Overview of the outputs and outcomes of the UNEP/GEF POPs GMP project

Presentations – Day 2

Final meeting of the UNEP/GEF POPs GMP projects
in the Asia and the Pacific region

Bangkok, Thailand 4-5 April 2023

Final Meeting for the UNEP/GEF POPs GMP projects in the Asia and the Pacific region

Final Meeting of the UNEP/GEF projects “Implementation of the POPs Monitoring Plan in the Asian Region” and “Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in Pacific Region”

Haosong Jiao, Associate Programme Management Officer
Chemicals and Health Branch, Industry and Economy Division

Recap of Day 1

Findings, thoughts, experience gained, lessons learnt and considerations for future

- We found POPs in humans and in the environment.
- Strong commitment to POPs monitoring and expectation for continuous support
- Continuing strengthening capacities
- A frequently mentioned difficulty: Collection and shipment of samples
- Interpretation and usage of data to inform population and advice decision making

Recap of Day 1

- Strengthen linkages/synergies with relevant initiatives (NIPs, legislation, etc.)
- Policies and programmes on POPs monitoring
- Outreaching, communication, awareness raising
- Strengthen the connection with partners, stakeholders and policy makers.

Recap of Day 1

The critical question:

How can we learn from the past and design better in the future.

Day 2

- Regional collaborations and case studies
- Brainstorm on a practical roadmap for sustainable monitoring of POPs
- Closure of the project

Final Meeting of the UNEP/GEF projects “Implementation of the POPs Monitoring Plan in the Asian Region” and “Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in Pacific Region”

4 – 5 April 2023, Krung Thep Maha Nakhon (Bangkok), Thailand

Future considerations of the POPsEA project

Secretariat of

Environmental Persistent Organic Pollutants Monitoring Project in East Asian Countries

(POPsEA project)

Japan Environmental Sanitation Center

Objectives of POPsEA project since 2002

- Understanding the background levels of POPs in the environment at the East Asia Sub-region
- Contributing to the effectiveness evaluation of the Stockholm Convention by implementing active monitoring in East-Asia subregion
- Preparing the comparable and scientifically sound data on the media considered as essential

Objectives of POPsEA project since 2002

- Sharing the information on the activities of Global Monitoring Plan, existing state of POPs issues in the member countries and consideration on the monitoring methodologies
- Building the POPs monitoring capacity in member countries

Past activities of POPsEA project

- Workshop
  - 1st – Dec. 2002 in Tokyo
  - 2nd – Dec. 2003 in Tokyo & Tsukuba
  - 3rd – Oct. 2005 in Tokyo
  - 4th – Sept. 2006 in Kyoto
  - 5th – Nov. 2007 in Kyoto
  - 6th – Nov. 2008 in Tokyo
  - 7th – Sept. 2009 in Tokyo
  - 8th – Sept. 2010 in Yokohama
  - 9th – Jan. 2012 in Krung Thep (Thailand)
  - 10th – Nov. 2013 in Manila (Philippines)
  - 11th – Jan. 2016 in Hanoi (Vietnam)
  - 12th – Jan. 2018 in Yokohama
  - 13th – Jan. 2020 in Krung Thep (Thailand)
  - 14th – Feb. 2022 on-line

Past activities of POPsEA project

- Implementation of background air monitoring by active sampling
  - Cooperative monitoring **(C)**
    - Japan dispatch the engineer to assist to implement ambient air sampling at the background sites in member countries and the collected samples are taken to Japanese laboratory and analysed.
    - The obtained monitoring data are reported to the corresponding countries as their own data.

Past activities of POPsEA project

- Implementation of background air monitoring by active sampling
  - Individual **(I)** and Super-site **(S)** monitoring
    - Whole procedures of POPs monitoring are implemented individually by the countries.
    - The monitoring interval is decided in accordance with the capacity of the country.
    - Monthly monitoring **(M)** or quarterly monitoring **(Q)**

Past activities of POPsEA project

Country	Site	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	22
Cambodia	Sihanoukville		C		C							C					C
Indonesia	Tangerang	C															
	Berastagi		C														
	Kototabang								C						C		
Japan	Hateruma	I	I	I													
	Hedo				ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM			
ROK	Goisan		I	I	I	I											
	Taean			I	I	I											
	Jeju						ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM			
Lao PDR	Na Kong Koun		C					C						C			
Malaysia	Muda Dam			C		C							C				
Mongolia	Terelj		C	C						C							
Philippines	Baguio		C				C									C	
Thailand	Ayuttaya		C														
	Doi Inthanon			C													
	Khao Yai										C						
Vietnam	Tam Dao	C	C			CSM	CSM		CSQ	CSQ							

POPs monitoring capacity building programme

- The training of the operation for the active air sampling is implemented in the member countries when the POPs sampling is implemented.
- The POPs monitoring capacity building programme is implemented toward the specified laboratories (Core Laboratories) in the member countries for the effective implementation of POPsEA project.
  - Environmental Research Laboratory Service Division, the Philippines
  - National Institute of Dioxins, Thailand
  - Medical Science Laboratory, Thailand
  - Institute of Chemistry and Chemical Technology, Mongolian Academy of Science, Mongolia

Future consideration of POPsEA project

- Existing POPs monitoring activities
- Existing issues to be tackled
- Future POPs monitoring framework
- Consideration on the implementation of passive air monitoring for filling the gap of monitoring interval
- Consideration on the target POPs chemicals for the effective contribution to the Global Monitoring Plan
- Improvement of the capacity building programme

Existing POPs monitoring activities

- The POPs monitoring activities under the POPsEA project are implemented with the following categories.
  - **Super-site monitoring**
  - **Strategic cooperative monitoring**
  - **Cooperative monitoring**

Existing POPs monitoring activities

- The POPs monitoring activities under the POPsEA project are implemented with the following categories.
  - **Super-site monitoring**
    - Japan and Republic of Korea are implementing their individual POPs monitoring monthly at the designated sites by their own budget from 2008 (Japan) and 2010 (ROK).

Existing POPs monitoring activities

- The POPs monitoring activities under the POPsEA project are implemented with the following categories.
  - **Cooperative monitoring**
    - The ambient air sampling is implemented with the dispatched Japanese engineer together in the rest of above countries.
    - Then the collected samples are sent to Japanese POPs monitoring laboratory and the monitoring results are reported to the implementing countries.
    - **The implementation frequency is generally once in 6 or 7 years.**
  - **Strategic cooperative monitoring**
    - Considering the coverage of East-Asia subregion
    - Filling the gap of monitoring data in this sub-region

Existing issues to be tackled

- The monitoring sites should represent East Asia sub-region effectively.
- The trend of POPs concentration is difficult to be evaluated with less frequency.
- Appropriate location for the POPs monitoring to grasp the state of POPs contamination and their trends with higher frequency is needed to be considered.
- The monitoring sites with higher frequency should be designated by considering the existing capacity level of POPs monitoring of member countries.

Future POPs monitoring framework

- Following framework for implementing effective POPs monitoring to strengthening the activities of POPsEA project is considered.
  - Super-site monitoring (monthly)
  - Super-site monitoring (once in 3 months)
  - Strategic cooperative monitoring (once in 3 years)
  - Conventional cooperative monitoring (once in 6 or 7 years)

Super-site monitoring (monthly)

- The monthly Super-site monitoring has been implemented at designated following sites.
  - Cape Hedo in Japan
  - Jeju Island in Republic of Korea
- Japan and ROK continue to implement Super-site monitoring by their own budget.

Super-site monitoring (once in 3 months)

- The POPs monitoring is implemented at relatively high concentration in the Philippines and Thailand, at first.
- After improving the Core Laboratories in these countries to enable their implementation of low concentration POPs monitoring, these countries implement higher frequency monitoring at following sites by their own activities.
  - Khao Yai National Park in Thailand
  - Baguio in the Philippines

Strategic cooperative monitoring

- Priority will be given to monitoring at following sites, which are needed to cover the East Asian region. (once in 3 years)
  - Kototabang in Indonesia as low latitude site
  - Terelj in Mongolia as high latitude site
  - Tam Dao in Vietnam as the site near-China

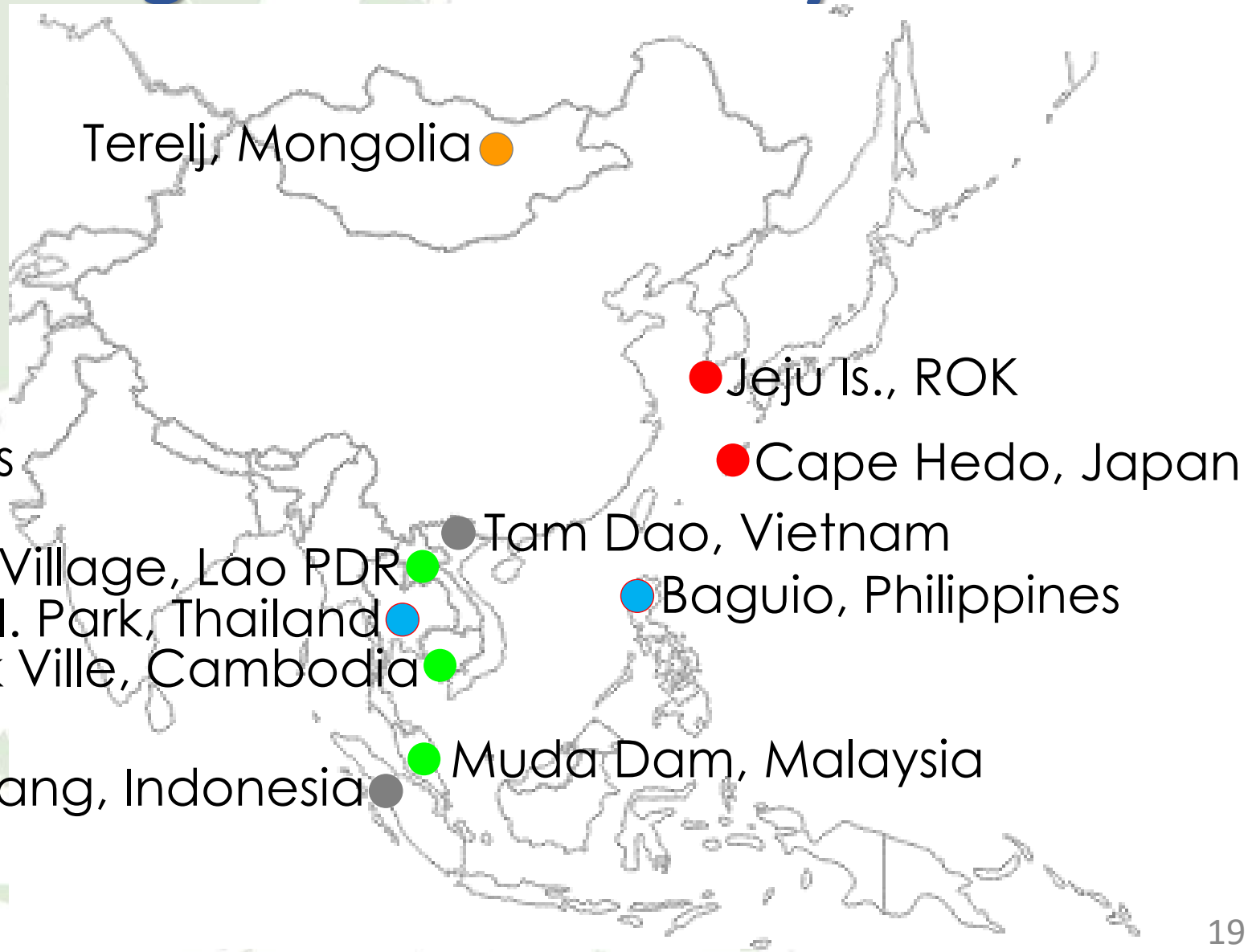
- Monitoring site at Terelj in Mongolia, will be considered to be upgraded to be a Super-site in near future.

Conventional cooperative monitoring

- Lower frequency monitoring will be implemented at the following sites with high-volume air sampling. (once in 6 - 8 years)
  - Muda Dam in Malaysia
  - Na Long Koun Village in Lao PDR
  - Sihanouk Ville in Cambodia
- The implementation of PAS in these sites are also considered to fill the data gap.
- Until Thailand and Philippines can implement higher frequency monitoring, the cooperative monitoring will be implemented in Khao Yai and Baguio as the representative sites in South-East Asia.

Location of monitoring sites – summary

- Super-site: monthly
- Super-site: once in 3 months
  if possible
- Strategic: to be a Super-site
- Strategic: once in 3 years
- Cooperative: once in 6 years



Implementation of POPs monitoring

Considered implementation plan except Japan and ROK

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Thailand		●	☆	☆	☆	☆	☆	☆	☆	☆
Philippines		○	☆	☆	☆	☆	☆	☆	☆	☆
Vietnam	●			○			○			○
Mongolia	▼	●			○			○		−2032○
Indonesia			●			○			○	−2033○
Cambodia				●						●
Lao PDR					●					−2032●
Malaysia						●				−2033●

☆: Sampling and analyses are implemented by their own laboratory
○: Sampling is implemented by the country and analysis is done in Japan
●: Sampling is implemented with dispatched Japanese engineer and analysis is done in Japan
▼: Feasibility study and training for enabling sampling activity by the domestic expert

Implementation of passive air sampling

- Present state of the implementation of passive sampling is trial phase since 2014 in 6 countries.
- The monitoring interval of several countries is once in 6 to 8 years.
- Considering the contribution to the effectiveness evaluation, these monitoring intervals are not enough.
- The POPsEA project will discuss the possibility of the implementation of PAS at the site of existing collaborative monitoring for filling the gap of monitoring frequency.

Implementation of passive air sampling

- Pesticides in legacy POPs including the consideration of replacement of the chemicals.
- When the active sampling is implemented, the PAS is also implemented parallelly. The obtained results should be compared.
- Sampling duration is 3 months.
- The PAS will be implemented at least once between the active sampling interval.

Consideration on target POPs chemicals in POPsEA

- Present target POPs chemicals to be monitored are:
  - aldrin, endrin, dieldrin, heptachlors, chlordanes, hexachlorobenzene, mirex, toxaphenes, DDTs, PCBs. (legacy POPs except dioxins & furans)
- The implementation of hexachlorobuta-1,3-diene monitoring will be discussed in 15th workshop of POPsEA project in the end of 2023.
  - Trial implementation has been done in Na Long Koun Village, Lao PDR and will be implemented in Terelj, Mongolia in 2023.
  - The concentration level of this compounds is slightly increasing in Japan.
- Recognising the significance of PFAS monitoring, the possibility of scope expansion will be discussed in next workshop.

Improvement of capacity building programme

- Fundamental consideration to organise the infrastructure of laboratory eliminating contamination and managing the standard solution
- Not only improving the operation of POPs monitoring but also strengthening the knowledge of the meaning and principle of whole procedures
- Operating procedures of sampling, sample preparation, analysis, data confirmation and QA/QC
- Harmonisation of monitoring procedures
  - Japan, Republic of Korea and GMP guidance document

Improvement of capacity building programme

- Consideration of the availability of GC/triple-stage quadrupole mass spectrometer for the POPs monitoring
  - The instruments have already been installed in the designated Core Laboratories including Mongolian Academy of Science.
  - Optimisation of operating conditions, such as collision energy for each POPs chemical, must be considered.

Thank you for your kind attention!

Collaboration between University of Queensland and University of South Pacific

Vincent Lal and team (USP)
Jochen Mueller and team (UQ)

Aspects of collaboration

- History
- Training
- GMP2 – Water – Air – ‘other matrices’
- Capacity building - lessons learned
- The future

History of collaboration

USP Director Bill Aalbersberg visits QAEHS

Vincent Lal – does a Masters in our team at UQ on POPs in Fiji

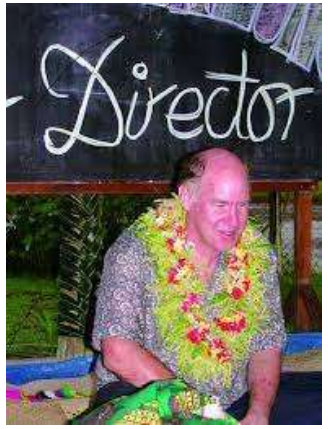
Vincent start PhD at UQ (with Prof Jack Ng)

We source a 2nd hand LC-MSMS for USP and develop a plan

First visit (un-funded) of one of QAEHS analyst at USP March 23

2000 2005 2010 2015 2020 2025

----GMP 2----



Covid throws a huge spanner to our set-up and training of LC-MS

Establish wastewater sampling…

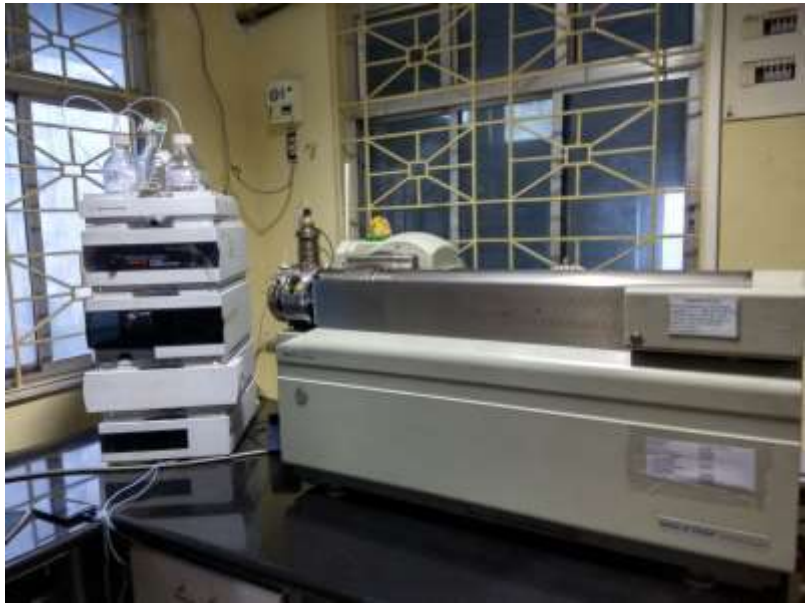
Training

- Masters and PhD at Uni Qld → extensive training (incl. confidence in method development & data interpretation)

- We have technicians, RAs & Analysts – and service contracts for instruments → we get instant help

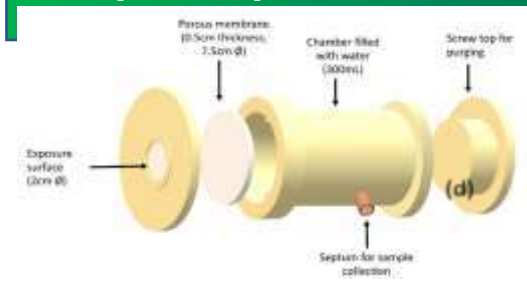
The challenge (and our ambition):

Can we establish a sustainable LC-MSMS capability at USP
(what will it take to do that → what will we learn from that)



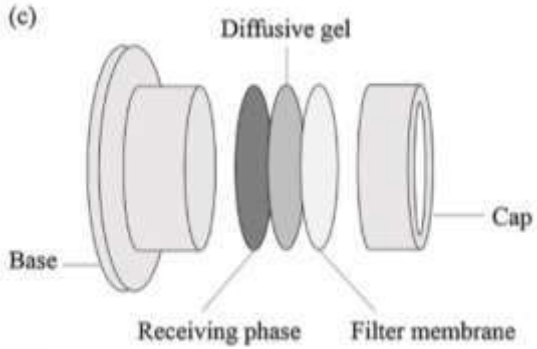
Monitoring chemicals in water

Super polar/small ionic ---> Polar --- > Nonpolar

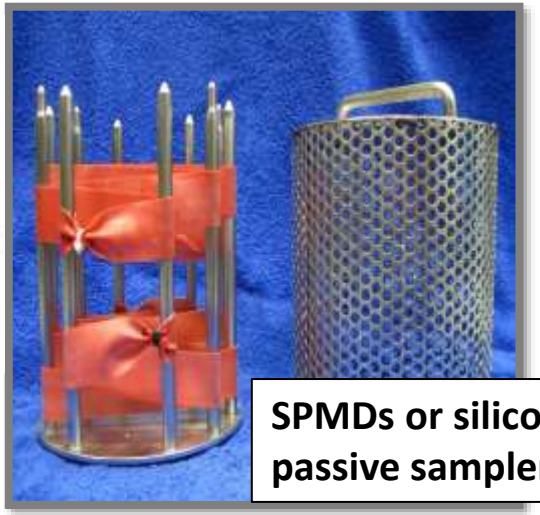


Dilution sampler

MPE sampler for PFAS & glyphosate



POCIS, DGT, Chemcatcher etc….



SPMDs or silicon rubber passive sampler

Very polar chemicals (no good sorbents)

Artificial sweeteners or alcohol metabolite ethylsulfate

Ok water solubility (ie Kow > 10 to 10^3 (or even to 10^4)

--> low ng to ug/L

Drugs, herbicides, some PFAS

Low to super low solubilities (ie Kow > 10^3 often 10^6 or greater)

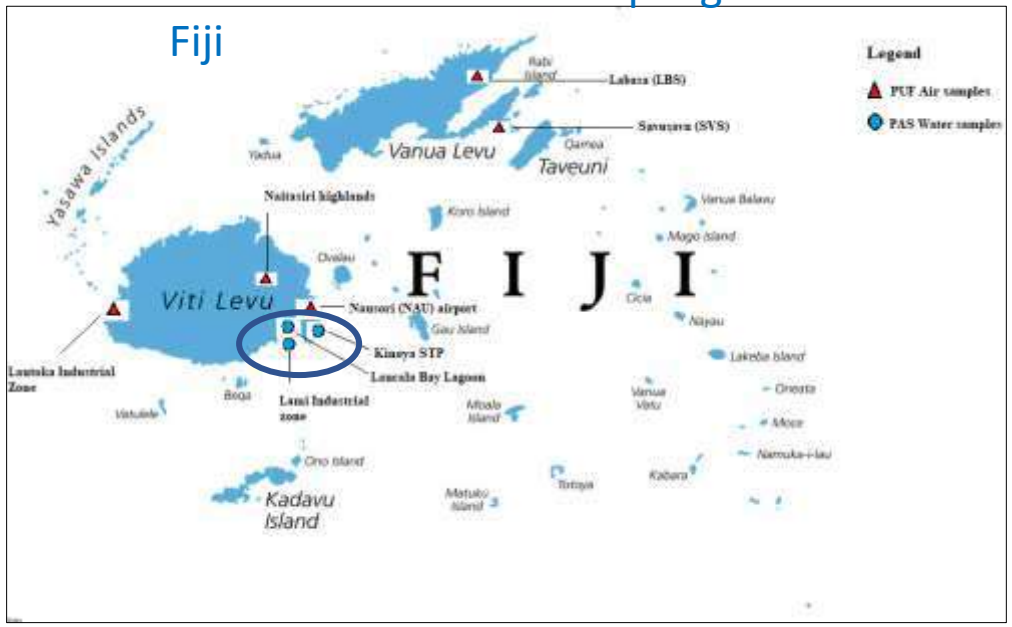
--> Very low concentrations in water

Most POPs, dioxins, PAHs, PCBs, BDEs.

