Intelligent management of water resources. GeoSmartCity Project

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Overview

GeoSmartCity project establishes a cross-platform, re-usable and open hub able to publish open geographic information and to provide specialized services based on open standards.

The GeoSmartCity cross-platform toolkit and operational methodology allow further integration of third-party data (open or restricted) as well as crowd-sourced data. The potentiality of the toolkit will be demonstrated through the development of 11 operative and re-usable pilot cases in the frame of two scenarios: **Green-Energy** and **Underground**.

The "**Mancomunidad de Comarca de Pamplona, MCP**" (Federation of 50 Local Councils of Navarra (Spain) http://www.mcp.es) is the entity that manages the services related to water cycle and solid waste management, regional urban transport and taxi management.

Mancomunidad Comarca de Pamplona Iruñerriko Mankomunitatea

- Population: 358.557
- Surface:1.305,7 km^2
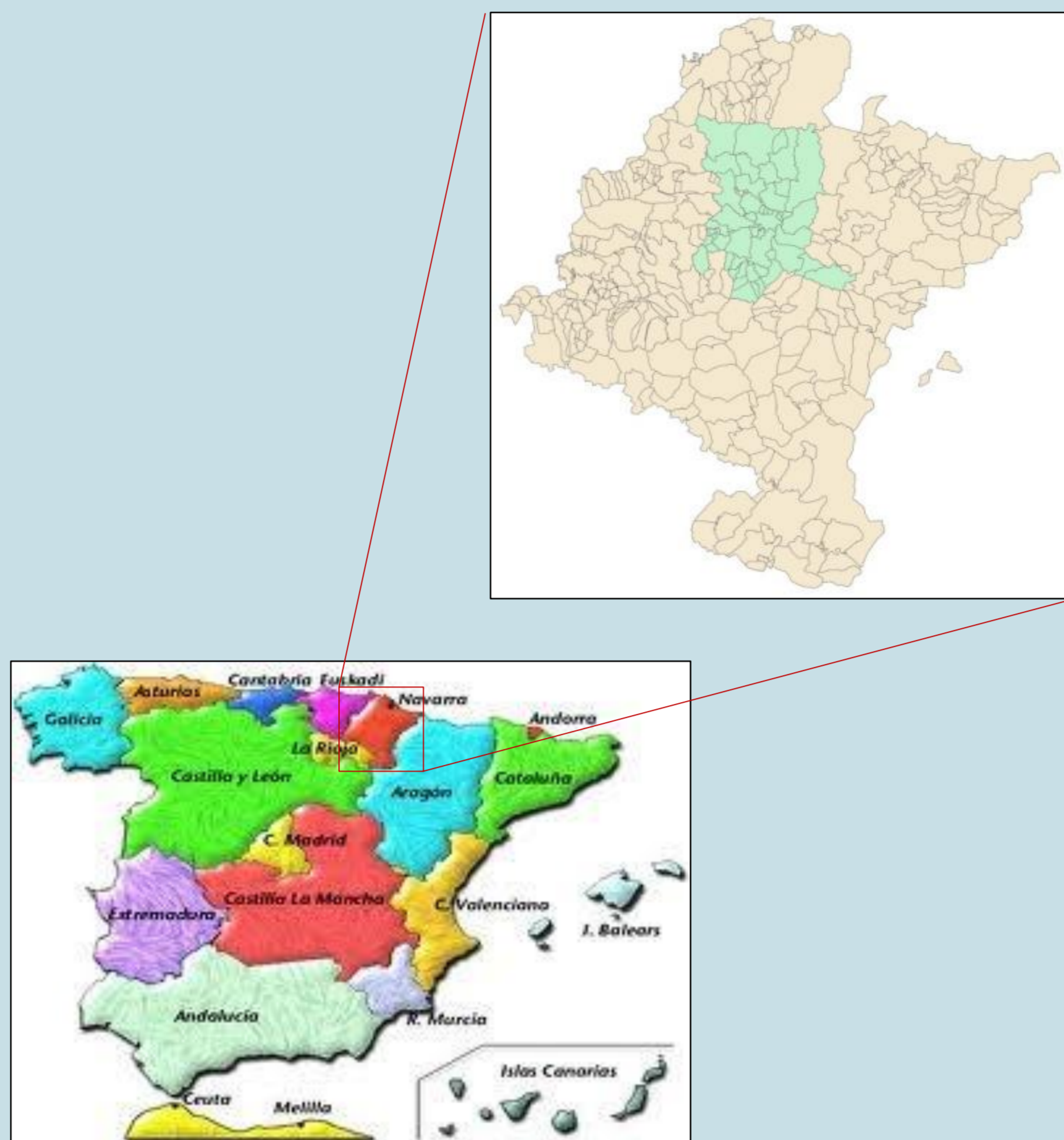
Underground Scenario

