



VILLAHERMOSA - MEXICO

Stormwater in urban area and constructions
29.08.2023

Water Cycle Unit
Jérémy GALLION

- 1- Curriculum Vitae
- 2- Territory
- 3- Organization around water and urban planning
- 4- Climate
- 5- Conclusion
- 6- Practical examples
 - Villeroy area
 - Control of pollution
 - Youth and citizen participation

1 – Curriculum Vitae

Engineering Degree - 2014



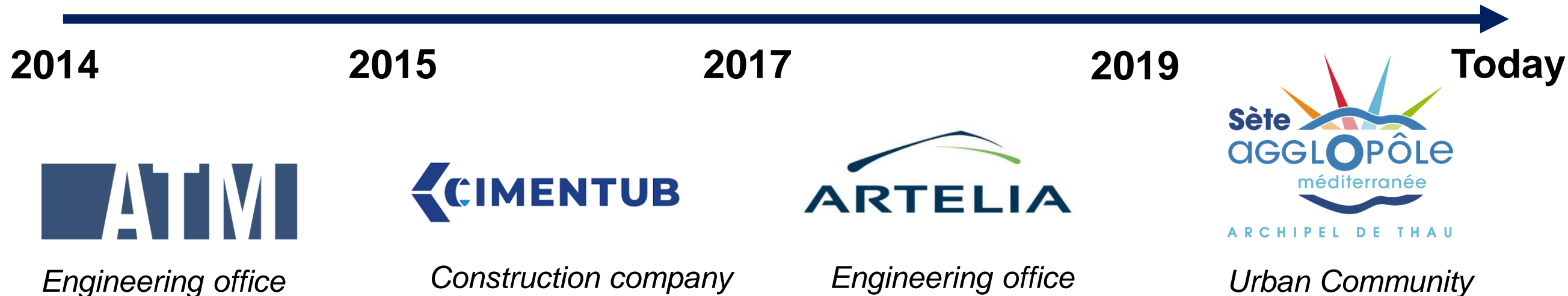
Jérémy GALLION

33 years old

Urban hydraulic engineer

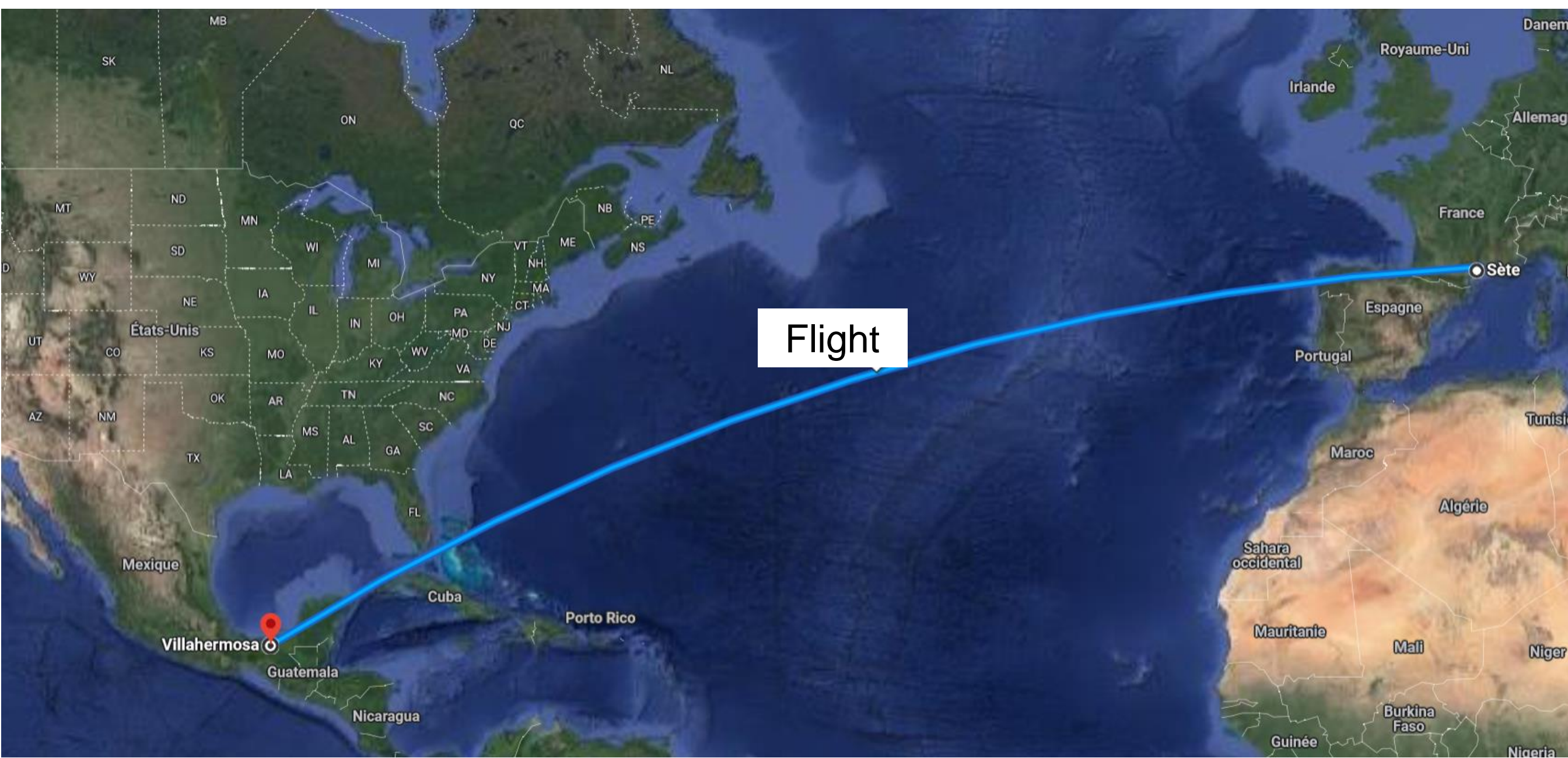
Urban planning and development for Water Cycle manager – Sete Agglopoles

