
Climix

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USER GUIDE

1.1 Basic

Climix is a tool to calculate climate indices. We focus on high performance for the efficient calculation of indices in large datasets, such as long simulations performed by high-resolution global or regional climate models, and on high-quality metadata, maximizing re-use and utility of these computations.

For now, we always base our calculations on daily input, though an extension to sub-daily input for specialized indices, or monthly input for long-running datasets with limited data availability may be considered in the future.

1.1.1 Getting started

Install

If you already have an installed version of Climix available, you can move on to [Calculating a first index](#).

The easiest way to install Climix is using the Conda-forge distribution.

Conda-forge (recommended)

To install Climix from Conda-forge, you use the Conda package manager or its faster sibling Mamba. If you don't already have a version of Conda or Mamba available to you, the best way to get started is by installing [Mambaforge](#), an installer for Mamba that will pre-configure your installation to use the Conda-forge distribution.

Tip: If you prefer to use Conda instead of Mamba, for example because this has been pre-installed for you, just replace `mamba` with `conda` in the following commands.

To install the latest version of Climix, just create an environment with the `climix` package in it by running

```
mamba create -n my-climix climix
```

where `my-climix` is an arbitrary name you choose.

To use Climix at any time, you need to make sure that the `my-climix` environment is activated. To do that, execute:

```
mamba activate my-climix
```

Try running Climix with the help-option:

```
climix --help
```

If installed correctly Climix will print information about the usage, installed version and available command line options.

See also:

Command Line Interface

Calculating a first index

As a first example, let's calculate the index *cdd* or consecutive dry days. This index is based on precipitation, which we provide to Climix in the form of a Netcdf file. Climix works with a wide variety of these files which are commonly used for climate and earth data. Here, we use *pr.nc* as a standin, try to run the program with a precipitation data file of your choosing, for example from CMIP6.

```
climix -x cdd -o cdd.nc pr.nc
```

You select the index you want to calculate with the *-x* option. Climix will store the result in a new Netcdf file in the current working directory. You can specify the name with the *-o* option as we did above, or you can let Climix choose a filename. For further information, see *Output template generation*.

Tip: For a quick overview of the available indices you can give the command: `climix -x list`

You will see a message `Calculation completed` when Climix is done with the computation.

See also:

Available Climate Indices

Output template generation

When running Climix, it automatically generates an output template for the filename. This works well for files with the same basic filename structure, where only the time stamp, variable and simulation components differ. For example, given an index *cdd* and two input files:

```
1: "/path/tasmin_project_historical_run_model_version_day_20060101-20101231.nc"
2: "/path/tasmin_project_scenario_run_model_version_day_200110101-20151231.nc"
```

The output template starts with the index that is being computed, in this case *cdd*. If there is any period constrains it will be connected to the index with a hyphen, e.g, *cdd-jfm*. Thereafter, the parts that are similar between the files are kept. If the input files contains both historical and scenario simulations, these will be concatenated with a hyphen in the output template. The time period of the template will always represent the whole period as covered by all files. Thus, it will be reformatted to ensure hyphenated form, *start-end*, even in the case of a single timestamp, e.g, a single year. A *computational_period* can be given as input argument to define a new time period. This period must be given in the format *yyyy-mm-dd/yyyy-mm-dd* and must be inside the original time period. If the input files contains a frequency keyword, the keyword will be replaced by the output frequency. Otherwise, the output frequency will be added to the end of the output template. The input files from above would result in the following output template:

```
"cdd_project_historical-scenario_run_model_version_{frequency}_20060101-20151231"
```

Note: If Climix fails to construct the output template because the time period could not be determined, the template will be given as {index}_{base}.nc. If the construction fails due to any other problems the fallback template {index}_{frequency}.nc will be returned.

Tip: This works well with CMIP/CORDEX style filenames.

