TRAVEL DIARY

Organized by EFIB

With the collaboration of INGENIEURBIOLOGIE GÉNIE BIOLOGIQUE INGEGNERIA NATURALISTICA INSCHENIERA BIOLOGICA, AGéBio, AEIP Bioingeniería del paisaje

INDEX

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WHO WE ARE

The **European Federation of Soil Bioengineering (EFIB) was founded in 1995 to coordinate and promote the dissemination of the knowledge and experience of member associations and companies. The Federation aims to develop and advance Biological Engineering techniques as a technical-biological discipline involving** the use of plants for engineering purposes.

The Swiss Association for Bioengineering aims to promote the use of plants as building materials. Soil and Water Bioengineering promotes the use of plant techniques for the stabilization of slopes and the development of watercourses. Using living or primed plants, these methods protect soils and rocks against erosion and landslides.

The AGéBio association, recognized as being of general interest, aims to promote the use of biological engineering or plant engineering techniques in France, in various fields of application (torrential watersheds, river and lake banks, embankments, pastoral and agricultural areas, ski slopes, etc.) and various regional contexts with their own climatic and socio-economic specificities.

The Spanish Association AEIP is a non-profit cultural and professional association whose aim is to promote the development, knowledge, and application of techniques for the restoration of the natural environment and landscape, in particular Biological Engineering techniques, as well as actions to control and combat erosion and desertification.

THANKS

The tour organizers would like to thank the following professionals and companies for their valuable collaboration and know-how:

Giovanni De Cesare EPFL

Stefania Soldati INGENIEURBIOLOGIE GÉNIE BIOLOGIQUE INGEGNERIA NATURALISTICA INSCHENIERA BIOLOGICA

Pierre-André Frossard hepia Haute école du paysage, d'ingénierie et d'architecture de Genève

Marianne Gfeller
Bednarz Piotr ÉTAT DE VAUD

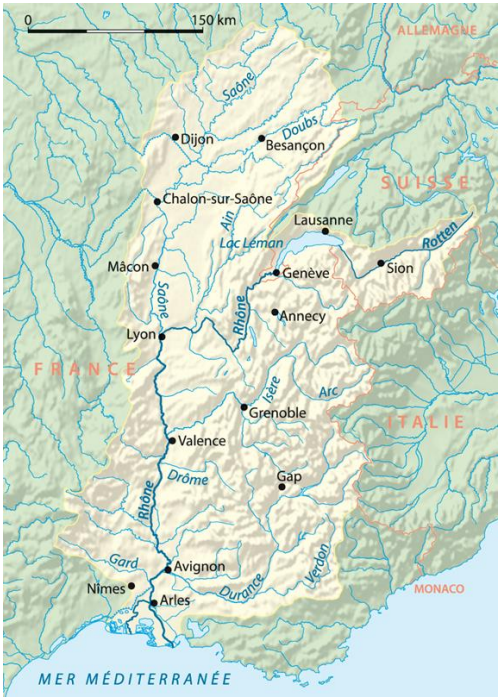
Christophe Guay cisalb lac du Bourget

Vincent Pasquier
Matthieu Hervé Bassin de l'Yzeron Vivre avec nos rivières

Nicolas Debiais
Ghislain Huyghe BIOTEC

William Brasier
Romain Brusson
Joly Celeste
Nedjma Salhi CNR

VISIT TO THE RHONE BASIN



When we talk about a river, we are talking about its basin, the part of the territory that feeds it. On this trip, we want to travel along one of the main European rivers, the Rhone, from its source to its mouth, to appreciate and become aware of this basin.

From the Alpine zone to the Mediterranean zone, this trip will allow us to discover the work carried out along its course and on its affluents to recover its functionality and biodiversity, as well as to better understand the functioning of the river and the different visions of its management and adaptation to the new climatic challenges. We can also think about the role of biological engineering in this process.

THE RHÔNE

The Rhône (French: Rhône; Occitan: Ròse; Franco-Provençal: Rôno; dialectal German: Rotten) is one of the great rivers of, the most important of the Mediterranean, running through Switzerland and France. Mediterranean, running through Switzerland and France. With a length of 812 km - 290 km in Switzerland and 522 km in France - it is the 2nd largest European river on the Mediterranean side and the 3rd largest in France.

Hydrography :

It drains a large basin. The Rhône basin is in two countries: Switzerland and France. At 97 800 km², it is twice the size of Switzerland.

Upper reaches :

The Rhone rises at an altitude of 2209 m in the Rhone glacier, in the Swiss, at the eastern end of the Valais. At its upper reaches, it flows through a glacial valley between the Bernese Alps, north and south.

Bernese Alps to the north and the Valais Alps to the south, until it flows into Lake Geneva or Lake Geneva.

Middle section:

It crosses the lake and enters France, starting its middle course, which runs in a general westerly direction along the western foothills of the Alps, towards Lyon, the largest city along its course, where it receives the Saône, its longest and most abundant tributary.

Low stretch :

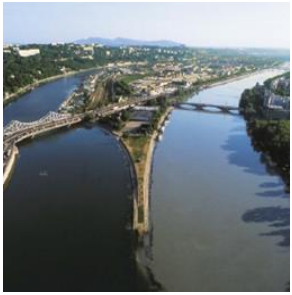
After leaving the metropolitan area, the lower reaches of the Rhône begin to flow southwards, between the Alps and the, where the river becomes navigable.