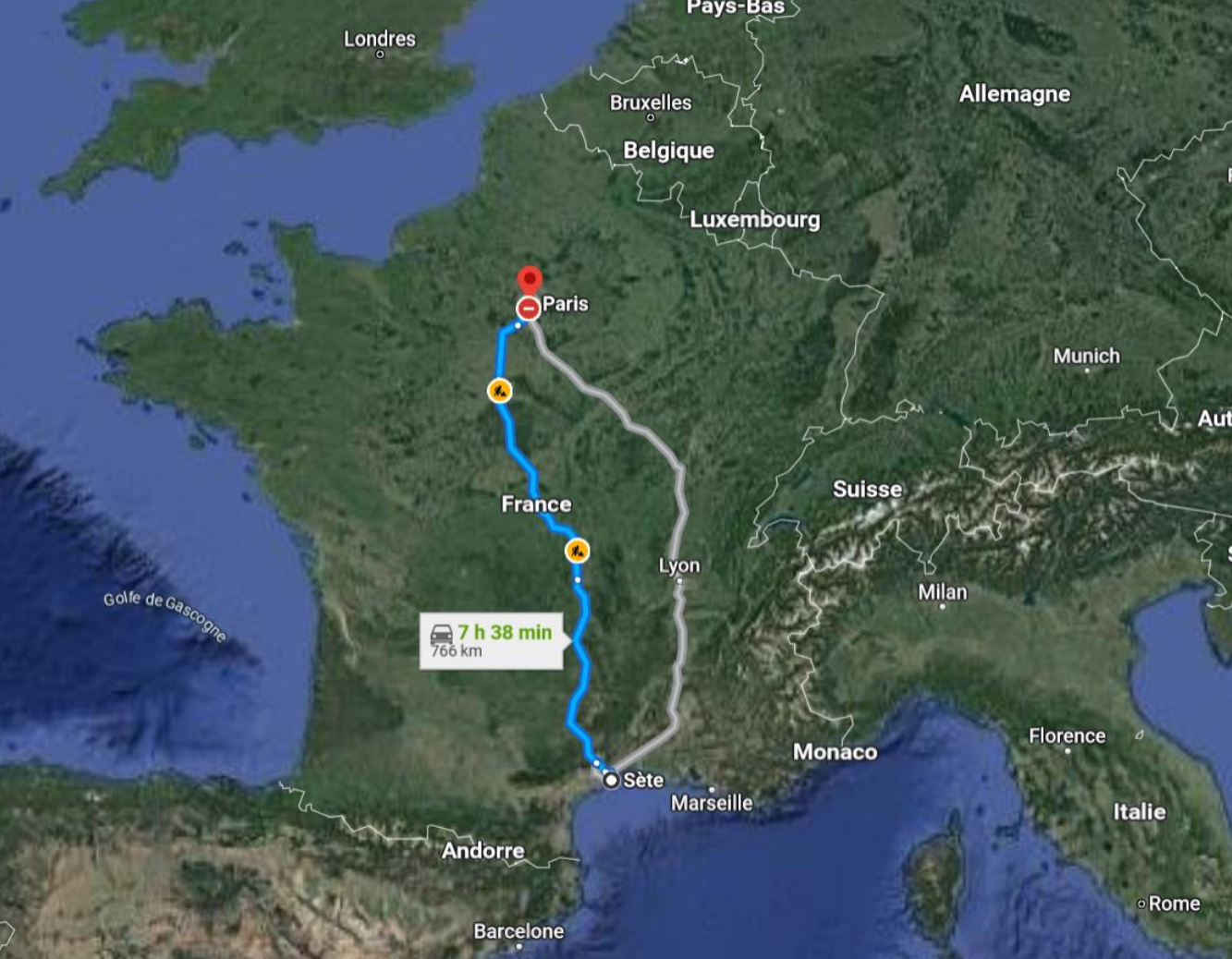
Jobs



2 – The territory

Sète - Villahermosa



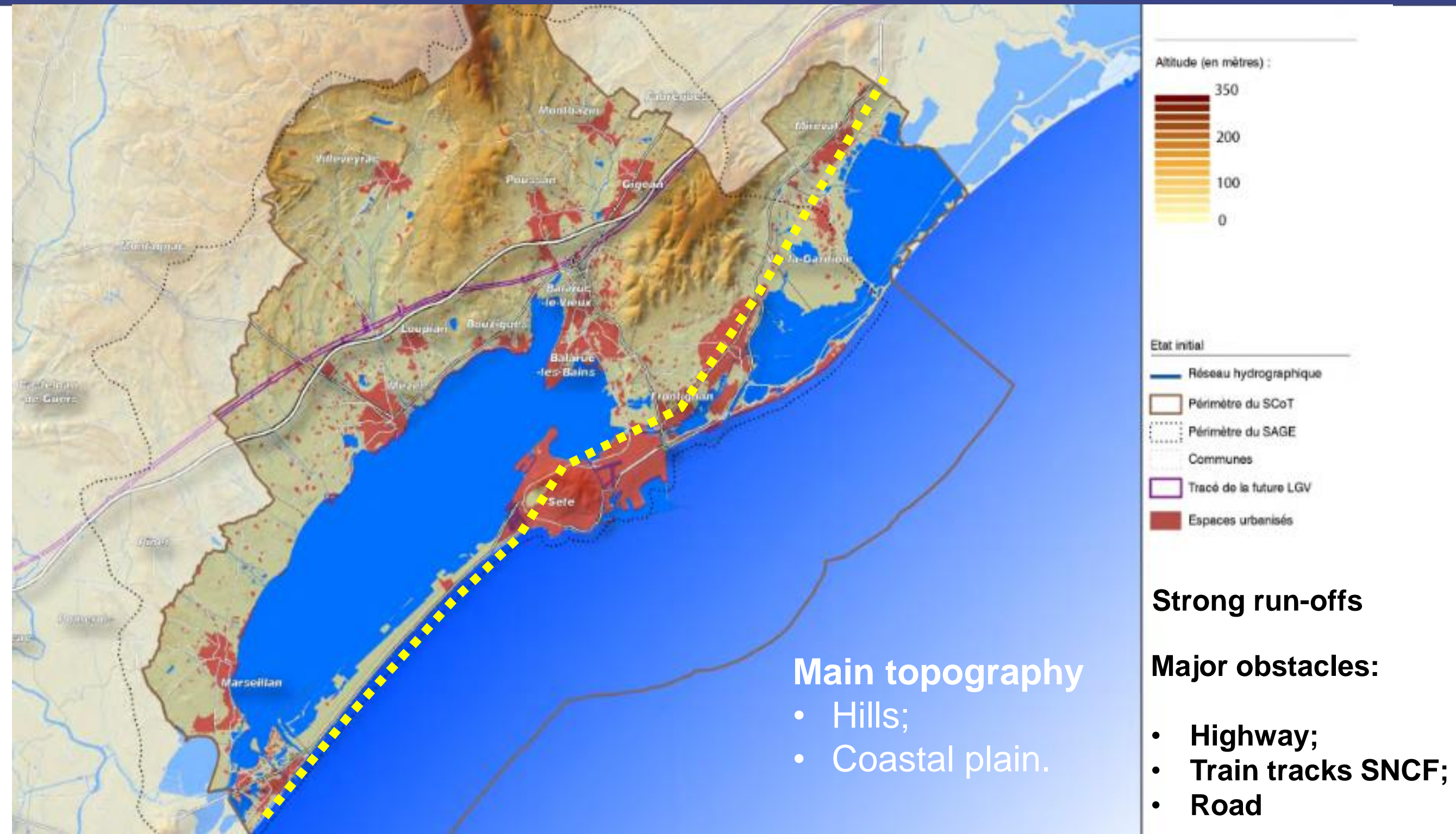


Sète Agglopôle Méditerranée:

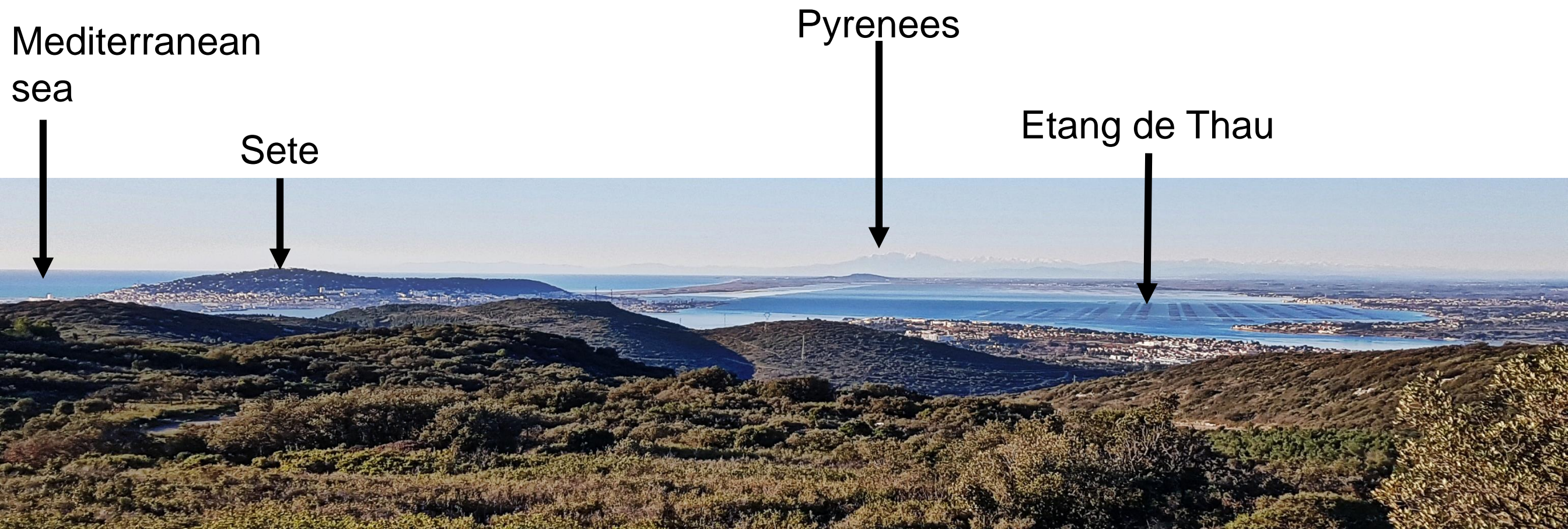
- 14 municipalities;
- 10 municipalities by the sea;
- 128 000 inhabitants
- 1,5 millions tourists per year
- 310 Km² surface area;
- 650 workers.



