

# CDO Reference Card

Climate Data Operators  
Version 1.5.4  
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<http://code.zmaw.de/projects/cdo>

## Syntax

<b>cdo</b>	<b>[Options]</b>	<b>Operator1</b>	<b>[ –Operator2</b>	<b>[ –OperatorN ] ]</b>
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## Options

<b>-a</b>	Generate an absolute time axis
<b>-b</b> <i>&lt;nbits&gt;</i>	Set the number of bits for the output precision (I8/I16/I32/F32/F64 for nc,nc2,nc4,nc4c; F32/F64 for grb2,srv,ext,ieg; 1-24 for grb,grb2) Add L or B for Little or Big endian byteorder
<b>-f</b> <i>&lt;format&gt;</i>	Outputformat: grb,grb2,nc,nc2,nc4,nc4c,srv,ext,ieg
<b>-g</b> <i>&lt;grid&gt;</i>	Grid or file name
	Grid names: <b>r</b> <NX> <b>x</b> <NY>, <b>n</b> <N>, <b>gme</b> <NI>
<b>-h</b>	Help information for the operators
<b>-M</b>	Indicate that the I/O streams have missing values
<b>-m</b> <i>&lt;missval&gt;</i>	Set the default missing value (default: -9e+33)
<b>-O</b>	Overwrite existing output file, if checked
<b>-R</b>	Convert GRIB1 data from reduced to regular grid
<b>-r</b>	Generate a relative time axis
<b>-s</b>	Silent mode
<b>-t</b> <i>&lt;table&gt;</i>	Set the parameter table name or file
	Predefined tables: echam4 echam5 mpiom1
<b>-V</b>	Print the version number
<b>-v</b>	Print extra details for some operators
<b>-z</b> szip	SZIP compression of GRIB1 records

## Operators

### Information

<b>info</b>	Dataset information listed by parameter identifier
<b>infor</b>	Dataset information listed by parameter name
<b>map</b>	Dataset information and simple map
<b>&lt;operator&gt; ifiles</b>	

<b>sinfo</b>	Short information listed by parameter identifier
<b>sinfor</b>	Short information listed by parameter name
<b>&lt;operator&gt; ifiles</b>	

<b>diff</b>	Compare two datasets listed by parameter id
<b>diffn</b>	Compare two datasets listed by parameter name
<b>&lt;operator&gt; ifile1 ifile2</b>	

<b>npar</b>	Number of parameters
<b>nlevel</b>	Number of levels
<b>nyear</b>	Number of years
<b>nmon</b>	Number of months
<b>ndate</b>	Number of dates
<b>ntime</b>	Number of timesteps
<b>&lt;operator&gt; ifile</b>	

<b>showformat</b>	Show file format
<b>showcode</b>	Show code numbers
<b>showname</b>	Show variable names
<b>showstdname</b>	Show standard names
<b>showlevel</b>	Show levels
<b>showltype</b>	Show GRIB level types
<b>showyear</b>	Show years
<b>showmon</b>	Show months
<b>showdate</b>	Show date information
<b>showtime</b>	Show time information
<b>showtimestamp</b>	Show timestamp
<b>&lt;operator&gt; ifile</b>	

<b>pardes</b>	Parameter description
<b>griddes</b>	Grid description
<b>zaxisdes</b>	Z-axis description
<b>vct</b>	Vertical coordinate table
<b>&lt;operator&gt; ifile</b>	

## File operations

<b>copy</b>	Copy datasets
<b>cat</b>	Concatenate datasets
<b>&lt;operator&gt; ifiles ofile</b>	

<b>replace</b>	Replace variables
<b>replace ifile1 ifile2 ofile</b>	

<b>merge</b>	Merge datasets with different fields
<b>mergetime</b>	Merge datasets sorted by date and time
<b>&lt;operator&gt; ifiles ofile</b>	

