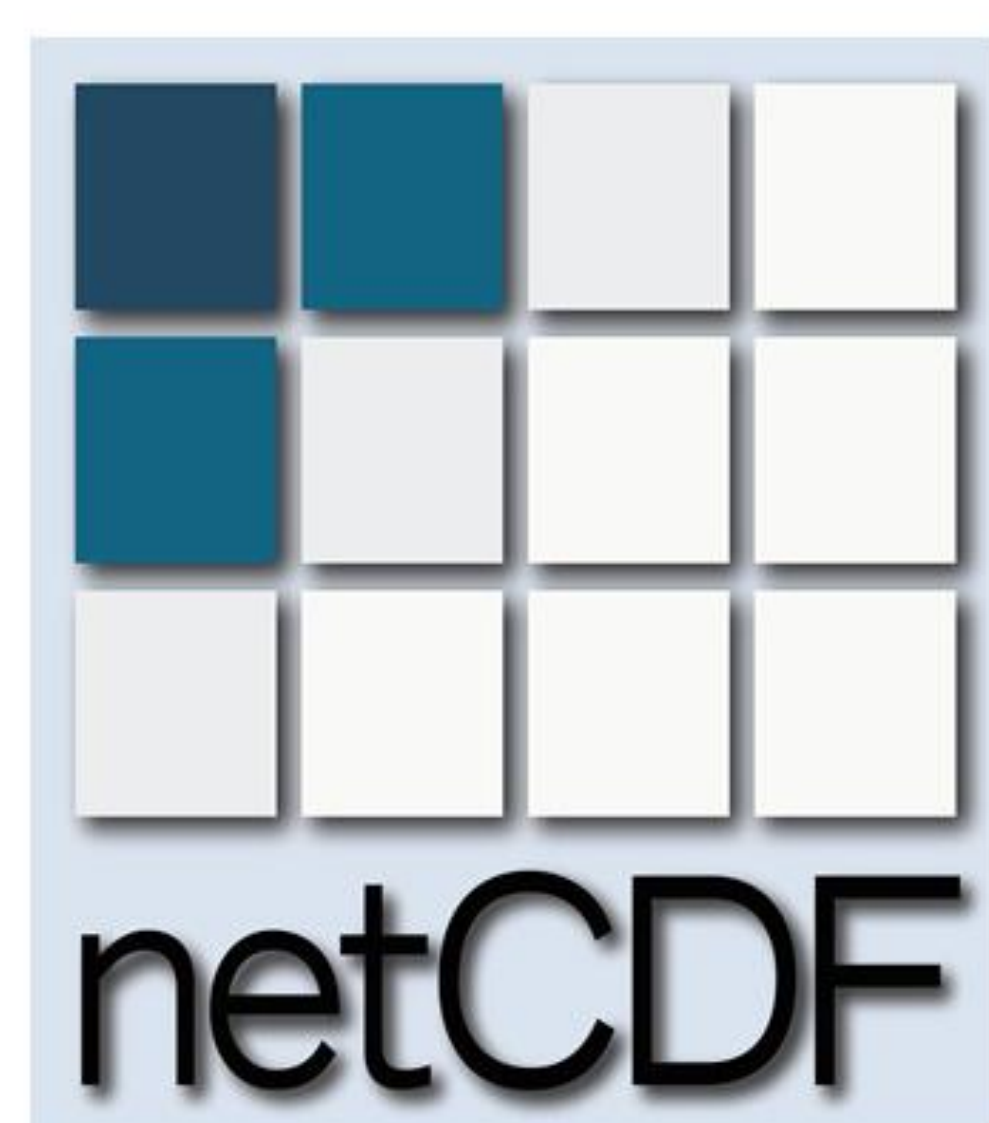


netCDF-LD: Enabling Linked Data for netCDF

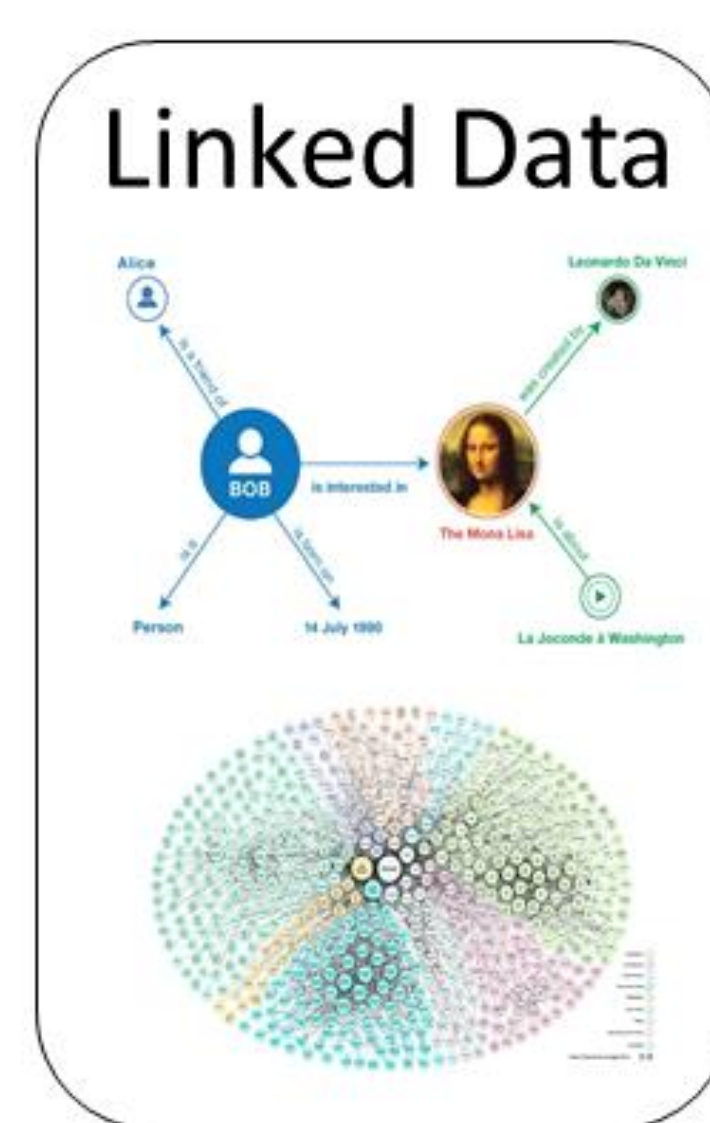
Jonathan Yu (CSIRO Australia), Mark Hedley (UK Met. Office), Adam Leadbetter (Marine Inst. Galway, Ireland), James Biard (Cooperative Institute for Climate and Satellites, Asheville, North Carolina, USA)

netCDF-LD is an approach for constructing Linked Data descriptions using the metadata and structures found in netCDF files. netCDF-LD enhances netCDF metadata, enabling information found in netCDF files to be linked with published conventions and controlled vocabularies used to express the content such as CF and ACDD. We are currently working on an OGC encoding standard for encoding linked data semantics into netCDF files and interpreting netCDF Classic files as RDF graphs.

