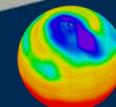




CF Standard Names: Current Status and What's New

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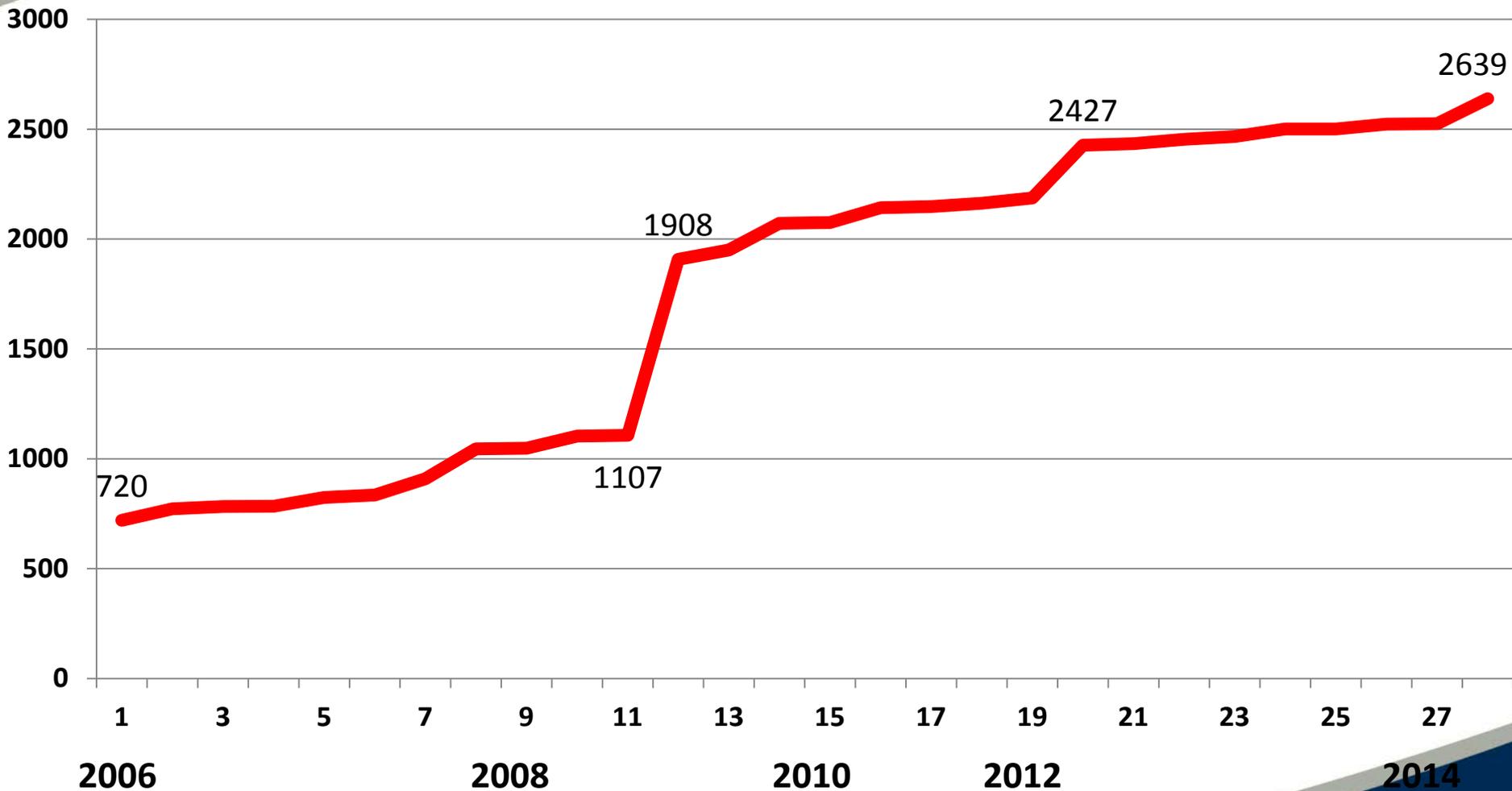


Why standard names?

