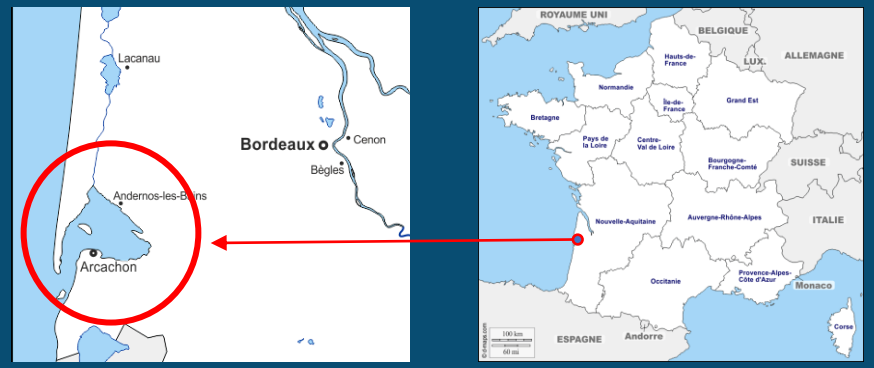
BASSIN D'ARCACHON
SIBA

Syndicat Intercommunal du Bassin d'Arcachon (SIBA)

Workshop
December 15th 2021

Water quality and micropollutants – from BIGDATA to ACTION



PART I: FRESH AND MARINE WATERS

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How to develop a sampling strategy adapted to **diffuse pollution**?
Example of the Arcachon Bay

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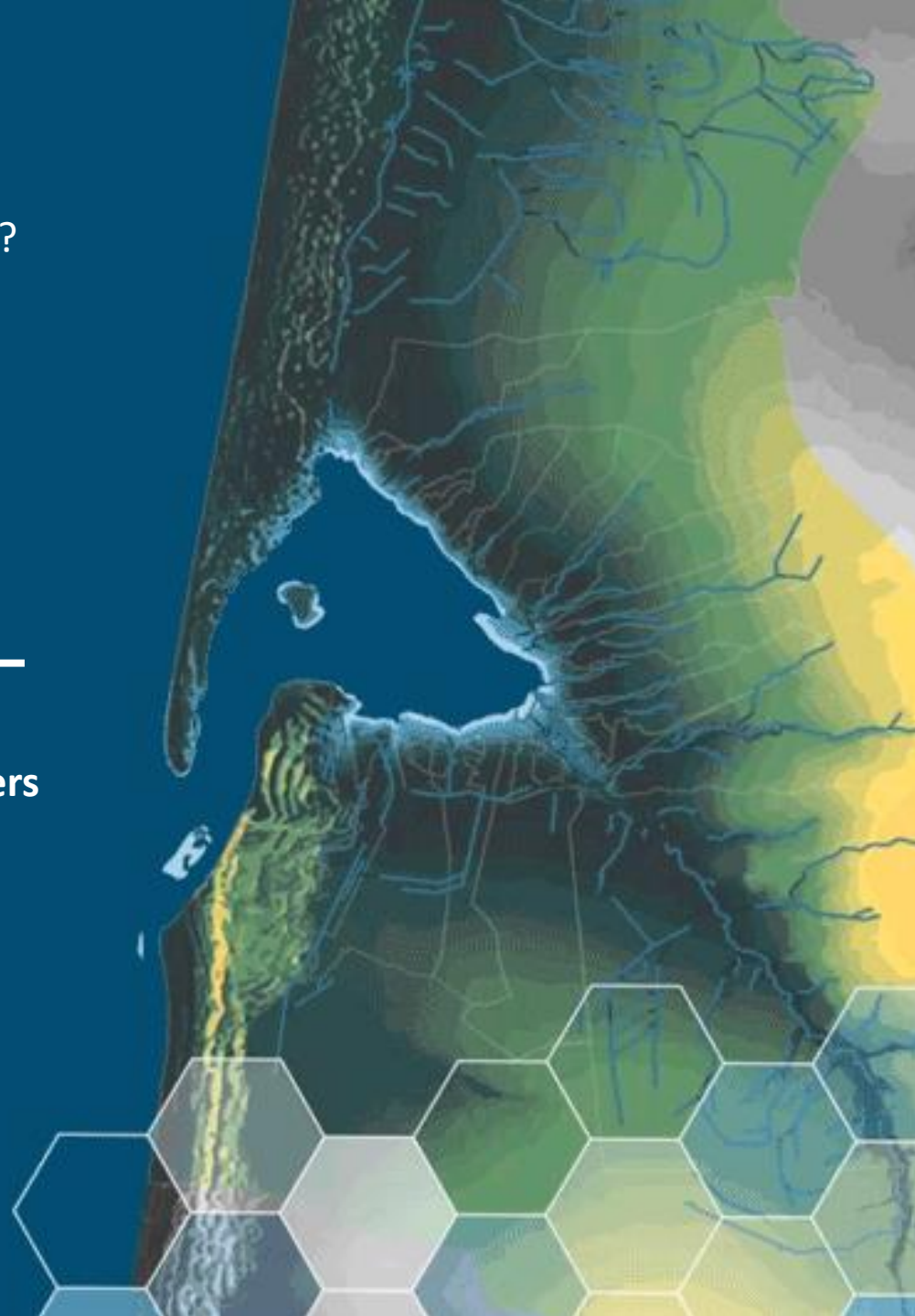

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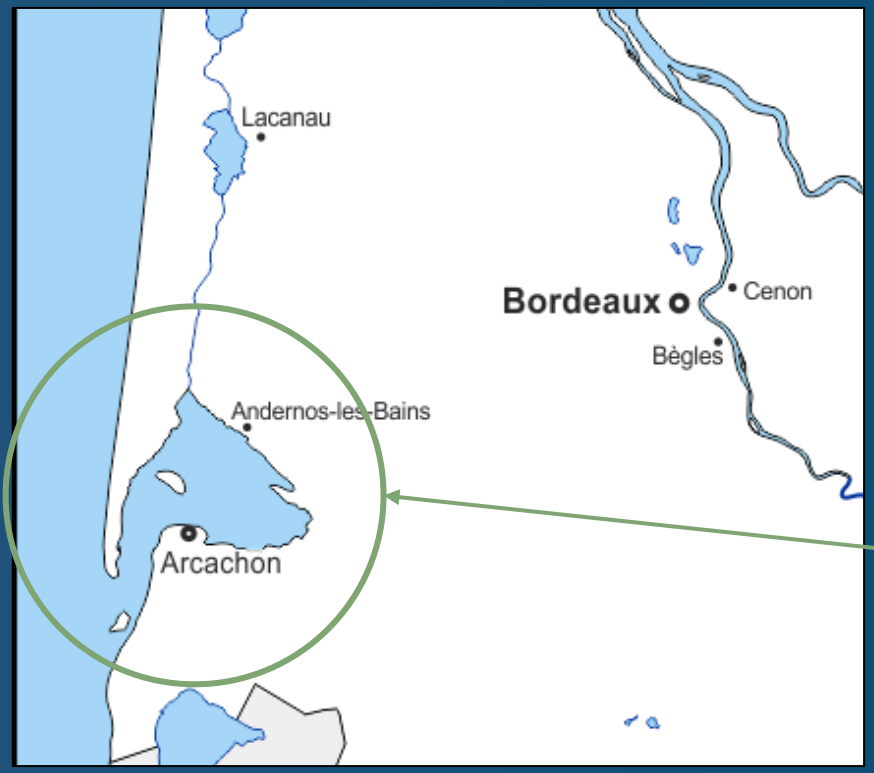

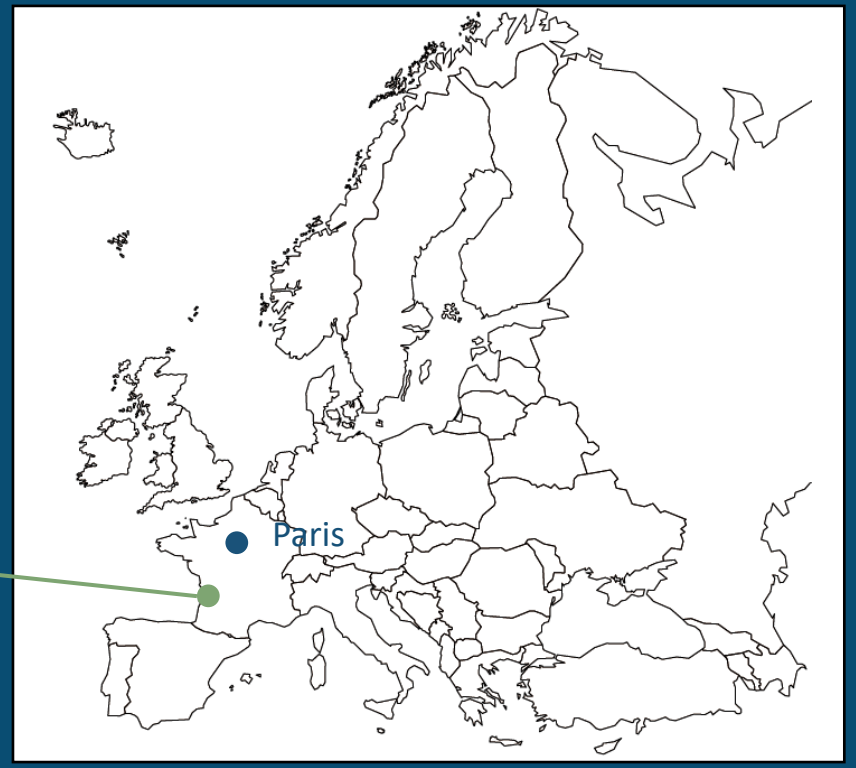

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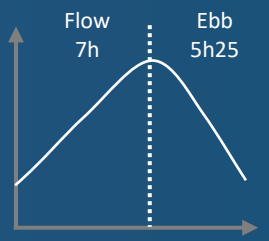
Some context...

~ Tides ~

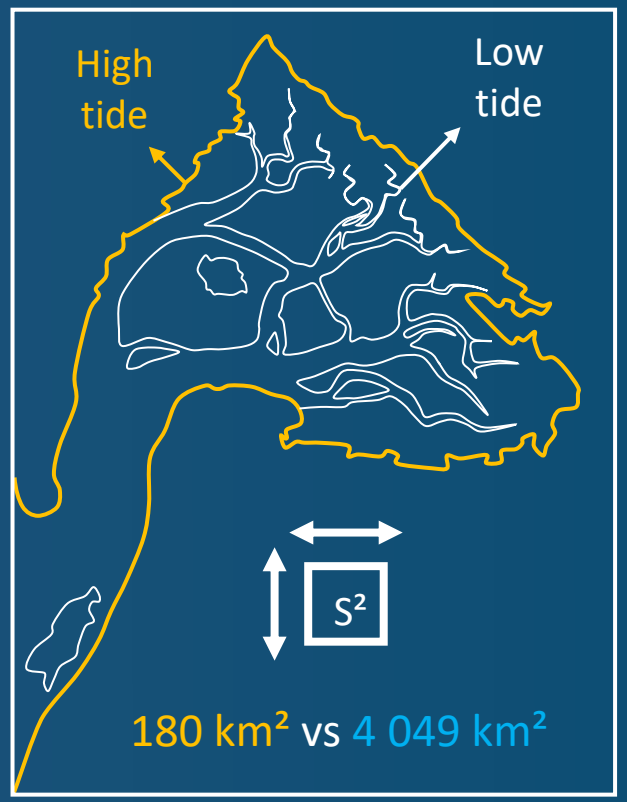
Macrotidal
(~ 2 to 4 m)

Semi-diurnal

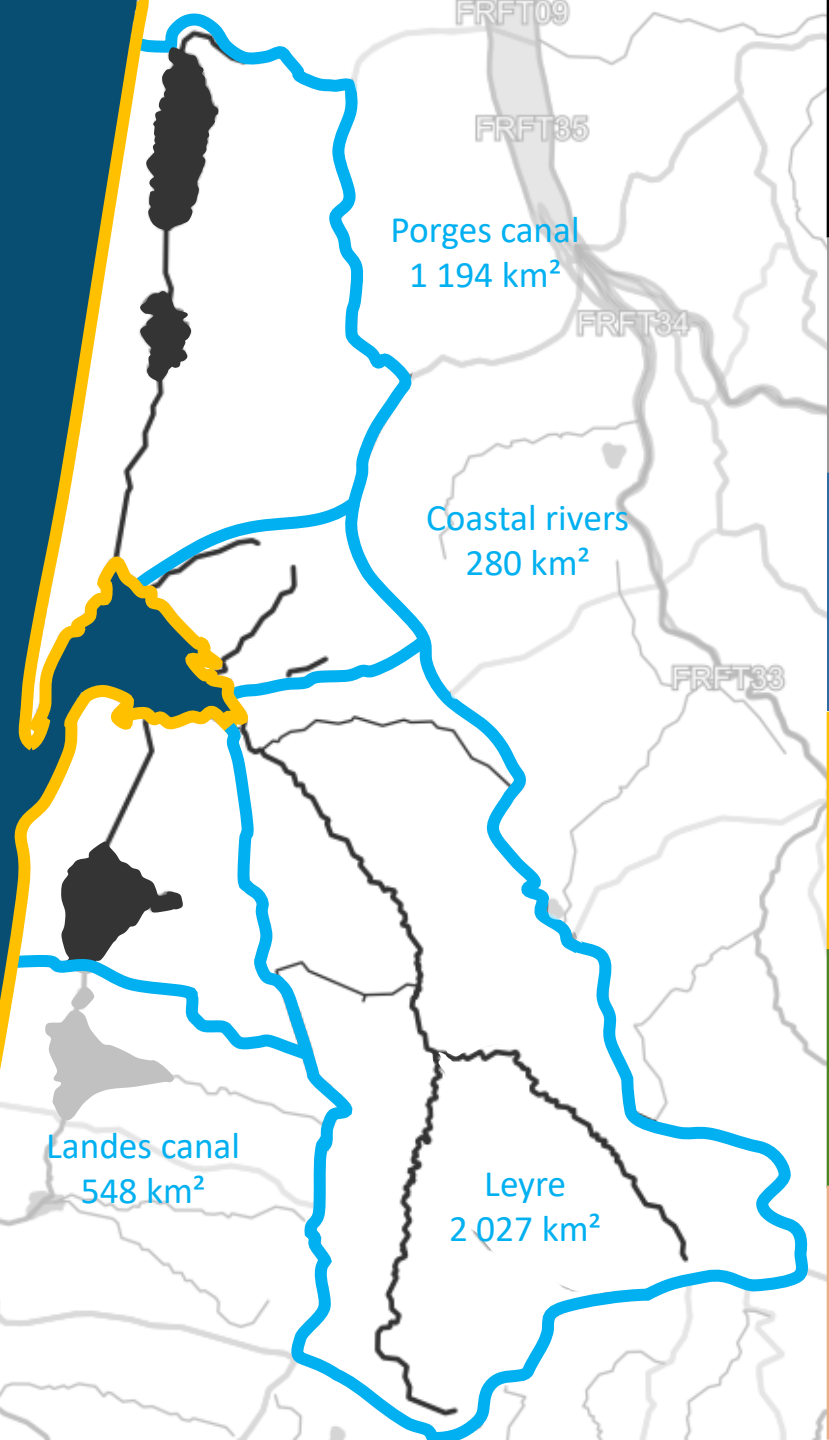
Asymetric



m³ 807 M vs 423 M



Bay of Biscay



160 000 inhabitants

sea products

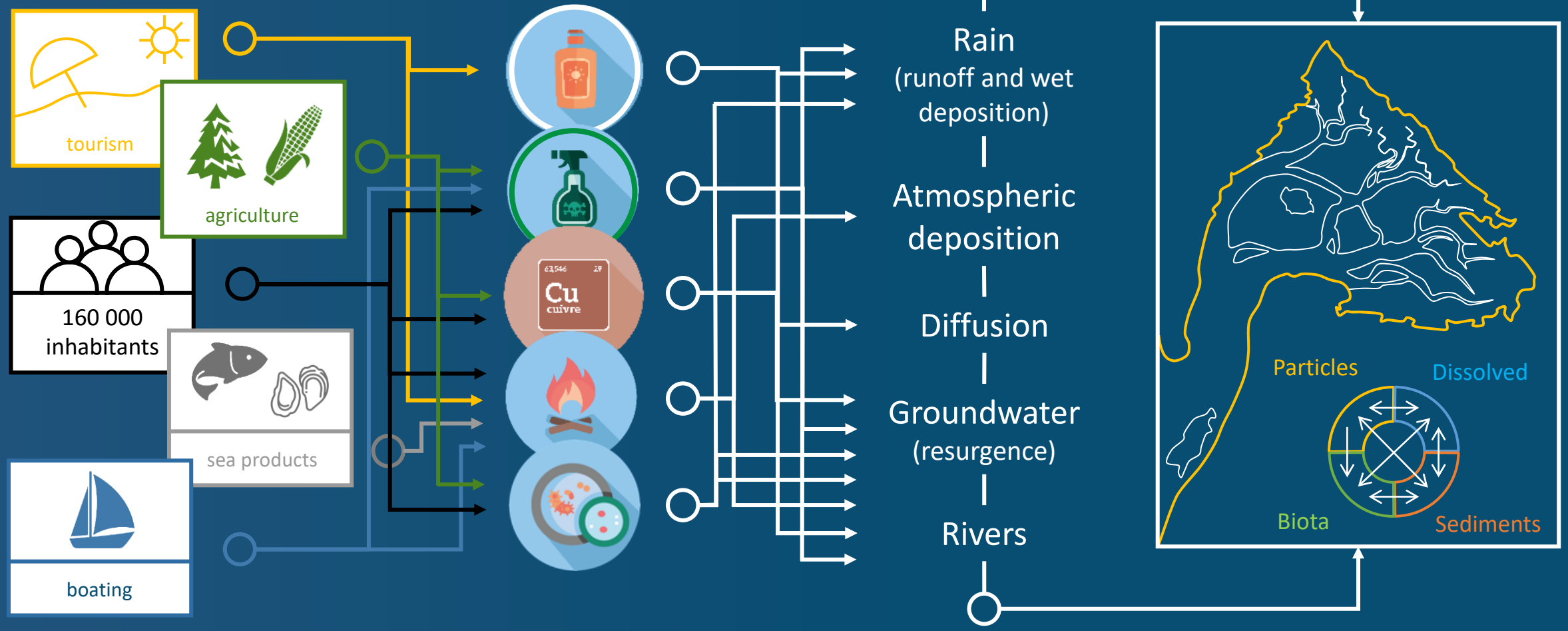
boating

tourism

agriculture

protected

Where does the contamination coming from?