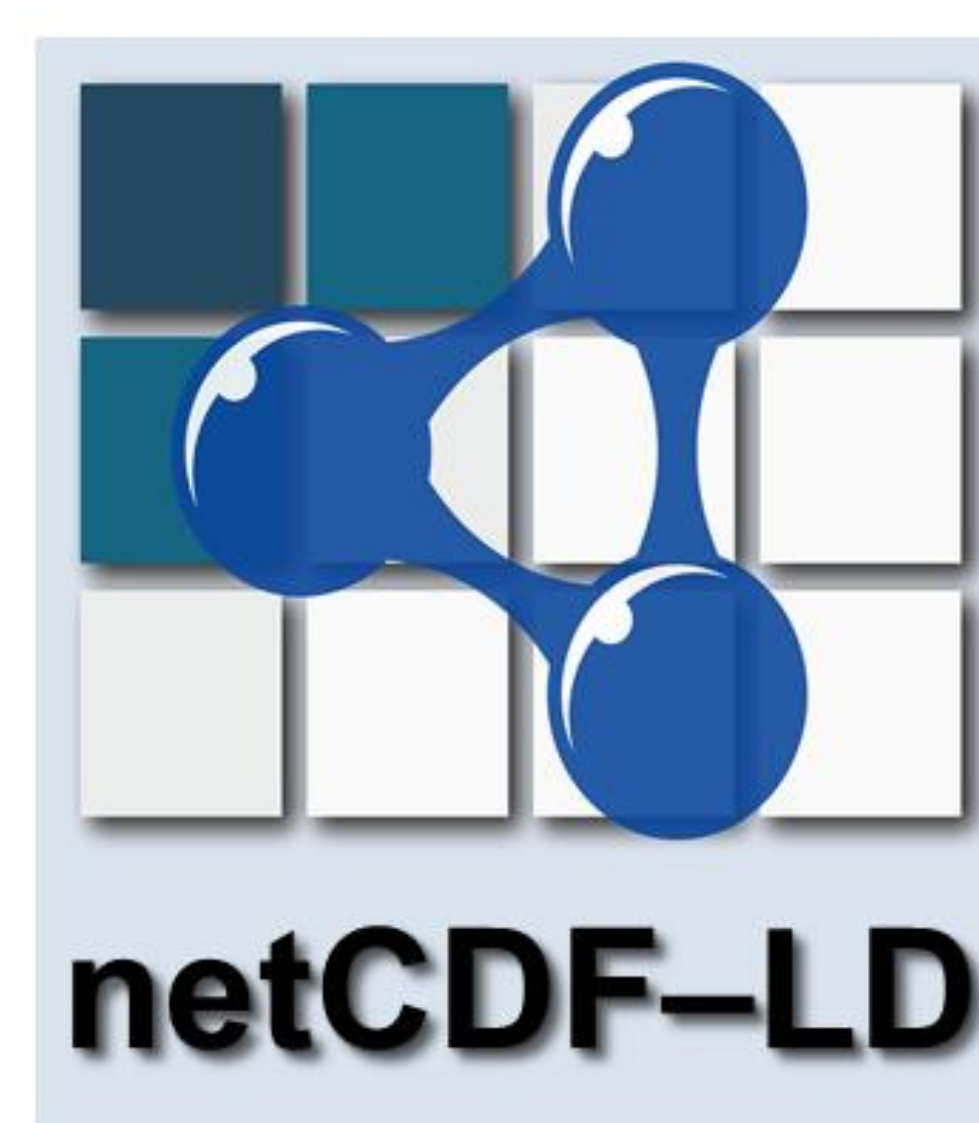


Commonly used format.
Lots of uptake and tools.

Many conventions.
Lots of data in netCDF!



Linked Data is a set of World Wide Web Consortium (W3C) best practices to allow structured data to be published so that it can be interlinked on the web and support semantic queries. Resource Description Framework (RDF) is used to express the information and relationships.



Recipe for constructing Linked Data from netCDF files (via aliasing and prefixing).

Opportunity to define conventions and validate them.

Enhance the usefulness of netCDF data by enabling linking to other resources.

variables:

```
int alias_list ;
alias_list:SDN_ParameterDiscoveryCode =
  "http://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/
  cdicSrCodelist.xml#SDN_ParameterDiscoveryCode" ;
alias_list:BactTaxaAbundSed =
  "http://vocab.nerc.ac.uk/collection/P02/current/BAUC/" ;
alias_list:standard_name =
  "https://def.scitools.org.uk/CFTerms/standard_name" ;
alias_list:air_temperature =
  "http://vocab.nerc.ac.uk/collection/P07/current/CFSN0023/" ;
```

```
int variable(pdIm0, pdIm1) ;
variable:SDN_ParameterDiscoveryCode = "BactTaxaAbundSed" ;
int cfvariable(pdIm0, pdIm1) ;
cfvariable:standard_name = "air_temperature" ;
```

```
// global attributes:
:isAliasedBy = "alias_list" ;
```

