

# Metadata aspects at DKRZ

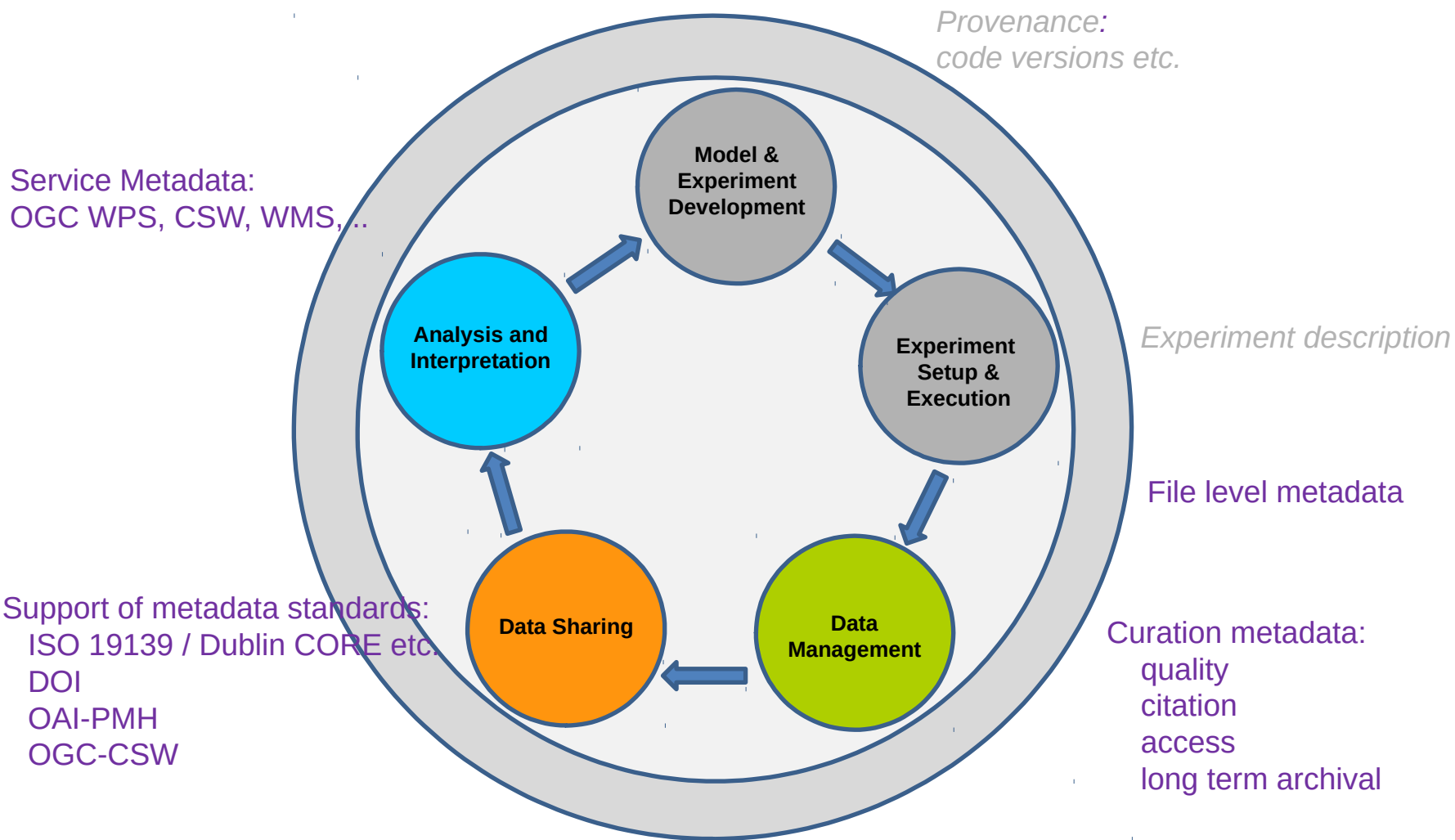
LSDMA Metadata Topical Meeting  
October 2014

Carsten Ehbrecht  
Stephan Kindermann

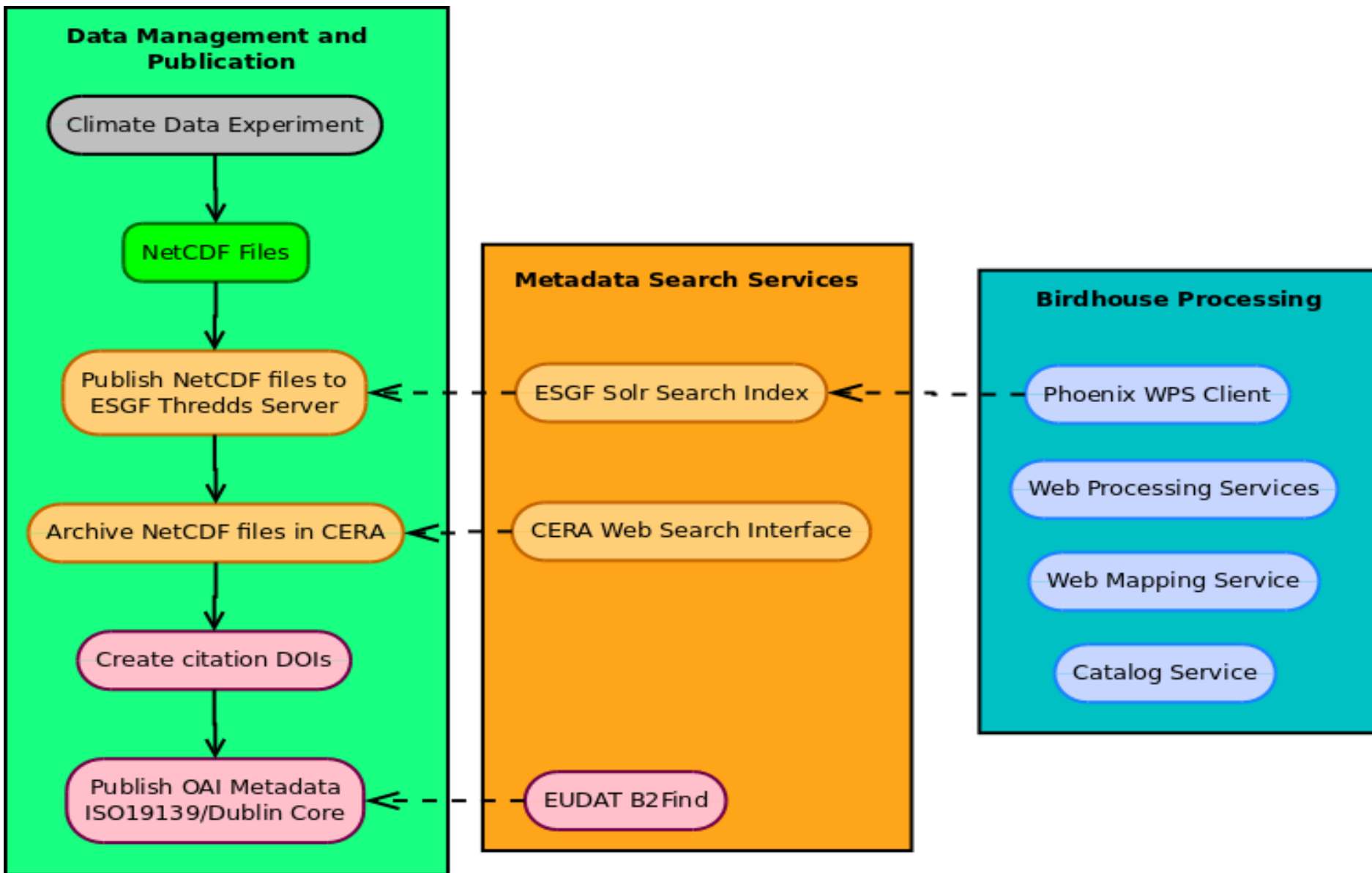
# Overview

- Metadata aspects in the Climate Data Life Cycle
- From experiment outputs over data management to data processing ...
- Example Processing Application: LSDMA Birdhouse Project
- Summary / Discussion

