



THE MULTISITE ARPA UMBRIA'S LABORATORY

Eugenia Peirone

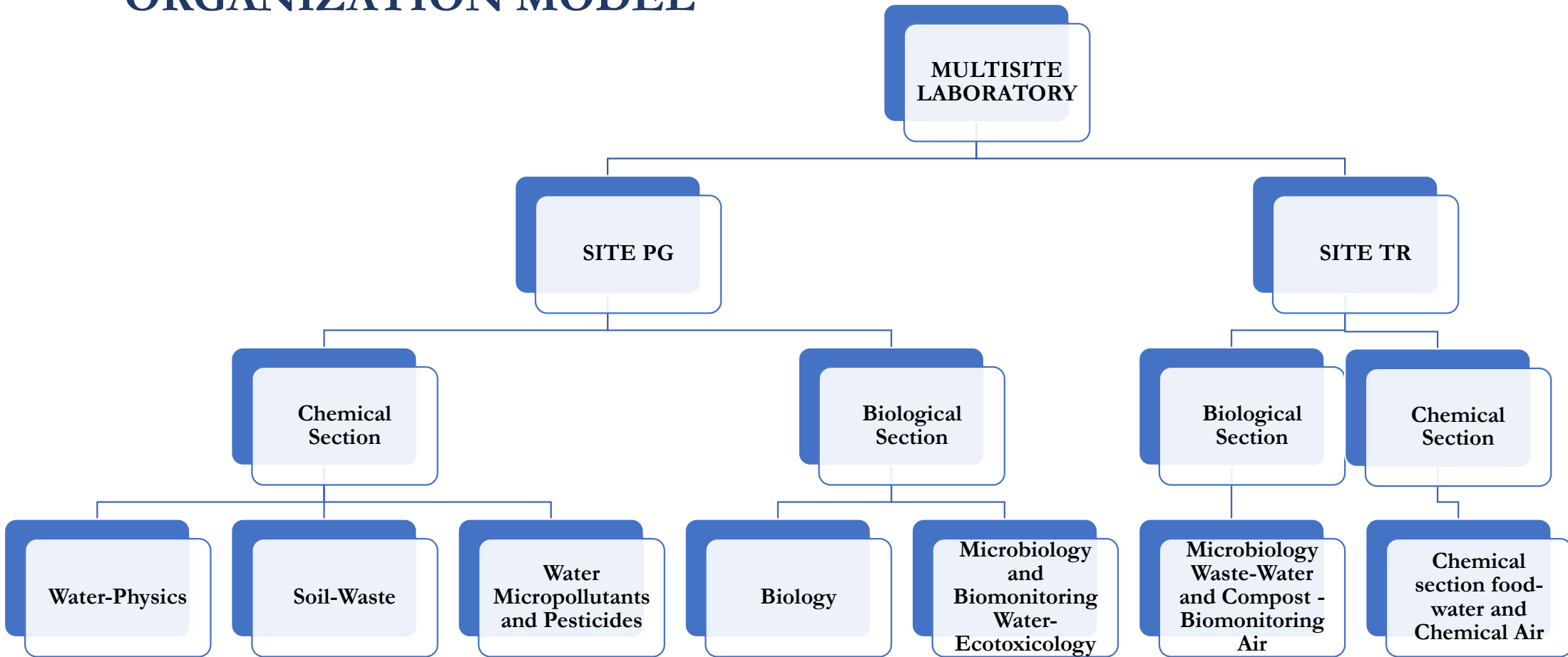
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Perugia, 23 July 2024



ORGANIZATION MODEL



ANALITICAL ACTIVITIES OF THE PERUGIA SITE

CHEMICAL AND MICROBIOLOGICAL WATER

SOIL - WASTE CHEMISTRY (specialist)

CHEMICAL MICRO-POLLUTANTS WATER AND PESTICIDES (specialist)

BIOMONITORING WATER-
ECOTOXICOLOGY (specialist)

BIOLOGY

PHYSICS (specialist)

ANALITICAL ACTIVITIES OF THE TERNI SITE

CHEMICAL AND MICROBIOLOGICAL WATER

AIR CHEMISTRY (specialist)

BIOMONITORING OF AIR (specialist) AND WATER BIOINDICATORS

FOOD AND MOCA (specialist)

PLASTICS /BIOPLATICS/MICROPLASTICS IN WATER (specialist)

