European PFAS baseline and case studies in PARC

Valeria Dulio (INERIS), Task 4.2 Co-leader

Tackling PFAS pollution, Antwerp 1-2 February 2024

PARC

INERIS
controlling risks
for sustainable development

PARC in a Nutshell

PARC = Partnership for the Assessment of Risks from Chemicals

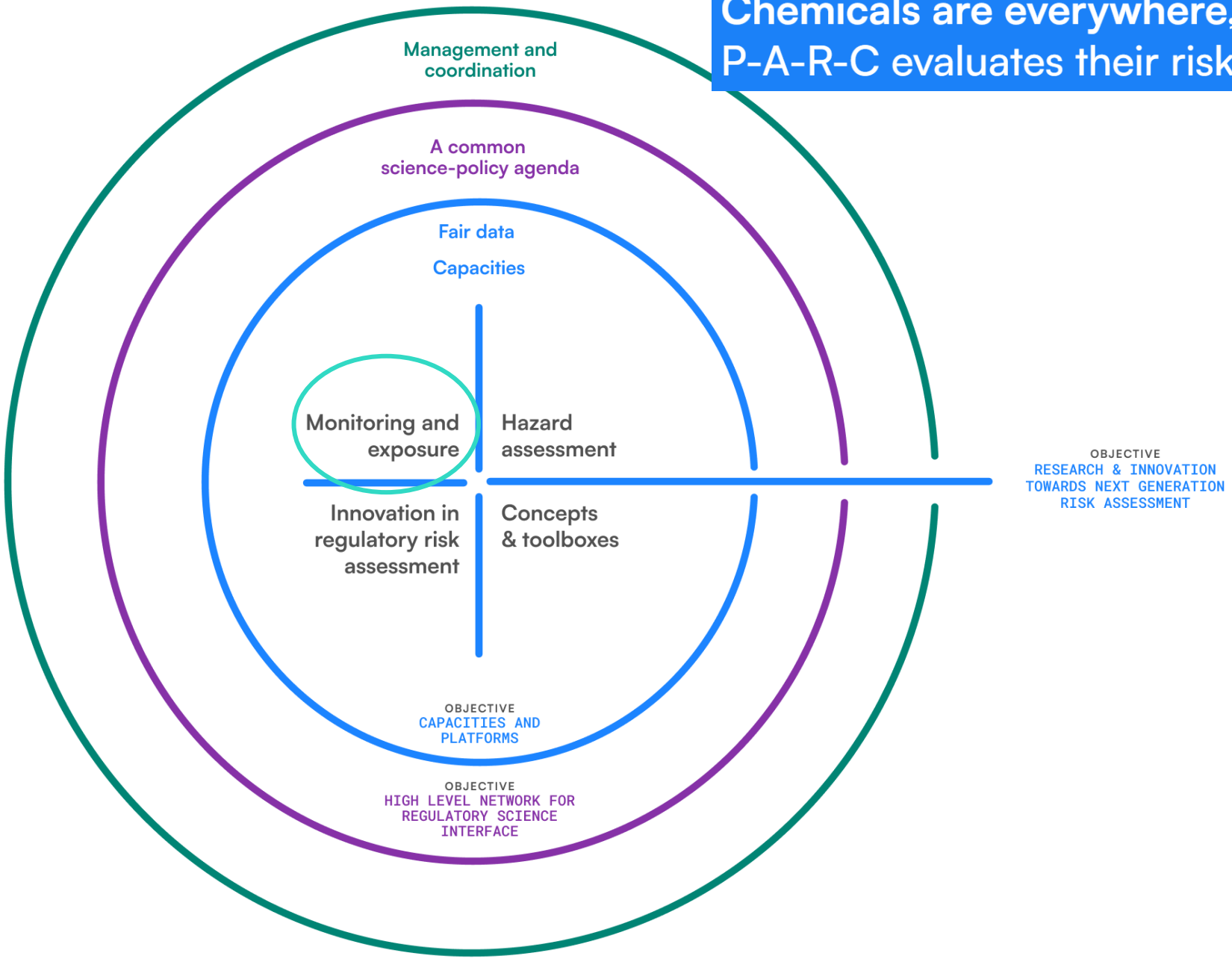
- A public-public **partnership** under Horizon Europe
- Co-fund budget
- Started 1st May 2022 ➔ duration of 7 years
- ≈ 200 partners from 29 countries
- Includes 3 European Agencies:

PARC Structure

Chemicals are everywhere, P-A-R-C evaluates their risks

Global Objective

Consolidate and **strengthen** the EU's **R&I** capacity for **chemical risk assessment** to protect **human health** and the **environment** and contribute to a non-toxic environment and a circular economy.



