

The Schools of Mantova for the Rivers 1976-2020



Sandro Sutti
Labter-CREA School Network – GLOBE Italy



Out or in?

When Francesca proposed that we write this report, we thought we were off topic because we hadn't had the opportunity to resurface to daylight the rivers and canals that were culverted in the past...

But ...maybe we aren't.



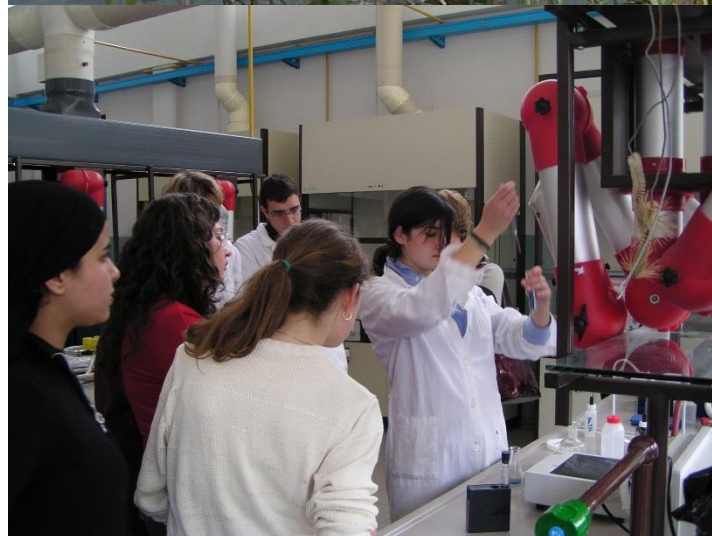


2020 Many celebrations, no celebrations

30th Edition of Mincio Project

25th Anniversary of the GLOBE Program

20th Edition of WWD in Mantova





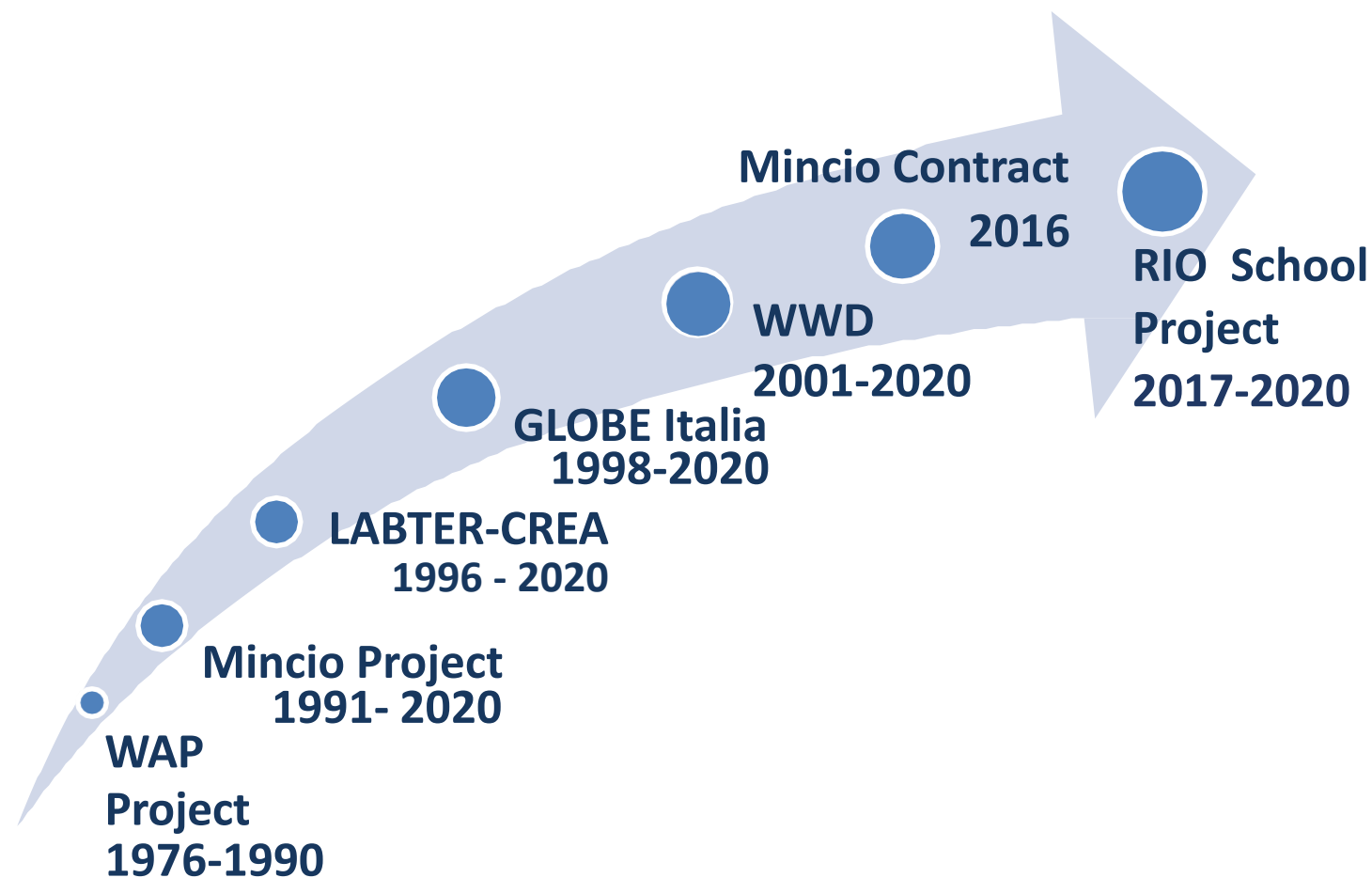
COVID-19

Started in 1976, the relationship between the Mantova's schools and their rivers had never been blocked even for a year.

The pandemic stopped it in 2020.

The long months of COVID confinement...

an opportunity to reflect...





In the 50s poor Houses and Mobility Limits

In the early post-war period, families were poor and their houses poorly furnished

Smart houses (now) versus very poorly furnished houses

No limit mobility versus intra village mobility

Non limit connections versus village people connections

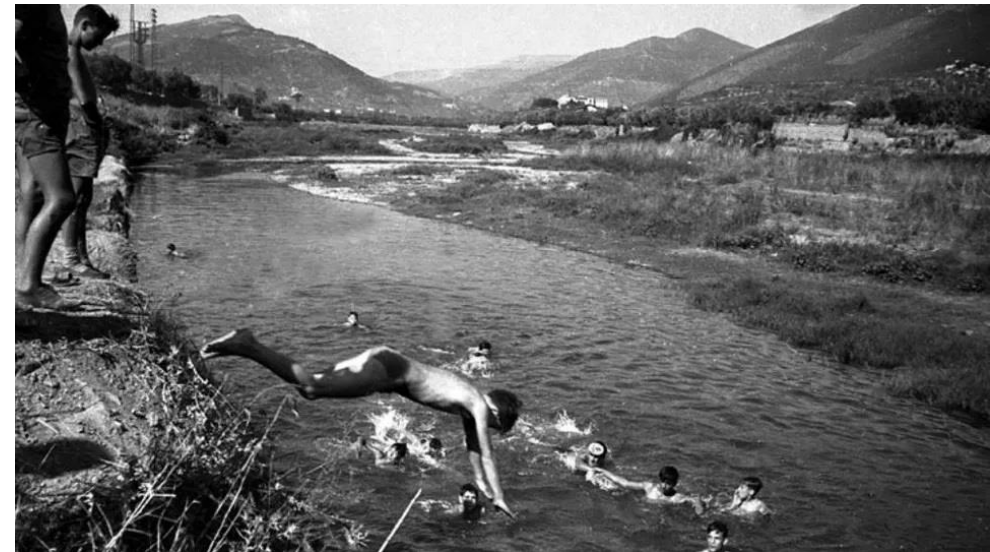
The physical limits of the village were the physical limits of our life