1.2 Reference

1.2.1 Available Climate Indices

The following indices are available, categorized by the defining distribution.

clix-meta (0.6.1)

fd

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of Frost Days (Tmin < 0C)
Reference	ETCCDI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long_name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	0 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

tnlt2

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of weak Frost Days (Tmin < +2C)
Reference	ET-SCI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	2 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

tnltm2

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of sharp Frost Days (Tmin < -2C)
Reference	ET-SCI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	-2 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

tnltm20

Field	Description
Distribution	clix-meta-0.6.1
Long name	None
Reference	ET-SCI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	-20 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

id

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of sharp Ice Days (Tmax < 0C)
Reference	ETCCDI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	0 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

su

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of Summer Days (Tmax > 25C)
Reference	ETCCDI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	25 degree_Celsius
<i>condition</i>	
kind	operator
operator	>

txge30

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of Hot Days (Tmax >= 35C)
Reference	ET-SCI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	30 degree_Celsius
<i>condition</i>	
kind	operator
operator	>=

txge35

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of Very Hot Days (Tmax >= 35C)
Reference	ET-SCI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	35 degree_Celsius
<i>condition</i>	
kind	operator
operator	>=

tr

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of Tropical Nights (Tmin > 20C)
Reference	ETCCDI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	20 degree_Celsius
<i>condition</i>	
kind	operator
operator	>

tmge5

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean >= 5C
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	5 degree_Celsius
<i>condition</i>	
kind	operator
operator	>=

tmt5

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean < 5C
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	5 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

tmge10

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean >= 10C
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	10 degree_Celsius
<i>condition</i>	
kind	operator
operator	>=

tmt10

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean < 10C
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	10 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

tngt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmin > {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>

tnlt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmin < {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<

tnge{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmin >= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>=

tnle{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmin <= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<=

txgt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmax > {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>

txlt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmax < {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<

txge{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmax >= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>=

txle{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmax <= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<=

tmgt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean > {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>

tmtl{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean < {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<

tmge{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean >= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>=

tmle{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with Tmean <= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<=

ctngt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmin > {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>
<i>statistic</i>	
kind	reducer
reducer	max

cfd

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive frost days (Tmin < 0 C)
Reference	ECA&D
Default period	annual
Input	
data	tasmin

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	0 degree_Celsius
<i>condition</i>	
kind	operator
operator	<
<i>statistic</i>	
kind	reducer
reducer	max

csu

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive summer days (Tmax >25 C)
Reference	ECA&D
Default period	annual
Input	
data	tasmax

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	25 degree_Celsius
<i>condition</i>	
kind	operator
operator	>
<i>statistic</i>	
kind	reducer
reducer	max

ctnlt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmin < {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<
<i>statistic</i>	
kind	reducer
reducer	max

ctnge{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmin >= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	max

ctnle{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmin <= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<=
<i>statistic</i>	
kind	reducer
reducer	max

ctxgt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmax > {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>
<i>statistic</i>	
kind	reducer
reducer	max

ctxlt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmax < {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<
<i>statistic</i>	
kind	reducer
reducer	max

ctxge{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmax >= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	max

ctxle{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmax <= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<=
<i>statistic</i>	
kind	reducer
reducer	max

ctmgt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmean > {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>
<i>statistic</i>	
kind	reducer
reducer	max

ctm1t{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmean < {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<
<i>statistic</i>	
kind	reducer
reducer	max

ctmge{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmean >= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	max

ctmle{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum number of consecutive days with Tmean <= {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<=
<i>statistic</i>	
kind	reducer
reducer	max

txx

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum daily maximum temperature
Reference	ETCCDI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	max

tnx

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum daily minimum temperature
Reference	ETCCDI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	max

txn

Field	Description
Distribution	clix-meta-0.6.1
Long name	Minimum daily maximum temperature
Reference	ETCCDI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	min

tnn

Field	Description
Distribution	clix-meta-0.6.1
Long name	Minimum daily minimum temperature
Reference	ETCCDI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	min

txm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean daily maximum temperature
Reference	ET-SCI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

tnm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean daily minimum temperature
Reference	ET-SCI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

tmx

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum daily mean temperature
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	max

tmn

Field	Description
Distribution	clix-meta-0.6.1
Long name	Minimum daily mean temperature
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	min

tmm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean daily mean temperature
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

txmax

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum daily maximum temperature
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	max

tnmax

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum daily minimum temperature
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	max

txmin

Field	Description
Distribution	clix-meta-0.6.1
Long name	Minimum daily maximum temperature
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	min

tnmin

Field	Description
Distribution	clix-meta-0.6.1
Long name	Minimum daily minimum temperature
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	min

txmean

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean daily maximum temperature
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

tnmean

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean daily minimum temperature
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

tmmax

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum daily mean temperature
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	max

tmmin

Field	Description
Distribution	clix-meta-0.6.1
Long name	Minimum daily mean temperature
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	min

tmmean

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean daily mean temperature
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

