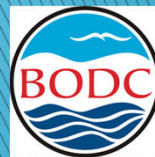


# SeaDataNet: Data Formats

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**British Oceanographic  
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# Aims

- ▶ To add NetCDF as a file format to SeaDataNet
- ▶ Why?
  - CF (Climate & Forecast) conventions became available for data other than grids.
  - Enables interoperability with many other users
    - MyOcean
    - US National Oceanographic Data Center
    - National Center for Atmospheric Research
    - Australian Ocean Data Network (IMOS, METOC)
- ▶ CF evolves
  - SeaDataNet uses the CF 1.6 standard (Dec 2011)
  - Latest version as of now



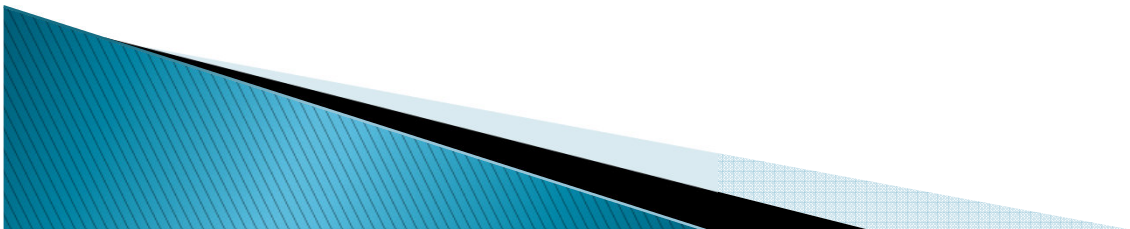
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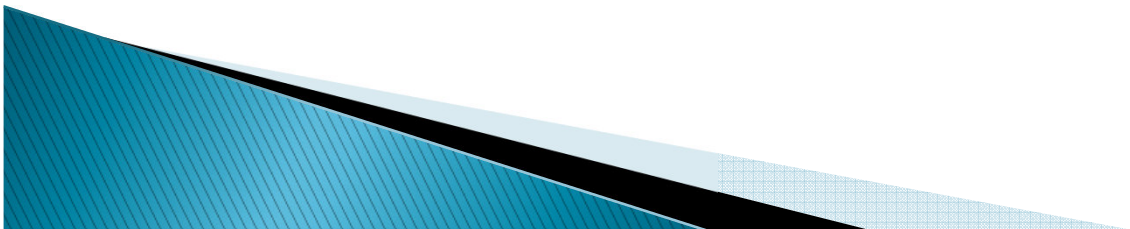
# How?

- ▶ Group of experts recruited
  - Members from
    - SeaDataNet TTT
    - OceanSITES / MyOcean
    - UNIDATA
      - Including author of CF point data conventions
    - US National Oceanographic Data Center
    - IMOS and METOC in Australia
- ▶ Specification developed by group
  - Through use of an active e-mail list



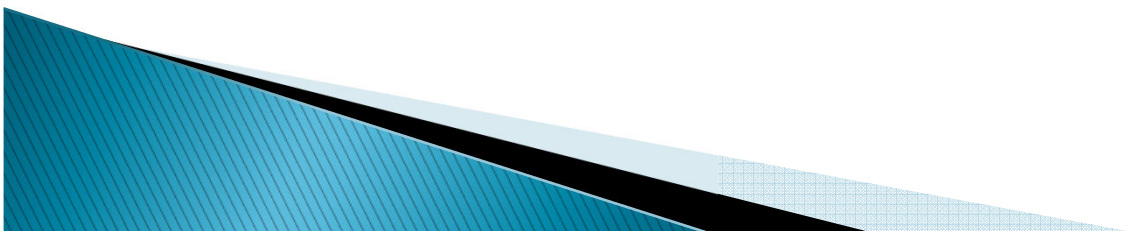
# Current status

- ▶ CF defines profiles for
  - Point data
  - Time series data
  - Profile data
  - Trajectory data
  - Time series of profiles (e.g. ADCP)
  - Trajectory of profiles (e.g. VMADCP)