At Arles, the river divides into two large branches: the Grand Rhône to the east and the Petit Rhône to the west, between which the extensive Camargue delta is formed, before flowing into the Mediterranean Sea in the Gulf of Lion (from the French: Golfe du Lion).

The river in its French course has been fully upgraded, for power generation and to prevent flooding, allowing safe navigation along much of its course, with major river ports.

- Lyon, Valence, and Avignon - and even a cruise service from Arles to the city of Lyon. Navigation is completed by a rich network of canals linking the basins of the Rhine (Rhône-Rhône canal to the Rhine), Seine, Loire, and Loire (Rhône to the Rhine), the Loire, and the Garonne.

The Rhône valley produces a quarter of France's electricity - 7 nuclear power stations are located along the river - and the Rhône itself produces 20% of the country's hydroelectric power.



Hydrology :

It is a very fast-flowing river because it receives water from the Alps on its left bank and from the French Massif Central and the Massif de la Rhone from the French Massif Central and the Vosges, via the Saône, on the right.

The Rhône Upstream of Lake Leman

The flow of the river has been observed for 78 years (1935- 2013) at Porte-du-Scex, at 377 m altitude and the mean annual flow or modulus observed during that period was 182 m^3/s for an approximate catchment of about 3524 km^2, 14.3% of the total catchment area of the river.

The Rhône downstream of Leman

The hydraulic regime of the Rhône is characterized by autumn peaks due to snowmelt. In the winter it often has sustained, but less marked flows and the hydraulic regime is minimal in the summer.

The Rhône is characterized by the diversity of its catchment area:

- sustained Alpine inflows between May and July (melting of snow and glaciers);
- oceanic winter inflows, with slow floods (Saône);
- Mediterranean inflows with violent autumn floods; and
- severe summer low water levels.

This results in a very complex hydrological regime, with great diversity in flood formation and development. The following types of floods can be distinguished:

- oceanic floods, in which the Saône plays a predominant role;

- extensive Mediterranean floods (January 1994), with a strong contribution from the Mediterranean tributaries on the left bank (Durance, in particular);

- floods caused by the 'cenevol' or 'cold drop' phenomena (September 2002) with a predominant role of the Mediterranean tributaries on the right bank (Ardèche, Cèze, Gardon);

- generalized floods (1856 type) which are the most damaging.

The mean interannual flow of the river observed at Beaucaire (lower section) was 1690 m^3/s (data calculated over 92 years, from 1920 to 2011, for a catchment area of 95 590 km^2 and 6 m of altitude).

The Rhône is considered to be in flood when its rate exceeds 5000 m^3/s. The recent record was measured in December 2003 with a rate of 11 500 m^3/s ± 5 %.

For flood risk assessment (development of Flood Risk Prevention Plans, IRPP), the State services retain the highest reference flood of the 1856 flood, estimated at 12 500 m^3/s at Beaucaire, which would be slightly stronger than the 2003 flood.

The largest was probably the historical flood of November 1548, and up to 580. The millennium flood, on the other hand, is estimated at more than 14 000 m^3/s (between 14-14 500 m^3/s).

PARTICIPANTS

Albert Sorolla Edo	AEIP - EFIB
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Ghislain Huyghe	BIOTEC
Christophe Moiroud	CNR
William Brasier	CNR
Romain Brusson	CNR
Joly Celeste	CNR

PROGRAM

Sunday, September 15, 2024

PROGRAM **Travel to Lausanne via Geneva or Lyon**

Night HOTEL ELITE Av. Sainte-Luce 1, 1003 Lausanne, Switzerland- (4-minute walk from Railway Station)

Monday, September 16, 2024

PROGRAM

Morning **EPFL, Lausanne**
Visit to the hydraulic construction platform
Giovanni De Cesare EPFL

Afternoon **Bex and Gryon**
Géni'Alp Books
Pierre-André Frossard Hepia Geneva

Dinner : Restaurant Refuge de Solalex / **Night** : Hotel Miroir d'Argentine

Tuesday, September 17, 2024

PROGRAM

Morning **Priority measure Chablais**
3rd correction of the Rhône

Afternoon
Bednarz Piotr, Gfeller Marianne. CANTON VAUD
George Descombes, Philippe Adam or Bernard Lachat BIOTEC Switzerland (to be confirmed)

Night : Hotel des Princess 4 Rue de Boigne, 73000 Chambéry, France

Wednesday, September 18, 2024

PROGRAM

Morning	**Chambéry – La Leysse** Revitalisation of the Leysse Christophe Guay CISALB
Afternoon	**Lyon City – Cité Internationale** Protection of the banks of the Rhône BIOTEC France

Night: Lyon Hotel Residence Villemancy 21 Mnt Saint-Sébastien, 69001 Lyon, France

Thursday, September 19, 2024

PROGRAM

Morning	**Lyon** Revitalization of the Yzeron Matthieu HERVE CNR Christophe Moiroud SACYRC Yzeron Basin Syndicate
Afternoon	**Are** Willow Nursery William Brasier CNR