wsgi

Field	Description
Distribution	clix-meta-0.6.1
Long name	Warm Spell Duration Index, count of days with at least 6 consecutive days when Tmax > 90th percentile
Reference	ETCCDI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_spell_duration
<i>spell_threshold</i>	
kind	quantity
long name	Minimum spell duration
var_name	spell_threshold
standard_name	None
proposed_standard_name	None
value	6 days
<i>spell_condition</i>	
kind	operator
operator	>=
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	90 %
<i>percentile_condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

wsdi{ND}

Field	Description
Distribution	clix-meta-0.6.1
Long name	User-defined Warm Spell Duration Index, count of days with at least {ND} consecutive days when Tmax > 90th percentile
Reference	ET-SCI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_spell_duration
<i>spell_threshold</i>	
kind	quantity
long name	Minimum spell duration
var_name	spell_threshold
standard_name	None
proposed_standard_name	None
value	{ND} days
<i>spell_condition</i>	
kind	operator
operator	>=
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	90 %
<i>percentile_condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

cspi

Field	Description
Distribution	clix-meta-0.6.1
Long name	Cold Spell Duration Index, count of days with at least 6 consecutive days when Tmin < 10th percentile
Reference	ETCCDI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_spell_duration
<i>spell_threshold</i>	
kind	quantity
long name	Minimum spell duration
var_name	spell_threshold
standard_name	None
proposed_standard_name	None
value	6 days
<i>spell_condition</i>	
kind	operator
operator	>=
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	10 %
<i>percentile_condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

cspi{ND}

Field	Description
Distribution	clix-meta-0.6.1
Long name	User-defined Cold Spell Duration Index, count of days with at least # consecutive days when Tmin < 10th percentile
Reference	ET-SCI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_spell_duration
<i>spell_threshold</i>	
kind	quantity
long name	Minimum spell duration
var_name	spell_threshold
standard_name	None
proposed_standard_name	None
value	{ND} days
<i>spell_condition</i>	
kind	operator
operator	>=
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	10 %
<i>percentile_condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

tn10p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmin < 10th percentile
Reference	ETCCDI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	10 %
<i>condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

tx10p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmax < 10th percentile
Reference	ETCCDI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	10 %
<i>condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

tn90p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmin > 90th percentile
Reference	ETCCDI
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	90 %
<i>condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

tx90p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmax > 90th percentile
Reference	ETCCDI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	90 %
<i>condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

tg10p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmean < 10th percentile
Reference	ECA&D
Default period	annual
Input	
data	tas

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	10 %
<i>condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

tg90p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmean > 90th percentile
Reference	ECA&D
Default period	annual
Input	
data	tas

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	90 %
<i>condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

txgt50p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmax > 50th percentile
Reference	ET-SCI
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	50 %
<i>condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

txgt{PRC}p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmax > {PRC}th percentile
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

tngt{PRC}p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmin > {PRC}th percentile
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

tmgt{PRC}p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmean > {PRC}th percentile
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

txlt{PRC}p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmax < {PRC}th percentile
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

tnlt{PRC}p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmin < {PRC}th percentile
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

tmIt{PRC}p

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of days when Tmean < {PRC}th percentile
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	count_percentile_occurrences
<i>percentile</i>	
kind	quantity
long name	None
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

dtr

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean Diurnal Temperature Range
Reference	ETCCDI
Default period	monthly
Input	
low_data	tasmin
high_data	tasmax

Field	Description
Index function	diurnal_temperature_range
<i>statistic</i>	
kind	reducer
reducer	mean

vdtr

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean day-to-day variation in Diurnal Temperature Range
Reference	ECA&D
Default period	monthly
Input	
low_data	tasmin
high_data	tasmax

Field	Description
Index function	interday_diurnal_temperature_range

etr

Field	Description
Distribution	clix-meta-0.6.1
Long name	Intra-period extreme temperature range
Reference	ECA&D
Default period	monthly
Input	
low_data	tasmin
high_data	tasmax

Field	Description
Index function	extreme_temperature_range

tx{PRC}pctl

Field	Description
Distribution	clix-meta-0.6.1
Long name	{PRC}th percentile of Tmax
Reference	CLIPC
Default period	annual
Input	
data	tasmax

Field	Description
Index function	percentile
<i>percentiles</i>	
kind	quantity
long name	None
var_name	percentiles
standard_name	None
proposed_standard_name	quantile
value	{PRC} %

tn{PRC}pctl

Field	Description
Distribution	clix-meta-0.6.1
Long name	{PRC}th percentile of Tmin
Reference	CLIPC
Default period	annual
Input	
data	tasmin

