

CLIPC DRS for Climate Impact Indicators

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Introduction

This document details the data reference syntax (DRS) for the climate impact indicators for the Climate Information Platform for Copernicus (CLIPC) project. The DRS consists of a number of facets that represent specific attributes from the CLIPC metadata standard. The facets should be thus associated to corresponding attribute names. In this way, we facilitate tracking of potential changes and allows consistency in faceted search through publication in ESGF (Earth System Grid Federation) within the portal.

Since climate impact indicators may be calculated from either climate model data or observational data, the DRS for climate impact indicators are non-trivial to construct. The approach taken here details two DRS one for model (or reanalysis) derived indicators and one general DRS for indicators derived from observations, multiple sources (models, observations or both) or non-climatic information.

For the purposes of the CLIPC project the following DRS has been agreed. All those producing, tier 1, 2, or 3 climate impact indicators should follow the DRS conventions detailed below. It is hoped that this DRS will be useful beyond the scope of CLIPC however given the complexities involved in compiling the climate impact indicators DRS it is possible to further refine these in the future.

Section 1 lists all the facets of climate impact indicator DRS, section 2 shows how to construct a climate impact indicator dataset DRS and section 3 shows how to construct a climate impact indicator filename DRS. Example dataset and filename DRS are shown in sections 2 and 3 respectively as a guide.

1. Facets for climate impact indicators DRS

The table below lists all the facets used to construct the climate impact indicator dataset and filename DRS. The facets used for model derived indicators closely follows the DRS used in CORDEX, however the CORDEX standard is not entirely flexible enough to cover the needs of the climate impact indicator community therefore some facets are optional or are not constrained in the same way as CORDEX (see table for full details). For observationally derived indicators the DRS is similar to the DRS used in the ESA Climate Change Initiative (CCI) that has been developed as part of CLIPC. The table indicates where facets are optional either in the dataset or filename and whether the facet value is fixed, i.e. to be selected from a controlled vocabulary or can be constructed freely.

NOTE: Some variables eg. growing season length has multiple competing definitions. The definition should be given in the global attributes and these should be given individual records Indicators database.

