

Maps under the Loire river: The Gorges de la Loire as a strategic mapped area

Pierre-Olivier Mazagol, Sarah Réault

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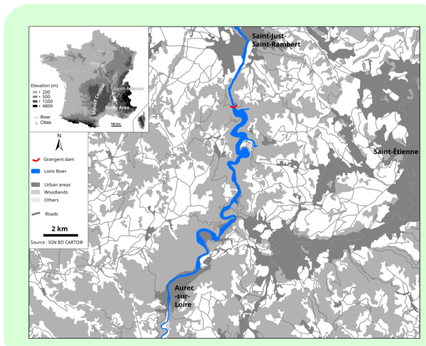
Maps under the Loire river



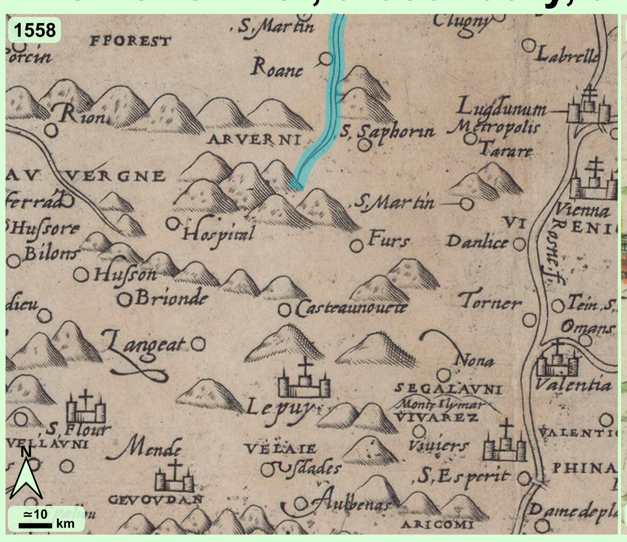
The *Gorges de la Loire* as a strategic mapped area

Pierre-Olivier Mazagol
Sarah Réault

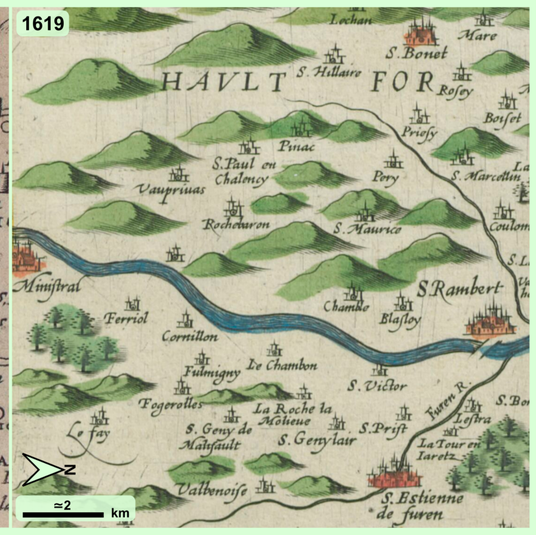
Laboratoire "Environnement - Ville - Société" (UMR 5600 - CNRS)
Université Jean Monnet - Saint-Étienne, France

Near Saint-Étienne (France), a part of the gorges of the Loire was flooded in 1957 following by the lake of Grangent, a reservoir hydroelectric dam. This lake accentuates a supposed local scale territorial limit, break off by the road crossing allowed by the construction of the dam. Contemporary (in french historigraphy: 1789 until today) maps and cadastres allow us to reconstruct landscapes now submerged. However using a 5-century cartographic succession from Modern era (1492-1789), we consider a Loire river segment, the "Gorges de la Loire", as part of a wider territorial framework, opening up questions about the strategic uses of watercourses' riparian territories.

The Loire river, a boundary, an obstacle?