WP4: Monitoring and Exposure

4.1 Human Biomonitoring

Consolidate and further develop the **human biomonitoring platform**, generating and analysis of HBM data, and develop the network of qualified laboratories for biomarkers analysis

4.2 Environmental & Multisource Monitoring

Understand the **presence of chemicals in the environment**, their exposure to humans, considering multiple sources (e.g. air, water food, consumer products)

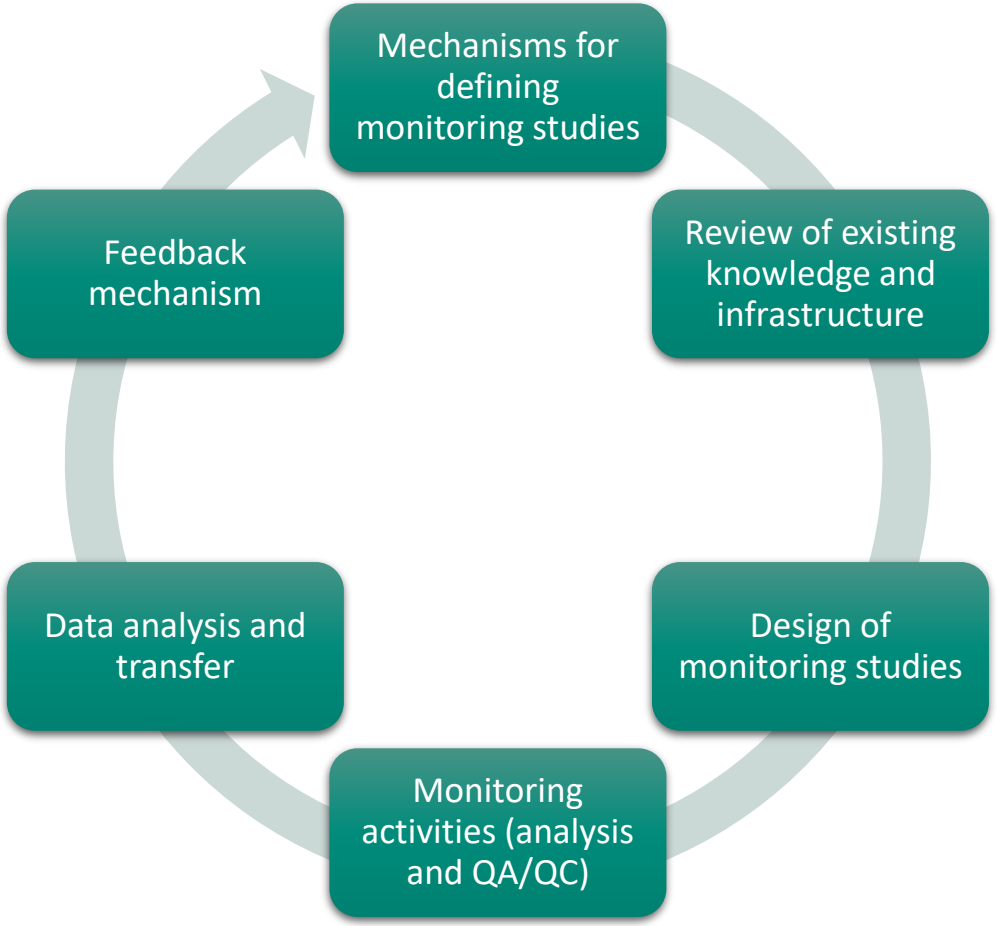
4.3 Innovative tools and methods

Develop **innovative tools and methods** to improve human, food and environmental monitoring schemes, contribute to an early warning detection of chemicals of emerging concern.

4.2 Environmental & Multisource Monitoring

Requirements:

- Respond to regulatory needs
- Build on existing information and infrastructure

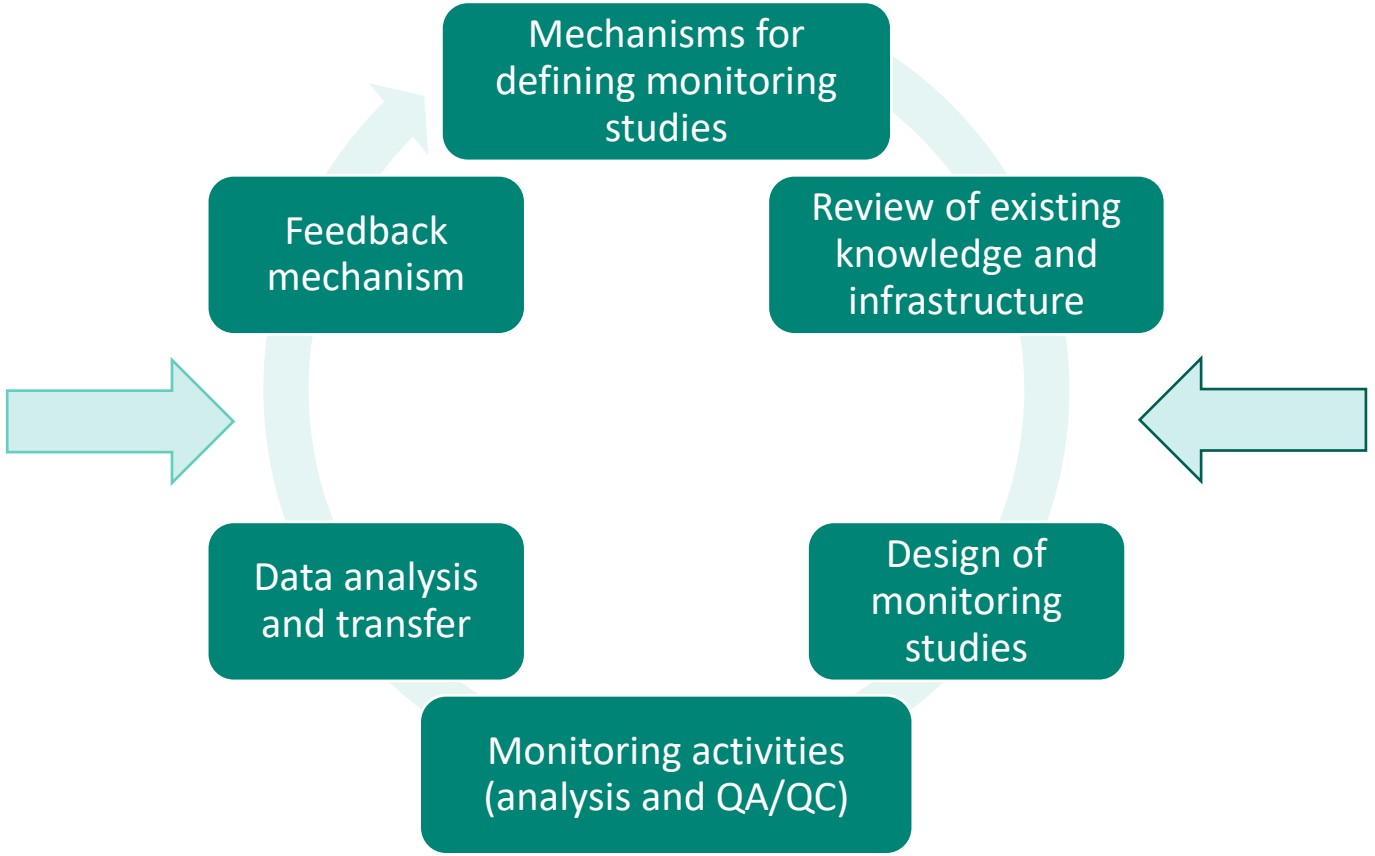


First project (2022 – 2025)

Pilot study on **PFAS** and **endocrine disrupting chemicals (EDCs)** to establish the overall process of **environmental monitoring**

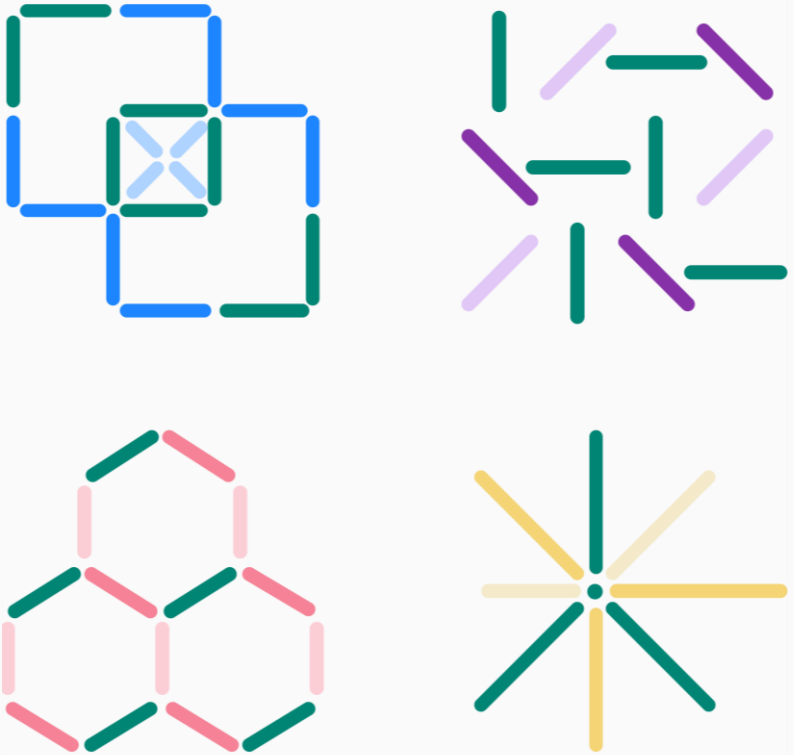
PFAS:
1) Baseline levels of contamination in the environment

2) Understanding source-recipient dynamics in waters



EDCs:
Integration of effect-based and chemical methods to generate a baseline level of contamination in the environment

PFAS baseline levels for Europe



Developing a PFAS baseline

= PFAS concentrations resulting of several decades of PFAS production and use

= reflect the current PFAS situation in Europe

≠ PFAS levels at hotspots

Why?

