Data handling and interpretation for the monitoring of POPs under the Stockholm Convention

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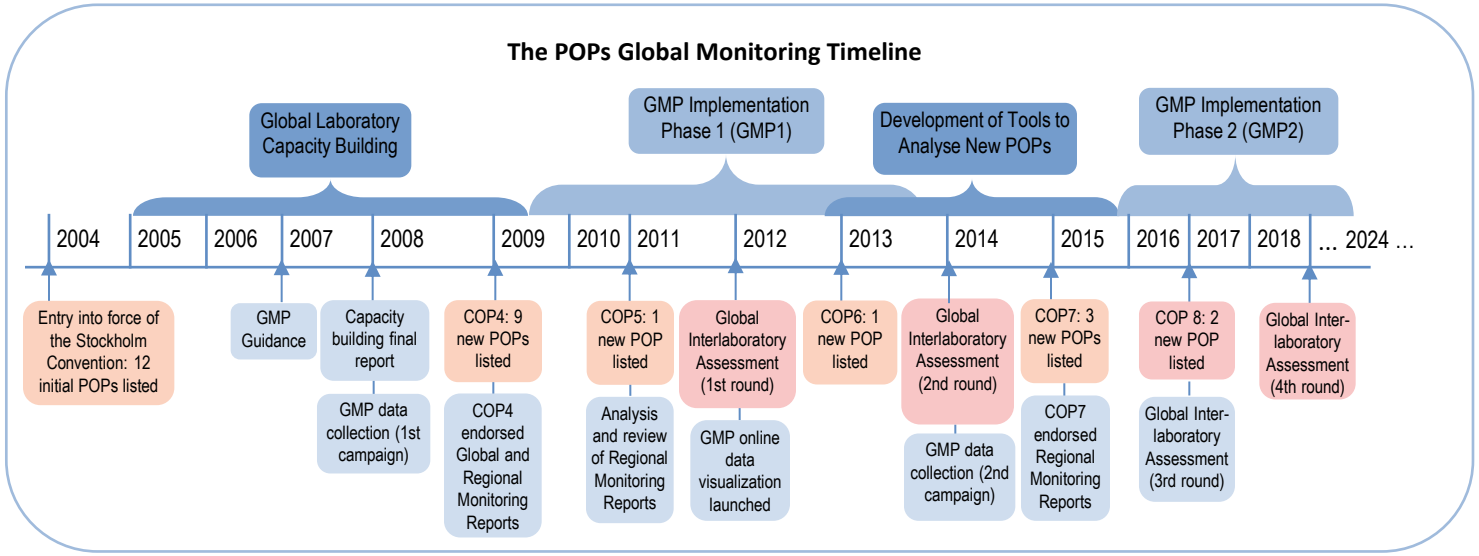
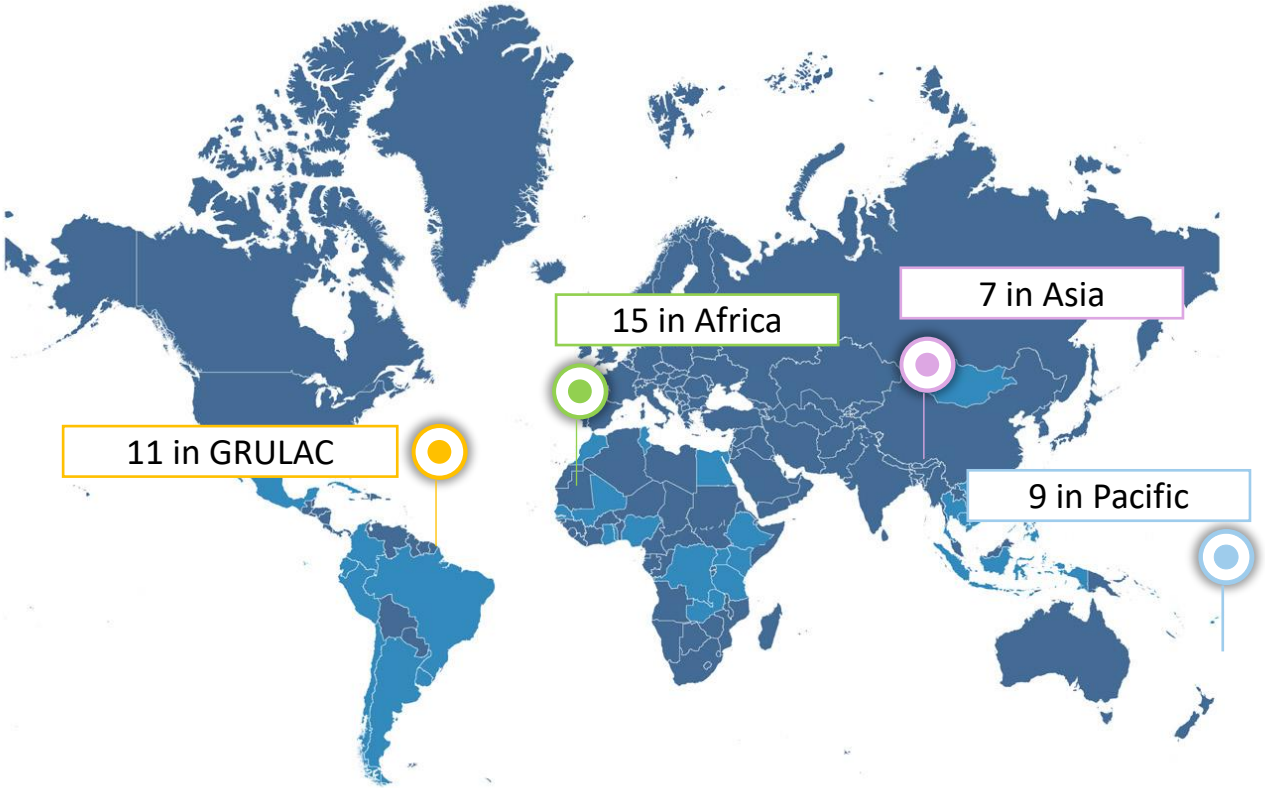
Making Data Work: Applying GMP and POPs Inventories for Evidence-Based Policy in NIPs
30 January 2026, online

Background – The Stockholm Convention

Article 16 of the Stockholm Convention establishes the framework for evaluating the effectiveness of measures taken to protect human health and the environment from persistent organic pollutants (POPs). It requires the Conference of the Parties to periodically (every six years) assess whether the Convention is achieving its objectives, including reductions in POPs releases and declining environmental levels. To enable this evaluation, Parties agreed to implement the Global Monitoring Plan (GMP), which provides harmonized, comparable data on POPs in core environmental matrices such as air, human milk and blood, and water.



Background: UNEP/GEF POPs GMP2 Project (2016-2024)



- UNEP/GEF GMP1 project (2008-2012) based on the success of two GEF pilot test projects
- UNEP/GEF GMP2 project (2016-present) following decision SC-6/23 and the success of the UNEP/GEF GMP1 project to support **data generation** and **capacity building.**

30 POPs analyzed in over **1300** samples of air, water, human milk and matrices of national interest in 42 countries.

Over **20** years of human milk data covering 82 countries globally.