Some of the services that are managed at regional level are utility networks that supply: gas, electricity, water, sanitation, telecommunications, etc. The limits of the networks are established considering the cost of infrastructure and the cost of managing.

Additionally, infrastructure networks are largely underground, which favors the integration of services seamlessly into the lives of citizens, but difficult to maintain the network itself. For these reasons we can say that coordination between administrative bodies and managing communication networks is a complex issue, executed with low efficiency if maintenance plans do not take into account all relevant factors, and it always requires high investment performance.

Comarca of Pamplona pilot objectives

The **aim** of the pilot is to work with the integration of real-time data, the improvement of the water management, and the integration of other underground utility networks to show the benefits of data interoperability.

Other target of this pilot is to show the capabilities of GIS systems as the best tool to manage, to monitor and to exploit real-time information. The data could be cross nearer to physical reality, could be interoperated in a geographical context, and the decisions could be applied over ways or regions with a more general meaning.

Sensor Observation Service (SOS)

Approved Open Geospatial Consortium standard that defines a web service interface for the discovery and retrieval of real time or archived data produced by all kinds of sensors like mobile or stationary as well as in-situ or remote sensors.
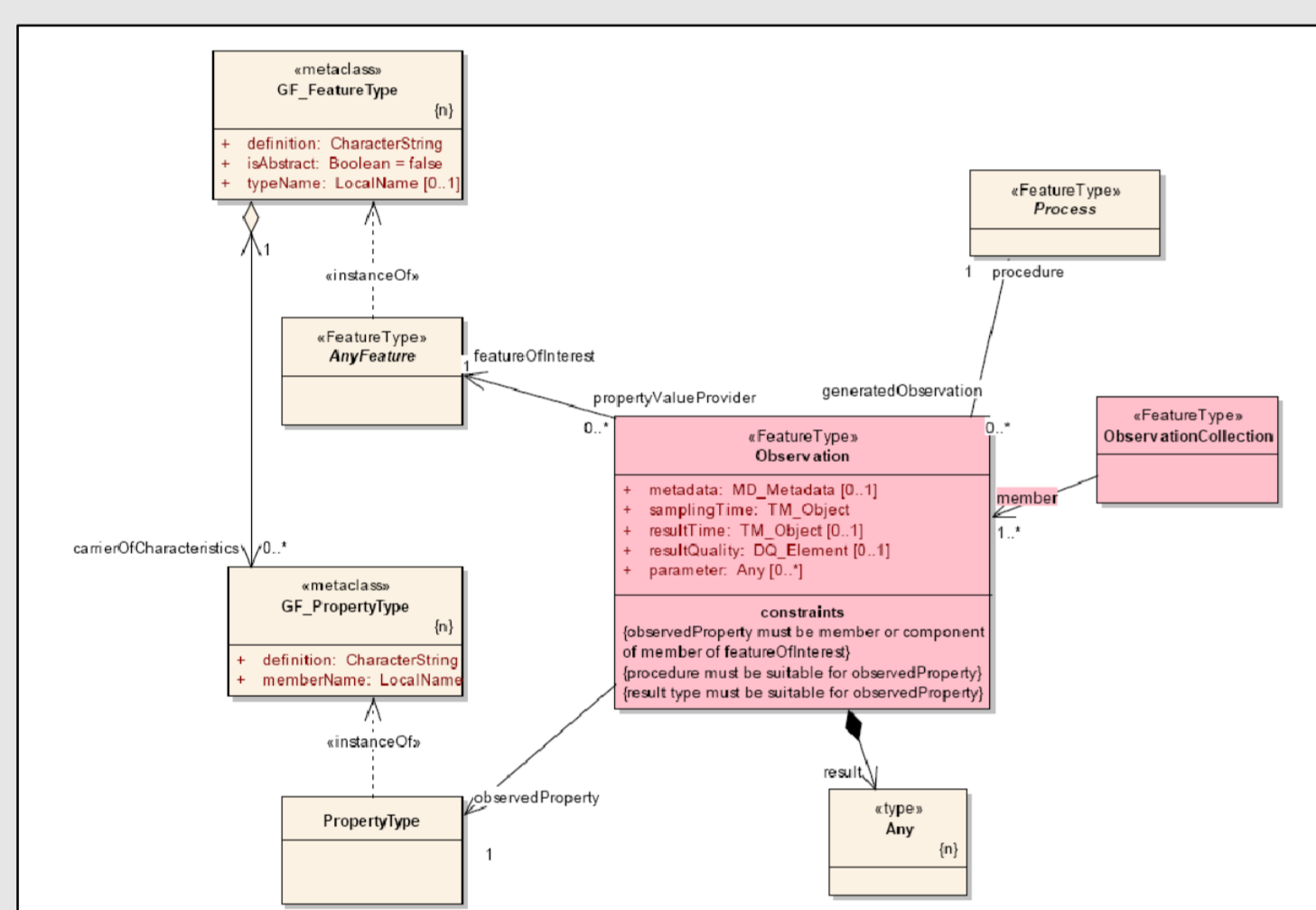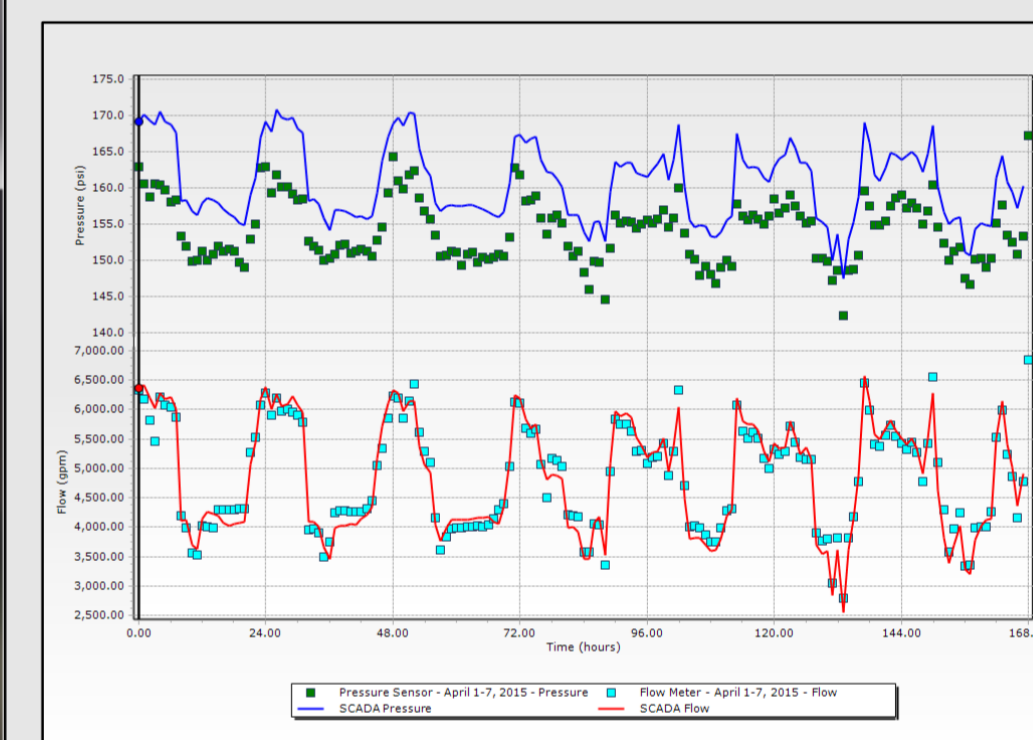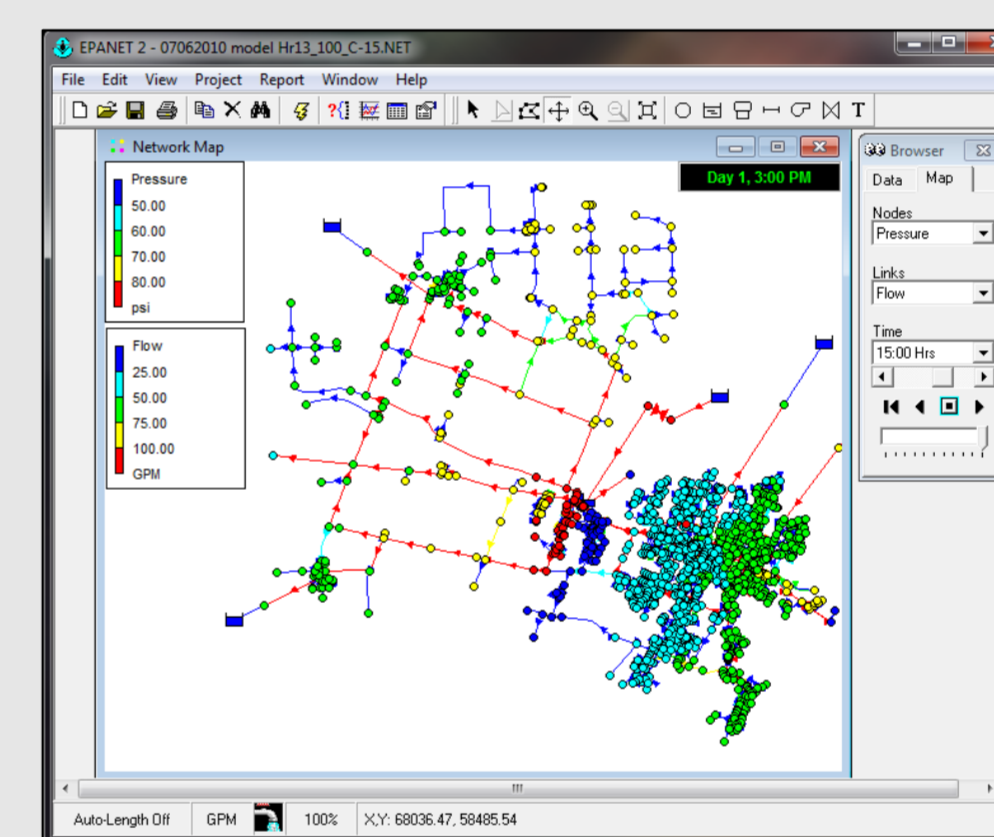