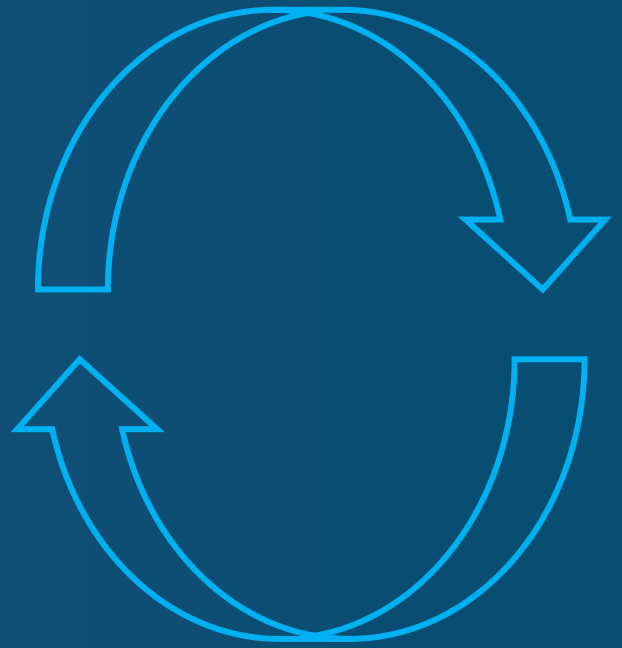


What do we look for?

Surveys
Local uses
Experts opinion
…

Screening

Do we find them?

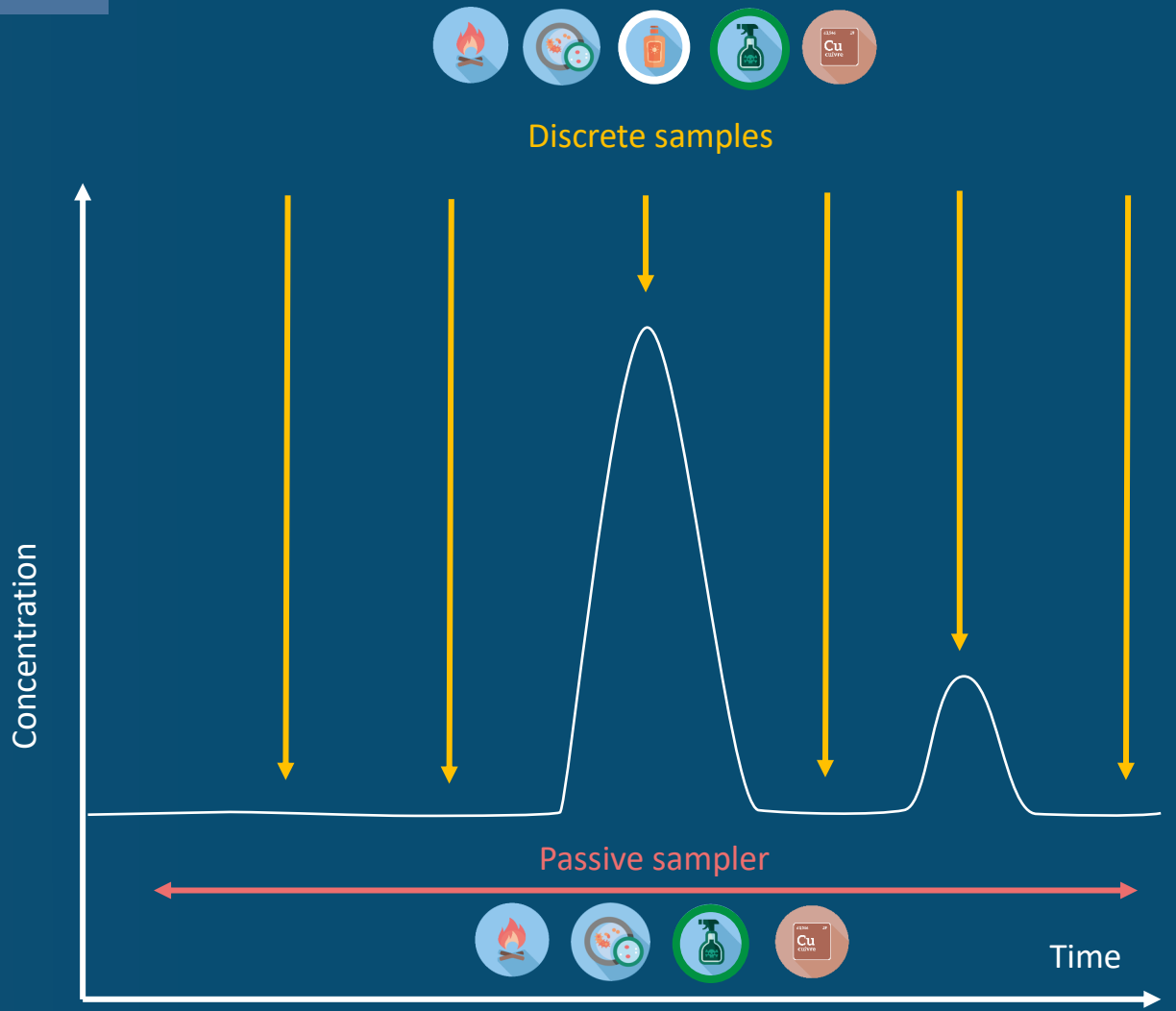


Reduced relevant list
of compounds

Regulation evolution
New compounds (metabolites)
Technical progress (chemistry)

How do we look for them?

Speciation / chemical form



Sample representativity

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Where do we search them?

- Catchment areas

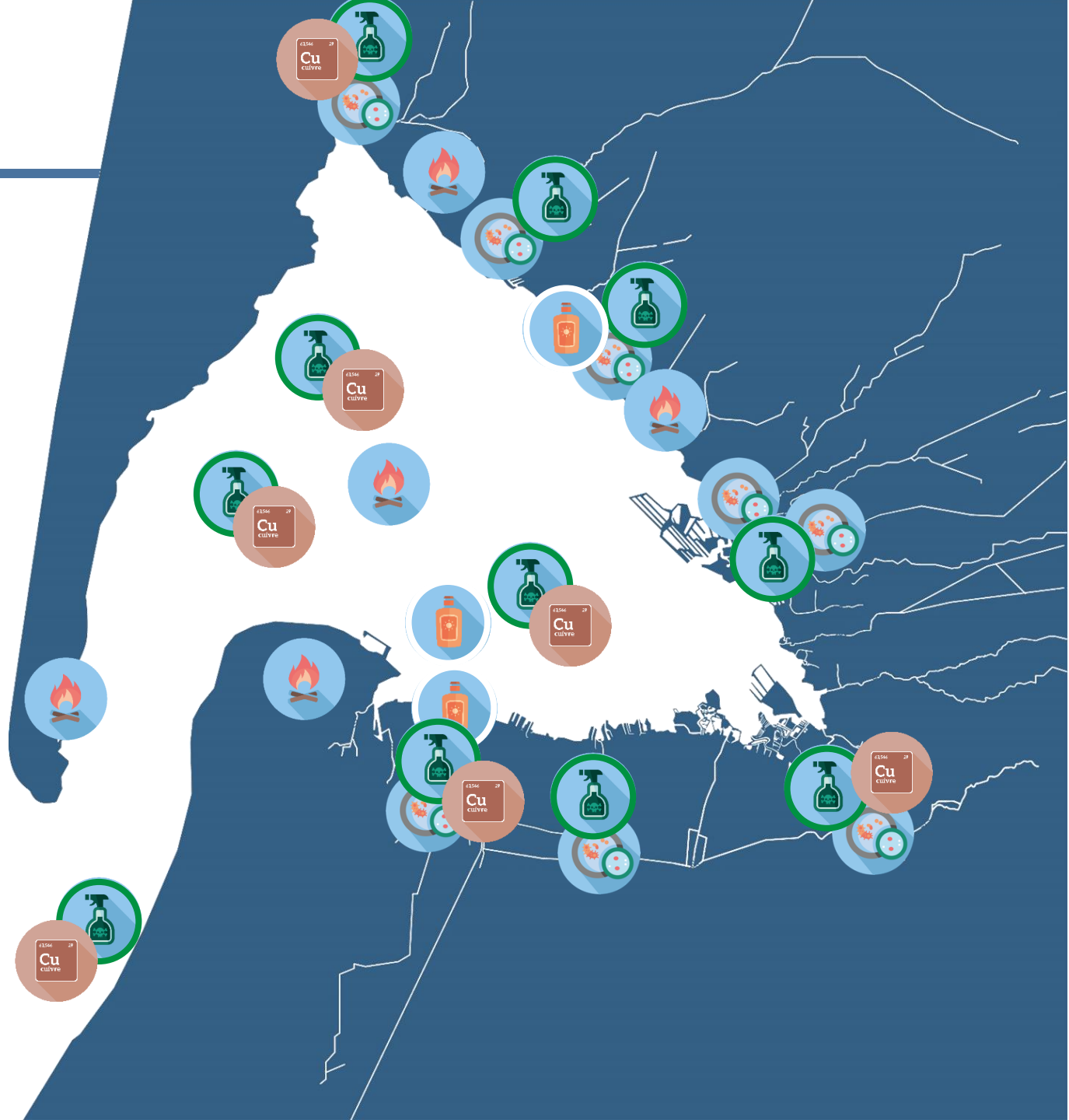
  Rivers, channels…

- Internal areas

  “Bird Island”, channels…

- Oceanic areas

  Arguin sandbar and the Ferret Peninsula



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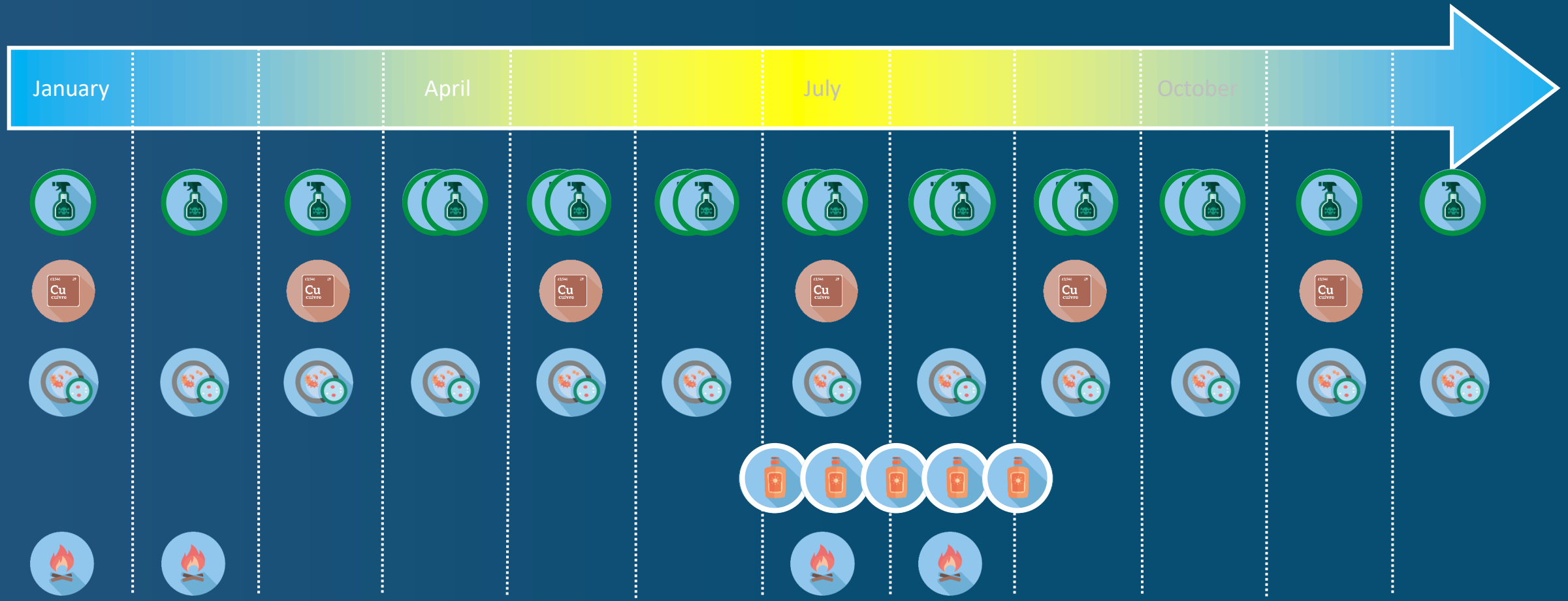
When do we look for them?

Adapting the frequency to seasonality



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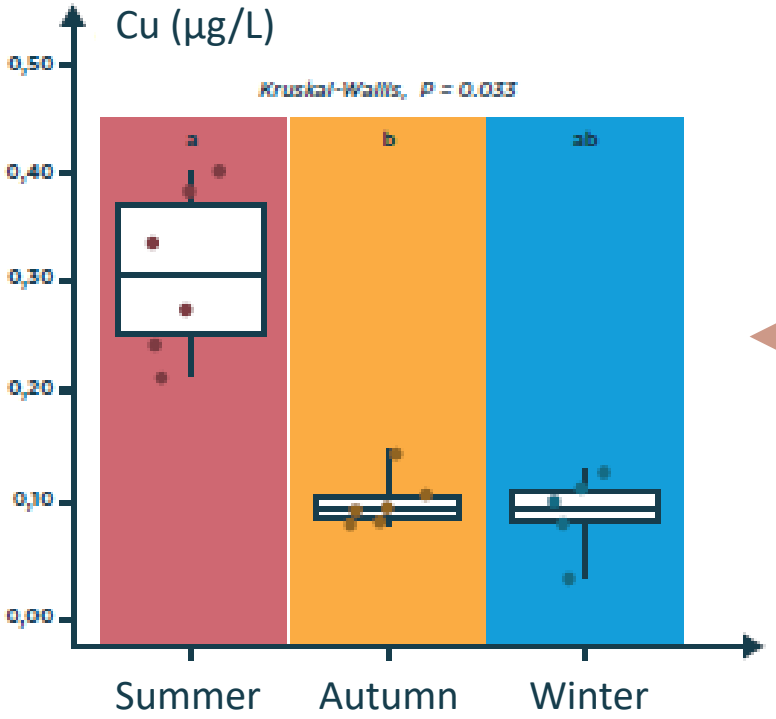
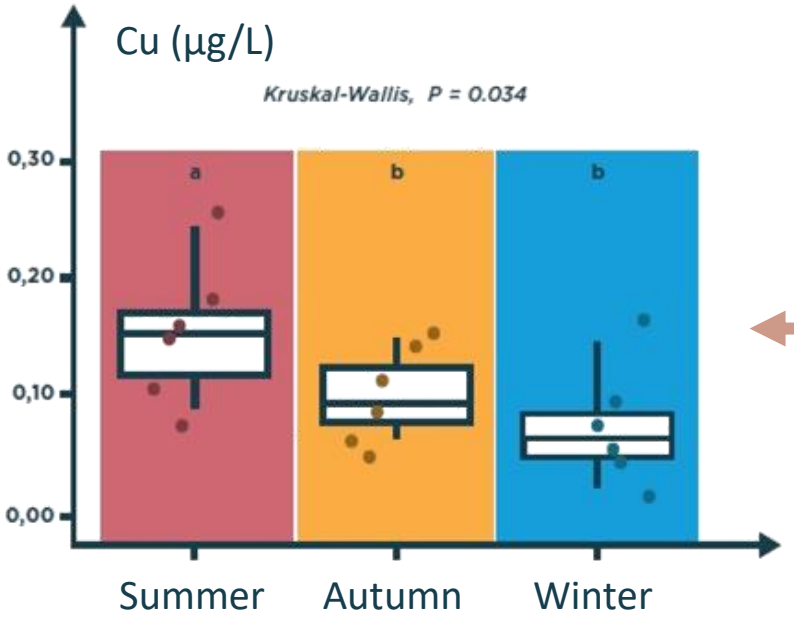
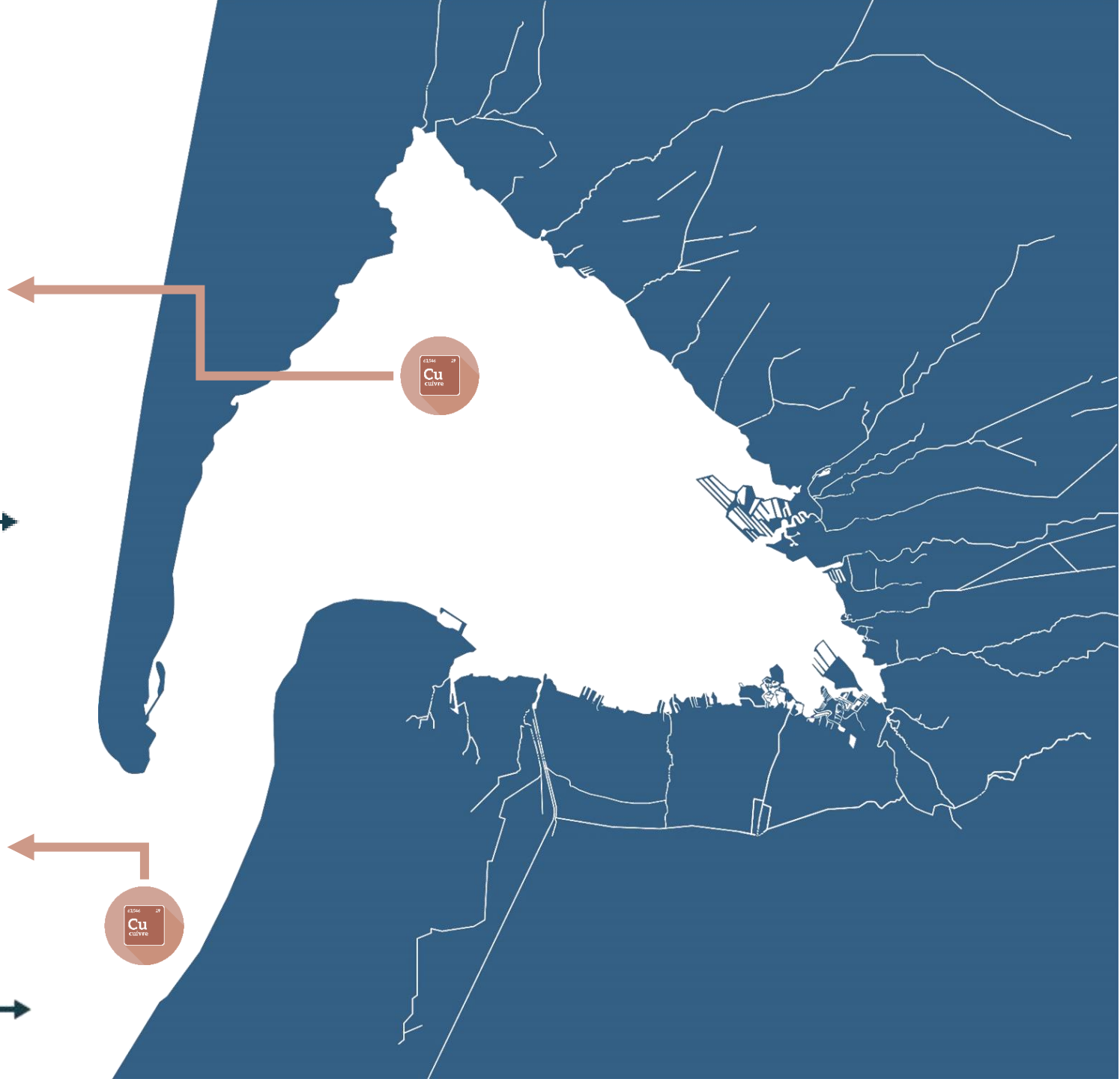
Example of copper – passive sampling