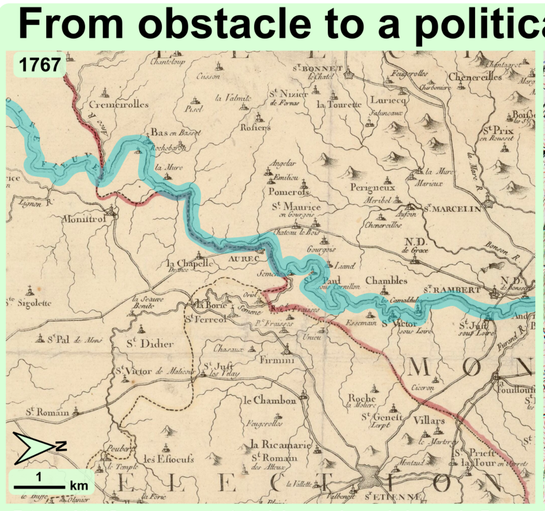
Extract of **Totius Galliae Descriptio cum parte Angliae, Germaniae, Flandriae, Brabantiae, Italiae Romam usque** [1:3 585 000 approx.] - Pyrrho Ligoric Neap. auctore 1558 - Bibliothèque nationale de France, GE D-14831



Extract of the ***Carte du Lionnois, Forest, Beaujolois et Masconnois*** [1:397 000 approx.] - Jean Le Clerc ***excudit*** - 1619 - Bibliothèque nationale de France, GE DD-627 (36RES)

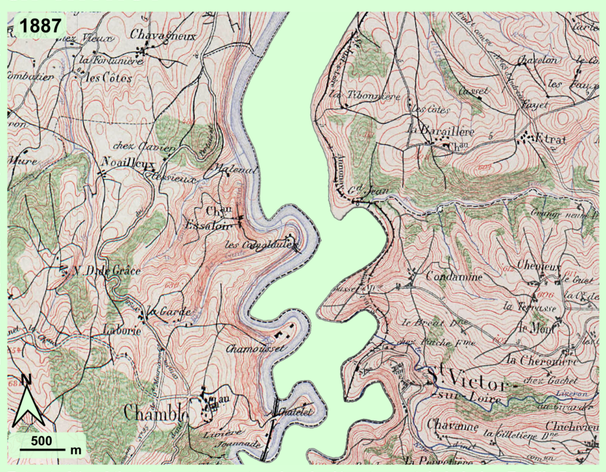
16th and 17th century maps accentuate width of a river that go through a sharply mountainous area. Between Auvergne and Forez to the west, and the Lyon and Rhône region to the east, the river inducts a territorial rupture. Its width tapers off upstream, to its source, and its location in the mountains is indirectly enough to provide information about its steep relief: the gorges. On the 17th-century map, this width is combined with a villages scattering far from the river's banks. A simple message for readers to inform them crossing is difficult or impossible?

From obstacle to a political limit?



Extract of the ***Gouvernement général des provinces du Lyonnais, Forez et Beaujolais, qui comprend la généralité de Lyon divisée par ses cinq élections*** - Louis Joubert (cartographe), Abbé Berlié (Directeur) - 1767 - Bibliothèque nationale de France, GE C-2470

The difficulty of crossing may be associated with a establishment of a political limit. This is not the case here. In the 18th century, maps of the Kingdom of France and its provinces included more and more the administrative boundaries. The supposed 'Loire obstacle' was not involved in any major territorial boundary. The provincial boundary here between Velay and Forez (in red) do not follow the Loire river.



Extract of the ***Atlas des cartes cantonales du département de la Loire, Feuille 7 et 26*** [1:40 000] - 1887 - Service vicinal - Archives départementales de Loire, 1FiCP410

The territorial division into communes and cantons is shown in the cantonal atlas of the Loire department published in 1887. On either side of the gorges, there are simply two different communes or cantons (in this case on two different sheets. Note that the boundary is not in the talweg, but on the right bank. In cartographic techniques terms, this atlas shows one of the first uses of contour lines in France on a topographic map. The rest of the base map uses the information and cartography of the Carte de l'État Major.