In the 50s an Environment to live

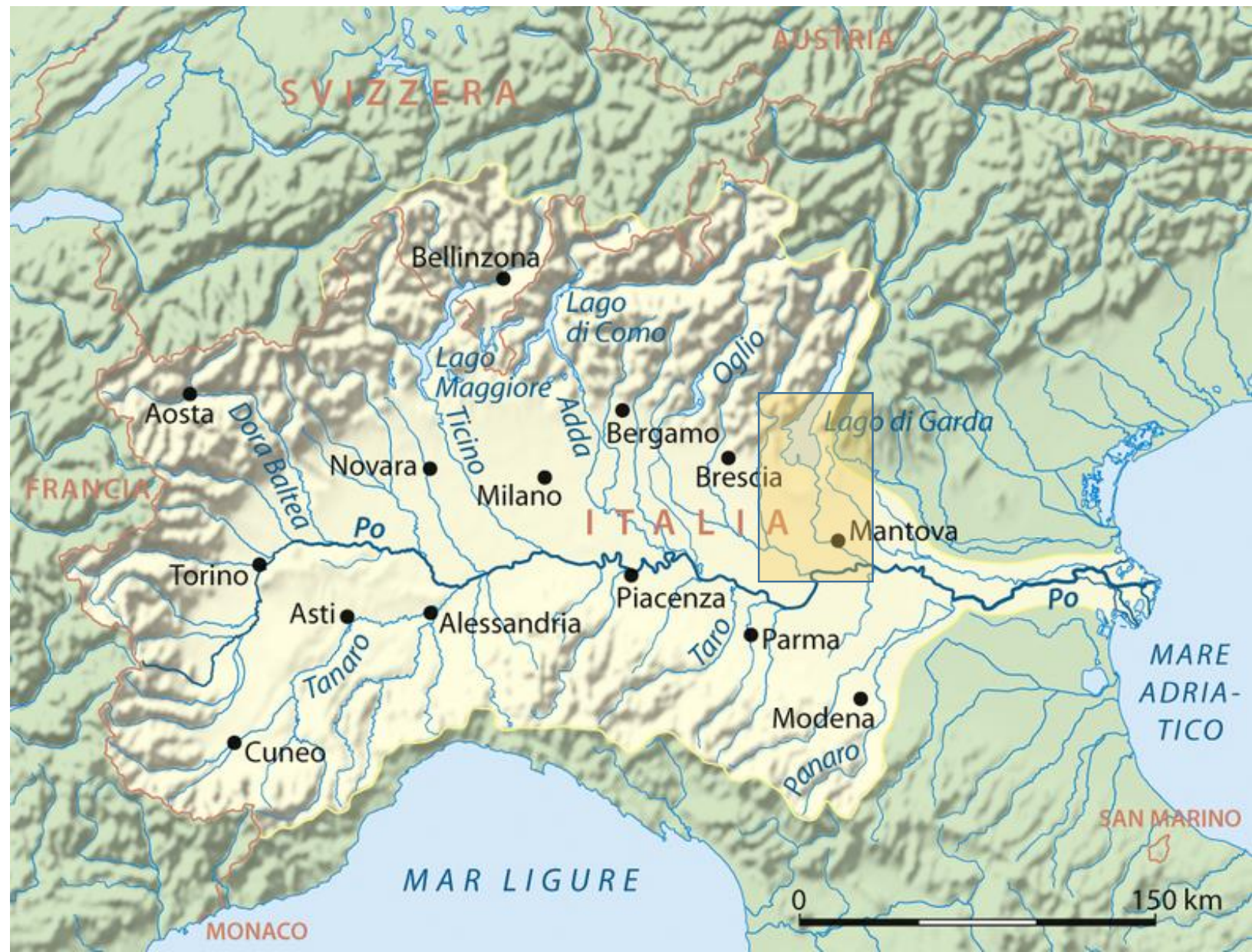
The misery of our own homes forced us to live outdoors: winter, autumn and spring, morning and night. After doing our homework we'd play on the streets, or in the soccer ground or in the cultivated fields. But in summer....in summer we'd be going after the water: before sunrise we'd be out fishing and with a simple hook take home a swag of carp, catfish, eels, tench, chubs. During the day, we'd take brief voyages with improvised rafts or boats on waters of mythical flavour; but we'd take most enjoyment out of late afternoon swims, dips and dives from the bridge across the Gherardo Canal, where the best of the village's male youth would put on a show.





Where we live1: the
Po River Water Basin

Where we live2: the
River Mincio Water
Basin





Mincio Regional Park (1984)

Surface = 16.000 ha
= 160 km²





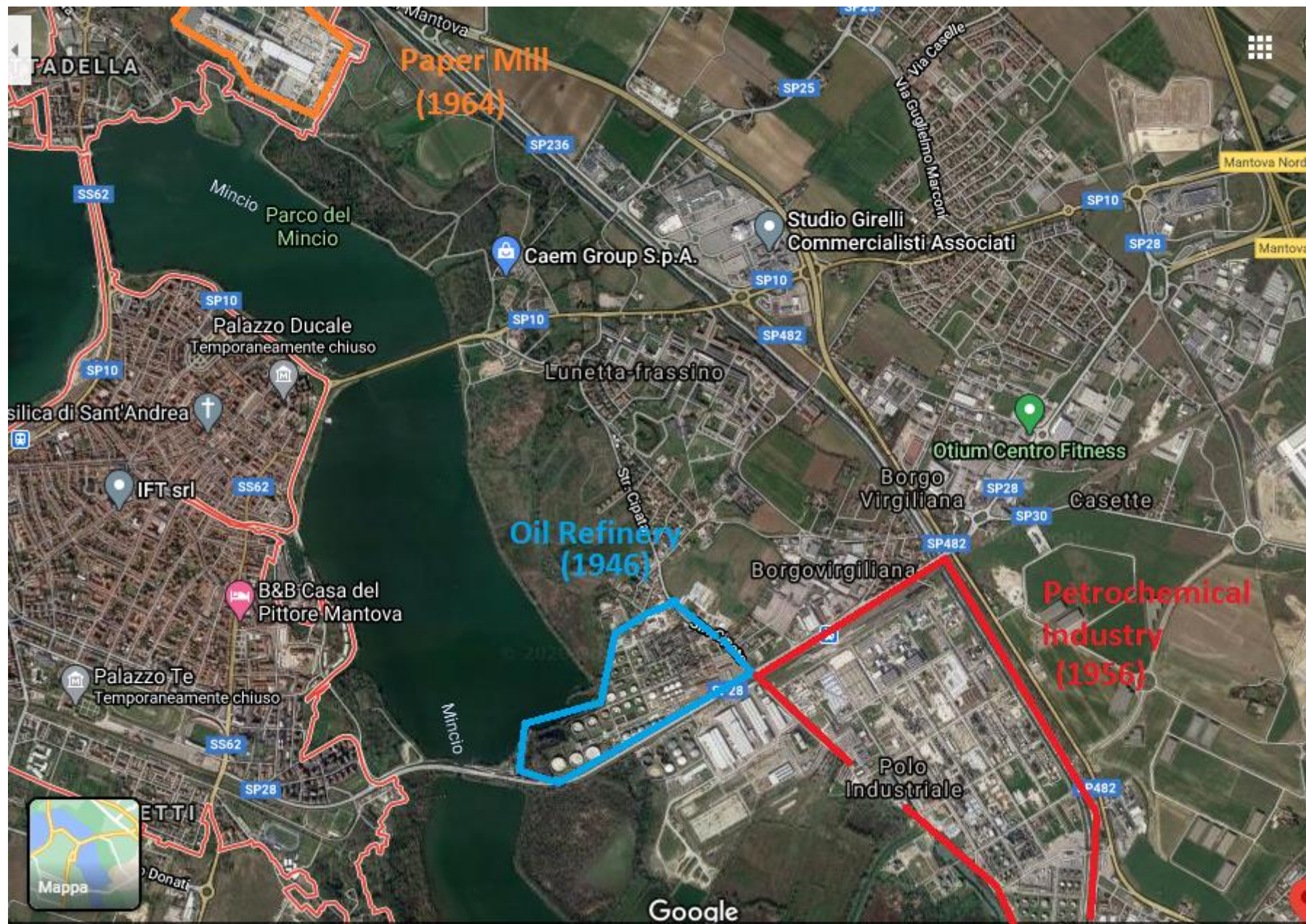
Mantova city and the Rio Canal





An Oil Refinery
(1946)

A Petrochemical
Industry (1956)





