

ICP Forests & LTER

a first handshake between data infrastructures



What is ICP Forests – the data portal?

What is ICP Forests – the data portal?

- European Forest Monitoring network under the „Air Convention“
- two intensity levels („Level I“ and „Level II“)
- 15 thematic surveys (Crown Condition, Deposition, Growth, ...)

The data portal*

- Highly structured data model (<https://icp-forests.org/documentation/>)
- Complex check routines
- Import/export routines

* <https://icp-forests.org/data>

What is ILTER – DEIMS-SDR?

What is ILTER – DEIMS-SDR?

- **International Long Term Ecological Research Network (ILTER) - a network of networks**
- **research sites located in a wide array of ecosystems**
- **focus on long-term, site-based research and monitoring**

Dynamic Ecological Information Management System - Site and Dataset Registry*

- **A global research site repository**
- **Using standardised services and formats (!!!)**
- **A user friendly web portal (search, download, export, edit - metadata)**

* DEIMS-SDR: <https://data.lter-europe.net/deims/>



Why a handshake?

Why a handshake?

- ICP Forests has standardized monitoring data
- LTER has standardized site information (metadata)
- **About 100 „ICP Forests plots“ are also „LTER sites“**

Austria (7), Belgium (15), Bulgaria (1), Czech Republic (1), Finland (7), Germany (9), Italy (13), Norway (2), Poland (9), Serbia (1), Slovakia (1), Spain (14), Sweden (4), Switzerland (19), United Kingdom (1)

Why a handshake?

If you find a „site of interest“ in the LTER network
you might also be interested in the ICP Forests monitoring data measured there!?

If you have monitoring data from ICP Forests plots,
you might also be interested in detailed information about the site from LTER!?

Why a handshake?

The DEIMS-SDR „Site Metadata Model“ (SMM)*

- Name and general description (of the site)
- Characteristics (Elevation, Temperature, Precipitation, Soil, Vegetation, ...)
- Status and history / Protection status
- Data sharing policy
- ...

* <https://data.lter-europe.net/deims/metadata-models>

Why a handshake?



ICP Forests monitoring data

-

LTER site information

Why a handshake?

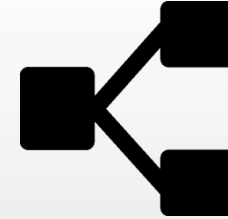
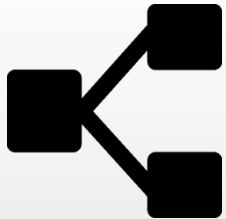
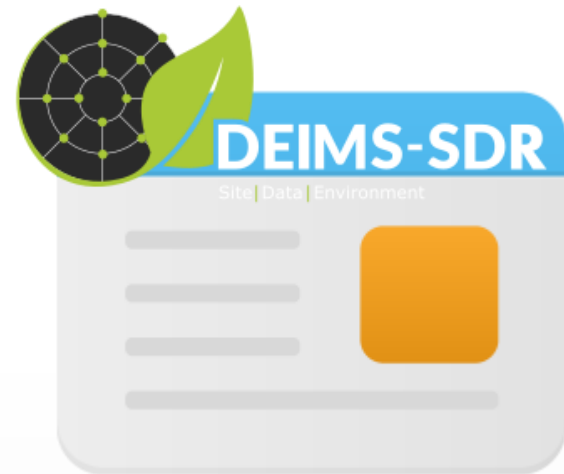
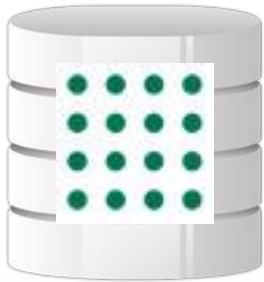


Questions to be answered:

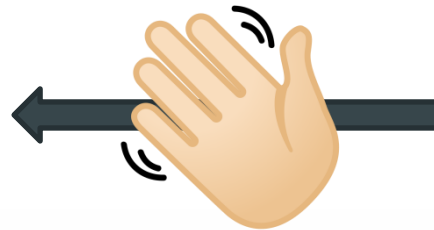
- Which ICP Forests plot is an LTER site?
- Is there a LTER site near to an ICP Forests plot of interest?
- How much are descriptions of ICP Forests plots harmonized in DEIMS-SDR?