Alias Mappings

Variable metadata

Aliasing

Prefixing

variables:

```
int prefix_list;
prefix_list:cf_ = https://def.scitools.org.uk/CFTerms/
prefix_list:cfsn_ = http://mmisw.org/ont/cf/parameter/
prefix_list:feature_ = "http://environment.data.gov.au/def/feature/" ;
prefix_list:property_ = "http://environment.data.gov.au/def/property/" ;
prefix_list:ereefs_ = "http://registry.it.csiro.au/sandbox/nclld/ereefs-attributes/" ;
```

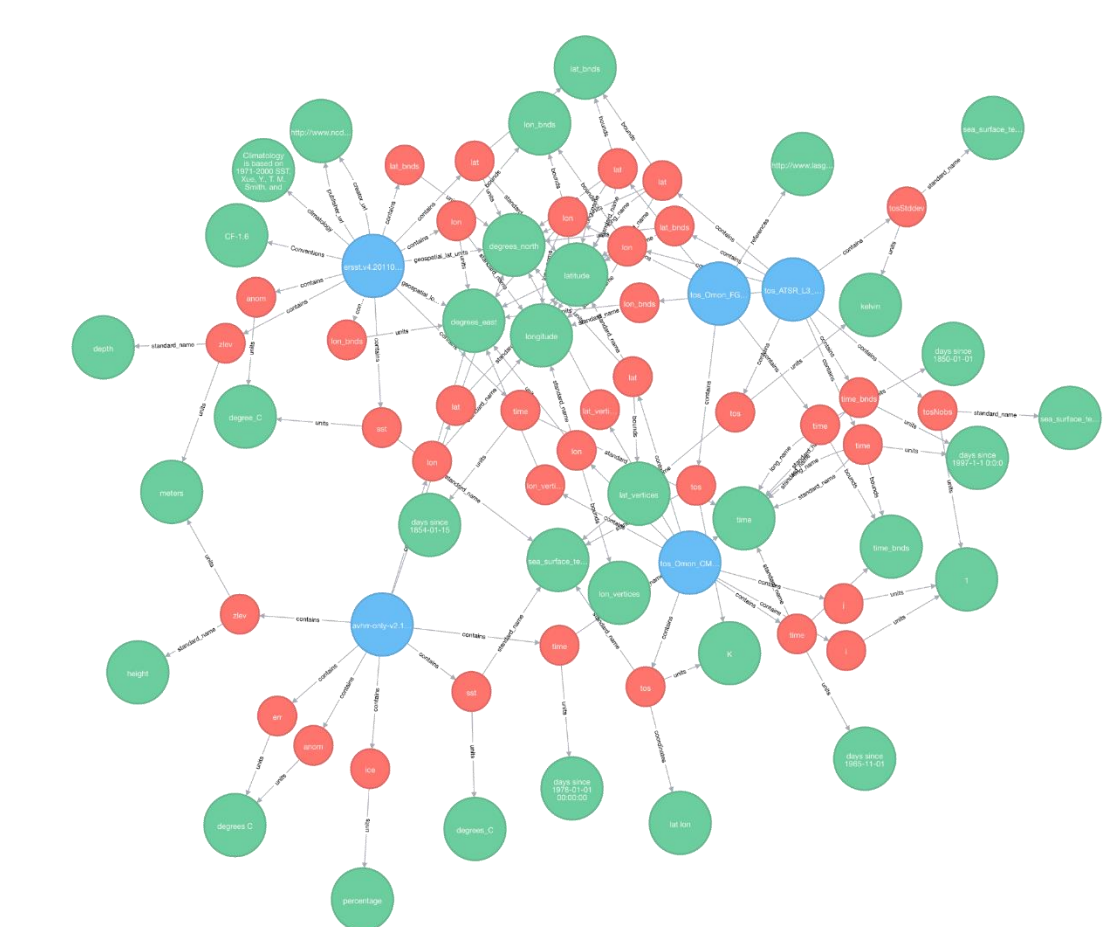
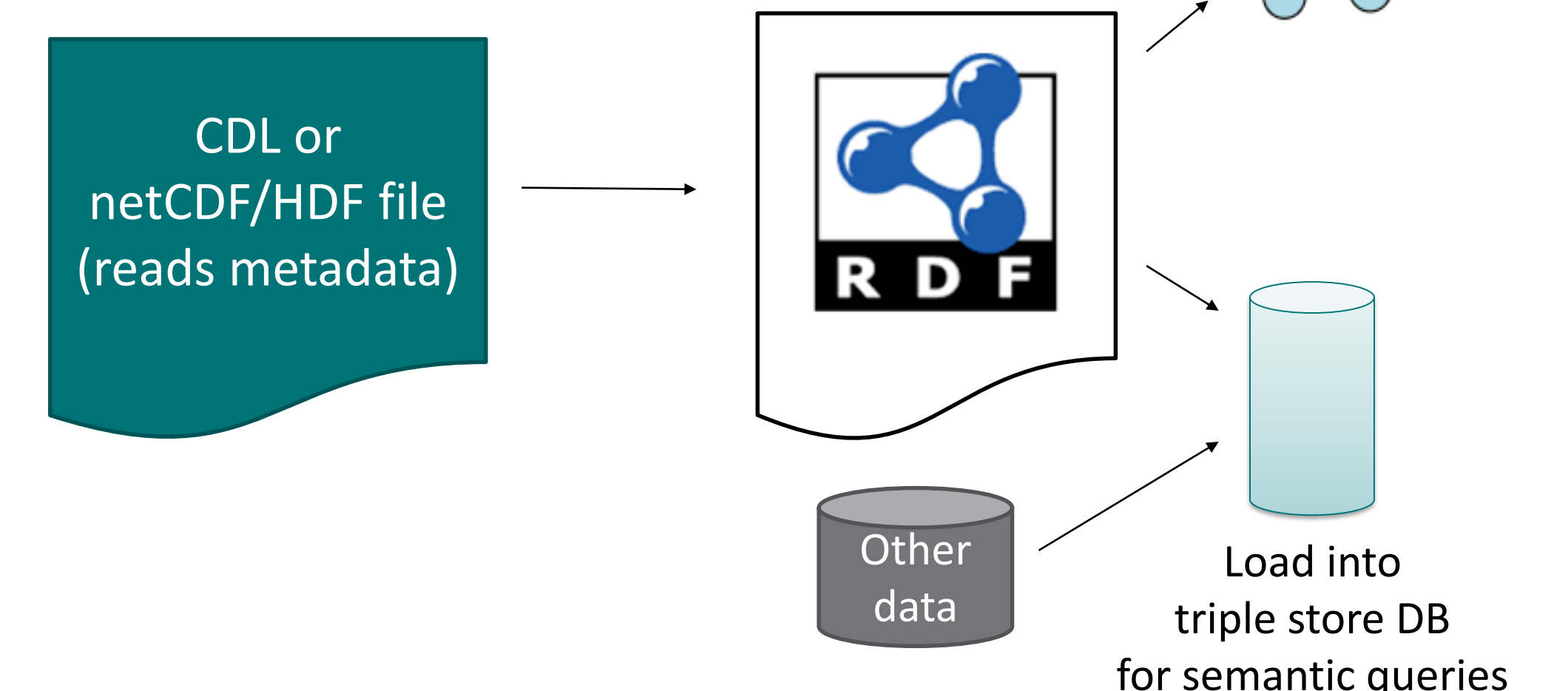
```
float eta(time, j, i) ;
eta:units = "metre" ;
eta:cf_long_name = "Surface elevation" ;
eta:cf_standard_name = "cfsn sea surface height above sea level" ;
eta:ereefs_medium_id = "feature_ocean"
eta:ereefs_scaledQuantityKind_id = "property sea surface elevation"
eta:ereefs_substanceOrTaxon_id = "feature_ocean near surface"
```

