OTALEXC project,

Territorial and Environmental Observatory Alentejo Extremadura Centro

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Observatorio Territorial y Ambiental Alentejo Extremadura Centro

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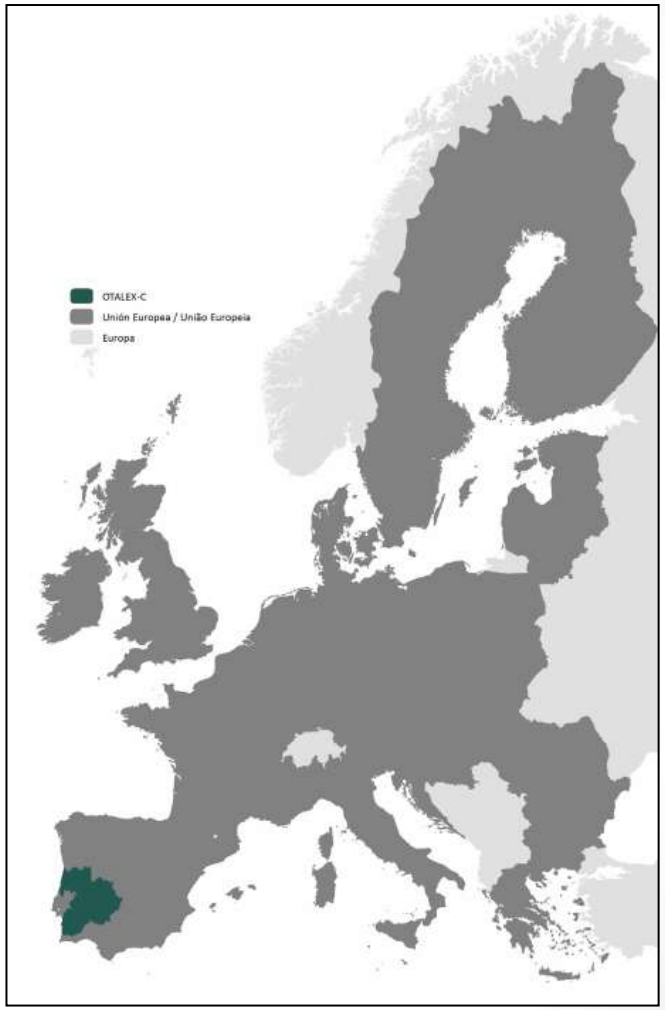
what is OTALEXC project?

- Extremadura in Spain, and Alentejo and Centro, in Portugal are three regions belonging to different countries but with several common interests. They are continuous border areas that share similar ecological, socioeconomic and environmental characteristics



what is OTALEXC project?

- is the project following OTALEX (2004-2006) and OTALEX II (2006-2009)
- is co-financed by the Cross Border Cooperation Operational Program of Spain-Portugal
- has as a main purpose the creation of a management and environmental monitoring system through the OTALEX SDI

