

Mercury total deposition at Kerguelen Island



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Hg deposition

- What is mercury
- Analyses
- Sampling
- Results

Mercury

Inorganic Hg

$\text{Hg}^{(0)}$ atomic Hg

$\text{Hg}^{(\text{I})}$

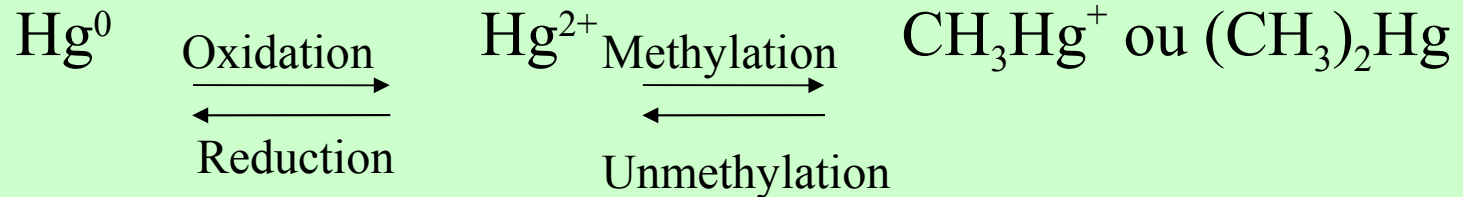
$\text{Hg}^{(\text{II})}$

Organic Hg

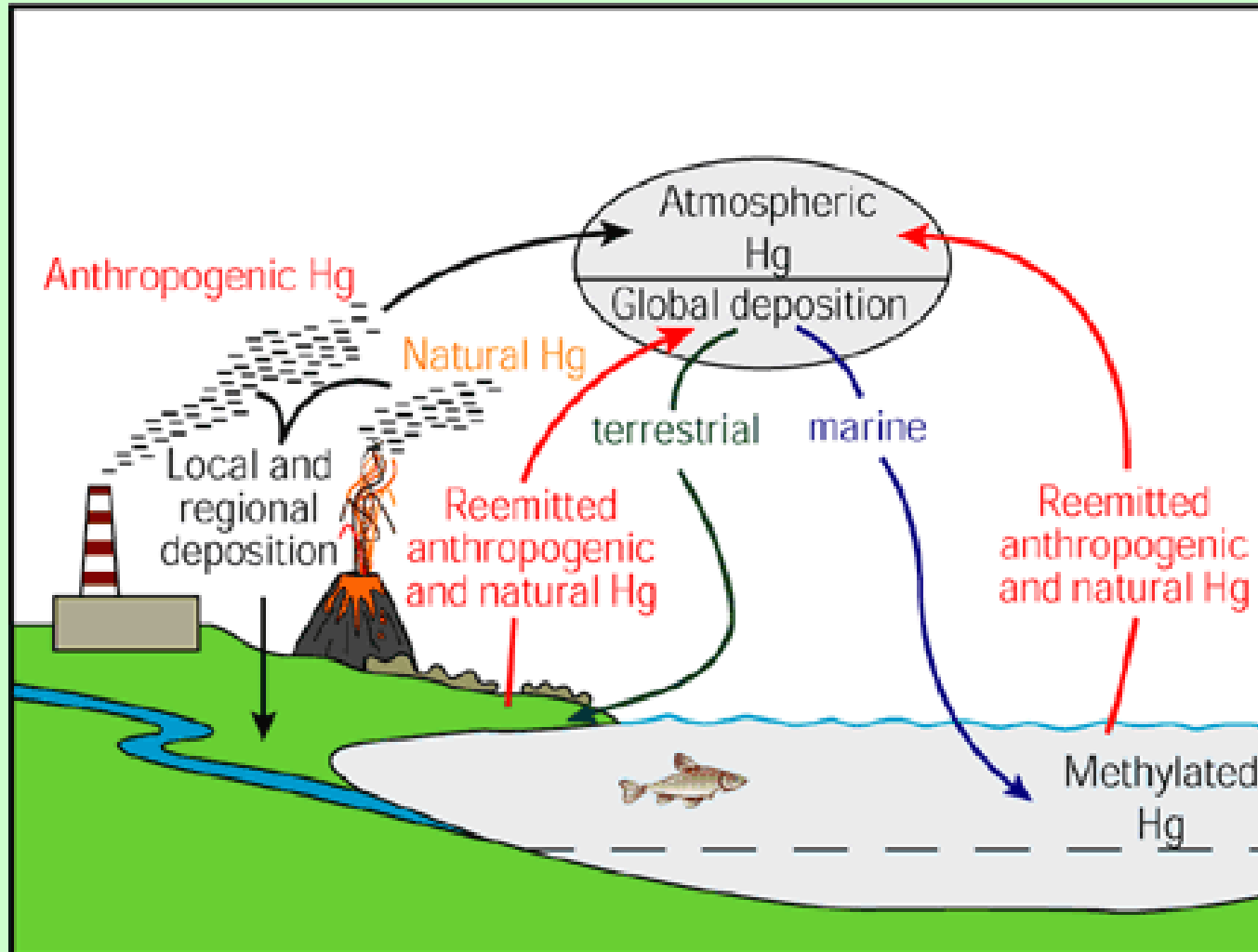
Methylmercury CH_3Hg^+

Dimethylmercury $(\text{CH}_3)_2\text{Hg}$

Main changes



Mercury cycle



Analyses

Analytical device



Hg analyses

- Very selective
