

Effect of global and local metallic contaminations on microbial communities of Pyrenean lakes

- Sources of contamination
- Consequences of contaminations



- Material and methods



- Consortium

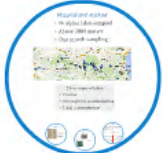


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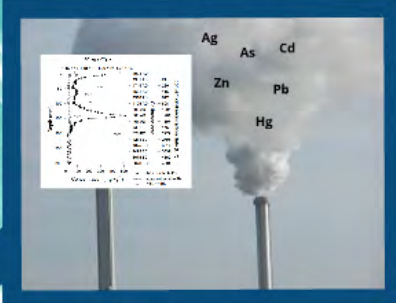
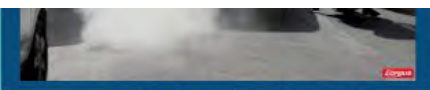


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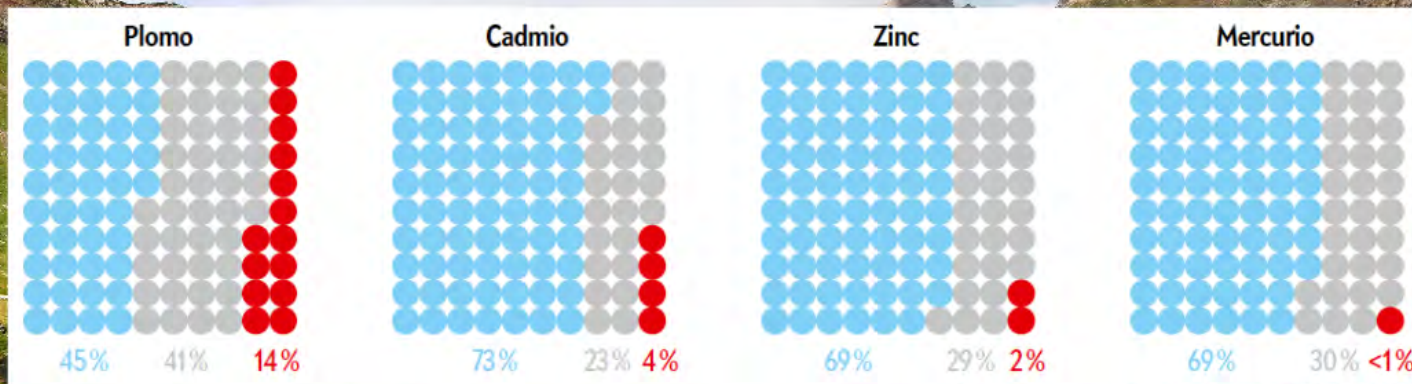
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- Geographic isolation
- Low local contamination background

- 2512 Pyrenean Lakes
- Integrity endangered by metallic contaminations



Local cotaminations due to past mining activities

- Mines de fer, or, argent, galène...
- Arrêt de l'activité dans les années 50-60
- Persistance dans le temps
- 72000 ha de lac impactés par efflux miniers