<b>splitcode</b>	Split code numbers
<b>splitparam</b>	Split parammeter identifiers
<b>splitname</b>	Split variable names
<b>splitlevel</b>	Split levels
<b>splitgrid</b>	Split grids
<b>splitzaxis</b>	Split z-axes
<b>splittabnum</b>	Split parameter table numbers
<b>&lt;operator&gt; ifile obase</b>	

<b>splthour</b>	Split hours
<b>spltday</b>	Split days
<b>splitmon</b>	Split months
<b>splitseas</b>	Split seasons
<b>splityear</b>	Split years
<b>&lt;operator&gt; ifile obase</b>	

<b>splitsel</b>	Split time selection
<b>splitsel,nsets[,noffset[,nskip]] ifile obase</b>	

## Selection

<b>selparam</b>	Select parameters by identifier
<b>delparam</b>	Delete parameters by identifier
<b>&lt;operator&gt; ,params ifile ofile</b>	
<b>selcode</b>	Select parameters by code number
<b>delcode</b>	Delete parameters by code number
<b>&lt;operator&gt; ,codes ifile ofile</b>	
<b>selname</b>	Select parameters by name
<b>delname</b>	Delete parameters by name
<b>&lt;operator&gt; ,names ifile ofile</b>	
<b>selstdname</b>	Select parameters by standard name
<b>selstdname,stdnames ifile ofile</b>	
<b>sellevel</b>	Select levels
<b>sellevel,levels ifile ofile</b>	
<b>sellevidx</b>	Select levels by index
<b>sellevidx,levidx ifile ofile</b>	
<b>selgrid</b>	Select grids
<b>selgrid,grids ifile ofile</b>	
<b>selzaxis</b>	Select z-axes
<b>selzaxis,zaxes ifile ofile</b>	
<b>selltype</b>	Select GRIB level types
<b>selltype,ltypes ifile ofile</b>	
<b>seltabnum</b>	Select parameter table numbers
<b>seltabnum,tabnums ifile ofile</b>	

<b>sel timestep</b>	Select timesteps
<b>sel timestep,timesteps ifile ofile</b>	
<b>seltime</b>	Select times
<b>seltime,times ifile ofile</b>	
<b>selhour</b>	Select hours
<b>selhour,hours ifile ofile</b>	
<b>selday</b>	Select days
<b>selday,days ifile ofile</b>	
<b>selmon</b>	Select months
<b>selmon,months ifile ofile</b>	
<b>selyear</b>	Select years
<b>selyear,years ifile ofile</b>	
<b>selseas</b>	Select seasons
<b>selseas,seasons ifile ofile</b>	
<b>seldate</b>	Select dates
<b>seldate,date1[,date2] ifile ofile</b>	
<b>selmon</b>	Select single month
<b>selmon,month[,nts1[,nts2]] ifile ofile</b>	

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

## Conditional selection

<b>ifthen</b>	If then
<b>ifnotthen</b>	If not then
<b>&lt;operator&gt; ifile1 ifile2 ofile</b>	

<b>ifthenelse</b>	If then else
<b>ifthenelse ifile1 ifile2 ifile3 ofile</b>	

<b>ifthenc</b>	If then constant
<b>ifnotthenc</b>	If not then constant
<b>&lt;operator&gt; ,c ifile ofile</b>	

## Comparison

<b>eq</b>	Equal
<b>ne</b>	Not equal
<b>le</b>	Less equal
<b>lt</b>	Less than
<b>ge</b>	Greater equal
<b>gt</b>	Greater than
<b>&lt;operator&gt; ifile1 ifile2 ofile</b>	

<b>eqc</b>	Equal constant
<b>nec</b>	Not equal constant
<b>lec</b>	Less equal constant
<b>ltc</b>	Less than constant
<b>gec</b>	Greater equal constant
<b>gtc</b>	Greater than constant
<b>&lt;operator&gt; ,c ifile ofile</b>	

