

CDO Reference Card

Climate Data Operators
Version 1.4.0
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Uwe Schulzweida
Max-Planck-Institute for Meteorology

http://www.mpimet.mpg.de/cdo

Syntax

cdo	[Options]	Operator1	[–Operator2	[–OperatorN]
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Options

-a	Convert from a relative to an absolute time axis
-b <i><nbits></i>	Set the number of bits for output precision (32/64 for nc,nc2,nc4,srv,ext,ieg; 1 - 32 for grb)
-f <i><format></i>	Output file format (grb,nc,nc2,nc4,srv,ext,ieg)
-g <i><grid></i>	Grid name or file Available grids: t<RES>grid, r<NX>x<NY>
-h	Help information for the operators
-m <i><missval></i>	Set the default missing value (default: -9e+33)
-R	Convert GRIB data from reduced to regular grid
-r	Convert from an absolute to a relative time axis
-s	Silent mode
-t <i><table></i>	Set the parameter table name or file Predefined tables: echam4 echam5 mpiom1
-V	Print the version number
-v	Print extra details for some operators
-z szip	Compress GRIB records with szip

Operators

Information

info infov map	Dataset information listed by code number Dataset information listed by variable name Dataset information and simple map
Syntax	<operator> ifiles
sinfo sinfov	Short dataset information listed by code number Short dataset information listed by variable name
Syntax	<operator> ifiles
diff diffv	Compare two datasets listed by code number Compare two datasets listed by variable name
Syntax	<operator> ifile1 ifile2
npar nlevel nyear nmon ndate ntime	Number of parameters Number of levels Number of years Number of months Number of dates Number of time steps
Syntax	<operator> ifile
showformat showcode showname showstdname showlevel showtype showyear showmon showdate showtime	Show file format Show code numbers Show variable names Show standard names Show levels Show GRIB level types Show years Show months Show dates Show time steps
Syntax	<operator> ifile

pardes griddes zaxisdes vct	Parameter description Grid description Z-axis description Vertical coordinate table
Syntax	<operator> ifile

File operations

copy cat	Copy datasets Concatenate datasets
Syntax	<operator> ifiles ofile
replace	Replace variables
Syntax	replace ifile1 ifile2 ofile
merge mergetime	Merge datasets with different fields Merge datasets sorted by date and time
Syntax	<operator> ifiles ofile
splitcode splitname splitlevel splitgrid splitzaxis	Split code numbers Split variable names Split levels Split grids Split z-axes
Syntax	<operator> ifile oprefix
splithour splitday splitmon splitseas splityear	Split hours Split days Split months Split seasons Split years
Syntax	<operator> ifile oprefix
splitsel	Split time selection
Syntax	splitsel,nsets[,noffset[,nskip]] ifile oprefix

Selection

selcode delcode	Select variables by code number Delete variables by code number
Syntax	<operator> , codes ifile ofile
selname delname	Select variables by name Delete variables by name
Syntax	<operator> , varnames ifile ofile
selstdname	Select variables by standard name
Syntax	selstdname,stdnames ifile ofile
sellevel	Select levels
Syntax	sellevel,levels ifile ofile
sellevidx	Select levels by index
Syntax	sellevidx,levidx ifile ofile
selgrid	Select grids
Syntax	selgrid,grids ifile ofile
selgridname	Select grids by name
Syntax	selgridname,gridnames ifile ofile
selzaxis	Select z-axes
Syntax	selzaxis,zaxes ifile ofile
selzaxisname	Select z-axes by name
Syntax	selzaxisname,zaxisnames ifile ofile
selltype	Select GRIB level types
Syntax	selltype,types ifile ofile
seltabnum	Select parameter table numbers
Syntax	seltabnum,tabnums ifile ofile