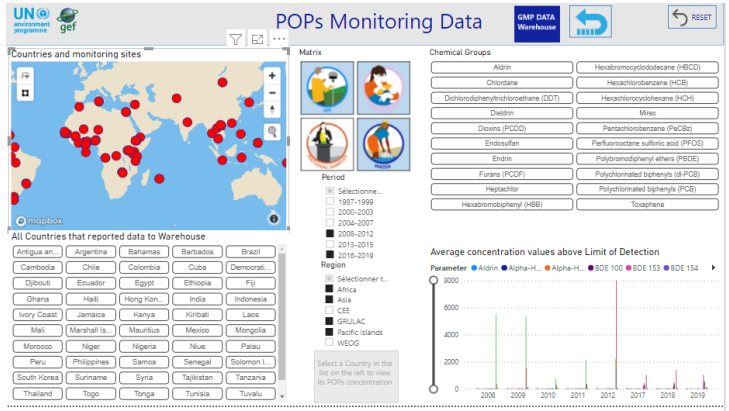
Over **50,000** data points generated.

Training in **26** national laboratories.

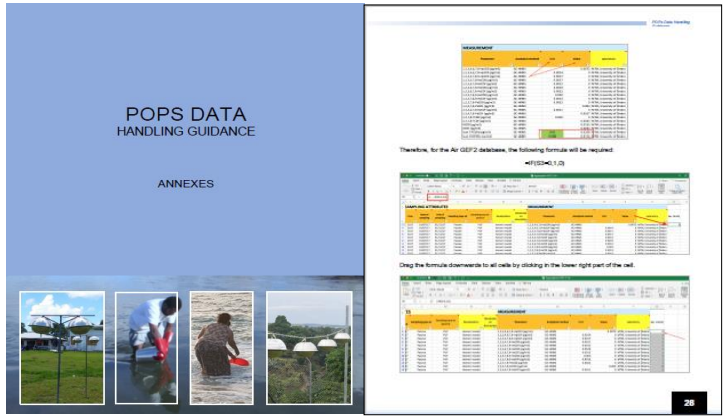
289 laboratories registered in the interlaboratory assessments with **228** reported data.

