

# Lancaster Environment Centre Resources and Capability



the **REACH** CENTRE

The Lancaster  
**Environment Centre**

Centre for Chemicals Management (CCM)

Centre for Sustainable  
Water Management

Centre for Sustainable  
Agriculture

Centre for Sustainable  
Energy

Centre for  
Environmental Informatics



**Centre for  
Ecology & Hydrology**

NATURAL ENVIRONMENT RESEARCH COUNCIL

CEH Science Programmes  
and cross-cutting themes

the **REACH** CENTRE

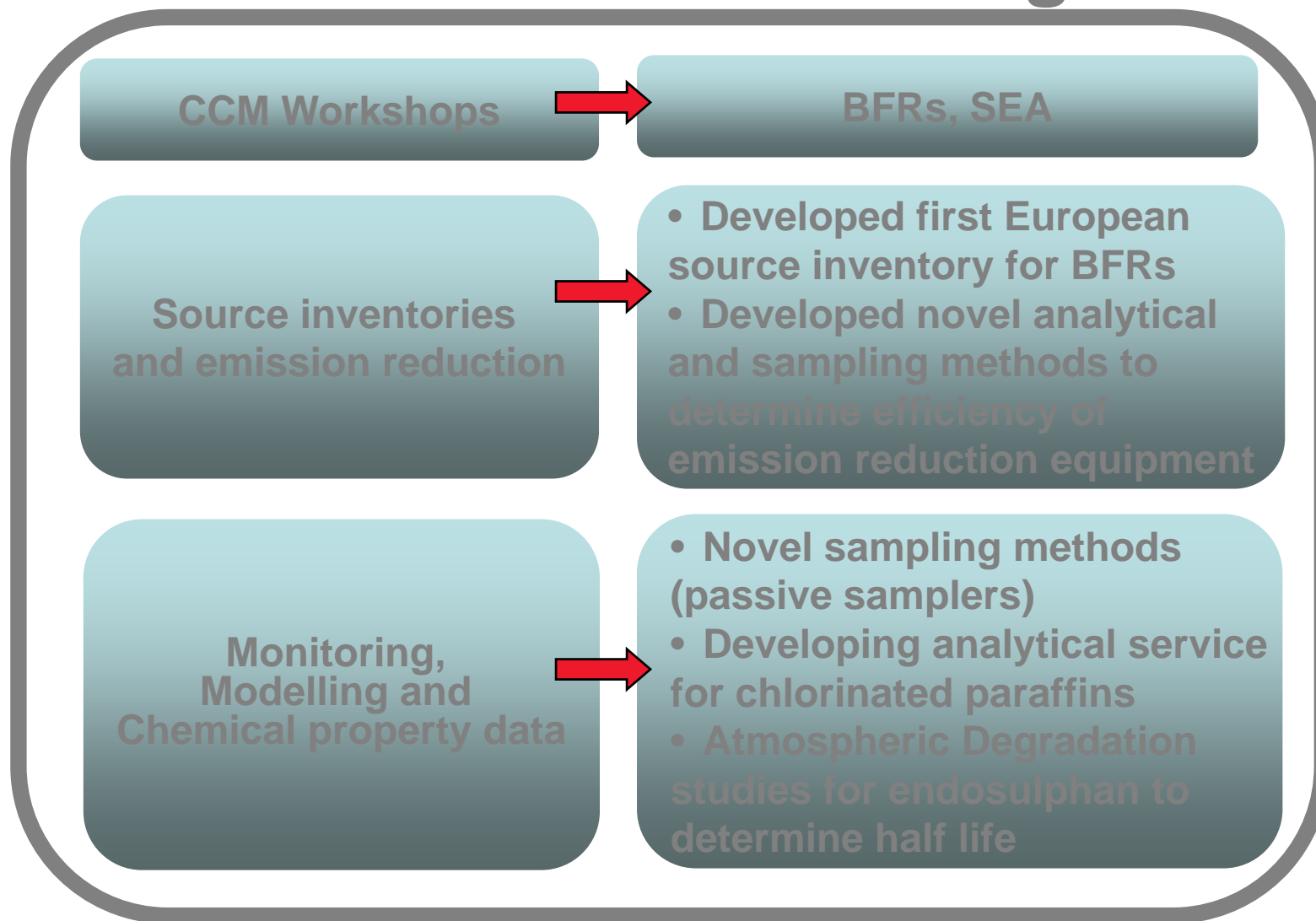


The Lancaster Environment Centre is one of the largest Centres for Environmental Research in Europe.