Industrial Agriculture and Pig Farming

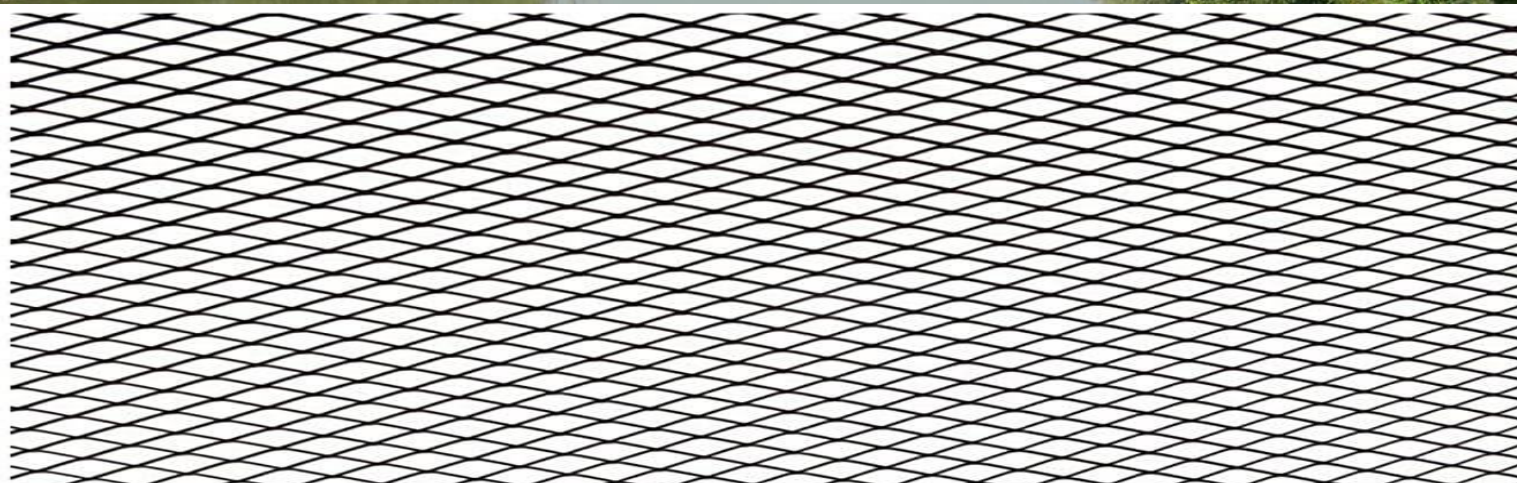
Intensive agriculture which tore to the ground trees that crowded our paddocks, and started to spread industrial quantities of agropharmaceuticals and fertilisers. Inexorably, the rains washed them into the canals. In parallel, industrial scale pig farming found it convenient to wash into rivers and canals the manure produced by a swine population that in a few years had become 4 times that of human residents in the region.





The lower Mincio: very polluted

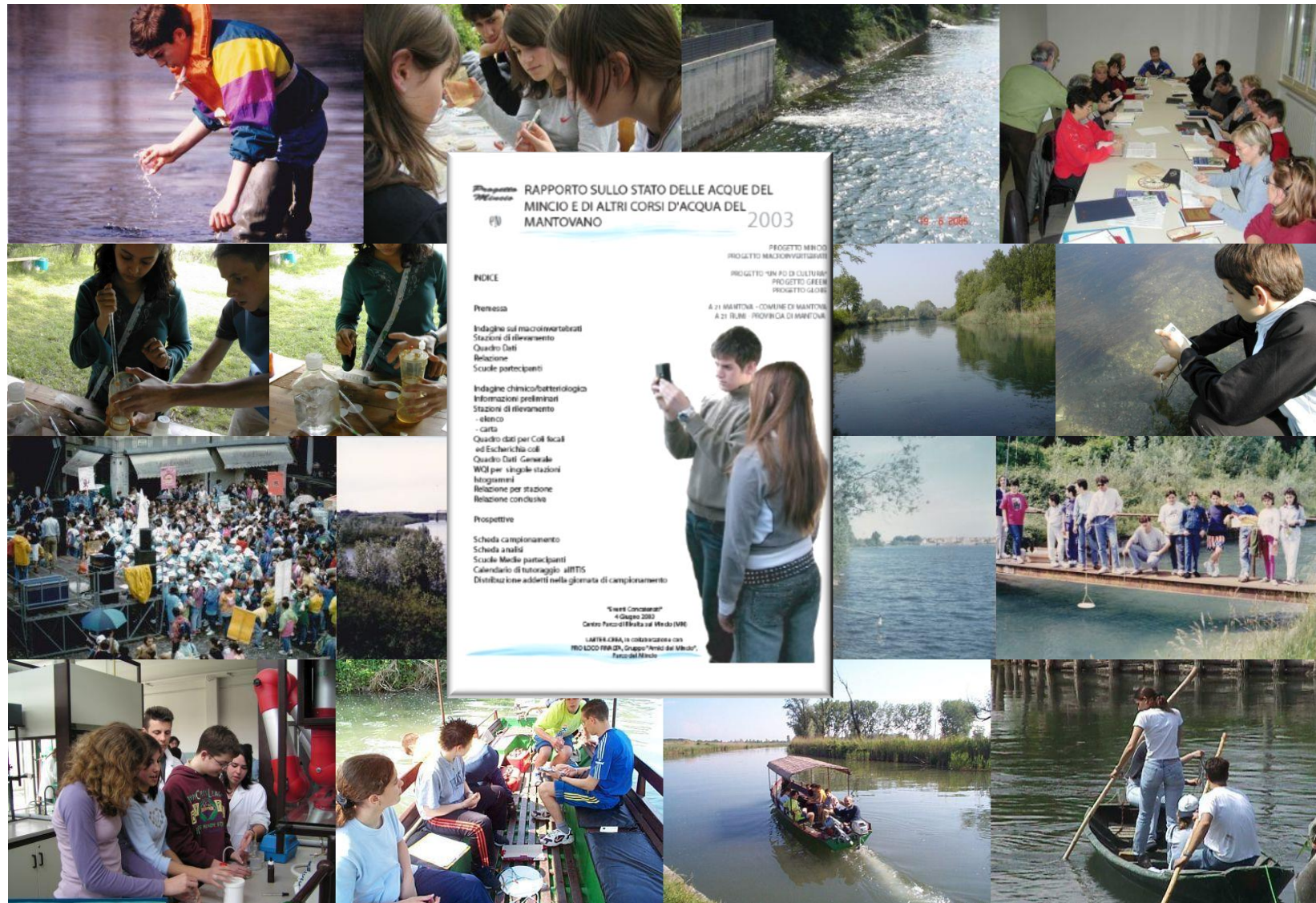
It was an anthropologically horrific strike: our rivers had not been culverted, but to us it felt as if they had been. We had been expelled from our beloved waters, and they would never come back.





Our Mission: to bring Rivers, Lakes and Canals back into the Culture and the Lives of Citizens

The examination that follows, focuses on water-centric projects, and the activities undertaken by the Mantuan Schools, which in fact has become their scope: *to resurface rivers, lakes and canals, bring them up into the light, bring them back into the culture and the lives of citizens. The last 70 years, characterised by the progress at all costs ideology and by unrestrained consumption, have substantially subtracted rivers, lakes and canals from the community's....fruition*





Common Elements to EE → SD Projects and Activities

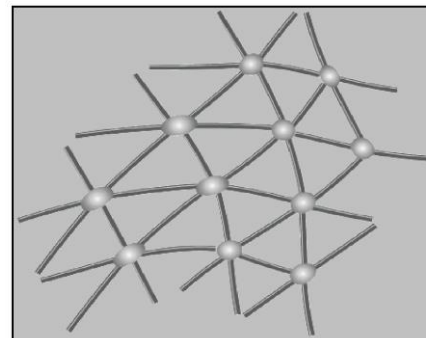
1 Activation of school networks

2 Huge support of local government
bodies

3 Collaboration with environmental
protection management and control
agencies

4 Interactions with Universities and
Research Centres (i.e. CNR-IBE in FI and
IREA in MI)

5



UNIVERSITÀ DI PARMA



Istituto per la
BioEconomia



istituto per il rilevamento
elettromagnetico
dell'ambiente



The RIO School Project 2017 -2020

It was realized in 2018 and 2019 by three Mantova High Schools (IS Fermi, ITET Mantegna, IS Strozzi). It was launched also in early 2020, but was immediately interrupted in its stride... Introducing this project requires a short premise...

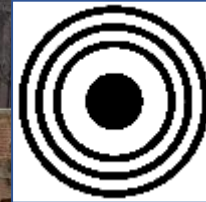
The RIO Canal



Nice buildings were built over the centuries



The center fo the city life





Mantova, RIO Canal partially culverted (1958)

The RIO Canal

Only 200 m culverted...
That moment marked the start of the decline of the Rio, which silently exited from the lives of the citizens of Mantova: only 200 m of the canal were culverted, but it felt like the whole of it had been removed from the sight of Mantova's citizens.



