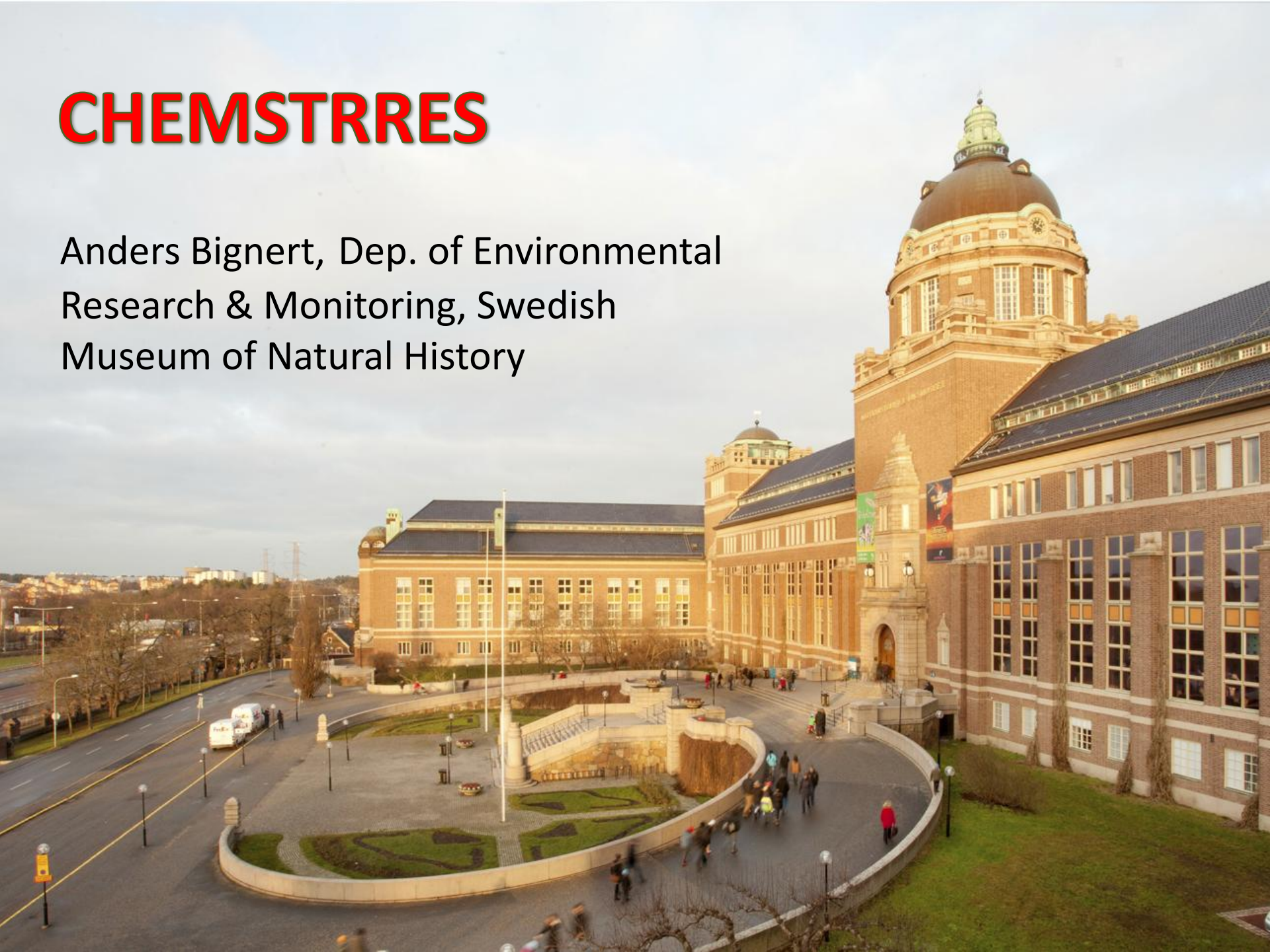
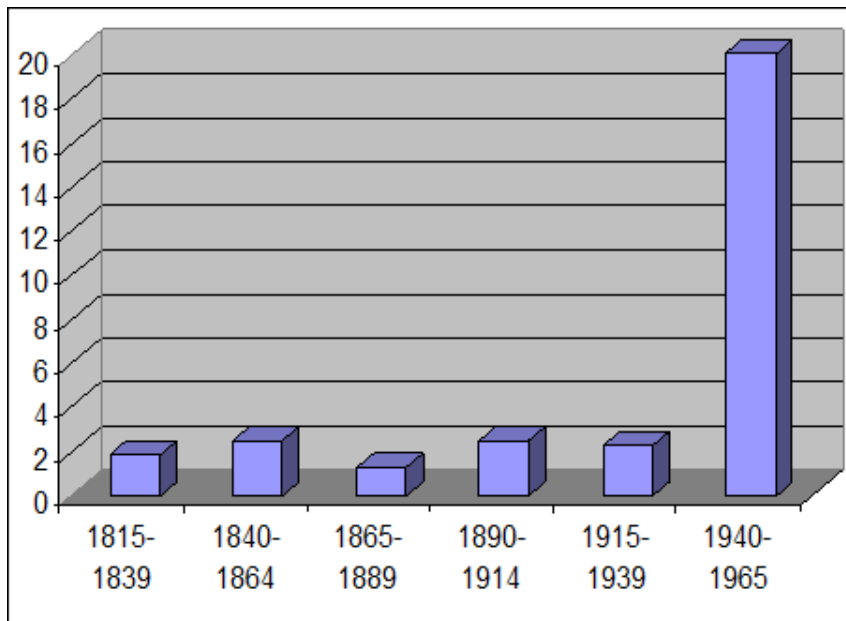


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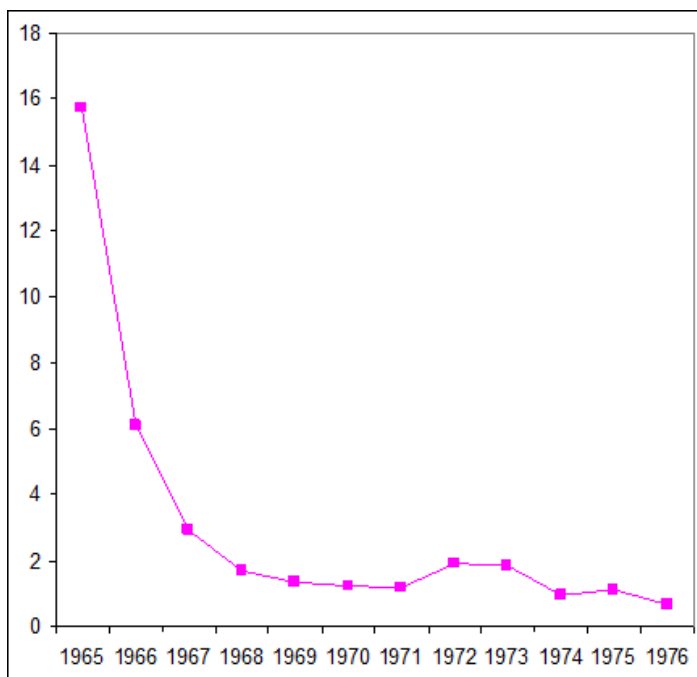
Anders Bignert, Dep. of Environmental
Research & Monitoring, Swedish
Museum of Natural History





Kvicksilver i fjäder fr. duvhök

Birke et al, 1967. Hg, mg/kg torrsvikt.

