NCAS CF-Checker

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is-enes
INFRASTRUCTURE FOR THE EUROPEAN NETWORK FOR EARTH SYSTEM MODELLING
Grant No. 824084

CF Workshop 9th-11th June 2020

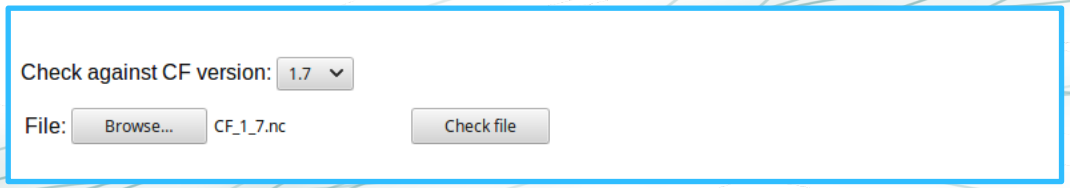
National Centre for Atmospheric Science
NATURAL ENVIRONMENT RESEARCH COUNCIL

CF-Checker

- Python utility to check conformance of a NetCDF file to the CF convention.
- Verifies against the requirements and recommendations set out in the CF Conformance document.
- Run via web interface, as a command-line script or imported as a python package.
- Can check conformance against any CF version
- Source code available on github
- Available from PyPI and conda

CF-Checker – Web Interface

Web interface available at:
https://pumatest.nerc.ac.uk/cgi-bin/cf-checker.pl
and
http://wps-web1.ceda.ac.uk/submit/form?proc_id=CFChecker



CF-Checker - Output

CF-Convention Compliance Checker for NetCDF Format

Checking against CF version 1.7...

Check another file | NetCDF format | CF Convention.

File name: CF_1_7.nc

Output of CF-Checker follows...

```
CHECKING NetCDF FILE: /tmp/3859.nc
==========
Using CF Checker Version 3.1.1
Checking against CF Version CF-1.7
Using Standard Name Table Version 72 (2020-03-10T11:52:02Z)
Using Area Type Table Version 9 (07 August 2018)
Using Standardized Region Name Table Version 4 (18 December 2018)

ERROR: (2.6.3): Variable external_var2 named as an external variable must not be present in this file

------------------
Checking variable: lat
------------------

------------------
Checking variable: lon
------------------
ERROR: (5): co-ordinate variable not monotonic

------------------
Checking variable: depth
------------------
WARN: (4.3): Positive attribute inconsistent with sign conventions implied by the standard_name
ERROR: (3.1): Units are not consistent with those given in the standard_name table.
ERROR: (5): co-ordinate variable not monotonic

------------------
Checking variable: time
------------------
ERROR: (5): co-ordinate variable not monotonic

------------------
Checking variable: crs
------------------
ERROR: (5.6): Attribute longitude_of_prime_meridian of incorrect data type (Appendix F)
ERROR: (5.6): reference_ellipsoid_name, prime_meridian_name, horizontal_datum_name and geographic_crs_name must all be definied if any one is defined

ERRORS detected: 26
WARNINGS given: 4
INFORMATION messages: 2
```

CF-Checker - Python

```
Python 3.7.4 (default, Aug 13 2019, 20:35:49)
[GCC 7.3.0] :: Anaconda, Inc. on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import cfchecker.cfchecks as cfchecks
>>> inst = cfchecks.CFChecker(silent=True)
>>> output = inst.checker('/home/ros/CF_1_8.nc')


>>> for l in output['global']['VERSION']:
... print(l)
...
CHECKING NetCDF FILE: /home/ros/CF_1_8.nc
Using CF Checker Version 4.0.0
Checking against CF Version CF-1.8
Using Standard Name Table Version 72 (2020-03-10T11:52:02Z)
Using Area Type Table Version 9 (07 August 2018)
Using Standardized Region Name Table Version 4 (18 December 2018)


>>> inst.get_total_counts()
OrderedDict([('FATAL', 0), ('ERROR', 27), ('WARN', 4), ('INFO', 2), ('VERSION', 7)])
```

CF-Checker – Python (2)

```
>>> output['variables'].keys()
odict_keys(['lat', 'lon', 'depth', 'time', 'tas', 'precipitation',
'external_var2', 'arv1', 'arv2', 'arv3', 'arv4', 'current_speed_qc',
'current_speed_qc2', 'n_heat_transport', 'geo_region', 'lev', 'PS', 'sigma',
'var2', 'var3', 'sigma2', 'temp', 'crs'])
```

```
>>> output['variables']['lat']
{'FATAL': [], 'ERROR': [], 'WARN': [], 'INFO': [], 'VERSION': []}
```

```
>>> output['variables']['depth']
{'FATAL': [], 'ERROR': ['(3.1): Units are not consistent with those given
in the standard_name table.', '(5): co-ordinate variable not monotonic'],
'WARN': ['(4.3): Positive attribute inconsistent with sign conventions
implied by the standard_name'], 'INFO': [], 'VERSION': []}
```

Current Status

- Currently up to and including CF-1.7

- In process of upgrading for CF-1.8:
  - Bug fixes
  - Geometries checks are almost complete
  - Groups still to do.
  - This will use the new NetCDF Flattener software written by EUMETSAT team

- Aiming for pre-release by mid-July

Futures

- Grown organically and is becoming harder to maintain in its current state
- NCAS has funding to redevelop the checker
- Will make it easier for the community to contribute
- Maintain a development branch:
  Conformance document now within the Conventions repository. Easier to continuously update and thus release new version much sooner after CF release

NCAS work on CF is additionally supported by the IS-ENES3 project funded by the European Commission under grant no. 824084