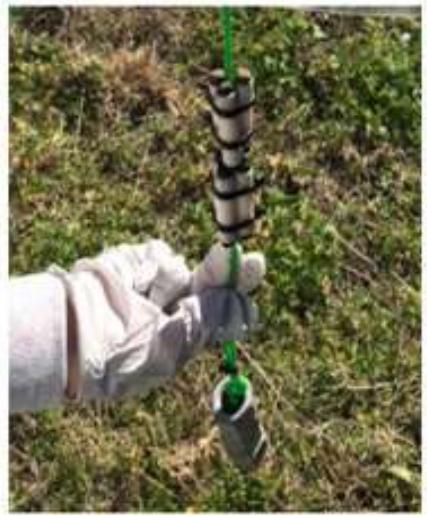
PFAS monitoring in Fiji using passive samplers

Provided MPE - PFAS passive samplers to FIJI in late 2020 – deployed in surface water and wastewater treatment plant sites

PFAS Passive water sampling sites in Fiji



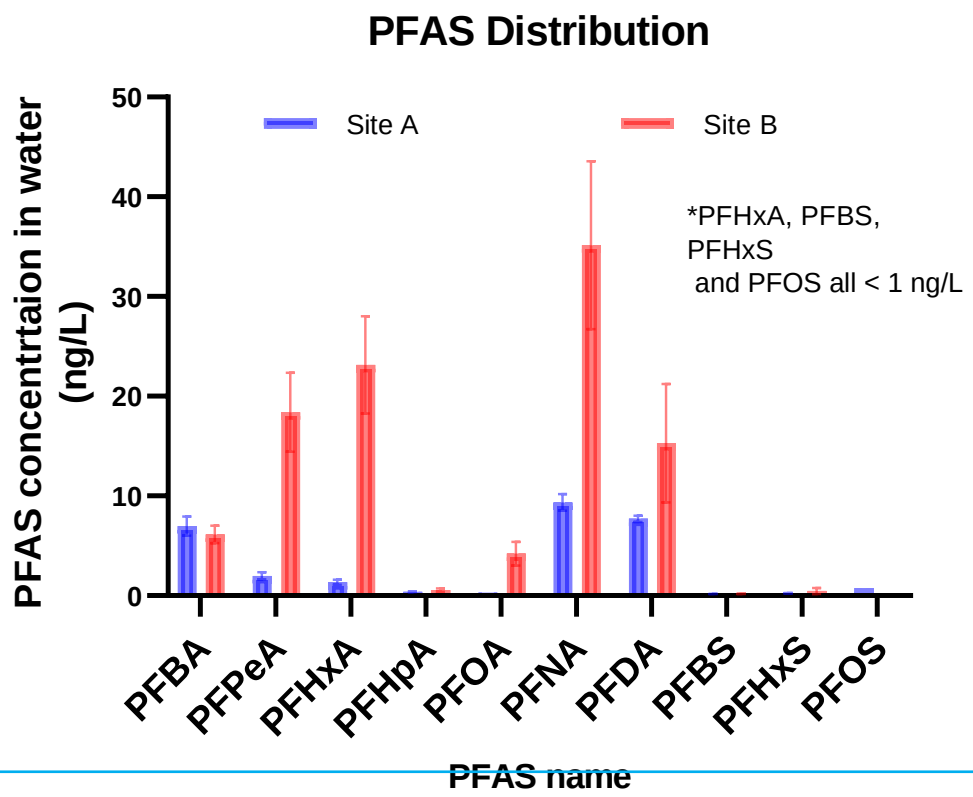
PFAS passive water samplers

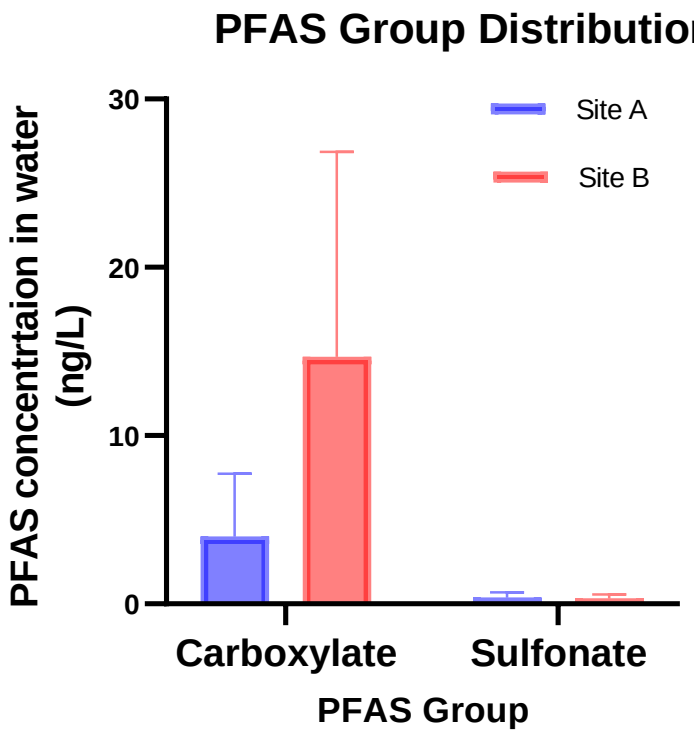


Sampling period – 4 weeks in 2020 and 2021

Kaserzon et al (2018)

PFAS distribution in Laucala Bay Lagoon -Fiji

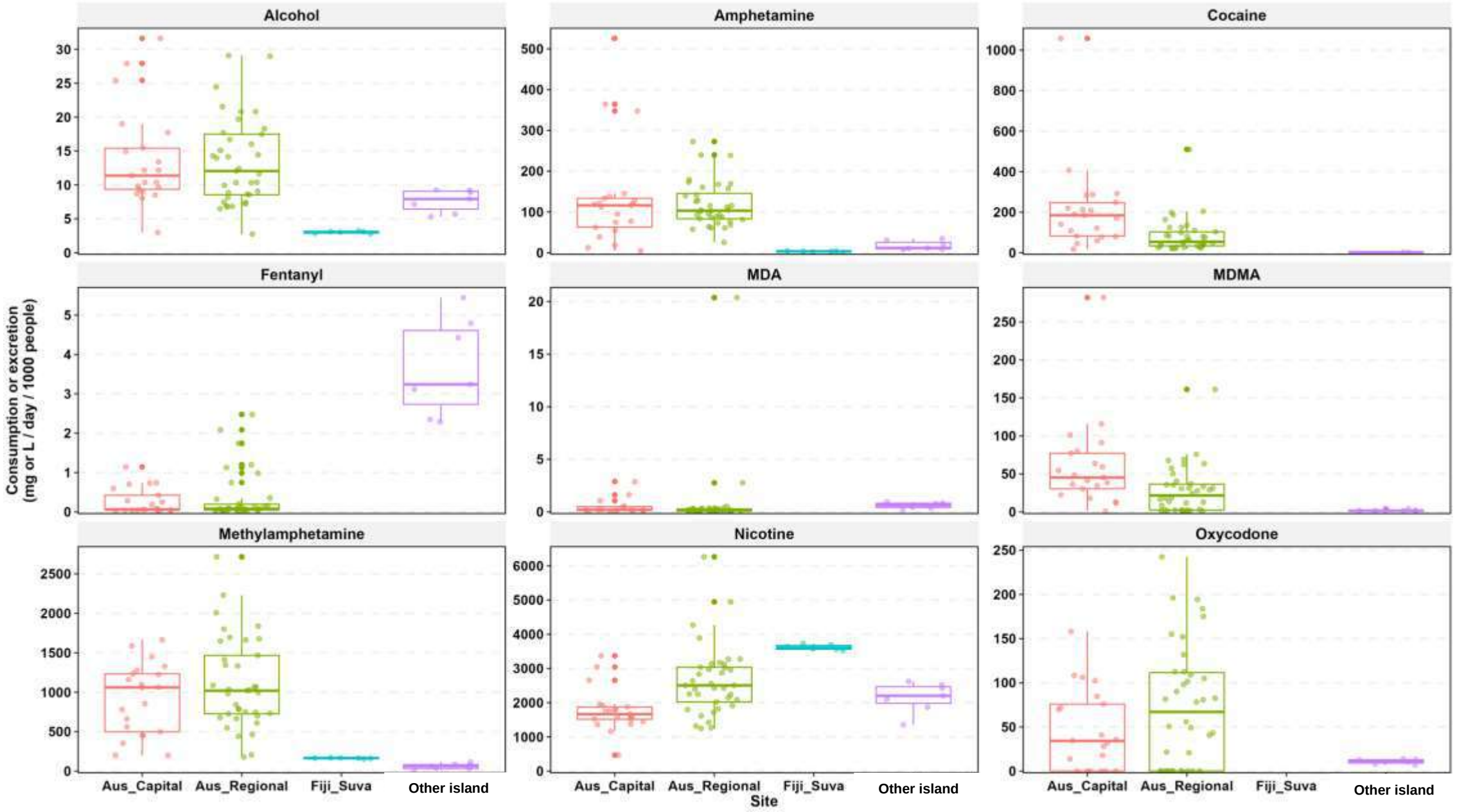




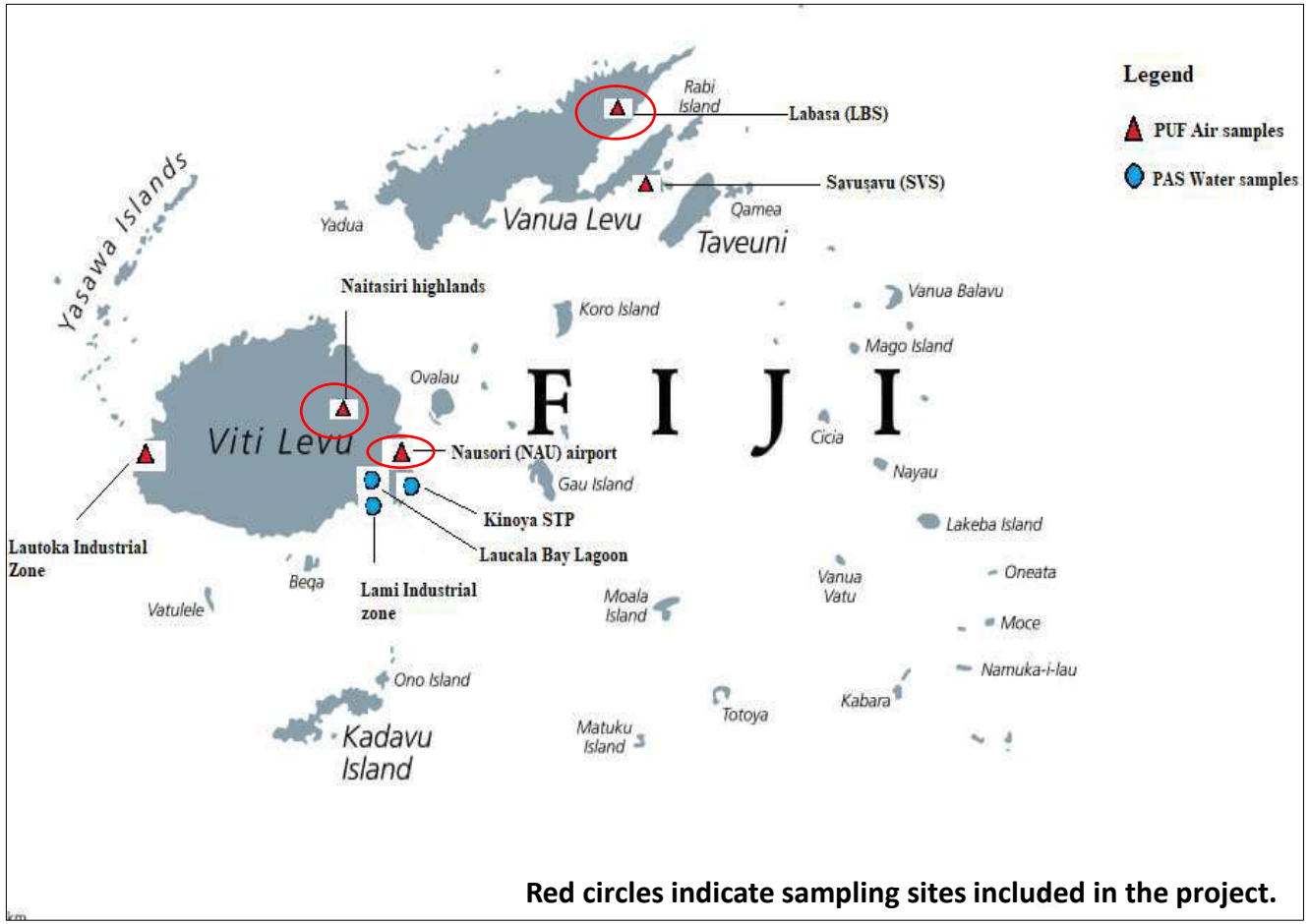
Shipping an autosampler to Fiji to establish better sampling capabilities

Vincent was trained late last year to set up this beast at a wastewater treatment plant in Suva

And results from Fiji

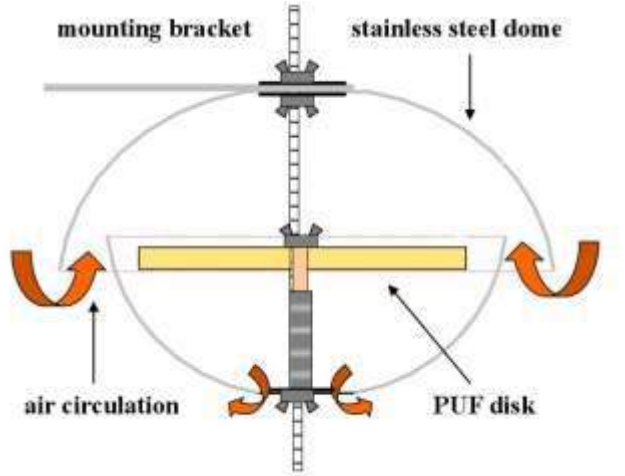


Passive air sampling sites in Fiji



Red circles indicate sampling sites included in the project.

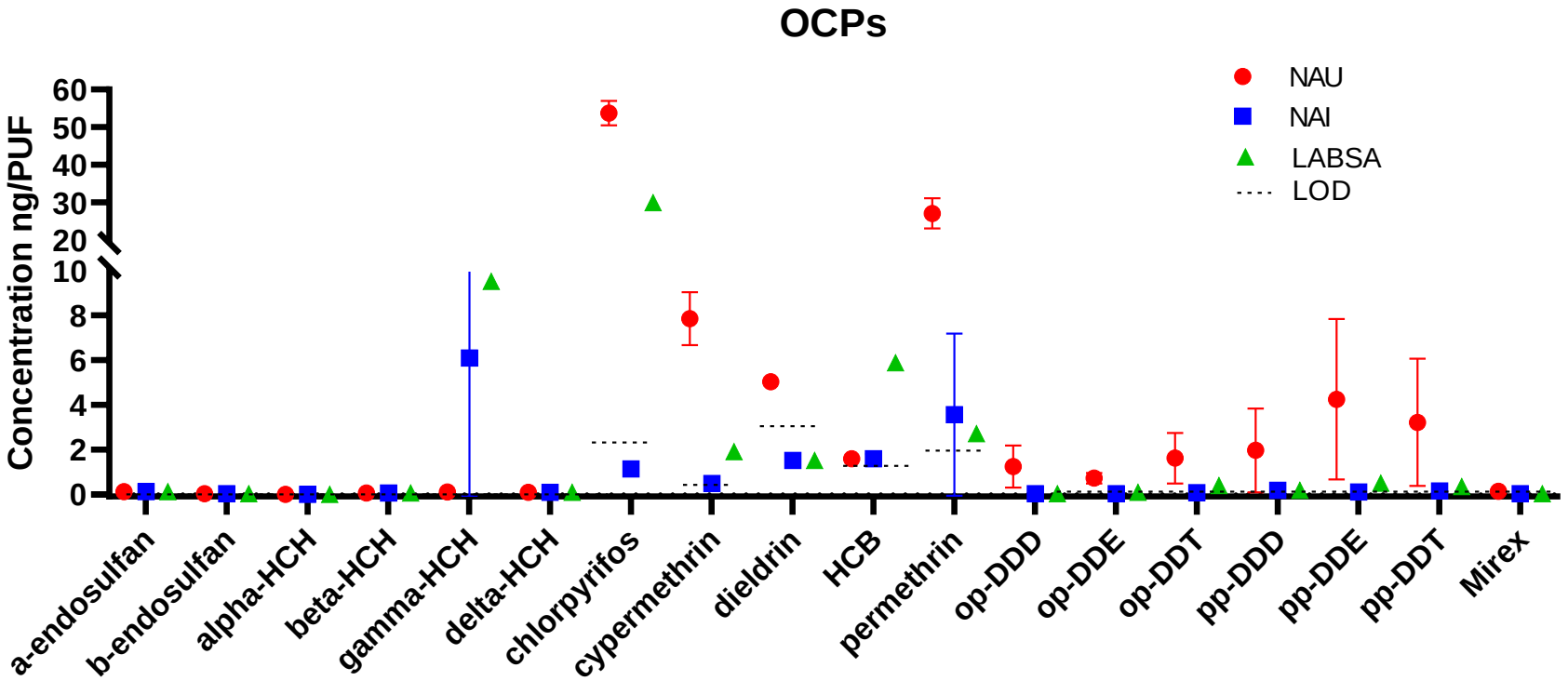
Five sites deployed but only 3 sites received and analysed so far – all from Viti Levu (NAU (airport) – NAI (highlands) and LABSA near sugar cane mill)
Sampling period – 3 months in 2020/2021



POPs and other emerging contaminants analysed:

- Polychlorinated biphenyls (PCB)
- Polychlorinated naphthalene (PCN)
- Polybrominated diphenyl ethers (PBDE)
- Organic chlorinated pesticides (OCPs)
- Polycyclic aromatic hydrocarbon (PAHs)
- Organophosphate flame retardants (OPFRs)
- Selected novel brominated flame retardants (BFRs)

OCPs in air at Fiji sites (ng/PUF)



- High(er) abundance of chlorpyrifos, cypermethrin, permethrin, dieldrin and DDTs in some sites
- ∑DDTs were low compared to the previously reported values for the Pacific Islands[a,b]

[a] Bogdal, C. (2012). Report on passive air sampling under the global monitoring plan for persistent organic pollutants—GMP projects 2010–2011. United Nations Environment Programme, Division of Technology, Industry, and Economics.
[b] Leslie, H. A., van Bavel, B., Abad, E., & De Boer, J. (2013). Towards comparable POPs data worldwide with global monitoring data and analytical capacity building in Africa, Central and Latin America, and the South Pacific. Trends in Analytical Chemistry, 46, 85-97.

PFAS in NATIONAL samples…

				Sailfish							Walu			Albacone	Skip Jack		
		LOD ng/g	LOQ ng/g	2015	2016	2017	2018	2019	2021	2022	2019	2020	2021	2020	2019	2020	2021
Perfluorocarboxylic acids	PFBA	0.01	0.03														
	PFPeA	0.01	0.02														
	PFHpA	0.01	0.02							0.06				0.07			
	PFHxA	0.01	0.03														
	PFOA	0.02	0.05							0.26				0.15			
	PFNA	0.01	0.04	0.06	0.04					0.18				0.19			
	PFDA	0.01	0.05		0.29		0.13	0.12		0.28	0.16	0.05		2.67			
	PFUnDA	0.01	0.03														
	PFDoDA	0.02	0.05														
	PFTriDA	0.01	0.03														
	PFTeDA	0.01	0.02														
	PFHxDA	0.01	0.02														
	PFODA	0.05	0.18														
Perfluorosulfonic acids	PFPrS	0.01	0.03														
	PFBS	0.01	0.02														
	PFPeS	0.01	0.03														
	PFHxS	0.01	0.03							0.04							
	PFHpS	0.02	0.06														
	PFOS	0.01	0.05	0.16					0.05						0.60	0.48	1.37
	PFNS	0.01	0.03														
	PFDS	0.01	0.02														
	PFDoDS	0.01	0.04														

Note: Empty cells represent the values <LOD or <LOQ

PFAS in NATIONAL samples… (Fish)

- Levels near LOD/LOQ (sub ng/g)

➔ Very difficult to measure temporal (or other) trends…

				Sailfish							Walu			Albacone	Skip Jack		
		LOD	LOQ	2015	2016	2017	2018	2019	2021	2022	2019	2020	2021	2020	2019	2020	2021
Perfluorocarboxylic acids	PFBA	0.01	0.03														
	PFPeA	0.01	0.02														
	PFHpA	0.01	0.02							0.06				0.07			
	PFHxA	0.01	0.04														
	PFOA	0.02	0.05							0.26				0.15			
	PFNA	0.01	0.04	0.06	0.04					0.18				0.19			
	PFDA	0.01	0.05		0.29		0.13	0.12		0.29	0.16	0.05		1.67			
	PFUnDA	0.01	0.04														
	PFDoDA	0.02	0.05														
	PFTrDA	0.01	0.03														
	PFTeDA	0.01	0.02														
	PFHxDA	0.01	0.02														
	PFODA	0.05	0.18														
Perfluoroalkanesulfonic acids	PFPrS	0.01	0.03														
	PFBS	0.01	0.02														
	PFPeS	0.01	0.03														
	PFHxS	0.01	0.03							0.04							
	PFHpS	0.02	0.06														
	PFOS	0.01	0.05	0.16					0.05						0.43	0.48	1.37
	PFNS	0.01	0.03														
	PFDS	0.01	0.02														
	PFDoDS	0.01	0.04														

➔ Good to know but I would not put too much effort in expanding this (unless there is a good hypothesis)

Capacity building

USP has capacity to collect samples…
(although everybody is busy)

UQ (and others) are more than happy to train … and try to facilitate sampling and sample shipment (not trivial)

Analytical work can be decided (Jochen's thought)

The Australian Environmental Specimen Bank (AESB) is also available for archiving samples from the Pacific (within reason)

How do you ruin a functioning analytical instrument???

How do you ruin a functioning analytical instrument???

By not using it

Key to sustainability of analytical capability is that it is always needed

GMP implementation is not sufficient for (sustainable) need

→ Other needs for analytical capabilities essential for sustainability

Some more thoughts from Vincent on sustainability

- Develop national sampling activities for core matrices with QAEHS until the next GMP
- Expand sampling sites to account for different land-use (air, water)
- Expand inventory of national samples analysed for POPs at QAEHS
- Develop analytical capacity at USP-IAS for trace contaminants
- Diversify academic research, training and peer mentoring on POPs
- Establish an MoU between USP and UQ (i.e. uniTWIN)
- Sustainable financing from commercialization of new tests at USP IAS lab
- Seeking out Co-investment (financing) opportunities or Trust funds/ philanthropy.

