



OTALEXC project, Territorial and Environmental Observatory 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





IDE OTALEXC

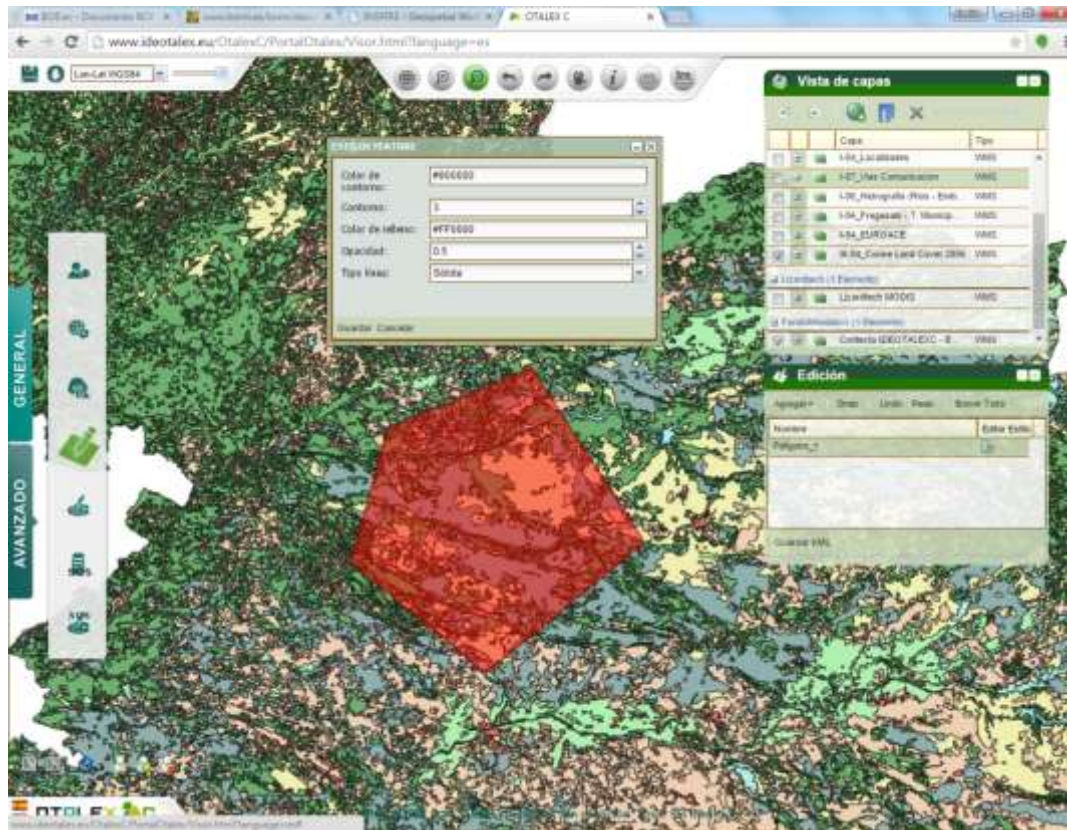
- since 2007
- modular platform
- open source platform





IDE OTALEXC

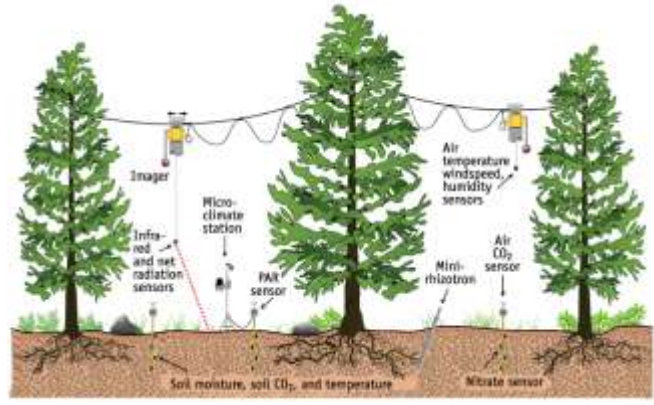
- viewer
 - OpenLayers
 - navigating, information measurement, print, add services and layers, legend
 - upload KML, SHP and GML, WPS
 - transparency, edition, WFS, SOS, mobile and social networks