Topography

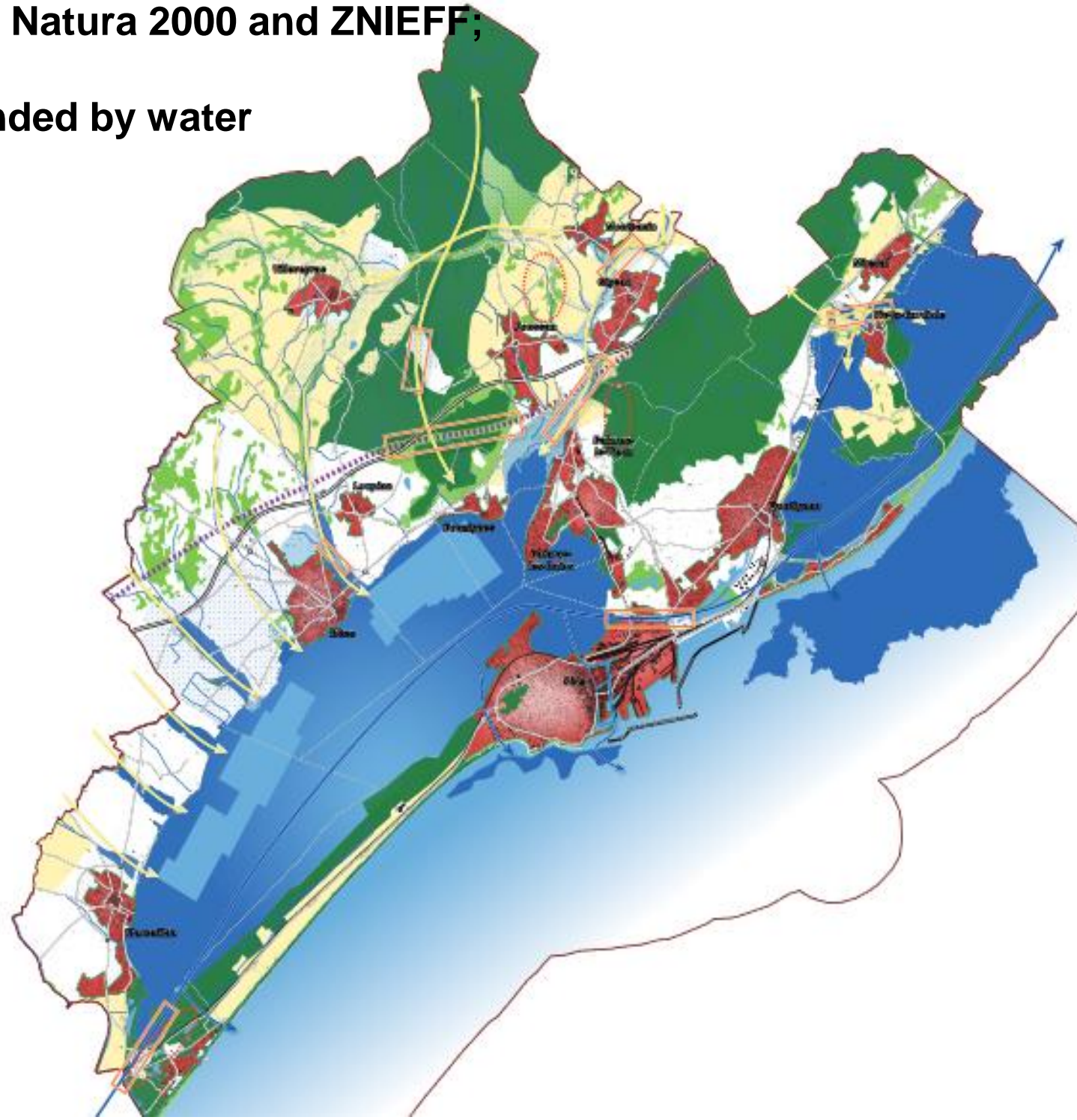


View from the Gardiole hills



A fragile area

- Many classified Natura 2000 and ZNIEFF;
- A place surrounded by water



OYSTER CULTURE

- 13 000 tonnes oysters/year
- Turnover of **35 millions euros**;
- About **2 000 direct jobs**

3 – Organization around water and urban planning

Jurisdictions of SAM

Spatial Planning

**Economic
development**

Flood risks

Natural areas



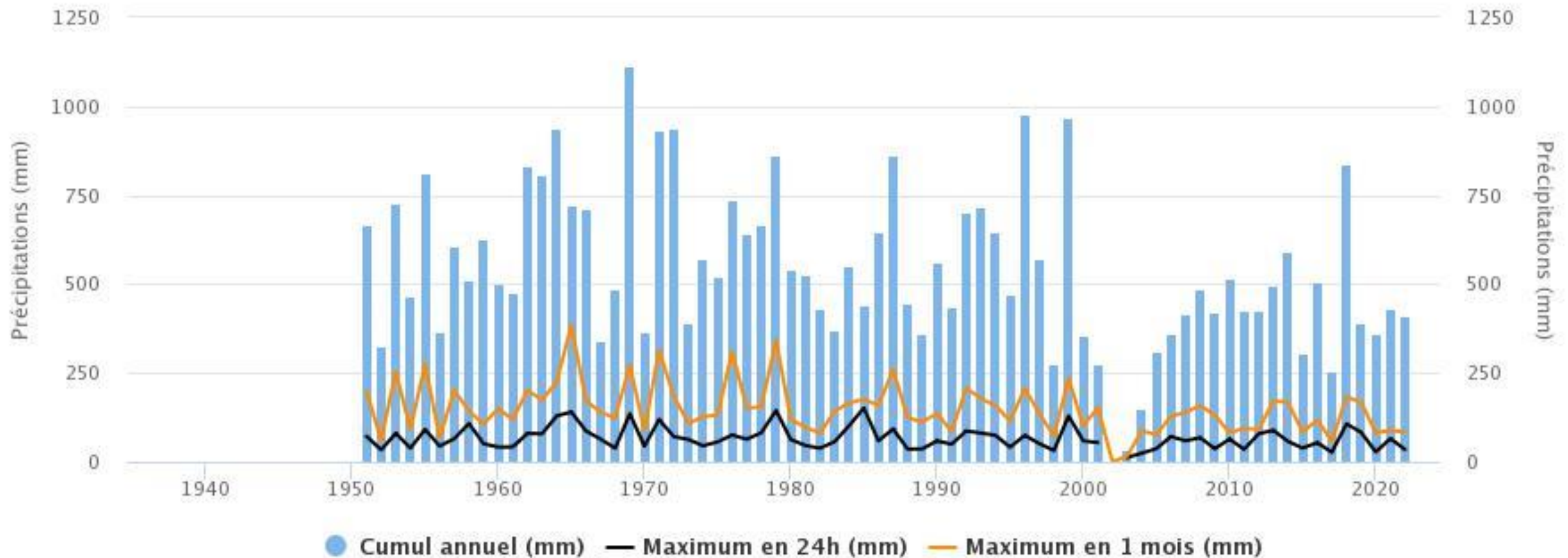
Water Cycle

4 - Climate

Weather Conditions Mediterranean Climate

Précipitations à Sète

Moyenne RR : 549.21 mm/an

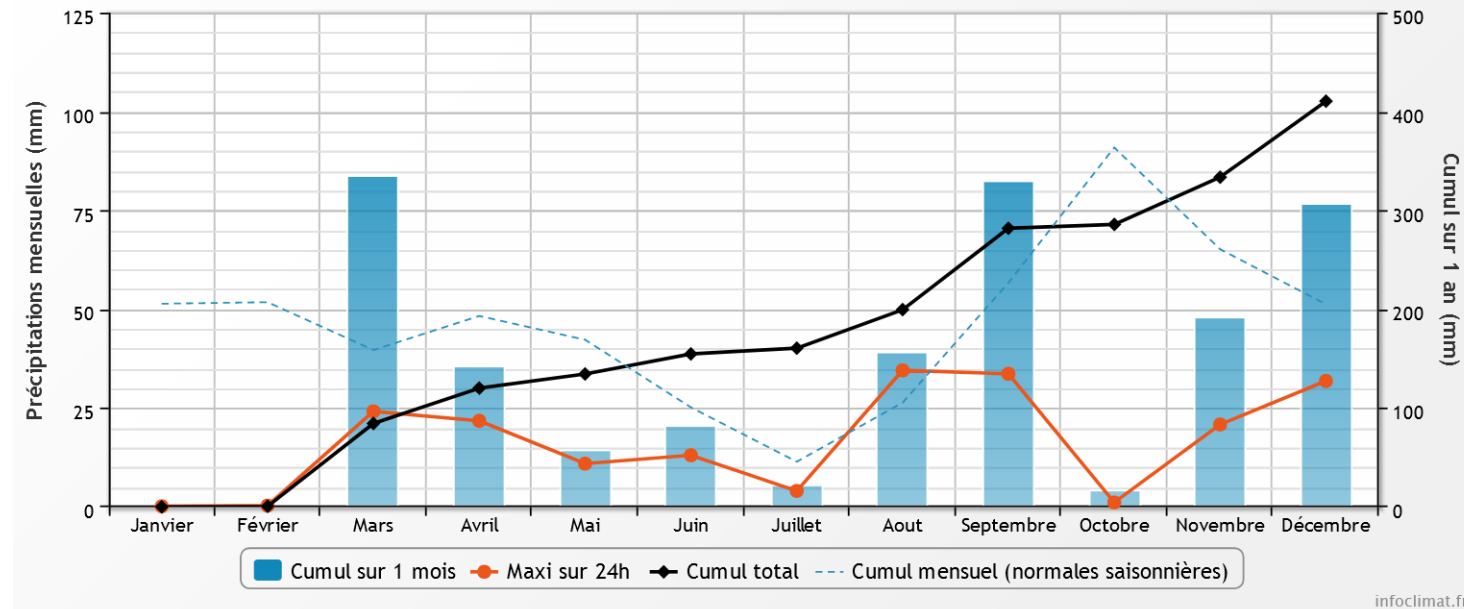


Average precipitation for one year since 1950: 550 mm (between 1950 et 2023)