How it was



1958



**How it is
(Course of Liberty)**

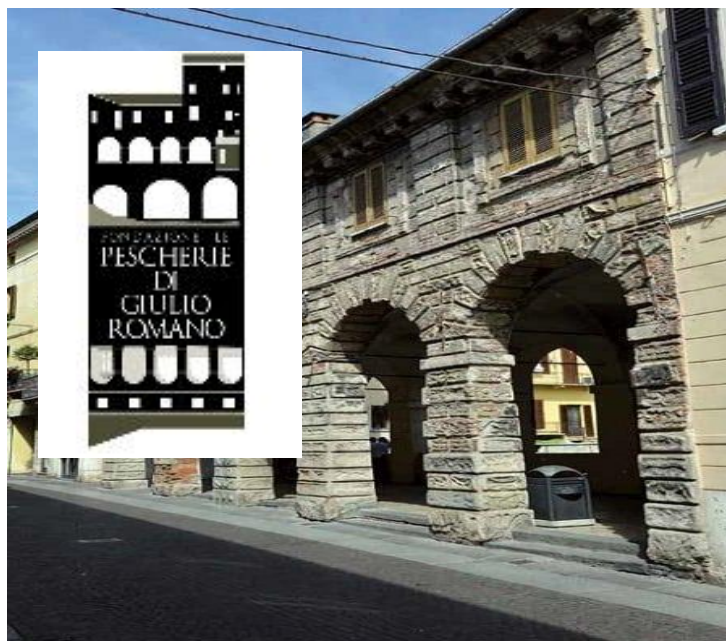


The RIO Canal: Buildings abandoned to their Fate

Some of the characteristic surrounding buildings were abandoned to their fate. For the last few years, the philanthropic foundation “Le Pescherie di Giulio Romano” has been hard at work to restore and return to the citizens and visitors of Mantova the *Pescherie di Levante di Giulio Romano* (Eastern Fish Markets by Giulio Romano – inaccessible for many years)....

«Le Pescherie di Giulio Romano» Foundation

“The Fishmongers by Giulio Romano” Foundation



Front



Back

Le Pescherie di Giulio Romano



The WORLD WATER DAY in Mantova 2001-2020

The celebration of World Water Day wants to promote a holistic culture of water and environment, as opposed to an “emergency” approach, and give continuity to a project that develops in the citizenship a keenness to be active participants and sustainable managers of the territory.

Rivers in Spring, The World Water Day in Mantova





The Idea!

RIO School Project Genesis: *Rivers in Spring*, The World Water Day in Mantova 2017

Idea!

During the 2017 edition, Paolo Corbellani (MEng), President of the “Le Pescherie di Giulio Romano” foundation, proposed that the high schools of Mantova run an a water quality campaign along the length of the Rio.



Ing. Paolo Corbellani
The President of «Le Pescherie di Giulio Romano» Foundation
2017.03.22 *Rivers in Spring*, WWD in Mantova



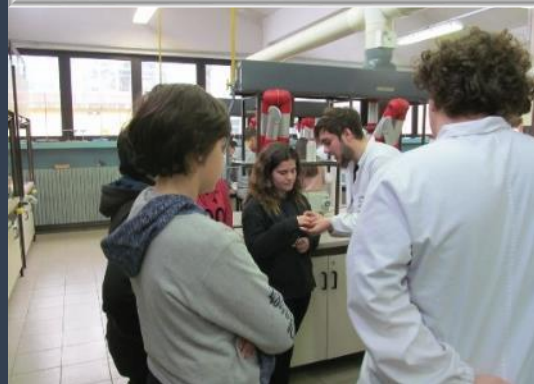
RIO School Project Genesis

Why the
proposal to
schools?

Because they had earned a
great reputation in water
quality monitoring



**Mantova Senior High Schools have been monitoring
the waters of rivers and lakes since 1977**





RIO School Project Birth 2017

LPGR Foundation – Schools – EPA - HPA – Mantova Municipality – Mincio Park
AGREEMENT

The RIO School Project
2017 -2020

The
Involvement
of Schools and
Agencies

RIO Water Quality Monitoring Subjects

Agencies



Health Protection Agency



Environmental Protection
Agency

Senior High Schools



Schools and Project Coordinating Subjects



Supporting
Subjects



Sampling Sites on Rio Canal

The RIO School Project
2017 -2020

The
Involvement
of Schools and
Agencies





The RIO School Project 2017 -2020

The Monitoring Plan

RIO School Project 2018

«LE PESCHERIE DI GIULIO ROMANO» Foundation

Rio Water Quality Monitoring Plan

ITET Mantegna

IS Fermi

Classes

4AAMB + 3AMB

4CBIO

Parameters

Escherichia coli

**Nitrates, Phosphates,
Esch. Coli and Fecal Enteroc.**

Campaigns

February, 22-24 – April, 12-14

Closing

June, 5 2018



STEP 4 RIO Project: Water Quality Monitoring by



The RIO School
Project
2017 -2020

The Lombardia
Region
Environmental
Protection
Agency
Monitoring
Plan

2017-2018

2018



Doct. Lorenza Galassi

Chemical Parameters tested monthly

Water Temperature

Dissolved Oxygen (mg/l)

Dissolved Oxygen (%)

pH

Redox Potential (mV)

Salinity

Chemical Parameters tested

Jul, Aug, Sep, Oct, Nov

Ammonia Nitrogen (as N)

Nitric Nitrogen (as N)

Total Phosphorus (as P)

Orthophosphates (as P)

Sulphates

Chlorides

COD





The RIO School Project 2017 -2020

The Lombardia
Region
Health
Protection
Agency
Monitoring
Plan

STEP 4 RIO Project: Water Quality Monitoring by



2018



Doct. Attilio Bertolotti

**Bacteriological Parameters
tested
Jul, Aug, Sep, Oct, Nov**

Escherichia coli

Enterococci



The RIO School Project 2017 -2020

The Steps of the Schools' Monitoring Plan

RIO School Project

Steps of the 2018 Project edition Chemical/bacterial Monitoring

1 Opening Ceremony (February)

2 Monitoring Campaigns by Schools (February-April)

**3 Final School Meeting: Public Report Presentation
(June, 5)**

4 Monitoring Campaigns by Agencies (June-October)



Step 1 Opening Ceremony (February, 10) and...

The RIO School Project 2017 -2020

The Opening Ceremony

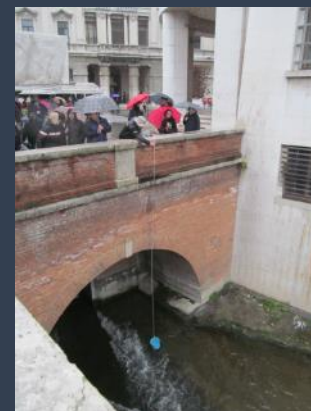




The RIO School Project 2017 -2020

The Monitoring Campaigns: in the Field

Step 2 School Water Quality Monitoring Campaigns (February-April 2018)

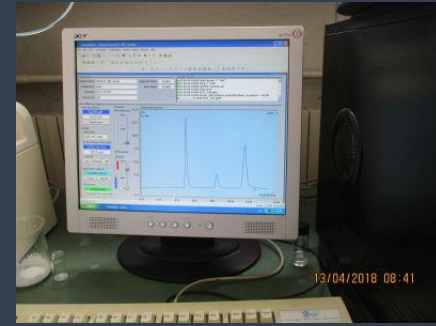
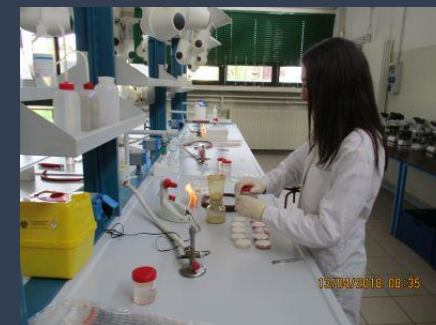




Step 2 School Water Quality Monitoring Campaigns (February-April 2018)

The RIO School
Project
2017 -2020

The
Monitoring
Campaigns:
at School





Step 3 Final School Meeting (June, 5 2018): Report Presentation by Students and Agencies