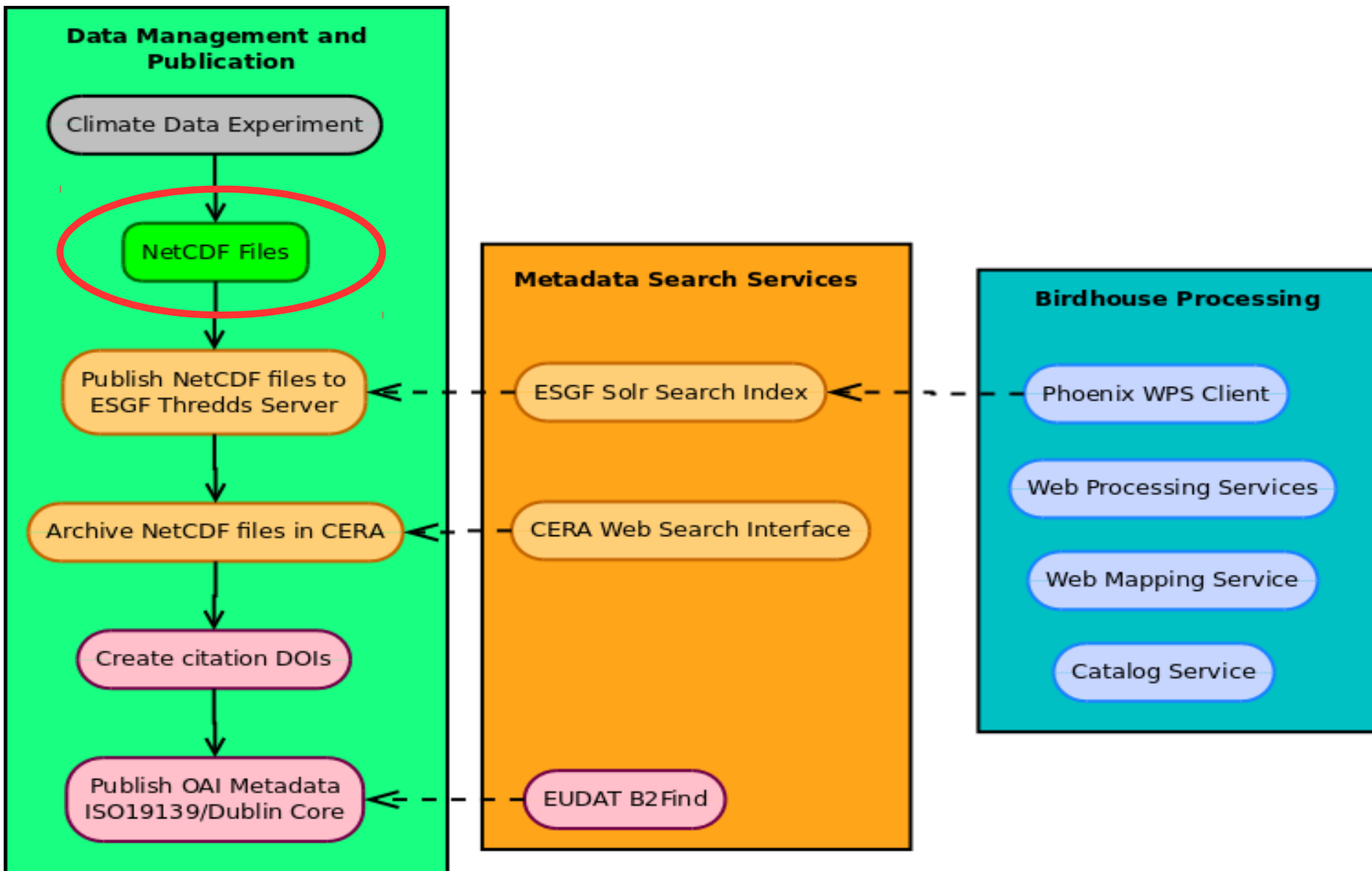
# Climate Data Life Cycle: Metadata



# Leitmotif: the red yarn ...

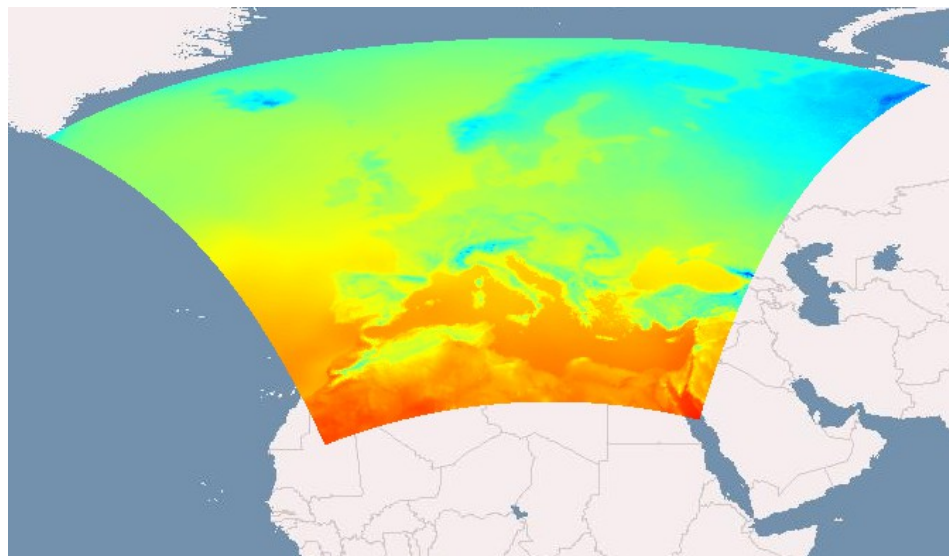


# Leitmotif: the red yarn ... NetCDF



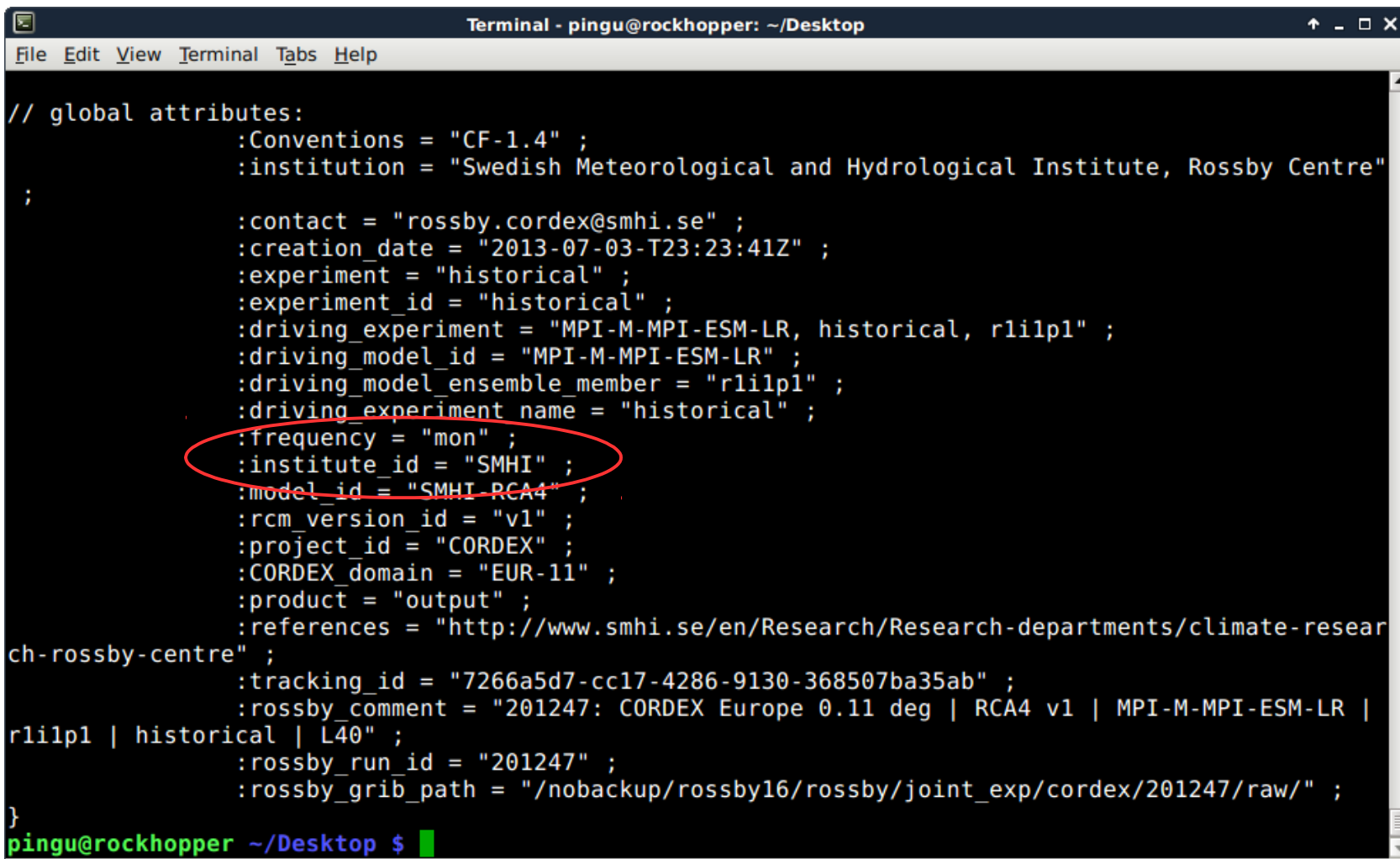
# Experiment Output: NetCDF files

- NetCDF = Network Common Data Form
- Open standard file format for array-oriented scientific data
- Self-describing: contains metadata as key/value attributes
  - Additional metadata: author, institute, variables names (CF conventions), ...
- Other formats used in climate science:
  - GRIB (contains no key/value metadata)
- <http://en.wikipedia.org/wiki/NetCDF>



# Example: Metadata of NetCDF file

```
$ ncdump -h cordex.nc
```



```
Terminal - pingu@rockhopper: ~/Desktop
File Edit View Terminal Tabs Help

// global attributes:
    :Conventions = "CF-1.4" ;
    :institution = "Swedish Meteorological and Hydrological Institute, Rossby Centre"
;

    :contact = "rossby.cordex@smhi.se" ;
    :creation_date = "2013-07-03-T23:23:41Z" ;
    :experiment = "historical" ;
    :experiment_id = "historical" ;
    :driving_experiment = "MPI-M-MPI-ESM-LR, historical, rlilp1" ;
    :driving_model_id = "MPI-M-MPI-ESM-LR" ;
    :driving_model_ensemble_member = "rlilp1" ;
    :driving_experiment name = "historical" ;
    :frequency = "mon" ;
    :institute_id = "SMHI" ;
    :model_id = "SMHI-RCA4" ;
    :rcm_version_id = "v1" ;
    :project_id = "CORDEX" ;
    :CORDEX_domain = "EUR-11" ;
    :product = "output" ;
    :references = "http://www.smhi.se/en/Research/Research-departments/climate-research-rossby-centre" ;
    :tracking_id = "7266a5d7-cc17-4286-9130-368507ba35ab" ;
    :rossby_comment = "201247: CORDEX Europe 0.11 deg | RCA4 v1 | MPI-M-MPI-ESM-LR |
rlilp1 | historical | L40" ;
    :rossby_run_id = "201247" ;
    :rossby_grib_path = "/nobackup/rossby16/rossby/joint_exp/cordex/201247/raw/" ;
}
pingu@rockhopper ~/Desktop $
```

# Climate and Forecast Metadata Conventions

[..] designed to promote processing and sharing of NetCDF files (wikipedia).

Project Page: <http://cfconventions.org>

Example: Standard name for surface temperature

(<http://cfconventions.org/standard-names.html>)