WATER MONITORING AND CONTROL



Surface Waters



Ground Waters



Bathing Waters



Drinking Waters



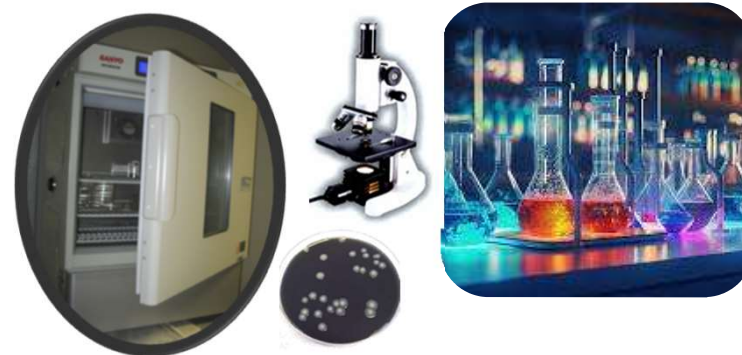
Dialysis Water, Swimming-pool Waters



Waste Waters

WATER SAMPLES ANALYZED IN 2023

SAMPLE TYPE	N. SAMPLE
Surface Waters	752
Underground Waters	492
Bathing Waters	399
Drinking Waters	3.953
Dialysis Water, Swimming-pool Waters	1.158
Waste Waters	275



LAB N° 0485 L

	PG SITE	TR SITE	TOTAL
NUMBER OF SAMPLES	6.694	5.624	12.318
NUMBER OF DETERMINATION	233.686	78.021	311.707
NUMBER OF ACCREDITED ANALYTICAL DETERMINATIONS	43	51	94
NUMBER OF PEOPLE	26	19	45

WATER MONITORING AND CONTROL

Chemical Analysis of basic parameters:

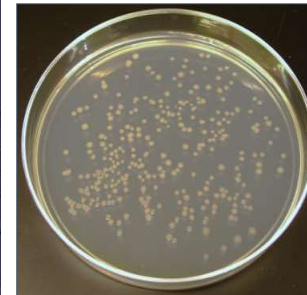
- pH
- Conductivity
- NNH_4 , NNO_3 , NNO_2
- P_{tot} , N_{tot}
- F, SO_4 , Cl
- Alkalinity
- COD



WATER MONITORING AND CONTROL

Microbiological Analysis:

- ❖ Intestinal Enterococci
- ❖ Escherichia Coli
- ❖ Microorganism at 22°C
- ❖ Microorganism at 36°C
- ❖ Staphylococcus aureus
- ❖ Pseudomonas aeruginosa
- ❖ Coliform bacteria
- ❖ Legionella pneumophila
- ❖ Salmonella



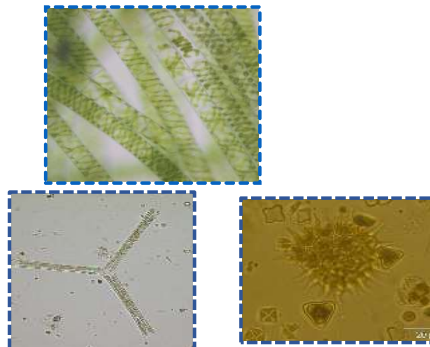
BIOLOGICAL MONITORING OF SURFACE WATERS

River waters

- Benthic macroinvertebrates
- Macrophytes
- Diatoms

Bathing waters

- ❖ Toxic algae



Lake waters

- ❖ Phytoplankton



ECOTOXICOLOGICAL CONTROLS IN SURFACE AND WASTE WATERS

Acute Toxicity test
with
Daphnia magna



Microtox
(Bioluminescent Bacteria)

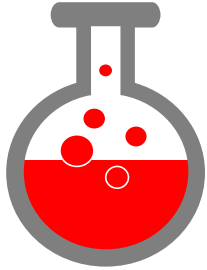


Green Algae



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CHEMICAL CONTROLS



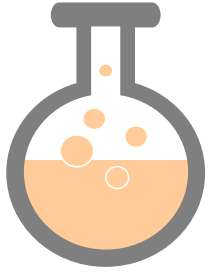
Metals

(Al, As, Ba, B, Cd,
Cr_{tot}, Fe, Mn, Ni,
Pb, Cu, Se, V, Zn)