## Modification

<b>setpartab</b>	Set parameter table
<b>setpartab,table ifile ofile</b>	
<b>setcode</b>	Set code number
<b>setcode,code ifile ofile</b>	
<b>setparam</b>	Set parameter identifier
<b>setparam,param ifile ofile</b>	
<b>setname</b>	Set variable name
<b>setname,name ifile ofile</b>	
<b>setlevel</b>	Set level
<b>setlevel,level ifile ofile</b>	
<b>setltype</b>	Set GRIB level type
<b>setltype,ltype ifile ofile</b>	

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

<b>chcode</b>	Change code number
<b>chcode,oldcode,newcode[...] ifile ofile</b>	
<b>chparam</b>	Change parameter identifier
<b>chparam,oldparam,newparam,... ifile ofile</b>	
<b>chname</b>	Change variable name
<b>chname,oldname,newname,... ifile ofile</b>	
<b>chlevel</b>	Change level
<b>chlevel,oldlev,newlev,... ifile ofile</b>	
<b>chlevelc</b>	Change level of one code
<b>chlevelc,code,oldlev,newlev ifile ofile</b>	
<b>chlevelv</b>	Change level of one variable
<b>chlevelv,name,oldlev,newlev ifile ofile</b>	

<b>setgrid</b>	Set grid
<b>setgrid,grid ifile ofile</b>	
<b>setgridtype</b>	Set grid type
<b>setgridtype,gridtype ifile ofile</b>	
<b>setgridarea</b>	Set grid cell area
<b>setgridarea,gridarea ifile ofile</b>	

<b>setzaxis</b>	Set z-axis
<b>setzaxis,zaxis ifile ofile</b>	

<b>setgatt</b>	Set global attribute
<b>setgatt,attname,attstring ifile ofile</b>	
<b>setgatts</b>	Set global attributes
<b>setgatts,attfile ifile ofile</b>	

<b>invertlat</b>	Invert latitudes
<b>invertlat ifile ofile</b>	

<b>invertlev</b>	Invert levels
<b>invertlev ifile ofile</b>	

<b>maskregion</b>	Mask regions
<b>maskregion,regions ifile ofile</b>	

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

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

<b>enlarge</b>	Enlarge fields
<b>enlarge,grid ifile ofile</b>	

<b>setmissval</b>	Set a new missing value
<b>setmissval,newmiss ifile ofile</b>	
<b>setctomiss</b>	Set constant to missing value
<b>setmisstoc</b>	Set missing value to constant
<b>&lt;operator&gt; ,c ifile ofile</b>	
<b>setrtomiss</b>	Set range to missing value
<b>setvrange</b>	Set valid range
<b>&lt;operator&gt; ,rmin,rmax ifile ofile</b>	

Arithmetic

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

<b>addc</b>	Add a constant
<b>subc</b>	Subtract a constant
<b>mulc</b>	Multiply with a constant
<b>divc</b>	Divide by a constant
<b>&lt;operator&gt; ,c ifile ofile</b>	

<b>add</b>	Add two fields
<b>sub</b>	Subtract two fields
<b>mul</b>	Multiply two fields
<b>div</b>	Divide two fields
<b>min</b>	Minimum of two fields
<b>max</b>	Maximum of two fields
<b>atan2</b>	Arc tangent of two fields
<b>&lt;operator&gt; ifile1 ifile2 ofile</b>	

<b>monadd</b>	Add monthly time series
<b>monsub</b>	Subtract monthly time series
<b>monmul</b>	Multiply monthly time series
<b>monddiv</b>	Divide monthly time series
<b>&lt;operator&gt; ifile1 ifile2 ofile</b>	

<b>ymonadd</b>	Add multi-year monthly time series
<b>ymonsub</b>	Subtract multi-year monthly time series
<b>ymonmul</b>	Multiply multi-year monthly time series
<b>ymonddiv</b>	Divide multi-year monthly time series
<b>&lt;operator&gt; ifile1 ifile2 ofile</b>	

<b>ydayadd</b>	Add multi-year daily time series
<b>ydaysub</b>	Subtract multi-year daily time series
<b>ydaymul</b>	Multiply multi-year daily time series
<b>ydaydiv</b>	Divide multi-year daily time series
<b>&lt;operator&gt; ifile1 ifile2 ofile</b>	