WG in advanced technologies

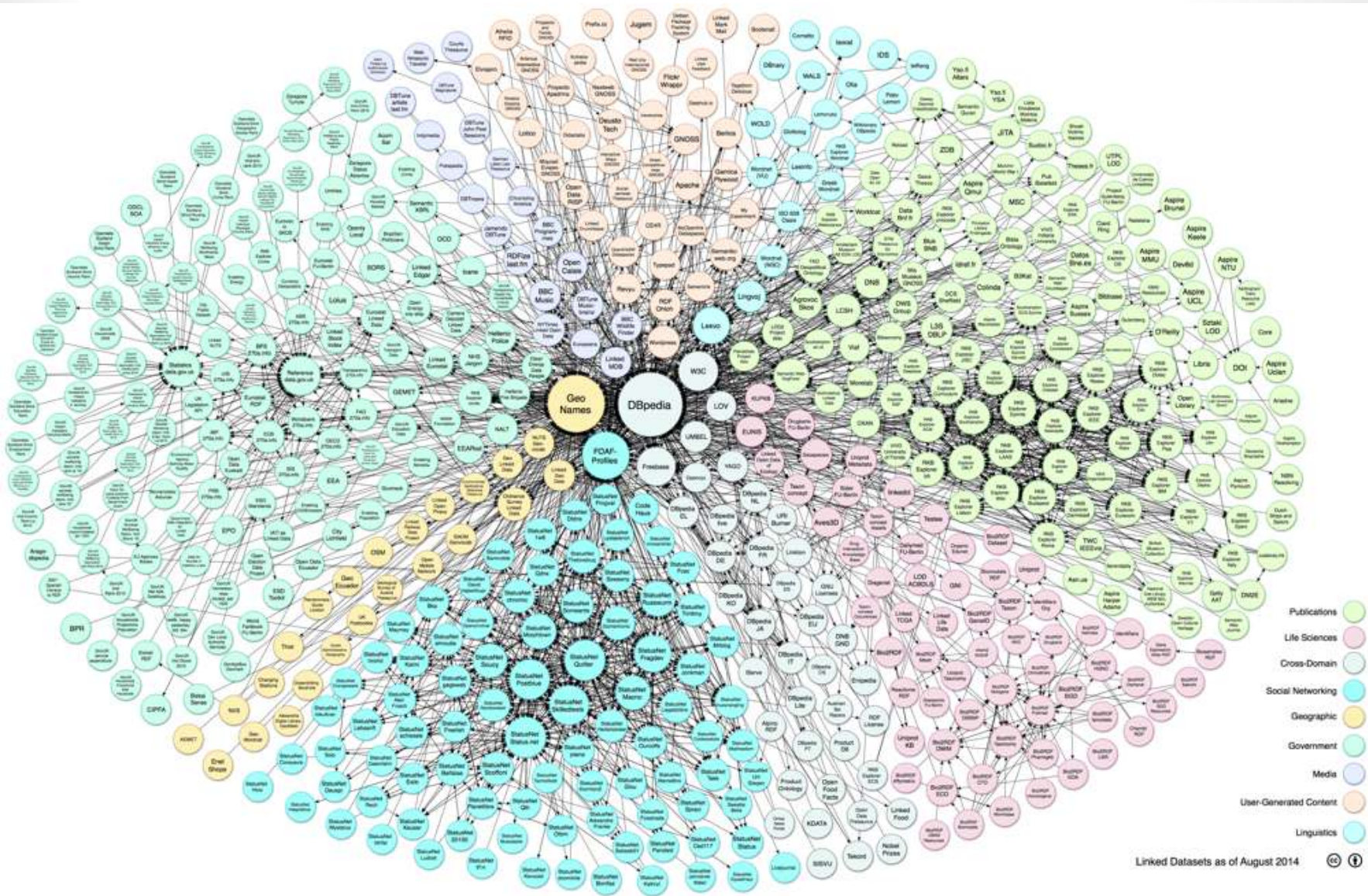
- two main tasks:
 - the generation of linked data of geographic information for the publication of a semantic web
 - publishing thematic maps in real time with environmental data obtained by sensors, using standard services for the publication of observation and measure sensors