 - $\text{Hg}^{(0, \text{I}, \text{II})} + \text{BrCl} \Rightarrow \text{HgCl}_4^{2-}$
 - $\text{HgCl}_4^{2-} + \text{SnCl}_2 \Rightarrow \text{Hg}^0$
 - $\text{Hg}^0 + \text{Au} \Rightarrow \text{HgAu}$
 - $\text{HgAu} + \text{Heat (400}^\circ\text{C)} \Rightarrow \text{Hg in argon}$
- Quite no interferences
- Sensitivity limited by contamination

Field experiments

Sampling



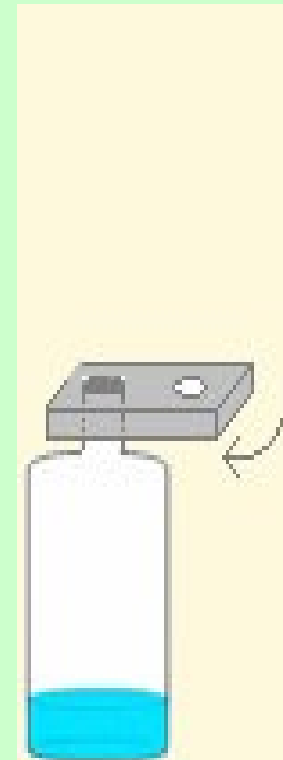
Cleaning



Sampling

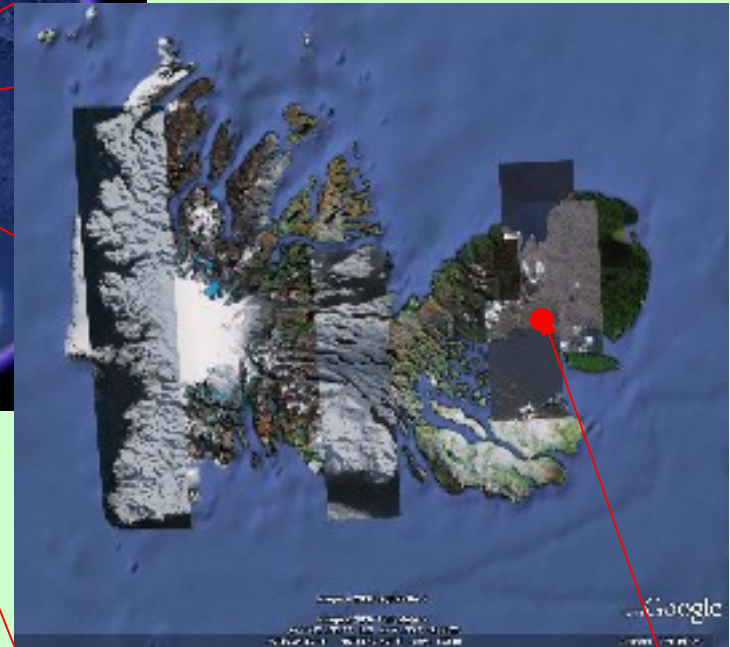
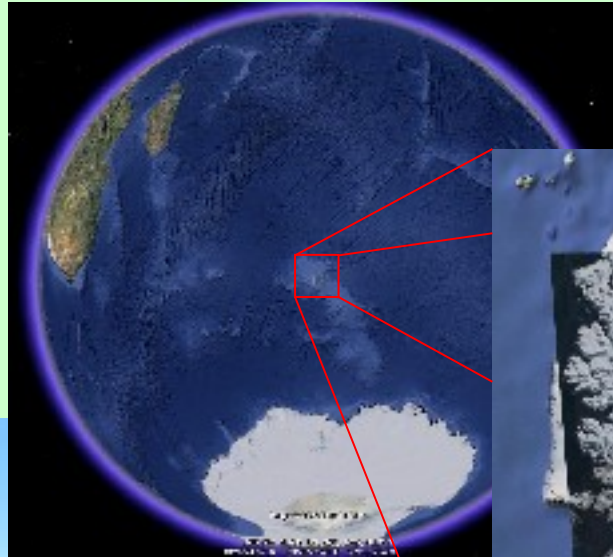