From data to informed decision-making

Data and knowledge sharing



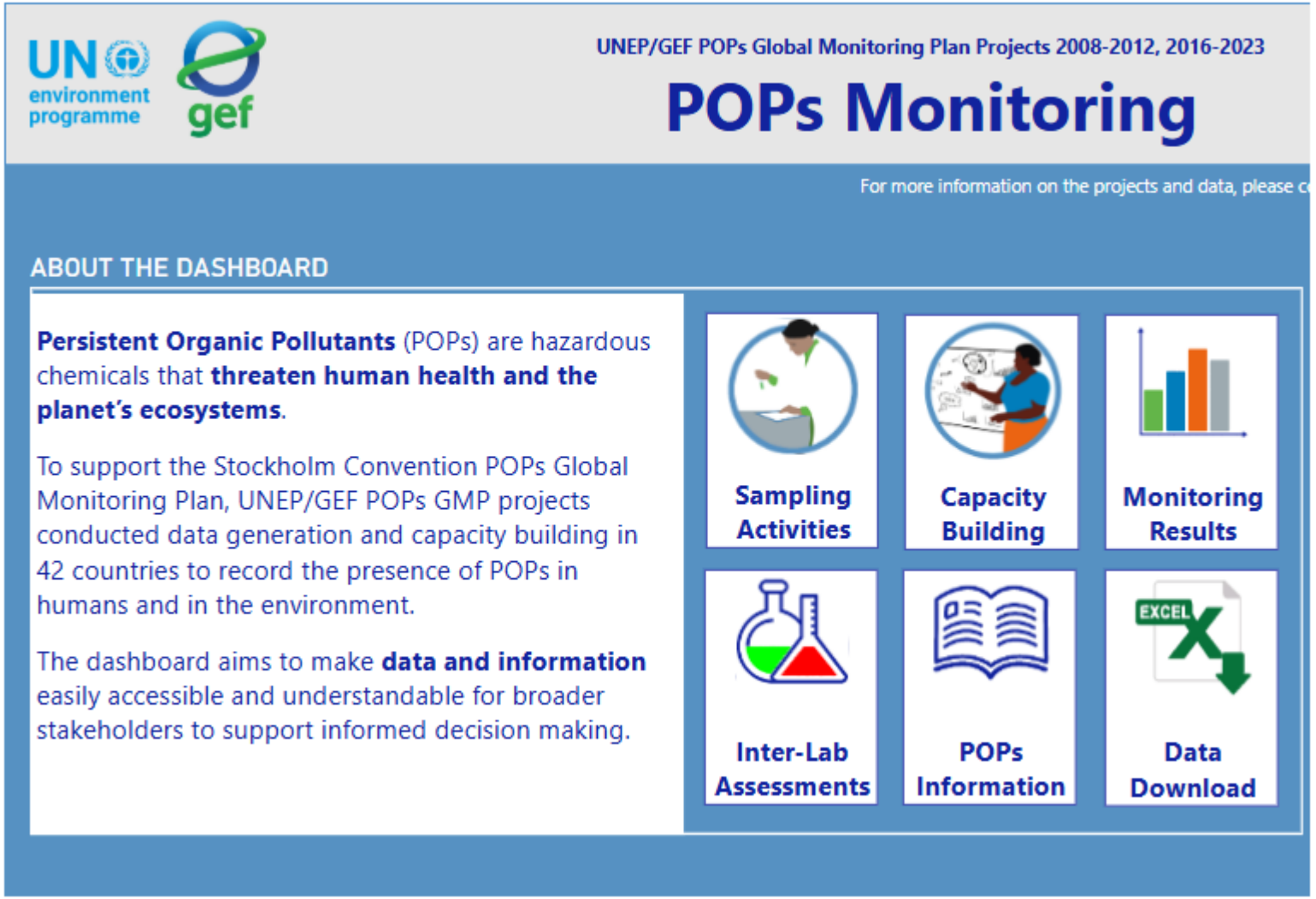
Data handling and interpretation

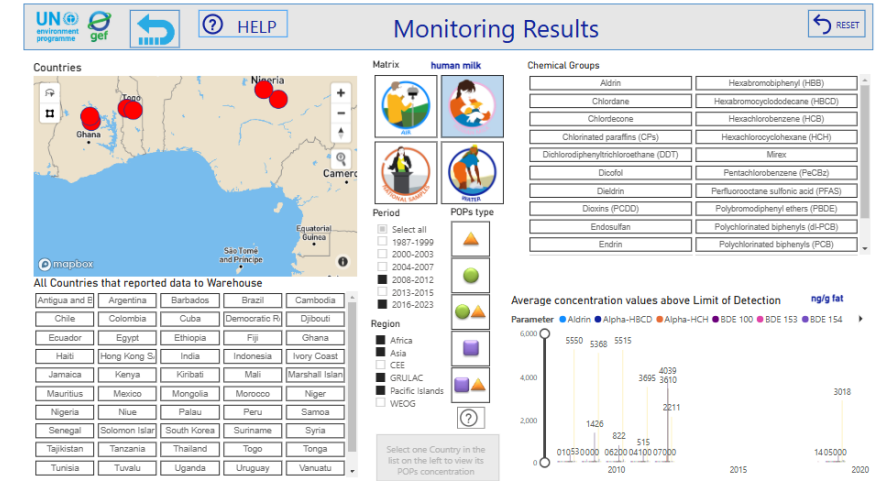


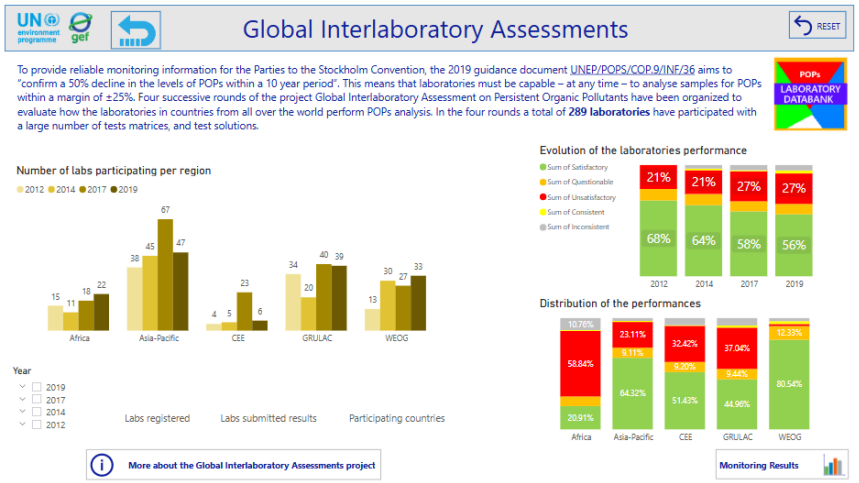
Integration and usage

- Development of guidance documents on data reporting and management.
- Self-paced e-course on data handling and interpretation.
- Additional activities proposed by countries based on the results generated under the project:
  - Additional analysis in national laboratory;
  - Analysis of additional matrices of national interest etc.

Data dashboard for information sharing







https://www.unep.org/topics/pollution-and-health/persistent-organic-pollutants-pops/global-monitoring-persistent-organic

Data Handling and Interpretation for the Monitoring of POPs under the Stockholm Convention

START COURSE

Link: [eCourse - Data Handling and Interpretation for the Monitoring of POPs under the Stockholm Convention | UNEP - UN Environment Programme]

UN environment programme

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- Module 1: Introduction
- Module 2: Background
- Module 3: Monitoring Process
- Module 4: Data Handling
- Module 5: Data Interpretation
- Module 6: 6 Steps for Data Interpretation
- Resoures and Acknowledgement
- Supporting Materials - French and Spanish Versions of the Course

Data Handling and Interpretation for the Monitoring of POPs under the Stockholm Convention

0% COMPLETE

Objective of the Course

To support Parties of the Stockholm Convention in the processing of data on levels of POPs in national circumstances, and for informed decision making and actions towards elimination of these toxic chemicals.

Target Audience

The course is designed for technical staff involved in POPs monitoring activities, specifically those involved in the management of data and the presentation of results to national decision makers and stakeholders.

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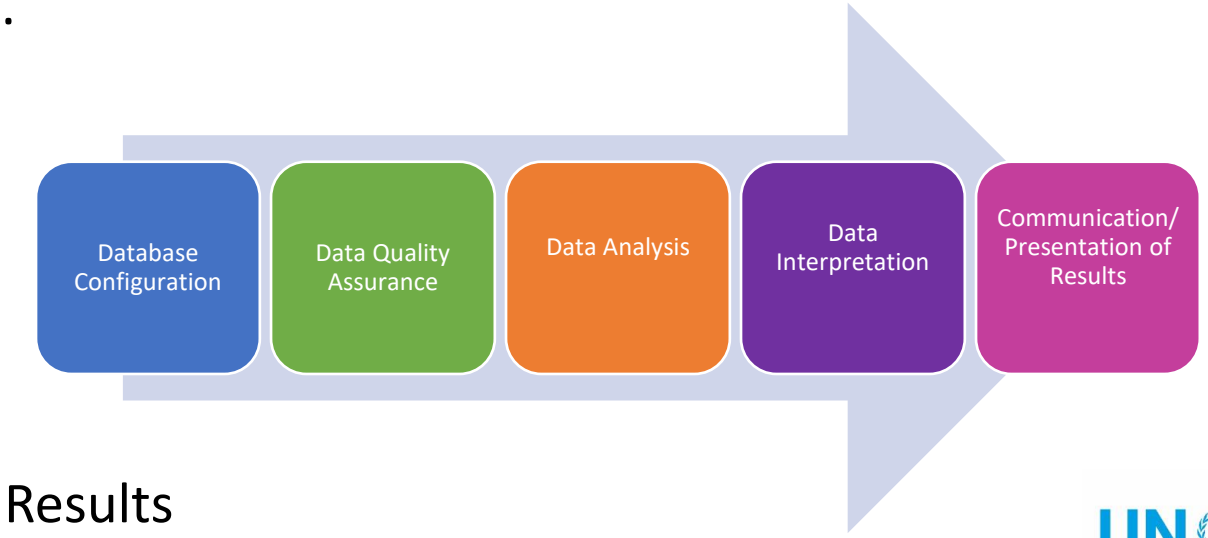
Monitoring process

- Many authors establish that environmental monitoring refers to **systematic sampling of air, water, soil, and biota in order to observe and study the environment, as well as to derive knowledge from this process.**
- **Monitoring categories:**
  - Successive monitoring
  - Prediction monitoring
  - Impact monitoring and
  - Mitigation success monitoring, among others.

Data handling

- Data Handling is the process of collecting, recording and presenting information in a way that is helpful to others.
- It can also be defined as the method of performing statistical analysis on the given data.
- Data handling transforms records into useful information.
- Data need to be comparable, validated and harmonized and capable of revealing trends over time, in the various regions.
- Data handling Process
  - ❖ Data base configuration
  - ❖ Data quality assurance
  - ❖ Data analysis
  - ❖ Data interpretation
  - ❖ Communication/ Presentation of Results



Data interpretation

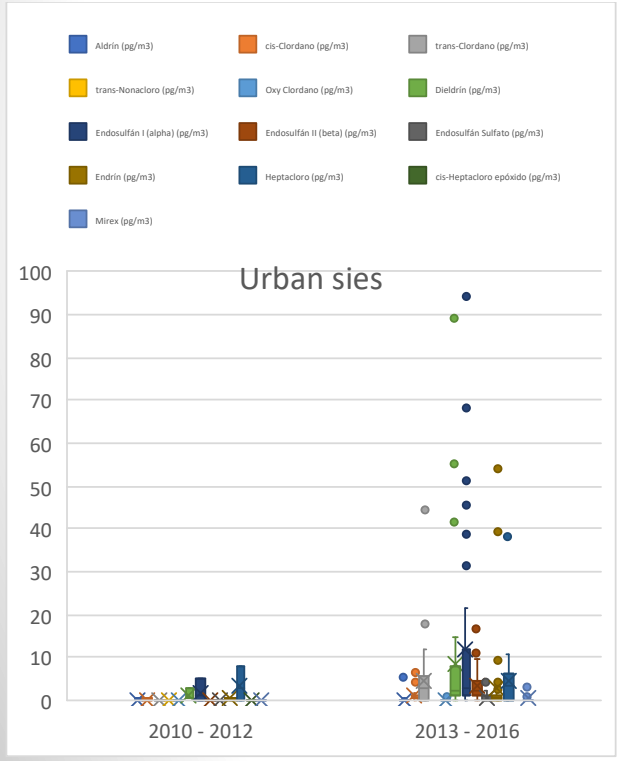
- Data interpretation gives meaning to the information analyzed and determines its significance and implications.
- Data interpretation is intended to help people make sense of the numerical data that have been collected, analyzed, and presented.
- In interpreting data, an analyst must attempt to discern differences between correlation, causation, and coincidence, as well as many other biases, but also must consider all the factors involved that may have led to a result, the context.