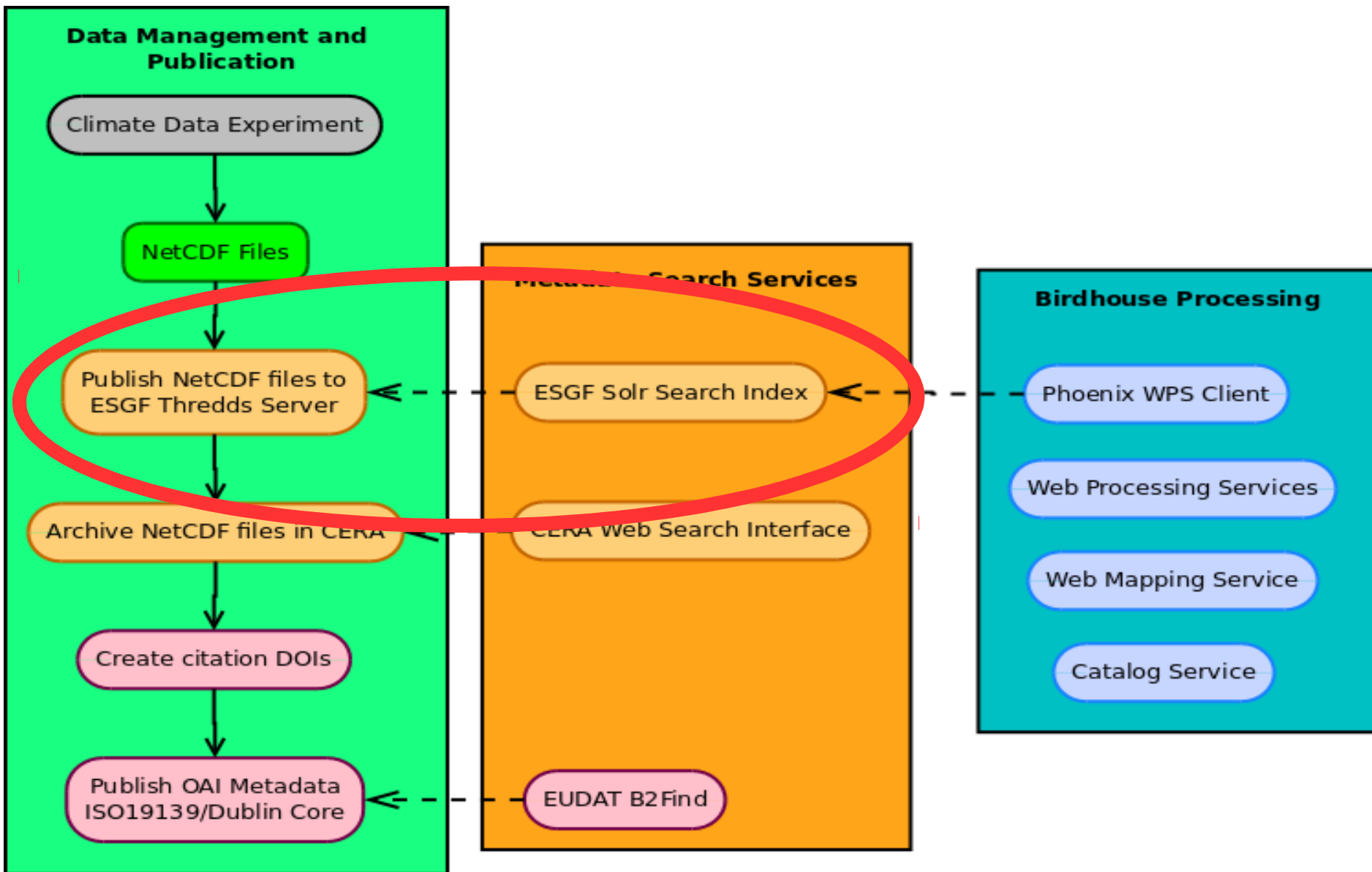
```

- <entry id="surface_temperature">
  <canonical_units>K</canonical_units>
  <grib>E139</grib>
  <amip>ts</amip>
- <description>
  The surface called "surface" means the lower boundary of the atmosphere.
  The surface temperature is the temperature at the interface, not the bulk
  temperature of the medium above or below. Unless indicated in the
  cell_methods attribute, a quantity is assumed to apply to the whole area of
  each horizontal grid box. Previously, the qualifier where_type was used to
  specify that the quantity applies only to the part of the grid box of the named
  type. Names containing the where_type qualifier are deprecated and newly
  created data should use the cell_methods attribute to indicate the horizontal
  area to which the quantity applies.
</description>
</entry>

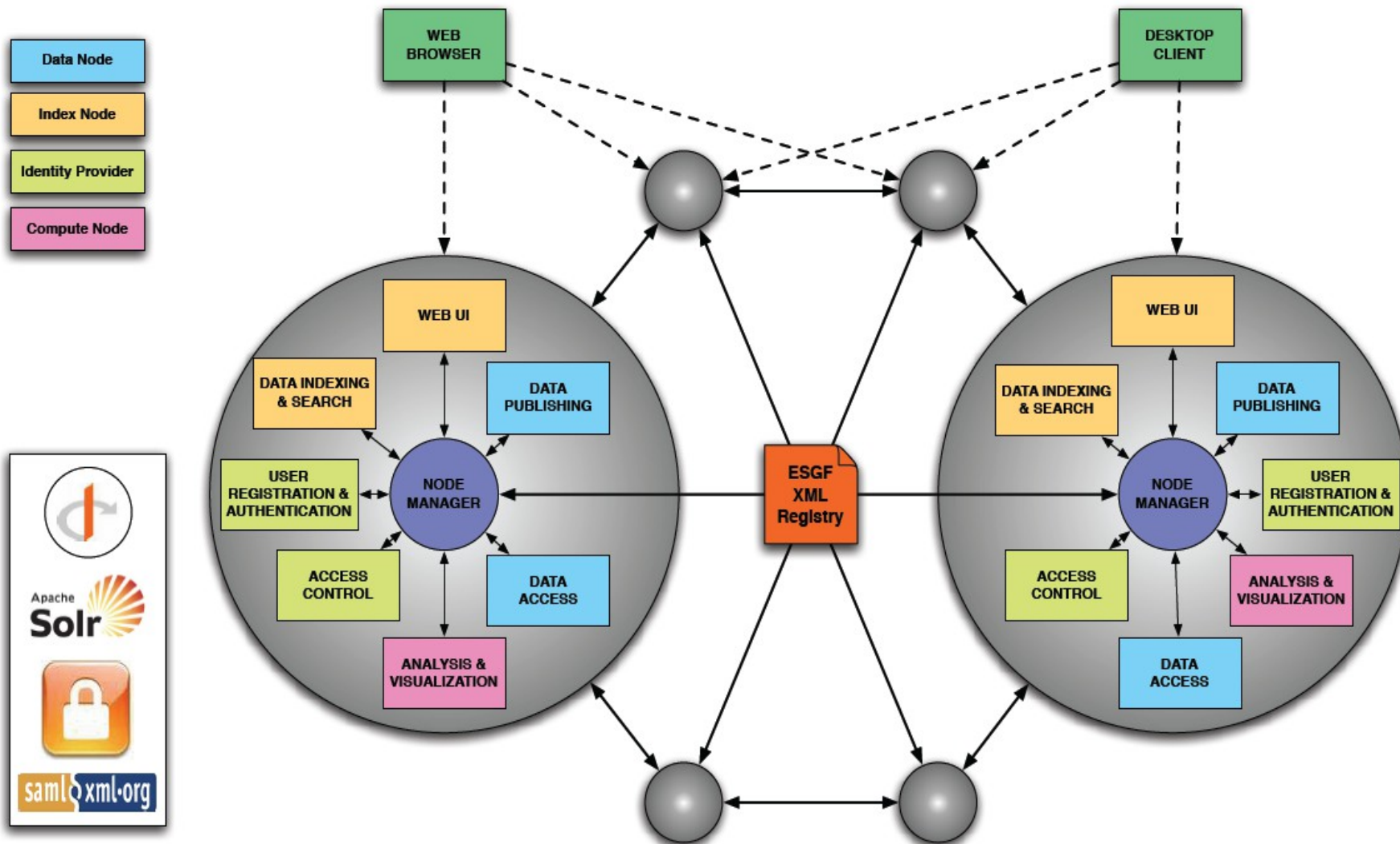
```




# Leitmotif: the red yarn ... ESGF




# ESGF: Federated Data Access




# ESGF faceted search: <http://esgf-data.dkrz.de>







GEFÖRDERT VOM



Bundesministerium  
für Bildung  
und Forschung



DEUTSCHES  
KLIMARECHENZENTRUM



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### Current Selections

[remove all](#)

[\(x\) project:CORDEX](#)

[\(x\) institute:KNMI](#)

[\(x\) variable:tas](#)

[\(x\) domain:EUR-11](#)

[\(x\) time frequency:mon](#)

Examples: *temperature*, *"surface temperature"*, *climate AND project:CMIP5 AND variable:hus*.  
To download data: add datasets to your Data Cart, then click on *Expand* or *wget*.

Search All Sites  
  Show All Replicas  
  Show All Versions

< 1 >   displaying 1 to 4 of 4 search results

Display 10 datasets per page

[Add All Displayed to Datacart](#)  
 [Remove All Displayed from Datacart](#)

Results
Data Cart

[cordex.output.EUR-11.KNMI.ICHEC-EC-EARTH.historical.r1i1p1.RACMO22E.v1.mon.tas](#)

Data Node: carbon.dkrz.de  
**Version: 20140313**  
No description available.  
Further options: [Add To Cart](#) [Visualize and Analyze](#)

[cordex.output.EUR-11.KNMI.ECMWF-ERAINT.evaluation.r1i1p1.RACMO22E.v1.mon.tas](#)

Data Node: carbon.dkrz.de  
**Version: 20140319**

[Temporal Search](#)

[Clear search constraints and datacart](#)

[Search Help](#)

[Search Controlled Vocabulary](#)

### Search Categories

**Project**

---

**Institute**

---

**Model**

---

**Instrument**

---

**Experiment Family**

---

**Experiment**

---

**Time Frequency**

# Thredds data server: <http://carbon.dkrz.de/thredds/>

Dataset: cordex.output.AFR-44.CLMcom.CNRM-CERFACS-CNRM-CM5.historical.r0i0p0.CCLM4-8-17.v1.fx.orog/orog\_AFR-44\_CNRM-CERFACS-CNRM-CM5\_historical\_r0i0p0\_CLMcom-CCLM4-8-17\_v1\_fx.nc

- *Data format:* netCDF
- *Data size:* 262.3 Kbytes
- *Data type:* GRID
- *ID:* cordex.output.AFR-44.CLMcom.CNRM-CERFACS-CNRM-CM5.historical.r0i0p0.CCLM4-8-17.v1.fx.orog.v20140401.orog\_AFR-44\_CNRM-CERFACS-CNRM-CM5\_historical\_r0i0p0\_CLMcom-CCLM4-8-17\_v1\_fx.nc
- *RestrictAccess:* esg-user

## Access:

1. **HTTPServer:** [/thredds/fileServer/cordex/output/AFR-44/CLMcom/CNRM-CERFACS-CNRM-CM5/historical/r0i0p0/CLMcom-CCLM4-8-17/v1/fx/orog/v20140401/orog\\_AFR-44\\_CNRM-CERFACS-CNRM-CM5\\_historical\\_r0i0p0\\_CLMcom-CCLM4-8-17\\_v1\\_fx.nc](http://thredds/fileServer/cordex/output/AFR-44/CLMcom/CNRM-CERFACS-CNRM-CM5/historical/r0i0p0/CLMcom-CCLM4-8-17/v1/fx/orog/v20140401/orog_AFR-44_CNRM-CERFACS-CNRM-CM5_historical_r0i0p0_CLMcom-CCLM4-8-17_v1_fx.nc)
2. **GridFTP:** [gsiftp://carbon.dkrz.de:2811/cordex/output/AFR-44/CLMcom/CNRM-CERFACS-CNRM-CM5/historical/r0i0p0/CLMcom-CCLM4-8-17/v1/fx/orog/v20140401/orog\\_AFR-44\\_CNRM-CERFACS-CNRM-CM5\\_historical\\_r0i0p0\\_CLMcom-CCLM4-8-17\\_v1\\_fx.nc](gsiftp://carbon.dkrz.de:2811/cordex/output/AFR-44/CLMcom/CNRM-CERFACS-CNRM-CM5/historical/r0i0p0/CLMcom-CCLM4-8-17/v1/fx/orog/v20140401/orog_AFR-44_CNRM-CERFACS-CNRM-CM5_historical_r0i0p0_CLMcom-CCLM4-8-17_v1_fx.nc)
3. **OPENDAP:** [/thredds/dodsC/cordex/output/AFR-44/CLMcom/CNRM-CERFACS-CNRM-CM5/historical/r0i0p0/CLMcom-CCLM4-8-17/v1/fx/orog/v20140401/orog\\_AFR-44\\_CNRM-CERFACS-CNRM-CM5\\_historical\\_r0i0p0\\_CLMcom-CCLM4-8-17\\_v1\\_fx.nc](http://thredds/dodsC/cordex/output/AFR-44/CLMcom/CNRM-CERFACS-CNRM-CM5/historical/r0i0p0/CLMcom-CCLM4-8-17/v1/fx/orog/v20140401/orog_AFR-44_CNRM-CERFACS-CNRM-CM5_historical_r0i0p0_CLMcom-CCLM4-8-17_v1_fx.nc)