The RIO School
Project
2017 -2020

The final
School
Meeting



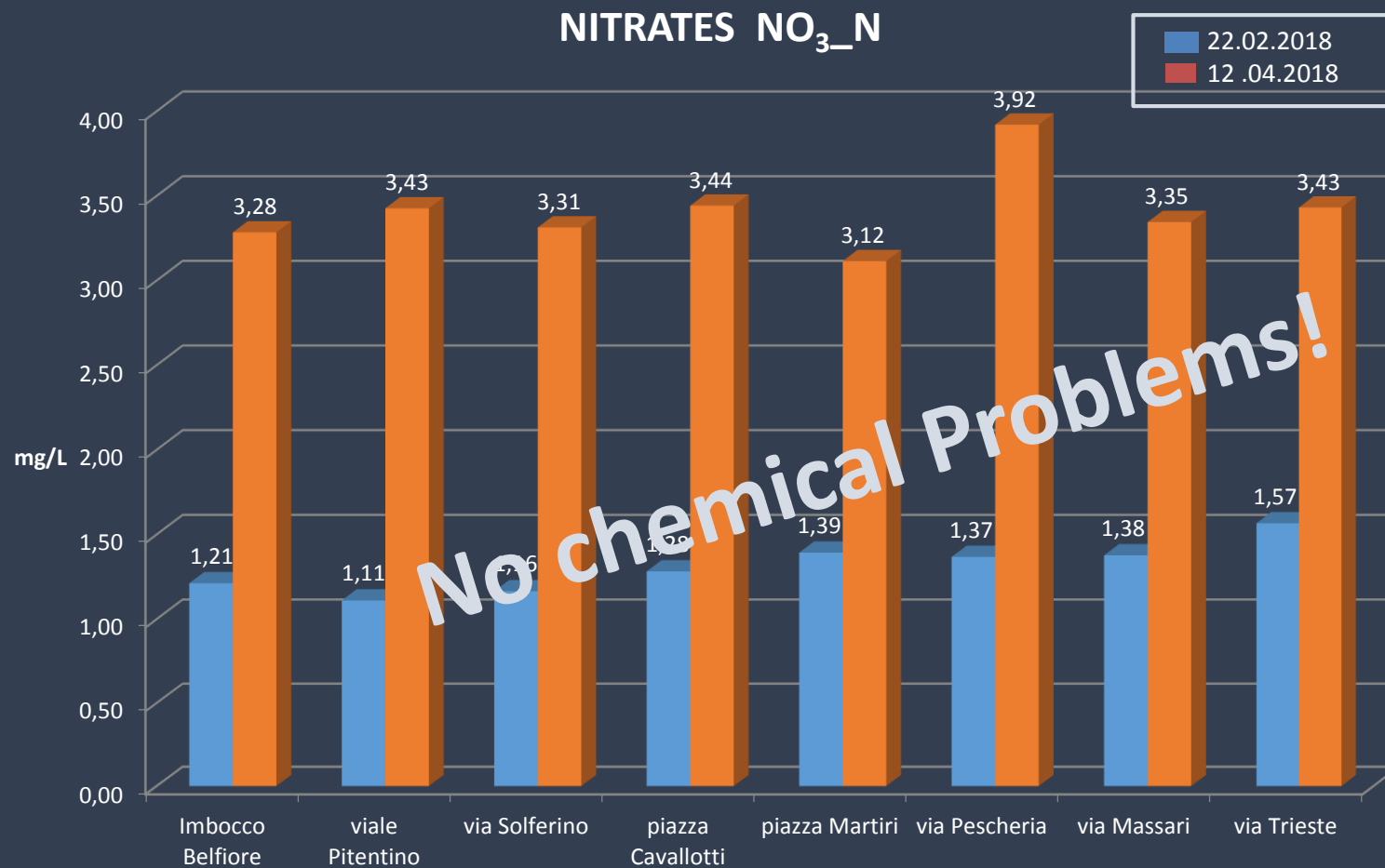


The RIO School Project 2017 -2020

The Chemical Analysis Results

Step 3

2018 Chemical Analysis Results by IS Fermi



HPLC Equipment



The RIO School Project 2017 -2020

The Bacteriological Analysis Results

Step 3 2018 Bacteriological Results by School Campaigns

Bacteriological Analysis by IS Fermi and ITET Mantegna 12.04.2018 IS Fermi 14.04.2018 ITET Mantegna

12.04.2018	12.04.2018
IS Fermi MN	IS Fermi MN

14.04.2018
ITET Mantegna MN

Sample Site	Description	Time	Escherichia coli (UFC/100mL)	Enterococchi (UFC/100mL)
1	Imbocco Belfiore	7:29	40	10
2	viale Pitentini	9:09	10	15
3	via Solferino	9:20	80	15
4	piazza Cavallotti	9:41	110	50
5	piazza Martiri	9:55	120	20
6	via Pescheria	10:08	90	30
7	via Massari	10:18	110	30
8	via Trieste	10:28	400	60

Escherichia coli (UFC/100mL)
100
800
170
300
1500
1850
2300
2260*

There is a bacteriological problem in April!



The RIO School Project 2017 -2020

The Bacteriological Analysis Results by the Health Protection Agency

		Escherichia coli UFC/100 mL					Enterococchi UFC/100mL				
		JUL	AUG	SEP	OCT	NOV	JUL	AUG	SEP	OCT	NOV
		10/7/18	21/8/18	10/9/18	2/10/18	14/11/2018	10/7/18	21/8/18	10/9/18	2/10/18	14/11/2018
Stazioni		10/7/18	21/8/18	10/9/18	2/10/18	14/11/2018	10/7/18	21/8/18	10/9/18	2/10/18	14/11/2018
2	viale Pitentino	300	100	120	110	150	<10	<100	<100	<100	<100
4	piazza Cavallotti	500	620	2700	1300	480	110	210	350	<100	300
5	piazza Martiri	250	400	520	2100	810	100	200	120	110	410
6	via Pescheria	460	850	1300	510	1900	100	100	220	120	450
8	via Trieste	450	650	1000	1800	1400	120	<100	150	250	370



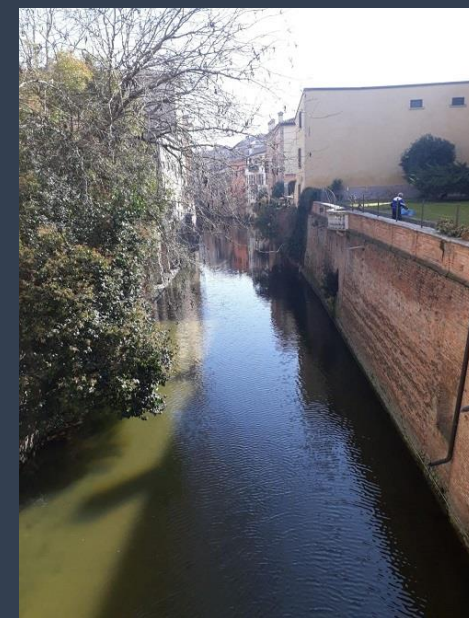


From
RIO School Project
to
RIO Project

A MORE AMBITIOUS PROJECT

From RIO Shool Project to RIO Project

Bringing the Rio back to
play a central role in city
life by determining its
cultural, functional and
environmental valorisation
and recovery





The RIO Panel
to implement
the RIO Project:
15
stakeholders

THE «RIO Panel» TO IMPLEMENT THE «RIO Project»



Municipality of Mantova
(project responsible)

BODIES, AGENCIES AND COMPANIES INVITED BY MANTOVA MUNICIPALITY TO JOIN THE «RIO Panel»

«LE PESCHERIE DI GIULIO ROMANO» Foundation

LABTER-CREA School Network + GLOBE ITALY

Environmental Protection Agency (ARPA)

Health Protection Agency (ATS Valpadana)

Interregional Agency for the Po River (AIPO)

MINCIO Regional Park

Consortium of Reclamation «Territori del Mincio»

TEA Water

ITET MANTEGNA Mantova (Senior High School)

IS FERMI Mantova (GLOBE Senior High School)

IS STROZZI Mantova (GLOBE Senior High School)

SLOW FOOD Association

+ others



The RIO Panel presented to the Town

29.03.2018



RIO Project: «RIO Panel» presented to the Town

NASCE IL TAVOLO DI LAVORO

Una nuova vita per il Rio Monitoraggio sull'acqua



Una via d'acqua in città: la presentazione delle iniziative sul Rio

Dare nuova vita al Rio. Con questo obiettivo nasce un tavolo di lavoro formato da istituzioni, enti e scuole: Comune, Regione, Soprintendenza, Fondazione Le Peschiere di Giulio Romano, Labter-Crea rete di scuole, istituti Mantegna e Fermi, Gruppo speleologico mantovano, Arpa, Aipo, Ats Valpadana, Consorzio di bonifica e Tea. Ieri mattina il primo incontro preceduto dalla presentazione dell'iniziativa da parte di Andrea Murari, assessore comunale all'ambiente, Paolo Corbellani, presi-

dente Fondazione Le Peschiere e Sandro Sutti, referente di Labter-Crea. Tra gli interventi in programma da portare a termine entro i prossimi tre anni: la valutazione e il monitoraggio delle acque e una ricerca storica, artistica e culturale del Rio recuperando documenti, informazioni, foto e video da enti pubblici e privati. Tutto il materiale sarà caricato su un sito web dedicato.

Ma tra i progetti ci sono anche l'installazione di un sistema automatico di paratoie a valle con azionamento a distanza e interventi di restauro della struttura del canale e di pulizia con la rimozione di ingombranti e di alghe. Infine si pensa al ripristino delle mini crociere.

«L'idea di intervenire sul Rio è partita un anno fa» spiega Corbellani- si inserisce nel lavoro che la fondazione Le Peschiere di Giulio Romano sta

» A giugno saranno presentati i risultati delle analisi. Nel progetto triennale anche una ricerca storica artistica e culturale. Si punta a ripristinare le mini crociere

portando avanti per riqualificare le Peschiere di Levante. Un intervento che prevede anche un accesso permanente al livello dell'acqua riaprendo un passaggio bloccato da decenni e la realizzazione di una terrazza-pontile sul Rio».