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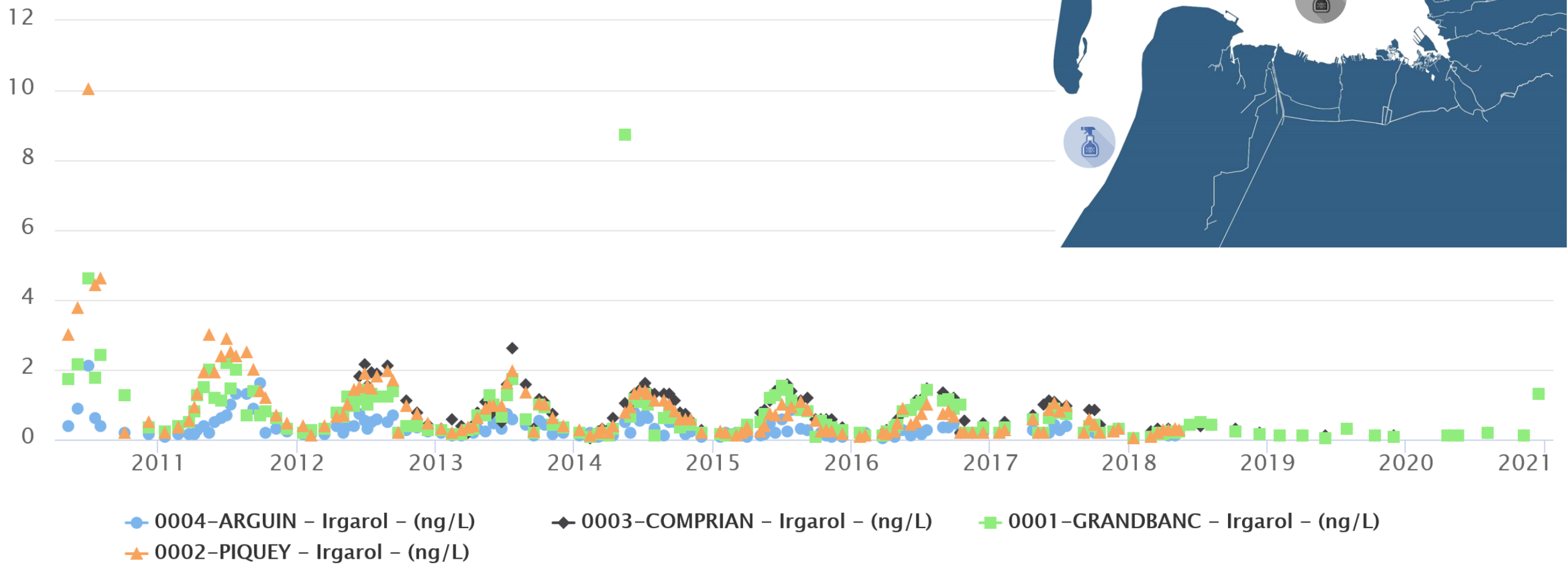
Example of cybutrin – discrete sampling

Cybutrin (ng/L)

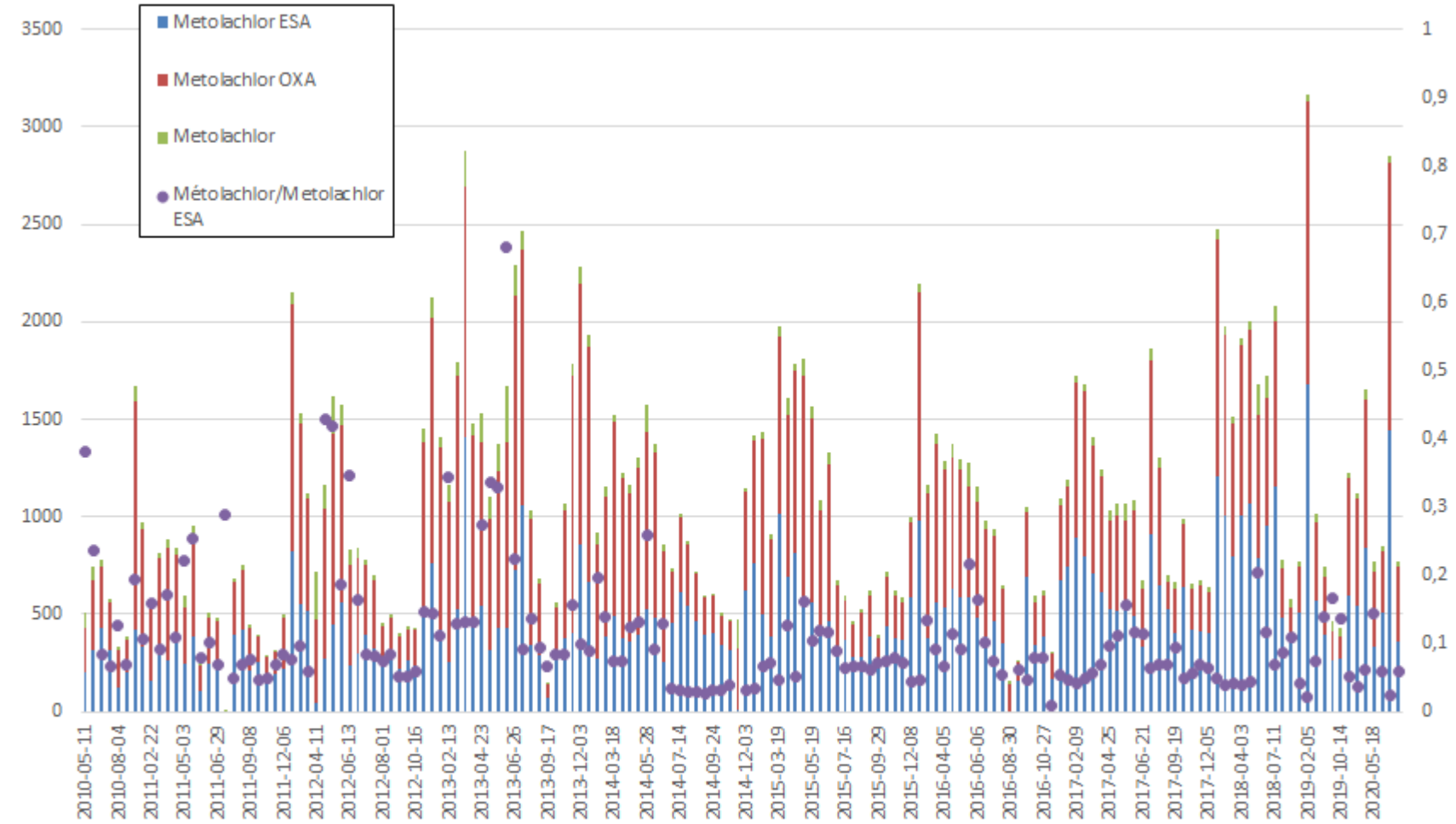


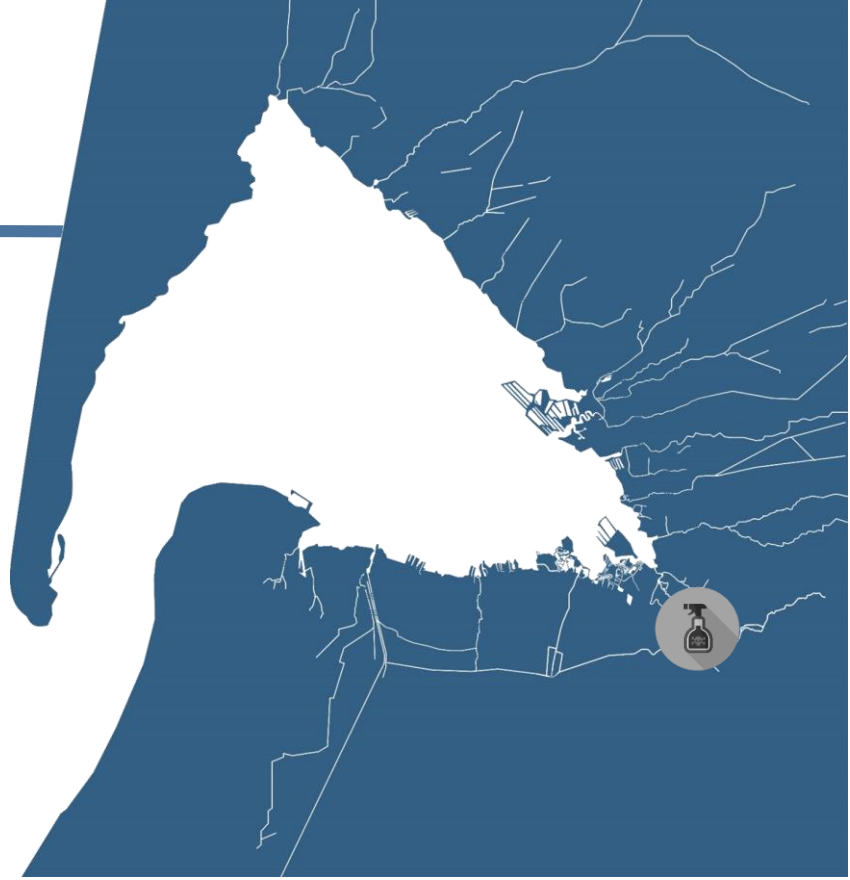
Highcharts.com

Example of the metolachlor – discrete sampling

Metolachlor
(ng/L)

Metolachlor / ESA
Metolachlor





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Optimization

- ## Spatial

  Pesticides : 4 rivers + 2 sites in the Bay

  Nutrients and microbiology : 8 rivers

  Metals : 3 sites in the Bay

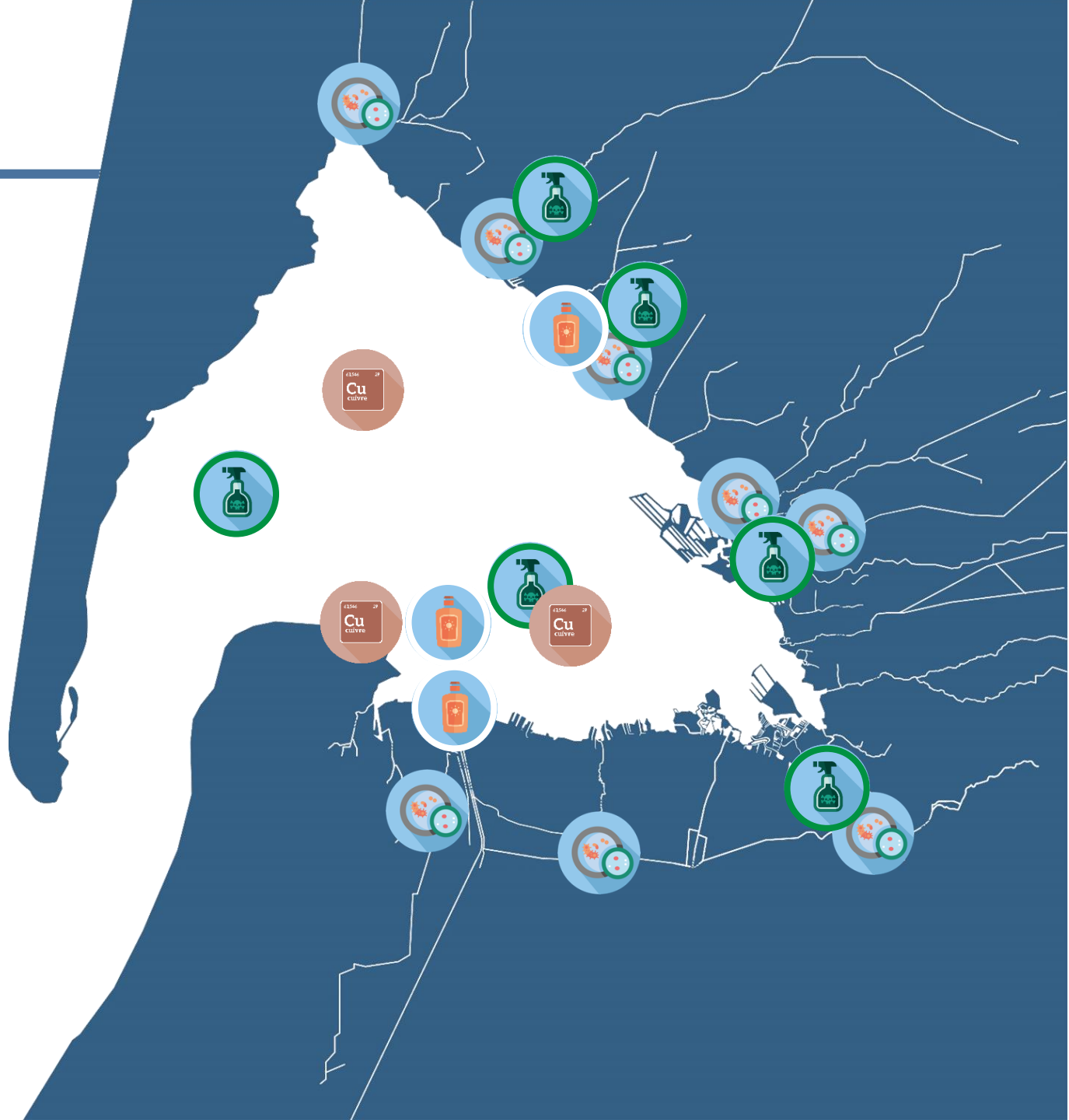
  UVF : 3 beaches

- ## Frequency

  Pesticides : 1 / 2 months

  Nutrients and microbiology : 1 / month

  Metals : X 3 in summer and X 2 in winter



Conclusion

- A diffuse pollution…

  …is challenging to address !

  …requires good knowledge of the territory

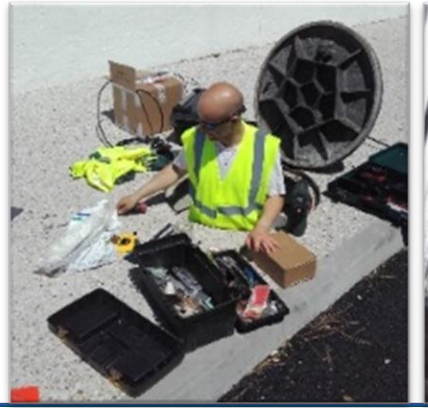
  …requires to developping a specific methodology

- We still wonder…

  …how to find non targeted molecules?

  …how to assess the risk with accuracy?

  …how to get to practical measures?



Open Discussion : Experience of other territories

How to develop a sampling strategy adapted to **diffuse pollution**?