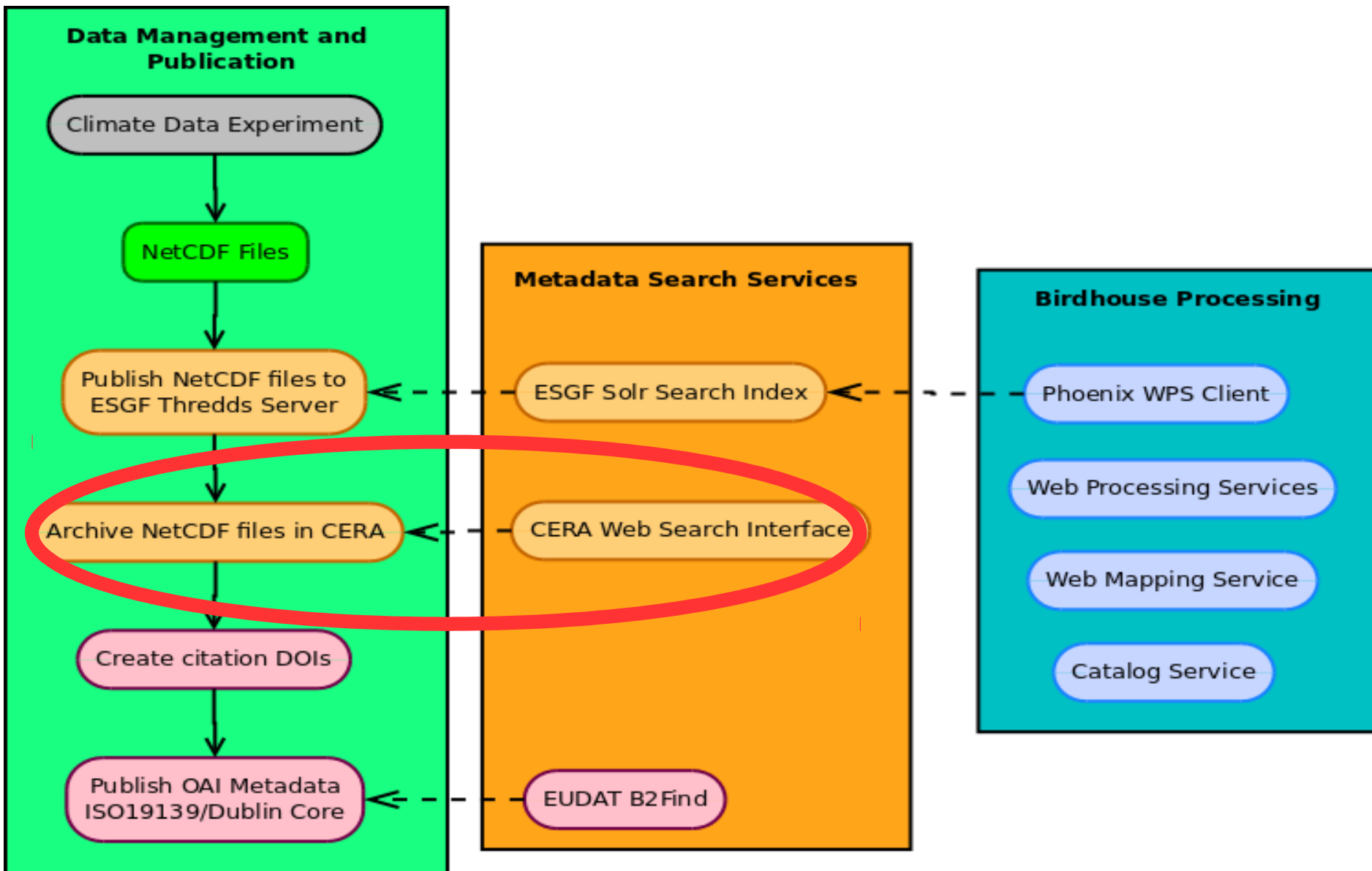
## Variables:

- *Vocabulary [CF-1.0]:*
  - **orog (m)** = *Surface Altitude* = surface\_altitude

## Properties:

- file\_id = "cordex.output.AFR-44.CLMcom.CNRM-CERFACS-CNRM-CM5.historical.r0i0p0.CCLM4-8-17.v1.fx.orog.orog\_AFR-44\_CNRM-CERFACS-CNRM-CM5\_historical\_r0i0p0\_CLMcom-CCLM4-8-17\_v1\_fx.nc"
- file\_version = "1"
- size = "262363"
- tracking\_id = "060991c1-838a-41b7-9e0a-9212c071ade4"
- mod\_time = "2014-03-14 10:52:15"
- checksum = "6f222ffb1ffa77ce82308386c87f74a6"
- checksum\_type = "MD5"

# Leitmotif: the red yarn ... CERA



# CERA: Long Term Archiving at DKRZ

- Long-term archiving is requested by the founding agencies in the context of “Rules for Good Scientific Practices” as a prerequisite to enable future research activities
- Storage period of at least 10 years
- Oracle database for metadata with pointers to tape archive with disk cache



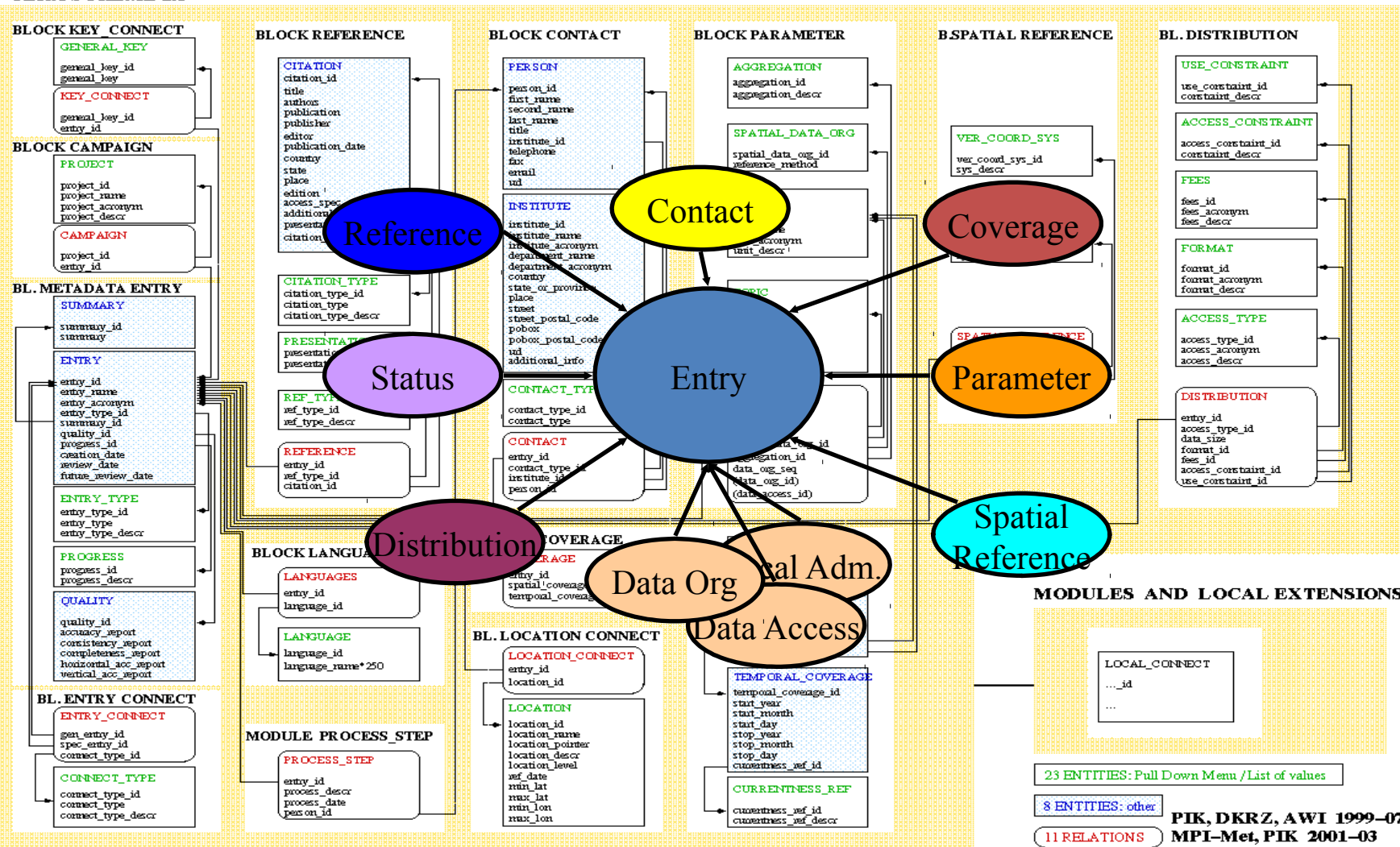
... strong and willed Cera (The Land Before Time)  
<http://landbeforetime.wikia.com/wiki/Cera>



# CERA: Data documentation

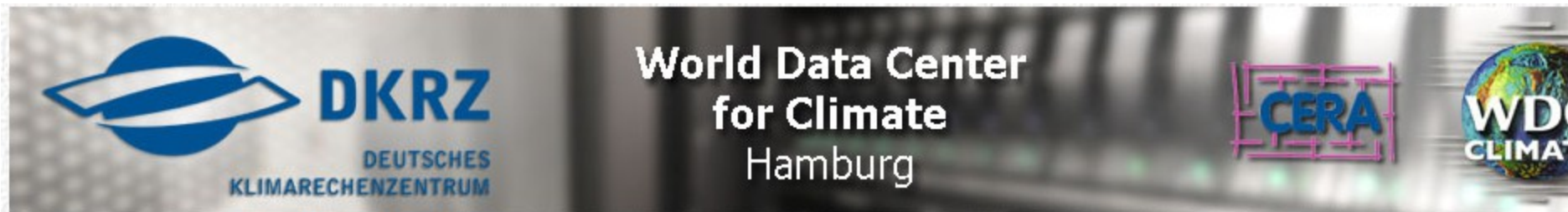


## CERA SCHEME 2.5



23 ENTITIES: Pull Down Menu /List of values  
 8 ENTITIES: other  
 11 RELATIONS  
 PIK, DKRZ, AWI 1999-07  
 MPI-Met, PIK 2001-03

# CERA web access: <http://cera-www.dkrz.de>











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[CERA UI Home](#) | [WDCC Home](#) | [Impressum](#)

