

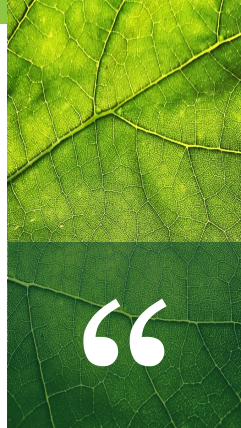
Classification of the different climates in Spain

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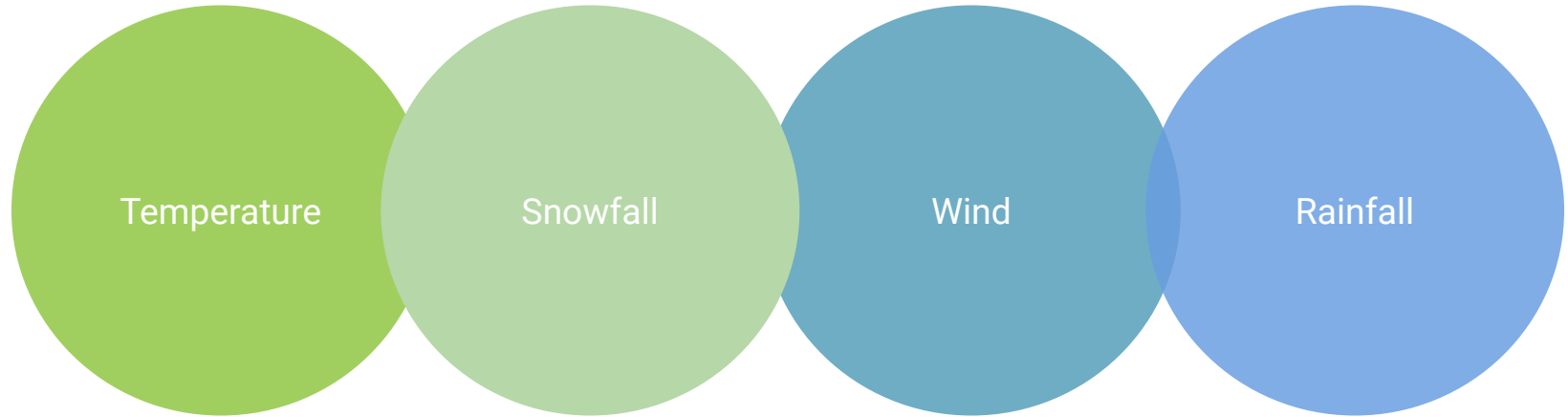
Index

- Initial question
- Find data
- Data integration and manipulation
- Clustering
- Analysis and results
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- Conclusions



*Has climate change affected the
climate classification in Spain?*

How can we measure the weather?