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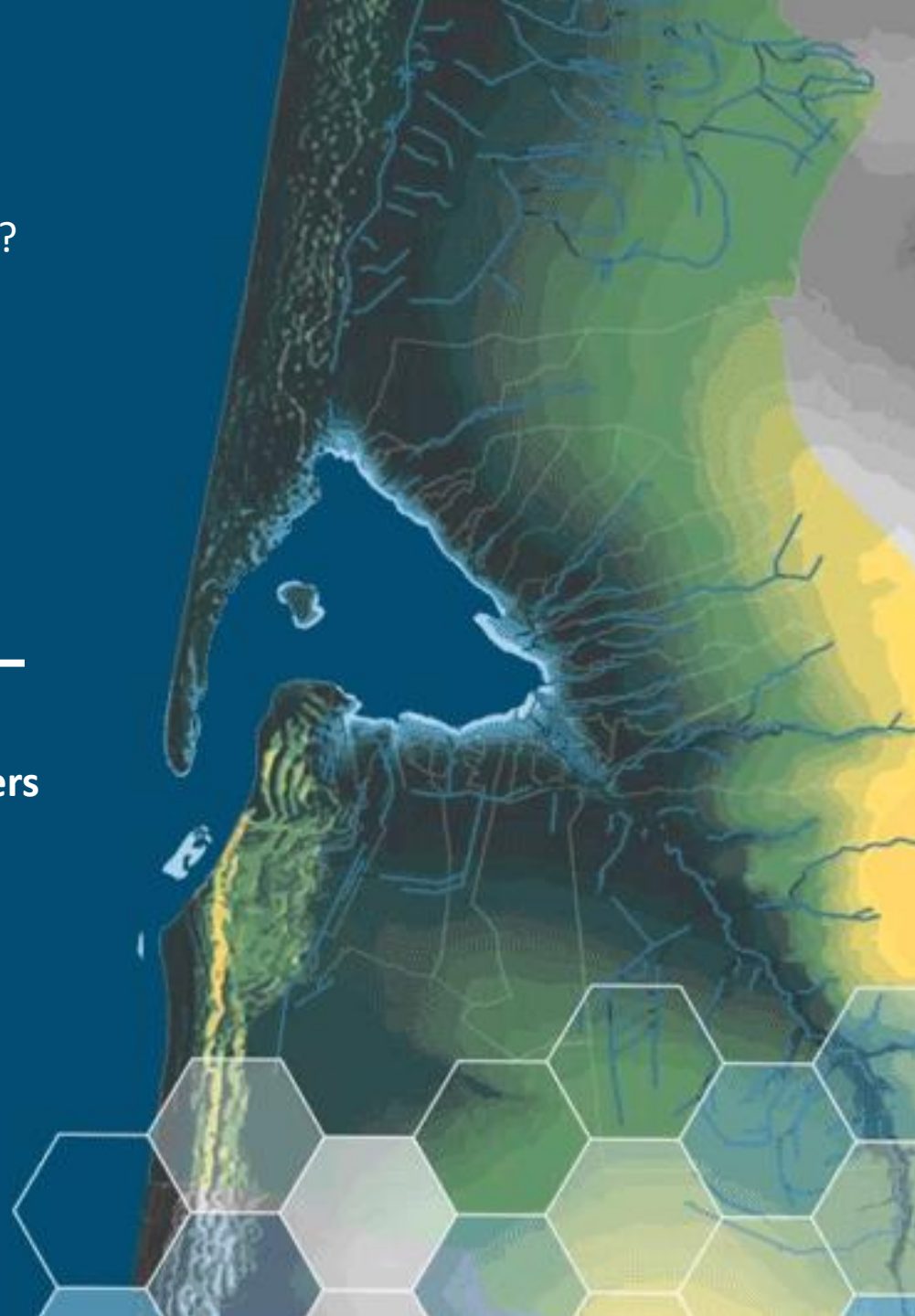

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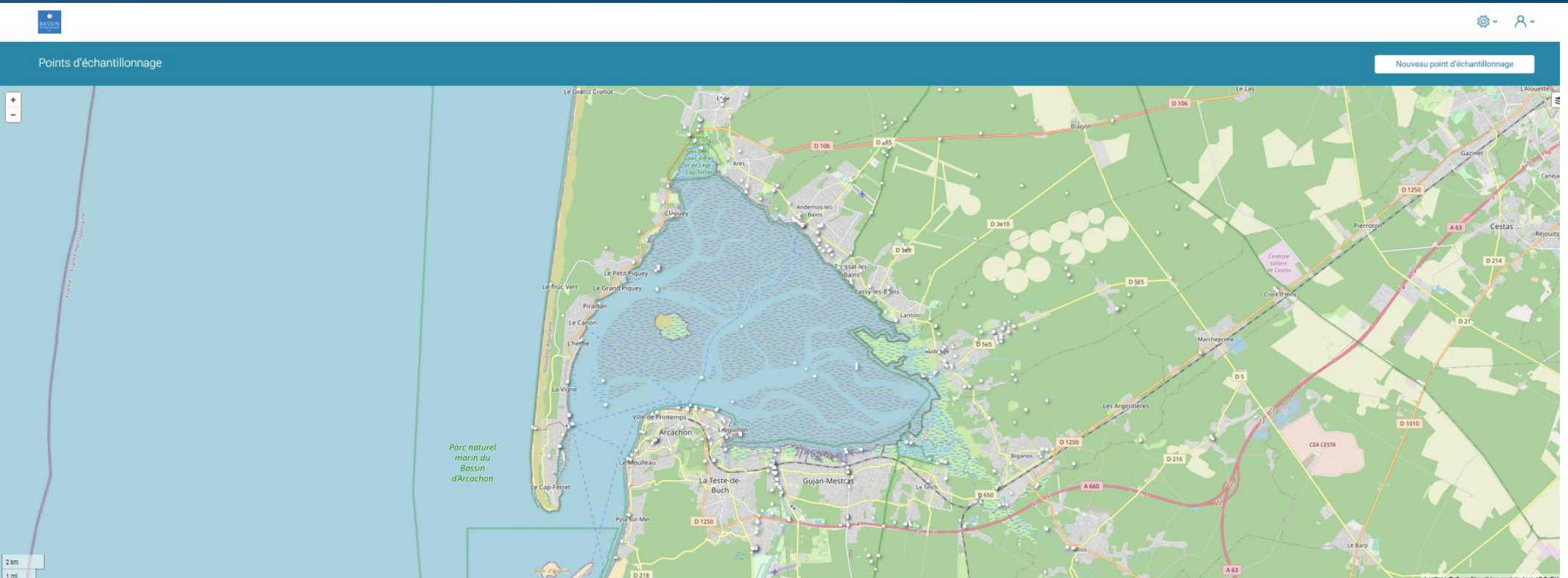

Enki

WaterShed Monitoring

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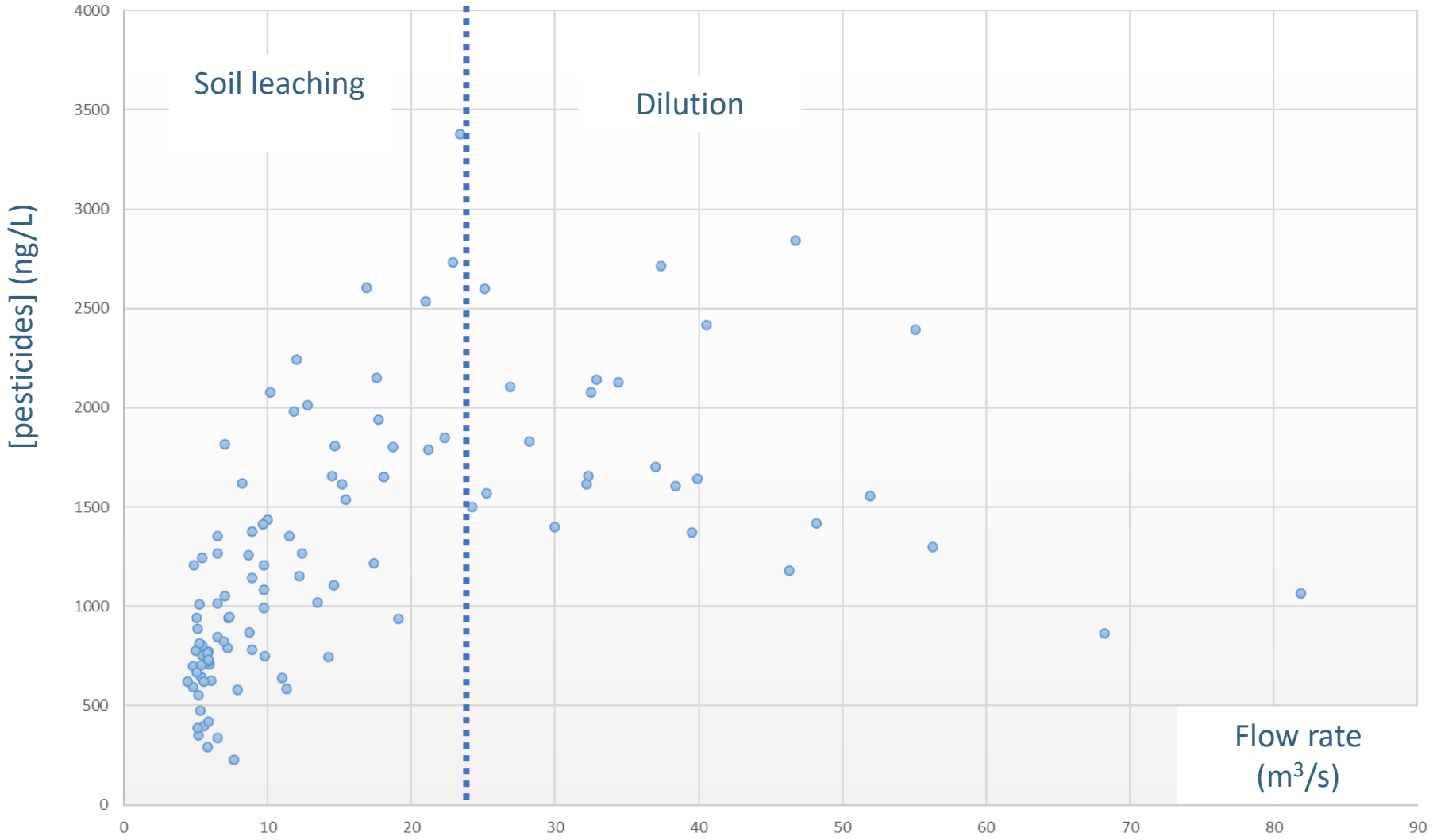
For instance…

Water level monitoring

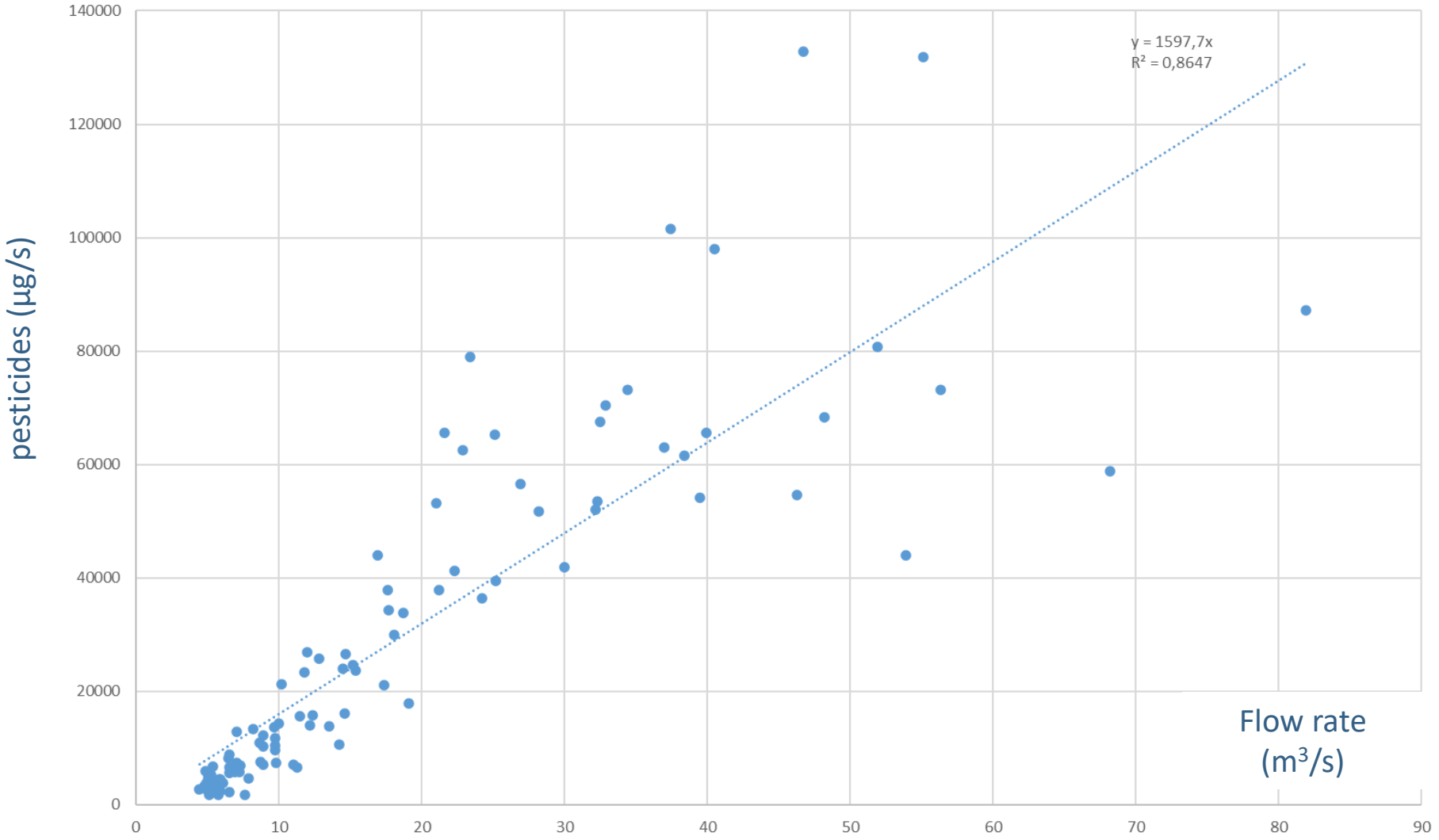
For instance…



Concentrations

Relevant regarding organisms exposure

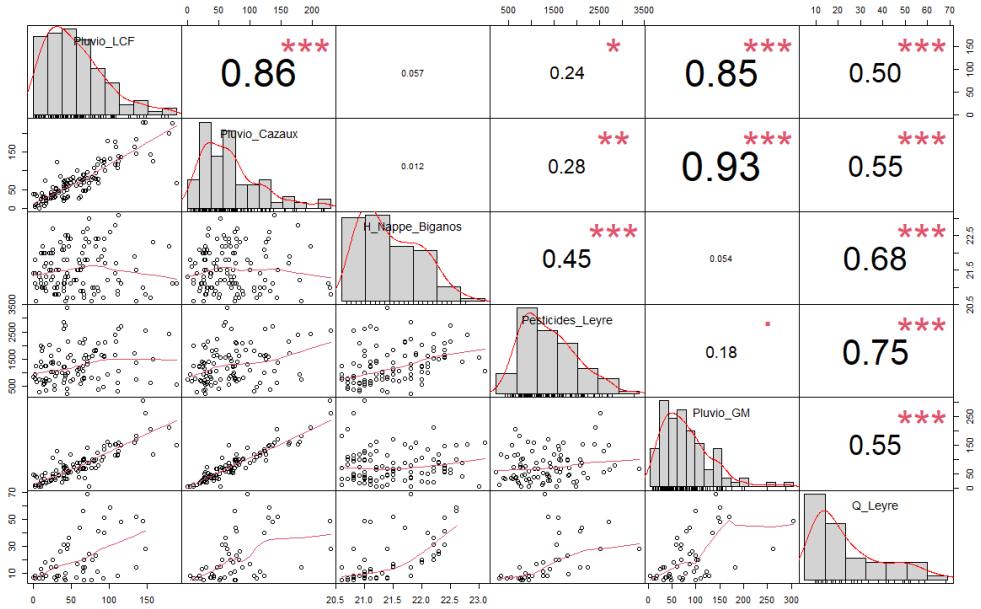
For instance…

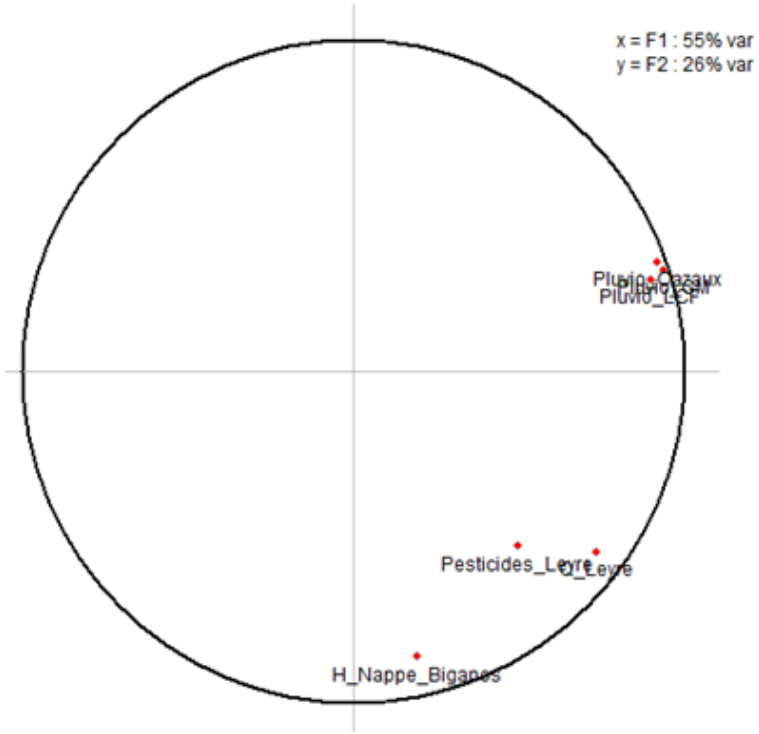


Fluxes

Relevant regarding contaminants inputs into the Bay

For instance…





Environment effect

Various correlations between [pesticides] and environmental parameters (groundwater level, rainfall…)

Conclusion / Open Discussion

- Databases are a great tool …
  - …for traceability
  - …for data archiving
  - …for cross project work
- A good start but…
  - …how can we go further?
  - …how can we sort our data?