Funnel rinsing



Firmly closed to prevent
gas exchange

Sampling area



Kerguelen Island:

Atmosphere Mountains
(49°18'42.3"S // 70°07'47.6"E)

4 field campaign at Kerguelen Island

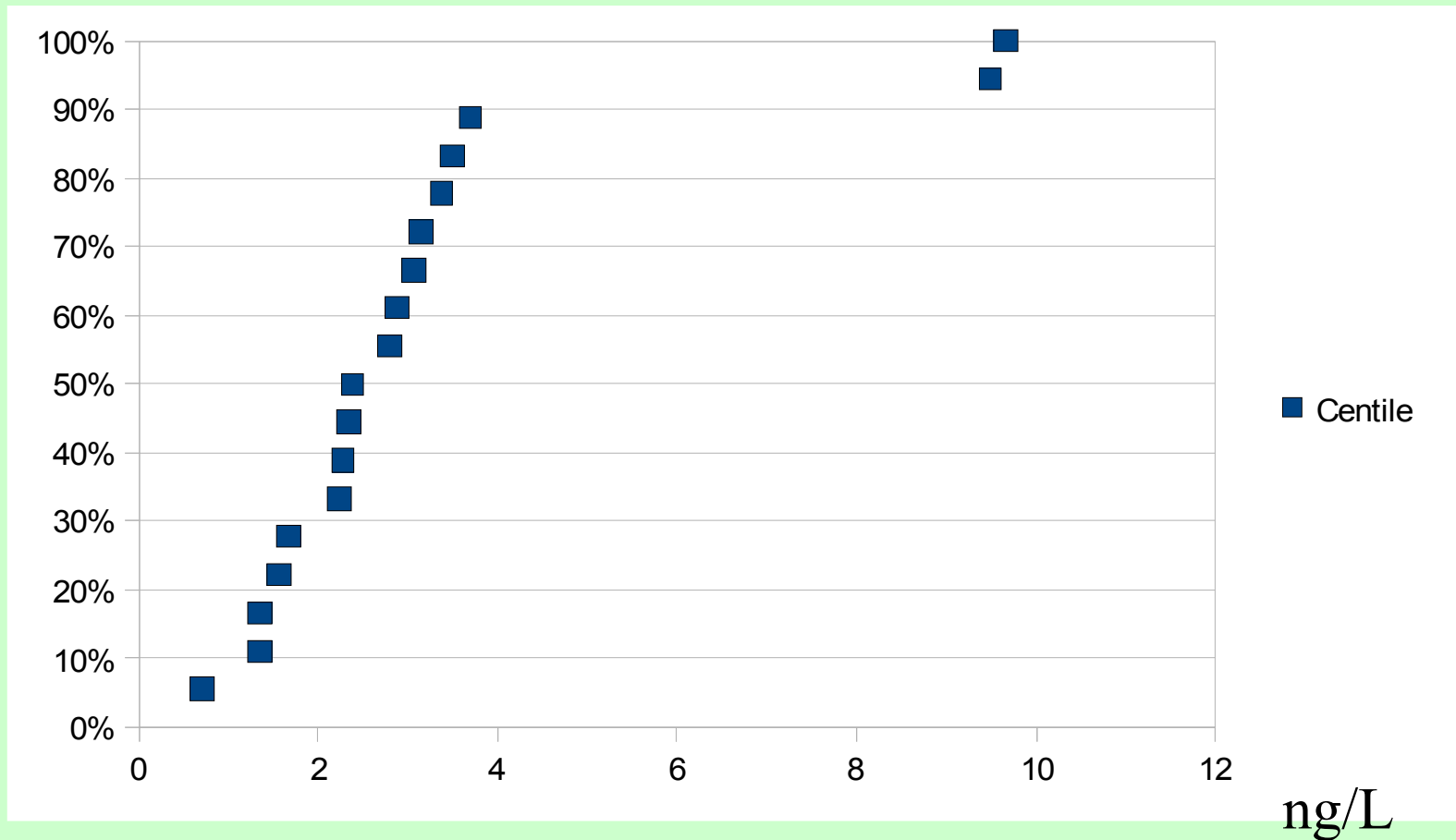
- February 2005
- November 2008
- December 2009
- December 2010