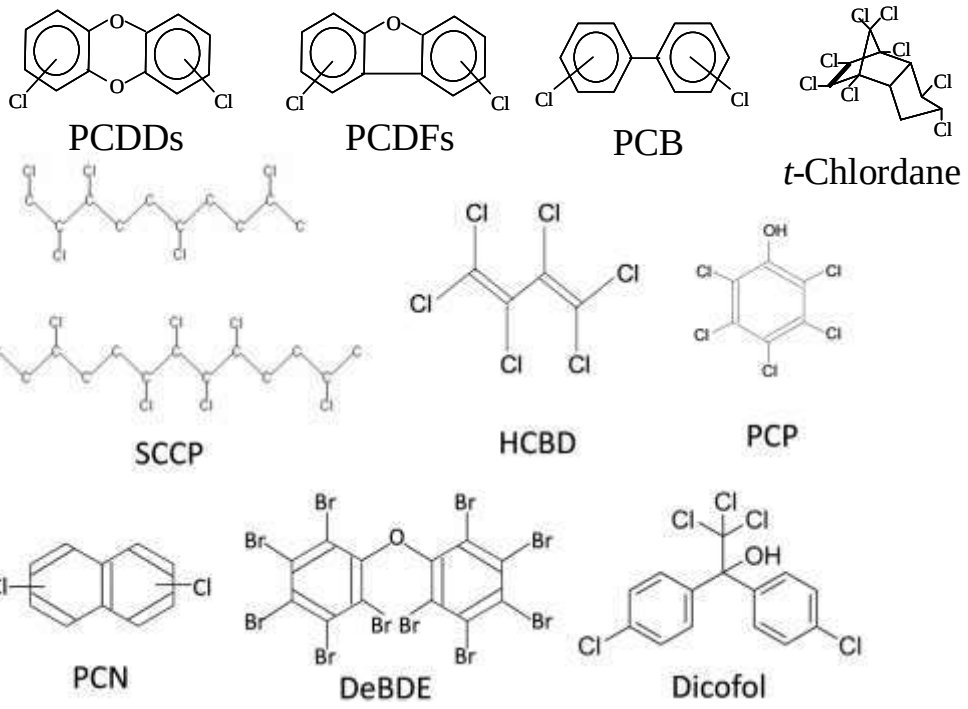
Thx for listening (or not)

Monitoring of POPs in other matrices

Yasuyuki Shibata
Member of GCG, and ROG in Asia-Pacific

Article 16: Effectiveness evaluation by POPs levels in core matrices

POPs



CF_3-$(CF_2)_7$-SO_3^- PFOS

CF_3-$(CF_2)_6$-COO^- PFOA

Core Matrices

Air

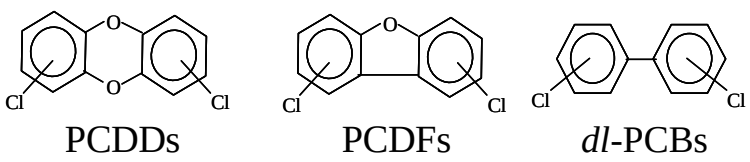
Human samples
* Breast milk
* Blood

Water

POPs levels in other matrices :

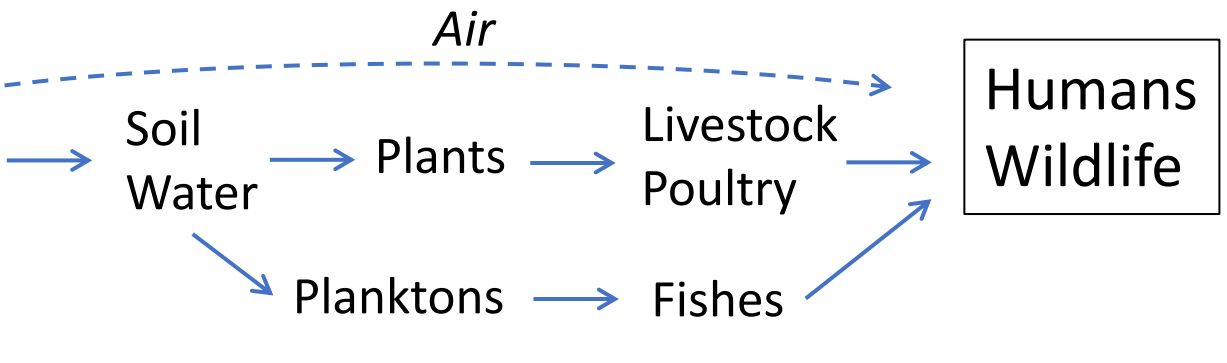
- Understand environmental cycling and accumulation of POPs
- Identify major route of POPs to humans / wildlife
- Wildlife as natural passive samplers

Dioxins
Furans
dl-PCBs



Sources

- Incinerators
- Paper breaching
- Metal refinery
- By-products



Dioxins monitoring in Japan

<Sampling sites (FY2020)>

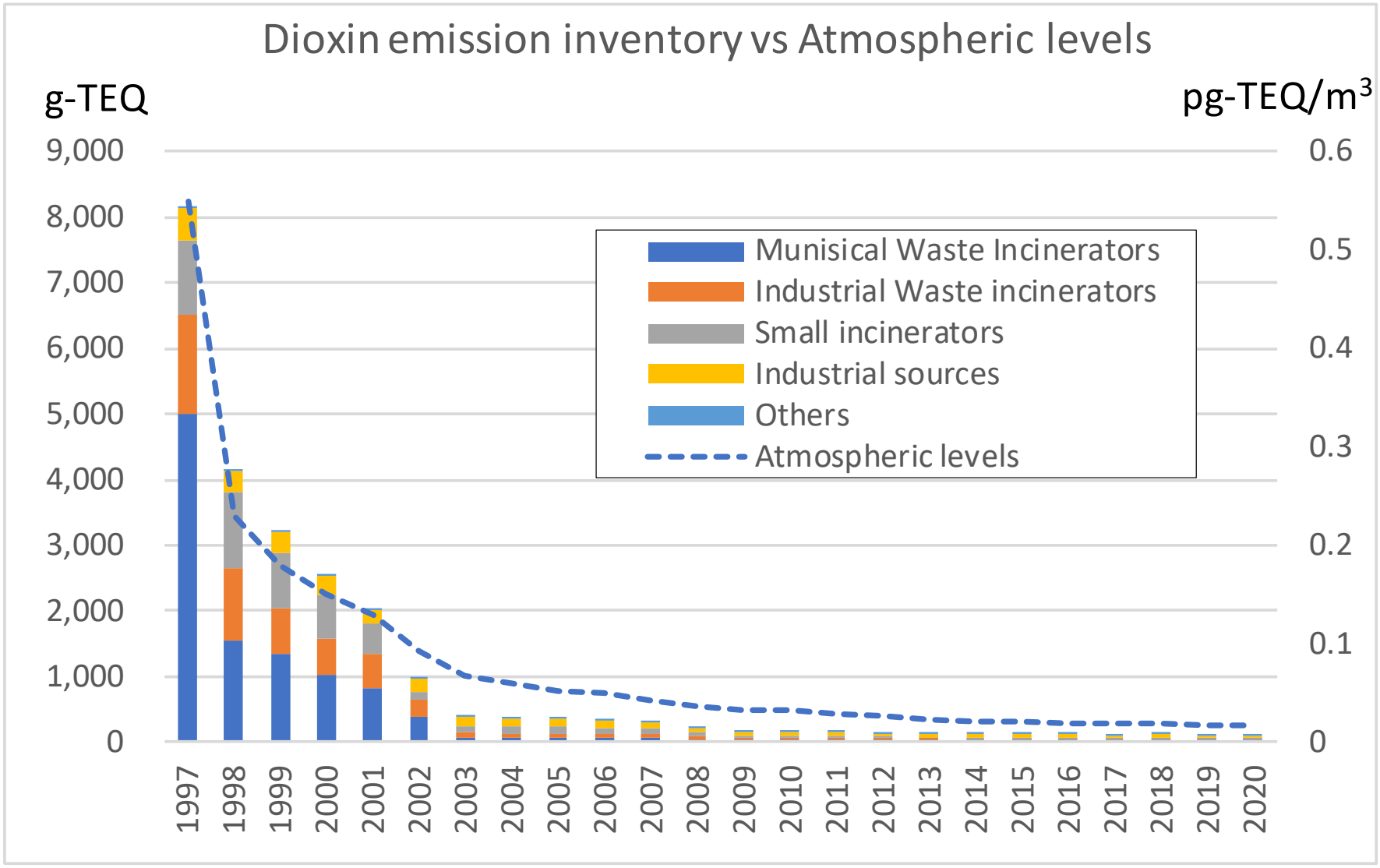
	Average	Min	Max	
Air: 614 sites	0.017	0.0025	0.33	pg-TEQ/m^3
Water: 1,411 sites	0.18	0.013	3.6	pg-TEQ/L
Sediments: 1,178 sites	6.5	0.04	530	pg-TEQ/g
Ground water: 493 sites	0.054	0.0087	1.7	pg-TEQ/L
Soil: 773 sites	3.8	0	960	pg-TEQ/g

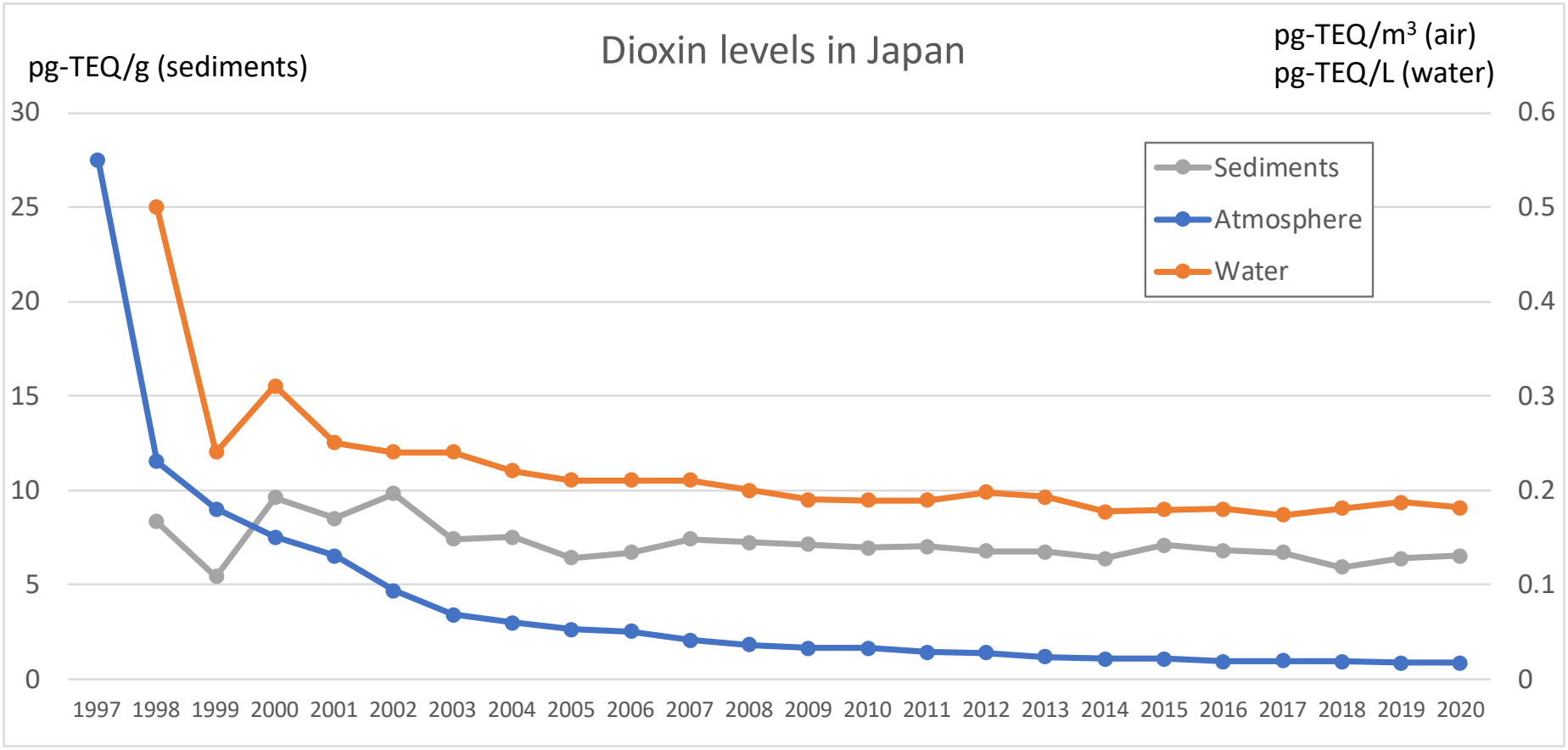
Dioxins: transported through air and water mainly as particle-bound
-> need many sampling sites to reveal national pollution status

Inventory program: identify and categorize major emission sources, and estimate total emissions by analyzing selected sources in each category

Both air dioxin levels and emission inventories to the air have been decreasing similarly, showing reliability of both inventory data and monitoring activities.

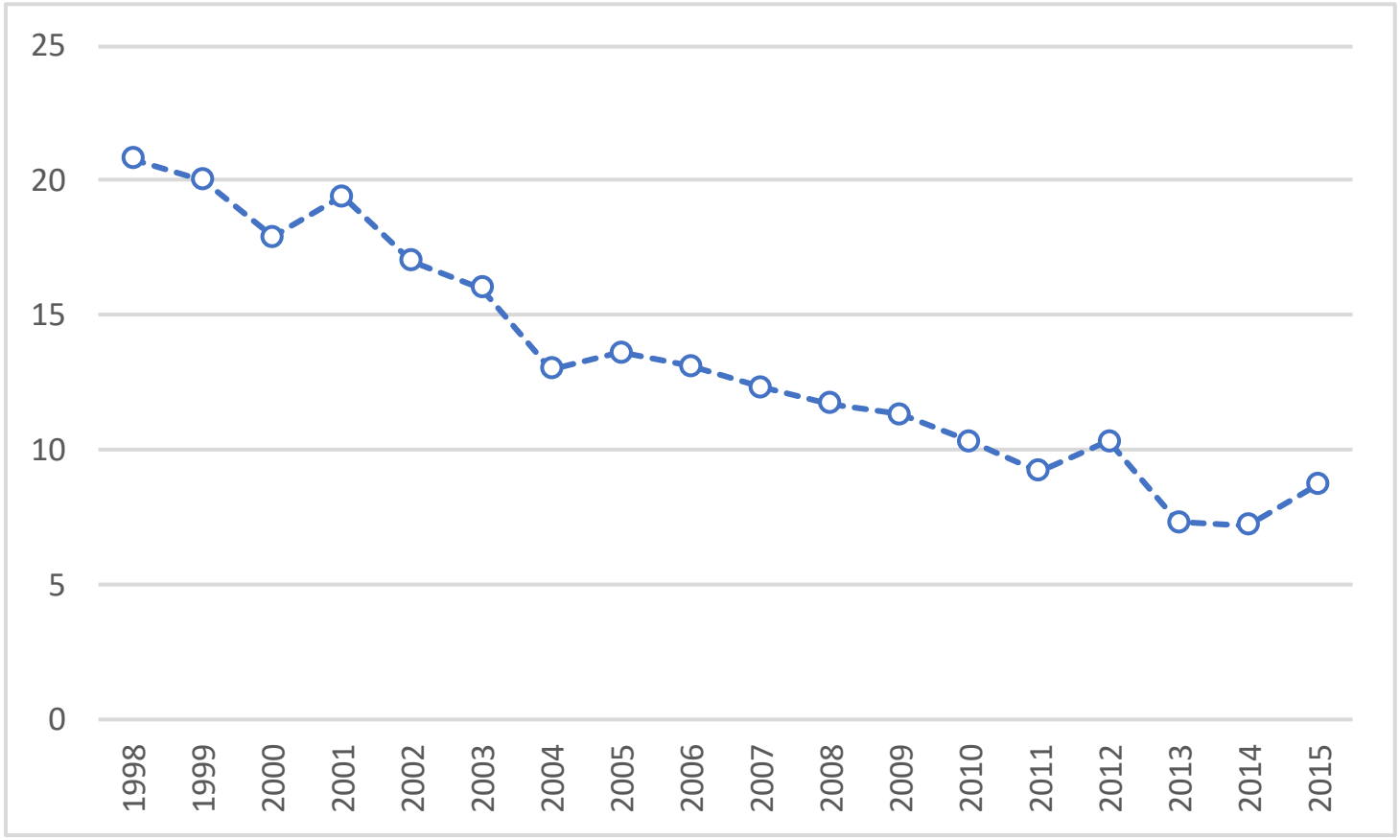
Inventory program is expanded to include other unintentionally produced POPs, i.e., PCB, PCN, HCB, PeCB and HCBD.


Dioxin emission inventory vs Atmospheric levels
g-TEQ
pg-TEQ/m3
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0.6
0.5
0.4
0.3
0.2
0.1
0
Munisical Waste Incinerators
Industrial Waste incinerators
Small incinerators
Industrial sources
Others
Atmospheric levels
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020



Air levels decreased rapidly while water levels decreased more slowly.
Sediment levels show only a slight decreasing trend.
(data from 'Dioxin monitoring report FY2020', Ministry of the Environment)

pg-TEQ/g fat



3rd Asia-Pacific Regional Report (2021)

Changes in dioxin levels in Japanese breast milk (unit: pg-TEQ/g fat)

National monitoring of POPs (except dioxins) in Japan in FY2020
- “Chemicals in the Environment, 2021” (KUROHON in Japanese) -

Monitored media	Numbers of local communities	Numbers of target chemicals (groups)	Numbers of monitored sites (or areas)	Numbers of samples at a monitored site (or area)
Surface water	41	11	46	1
Sediment	45	11	58	1*
Wildlife (bivalves)	3	11	3	1**
Wildlife (fish)	17	11	18	1**
Wildlife (birds)	2***	11	2***	1**
Air (warm season)	34	11	37	1 or 3****
All media	57	11	118***	

Water

Sediment

Wildlife

Air

Temporal trend of selected POPs in surface water (FY2002 to 2020)

No	Name	Surface water	River area	Lake area	Mouth area	Sea area
[1]	PCB	↘ Half-life : 7 years [6 ~ 9 years]	↘ Half-life : 6 years [5 ~ 9 years]	↘ Half-life : 7 years [5 ~ 10 years]	↘ Half-life : 11 years [8 ~ 18 years]	-
[2]	HCB	↘ Half-life : 12 years [10 ~ 16 years]	↘	-	↘ Half-life : 9 years [7 ~ 11 years]	⌐
[7]	*cis*-Chlordane	↘ Half-life : 8 years [6 ~ 13 years]	↘ Half-life : 7 years [5 ~ 12 years]	-	↘	↘ Half-life : 7 years [6 ~ 9 years]
	trans-Chlordane	↘	-	-	-	-
	Oxychlordane	-**	⌐	-**	-	-**
	cis-Nonachlor	-	↘	-	-	-
	trans-Nonachlor	↘	↘ Half-life : 11 years [7 ~ 27 years]	-	-	-
[8]	Heptachlor	↘	-**	-**	-**	-**
	cis-Heptachlor epoxide	↘	↘	-	-	↘
	trans-Heptachlor epoxide	-**	-**	-**	-**	-**
[15]	PFOS	-	-	↘ Half-life : 13 years [8 ~ 25 years]	-	-
[16]	PFOA	↘	-	-	↘ Half-life : 7 years [5 ~ 13 years]	-
[17]	PeCB	-	-	-	-	-

Temporal trend of selected POPs in sediments (FY2002 to 2020)

No	Name	Sediment	River area	Lake area	Mouth area	Sea area
[1]	PCB	↘ Half-life : 19 years [14 ~ 35 years]	↘ Half-life : 15 years [10 ~ 25 years]	-	-	↘ Half-life : 21 years [15 ~ 33 years]
[2]	HCB	↘ Half-life : 19 years [13 ~ 33 years]	↘ Half-life : 12 years [8 ~ 20 years]	-	-	-
[7]	*cis*-Chlordane	↘ Half-life : 9 years [7 ~ 13 years]	↘ Half-life : 8 years [6 ~ 12 years]	-	↘ Half-life : 8 years [6 ~ 13 years]	↘ Half-life : 9 years [7 ~ 13 years]
	trans-Chlordane	↘ Half-life : 13 years [10 ~ 19 years]	↘ Half-life : 10 years [8 ~ 15 years]	-	↘	↘
	Oxychlordane	⌐	-	-**	⌐	-**
	cis-Nonachlor	↘ Half-life : 17 years [13 ~ 27 years]	↘ Half-life : 11 years [9 ~ 16 years]	-	-	↘ Half-life : 18 years [14 ~ 25 years]
	trans-Nonachlor	↘ Half-life : 13 years [10 ~ 19 years]	↘ Half-life : 12 years [9 ~ 20 years]	-	↘ Half-life : 11 years [8 ~ 18 years]	↘ Half-life : 13 years [9 ~ 22 years]
[8]	Heptachlor	↘	↘	-**	⌐	-**
	cis-Heptachlor epoxide	⌐	⌐	-*	-	↘
	trans-Heptachlor epoxide	-**	-**	-**	-**	-**
[15]	PFOS	↘	-	-	↘	↘ Half-life : 8 years [6 ~ 13 years]
[16]	PFOA	↘	↘	-	↘ Half-life : 5 years [4 ~ 6 years]	-
[17]	PeCB	-	-	-	-	↘

Temporal trend of selected POPs in wildlife (FY2002 to 2020)

No	Name	Bivalves	Fish
[1]	PCB	↘ Half-life : 15 years [9 ~ 33 years]	↘
[2]	HCB	-	-
[7]	*cis*-Chlordane	↘	-
	rans-Chlordane	-	-
	Oxychlordane	-	↘
	cis-Nonachlor	↘	-
	trans-Nonachlor	↘	-
[8]	Heptachlor	-**	↘
	cis-Heptachlor epoxide	-	-
	trans-Heptachlor epoxide	-**	-**
[15]	PFOS	↘	-
[16]	PFOA	↘	↘
[17]	PeCB	↘	-*

Temporal trend of selected POPs in air (FY2002 to 2020)

No	Name	Air
		Warm season
[1]	PCB	↘ Half-life : 14 years [10 ~ 23 years]
[2]	HCB	-
[7]		
	cis-Chlordane	↘ Half-life : 12 years [10 ~ 14 years]
	trans-Chlordane	↘
	Oxychlordane	↘ Half-life : 16 years [12 ~ 25 years]
	cis-Nonachlor	↘
	trans-Nonachlor	↘ Half-life : 13 years [10 ~ 18 years]
[8]		
	Heptachlor	↘ Half-life : 9 years [7 ~ 11 years]
	cis-Heptachlor epoxide	↘ Half-life : 16 years [14 ~ 19 years]
	trans-Heptachlor epoxide	↘
[15]	PFOS	↘ Half-life : 22 years [15 ~ 38 years]
[16]	PFOA	-
[17]	PeCB	-

Environmental Specimen Bank (ESB) (Chapter 8, GMP Guidance)

Time Capsule Facility at National Institute for Environmental Studies (NIES)

Archive biota (fish, mussel, bird) and sediment samples at -60 C for future retrospective analysis.