Night: Auberge la Plaine
La Plaine Mourier, 26400 Chabrillan, France

Friday, September 20, 2024

PROGRAM

Morning	**CRUAS** Chantier de Gouvernement CRUAS Nedjma Salhi (CNR)
Afternoon	**Avignon - Arlés** Domaine de la Palissade Conservatoire du Litoral

Overnight : Hotel Atrium, 1 Rue Emile Fassin, 13200 Arlés, France

HOTELS

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Tel. +33 (0)4 490 49 92 92

RHONE BASIN – ITINERARY

DATE: **Monday, September 16, 2024**

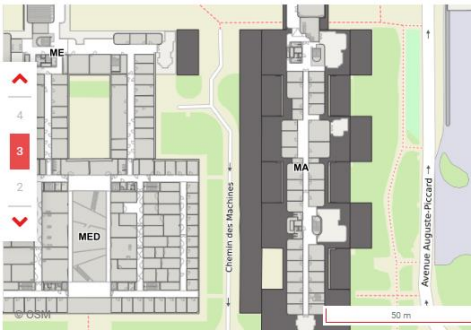
APPOINTMENT: **9:00 AM**

PLACE: **Hydraulic construction platform**

EPFL Rte Cantonale, 1015 Lausanne, Switzerland

LOCATION: **EPFL ENAC IIC PL-LCH-Station N° 18-CH-1015 Lausanne**

GUIDES: **Giovanni de Cesare : Operatonali Head of PL-LCH (EPFL) and Verein Für Ingenieurbiologie**



FUNDAMENTAL RESEARCH AND INNOVATION IN HYDRAULIC ENGINEERING

The PL-LCH focuses on fundamental research and innovation in hydraulic engineering for the sustainable use of water resources.

The main missions of the laboratory include activities in research, teaching, and services. A state-of-the-art approach including analytics, physical experiments, and numerical simulations allows advanced modeling of complex phenomena in the domains of :

- Water infrastructure engineering
- River Mechanics
- Water and groundwater management
- Hydrological processes
- Eco-hydropower engineering

The main fields of activity of the laboratory include hydropower, hydraulic structures, sediment management, flood protection, hydraulic networks, sediment transport, erosion processes, morphodynamics, habitats and

connectivity, sustainable allocation, irrigation and drainage, resilience and restoration, nonlinear routing, time series analysis, stochastic modeling, plant roots biomechanics, eco-morphodynamics, and nature-based solutions. The PL-LCH (former LCH) is a laboratory from the Institute of Civil Engineering (IIC) from the School of Architecture, Civil and Environmental Engineering (ENAC).

- Plant roots biomechanics
- Ecomorphodynamics
- Nature-based solutions

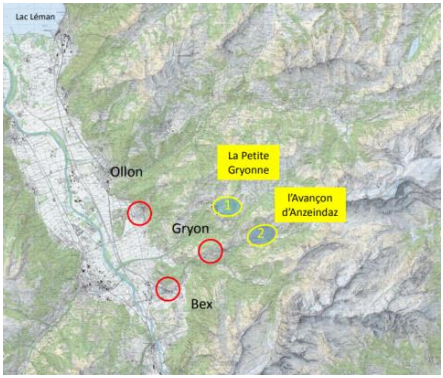
DATE: **Monday, September 16, 2024**

APPOINTMENT: **1:45 PM**. **Step One**

PLACE: **Chablais-ouest rest stop** (on the A9 motorway towards Valais)

LOCATION: **Bex**

GUIDES: **Pierre-André Frossard Hepia Geneva**



ADVANCE FROM ANZEINDAZ TO LA BENJAMINE – BANK STABILIZATION

Country: Switzerland / **Municipalities:** Bex (VD)

Completion date : Fall 2012

Altitude: 1,300 m

Latitude-longitude: 46°16'59''N; 07°07'05''E

Client: municipalities of Bex

Project manager: HEPIA inTNE

Safety issue: protection of a municipal road

Types of degradation: landslide, bank erosion

Longitudinal profile pent: 7% / **Centennial flood flow :** 55 m3/s

<u>Plant engineering work:</u>

Vegetated log box

Vegetated wood trellis

Seedling beds and spears

Hydroseeding

ISSUES AND OBJECTIVES

• Landslide on the left bank at a height of 13 m
with a slope of 100%.

• Erosion of the foot of the bank that does not allow stabilization
spontaneous use of fallen materials.

• Protection of the foot of the bank and the bank over its entire height
in order to secure the municipal road that accesses Solalex,
located only 12 m from the top of the eroded bank.

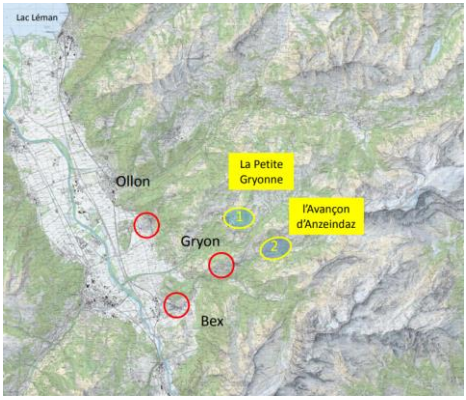
• Experimental development for the promotion of plant engineering
in mountain watercourses (Interreg IV A / Geni'Alp).

