ITALIAN CAMPAIGN PLASTIC PIRATES

ITALIAN TEAM

Italy joined the European Campaign Plastic Pirates in 2022 and was carried out thanks to three partners:

- **CNR (National Research Council)**
  Italy's main public research body, CNR, advances scientific and technological innovation for societal and economic growth, emphasizing sustainability and international collaboration.
- **Legambiente**
  Italy's leading environmental organization, Legambiente, promotes biodiversity, green policies, and public awareness through advocacy and volunteer projects, focusing on renewable energy and climate action.
- **Marevivo**
  Dedicated to marine conservation, Marevivo protects Italy's coastal ecosystems by combating pollution, promoting sustainable practices, and educating the public about marine preservation.

Italian Partner

1

The project "Little Big Scientists and Citizens"

2

The "Little Big Scientists and Citizens" project is a Citizen Science initiative aimed at engaging children and young people in scientific exploration and community awareness. The project incorporated the Plastic Pirates initiative and developed a tailored engagement method to support the campaign and foster schools' long-term involvement. A dedicated kit was created to facilitate participation. Through hands-on activities, students learn to collect data, observe natural phenomena, and investigate environmental and social issues impacting their surroundings. This project fosters a sense of responsibility, encouraging participants to see themselves as active contributors to scientific knowledge and community well-being. Students are introduced to scientific methods, learning how to analyze results and communicate findings effectively. With a focus on environmental sustainability and civic values, "Little Big Scientists and Citizens" not only enhances educational experiences but also cultivates a generation of informed, proactive citizens ready to protect and improve their world.

Kit and samplings

3

The schools that have joined the project of CNR "Little Big Scientists and Citizens" also received a kit with everything necessary to go to make samples on the river banks.

When the first sampling started, we immediately realized that the Italian rivers are profoundly different from the German rivers, have a more torrential trend and banks often rich in vegetation that do not allow to make samples as confirmed by the Plastic Pirates protocols.
It was a challenge to find some suitable locations for safety and feasibility but the teachers were the first engine to find the right situations, in some cases we had to make some changes to the protocols.
For example, we have created an additional filter with a net for microplastics to simplify the sending of samples to the CNR laboratory in Genoa.

Young Conference

4

During these 2 years of sampling we organized: various trainings for teachers, meetings in schools with experts to deepen topics related to the protection of rivers and the environment, Monitoring sessions and various events for students that we have called Boys' Conferences.
During the Conferences, students presented their work as scientists.

5

Interviews thinking ahead

What have you learned before, during or after a sampling?

Before making the first sampling ever I was quite aware of the amount of pollution that we are causing to the planet, but working on the river made me even more conscious. I learned that even a simple action can change everything and that men still have a lot to do to help the planet.
(Laura D'Antini)

Have you developed an interest for doing more research (of any kind) in the field? Or would you like to become a scientist one day?

Yes, although I have always enjoyed doing various research I never had the opportunity to do one in the field like this and it was a fantastic experience that also helped me for a choice on my future by making me understand that probably I would like to be a scientist and continue with those kind of research.
(Giulia Pagnozzi)

Have you changed your views or behaviour when it comes to using or buying plastic items?

Yes, I have definitely changed my views and behavior when it comes to using or buying plastic items. Working on this project has made me more aware of the long-lasting impact plastic has on the environment. Seeing how much plastic waste ends up in the water has reinforced the need for action in my everyday choices. So I try not to use plastic items, preferring eco friendly packaging. But I have to admit that it's pretty challenging!
I hope that one day this can become a habit both for me and others.
(Eleonora Savona)

In two years:

114 Samplings in the field

1937 Students

41 Schools

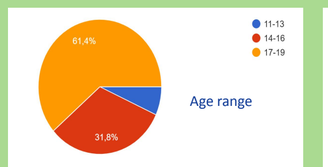
3297 Plastic Items

1543 Single-use Plastic items

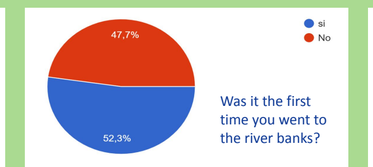
408,9 Kg of waste

What do Italian students think of Plastic Pirates?