- confirmation of previous analytical data
- retrospective analysis of new POPs and other contaminants of emerging concern
- use of archived samples for QA/QC

Use of wildlife as natural passive sampler for POPs monitoring

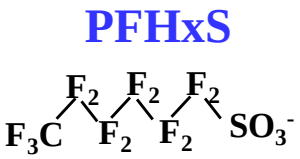
Perfluorochemicals pollution

<POPs under the Stockholm Convention>

PFOS: perfluorooctane sulfonate (2009)

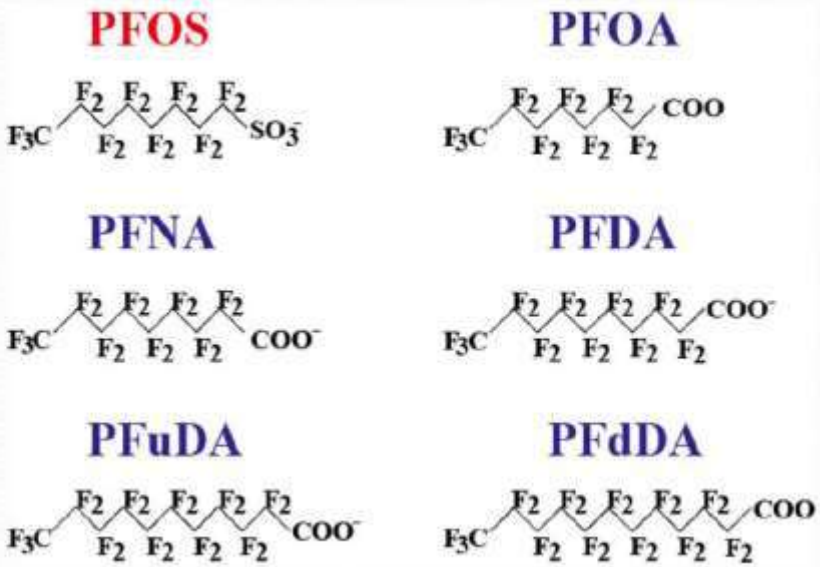
PFOA: perfluorooctanoate (2019)

PFHxS: Perfluorohexane sulfonate (2022)



<POPs candidate: Long chain PFAA>

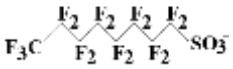
PFNA (perfluorononanoate)
PFDA (perfluorodecanoate)
PFuDA (perfluoroundecanoate)
PFdDA (perfluorododecanoate)

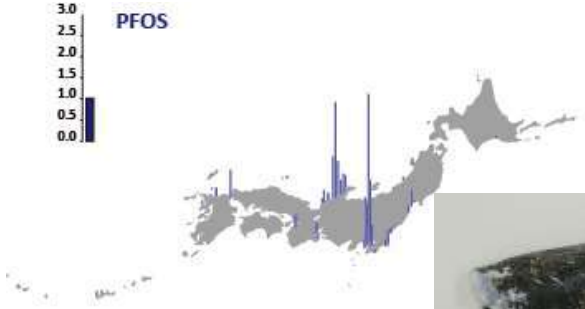


Mussel Watch along the Coastline of Japan (research result at NIES)

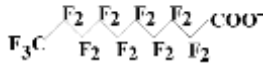
(ng g^{-1})

PFOS

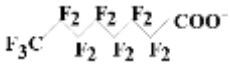




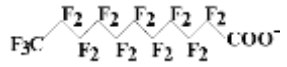
PFDA



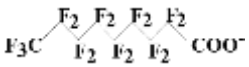
PFOA

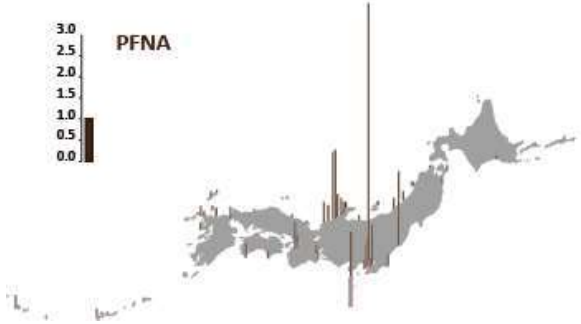


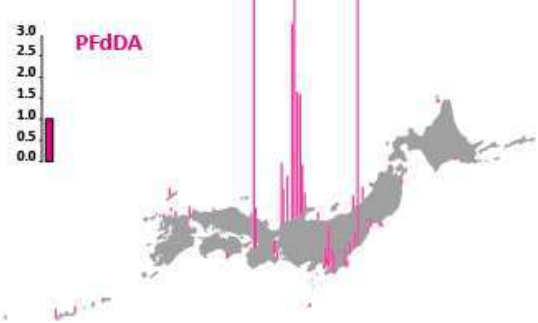
PFuDA



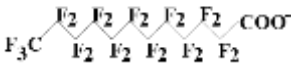
PFNA

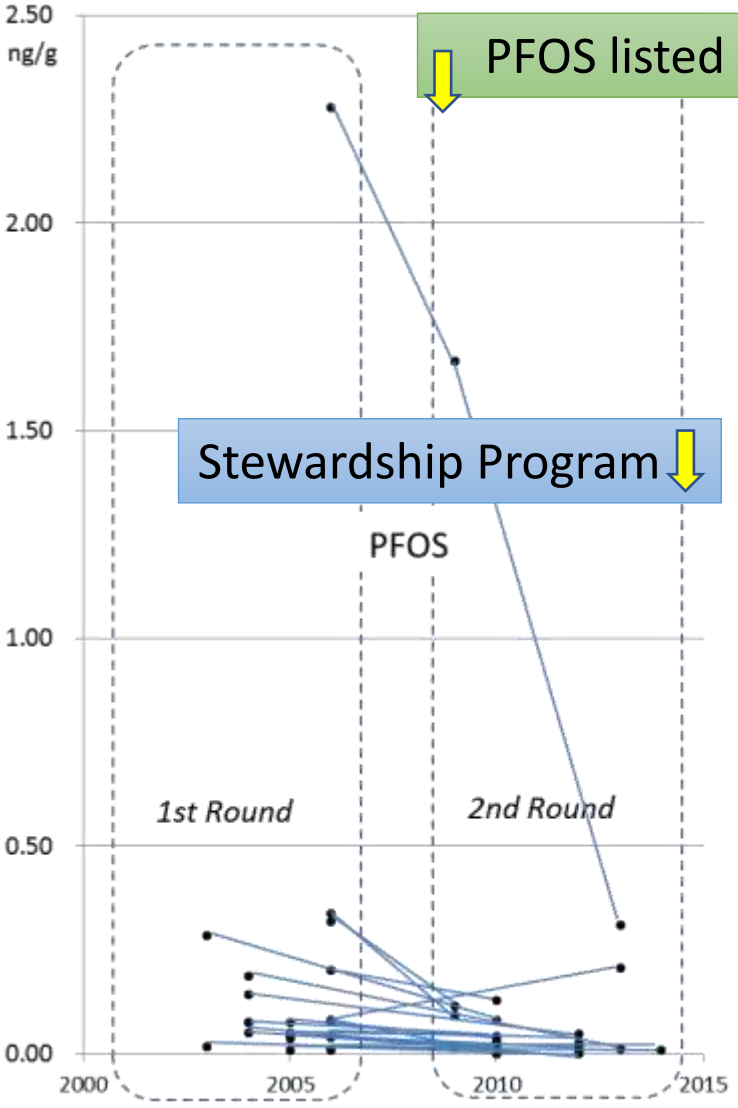




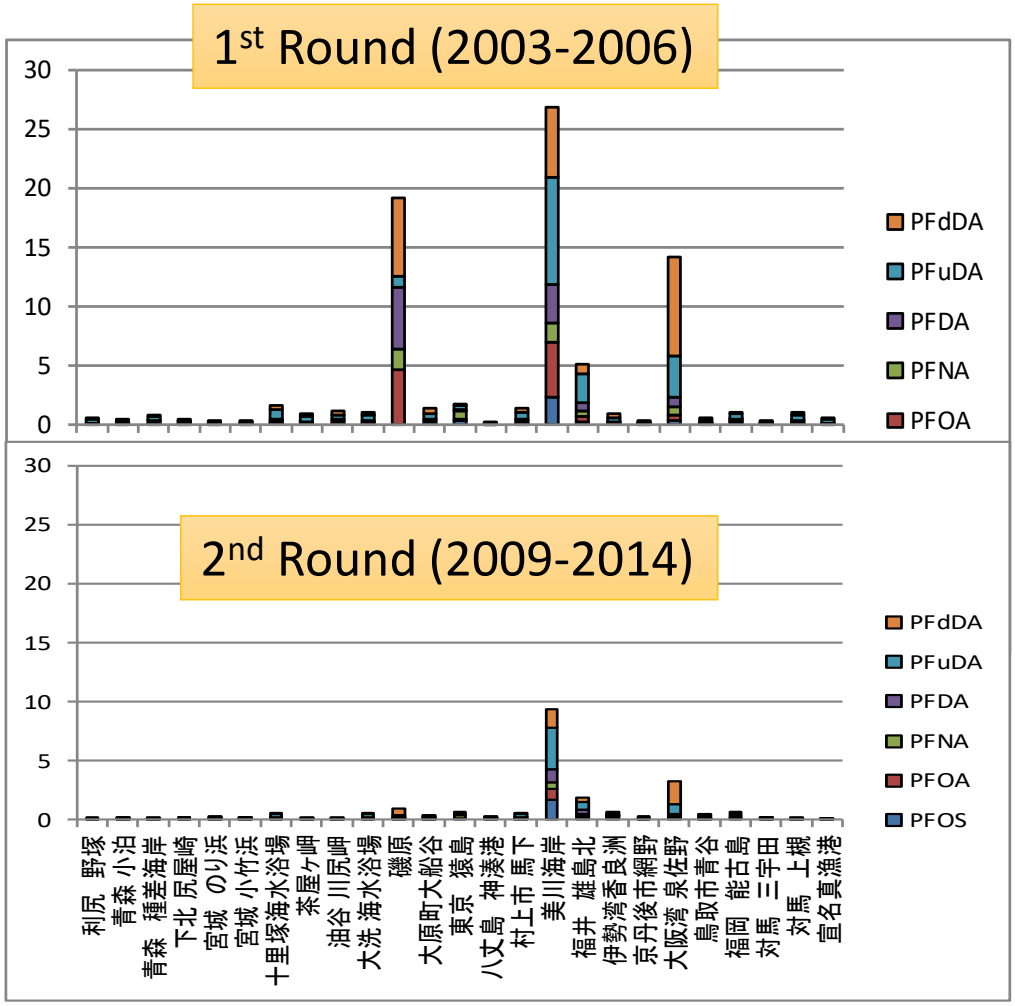


PFdDA



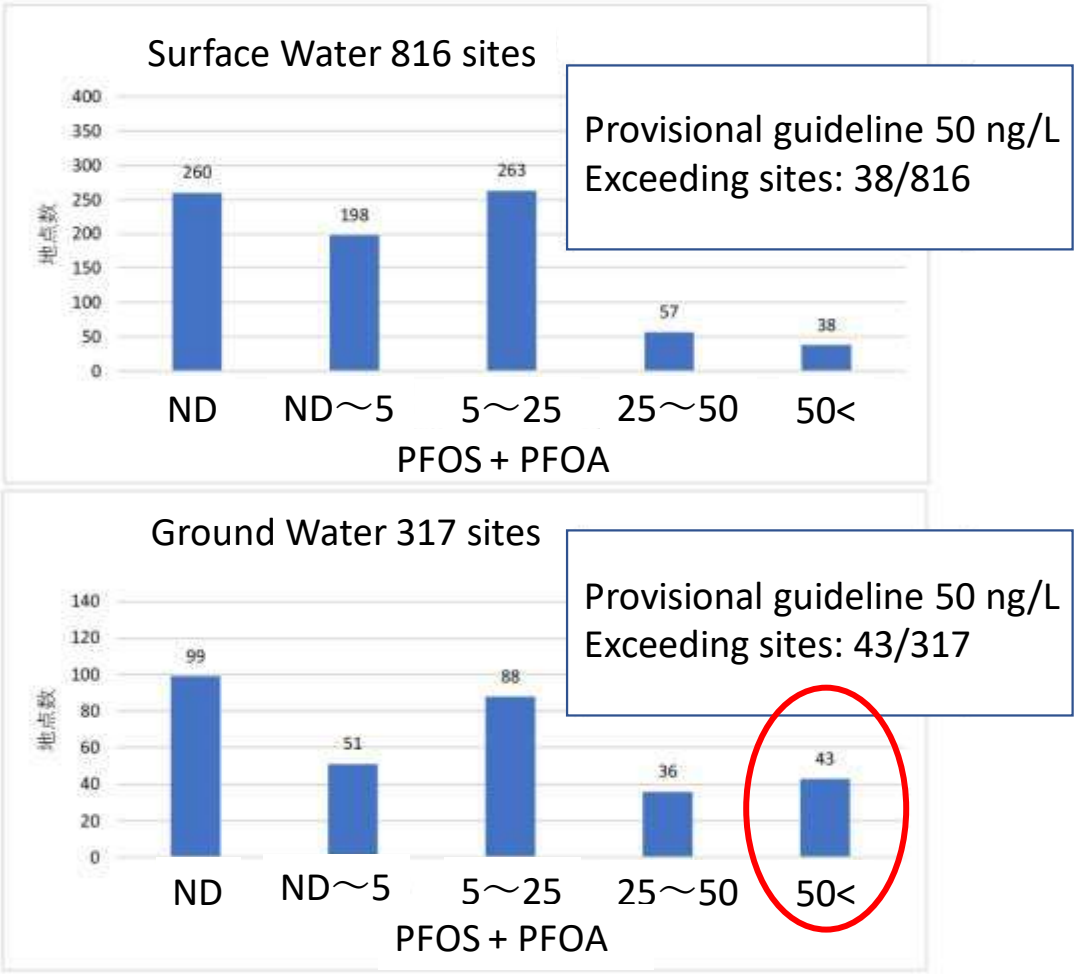


Temporal change of PFOS levels in bivalves



Changes of other PFAAs

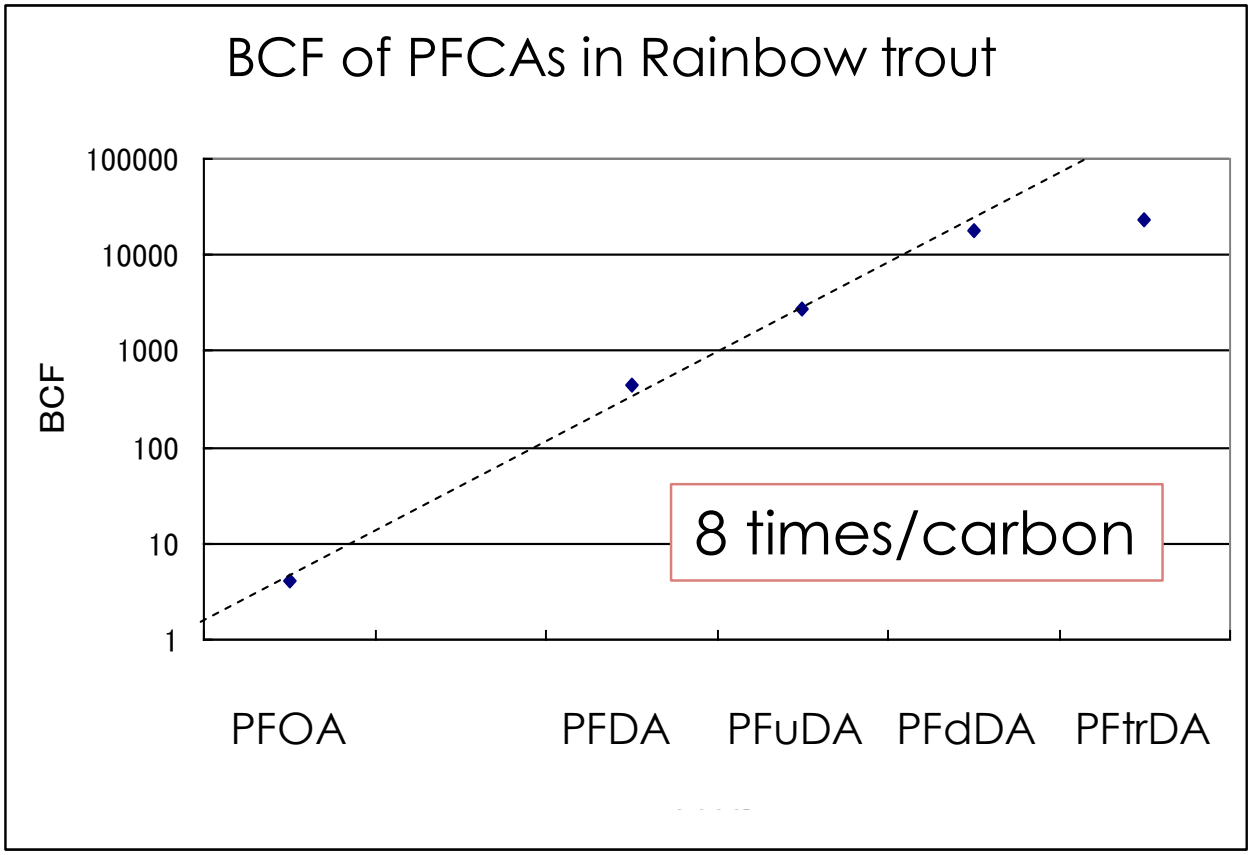
PFOS and PFOA monitoring in Japanese water environment
* Ground water pollution is an issue of concern



Monitoring survey (FY2021); Ministry of the Environment, Japan
(modified from Material 1-2, 2nd Meeting of Expert Committee;
https://www.env.go.jp/content/000123223.pdf)

Challenges in the analysis of long-chain perfluoroalkyl carboxylates

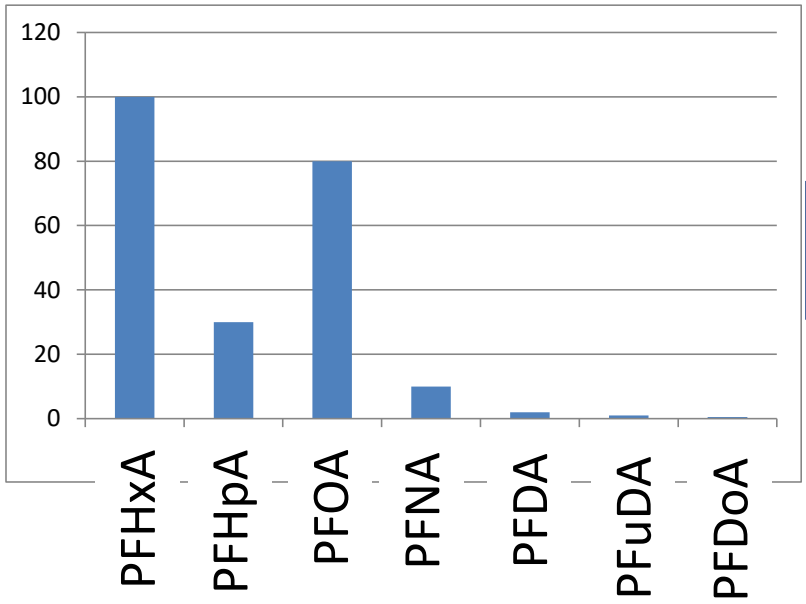
* Large differences in bioaccumulation property among PFCAs



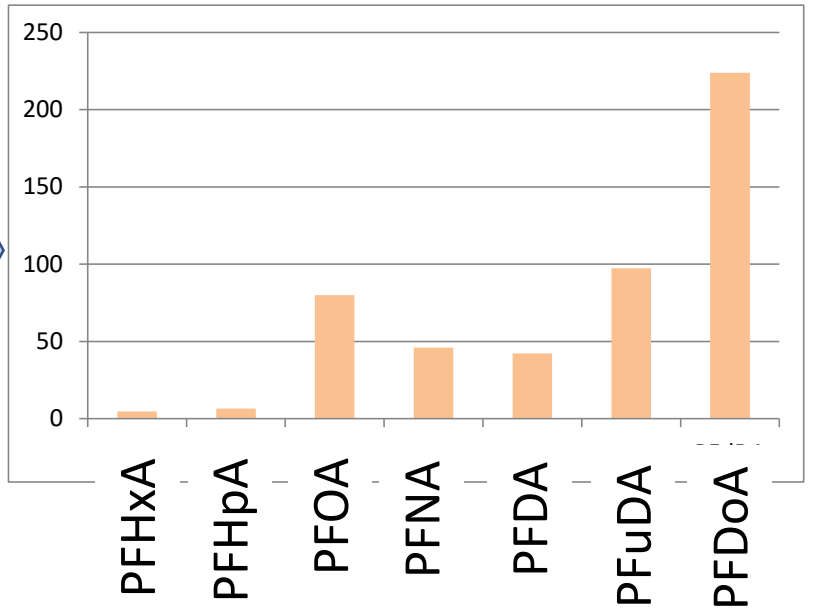
Martin et al., Env. Tox. Chem., 22, 196 (2003)

Water environment: dominated by short-chain PFAAs
Organisms: longer-chain PFAAs are major compounds

Water PFC levels

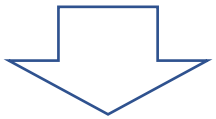


PFC levels in organisms



New types of POPs have been added / proposed to the Stockholm Convention recently.

- Brominated flame retardants (PBDEs, HBCD, HBB etc.)
- Fluorinated surfactants (PFOS, PFOA, PFHxS)
- UV328



- Used as plastic additives
- Used in household appliances / toys

  -> Exposure in indoor environment
- Spread of contamination via recycling of plastics
- Long-range transport with plastics / microplastic

How to conduct monitoring for effectiveness evaluation

POPs in plastic is becoming a key issue

<Summary>

POPs levels in other matrices is useful for

- understanding environmental cycling / accumulation of POPs
- identifying major route of POPs to humans / wildlife
- monitoring environmental levels by using wildlife as natural passive samplers

In Japanese POPs monitoring, not only air and human matrices, but also sediments and biota are analyzed. In addition, part of biota and sediment samples have been kept freezing for future (environmental specimen bank; ESB).

Increase of plastic additives in the POPs list challenges the concept of monitoring design for proper assessment of the effectiveness evaluation of the Convention.


Thank you very much !
Yasuyuki Shibata
2019ys0201@gmail.com

Small-Scale Funding Agreement between UNEP and IPCP

Main Objectives:

- To support data generation on levels of industrial POPs in project countries and contribute to the implementation of the Stockholm Convention and sound management of POPs.
- To support strengthening analytical capacities in project countries on newly listed POPs and POPs candidates.
- To support sound management of chemicals in plastics.

Research Activities:

- Activity 1: Webinar series to promote awareness and share information on three main topics:
    - Understanding POPs in plastic
    - Sampling of plastic from major sectors to monitor POPs in plastic
    - Extraction, clean-up, and analysis of POPs in plastic

- Activity 2: Assessment of state of knowledge and gaps on sampling and analysis of POPs and POPs candidates in plastic pellets in major use sectors
    - Assessment of available guidance documents for practical understanding and controlling POPs in plastics.
    - Develop a report on state of knowledge and gaps on sampling and analysis of POPs and POPs candidates in major plastic use categories and related pellets, including practical guidance to better control POPs in plastics.