- gain understanding in the current exposure to PFAS
- monitor the evolution and trend resulting from policy measures
- identify hot spots as locations where concentrations are significantly higher than the baseline

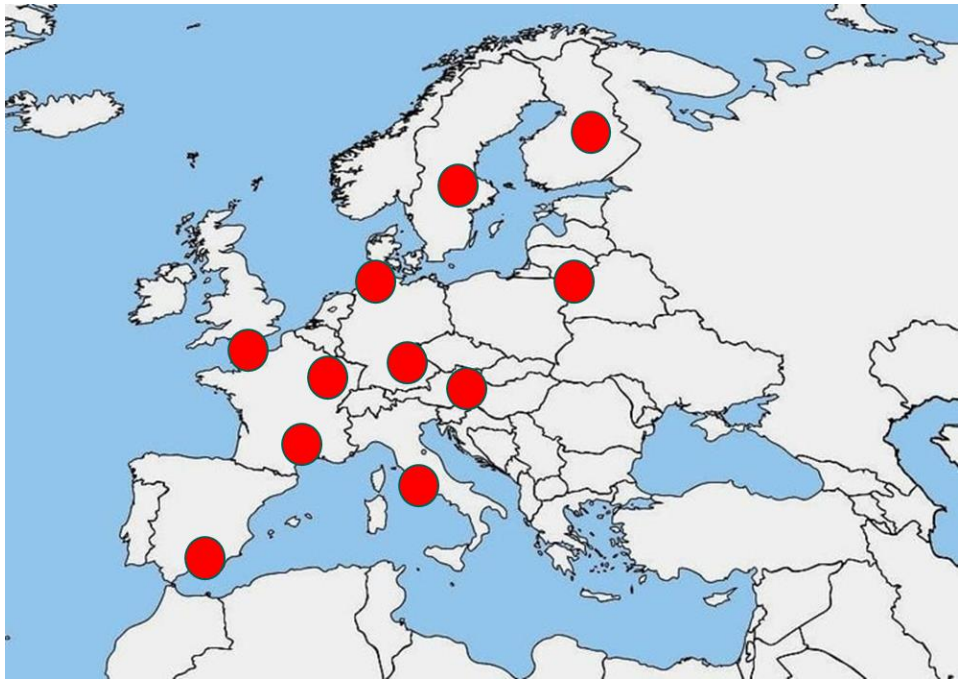
Which data?

Media: surface water, groundwater, soil, air, sediment, biota (incl. eggs),…

Spatial representativeness: aim to have good coverage of EU

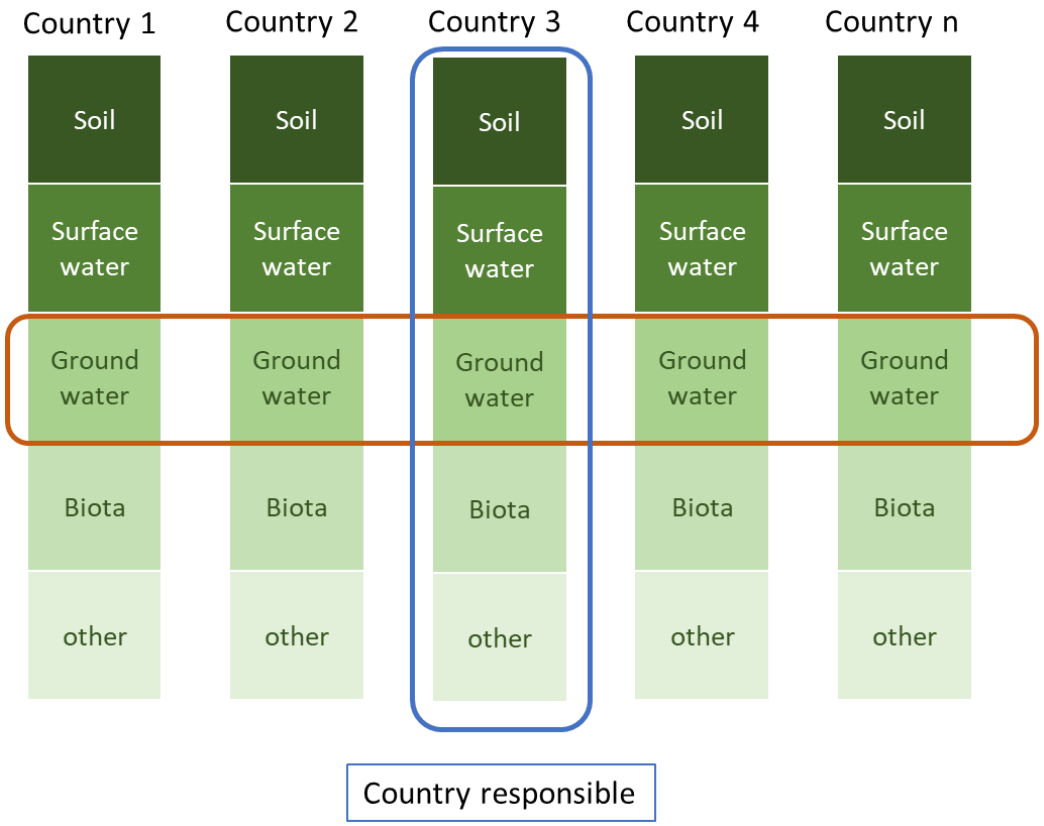
Temporal representativeness: ≤ 5 years old (to consider recent bans of legacy PFAS)

Compounds: All PFAS target data with concentration information.