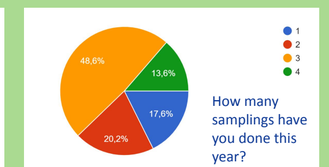
These are some of the results of the survey administered to almost 500 students in Italy who participated in the project in the school year 2023/24



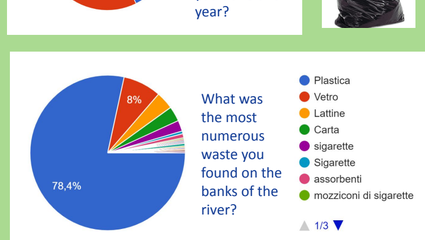
Age range



Was it the first time you went to the river banks?



How many samplings have you done this year?



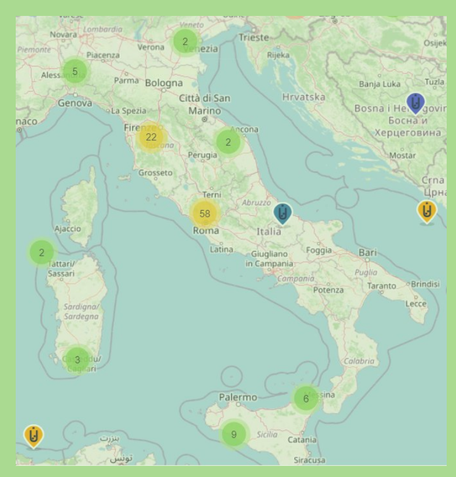
Schools, Teachers and Students

Second year

scuola	n. docenti	n. classi	n. studenti
IC Baccano	10	4	100
IC Traiano	16	6	150
IIS Pertini	4	2	43
IIS Midossi	10	2	37
Rossellini	4	2	51
Liceo Visconti	1	2	48
Liceo Nomenta	20	8	253
Milazzo	2	1	23
Milazzo	2	1	22
Ribera	2	1	24
Cattolica Eracle	2	1	24
Sciacca	2	1	25
Umbria	Circolo legamb	1	12
Veneto	Circolo legamb	1	9
Marche	Circolo legamb	1	6
Liguria	Circolo legamb	1	11
TOT	75	35	838

First year

scuola	n. docenti	n. classi	n. studenti
IIS Pertini *	5	2	33
IIS Midossi *	10	2	37
Rossellini *	4	1	25
Liceo Visconti *	1	1	25
Liceo Nomenta	20	8	160
IIS Piazza della	6	2	47
IIS Leonardo da	6	3	73
Liceo Montale	4	2	50
Liceo Petrarca	6	2	48
Liceo Machiave	4	2	48
Liceo Giovanni	7	2	51
IIS Santoni	7	2	48
Rondine	4	1	31
ITIS Galileo Gal	6	2	37
IC Cecco Angio	4	4	100
IC Piaget Major	18	6	130
Milazzo	2	1	23
Milazzo	2	1	22
Ribera	2	1	24
Cattolica Eracle	2	1	24
Sciacca	2	1	25
Umbria	Circolo legamb	1	12
Veneto	Circolo legamb	1	9
Marche	Circolo legamb	1	6
Liguria	Circolo legamb	1	11
TOT	122	51	1099



In these two years the sampling sites were in different Italian regions:

- Lazio
- Toscana
- Sicilia
- Umbria
- Lombardia
- Liguria
- Abruzzo

CNR DSSTTA

CNR IAS
INSTITUTE OF ANTHROPIC IMPACTS AND SUSTAINABILITY IN THE MARINE ENVIRONMENT

LEGAMBIENTE

MAREVIVO

LICEO SCIENTIFICO STATALE NOMENTANO

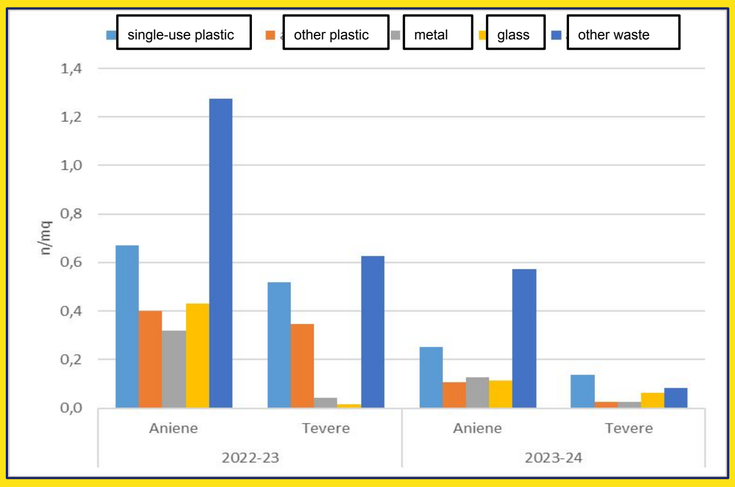
ISTITUTO D'ISTRUZIONE SUPERIORE MIDOSSI CIVITA CASTELLANA