## Related CERA entries for CLM\_B1\_1\_D2

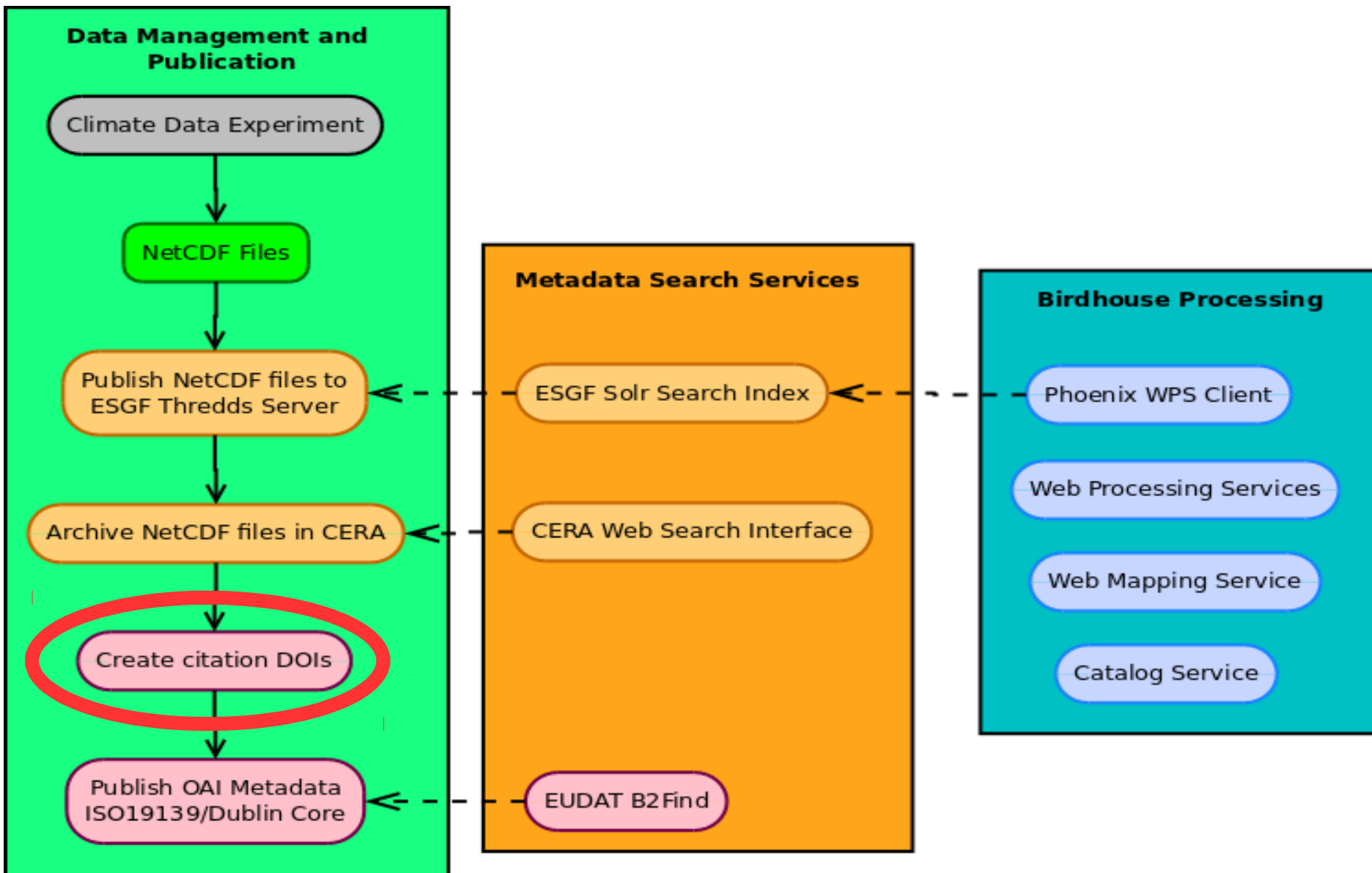
Create jblob download script for all datasets

Include:  Datasets  Dataset Groups  Add. Info | Sort by: **Acronym**  Descending

	Acronym / Name	Type	Progress	
<input type="checkbox"/>	 <b>CLM_B1_1_D2_d_GZ0</b> CLM_B1_1_D2_d_GZ0: surface_roughness_length	dataset	completely archived	
<input type="checkbox"/>	 <b>CLM_B1_1_D2_d_HMO3</b> CLM_B1_1_D2_d_HMO3: air_pressure_at_ozone_maximum	dataset	completely archived	
<input type="checkbox"/>	 <b>CLM_B1_1_D2_d_HZEROCL</b> CLM_B1_1_D2_d_HZEROCL: freezing_level_altitude	dataset	completely archived	
<input type="checkbox"/>	 <b>CLM_B1_1_D2_d_LAI</b> CLM_B1_1_D2_d_LAI: leaf_area_index	dataset	completely archived	



# Leitmotif: the red yarn ... Data Citation




## Data citation with DOI (digital object identifier)



- DOIs are used for citation of published climate experiment data archived in the CERA database at DKRZ  
Example: [http://dx.doi.org/DOI:10.1594/WDCC/CLM\\_B1\\_2\\_D3](http://dx.doi.org/DOI:10.1594/WDCC/CLM_B1_2_D3)
- DOI remains fixed over lifetime, whereas the location of the document may change (wikipedia)
- “Cream of the Cake” for climate data scientists



# CERA: DOI landing page



World Data Center  
for Climate  
Hamburg



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[CERA UI Home](#) | [WDCC Home](#) | [Impressum](#)

Always quote citation when using data!

## DOI for Scientific and Technical Data

10.1594/WDCC/CLM\_B1\_2\_D3

### Citation elements

**Creator**  
(person(s) or institute(s) responsible for this assemblage of data: e.g. author, data collector, editor...)  
Lautenschlager,Michael; Keuler,Klaus; Wunram,Claudia; Keup-Thiel,Elke; Schubert, Martina; Will,Andreas; Rockel,Burkhardt; Boehm,Uwe

**Publication Year**  
2009

**Title**  
Climate Simulation with CLM, Scenario B1 run no.2, Data Stream 3: European region MPI-M/MaD

**DOI Publisher**  
[WDCC at DKRZ](#)

**Identifier**  
[DOI:10.1594/WDCC/CLM\\_B1\\_2\\_D3](#)

The [DataCite](#) consortium proposes a **citation format** (Creator (PublicationYear): Title. DOI Publisher. Identifier) and also offers citation export in different formats.

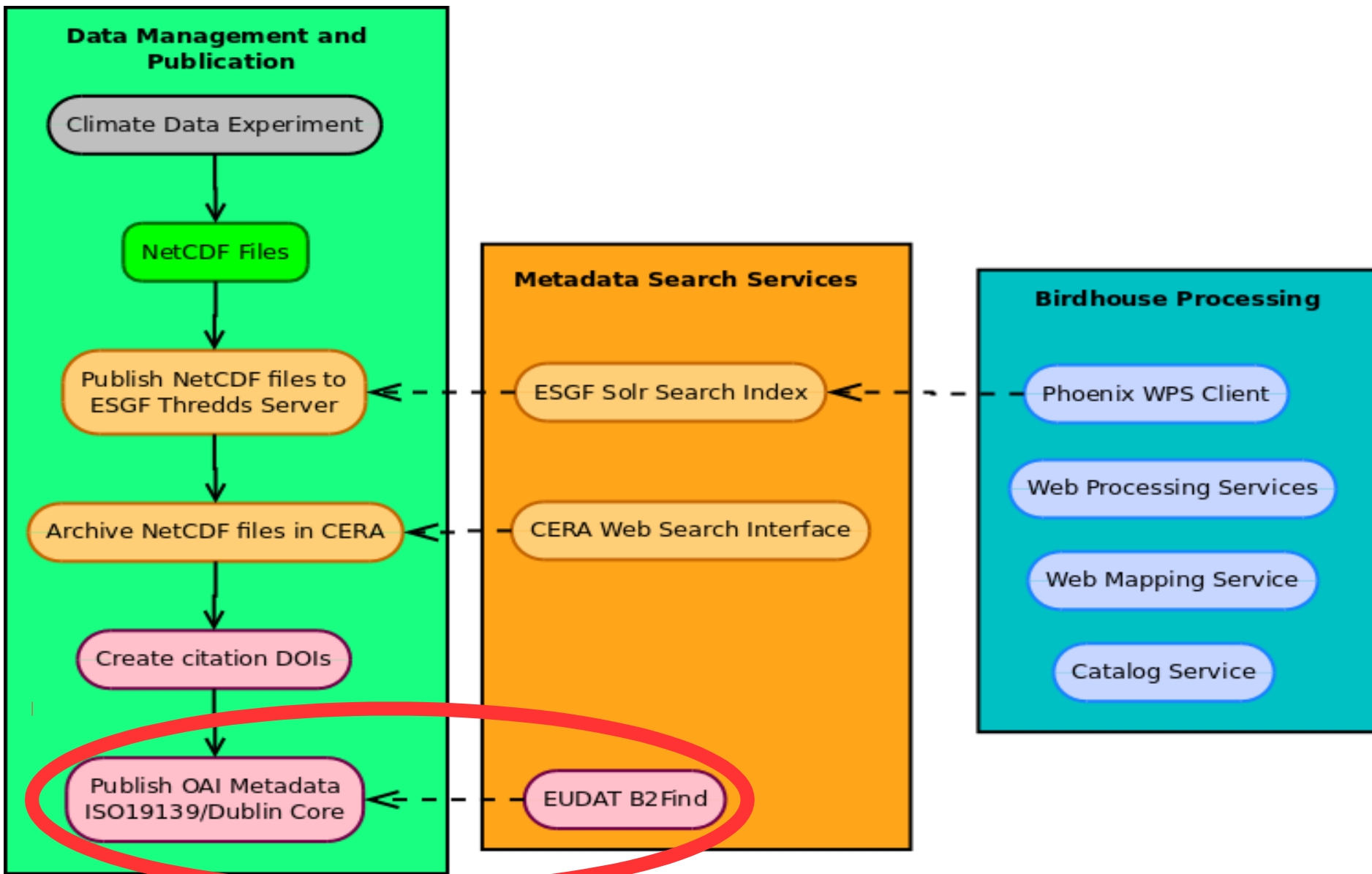
### Detailed Metadata

[http://cera-www.dkrz.de/WDCC/ui/Entry.jsp?acronym=CLM\\_B1\\_2\\_D3](http://cera-www.dkrz.de/WDCC/ui/Entry.jsp?acronym=CLM_B1_2_D3)

### Data Access

[http://cera-www.dkrz.de/WDCC/ui/EntryList.jsp?acronym=CLM\\_B1\\_2\\_D3](http://cera-www.dkrz.de/WDCC/ui/EntryList.jsp?acronym=CLM_B1_2_D3)