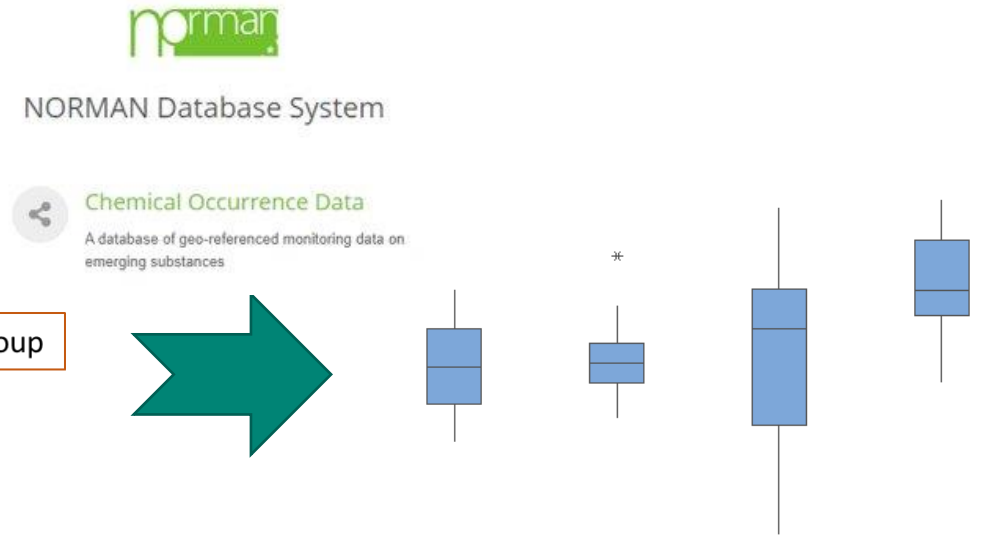
Current status: Data from 18 partners from 11 countries