What we have done so far

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icp-forests.org/data

data.iter-europe.net/deims/

What we have done so far

Information from DEIMS-SDR:

Overview

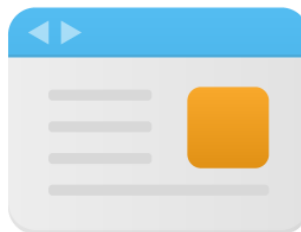


List

Few information



Site presentation



Profile

Detailed, standardised
(SMM)



Export



EMF* file

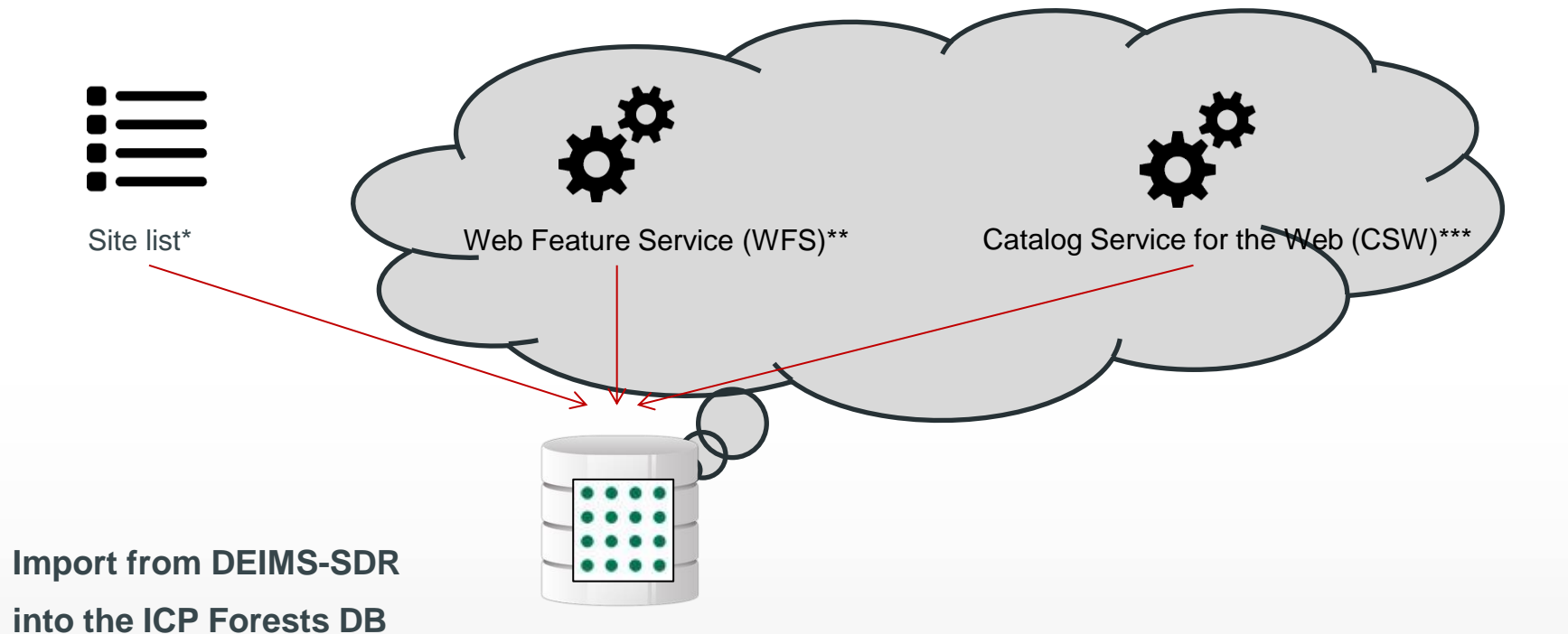
Standardized
Not complete SMM



*Environmental monitoring facilities

What we have done so far

Information from DEIMS-SDR:



* <https://data.lter-europe.net/deims/site/list>

** <https://data.lter-europe.net/geoserver/wfs>

*** <https://data.lter-europe.net/pycsw/catalogue/csw>

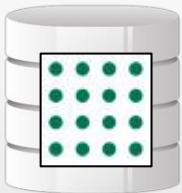
What we have done so far

Information from DEIMS-SDR:

```
<GetRecordById service="CSW" ...>  
  <Id>01975cc6-90a2-11e2-b534-005056ab003f</Id>  
  <ElementSetName>full</ElementSetName>  
</GetRecordById>
```