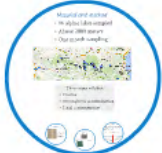


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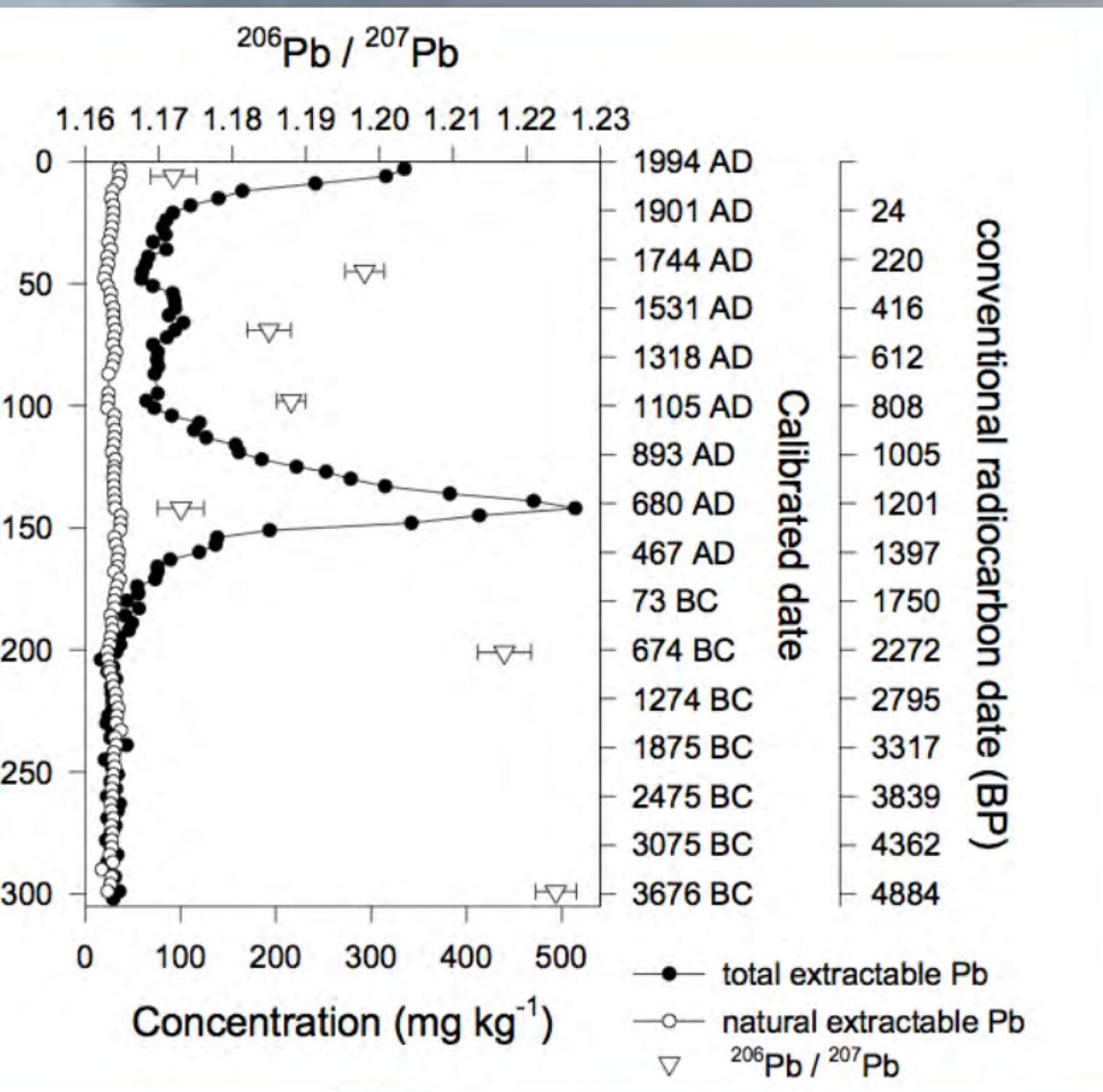


- Material and methods



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Ag

As

Cd

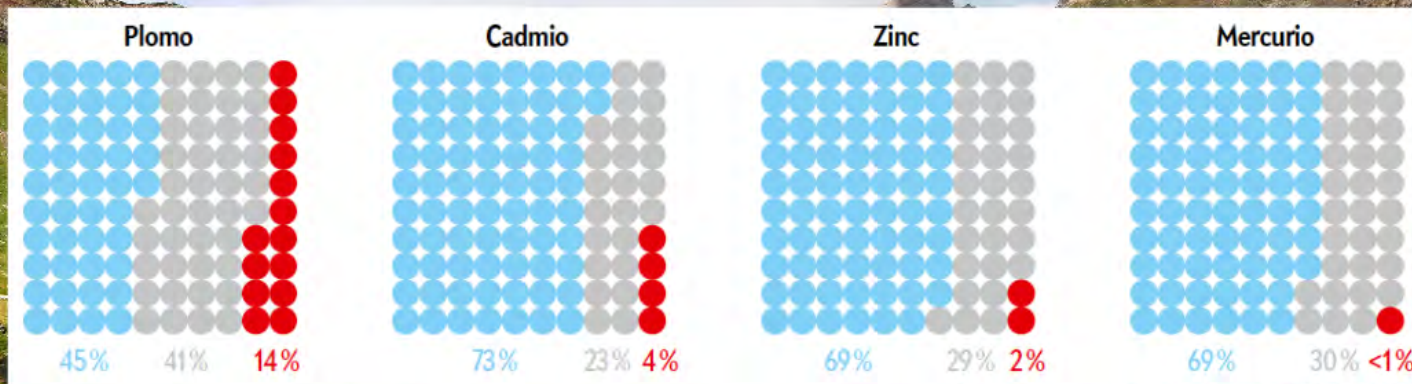
Zn

Pb

Hg

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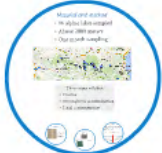