Workflow towards a PFAS baseline



Matrix responsible + working group

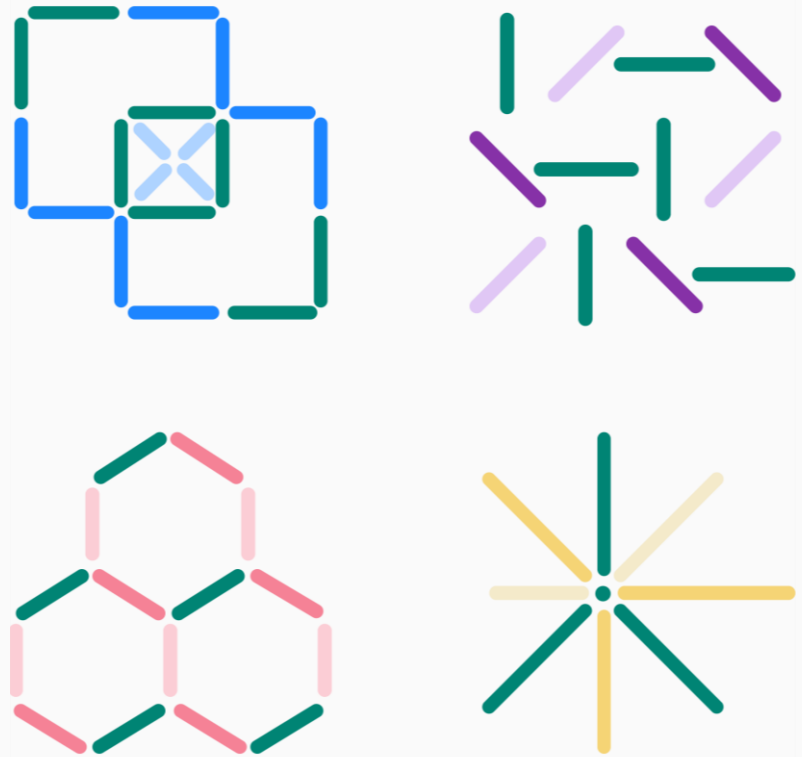
Transfer to NORMAN database



Statistics and reporting

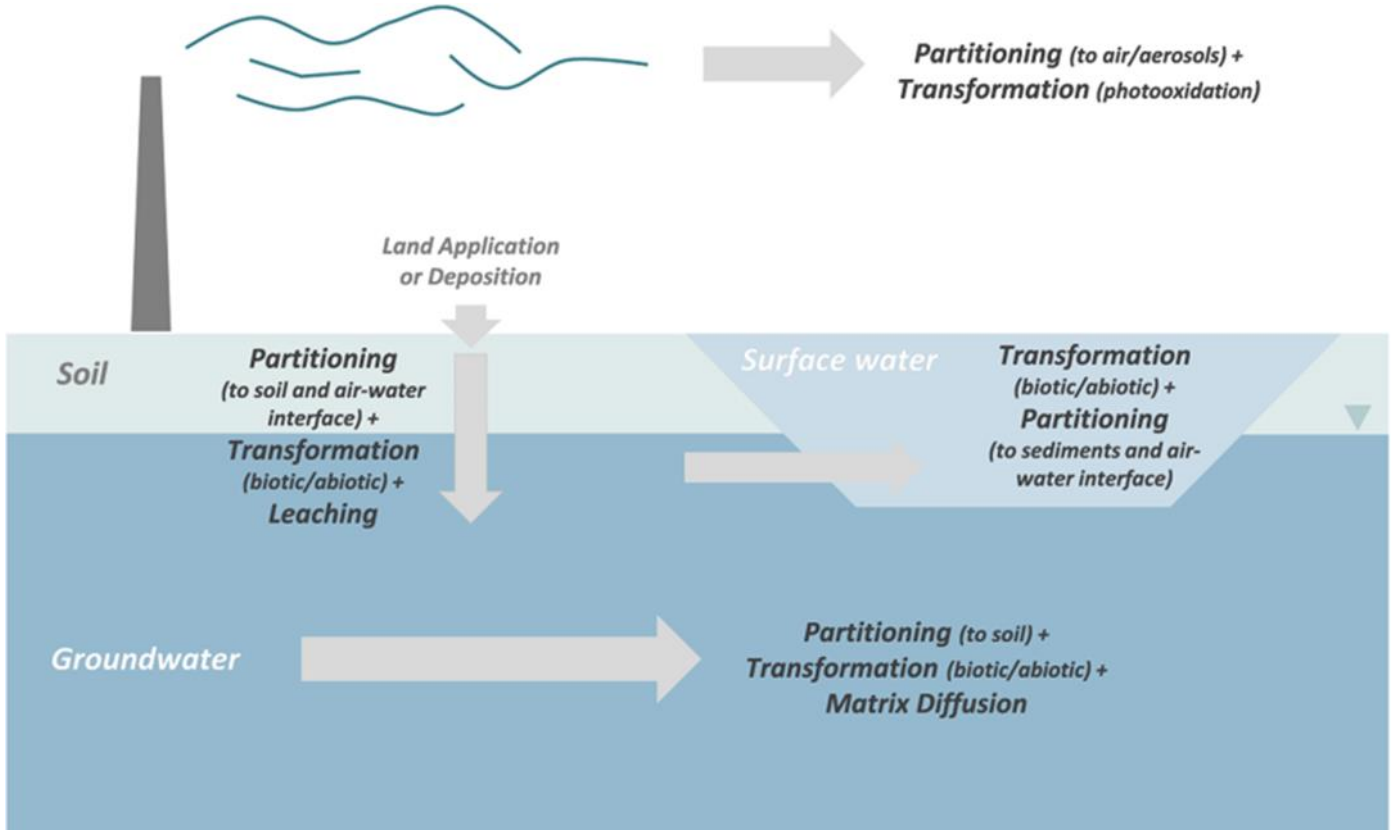
Want to contribute? Contact us!
Laetitia.six@ovam and stefano.polesello@irsa.cnr.it

PFAS case studies: Unravelling source-to-recipient dynamics in European waters



Aim of PFAS Case Studies

To gain a better understanding of the PFAS fate and pathways from sources to aquatic recipients

