Side Event
Challenges for POPs monitoring – How can we use international synergies to support the effectiveness evalution under the Stockholm Convention?

International Panel on Chemical Pollution

COP6, Stockholm Convention
Geneva, May 1, 2013

IPCP
International Panel
on Chemical Pollution

Activities of the IPCP and Objectives of the Side Event

Martin Scheringer
Chair, International Panel on Chemical Pollution

Geneva, May 1, 2013

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

IPCP
International Panel
on Chemical Pollution

The International Panel on Chemical Pollution

- Global network of (mostly) academic scientists working on chemical pollution issues
- Members from all regions of the world

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

IPCP
International Panel
on Chemical Pollution

The International Panel on Chemical Pollution

- Aims of the IPCP:
  - 1. to **disseminate** condensed state-of-the-science information on chemical pollution issues
  - 2. to **act internationally** in order to improve knowledge needed for the sound management of chemicals
  - 3. to **offer scientific expertise** available within IPCP to inter-national organizations, national governments and other parties
- Established in 2008 in Zurich, Switzerland
- Information, by-laws, reports at **http://www.ipcp.ch**

IPCP

International Panel on Chemical Pollution

A NEW INTERNATIONAL ORGANIZATION FOR INDEPENDENT SCIENTISTS TO PROVIDE INPUT FOR POLICYMAKERS' WORK

Martin Scheringer, Åke Bergman, Jana Weiss

International Panel on Chemical Pollution, IPCP, Zürich, Switzerland, ipcp@chem.ethz.ch

IPCP is an organization for active and independent scientists with expertise in chemicals, their intrinsic properties, environmental occurrence, fate, effects and implications for human health, wildlife and the total environment. IPCP is welcoming scientists from all disciplines working on environment- and health-related issues of chemicals. IPCP has members from all regions of the world and collaborates with the United Nations Environment Programme, UNEP.

The aim of the IPCP is to generate easily accessible documentation of up-to-date science of highest quality to support the work of politicians and other policymakers to decide for the best possible management of chemicals and chemical-related environment and health issues.

The transfer of knowledge by the IPCP is double-directed:

to provide scientific support for politics by
- **compiling** and **evaluating existing results** of research into large-scale chemical pollution
- providing **guidance documents**

to encourage political support for science by
- **creating awareness** among policy makers
- putting **emphasis** on fields not part of the scientific mainstream

Objectives of the IPCP are:

1. to initiate, prepare and disseminate condensed state-of-the-science documentation on all aspects of environmentally relevant chemicals,

2. to act internationally and in countries with particular needs for improving knowledge regarding chemicals for them to manage issues related to chemicals,

3. to offer the scientific expertise accumulated within IPCP to international organizations, national governments and other parties for discussions and for review of all aspects of the scientific basis for regional and/or global management of chemicals.

IPCP website: **http://www.ipcp.ch**
There you will find information about the organization, the IPCP bylaws and membership application forms.

Means to pursue the objectives are:

- to establish working groups on selected topics and to present condensed state-of-the-science IPCP reports
- to organize workshops
- to encourage international collaboration and exchange of information through the work of different and *ad hoc*-formed task forces
- to form expert panels of IPCP members to respond to requests from international organizations, national governments and other parties
- to foster scientific education and training by establishing exchange and collaboration with partner institutions
- to promote scientific research in specified areas

Reference: Scheringer, M., Bergman, Å, Fiedler, H. (2011) The International Panel on Chemical Pollution (IPCP), in: Wexler, P., van der Kolk, J., Mohapatra, A., Agarwal, R. (eds.) Chemicals, Environment, Health. A Global Management Perspective. Taylor & Francis, Boca Raton, USA, 359–370.

Upcoming : IPCP Side Event on "Challenges for POPs monitoring – How can we use international synergies to support the effectiveness evalution under the Stockholm Convention?"
at the Conference of the Parties of the Stockholm Convention on POPs, Geneva, May 1, 2013

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

IPCP
International Panel on Chemical Pollution

Activities of the IPCP

- Executing agency of a SAICM QSP Project on **“Training on Risk Assessment for Chemicals at National Level in a Global Context”**
- Multi-country project by Armenia, Chile and Ghana
  - Are data and methods for chemical risk assessment available in the countries?
  - Are they applicable under the conditions of the countries?
  - Workshops and case studies in the three countries
- Project description:

  http://www.ipcp.ch/IPCP_SAICM_QSP.html

Objectives of this Side Event

- Identify needs for input from science (Abiola Olanipekun)
- Evaluate experiences from GMP up to now (Ivan Holoubek, Jacob de Boer)
- Identify main bottlenecks for POPs monitoring in different countries (if any): attendees

Questionnaire

- We would like to ask you to fill out the questionnaire in front of you.
- We will evaluate the responses and make available the results.

IPCP Side Event at the Sixth Meeting of the Conference of the Parties to the Stockholm Convention, Geneva, Switzerland, May 1, 2013

Challenges for POPs monitoring – How can we use international synergies to support the effectiveness evalution under the Stockholm Convention?

IPCP
International Panel on Chemical Pollution

Questionnaire about monitoring of persistent organic pollutants (POPs) for participants in the IPCP COP side event

This is a multiple-choice form where you can tick several boxes. If you don't know the answer to a question, you can simply leave all boxes blank.

Personal information

These indications are optional, but the more information you provide, the more valuable the results of this inquiry will be. Particularly the country where you work is important. All responses will be treated confidentially.

Name: ..... Email: .....

Country: ..... Organization name: .....

Organization type: ☐ government, ☐ academia, ☐ non-profit non-governmental organization (NGO), ☐ private sector, incl. consultancy, ☐ other: .....

Questions regarding monitoring of POPs in food and/or in the environment in your country

1. Have you already participated in studies on monitoring POPs in humans, in food, in the environment and/or in products in your country?

Thank you very much for your attention!

http://www.ipcp.ch

Role and challenges for scientific support under the MEAs

Abiola Olanipekun
Chief , Scientific Support Branch
Secretariat of the Basel, Rotterdam and Stockholm Conventions

Geneva, 1st May 2013

Global scientific exchange under MEAs

- MEAs are triggering, streamlining and catalyzing global scientific exchange
  - Drawing on the scientific potential of Parties through the scientific subsidiary bodies and expert groups established by the conferences of the Parties
  - Creating a growing global network of experts from different countries
- Scientist are identifying research and infrastructure needs for the global assessment of hazardous chemicals (The Brno 2011 Declaration)
  - Identified priority areas, including POPs sources, global transport, monitoring, data management and interpretation

Science to serve policy needs

Effectiveness evaluation under Article 16 of the Stockholm Convention

- Major information sources according to Article 16:
  - National reports pursuant to Article 15
  - Global Monitoring Plan for POPs
  - Non-compliance procedure under Article 17
- Framework for effectiveness evaluation
  - Developed by the ad-hoc working group established at COP-4
  - COP-5 requested further comments/ input
  - Revised framework available for consideration at COP-6 document COP-6/27/Add.1

GMP is the backbone of effectiveness evaluation

- Successes of GMP 1st phase
  - Harmonized framework developed, in particular the Guidance on GMP
  - Strategic partnerships established with WHO, UNEP Chemicals/GEF, GAPS, RECETOX, AMAP, East Asia Monitoring Programme etc.
  - Five regional reports with baseline data available
- Challenges
  - Sampling/analytical capacity in regions still not sufficient
  - New POPs listed in the Convention
  - Baseline data available but still not fully harmonized and accessible

Implementation of the GMP 2nd phase

❑ Challenges / needs

- ❑ Ensuring sustainability of monitoring activities which contributed baseline data in order to provide data also for GMP 2nd phase
- ❑ Include the newly listed POPs in the monitoring activities
- ❑ Further to enhance sampling/analytical capacity in regions including for the newly listed POPs
- ❑ Ensure that the GMP data are fully harmonized and accessible in a electronic data warehouse

❑ Role of the GMP Global Coordination Group

- ❑ Support by the international scientific community

http://synergies.pops.int/

Thank you !