seltimestep	Select time steps
Syntax	seltimestep,timesteps ifile ofile
seltime	Select times
Syntax	seltime,times ifile ofile
selhour	Select hours
Syntax	selhour,hours ifile ofile
selday	Select days
Syntax	selday,days ifile ofile
selmon	Select months
Syntax	selmon,months ifile ofile
selyear	Select years
Syntax	selyear,years ifile ofile
selseas	Select seasons
Syntax	selseas,seasons ifile ofile
seldate	Select dates
Syntax	seldate,date1[,date2] ifile ofile
selsmon	Select single month
Syntax	selsmon,month[,nts1[,nts2]] ifile ofile

sellonlatbox	Select a longitude/latitude box
Syntax	sellonlatbox,lon1,lon2,lat1,lat2 ifile ofile
selindexbox	Select an index box
Syntax	selindexbox,idx1,idx2,idy1,idy2 ifile ofile

Conditional selection

ifthen ifnotthen	If then If not then
Syntax	<operator> ifile1 ifile2 ofile
ifthenelse	If then else
Syntax	ifthenelse ifile1 ifile2 ifile3 ofile
ifthenc ifnotthenc	If then constant If not then constant
Syntax	<operator> , c ifile ofile

Comparison

eq ne le lt ge gt	Equal Not equal Less equal Less than Greater equal Greater than
Syntax	<operator> ifile1 ifile2 ofile
eqc nec lec ltc gec gtc	Equal constant Not equal constant Less equal constant Less than constant Greater equal constant Greater than constant
Syntax	<operator> , c ifile ofile

Modification

setpartab	Set parameter table
Syntax	setpartab,table ifile ofile
setcode	Set code number
Syntax	setcode,code ifile ofile
setname	Set variable name
Syntax	setname,name ifile ofile
setlevel	Set level
Syntax	setlevel,level ifile ofile
setltype	Set GRIB level type
Syntax	setltype,ltype ifile ofile

setdate	Set date
Syntax	setdate,date ifile ofile
settime	Set time of the day
Syntax	settime,time ifile ofile
setday	Set day
Syntax	setday,day ifile ofile
setmon	Set month
Syntax	setmon,month ifile ofile
setyear	Set year
Syntax	setyear,year ifile ofile
settunits	Set time units
Syntax	settunits,units ifile ofile
settaxis	Set time axis
Syntax	settaxis,date,time[,inc] ifile ofile
setreftime	Set reference time
Syntax	setreftime,date,time[,units] ifile ofile
setcalendar	Set calendar
Syntax	setcalendar,calendar ifile ofile
shifttime	Shift time steps
Syntax	shifttime,sval ifile ofile

chcode	Change code number
Syntax	chcode,oldcode,newcode[,...] ifile ofile
chname	Change variable name
Syntax	chname,oldname,newname,... ifile ofile
chlevel	Change level
Syntax	chlevel,oldlev,newlev,... ifile ofile
chlevelc	Change level of one code
Syntax	chlevelc,code,oldlev,newlev ifile ofile
chlevelv	Change level of one variable
Syntax	chlevelv,name,oldlev,newlev ifile ofile

setgrid	Set grid
Syntax	setgrid,grid ifile ofile
setgridtype	Set grid type
Syntax	setgridtype,gridtype ifile ofile

setzaxis	Set z-axis
Syntax	setzaxis,zaxis ifile ofile

setgatt	Set global attribute
Syntax	setgatt,attname,attstring ifile ofile
setgatts	Set global attributes
Syntax	setgatts,attfile ifile ofile

invertlat	Invert latitudes
Syntax	invertlat ifile ofile

invertlev	Invert levels
Syntax	invertlev ifile ofile

maskregion	Mask regions
Syntax	maskregion,regions ifile ofile

masklonlatbox	Mask a longitude/latitude box
Syntax	masklonlatbox,lon1,lon2,lat1,lat2 ifile ofile
maskindexbox	Mask an index box
Syntax	maskindexbox,idx1,idx2,idy1,idy2 ifile ofile