Weather Conditions Mediterranean Climate

Précipitations en 2022 à Sète

Ecart aux normales 1981-2010 sur l'année : -27% (-150.3mm)



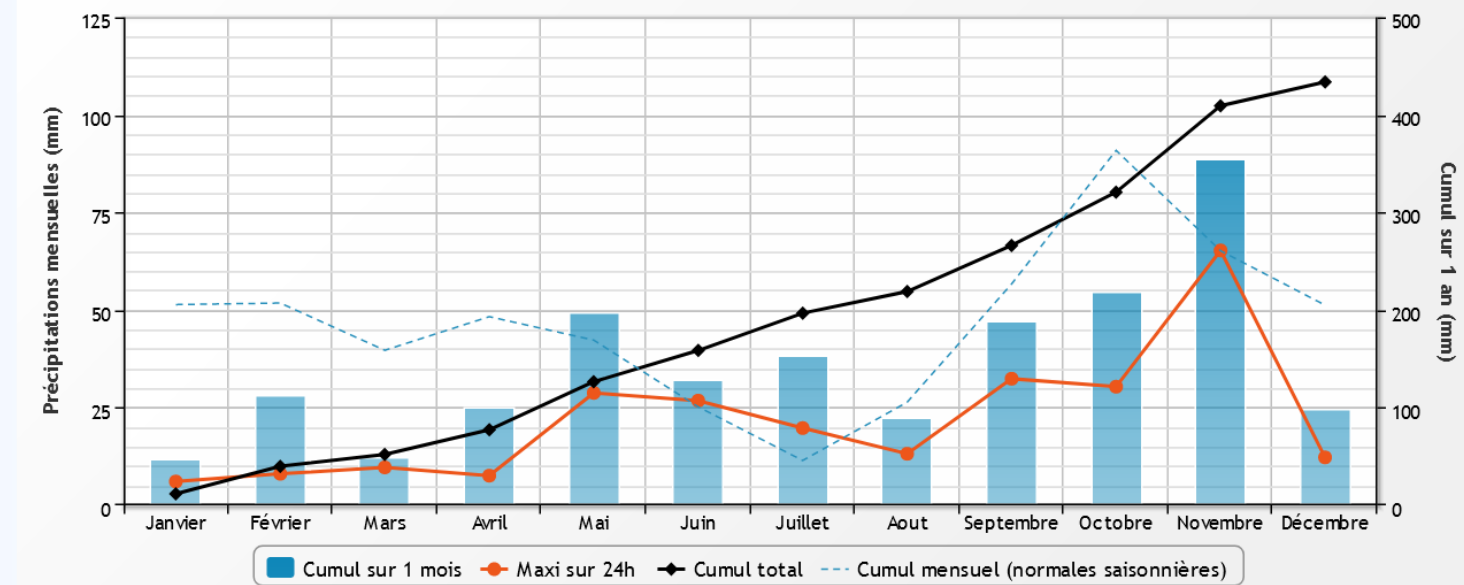
Short and intense rainfalls

2022

415 mm of rain accumulation
=> 127 mm in 4 days (31%)

Précipitations en 2021 à Sète

Ecart aux normales 1981-2010 sur l'année : -23% (-126.9mm)

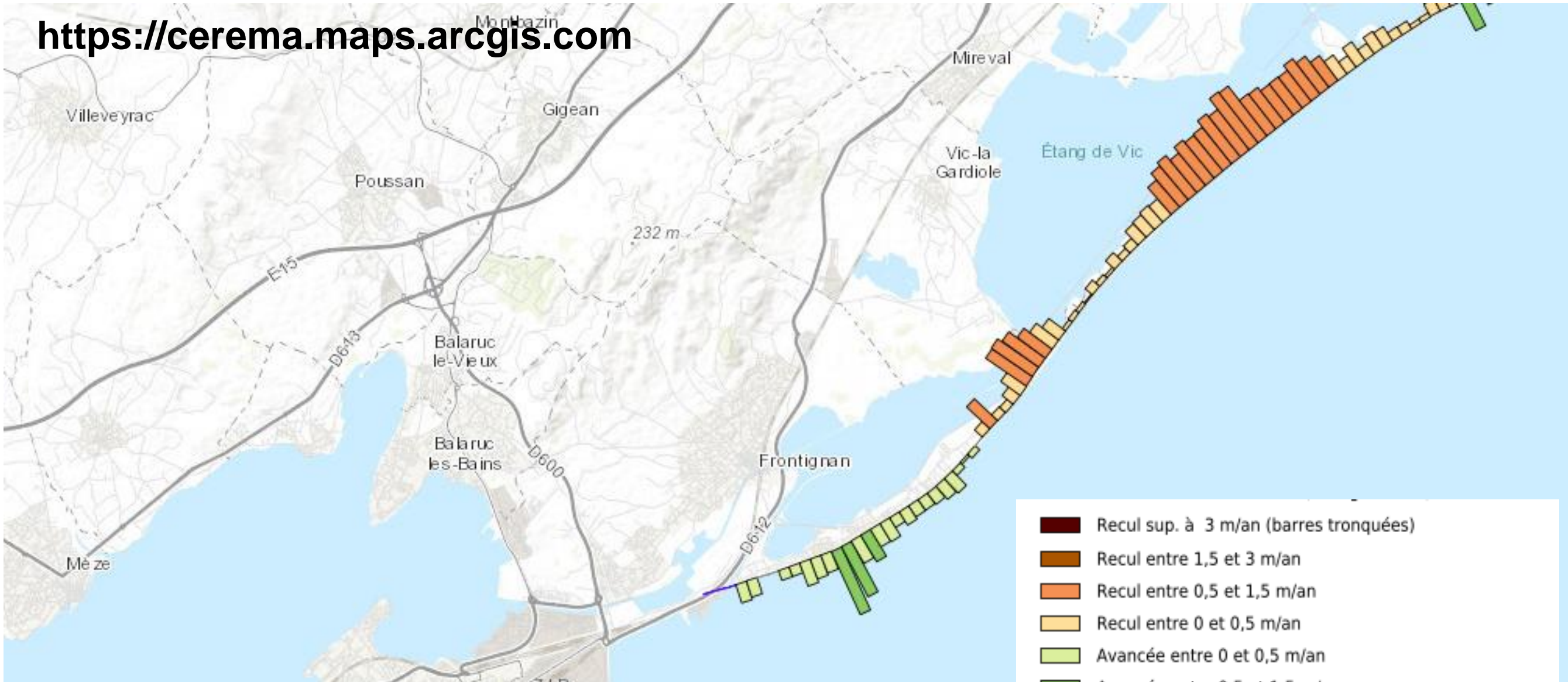


2021

434 mm of rain accumulation
65 mm on 24th of November
(15%)