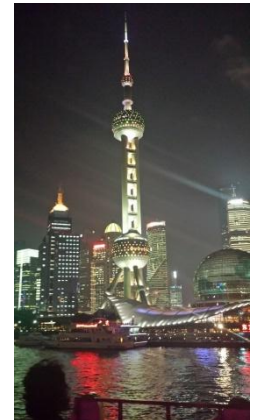


Kvicksilver i fjäder fr. kärnhök

Odsjö, Sondell 1977. Hg, mg/kg torrsvikt

Swedish-Chinese chemical pollution stress and risks research program in the Yangtze River Delta region

CHEMSTRRES



Naturhistoriska
riksmuseet



Stockholms
universitet

The Past, the Present and the Future – Experienced gained from the SIDA project



CHEMSTRRES – PREVIOUS ACTIVITIES & COLLABORATION

- ❖ SIDA FUNDED Partner Driven Cooperation project (2011 – 2013)
- ❖ Development of a monitoring program for the YRD area
- ❖ Construction of the Sino-Swedish Environment and Health Laboratory and the Yangtze Environmental Specimen Bank in Jiaying
- ❖ Annual "Sino-Swedish Workshop on Environmental Pollutants"



3rd Sino-Swedish Workshop, Stockholm, 2012

The Team in China, Tongji University, Shanghai



Prof. Zhao Jianfu
Director of the State Key
Laboratory



Prof. Yin Daqiang
Deputy Dean of the CESE



Prof. Zhu Zhiliang
Deputy Director of the CESE



Assoc. Prof. Qiu Yanling



Ms. Xiao Qianfen & Sun Yajie



Assoc. Prof. Meng Xiangzhou

The Team in Sweden, SU



Dr. Birgit Paulsson



Ge Yin, Ph.D. Student



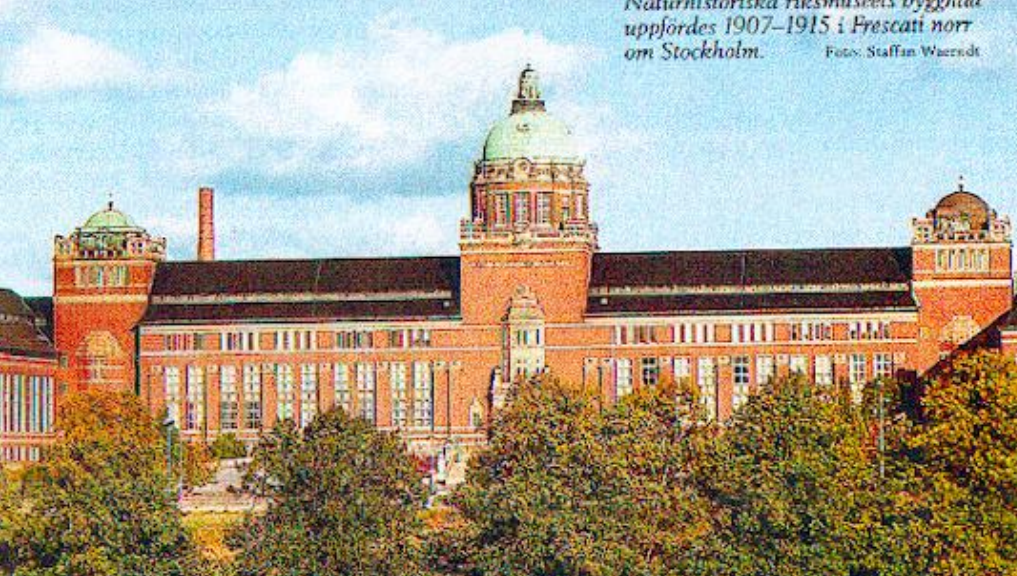
Prof. Åke Bergman



Dr. Lillemor Asplund



Vivianne



Naturhistoriska
riksmuseet

Mara Vasileiou



Anders Bignert,



Elisabeth Nyberg,



Sara Danielsson



The SINO-SWEDISH ENVIRONMENTAL & HEALTH LABORATORY AND YANGTZE ENVIRONMENTAL SPECIMEN BANK



The Jiaxing Sustainable Development Park (10 hectare) hosts the 3000 m² Sino-Swedish EHL, Laboratory, the 400 m² Yangtze ESB and a Infrastructure building, hosting e.g. lecture rooms, display areas, a restaurant and overnight rooms. All located in Jiaxing, 30 min away from Shanghai by highspeed train



嘉兴可持续发展公园

JIAXING SUSTAINABLE DEVELOPMENT PARK

嘉兴同济环境研究院

JIAXING - TONGJI ENVIRONMENT RESEARCH INSTITUTE







CHEMSTRRES

Five year project (2014 – 2018) funded by
The Swedish Research Council



Collaboration between;

- Stockholm University (SU)
Department of Materials and Environmental Chemistry (MMK)
Department of Applied Environmental science (ITM)
- Swedish Museum of Natural History (NRM)
Department of Contaminant Research
- Tongji University (TJU)
College of Environmental Science and Engineering

CHEMSTRRES - RESEARCHERS

STEERING BOARD

Å. Bergman – Project Investigator

A. Strid – Secretary

A. Bignert, M. Breitholz, Y. Qiu & J. Zhao

OTHERS

Yin Ge (PhD student, SU)

Sara Furuhausen (PhD student, SU)

Maria Vasileiou, Sara Danielsson (NRM)

Dr. Yihui Zhou (TJU)

Dr. Zhenyang Yu (TJU)

and others from both Sweden & China...

APPLICANTS

Prof. Åke Bergman (SU)

Prof. Anders Bignert (NRM)

Prof. Elena Gorokhova (SU)

Assoc. Prof. Lillemor Asplund (SU)

Assoc. Prof. Magnus Breitholz (SU)

Dr. Anna Strid (SU)

Prof. Jianfu Zhao (TJU)

Prof. Yanling Qiu (TJU)

Prof. Daqiang Yin (TJU)

Prof. Zhiliang Zhu (TJU)

CHEMSTRRES - REFERENCE GROUP

The progress of CHEMSTRRES is based on interactions with a **Reference group** consisting of representatives from stakeholder authorities in:

Sweden

Dr. Charlotte Unger, The Medical Products Agency

Dr. Anders Glynn, The National Food Agency

Dr. Bert-Ove Lund, The Swedish Chemicals Agency

Ms. Tove Lundeberg, The Swedish EPA

China

Dr. Longchao Zhou, Office of European Affairs, Department of International Cooperation, Ministry of Science and Technology

Prof. Yongning Wu, China National Center for Food Safety Risk Assessment, National Health and Family Planning Commission

Prof. Chunxia Wang, Environmental Chemistry Division, National Natural Science Foundation of China

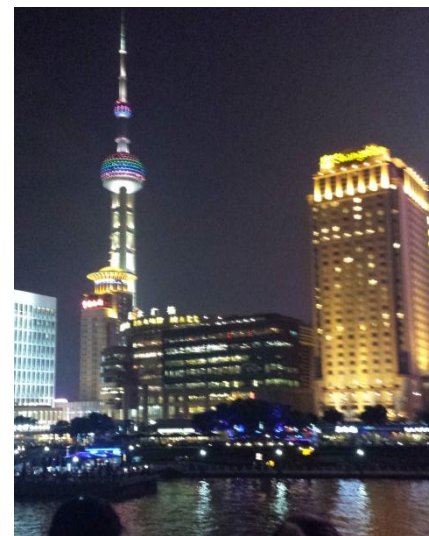
Dr. Mingxu Zhang, Shanghai Environmental Monitoring Center

CHEMSTRRES - PURPOSE & AIMS

Development of a structured framework for assessment of chemical environmental hazards and risks in the highly industrialized and trade intensive Yangtze River Delta region, with its commercial center, Shanghai.

The goal is to strengthen Swedish and international research on hazard identification and risk assessment by working in a heavily contaminated region.

To support the management of chemicals and the environment, both in China and EU/Sweden.