Field	Description
Index function	percentile
<i>percentiles</i>	
kind	quantity
long name	None
var_name	percentiles
standard_name	None
proposed_standard_name	quantile
value	{PRC} %

tm{PRC}pctl

Field	Description
Distribution	clix-meta-0.6.1
Long name	{PRC}th percentile of Tmean
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	percentile
<i>percentiles</i>	
kind	quantity
long name	None
var_name	percentiles
standard_name	None
proposed_standard_name	quantile
value	{PRC} %

hd17

Field	Description
Distribution	clix-meta-0.6.1
Long name	Heating degree days (sum of 17C – Tmean, for days when Tmean < 17C)
Reference	ECA&D
Default period	annual
Input	
data	tas

Field	Description
Index function	temperature_sum
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	17 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

hddheat{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Heating Degree Days (sum of {TT}C - Tmean, for days when Tmean < {TT}C)
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	temperature_sum
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<

ddgt{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Degree Days above threshold {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	temperature_sum
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>

cddcold{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Cooling Degree Days (sum of Tmean – {TT}C, for days when Tmean > {TT}C)
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	temperature_sum
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>

ddl{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Degree Days below threshold {TT}C
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	temperature_sum
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	<

gddgrow{TT}

Field	Description
Distribution	clix-meta-0.6.1
Long name	Annual Growing Degree Days (sum of Tmean – {TT}C, for days when Tmean > {TT}C)
Reference	ET-SCI
Default period	annual
Input	
data	tas

Field	Description
Index function	temperature_sum
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	{TT} degree_Celsius
<i>condition</i>	
kind	operator
operator	>

gd4

Field	Description
Distribution	clix-meta-0.6.1
Long name	Growing degree days (sum of Tmean – 4C, for days when Tmean > 4C)
Reference	ECA&D
Default period	annual
Input	
data	tas

Field	Description
Index function	temperature_sum
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	4 degree_Celsius
<i>condition</i>	
kind	operator
operator	>

gsl

Field	Description
Distribution	clix-meta-0.6.1
Long name	ETCCDI Growing Season Length (Tmean > 5C)
Reference	ETCCDI
Default period	annual
Input	
data	tas

Field	Description
Index function	season_length
<i>start_duration</i>	
kind	quantity
long name	Spell duration for initiating the growing season
var_name	start_duration
standard_name	None
proposed_standard_name	None
value	6 days
<i>start_threshold</i>	

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Table 1 – continued from previous page

Field	Description
kind	quantity
long name	Temperature threshold for initiating the growing season
var_name	start_threshold
standard_name	air_temperature
proposed_standard_name	None
value	5 degree_Celsius
<i>start_condition</i>	
kind	operator
operator	>
<i>start_delay</i>	
kind	quantity
long name	None
var_name	start_delay
standard_name	None
proposed_standard_name	None
value	0 days
<i>end_duration</i>	
kind	quantity
long name	Spell duration for ending the growing season
var_name	end_duration
standard_name	None
proposed_standard_name	None
value	6 days
<i>end_threshold</i>	
kind	quantity
long name	Temperature threshold for ending the growing season
var_name	end_threshold
standard_name	air_temperature
proposed_standard_name	None
value	5 degree_Celsius
<i>end_condition</i>	
kind	operator
operator	<
<i>end_delay</i>	
kind	quantity
long name	None
var_name	end_delay
standard_name	None
proposed_standard_name	None
value	182 days

gsstart

Field	Description
Distribution	clix-meta-0.6.1
Long name	Start of ETCCDI Growing Season (6 days with Tmean > 5C)
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	season_start
<i>threshold</i>	
kind	quantity
long name	Temperature threshold for initiating the growing season
var_name	start_threshold
standard_name	air_temperature
proposed_standard_name	None
value	5 degree_Celsius
<i>condition</i>	
kind	operator
operator	>
<i>duration</i>	
kind	quantity
long name	Spell duration for initiating the growing season
var_name	start_duration
standard_name	None
proposed_standard_name	None
value	6 days
<i>delay</i>	
kind	quantity
long name	None
var_name	start_delay
standard_name	None
proposed_standard_name	None
value	0 days

gsend

Field	Description
Distribution	clix-meta-0.6.1
Long name	End of ETCCDI Growing Season (6 days with Tmean < 5C)
Reference	CLIPC
Default period	annual
Input	
data	tas