Coastline & Erosion

<https://cerema.maps.arcgis.com>



Rising water levels=> FLOODED OUTLET

5 – Conclusions and issues

Thau Territory Profile

Temperature rise



Storm and heavy swell



Crossed used



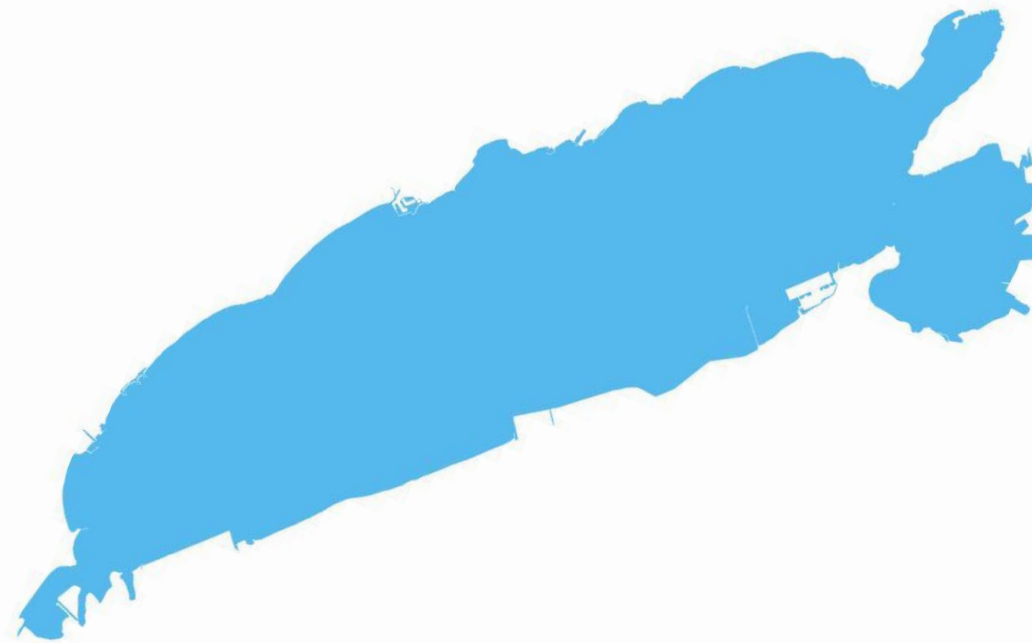
Erosion



Real estate pressure



Flooding





Ciel en colère © Canva

Too much water or not enough?



© SMBT



© Montpellier 3 M

Solutions for the future

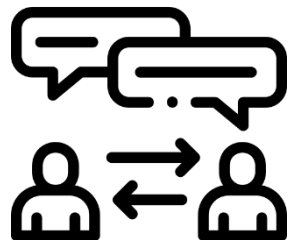
Regain a natural
water cycle



Resilient
contruction



Communication and
citizen consultation

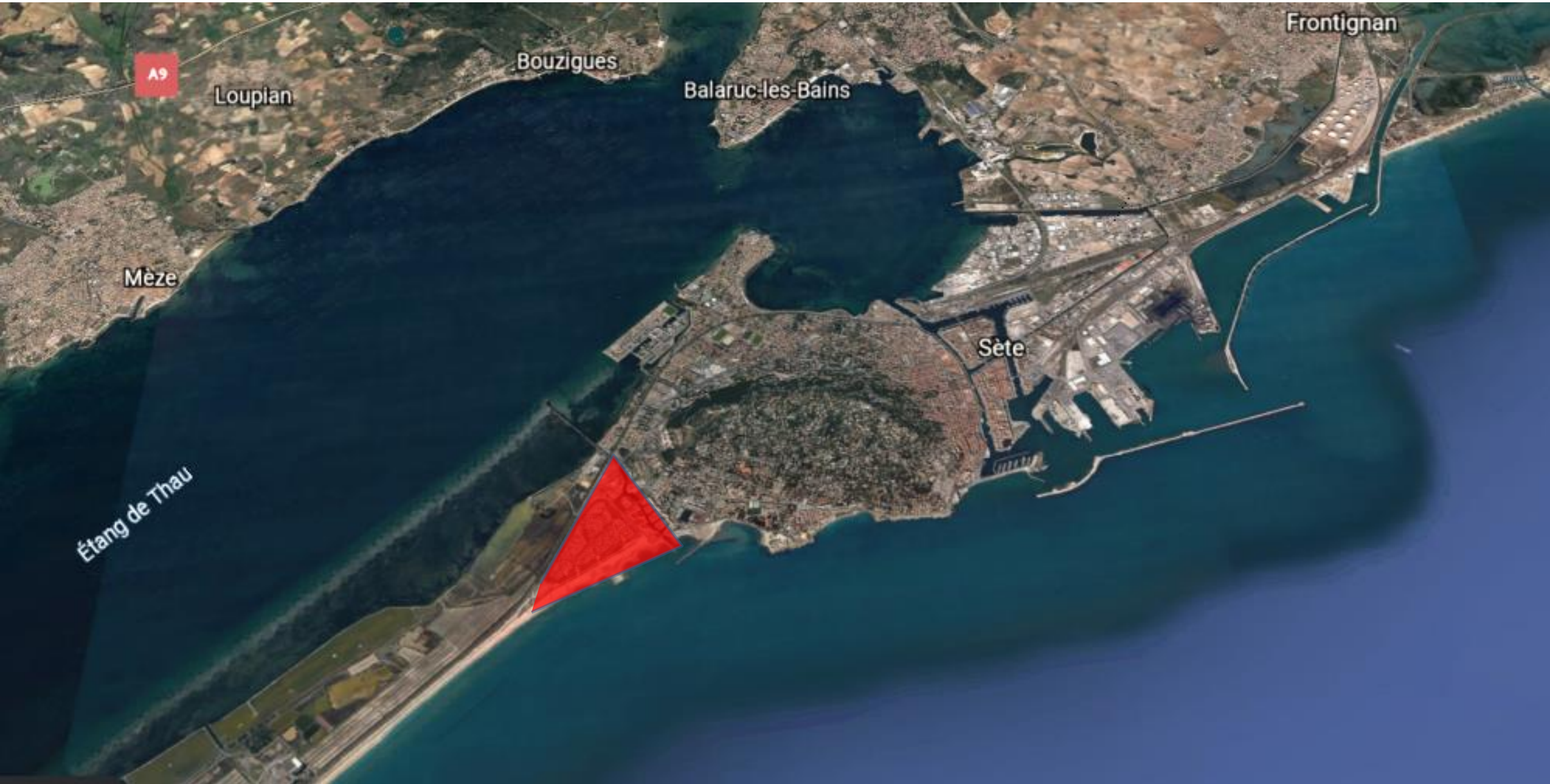


Training and
education



6 – Practical examples

Villeroy area – SETE



Villeroy area – SETE Before the project



Erosion control



Erosion control between SETE and MARSEILLAN



Road before the project

Road after the project

SAND RELOAD



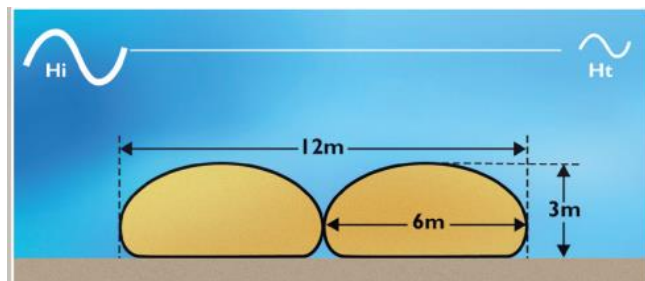
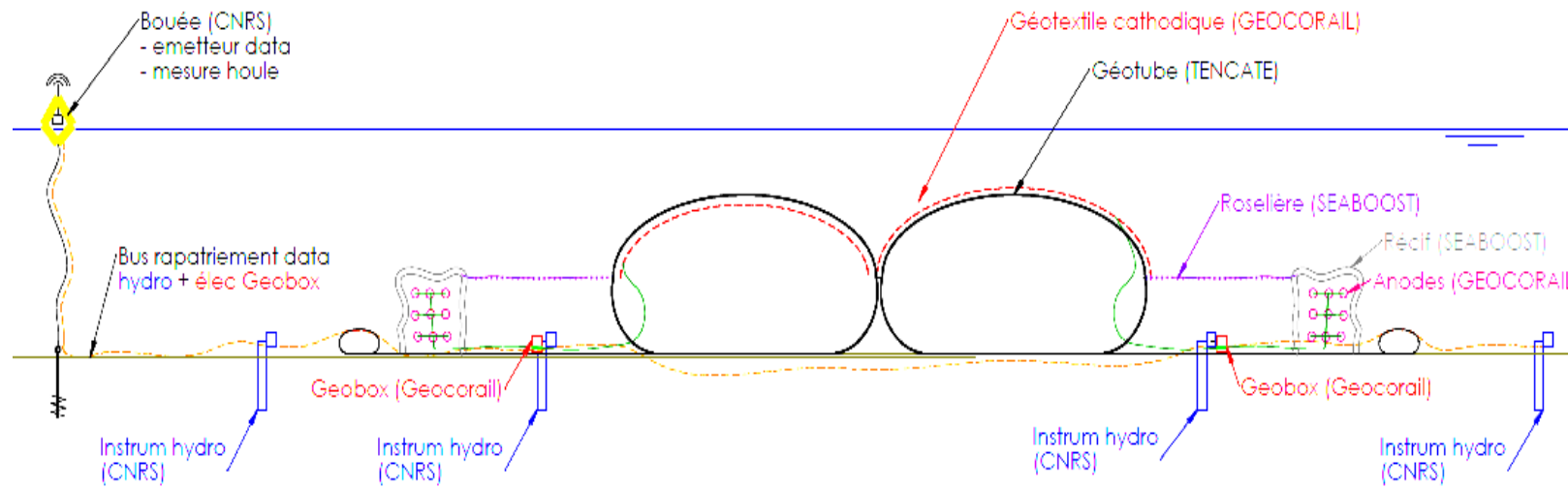
An R&D program to make geotubes more resilient