<b>muldpm</b>	Multiply with days per month
<b>divdpm</b>	Divide by days per month
<b>muldpy</b>	Multiply with days per year
<b>divdpy</b>	Divide by days per year
<b>&lt;operator&gt; ifile ofile</b>	

Statistical values

Available statistical functions	<b>&lt;stat&gt;</b>
minimum	<b>min</b>
maximum	<b>max</b>
sum	<b>sum</b>
mean	<b>mean</b>
average	<b>avg</b>
variance	<b>var</b>
standard deviation	<b>std</b>
<b>consects</b>	Consecutive Timesteps
<b>&lt;operator&gt; ifile ofile</b>	

<b>ens&lt;stat&gt;</b>	Statistical values over an ensemble
<b>&lt;operator&gt; ifiles ofile</b>	
<b>enspctl</b>	Ensemble percentiles
<b>enspctl,p ifiles ofile</b>	
<b>ensrkhistspace</b>	Ranked Histogram averaged over time
<b>ensrkhisttime</b>	Ranked Histogram averaged over space
<b>ensroc</b>	Ensemble Receiver Operating characteristics
<b>&lt;operator&gt; obsfile ensfiles ofile</b>	

<b>enscrps</b>	Ensemble CRPS and decomposition
<b>enscrps rfile ifiles ofilebase</b>	
<b>ensbrs</b>	Ensemble Brier score
<b>ensbrs,x rfile ifiles ofilebase</b>	

<b>fld&lt;stat&gt;</b>	Statistical values over a field
<b>&lt;operator&gt; ifile ofile</b>	
<b>fldpctl</b>	Field percentiles
<b>fldpctl,p ifile ofile</b>	

<b>zon&lt;stat&gt;</b>	Zonal statistical values
<b>&lt;operator&gt; ifile ofile</b>	
<b>zonpctl</b>	Zonal percentiles
<b>zonpctl,p ifile ofile</b>	

<b>mer&lt;stat&gt;</b>	Meridional statistical values
<b>&lt;operator&gt; ifile ofile</b>	
<b>merpctl</b>	Meridional percentiles
<b>merpctl,p ifile ofile</b>	

<b>gridbox&lt;stat&gt;</b>	Statistical values over grid boxes
<b>&lt;operator&gt; ,nx,,ny ifile ofile</b>	

<b>vert&lt;stat&gt;</b>	Vertical statistical values
<b>&lt;operator&gt; ifile ofile</b>	

<b>timsel&lt;stat&gt;</b>	Time range statistical values
<b>&lt;operator&gt; ,nsets[,noffset[,nskip]] ifile ofile</b>	

<b>timselfctl</b>	Time range percentiles
<b>timselfctl,p,nsets[,noffset[,nskip]] ifile1 ifile2 ifile3 ofile</b>	

<b>run&lt;stat&gt;</b>	Running statistical values
<b>&lt;operator&gt; ,nts ifile ofile</b>	

<b>runpctl</b>	Running percentiles
<b>runpctl,p,nts ifile1 ofile</b>	

<b>tim&lt;stat&gt;</b>	Statistical values over all timesteps
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>hour&lt;stat&gt;</b>	Hourly statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>day&lt;stat&gt;</b>	Daily statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>mon&lt;stat&gt;</b>	Monthly statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>year&lt;stat&gt;</b>	Yearly statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>seas&lt;stat&gt;</b>	Seasonal statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>yhour&lt;stat&gt;</b>	Multi-year hourly statistical values
<b>&lt;operator&gt; ifile ofile</b>	

<b>yday&lt;stat&gt;</b>	Multi-year daily statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>ymon&lt;stat&gt;</b>	Multi-year monthly statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>yseas&lt;stat&gt;</b>	Multi-year seasonal statistical values
<b>&lt;operator&gt; ifile ofile</b>	

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

<b>ydrun&lt;stat&gt;</b>	Multi-year daily running statistical values
<b>&lt;operator&gt; ,nts ifile ofile</b>	

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

Correlation and co.