Facet Name	Fixed or flexible	Usage	Required (Req) / Optional (Opt)			
			Dataset		Filename	
			Model	General	Model	General
activity	Fixed	Within the CLIPC project the fixed string "clipc" will be used.	Req	Req	Req	---
product	Fixed	One of "gcm", "rcm", "obs", "reana" or "multi" immediately followed by "-derived" (without any space)	Req	Req	Req	---
package	Fixed	Software package used to generate the climate indicator. Include version by appending "-" directly after package name, , e.g. icclim, R-package, cdo-1-6 (note some versions may be dot delimited translate to "-")	Req	Req	Req	Req
domain	Flexible	<u>Preference is to use CORDEX domain names.</u> This may not be flexible enough to cover all possibilities for impact indicators. Therefore, a sensible alternative maybe used, if this is the case it should be clearly stated in the global attributes of the file. Alternatively, a lat/lon bounding box may also be used. For example for a northern Pacific domain use 170E-170W-40N-70N.	Opt	Req	Opt	---
institution	Flexible	Institution or organisation that generated the data. Where data has been generated through a multi-institutional collaboration, the lead institution takes precedence (others listed in the global attributes).	Req	Req	Req	Req
GCMModelName	Fixed	Name of model used to derive the index, this may be a driving model in the case of indicators calculated from regional models. Conventions for this facet should follow that of the program (i.e. CMIP5 or CORDEX) used to derive the indicator.	Req	---	---	---
CMIP5ExperimentName	Fixed	CMIP5 experiment name	Req	---	Req	---
CMIP5EnsembleMember	Fixed	CMIP5 ensemble reference number	Req	---	Req	---
RCMName	Fixed	Regional climate model name	Opt	---	Opt	---
RCMVersionID	Fixed	Regional climate model version id	Opt	---	Opt	---
BcName	Flexible	An identifier/name for the applied bias-correction method; add additional details in global attributes	Opt	---	Opt	---
BcObsName	Flexible	An acronym for the observation/reanalysis datasets used as a reference for bias adjustment	Opt	---	Opt	---
BcRefPeriod	Fixed	Reference or calibration period given in the form "bcref-YYYY-YYYY" format	Opt	---	Opt	---
sourceDataID	Flexible	This is a reference to the data source it could be the name of observational dataset, e.g. cci-sst, HadCRUT4, or the name of an instrument or platform. In the case of multiple sources it should be multi-xxxx for a unique number xxxx- Additionally for multiple input sources include a description in the global attributes of the file detailing the multiple input sources.	---	Req	---	Req
frequency	Fixed	Temporal resolution at which output is given. Note: Not in CF and ACDD conventions, but as used in the WCRP programs such as CMIP and CORDEX: yr, mon, day, 6hr, 3hr, subhr, monClim (climatological monthly mean), yrClim (climatological annual mean) or "fx" (time invariant)	Req	Req	Req	Req
Reference_period	Fixed	Baseline reference period over which the indicator is calculated. It should be supplied in the format YYYY-YYYY; use "na" if not applicable	Req	Req	Opt	Opt
VariableName	Fixed	Climate indicator acronym or name e.g. stormSurgeFlood or ssfld not the impact theme flooding. (Full details can be provided with in the variable attributes (note not global attributes).	Req	Req	Req	Req
version	Fixed	ESGF version at the dataset level	Req	Req	---	---
model	Fixed	Model name, could be global, regional or a reanalysis product	---	---	Req	---
IndicatorRealisation	Flexible	Additional facet for flexibility to allow for potential future variations. Potential usage could be e.g. v1 or r1	---	---	Opt	---
StartTime-EndTime	Flexible	Temporal range of output: YYYYMMDD-YYYYMMDD.	---	---	Req	Req
tile-nnnnn	Fixed	Geographic location tile for indicator. Coordinates of the tile should be specified within the attributes of the file and it should be uniquely numbered. (Required due to high resolution input data.)	---	---	Opt	Opt

2. Dataset DRS proposal

Model-derived indices:

<activity>.<product>.<package>.<Institution>.<GCMModelName>.<CMIP5ExperimentName>.<CMIP5EnsembleMember>.[<RCMName>.<RCMVersionID>.<domain>.]
[<BcName>.<BcObsName>.<BcRefPeriod>.]<frequency>.<reference_period>.<VariableName>.<version>

Examples:

clipc.gcm-derived.icclim.SMHI.EC-EARTH.historical.r1i1p1.yr.na.cdd.v20141010

A CORDEX example:

clipc.rcm-derived.icclim.SMHI.ICHEC-EC-EARTH.historical.r1i1p1.SMHI-RCA4.EUR-11.yr.na.cdd.v20141010

General: This DRS covers observationally-derived, multi-source (models or observations) or non-climatic indices:

<activity>.<product>.<package>.<domain>.<Institution>.<sourceDataId>.<frequency>.<reference_period>.<VariableName>.<version>

Example:

clipc.obs-derived.icclim.EUR.SMHI.EOBS10.yr.na.cdd.v20150101

clipc.multi-derived.icclim.global.CERFACS.multi-0010.mon.1950-2000.cdd.v20160101

3. Filename DRS proposal

Model-derived indices:

<VariableName>_<package>_<institution>_<model>_<CMIP5ExperimentName>_<CMIP5EnsembleMember>_[IndicatorRealisation][<RCMName>_<RCMVersionID>_<domain>_] [<BcName>_<BcObsName>_<BcRefPeriod>_] <Frequency>_<StartTime-EndTime>_[<reference_period>][_tile-nnnnn].nc

General: This DRS covers observationally-derived, multi-source (models or observations) or non-climatic indices:

<VariableName>_<package>_<institution>_<sourceDataId>_<frequency>_<StartTime-EndTime>[--<reference_period>][_tile-nnnnn].nc

Example:

sst_cdo-1-6-2_MOHC_HadCRUT4_mon_20000101-20191231.nc