

NetCDF Operator (NCO) Reference Card version 4.5.2

Syntax: **Operator** **Options** **Input_File(s)** **Output_File**

Hyperslab: **ncks** -d **dim_name,min,max[,stride]** in out

ncks -d lon,0,2 # First through third longitudes
ncks -F -d lon,1,3 # First through third longitudes
ncks -d lon,,2 # First through third longitudes
ncks -d lon,2, # Third to last longitudes
ncks -d lon,,,2 # First to last every other longitudes
ncks -d lon,-70.0,-10.0 # Lon values btw -70° and -10°
ncks -d time,'1939-09-09 12:00:0.0',\
'1945-05-08 00:00:0.0'
ncks -d time,'1918-11-11','1939-9-9'
ncks -d time,'1979-1',,12 # Every January

Concatenate Files: **ncecat** or **ncrcat**

Monthly files into annual with new dimension: month
ncecat -u month file_{1..12}.nc file_annual.nc
Station files into one with new dimension: stn
ncecat -u stn file_*.nc file_all.nc
Append files along time (ie, record dimension²)
ncrcat f1979-2003.nc f2004-2014.nc f1979-2014.nc

Average: **nces**, **ncra** or **ncwa**

nces file_*.nc file_avg.nc # Average of multiple files
Average of a certain time
nces -d time,"1979","2005" file_*.nc file_avg.nc
Average of all March using monthly data
ncra -d time,2,,12 in.nc out.nc
Average of all JJA using monthly data
ncra -d time,5,,12,3 in.nc out.nc
Average of each JJA using monthly data
ncra --mro -d time,5,,12,3 in.nc out.nc
Annual average from monthly data
ncra --mro -d time,,,12,12 in.nc out.nc
Monthly average of 2000 from daily data
for moy in {1..12}; do
mm=\$(printf "%02d" \${moy})
ncra -d time,"2000-\${mm}", in.nc out_\${mm}.nc
done
ncrcat out_??_nc out_mthly-avg.nc
Spatial average using geographical weights (gw)
ncwa -w gw -d lat,10.0,20.0 -d lon,30.0,35.0 \
-a lat,lon in.nc out.nc
Ensemble average using groups
nces --nsm_grp in.nc out.nc

Edit Attributes: **ncatted** -a **att,var,mode,type,value**

Append string to global attribute history
ncatted -a history,global,a,c,'some_string' in.nc
Overwrite att. long_name for variable T to Pressure
ncatted -a long_name,T,o,c,'Pressure' in.nc
Overwrite _FillValue for all variable to a float number
ncatted -a _FillValue,,o,f,1.0e36 in.nc
Delete attribute units for all variables
ncatted -a units,,d,, in.nc
Delete all attributes for variable var
ncatted -a ,var,d,, in.nc

Anomaly:

Step 1: annual average
ncra -d time,,11 in.nc annual_avg.nc
Step 2: subtraction
ncbo -d time,,11 in.nc annual_avg.nc out.nc

Standard Deviation (std):

Method 1: for large data file
Temporal std of all data in one file
Step 1: average
ncwa -a time in.nc avg.nc
Step 2: anomaly
ncbo in.nc avg.nc anm.nc
Step 3: root-mean square
ncra -y rmssdn anm.nc std.nc

Spatial std of all data in one file using weights
Step 1: average
ncwa -a lat,lon -w gw in.nc avg.nc
Step 2: anomaly
ncbo in.nc avg.nc anm.nc
Step 3: root-mean square
ncwa -y rmssdn -a lat,lon -w gw anm.nc std.nc

Method 2: for small data file

ncap2 -s 'var_std=(var-var.avg(\$time)).rmssdn(\$time)' \
in.nc out.nc

Selection: **Operator** **Options** in*.nc out.nc

<operator> -v var1,var2 # Include var1 and var2
<operator> -x -v var1 # Include all variables but var1
<operator> -g group2 -v var1 # Include var1 in group2
<operator> -x -g grp1 # Include all groups but grp1

Rename: **ncrename** **Options** in*.nc

ncrename -v old,new # Rename var from 'old' to 'new'
ncrename -d old,new # Rename dimension
ncrename -g old,new # Rename group
ncrename -v /grp/old,new # Rename var in group
ncrename -a old,new # Rename global attribute
ncrename -a var@old,new # Rename attribute of var

Specify Input Files:

input files: 85.nc, 86.nc, 87.nc, 88.nc, 89.nc
Operator -p input_path 85.nc 86.nc 87.nc 88.nc 89.nc
Operator 8[56789].nc
Operator 8?.nc # No other 8?.nc files
Operator -n file_num,digit_num,increment[,max_digit, \
min_digit,yyyymm]
Operator -n 5,2,1 85.nc
Operator -n 3,2,1 85_06.nc # Input 85_06 85_07 85_08
Operator -n 3,2,1,12 85_12.nc # 85_12 85_01 85_02
Op -n 3,6,1,12,1 198512.nc # 198512 198501 198502
198512 198601 198602
Op -n 3,6,1,12,1,yyyymm 198512.nc
198512 198612 198712
Op -n 3,6,1,12,12,yyyymm 198512.nc