SCADA

Supervisory Control & Data Acquisition (SCADA) is a system for remote monitoring and control that operates with coded signals over communication channels (using typically one communication channel per remote station).
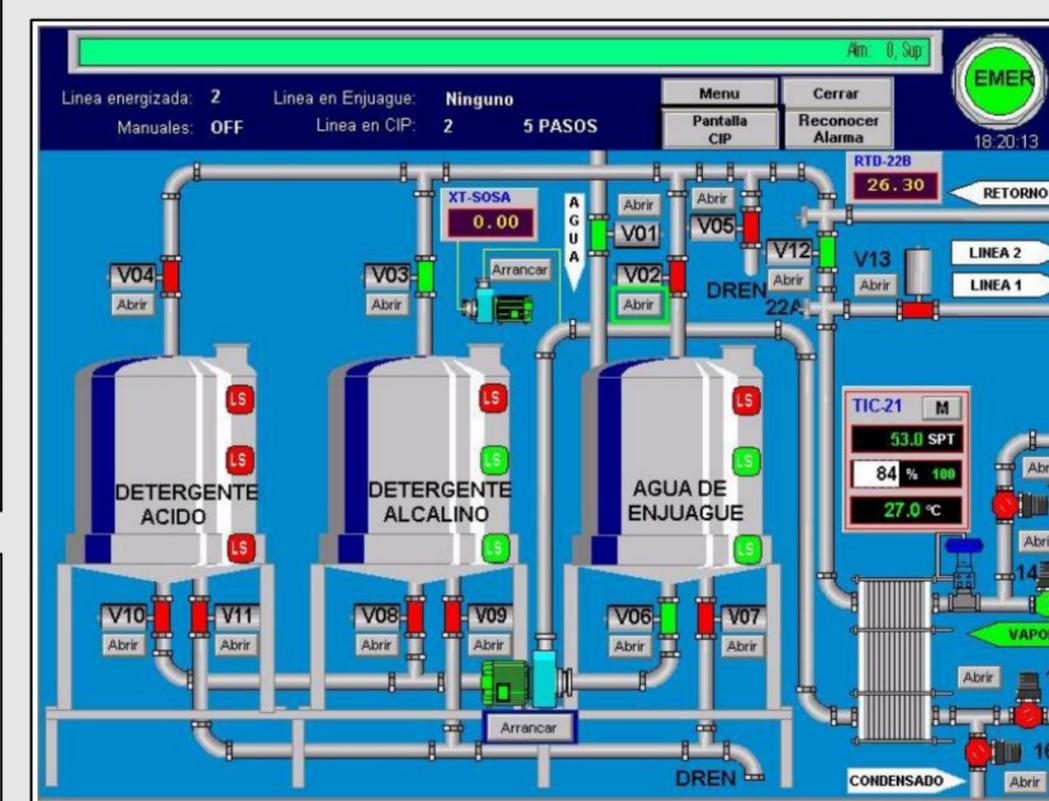
EPANET

EPANET is software that models water distribution piping systems. It calculates the hydraulic behavior and water quality in pressurized pipe networks. The network elements can be copied to SOS standard as "virtual" sensors. Calculated values in the network simulation correspond to observations.

Pilot Components Development

API SITNA

http://sitna.navarra.es/geoportal/recursos/api.aspx
OGC Compliant Web Mapping API