- Activity 3: Monitoring of POPs in recycled plastics:
    - Sample collection in selected countries
    - Chemical analysis of POPs
    - Develop a report on POPs in recycled plastics at selected countries

Detailed Activities:

- Activity 1: Webinar series to promote awareness and share information on three main topics:
  - The webinars will be organised by IPCP and will build on the results of the GMP2 projects.
  - The webinars are intended for capacity building of the countries participating in the GMP2 projects and will also be offered to other countries where UNEP/GEF projects with associated topics are being carried out.
  - The first webinar will focus on background information on POPs in plastic, including related environmental pollution and human exposure, which will be compared to GMP background data. It will also focus on the current and future relevance of individual POPs in plastic recycling.
  - The second webinar will focus on the screening and sampling strategies for major POPs use sectors including EEE/WEEE, the transport sector, and buildings and construction. Presentations will also inform on the experiences from the current plastic pellet sampling activities.
  - The third webinar will focus on three major steps: 1) extraction; 2) clean-up; and 3) POP measurements. All steps will be covered for the major POPs used in plastics and for POP candidates (i.e., UV-328, and dechlorane plus, which shall be listed this May 2023 in the Stockholm Convention.

Detailed Activities:

- Activity 2: Assessment of state of knowledge and gaps on sampling and analysis of POPs and POPs candidates in plastic pellets in major use sectors:

  Task 1:
  - The major guidance documents of the Stockholm Convention (SC) and the Basel Convention (BC) will be assessed for their information on POPs monitoring and POPs in plastic.
  - The assessment will be compiled in a report on available guidance documents and will give an overview on the documents available where relevant information on POPs in plastic and management of plastic containing POPs can be found.
  - This document can then support Parties which want to conduct POPs monitoring in relevant matrices in high impacted sectors and to control POPs in plastic to find pertinent information in SC and BC guidance documents.

  Task 2:
  - The experience of this monitoring project will be compiled in a report along with the state-of-art knowledge on sampling and analysis of plastic in the major POPs use sectors. This will support the prevention of recycling of POP-containing plastics. In this report, gaps on monitoring of POPs in plastic will also be shorty described which can be used in future for relevant studies.

Detailed Activities:

- Activity 3: Monitoring of POPs in recycled plastics:
    - Recycled plastic pellets will be collected in at least six countries from Africa, Asia, and the GRULAC region. Additionally, pellets samples collected under the GMP2 GRULAC project could be included and exchanged. Different types of polymers will be sampled focusing on those where POPs are known to be used as additives, but with flexibility to include other polymer types.
    - Samples will be shared among three laboratories partners with IPCP for measurements of POPs. Laboratories from NIES (Japan), Fraunhofer Institute (Germany), and CSIC-Barcelona (Spain), will be respectively responsible for: brominated flame retardants and chlorinated paraffins; UV-328 and dechlorane plus; and PFAS analysis. A screening of bioassays like genotoxicity or endocrine effects will be conducted for selected samples by Bio Detection Systems (The Netherlands).
    - All results generated under Activity 3 will be compiled in a report on POPs in recycled plastics.

Thank you very much for you attention

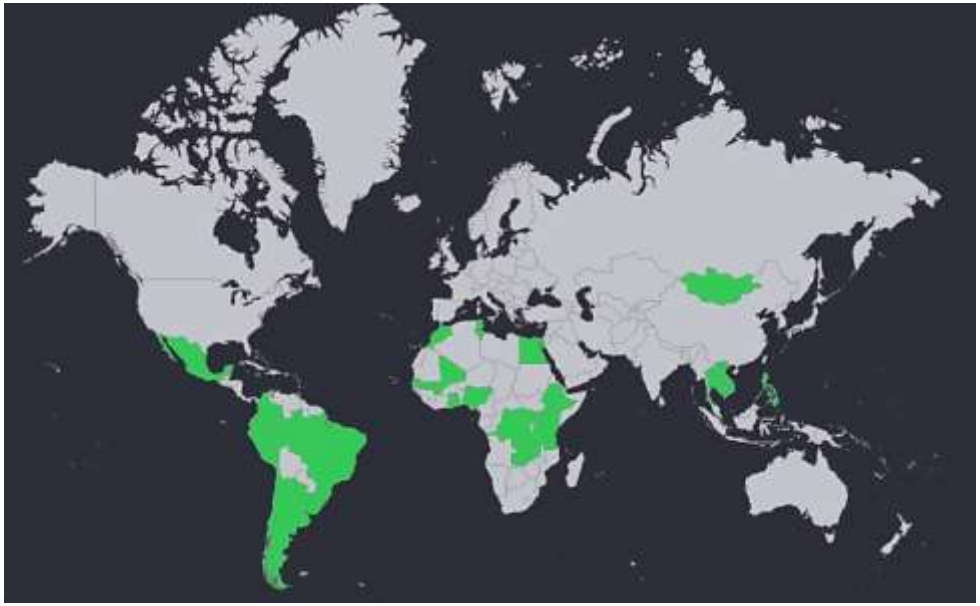
For clarification, further information, or participation, please contact any of the following people:

- Ms. Haosong Jiao (UNEP): haosong.jiao@un.org;
- Dr. Roland Weber (IPCP, POPs Envrionmental Consulting): roland.weber10@web.de; or
- Dr. Natsuko Kajiwara (IPCP, NIES-Japan): kajiwara.natsuko@nies.go.jp

Final Meeting of the UNEP/GEF projects

"Implementation of the POPs Monitoring Plan in the Asian Region"
and
"Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in Pacific Region"

Dr. Esteban Abad, Dr. Manuela Ábalos
Laboratory of Dioxins, IDAEA-CSIC



Bangkok, Thailand 4-5 April 2023

Final Meeting of the UNEP/GEF projects

"Implementation of the POPs Monitoring Plan in the Asian Region"
and
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GRULAC Region

The journey from 2016:

Training Capacity Building
Procurements
POPs Survey in core matrices
National Samples

Final Meeting of the UNEP/GEF projects - Asia

Training and Capacity Building – 11 countries, around 100 people instructed

Antigua and Barbuda

Argentina

Barbados

Brazil

Colombia

Jamaica

Uruguay

Ecuador, Chile and Peru

On-line training

Final Meeting of the UNEP/GEF projects - Asia

Sampling: 2 years, 8 campaigns, 400 PUFs, 12 PAS, more than 5,000 data of POPs in AIR in GRULAC

Antigua and Barbuda

Argentina

Barbados

Brazil

Chile

Colombia

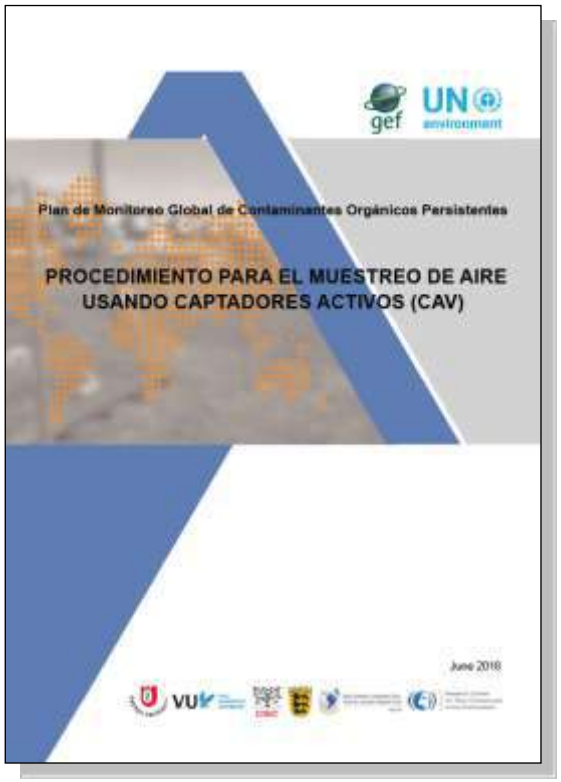
Ecuador

Jamaica

Mexico

Uruguay

Collecting Ambient Air Samples by High Volume Sampling Device



https://wedocs.unep.org/bitstream/handle/20.500.11822/27634/ActSamplSOP.pdf?sequence=1&isAllowed=y

Collecting Ambient Air Samples by High Volume Sampling Device

Video

https://youtu.be/S0OtiboWuzE

COLLECTING AMBIENT AIR SAMPLES BY HIGH VOLUM SAMPLING DEVICE

Three Different Regions

Brazil

COLLECTING AMBIENT AIR SAMPLES BY HIGH VOLUM SAMPLING DEVICE

Three Different Regions

Mongolia – September 2019

Some testing before sampling episodes

COLLECTING AMBIENT AIR SAMPLES BY HIGH VOLUM SAMPLING DEVICE

Three Different Regions

Mongolia – September 2019

Lecture at the Mongolian National University

Persistent Organic Pollutants in the Environment: Concerns and Challenges’.

COLLECTING AMBIENT AIR SAMPLES BY HIGH VOLUM SAMPLING DEVICE

Three Different Regions

Mauritius – January 2020

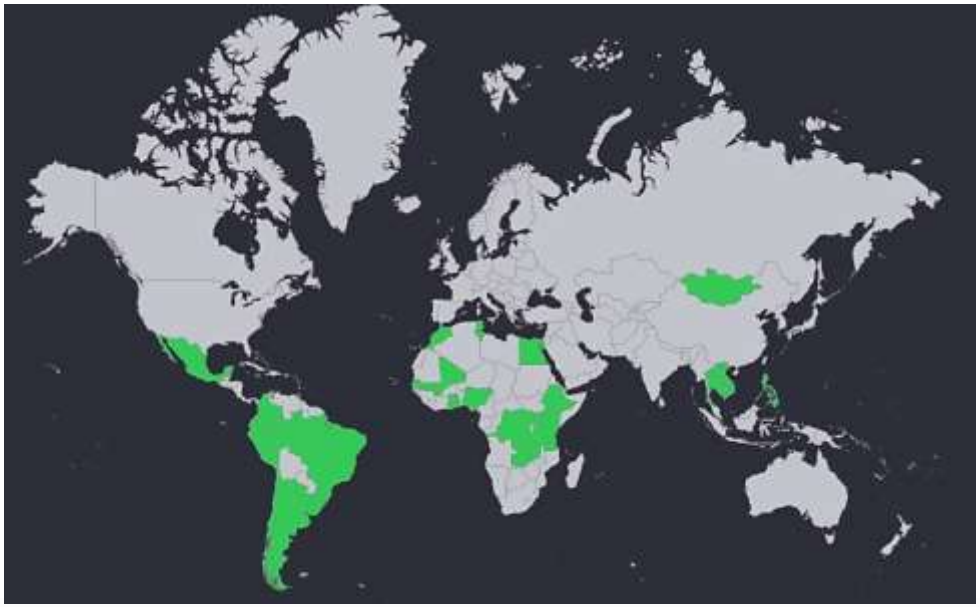
On behalf of all the CSIC team:

Thanks for your attention

Final Meeting of the UNEP/GEF projects

"Implementation of the POPs Monitoring Plan in the Asian Region"
and
"Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in Pacific Region"

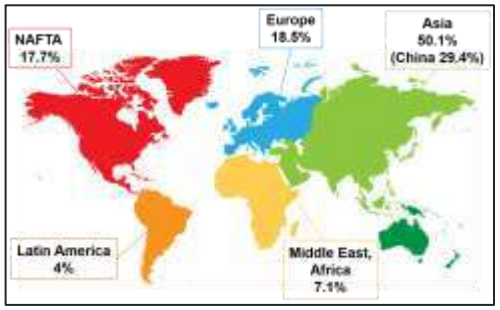
Dr. Esteban Abad[1], Dr. Marinella Farré[2]
[1]Laboratory of Dioxins, IDAEA-CSIC
[2]OneHealth, IDAEA-CSIC



Bangkok, Thailand 4-5 April 2023

Introduction

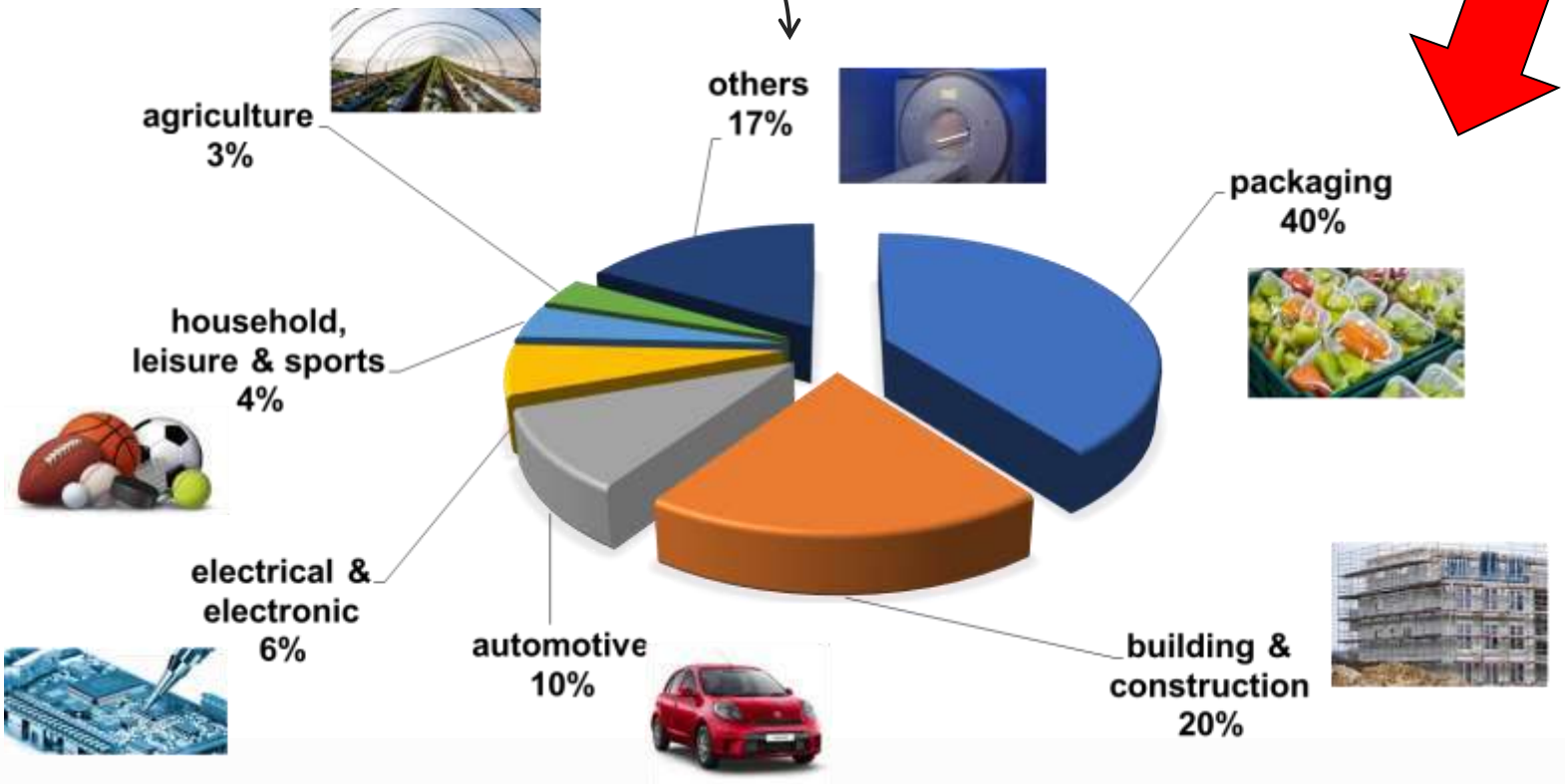
World plastics production represents **348 million tonnes / year** (PlasticsEurope 2018)



Plastic converter demand: 51.2 mt

(more than 3 mt in Spain)

Single use



Map from VectorStock.com/19861053

Introduction

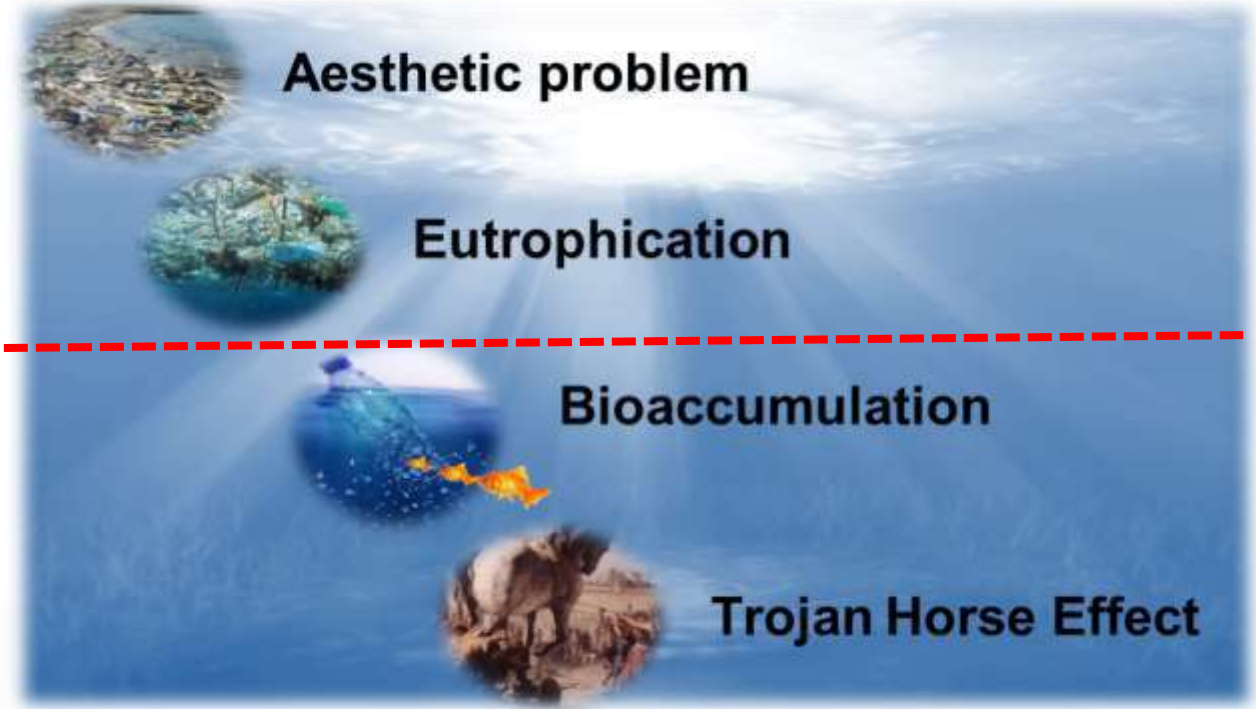
PLASTICS - NOT EVERYTHING IS '**BLACK**' OR '**WHITE**'

BENEFITS vs. DERIVED PROBLEMS

Introduction – MPLs sources in the environment

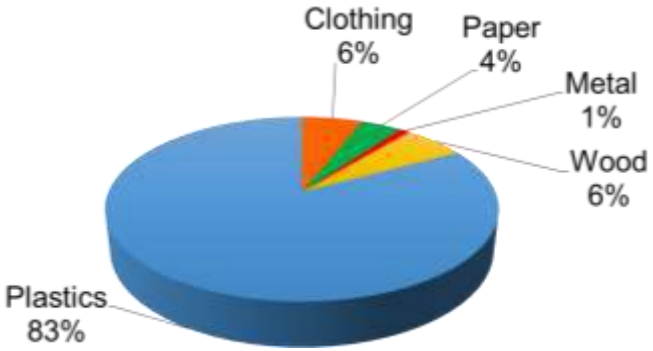
Plastic: Polymer + Additives
A few additives are POPs nowadays

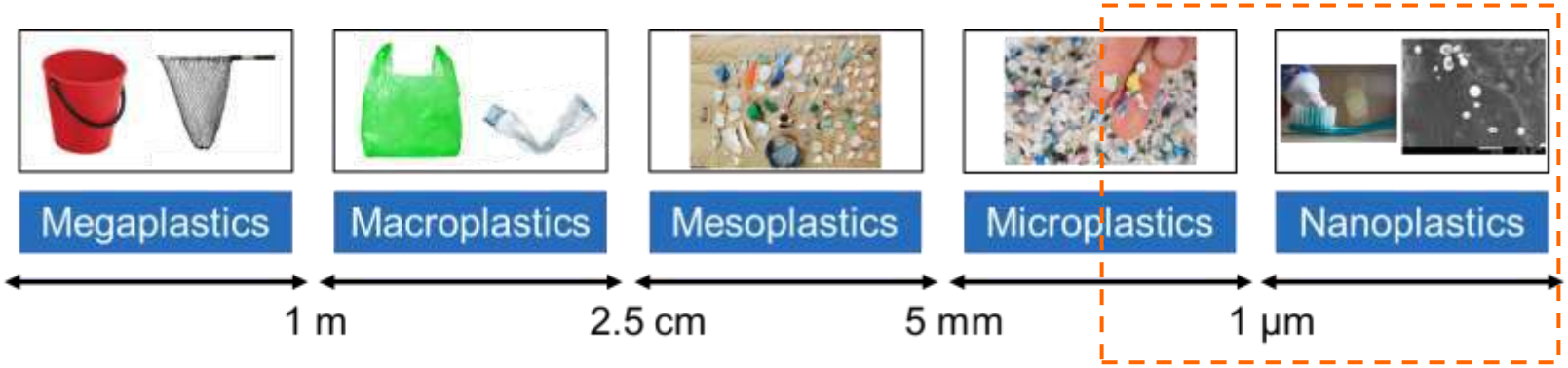
Where the problems come!!!