-Measuring concentration back at laboratory

- Total amount

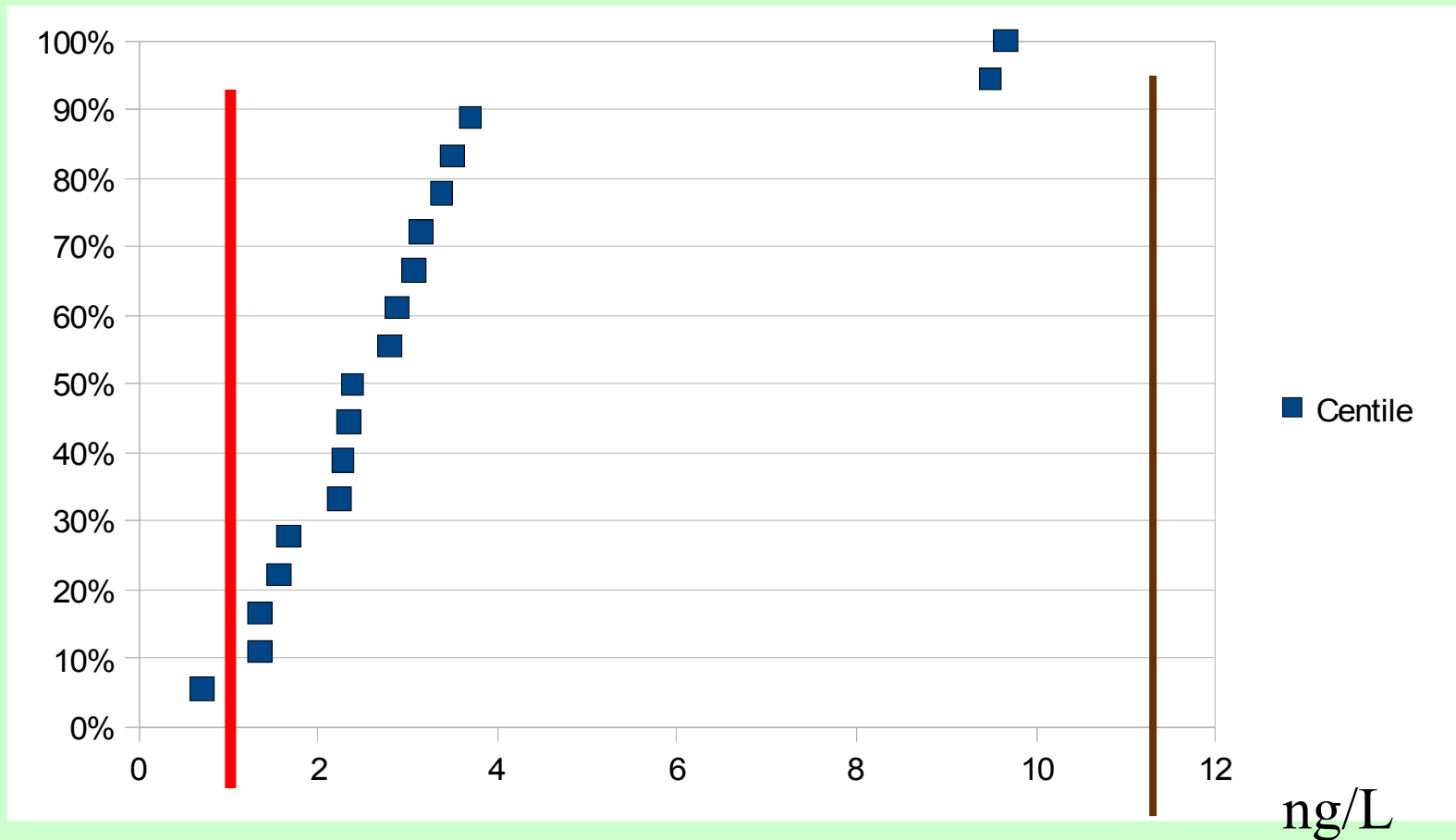
-Flux (surface is 0.011 m²)

