istituto per il rilevamento elettromagnetico dell'ambiente

GeoNode

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GET-IT: Integrating sensor information and semantics-aware metadata in GeoNode

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Context

TRAINING FOR EDUCATION, LEARNING AND LEADERSHIP
TOWARDS A NEW METROPOLITAN DISCIPLINE

ICPSM

Description (1)

Software tools:

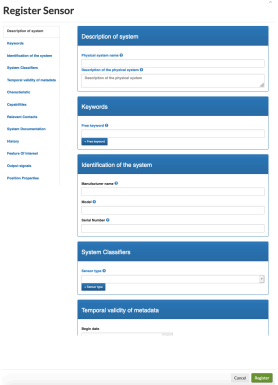
- GeoNode (now v2.7, soon v2.10)
  - Improved **geoext** library for SOS resources
  - JavaScript application (***upload_observations***) for insertion of SOS observations
- EDI (v1.2)
  - Integrated via module **geosk.mdtools**
- 52°North SOS (v4.4.2)
  - Integrated via module **geosk.osk**

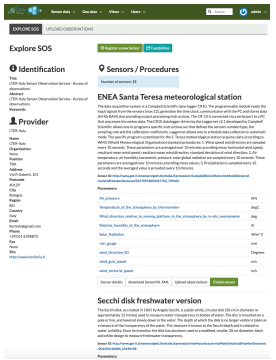
Relevant formats:

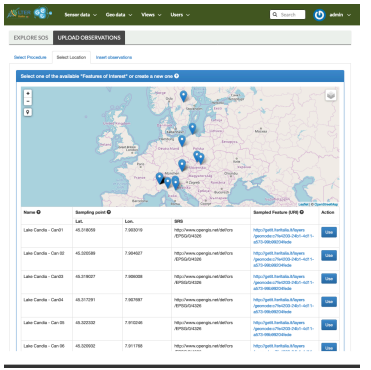
- XML
  - Template language for definition of the metadata profile (and of the editing interface)
  - Storage format for metadata based on the template language
  - XPath simple paths specifying the XML nodes to be created
  - XSLT for:
    - modifying the target metadata output prior to insertion in the catalog
    - composing transactional SOS operations operated by JavaScript
    - HTML representation of XML SensorML
- RDF
  - Triple store
  - SPARQL

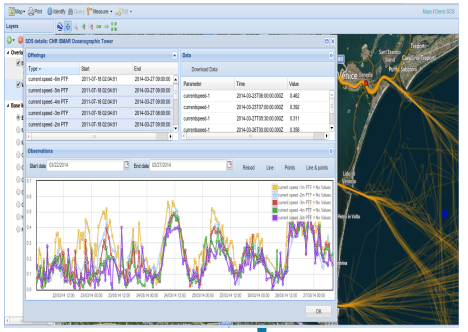
Sensor management WF

	Insert Sensor	Sensor list	Sensor details	Insert observation	Maps with observations
Integration module	**geosk.osk**	**geosk.osk**	**geosk.osk**	***upload_observations***	**geoext** extended
Programming language	py	py	py XSLT	js	js
Software involved	EDI SOS	SOS	SOS GeoServer	SOS GeoServer	SOS GeoServer









