



Perception, Regulation and Measurement of Surface Water Quality in France, 1854-1964

The Versailles water
supply and the Seine,
1859-1894

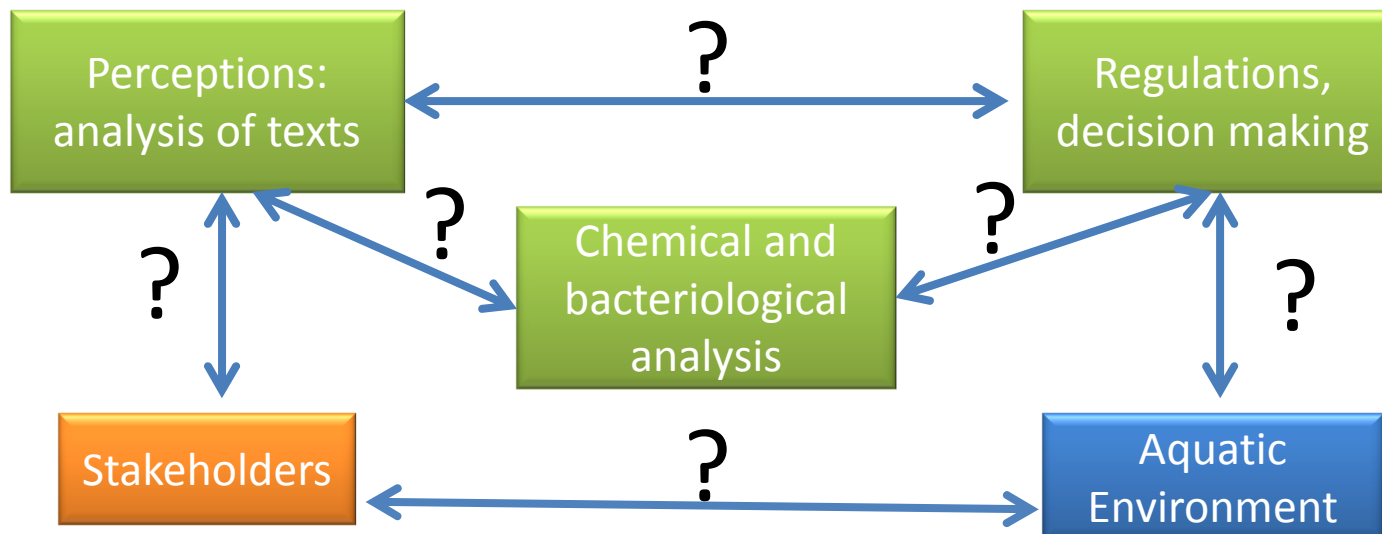
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UMR 7619 Metis - University of Pierre and Marie Curie - Paris 6
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1. Objectives

- To better understand the evolutions in the relationship between urban society and surface water quality:
 - A. To identify stakeholders and urban hydrosystem following the example of Versailles' water supply
 - B. To identify water analyses and examine their role in the water quality perception and in decision making