Tools used



Scripting to process data



Process in R



API Data source



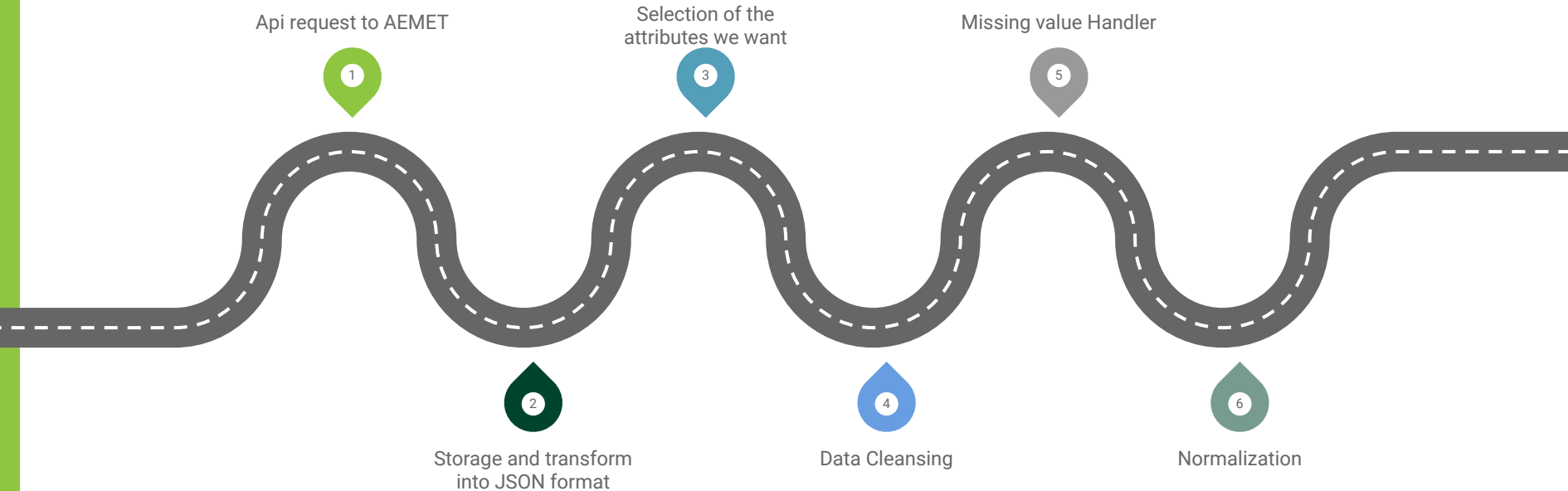
Data source



Power BI

Visualization

Data integration and manipulation

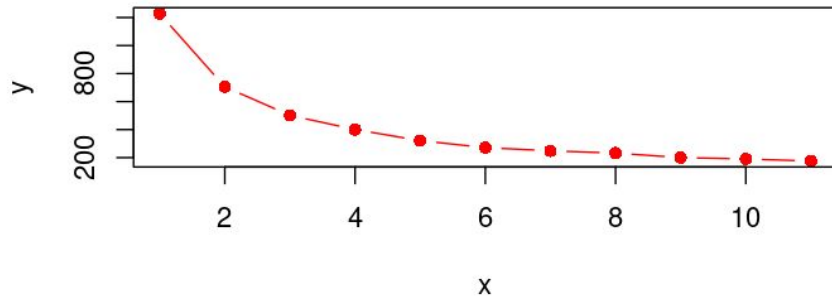


Final Dataset

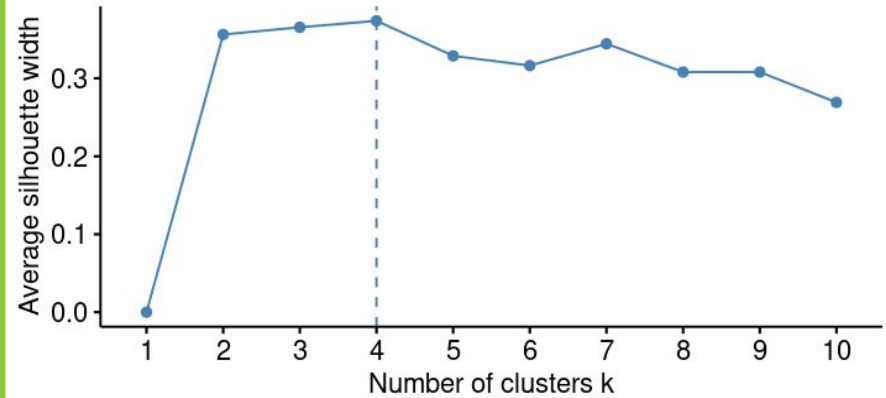
dt x												
Filter												
indicativo	nombre	provincia	latitud	longitud	precTot	precSD	tMinMed	tMaxMed	tMed	tMedSD	climate_type	
1 0252D	ARENYS DE MAR	BARCELONA	413515N	023224E	358.0	4.1540295	12.3679452	21.641096	17.006027	5.814009	1	
2 0076	BARCELONA AEROPUERTO	BARCELONA	411734N	020412E	334.0	4.0574807	13.6270195	20.965181	17.296657	6.039756	1	
3 0200E	BARCELONA, FABRA	BARCELONA	412506N	020727E	327.9	3.3057522	12.3498630	20.600822	16.474795	6.365258	1	
4 0201D	BARCELONA	BARCELONA	412326N	021200E	249.1	2.6470597	14.1994505	19.973626	17.083791	5.671457	1	