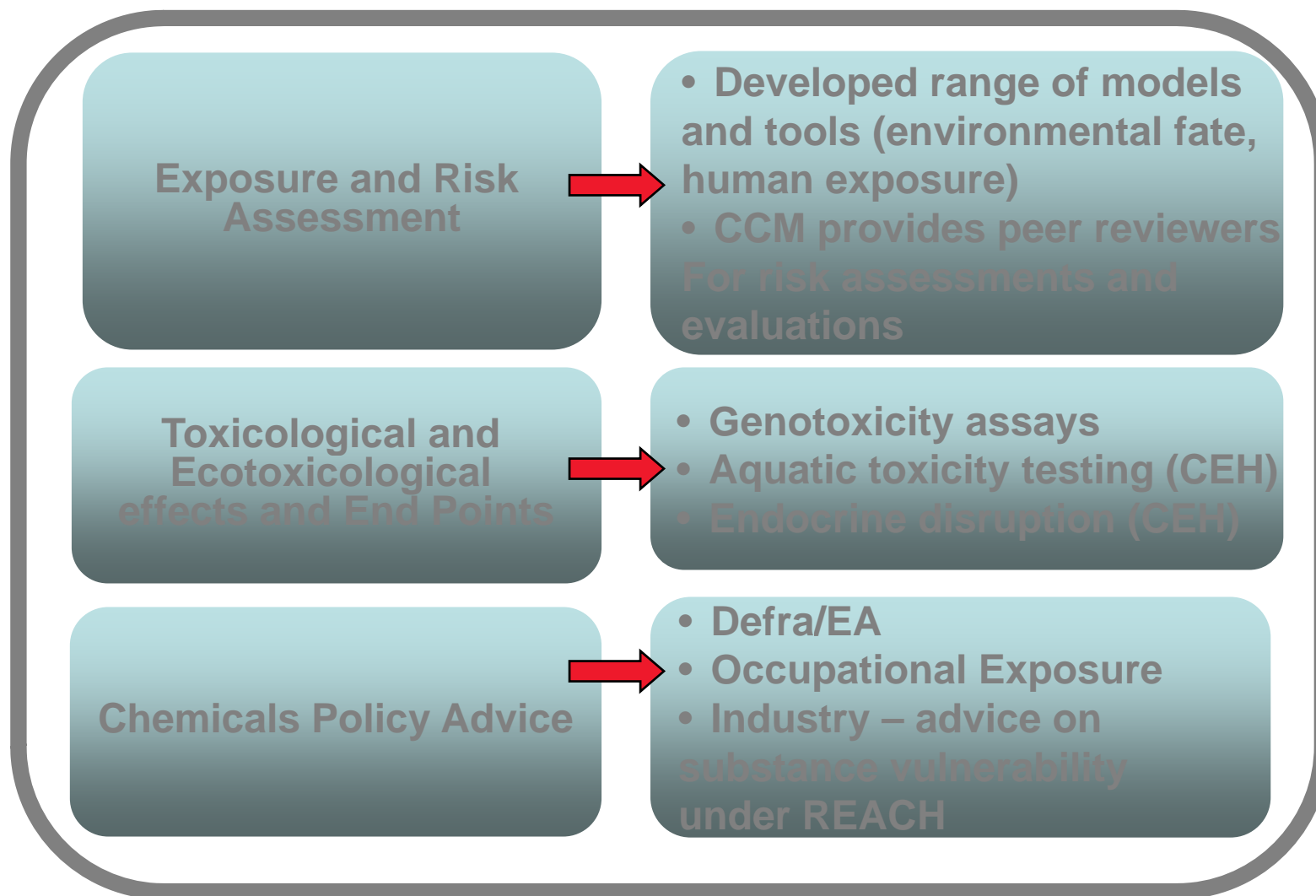
Our research is funded by a number of organisations:



# Centre for Chemicals Management



# Centre for Chemicals Management



# Flame Retardant Workshop

- 30 Delegates from across FR Supply Chain
- Introduced LEC Facilities
- PBDEs an Environmental Perspective
- Flame Retardants in Industry
- REACH: Regulatory Implications
- Chemical Stewardship and VECAP Process
- Identify industry needs and collaborative opportunity



# Strategic Research and Development

## Case studies

Brominated flame retardants

Chemicals Policy Advice

International Chemicals Regulation

Human Exposure Assessment

# Brominated Flame Retardants in the news

BBC FOUR



## EARTH SUMMIT SHORTS: THE FALCON'S WARNING

Documentary-maker **Dan Rees** writes about his short film on the discovery of toxic chemicals in bird eggs:

Scientists in Sweden have made what appears to be an ominous discovery. They have detected high levels of potentially toxic man-made chemicals in the eggs of peregrine falcons on cliffs in Lapland, thousands of kilometres from the sources of their release.

### Contradictory claims

These chemicals, known as Brominated Flame Retardants (BFRs), are found in a wide range of products from furniture to computers. They are released into the environment both at the sources of their manufacture and through everyday wear and tear of products. The industries manufacturing the chemicals have always claimed that biological organisms could not absorb them and they would never end up in the food chain. The discoveries in Sweden appear to contradict this.

What toxic effect BFRs might have is not yet clear. There is evidence that they may cause cancer in some animals and also affect hormone systems. However, because the chemical structure of the BFRs is very similar to chemicals known as Persistent Organic Pollutants (POPs) many scientists are now calling for a precautionary ban on their use.

### Chemical ban?

BBC FOUR NEWSLETTER

Sign up for TV programme

bbc.co.uk

4 May 2006

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A female polar bear and her cubs roam the Arctic in search of prey. The mother smells a distant ringed seal, and slowly stalks it. From fifteen metres away, she explodes in a burst of energy, her paw shattering the seal's skull. The family feeds, enjoying the fat layer so vital for their survival. Fat which is full of pollutants, fat which is slowly but surely poisoning the bears.

The Arctic is Europe's last true wilderness. Yet today, pollutants are contaminating this unique ecosystem. Dying seabirds, seals with obstructed uteri, and polar bears with impaired immune systems may just be the tip of the iceberg.

Many pollutants can travel large distances. Air currents over Europe and Russia take the chemicals northwards, where because of the low temperatures, they condense and are deposited in the Arctic Ocean. The Arctic thus functions as Europe's garbage can.

**STOP THE TOXIC THREAT TO OUR CHILDREN AND WILDLIFE**

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You are here: WWF-UK > Chemicals and Health > Latest research on toxic chemicals

### Chemicals and Health

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## Latest research on toxic chemicals

The science of toxicology is constantly changing as new facts and impacts are discovered in laboratories and in the wider world. The campaign has written short summaries of the latest research and information on man-made hazardous chemicals below.

References are provided if you want to see the original paper. Unfortunately some of the publications are subscription only so you will need to follow them up at your local university library. The campaign will update this section regularly.

### Widespread contamination

Contamination of the remotest regions of the planet is ongoing. For example, the chemical TBT (tributyltin) used in antifoulant paints on large ships, has recently been detected for the first time in the sediments of the Ross Sea, Antarctica. Butyltin compounds have been detected in the Malaysian marine environment in concentrations that have raised concerns for human health.



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Print version



# CCM Research into BFRs

## Penta-BDE

- EU wide ban (August 2004)
- Currently being discussed under UNECE and Stockholm
- US (and worldwide) voluntary agreement to phase out
- CCM has carried out a range of source inventory studies measurement studies including air (UK, Europe and Asia), and humans. Also carried out modelling exercises to quantify sources and exposure pathways.