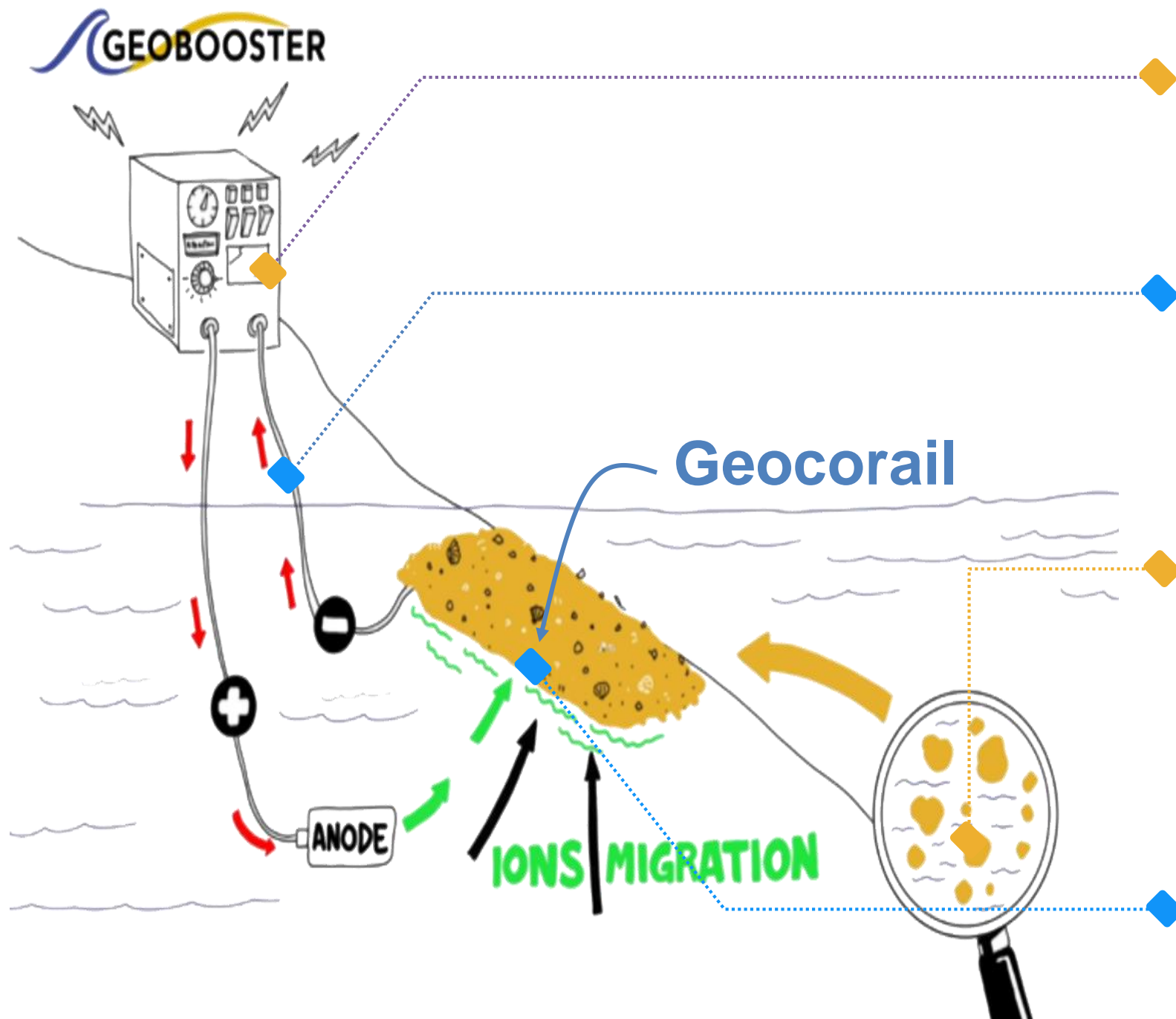
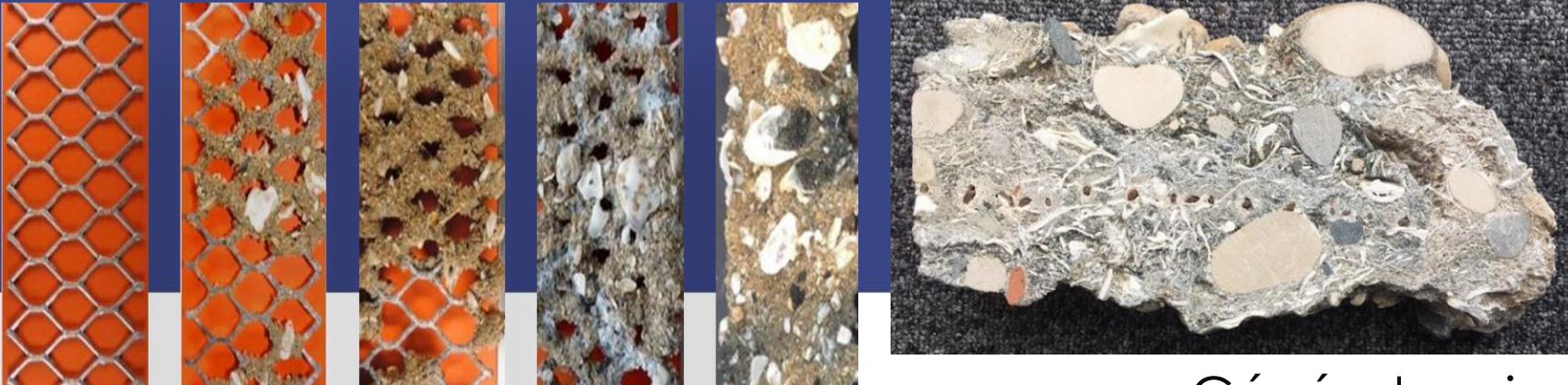


UNIVERSITÉ
DE MONTPELLIER



WAVE ATTENUATOR





Générateur immergé assurant la création du Geocorail

Circulation d'un courant électrique de très basse tension entre anode et support cathodique

Sable, gravier, sédiments ou débris charriés par les courants au voisinage du support cathodique

Formation d'un conglomérat rocheux autour du support cathodique : roche solide et adhésive

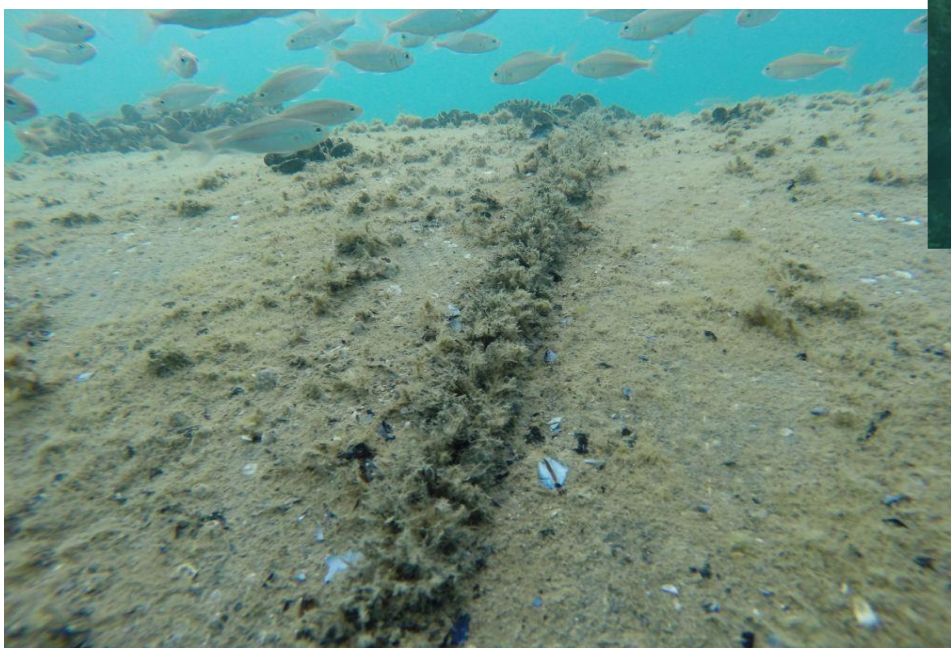
New generation geotube integrating the cathode - weaving a copper wire