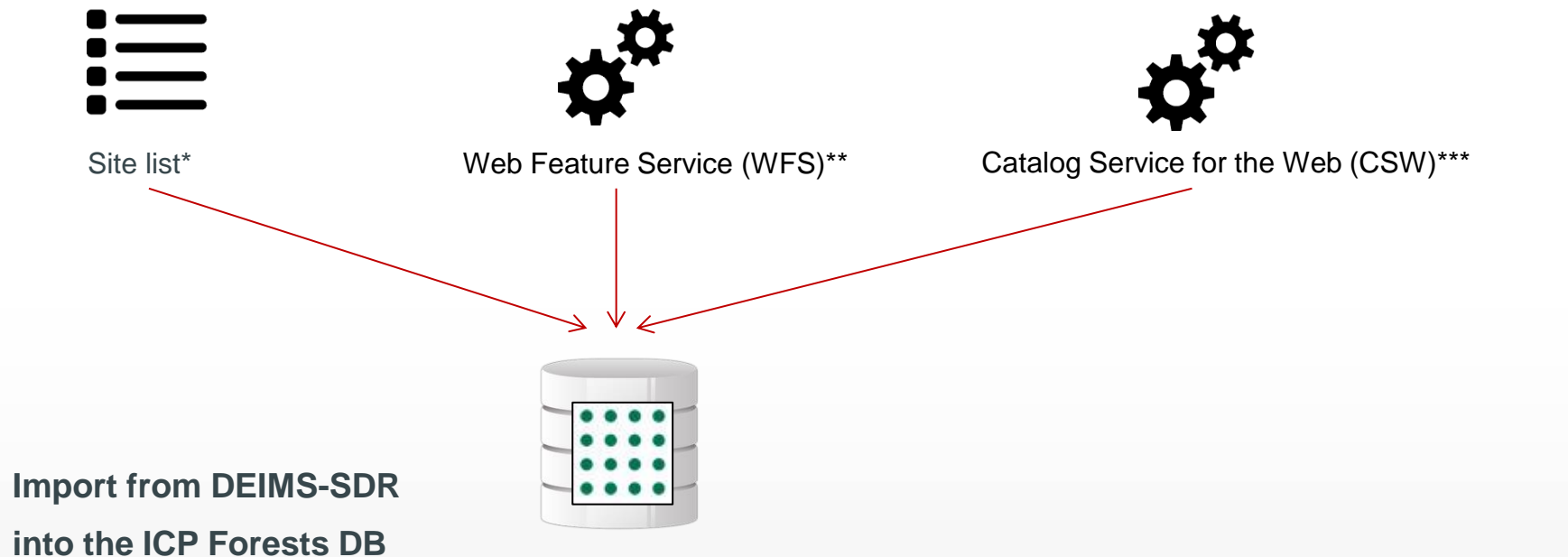
Catalog Service for the Web (CSW)



```
<GetRecordsResponse>  
  <title>Some Site</title>  
  <onLine>Online resource</onLine>  
  ...  
</GetRecordsResponse>
```

What we have done so far

Information from DEIMS-SDR:



* <https://data.lter-europe.net/deims/site/list>

** <https://data.lter-europe.net/geoserver/wfs>

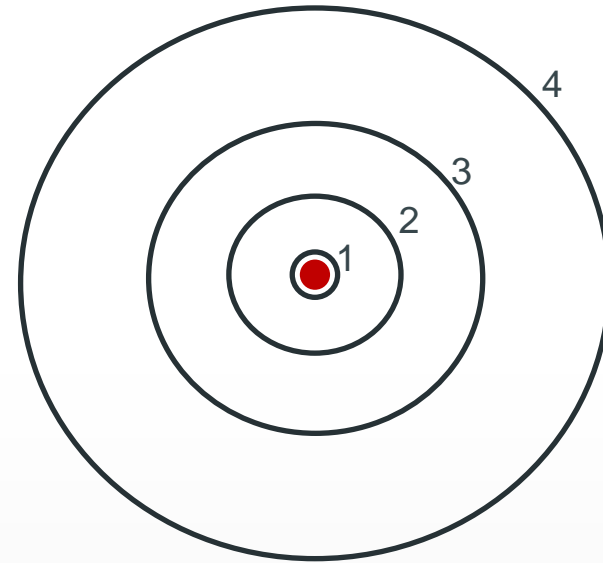
*** <https://data.lter-europe.net/pycsw/catalogue/csw>

