Evaporative fraction coldest quarter | - | Monthly surface latent heat flux divided by the monthly total sensible and latent heat flux, averaged over the coldest quarter |
| Evaporative fraction warmest quarter | - | Monthly surface latent heat divided by the monthly total sensible and latent heat flux, averaged over the warmest quarter |
| Evaporative fraction wettest quarter | - | Monthly surface latent heat divided by the monthly total sensible and latent heat flux, averaged over the wettest quarter |
| Evaporative fraction driest quarter | - | Monthly surface latent heat flux divided by the monthly total sensible and latent heat flux, averaged over the driest quarter |
| *Surface energy fluxes (6)* |
| Surface latent heat flux year mean | Wm-2 | The transfer of latent heat (resulting from water phase changes, such as evaporation or condensation) between the Earth's surface and the atmosphere through the effects of turbulent air motion, averaged over the year |
| Surface latent heat flux coldest quarter | Wm-2 | The transfer of latent heat (resulting from water phase changes, such as evaporation or condensation) between the Earth's surface and the atmosphere through the effects of turbulent air motion, averaged over the coldest quarter |
| Surface latent heat flux warmest quarter | Wm-2 | The transfer of latent heat (resulting from water phase changes, such as evaporation or condensation) between the Earth's surface and the atmosphere through the effects of turbulent air motion, averaged over the warmest quarter |
| Surface latent heat flux wettest quarter | Wm-2 | The transfer of latent heat (resulting from water phase changes, such as evaporation or condensation) between the Earth's surface and the atmosphere through the effects of turbulent air motion, averaged over the wettest quarter |
| Surface latent heat flux driest quarter | Wm-2 | The transfer of latent heat (resulting from water phase changes, such as evaporation or condensation) between the Earth's surface and the atmosphere through the effects of turbulent air motion, averaged over the driest quarter |
| Surface sensible heat flux year mean | Wm-2 | Transfer of heat between the Earth's surface and the atmosphere through the effects of turbulent air motion |
| *Soil water (16)*  |
| Volumetric soil water layer 1 year mean | m3 m-3 | The volume of water in soil layer 1 (0 - 7cm, the surface is at 0cm) averaged over the year. The ECMWF Integrated Forecasting System model has a four-layer representation of soil: Layer 1: 0 - 7cm Layer 2: 7 - 28cm Layer 3: 28 - 100cm Layer 4: 100 - 289cm. The volumetric soil water is associated with the soil texture (or classification), soil depth, and the underlying groundwater level. |
| Volumetric soil water layer 1 coldest quarter | m3 m-3 | The volume of water in soil layer 1 (0 - 7cm, the surface is at 0cm) averaged over the coldest quarter. |
| Volumetric soil water layer 1 warmest quarter | m3 m-3 | The volume of water in soil layer 1 (0 - 7cm, the surface is at 0cm) averaged over the warmest quarter. |
| Volumetric soil water layer 1 wettest quarter | m3 m-3 | The volume of water in soil layer 1 (0 - 7cm, the surface is at 0cm) averaged over the wettest quarter. |
| Volumetric soil water layer 1 driest quarter | m3 m-3 | The volume of water in soil layer 1 (0 - 7cm, the surface is at 0cm) averaged over the driest quarter. |
| Volumetric soil water layer 2 year mean | m3 m-3 | The volume of water in soil layer 2 (7 - 28cm, the surface is at 0cm) averaged over the driest quarter. |
| Volumetric soil water layer 2 coldest quarter | m3 m-3 | The volume of water in soil layer 2 (7 - 28cm, the surface is at 0cm) averaged over the coldest quarter. |
| Volumetric soil water layer 2 warmest quarter | m3 m-3 | The volume of water in soil layer 2 (7 - 28cm, the surface is at 0cm) averaged over the warmest quarter. |
| Volumetric soil water layer 2 wettest quarter | m3 m-3 | The volume of water in soil layer 2 (7 - 28cm, the surface is at 0cm) averaged over the wettest quarter. |
| Volumetric soil water layer 2 driest quarter | m3 m-3 | The volume of water in soil layer 2 (7 - 28cm, the surface is at 0cm) averaged over the driest quarter. |
| Volumetric soil water layer 3 year mean | m3 m-3 | The volume of water in soil layer 3 (28- 100cm, the surface is at 0cm) averaged over the driest quarter. |
| Volumetric soil water layer 3 coldest quarter | m3 m-3 | The volume of water in soil layer 3 (28 - 100cm, the surface is at 0cm) averaged over the coldest quarter. |
| Volumetric soil water layer 3 warmest quarter | m3 m-3 | The volume of water in soil layer 3 (28 - 100cm, the surface is at 0cm) averaged over the warmest quarter. |
| Volumetric soil water layer 3 wettest quarter | m3 m-3 | The volume of water in soil layer 3 (28 - 100cm, the surface is at 0cm) averaged over the wettest quarter. |
| Volumetric soil water layer 3 driest quarter | m3 m-3 | The volume of water in soil layer 3 (28 - 100cm, the surface is at 0cm) averaged over the driest quarter. |
| Volumetric soil water layer 4 year mean | m3 m-3 | The volume of water in soil layer 4 (100 - 289cm, the surface is at 0cm) averaged over the driest quarter. |
| Volumetric soil water layer 4 coldest quarter | m3 m-3 | The volume of water in soil layer 4 (100 - 289cm, the surface is at 0cm) averaged over the coldest quarter. |
| Volumetric soil water layer 4 warmest quarter | m3 m-3 | The volume of water in soil layer 4 (100 - 289cm, the surface is at 0cm) averaged over the warmest quarter. |
| Volumetric soil water layer 4 wettest quarter | m3 m-3 | The volume of water in soil layer 4 (100 - 289cm, the surface is at 0cm) averaged over the wettest quarter. |
| Volumetric soil water layer 4 driest quarter | m3 m-3 | The volume of water in soil layer 4 (100 - 289cm, the surface is at 0cm) averaged over the driest quarter. |

Additional variables currently under development:

**Number of sunny days**

**Growing degree days above 5°C**

**Number of frost days**

**Temperature and precipitation seasonality (already included as BIO04)**

**Timing of the growing period**

**Koeppen-geiger Class**

**sea ice concentration**

**sea ice thickness**

**sea ice edge**

**sea ice type**

**snow depth**