Results: rainwater concentration



Not on an event basis (3 to 7 days averaging)

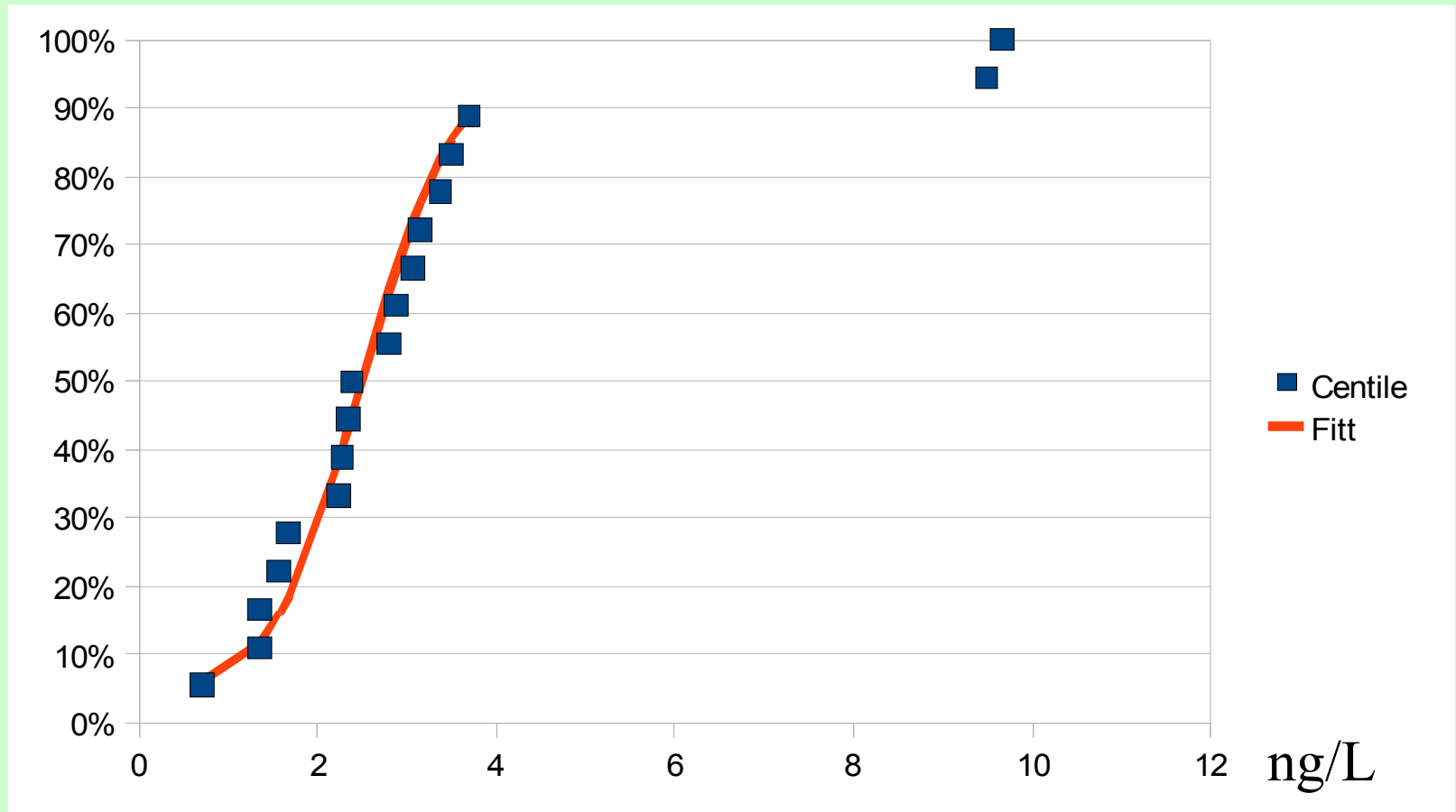