Before / After



IGN reference basemap 2nd version - 2023 - 1/25000

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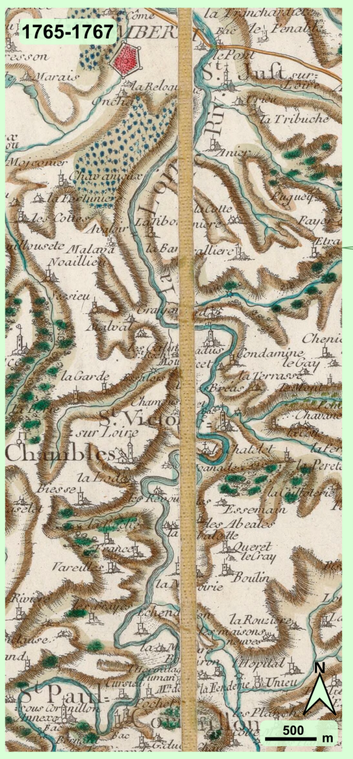
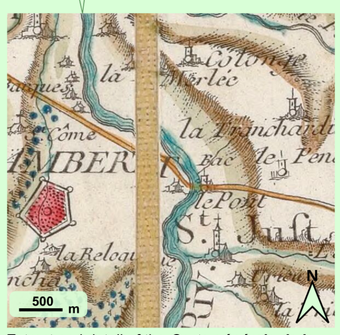
Crossing and navigation

Until the publication of Cassini's map at the end of the 18th century, the Modern period maps provided little information on crossing methods and navigation.



For a long time, the Saint-Rambert bridge was the last mentioned crossing point until the source.

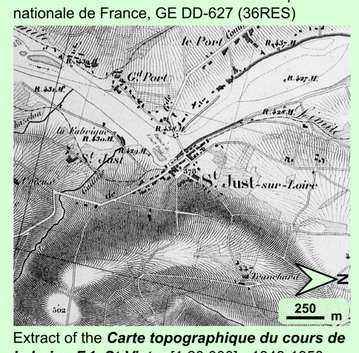
Breaking with an ***a priori*** idea of less accurate mapping, the Cassini map mentions 3 crossing points over a distance of around 13km.



Extract and detail of the ***Carte générale de la France. 088, [Saint-Etienne - Saint-Marcellin]. N°88. Flle 80*** - 1765-1767 - César-François Cassini de Thury (Directeur) - Bibliothèque nationale de France, GE FF-18595 (88)

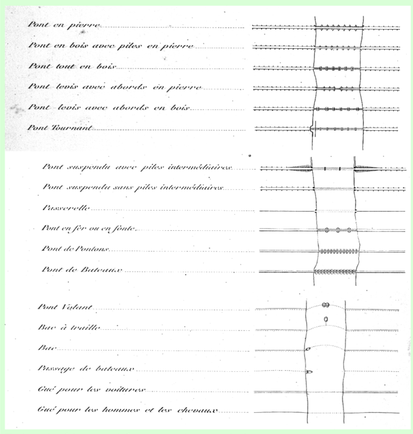


Detail of the ***Carte du Lionnois, Forest, Beaujolois et Masconnois*** [1:397 000 environ] - Jean Le Clerc ***excudit*** - 1619 - Bibliothèque nationale de France, GE DD-627 (36RES)



Extract of the ***Carte topographique du cours de la Loire, F.1, St-Victor*** [1:20 000] - 1848-1850 - Ministère des Travaux Publics - Archives Départementales de la Loire, 2098VT8

There are many ways of crossing a river. The legend of the ***Carte topographique du cours de la Loire*** published between 1848 and 1850 lists many of them :

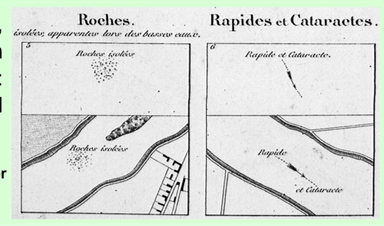


Extract of **legend for passing points**

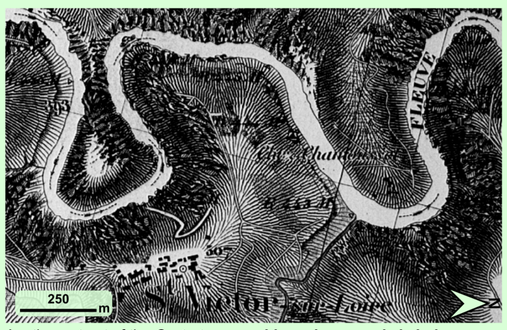
The first purpose of this atlas a cartography of flood-prone areas. But this atlas also shows navigation possibilities. Upstream of the navigable Loire, on map index page, an 'anchor' symbol marks the limit of navigability in Saint-Victor-sur-Loire.