5 0149X	MANRESA	BARCELONA	414312N	015025E	335.4	3.3049235	9.0673077	21.712637	15.387637	7.217301	1	
6 0255B	SANTA SUSANNA	BARCELONA	413903N	024149E	435.4	4.2870411	10.0986264	20.086813	15.092857	6.117046	1	
7 0367	GIRONA AEROPUERTO	GIRONA	415442N	024548E	473.1	5.1574217	8.8884298	22.204959	15.546006	6.699858	1	
8 0372C	PORQUERES	GIRONA	420616N	024549E	399.0	3.7950170	8.8785515	21.701393	15.288022	6.580476	1	
9 0324A	RIPOLL	GIRONA	421129N	021146E	487.3	4.3007811	6.6558333	19.343056	12.998056	6.705153	3	
10 0016A	REUS AEROPUERTO	TARRAGONA	410842N	010949E	364.8	5.1561055	11.3458791	22.247253	16.793956	6.305284	1	
11 0002I	VANDELLÒS	TARRAGONA	405729N	005217E	69.4	6.4471371	10.8222222	18.588889	14.700000	1.407125	1	
12 1387E	A CORUÑA AEROPUERTO	A CORUÑA	431825N	082219W	995.8	5.9272668	9.7082192	18.454521	14.079726	4.251095	2	

Choosing the Optimal Number of Clusters

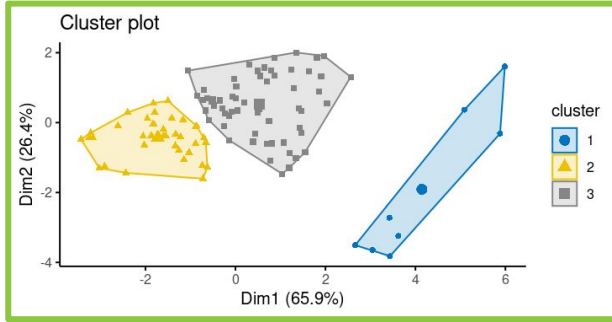
Sum of withinss for each number of clusters