setclonlatbox	Set a longitude/latitude box to constant
Syntax	setclonlatbox,c,lon1,lon2,lat1,lat2 ifile ofile
setcindexbox	Set an index box to constant
Syntax	setcindexbox,c,idx1,idx2,idy1,idy2 ifile ofile

enlarge	Enlarge fields
Syntax	enlarge,grid ifile ofile

setmissval	Set a new missing value
Syntax	setmissval,newmiss ifile ofile
setctomiss	Set constant to missing value
setmisstoc	Set missing value to constant
Syntax	<operator> , c ifile ofile
setrtomiss	Set range to missing value
Syntax	setrtomiss,rmin,rmax ifile ofile

Arithmetic

expr	Evaluate expressions
Syntax	expr , <i>instr</i> ifile ofile
exprf	Evaluate expressions from script file
Syntax	exprf , <i>filename</i> ifile ofile
abs	Absolute value
int	Integer value
nint	Nearest integer value
pow	Power
sqr	Square
sqrt	Square root
exp	Exponential
ln	Natural logarithm
log10	Base 10 logarithm
sin	Sine
cos	Cosine
tan	Tangent
asin	Arc sine
acos	Arc cosine
reci	Reciprocal value
Syntax	<operator> ifile ofile

addc	Add a constant
subc	Subtract a constant
mulc	Multiply with a constant
divc	Divide by a constant
Syntax	<operator> , <i>c</i> ifile ofile

add	Add two fields
sub	Subtract two fields
mul	Multiply two fields
div	Divide two fields
min	Minimum of two fields
max	Maximum of two fields
atan2	Arc tangent of two fields
Syntax	<operator> ifile1 ifile2 ofile

monadd	Add monthly time series
monsub	Subtract monthly time series
monmul	Multiply monthly time series
monddiv	Divide monthly time series
Syntax	<operator> ifile1 ifile2 ofile

ymonadd	Add multi-year monthly time series
ymonsub	Subtract multi-year monthly time series
ymonmul	Multiply multi-year monthly time series
ymonddiv	Divide multi-year monthly time series
Syntax	<operator> ifile1 ifile2 ofile

muldpm	Multiply with days per month
divdpm	Divide by days per month
muldpy	Multiply with days per year
divdpy	Divide by days per year
Syntax	<operator> ifile ofile

Statistical values

Available statistical functions	<STAT>
minimum	min
maximum	max
sum	sum
mean	mean
average	avg
variance	var
standard deviation	std

ens<STAT>	Statistical values over an ensemble
Syntax	<operator> ifiles ofile
enspctl	Ensemble percentiles
Syntax	enspctl , <i>p</i> ifiles ofile

fld<STAT>	Statistical values over a field
Syntax	<operator> ifile ofile
fldpctl	Field percentiles
Syntax	fldpctl , <i>p</i> ifile ofile

zon<STAT>	Zonal statistical values
Syntax	<operator> ifile ofile
zonpctl	Zonal percentiles
Syntax	zonpctl , <i>p</i> ifile ofile

mer<STAT>	Meridional statistical values
Syntax	<operator> ifile ofile
merpctl	Meridional percentiles
Syntax	merpctl , <i>p</i> ifile ofile

vert<STAT>	Vertical statistical values
Syntax	<operator> ifile ofile
timsel<STAT>	Time range statistical values
Syntax	<operator> , <i>nsets</i> [, <i>noffset</i> [, <i>nskip</i>]] ifile ofile

timselfpctl	Time range percentiles
Syntax	timselfpctl , <i>p,nsets</i> [, <i>noffset</i> [, <i>nskip</i>]] ifile1 ifile2 ifile3 ofile