International Panel on Chemical Pollution (IPCP)
View of Chemical Universe Problems

Problems of Effectiveness of the Stockholm Convention

Ivan Holoubek, Kevin C. Jones

COP SC Side event, Geneva, Switzerland, 01/05/2013

What is our common interest ?

There are tens of thousands of chemicals on the market for which risks to humans and the environment have not yet been evaluated.

Chemicals are released to the environment and to food, drinking water and indoor air from many applications.

Examples are flame retardants, surfactants, pharmaceuticals, plastic softeners, pesticides, industrial chemicals, heavy metals, and unintentional by-products.

- A lot of chemicals
- A lot of Conventions
- Complicated regulation and much more complicated and low effective realisation

Problems of International Conventions / I

What the Conventions need IPCP has identified relevant limits of existing conventions addressing chemical pollution ?

- **To solve the major problems of chemical pollution, broad and highly effective international cooperation is required**
- **Despite tremendous efforts, the key question is whether the effectiveness of activity of the international community in the UN could not be significantly higher**
- **It is extremely important to have perspectives from the current economic crisis, critically evaluate the relationship between funds spent and the results obtained**

Problems of International Conventions / II

- It is necessary to critically evaluate the relationship between the resources embedded in the organization of conferences, expert meetings, workshops, tours (sitting time) and resolution procedure in individual countries (resolution time)

- How to carry the participation of representatives of each country largely funded from international resources to solve problems in these countries

- It is necessary to critically assess whether it would be possible these (sitting) resources better invested in solving problems, solving specific problems in individual countries

Problems of International Conventions / III

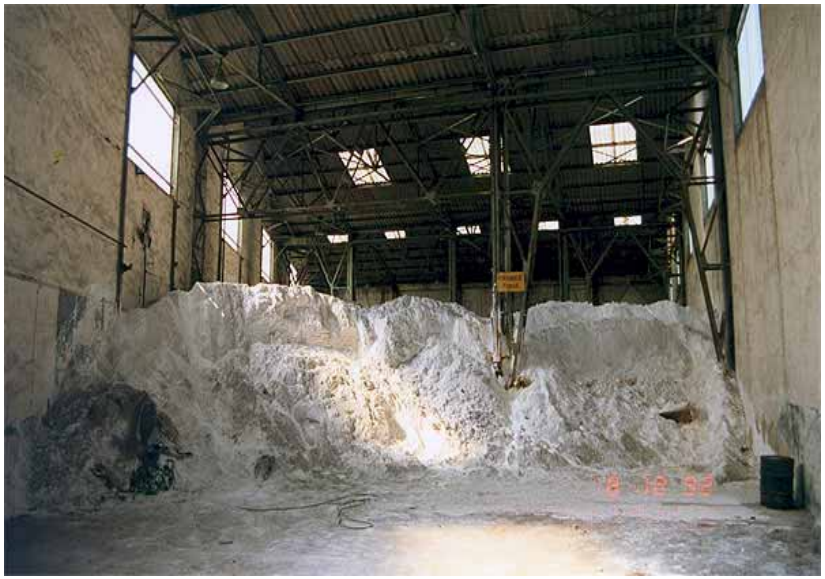
From management and organization point of view:

- **Effectiveness evaluation of the Convention measures and activities**
- **Evaluation of the financial resources application and usage**
- **Feedback of the Convention measures in the countries**
- **Ratio between hours of Convention discussion and solution of real POPs problems round the Globe**
- **Increasing of impacts of the Convention(s) measures**
- **Less discussion, more action for the effectiveness**

Example of problems

- National implementation plans
- Inventories
- Solution obsolete POPs wastes problems – BAT/BEP approach
- Capacity building
- Scientific topics

Global hills of POPs problems



What have to be done / What can be done / What was done ?

Example of problems

- **National implementation plans**
- Inventories
- Solution obsolete POPs wastes problems – BAT/BEP approach
- Capacity building
- Scientific topics

Relationship between funds spent and the results obtained – cost-benefit analysis

Cost – effective issue

NIPs 1st phase - Analysis of Scientific and Technical Aspects of the Stockholm Convention NIP Inventories

Generally the summary of information concerning to the is that the information are very heterogennic with many quite uncertain results, in some evaluated NIPs there is not any relavant information and reasonable results in the comparison with the financial input.

Quality of used data (statistical, emission levels, inventory data) the level of produced real information concerning to POPs is in many cases very low – but better than nothing ??? It depends of the following decision(s).

Relationship between funds spent and the results obtained – cost-benefit analysis

The description of existing legal aspect, the collection of country information and low level of real information concerning to the POPs inventories could not cost 300-500 000 USD.

Other problem is in many cases very high overestimation of potential financial support, quite unrealistic, out of economical reality of the countries and globe.

Essential conclusion for the future similar project – it is a necessary very carefully and strictly evaluate the effectiveness of the use of budget, in this step of NIPs development it was very formal from the side of implementing agencies.

Example of problems

- National implementation plan
- **Inventories**
- Solution obsolete POPs wastes problems – BAT/BEP approach
- Capacity building
- Scientific topics

Do we need new inventories when we are not able to solve the old problems sufficiently ???

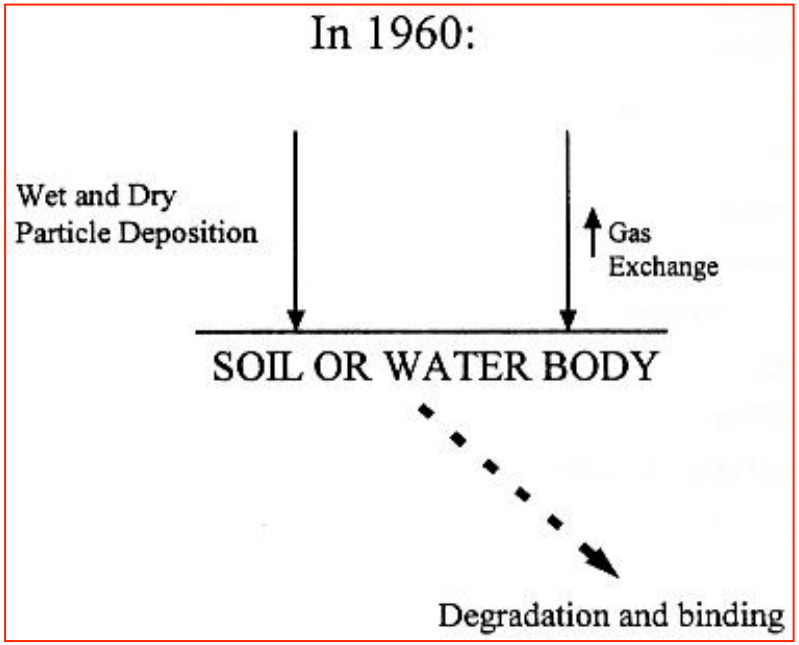
How can hills of obsolete pesticides contribute to global environmental chemical risks ?