Data mining?

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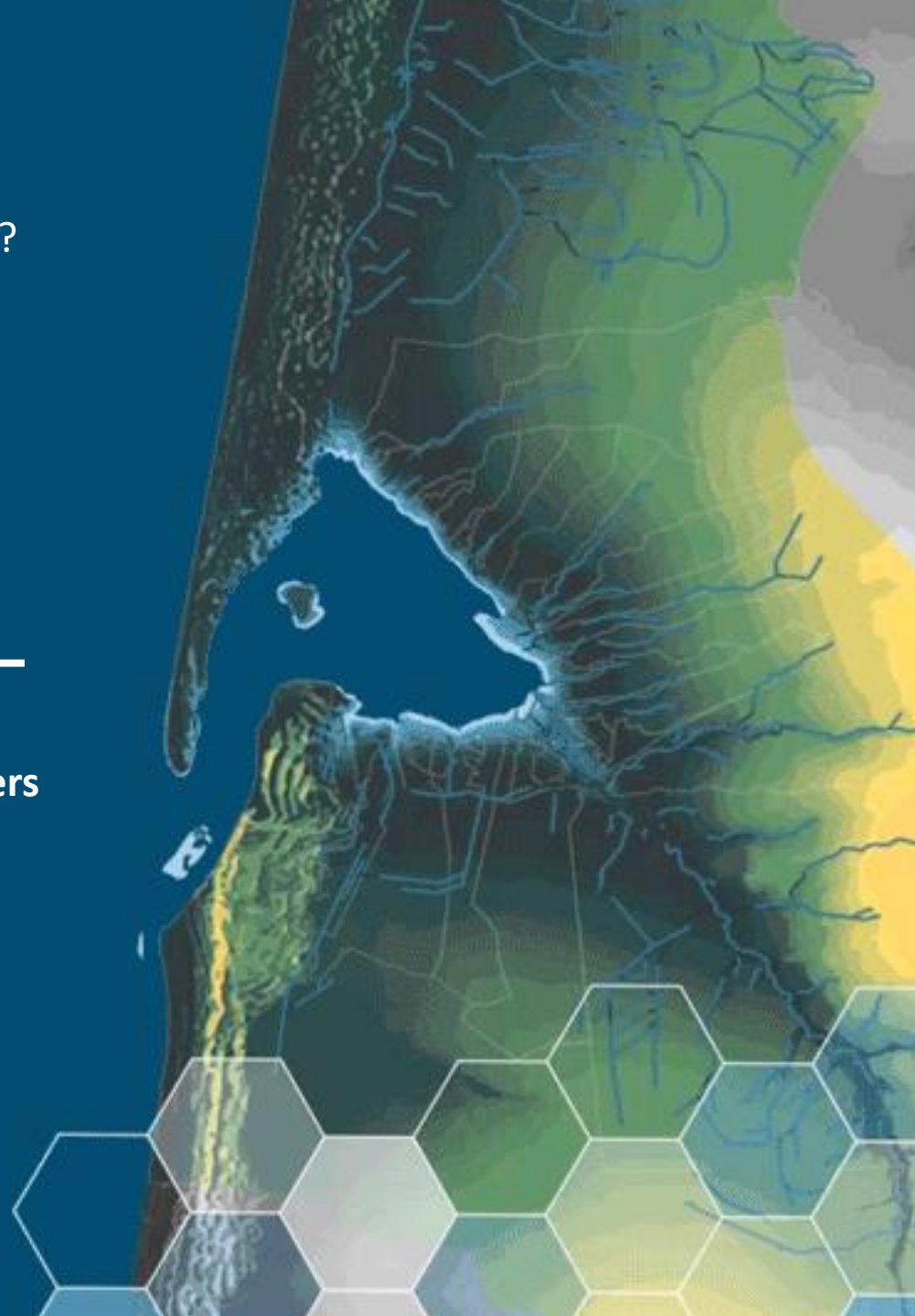

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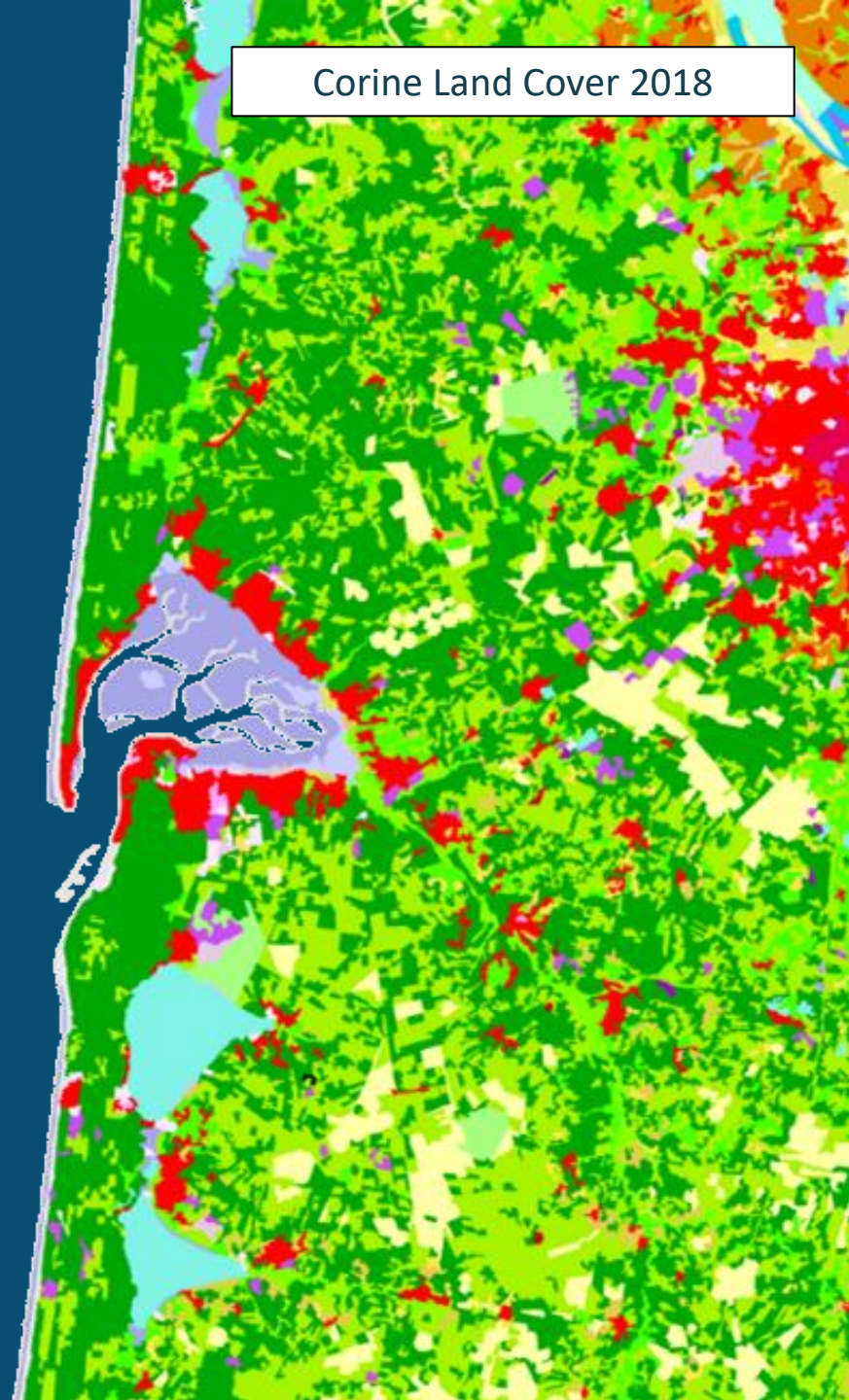
Example of actions to reduce footprint in fresh and marine waters

Land use : 11% of agriculture (corn)

Chemical signature : herbicides (Metolachlor / ESA / OA)



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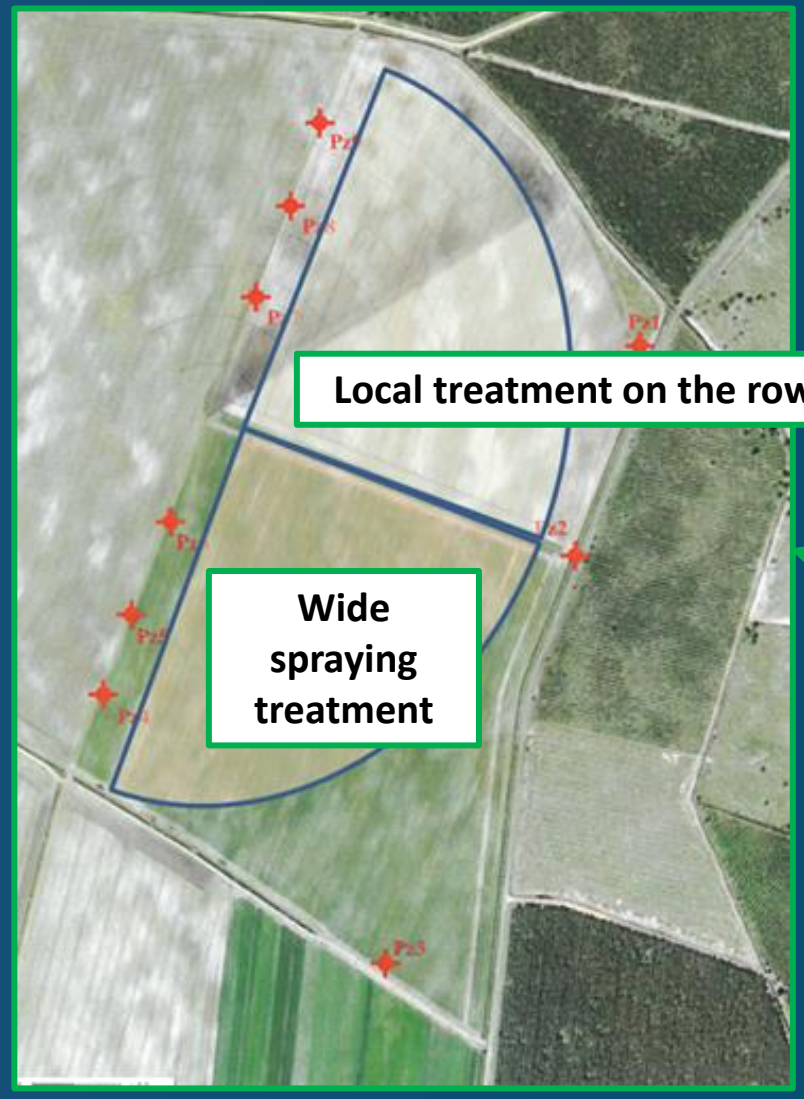
An experiment to encourage the transition

1 farmer

2 tests fields

2 herbicides application methods



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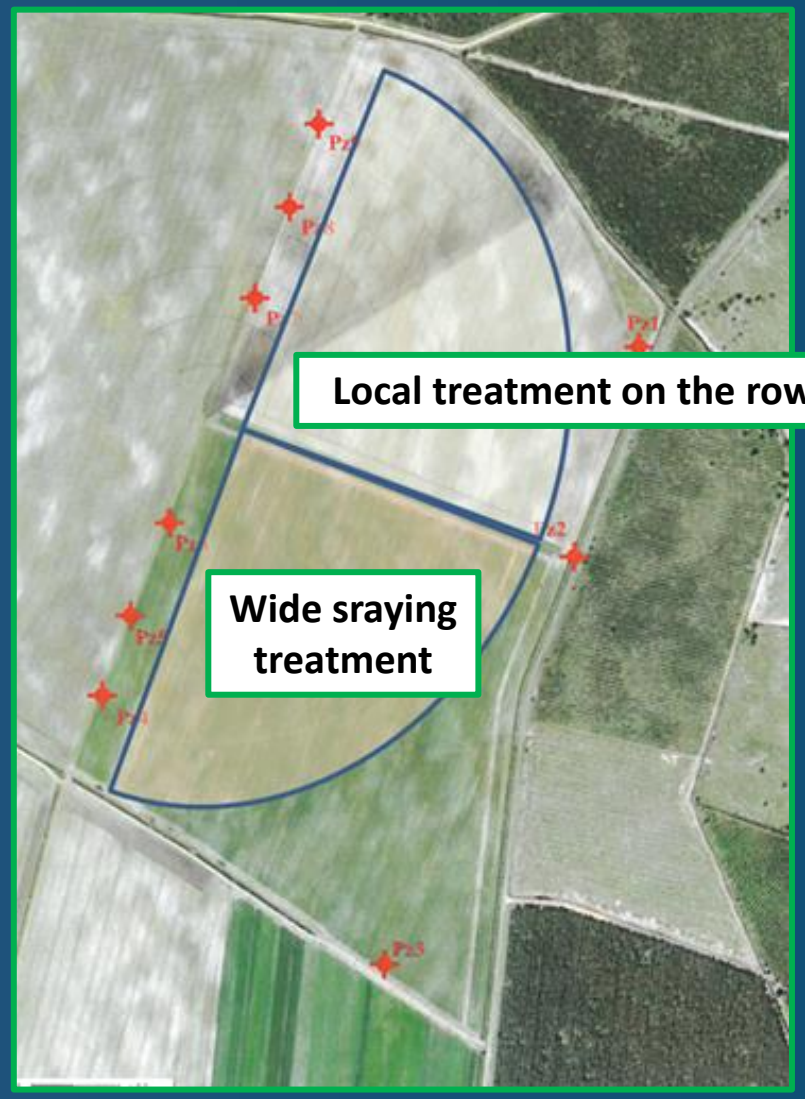
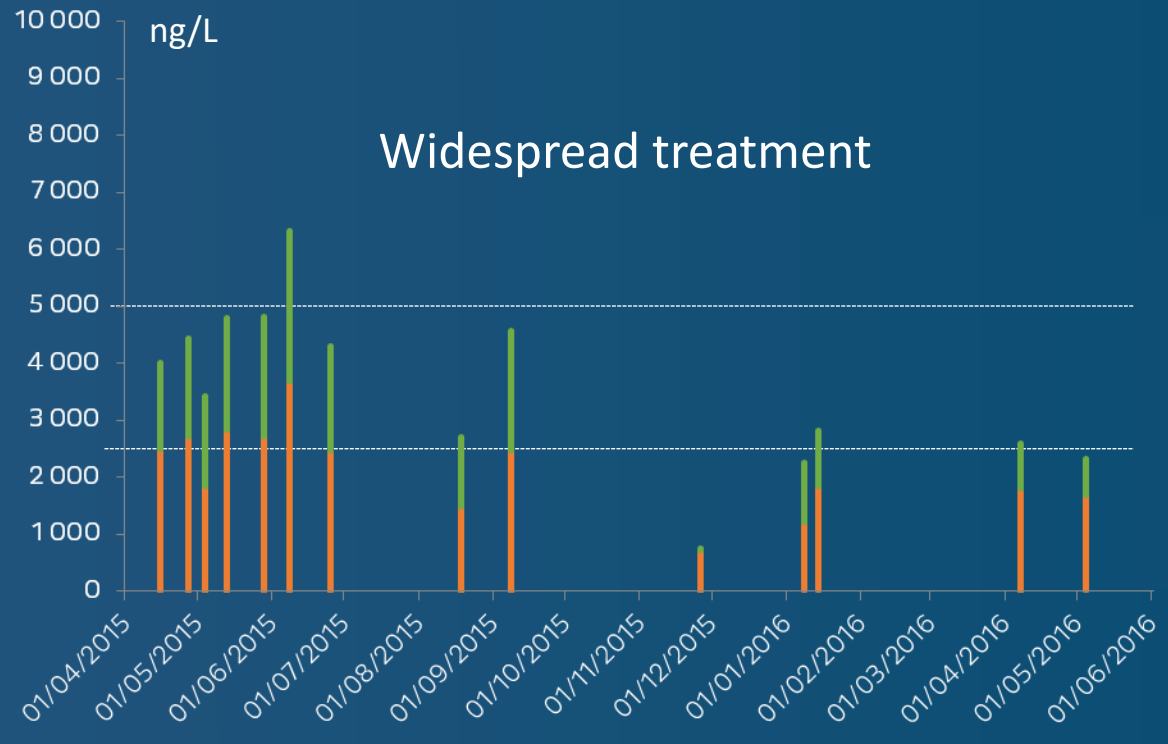
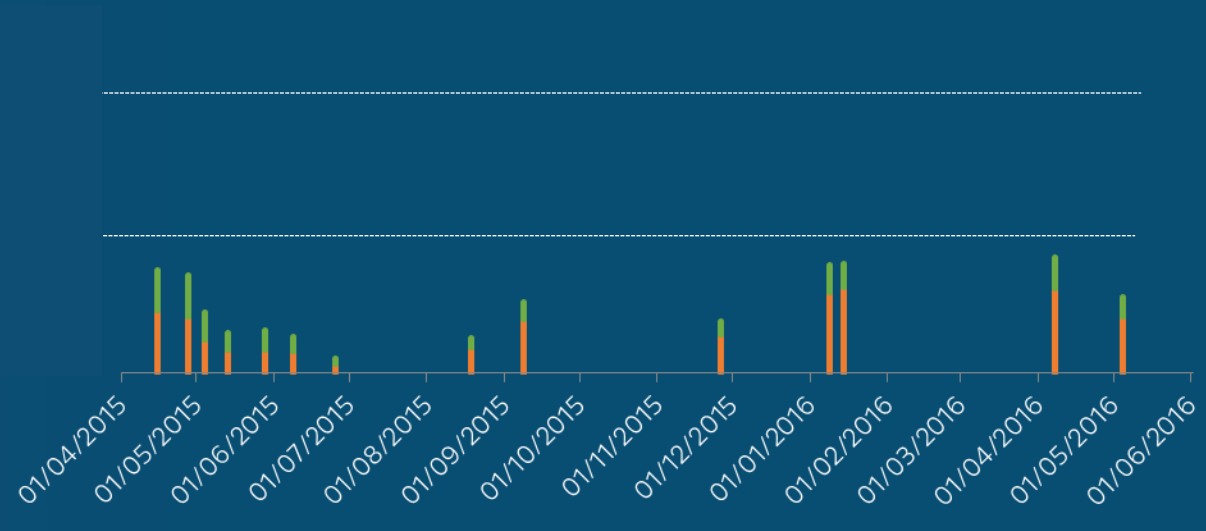