<b>fldcor</b>	Correlation in grid space
<b>fldcor ifile1 ifile2 ofile</b>	

<b>timcor</b>	Correlation over time
<b>timcor ifile1 ifile2 ofile</b>	

<b>fldcovar</b>	Covariance in grid space
<b>fldcovar ifile1 ifile2 ofile</b>	

<b>timcovar</b>	Covariance over time
<b>timcovar ifile1 ifile2 ofile</b>	

Regression

<b>regres</b>	Regression
<b>regres ifile ofile</b>	

<b>detrend</b>	Detrend
<b>detrend ifile ofile</b>	

<b>trend</b>	Trend
<b>trend ifile ofile1 ofile2</b>	

<b>subtrend</b>	Subtract trend
<b>subtrend ifile1 ifile2 ifile3 ofile</b>	

EOFs

<b>eof</b>	Calculate EOFs in spatial or time space
<b>eoftime</b>	Calculate EOFs in time space
<b>eofspatial</b>	Calculate EOFs in spatial space
<b>eof3d</b>	Calculate 3-Dimensional EOFs in time space
<b>&lt;operator&gt; ,neof ifile ofile1 ofile2</b>	

<b>eofcoeff</b>	Calculate principal coefficients of EOFs
<b>eofcoeff ifile1 ifile2 obase</b>	

Interpolation

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

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

<b>remap</b>	SCRIP grid remapping
<b>remap ,grid ,weights ifile ofile</b>	

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

<b>ml2pl</b>	Model to pressure level interpolation
<b>ml2pl ,plevels ifile ofile</b>	

<b>ml2hl</b>	Model to height level interpolation
<b>ml2hl ,hlevels ifile ofile</b>	

<b>intlevel</b>	Linear level interpolation
<b>intlevel ,levels ifile ofile</b>	

<b>intlevel3d</b>	Linear level interpolation onto a 3d vertical coordinate
<b>intlevelx3d</b>	like intlevel3d but with extrapolation
<b>&lt;operator&gt; ,icoordinate ifile1 ifile2 ofile</b>	

<b>inttime</b>	Interpolation between timesteps
<b>inttime ,date ,time[,inc] ifile ofile</b>	
<b>intntime</b>	Interpolation between timesteps
<b>intntime ,n ifile ofile</b>	

<b>intyear</b>	Interpolation between two years
<b>intyear ,years ifile1 ifile2 obase</b>	

Transformation

<b>sp2gp</b>	Spectral to gridpoint
<b>sp2gpl</b>	Spectral to gridpoint (linear)
<b>gp2sp</b>	Gridpoint to spectral
<b>gp2spl</b>	Gridpoint to spectral (linear)
<b>&lt;operator&gt; ifile ofile</b>	
<b>sp2sp</b>	Spectral to spectral
<b>sp2sp ,trunc ifile ofile</b>	

<b>dv2uv</b>	Divergence and vorticity to U and V wind
<b>dv2u vl</b>	Divergence and vorticity to U and V wind (linear)
<b>uv2dv</b>	U and V wind to divergence and vorticity
<b>uv2d vl</b>	U and V wind to divergence and vorticity (linear)
<b>dv2ps</b>	D and V to velocity potential and stream function
<b>&lt;operator&gt; ifile ofile</b>	

Import/Export

<b>import_binary</b>	Import binary data sets
<b>import_binary ifile ofile</b>	

<b>import_cmsaf</b>	Import CM-SAF HDF5 files
<b>import_cmsaf ifile ofile</b>	

<b>import_amsr</b>	Import AMSR binary files
<b>import_amsr ifile ofile</b>	

<b>input</b>	ASCII input
<b>input ,grid ofile</b>	
<b>inputsrv</b>	SERVICE ASCII input
<b>inputext</b>	EXTRA ASCII input
<b>&lt;operator&gt; ofile</b>	