Instrumental Technique:
ICP-MS

Cost: 150,000 €





**BTEX (Benzene, Toluene,
Ethylbenzene, Styrene, Xylenes)
VOC (Volatile Organic Compounds)**

Instrumental Technique:
Purge&Trap GC-MS

Cost: 150,000 €

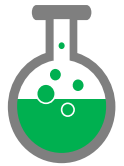




PAHs

Instrumental
Technique

• GC-MS

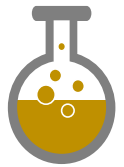


PCBs

Instrumental
Technique

• GC-MS

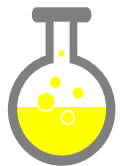
Cost: 60.000 €



Dioxins

Instrumental
Technique

• GC-MS-MS



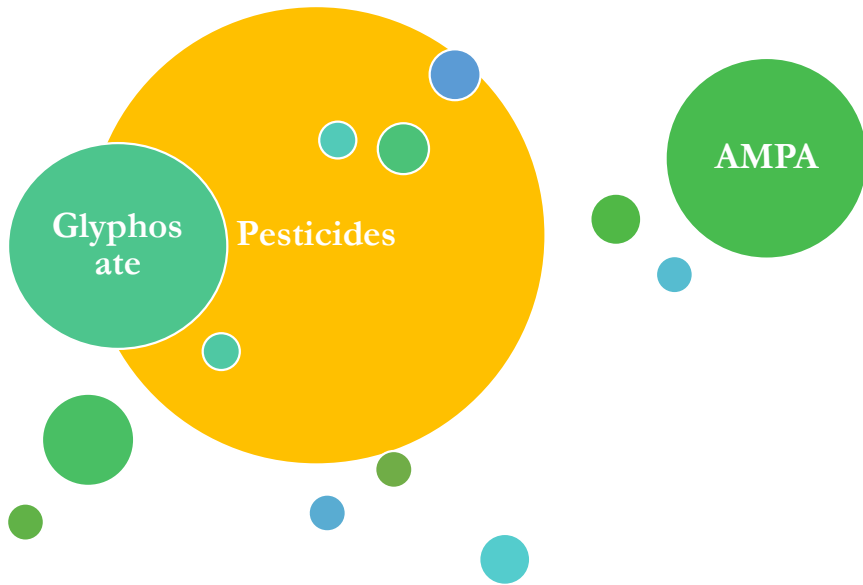
Pesticides

Instrumental
Technique

• GC-MS-MS

Cost: 150.000 €

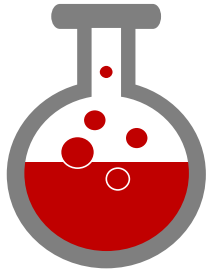




Instrumental Technique:
LC-MS-MS

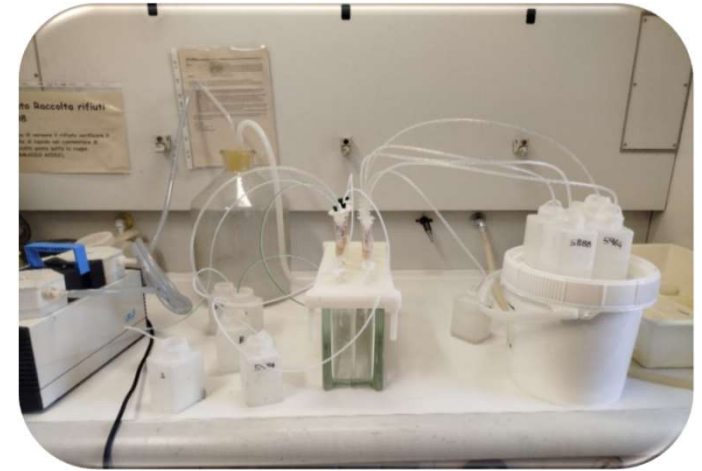
Cost: 300,000 €





PFAS

SAMPLE PREPARATION: SPE EXTRACTION



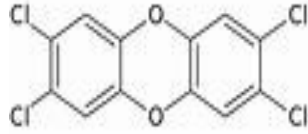
Instrumental Technique:
LC-MS-MS

Cost: 200,000 €





Dioxins



Sample Preparation

- Liquid-liquid Extraction



Instrumental Technique

- GC-MS-MS



Cost: 150.000 €

MONITORING MICROPLASTICS IN LAKES: LABORATORY'S ANALYSIS



**SIEVING- SORTING – COUNTING
AND CLASSIFICATION**



**THANK YOU FOR YOUR
ATTENTION**

**I WOULD LIKE TO THANK
ALL THE TECHNICAL AND MANAGEMENT STAFF
OF THE LABORATORY**