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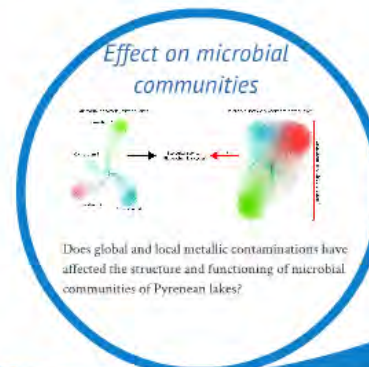
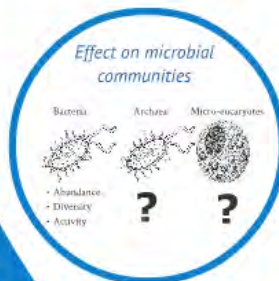


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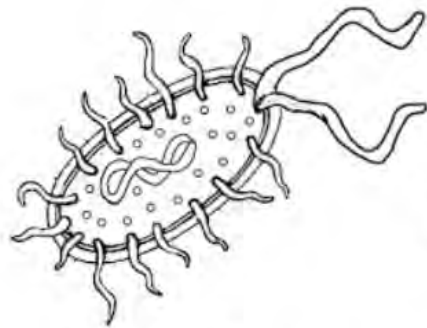
Consequences of contaminations

- Biodiversity reduction
- Tourism reduction

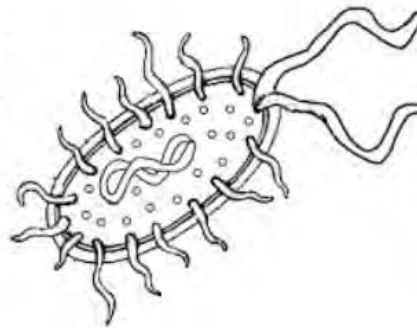


Effect on microbial communities

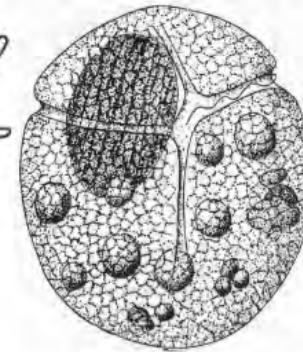
Bacteria



Archaea



Micro-eucaryotes



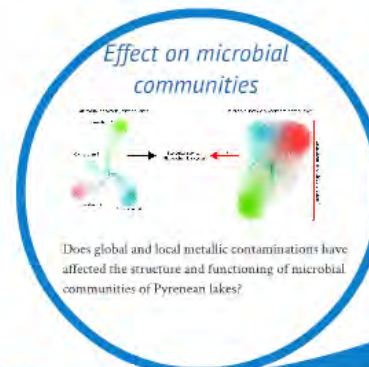
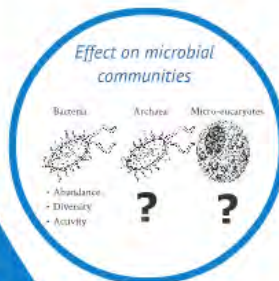
- Abundance
- Diversity
- Activity

?

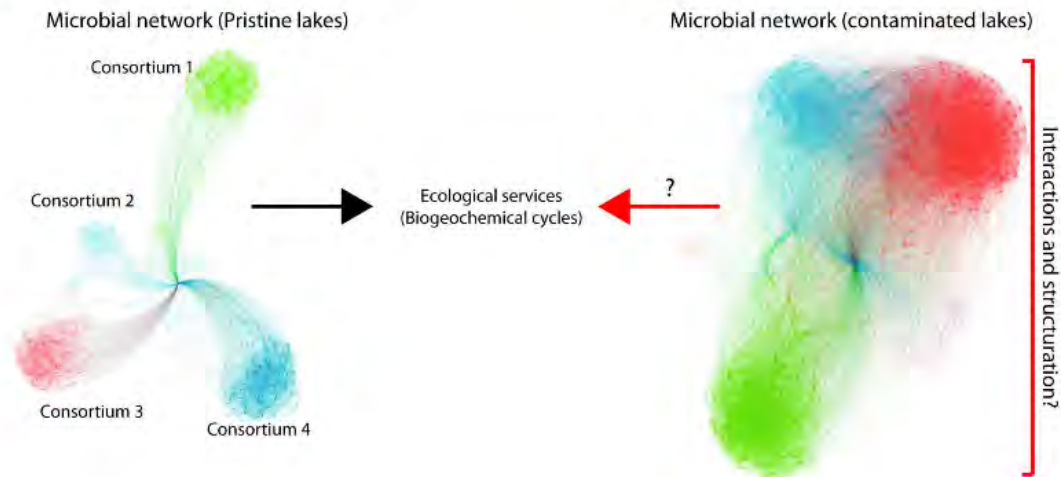
?

