NetCDF Operator (NCO) Reference Card version 4.6.1

This reference card includes some common features of NCO. It is for users to look up the syntax quickly. For details and more features, see NCO User's Guide at http://nco.sourceforge.net/#RTFM.

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 -70⁰ and -10⁰
```
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 dimension)
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 montly 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