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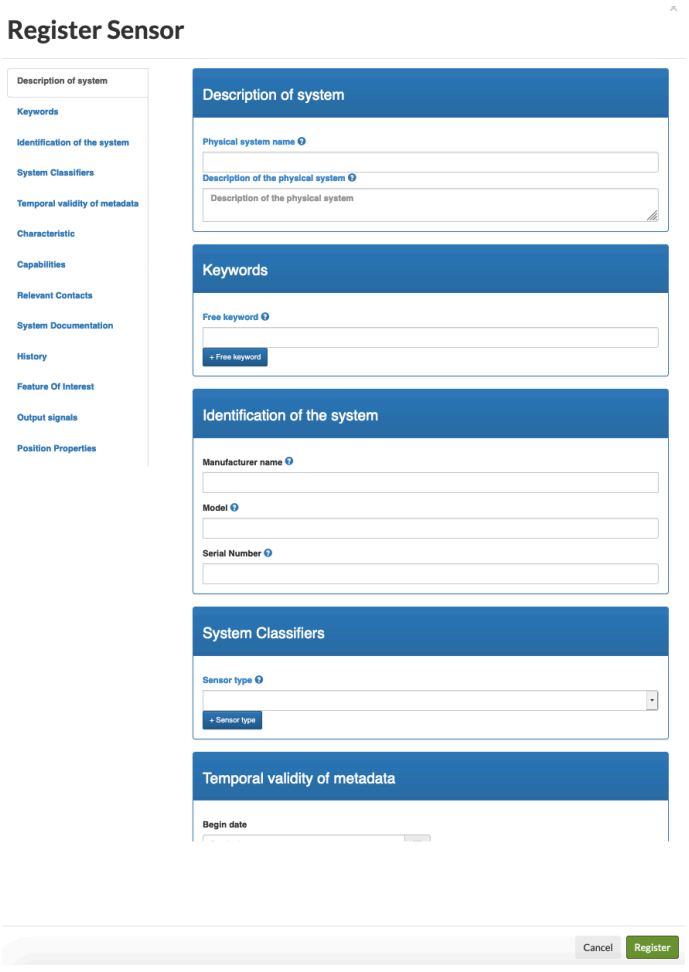
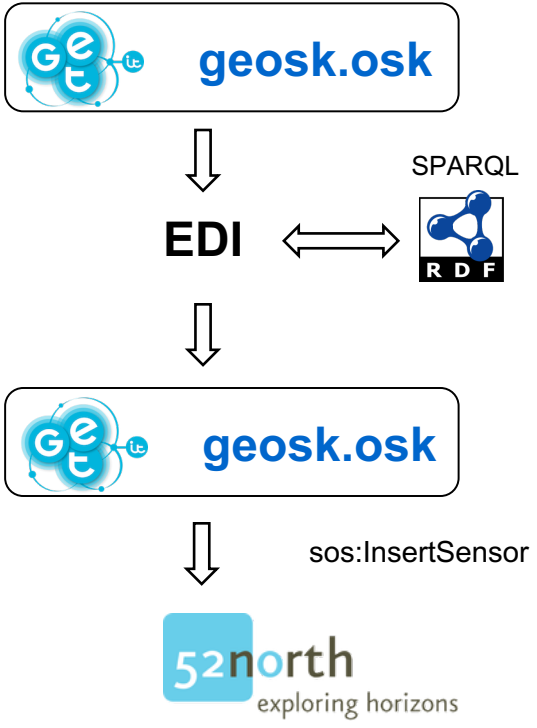
GeoNode

1. Insert sensor

	Insert Sensor
Integration module	geosk.osk
Programming language	py
Involved software	EDI SOS





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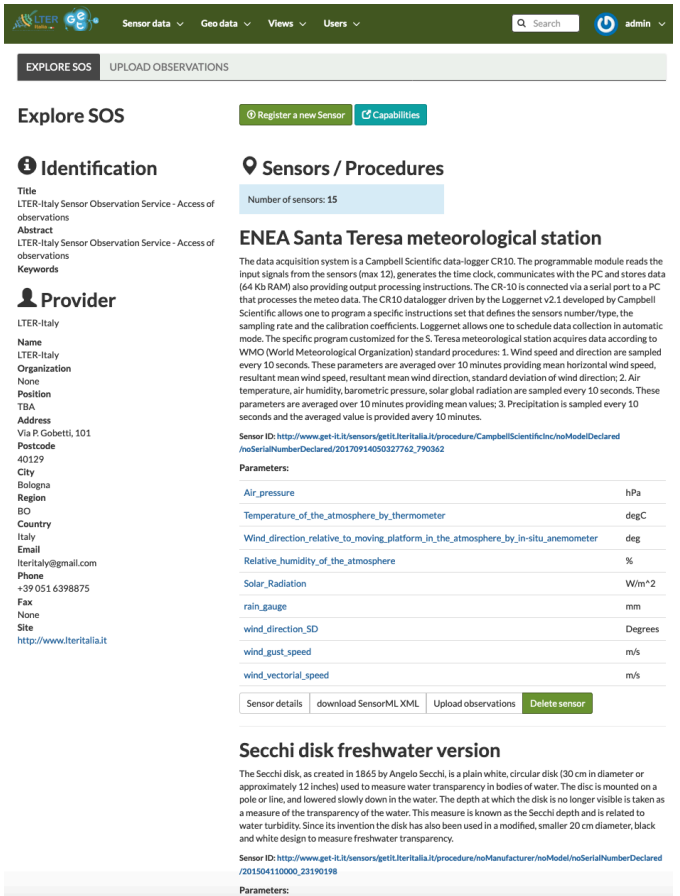
GeoNode