Results: rainwater concentration



Antarctic snow

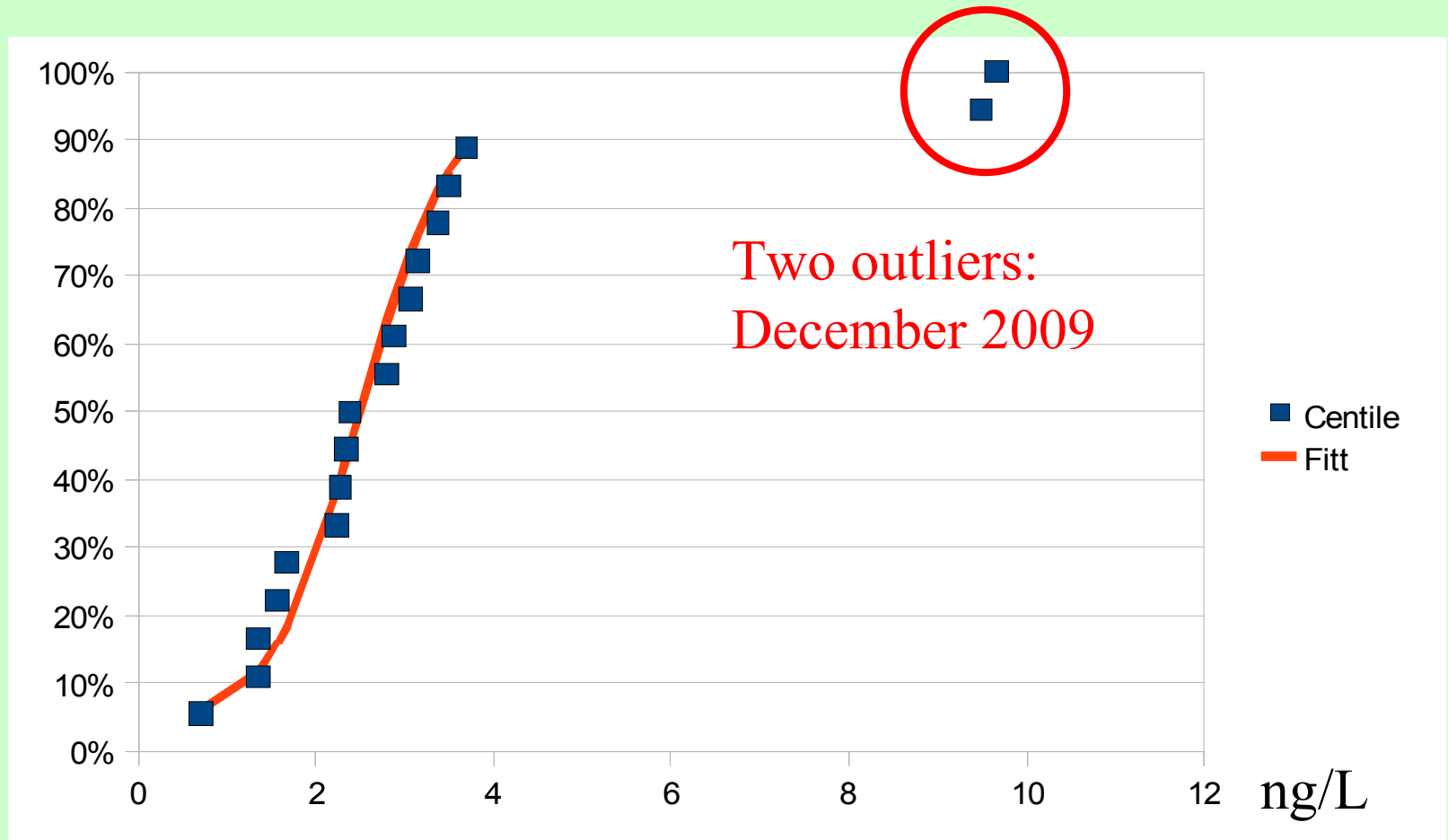
North Hemisphere