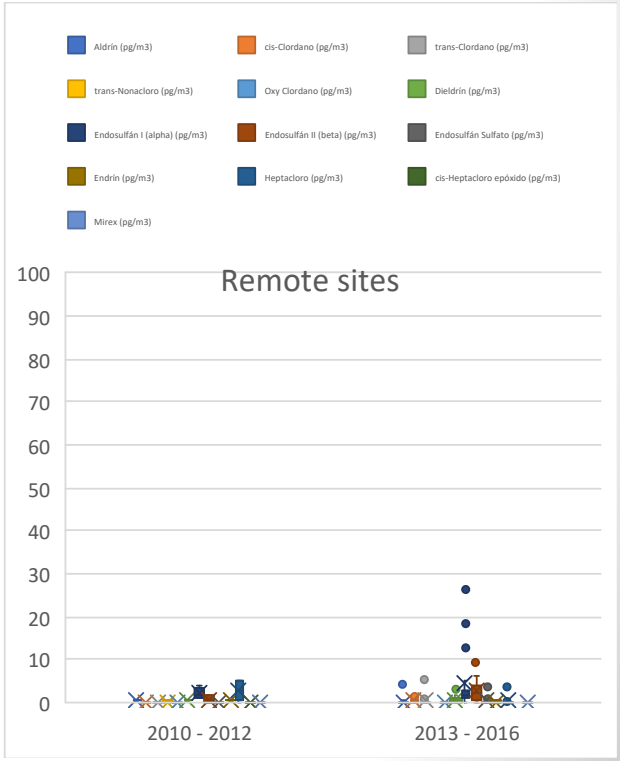
Data Interpretation Process

Data analysis	□ Numerical value data by quantitative analysis. □ Issues grasped through qualitative analysis.
Interpretation of results using Visualization and evaluation criteria	□ Judgments based on context, experience, and knowledge among others. □ Provide evidence for the judgment and analyze hindering or contributing factors.
Conclusion	□ Responses to evaluation questions. □ Judgment for evaluation purpose from the comprehensive viewpoint based on the results □ Judgments for other evaluation purposes.
Recommendations	□ Specific measures, suggestions, and advice regarding a project, to be taken into consideration by those concerned.
Lessons Learned	□ Knowledge obtained through the experience of a target project (useful information for the future or for the management of other on-going projects).

Source. Adapted from: https://www.jica.go.jp/english/our_work/evaluation/tech_and_grant/guides/pdf/guideline02-03.pdf