# Leitmotif: the red yarn ... Publish OAI/B2Find



# OAI Metadata Server: ISO 19139 document

```

- <OAI-PMH xsi:schemaLocation="http://www.openarchives.org/OAI/2.0/ http://www.openarchives.org/OAI/2.0
/OAI-PMH.xsd" >
  <responseDate>2014-10-02T09:17:12Z</responseDate>
  <request verb="GetRecord" identifier="oai:c3grid.dkrz.de.dkrz.wdcc.iso_doi2110948"
  metadataPrefix="iso">http://c3grid1.dkrz.de:8080/oai/provider</request>
- <GetRecord>
  - <record>
    - <header>
      <identifier>oai:c3grid.dkrz.de.dkrz.wdcc.iso_doi2110948</identifier>
      <datestamp>2014-03-17T08:20:34Z</datestamp>
      <setSpec>iso-wdcc-doi</setSpec>
    </header>
  - <metadata>
    - <gmi:MI_Metadata xsi:schemaLocation="http://www.isotc211.org/2005/gmi http://www.ngdc.noaa.gov
/metadata/published/xsd/schema.xsd" id="de.dkrz.mpim.iso2110948">
      - <gmd:fileIdentifier>
        <gco:CharacterString>de.dkrz.mpim.iso2110948</gco:CharacterString>
      </gmd:fileIdentifier>
      - <gmd:hierarchyLevel>
        <gmd:MD_ScopeCode codeList="http://wis.wmo.int/2006/catalogues
/gmxCodelists.xml#MD_ScopeCode" codeListValue="series">series</gmd:MD_ScopeCode>
      </gmd:hierarchyLevel>
      - <gmd:hierarchyLevelName>
        <gco:CharacterString>CLM_regional_climate_model_runs:CLM_B1_2_D3</gco:CharacterString>
      </gmd:hierarchyLevelName>
      - <gmd:contact>
        - <gmd:CI_ResponsibleParty id="data_provider">
          - <gmd:individualName>
            <gco:CharacterString>Keup-Thiel, Elke</gco:CharacterString>
          </gmd:individualName>

```



# EUDAT B2Find (CKAN): <http://b2find.eudat.eu/>

The screenshot displays the EUDAT B2Find (CKAN) interface. On the left, there is a sidebar with filters: 'Filter by location' (with a map), 'Publication Year' (with input fields), 'Communities' (with 'ENES (27)' selected), and 'Tags' (with 'climate simulation ... (27)' selected). The main content area shows a search bar with 'Search datasets...', a search button, and '27 datasets found'. The results are ordered by 'Relevance'. The first result is circled in red and reads: 'Climate Simulation with CLM, Scenario B1 run no.2, Data Stream 3: European re...'. Below it is another result: 'Climate Simulation with CLM, Scenario A1B run no.2, Data Stream 3: European r...'. The third result is: 'Climate Simulation with CLM, Scenario A1B run no.2, Data Stream 2: European r...'. The fourth result is: 'coastDat-2 TRIM-NP-2d'.

Home / Datasets

Filter by location [Clear](#)

Search datasets...

**27 datasets found** Order by: [Relevance](#)

Communities: [ENES x](#) Tags: [climate simulation regional m x](#)

**Climate Simulation with CLM, Scenario B1 run no.2, Data Stream 3: European re...**  
The experiment CLM\_B1\_2\_D3 contains European regional climate simulations of the years 2001-2100 on a regular geographical grid. The data are generated during post processing of...

**Climate Simulation with CLM, Scenario A1B run no.2, Data Stream 3: European r...**  
The experiment CLM\_A1B\_2\_D3 contains European regional climate simulations of the years 2001-2100 on a regular geographical grid. The data are generated during post processing...

**Climate Simulation with CLM, Scenario A1B run no.2, Data Stream 2: European r...**  
The experiment CLM\_A1B\_2\_D2 contains European regional climate simulations of the years 2001-2100 on a rotated grid (CLM non hydrostatic, 0.165 deg. hor. resolution, see...

**coastDat-2 TRIM-NP-2d**  
This is a hydrodynamic hindcast for the North Sea and the Northeast Atlantic over the period 1948-2012. The simulation has been performed with the hydrodynamic model TRIM-NP...

Map data © OpenStreetMap contributors  
Tiles by MapQuest

Publication Year [Clear](#)

Communities

ENES (27) [x](#)

Show Only Popular Communities

Tags

climate simulation ... (27) [x](#)

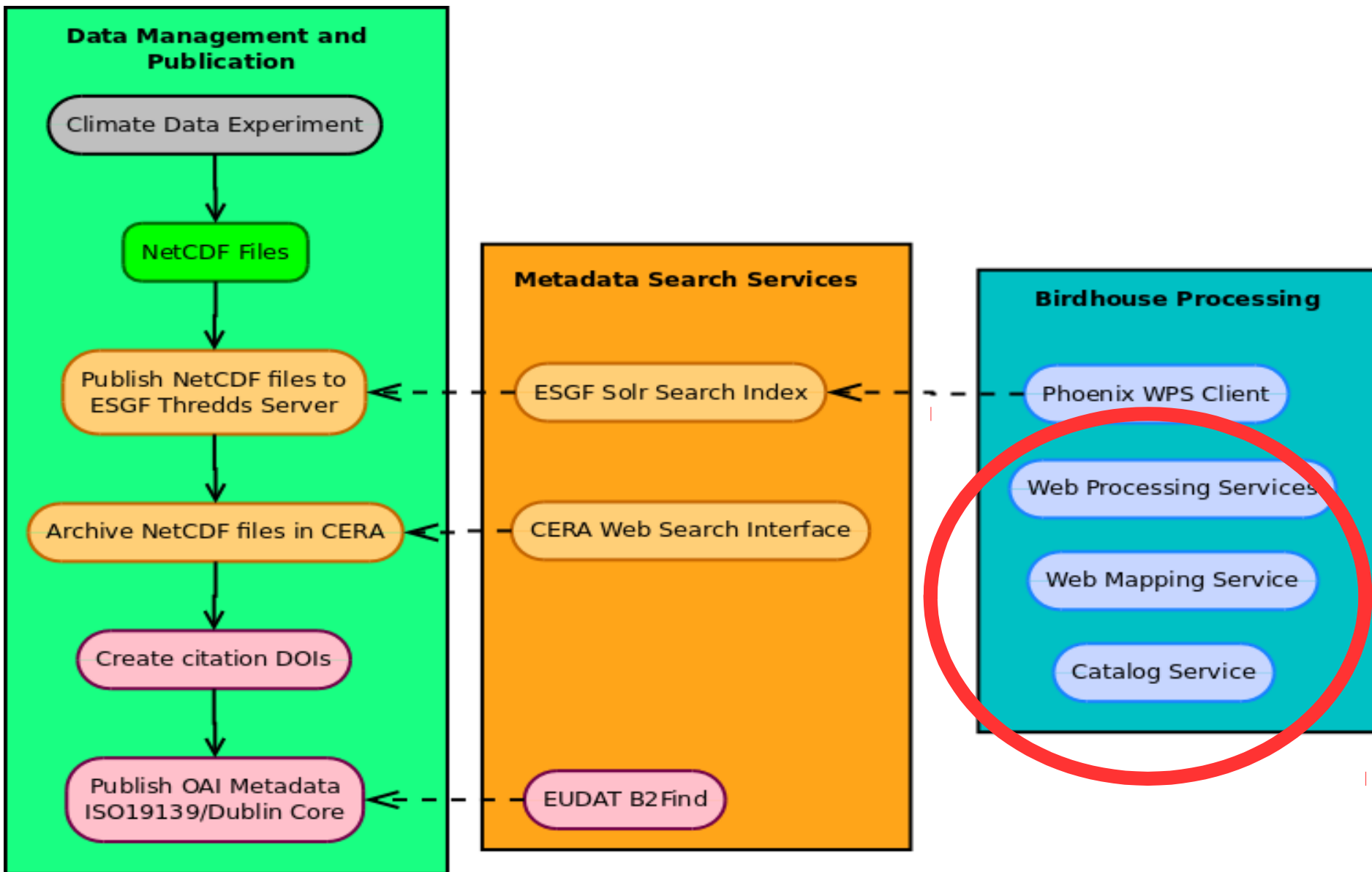
Show More Tags

# EUDAT B2Find: Additional Info for Dataset

## Additional Info

Field	Value
Source	<a href="http://dx.doi.org/DOI:10.1594/WDCC/CLM_B1_2_D3">http://dx.doi.org/DOI:10.1594/WDCC/CLM_B1_2_D3</a>
Author	Dr. Michael Lautenschlager; Dr. rer. nat. Klaus Keuler; Dr. Burkhardt Rockel; Martina Schubert; Dr. Claudia Wunram
Maintainer	Max-Planck-Institut fuer Meteorologie (MD), Model and Data
Discipline	series
Format	network Common Data Format
Language	German
MetaDataAccess	<a href="http://c3grid1.dkrz.de:8080/oai/provider?verb=GetRecord&amp;metadataPrefix=iso&amp;identifier=oai:c3grid.dkrz:de.dkrz.wdcc.iso_doi_iso_old2110948">http://c3grid1.dkrz.de:8080/oai/provider?verb=GetRecord&amp;metadataPrefix=iso&amp;identifier=oai:c3grid.dkrz:de.dkrz.wdcc.iso_doi_iso_old2110948</a>
Origin	Max-Planck-Institut fuer Meteorologie (MD), Model and Data
PublicationYear	2006
TempCoverageBegin	63116496000
TempCoverageEnd	66269491200
TemporalCoverage:BeginDate	2001-01-31T00:00:00Z
TemporalCoverage:EndDate	2100-12-31T00:00:00Z
oai_identifier	oai:c3grid.dkrz:de.dkrz.wdcc.iso_doi_iso_old2110948

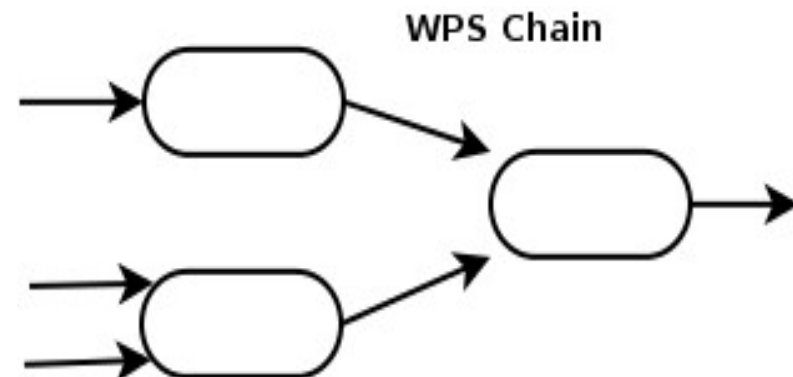
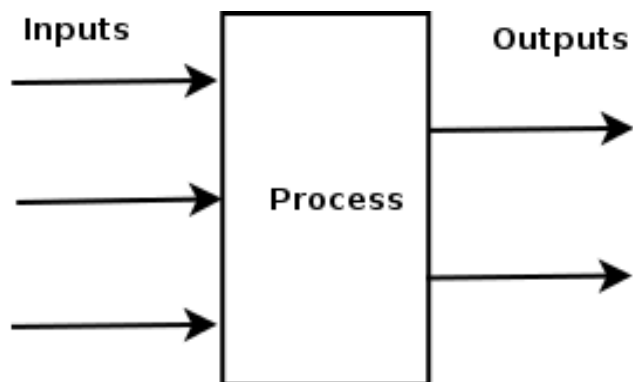
# Leitmotif: the red yarn ... OGC Services