Consequences of contaminations

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Effect on microbial communities

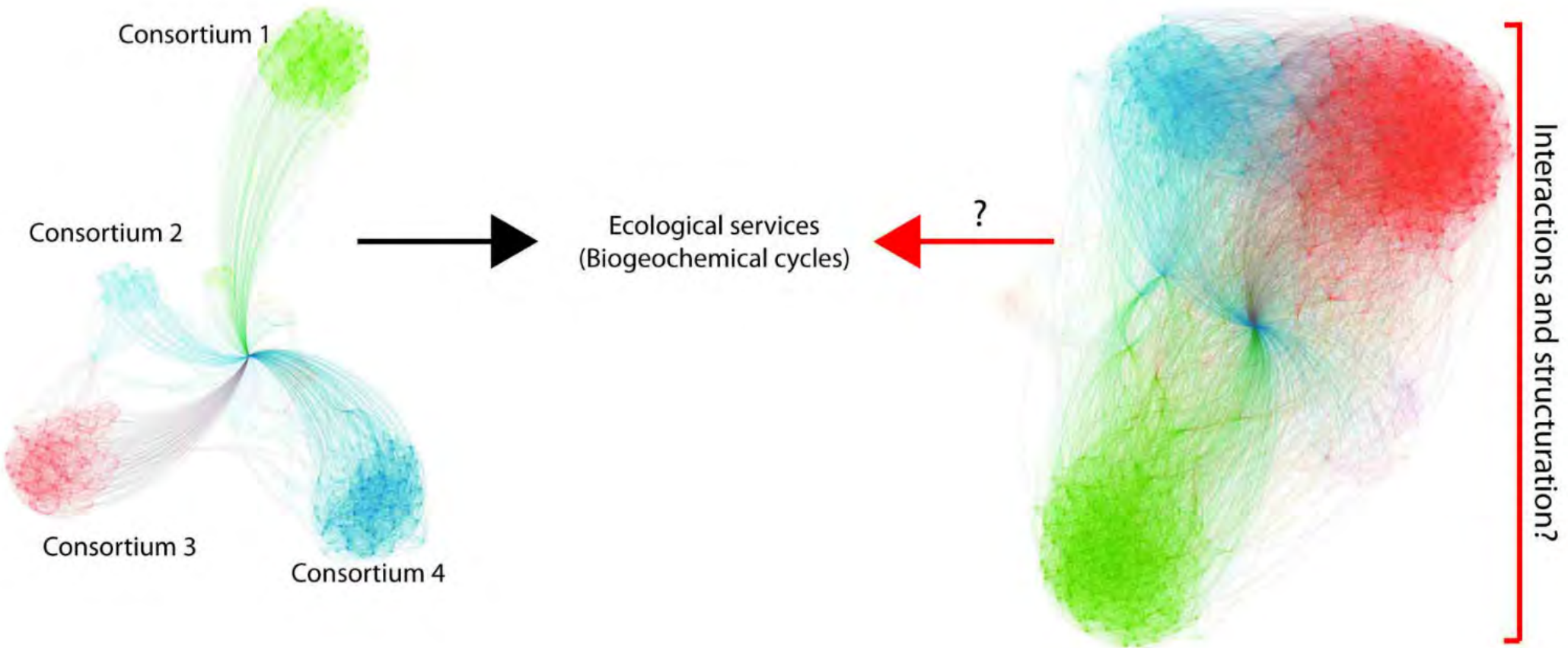


Does global and local metallic contaminations have affected the structure and functioning of microbial communities of Pyrenean lakes?

