

# Röstigraben Evaluating the divide in Swiss voting patterns

## Introduction

Switzerland is a unique case study when it comes to voting. With the current state of political polarization across the world, we chose to use the voting results of the past four decades to study the evolution of the divides of opinions in the country.

A well-known idiom among the Swiss is "Röstigraben" (literally "Rösti ditch"), which describes an assumed divide of opinions between the German- and French-speaking parts of the country. We are interested in finding out whether this concept is relevant today or if we are facing other kinds of divides, such as city versus countryside.

## Dataset and methodology

The main dataset used is the statistics per municipality of all the popular votations **from 1981 to May 2017** in Switzerland. The data are official and published by the Swiss Federal Statistical Office (BFS).

From the statistics, we generate a vector for each municipality with each of the **312 components** being the percentage of "yes" for one votation. We can then run clustering methods, such as K-means, to generate clusters of municipalities with similar voting patterns.

## Languages of Switzerland

The country counts no less than 4 national languages. In **2015**, the repartition of the population speaking each of the national languages as their primary language was

<b>63.0 %</b>	German	<b>22.7 %</b>	French
<b>8.4 %</b>	Italian	<b>0.6 %</b>	Romansh

The map below shows where each language had a weak majority ( $\geq 75\%$ ) and a strong majority ( $\geq 85\%$ ) in 2000.

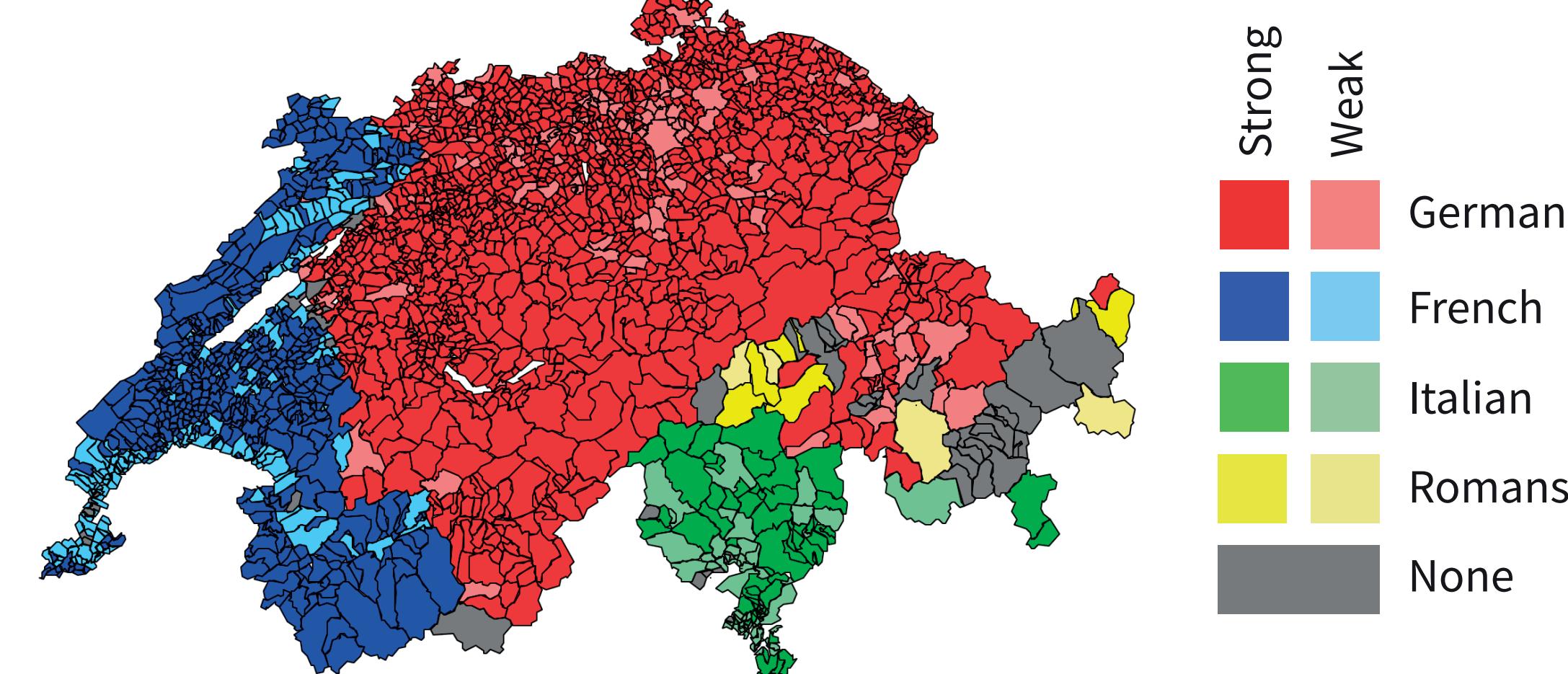


Figure 1. Majority language per municipality (source: BFS)