CHEMSTRRES - NATIONAL & INTERNATIONAL COLLABORATION/EXCHANGE

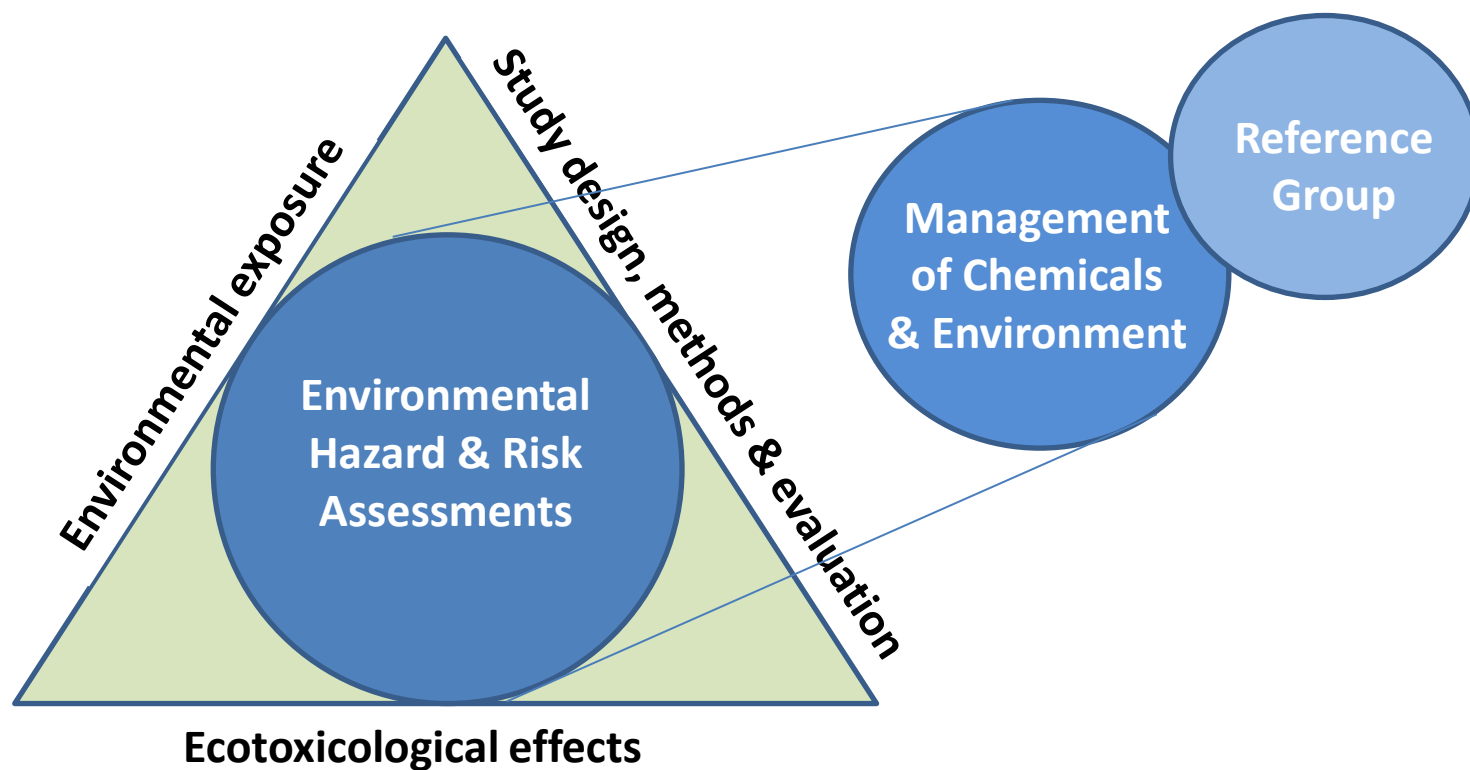
Close cooperation between researchers at TJU and the Swedish scientists from NRM and SU

Senior researchers from China will spend time in Sweden annually;

- Prof. Qiu – 2.5 months/ year
- Prof. Zhao & Prof. Yin – 1 month/ year
- Prof. Zhu – 1 month/ year (year 1, 3 & 5)
- Dr. Zhou & Dr. Yu – 6 months/ year

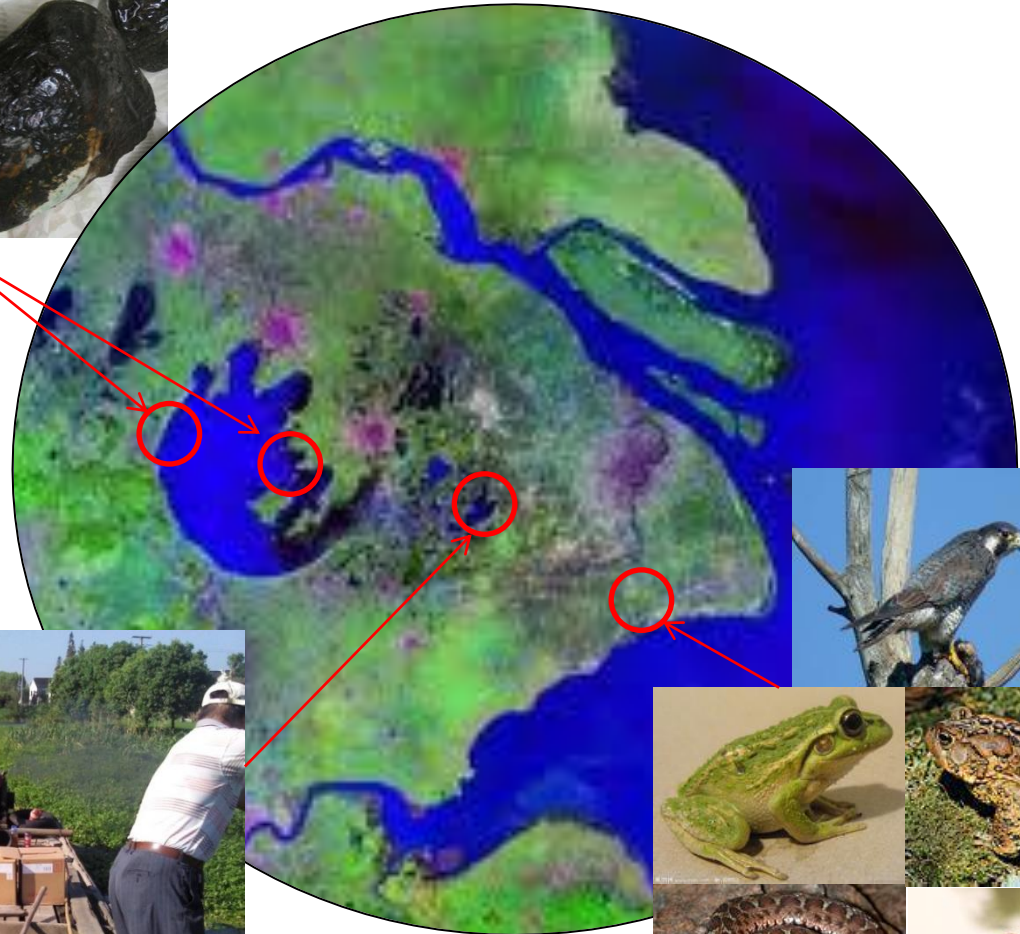
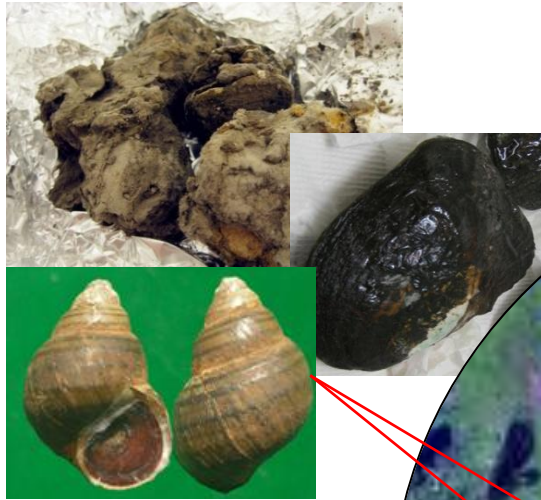
Time is also allocated for Swedish researchers to annually visit TJU through Chinese funding

