| ***TT*** | ***Ký hiệu*** | ***Đơn vị đo*** | ***Mô tả*** |
| --- | --- | --- | --- |
| 1 | FD | Day | *Number of frost days*: Annual count of days when TN (daily minimum temperature) < 0oC. Let *TNij*be daily minimum temperature on day *i* in year *j*. Count the number of days where: *TNij* < 0oC. |
| 2 | SU | Day | *Number of summer days*: Annual count of days when TX (daily maximum temperature) > 25oC. Let *TXij* be daily maximum temperature on day *i* in year *j*. Count the number of days where: *TXij* > 25oC. |
| 3 | ID | Day | *Number of icing days*: Annual count of days when TX (daily maximum temperature) < 0oC. Let *TXij*be daily maximum temperature on day *i* in year *j*. Count the number of days where: *TXij* < 0oC. |
| 4 | TR | Day | *Number of tropical nights*: Annual count of days when TN (daily minimum temperature) > 20oC. Let *TNij*be daily minimum temperature on day *i* in year *j*. Count the number of days where: *TNij* > 20oC. |
| 5 | GSL | Day | *Growing season length*: Annual (1st Jan to 31st Dec in Northern Hemisphere (NH), 1st July to 30th June in Southern Hemisphere (SH)) count between first span of at least 6 days with daily mean temperature TG>5oC and first span after July 1st (Jan 1st in SH) of 6 days with TG<5oC. Let *TGij* be daily mean temperature on day *i* in year *j*. Count the number of days between the first occurrence of at least 6 consecutive days with: *TGij* > 5oC.and the first occurrence after 1st July (1st Jan. in SH) of at least 6 consecutive days with: *TGij* < 5oC. |
| 6 | TXx | C | *Monthly maximum value of daily maximum temperature*: Let *TXx* be the daily maximum temperatures in month *k*, period *j*. The maximum daily maximum temperature each month is then: *TXxkj*=max(*TXxkj*) |
| 7 | TNx | C | *Monthly maximum value of daily minimum temperature*: Let *TNx* be the daily minimum temperatures in month *k*, period *j*. The maximum daily minimum temperature each month is then: *TNxkj*=max(*TNxkj*) |
| 8 | TXn | C | *Monthly minimum value of daily maximum temperature*: Let *TXn* be the daily maximum temperatures in month *k*, period *j*. The minimum daily maximum temperature each month is then: *TXnkj*=min(*TXnkj*) |
| 9 | TNn | C | *Monthly minimum value of daily minimum temperature*: Let *TNn* be the daily minimum temperatures in month *k*, period *j*. The minimum daily minimum temperature each month is then: *TNnkj*=min(*TNnkj*) |
| 10 | TN10p | % | *Percentage of days when TN < 10th percentile* : Let TNij be the daily minimum temperature on day *i* in period *j* and let TNin10 be the calendar day 10th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TNij < TNin10To avoid possible inhomogeneity across the in-base and out-base periods, the calculation for the base period (1961-1990) requires the use of a bootstrap procedure. Details are described in [Zhang *et al.* (2005)](http://www.climdex.org/27_indices.html#refs).  |
| 11 | TX10p | % | *Percentage of days when TX < 10th percentile* : Let TXij be the daily maximum temperature on day *i* in period *j* and let TXin10 be the calendar day 10th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TXij < TXin10To avoid possible inhomogeneity across the in-base and out-base periods, the calculation for the base period (1961-1990) requires the use of a bootstrap processure. Details are described in [Zhang *et al.* (2005)](http://www.climdex.org/27_indices.html#refs).  |
| 12 | TN90p | % | *Percentage of days when TN > 90th percentile* : Let TNij be the daily minimum temperature on day *i* in period *j* and let TNin90 be the calendar day 90th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TNij > TNin90To avoid possible inhomogeneity across the in-base and out-base periods, the calculation for the base period (1961-1990) requires the use of a bootstrap processure. Details are described in [Zhang *et al.* (2005)](http://www.climdex.org/27_indices.html#refs).  |
| 13 | TX90p | % | *Percentage of days when TX > 90th percentile* : Let TXij be the daily maximum temperature on day *i* in period *j* and let TXin90 be the calendar day 90th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TXij > TXin90To avoid possible inhomogeneity across the in-base and out-base periods, the calculation for the base period (1961-1990) requires the use of a bootstrap processure. Details are described in [Zhang *et al.* (2005)](http://www.climdex.org/27_indices.html#refs).  |