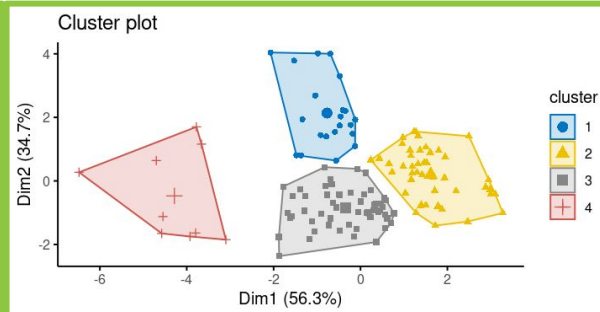
Optimal number of clusters



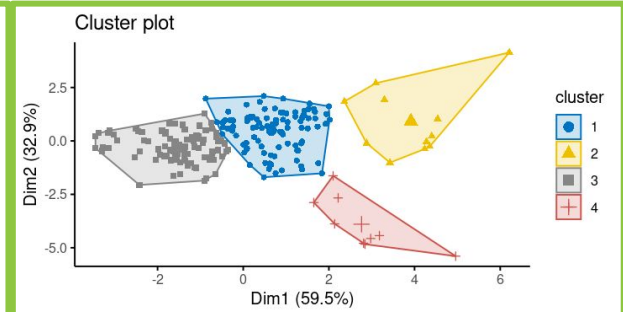
Cluster result



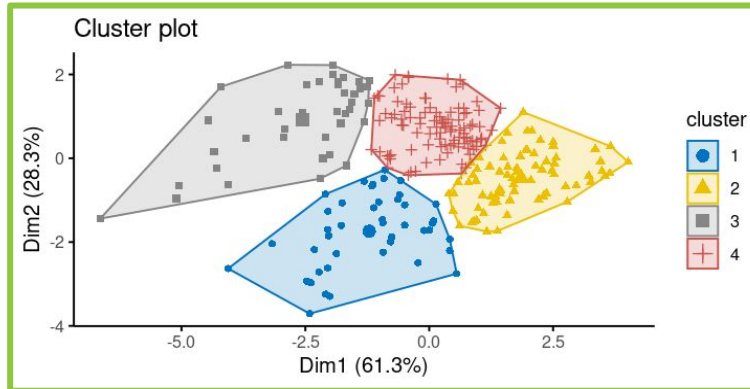
1981



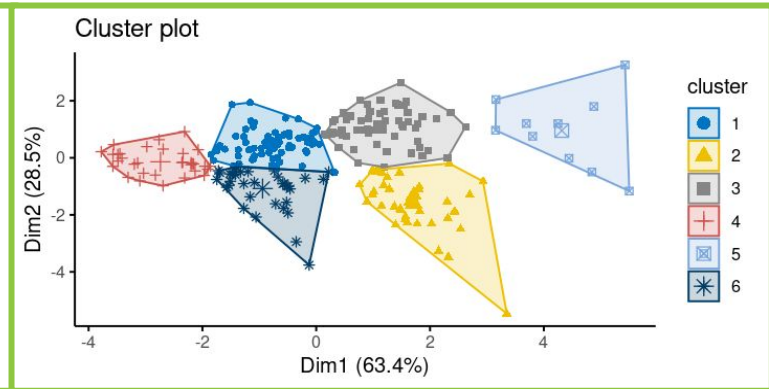
1991



2001



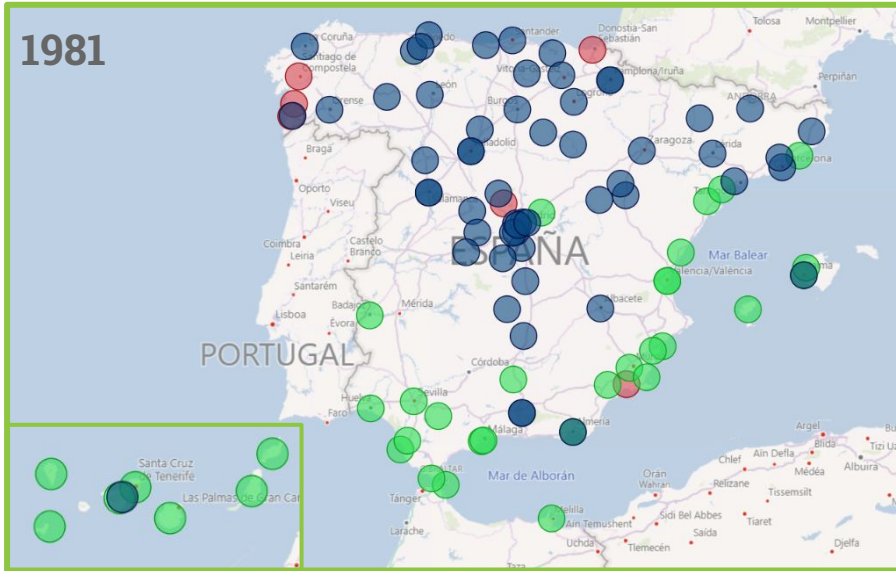
2011



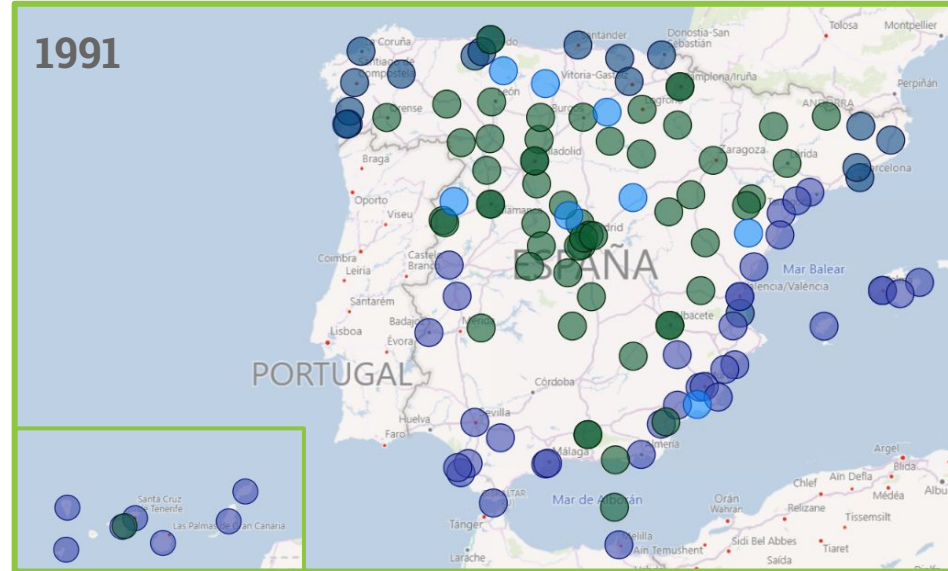