Extract of the **Map index page** of the ***Carte topographique du cours de la Loire***

In the river bed, two signs warn of difficulties: rocky banks and rapids.



Extract of **legends for rocky banks and rapids**



Another extract of the ***Carte topographique du cours de la Loire***

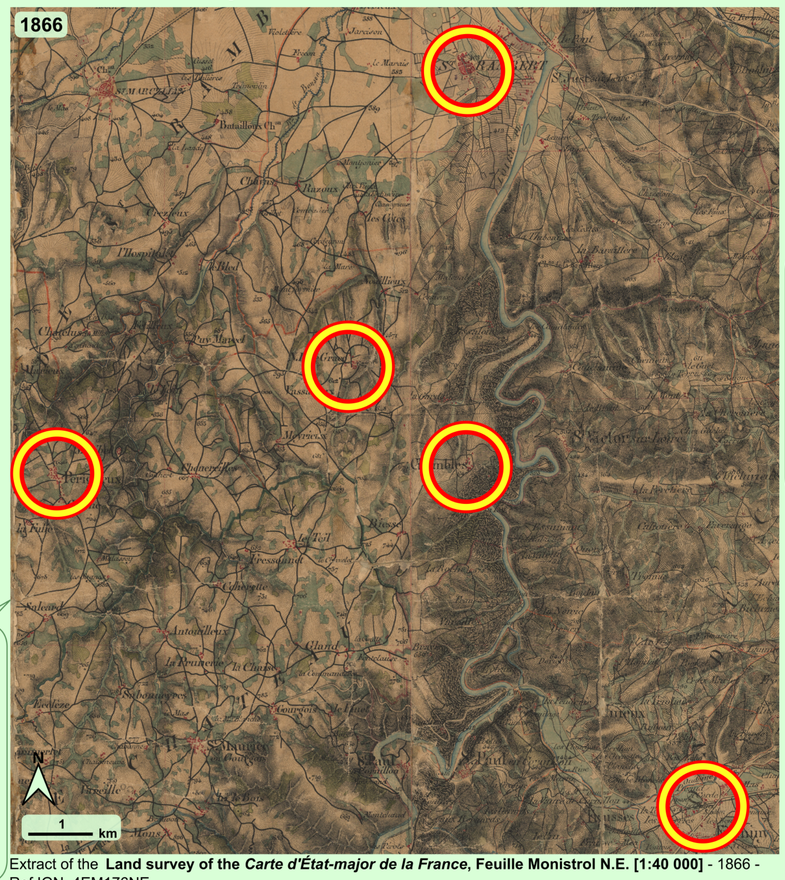
Military mapping of riparian territories of the *Gorges de la Loire*

Maps are knowledge sources about a territory, helping to move on land and water. But maps also help **to wage war**. Why not compare the Carte de l'État-major, initiated by Napoleon I, and some maps drawn during the Cold War draw by the Soviets and the Americans?



High points referenced during the mapping

This is a coloured field official record with a 1:40,000 scale , with its annotations, which preceded the publication of the ***Carte de l'Etat-major*** (in black and white, with a at a scale of 1:80,000 scale). First, let's focus on landscape markers, and then on crossing points, strategic informations for troops movements.



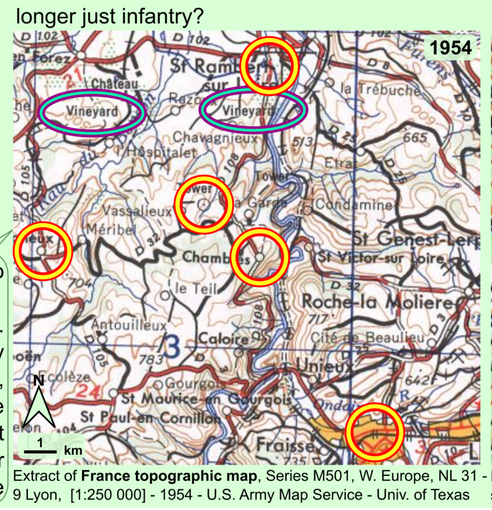
Extract of the **Land survey of the *Carte d'État-major de la France*, Feuille Monistrol N.E. [1:40 000]** - 1866 - Ref IGN: 4EM176NE

High points of view used for create map are also used as landscape markers. Only bridges are identified as crossings points: no ferries, because certainly not relevant for an army.

