Developing a Visualization Tool to Monitor Reservoir Fill in Spain

Data Description and Use for the Solution

The data currently available on reservoirs can be found on the site https://www.embalses.net/ . Data in the site is displayed in charts such as the following:

Embalses en Asturias

Pantano	Capacidad	Embalsada	Variacion
ALFILORIOS	8	8	0
ARBON	41	37	-1
DOIRAS	97	87	-1
LA BARCA	34	15	-2
RIOSECO	4	4	1
SALIME	266	225	2
TANES	34	29	-1

Embalses en Asturias (Sin datos Semanales)

Pantano	Capacidad
EL FURACON	1
LA FLORIDA	1
LA GRANDA	3
LA JOCICA	1
LA MORTERA	0
PRIAÑES	2
SALIENCIA	0
SAN ANDRES TACONES	4
SOMIEDO	6
TRASONA	4
VALDEMURIO	1
VALDUNO	0
VALLE	0

We have a chart like this for every province in Spain, autonomous region and fluvial basin. We could use any set of tables to perform our study, but we have chosen to use the tables from the autonomous regions (provinces are contained inside them), for practical reasons.

First of all, we find that there are two different charts for most regions, one of them with “live” data, updated weekly, and the other just displaying the capacity of the reservoirs.

For the weekly updated chart, we find the reservoir capacity, the water reserves and the variation since the previous measurement. In both cases, the first column displays the reservoir’s name.

The objective of my project will be to develop a visualization tool that allows us to visualize and monitor this data in a more intuitive and visually attractive manner.

The data will be used as following:

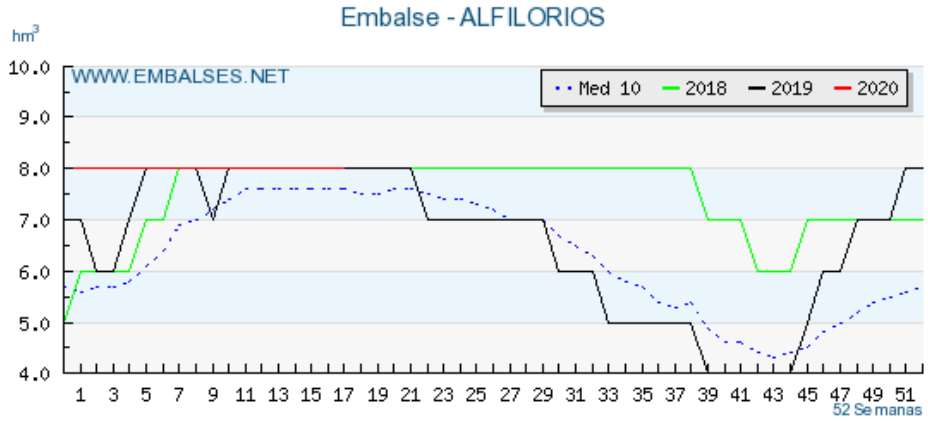
- The reservoir name will be used to find the reservoir's location and precise name using the Nominatim API to search OpenStreetMaps.
- We will then use the reservoir's precise name to retrieve the reservoir's shape from OpenStreetMaps using the OverPass API, in order to use it for data visualization.
- We will use the reservoir's capacity and reserves (in absolute terms) to calculate the reserves as a percentage of capacity. We will use this metric to give a colour to each reservoir's shape in the map as a function of their relative reserves.

We will also use this data to find other insights on the distribution of reservoirs:

- How many of these are large, medium or small?
- Is there some correlation between the relative reservoir's reserves and their geographical position?

Data Limitations:

The website includes graphs such as the one below, showing the evolution of the reservoir's reserves in time, for several years, however, we cannot access the data from the time series.



Having the data from the time series, would allow for a much deeper analysis of the Spanish reservoirs, unfortunately, I have not been able to come across a source with this data.