PART OF THE EU MISSIONS
RESTORE OUR OCEAN & WATERS

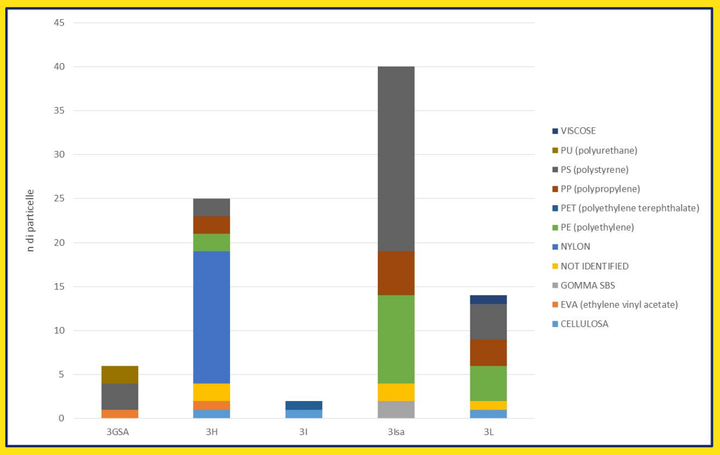
Funded by the European Union

LICEO SCIENTIFICO STATALE NOMENTANO

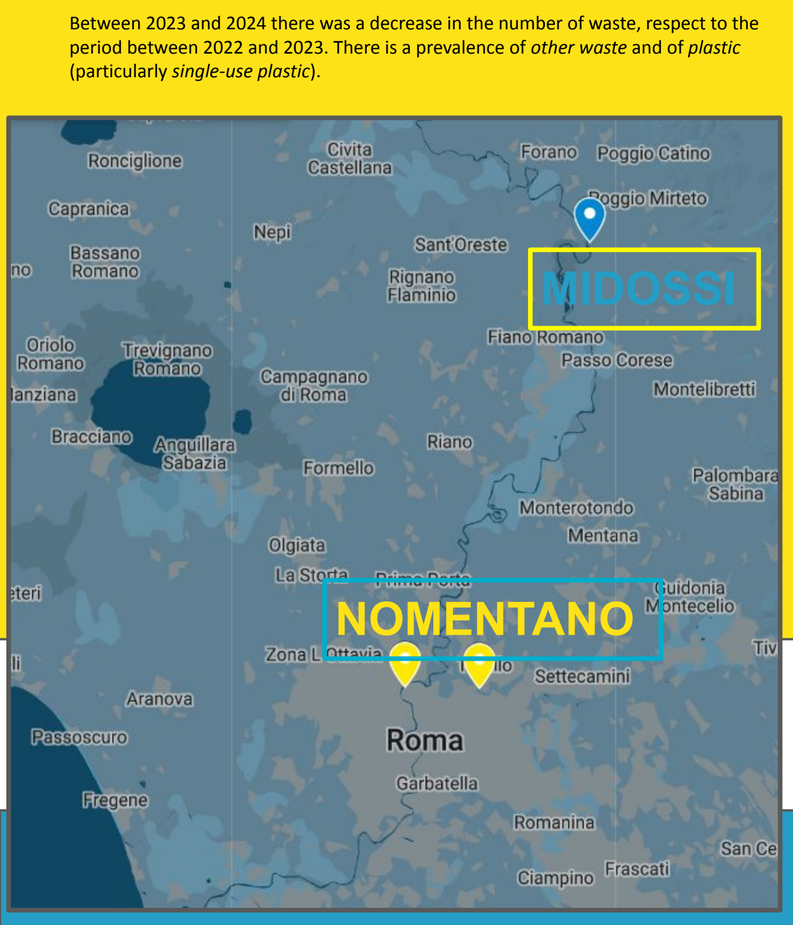
The school is in Rome and it is a scientific school, that means that mostly scientific subjects are studied. The classes that participated were supervised by science teachers.
Ten classes of the school participated to this project around **2022, 2023 and 2024**.
They worked on the river **Tiber** and on the river **Aniene**.

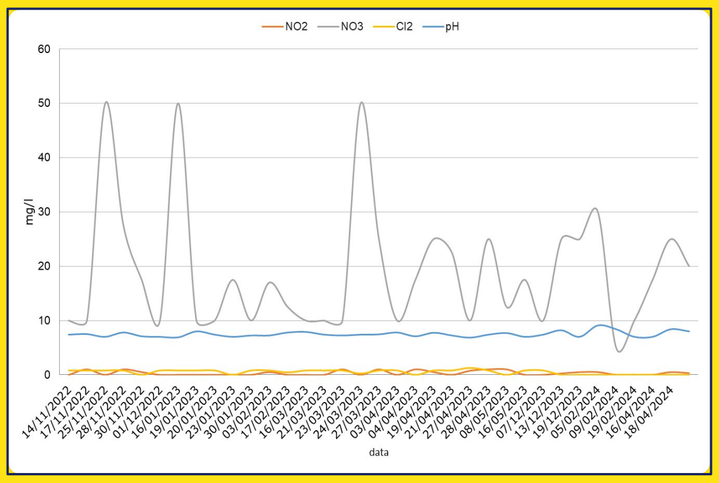


Between 2023 and 2024 there was a decrease in the number of waste, respect to the period between 2022 and 2023. There is a prevalence of *other waste* and of *plastic* (particularly *single-use plastic*).

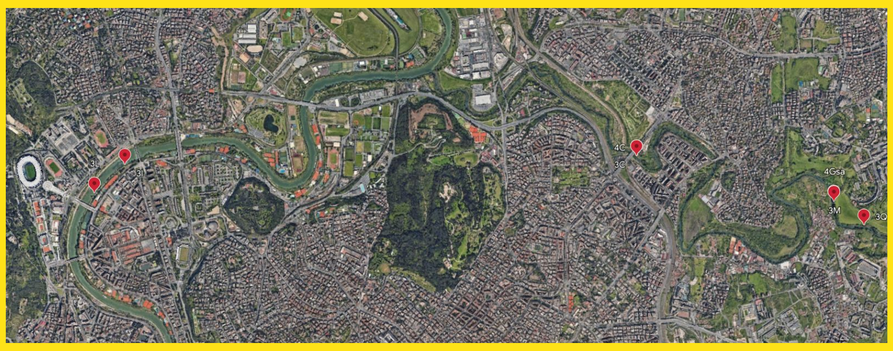


For each of the water streams the presence of microplastics was detected, in particular *PS (polystyrene), PE (polyethylene)* and *PP (polypropylene)* prevail. Also the class 3H found the Nylon to be the most plentiful pollutant.