<b>output</b>	ASCII output
<b>output ifiles</b>	
<b>outputf</b>	Formatted output
<b>outputf ,format ,nelem ifiles</b>	
<b>outputint</b>	Integer output
<b>outputsrv</b>	SERVICE ASCII output
<b>outputext</b>	EXTRA ASCII output
<b>&lt;operator&gt; ifiles</b>	

Miscellaneous

<b>gradsdes1</b>	GrADS data descriptor file (version 1 GRIB map)
<b>gradsdes2</b>	GrADS data descriptor file (version 2 GRIB map)
< operator > ifile	
<b>bandpass</b>	Bandpass filtering
<b>bandpass,fmin,fmax</b> ifile ofile	
<b>lowpass</b>	Lowpass filtering
<b>lowpass,fmax</b> ifile ofile	
<b>highpass</b>	Highpass filtering
<b>highpass,fmin</b> ifile ofile	
<b>gridarea</b>	Grid cell area
<b>gridweights</b>	Grid cell weights
< operator > ifile ofile	
<b>smooth9</b>	9 point smoothing
<b>smooth9</b> ifile ofile	
<b>setvals</b>	Set list of old values to new values
<b>setvals,oldval,newval[,...]</b> ifile ofile	
<b>setrtoc</b>	Set range to constant
<b>setrtoc,rmin,rmax,c</b> ifile ofile	
<b>setrtoc2</b>	Set range to constant others to constant2
<b>setrtoc2,rmin,rmax,c,c2</b> ifile ofile	
<b>timsort</b>	Sort over the time
<b>timsort</b> ifile ofile	
<b>const</b>	Create a constant field
<b>const,const.grid</b> ofile	
<b>random</b>	Create a field with random numbers
<b>random.grid[,seed]</b> ofile	
<b>stdatm</b>	Create values for pressure and temperature for hybrid
<b>stdatm,levels</b> ofile	
<b>rotuvb</b>	Backward rotation
<b>rotuvb,u,v,...</b> ifile ofile	
<b>mastrfu</b>	Mass stream function
<b>mastrfu</b> ifile ofile	
<b>histcount</b>	Histogram count
<b>histsum</b>	Histogram sum
<b>histmean</b>	Histogram mean
<b>histfreq</b>	Histogram frequency
< operator >,bounds ifile ofile	
<b>sethalo</b>	Set the left and right bounds of a field
<b>sethalo,lhalo,rhalo</b> ifile ofile	
<b>wct</b>	Windchill temperature
<b>wct</b> ifile1 ifile2 ofile	
<b>fdns</b>	Frost days where no snow index per time period
<b>fdns</b> ifile1 ifile2 ofile	
<b>strwin</b>	Strong wind days index per time period
<b>strwin[,v]</b> ifile ofile	
<b>strbre</b>	Strong breeze days index per time period
<b>strbre</b> ifile ofile	
<b>strgal</b>	Strong gale days index per time period
<b>strgal</b> ifile ofile	
<b>hurr</b>	Hurricane days index per time period
<b>hurr</b> ifile ofile	

Climate indices

<b>eca_cdd</b>	Consecutive dry days index per time period
<b>eca_cdd[,R]</b> ifile ofile	
<b>eca_cfd</b>	Consecutive frost days index per time period
<b>eca_cfd</b> ifile ofile	
<b>eca_csu</b>	Consecutive summer days index per time period
<b>eca_csu[,T]</b> ifile ofile	
<b>eca_cwd</b>	Consecutive wet days index per time period
<b>eca_cwd[,R]</b> ifile ofile	

<b>eca_cwdi</b>	Cold wave duration index wrt mean of reference period
<b>eca_cwdi[,nday[,T]]</b> ifile1 ifile2 ofile	
<b>eca_cwfi</b>	Cold-spell days index wrt 10th percentile of reference period
<b>eca_cwfi[,nday]</b> ifile1 ifile2 ofile	
<b>eca_etr</b>	Intra-period extreme temperature range
<b>eca_etr</b> ifile1 ifile2 ofile	
<b>eca_fd</b>	Frost days index per time period
<b>eca_fd</b> ifile ofile	
<b>eca_gsl</b>	Growing season length index
<b>eca_gsl[,nday[,T[,fland]]]</b> ifile1 ifile2 ofile	
<b>eca_hd</b>	Heating degree days per time period
<b>eca_hd[,T1[,T2]]</b> ifile ofile	