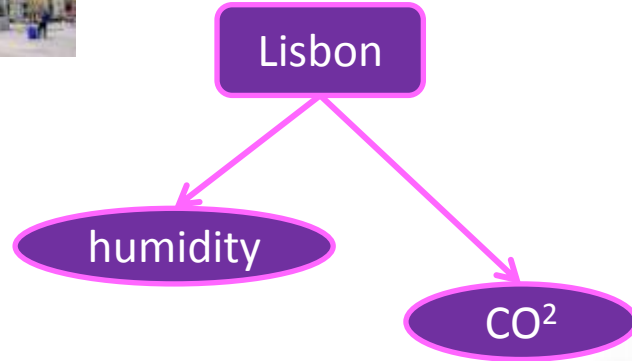
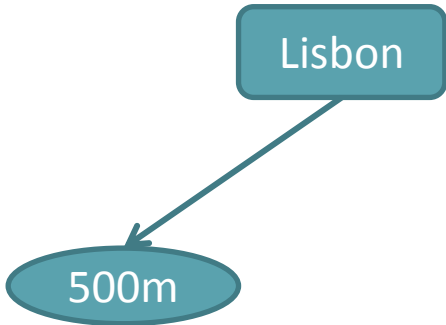
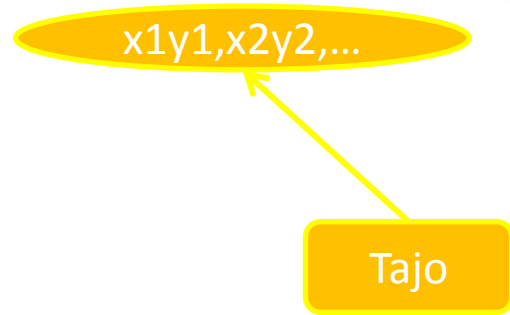
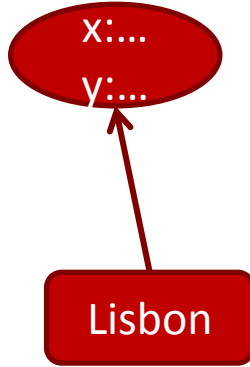
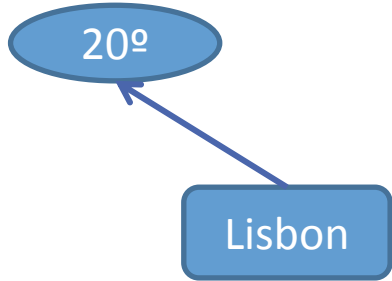
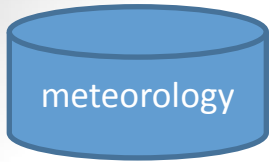




what is linked data?

