

Towards improving the understanding of biofouling within ORE environments

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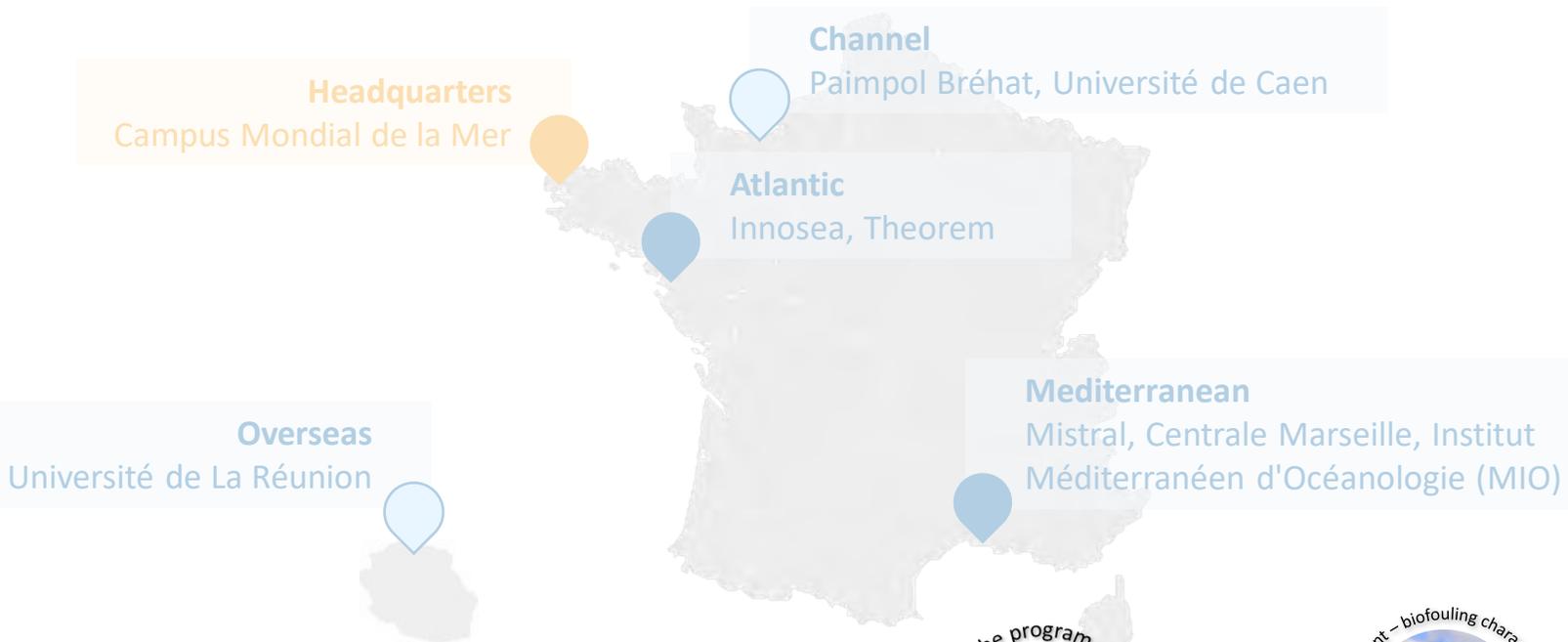
Outline

1. Background
2. What is biofouling and what are the challenges associated with this phenomenon?
3. Synthesis of knowledge regarding biofouling along French coasts
4. Summary & perspectives