communities

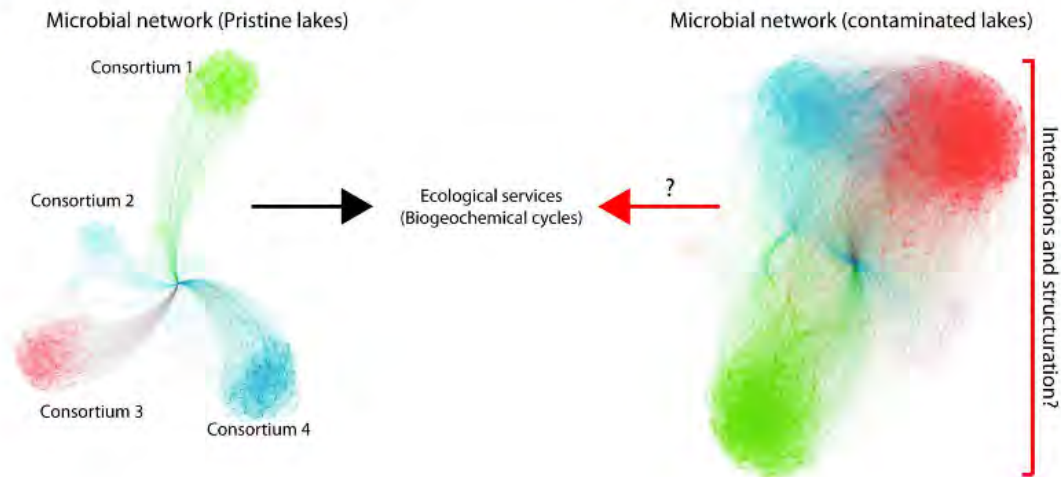
Microbial network (Pristine lakes)

Microbial network (contaminated lakes)



Does global and local metallic contaminations h

Effect on microbial communities



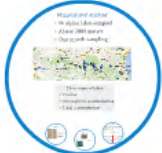
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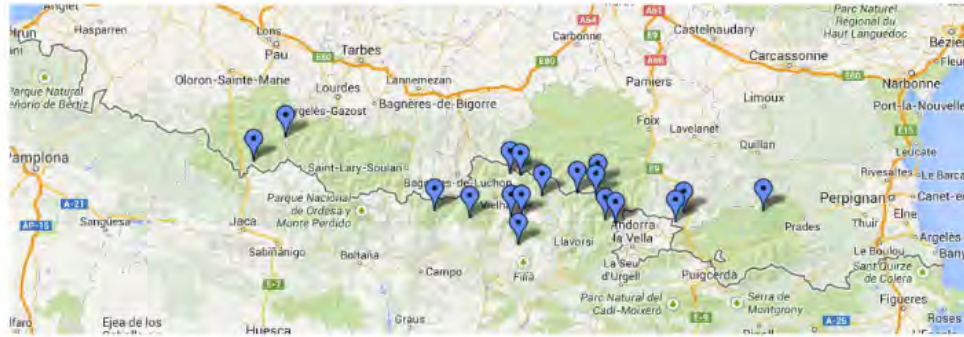


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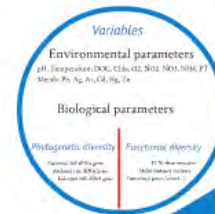
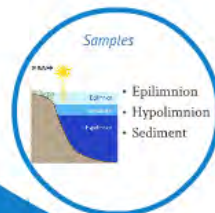
Material and method