- 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





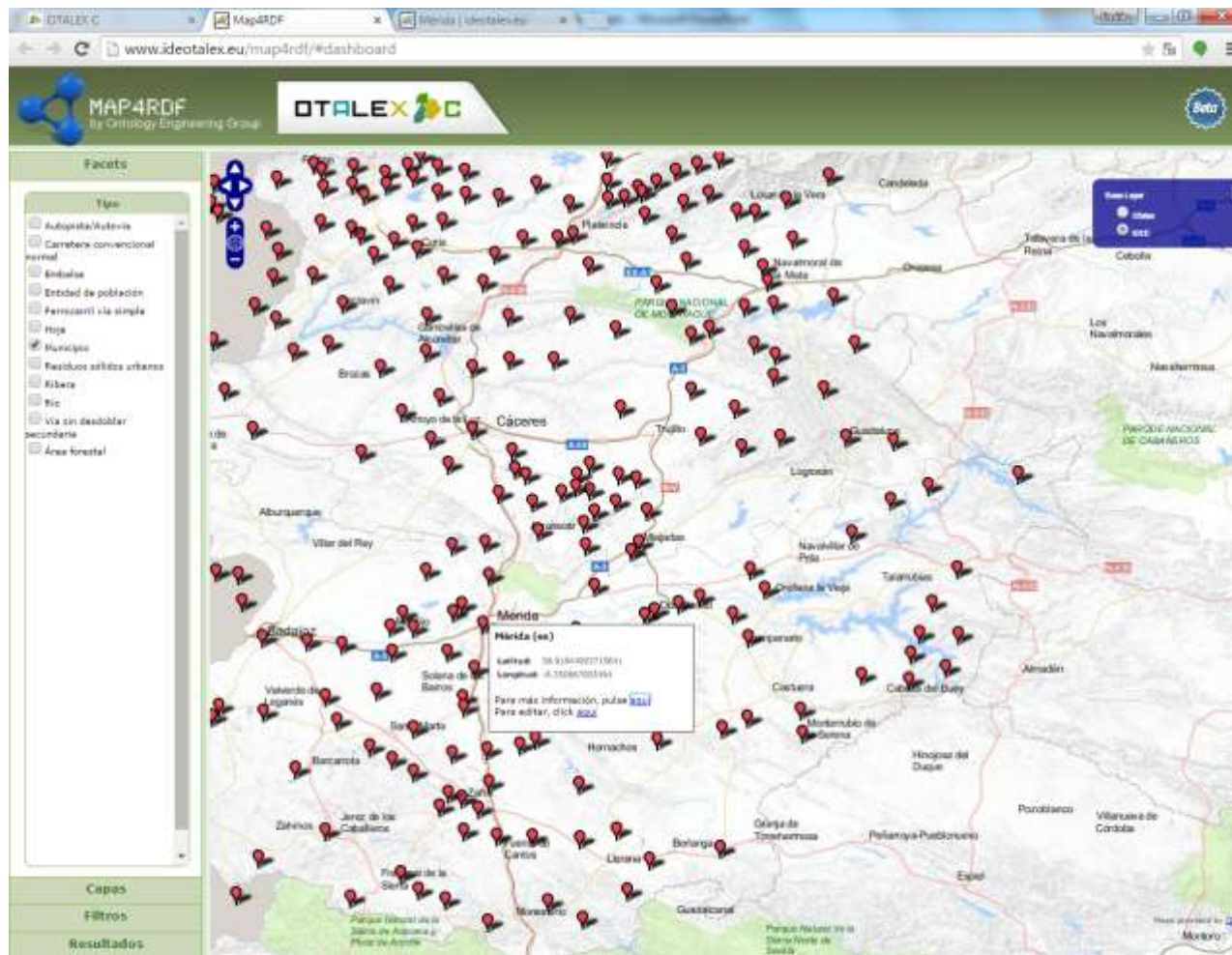


subtasks about linked data

- 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

The screenshot shows a web browser window with the URL `www.ideotalex.eu/page/recurso/Municipio/Mérída`. The page title is 'Mérída' and the URL is `http://www.ideotalex.eu/recurso/Municipio/M%C3%A9rída`. The main content is a table with two columns: 'Property' and 'Value'. The table lists several properties and their corresponding values, including identifiers, coordinates, and labels.