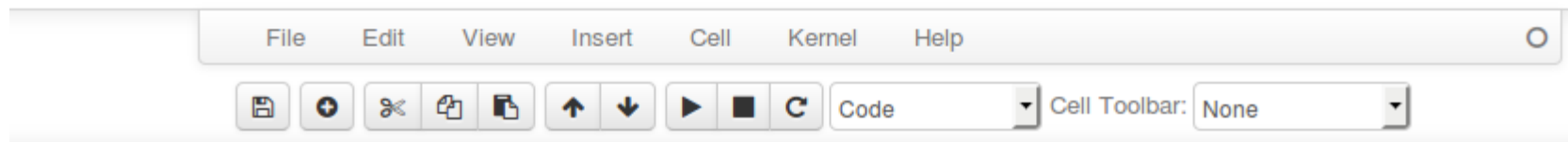
# The Web Processing Service Standard

- “The [OGC Web Processing Service \(WPS\)](#) Interface Standard provides rules for standardizing inputs and outputs (requests and responses) for invoking geospatial processing services, ..., as a Web service” (wikipedia)
- “WPS makes it possible to publish, find, and bind to processes in a standardized and thus interoperable fashion” (wikipedia)
- Precondition for workflow composition



# Example: WPS capabilities

IP[y]: Notebook wps-caps (autosaved)



```
In [1]: from owslib.wps import WebProcessingService
wps = WebProcessingService("http://localhost:8094/wps", skip_caps=True)
wps.version
```

```
Out[1]: '1.0.0'
```

```
In [2]: wps.getcapabilities()
wps.identification.abstract
```

```
Out[2]: 'WPS processes for testing and demos'
```

```
In [3]: [op.name for op in wps.operations]
```

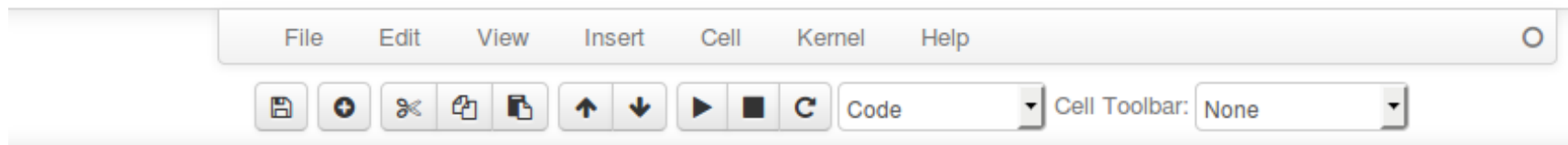
```
Out[3]: ['GetCapabilities', 'DescribeProcess', 'Execute']
```

```
In [4]: for process in wps.processes:
        print process.title, "/" , process.identifier
```

```
Chomsky test generator / chomsky
Hello World / helloworld
Testing all Data Types / inout
Answer to Life, the Universe and Everything / ultimatequestionprocess
Word Counter / wordcount
```

# Example: WPS describeprocess

IP[y]: Notebook wps-describe (autosaved)



```
In [1]: from owslib.wps import WebProcessingService
wps = WebProcessingService("http://localhost:8094/wps", skip_caps=True)
wps.version
```

```
Out[1]: '1.0.0'
```

```
In [2]: wps.getcapabilities()
wps.identification.abstract
```

```
Out[2]: 'WPS processes for testing and demos'
```

```
In [3]: process = wps.describeprocess(identifier='helloworld')
print process.title, "/", process.abstract
```

```
Hello World / Welcome user and say hello ...
```

```
In [4]: for param in process.dataInputs:
print param.title, "/", param.dataType
```

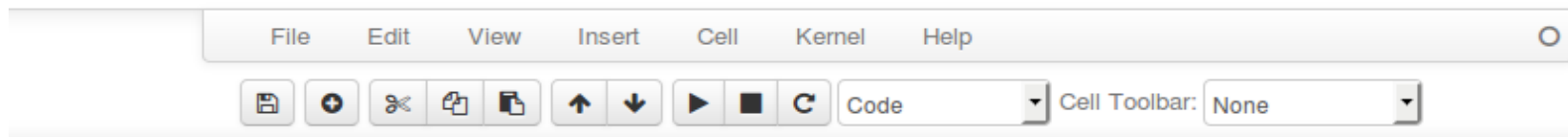
```
Your name / //www.w3.org/TR/xmlschema-2/#string
```

```
In [5]: for param in process.processOutputs:
print param.title, "/", param.dataType
```

```
Welcome message / //www.w3.org/TR/xmlschema-2/#string
```

# Example: CSW catalog service

IP[y]: Notebook csw-example (autosaved)



```
In [1]: from owslib.csw import CatalogueServiceWeb
        csw = CatalogueServiceWeb('http://localhost:8082/csw')
        csw.version
```

```
Out[1]: '2.0.2'
```

```
In [2]: [op.name for op in csw.operations]
```

```
Out[2]: ['GetCapabilities',
         'Transaction',
         'GetRepositoryItem',
         'DescribeRecord',
         'GetDomain',
         'GetRecordById',
         'GetRecords',
         'Harvest']
```

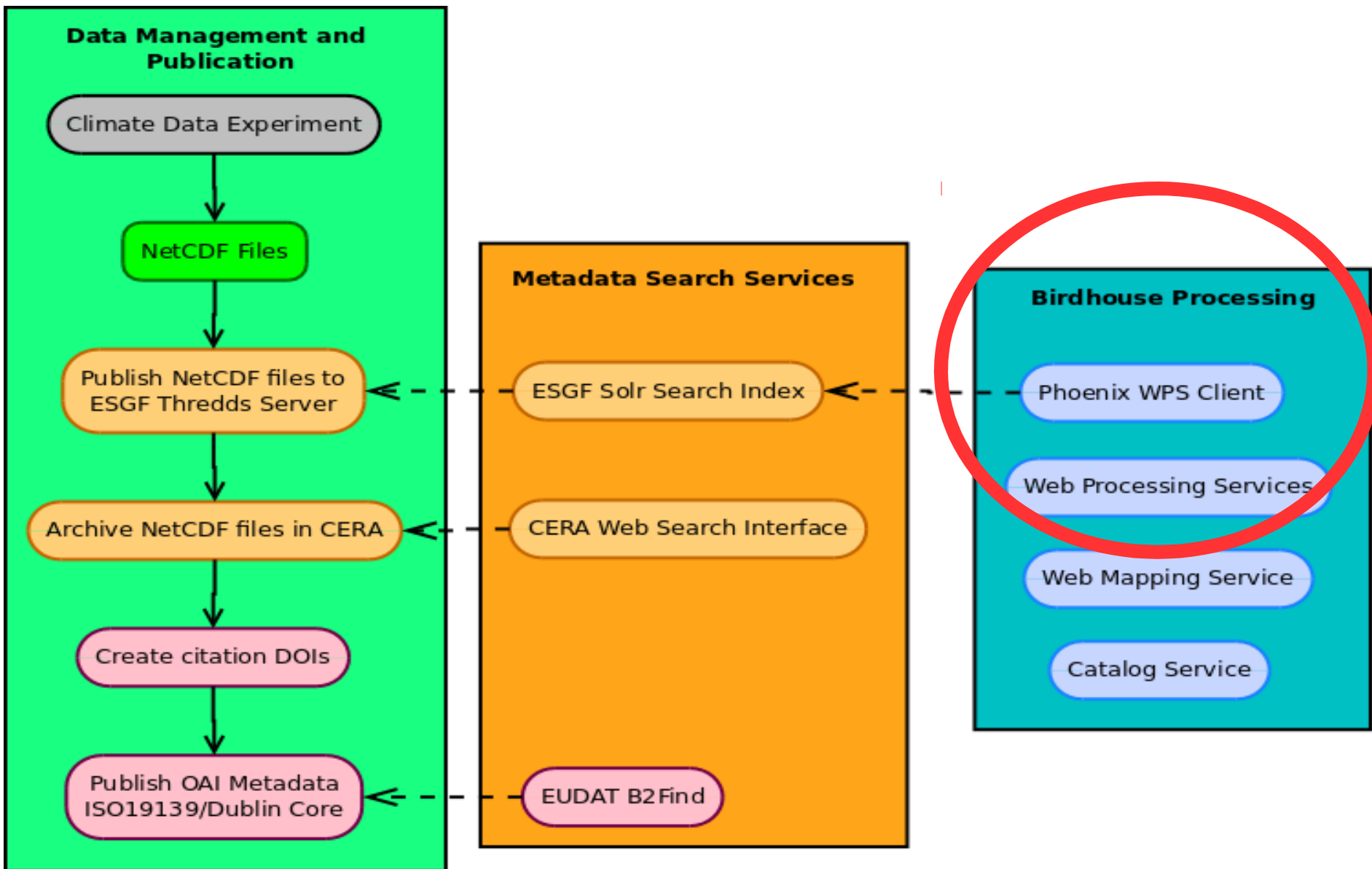
```
In [5]: csw.getrecords(keywords=['pywps'], maxrecords=5)
        csw.results
```

```
Out[5]: {'matches': 2, 'nextrecord': 0, 'returned': 2}
```

```
In [6]: for rec in csw.records:
        item = csw.records[rec]
        print item.title, "/", item.abstract
```

```
Malleefowl / Malleefowl Processes (esgf, workflow, publish, security, ...)
Flyingpigeon / Processes for climate data, indices and extrem events
```

# Leitmotif: the red yarn ... Birdhouse Processing

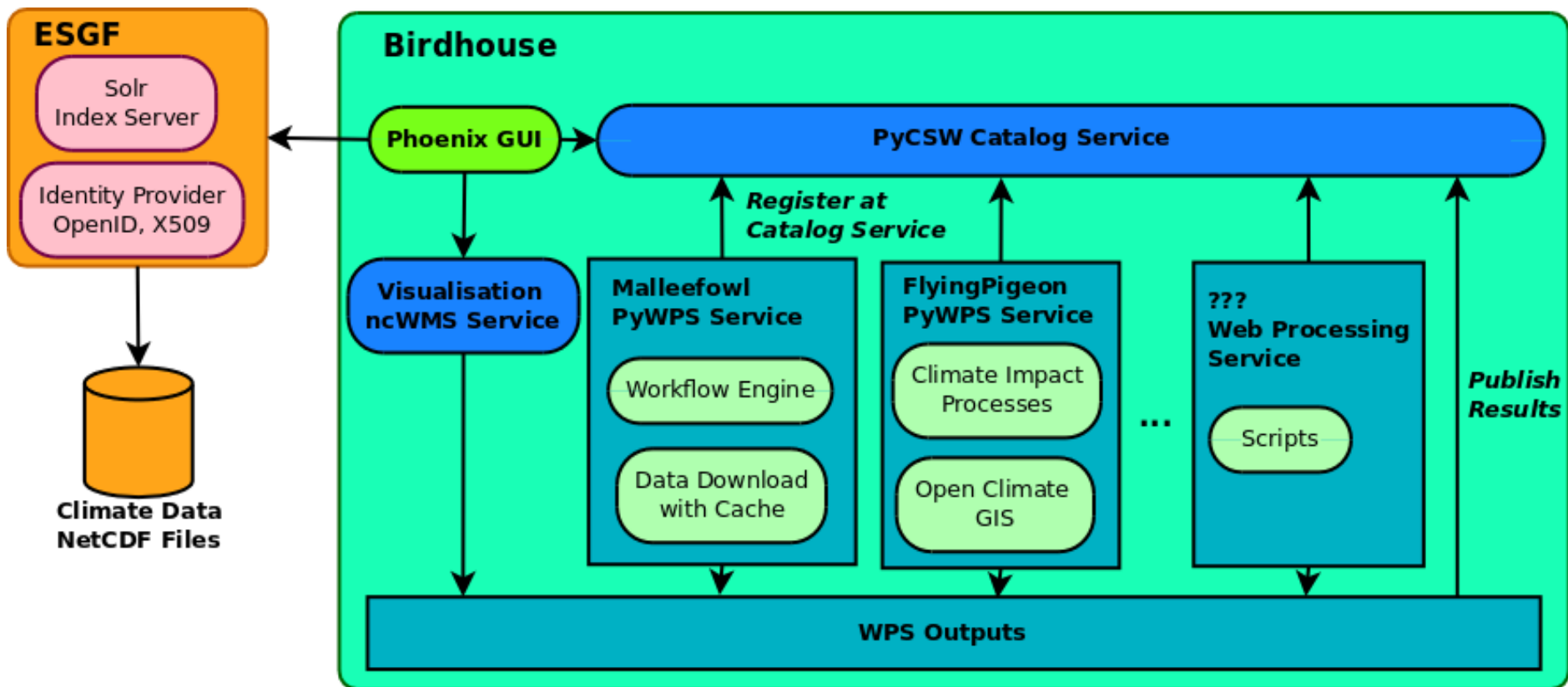


# The Birdhouse WPS component system

- Currently being developed in the LSDMA „Erde und Umwelt“ life cycle lab
- Provides generic components supporting standards based earth data access, discovery, management and processing
- Uses OGC services like WPS, CSW and WMS
- Available on GitHub: <https://github.com/bird-house>