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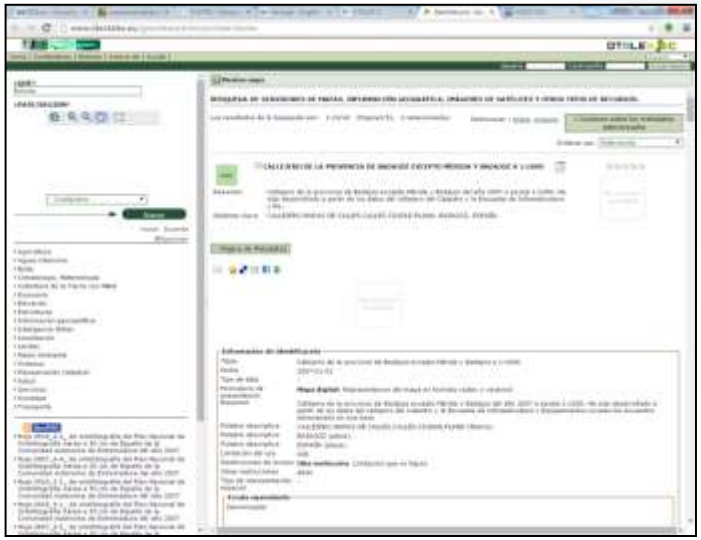
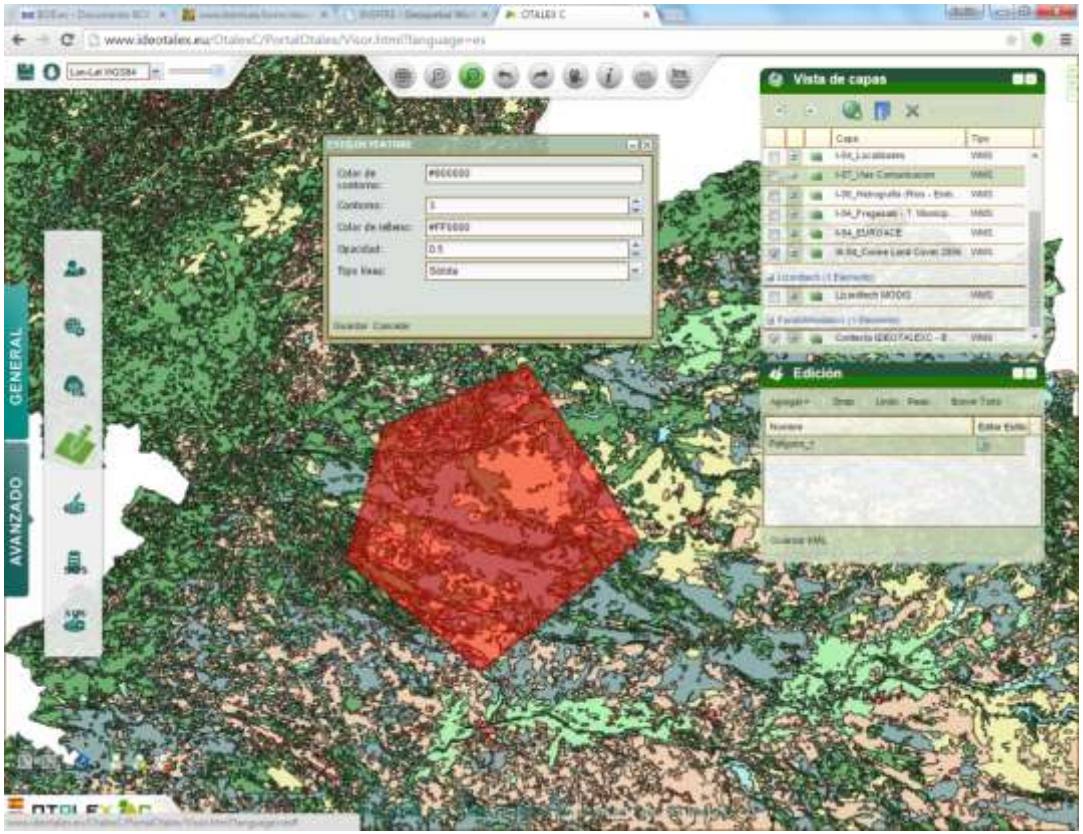
IDE OTALEXC

- since 2007
- modular platform
- open source platform



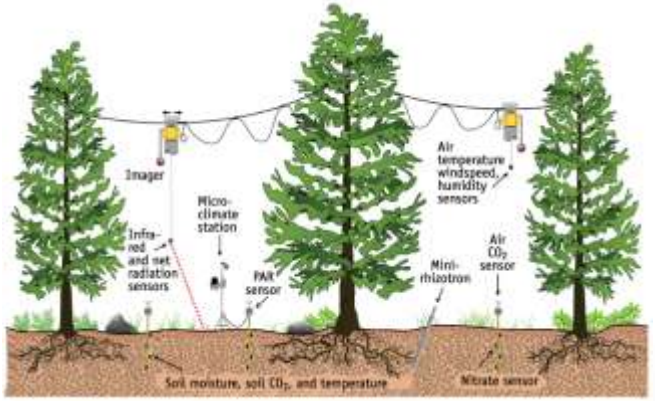
IDE OTALEXC

- viewer
  - OpenLayers
  - navegating, information measurement, print, add services and layers, legend
  - upload KML, SHP and GML, WPS
  - transparency, edition, WFS, SOS, mobile and social networks