| 14 | WSDI | Day | *Warm spell duration index*: Annual count of days with at least 6 consecutive days when TX > 90th percentile Let TXij be the daily maximum temperature on day *i* in period *j* and let TXin90 be the calendar day 90th percentile centred on a 5-day window for the base period 1961-1990. Then the number of days per period is summed where, in intervals of at least 6 consecutive days: TXij > TXin90 |
| 15 | CSDI | Day | *Cold spell duration index*: Annual count of days with at least 6 consecutive days when TN < 10th percentile Let TNij be the daily maximum temperature on day *i* in period *j* and let TNin10 be the calendar day 10th percentile centred on a 5-day window for the base period 1961-1990. Then the number of days per period is summed where, in intervals of at least 6 consecutive days: TNij < TNin10  |
| 16 | DTR | C | *Daily temperature range*: Monthly mean difference between TX and TN Let TXij and TNij be the daily maximum and minimum temperature respectively on day *i* in period *j*. If *I* represents the number of days in *j*, then: $$DTR\_{j}=\frac{\sum\_{i=1}^{I}(Tx\_{ij}-Tn\_{ij})}{I}$$ |
| 17 | Rx1day | Mm | *Monthly maximum 1-day precipitation*: Let *RRij* be the daily precipitation amount on day *i* in period *j*. The maximum 1-day value for period *j* are: *Rx1dayj* = max (*RRij*) |
| 18 | Rx5day | Mm | *Monthly maximum consecutive 5-day precipitation*: Let *RRkj* be the precipitation amount for the 5-day interval ending k, period *j*. Then maximum 5-day values for period *j* are: *Rx5dayj* = max (*RRkj*) |
| 19 | SDII | 1 | *Simple pricipitation intensity index*: Let *RRwj* be the daily precipitation amount on wet days, *w (RR ≥ 1mm)* in period *j*. If *W* represents number of wet days in *j*, then:$$SDII\_{j}=\frac{\sum\_{i=1}^{W}RR\_{wj}}{W}$$ |
| 20 | R10mm | Day | *Annual count of days when PRCP≥ 10mm*: Let *RRij* be the daily precipitation amount on day *i* in period *j*. Count the number of days where: *RRij ≥ 10mm* |
| 21 | R20mm | Day | *Annual count of days when PRCP≥ 20mm*: Let *RRij* be the daily precipitation amount on day *i* in period *j*. Count the number of days where: *RRij ≥ 20mm* |
| 22 | Rnnmm | Day | *Annual count of days when PRCP≥ nnmm, nn is a user defined threshold*: Let *RRij* be the daily precipitation amount on day *i* in period *j*. Count the number of days where: *RRij ≥ nnmm* |
| 23 | CDD | Day | *Maximum length of dry spell, maximum number of consecutive days with RR < 1mm*: Let *RRij* be the daily precipitation amount on day *i* in period *j*. Count the largest number of consecutive days where: *RRij < 1mm* |
| 24 | CWD | Day | *Maximum length of wet spell, maximum number of consecutive days with RR ≥ 1mm*: Let *RRij* be the daily precipitation amount on day *i* in period *j*. Count the largest number of consecutive days where: *RRij ≥ 1mm* |
| 25 | R95pTOT | Mm | *Annual total PRCP when RR > 95p*. Let *RRwj* be the daily precipitation amount on a wet day *w (RR ≥ 1.0mm)* in period *i* and let *RRwn95* be the 95th percentile of precipitation on wet days in the 1961-1990 period. If *W* represents the number of wet days in the period, then:$R95p\_{j}=\sum\_{i=1}^{W}RR\_{wj}$ where $RR\_{wj}>RR\_{wn}95$ |
| 26 | R99pTOT | Mm | *Annual total PRCP when RR > 99p*: Let *RRwj* be the daily precipitation amount on a wet day *w (RR ≥ 1.0mm)* in period *i* and let *RRwn99* be the 99th percentile of precipitation on wet days in the 1961-1990 period. If *W* represents the number of wet days in the period, then:$R99p\_{j}=\sum\_{i=1}^{W}RR\_{wj}$ where $RR\_{wj}>RR\_{wn}99$ |
| 27 | PRCPTOT | Mm | *Annual total precipitation in wet days*: Let *RRij* be the daily precipitation amount on day *i* in period *j*. If *I* represents the number of days in *j*, then:$$PRCPTOT\_{j}=\sum\_{i=1}^{I}RR\_{ij}$$ |

Tham khảo:

1) <http://www.climdex.org/indices.html>

2) <https://bitbucket.org/climdex/fortran/src>

* Karl, T.R., N. Nicholls, and A. Ghazi, 1999: CLIVAR/GCOS/WMO workshop on indices and indicators for climate extremes: Workshop summary. *Climatic Change*, **42**, 3-7.
* Peterson, T.C., and Coauthors: Report on the Activities of the Working Group on Climate Change Detection and Related Rapporteurs 1998-2001. WMO, Rep. WCDMP-47, WMO-TD 1071, Geneve, Switzerland, 143pp. (Available as: [wgccd.2001.pdf](http://etccdi.pacificclimate.org/docs/wgccd.2001.pdf))
* Zhang, X., *et al.* (2005): Avoiding Inhomogeneity in Percentile-Based Indices of Temperature Extremes. *J. Climate*, **18**, 1641-1651. (Available as: [JCLI3366.1.pdf](http://journals.ametsoc.org/doi/pdf/10.1175/JCLI3366.1))