Property	Value
<code>procc.cbdgoHE</code>	• 06083 (en: string)
<code>geo geometry</code>	• <code>ideotalex:02a6705c90b6db2b44c01316676e54713bd41bb</code> • <code>ideotalex:91a0674c547727713a2777079521d523001300</code> • <code>ideotalex:wgs84:38 918449371156414 -6:350667003494</code> • <code>ideotalex:wgs84:38 97409472753036 -6:412994409445673</code>
<code>rdfs label</code>	• Mérída (es)
<code>rdfs sameAs</code>	• <code><http://dbpedia.org/resource/M%C3%A9rída_-_Spain></code> • <code><http://geo.linkdata.es/resource/Municipio/M%C3%A9rída></code>
<code>rdfs type</code>	• <code>geo: Municipio</code>

Below the table, there is a note: 'This page shows information obtained from the SPARQL endpoint at `http://localhost:8091/sparql`'. Below this note are several links: 'As Turtle', 'As RDF/XML', 'Browse in Disco', 'Browse in Tabulator', and 'Browse in OpenLink Browser'.



what is a SOS service? and SensorML?

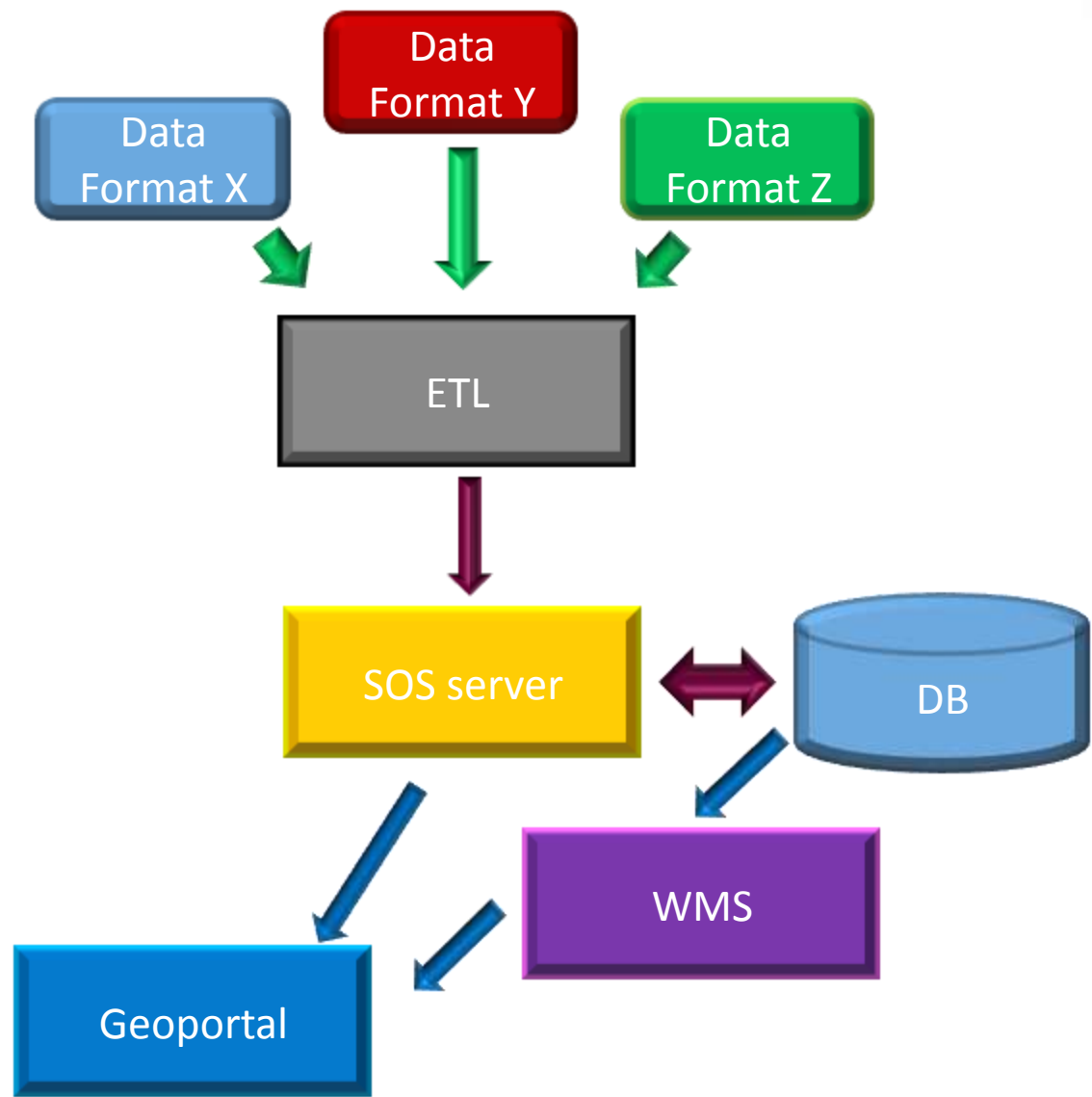
- the SOS standard is applicable to use cases in which sensor data needs to be managed in an interoperable way. This standard defines a web service interface which allows:
 - querying observations, sensor metadata, as well as representations of observed features.
 - registering new sensors and removing 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 (CO₂,CO,NO,NO₂,NOX,O₃)
 - and own data sources
 - EMA (Evora)
 - environmental data (temperature, pressure, wind, humidity, noise, radioactivity,...)