run<STAT>	Running statistical values
Syntax	<operator> , <i>nts</i> ifile ofile

runpctl	Running percentiles
Syntax	runpctl , <i>p,nts</i> ifile1 ofile

tim<STAT>	Statistical values over all time steps
Syntax	<operator> ifile ofile

timpctl	Time percentiles
Syntax	timpctl , <i>p</i> ifile1 ifile2 ifile3 ofile

hour<STAT>	Hourly statistical values
Syntax	<operator> ifile ofile

hourpctl	Hourly percentiles
Syntax	hourpctl , <i>p</i> ifile1 ifile2 ifile3 ofile

day<STAT>	Daily statistical values
Syntax	<operator> ifile ofile

daypctl	Daily percentiles
Syntax	daypctl , <i>p</i> ifile1 ifile2 ifile3 ofile

mon<STAT>	Monthly statistical values
Syntax	<operator> ifile ofile

monpctl	Monthly percentiles
Syntax	monpctl , <i>p</i> ifile1 ifile2 ifile3 ofile

year<STAT>	Yearly statistical values
Syntax	<operator> ifile ofile

yearpctl	Yearly percentiles
Syntax	yearpctl , <i>p</i> ifile1 ifile2 ifile3 ofile

seas<STAT>	Seasonal statistical values
Syntax	<operator> ifile ofile

seaspctl	Seasonal percentiles
Syntax	seaspctl , <i>p</i> ifile1 ifile2 ifile3 ofile

yhour<STAT>	Multi-year hourly statistical values
Syntax	<operator> ifile ofile

yday<STAT>	Multi-year daily statistical values
Syntax	<operator> ifile ofile

ydaypctl	Multi-year daily percentiles
Syntax	ydaypctl , <i>p</i> ifile1 ifile2 ifile3 ofile

ymon<STAT>	Multi-year monthly statistical values
Syntax	<operator> ifile ofile

ymonpctl	Multi-year monthly percentiles
Syntax	ymonpctl , <i>p</i> ifile1 ifile2 ifile3 ofile

yseas<STAT>	Multi-year seasonal statistical values
Syntax	<operator> ifile ofile

yseaspctl	Multi-year seasonal percentiles
Syntax	yseaspctl , <i>p</i> ifile1 ifile2 ifile3 ofile

ydrun<STAT>	Multi-year daily running statistical values
Syntax	<operator> , <i>nts</i> ifile ofile

ydrunpctl	Multi-year daily running percentiles
Syntax	ydrunpctl , <i>p,nts</i> ifile1 ifile2 ifile3 ofile

Regression

regres	Regression
Syntax	regres ifile ofile

detrend	Detrend
Syntax	detrend ifile ofile

trend	Trend
Syntax	trend ifile ofile1 ofile2

subtrend	Subtract trend
Syntax	subtrend ifile1 ifile2 ifile3 ofile

Interpolation

remapbil	Bilinear interpolation
remapbic	Bicubic interpolation
remapdis	Distance-weighted average remapping
remapnn	Nearest neighbor remapping
remapcon	First order conservative remapping
remapcon2	Second order conservative remapping
remaplaf	Largest area fraction remapping
Syntax	<operator> , <i>grid</i> ifile ofile

genbil	Generate bilinear interpolation weights
genbic	Generate bicubic interpolation weights
gendis	Generate distance-weighted average remap weights
gennn	Generate nearest neighbor remap weights
gencon	Generate 1st order conservative remap weights
gencon2	Generate 2nd order conservative remap weights
genlaf	Generate largest area fraction remap weights
Syntax	<operator> , <i>grid</i> ifile ofile

remap	SCRIP grid remapping
Syntax	remap , <i>grid,weights</i> ifile ofile

interpolate	PINGO grid interpolation
Syntax	interpolate , <i>grid</i> ifile ofile

remapeta	Remap vertical hybrid level
Syntax	remapeta , <i>vct</i> [, <i>oro</i>] ifile ofile

ml2pl	Model to pressure level interpolation
Syntax	ml2pl , <i>p,levels</i> ifile ofile

ml2hl	Model to height level interpolation
Syntax	ml2hl , <i>h,levels</i> ifile ofile

intlevel	Linear level interpolation
Syntax	intlevel , <i>levels</i> ifile ofile

inttime	Interpolation between time steps
Syntax	inttime , <i>date,time</i> [, <i>inc</i>] ifile ofile
intntime	Interpolation between time steps
Syntax	intntime , <i>n</i> ifile ofile

intyear	Interpolation between two years
Syntax	intyear , <i>years</i> ifile1 ifile2 <i>oprefix</i>