2021

Result

1981

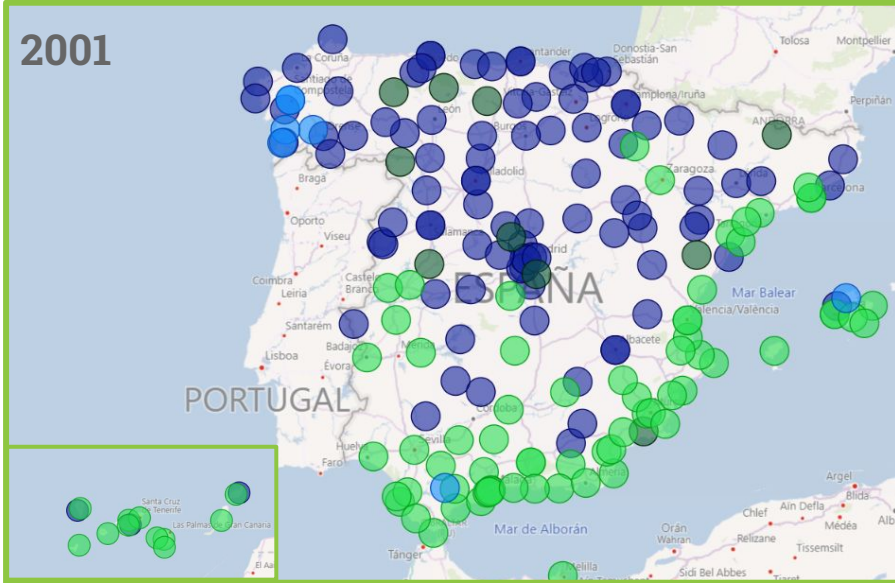


1991

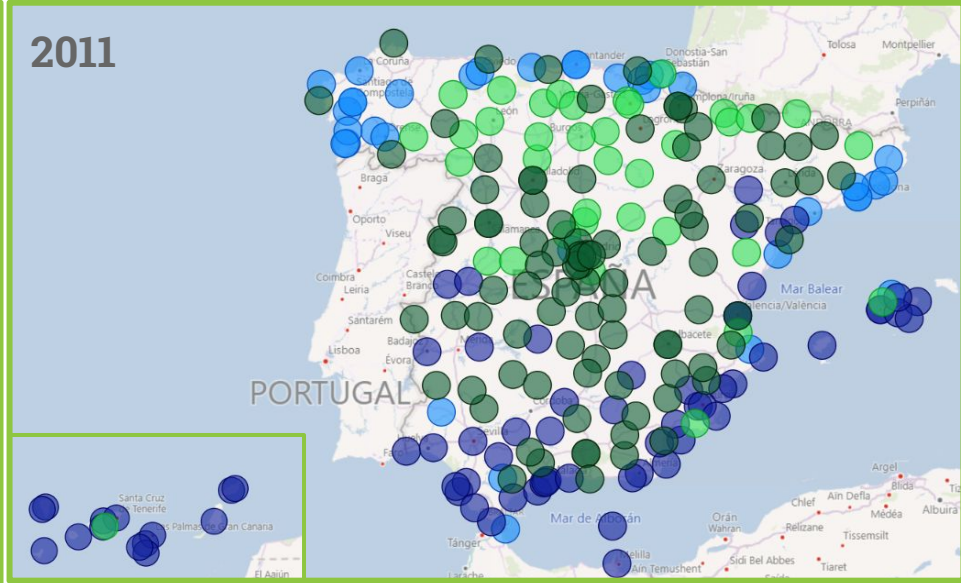


Result

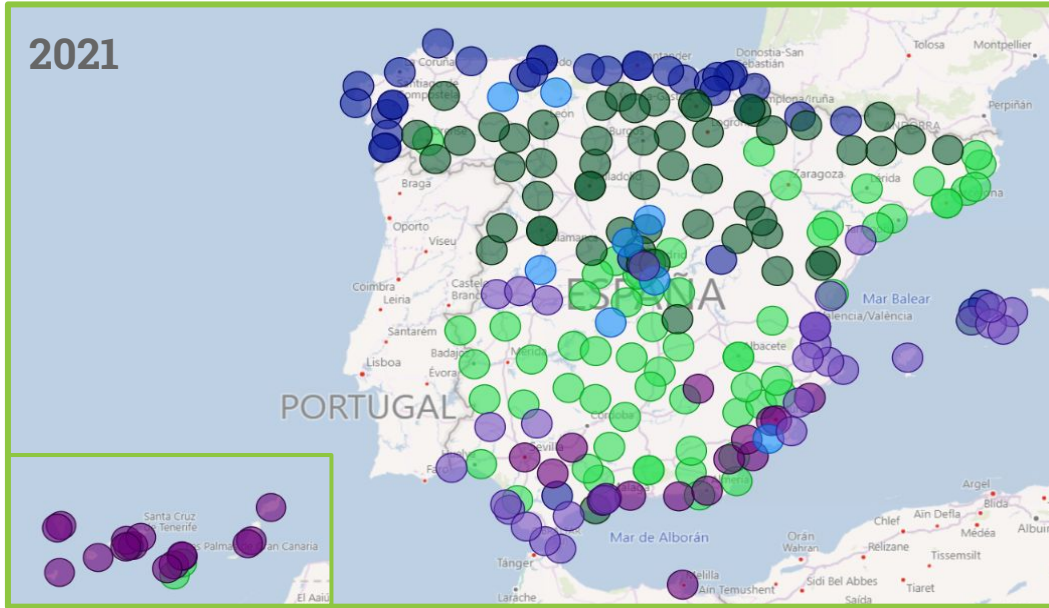
2001



2011



Result



Problems

- No completed dataset.
- API no Standardized.
- No documentation.
- Missing station over the years.
- We are not expert in meteorologic.

Improvements

- Start with more knowledge about the weather.
- More stations.
- More years.

Conclusions



→ We cannot answer the first question.



→ Our model would improve with more data and time.



→ Clustering similar to the reality.

Thanks!

Any questions?