2. Sensor list

	Sensor list
Integration module	geosk.osk
Programming language	py
Involved software	SOS



geosk.osk

geosk.osk

sos:GetCapabilities

52north exploring horizons

SPARQL

RDF

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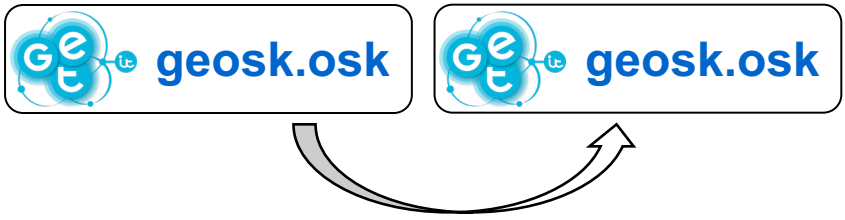
GeoNode

3. Sensor details

	Sensors list
Integration module	geosk.osk
Programming language	py XSLT
Involved software	SOS GeoServer



sos:describeSensor

WFS GetFeature

SPARQL

52north exploring horizons

GeoServer

RDF

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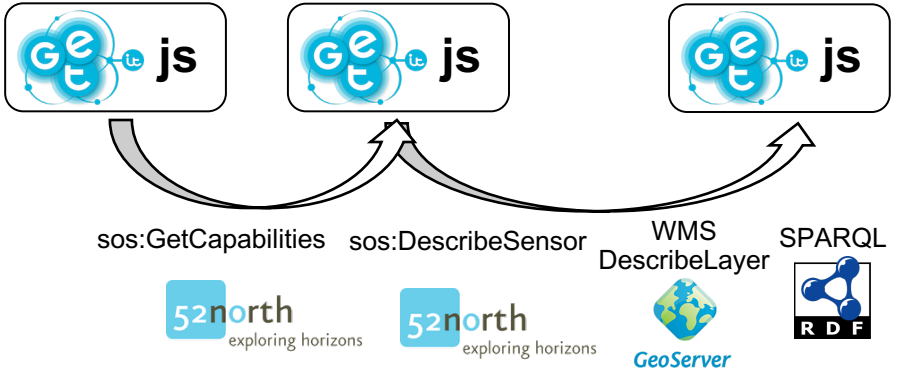
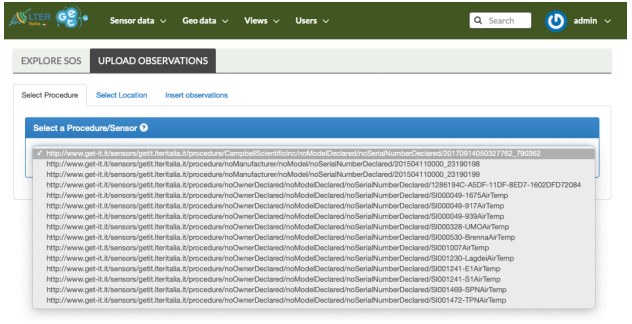
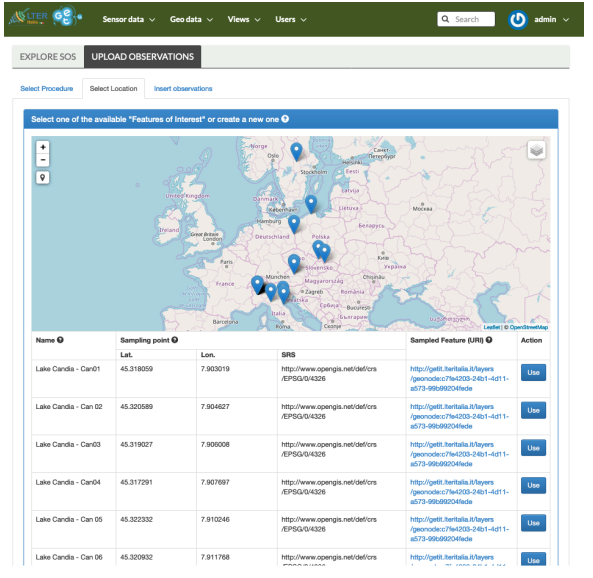
GeoNode