CHEMSTRRES - PURPOSE & AIMS

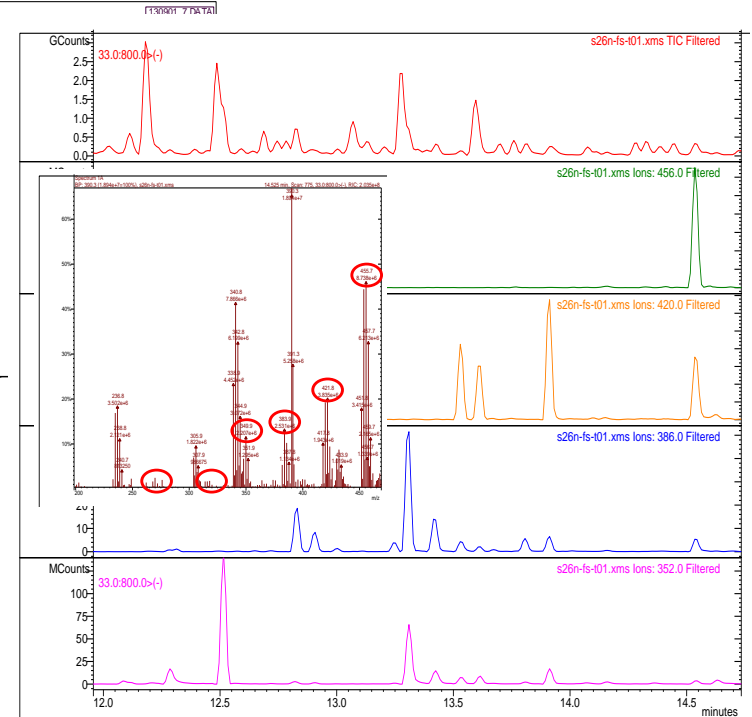
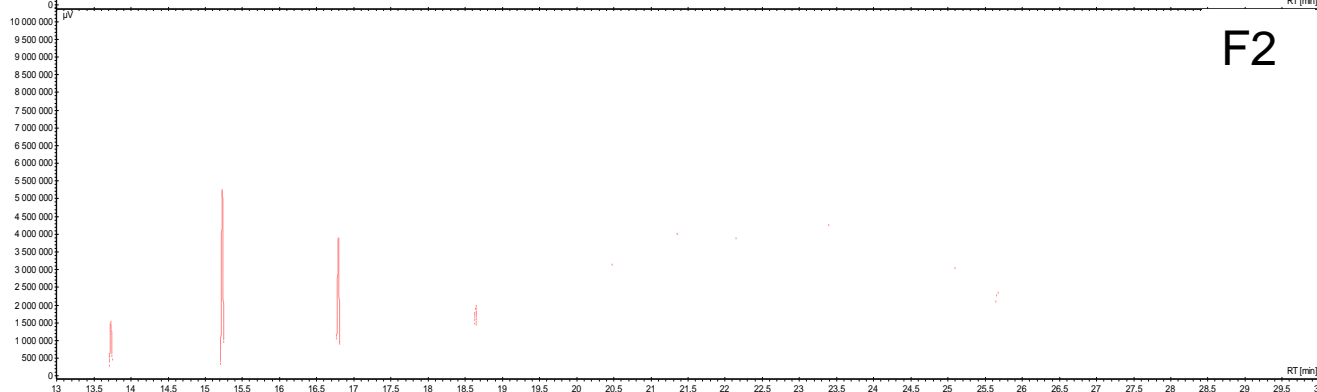
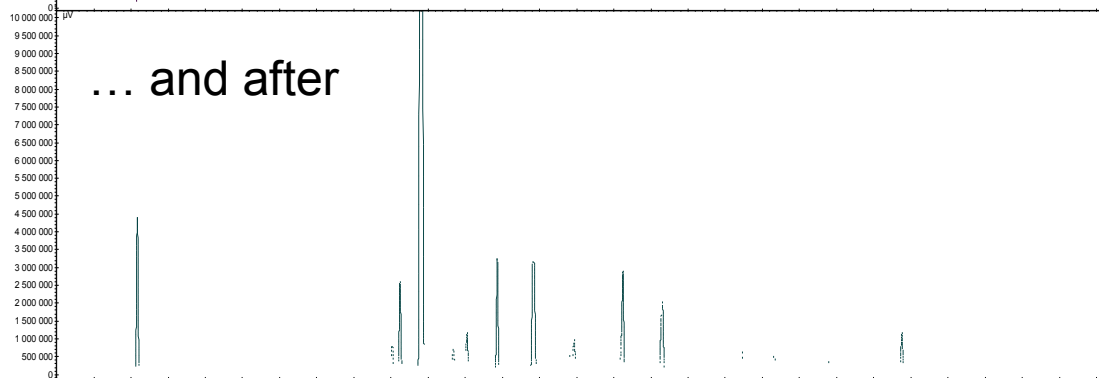
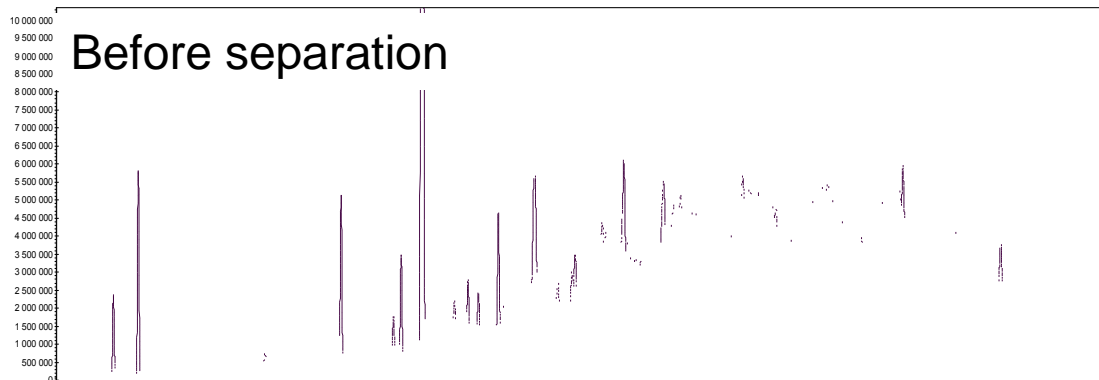


Sampling in the YRD area

Development of a monitoring research program applying a snail species for assessing heavy metals and persistent organic pollutants in the YRD area. The snail, *Bellamya aeruginosa* is available throughout China



Chemical environmental analysis of a YRD wildlife



Results showing high concentrations of chlorinated paraffins in wildlife and of some entirely novel, yet unknown, organochlorine contaminants.