Metolachlor and metabolites monitoring in groundwaters

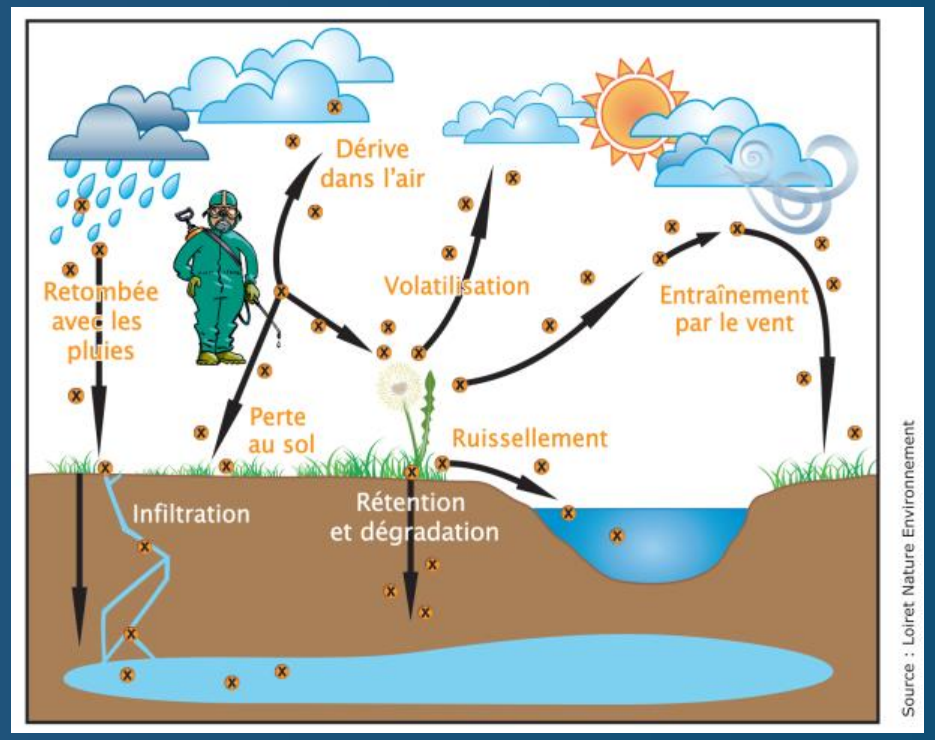




Metolachlor OA

Metolachlor ESA

Assistance and guidance of municipalities



Transition to zero pesticide since 2008 for municipalities

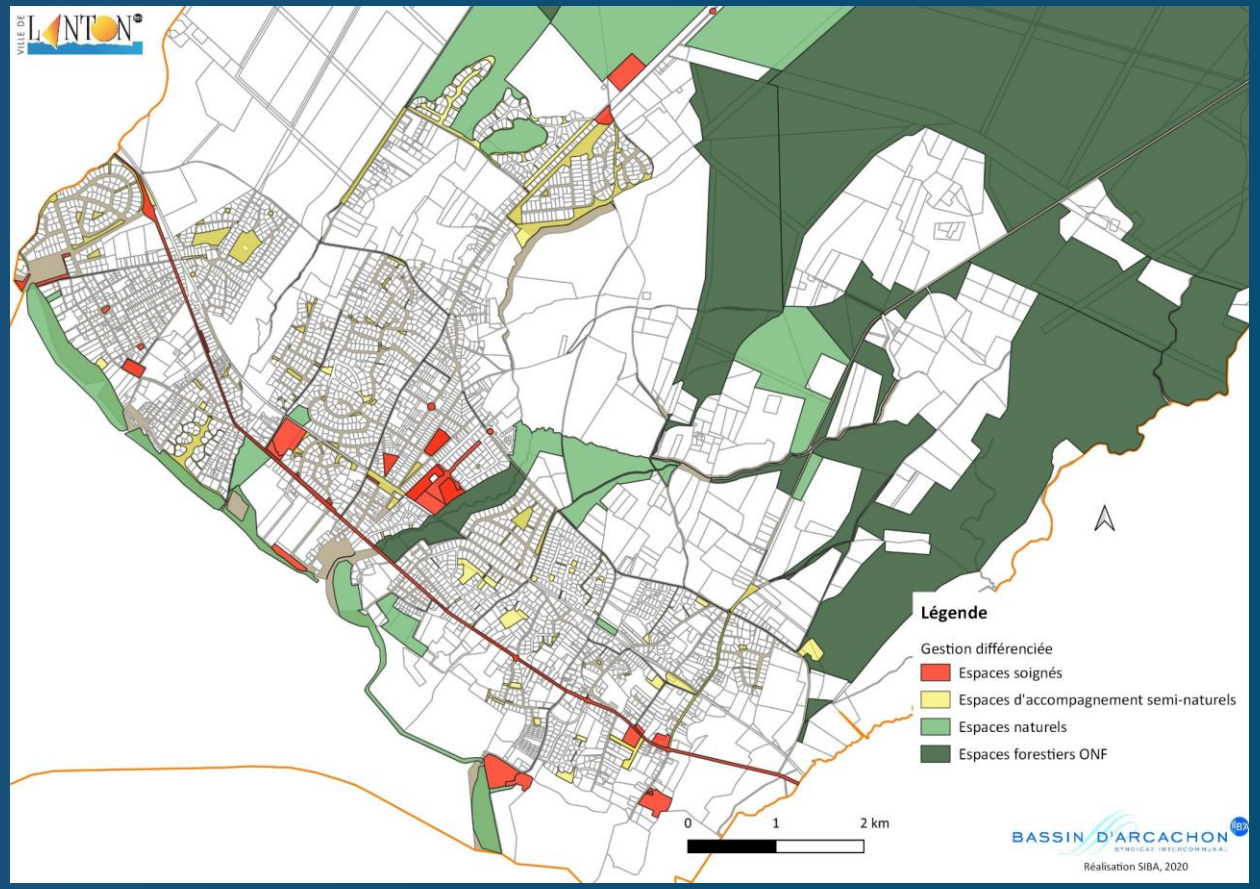
↓

Labbé law in 2017 banning the use of pesticides for maintenance of green spaces belonging to public entities and then in 2019 for private users

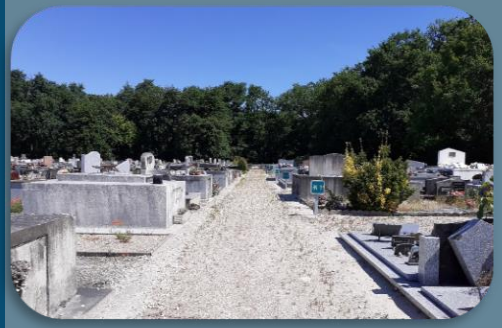
Method changes for green space maintenance: differentiated management

Assistance and guidance of municipalities: differentiated management

Aim: to not apply the same management to all urban spaces in order to be more compatible with environmental preservation



New legislation banning pesticides for cemeteries and field sports



2022

2025 for fields with restricted access

Assistance and guidance of municipalities: CITECO PROJECT

Launch of a new project in 2021: assisting municipalities into managing cemeteries and sport fields without pesticides

Cemeteries

Transition from mineral sites to refuges for local biodiversity

- **Individual counselling** (site assessments, recommendation of different approaches for maintenance and landscaping, etc.) ;
- **Collective counselling** with all cities involved to allow feedbacks between municipalities that often share same issues.

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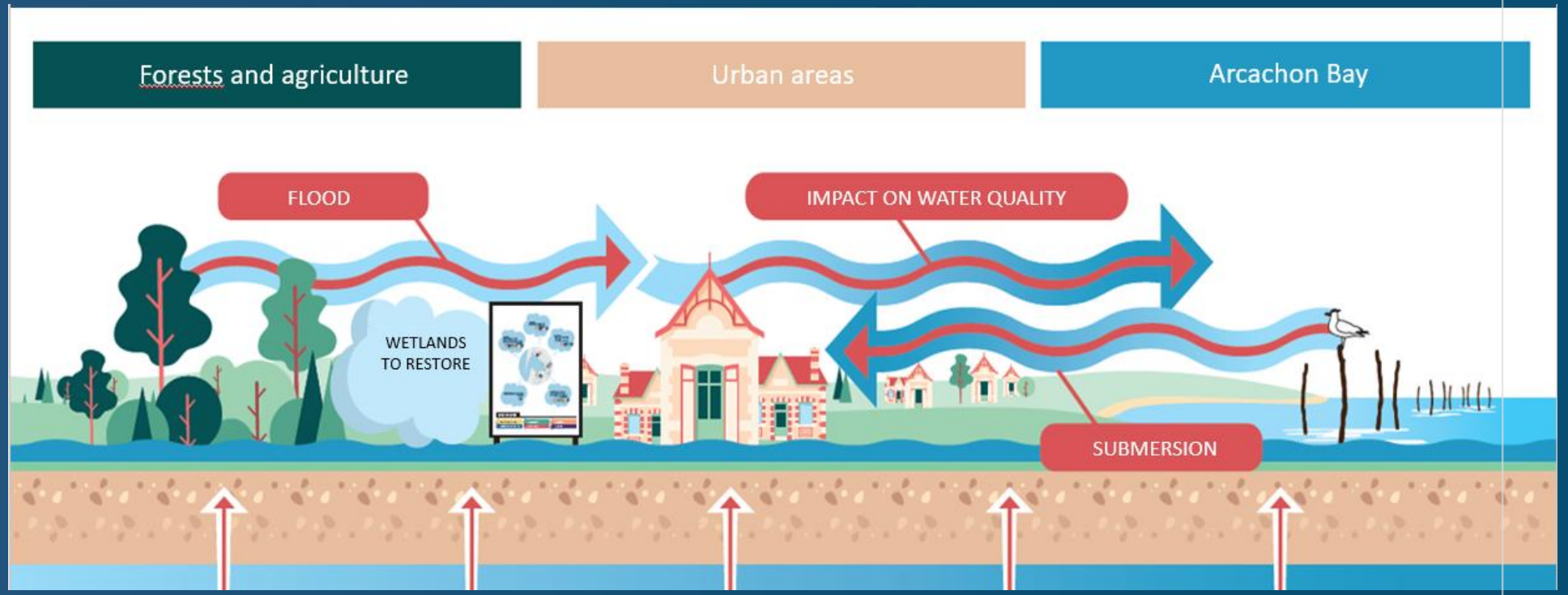
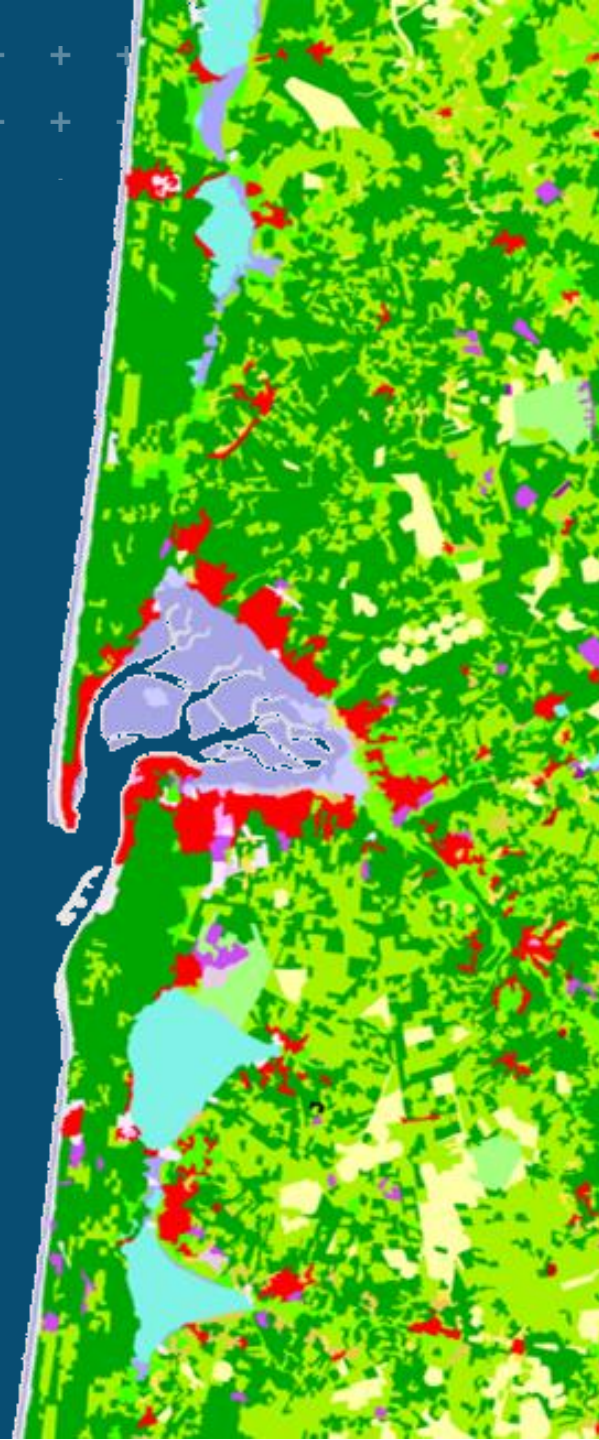
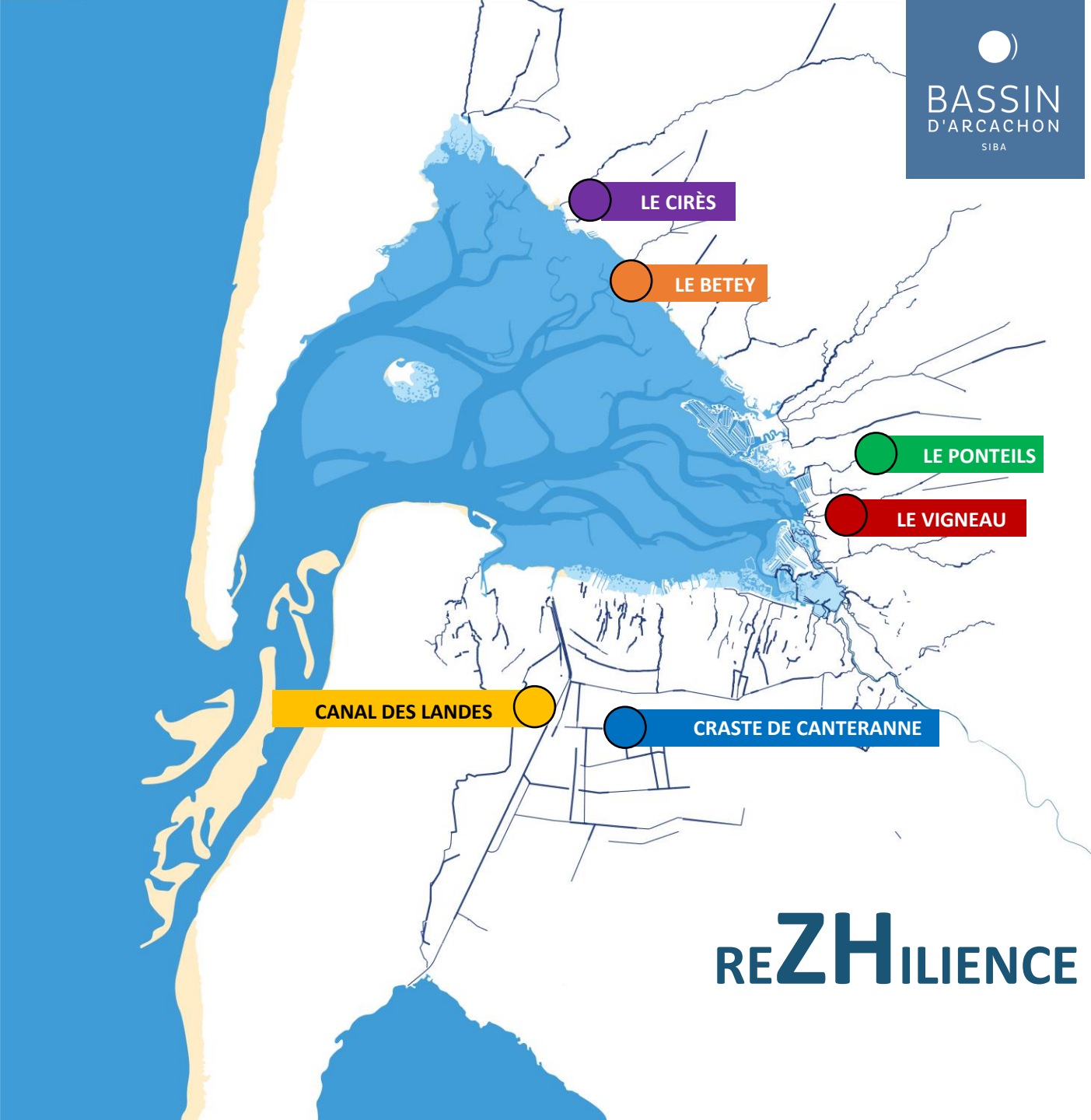
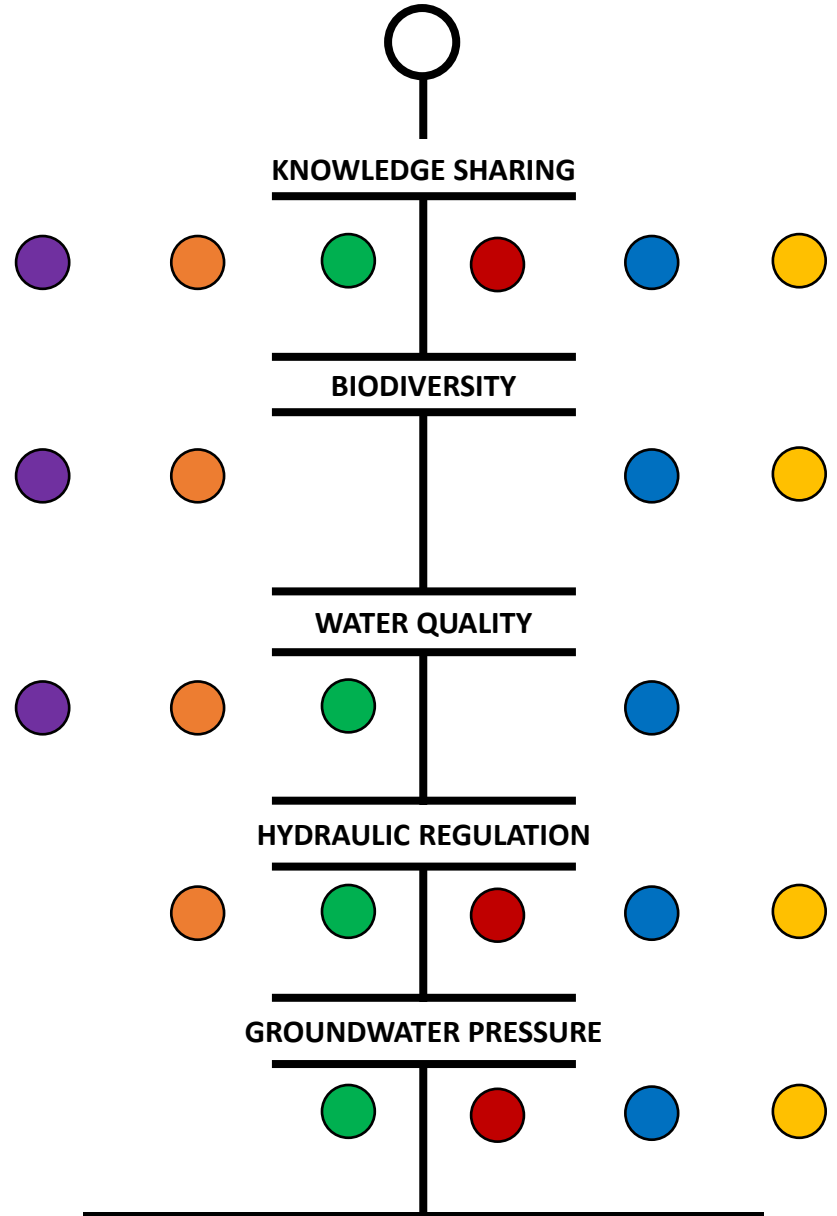
ReZHilience project