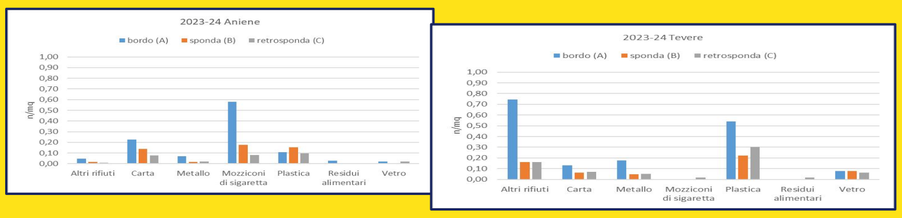




The values of *Cl2* and *NO2* remained almost the same and near 0.
The values of the *pH* are variables but none of them had a great variation.
The values of *NO3* show pretty huge variations, especially between 2022-2023.



Sampling was carried out during these 2 years in the above mentioned places, both on the banks of the Tiber and on the Aniene. The area is urban and is located where the Aniene flows into the Tiber.



Most of the waste was located on the bank of the river.
In the Aniene there is a major prevalence of *cigarette butts*, while, on the Tiber, of *plastic* and *other waste*.

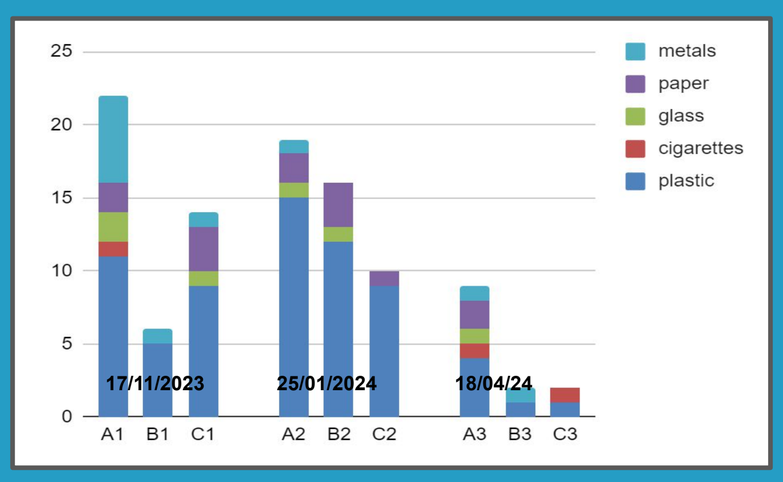
Samplings Pictures

THE NEW FUTURE?

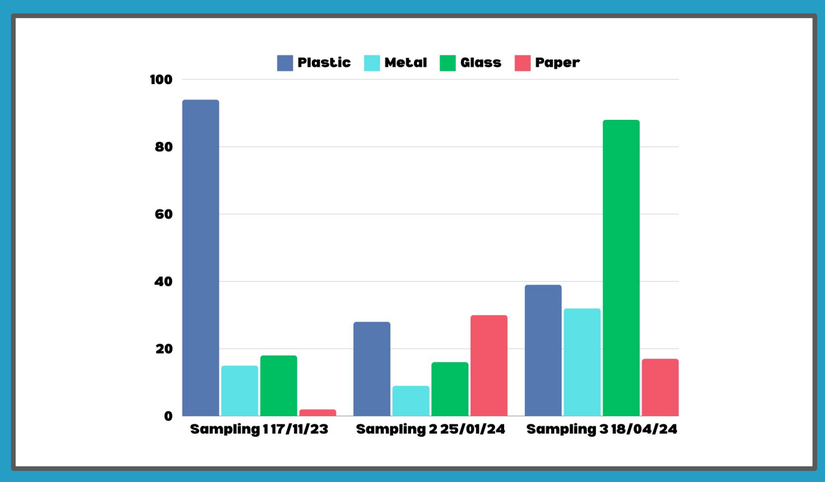
PROTOTYPE FOR SORTING AND CATALOGUING OF WASTE BASED ON AI:
Working on the rivers inspired the idea of creating a robot whose job was to recognise a type of waste and sort it into the correspondent container (plastic, paper and glass) thanks to the application of computer skills of programming to real objects. An online model of AI was used which was trained to acknowledge the different kind of waste. After it recognised the waste an engine that rotates of 180 degrees opens the right container to throw it in there.
Now, the robot has to be connected to a computer to be able to recognise the waste, but we hopes that in the future a camera could be incorporate in it.