2. References, Sources, Methods

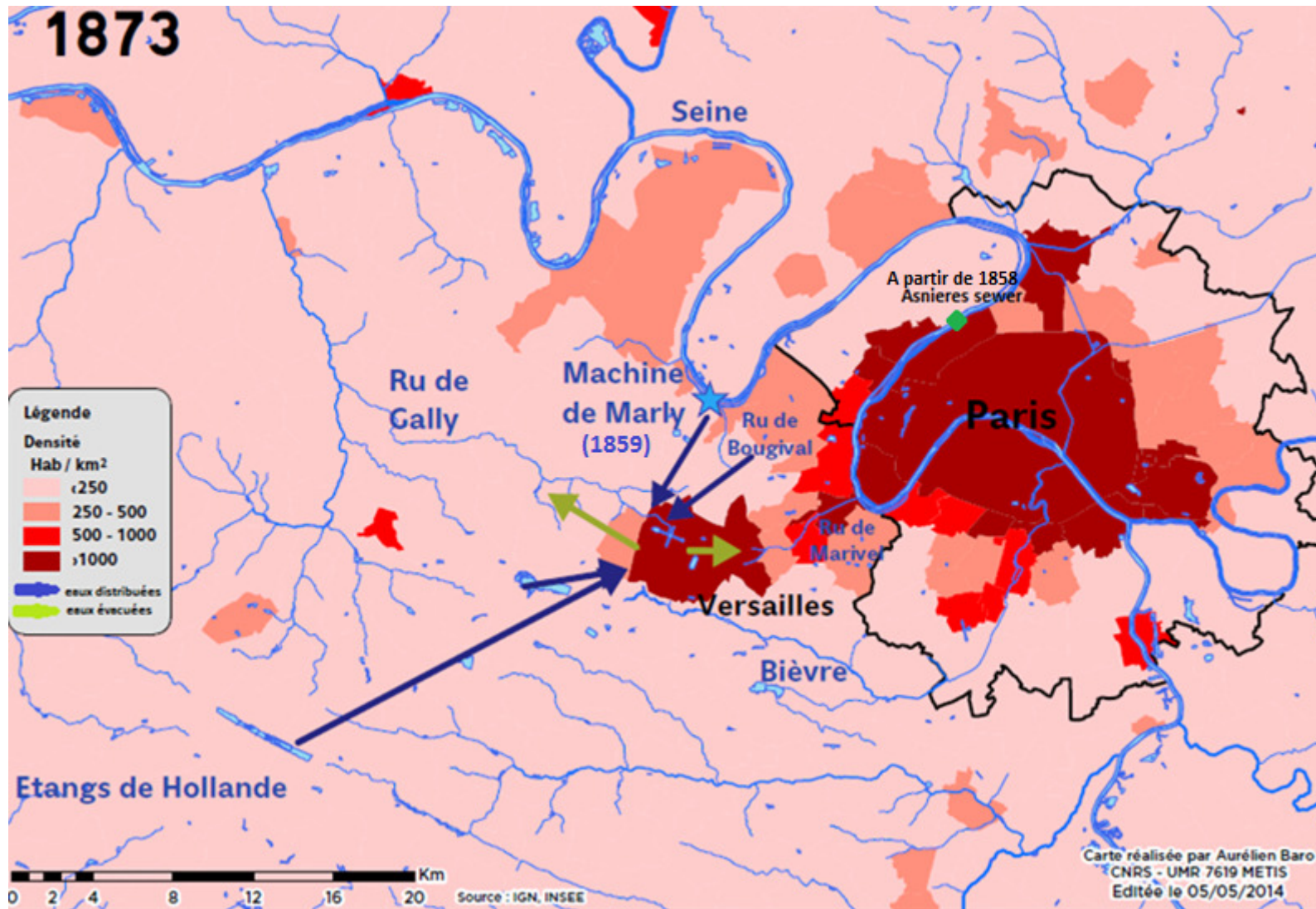
References:

Scientific fields	Authors
Water analysis	Laurence LESTEL, Michel MEYBECK and all
Water politics	Bernard BARRAQUÉ, Jean-Louis GAZZANIGA , Henri LORIFERNE
Sociology	Agathe EUZEN, C. LEMIEUX,G. MOSER
Environmental history	Sabine BARLES, Emmanuel BELLANGER, Stéphane FRIOUX, Jean-Pierre GOUBERT, Frédéric GRABER, Christopher HAMLIN, Thomas LE ROUX, Jamie LINTON, Geneviève MASSARD-GUILBAUD