Transformation

sp2gp	Spectral to gridpoint
sp2gpl	Spectral to gridpoint (linear)
gp2sp	Gridpoint to spectral
gp2spl	Gridpoint to spectral (linear)
Syntax	<operator> ifile ofile

sp2sp	Spectral to spectral
Syntax	sp2sp , <i>trunc</i> ifile ofile

spcut	Cut spectral wave number
Syntax	spcut , <i>wnums</i> ifile ofile

dv2uv	Divergence and vorticity to U and V wind
dv2uvl	Divergence and vorticity to U and V wind (linear)
uv2dv	U and V wind to divergence and vorticity
uv2dvl	U and V wind to divergence and vorticity (linear)
Syntax	<operator> ifile ofile

Formatted I/O

input	ASCII input
Syntax	input , <i>grid</i> ofile
inputsrv	SERVICE ASCII input
inputext	EXTRA ASCII input
Syntax	<operator> ofile

output	ASCII output
Syntax	output ifiles
outputf	Formatted output
Syntax	outputf , <i>format,nelem</i> ifiles

outputint	Integer output
outputsrv	SERVICE ASCII output
outputext	EXTRA ASCII output
Syntax	<operator> ifiles

Miscellaneous

gridarea	Grid cell area
gridweights	Grid cell weights
Syntax	<operator> ifile ofile

gradsdes1	GrADS data descriptor file (version 1 GRIB map)
gradsdes2	GrADS data descriptor file (version 2 GRIB map)
Syntax	<operator> ifile

smooth9	9 point smoothing
Syntax	smooth9 ifile ofile

setrtoc	Set range to constant
Syntax	setrtoc , <i>rmin,rmax,c</i> ifile ofile

setrtoc2	Set range to constant others to constant2
Syntax	setrtoc2 , <i>rmin,rmax,c,c2</i> ifile ofile

timsort	Sort over the time
Syntax	timsort ifile ofile

const	Create a constant field
Syntax	const , <i>const,grid</i> ofile

random	Create a field with random values
Syntax	random , <i>grid</i> ofile

rotuvb	Backward rotation
Syntax	rotuvb , <i>u,v,...</i> ifile ofile

mastrfu	Mass stream function
Syntax	mastrfu ifile ofile

histcount	Histogram count
histsum	Histogram sum
histmean	Histogram mean
histfreq	Histogram frequency
Syntax	<operator> , <i>bounds</i> ifile ofile

wct	Windchill temperature
Syntax	wct ifile1 ifile2 ofile

fdns	Frost days where no snow index per time period
Syntax	fdns ifile1 ifile2 ofile

strwin	Strong wind days index per time period
Syntax	strwin [, <i>v</i>] ifile ofile