What we have done so far

Stepwise spatial join between ICP Forests plots and LTER sites:

Precision levels

- 1 – equal coordinates
- 2 - buffer zone: 56 m (0.001 degree)
- 3 - buffer zone: 0.5 km (0.01 degree)
- 4 - buffer zone: 5.6 km (0.1 degree)



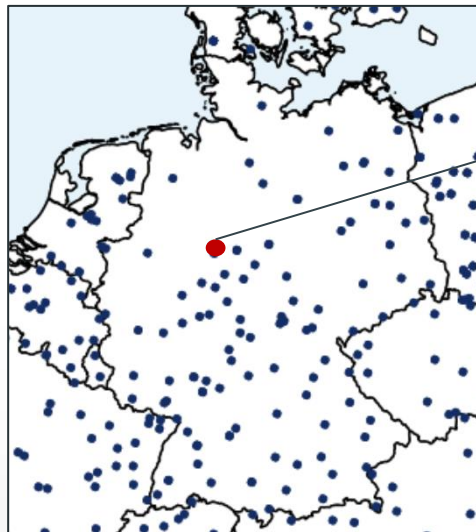
Results:

- Identify ICP Forests plots in DEIMS-SDR
- Find LTER sites near ICP Forests plots

What we can do now

What we can do now

Link ICP Forests plots to the corresponding LTER site directly



Level II plots

LTER site: „Solling“

Solling - Germany

Basic Information

LTER **100%**

Site Name: Solling
Site Code: LTER_EU_DE_009
Web Address: <https://www.rnw-fva.de/index.php.../>
Country (Site Location): Germany
LTER Member Network: Germany (LTER-D)
Contact: Site Manager: Henning Massenburg
Keywords originating from EnvEurope Thesaurus:
forest ecosystems TeaComposition acid forest acidification nitrogen cycling

General Site Description:
Solling Experimental Forest
UUID: 2d55b484-2a89-4023-ba00-49629ab327f9

Environmental monitoring facilities

General Characteristics, Purpose, History

Metadata provider: Henning Massenburg
Northwest German Forest Research Institute

Site Status: existing
Year Site Established: 1966

Size: 50.00ha

Purpose of Site:
Intensive forest monitoring site

Research Topics:

biology physiology ecophysiology phenology taxonomy dendrochronology biodiversity
ecosystem diversity species diversity chemistry air chemistry atmospheric chemistry
depositions chemistry soil chemistry water chemistry soil solution chemistry ecology
terrestrial ecology forest ecology plant ecology vegetation dynamics community ecology
trophic dynamics ecosystem ecology ecosystem function ecosystem service microbial ecology
fungal ecology environmental science pollution geology sedimentology biogeochemistry history
land use history hydrology management silviculture meteorology climatology climate monitoring
climate change physics soil physics toxicology ecotoxicology

Parameters:

atmospheric measure air measure dew point NO_x concentration air water vapour pressure
air temperature air humidity air water vapour concentration air specific humidity
Ozone concentration vapor pressure deficit (VPD) SO_2 concentration precipitation interception
water interception precipitation intensity rain snow depth snow thickness snow water equivalence
throughfall radiation global radiation duration of sunshine air quality wind wind direction
wind direction (mean and gust) wind speed wind speed (mean and gust) biological measure
plant nutrition plant part chemical composition plant physiology plant transpiration plant height
root density root growth tree measure tree height tree age tree diameter tree distribution
canopy measure canopy transpiration canopy height canopy cover rate canopy characteristics
ecosystem measure above ground net primary production crop growth rate
below ground autotrophic respiration biogeochemical cycles ecosystem structures
abiotic environment basal area forest structure canopy cover canopy gaps environmental stress
global change ground water level leaf area leaf area index specific leaf area litter residence time
nitrogen content ammonium content ammonium nitrogen content ammonium nitrate concentration