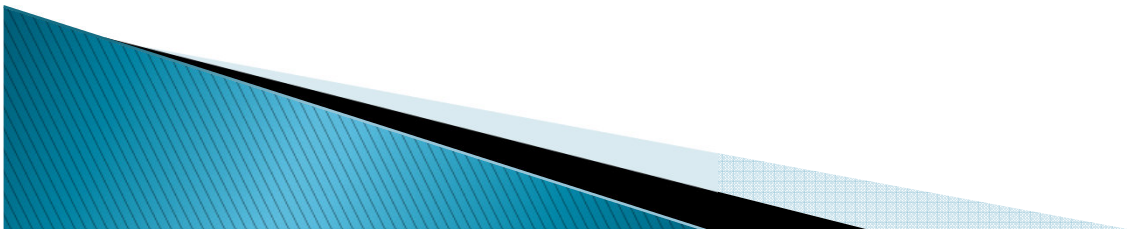
# Current status

- ▶ SeaDataNet CF profiles developed for
  - Point data
  - Time series data
  - Profile data
  - Trajectory data
  - Time series of profiles (e.g. ADCP)
    - Huge repetition of z-coordinate variables
  - Trajectory of profiles (e.g. VMADCP)



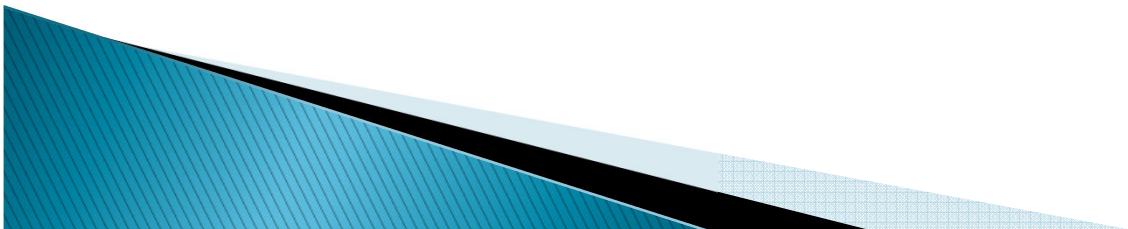
# Profiling process

- ▶ Addition of SeaDataNet standards to CF
  - Conventions for co-ordinate variables
    - Time, latitude, longitude
      - --
      - -- SeaDataNet CRS reporting – include verbatim
      - --
      - int crs ;
      - crs:grid\_mapping\_name = "latitude\_longitude"
      - crs:epsg\_code = "EPSG:4326"
      - crs:semi\_major\_axis = 6378137.0 ;
      - crs:inverse\_flattening = 298.257223563 ;
  - Convention for auxiliary variables
    - SeaDataNet flags



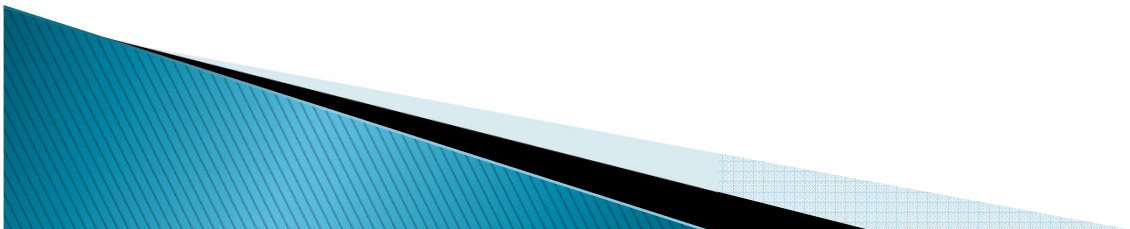
# Profiling process

- ▶ Addition of SeaDataNet standards to CF
  - Conventions for attributes
    - “Semantic header”
      - URNs and plain text labels
        - --
        - -- SeaDataNet semantic extensions – mandatory for SeaDataNet
        - --
        - LONGITUDE:sdn\_parameter\_urn = "SDN:P01::ALONZZ01" ;
        - LONGITUDE:sdn\_parameter\_name = "Longitude east" ;
        - LONGITUDE:sdn\_uom\_urn = "SDN:P06::DEGE" ;
        - LONGITUDE:sdn\_uom\_name = "Degrees east" ;
  - Mandatory metadata deliberately “light”