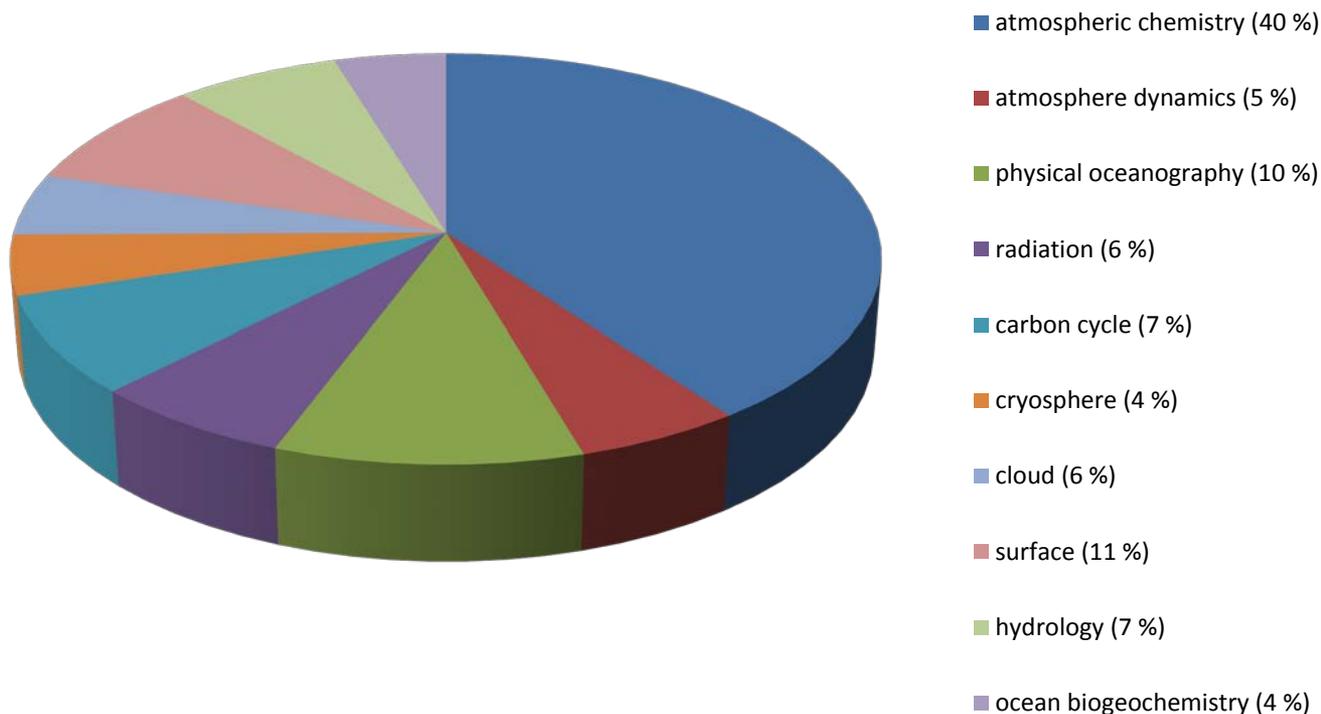
- *Geophysical* parameter names
- Can two quantities be compared?

Standard Name	Canonical Units
<p>air_potential_temperature</p> <p>Potential temperature is the temperature a parcel of air or sea water would have if moved adiabatically to sea level pressure.</p>	K
<p>surface_upward_latent_heat_flux</p> <p>The surface latent heat flux is the exchange of heat between the surface and the air on account of evaporation (including sublimation). In accordance with common usage in geophysical disciplines, "flux" implies per unit area, called "flux density" in physics.</p>	K

Number of CF Standard Names by Table Version



CF standard names by science domain (V 28)



Managing CF Standard Names

- New names must be proposed on CF mailing list:
 - <http://mailman.cgd.ucar.edu/pipermail/cf-metadata/>
 - Include name, unit, definition
- All list members may comment on proposals
- Aim is to achieve community consensus
- CF governance committee can be asked to vote if consensus cannot be achieved



CMIP6

- For CMIP5, first agreed which experiments would be performed
- The model output variables were defined for each experiment
- A representative for each “MIP” proposed all the names for, e.g. carbon cycle, and acted as primary contact
- Tried and tested approach
- Process of agreeing standard names should begin as soon as outputs are defined



CEDA Standard Names Editor

optical_particle_diameter

under discussion

[View](#)

Proposer: Markus Fiebig

Proposed Date: Nov. 26, 2014

Comments: 16a

CF mailing list link: [standard names for surface aerosol](#)

Units: m

New Term

[optical properties](#)

(<http://vocab.ndg.nerc.ac.uk/term/P061/current/ULAA>)

The diameter of spherical particles whose presence in a medium would result in the same refractive index and lead to the same intensity of scattered light as the particles in question.

toa_incoming_photon_solar_irradiance_per_unit_wavelength

new

[View](#)

Proposer: Maarten Sneep

Proposed Date: Nov. 12, 2014

Comments:

CF mailing list link: [Proposal for standard names: radiance and irradiance as measured from satellite](#)

Units: mol m⁻² m⁻¹ s⁻¹

New Term

"toa" means top of atmosphere. "Photon solar irradiance" is the photon flux on a surface perpendicular to the incoming solar radiation. The direction is specified as "incoming". A photon flux is specified in terms of numbers of photons expressed in moles. The "per unit wavelength" indicates a spectrally resolved quantity. A coordinate variable for radiation wavelength should be given the standard name radiation_wavelength.