Photos



Geographic

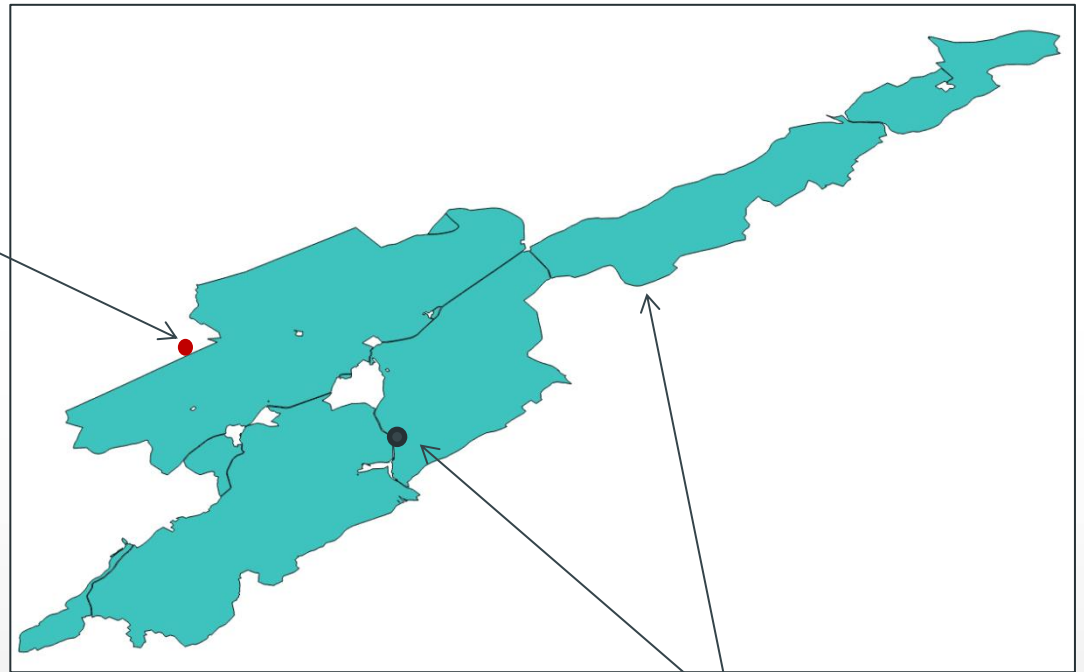
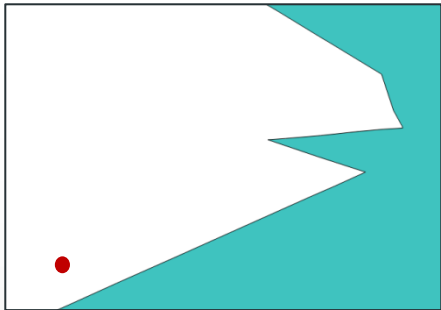


Coordinates:
Latitude: 51.766700000000
Longitude: 9.566670000000
Download boundaries (.shp)

What we can do now

Look for LTER sites near to ICP Forests plots

ICP Forests plot 701 (Germany)



LTER site: „National Park Hunsrück-Hochwald“

What we should do

What we should do

Register and describe ICP Forests Level II plots as LTER sites in a HARMONIZED way.

We found

- Plots described as „ICP Forests“ which could not be identified in the ICP Forests DB
- Differing names used for the ICP Forests network
- No way to define the ICP Forests „plot code“
- Differing levels of details used in the descriptions
- ...

What we should do

Potential **harmonization aspects** to agree on in the ICP Forests network

- Unique name for the ICP Forests network
- Defined set of keywords to be used
- Photos of each survey equipment
- ...

What we should do

Suggestion:

Write a guidance document to further specify the SMM for the ICP Forests network.

Publish the guidance document as part of the online Documentation.

What we should do



Continue the excellent knowledge exchange with colleagues from LTER!

Till Kirchner
Ralph Ryl

Christoph Wohner
Johannes Peterseil

What we should do



Potential topic Scientific Conference 2019:

„ICP Forests & ILTER – two infrastructures walking hand in hand“?

Outline

- **What is ICP Forests – the data portal?**
- **What is ILTER – DEIMS-SDR?**
- **Why a handshake?**
- **What we have done so far**
- **What we can do now**
- **What we should do**

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