Pamplona pilot
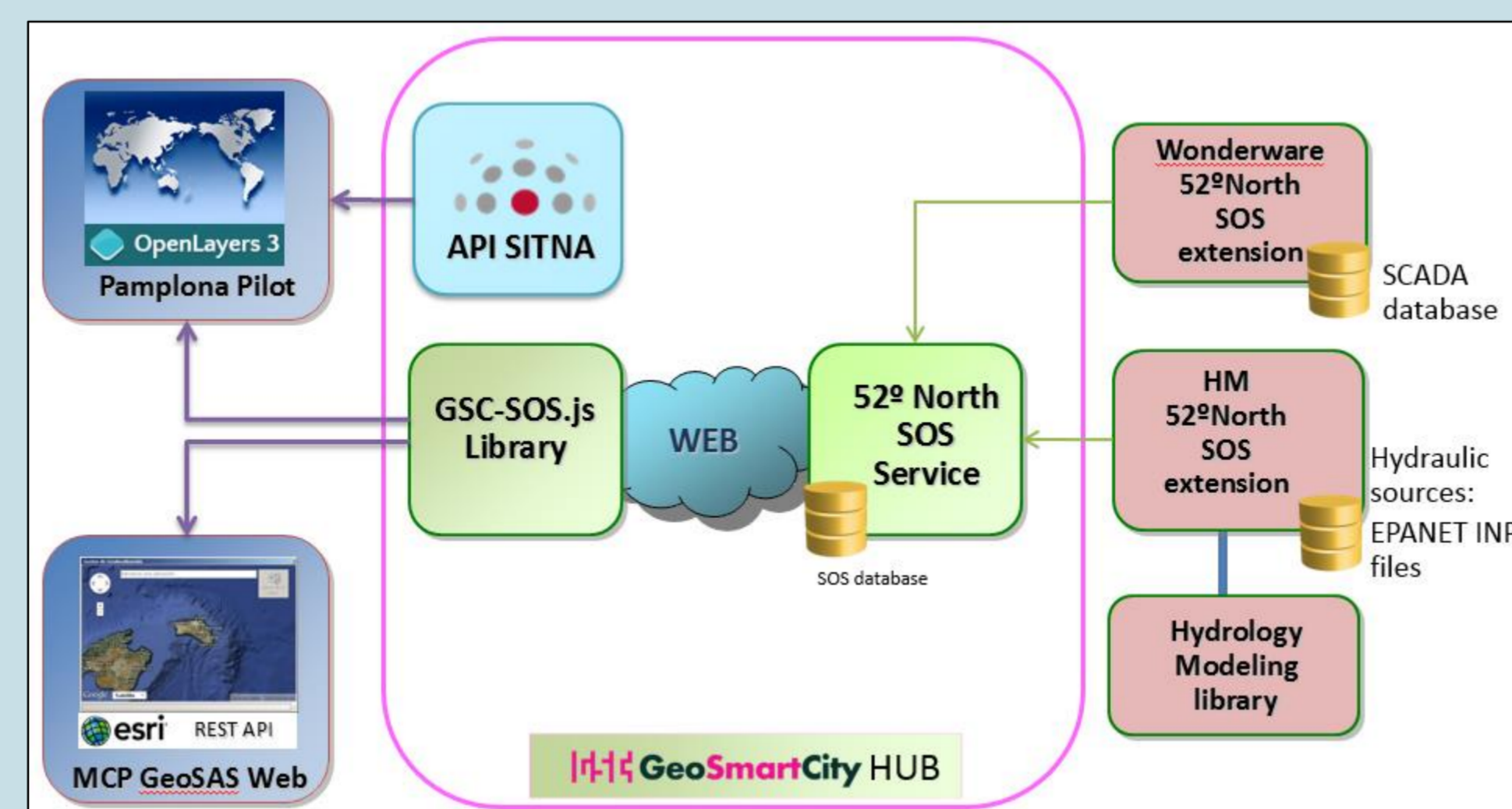https://geoweb.tracasa.es/geosmartcity/pamplona

Technological Challenge

Improve 52North SOS service implementation to integrate data provided by SCADA sensors and EPANET, and be able to exploit the results using a generic Web Map Viewer based on OGC standards.

Architecture

GSC_SOS.js

https://github.com/GeoSmartCity-CIP/gsc-sos.js
JavaScript library that encapsulates calls to a web service with SOS 2.0 implementation. Communication messages are XML formatted. The code is agnostic JavaScript, with no dependencies on other JavaScript libraries and it has the same 52North SOS client front-end to facilitate integration and evolutive development.
All functions handled the request to capabilities, so it is not necessary call it before any request like "*getOffering*", "*getFeatureOfInterest*" or "*getObservation*".

52North SOS Extension for SCADA and EPANET Networks