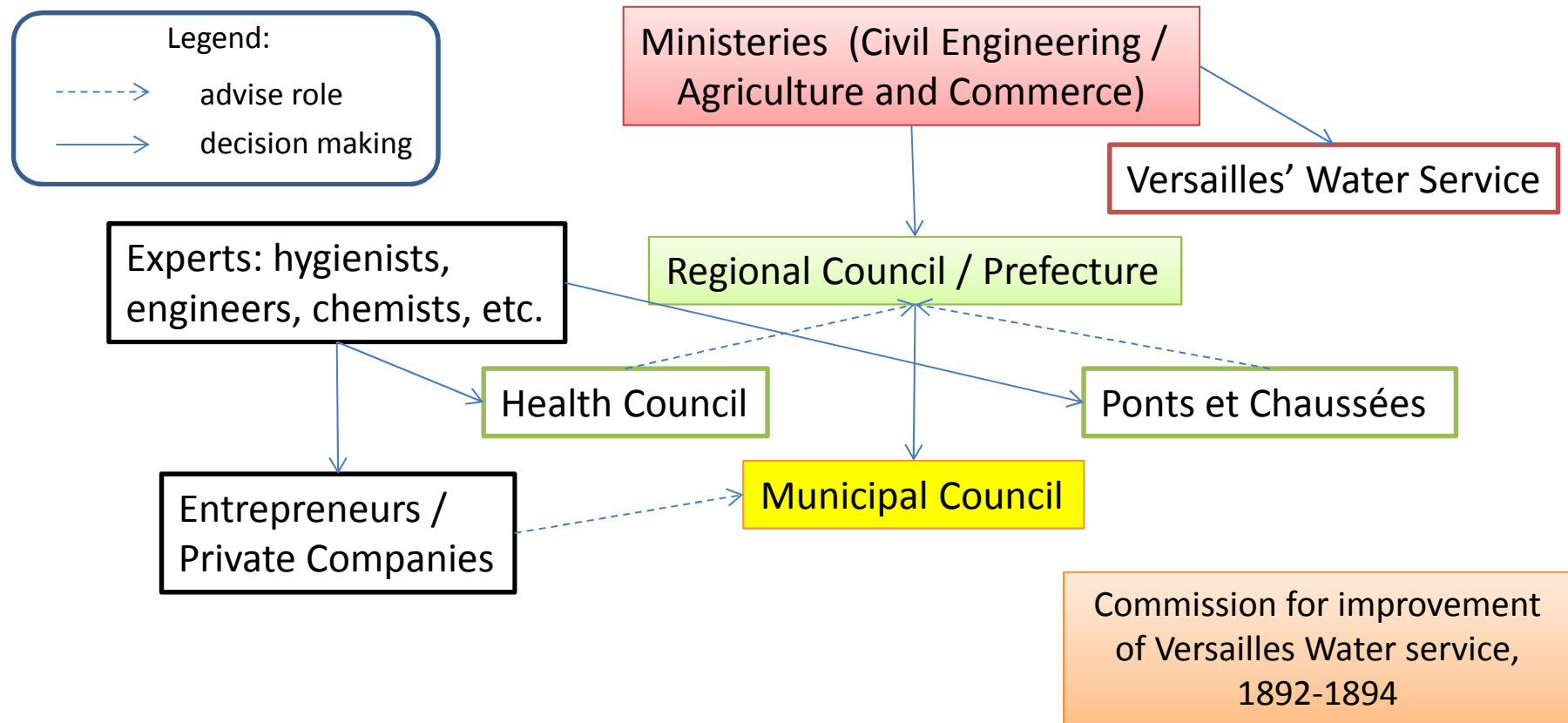
Sources:

Archives	Series Titles
Municipal Archives of Versailles	Municipal council proceedings, Public Health, Water
Regional Archives of Yvelines	General Council Proceedings, Hygiene and Public Health, Hydraulic Service
National Archives	Health Policing, Civil Engineering
+ Hygienist Journals	

A.1. Versailles : characteristics, stakeholders and hydrosystem, 1854-1894



A.2. Water Quality Management



To judge water quality, the stakeholders share the same criteria: limpidity, odor, residue, discharge, presence of organic matters, oxygen, bacteria.

To clean polluted waters, the agreement is difficult to find at the interdepartemental level. Every city is preoccupied to keep the rivers clean through its territory and sends the pollution outside its orders.

B.1. Surface Water Analysis: Water Observation

1854 – first quantitative and qualitative analysis of the Seine waters (hardness, organic matters)

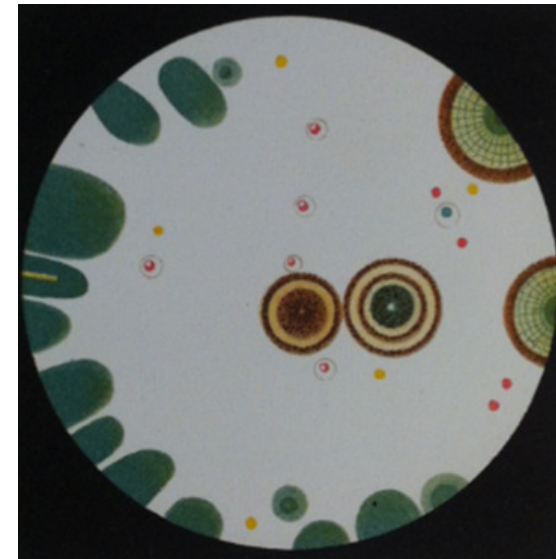
1873 – ammoniac at Marly by Rabot, Seine-et-Oise department

1874 – oxygen in the Seine waters by Geradin, Seine departement

1880 – bacteriological analyses of the Seine waters at Marly

Amount of Dissolved Oxygen (DO) in the Seine waters at Marly (mg/L)		
Years	1875	1880
21 Jan	7,90	
9 Febr		9,00
26 March	5,68	5,20
22 April	4,10	
17 May	2,00	
25 July		0,90
8 August		1,00
15 August		2,00
18 August		0,60

Normal amount of DO in water = 10 mg/L



AN F8 205 Sanitary Police, Gavin, 1879-1880.

