**VR-CESM DATA README**

**NetCDF file descriptions:**

*1. vrcesm\_ablation\_zones.nc*: mean ablation zone in the domain in HIST and FUT

|  |  |  |
| --- | --- | --- |
| *Variable name* | *Description/long name* | *Units* |
| hist\_ablation | Mean ablation zone during the historical period | Unitless (1 = ablation zone, 0 = non-ablation zone) |
| fut\_ablation | Mean ablation zone during the future period | Unitless (1 = ablation zone, 0 = non-ablation zone) |
| z | Mean grid-cell altitude | m |

*2. vrcesm\_ex\_contribution\_to\_seas\_smb\_DJFM.nc & vrcesm\_ex\_contribution\_to\_seas\_smb\_JJAS.nc:* Fractional contribution of extreme precipitation days to seasonal positive/negative SMB

|  |  |  |
| --- | --- | --- |
| *Variable name* | *Description/long name* | *Units* |
| hist\_pos\_frac | Mean fraction of historical positive seasonal SMB from extreme precipitation days | unitless |
| hist\_neg\_frac | Mean fraction of historical negative seasonal SMB from extreme precipitation days | unitless |
| fut\_pos\_frac | Mean fraction of future positive seasonal SMB from extreme precipitation days | unitless |
| fut\_neg\_frac | Mean fraction of future negative seasonal SMB from extreme precipitation days | unitless |

*3. vrcesm\_hist\_ex\_neg\_smb\_days\_anoms\_JJAS.nc, vrcesm\_hist\_ex\_pos\_smb\_days\_anoms\_JJAS.nc, vrcesm\_fut\_ex\_neg\_smb\_days\_anoms\_JJAS.nc, vrcesm\_fut\_ex\_pos\_smb\_days\_anoms\_JJAS.nc:* Mean SMB-related variable anomalies relative to 15 days

|  |  |  |
| --- | --- | --- |
| *Variable name* | *Description/long name* | *Units* |
| ex\_smb\_day\_count | Count of extreme precipitation days with positive or negative SMB in JJAS | unitless (count) |
| smb\_anom | Mean SMB anomaly on positive or negative SMB extreme precipitation days in JJAS | mm w.e. |
| runoff\_anom | Mean runoff anomaly on positive or negative SMB extreme precipitation days in JJAS | mm w.e. |
| refreeze\_anom | Mean refreezing anomaly on positive or negative SMB extreme precipitation days in JJAS | mm w.e. |
| albedo\_anom | Mean albedo anomaly on positive or negative SMB extreme precipitation days in JJAS | unitless |
| melt\_anom | Mean melt anomaly on positive or negative SMB extreme precipitation days in JJAS | mm w.e. |
| temp\_anom | Mean 2 m air temperature anomaly on positive or negative SMB extreme precipitation days in JJAS | K |

**CSV File Descriptions:**

*1. vrcesm\_mean\_monthly\_ex\_precip\_accum.csv:* mean monthly precipitation accumulations from extreme precipitation days for each subregion

|  |  |  |
| --- | --- | --- |
| *Column name* | *Description/long name* | *Units* |
| subregion | Name of subregion | - |
| month | Month (1-12) | - |
| era5\_hist | Mean monthly accumulation from extreme precipitation days from ERA5 | mm w.e. |
| vrcesm\_hist | Mean monthly accumulation from extreme precipitation days from historical VR-CESM simulation | mm w.e. |
| vrcesm\_fut | Mean monthly accumulation from extreme precipitation days from future VR-CESM simulation | mm w.e. |

*2. vrcesm\_ex\_and\_nonex\_monthly\_rainfrac (folder):* mean monthly rain fraction for extreme and non-extreme precipitation in each subregion. Each csv file is for a single subregion.

|  |  |  |
| --- | --- | --- |
| *Column name* | *Description/long name* | *Units* |
| month | Month (1-12) | - |
| hist\_nonex\_rainfrac | Mean rain fraction on non-extreme precipitation days in historical period | unitless |
| hist\_ex\_rainfrac | Mean rain fraction on extreme precipitation days in historical period | unitless |
| fut\_nonex\_rainfrac | Mean rain fraction on non-extreme precipitation days in future period | unitless |
| fut\_ex\_rainfrac | Mean rain fraction on extreme precipitation days in future period | unitless |

3. *vrcesm\_ex\_nonex\_scatter\_data (folder):* yearly seasonal mean SMB on extreme and non-extreme days from HIST and FUT. Each csv file is for a single subregion for DJFM or JJAS.

|  |  |  |
| --- | --- | --- |
| *Column name* | *Description/long name* | *Units* |
| year | year | - |
| ex\_smb | Mean SMB on extreme precipitation days during the season integrated over the subregion | Gt |
| nonex\_smb | Mean SMB on non-extreme precipitation days during the season integrated over the subregion | Gt |