Prefix Mappings

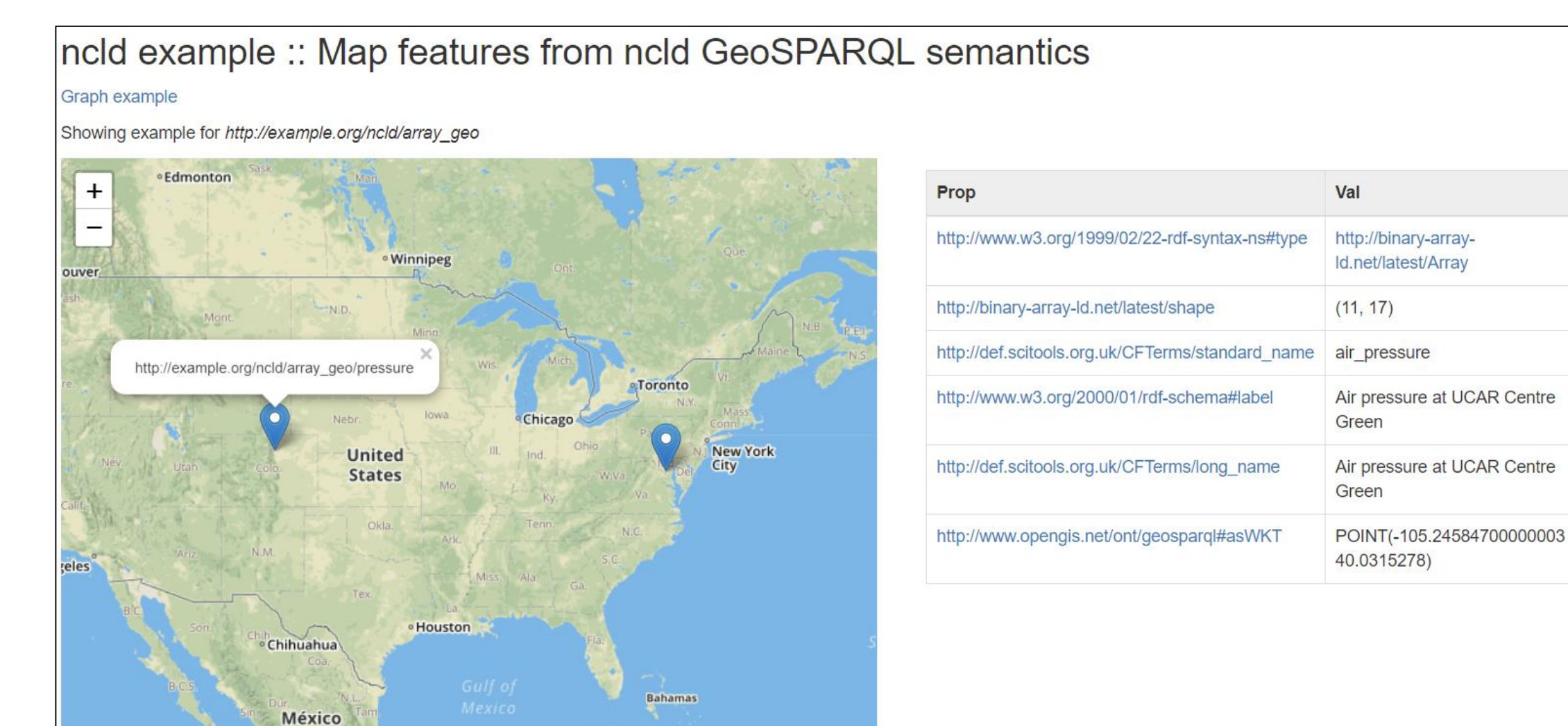
Variable metadata

Example tools

\$ python nc2rdf.py example.cdl (visualisation)



Knowledge graph generated from 5 netCDF files



Want to Contribute?

You can:

- Suggest improvements
- Explore adoption
- Provide feedback on the specification
- Join the working group

Contact:

Jonathan Yu (CSIRO), jonathan.yu@csiro.au

Links:

<https://github.com/opengeospatial/netCDF-Classic-LD>

<http://tinyurl.com/netcdf-ld>