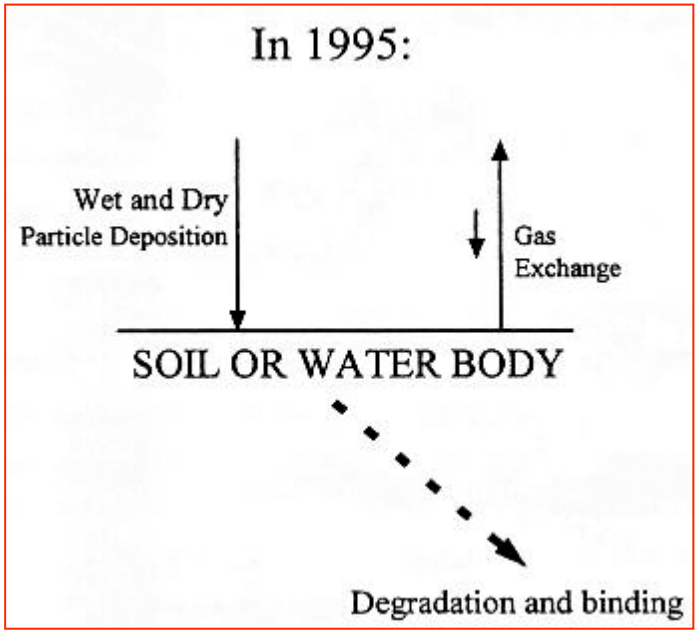
Problem – how it is a big ?

Do we know amounts which can be evaporated to the air, leach to the waters and soils and accumulated by biota including man from every tons of freely available POPs ???

How can - in this case contribute - the hills of POPs pesticides to the global distribution of POPs ?

Exchange processes air – soil - trends



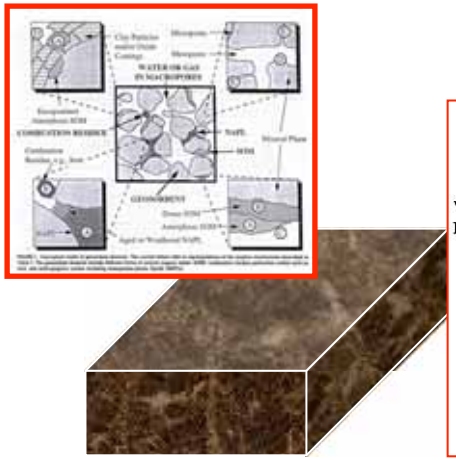


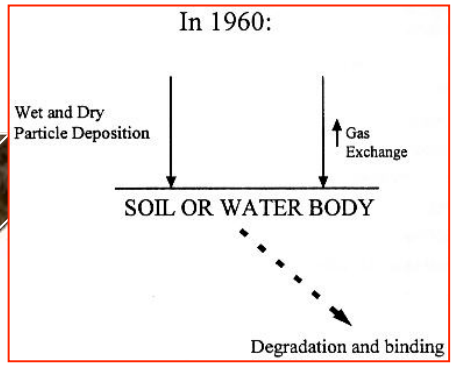
Old sources, controlable - the main sources of air contamination in this time were industry and agriculture – this contamination has led to the high levels of POPs in soils, water / sediments, biota.

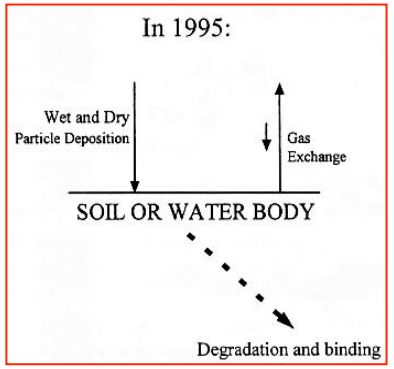
Many hotspot, dumping sites and very high amount of contaminated sites exist from this time as a result of bad management and no existence of sufficient legal acts.

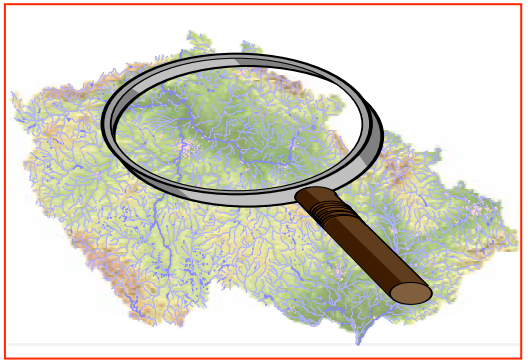
Recent, mainly secondary sources - contaminated compartments and sites - main sources of air contamination by POPs.

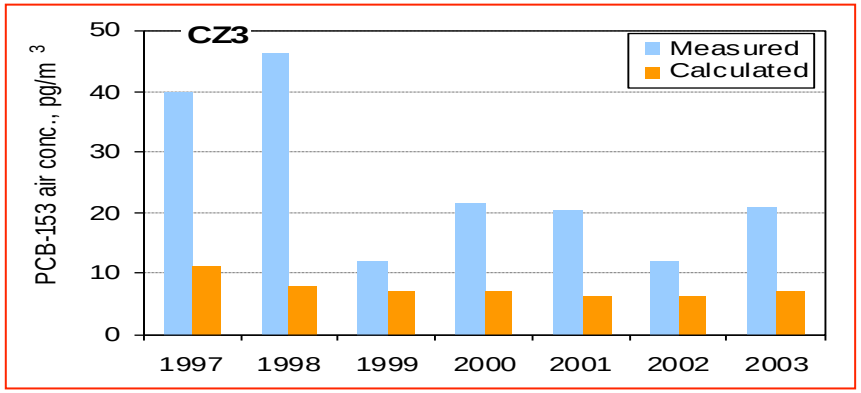
POPs Stockpiles

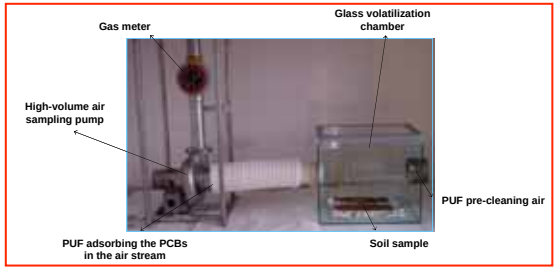


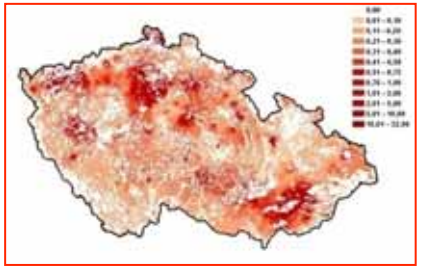












POPs Stockpiles

Stockpiles of POPs in the soil [t] - territory of the Czech Republic

pp´-DDT	897.18
pp´-DDD	51.43
pp´-DDE	529.64
op´-DDT	149.32
op´-DDD	19.22
op´-DDE	22.32
DDTs	1 669.11
a-HCH	71.85
b-HCH	88.33
g-HCH	118.89
d-HCH	24.16
HCHs	303.23