I lavori che riguardano l'indagine chimico-fisica batteriologica delle acque sono già partiti col progetto di alternanza scuola-lavoro «Rio scuole». Sul campo i ragazzi del Mantegna e dell'Itis. A inizio febbraio

gli studenti hanno fatto un primo sopralluogo nelle otto stazioni scelte per il monitoraggio. A fine febbraio ha avuto poi inizio la prima campagna di indagine che proseguirà il 12 e il 14 aprile. Il 5 giugno incontro finale con la presentazione dei risultati che saranno incrociati con quelli riscontrati da Arpa che da aprile 2017 sta analizzando l'acqua con campagne mensili con sonda parabolica.

Per far riavvicinare i cittadini all'acqua, il 12 maggio sera è in calendario una proiezione di filmati proprio sul Lungo Rio curati dall'associazione Amici di Palazzo Te. Tema: Mantova città d'acqua.

Il Tavolo del Rio, per i prossimi incontri, vuole allargarsi chiamando ulteriori stakeholder. Chi è interessato a partecipare può scrivere a sandro.sutti@gmail.com

Barbara Rodella

New Life for RIO
Water Monitoring



The Goals of the RIO Project

29.03.2018

RIO Project

GOALS

SHORT TERM GOALS (Scientific Investigations)

MEDIUM TERM GOALS (Collection of Information)

LONG TERM GOALS (Spreading the Culture of the Rio)

LONG TERM GOALS (Rio Canal hydraulic Functionality and environmental Remediation)

15 Stakeholders



An great Output

Schools interweave their actions with those of the community and become agents and drivers of change.

An great Output



A restoration Project of historical monuments on the Rio

leads



A water quality monitoring project by schools and agencies

catalyzes



A project for the environmental, social and cultural recovery of the canal



THE MINCIO CONTRACT 2016

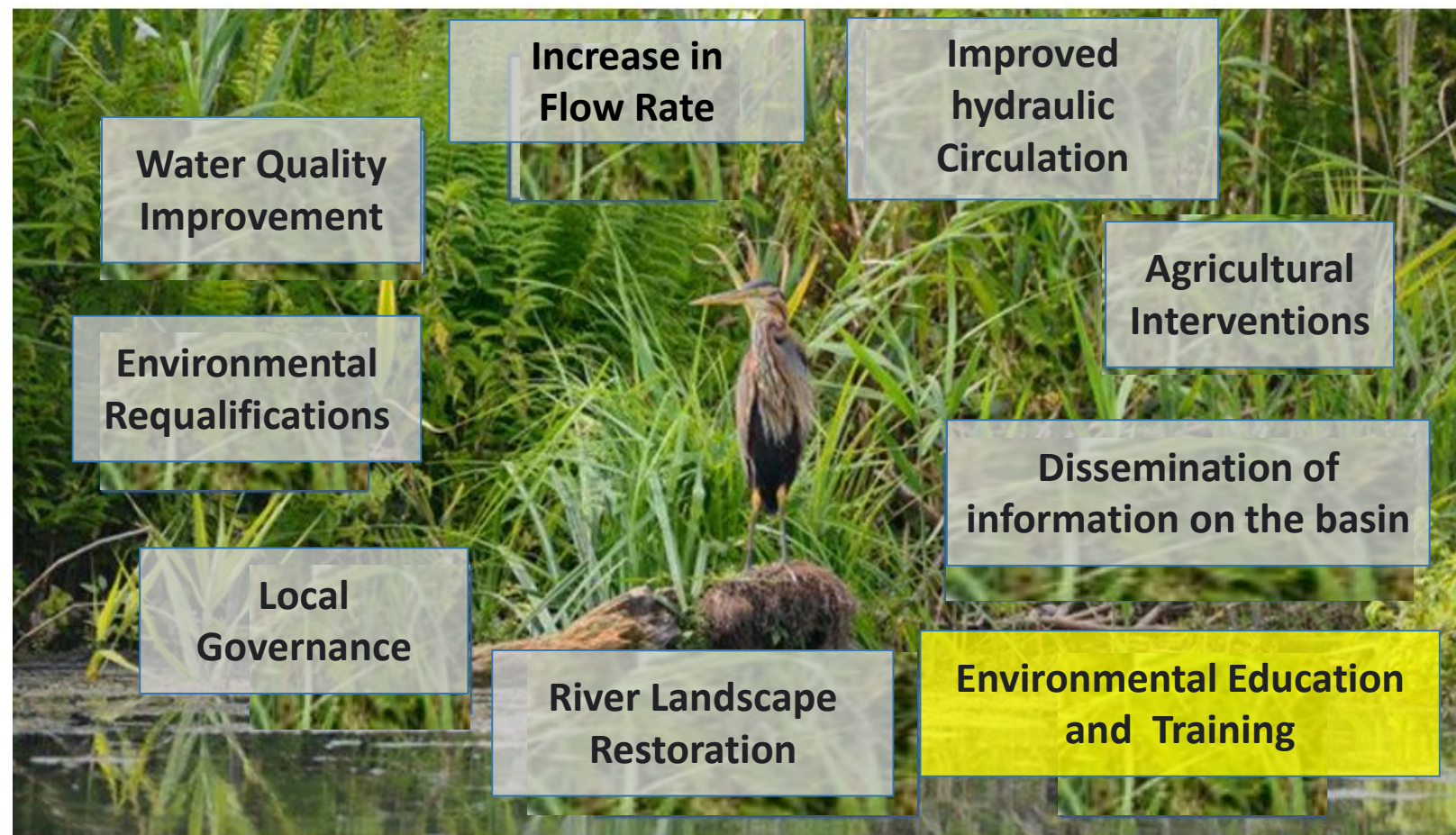


The contract is a negotiated programme for the requalification of River Mincio. It's subscribed by 60 government bodies (Regions, Provinces, Councils) and associations operating in the Mincio River Catchment as of 18th May 2016. Among these, the Labter-Crea School Network, representing the 15 schools of the network (High Schools and Comprehensive Institutes).

The Action Programme in the Contract encompasses over 60 actions, under 9 theme areas. One area is the Environmental Communication and Sensitisation. It includes World Water Day actions, the Progetto Mincio (Mincio Project) and welcomes the RioProject.