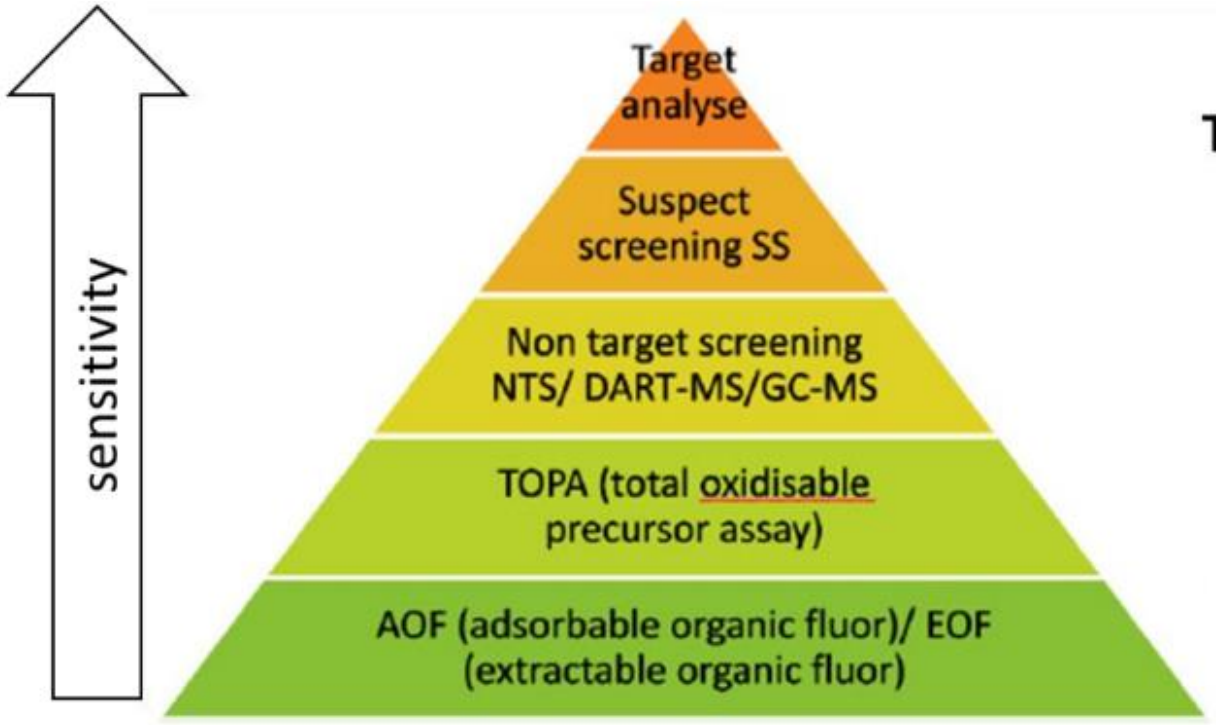


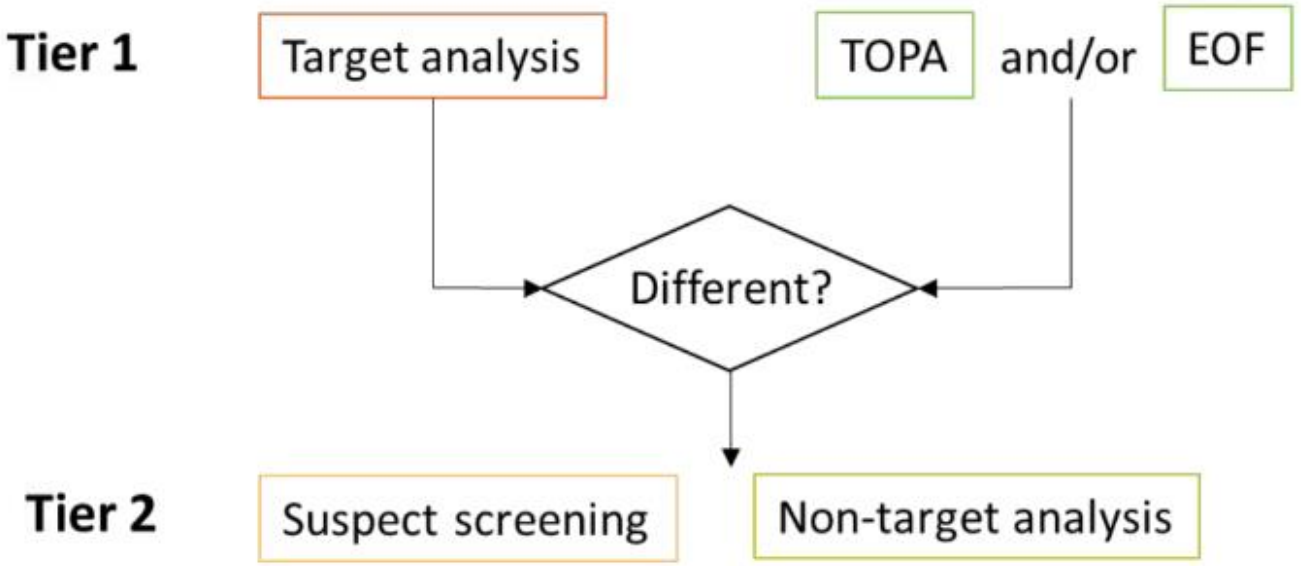
Source: D. Adamson, GSI

PFAS case studies – research questions

- What is the role of precursors in the environmental fate of PFAS? (15)
- How far can PFAS precursors be transported from a source in the terrestrial/aquatic environment? (12)
- How do environmental conditions (e.g., soil type, temperature, organic carbon content) and PFAS molecular structures (chain length, functional group) influence their transport to aquatic recipients? (8)
- Can non-target methods contribute to establishing a “PFAS fingerprint”, which might improve our understanding of pathways? (14)
- Can fingerprinting be used for source identification and can it be embedded in monitoring? (12)