PHASE EXPERIMENTALE : 1 000m - 2013

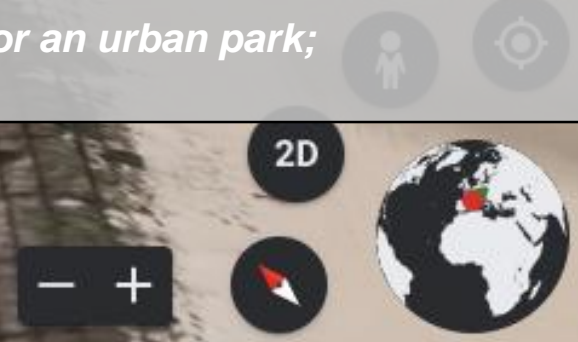
SEALIFE AROUND THE ATTENUATOR SYSTEM



Villeroy area – SETE Global presentation



- 35 hectares
- 200 collective dwellings + 32 individual houses
- 6 Ha for an urban park;



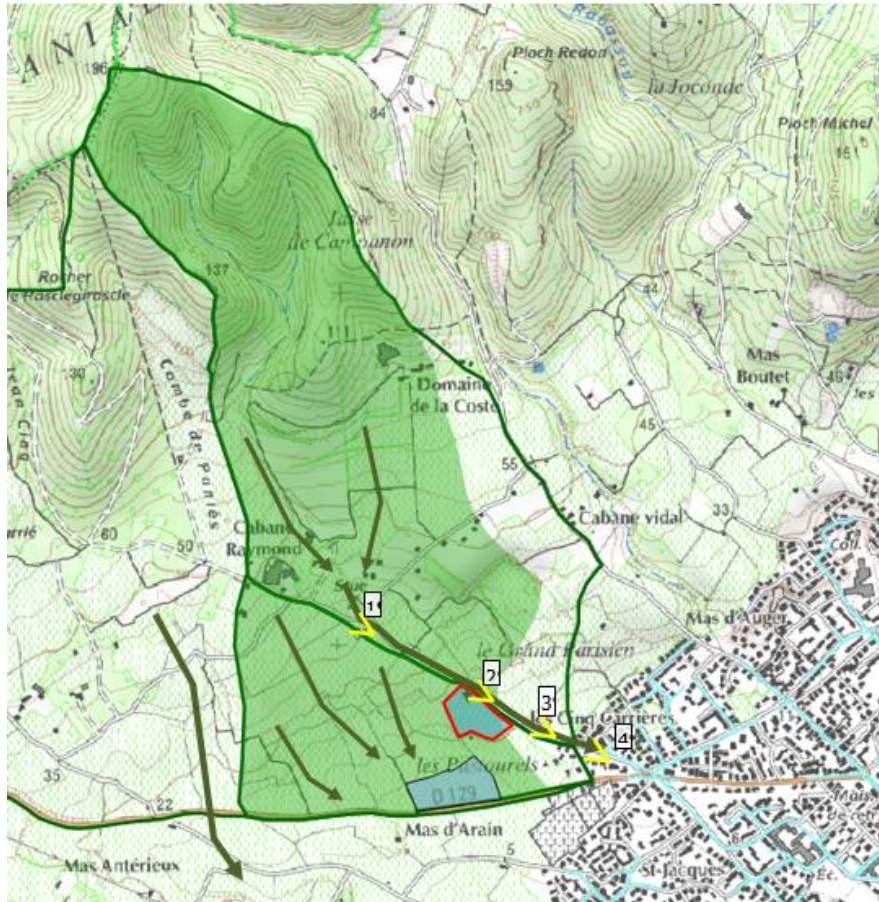
ZAC Villeroy – SETE

20 years after the project

Run-off control

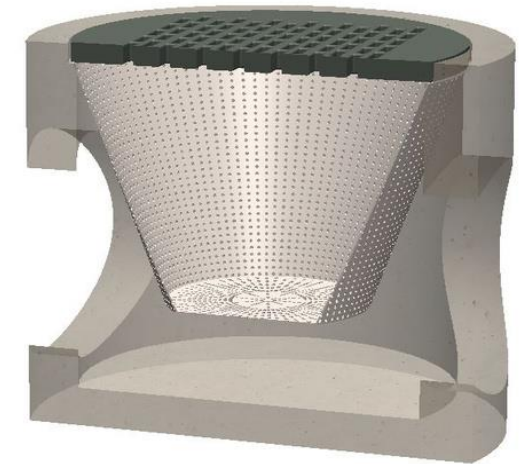
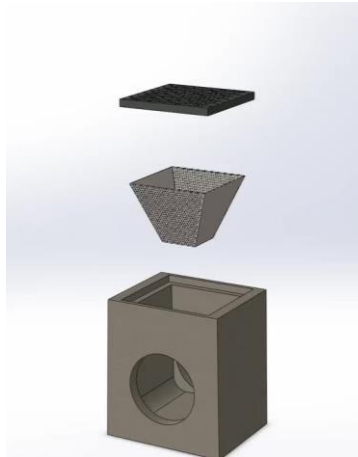
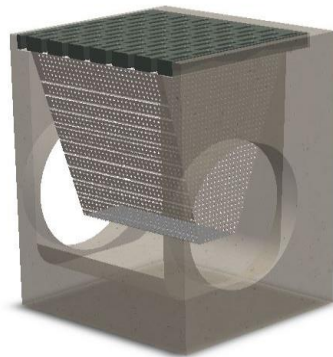