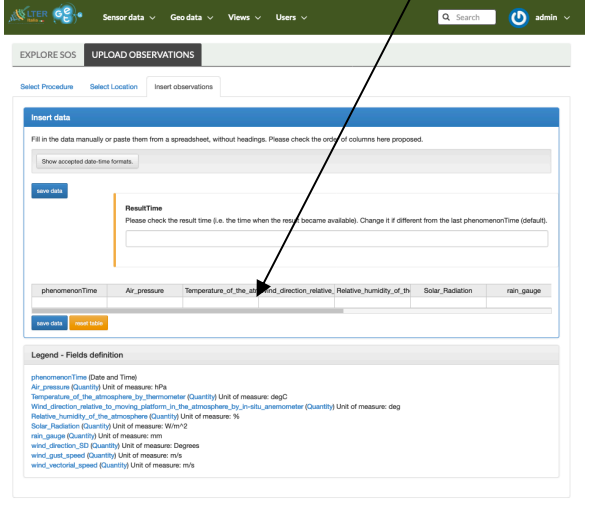
4. Insert observation

	Insert observation
Integration module	upload_ observations
Programming language	js
Involved software	SOS GeoServer









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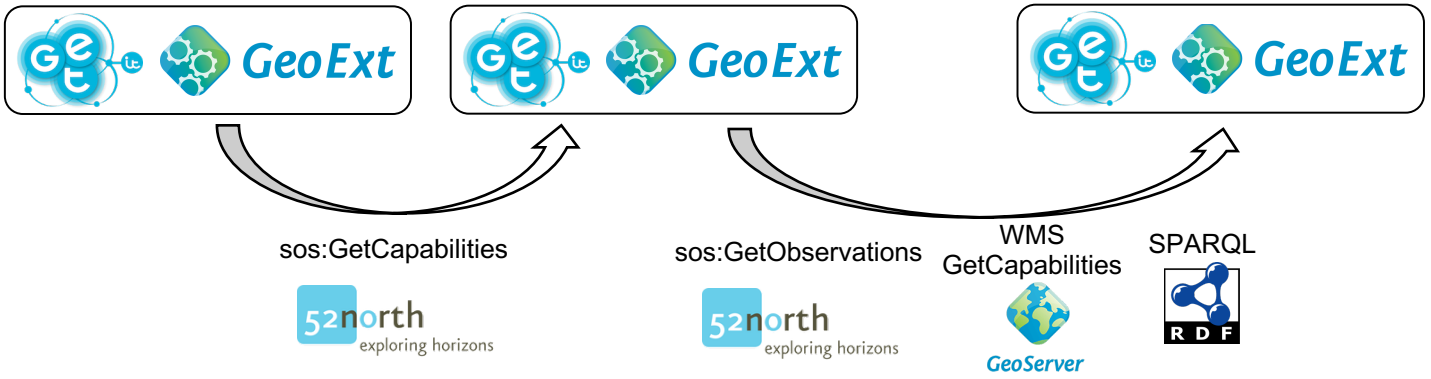
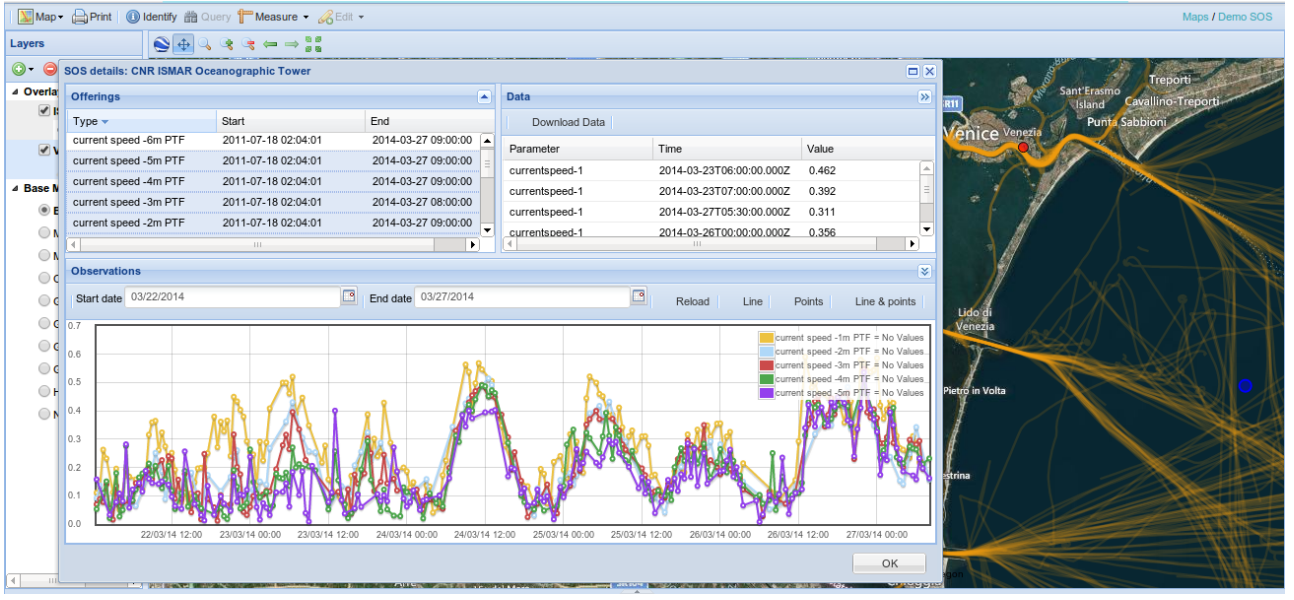
5. Maps with observation