Field	Description
Index function	season_end
<i>start_duration</i>	
kind	quantity
long name	Spell duration for initiating the growing season
var_name	start_duration
standard_name	None
proposed_standard_name	None
value	6 days
<i>start_threshold</i>	
kind	quantity
long name	Temperature threshold for initiating the growing season
var_name	start_threshold
standard_name	air_temperature
proposed_standard_name	None
value	5 degree_Celsius
<i>start_condition</i>	
kind	operator
operator	>
<i>start_delay</i>	
kind	quantity
long name	None
var_name	start_delay
standard_name	None
proposed_standard_name	None
value	0 days
<i>end_duration</i>	
kind	quantity
long name	Spell duration for ending the growing season
var_name	end_duration
standard_name	None
proposed_standard_name	None
value	6 days
<i>end_threshold</i>	
kind	quantity
long name	Temperature threshold for ending the growing season
var_name	end_threshold
standard_name	air_temperature

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Table 2 – continued from previous page

Field	Description
proposed_standard_name	None
value	5 degree_Celsius
<i>end_condition</i>	
kind	operator
operator	<
<i>end_delay</i>	
kind	quantity
long name	None
var_name	end_delay
standard_name	None
proposed_standard_name	None
value	182 days

r10mm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of heavy precipitation days (Precip >=10mm)
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	10 mm day-1
<i>condition</i>	
kind	operator
operator	>=

r20mm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of very heavy precipitation days (Precip >= 20mm)
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long_name	None
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	20 mm day-1
<i>condition</i>	
kind	operator
operator	>=

r{RT}mm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with daily Precip >= {RT}mm)
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	{RT} mm day-1
<i>condition</i>	
kind	operator
operator	>=

wetdays

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of Wet Days (precip >= 1 mm)
Reference	CLIPC
Default period	annual
Input	
data	pr

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=

rr1

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of Wet Days (precip $\geq$ 1 mm)
Reference	ECA&D
Default period	annual
Input	
data	pr

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long_name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day ⁻¹
<i>condition</i>	
kind	operator
operator	$\geq$

cdd

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum consecutive dry days (Precip < 1mm)
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	<
<i>statistic</i>	
kind	reducer
reducer	max

cwd

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum consecutive wet days (Precip >= 1mm)
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	spell_length
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	max

prcptot

Field	Description
Distribution	clix-meta-0.6.1
Long name	Total precipitation during Wet Days
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	thresholded_statistics
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	sum

sdii

Field	Description
Distribution	clix-meta-0.6.1
Long name	Average precipitation during Wet Days (SDII)
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	thresholded_statistics
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	mean

r{PRC}pctl

Field	Description
Distribution	clix-meta-0.6.1
Long name	{PRC}th percentile of precipitation during wet days (Precip >= 1mm)
Reference	CLIPC
Default period	annual
Input	
data	pr

Field	Description
Index function	thresholded_percentile
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>percentiles</i>	
kind	quantity
long name	None
var_name	percentiles
standard_name	None
proposed_standard_name	quantile
value	{PRC} %

r{PRC}pSUM

Field	Description
Distribution	clix-meta-0.6.1
Long name	Total precipitation amount from days above the {PRC}th percentile
Reference	2022 Ad hoc group
Default period	annual
Input	
data	pr

Field	Description
Index function	count_thresholded_percentile_occurrences
<i>data_threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	data_threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>data_condition</i>	
kind	operator
operator	>=
<i>percentile</i>	
kind	quantity
long name	Percentile value
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>percentile_condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

r{PRC}pPCT

Field	Description
Distribution	clix-meta-0.6.1
Long name	Percentage of total precipitation amount from days above the {PRC}th percentile
Reference	2022 Ad hoc group
Default period	annual
Input	
data	pr

Field	Description
Index function	count_thresholded_percentile_occurrences
<i>data_threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	data_threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>data_condition</i>	
kind	operator
operator	>=
<i>percentile</i>	
kind	quantity
long name	Percentile value
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{PRC} %
<i>percentile_condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

r{PRC}pDAYS

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days when precipitation is above the {PRC}th percentile
Reference	2022 Ad hoc group
Default period	annual
Input	
data	pr