strbre	Strong breeze days index per time period
Syntax	strbre ifile ofile

strgal	Strong gale days index per time period
Syntax	strgal ifile ofile

hurr	Hurricane days index per time period
Syntax	hurr ifile ofile

import_amsr	Import AMSR binary files
Syntax	import_amsr ifile ofile

import_cmsaf	Import CM-SAF HDF5 files
Syntax	import_cmsaf ifile ofile

import_binary	Import binary data sets
Syntax	import_binary ifile ofile

Climate indices

		eca_tg90p Syntax	Warm days percent wrt 90th percentile of reference period eca_tg90p ifile1 ifile2 ofile
eca_cdd Syntax	Consecutive dry days index per time period eca_cdd ifile ofile	eca_tn10p Syntax	Cold nights percent wrt 10th percentile of reference period eca_tn10p ifile1 ifile2 ofile
eca_cfd Syntax	Consecutive frost days index per time period eca_cfd ifile ofile	eca_tn90p Syntax	Warm nights percent wrt 90th percentile of reference period eca_tn90p ifile1 ifile2 ofile
eca_csu Syntax	Consecutive summer days index per time period eca_csu[,T] ifile ofile	eca_tr Syntax	Tropical nights index per time period eca_tr[,T] ifile ofile
eca_cwd Syntax	Consecutive wet days index per time period eca_cwd ifile ofile	eca_tx10p Syntax	Very cold days percent wrt 10th percentile of reference period eca_tx10p ifile1 ifile2 ofile
eca_cwdi Syntax	Cold wave duration index wrt mean of reference period eca_cwdi[,nday[,T]] ifile1 ifile2 ofile	eca_tx90p Syntax	Very warm days percent wrt 90th percentile of reference period eca_tx90p ifile1 ifile2 ofile
eca_cwfi Syntax	Cold-spell days index wrt 10th percentile of reference period eca_cwfi[,nday] ifile1 ifile2 ofile		
eca_etr Syntax	Intra-period extreme temperature range eca_etr ifile1 ifile2 ofile		
eca_fd Syntax	Frost days index per time period eca_fd ifile ofile		
eca_gsl Syntax	Growing season length index eca_gsl[,nday[,T[,fland]]] ifile1 ifile2 ofile		
eca_hd Syntax	Heating degree days per time period eca_hd[,T1[,T2]] ifile ofile		
eca_hwdi Syntax	Heat wave duration index wrt mean of reference period eca_hwdi[,nday[,T]] ifile1 ifile2 ofile		
eca_hwfi Syntax	Warm spell days index wrt 90th percentile of reference period eca_hwfi[,nday] ifile1 ifile2 ofile		
eca_id Syntax	Ice days index per time period eca_id ifile ofile		
eca_r10mm Syntax	Heavy precipitation days index per time period eca_r10mm ifile ofile		
eca_r20mm Syntax	Very heavy precipitation days index per time period eca_r20mm ifile ofile		
eca_r75p Syntax	Moderate wet days wrt 75th percentile of reference period eca_r75p ifile1 ifile2 ofile		
eca_r75ptot Syntax	Precipitation percent due to R75p days eca_r75ptot ifile1 ifile2 ofile		
eca_r90p Syntax	Wet days wrt 90th percentile of reference period eca_r90p ifile1 ifile2 ofile		
eca_r90ptot Syntax	Precipitation percent due to R90p days eca_r90ptot ifile1 ifile2 ofile		
eca_r95p Syntax	Very wet days wrt 95th percentile of reference period eca_r95p ifile1 ifile2 ofile		
eca_r95ptot Syntax	Precipitation percent due to R95p days eca_r95ptot ifile1 ifile2 ofile		
eca_r99p Syntax	Extremely wet days wrt 99th percentile of reference period eca_r99p ifile1 ifile2 ofile		
eca_r99ptot Syntax	Precipitation percent due to R99p days eca_r99ptot ifile1 ifile2 ofile		
eca_rr1 Syntax	Wet days index per time period eca_rr1 ifile ofile		
eca_rx1day Syntax	Highest one day precipitation amount per time period eca_rx1day[,mode] ifile ofile		
eca_rx5day Syntax	Highest five-day precipitation amount per time period eca_rx5day[,x] ifile ofile		
eca_sdii Syntax	Simple daily intensity index per time period eca_sdii ifile ofile		
eca_su Syntax	Summer days index per time period eca_su[,T] ifile ofile		
eca_tg10p Syntax	Cold days percent wrt 10th percentile of reference period eca_tg10p ifile1 ifile2 ofile		