Results: rainwater concentration



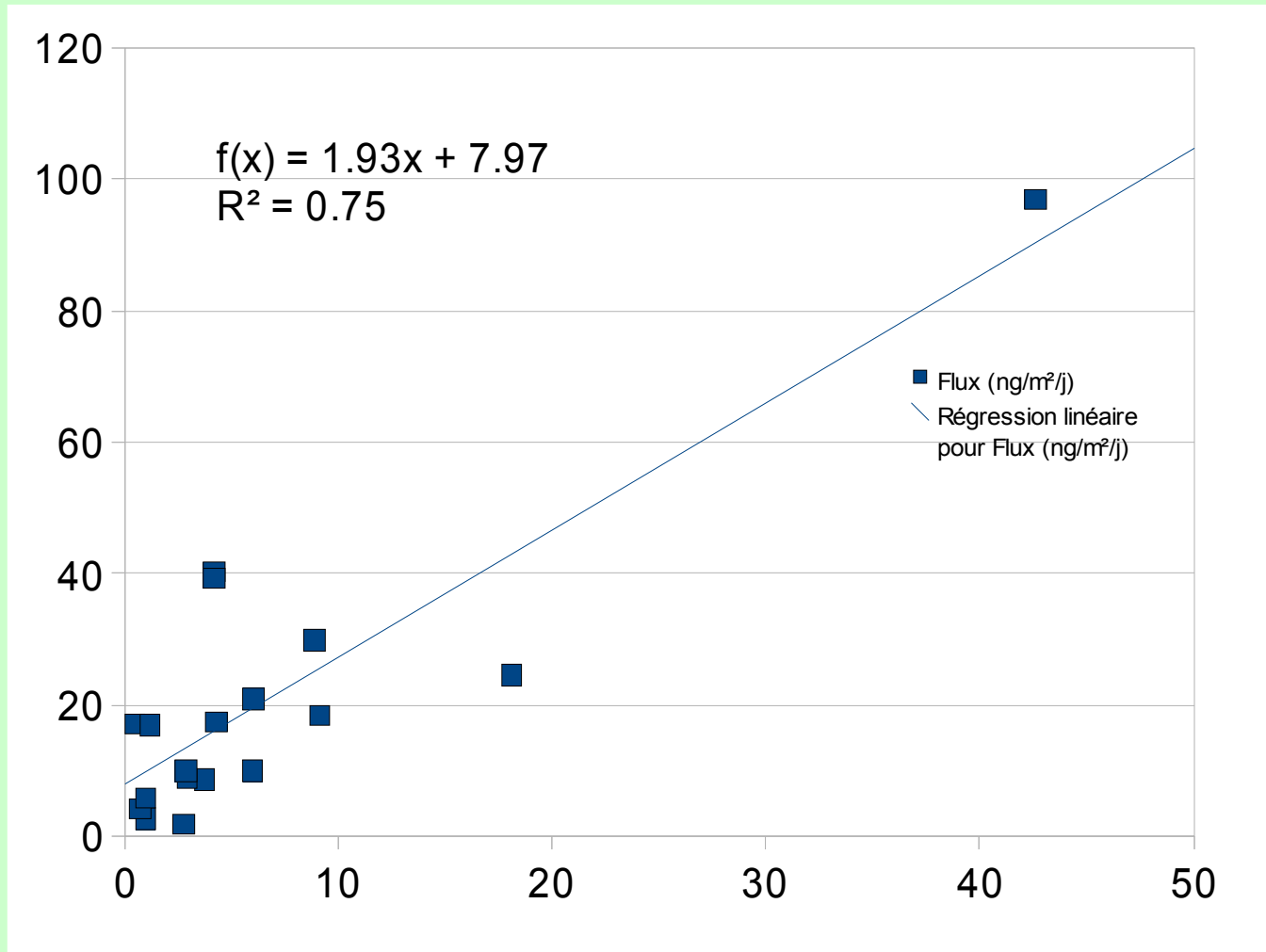
Normal distribution: average 2.5 – stdev 0.8 ng/L