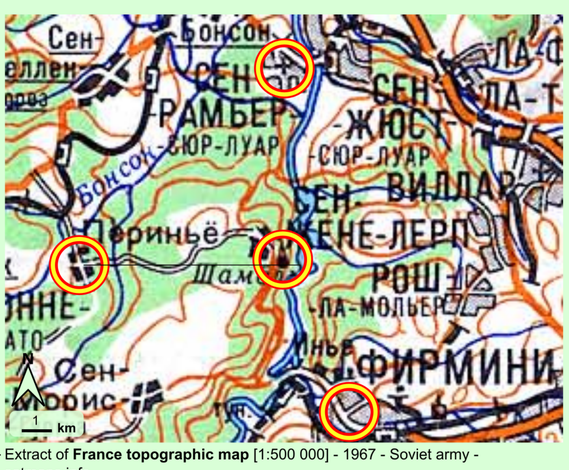
Same high points are showed in all maps

The U.S. Army map also mentions vineyards . Probably not (only) for wine. Permanent crop, easily identifiable, all year round, stable through years within the landscape, vineyards represent ideal landmarks. That is our interprétation on this presence

What did the Russians and Americans learn from their preoccupation with moving (heavy) artillery, no longer just infantry?



Extract of **France topographic map**, Series M501, W. Europe, NL 31 - 9 Lyon, [1:250 000] - 1954 - U.S. Army Map Service - Univ. of Texas



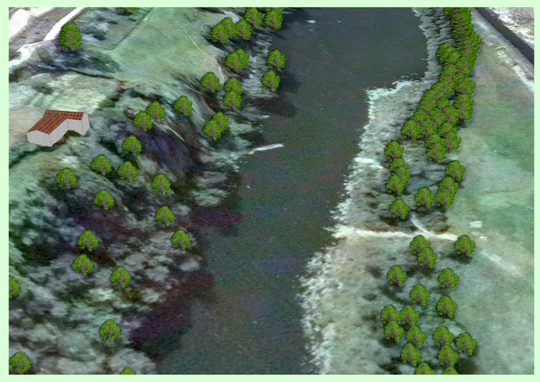
Extract of **France topographic map** [1:500 000] - 1967 - Soviet army - satmaps.info

New methods for mapping past



Current concerns are more heritage-related, especially since the Loire Gorges are on the immediate outskirts of an urban area. Recent cartographic representations (including 3D technologies) benefit from techniques that make it possible to offer results closer to “real landscapes” and to include buildings from the past that have now disappeared. Here for exemple, the Saint-Victor-sur-Loire ferry.

Interactive 3D Geovisualization of the ***Gorges de la Loire*** before flooding (Mazagol et al. 2021 - DOI: 10.1007/s41651-020-00072-5)



Here, as elsewhere, cartographic succession over 5 centuries shows that representations follow technical changes and aims. The focus here was on an riparian territory of a valley which is now flooded: the ***Gorges of the Loire*** upstream of the ***Grangent*** dam. That allow us to examine the question of semiological choices when crossing a river is necessary, in both civil and military cartography. The first maps show the main landscape features (mountain humps, watercourses of varying thickness, village locations) required interpretation. The Cassini map, whose first goal was to provide a better understanding of the territory, draws detail on crossings (ferries and bridge), and emphasizes deepening of the valley with hatching of landforms. The most recent représentation shown has a "patrimonial" purpose. However, the reader may select his glance and enjoy immediacy of an indication close to landscape information. Extracts of the maps here shown are a very restricted choice. You may see total maps and more using the qr-code in the middle on this poster.