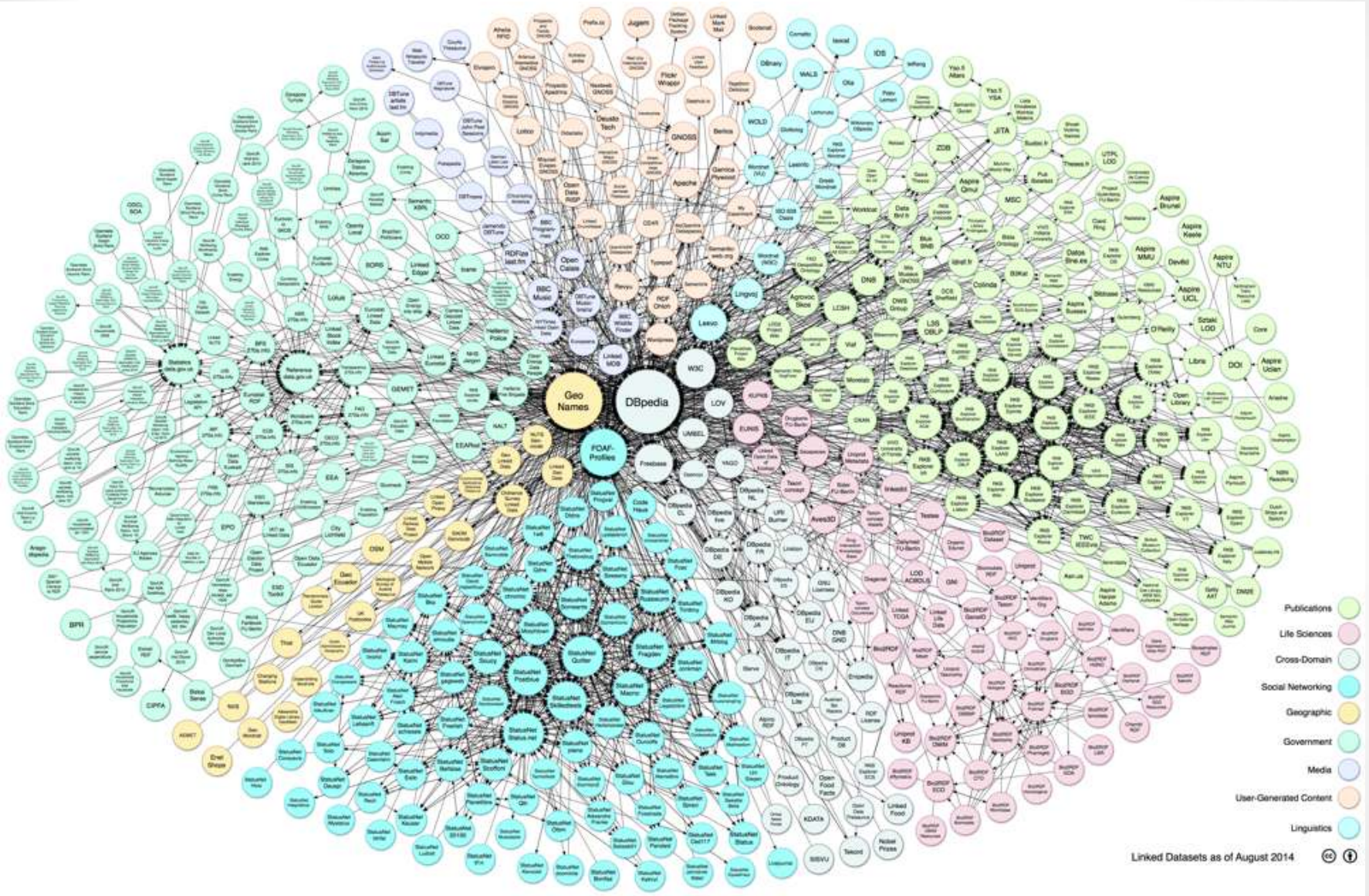
WG in advanced technologies

- two main tasks:
  - the generation of linked data of geographic information for the publication of a semantic web
  - publishing thematic maps in real time with environmental data obtained by sensors, using standard services for the publication of observation and measure sensors



what is linked data?

- linked data is a term used to describe a recommended best practice for exposing, sharing, and connecting pieces of data, information, and knowledge on the Semantic Web using URIs and RDF.
- linked data facilitates data integration from heterogenous sources, in different formats, granularity, languages and countries


Geo Names
DBpedia
FOAF-Profiles
Publications
Life Sciences
Cross-Domain
Social Networking
Geographic
Government
Media
User-Generated Content
Linguistics
Linked Datasets as of August 2014

meteorology

statistics

geography

hydrography

environment

20º

Lisbon

x:...
y:...