Results: rainwater concentration

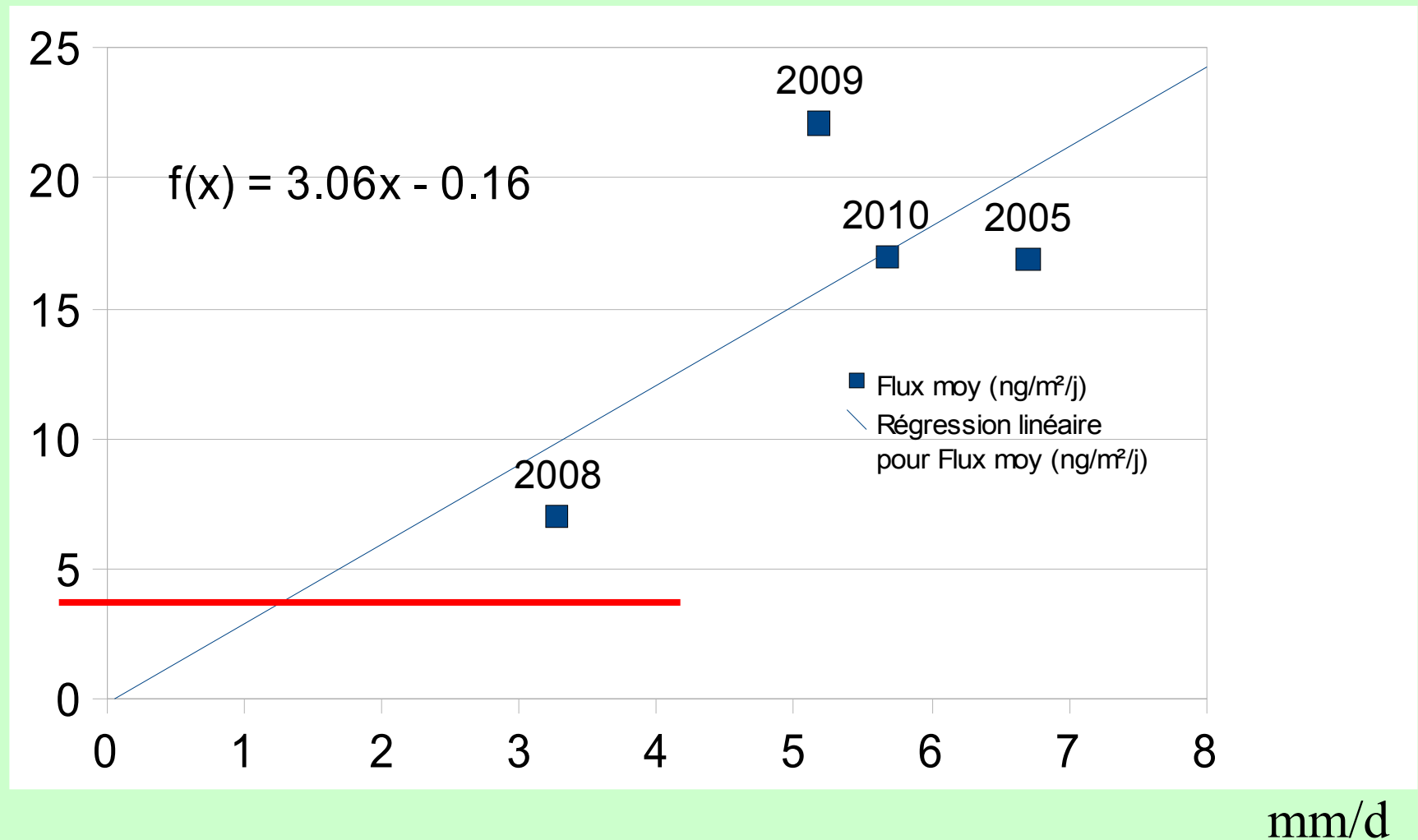


Results: Fluxes

ng/m²/d



ng/m²/d Averaged fluxes (1 month)



Conclusions

- Mercury concentration in wet deposition higher than antarctic and much lower than North Hemisphere
- Deposition flux strongly dependant on rainfall
- What appends from february to october?

Blanks

- 0.1 ng per bottle
- 1%-20% of the collected Hg