components of the SOS?

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


```
1 <InsertObservation xmlns="http://www.opengis.net/sos/1.0" xmlns:ows="http://www.opengis.net/sos/1.0" >
2   <AssignedSensorId>urn:ogc:object:feature:Sensor:aemet-badajoz-3410</AssignedSensorId>
3   <om:Measurement>
4     <!-- tiempo de la observación -->
5     <om:samplingTime>
6       <gml:TimeInstant>
7         <gml:timePosition>2012-06-14'T'00:00:00.000Z</gml:timePosition>
8       </gml:TimeInstant>
9     </om:samplingTime>
10    <!-- sensor y medida observada -->
11    <om:procedure xlink:href="urn:ogc:object:feature:Sensor:aemet-badajoz-3410" />
12    <om:observedProperty xlink:href="urn:ogc:def:phenomenon:OGC:1.0.30:DirViento" />
13    <!-- posición de la medida -->
14    <om:featureOfInterest>
15      <sa:SamplingPoint gml:id="foi-aemet-badajoz-3410">
16        <gml:name>Estación Badajoz</gml:name>
17        <sa:sampledFeature xlink:href="Estación Badajoz"/>
18        <sa:position>
19          <gml:Point>
20            <gml:pos srsName="urn:ogc:def:crs:EPSG::4326">38.5243 -6.5815</gml:pos>
21          </gml:Point>
22        </sa:position>
23      </sa:SamplingPoint>
24    </om:featureOfInterest>
25    <!-- medida observada -->
26    <om:result uom="°">30</om:result>
27  </om:Measurement>
28 </InsertObservation>
```