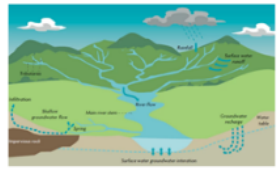
Analytical approach

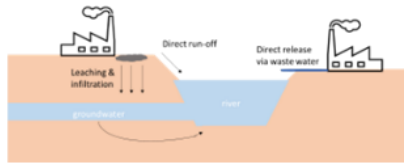




Advanced technologies for risk assessment of PFAS close to emission sources

PFAS case studies – interlinks





Case study 1 Case study 2 Case study 3 Case study 4 .... Case study n

Research question 1

Research question 2

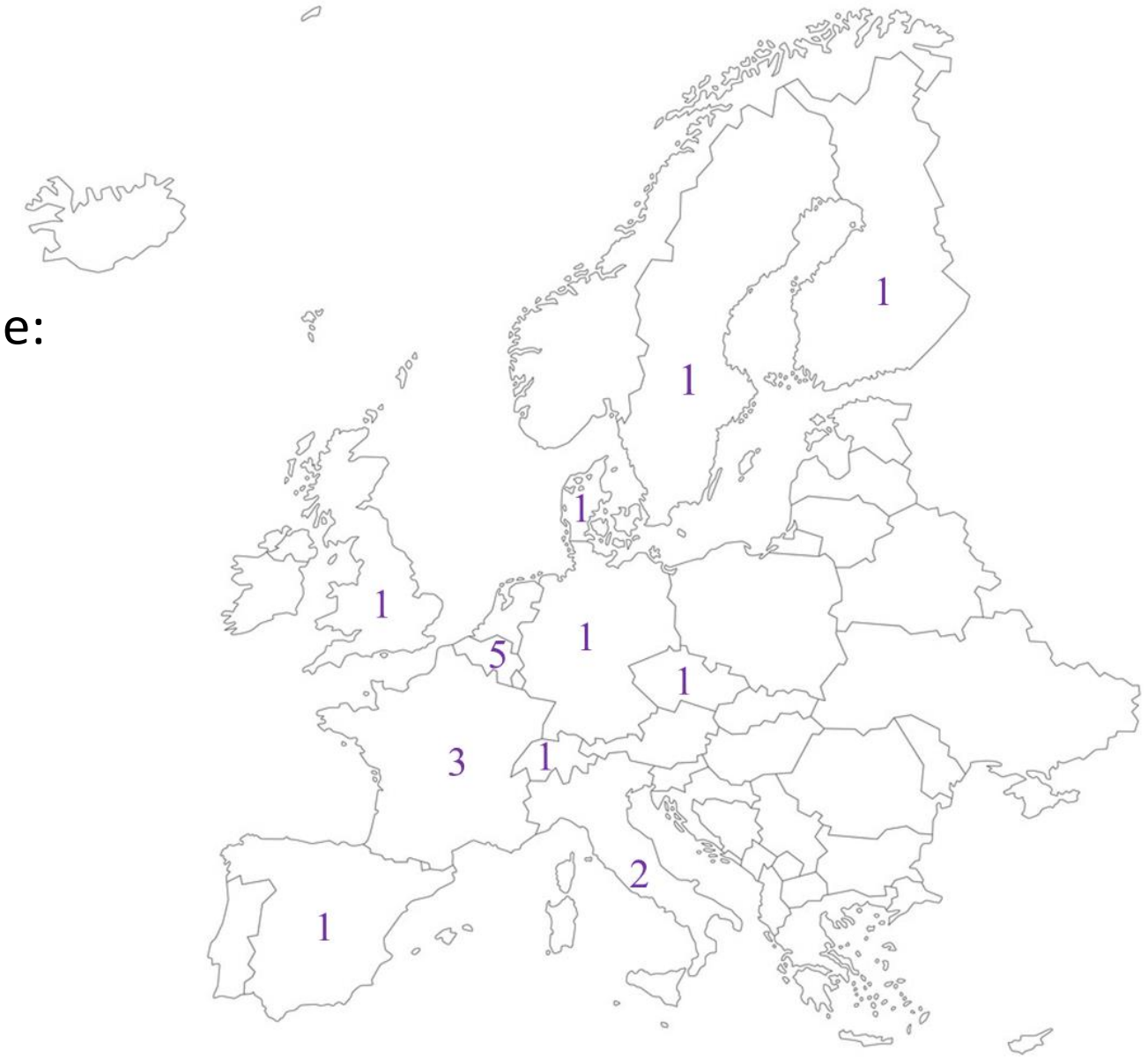
....

Research question n

Geographical coverage

18 distinctive case studies covering Europe:

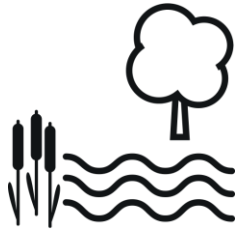
- North: 3
- South: 3
- East: 1
- West: 11



Sources and matrices investigated

- Case studies address a diversity of known **PFAS sources**, for example:
  - textile industry,
  - paper industry,
  - fluorochemical production,
  - firefighting training areas
  - landfill leachate

- **Matrices** : surface water, groundwater, soil, sediment, suspended matter and aquatic organisms



Expected outcomes

- Understanding of the **current environmental PFAS levels** (away from emission sources) and **PFAS pathways** from **source** to aquatic **receptors**

  ➔ Will enable the evaluation of the effectiveness of the management measures

  ➔Provide guidance for future monitoring studies: study set-up, QA/QC protocols, use of innovative analytical methods for PFAS monitoring

- Pave the way for improved **collaboration at EU level**

  ➔ alignment of national / research monitoring studies, data sharing, harmonisation of practices, optimised use of resources

Collaboration is key

T4.2 Task leaders

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PFAS Project leaders

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PARC T4.2 PFAS group

UBA, AU, SYKE, INRAE, UFZ, IDAEA-CSIC, ANSES, BfG, BPI, BRGM, CNRS, CSTB, EAWAG, EFET, Fraunhofer-IME, FISABIO, INERIS, ISS, ISSeP, IVL, JSI, LNS, MU, NILU, NKUA, NMBU, ONIRIS, SCIENSANO, UAntwerpen, UL, VSCHT, VU-E&H, VITO

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Thank you for your attention