THE TRANSBOUNDARY AQUIFER OF THE GENEVA REGION (SWITZERLAND AND FRANCE):

Successfully managed for 30 years by the State of Geneva and French border communities

Sébastien Javogues – Communauté de Communes du Genevois
SKETCH OF AQUIFERS OF THE GENEVA AREA

- Lake Geneva
- 2 water pumping plants in the lake (distributing +/- 80% of the drinking water)
- 11 wells catching ground-water from main aquifers (distributing +/- 20% of the drinking water)
10 wells on the Swiss side
5 wells on the French side
Behaviour of the “Genevois” groundwater level before A.R.

Between 1940 and 1960 the groundwater level was slowly decreasing without serious effects.

Between 1960 and 1980 the aquifer was overdrafted with withdrawal rates up to 14 Mm3/year.

This overpumping lowered the groundwater level by more than 7 m in 20 years.
Urgent hydraulic management:

To consider a decrease in withdrawal rate by using another water resource (the construction of a new water filtration and treatment plant in the lake)

To carry out a reinforcement of the natural capacity of groundwater by artificial recharge

2 criteria:

1 - water supply security (diversification of water resources)

2 - economical criteria (the cost of a groundwater A.R. is not the same as a new water treatment plant in the lake)
Technical aspect:
Studies and tests carried out on the experimental plant

Administrative and political aspects:
Several meetings and discussions (CH-F) in order to

1 – Impose restrictions on use until an A.R. plant completed
2 – Establish equitable cost sharing

1972 to 1977 work on drinking water resources and hydrogeological issues (losses, natural recharge, futur pumping and fees) in order to laying the bases of a futur Franco-Swiss agreement.
1977: artificial recharge benefits underlined:

◆ **All users**: availability of 15 Mm3 of drinking water stored in the underground.

◆ **Swiss water companies (SEA & SIG)**: ability to exploiting all the existing pumping wells without the construction of a water plant for treating lake water.

◆ **French communities**: Extraction of supplementary amounts of water paying their part of the costs beyond the annual minimum allowance of 2 Mm3/year.

◆ The cost of A.R. (depreciation, interest, usage and renovation costs) spread among all groundwater users, whatever the origin of the water (natural or artificial recharge)
1978: Arrangement between the canton of Geneva & the prefecture of Haute-Savoie

- The Arrangement ignores territorial sovereignty and territorial integrity concepts.
- Follows a pragmatic approach based on a rational management of the common resource.

- The Arrangement covers the following matters:
  - The Commission
  - The annual aquifer management programme
  - The groundwater recharge installation
  - Water rights
  - Water pricing
  - Miscellaneous provisions
The Commission: advisory committee

- To oversee the management of the recharge of Genevese aquifer (dealing with problems relating to the use, maintenance and monitoring of the system)

- To assess the status of the resource in terms of pumping and A.R.

- Responsible for reviewing the annual artificial recharge programme and the budget prepared in line with the recharge programme, the operating costs and the results of water quality control tests.

- Joint commission composed of representatives from State of Geneva and French communities and authorities and representative for water company.

- Committee members could be accompanied by experts

- Meetings once to twice per year, alternatively in France and in Switzerland.
1 Water-intake structure

2 Pipe to the plant (length 340m)

3 Water treatment plant

4 Pipe to the infiltration area (length 700m)

5 Underground infiltration area (perforated pipes-length 5000m)
- Reconstruction of groundwater storage
- Adjustment of the A.R. according to the withdrawal and the variations in groundwater level
- Annual total pumpage between 15 and 17 Mm3/year
- Total artificial recharge between 8 and 10 Mm3/year
- Good balance between withdrawals A.R. and average groundwater level
2007-2008: extension of the 1978 arrangement

- Franco-Swiss working group of the committee created in order to produce a basic document outlining the management of Genevese aquifer for the next 30 years, with legal support

- Technical specificities agreed on by the parties placed within a global context recognised at administrative and political levels

- Setting up the cross border legal bases for the new agreement.
2008: The new Genevese aquifer agreement based on the international legal instruments

**General instruments**

- Madrid Convention 1980
  - Strasbourg Protocol 1995
  - Strasbourg Protocol no 2 1998
  - Karlsruhe Agreement 1996
  - LGTC
- CRFG 1973
  - Transboundary Draft Agreement 1997
  - River contracts
- Conseil du Léman 1987

**Specific instruments for the water protection**

- Helsinki Convention 1992
  - London Protocol 1999
  - Kiev Protocol 2003
  - DCE 2000
    - EU Water Framework Directive

Franco-Genoese Regional committee
Agreement between the State of Geneva and the French communities

- based on the Karlsruhe agreement (art. 5 – possibility to delegate a mission to one of the local communities)

- in accordance with the Swiss federal constitution (cantons are free to act autonomously and to conclude an international agreement by themselves)

Agreement relating to the use, recharge and monitoring of Franco-Swiss Genevese aquifer signed on 18 December 2007 and entered into force on January 1, 2008 for 30 years
CONCLUSIONS

✓ In 30 years of exploitation, the A.R. system of Geneva has brought over 250 Mm3 of treated water into the “Genevese aquifer”

✓ The A.R. system brought positive results to the global quality of water resources especially its hardness and nitrate contents

✓ The choice taken in the seventies between a new water treatment plant from the lake and an A.R. plant using water from the Arve river has been perfectly judicious. It is providing the Geneva area with an optimal and safe drinking water supply thanks to the diversification and qualitative and quantitative potentialities of water resources

✓ The agreement signed between Geneva and French communities is a rare example of an aquifer management transboundary agreement between a Swiss canton and European Union communities.