Introduction

Nowadays, plastic residues constitute the 83 % of the total marine litter:





Major environmental sources of MPLs and NPLs

- Plastic debris used in industrial and consumer products
- Erosion and degradation processes of plastics

Reported data

Journal of Hazardous Materials 450 (2023) 131036

Contents lists available at ScienceDirect

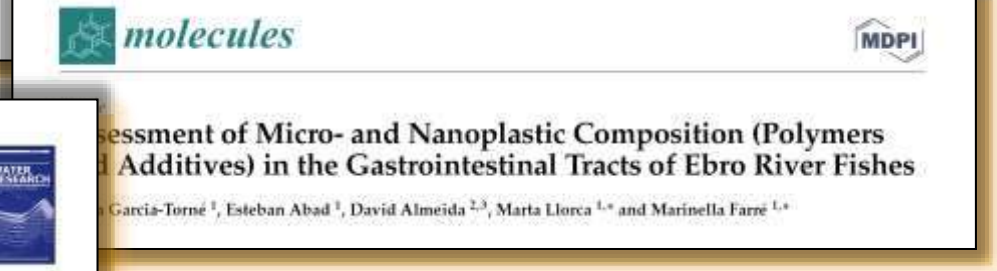
Journal of Hazardous Materials

journal homepage: www.elsevier.com/locate/jhazmat

Micro(nano)plastics in the atmosphere of the Atlantic Ocean

Elisa Caracci [a,1], Albert Vega-Herrera [b,1], Jordi Dachs [b], Naiara Berrojalbiz [b], Giorgio Buonanno [a,c], Esteban Abad [b], Marta Llorca [b], Teresa Moreno [b,*], Marinella Farré [b,*]

[a] Department of Civil and Mechanical Engineering, University of Cassino and Southern Lazio, FR, Cassino, Italy
[b] Institute of Environmental Assessment and Water Research (IDAEA-CSIC), C. Jordi Girona, 18-26, 08034 Barcelona, Spain
[c] International Laboratory for Air Quality and Health, Queensland University of Technology, Brisbane, Australia



molecules

MDPI

essment of Micro- and Nanoplastic Composition (Polymers
l Additives) in the Gastrointestinal Tracts of Ebro River Fishes

García-Torné [1], Esteban Abad [1], David Almeida [2,3], Marta Llorca [1,*] and Marinella Farré [1,*]

Water Research 220 (2022) 118643

Contents lists available at ScienceDirect

Water Research

journal homepage: www.elsevier.com/locate/watres

Polymers of micro(nano) plastic in household tap water of the Barcelona Metropolitan Area

Albert Vega-Herrera [a], Marta Llorca [a], Xavier Borrell-Diaz [a], Paula E. Redondo-Hasselerharm [b,c,d], Esteban Abad [a], Cristina M. Villanueva [b,c,d,e], Marinella Farré [b,*]

[a] Institute of Environmental Assessment and Water Research (IDAEA-CSIC), C. Jordi Girona, 18-26, 08034, Barcelona (Spain)
[b] ISGlobal, C. Doctor Aiguader, 88, 08003, Barcelona (Spain)
[c] Universitat Pompeu Fabra (UPF), Pl. de la Mercè, 10-12, 08002, Barcelona (Spain)
[d] CIBER Epidemiología y Salud Pública (CIBERESP), Av. Monforte de Lemos, 3-5, 28029, Madrid (Spain)
[e] Hospital del Mar Medical Research Institute (IMIM), Passeig Marítim, 25-29, 08003, Barcelona (Spain)

Journal of Hazardous Materials 404 (2021) 124022

Contents lists available at ScienceDirect

Journal of Hazardous Materials

journal homepage: www.elsevier.com/locate/jhazmat

Screening of suspected micro(nano)plastics in the Ebro Delta (Mediterranean Sea)

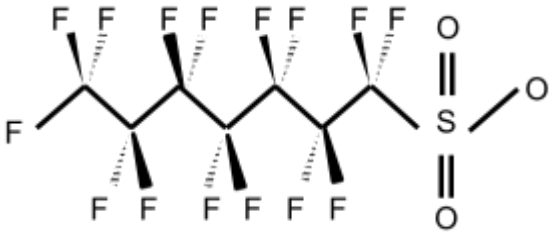
Marta Llorca, Albert Vega-Herrera, Gabriella Schirinzi, Katerina Savva, Esteban Abad, Marinella Farré

Institute of Environmental Assessment and Water Research (IDAEA-CSIC), C. Jordi Girona, 18-26, 08034 Barcelona, Catalonia, Spain

Introduction

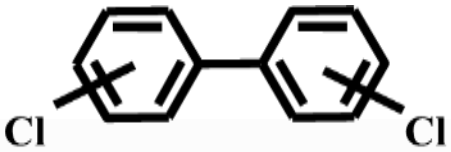
According to WHO - Persistent Organic Pollutants (POPs) are chemicals of global concern due to their **potential for long-range transport**, **persistence** in the **environment**, ability to **bio-magnify** and **bio-accumulate** in ecosystems, as well as their significant **negative effects** on **human** health and the **environment**.

Perfluoroalkyl substances (PFASs)



(PFOS)

Polychlorinated biphenyls (PCBs)



Stockholm Convention

Introduction – why POPs with MPLs?

Plastic residues constitute the 83 % of the total marine litter

Microplastics (MPLs) - small particles in the millimetre to sub-millimetre size range (<5 mm) and high densities (e.g., 100 000 items per m^3).

Major environmental sources of MPLs

- Plastic debris used in industrial and consumer products
- Erosion and degradation processes of plastics

Why POPs with MPLs:

- Evidences of sorption of surrounding POPs
- Can act as a vector for those contaminants
- Facilitate the introduction of POPs to aquatic organisms
- Trojan Horse toxicity effect

Reported data

toxics

MDPI

Article

Adsorption and Desorption Behaviour of Polychlorinated Biphenyls onto Microplastics' Surfaces in Water/Sediment Systems

Marta Llorca, Manuela Ábalos, Albert Vega-Herrera, Miquel A. Adrados, Esteban Abad and Marinella Farré *

Institute of Environmental Assessment and Water Research (IDAEA-CSIC), C/Jordi Girona, 18–26, 08034 Barcelona, Spain; mlcqam@cid.csic.es (M.L.); manuela.abalos@idaea.csic.es (M.Á.); avhqam@cid.csic.es (A.V.-H.); miquel.adrados@idaea.csic.es (M.A.A.); eaheco@idaea.csic.es (E.A.)

* Correspondence: mfuqam@cid.csic.es

- The compounds are adsorbed onto MPLs surface after short exposure time.
- It can be concluded that MPLs of HDPE and PS can adsorb and stabilise residues of POPs that are present in waters/sediment systems and act as carriers for them.

Objectives

The Objectives

- To support data generation on levels of POPs in project countries to further support the implementation of the Stockholm Convention as well as broader actions on sound management of POPs.

- To support strengthening analytical capacities in project countries for sustainable monitoring of POPs.

Activities:

- Identify industrial POPs of major concerns in the plastic sector and connect with GMP results, and conduct follow-up analysis of POPs in plastic pellets to support assessing the presence of POPs.

- Develop protocols for the sampling and analysis of POPs in plastics in to support strengthening analytical capacities in project countries.

On behalf of all the CSIC team:

Special thanks to my colleague Dr. Marta Llorca for helping me with this presentation

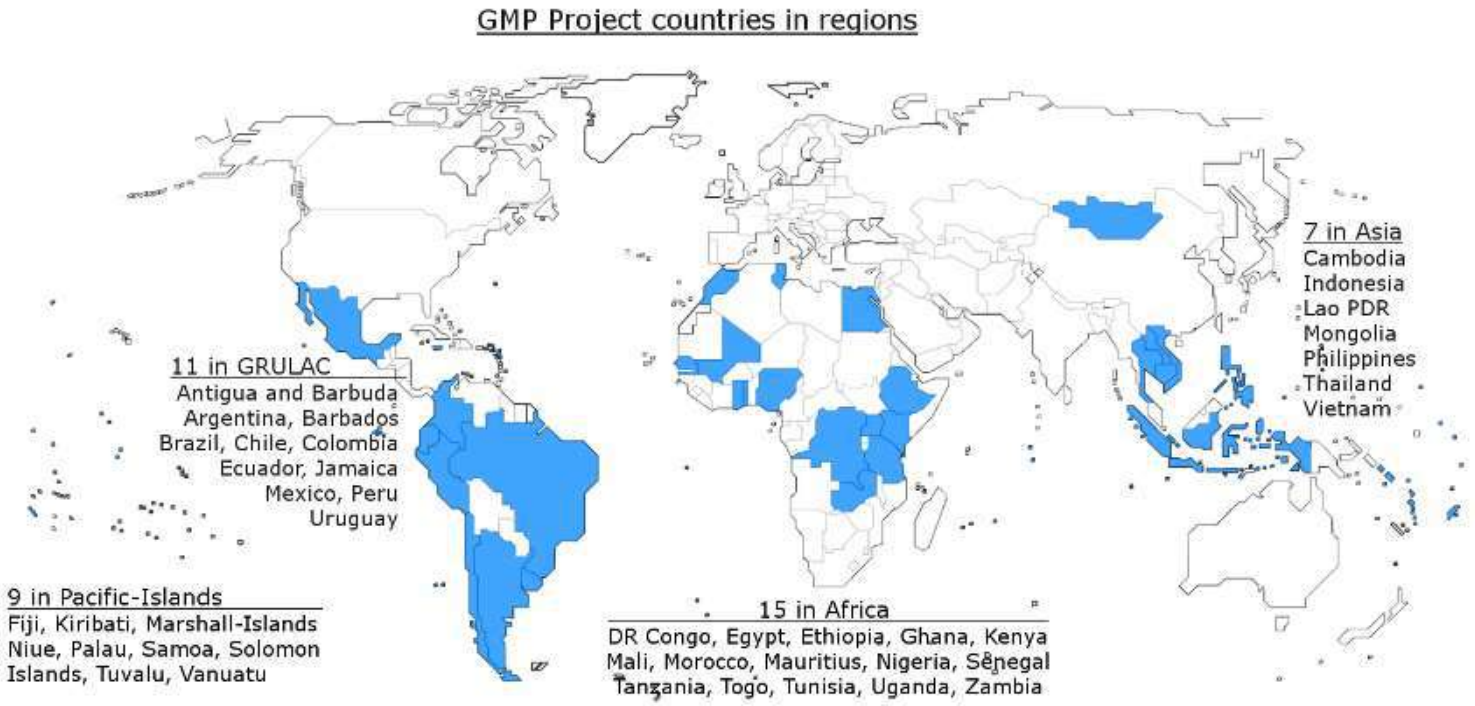
Thanks to you for your attention

Data dashboard, laboratory databank and UNEP WESR

Final Meeting of the UNEP/GEF GMP of POPs projects in: Asia and Asia-Pacific Regions
Bangkok, Thailand 4-5 April 2023

Victor Estellano
Chemicals and Health Branch, UNEP

Overview



30 POPs analyzed in over **900** 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.

- 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.**

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

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Overview of data generated under the GMP2-Projects

POPs groups	Analytes		Total N° of Samples			
	PUF & Nat.S.	HBM	PUF-PAS	Nat. Samples	HBM	Water
dl-POPs	29	29	195	~276	44	
OCPs(all)+PCB(6)	31	31	295		44	
PBDE+PBB+HBCD screening	13	29	295		43	
toxaphene/chlordecone	4	4	295		44	
PFAS	11	4	308		44	144
PCNs	-	21	-	-	40	
CPs (SCCPs + MCCPs)	-	2	-	-	42	
Data for single analytes produced			**23,203**	**~ 20,000**	**5,163**	**432**
			Approx. 50,000			

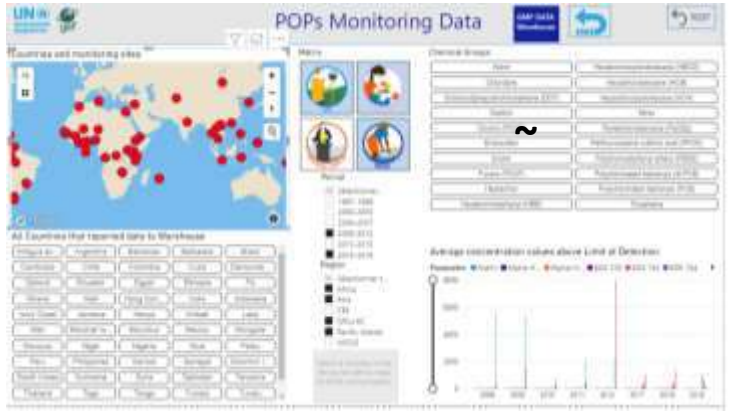

A lot of data, knowledge and information generated
But so what?

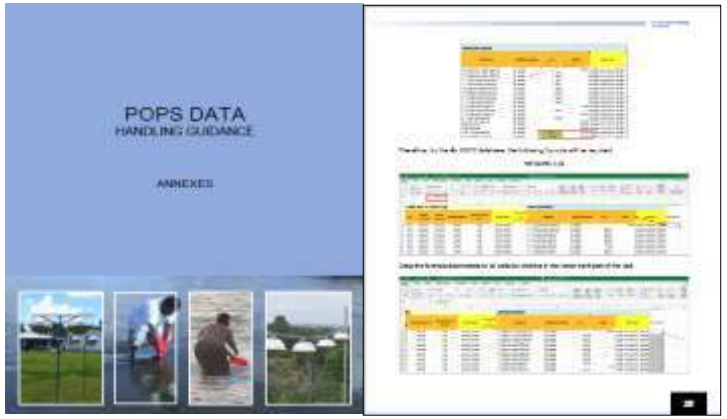
The evidence base needs strengthening

Data and knowledge generation

Data interpretation

Integration, management and usage





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HELP

UNEP/GEF POPs Global Monitoring Plan Projects 2008-2012, 2016-2022

POPs Monitoring

For more information on the projects and data, please contact **science.chemicals@un.org**

How to navigate the Dashboard?

YouTube

ABOUT THE DASHBOARD

Persistent Organic Pollutants (POPs) are hazardous chemicals that **threaten human health and the planet's ecosystems**.

To support the Stockholm Convention POPs Global Monitoring Plan, UNEP/GEF POPs GMP projects conducted data generation and capacity building in 42 countries to record the presence of POPs in humans and in the environment.

The dashboard aims to make **data and information** easily accessible and understandable for broader stakeholders to support informed decision making.

Sampling Activities

Capacity Building

Monitoring Results

Inter-Lab Assessments

POPs Information

Data Download

EXTERNAL INFORMATION

GMP DATA Warehouse

POPs LABORATORY DATABANK

Global Monitoring Plan

Update POPs laboratory databank.

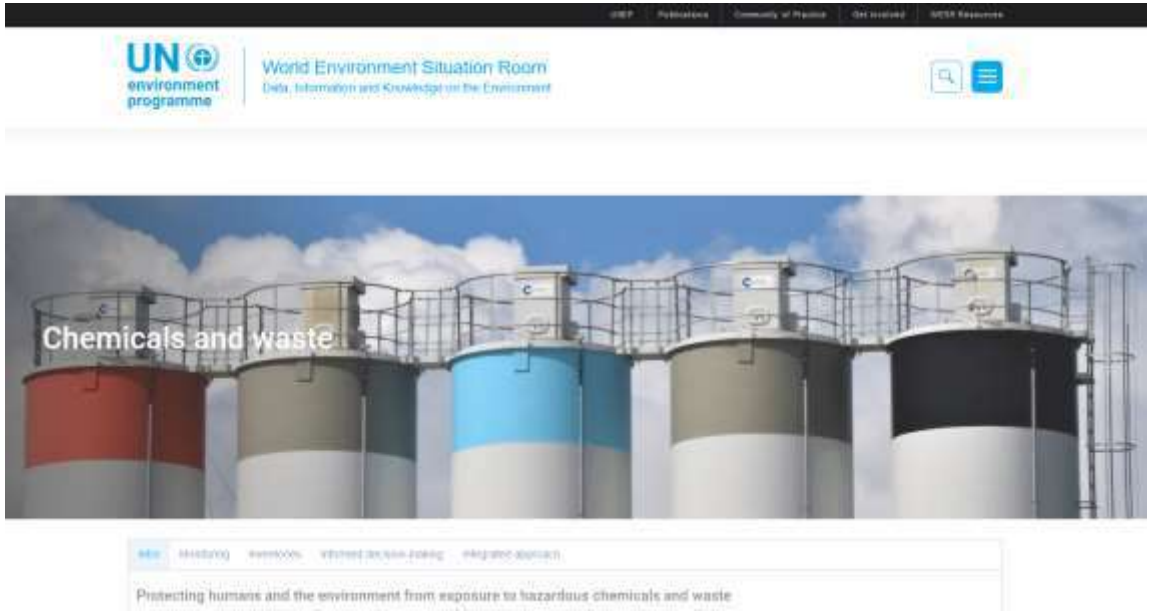
In total, 256 laboratories analyzing POPs are registered in the UNEP databank of Laboratories.
The databank include laboratories analyzing:

- ✓ 101 labs analyzing LEAD
- ✓ 210 labs analyzing MERCURY
- ✓ 256 labs analyzing POPS

World Environment Situation Room
Data, Information and Knowledge on the Environment

Protecting humans and the environment from exposure to hazardous chemicals and waste

The work of UNEP Chemicals and Health Branch has generated a wealth of information, data and knowledge related to chemicals and wastes. To assist countries and stakeholders with meeting various environmental targets and objectives of Multilateral Environmental Agreements, activities were conducted with digital tools developed and data generated.



https://staging7.unep.org/wesr/web/article/chemicals-and-waste


Thank you

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Stockholm Convention Regional Centre

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Capacity Building on Data Handling and Management

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Convenio de Estocolmo

NETWORK of CENTRES
Basel Convention
Latin America & the Caribbean

Stockholm Convention

OVERVIEW

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NETWORK of CENTRES
Basel Convention
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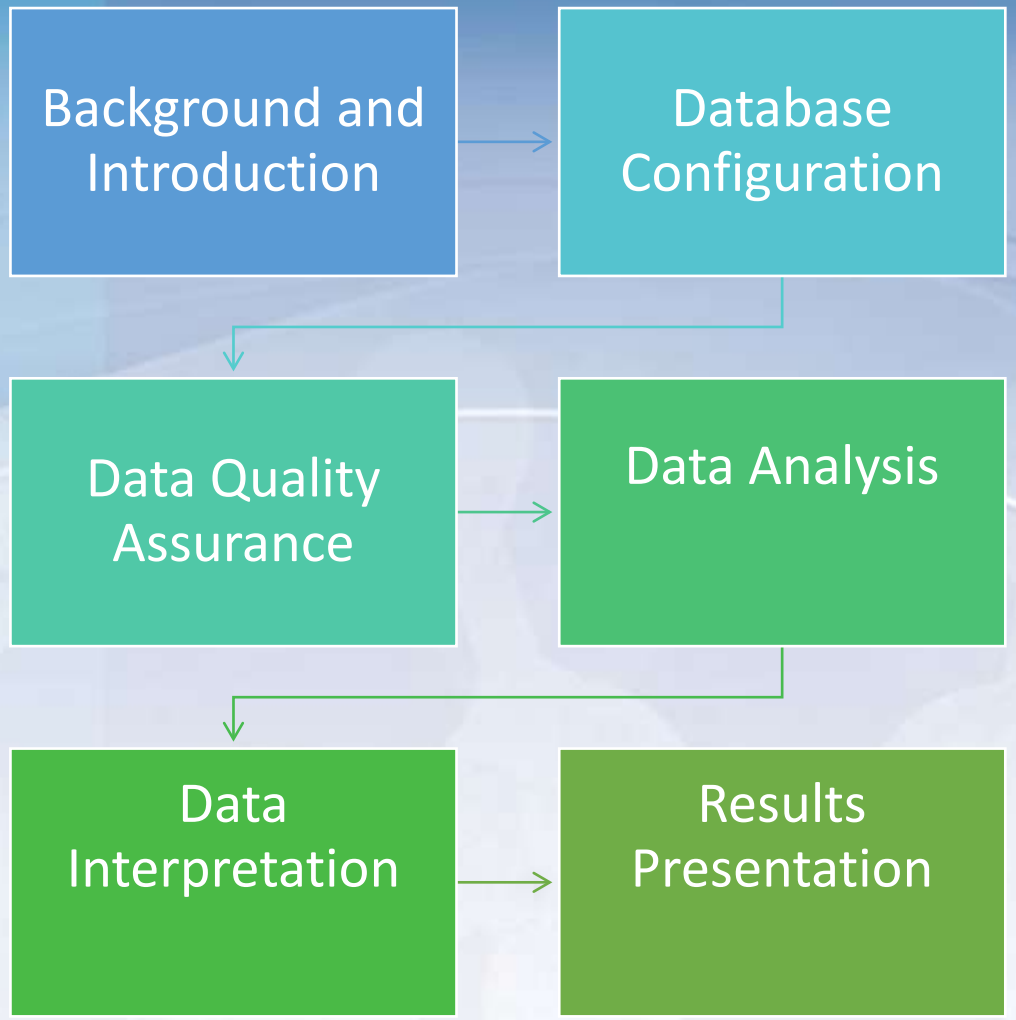
Stockholm Convention

Training courses modules



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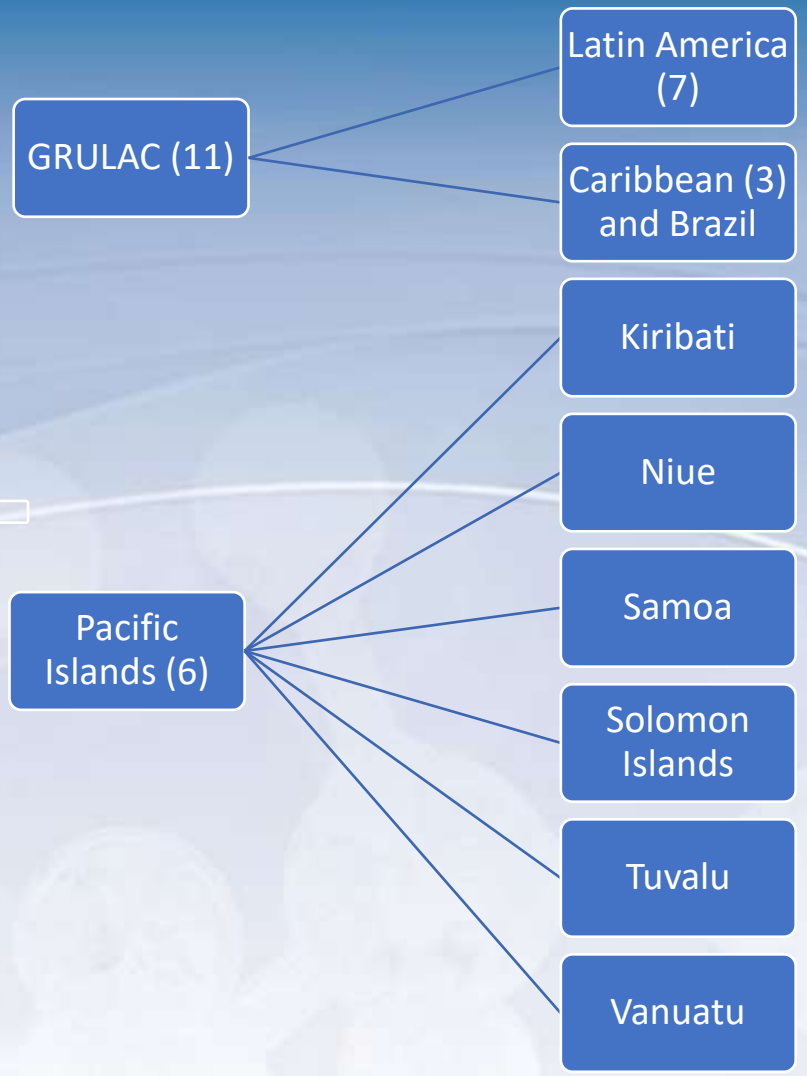
Training courses. Participating countries



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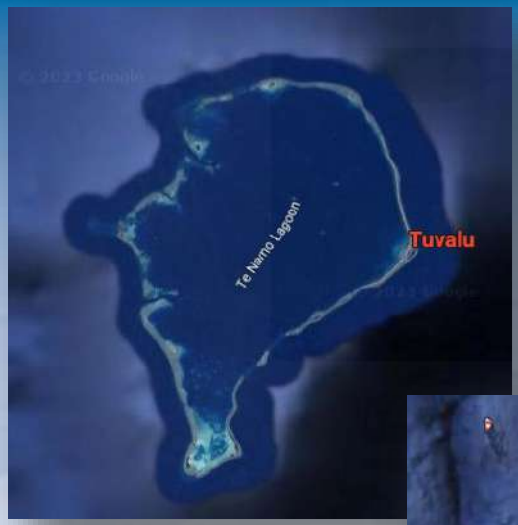
Individual tutorial (Pacific Islands)



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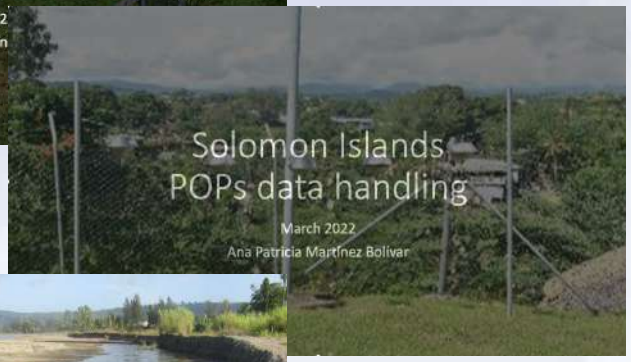
Guidance to the national implementation team (Pacific Islands)