Wetlands restauration in rivers basins heads for the Bay resiliency improvement









STUDIED SITES AND STAKES OF THE PROJECT

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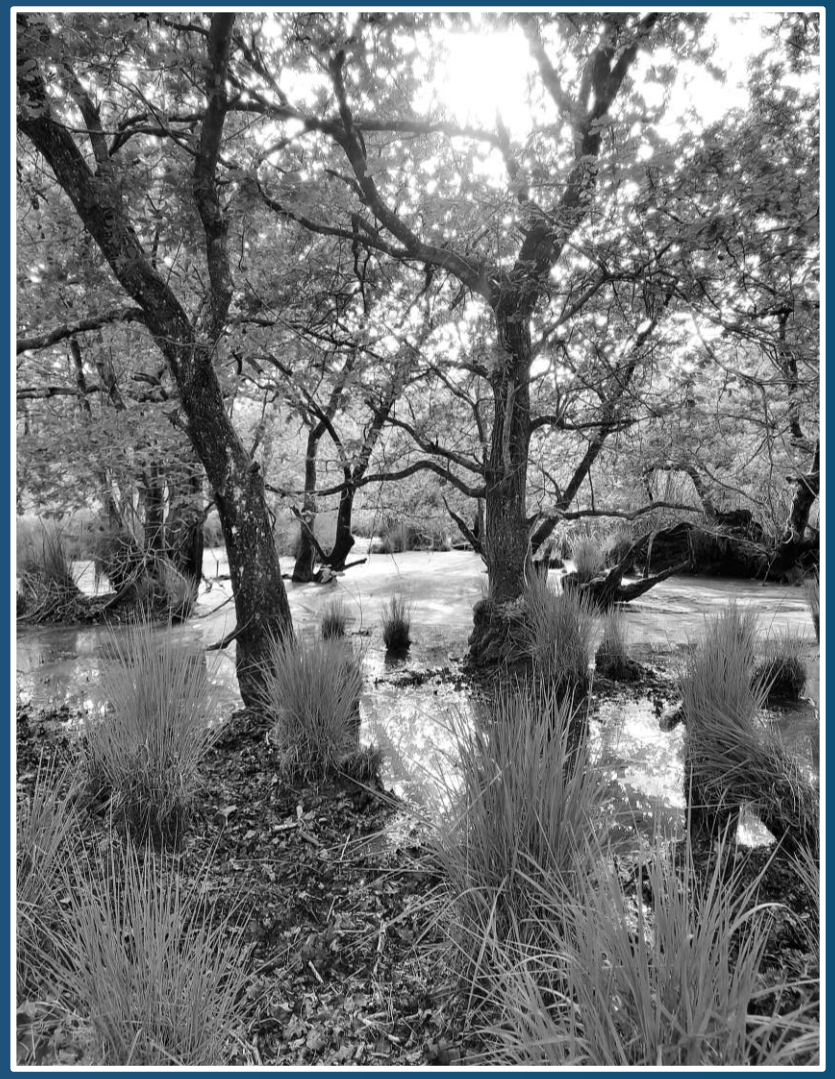

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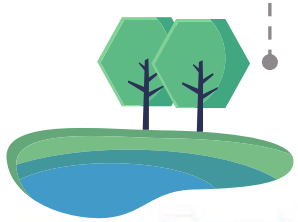
137
Open infiltration and retention basins

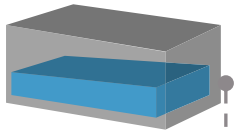


360 km
of pipes

413 km
of ditches

149
outlets
in Arcachon Bay

More than 2000
estate transactions with infiltration areas
= retention volume about 10 000 m³



44
Underground basins

25
Pumping stations

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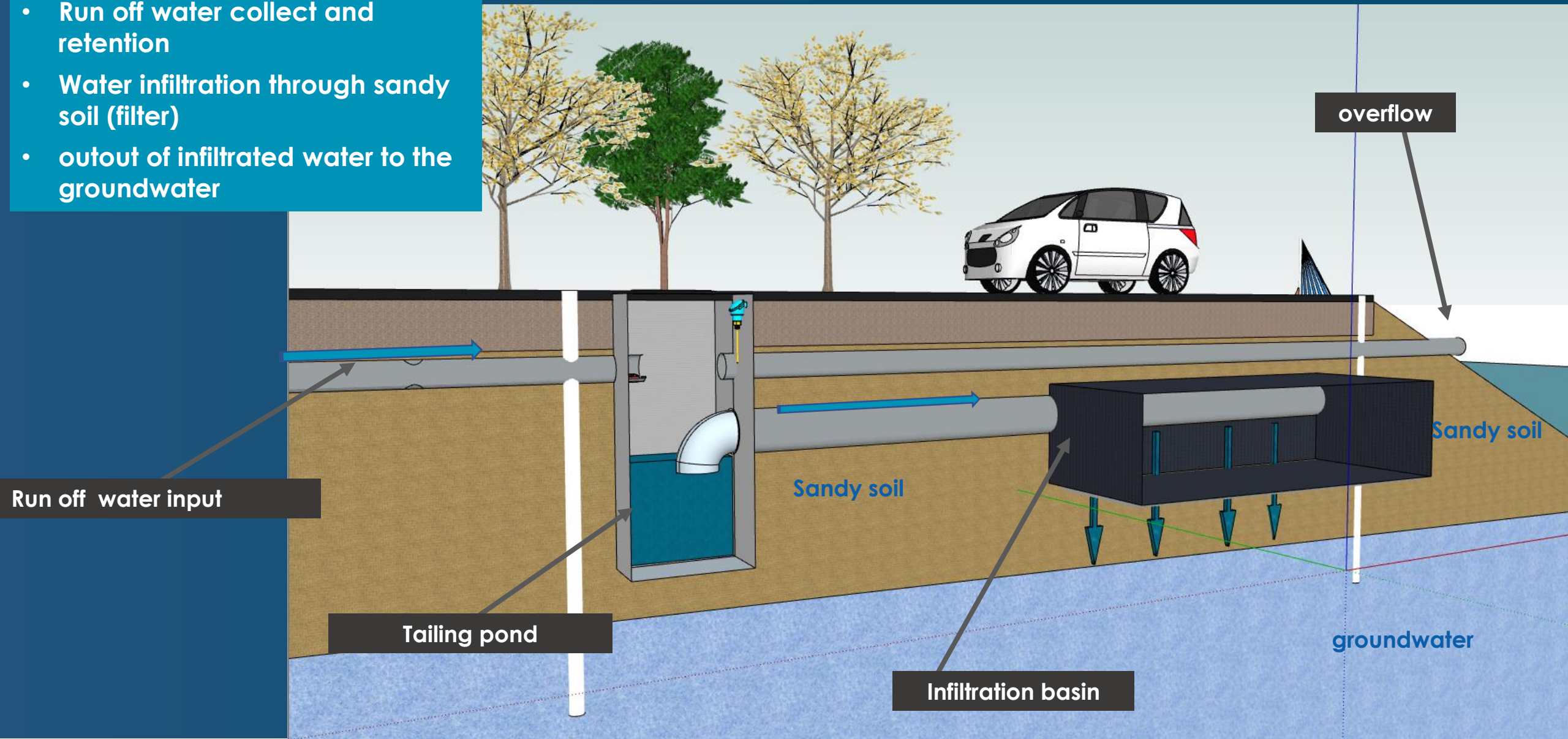
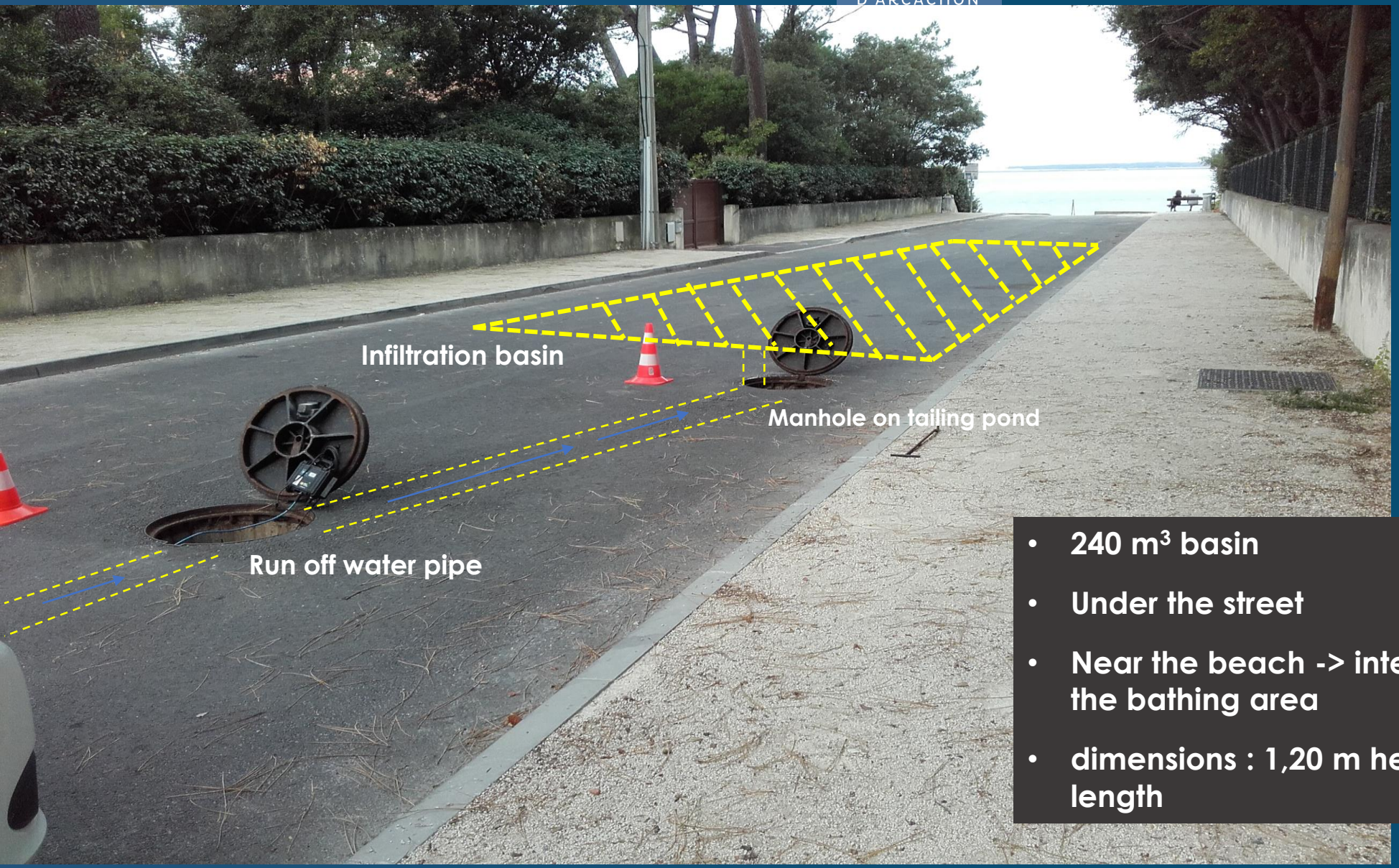
- Run off water collect and retention
- Water infiltration through sandy soil (filter)
- outout of infiltrated water to the groundwater





- 240 m^3 basin
- Under the street
- Near the beach -> intercept run off water before the bathing area
- dimensions : 1,20 m height, 4,80 m width, 38,50 m length

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Open Discussion : Experience of other territories

Example of actions to reduce footprint in fresh and marine waters

Specifically : do you have any feedback on wetland restoration ?

PART I: FRESH AND MARINE WATERS

9.30
10.15
How to develop a sampling strategy adapted to **diffuse pollution**?
Example of the Arcachon Bay

10.15
11.00
How to analyze the results efficiently for coherent and relevant actions?
Data bases - Optimizing data use

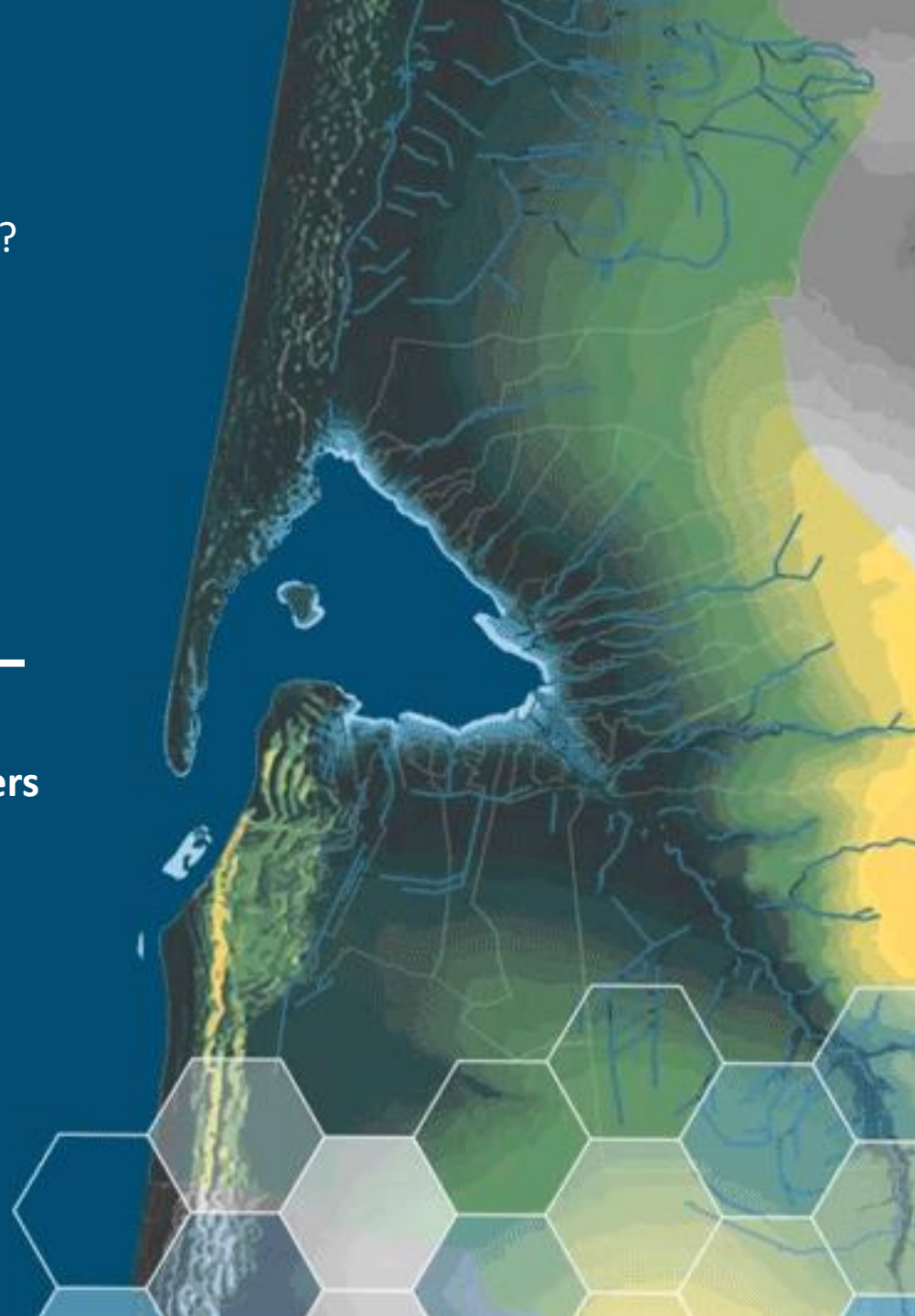
Break

11.15
12.00
Example of actions to reduce footprint in fresh and marine waters

PART II: WASTE WATER TREATMENT

12.00
12.45
From microbiology to micropollutants
Systems and treatments currently in use on our territory