The present pilot ESB at Tongji campus

A pilot ESB facility was set up in early 2012. With an area of about 200 m², including spaces for sample preparation, storage and pretreatment, the pilot ESB is located in an existing laboratory building on the main Tongji campus



CHEMSTRRES – PROJECTS

Development of:

- of the snail *Bellamy aeruginosa* to a biomonitoring and chemical monitoring species for YRD and all of China
- a fish sampling strategy and assessment program for the YRD region
- bird egg (possibly a heron) sampling and assessment program for the YRD region
- and Identification of a low trophic environmental quality indicator
- a mothers' milk program in the YRD region

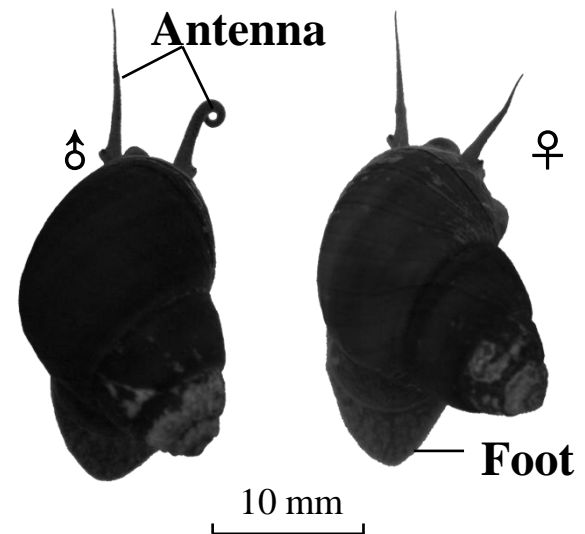
CHEMSTRRES – PROJECTS

Taowu Ma

Jishou University



Bellamya aeruginosa but
90% *Bellamya quadrata*



Sexual dimorphism of
adult *Bellamya aeruginosa*

Tests with *Bellamyia aeruginosa*

28-day sediment bioaccumulation

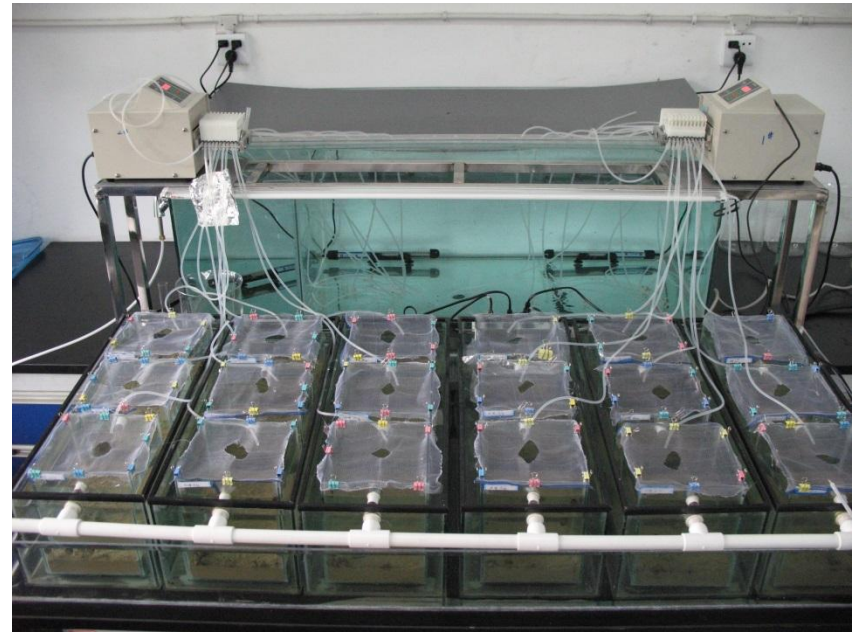
Reproductive effects

Biochemical biomarker responses
(hepatopancreas)

Superoxide dismutase (SOD)
Catalase (CAT); Glutathione (GSH)
Metallothionein (MT)
Malondialdehyde (MDA)
Na⁺, K⁺-ATPase
Heat shock protein 70 (HSP70)