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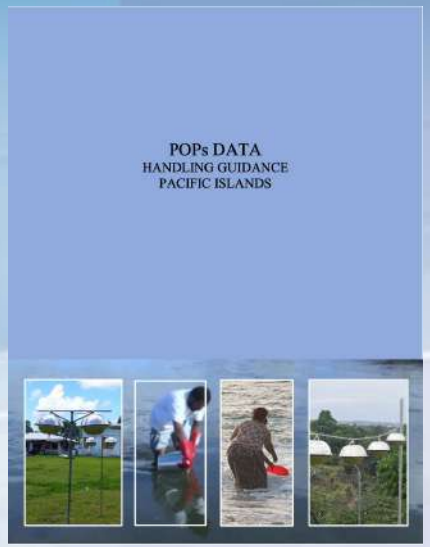
POPs Data Handling Guidance



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Self-paced course on data interpretation

Context | Background | Monitoring | Data Handling | Data Interpretation

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Thank you

Ana Patricia Martínez Bolívar

http://www.ccbasilea-crestocolmo.org.uy/es

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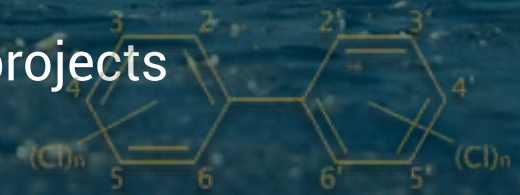
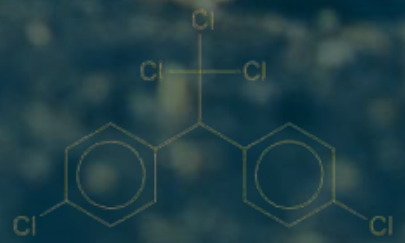
Road map for strengthening conditions for sustainable monitoring of POPs

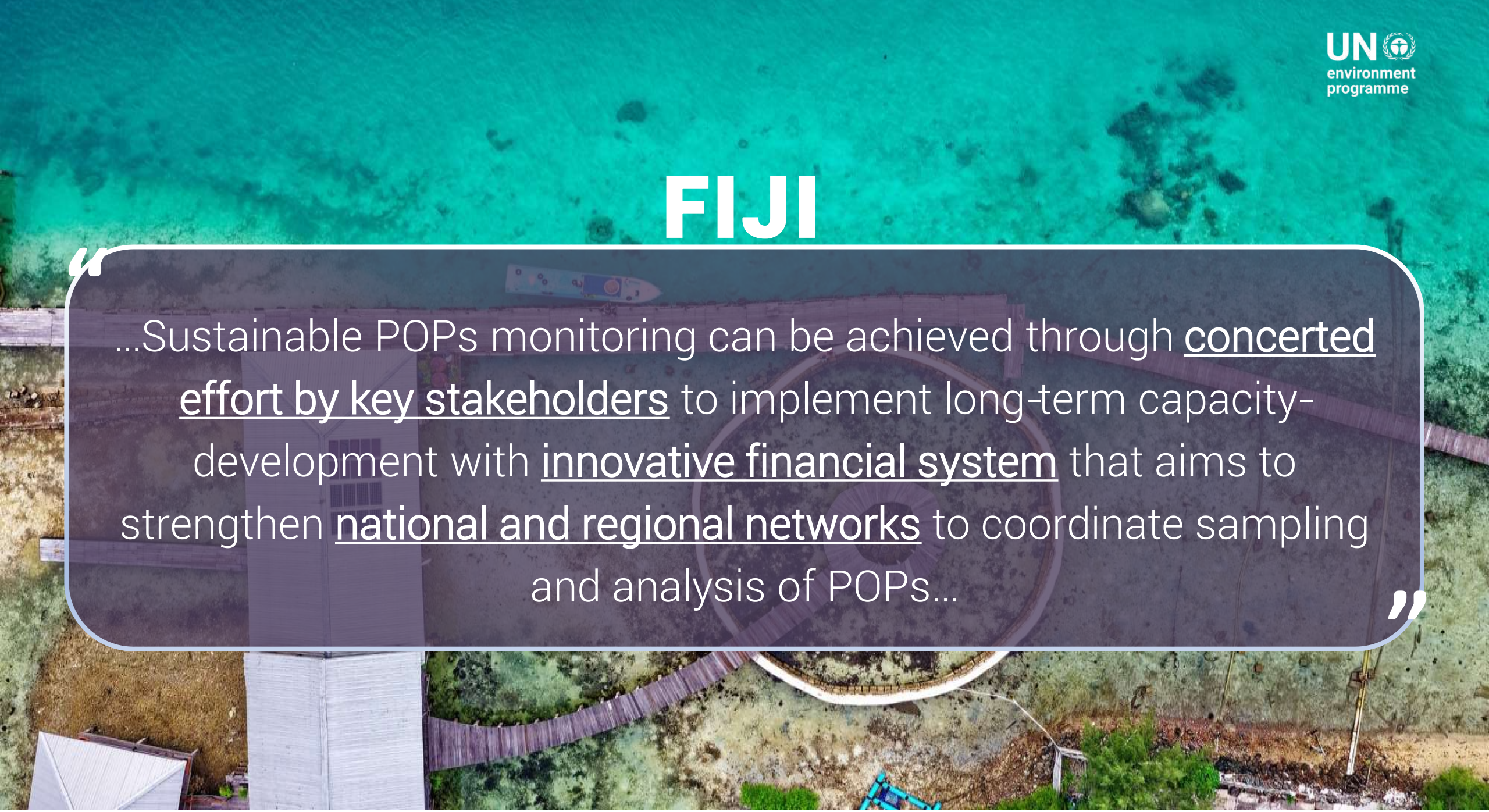
Outcomes and lessons of the UNEP/GEF Global Monitoring of POPs-II projects under the Stockholm Convention



Gamini Manuweera, Expert, Sound chemical management

April 2023, Bangkok, Thailand

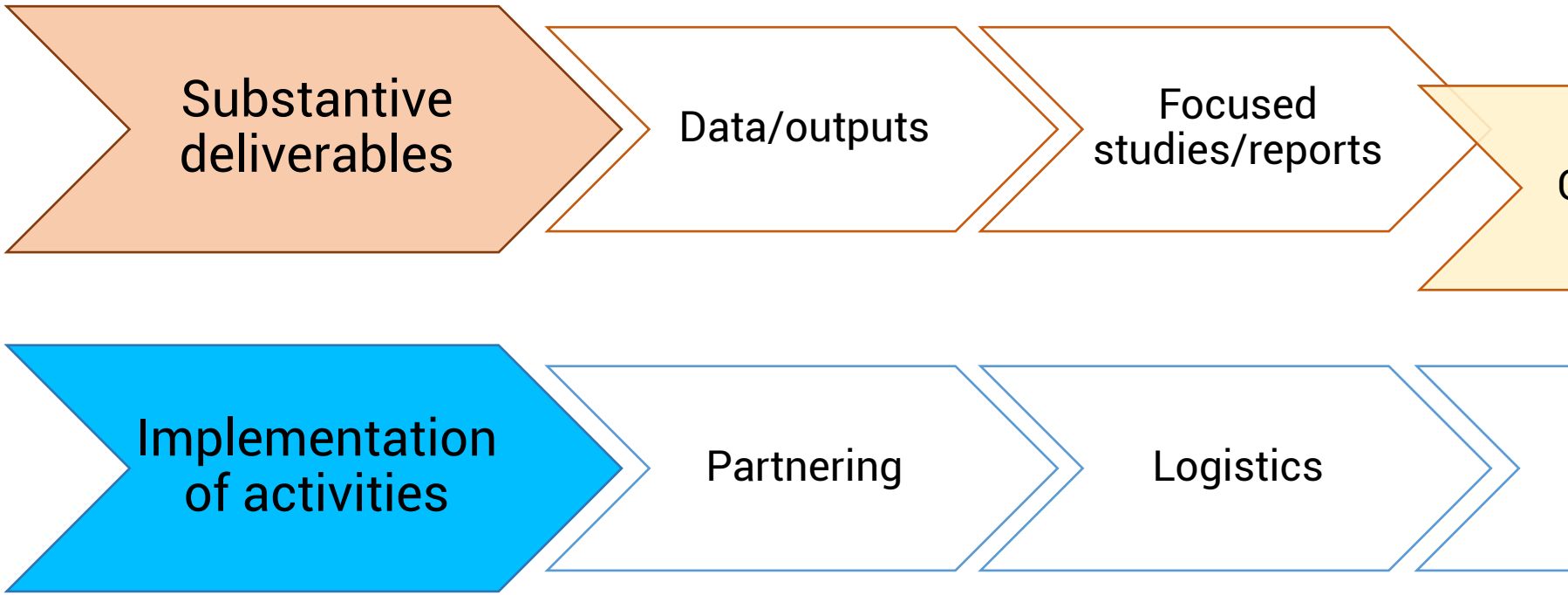




FIJI

"...Sustainable POPs monitoring can be achieved through concerted effort by key stakeholders to implement long-term capacity-development with innovative financial system that aims to strengthen national and regional networks to coordinate sampling and analysis of POPs..."

Creating sustainable conditions -Where did we learn from?



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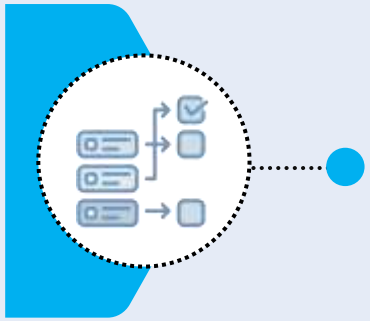
WHAT DID WE LEARN?

What did we learn? - Data

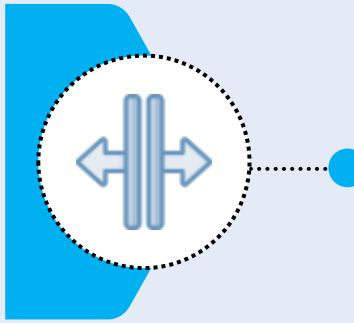


Presence/ distribution/ priorities

- An overall global declining trend on the levels of POPs
- Actions have produced results => DDT in Africa, PCB in Europe
- Traces of legacy POPs still present in some locations
- CPs and some other new Industrial POPs are an emerging concern
- DDT is the most detected across all regions

Data gaps in

- Time trend assessment at all levels => national> regional> global
- Hot-spots/sources identification
- Coverage of all 30+ POPs in all matrices
- Data quality and comparability



Knowledge gaps

- Data interpretation => actual health and/or environmental impacts of the levels found
- Analytical methods => mostly of new POPs
- Sources of releases of POPs

What did we learn? - Capacity

Monitoring

- Some capacities to generate data but limited mostly to basic POPs
- Participated in various training & research programs and have generation of data, but not comparable at regional/global level
- Continue to lack human resources and technical capacity, despite having received training and capacity assistance
- Financial capacity is lacking not only to equip and update their laboratories, but also to sustain the operation of national POPs monitoring programs.
- Many countries rely on strategic partners to analyze all POPs in monitoring samples.

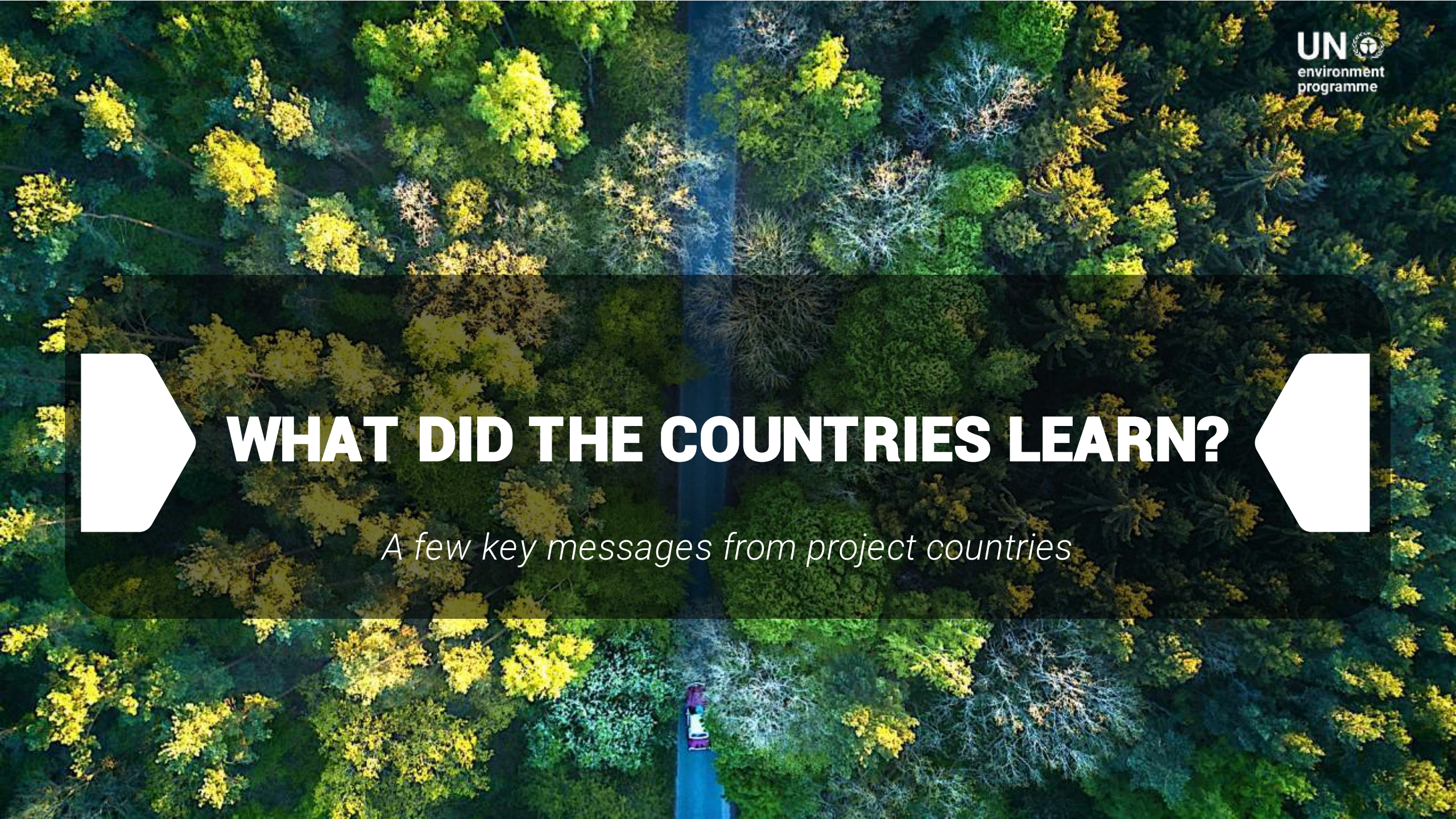
Data interpretation

- Capacity to understand the data
  - Context and what it means
- Knowledge to interpret & relate to local conditions for actions
  - Policies and legislative infrastructure
  - NIPs, National Priorities
  - Surveillance and monitoring programmes and mechanisms

What did we learn? - Communication & Info Sharing

Weak at all levels

- Between national agencies
- Important and high impact sectors (e.g.: Waste, mercury, conservation-related activities)
- Key actors (e.g.: Research and academia, Industry, social workers)
- Within and between regions
- General public



WHAT DID THE COUNTRIES LEARN?

A few key messages from project countries

Key messages from project countries…

TIER 1

- …capacity for monitoring and analysis is nonexistent without external technical and financial support…
- …possibility of working with [XX] Community College to conduct the analysis however, the associated costs is not something that can be covered by the government…"
- …if a laboratory can be identified in the region and upgraded to accredited standards, then the Pacific island countries can use that rather than sending samples all the way to Europe for analysis…"

TIER 2

- …provide adequate training and maintain core staff…
- …. continue to develop analytical capacities within the region through partnerships
- …support community awareness…
- …feedback mechanisms need to be developed to encourage information sharing between governments, non-governmental organisations as well as community-based organisations.
- The role of regional institutions like the USP and SPREP would be important to sustain POPs research in the PIR…
- …working with Conservation International to identify POPs monitoring areas in Fiji…
- …It is important to build critical mass of support for POPs monitoring…

Key messages … *connecting the dots*

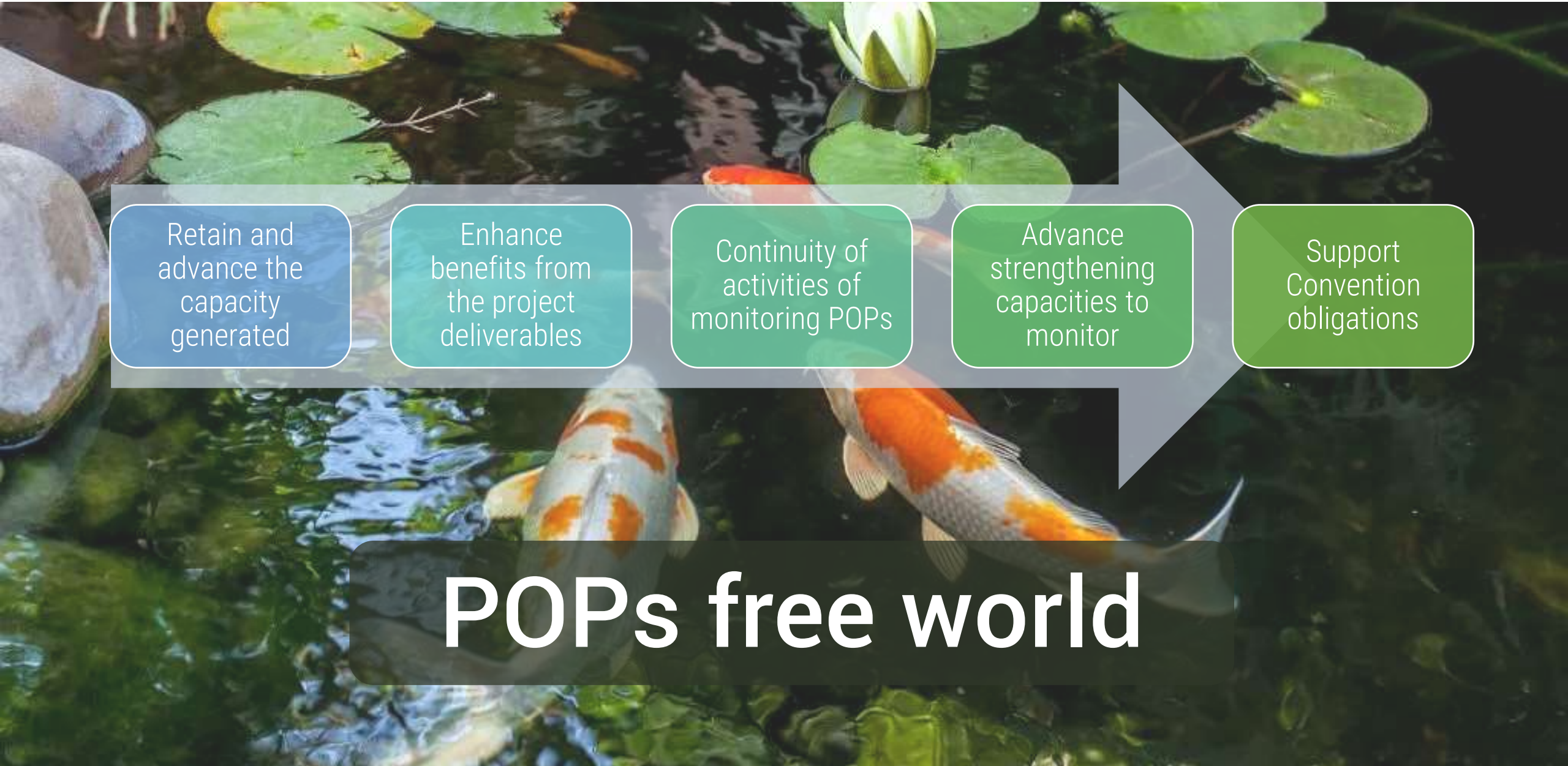
> ….The **sustainability** of such projects and activities related to POPs in the county is **directly related to the National Implementation Plan (NIP)** ….

> …. data generated demonstrate the **need for the NIP to be implemented**….

> …. **NIP provides a framework** plan for managing and reducing POPs ….

> …. Vanuatu is also in the [process] of **enacting a legislation for the sound management of chemicals including POPs** …. [Including strengthening the control systems such as preventing the imports of POPs pesticides]

Road map for what?