- 18 alpine lakes sampled
- Above 2000 meters
- One month sampling

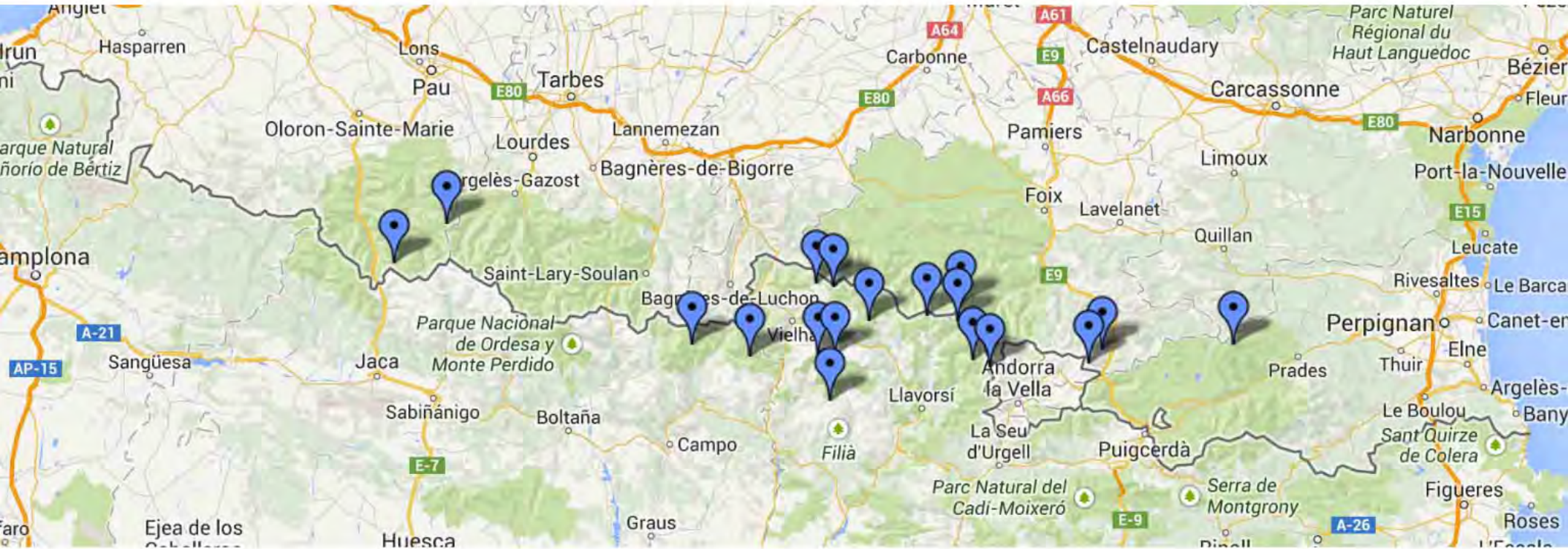


Three types of lakes:

- Pristine
- Atmospheric contamination
- Local contamination



- Above 2000 meters
- One month sampling



Three types of lakes:

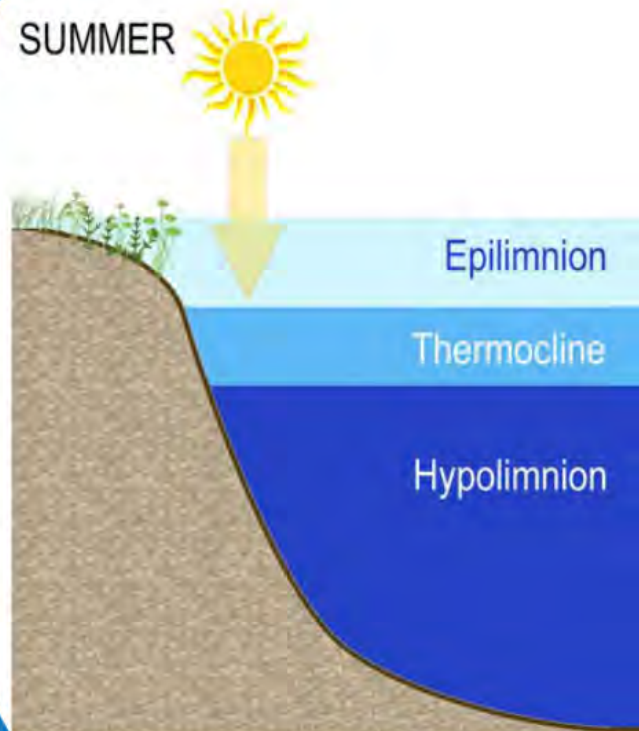
- Pristine



Three types of lakes:

- Pristine
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- Local contamination

Samples



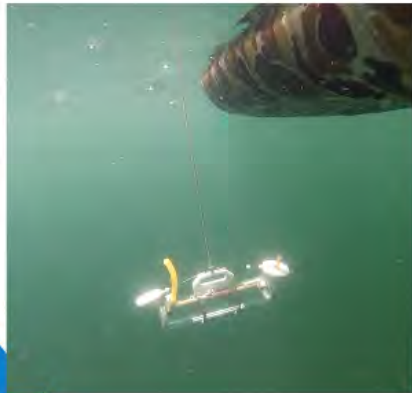
- Epilimnion
- Hypolimnion
- Sediment

Sampling

The boat



Niskin Bottle



Corer

Variables

Environmental parameters

pH, Temperature, DOC, Chla, O₂, NO₂, NO₃, NH₄, PT
Metals: Pb, Ag, As, Cd, Hg, Zn

Biological parameters

Phylogenetic diversity

Bacterial 16S rRNA gene
Archaeal 16S rRNA gene
Eukaryot 18S rRNA gene

Functional diversity

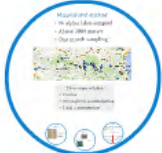
EC50 determination
Stable isotopes analyses
Functional genes (amoA...)

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Financement BQR + CTP