Chemical analysis

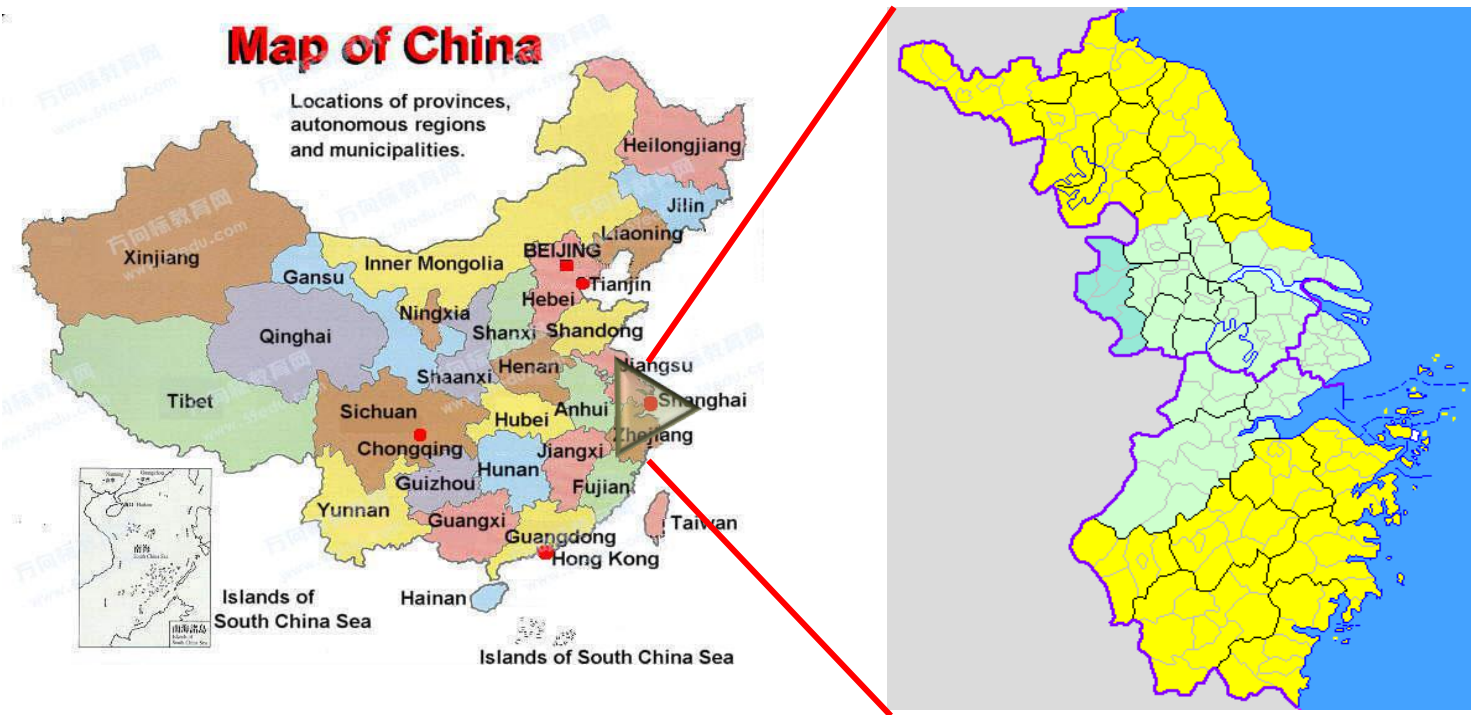
Heavy metals
Organic pollutants



CHEMSTRRES – Recent sampling



Yangtze River Delta (YRD) Region



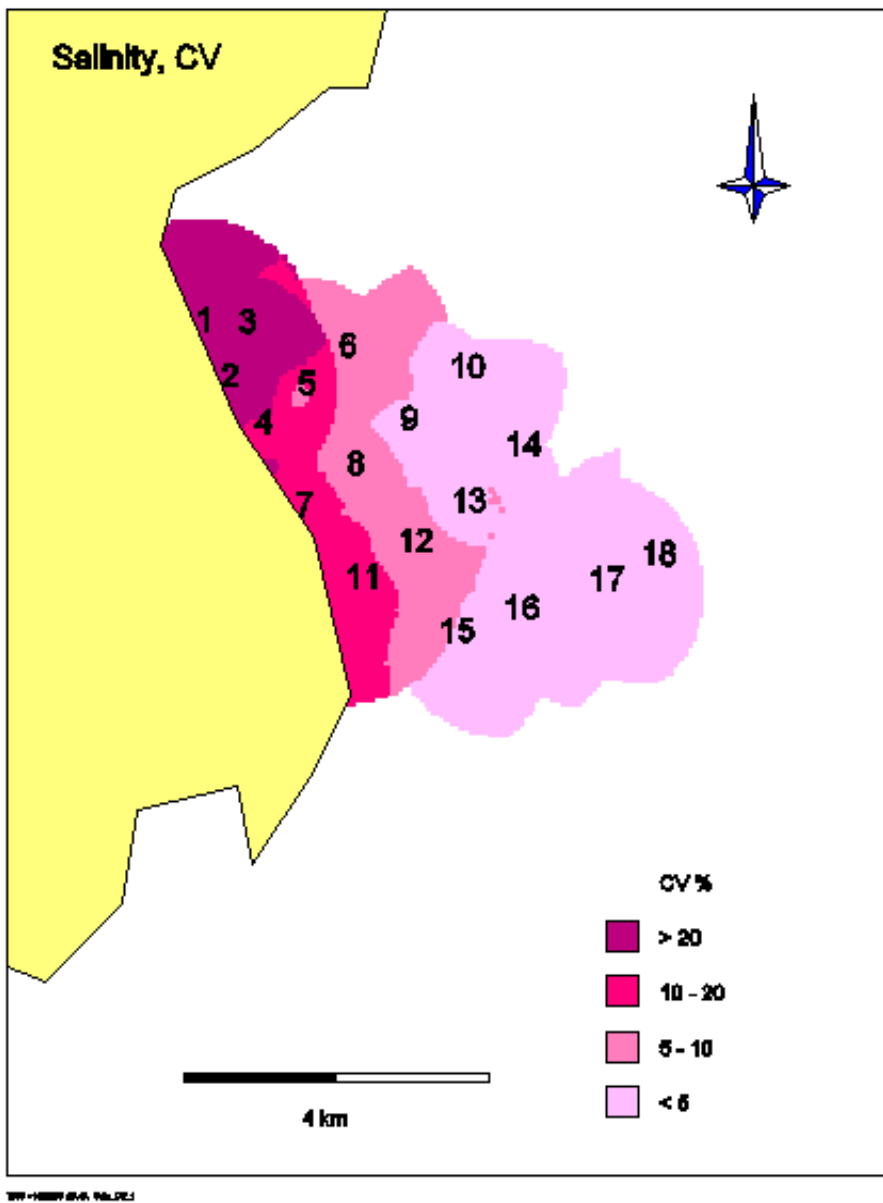
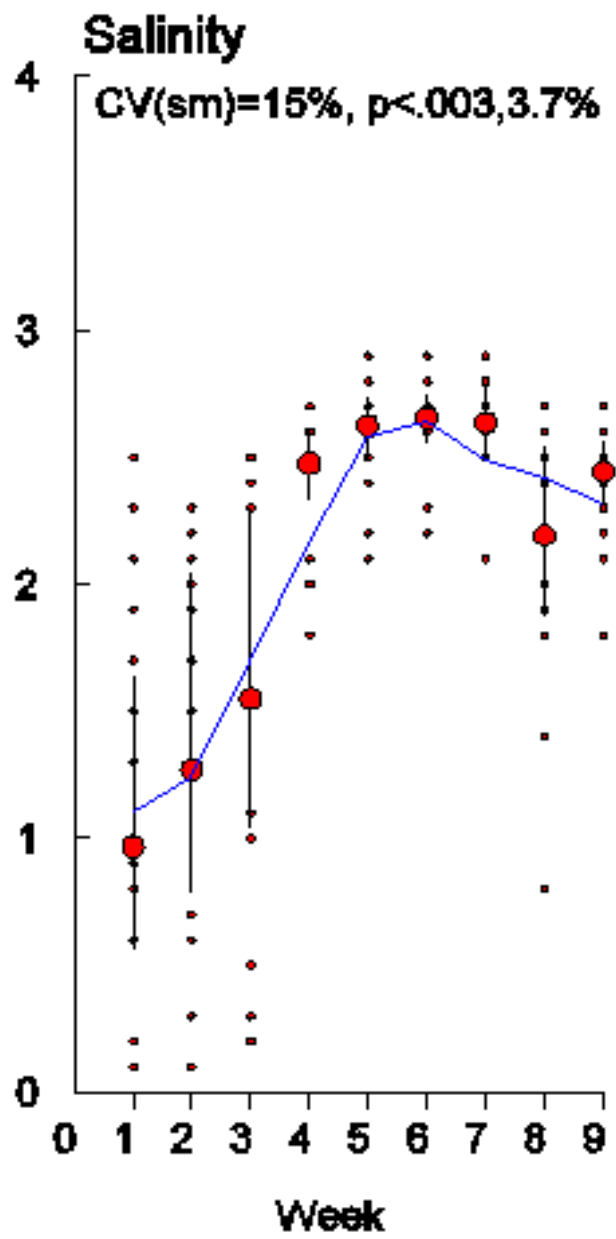
- YRD Region includes Shanghai, southern Jiangsu province and northern Zhejiang province
- It covers an area of 210,000 km² (All of Sweden is: 449,964 km²) .
- In 2009, GDP of YRD is 7.2 trillion CNY, **21.4%** of the national GDP of China with **6%** of population

Challenging issues for monitoring of contaminants

e.g. confounding factors

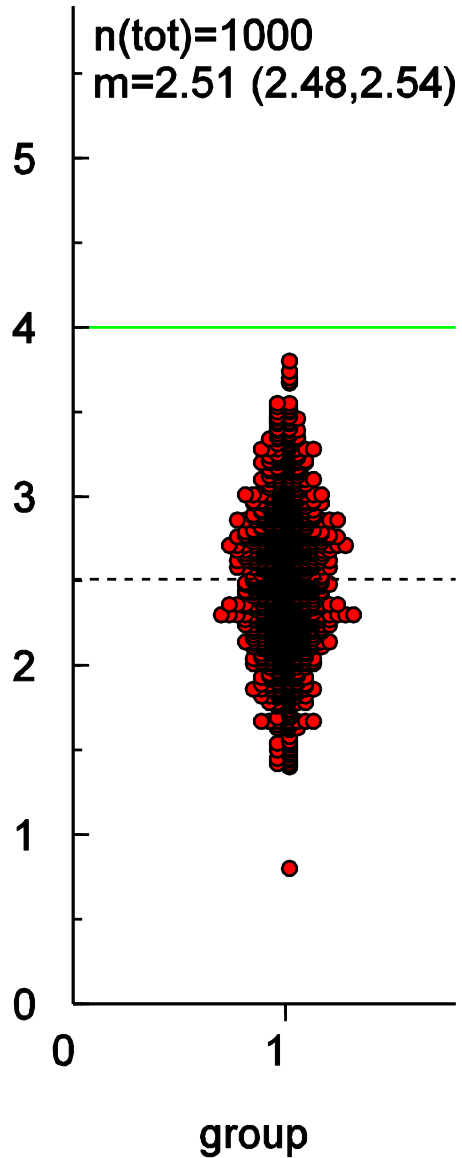
Sampling strategies,
e.g. densities, frequencies, sample sizes,
maintaining sufficient statistical power for
detecting temporal and geographical trends and
for compliance with Quality Standards