Example of bacteriological analyses of the Seine waters at Marly, by Gavin, 1880.

49 colonies:

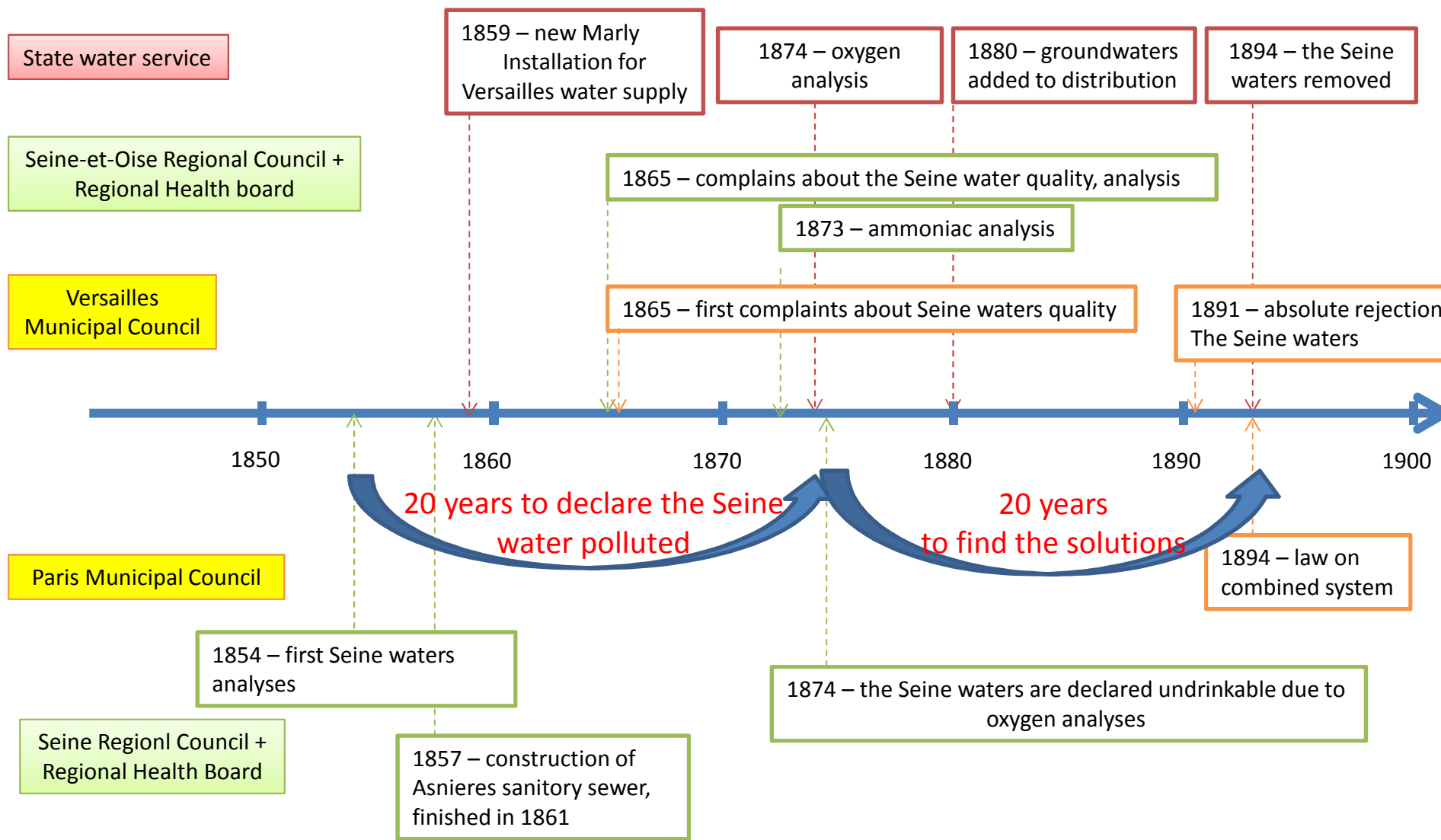
17 – water molds/fungi

26 – different microbes among which 6 bacterium Coli-Commune

B.2. Volumes of water coming from the Seine compared to volumes from ponds and springs for the period from 1852 to 1891