- PCB 153: 61.39 tonnes

Evaporation flux from the soils in the CR

- 22 kg/y for PCB 153 / 0°C
- 65 kg/y for PCB 153 / 20°C

Reported amounts of S PCBs from the industrial sources: 48 kg/y

HCB	120.96
PCB118	19.06
PCB101	25.48
PCB52	15.52
PCB28	13.57
PCB180	63.25
PCB153	61.39
PCB138	82.44
PCBs	280.70

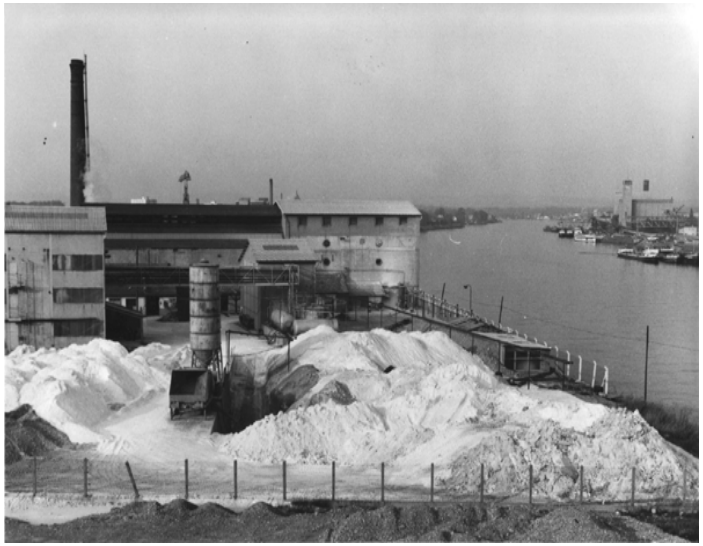
BUT we have ??? - the estimation of obsolete waste - storage, dumps, unsatured and saturated zones in the area of former producer … – ten´s thousands tones

Holoubek et al., 2009, Čupr et al., 2010

Example of problems

- National implementation plans
- Inventories
- **Solution obsolete POPs wastes problems – BAT/BEP approach**
- Capacity building
- Scientific topics

POPs mountains



POPs storage





Not only hills, new types of wastes – „closed POPs“

BEP / Best storage / disposal practice

OR ???

Is every country to do it ownself or needs to wait for help and support only ???

Example of problems

- National implementation plans
- Inventories
- Solution obsolete POPs wastes problems – BAT/BEP approach
- **Capacity building**
- Scientific topics

Capacity building

A huge amount of problems connected with the capacity bulding.

Were this huge amounts of money used for relly capacity building ?

- **Training of local lab people,**
- **Step by step explanation and training of people,**
- **Development and adoption of standard operation procedures,**
- **QA/QC and**
- **Finally the production of relevant national data internationally acceptable.**
- **Sustainable production of course**

Example of problems

- National implementation plans
- Inventories
- Solution obsolete POPs wastes problems – BAT/BEP approach
- Capacity building
- Scientific topics

Identifying the research and infrastructure needs for the global assessment of hazardous chemicals 10 years after establishing the Stockholm Convention. RECETOX/SSC/ACS/EuCheMS Brno Workshop 2011

Klánová, J. et al. (2011): Identifying the research and infrastructure needs for the global assessment of hazardous chemicals 10 years after establishing the Stockholm Convention. Environ. Sci. Technol. 45, 7617–7619

Problems of International Conventions / IV

From the scientific point of view:

- Source control of POPs and other chemicals
- Global scale transport, sources and sinks
- Persistence of chemical compounds
- Tools for monitoring of chemical concentrations and fluxes
- Future trends and scenarios
- Global monitoring plan
- Global Earth observation system of systems (GEOSS)
- Capacity building
- Limiting adverse effects from hazardous chemicals
- Effective science to serve policy needs

Problems of International Conventions / IV

How were these recommendations of 50 leading scientists used by SSC / UNEP – for example for the discussion with EC about the new research prioritieis of EU or for any other agencies ???

Broad and effective international co-operation

Problems are global, transboundary, long-term

It is impossible to solve these problems without very broad international co-operation on the political, academic, industrial, public, economical, social level.

Reality of world – a lot of obstacles – political, historical, religious without the chance to real progress or very formal and ineffective.

Relationship between sitting time and resolution time

Simplicity is beautiful

Feedback of meetings, regional and subregional meetings in countries – reflection in the legal, economical, political decisions and progress in the solution of problems.

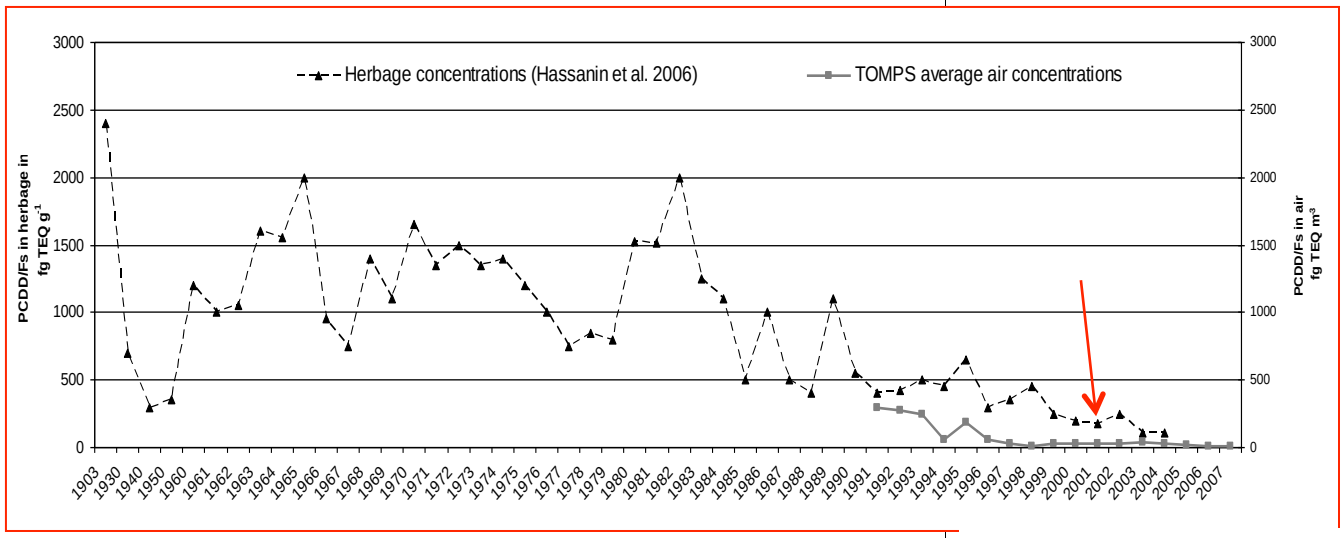
Example – range of problems – POPs and POPs wastes