Sampling strategy, e.g. temporal & spatial variance components

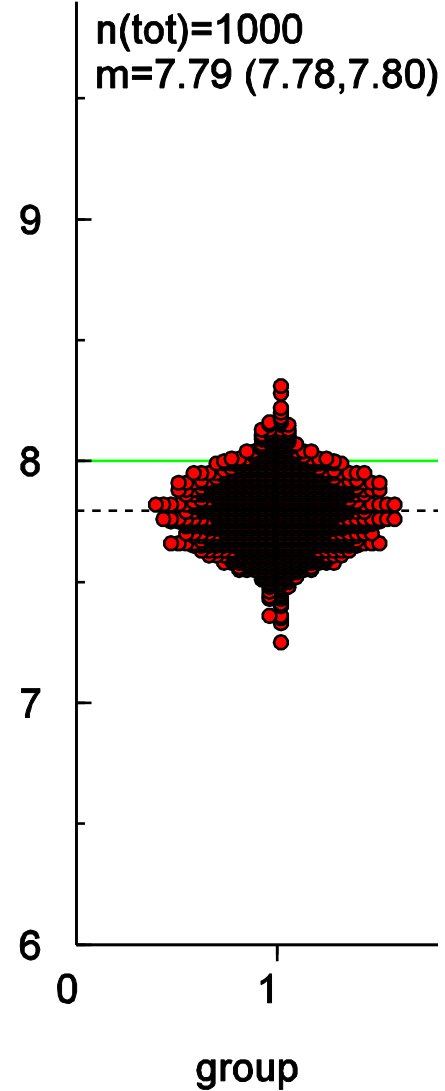


E.g. Compliance monitoring

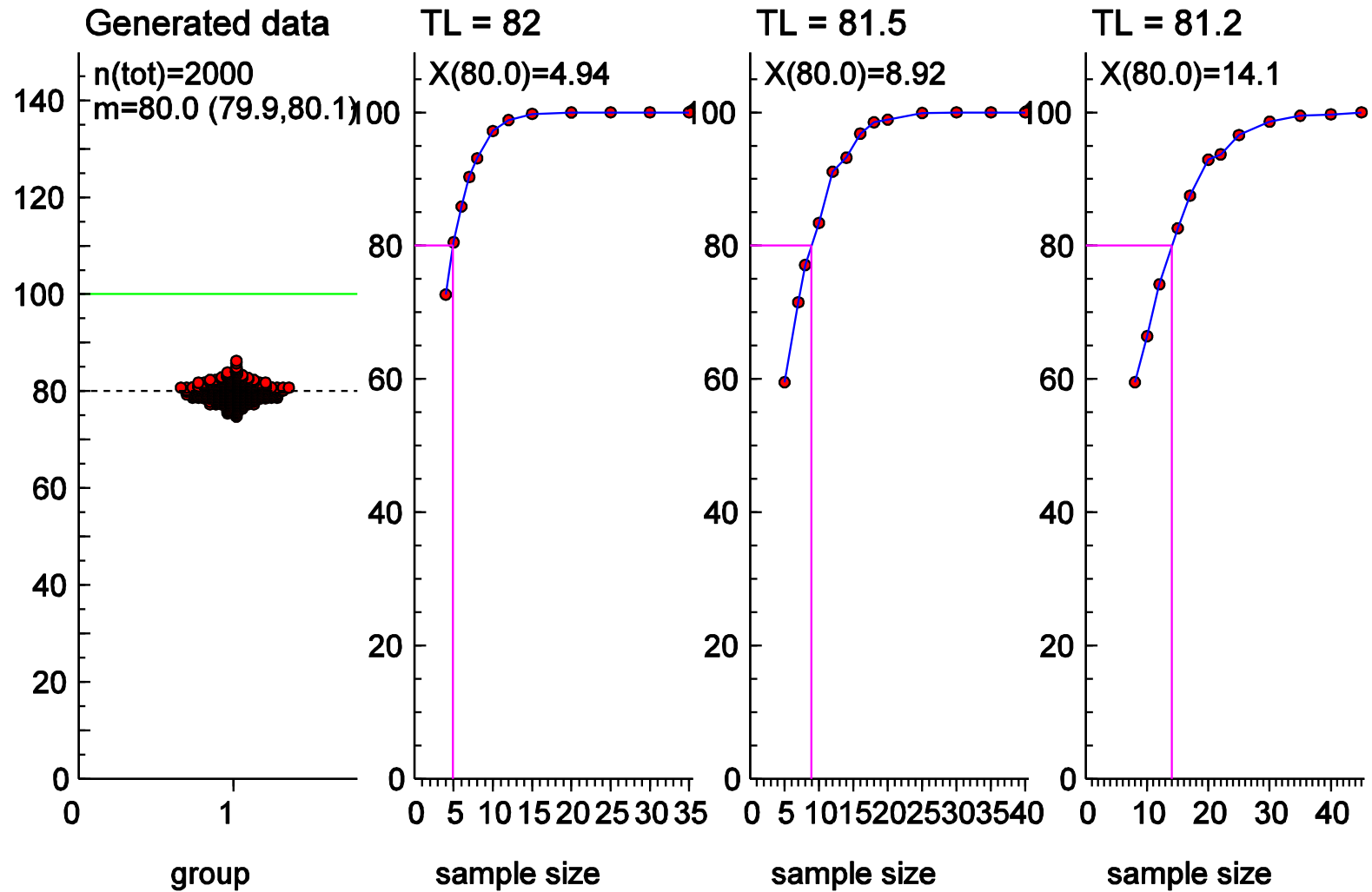
Generated data



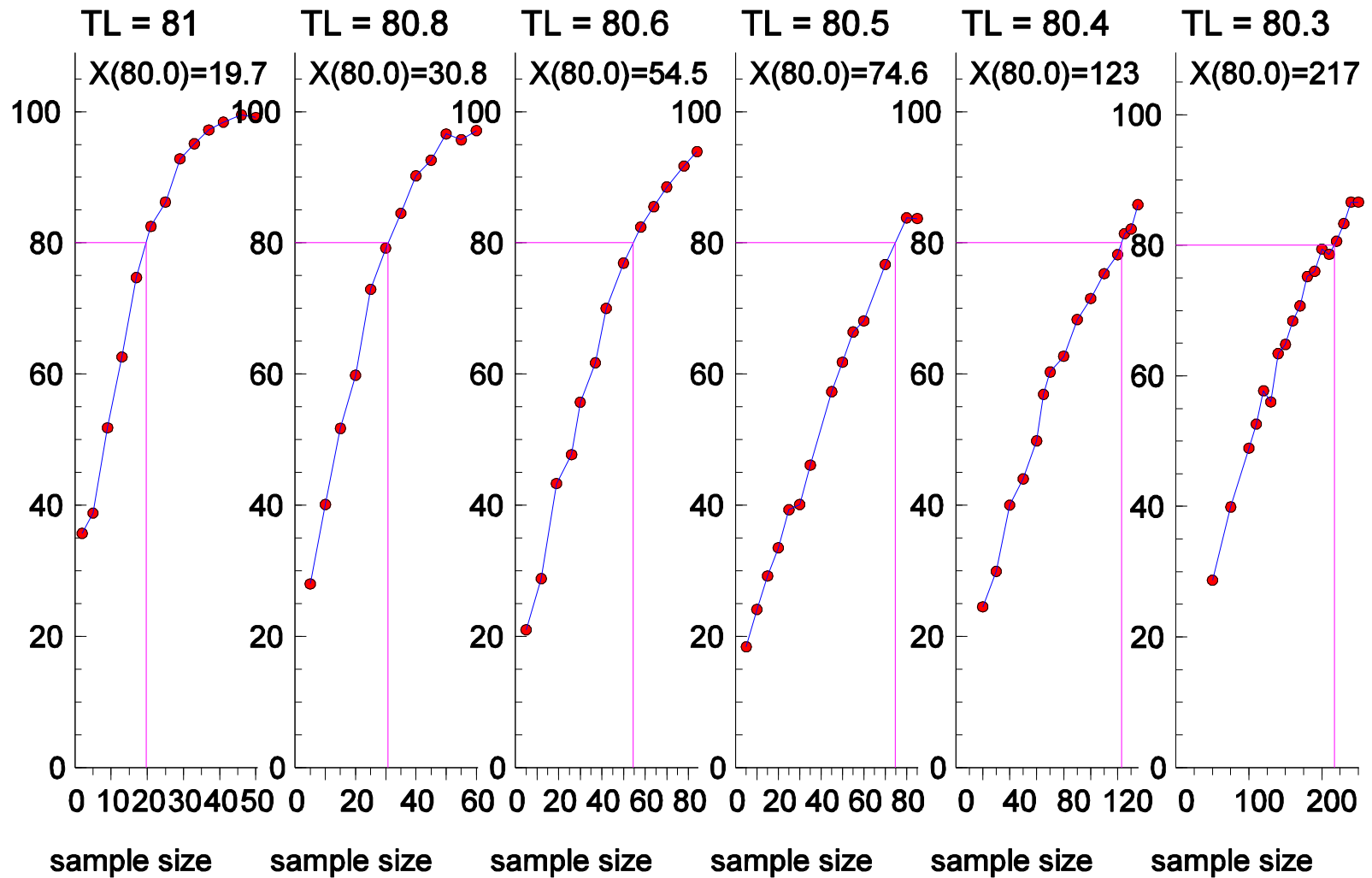
Generated data



Compliance, one-sample t-test

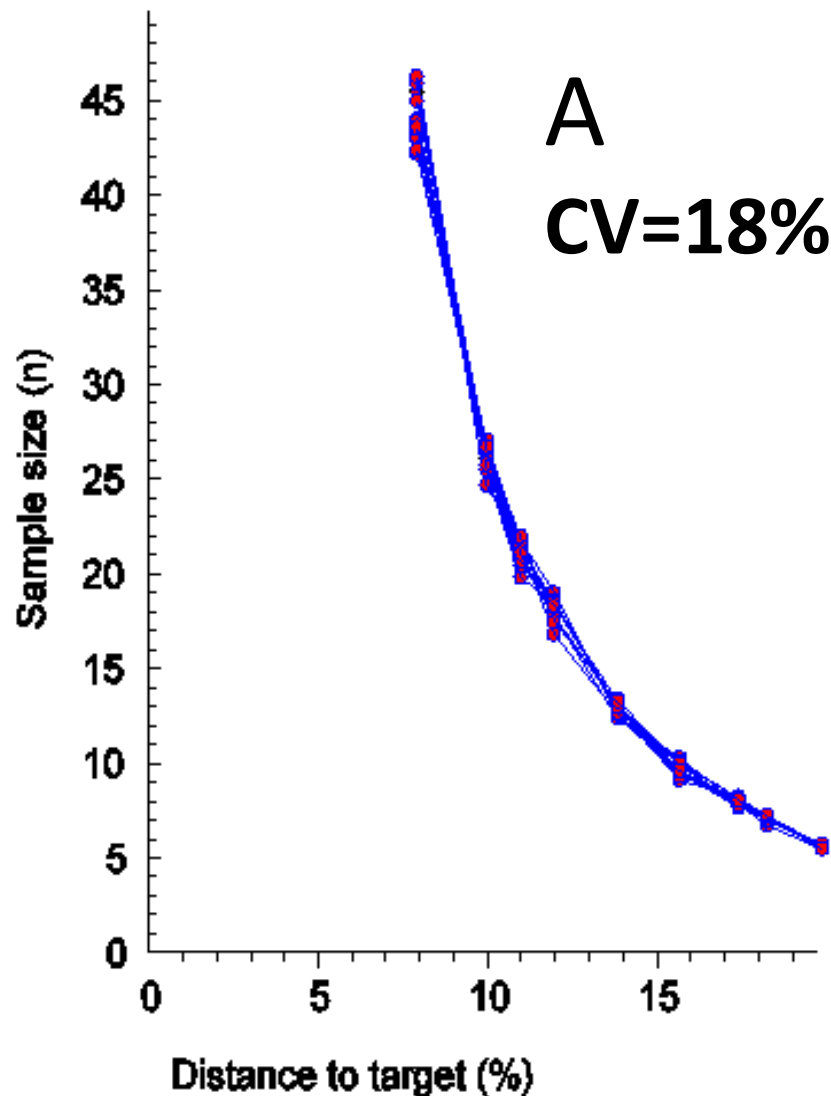


Compliance, one-sample t-test



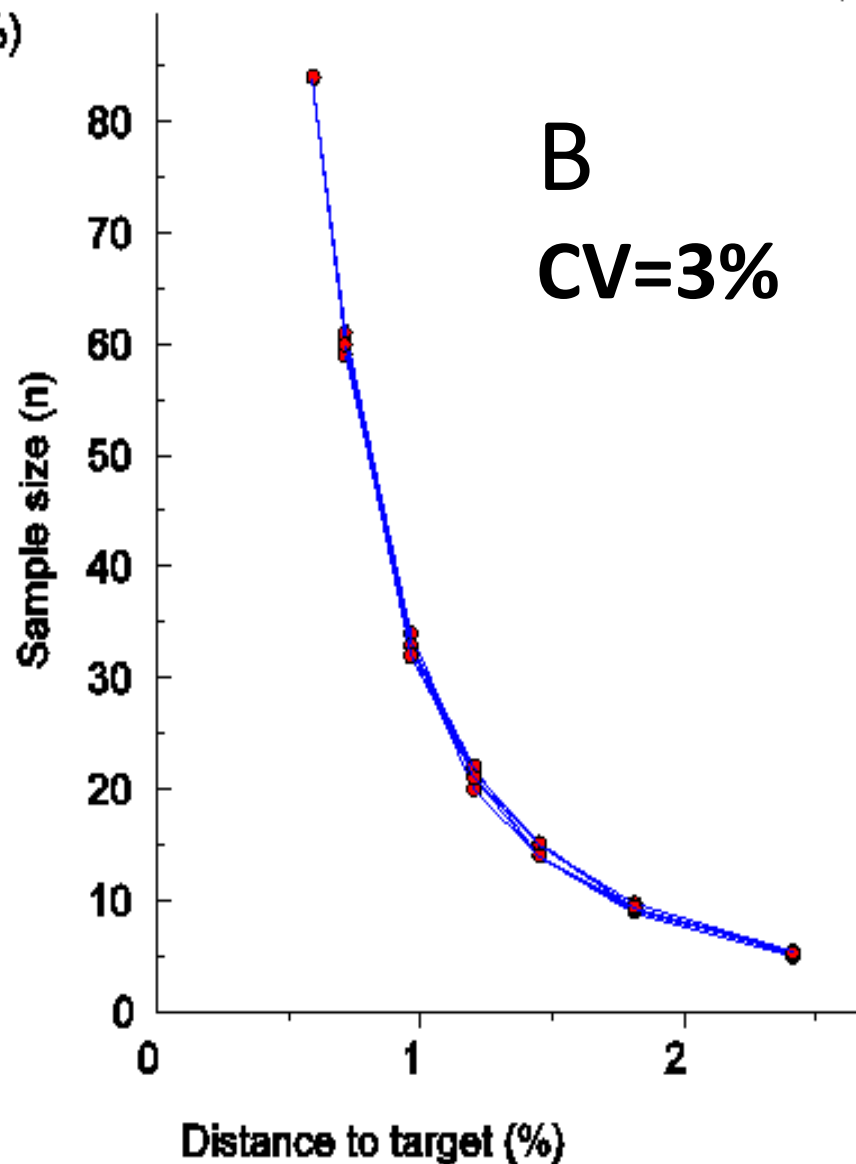
Compliance, one-sample t-test

Sample size (n) vs distance to target (%)



Compliance, one-sample t-test

Sample size (n) vs distance to target (%)



At PRESENT


Different views, different objectives, need to get started to keep the spirit up

How can I
organize
the catch?



What will I
find in that
amazing
sample?

What
fancy
equipment
do I need?



How can SMaReF and CHEMSTRRES collaborate to achieve largest possible mutual benefit ?

Thank you !