DATE : **Monday, September 16, 2024**

APPOINTMENT : **Second step**

LOCATION : **Bex and Gryon**

GUIDES : **Pierre-André Frossard (HEPIA inTNE)**



ANZEINDAZ ADVANCE IN CERGNEMENT – BANK STABILIZATION

Country: Switzerland

Municipalities: Bex and Gryon (VD) / **Completion date:** autumn 2011

Altitude : 1,248 m

Latitude-longitude : 46°16'56''N; 07°06'55''E

Client: municipalities of Bex and Gryon

Project manager: HEPIA inTNE

Safety issue: Bridge stability

Types of degradation: erosion and incision

Longitudinal profile weight: 5 to 10% / **Centennial flood flow:** 57 m3/s

Plant engineering work:

Seedbeds and spears reinforced with geotextile

Layers of branches with suckers

Plantations

Hydroseeding

ISSUES AND OBJECTIVES

• Stabilization of the right bank against erosion that encroaches on farmland.

• Stabilization of the longitudinal profile to protect the bed against the phenomenon of incision threatening the foundations of the bridge of the municipal road giving access to Solalex.

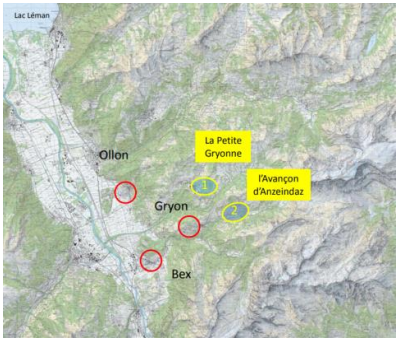
• Experimental development for the promotion of plant engineering in mountain watercourses (Interreg IV A / Génie'Alp).

DATE: **Monday, September 16, 2024**

APPOINTMENT: **Third step**

LOCATION: **Ollon**

GUIDES: **Pierre-André Frossard (HEPIA inTNE)**



PETITE GRYONNE IN OLLON – STABILIZATION OF A FOREST PATH

Country: Switzerland

Municipalities: Ollon (VD) / **Completion date :** spring 2012

Altitude : 1,320 m

Latitude-longitude : 46°18'20''N; 07°03'33''E

Client: Municipalities of Ollon

Project manager: HEPIA inTNE

Safety issues: protection of an access road and prevention against the risk of bed obstruction

Types of degradation: landslide, bank erosion

Longitudinal profile pent: 7% / **Centennial flood flow :** 55 m3/s

Plant engineering work :

Plant-based log box

Log sill (stabilization of the longitudinal profile)

Willow weir with double row of pilesHydroseeding

Seedling beds and spears

Hydroseeding

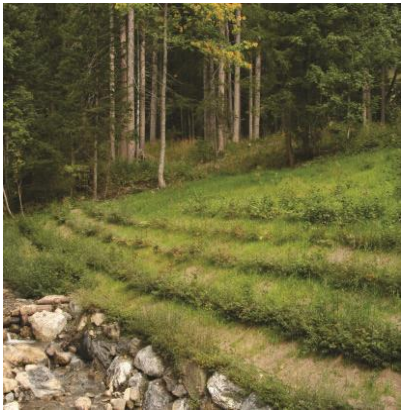
ISSUES AND OBJECTIVES

• Landslide on the left bank leading to a risk of obstruction of the minor bed and arching under a municipal road.

• Erosion on the right bank threatening a forest path that also serves as access to chalets and the ski area.

• Stabilization of the left bank and protection of the path on the right bank.

• Experimental development for the promotion of plant engineering in mountain watercourses (Interreg IV A / Geni'Alp).



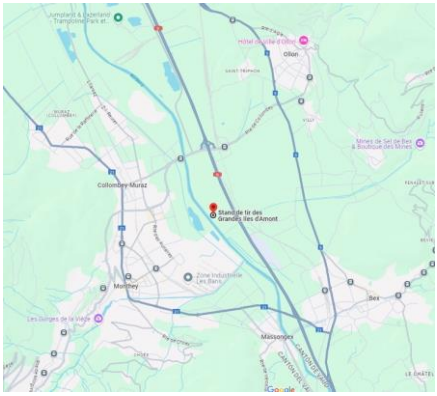
DATE: **Tuesday, September 17, 2024**

APPOINTMENT: **9:30 AM**

PLACE: **Parking du stand de tir de Grandes Îles d´Aval - Ollon**

LOCATION: **Third Rhône Correction**

GUIDES: **Marianne Gfeller. Head of Section Rhône 3 Directorate-General for the Environment – Water Division (DGE-EAU)**