Key elements in optimizing global monitoring of POPs
-Brisbane Consultation outcomes

Human milk monitoring- Continue the current model	• Centrally organized, focus on long term trends. • Cost effective; archiving opportunities.
Air monitoring- optimize	• Sites and analytes to ensure minimum global coverage; • Focus to complement with gaps found in existing networks; • Priority to support long-term trends -
Water monitoring: develop and consolidate further	• Sampling sites; capacity, tools; • Priority on time trends.
Interlaboratory Assessment: optimize the impacts and cost-efficiency	• Serve as the mechanism of QA/QC for POPs analysis • Introduce cost-effective criteria for participation • Explore collaboration with other established programs
Cross-cutting- Enhanced data/trend interpretation	• Improve tools and guidance • Assist in the use of monitoring results at national level

Major categories of actors

Countries with very limited facilities/capacity

Countries with some capacities and some experience

Countries with capacities in place

Experts

Group work topics- *What can we do……?*

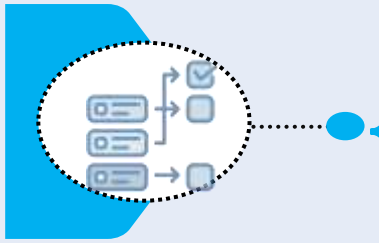
Identify the key elements for

- The generation of high quality and comparable data
- Understanding the data and communication
- Mechanisms to trigger action and political support (Science to action)
- Financial/resource availability and stability
- POPs monitoring mechanism

- What are the key milestones of a National roadmaps to create sustainable conditions for long term POPs monitoring?
- Where we are
- Where do we expect to reach
- How to get there
- Any other important points to consider

Cost-efficient and effective monitoring of POPs

Generation of high quality and comparable data

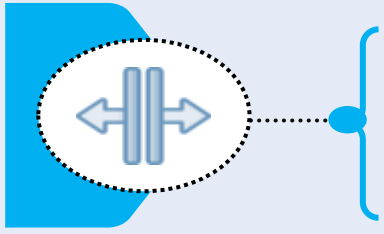


Where we are

- We can only do legacy POPs for core matrices, but not good for new POPs; can only analyze some POPs such as PCBs, OCPs, PFOS, dioxins; data we have is only from GMP1, GMP2, POPsEA projects, proficiency testing

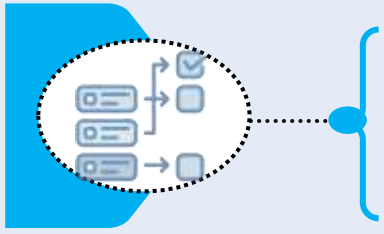
Where to go

- Become a regional center of excellence laboratory



How to get there

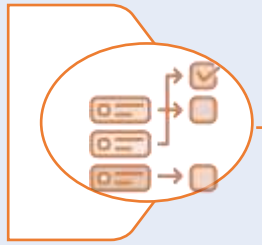
- Need support from government, other stakeholders, expert laboratories, funding agencies



Other points

- Sustainable financing

Understanding the data and communication

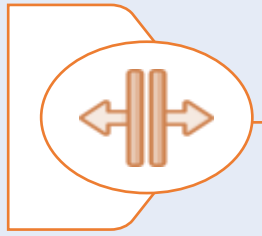


Where we are

- with support of the experts we can compile, interpret the data and publish it

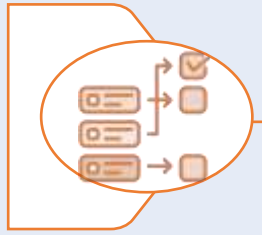
Where to go

- Do it on our own



How to get there

- continued effort to produce reliable data; we need to train the people; knowledge sharing



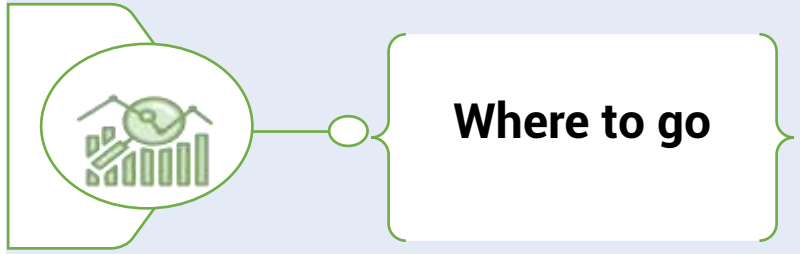
Other points

- we need dedicated staff and equipment only for POPs monitoring

Mechanisms to trigger action and political support (Science to action)

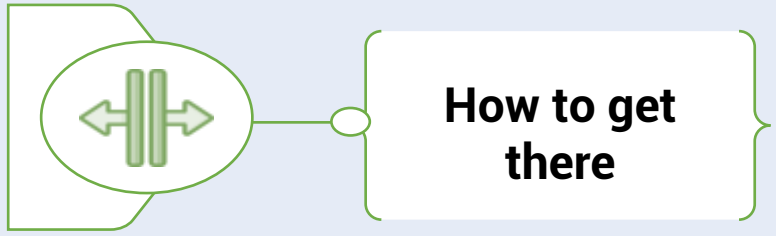
Where we are

- we are just starting to do science (some data published)



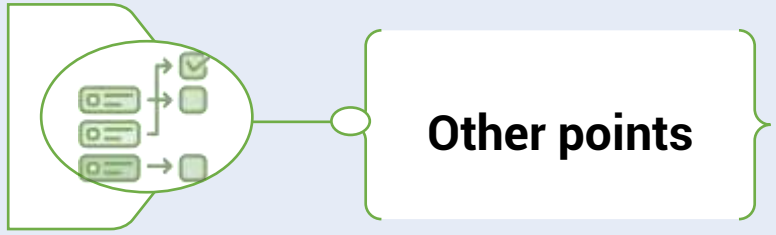
Where to go

- we need more data/comparable data to convince policy makers



How to get there

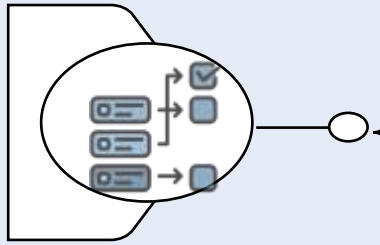
- data driven decision making for POPs; more awareness in national and international level



Other points

- educating society

Financial/resource availability and stability

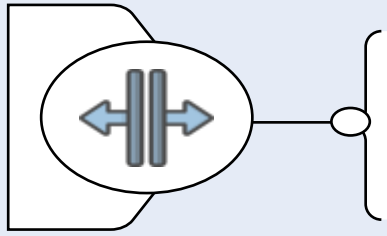


Where we are

- we are very dependent on external funding

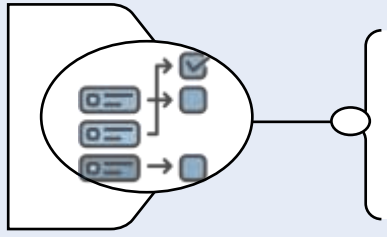
Where to go

- sustainable financing of POPs from different sources (both domestic and international)



How to get there

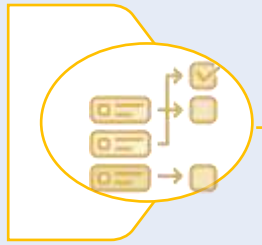
- have a target in the NIP; convince policy makers



Other points

- cofinancing

POPs monitoring mechanism

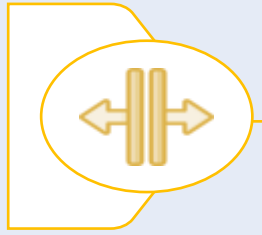


Where we are

- apart from GMP, POPsEA some countries have national institute to monitor specific matrices and POPs

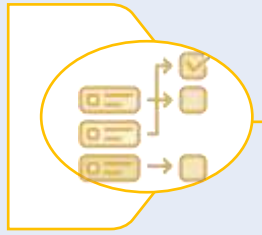
Where to go

- establish national/regional laboratory for specific matrices and POPs



How to get there

- country commitments; consensus building at national and regional priorities on POPs

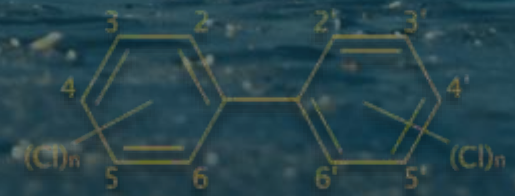


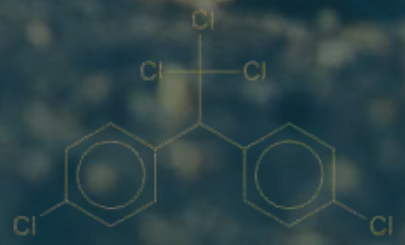
Other points

- multistakeholder approach

Thank you....

Gamini Manuweera
Expert, Sound Chemical Management





Closure of the UNEP/GEF POPs GMP projects in the Asia and the Pacific region

Final Meeting of the UNEP/GEF projects “Implementation of the POPs Monitoring Plan in the Asian Region” and “Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in Pacific Region”

Haosong Jiao, Associate Programme Management Officer
Chemicals and Health Branch, Industry and Economy Division

Deliverables of the UNEP/GEF POPs GMP projects against the requirements of the project documents

Bangkok, Thailand 5 April 2023

Component 1

1.1 Technical and administrative support provided for the implementation of the project and organization of process established in the Asian and Pacific Islands regions.

Activity 1.1. Agreements with project countries signed.

Activity 1.2. Inception and Midterm workshops. Steering Committee Meeting.

Asia	Pacific
• Inception Workshop - 5 - 27 January 2016, Hanoi, Vietnam • Steering committee meeting 26 January 2016, Hanoi, Vietnam • Midterm Workshop - 8-10 August 2018 in Ulaanbaatar, Mongolia • Steering committee meeting, 10 August 2018 in Ulaanbaatar, Mongolia	• Inception Workshop - 4 - 8 April 2016, Suva, Fiji • Steering committee meeting, 7 April 2016, Suva, Fiji • Midterm Workshop - 17-18 September 2018 in Brisbane, Australia • Steering committee meeting, 17 September 2018 in Brisbane, Australia

Component 1

1.3. Update POPs laboratory databank.

In total, 256 laboratories analyzing POPs are registered in the UNEP databank of Laboratories.
The databank include laboratories analyzing:

- ✓ 101 labs analyzing LEAD
- ✓ 210 labs analyzing MERCURY
- ✓ 256 labs analyzing POPS

Component 2

2.1 Training reports and sectoral reports on POPs analysis undertaken on two abiotic core matrices (i.e., air and water) in the Asian and the Pacific Islands.

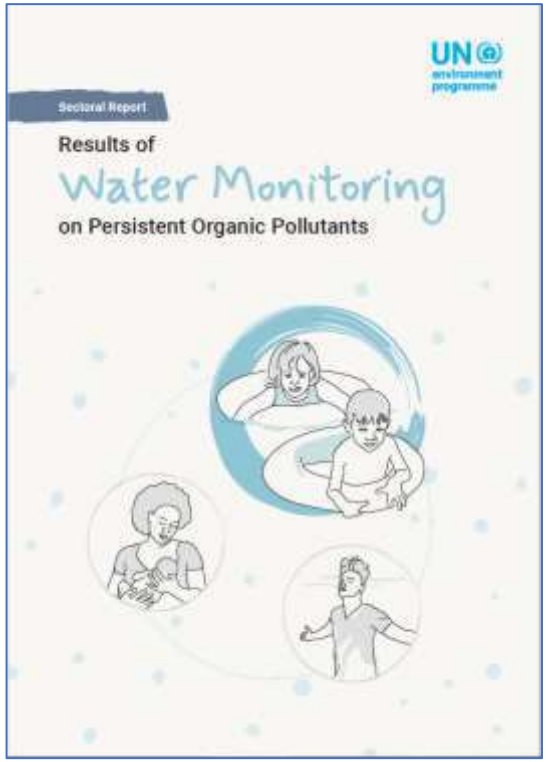







Component 2

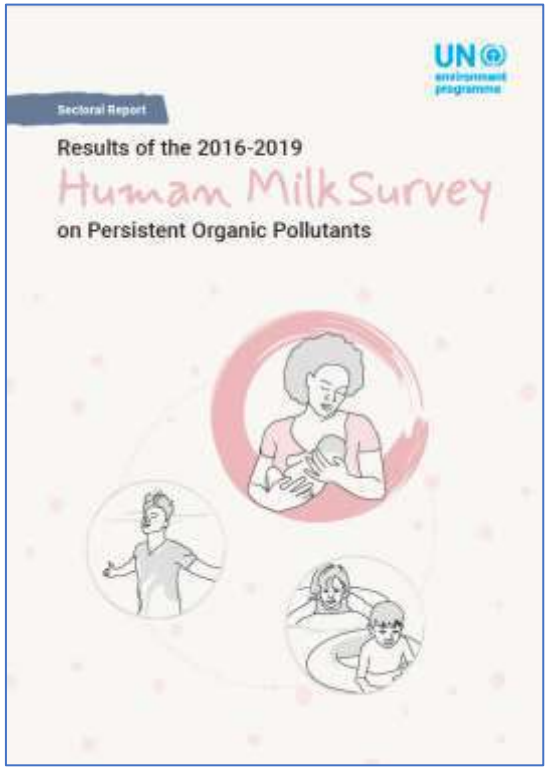
Activity 2.4: Analyse national samples for air and water, and report high quality data.
Activity 2.5: Summarize results of analysis in two distinctive sectoral reports.



Capacity building		Asia	Pacific
# of training report for analysis of abiotic matrices	Target	3	1
	Actual	5	2
# of training report for analysis of biotic matrices	Target	2	1
	Actual	5	2

Component 3

- 3.1 Training reports and sectoral reports on POPs analysis undertaken on one biotic core matrix (6th round of human milk survey) in the Asian and the Pacific Islands.



In total 44 countries participated in the Human milk survey, including:

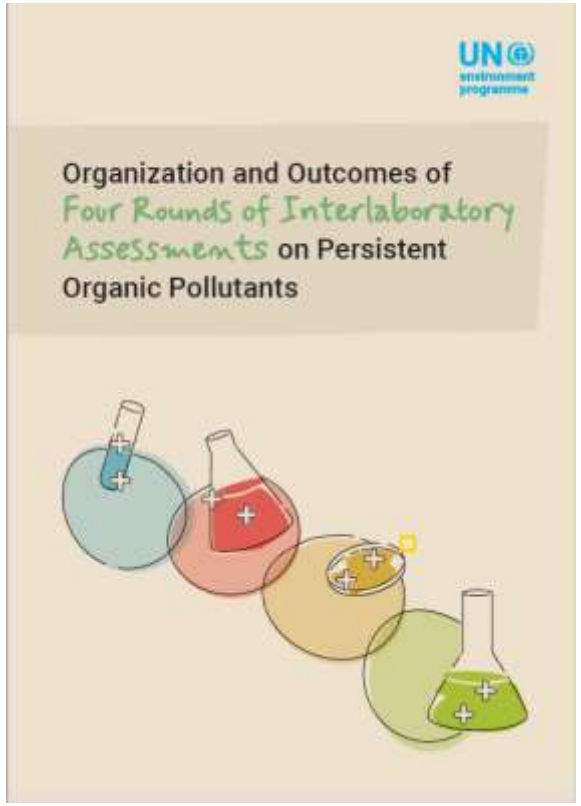
- 36 countries from the UNEP/GEF POPs GMP II projects, 6 countries were not able to complete the milk survey, and
- 8 self-funded countries from the WEOG and CEE regions.

Regional meeting on analytical results of human milk and national samples was held on November in all four regions.

Component 4

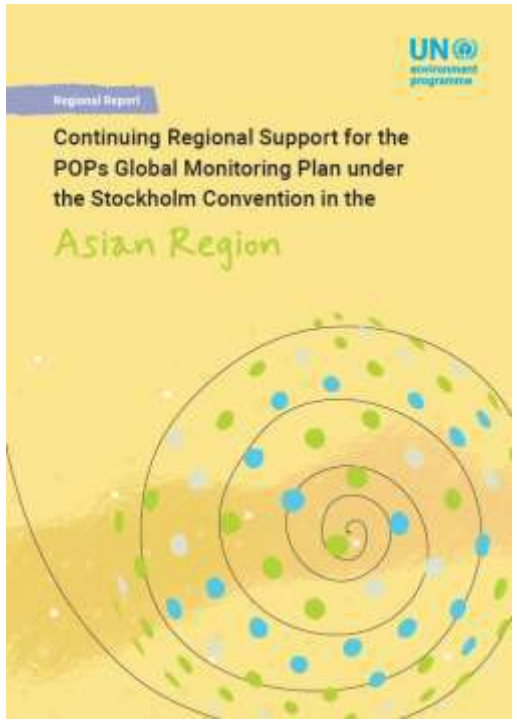
- 4.1 Assessment report of existing analytical capacities prepared and report on POPs analysis undertaken in samples of national priority (other than core matrices) in the Asian and the Pacific Island, African, and GRULAC Regions.

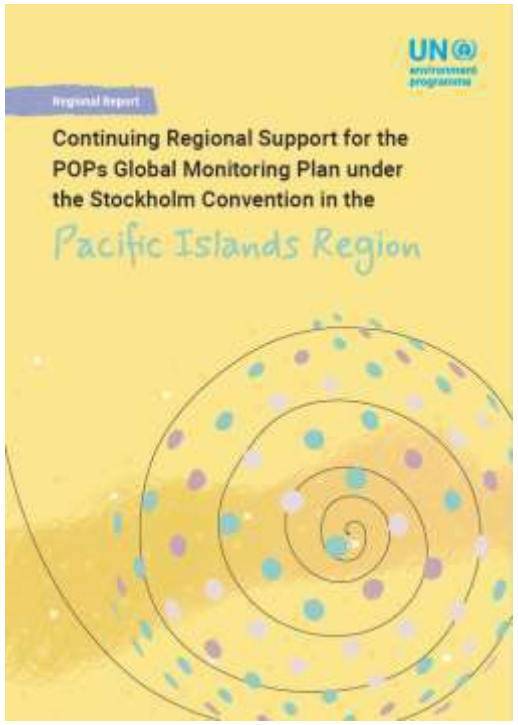
  - Two rounds of the global interlaboratory assessment were undertaken.



Component 5

- 5.1 Assessment reports contributing to regional report for the GMP undertaken, and a roadmap for sustainable POPs monitoring developed for the in the Asian and the Pacific Island regions.

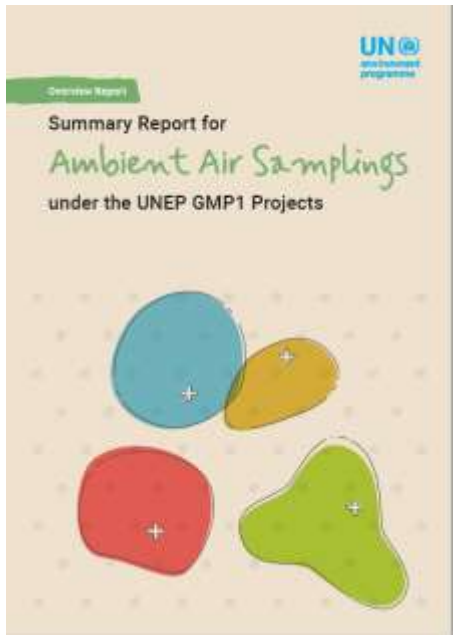


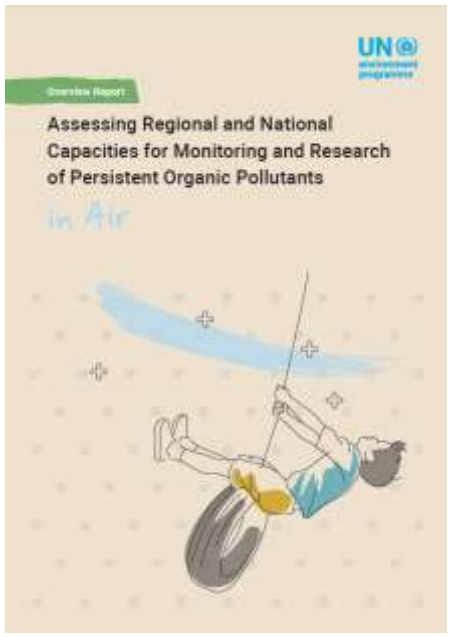


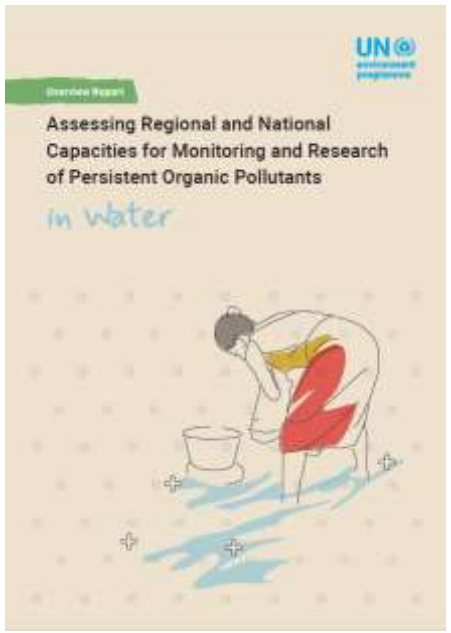
Regional Reports: Regional reports have been developed.

Component 5

- Activity 5.2: Prepare a state-of-the-art report to picture the present situation of POPs in the region's environment and humans.



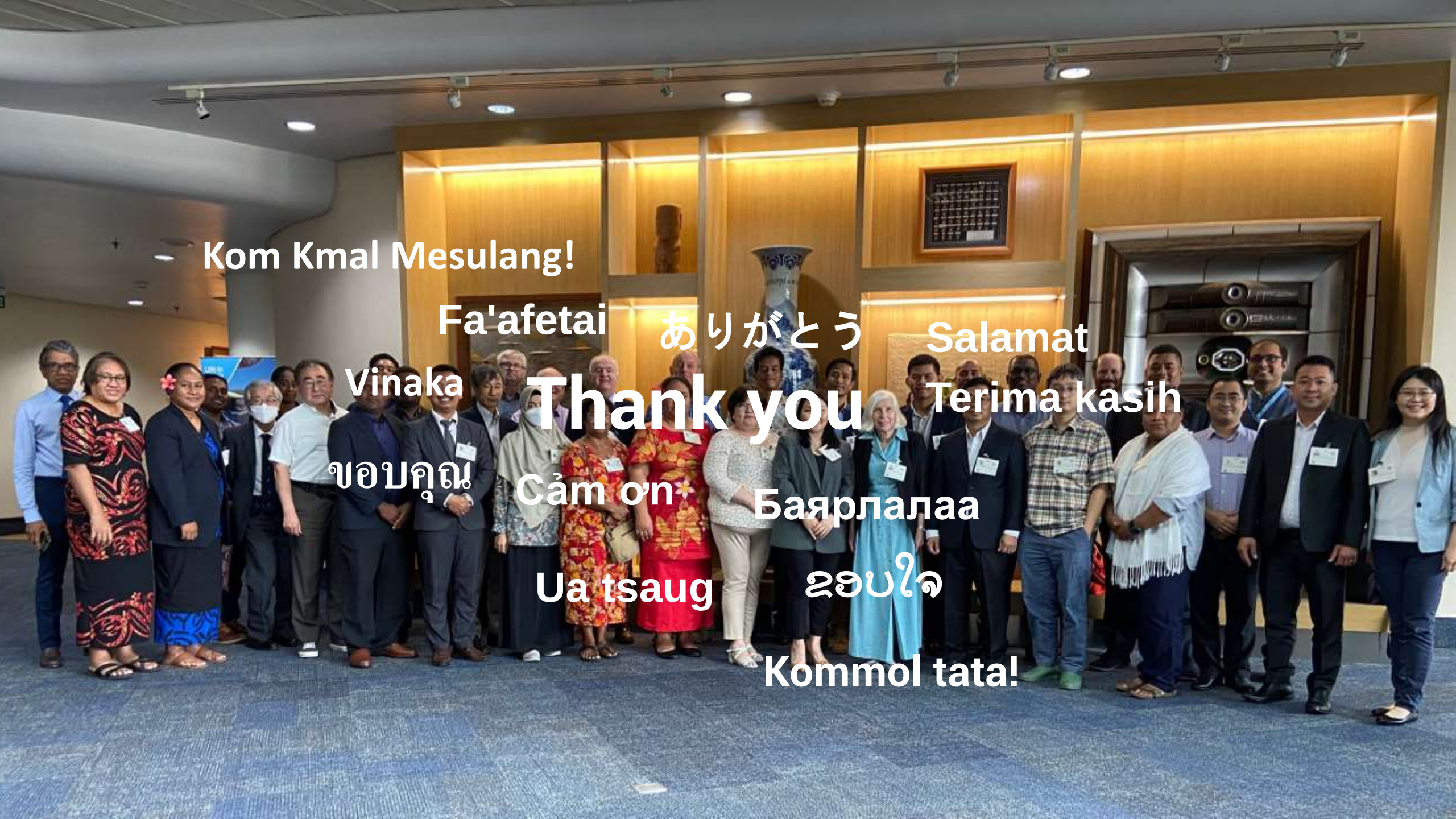




- Activity 5.3: Develop a roadmap for sustainable POPs monitoring. Based on the key messages and the approach of the Stakeholder Consultation meeting in Brisbane. As well as the national road maps and technical reports.

Closure of the project

- Endorsement of the project deliverables and approaches towards the closure of the project.
- Recommendations on ensuring sustainability of the project.
- Nomination of four representatives of the Asia and the Pacific Region in the upcoming GMP3 brainstorming meeting.


Kom Kmal Mesulang!
Fa'afetai
ありがとう
Salamat
Vinaka
Thank you
Terima kasih
ขอบคุณ
Cảm ơn
Баярлалаа
Ua tsaug
ຂອບໃຈ
Kommol tata!