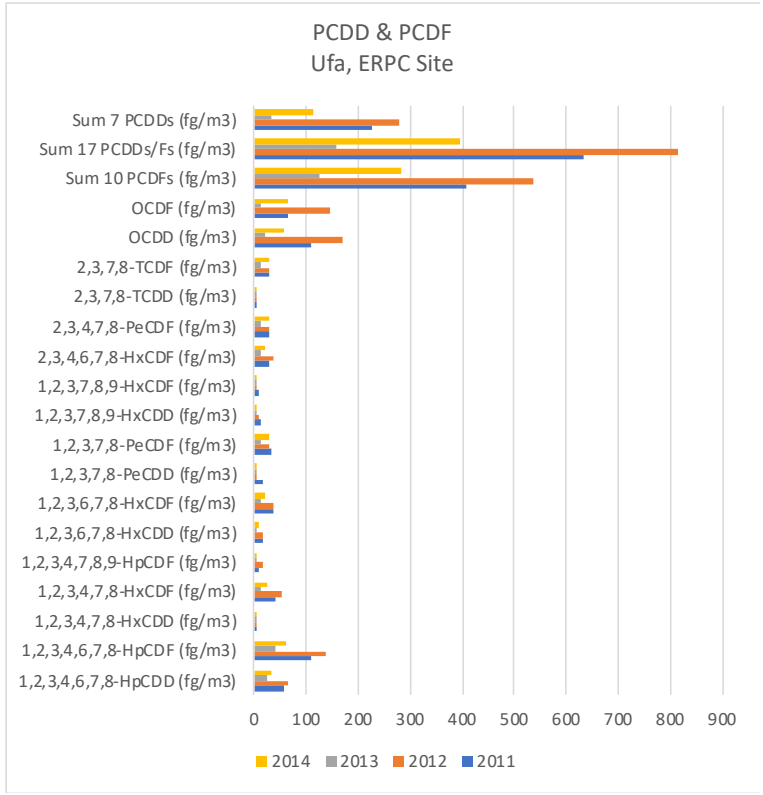
1. Review the analysis. Grouping

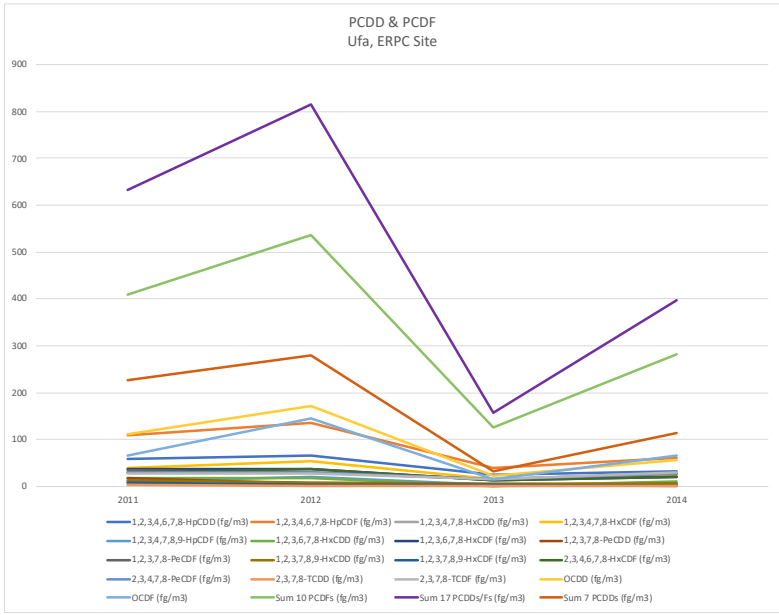


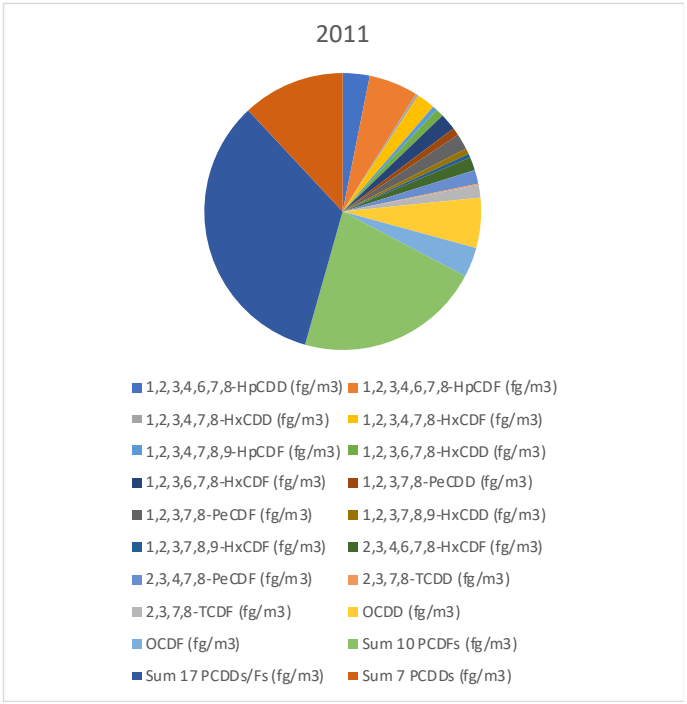


Data visualization

- Example. PCDD & PCDF comparisons







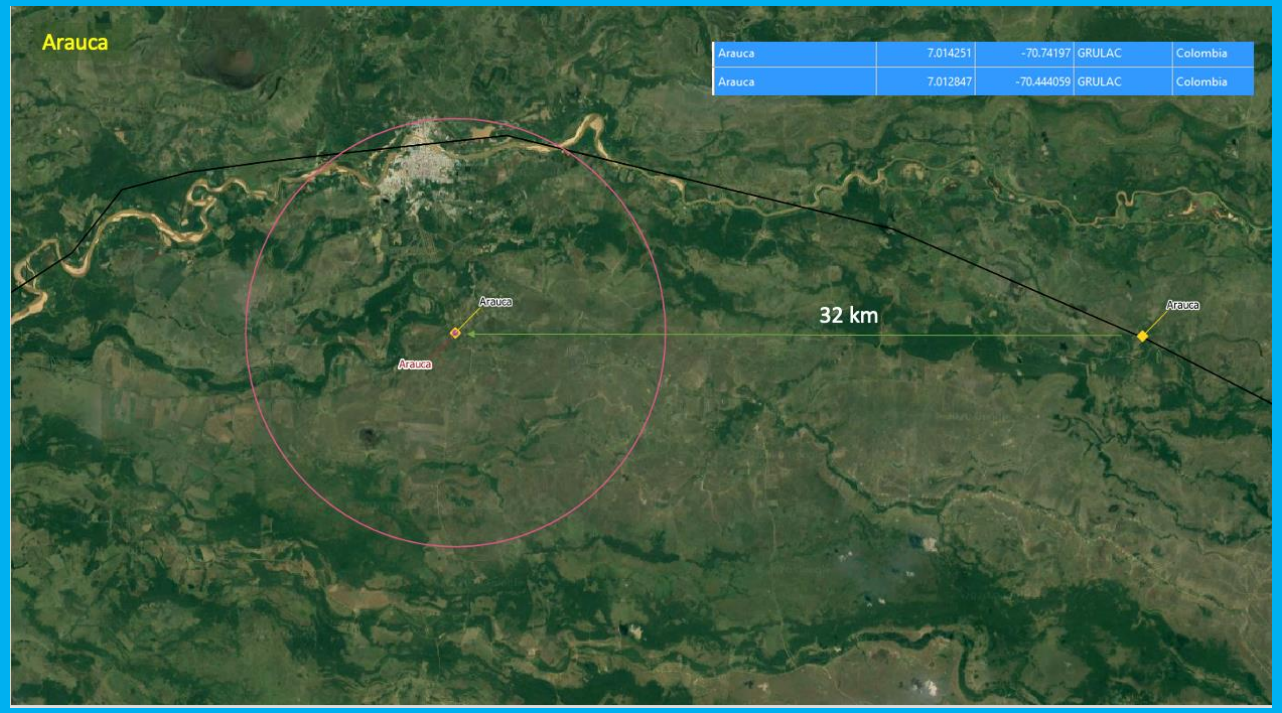
Review the quality assurance criteria - Consistency

Consistency refers to the conformity in the characteristics or application of something.

In the case of POPs monitoring, it is recommended to verify the following:

- Matrix
- Monitoring network
- Type of Sampling
- Time span
- Sampling frequency
- Laboratory performing the analysis (method)

For air, passive sampling, or water it is also recommended to confirm the prevalence of the monitoring sites.



Example of inconsistencies. Sites with the same name, Arauca, but different locations.

Review the quality assurance criteria- Completeness criterion

Completeness, in the data quality framework, refers to the degree to which all data in a data set are available.

The GMP Guidance (UNEP, 2024) recommends the use of annually aggregated data for spatial and temporal comparisons.

Recommendations:

- For air matrix, criterion of 75% of sampling days per sampling year:
  - Passive PUF - 3 or 4 samples exposed each for almost three months (around 270 days in total)
  - Active sampling - Completeness criterion should be established considering the recommendation of the GMP Guidance.

- For water matrix, the completeness criterion will be 3 out of 4 active samples taken in a calendar year.
- Databases of the biotic matrices, human blood and milk, are already aggregated.

Look for trends, patterns and relationships in the data sets

vhttps://www.youtube.com/watch?v=ca0rDWo7IpI
https://www.youtube.com/watch?v=QMPD7yY_Eqo

When the data are displayed in graphs and figures for the analysis, trends and patterns can be identified, as well as some relationships.

Trend: shows the general direction in which something is changing or the direction in which the data is moving, upward or downward.

Pattern: are sequences or repeated occurrences in the data series. A data series may repeat in a recognizable way.

Relationships: connections or associations between the variables. Any relationship between two or more variables showing that when one variable changes so does the other.

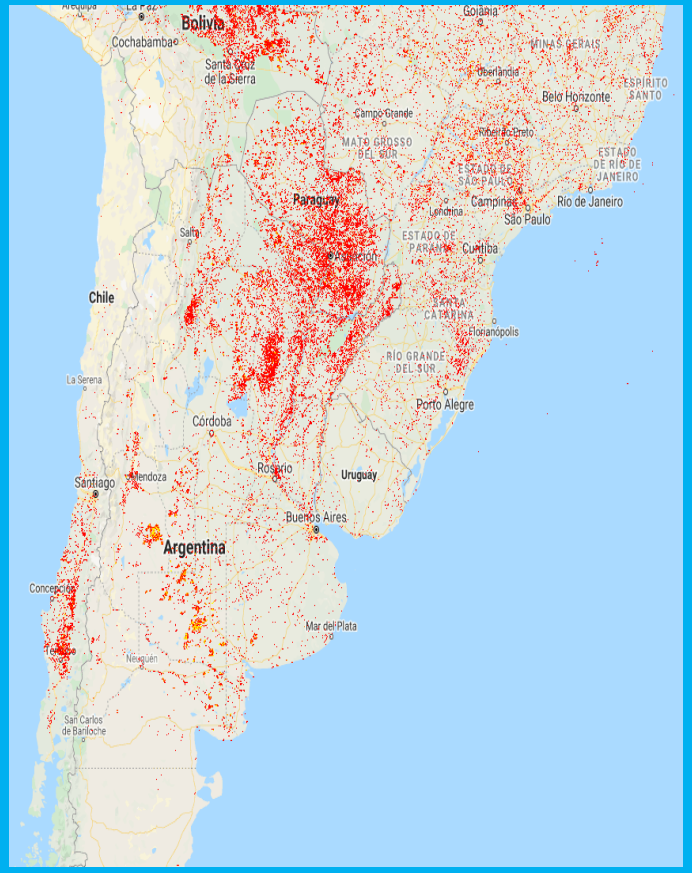
Explain trends, patterns, relationships and findings