RHÔNE CORRECTION PROJECT 3

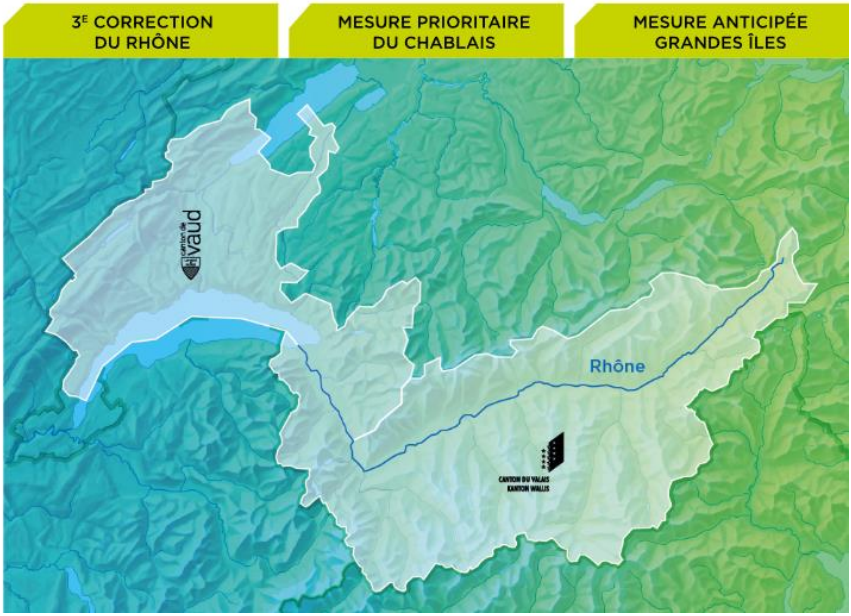
The first corrections to the Rhône (from 1860 to 1890 and from 1930 to 1960) led to significant development of the plain. However, diking the river has not guaranteed total safety, and has degraded or eliminated the natural environments associated with the river. In addition, the river's economic, agricultural, tourism, and hydroelectric potential must be exploited in sectoral and regional projects. The 3rd Rhone correction is a major flood protection project in Switzerland, stretching 162 kilometers from Gletsch to Lake Geneva. It aims to make the plain, its inhabitants and infrastructures safer, and the river more natural.

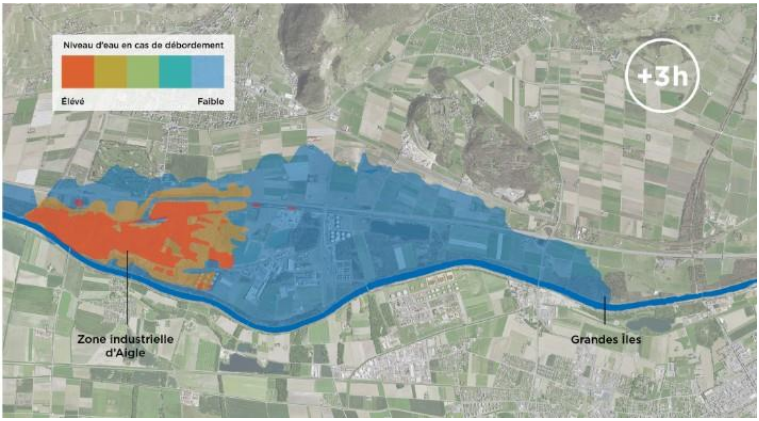
The aim of the Rhône 3rd correction project (Rhône 3)

This project aims to provide long-term protection for the plain against flooding from the river. The governments of Vaud and Valais adopted a plan setting out the principles for developing the river and the measures to be undertaken, which are being carried out in stages, according to priorities. There are two main types of measure :

Priority Measures (PM) aim to completely redevelop an area, to protect the population sustainably from flooding and improve the river's biodiversity. These measures involve widening the river and consolidating the dikes. In constrained sectors, deepening is planned.

Anticipated measures (AM) are one-off measures that involve carrying out some of the work planned in the priority measures.in advance. The aim of these works is either to secure a particularly vulnerable sector, or to strengthen synergies with other priority projects (hydroelectric generation, etc.), or even to improve the quality of the water.




Niveau d'eau en cas de débordement
Élevé
Faible
+3h
Zone industrielle d'Aigle
Grandes Iles


2040

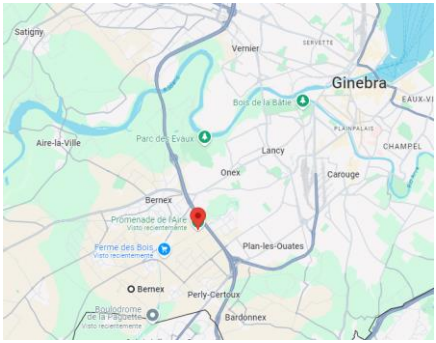
DATE**: Tuesday, September 17, 2024**

APPOINTMENT: **2:30 PM**

PLACE: **Renaturation of AIRE River, Geneva**

LOCATION : **Pomedade de l' AIRE**

GUIDES :



RENATURATION OF AIRE RIVER, GENEVA

The canalization of the small river Aire at the end of the 19th century has long been considered a technical feat. five kilometers stretch of the river was tamed, the risk of flooding was eliminated, and the once marshy area was transformed into fertile arable land available to farmers.

The profound changes that the intervention brought to the landscape and the animals and plants that once lived along this winding watercourse were relegated to the background at the time. In 1998, the canton of Geneva launched a renaturation program with several objectives: to give more space to the water to protect it from flooding, to transform the rivers into valuable habitats and, at the same time, to give the population access to a recreational area.

In 2000, the canton issued a call for tenders for a study on revitalizing the AIRE. The Superpositions team, an interdisciplinary consortium made up of urban planners, biologists and hydrologists, as well as civil and environmental engineers, won over the public with a varied project: the river landscape should not have been restored to its natural state. On the contrary, the authors of the project wanted to preserve the traces left by

the human interventions of recent decades. Since 2002, the project has been implemented in four stages.