The Mincio Contract: Action Program

PROGRAMMA D'AZIONE

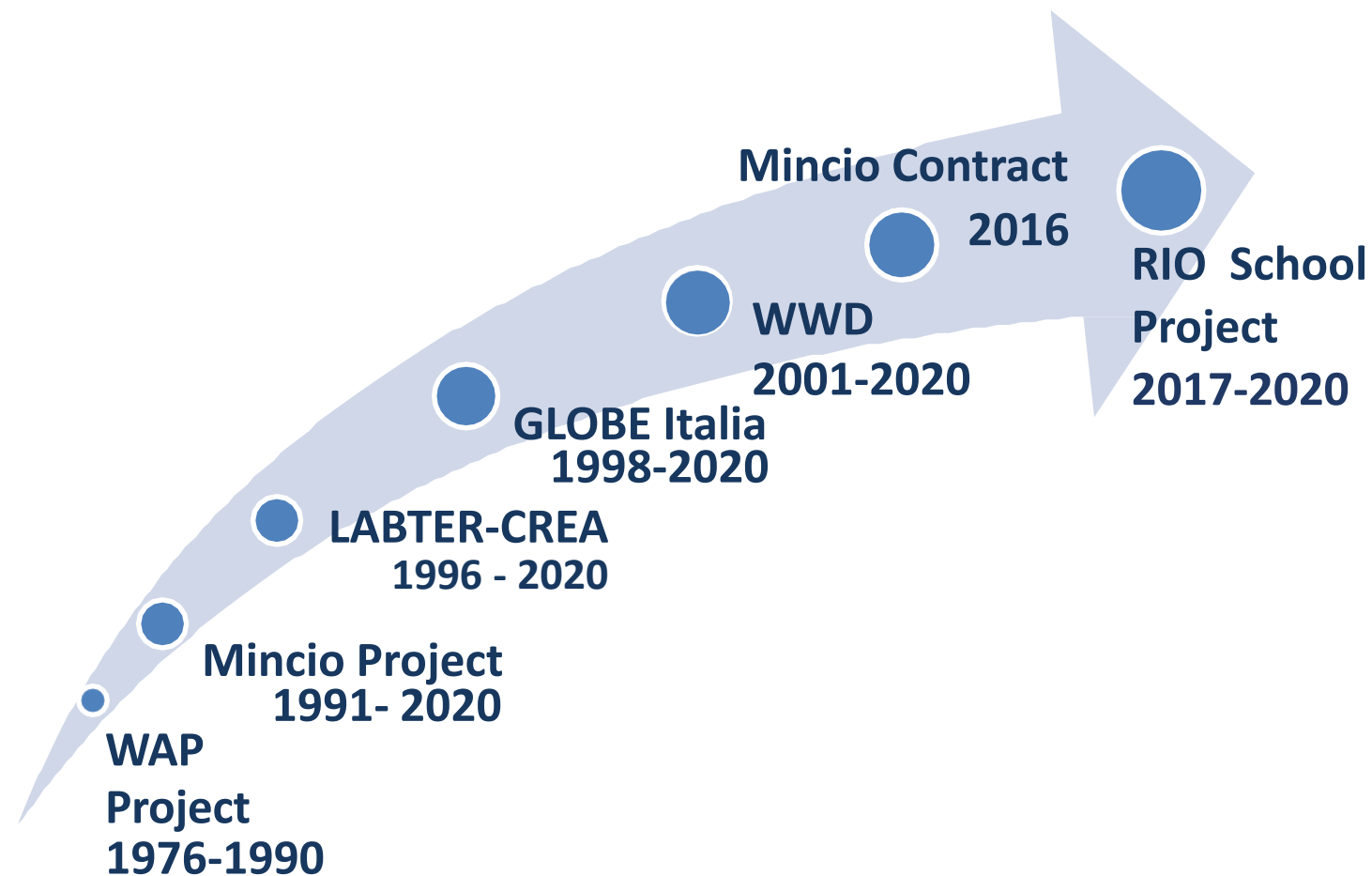




A Question

What have schools done to cross the purely educative framework, even if scientific in nature, and become environmental stakeholders?

*Labter-Crea facilitates the entrance of schools in the **Mincio Contract**, putting them at the centre of a process of environmental requalification of a water catchment with a portfolio of studies, communicative investigations, and sensitisation actions. This is a first in Italian schools and possibly also internationally.*

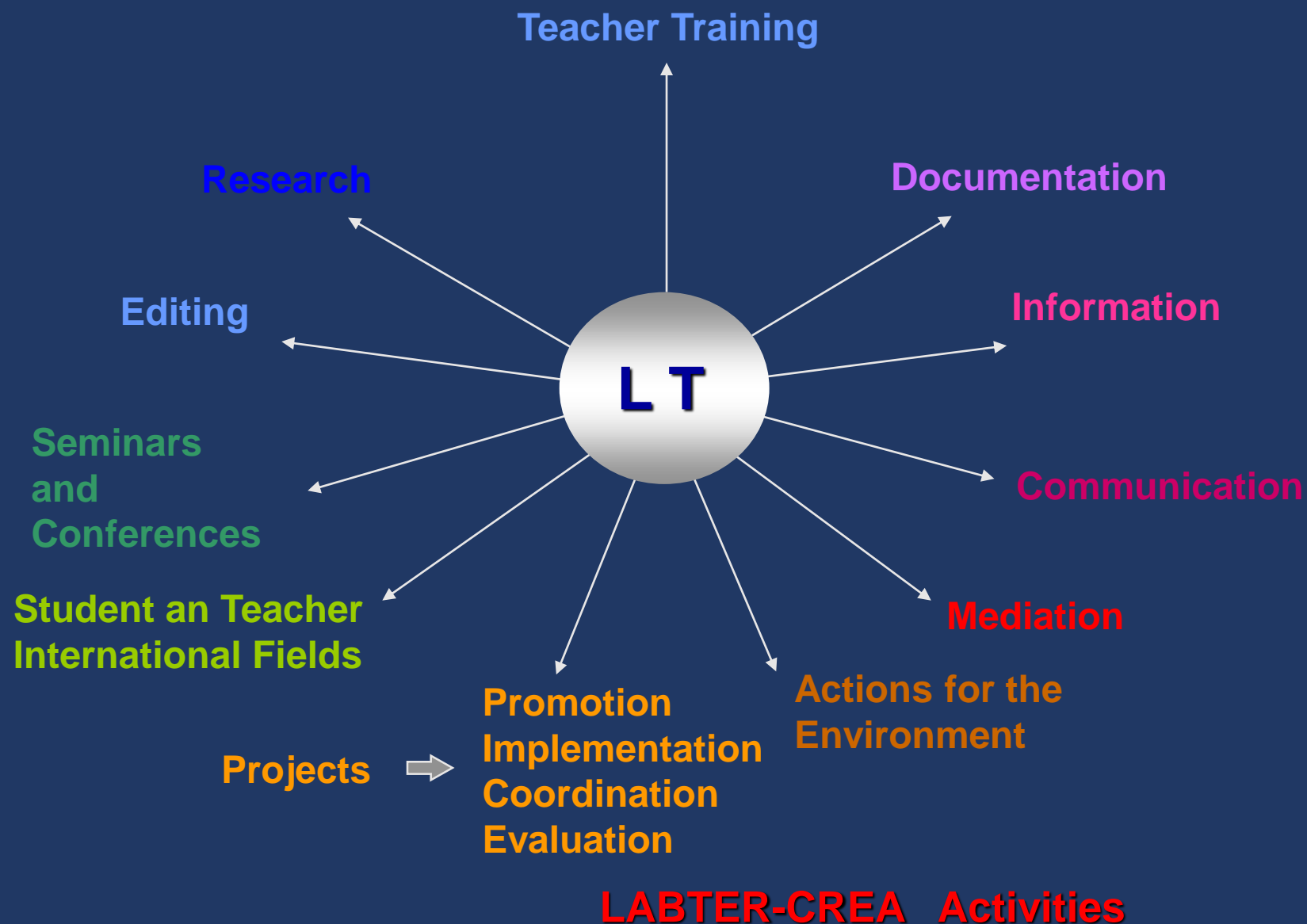




LABTER-CREA
1996-2020

The Territorial Laboratory –
Reference Center
for EE towards SD

MATERIALI





The GLOBE Program 1995

The Global Learning and Observations to Benefit the Environment (GLOBE) Program is an international science and education program that provides students and the public worldwide with the opportunity to participate in data collection and the scientific process, and contribute meaningfully to our understanding of the Earth system and global environment. Announced by the U.S. Government on Earth Day in 1994, GLOBE launched its worldwide implementation in 1995.

Vision: A worldwide community of students, teachers, scientists, and citizens working together to better understand, sustain, and improve Earth's environment at local, regional, and global scales.

Mission: To promote the teaching and learning of science, enhance environmental literacy and stewardship, and promote scientific discovery.

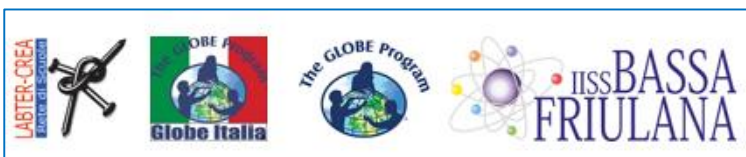


More than 120 countries participate in The GLOBE Program. GLOBE's global network provides opportunities for international collaboration through engagement in global measurement campaigns, an annual International Virtual Science Symposium, GLOBE Learning Expeditions and a dynamic range of multi-national activities.





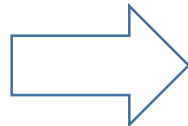
GLOBE Italy National Network 1998-2020



For Labter-Crea and the Schools of Mantova and Friuli Region, GLOBE means the ability to interface with a new world of educational and collaborative scenari.

GLOBE has been a unique opportunity to be involved in an outstanding managerial education system.