Field	Description
Index function	count_thresholded_percentile_occurrences
<i>data_threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	data_threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>data_condition</i>	
kind	operator
operator	>=
<i>percentile</i>	
kind	quantity
long name	Percentile value
var_name	percentile
standard_name	None
proposed_standard_name	quantile
value	{ PRC } %
<i>percentile_condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

rx1day

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum 1-day precipitation
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	thresholded_statistics
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	max

rx5day

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum 5-day precipitation
Reference	ETCCDI
Default period	annual
Input	
data	pr

Field	Description
Index function	thresholded_running_statistics
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>rolling_aggregator</i>	
kind	reducer
reducer	sum
<i>window_size</i>	
kind	quantity
long name	None
var_name	window_size
standard_name	None
proposed_standard_name	temporal_window_size
value	5 day
<i>overall_statistic</i>	
kind	reducer
reducer	max

rx{ND}day

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum {ND}-day precipitation
Reference	ET-SCI
Default period	annual
Input	
data	pr

Field	Description
Index function	thresholded_running_statistics
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>rolling_aggregator</i>	
kind	reducer
reducer	sum
<i>window_size</i>	
kind	quantity
long name	None
var_name	window_size
standard_name	None
proposed_standard_name	temporal_window_size
value	{ND} day
<i>overall_statistic</i>	
kind	reducer
reducer	max

rh

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean of daily relative humidity
Reference	ECA&D
Default period	monthly
Input	
data	hurs

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

rr

Field	Description
Distribution	clix-meta-0.6.1
Long name	Precipitation sum
Reference	ECA&D
Default period	monthly
Input	
data	pr

Field	Description
Index function	thresholded_statistics
<i>threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>condition</i>	
kind	operator
operator	>=
<i>statistic</i>	
kind	reducer
reducer	sum

pp

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean of daily sea level pressure
Reference	ECA&D
Default period	monthly
Input	
data	psl

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

tg

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean of daily mean temperature
Reference	ECA&D
Default period	monthly
Input	
data	tas

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

tn

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean of daily minimum temperature
Reference	ECA&D
Default period	monthly
Input	
data	tasmin

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

tx

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean of daily maximum temperature
Reference	ECA&D
Default period	monthly
Input	
data	tasmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

sd

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean of daily snow depth
Reference	ECA&D
Default period	monthly
Input	
data	snd

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

sd1

Field	Description
Distribution	clix-meta-0.6.1
Long name	Snow days (SD >= 1 cm)
Reference	ECA&D
Default period	monthly
Input	
data	snd

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	surface_snow_thickness
proposed_standard_name	None
value	1 cm
<i>condition</i>	
kind	operator
operator	>=

sd5cm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with snow depth >= 5 cm
Reference	ECA&D
Default period	monthly
Input	
data	snd

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	surface_snow_thickness
proposed_standard_name	None
value	5 cm
<i>condition</i>	
kind	operator
operator	>=

sd50cm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with snow depth >= 50 cm
Reference	ECA&D
Default period	monthly
Input	
data	snd

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	surface_snow_thickness
proposed_standard_name	None
value	50 cm
<i>condition</i>	
kind	operator
operator	>=

sd{D}cm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of days with snow depth >= {D} cm
Reference	ECA&D
Default period	monthly
Input	
data	snd

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	surface_snow_thickness
proposed_standard_name	None
value	{D} cm
<i>condition</i>	
kind	operator
operator	>=

ss

Field	Description
Distribution	clix-meta-0.6.1
Long name	Sunshine duration, sum
Reference	ECA&D
Default period	monthly
Input	
data	sund

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	sum

fxx

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum value of daily maximum wind gust strength
Reference	ECA&D
Default period	monthly
Input	
data	wsgsmax

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	max

fg6bft

Field	Description
Distribution	clix-meta-0.6.1
Long name	Days with daily averaged wind strength >= 6 Bft (>=10.8 m/s)
Reference	ECA&D
Default period	monthly
Input	
data	sfcWind

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	wind_speed
proposed_standard_name	None
value	10.8 meter second-1
<i>condition</i>	
kind	operator
operator	>=

fgcalm

Field	Description
Distribution	clix-meta-0.6.1
Long name	Calm days (daily mean wind strength <= 2 m/s)
Reference	ECA&D
Default period	monthly
Input	
data	sfcWind