- Stage 1 (2002-2006) Pilot section of the Mariax-Centenaire sector
- Stage 2 (2007-2010) Certoux Lully –
- Stage 3 (2013-2016) Luylly Confignon –
- Stage 4 (2019-2022) St. Julien Certoux

In the canton of Geneva, the Aire was the first watercourse to be physically restored to its natural state... and 22 years on, the results are excellent and gratifying. The increase in biodiversity is astonishing, with 80% of the species found on the Swiss plateau represented. A diverse landscape Today, the revitalized banks of the Aire are a popular recreational area and a valuable natural habitat for water-loving plants and animals. The landscape is no longer split in two by a concrete canal, but has many facets: depending on the water level, the little river finds its way into a new bed, providing a valuable habitat for a multitude of species. The villages are protected against flooding for events with a return period of more than 300 years, and the public enjoy coming to walk, recharge their batteries or go for a jog in the many freely accessible areas.

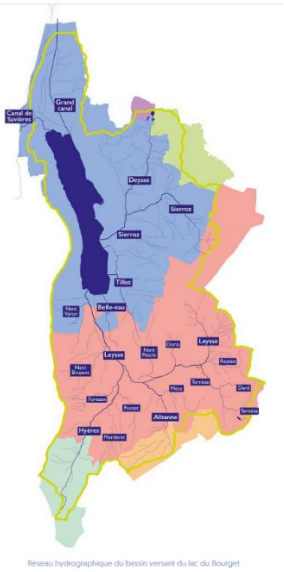
DATE : **Wednesday, September 18, 2024**

APPOINTMENT : **8:30 AM**

PLACE : **Pré Marquis, 45°36'19.7"N 5°53'07.2"E (Supermarket SUPER U de la Motte servolex)**

LOCATION : **La Motte Servolex**

GUIDES : **Christophe Guay (CISALB)**



Réseau hydrographique du bassin versant du lac du Bourget

RIVER DEVELOPMENT PROJECTS

CISALB has been exercising GEMAPI competence since 1 January 2019 by a delegation of the 6 EPCIs that make up the hydraulic catchment area of Lake Bourget. It implements projects resulting from the master plans of the agglomerations. The territory of CISALB covers 580km², 1000 km of rivers, 25 km of dikes, 220,000 inhabitants, and the largest natural lake in France. "River" development projects always have a dual objective: protection against flooding AND ecological restoration of environments, *for a safer and livelier river*. The project visited today represents a total cost of nearly €18 million and will last 4 years between 2014 and 2018. This development carried out in 2 phases (the visit mainly concerns the second phase), has made it possible to secure and restore 4.5km of river in the middle of an urban and sub-urban area. This project was financed by the State (PAPI), the water agency for ecological restoration and the Region. The CISALB territory is linked to the Rhône by the Chautagne plain, and the Savières Canal, the outlet of the Lac du Bourget.

ISSUES AND OBJECTIVES

The main issue was to respond to the subject of flooding, restoration of the dikes, while allowing the ecological restoration of the river. The techniques of protection in embankments (dikes) do not allow a certain number of ecological restoration developments (planting, intrusive developments in the body of the dike such as caissons, etc.).

It was therefore necessary to find solutions to allow the installation of a green and blue network (also known as a turquoise network) while guaranteeing the stability of the flood protection structures for the project flood (hundred-year flood) and their durability over time.

It is the liberation of spaces, the work on the course of the watercourse, the reconnection of spaces disconnected by the dikes, the intervention on the bed, etc. that have made it possible to achieve this dual objective of protection and restoration.

The general principle was to install classic facilities to allow the river to sculpt its own bed in the sandstone of the floods. This process makes it possible to have an environment in motion and not fixed by the facilities that can be installed there.

Before, December 2015: Straight watercourse, a canal without any diversification of flow, with vegetation on a dike that is not very diverse, mainly composed of invasive species such as *Robinia pseudoacacia* and an alluvial forest disconnected from hydraulic functioning.

After, June 2019: work on the morphodynamics of the bottom, installation of vegetation, retreat of the dike and reintegration of the alluvial forest into the inter-dike space, installation of modules (weirs, groynes, , etc.). to create diversification and bring vegetation back to the watercourse...). Since June 2019, the vegetation has developed and as you will see on the ground, the appearance of the environment is still different from what could be observed in 2019.

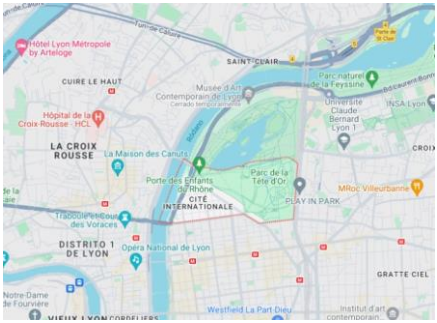
DATE: **Wednesday, September 18, 2024**

APPOINTMENT: **14h30**

PLACE: Cité **Internationale**

LOCATION: **Lyon**

GUIDES: **Nicolas Debiaus and Ghislain Huyghe (BIOTEC)**



LANDSCAPING OF THE LEFT BANK OF THE RHÔNE TO THE RIGHT OF THE CITÉ INTERNATIONALE, IN LYON

Work period: Work carried out between January and March 1994

Design, monitoring, and supervision of the plant reinforcement site of the left bank slope of the Rhône over a length of more than 600 meters using techniques derived from plant engineering. The project for a new district of the Cité Internationale, integrating the creation of tertiary, commercial, and cultural facilities as well as a residential and hotel center in the north-eastern part of the Lyon conurbation and near the Parc de la Tête d'Or, required the remodelling of the left and convex bank of the Rhône, between the Poincaré and Churchill bridges. The embankment thus erected and entirely bare, exposed to the constraints of flow, submersion and wave sailing, had to be reinforced in the joint objectives of securing the site and then recreating a riverside wooded corridor typical of the river's riparian environments.