Lisbon

x1y1,x2y2,...

Tajo

Lisbon

Lisbon

500m

Lisbon

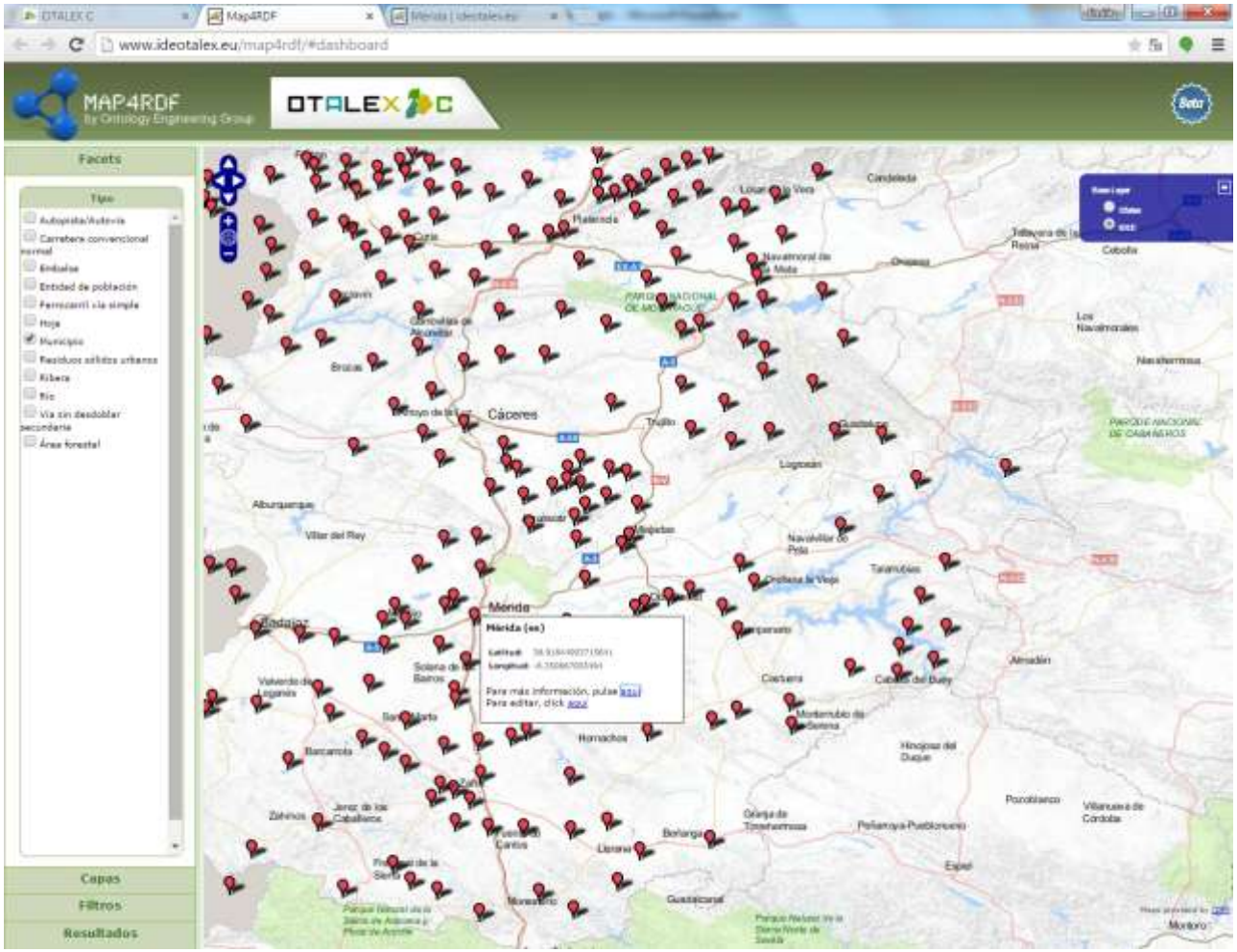
humidity

CO^2

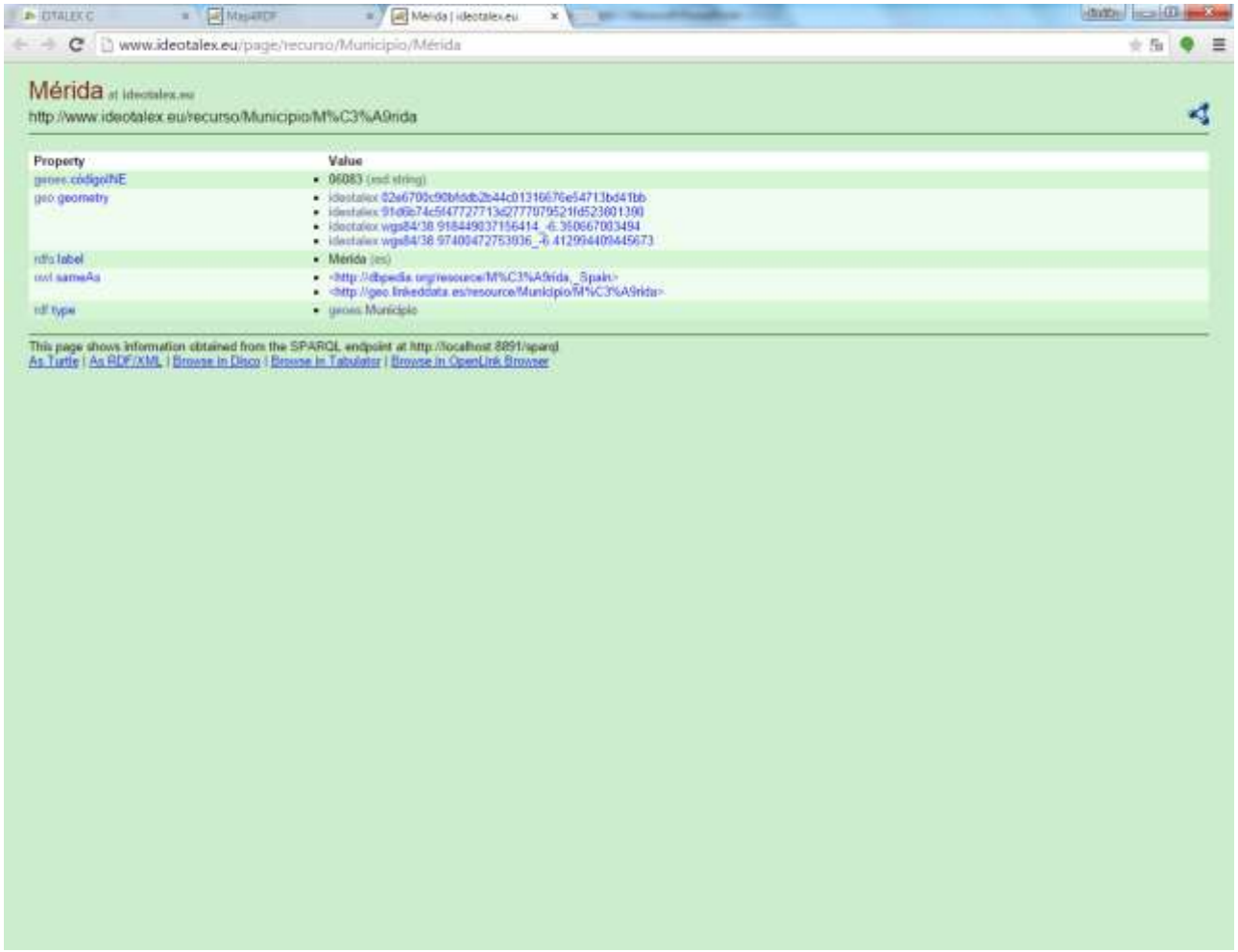
subtasks about linked data

- analysis, reuse and development of ontological resources
- generating information in RDF format
- deployment of the architecture for publishing and querying of the data (SPARQL endpoints and HTML)
- development of an OGC compliant viewer
- establishing relationships between OTALEX data and other datasets
- training