## Deca-BDE

- Draft EU risk assessment reported in 2002 (updated 2007)
- CCM has carried out two air monitoring campaigns for BSEF at the request of EU rapporteur (UK-EA)
- Intended to provide evidence of environmental response to VECAP
- Development of analytical methods for DecaBDE.
- Provided expert peer reviewers for risk evaluation process

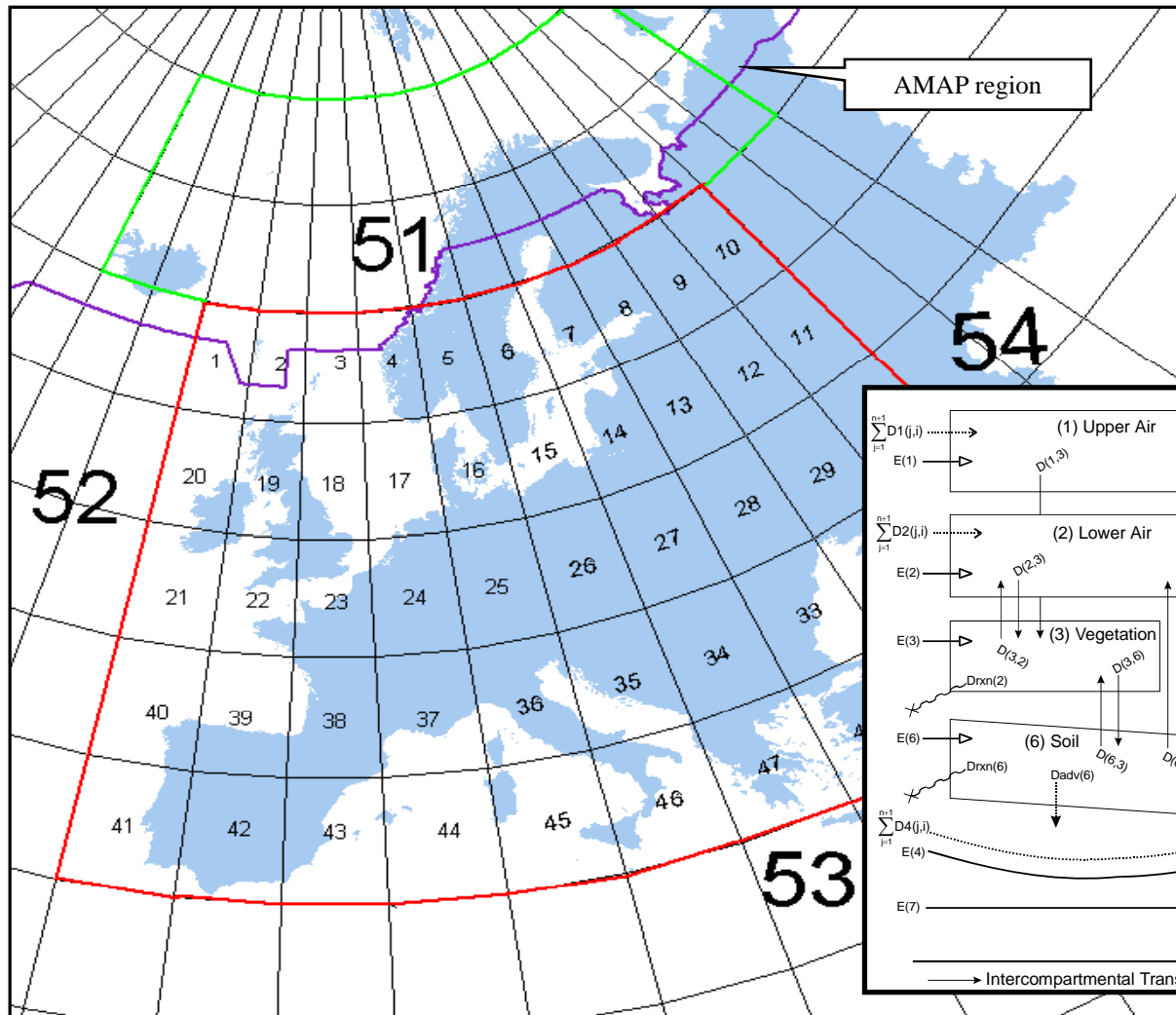
# CCM Research into Perfluorinated Chemicals