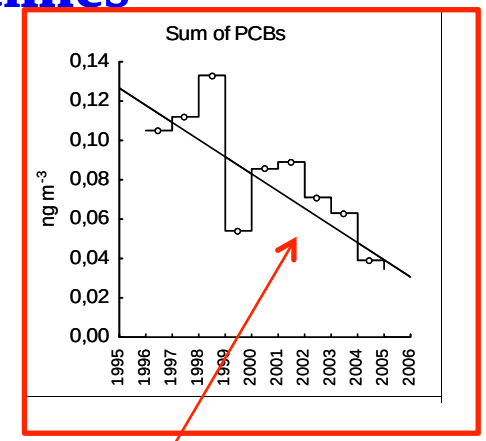
Solution – final, expensive, hitech (combustion/non-combustion)

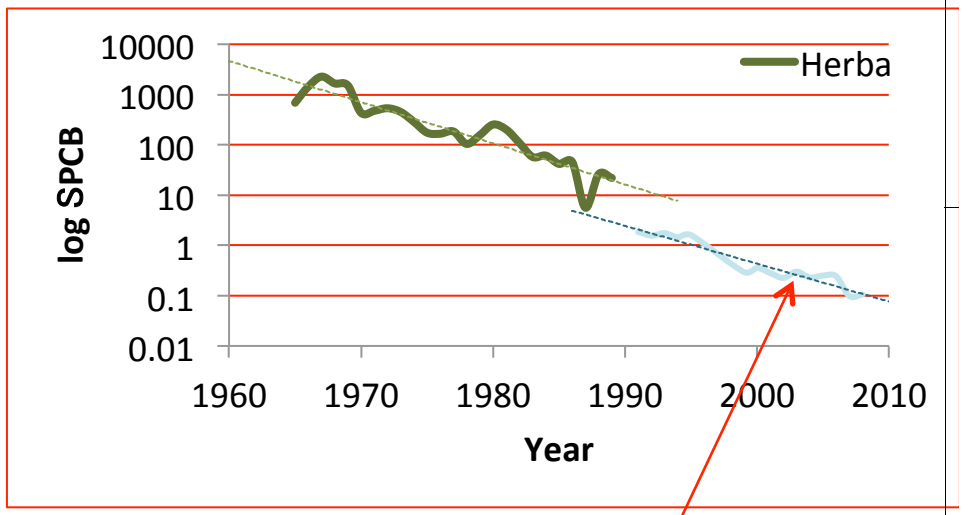
Temporal, less expensive or relatively unexpensive, but with relevant reduction of potential human and environmental risk

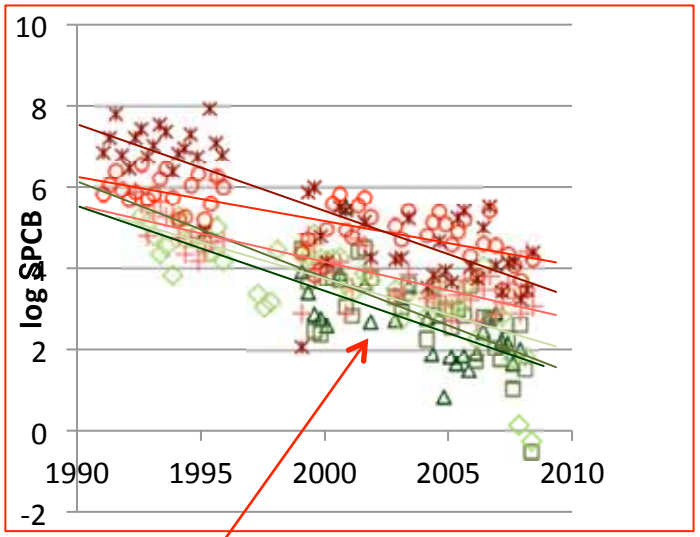
Effectiveness evaluation – so far

- Long times for POPs to decline…
- All started before Stockholm with steady declines









Effectiveness evaluation – so far

- **Some POPs (e.g. pesticides) – use can be banned and there is an environmental stock (e.g. soil) which controls global trends**

- **Others (e.g. PCBs) have stocks from past uses and wastes which disappear very slowly**

- **Others (e.g. PCDD/Fs; PAHs) have long-term past sources and continuing 'difficult to control sources'**

Effectiveness evaluation – so far

- **Clear science need - good data, long-term trends, Biobanks and archives**

- **All show declines occur before Stockholm came into force…**

- **How is Stockholm affecting other parts of the world – not Europe and North America…? This is critical and we just don't know enough to say.**

- **Knowledge and understanding of processes are essential – not just monitoring**

Some (more) thoughts

- **'Early warning' of problems was essential – voluntary bans and national controls were effective**

- **Need to be able to explain the 'added value' of Stockholm?**

- **When have scientists and regulators 'done enough'?**

- **Chemicals management has a much broader range of challenges and perspectives – resource management, sustainability agenda, impacts.**

What have to be done / What can be done / What was done ?

Let's call a spade a spade

Life is short. There is no time to leave important words unsaid.

Paolo Coelho

VU University Amsterdam

Capacity Building for the Stockholm Convention

IVM Institute for Environmental Studies

Jacob de Boer, Heather Leslie

Capacity Building

Stockholm Convention – Global Monitoring Programme

POPs	Air, Human Milk and Blood

UNEP – Capacity Building Program 2005-2013

Interlaboratory Studies	Documentation	Workshops	On-Site Training

Interlab Round I (2010-2011)– Round II (2013)

PCB, OCP, Dioxins 103 Participants, 46 countries	Id. + New POPs, 112 Participants 47 countries

Reference Laboratories

Örebro University, MTM, Sweden	• Prof. Van Bavel • Prof. Lindstrom
CSIC, Barcelona, Spain	• Dr. Abad • Dr. Abalos
VU University (IVM) Amsterdam, NL	• Prof. De Boer • Dr. Leslie

UNEP Coordination: Dr. Fiedler

Activities: overview

On site training: 25 training missions in expert labs

Procurement

Air sampling

Workshops (Hong Kong, Beijing, Bamako, Suva (2), Barcelona, Amsterdam (2))

Training in expert labs

Activities

Guidelines

Presentations

Instruction Film PFOS

Special issue TrAC

Three interlab studies

Mirror exercise

Countries involved – pilot

Continent/Area	Countries
Africa	Kenya
Asia	China, Vietnam
Latin-America (GRULAC)	Ecuador, Uruguay
Pacific	Fiji
(Eastern) Europe	Moldova

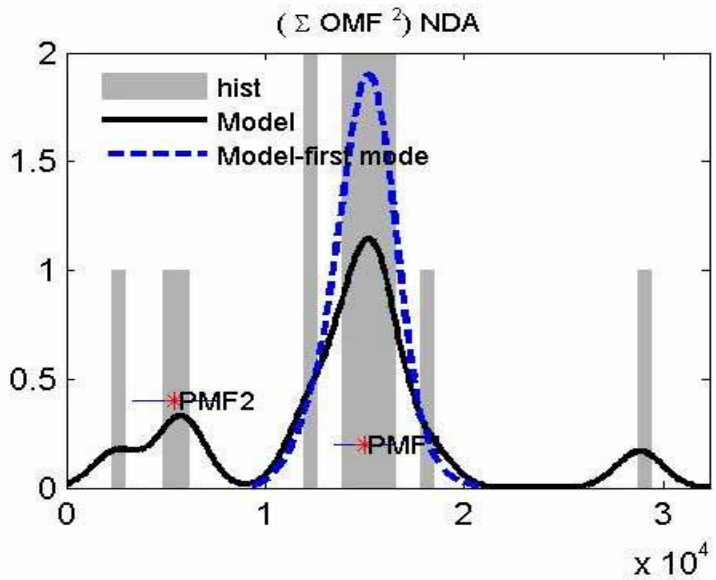
Countries (II)