12.45
13.00
Questions, Conclusions and Open call for further cooperation



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From microbiology to micropollutants

Systems and treatments currently in use on our territory

WASTEWATER TREATMENT SYSTEM OF THE ARCACHON BAY

- SYNDICATE WASTEWATER TREATMENT PLANTS
- PRIVATE WASTEWATER TREATMENT PLANTS
- MAJOR PUMPING STATIONS FOR THE TREATED WATERS OF THE MAIN COLLECTOR
- MAJOR PUMPING STATIONS FOR THE RAW WATERS OF THE MAIN COLLECTING PIPE
- STORAGE BASIN FOR RAW WATERS
- STORAGE BASIN FOR TREATED WATERS
- COLLECTING PIPE FOR RAW WATERS
- COLLECTING PIPE FOR TREATED WATERS
- SECONDARY WASTEWATER NETWORK
- PIPE REPLACEMENT

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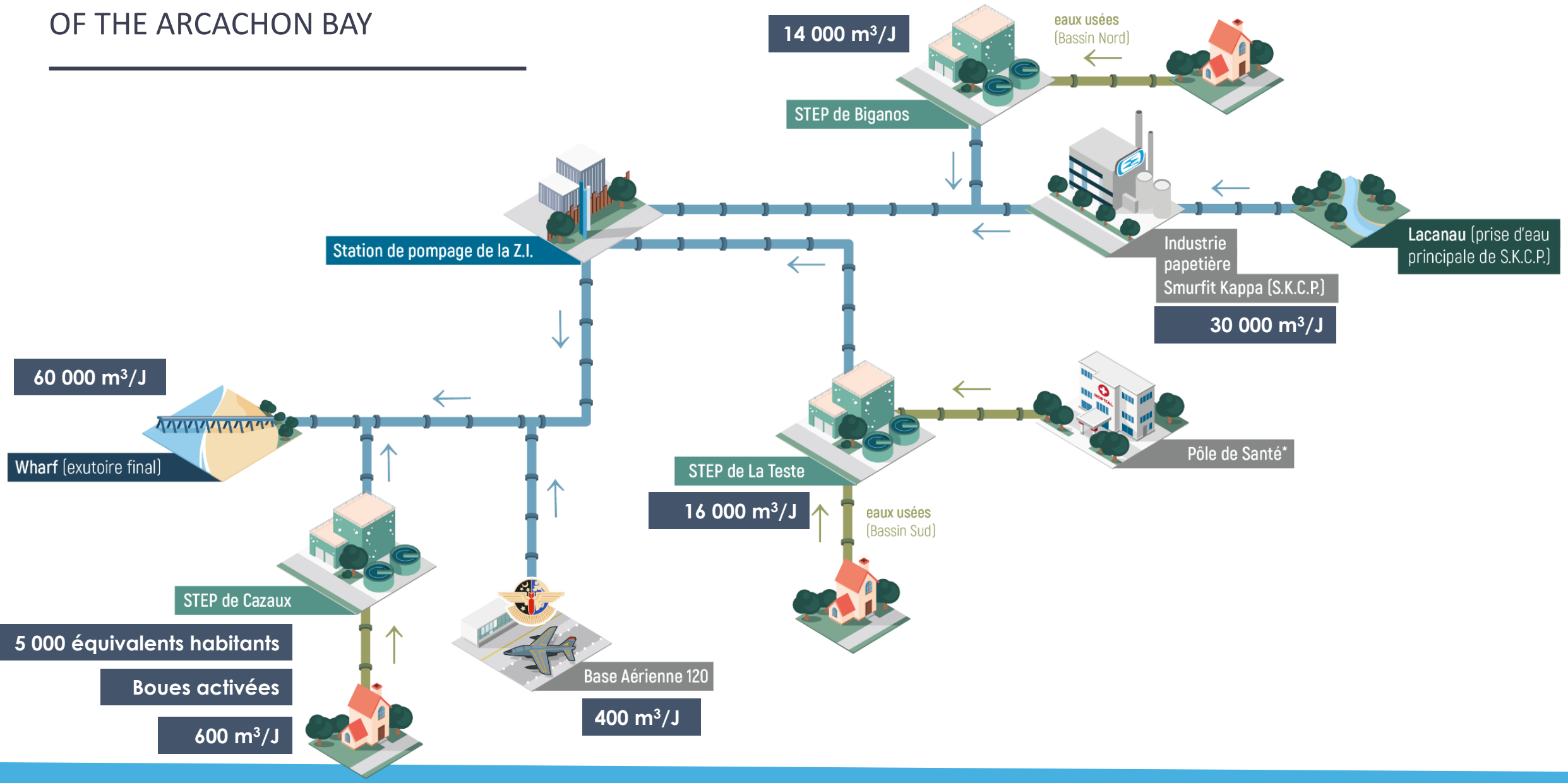
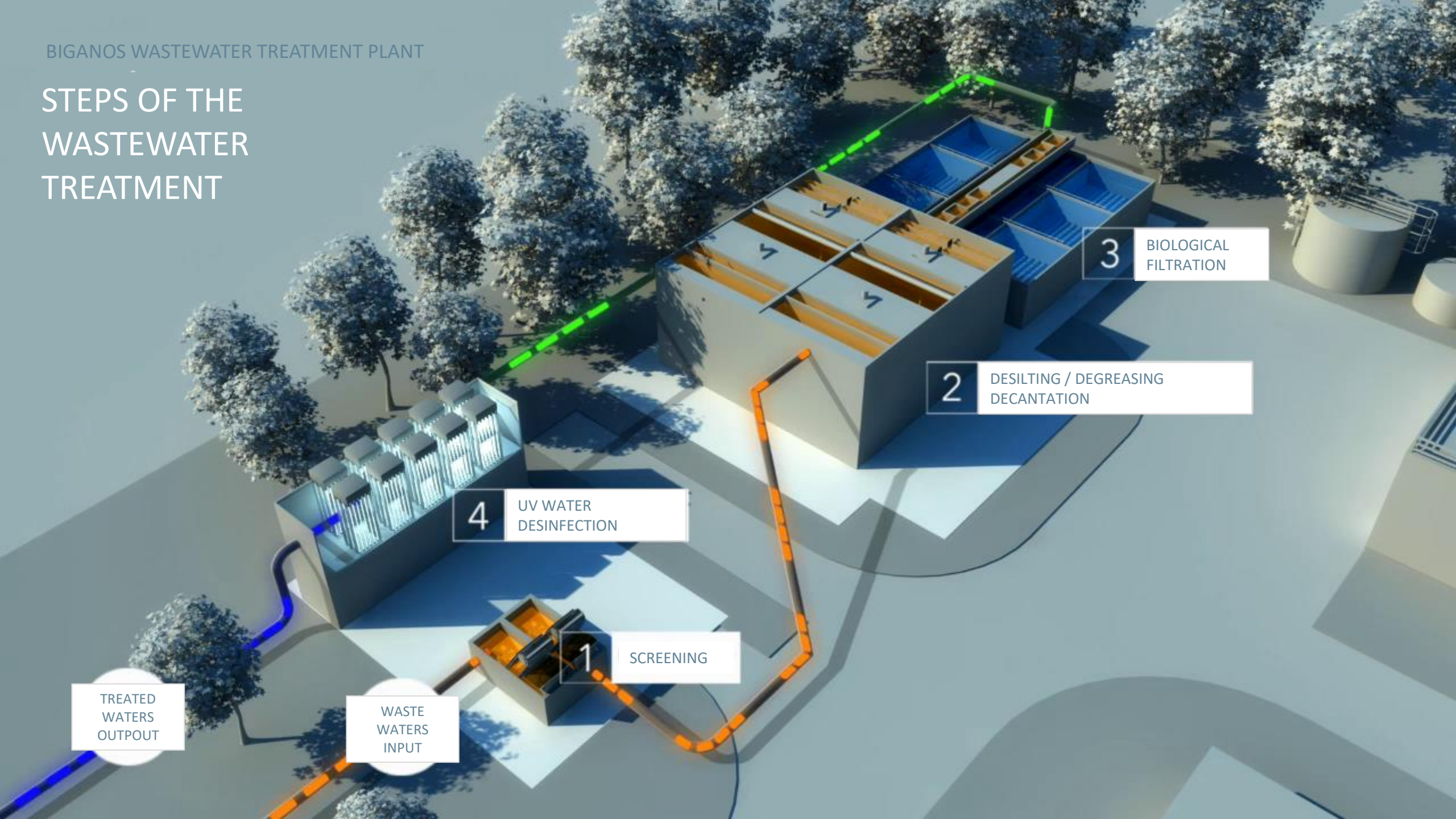
PUMPING STATIONS OF THE SECONDARY NETWORK ARE NOT REPRESENTED

WASTEWATER TREATMENT SYSTEM OF THE ARCACHON BAY



BIGANOS WASTEWATER TREATMENT PLANT

STEPS OF THE WASTEWATER TREATMENT



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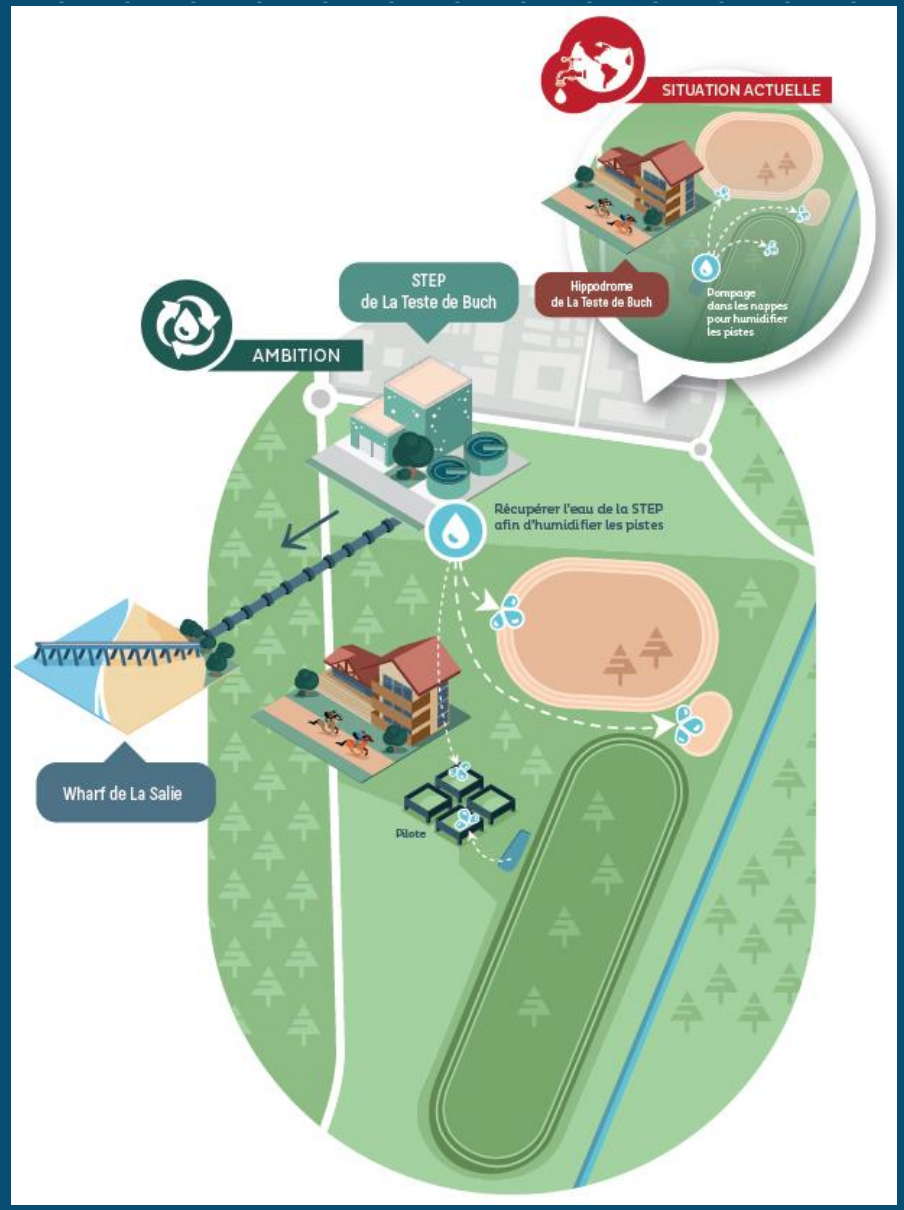
From microbiology to micropollutants

Research perspectives

- **Bacteria and viruses reduction by UV treatments**
- **Improving micropollutants and microplastics treatments**
- **Waste waters reuse**



Waste water treatment
From microbiology to micropollutants

Open Discussion : Experience of other territories

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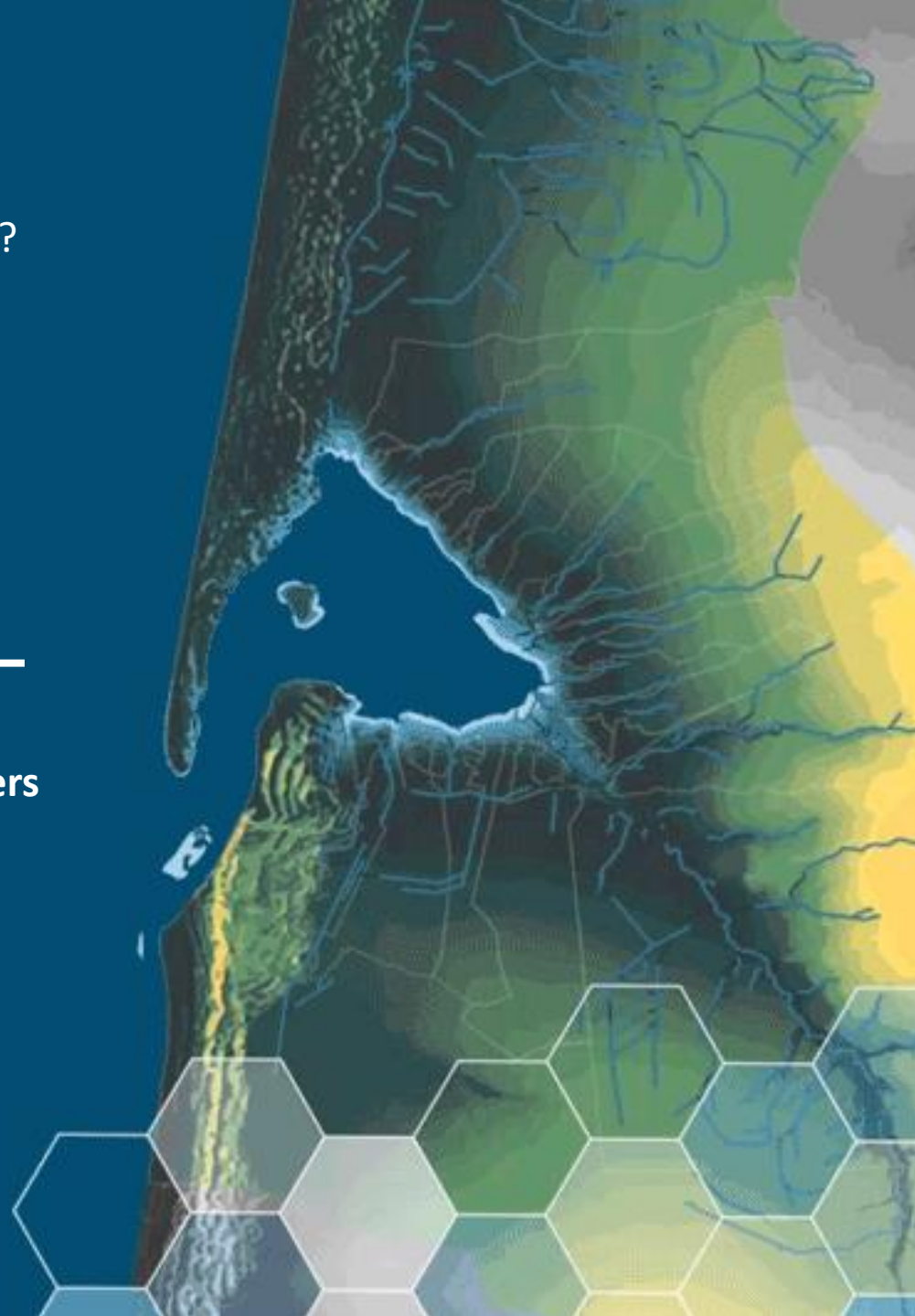
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