Explain trends, patterns and draw conclusions, recommendations and lessons learned. It is recommended:

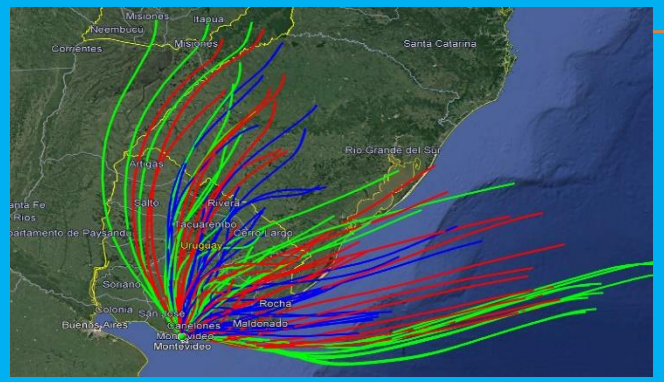
- **Explain the "Statistical Meaning"**
- **Explain Correlations.**
- **Put the results in Context**

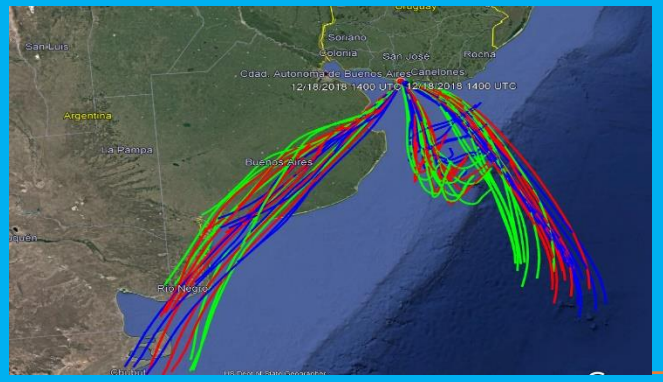
And remember if no explanation is found, restart the process.

Additional assessment tools



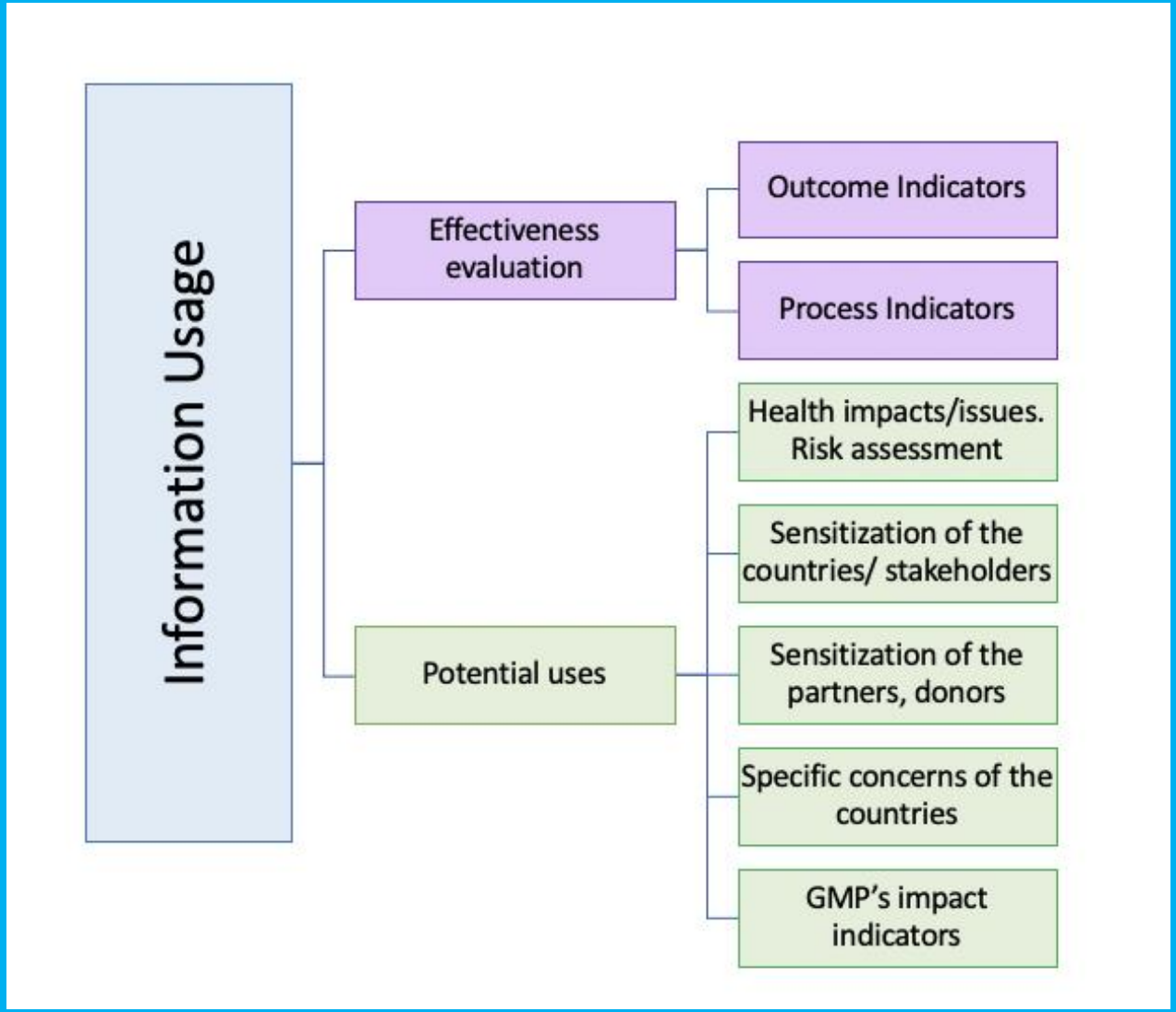
Fires and burns reported on the FIRMS-NASA 2018 platform, South of South America