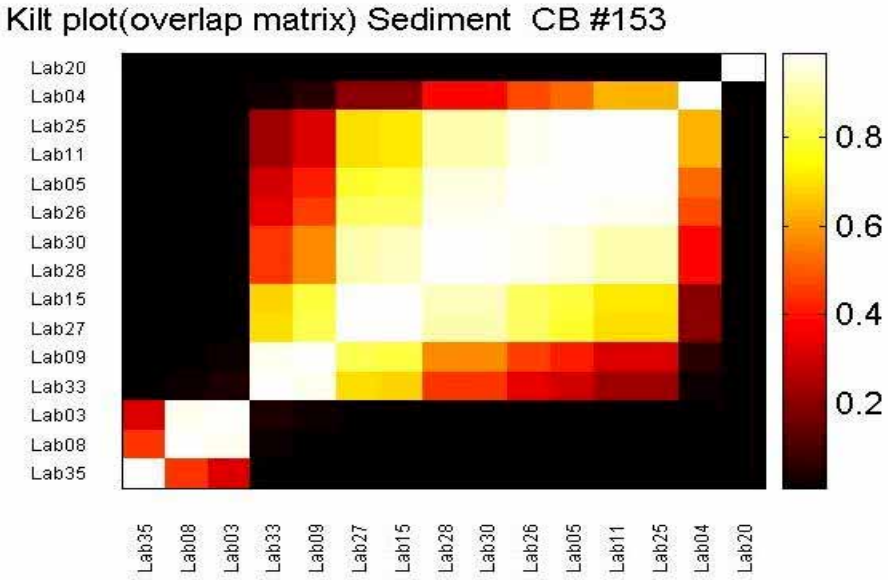
Continent/Area	Countries
Africa	Egypt, Ghana, Kenya, Mali, Mauritius, Nigeria, Senegal, Uganda, Zambia
Asia	China, Vietnam
Latin America	Barbados, Brasil, Chile, Cuba, Ecuador, Haïti, Jamaica, Mexico, Peru, Uruguay
Pacific	Fiji

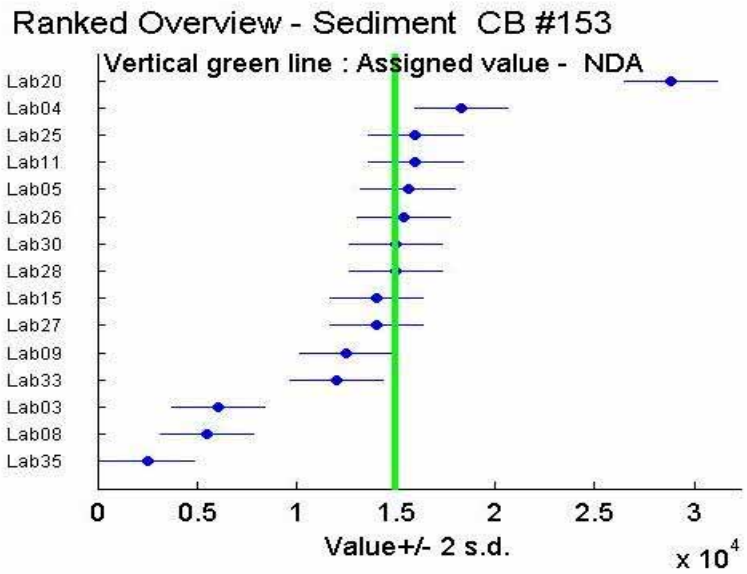
On-SiteTraining - Observations

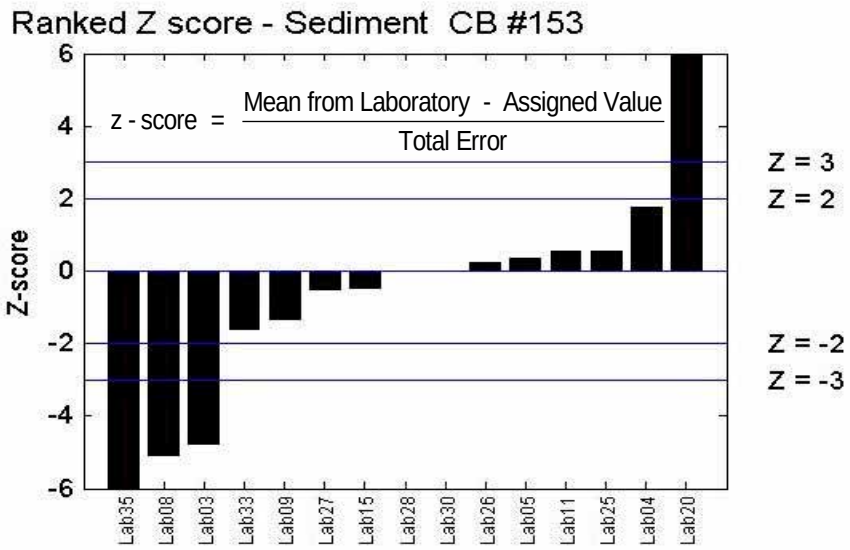
- **Lack of consumables** (glassware, syringes, chemicals, etc.)
- **Bureaucracy** is hindering processes in laboratories
- Laboratories need to build up **routine**
- **Training** is needed for understanding basic principles of trace analysis (optimization, validation, clean lab, QA/QC)
- **Safety** issues need strong improvement
- **Air analysis** seems to be easier than expected
- Laboratories often have **a preference for food analysis**