## Clustering of municipalities

The aim of this analysis is to identify distinct communities (sets of municipalities) with **distinct voting patterns** over all the votations from 1981 to nowadays **as a single period of time**. Below are presented the results for K-means with **2 to 5 clusters**.

We can establish a hierarchy of the strength of the different hypothetical divides :

- The first one that transpires is the **Röstigraben** in K = 2.
- Follows the emergence of **the city-countryside divide** of the German-speaking area in K = 3.
- We then see a divide between Ticino and the rest of the country (also known as **Polentagrab**) in K = 4.
- Finally in K = 5, we notice a division in the French-speaking regions between the Plateau and the highlands.

The Principal Component Analysis (PCA) below further strengthens our confidence in this hierarchy.

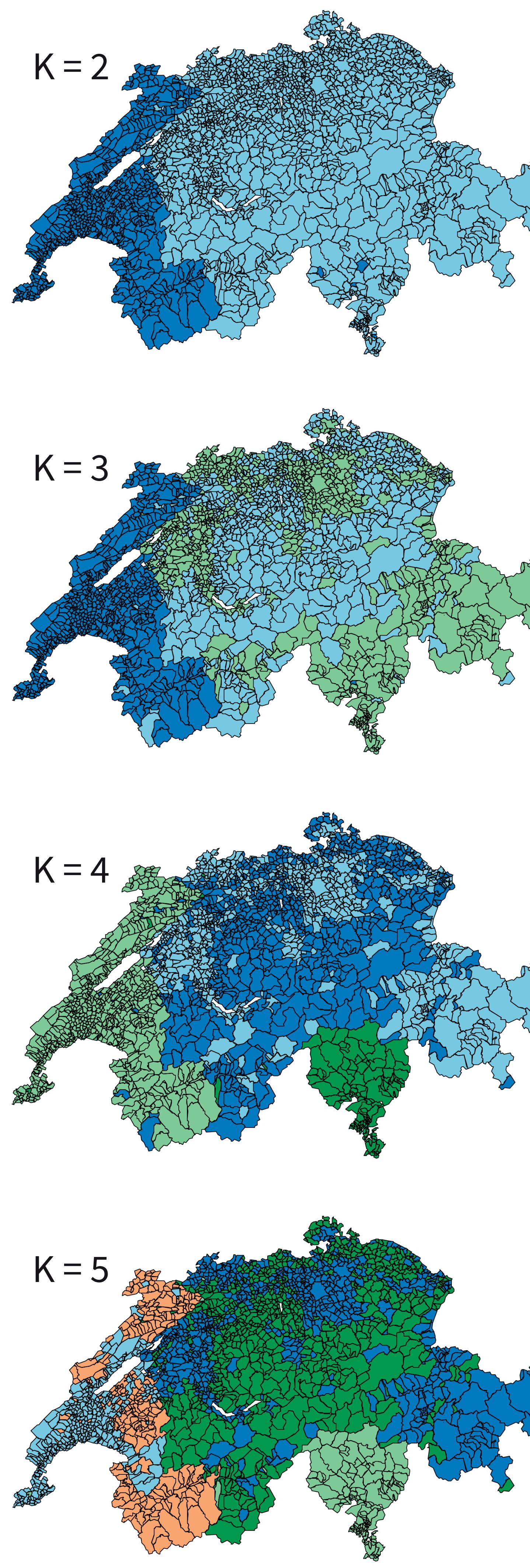


Figure 2. Communities with distinct voting patterns identified using K-means with K = (2, ..., 5) with their corresponding PCA.

## Clustering of municipalities by decades

The results of the clustering (on the left) may have been influenced by strong components in a specific timeframe and **may not be representative of the entire studied period**. Therefore we performed the same analysis per decade. We present here the results for K-means with **2 clusters**.

**In the 80s**, we start to observe different voting patterns among linguistic communities. However, the result is **noisy**.