<b>eca_hwdi</b>	Heat wave duration index wrt mean of reference period
<b>eca_hwdi[,nday[,T]]</b> ifile1 ifile2 ofile	
<b>eca_hwfi</b>	Warm spell days index wrt 90th percentile of reference period
<b>eca_hwfi[,nday]</b> ifile1 ifile2 ofile	
<b>eca_id</b>	Ice days index per time period
<b>eca_id</b> ifile ofile	
<b>eca_pd</b>	Precipitation days index per time period
<b>eca_pd,x</b> ifile ofile	
<b>eca_r10mm</b>	Heavy precipitation days index per time period
<b>eca_r20mm</b>	Very heavy precipitation days index per time period
< operator > ifile ofile	

<b>eca_r75p</b>	Moderate wet days wrt 75th percentile of reference period
<b>eca_r75p</b> ifile1 ifile2 ofile	
<b>eca_r75ptot</b>	Precipitation percent due to R75p days
<b>eca_r75ptot</b> ifile1 ifile2 ofile	
<b>eca_r90p</b>	Wet days wrt 90th percentile of reference period
<b>eca_r90p</b> ifile1 ifile2 ofile	
<b>eca_r90ptot</b>	Precipitation percent due to R90p days
<b>eca_r90ptot</b> ifile1 ifile2 ofile	

<b>eca_r95p</b>	Very wet days wrt 95th percentile of reference period
<b>eca_r95p</b> ifile1 ifile2 ofile	
<b>eca_r95ptot</b>	Precipitation percent due to R95p days
<b>eca_r95ptot</b> ifile1 ifile2 ofile	
<b>eca_r99p</b>	Extremely wet days wrt 99th percentile of reference period
<b>eca_r99p</b> ifile1 ifile2 ofile	
<b>eca_r99ptot</b>	Precipitation percent due to R99p days
<b>eca_r99ptot</b> ifile1 ifile2 ofile	
<b>eca_rr1</b>	Wet days index per time period
<b>eca_rr1[,R]</b> ifile ofile	

<b>eca_rx1day</b>	Highest one day precipitation amount per time period
<b>eca_rx1day[,mode]</b> ifile ofile	
<b>eca_rx5day</b>	Highest five-day precipitation amount per time period
<b>eca_rx5day[,x]</b> ifile ofile	
<b>eca_sdii</b>	Simple daily intensity index per time period
<b>eca_sdii[,R]</b> ifile ofile	
<b>eca_su</b>	Summer days index per time period
<b>eca_su[,T]</b> ifile ofile	

<b>eca_tg10p</b>	Cold days percent wrt 10th percentile of reference period
<b>eca_tg10p</b> ifile1 ifile2 ofile	
<b>eca_tg90p</b>	Warm days percent wrt 90th percentile of reference period
<b>eca_tg90p</b> ifile1 ifile2 ofile	
<b>eca_tn10p</b>	Cold nights percent wrt 10th percentile of reference period
<b>eca_tn10p</b> ifile1 ifile2 ofile	
<b>eca_tn90p</b>	Warm nights percent wrt 90th percentile of reference period
<b>eca_tn90p</b> ifile1 ifile2 ofile	
<b>eca_tr</b>	Tropical nights index per time period
<b>eca_tr[,T]</b> ifile ofile	
<b>eca_tx10p</b>	Very cold days percent wrt 10th percentile of reference period
<b>eca_tx10p</b> ifile1 ifile2 ofile	

<b>eca_tx90p</b>	Very warm days percent wrt 90th percentile of reference period
<b>eca_tx90p</b> ifile1 ifile2 ofile	