ISTITUTO TECNICO E TECNOLOGICO U.MIDOSSI

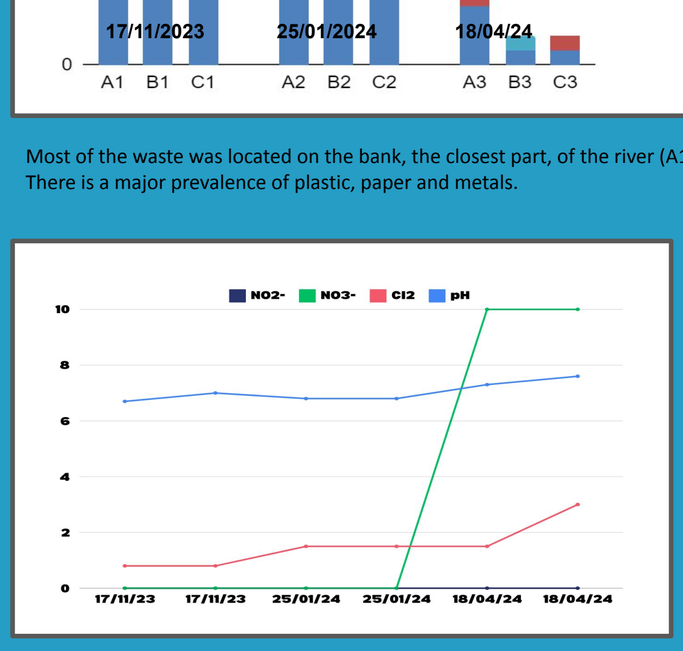
The U. Midossi Technical and Technological Institute in Civita Castellana (VT) is dedicated to providing students with a comprehensive education in technical and technological disciplines.
Three classes of the school have taken part in this project around **2022, 2023** and **2024.**
They have worked only on the river **Tiber.**



Most of the waste was located on the bank, the closest part, of the river (A1,A2,A3).
There is a major prevalence of plastic, paper and metals.



We collected less waste in the second sampling.
We also analyzed microplastic but only five were found during the year.



The values of NO2 has always been the same.
The values of NO3 has increased during the year.
The values of Cl2 and pH are variables but none of them had a great variation.

LOCATION:
VIA CANNARO - TORRITA TIBERINA (RM)
GPS COORDINATES:
42.235908, 12.631018

LEGEND:
- RIPARIAL VEGETATION
- ARBOREAL
- PASTURE
- FORESTS

Students following the agricultural discipline have carried out a study on the vegetation present at the sampling site, so as to have further information for possible analyses and interventions.

WARNING: ALIEN SPECIES
During one of the first sampling in 2022, the team that was taking care of the cataloging and the weight of the waste on the banks came across a strange shrimp (see photo).
After a research done by the children and professors, it was discovered that the find was of a Louisiana Red Shrimp, alien species that should not be present in the inhabited Tiber.
It is a highly invasive species, much stronger in size and reproductive capacity than native freshwater shrimp.

Samplings Pictures

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