# Birdhouse Overview



# WPS process selection

Phoenix Dashboard Processes My Jobs Wizard Map My Account Settings

🏠 / Processes / Choose Process

## Choose Process Emu

Choose WPS

**Title**

<b>Chomsky test generator</b> Generates a random chomsky text ... XML	Execute
<b>Hello World</b> Welcome user and say hello ... XML	Execute
<b>Testing all Data Types</b> Just testing data types like date, datetime etc ... XML	Execute
<b>Answer to Life, the Universe and Everything</b> Numerical solution that is the answer to Life, Universe and Everything. The process is an improvement to Deep Thought computer (therefore version 2.0) since it no longer takes 7.5 million years, but only a few seconds to give a response, with an update of status every 10 seconds. XML	Execute
<b>Word Counter</b> Counts words in a given text ... XML	Execute



# WPS execute process with parameters

Phoenix Dashboard Processes My Jobs Wizard Map My Account Settings

🏠 / Processes / Execute

## Execute Testing all Data Types

Title

Abstract

Keywords

Integer

This is an Integer

String

This is a String

Float

This is a Float

Boolean

This is a Boolean

Date

This is a Date: 2013-07-10

# WPS outputs

Phoenix [Dashboard](#) [Processes](#) [My Jobs](#) [Wizard](#) [Map](#) [My Account](#) [Settings](#)

[Home](#) / [My Jobs](#) / Process Outputs

[Outputs](#)
[Inputs](#)
[Resources](#)
[Workflow](#)

Output	Identifier	Preview
<b>XML File</b> xml file <span>text/xml</span>	job.xmlfile	<a href="#">Publish</a> <a href="#">View</a> <a href="#">Show on Map</a>
<b>XML File</b> XML File given by URL <span>text/xml</span>	job.xml_url	<a href="#">Publish</a> <a href="#">View</a> <a href="#">Show on Map</a>
<b>More than One</b> This is a more than one String (0-2) <span>None</span>	job.stringMoreThenOne	
<b>String Choice</b> Chosen string <span>one</span>	job.stringChoice	





# Catalog Service for WPS registration and published files

Home / Settings / Catalog Service

## Catalog Service pycsw Geospatial Catalogue (http://localhost:8082/csw)

Add Service
Add Dataset
Remove all Datasets

4 Datasets found

Title	Creator	Modified	Format	
<b>Malleefowl</b> Malleefowl Processes (esgf, workflow, publish, security, ...) <span>WPS</span> <span>PyWPS</span>			<span>WPS</span>	
<b>Flyingpigeon</b> Processes for climate data, indices and extrem events <span>WPS</span> <span>PyWPS</span>			<span>WPS</span>	
<b>visualisation</b> None <span>test</span> <span>cordex</span> <span>tas</span> <span>temperature</span>	ehbrecht@dkrz.de	2014-10-01 18:10:10	application/html	
<b>cordex-tas-mon</b> None <span>test</span> <span>cordex</span> <span>tas</span> <span>temperature</span> <span>cdo</span> <span>monmax</span>	ehbrecht@dkrz.de	2014-10-01 18:16:27	application/x-netcdf	

# ESGF as data source

Phoenix

Dashboard

Processes

My Jobs

Wizard

Map

My Account

Settings

[Home](#) / [Wizard](#) / ESGF Search

ESGF Search\*

**Datasets found: 1**Options:  All Sites  Including Replicas  Latest Version  Temporal

Query

\*

Current Selection

project:CORDEX x

experiment:historical x

variable:tas x

time\_frequency:day x

ensemble:r1i1p1 x

institute:MPI-CSC x

domain:EUR-11 x

Search Categories

experiment\_family

Category: domain

EUR-11

Start 2001-01-01T12:00:00Z

End 2010-12-31T12:00:00Z

# Visualizing with WMS

Phoenix

Dashboard

Processes

My Jobs

Wizard

Map

My Account

Settings

Sign out

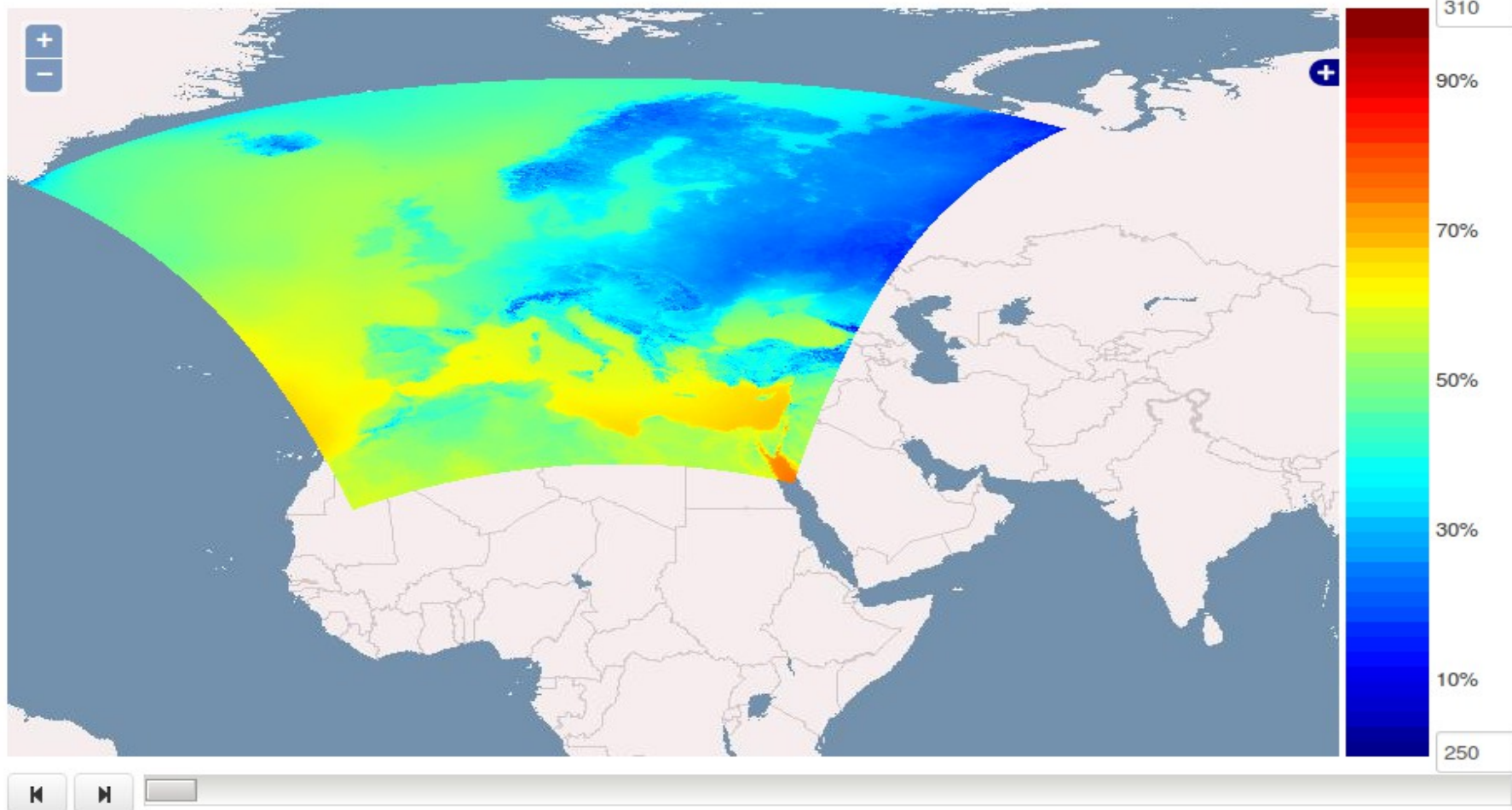
Add Layer

Remove Layer

Animate

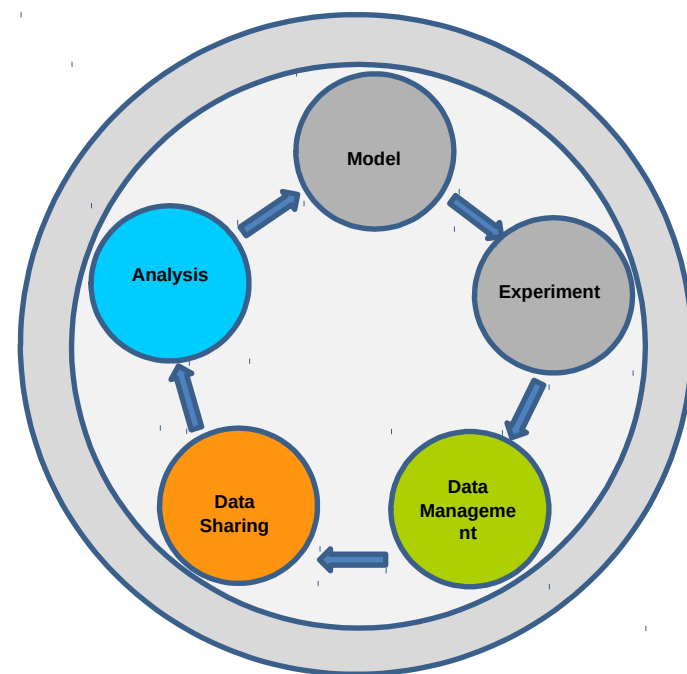
Map

Quick Guide



# Summary

- Climate Data Life Cycle involves a heterogeneous set of tools over institutional borders
- Open Standards are important to ...
  - provide interoperable services,
  - make data searchable in a common way
- Currently used Open Standards
  - OGC Services, NetCDF format, CF name conventions, ISO 19139, Dublin Core, ...



Thank You