subtasks about linked data



subtasks about linked data

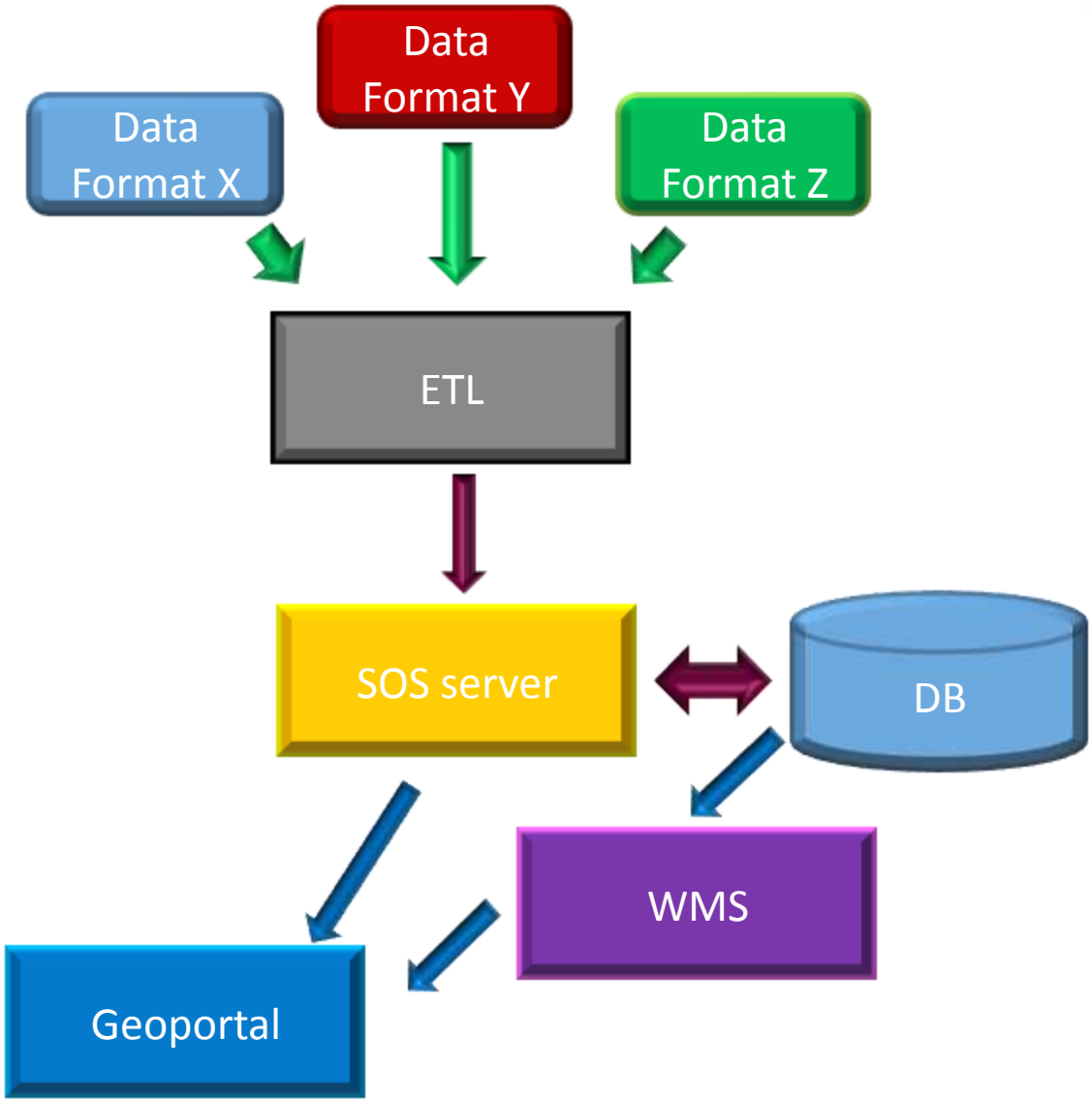


what is a SOS service? and SensorML?

- the SOS standard is applicable to use cases in which sensor data needs to be managed in an interoperable way. This standard defines a web service interface which allows:
  - querying observations, sensor metadata, as well as representations of observed features.
  - registering new sensors and removing existing ones.
  - inserting new sensor observations.
- The objective of the Sensor Model Language (SensorML) is to provide a way of defining processes associated with the measurement of observations. The main objective is to enable interoperability, so sensors and processes can be better understood by machines, utilized automatically in complex workflows, and easily shared between intelligent sensor web nodes.

sources of the SOS?