Run-off control around urban area – Frontignan

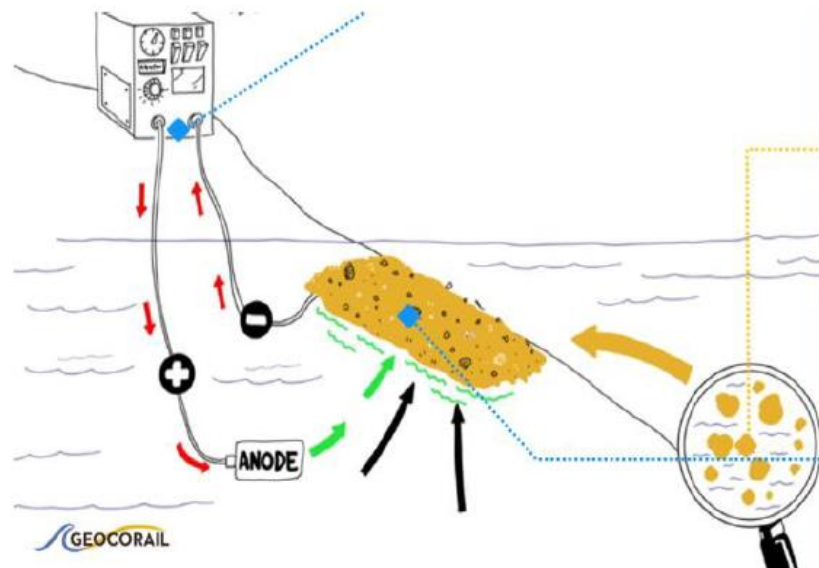


Volume: 25 000 m³

Circular economy and pollution control

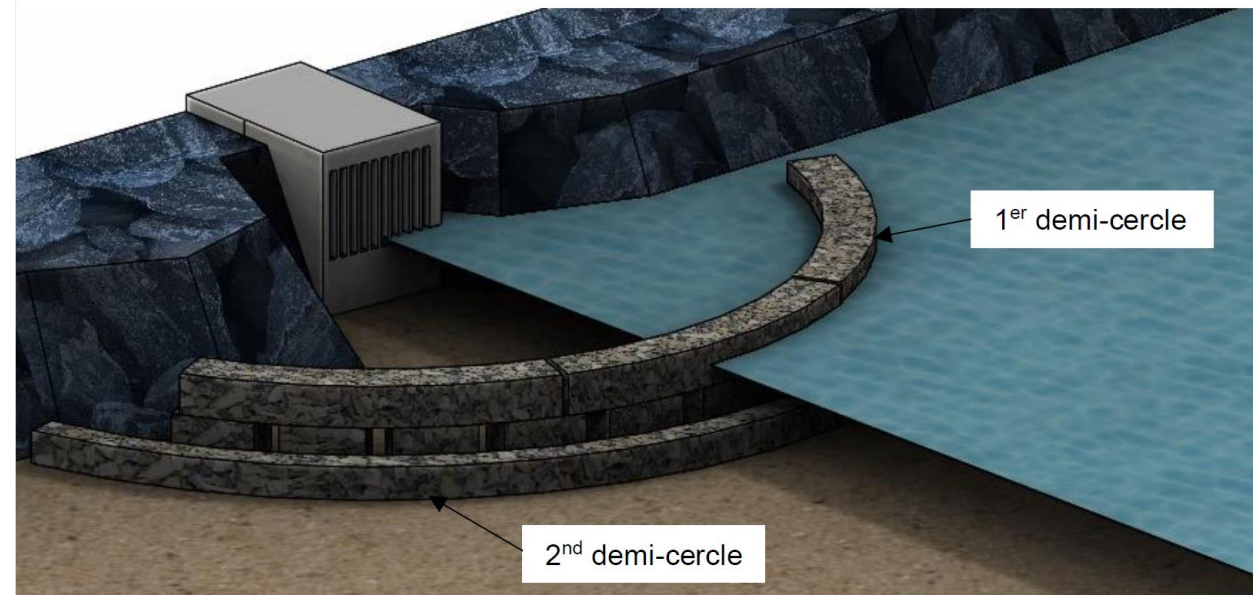


La solution Geocorail



Sable, gravier, sédiments ou débris charriés par les courants au voisinage du support cathodique

Formation d'un conglomérat rocheux autour du support cathodique : béton solide et adhésif



Youth an citizen participation Tomorrow's Garden Balaruc-Le-Vieux



Tomorrow's Garden Balaruc-Le-Vieux



Tomorrow's Garden Balaruc-Le-Vieux

Adaptation to existing system



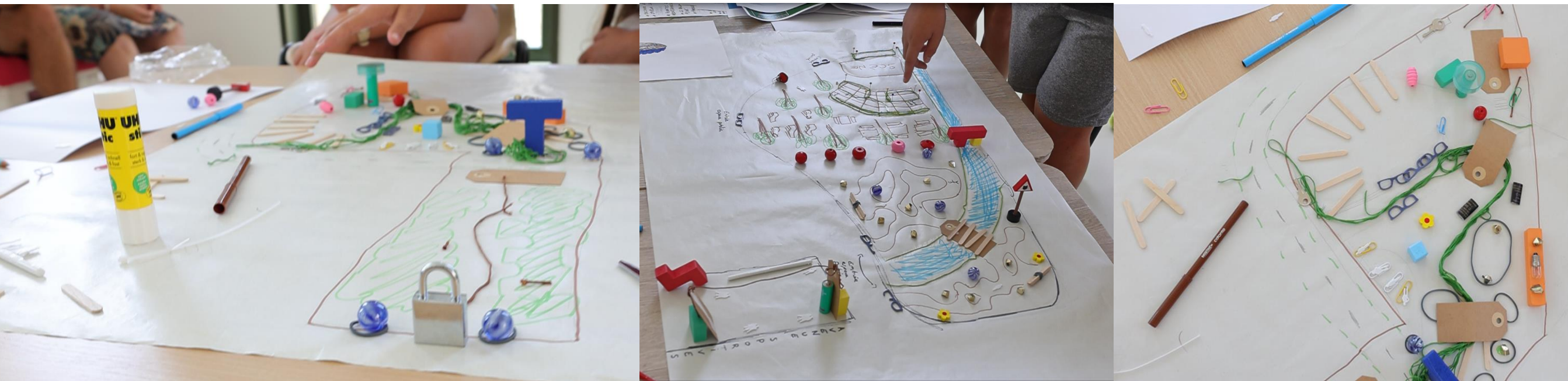
Low
landscape
quality and
many waste

Adaptation with existing system



Tomorrow's Garden Balaruc-Le-Vieux

Doing to think...
And not thinking to do !



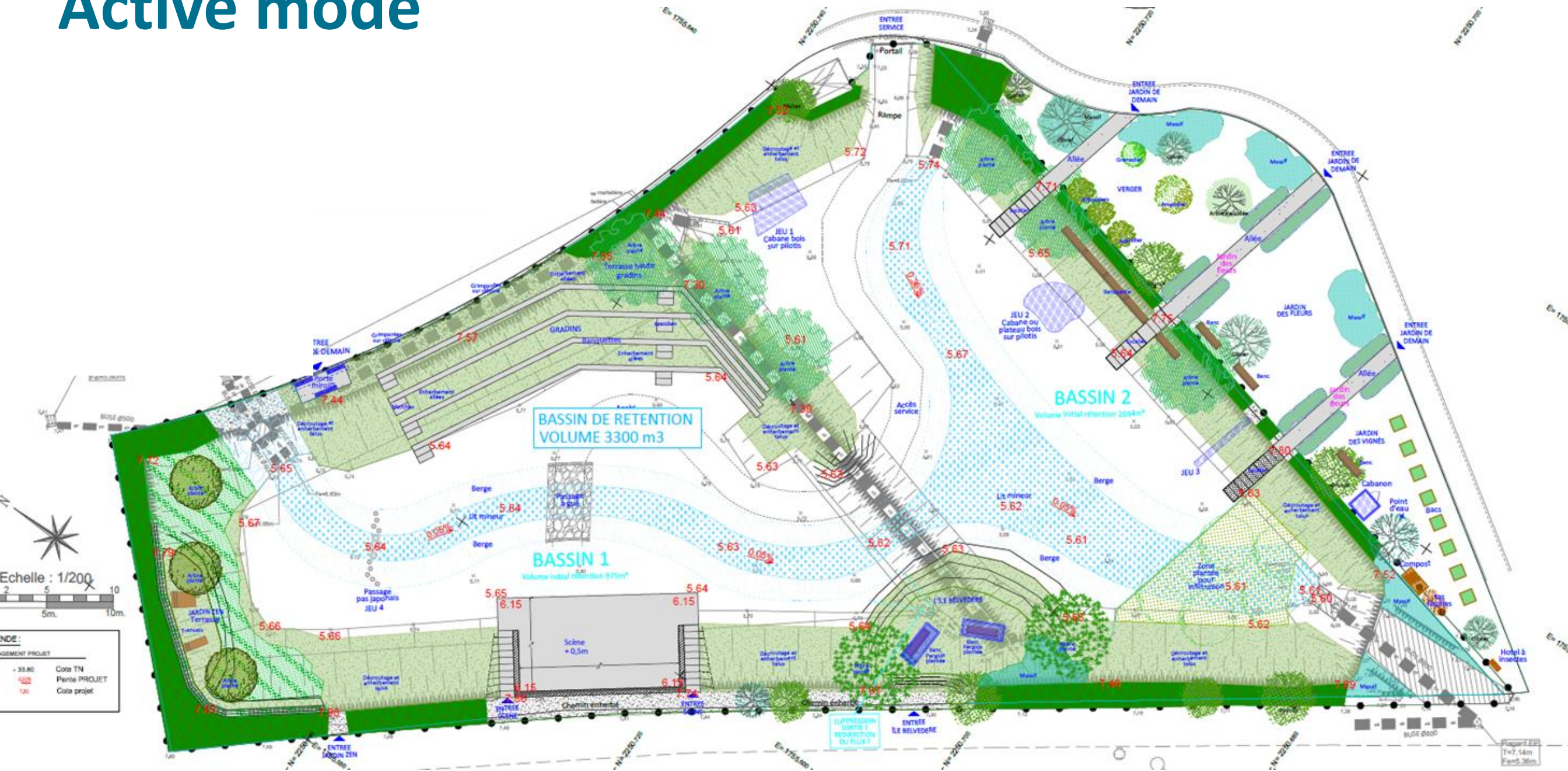
Tomorrow's Garden Balaruc-Le-Vieux

Prototype



Tomorrow's Garden Balaruc-Le-Vieux

Active mode



Conclusion

Right to make mistakes

Youth generation with a new way of think

A team with different profiles an views

Engagement

Time management

Thank you for your attention.

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