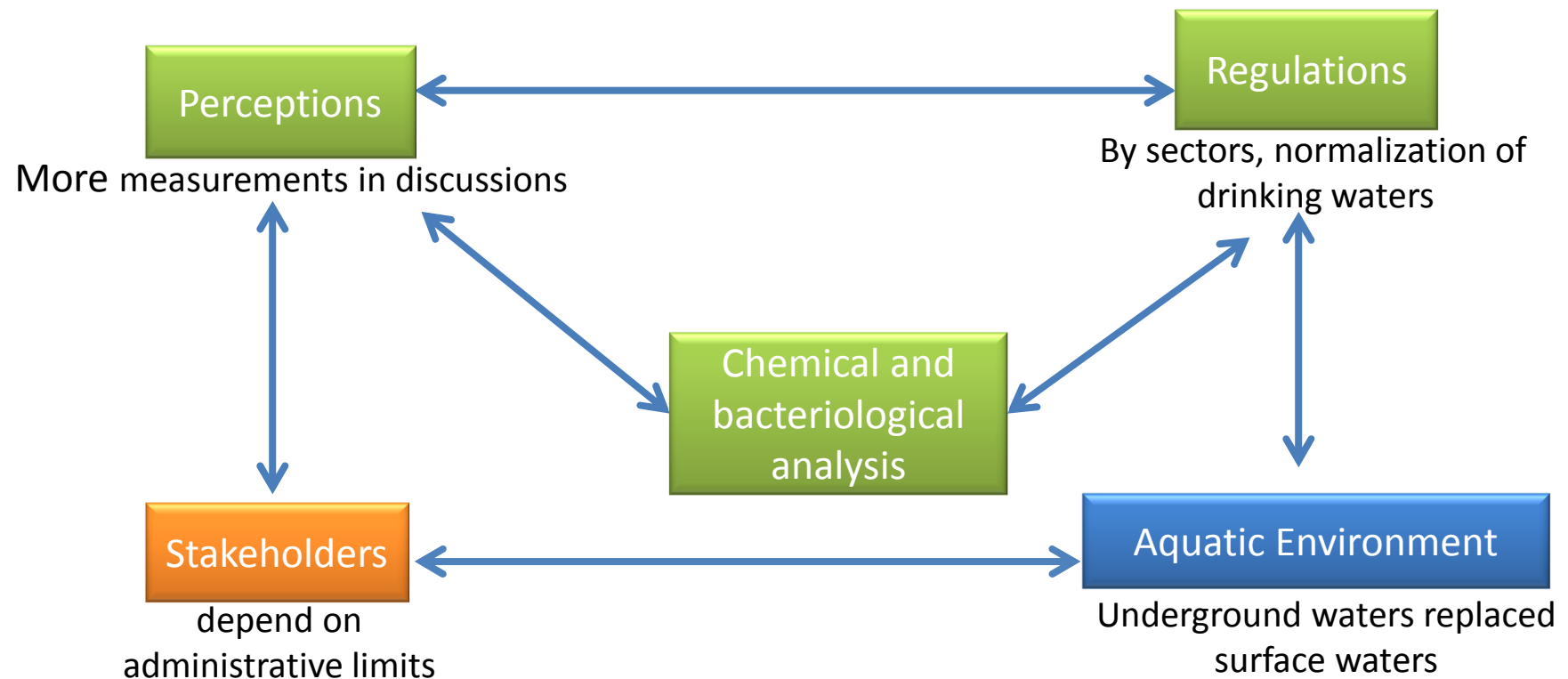
Year	Water from Seine (m ³ /d)	Water from ponds (m ³ /d)	Water from springs (m ³ /d)
1852	1400	3979	100
1856	1400	4000	100
1857	1400	4000	100
1858	1400	4000	100
1860	3100	3400	100
1861	2480	3600	100
1862	4900	3100	100
1863	3500	4400	100
1880	Croissy underground waters added		
1891	7259	4321	140
1894	0	About 4 000	Avre spring waters added

3. Synthesis



4. Conclusions

- Versailles' case is particular: management of its waters by State owned service and severe pollution of its water by Paris sewers
 - Numerous stakeholders and large territory make difficult water quality management at that time
- It took almost 40 years to find another water supply but not resolve the question of surface water pollution



5. Perspectives

- How should the water from the Seine be monitored to allow safe production of drinking water? What was the impact of the biggest Seine flooding (1910) on the quality of its waters and those of underground waters?
- The future of the Versailles water service management ?
- How does Versailles sewage pollute the Seine waters?

Thank you for your attention!



The 1859 Machine de Marly painted at 1873 by Alfred Sisley