	Maps with observation
Integration module	**geoext** extended
Programming language	js
Involved software	SOS GeoServer





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GeoNode

Formats: XML

```
<element xml:id="resp">
   <label xml:lang="en">Responsible party</label>
   <label xml:lang="it">Responsabile</label>
   <produces>
      <item datasource="person"...>
         <label xml:lang="en">Email</label>
         <label xml:lang="it">Email</label>
         <hasPath>/.../gmd:electronicMailAddress/...</hasPath>
      </item>
      <item ...>
         <label xml:lang="en">Institute</label>
         <label xml:lang="it">Istituto</label>
         <hasPath>/.../gmd:organisationName/...</hasPath>
      </item>
      <item ...>
         <label xml:lang="en">Role</label>
         <label xml:lang="it">Ruolo</label>
         <hasPath>/.../gmd:CI_RoleCode/...</hasPath>
      </item>
   </produces>
</element>
```

Formats: RDF

```
<datasources>
 <sparql xml:id="person">
  <query>
  <![CDATA[
   SELECT ?contact ?label
   WHERE {
    ?contact rdf:type foaf:Person .
    ?contact vcard:email ?label .
    FILTER(
     REGEX( STR(?label) ,"$search_param","i") )
   }
   ORDER BY ASC(?label)
  ]]>
  </query>
  <url>http://url.to.endpoint/</url>
 </sparql>
</datasources>
```

GET-IT specific endpoints

URL / Endpoint	Type	Title	Software
/layers/[layername]#ediclient_container	GUI	Semantic metadata editor	GET-IT (EDI Client)
/maps/	GUI	Explore view/map	GeoNode/GET-IT (SOS Client)
/observations/	GUI	SOS 52°North Home page	SOS 52°North
/observations/sos/	Service	SOS	SOS 52°North
/sensors/	GUI	Explore sensor	GET-IT (SOS Manager)
/sensors/#ediclient_container	GUI	Semantic metadata editor	GET-IT (EDI Client)
/sensors/sensor/ds/?[sensor_id]	GUI	Sensor details	GET-IT (SOS Manager)
/sensors/upload?[sensor_id]	GUI	Upload observations	GET-IT (SOS Manager)
/sensors/deletesensor?[sensor_id]	GUI	Delete sensor	GET-IT (SOS Manager)
/whoami	API	Who am I (GET-IT info)	GET-IT
/mdtools/api/listediml	API	List of EDIML resources	GET-IT
/layers/[layername]/ediml	API	EDIML resource metadata	GET-IT
/layers/[layername]/rndt	API	RNDT resource metadata	GET-IT
/mdtools/api/importediml	GUI/API	Import EDIML metadata	GET-IT
/mdtools/api/importrndt	GUI/API	Import RNDT metadata	GET-IT
/static/EDI-NG_client/	GUI	EDI Client	GET-IT (EDI Client)

Outcome

- Integration of geographic and sensor data
  - Both for authentication and visualization
- Semantic characterization of metadata
  - Allow for advanced assisted editing of metadata
  - Integrated with the GeoNode structures (e.g., for facets)
  - Enables query expansion in discovery tasks

Outlook

- Internal triple store (e.g., Virtuoso, Jena) for self-contained customization of the metadata editing facilities
- SDI-wide federated authentication / authorization among the nodes (and selected third-party applications)
  - An internal triple store would allow for RDF-based representation of users and re-use of this information for editing metadata
- Semantic lift of existing metadata for re-EDIting
- Community support

Question time

https://github.com/SP7-Ritmare/starterkit

http://get-it.it/

https://getit.readthedocs.io/en/latest/index.html