Field	Description
Index function	count_occurrences
<i>threshold</i>	
kind	quantity
long name	None
var_name	threshold
standard_name	wind_speed
proposed_standard_name	None
value	2 meter second-1
<i>condition</i>	
kind	operator
operator	<=

fg

Field	Description
Distribution	clix-meta-0.6.1
Long name	Mean of daily mean wind strength
Reference	ECA&D
Default period	monthly
Input	
data	sfcWind

Field	Description
Index function	statistics
<i>statistic</i>	
kind	reducer
reducer	mean

CD

Field	Description
Distribution	clix-meta-0.6.1
Long name	Days with TG < 25th percentile of daily mean temperature and RR < 25th percentile of daily precipitation sum (cold/dry days)
Reference	ECA&D
Default period	annual
Input	
temp_data	tas
precip_data	pr

Field	Description
Index function	count_bivariate_percentile_occurrences
<i>temp_percentile</i>	
kind	quantity
long name	Percentile value for temperature threshold
var_name	temp_percentile
standard_name	None
proposed_standard_name	quantile
value	25 %
<i>temp_percentile_condition</i>	
kind	operator
operator	<
<i>precip_data_threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	precip_data_threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>precip_data_condition</i>	
kind	operator
operator	>=
<i>precip_percentile</i>	
kind	quantity
long name	Percentile value for precipitation threshold
var_name	precip_percentile
standard_name	None
proposed_standard_name	quantile
value	25 %
<i>precip_percentile_condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

CW

Field	Description
Distribution	clix-meta-0.6.1
Long name	Days with TG < 25th percentile of daily mean temperature and RR > 75th percentile of daily precipitation sum (cold/wet days)
Reference	ECA&D
Default period	annual
Input	
temp_data	tas
precip_data	pr

Field	Description
Index function	count_bivariate_percentile_occurrences
<i>temp_percentile</i>	
kind	quantity
long name	Percentile value for temperature threshold
var_name	temp_percentile
standard_name	None
proposed_standard_name	quantile
value	25 %
<i>temp_percentile_condition</i>	
kind	operator
operator	<
<i>precip_data_threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	precip_data_threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>precip_data_condition</i>	
kind	operator
operator	>=
<i>precip_percentile</i>	
kind	quantity
long name	Percentile value for precipitation threshold
var_name	precip_percentile
standard_name	None
proposed_standard_name	quantile
value	75 %
<i>precip_percentile_condition</i>	
kind	operator
operator	>
<i>reference_period</i>	

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Table 4 – continued from previous page

Field	Description
kind	time_range
data	1961/1990

WD

Field	Description
Distribution	clix-meta-0.6.1
Long name	Days with TG > 75th percentile of daily mean temperature and RR < 25th percentile of daily precipitation sum (warm/dry days)
Reference	ECA&D
Default period	annual
Input	
temp_data	tas
precip_data	pr

Field	Description
Index function	count_bivariate_percentile_occurrences
<i>temp_percentile</i>	
kind	quantity
long name	Percentile value for temperature threshold
var_name	temp_percentile
standard_name	None
proposed_standard_name	quantile
value	75 %
<i>temp_percentile_condition</i>	
kind	operator
operator	>
<i>precip_data_threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	precip_data_threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>precip_data_condition</i>	
kind	operator
operator	>=
<i>precip_percentile</i>	
kind	quantity
long name	Percentile value for precipitation threshold
var_name	precip_percentile
standard_name	None
proposed_standard_name	quantile

continues on next page

Table 5 – continued from previous page

Field	Description
value	25 %
<i>precip_percentile_condition</i>	
kind	operator
operator	<
<i>reference_period</i>	
kind	time_range
data	1961/1990

WW

Field	Description
Distribution	clix-meta-0.6.1
Long name	Days with TG > 75th percentile of daily mean temperature and RR > 75th percentile of daily precipitation sum (warm/wet days)
Reference	ECA&D
Default period	annual
Input	
temp_data	tas
precip_data	pr