Interlab studies – target: <25% RSD

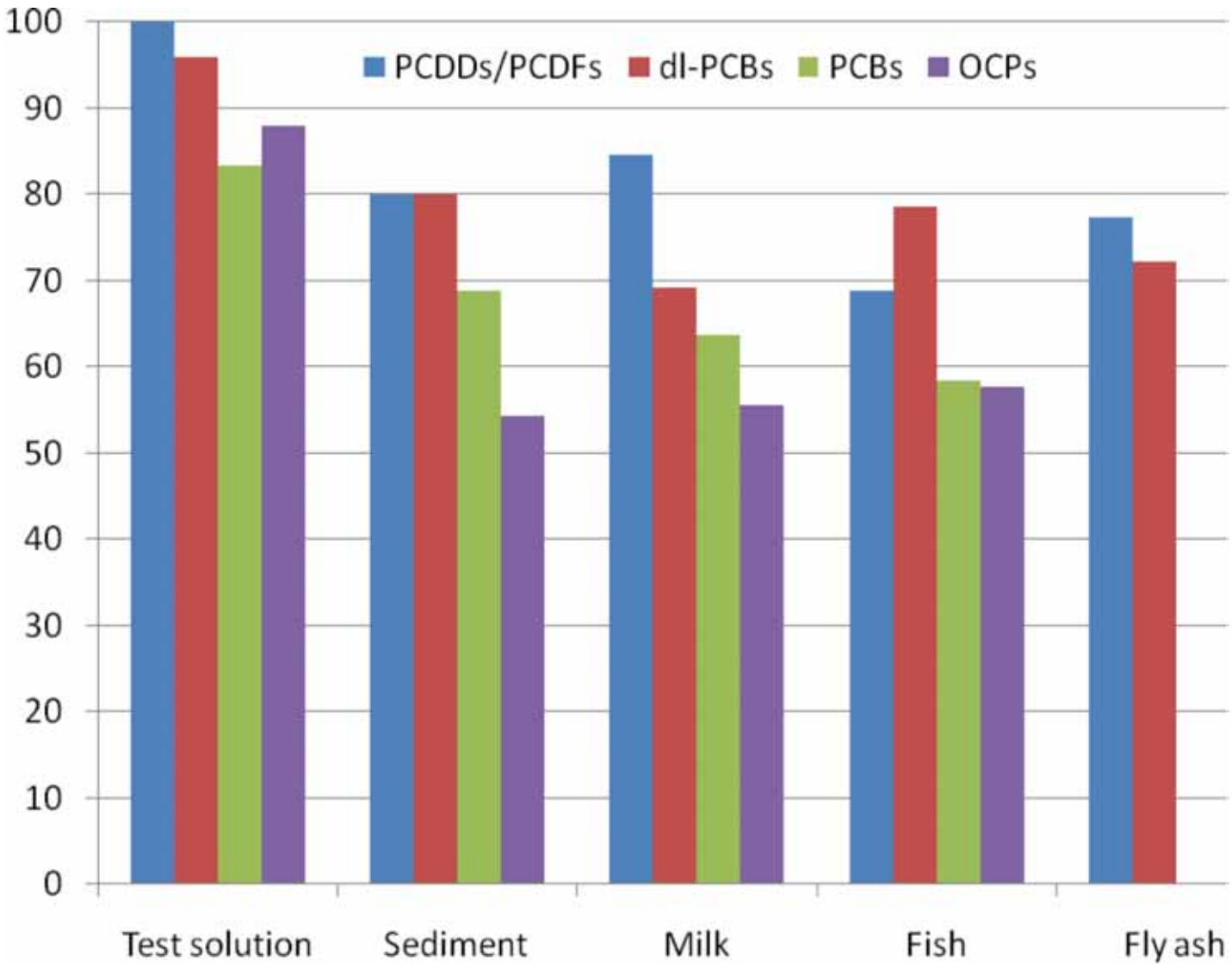




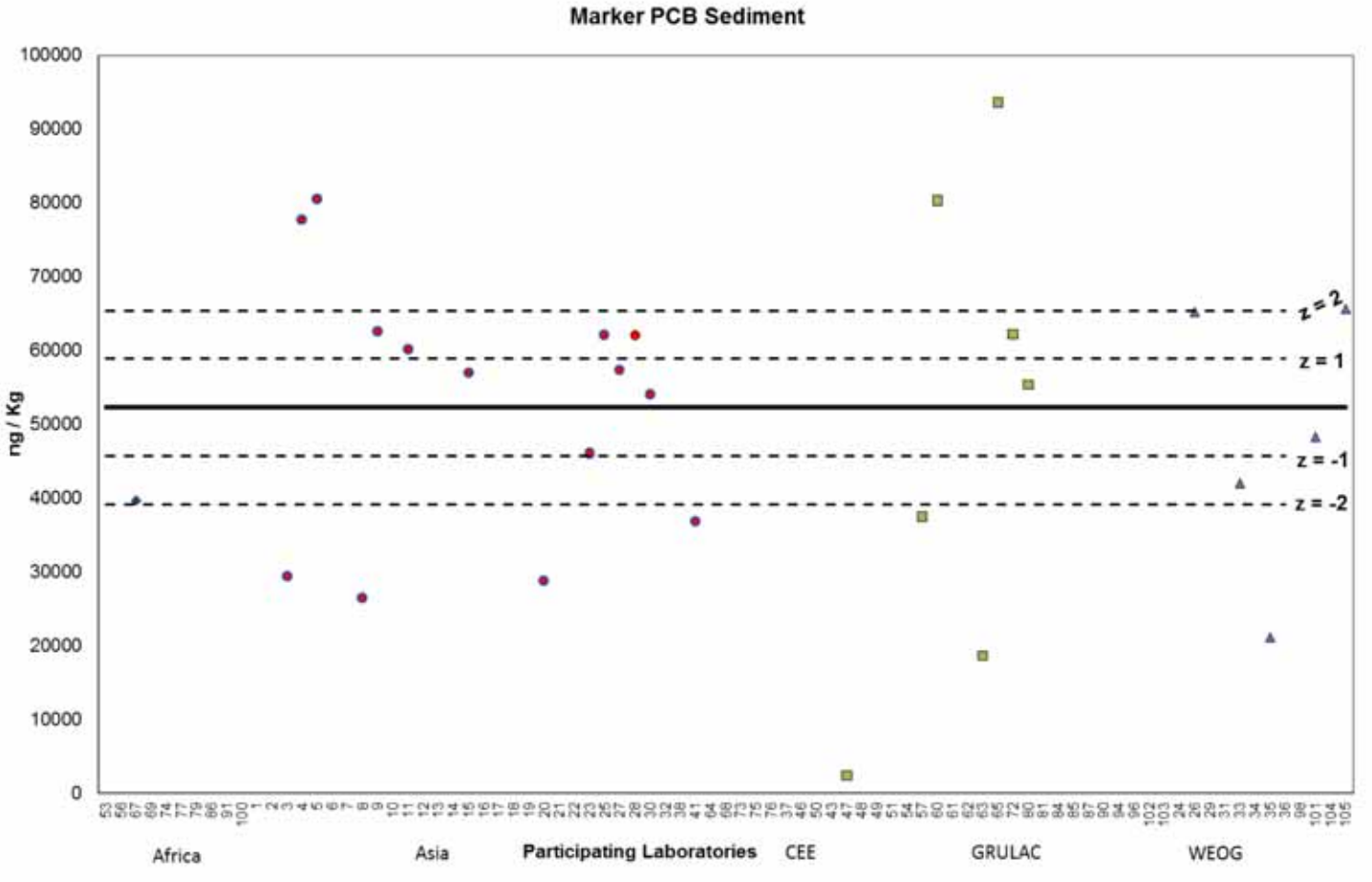




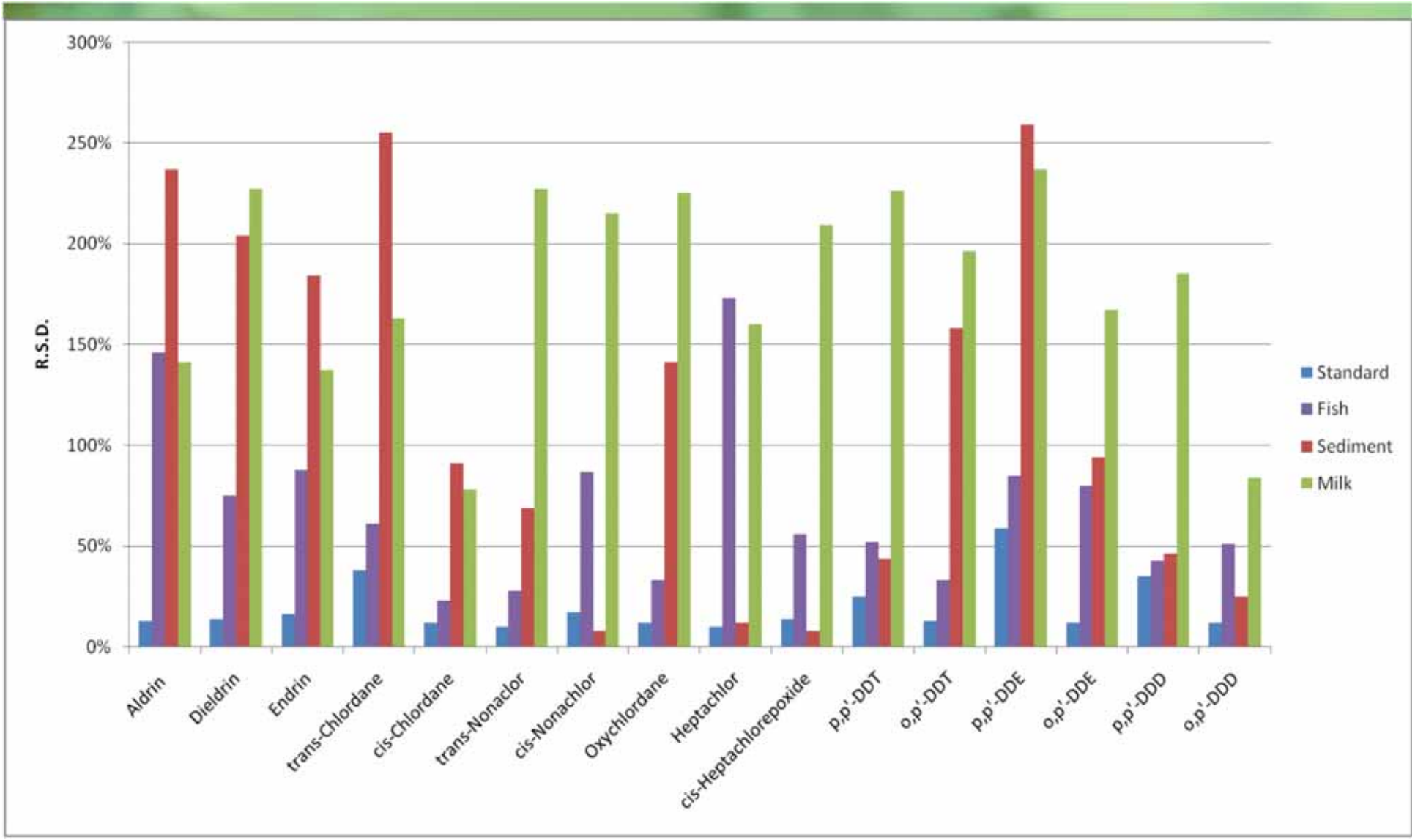
Interlab I - satisfactory z-scores



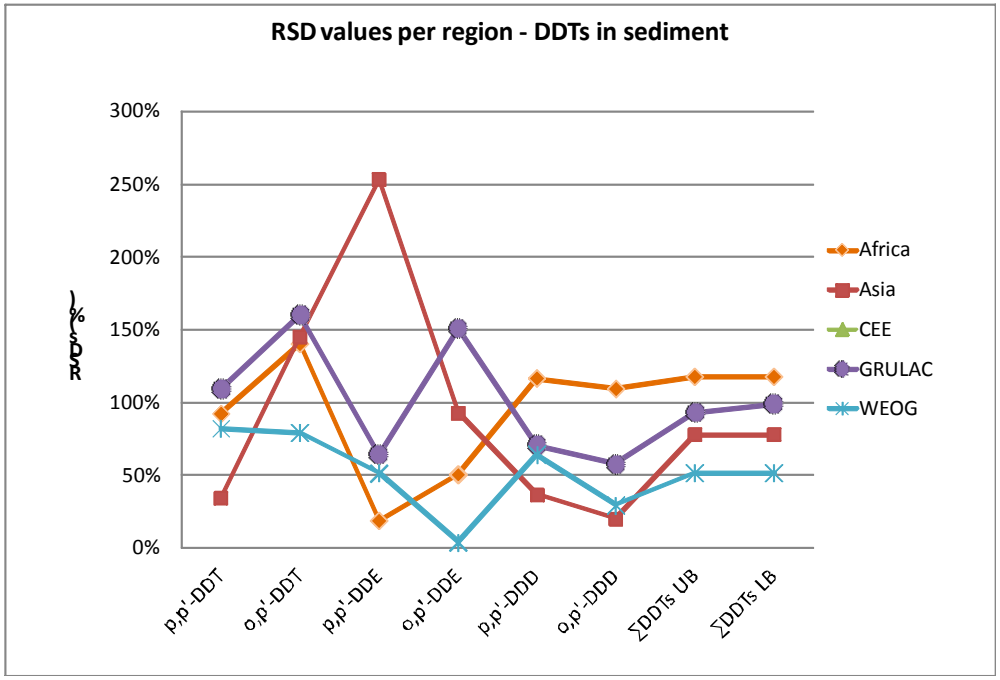
Interlab I - results PCBs in sediment



Results: RSDs per Matrix - OCPs



Interlab I- results: DDT in sediment



Summary of Results

	Sediment		Fish		Milk		Solution	
	RSD (%)	n	RSD (%)	n	RSD (%)	n	RSD (%)	n
PCBs	39%	27	38%	29	16%	23	19%	35
Dieldrin, endrin	120%	21	35%	20	29%	20	19%	47
Chordanes	123%	14	81%	17	93%	18	9%	22
DDTs	26%	26	59%	21	45%	21	17%	31
HCB	59%	30	99%	28	41%	11	8%	28
Mirex	53%	10	64%	20	31%	9	9%	18

Interlab studies: Problem Areas

- OCP analysis with ECD
- OCP degradation due to H_2SO_4 treatment
- Low levels in fatty tissues
- Low levels in sediments
- Cleanliness of GC (and glassware)
- General attention to QA/QC (e.g. quality charts)
- Use of w/w basis instead of v/v with dilutions
- Background, blanks, interferences

Recommendations

Laboratories should receive more training, either in their own laboratory or in an expert laboratory or in a combination, preferably for a substantial period, in order to learn all details of the POP analysis and build up experience in this type of analysis

Follow-up through subsequent interlaboratory studies is needed to monitor and improve the overall level of performance of POPs analysis of the participating laboratories

Participating laboratories should maintain and improve the level of expertise in their laboratory by ongoing and frequent POPs analysis

Participating laboratories are encouraged to train their own technicians by repeatedly analyzing certified reference materials and internal laboratory reference materials

Efficiency

- Planning: very time consuming, due to different cultures and labs that have no experience yet
- The required effort may be underestimated by UNEP
- Trained technicians may choose a better job….
- The training is very useful for more than POPs alone