<http://cfeditor.ceda.ac.uk/proposals/1>



Publishing CF Standard Names

- CF website:

<http://cfconventions.org/>

- XML
- HTML

<http://cfconventions.org/Data/cf-standard-names/current/build/cf-standard-name-table.html>

- NERC vocabulary server

<http://vocab.ndg.nerc.ac.uk/list/P071/current>



Other CF Vocabularies

- Area types

<http://cfconventions.org/Data/area-type-table/current/build/area-type-table.html>

<http://vocab.ndg.nerc.ac.uk/list/P291/current>

- Region list

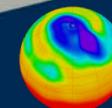
<http://cfconventions.org/Data/cf-standard-names/docs/standardized-region-names.html>

<http://vocab.ndg.nerc.ac.uk/list/P301/current>



Strengths of CF approach

- (Almost) all standard names have accompanying definition
- Self consistent names and definition text
- Arrived at by community engagement in transparent process
- Real strength is in discussion process -> “canned expertise”
- Expanded well beyond original aims of only gridded model data and only climate and forecast data
- Standard names and other controlled vocabs useful outside CF/netCDF framework



Use Case 1: ASCII files

- **NASA Ames:** used for 1D, or sometimes 2D data.
- Self-describing and human readable BUT
- Allows variable names like “fred1”, “fred2”
-> CEDA recommended practice is to use CF standard names
- Similarly for **BADC CSV** files: use metadata conventions on top of comma separated values files (CSV) as produced by applications like Excel

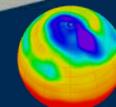
Use Case 2: CHARMe



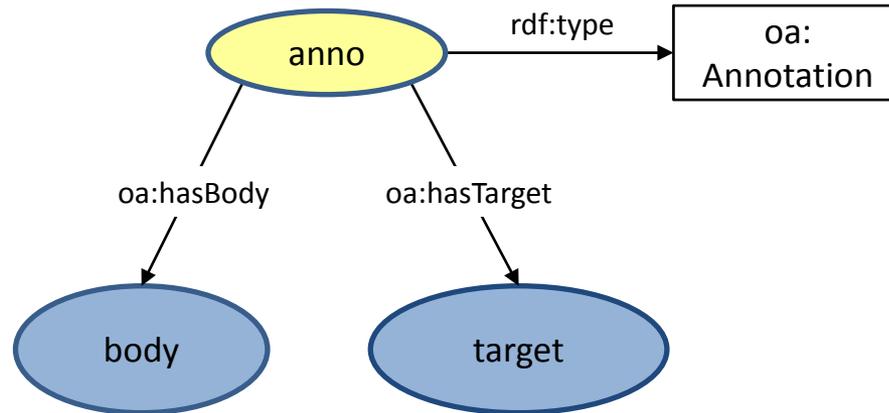


Use Case 2: CHARMe

- Help users of climate data to judge whether a dataset is suitable for their own application
- Different users require different information e.g. reports on validation campaigns, the robustness of the algorithms used
- **'Commentary' metadata**
- A javascript plugin integrated into a data catalogue search allows the data providers and users end user to create an annotation and link it to the data



Open Annotation



- The core to the model are these basic concepts:
 - **target** – the subject of an annotation
 - **body** – a comment, classification or another resource which is to be associated with the target
 - **annotation** - the conceptual linkage between the two

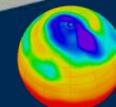


Use Case 2: CHARMe

- “Fine grained commentary” tool allows annotation of part of a dataset
- For annotation with calendar type and vertical coverage CF terms were chosen:

<http://vocab.ndg.nerc.ac.uk/list/P370/current>

<http://vocab.ndg.nerc.ac.uk/list/P380/current>



What next for standard names?

- External vocabularies
- Already one example in standard name table:
land_cover_lccs
Standardized strings taken from UN Land Cover Classification System
- Other candidates:
 - Biological taxa

float abundance(time,taxon);

abundance:standard_name="number_concentration_of_taxon_in_sea_water";
abundance:coordinates="taxon_identifier taxon_name";

– Chemical species?

CF - GRIB interoperability

- **GRIB**
 - operational meteorological format
 - Designed for telecommunications
 - Governed by WMO
 - Mixture of file format + metadata convention
 - TABLE DRIVEN
- **CF**
 - Used by research community
 - Designed for use with files
 - Governed by user community
 - File format NetCDF, metadata model is CF
 - Files are (usually) self describing



Mapping GRIB and CF parameters

- What information would mappings need to capture?

A **simple(!)** example:

CF std name table vn 27: tropopause_air_temperature

MAPS TO

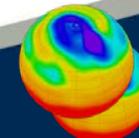
GRIB ed 2: Master table vn 12:

Master table 0.0 code 0 (meteorological product):

Master table 4.1 code 0 (temperature category):

Master table 4.2 code 0 (parameter is temperature):

Master table 4.5 code 7 (tropopause)





Questions?