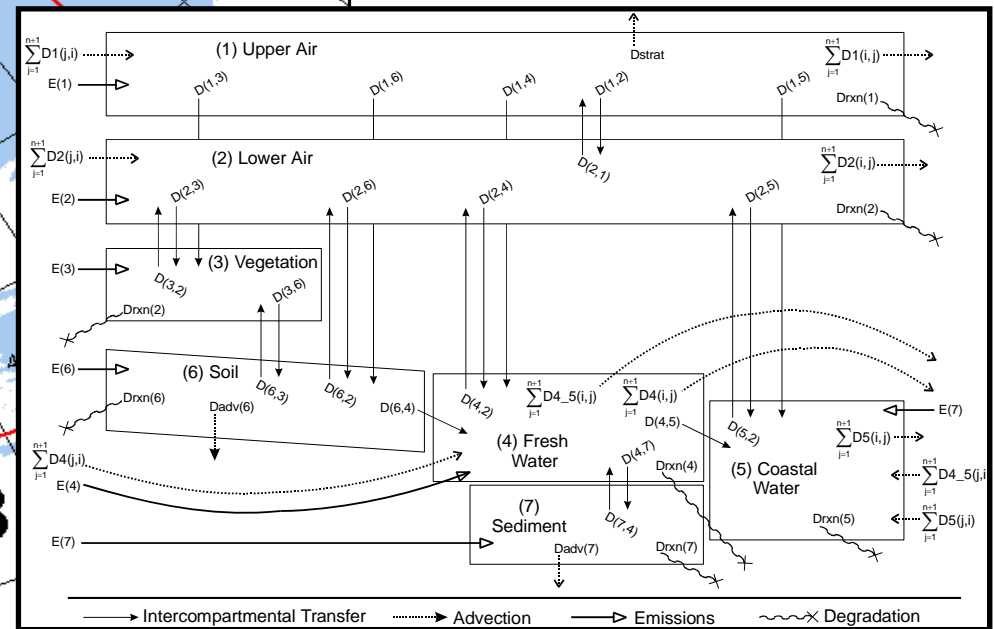
- 1950 – Large scale production - many uses identified
- 1998 - PFOS found distributed widely in human serum and fish-eating wildlife serum and liver
- 2000 - 3M announce that the company will voluntarily phase out POSF manufacturing process and use of PFOS
- Sweden proposes PFOS POPs Stockholm and UNECE
- CCM has developed national expertise in the measurement, fate and behaviour of perfluorinated chemicals. Carried out first measurements in UK air.

As a result, Dupont, and other industrial partners have supported our research to into providing a more detailed understanding of the sources and environmental fate of perfluorinated chemicals.

# Development of Management Tools - European gridded multimedia model



Our research supports Defra with their negotiation of international chemicals conventions and agreements











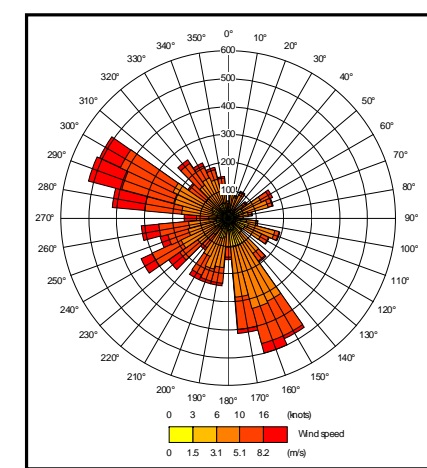
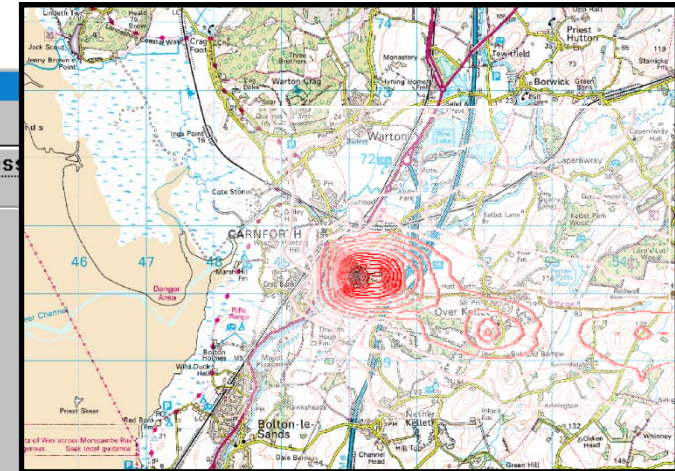
# Development of Management Tools – Point Source Evaluation