- datasets and data sources
  - internal (in the future)
    - sensors of Evora University
    - Instituto Portugues do Mar e da Atmosfera
    - EDIA (water reservoir of Alqueva)
  - external
    - AEMET (Spanish Meteorological Office)
    - REDAREX (Irrigation Network of Extremadura)
    - REPICA (CO_2,CO,NO,NO_2,NOX,O_3)
  - and own data sources
    - EMA (Evora)
    - environmental data (temperature, pressure, wind, humidity, noise, radioactivity,…)


Data Format Y
Data Format X
Data Format Z
ETL
SOS server
DB
WMS
Geoportal

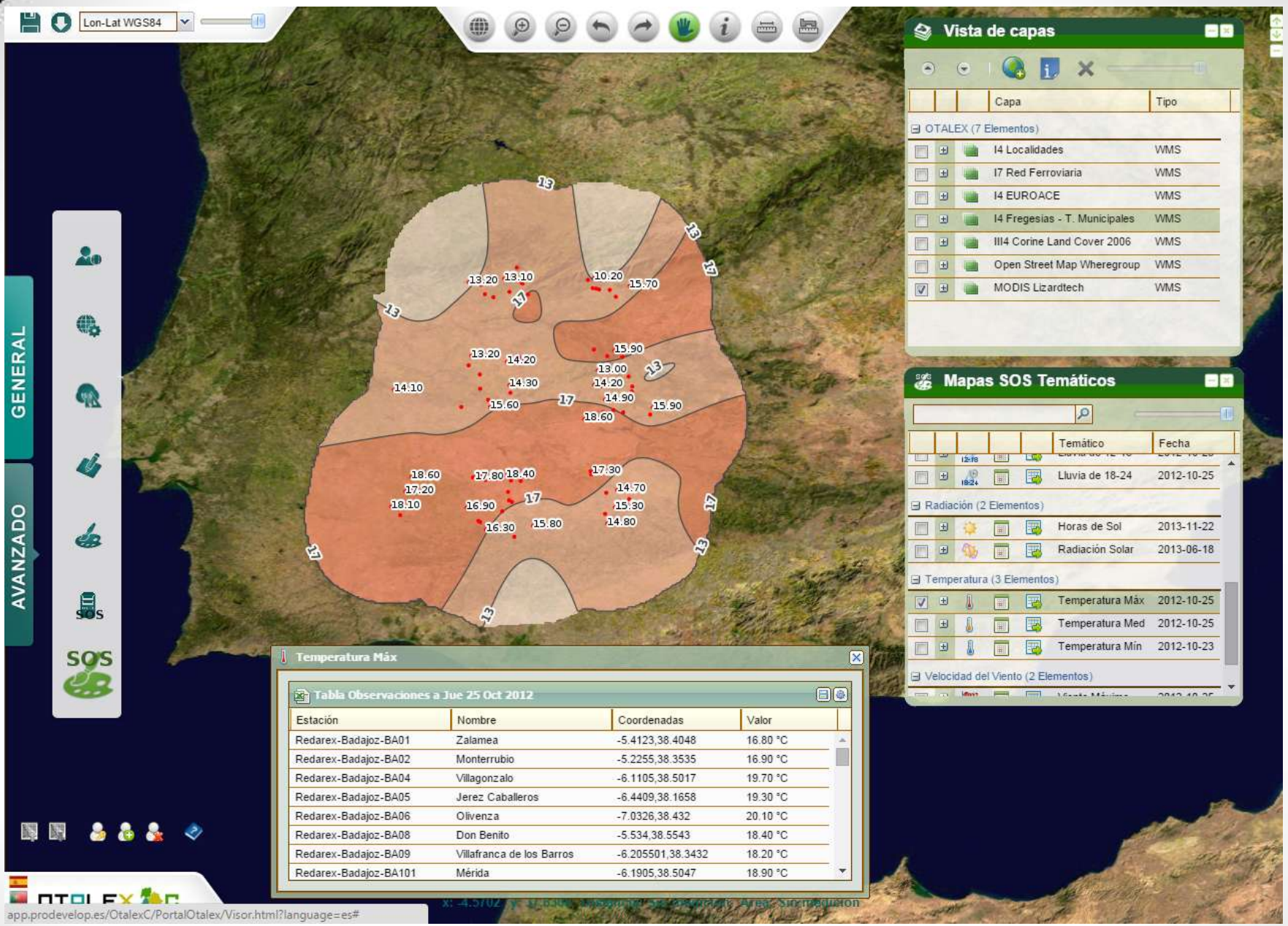
components of the SOS?