TECHNICAL CHOICES

• Manufacture of a low and block embankment at the foot of the bank allowing the creation of a longitudinal hem favorable to the installation of helophyte plants

• Revegetation of the bank front by means of layers of branches with shoots in the lower part of the embankment and then covering of all the surfaces worked with biodegradable jute meshes.

• Sowing of the worked areas using selected seed mixtures, then planting of salicaceae cuttings, bare-root shrubs, saplings and stem trees of suitable native species.

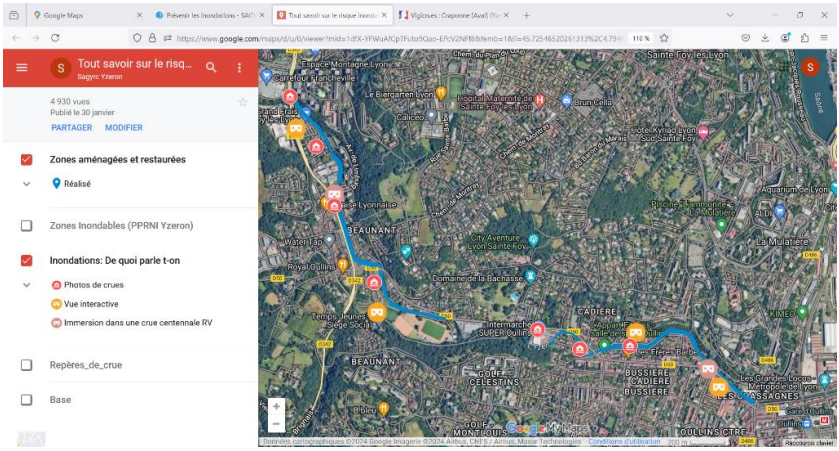
DATE: **Thursday, 19 September 2024**

APPOINTMENT: **9:00 AM**

PLACE: **Sainte-Foy- Les Lyon + Oullins Yzeron river**

LOCATION : **2-4 chemin de l'Yzeron 69110 Sainte-Foy-Les-Lyon**

GUIDES : **Matthieu Hervé & Vincent Pasquier (SAGYCR)**



SITES RESTORED BY SAGYRC

The visit will consist of visiting two sites restored by SAGYRC over the last 10 years. These sites have been the subject of work with various objectives: reduction of flood hazards, restoration of aquatic environments, and reappropriation of the river.

The exchanges will allow us to address these subjects at work during the different periods:

- Project development
- Works phase
- Maintenance and development of the sites.

ISSUES AND OBJECTIVES

The principle of the restoration of the river in these two sectors was the same:

- Removal of the concrete culvert
- Widening the riverbed
- Recreation of a low waterbed
- Diversification of flows and facies by planting plant engineering
- Containment of the necessary sectors.

This work has also enabled work on the management of invasive alien species and the diversification of riparian forest biodiversity.

These sites have been developed as part of a global project combining:

- Environmental restoration
- Flood Prevention
- Social reappropriation of the river

They are also monitored and maintained at present with the same search for compromises between environment, safety, and cohabitation with follow-ups:

- Wildlife
- Floristic
- Maintenance of vegetation or even pruning about the risk of flooding

- Topographical monitoring and structures in view also allow the achievement of regulatory levels of protection against flooding.

The exchange will focus on:

- the preparation phase
- the works phase
- the maintenance phase of the sites

And can be extended to all the subjects/issues covered by the syndicate (fish farming continuity, water resources, etc.)

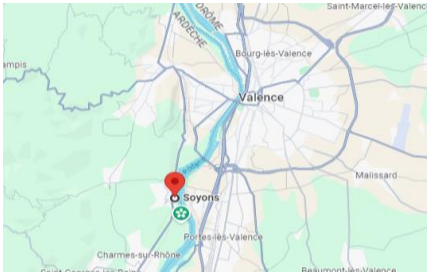
DATE: **Thursday, 19 September 2024**

APPOINTMENT: **15 :00 PM**

PLACE: **Pepinière de Saules SOYONS**

LOCATION: **Soyons**

GUIDES: **William Brasier CNR**



PEPINIÈRE DE SAULES SOYONS

The Compagnie Nationale du Rhône (CNR) is France's leading producer of electricity from 100% renewable sources (water, wind, sun) and the multi-purpose concession holder for the Rhône (hydroelectricity production, navigation, and agricultural uses), from the Swiss border to the Mediterranean Sea. Since 2015, CNR has been committed to the Local Plant initiative with a desire to set up a supply chain to meet its needs. CNR has acted as a catalyst to drive the approach on several levels:

- Initially producing a list of species that CNR needed for vegetation, with the identification and mapping of 72 sampling sites for 36 species spread over the 2 regions of origin.
- Identifying around 250 potential players within a 50km radius of the Rhône, including secondary schools, nurseries, ESATs, etc., to assess a panel of potential suppliers. The aim was to evaluate a potential market panel to see if a local plant dynamic could be launched in the CNR area of action, which covers 2 regions of origin in terms of shrub plants.
- By collecting local plant material ourselves (seeds, cuttings, twigs) and approaching nurseries to supply them with seeds for production and to get them involved in the brand approach.