Back trajectories by quarters in Uruguay, 2018

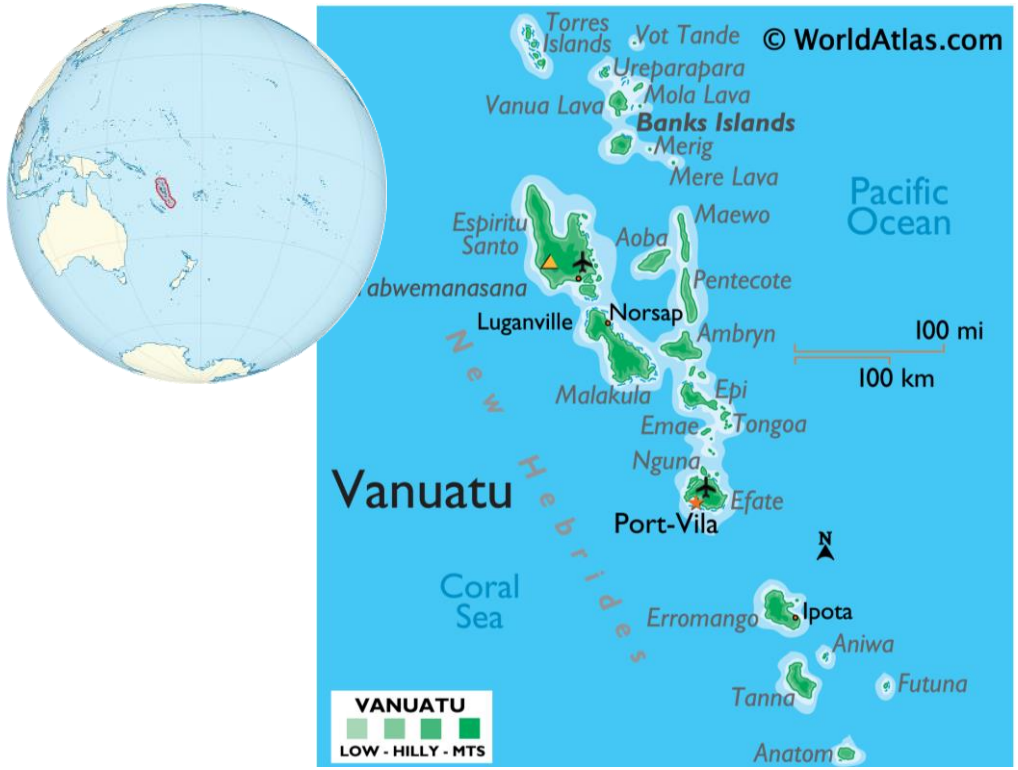
The use of POPs information



From data to action - Vanuatu

Vanuatu is a small island developing state, located in the South Pacific Ocean to the east of Northern Australia. Has population of approximately 300,000.

Joined 1st time on the 6th round of the Global Monitoring Project, Phase 2 which started in 2017. It sent most of the samples of air, water, breastmilk and other national matrices from 2018 to 2019.

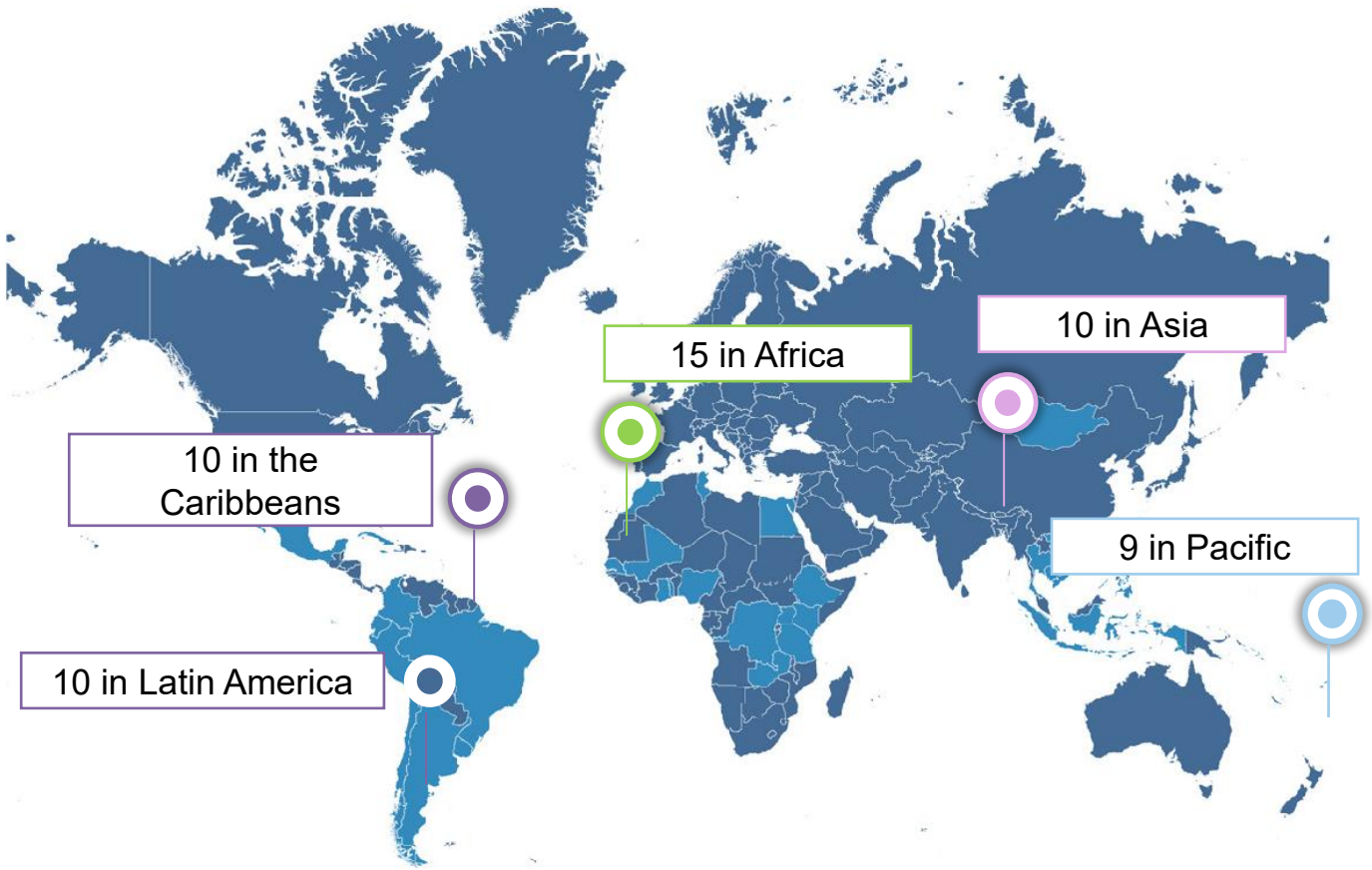


From data to action

Chemical	Use	Annex	National Presence	Action required	Action Plan number
DDT[b,w]	Pesticide	B	Past use in Vanuatu	Monitor (GMP)	AP7 A11
Pentachlorophenol (PCP) and its salts and esters	Pesticide	A	Unlikely to be present	Not required	
Decabromo-diphenyl ether (commercial mixture, c-decaBDE)[b]	Industrial chemical	A	Likely to be present	Improved waste and E-waste management Monitor (GMP)	AP5 AP11
Hexachlorobutadiene (HCBD)	Industrial chemical	A & C	Likely to be present	uPOPs management Monitor (GMP)	AP8 AP11
Perfluorooctane sulfonic acid (PFOS)[w], its salts and Perfluorooctane sulfonyl fluoride (PFOS-F)[w]	Industrial chemical	B	Likely to be present	Improved waste management Monitor (GMP)	AP6, AP9, AP10, AP11

- Experience on communities that are encouraged to segregate rubbish, and not burn rubbish mixed with plastics to minimize release of dioxins and furans and use the organic matter to do composting.