- Extract Transform Load (ETL)
  - GeoKettle
- custom developed software
- Database
  - PostgreSQL/PostGIS
- SOS service
  - 52North
- WMS
  - Geoserver

```
<InsertObservation xmlns="http://www.opengis.net/sos/1.0" xmlns:ows="http://www.opengis.
  <AssignedSensorId>urn:ogc:object:feature:Sensor:aemet-badajoz-3410</AssignedSensorId>
  <om:Measurement>
    <!-- tiempo de la observación -->
    <om:samplingTime>
      <gml:TimeInstant>
        <gml:timePosition>2012-06-14'T'00:00:00.000Z</gml:timePosition>
      </gml:TimeInstant>
    </om:samplingTime>
    <!-- sensor y medida observada -->
    <om:procedure xlink:href="urn:ogc:object:feature:Sensor:aemet-badajoz-3410" />
    <om:observedProperty xlink:href="urn:ogc:def:phenomenon:OGC:1.0.30:DirViento" />
    <!-- posición de la medida -->
    <om:featureOfInterest>
      <sa:SamplingPoint gml:id="foi-aemet-badajoz-3410">
        <gml:name>Estación Badajoz</gml:name>
        <sa:sampledFeature xlink:href="Estación Badajoz"/>
        <sa:position>
        <gml:Point>
          <gml:pos srsName="urn:ogc:def:crs:EPSG::4326">38.5243 -6.5815</gml:pos>
        </gml:Point>
        </sa:position>
      </sa:SamplingPoint>
    </om:featureOfInterest>
    <!-- medida observada -->
    <om:result uom="°">30</om:result>
  </om:Measurement>
</InsertObservation>
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
<GetObservation xmlns="http://www.opengis.net/sos/1.0"
    xmlns:ows="http://www.opengis.net/ows/1.1"
    xmlns:gml="http://www.opengis.net/gml"
    xmlns:ogc="http://www.opengis.net/ogc"
    xmlns:om="http://www.opengis.net/om/1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://www.opengis.net/sos/1.0
    http://schemas.opengis.net/sos/1.0.0/sosGetObservation.xsd"
    service="SOS" version="1.0.0" srsName="urn:ogc:def:crs:EPSG::4326">

    <offering>REDAREX</offering>

    <eventTime>
        <ogc:TM_Equals>
            <ogc:PropertyName>om:samplingTime</ogc:PropertyName>
            <gml:TimeInstant>
                <gml:timePosition>latest</gml:timePosition>
            </gml:TimeInstant>
        </ogc:TM_Equals>
    </eventTime>

    <observedProperty>urn:ogc:def:phenomenon:OGC:1.0.30:TempMed</observedProperty>
    <responseFormat>text/xml;subtype=&quot;om/1.0.0&quot;</responseFormat>

</GetObservation>
```

```
<om:ObservationCollection xmlns:om="http://www.opengis.net/om/1.0" xmlns:gml="http://www.ope
▶ <gml:boundedBy>
  <om:member>
    <om:Observation gml:id="go_1362482733011">
    ▶ <om:samplingTime>
      <om:procedure xlink:href="urn:ogc:object:feature:Sensor:redarex-caceres-CC04" />
      <om:observedProperty xlink:href="urn:ogc:def:phenomenon:OGC:1.0.30:TempMed" />
      <om:featureOfInterest xlink:title="foi-redarex-caceres-CC04">
        <sa:SamplingPoint gml:id="foi-redarex-caceres-CC04">
          <gml:name>aldehuela del jerte</gml:name>
          <sa:sampledFeature xlink:href="urn:ogc:def:nil:OGC:unknown" />
        ▶ <sa:position>
        </sa:SamplingPoint>
      </om:featureOfInterest>
      <om:result>
        <swe:DataArray>
          <swe:elementCount>
            <swe:Count>
              <swe:value>1</swe:value>
            </swe:Count>
          </swe:elementCount>
          <swe:elementType name="Components">
          ▶ <swe:DataRecord>
          </swe:elementType>
          <swe:encoding>
            <swe:TextBlock decimalSeparator="." tokenSeparator="," blockSeparator=";" />
          </swe:encoding>
          <swe:values>2013-02-18T01:00:00.000+01:00,11.2;</swe:values>
        </swe:DataArray>
      </om:result>
    </om:Observation>
  </om:member>
</om:ObservationCollection>
```



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