- -Providing financial assistance to growers and collectors in the first year.
- Producing the seedlings and cuttings with the creation of a 2.7-hectare cuttings park, containing 20,000 cuttings of 9 species that make up the Rhone riparian zone (6 willow species, 2 poplar species (black and white) and 1 tamarisk species), to meet the planting needs of natural environment restoration projects on the Rhone. The park is thus a breeding ground for species typical of the banks of the Rhône, helping in particular to safeguard a species that is emblematic of the Rhône, such as the black poplar (*Populus nigra*).

DATE : **Friday, 20 Septembre 2024**

APPOINTMENT : **9:00 AM**

PLACE : **Cruas (07)** **https://maps.app.goo.gl/WU7Ld8Px15m77tkt5**

LOCATION : **Chemin du Plot 07350 CRUAS**

GUIDES : **Nedjma Salhi (CNR)**

CRUAS

The Rhône has experienced two periods of containment. The first, in the 19th century with the Girardon structures to allow navigation and the second in the 20th century with the creation of the hydroelectric plants diverting a large part of the flow of the Rhône. These two phenomena have blocked and exempted the historic active lateral strip of the Rhône (alluvial margin). The Rhône ecological restoration process was initiated in 2011. Restoration projects were developed in the most favorable and relevant sectors of the Rhône. These projects aim to dismantle the Girardon structures to restore the dynamics of the river and dig out the old arms of the Rhône (lône). Three sites are identified in the Old Rhône of Baix-Le-Logis-Neuf. After the Baix site (2020-2022), work on the Saulce and Gouvernement sites started in September 2023. The Water Agency is co-financing these projects. The work on Gouvernement site will make it possible to reconnect 1,400 m of lône and dismantle 1,650 m of rock dike.

PROBLEMATIC

Ecological restoration projects focus on sectors with potential for revitalizing the Rhône (erosion capacity, speed, absence of human issues, etc.). They aim for several objectives : restoring the potential for lateral erosion, promoting pioneer habitats, preserving existing habitats and species, taking into account invasive exotic species, reactivating transport by cartage, etc. Wider consultations (users, scientists, environmental stakeholders, local elected officials) made it possible to reflect on, design and bring these projects to fruition. Since the last Baix project, the reduction of greenhouse gases has been an integral part of these projects, through their implementation but also in terms of commitment for the companies carrying out this work.

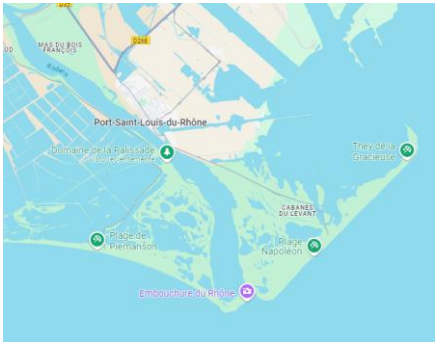
DATE: **Friday, 20 Septembre 2024**

APPOINTMENT: **15h30 PM**

PLACE : **Domaine de la Palissade. Conservatoire du Litoral**

LOCATION: **13129 Salin de Giraud**

GUIDES : **LOCAL**



DOMAINE DE LA PALISSADE. CONSERVATOIRE DU LITORAL

The Domaine de la Palissade is a protected natural area belonging to the Conservatoire du Littoral. It has been managed by the Camargue Regional Nature Park since 1 January 2014.

The Domaine de la Palissade was an early example of the desire to protect the natural riches of the Rhône delta through land management. In 1977, one year after its creation, the Conservatoire du Littoral bought this 700-hectare site at the mouth of the Rhône.

Since its acquisition, this area has been open to the public, with a clear focus on environmental education. The estate was created very recently (18th century) because of the combined action of the Rhône and the sea, forming a triangle bordered to the east by the Rhône, to the west by the Piémanson grau, and to the south by the sea. Several montilles (fossil dunes) parallel to the current coastline bear witness to the evolution of the various dune belts. The area around the mouth of the Grand Rhône, of which the estate is a part, is one of the very last vestiges of the Camargue not protected by the dikes of the Rhône and the sea.

As a result, it is one of the most representative examples of how the delta functioned before the major developments of the 19th century. It is one of the last undeveloped mouths of France's major rivers, and a tour of the 702 ha of the estate reveals a remarkable diversity of environments, including sansouïres, reedbeds, marshes, lagoons, and the riparian forests of the Rhône. This diversity is remarkable on a regional scale: 12 of the 14 habitats found in the 13,000 ha of the Camargue National Reserve are listed in Annex 1 of the Natura 2000 Habitats Directive.

RHONE BASIN – NOTES of VISITS