New Global Chemicals Monitoring Programme



Objective

POPs and mercury monitoring to support the effectiveness evaluation of the Stockholm Convention and provide data to support the effectiveness evaluation mechanism of the Minamata Convention

Scope

5 regions (Africa, Asia, Pacific Islands, Caribbeans Islands, and Latin America)

Implementation arrangement

Global coordination project + five regional projects

Duration

2026-2030

Budget

USD 23,5 million (GEF Grant) +approx. ~USD 65 million co-finance

Major Components and Activities

Sampling

- Guidance and protocols.
- Sampling materials.
- Sampling in 54 countries.
- Sample shipment and analysis in qualified laboratories.

Data generation and quality control

- Interlaboratory assessment
- Trainings
- - make regional advanced labs qualified as data generators.
- - assist labs with basic capacities with improving their analytical performance.
- Mechanism to engage with broader researchers and experts at the regional level.

Data reporting, interpretation and use

- Reporting data to the Stockholm and Minamata Conventions
- Report and interpret data for broader use
- --- Establish a data platform to enable data use across topics.
- --- Support data interpretation linking to national policy and decision making.
- Report data to the general public and broader stakeholders for awareness raising (communication, indigenous groups, youth groups etc.)

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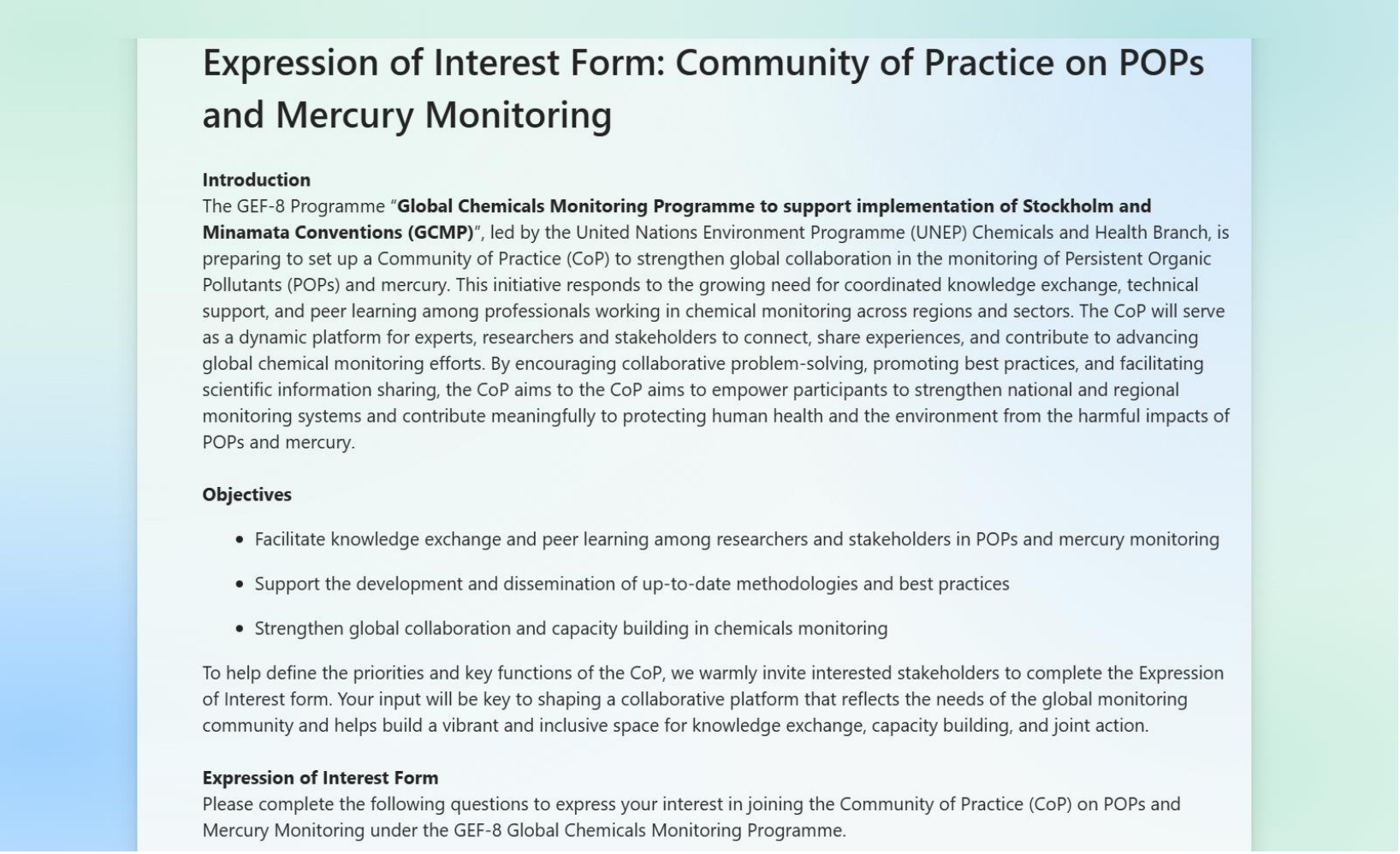
Collaborating with broader researchers: Community of Practice



Expression of Interest Form: Community of Practice on POPs and Mercury Monitoring

Introduction

The GEF-8 Programme "**Global Chemicals Monitoring Programme to support implementation of Stockholm and Minamata Conventions (GCMP)**", led by the United Nations Environment Programme (UNEP) Chemicals and Health Branch, is preparing to set up a Community of Practice (CoP) to strengthen global collaboration in the monitoring of Persistent Organic Pollutants (POPs) and mercury. This initiative responds to the growing need for coordinated knowledge exchange, technical support, and peer learning among professionals working in chemical monitoring across regions and sectors. The CoP will serve as a dynamic platform for experts, researchers and stakeholders to connect, share experiences, and contribute to advancing global chemical monitoring efforts. By encouraging collaborative problem-solving, promoting best practices, and facilitating scientific information sharing, the CoP aims to the CoP aims to empower participants to strengthen national and regional monitoring systems and contribute meaningfully to protecting human health and the environment from the harmful impacts of POPs and mercury.

Objectives

- Facilitate knowledge exchange and peer learning among researchers and stakeholders in POPs and mercury monitoring
- Support the development and dissemination of up-to-date methodologies and best practices
- Strengthen global collaboration and capacity building in chemicals monitoring

To help define the priorities and key functions of the CoP, we warmly invite interested stakeholders to complete the Expression of Interest form. Your input will be key to shaping a collaborative platform that reflects the needs of the global monitoring community and helps build a vibrant and inclusive space for knowledge exchange, capacity building, and joint action.

Expression of Interest Form

Please complete the following questions to express your interest in joining the Community of Practice (CoP) on POPs and Mercury Monitoring under the GEF-8 Global Chemicals Monitoring Programme.

Link: Expression of interest form

Thank you

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