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <GetObservation xmlns="http://www.opengis.net/sos/1.0"
3   xmlns:ows="http://www.opengis.net/ows/1.1"
4   xmlns:gml="http://www.opengis.net/gml"
5   xmlns:ogc="http://www.opengis.net/ogc"
6   xmlns:om="http://www.opengis.net/om/1.0"
7   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
8   xsi:schemaLocation="http://www.opengis.net/sos/1.0
9   http://schemas.opengis.net/sos/1.0.0/sosGetObservation.xsd"
10  service="SOS" version="1.0.0" srsName="urn:ogc:def:crs:EPSG::4326">
11  <offering>REDAREX</offering>
12
13  <eventTime>
14    <ogc:TM_Equals>
15      <ogc:PropertyName>om:samplingTime</ogc:PropertyName>
16      <gml:TimeInstant>
17        <gml:timePosition>latest</gml:timePosition>
18      </gml:TimeInstant>
19    </ogc:TM_Equals>
20  </eventTime>
21
22  <observedProperty>urn:ogc:def:phenomenon:OGC:1.0.30:TempMed</observedProperty>
23  <responseFormat>text/xml; subtype="om/1.0.0"</responseFormat>
24
25
26 </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:DataRecord>
              </swe:elementType>
            </swe:DataArray>
          </om:result>
        </om:Observation>
      </om:member>
    </om:ObservationCollection>
```

Vista de capas

Capa	Tipo
OTALEX (7 Elementos)	
<input type="checkbox"/> 14 Localidades	VMS
<input type="checkbox"/> 17 Red Ferroviaria	VMS
<input type="checkbox"/> 14 EUROACE	VMS
<input type="checkbox"/> 14 Fregesias - T. Municipales	VMS
<input type="checkbox"/> III4 Corine Land Cover 2006	VMS
<input type="checkbox"/> Open Street Map Wheregroup	VMS
<input checked="" type="checkbox"/> MODIS Lizardtech	VMS

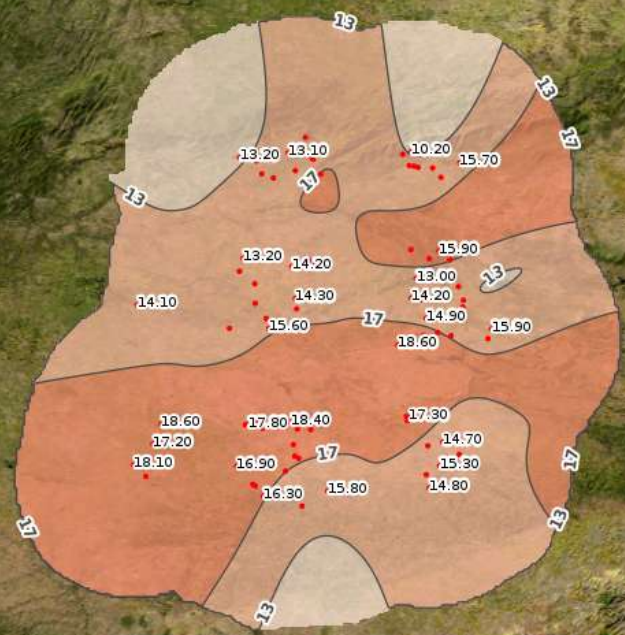
Mapas SOS Temáticos

Temático	Fecha
Radiación (2 Elementos)	
<input type="checkbox"/> Lluvia de 18-24	2012-10-25
<input type="checkbox"/> Horas de Sol	2013-11-22
<input type="checkbox"/> Radiación Solar	2013-06-18
Temperatura (3 Elementos)	
<input checked="" type="checkbox"/> Temperatura Máx	2012-10-25
<input type="checkbox"/> Temperatura Med	2012-10-25
<input type="checkbox"/> Temperatura Min	2012-10-23
Velocidad del Viento (2 Elementos)	
<input type="checkbox"/> Viento Máximo	2012-10-25

GENERAL

AVANZADO

SOS



Temperatura Máx

Tabla Observaciones a Jue 25 Oct 2012

Estación	Nombre	Coordenadas	Valor
Redarex-Badajoz-BA01	Zalamea	-5.4123,38.4048	16.80 °C
Redarex-Badajoz-BA02	Monterrubio	-5.2255,38.3535	16.90 °C
Redarex-Badajoz-BA04	Villagonzalo	-6.1105,38.5017	19.70 °C
Redarex-Badajoz-BA05	Jerez Caballeros	-6.4409,38.1658	19.30 °C
Redarex-Badajoz-BA06	Olivenza	-7.0326,38.432	20.10 °C
Redarex-Badajoz-BA08	Don Benito	-5.534,38.5543	18.40 °C
Redarex-Badajoz-BA09	Villafranca de los Barros	-6.205501,38.3432	18.20 °C
Redarex-Badajoz-BA101	Mérida	-6.1905,38.5047	18.90 °C



Thank you for your attention

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