# Interoperability

- ▶ To interoperate with another profile
  - Include their conventions!
  - e.g.
    - MyOcean flagging scheme



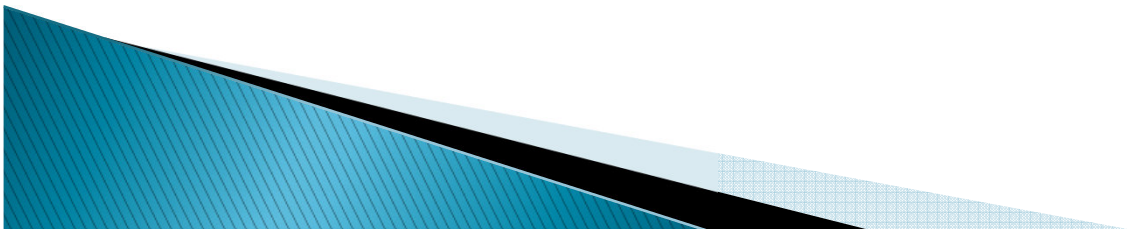


# Interoperability

```
-- Again we have flags in OceanSITES (optional) and SeaDataNet
-- (mandatory) conventions.
--
-- OceanSITES
--
    byte PSAL_OCEANSITES_QC(INSTANCE, MAXZ) ;
        PSAL_OCEANSITES_QC:long_name = "OceanSites quality flag" ;
        PSAL_OCEANSITES_QC:Conventions = "OceanSites reference table 2" ;
        PSAL_OCEANSITES_QC:_FillValue = -128b ;
        PSAL_OCEANSITES_QC:valid_min = 0b ;
        PSAL_OCEANSITES_QC:valid_max = 9b ;
        PSAL_OCEANSITES_QC:flag_values = 0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b,
9b ;
        PSAL_OCEANSITES_QC:flag_meanings = "no_qc_performed    good_data
probably_good_data    bad_data_that_are_potentially_correctable    bad_data
value_changed_not_used nominal_value interpolated_value missing_value" ;
--
-- SeaDataNet flag
--
    byte PSAL_SEADATANET_QC(INSTANCE, MAXZ) ;
        PSAL_SEADATANET_QC:long_name = "SeaDataNet quality flag" ;
        PSAL_SEADATANET_QC:Conventions = "SeaDataNet measurand qualifier
flags" ;
        PSAL_SEADATANET_QC:_FillValue = 57b ;
        PSAL_SEADATANET_QC:sdn_conventions_urn = "SDN:L20::";
        PSAL_SEADATANET_QC:flag_values = 48b, 49b, 50b, 51b, 52b, 53b, 54b,
55b, 56b, 57b, 65b ;
        PSAL_SEADATANET_QC:flag_meanings = "no_quality_control good_value
probably_good_value    probably_bad_value    bad_value    changed_value
value_below_detection    value_in_excess    interpolated_value    missing_value
value_phenomenon_uncertain" ;
```

# Implementation

- ▶ Latest version of NEMO produces CF–NetCDF
  - More to come on this later
- ▶ [http://www.seadatanet.org/content/download/16251/106283/file/SDN2\\_D85\\_WP8\\_Datafile\\_formats.pdf](http://www.seadatanet.org/content/download/16251/106283/file/SDN2_D85_WP8_Datafile_formats.pdf)



# Thank you!

▶ Any questions?

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