Our research supports the EA and industry to quantify food chain exposure

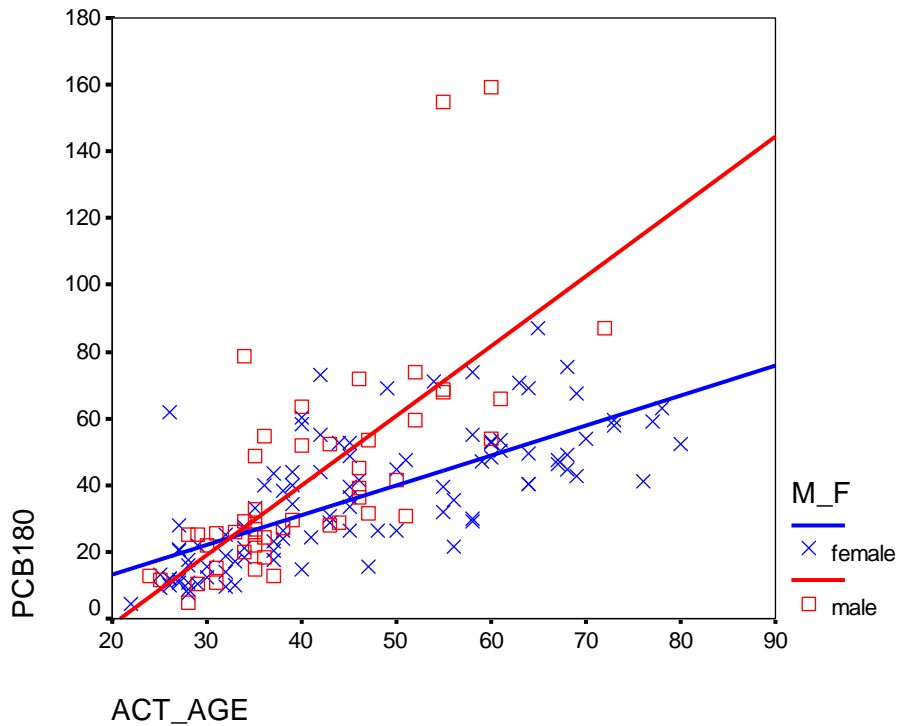
**Risk modelling for point source dioxin releases**

Restart

Data input		File access		Media concentrations		Exposure assess	
	142.6 g fat per week	% intake 43.6	include? <input checked="" type="checkbox"/>	FSA? <input type="checkbox"/>	Output for age ranges		
	24.8 g fat per week	31.7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dietary intake (pg per kg body weight per day)		
	7.6 g per week	3.3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	min (95%) <input type="text"/> MEAN		
	1.8 eggs per week	2.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max (95%) <input type="text"/>		
	180.0 g per week	0.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dietary intake (pg per kg body weight per day)		
	142.9 g per week	13.9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	min (95%) <input type="text"/>		
	240.0 g per week	3.7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max (95%) <input type="text"/> MAX		
	1401.0 g per week	1.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Output for age ranges <input type="button" value="Output for age ranges"/>		
<input type="checkbox"/> Contaminated foodstuff	Soil ingestion	0.3	<input checked="" type="checkbox"/>		Background scenario		
					Dietary intake (pg per kg body weight per day)		
					min (95%) <input type="text"/> 0.54		
					max (95%) <input type="text"/> 0.87		
					Output file		
					<input type="text" value="outputfile"/> Create output file <input type="button" value="PDF"/> <input type="button" value="Excel"/>		
					<input type="button" value="Calculate"/> <input type="button" value="Close"/>		



# Biomonitoring: relating sources to exposure



## Survey results

Click on the pictures below or select a location from the right to see the results from a range of volunteers.