**In the 90s**, the difference between Romandy and the rest of the country is **clear and sharp**. The **Röstigraben** is observed. It corresponds to the time where Switzerland voted twice on EU membership.

**In the 00s**, we observe a **strong polarization**, the German-speaking cities together with the Italian- and French-speaking having distinct voting patterns compared to the rest of the country.

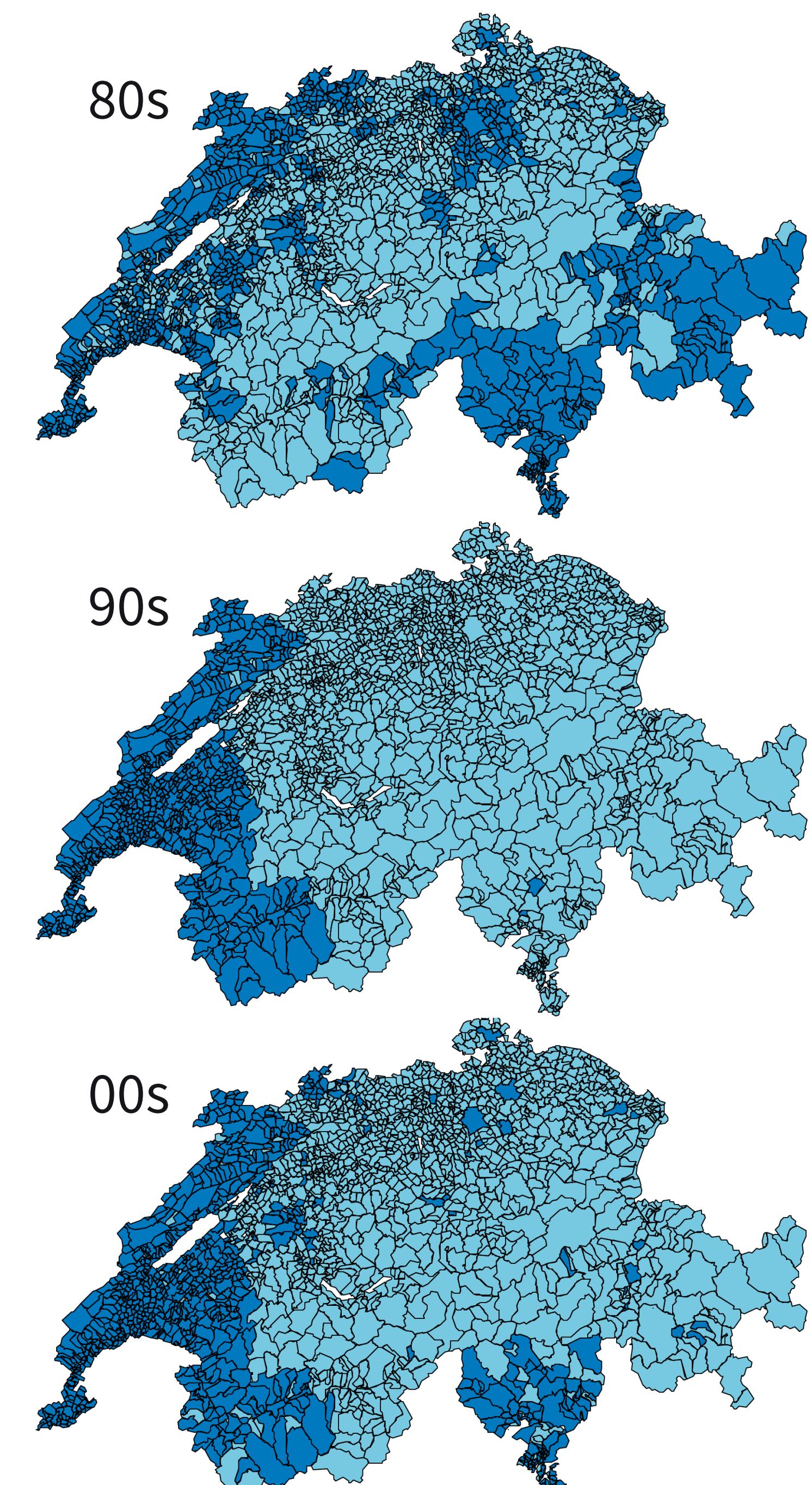


Figure 3. Clustering of the 80s, 90s and 00s with K-means and two clusters.

## Winners and losers

The map on the left shows how often a municipality voted like the majority.