Field	Description
Index function	count_bivariate_percentile_occurrences
<i>temp_percentile</i>	
kind	quantity
long name	Percentile value for temperature threshold
var_name	temp_percentile
standard_name	None
proposed_standard_name	quantile
value	75 %
<i>temp_percentile_condition</i>	
kind	operator
operator	>
<i>precip_data_threshold</i>	
kind	quantity
long name	Wet day threshold
var_name	precip_data_threshold
standard_name	lwe_precipitation_rate
proposed_standard_name	None
value	1 mm day-1
<i>precip_data_condition</i>	
kind	operator
operator	>=
<i>precip_percentile</i>	

continues on next page

Table 6 – continued from previous page

Field	Description
kind	quantity
long name	Percentile value for precipitation threshold
var_name	precip_percentile
standard_name	None
proposed_standard_name	quantile
value	75 %
<i>precip_percentile_condition</i>	
kind	operator
operator	>
<i>reference_period</i>	
kind	time_range
data	1961/1990

nzero

Field	Description
Distribution	clix-meta-0.6.1
Long name	Number of zero-crossing days (days when Tmin < 0 degC < Tmax)
Reference	SMHI
Default period	annual
Input	
low_data	tasmin
high_data	tasmax

Field	Description
Index function	count_level_crossings
<i>threshold</i>	
kind	quantity
long name	Level crossing value for daily air temperature
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	0 degree_Celsius

faf

Field	Description
Distribution	clix-meta-0.6.1
Long name	First Autumn Frost (day-of-year during Jul-Dec when Tmin < 0 degC)
Reference	B4EST
Default period	annual[jasond]
Input	
data	tasmin

Field	Description
Index function	first_occurrence
<i>threshold</i>	
kind	quantity
long name	Threshold temperature for frost
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	0 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

lsf

Field	Description
Distribution	clix-meta-0.6.1
Long name	Last Spring Frost (day-of-year during Jan-Jun when Tmin < 0 degC)
Reference	B4EST
Default period	annual[jfmamj]
Input	
data	tasmin

Field	Description
Index function	last_occurrence
<i>threshold</i>	
kind	quantity
long name	Threshold temperature for frost
var_name	threshold
standard_name	air_temperature
proposed_standard_name	None
value	0 degree_Celsius
<i>condition</i>	
kind	operator
operator	<

maxdtr

Field	Description
Distribution	clix-meta-0.6.1
Long name	Maximum Diurnal Temperature Range
Reference	SMHI
Default period	monthly
Input	
low_data	tasmin
high_data	tasmax

Field	Description
Index function	diurnal_temperature_range
<i>statistic</i>	
kind	reducer
reducer	max

1.2.2 Command Line Interface

The following CLI options are available when running Climix:

Option	Args	Description
-h, --help		Show help, e.g., usage, version, positional arguments, and, CLI options.
-l, --log-level	<i>debug, info, warning, error, critical</i>	Set the lowest priority level of log messages to display, default is info .
-v, --verbose		Output more detailed log messages.
-d, --dask-scheduler	<i>distributed-local-cluster external, threaded, mpi, single-threaded</i>	For more advanced usage of dask schedulers. Default is distributed-local-cluster .
-k, --keep-open		Keep Climix running until key press (useful for debugging).
-p, --period	<i>seasonal, annual, monthly, annual[jan], annual[djf] etc.</i>	Specify period for index (overrides index default period). Must be one of annual, seasonal, monthly. For annual period, an optional argument can be given to specify a range of months, e.g. annual[jja] for multiple months, or annual[feb] for a single month.
-s, --sliced-mode		Activate calculation per period to avoid memory problems.
-i, --iterative-storage		Store results iteratively per period.
-o, --output	<i>/path/myfile.nc</i>	Specify where the result is stored. If not used, by default Climix uses <i>Output template generation</i> to give the file a name and stores the result in the current working directory.
-f, --metadata-file	<i>/path/mymetadatafile.yaml</i>	Add an external metadata file (overrides any default definitions), can be used multiple times to add several files (the last specified file will override any earlier definitions).
--activate-config		Specify if the Climix configuration should be activated. This will apply the default configuration for the output global attributes metadata. The default configuration file can be overridden by adding an external metadata file containing a configuration.
-r, --reference-period	<i>1971/2000, P48Y/2000, 1971-06-01/2000, P47Y7M/2000</i>	Specify reference period for an index (overrides the default reference period in the index definition), accepted formats are ISO 8601 .
cp, --computational-period	<i>1961-01-01/1990-01-01, 2001-03-13/2009-05-20, etc.</i>	Specify computational period for the index, i.e. limit the time interval to a subset of what is available in the input data. The start and end time strings must follow yyy-mm-dd/yyy-mm-dd format.
-x, --index	<i>list, tn, fd, cdd, rx10day, r95pctl, tngtm2, txgt30, etc.</i>	The index to calculate. -x list returns a list of all available indices.