The MINCIO Project 1991-2020

PROGETTO MINCIO 29th ed
Dec 2018 - Jun 2019



AT SCHOOL



TUTORING IN LABS



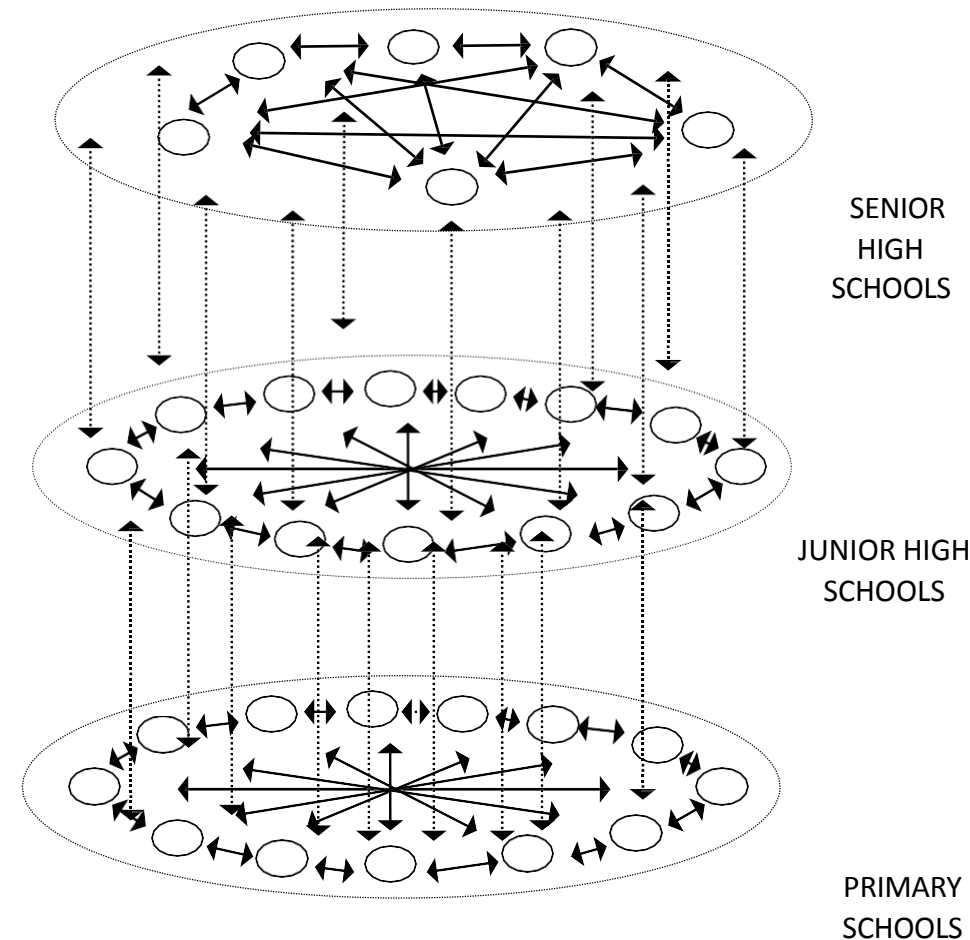
WATER SAMPLING

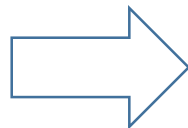


FIELD WATER QUALITY MONITORING



THE REPORT



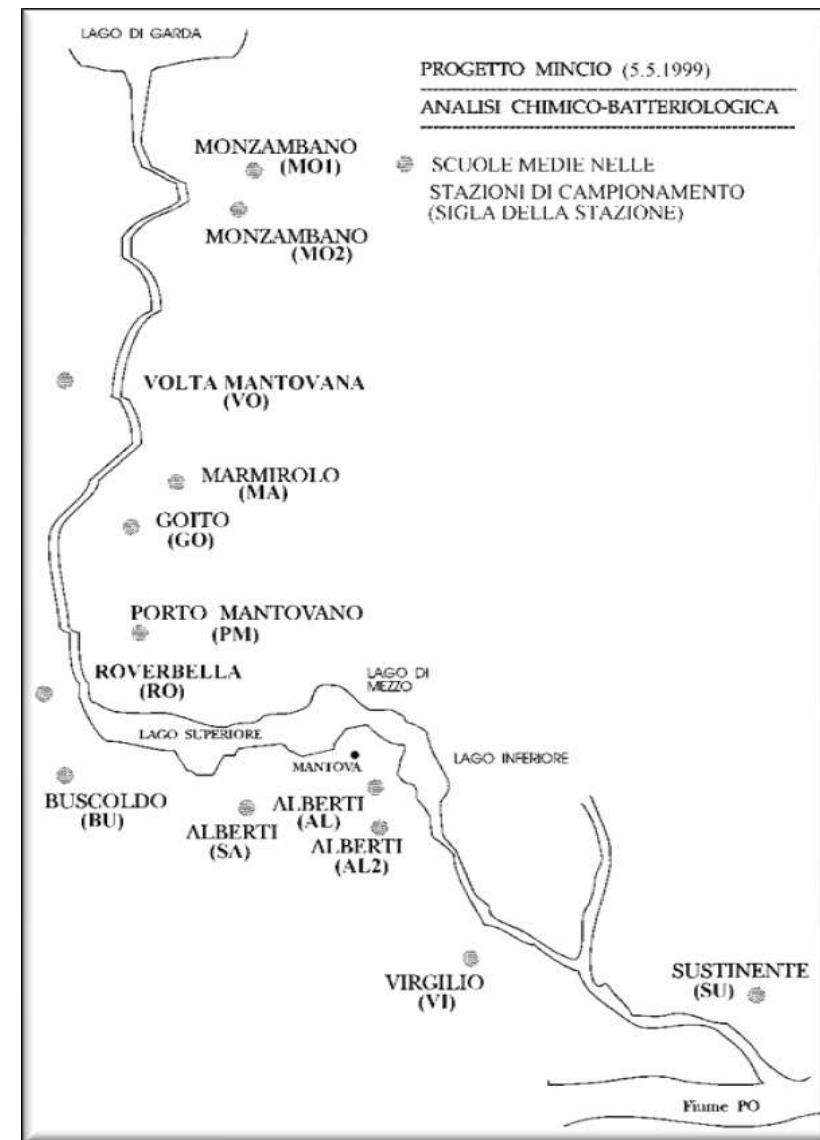


The MINCIO Project 1991-2020

PROGETTO MINCIO 29th ed
Dec 2018 - Jun 2019



Stazione	LIMeco	Stato di Qualità
MO1	0,69	Elevato
MO2	0,56	Buono
MA (Massimbona)	0,50	Buono
GO (Goito)	0,81	Elevato
GL (Goldone)	0,16	Cattivo
RO (Rivalta)	0,50	Buono
OS (Osona)	0,22	Scarso
BU (Valli del Mincio)	0,47	Sufficiente
SA3 (Lago Superiore)	0,50	Buono
AL3 (Lago di Mezzo)	0,63	Buono
AL2 (Lago Inferiore)	0,63	Buono
SU (Governolo)	0,56	Buono





The MINCIO Project: a Case Study

The originality and breadth of the project attracted the attention of international and national agencies.

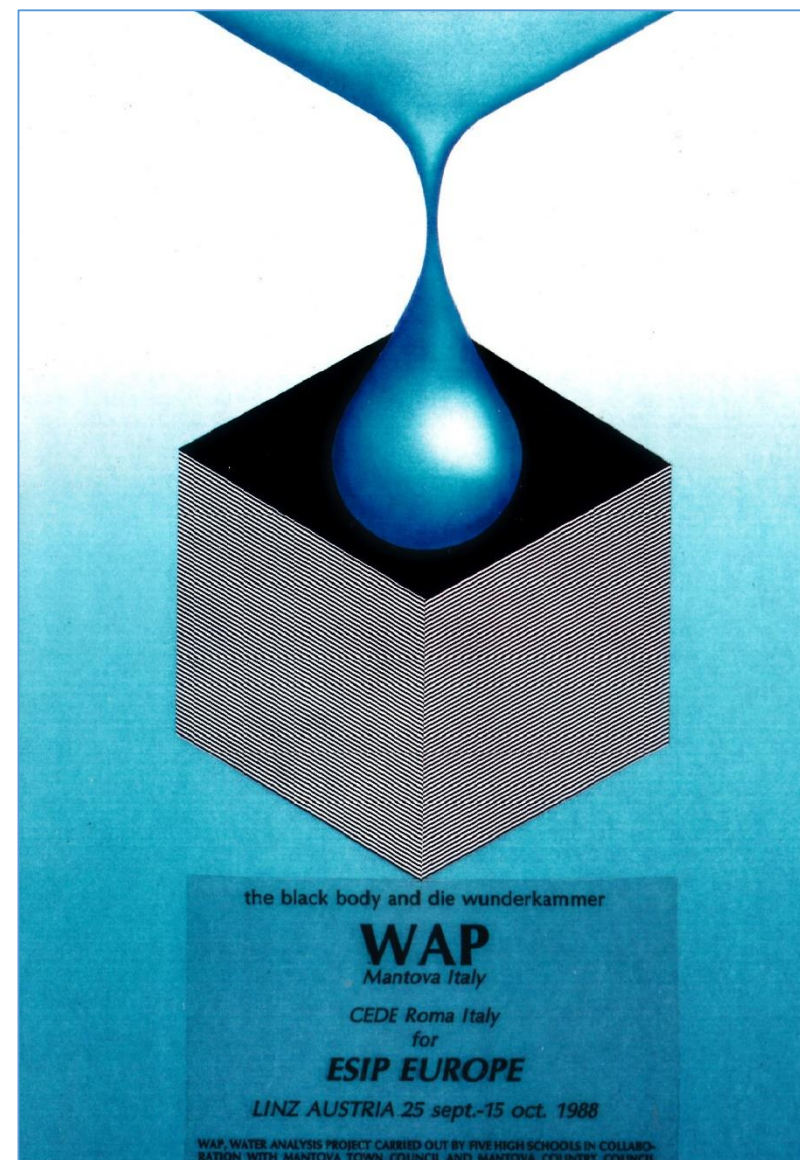
After just a few years, the Progetto Mincio schools are visited and studied by many foreign researchers.

Many international conferences, training camps and courses quickly add to the project's activities.





But what had
made the
Mincio Project
possible?





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