Most of the municipalities with a **high winning rate** are located around **Zurich, Bern and Basel**.

The **median is high** with a winning rate of **82%** and the **interquartile range is small**. It confirms that a number of votations show a **consensus** across the country.

The most wins go to **Ebikon (LU) - 95.35%** while the least wins go to **Unteriberg (SZ) - 58.81%**.

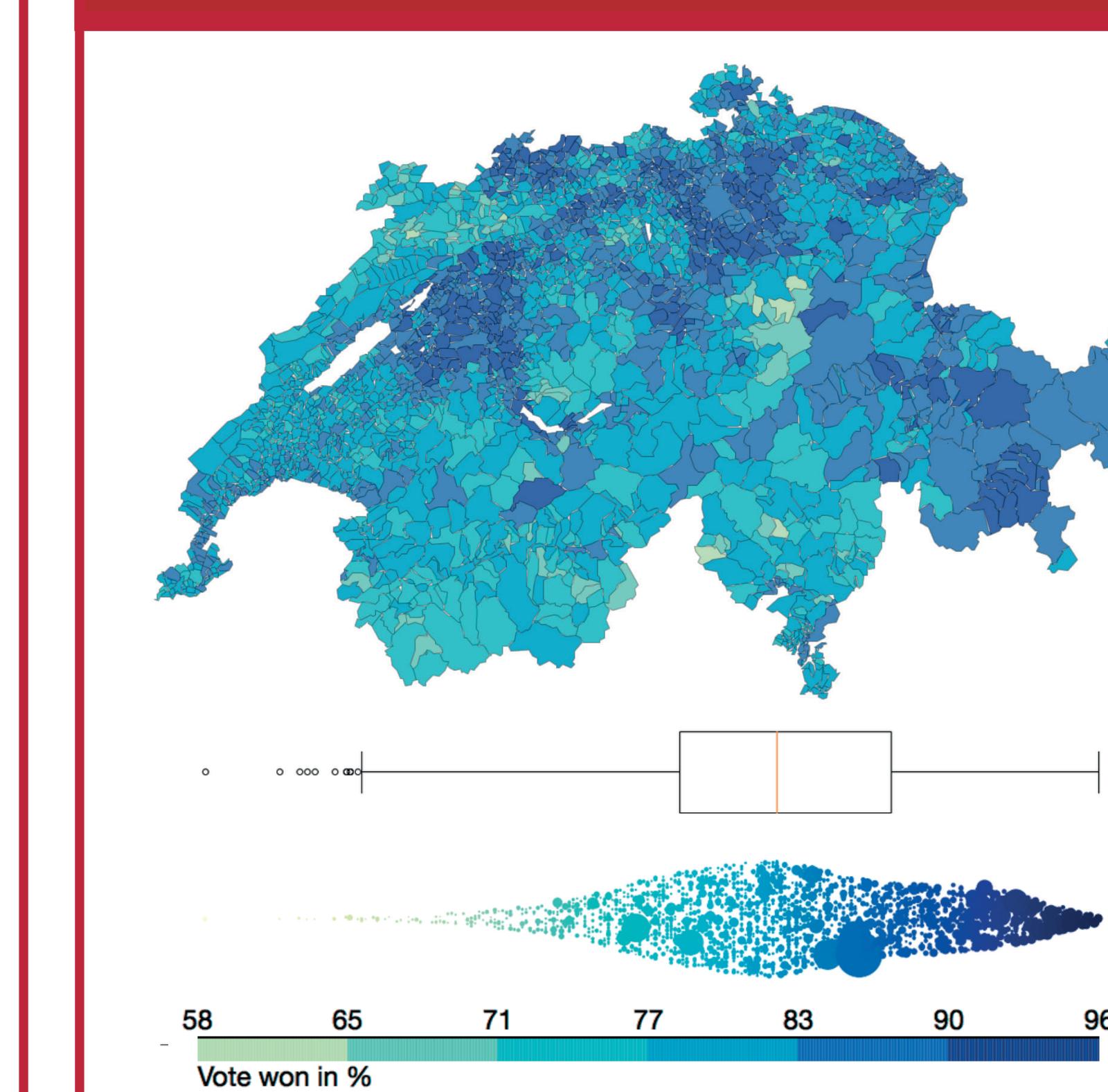


Figure 4. Distribution of votes won per municipality (in %). Size of dots proportional to the number of voters.