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Background

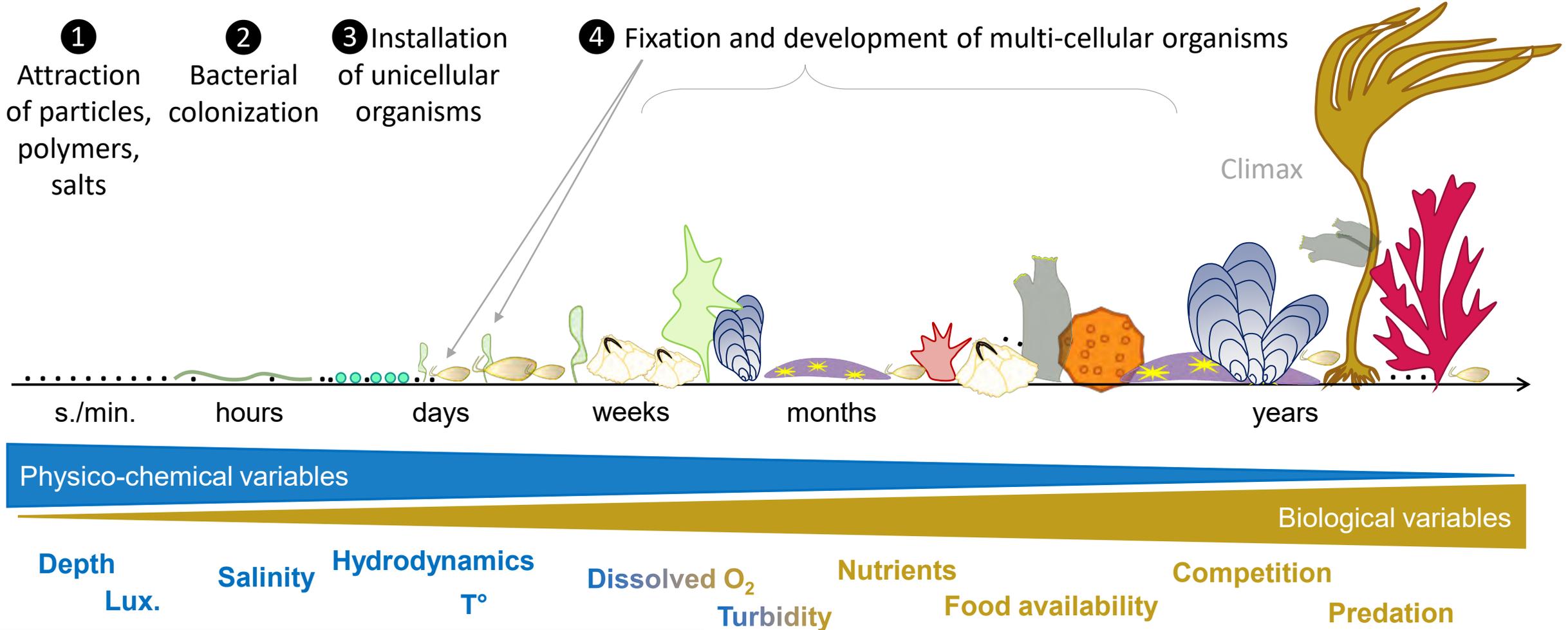


What is biofouling and what are the challenges associated with this phenomenon? *Biofouling on offshore structures*

- Impacts on Ocean Renewable Energy systems?
- Studying biofouling in ORE context is important, and challenging....

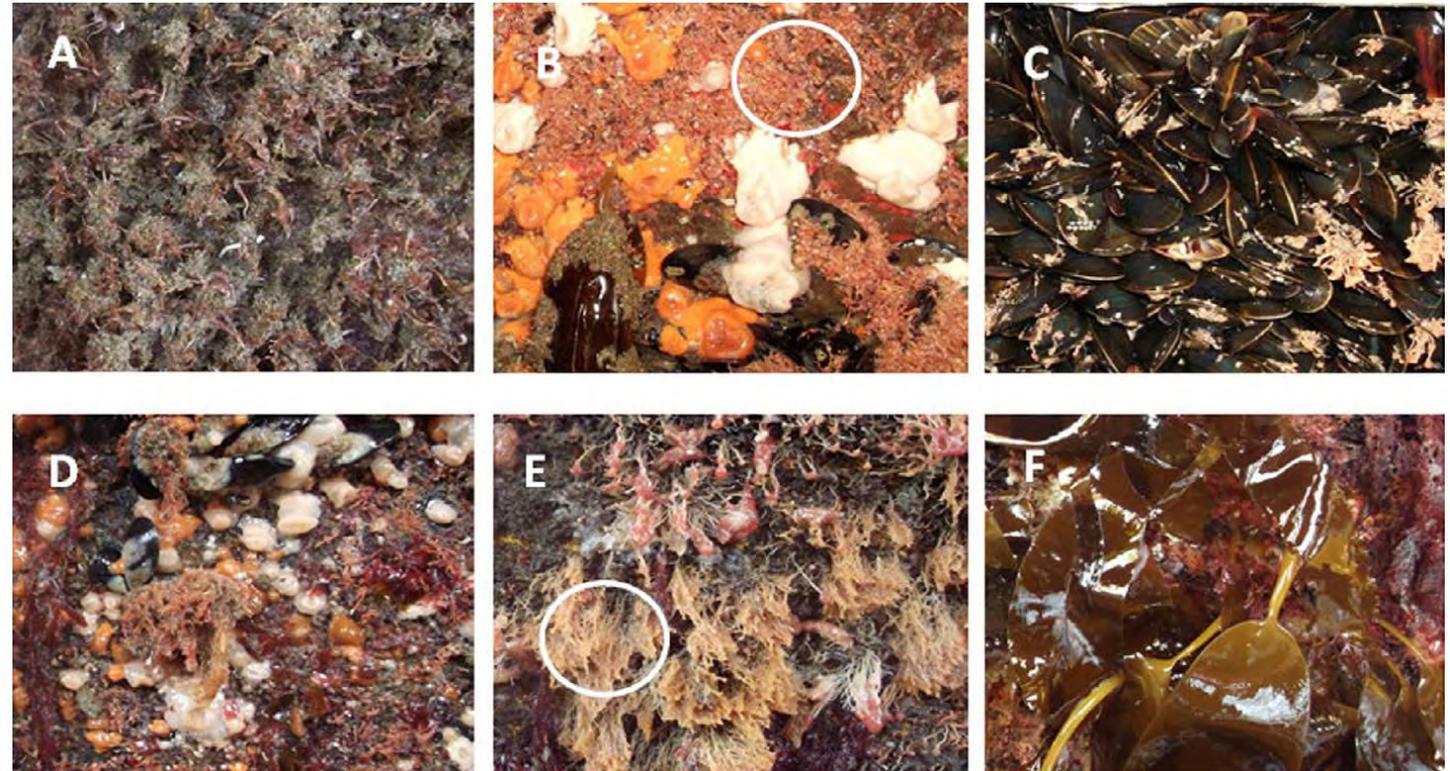


What is biofouling and what are the challenges associated with this phenomenon? *The result of a complex process*



What is biofouling and what are the challenges associated with this phenomenon? *A variable phenomenon*

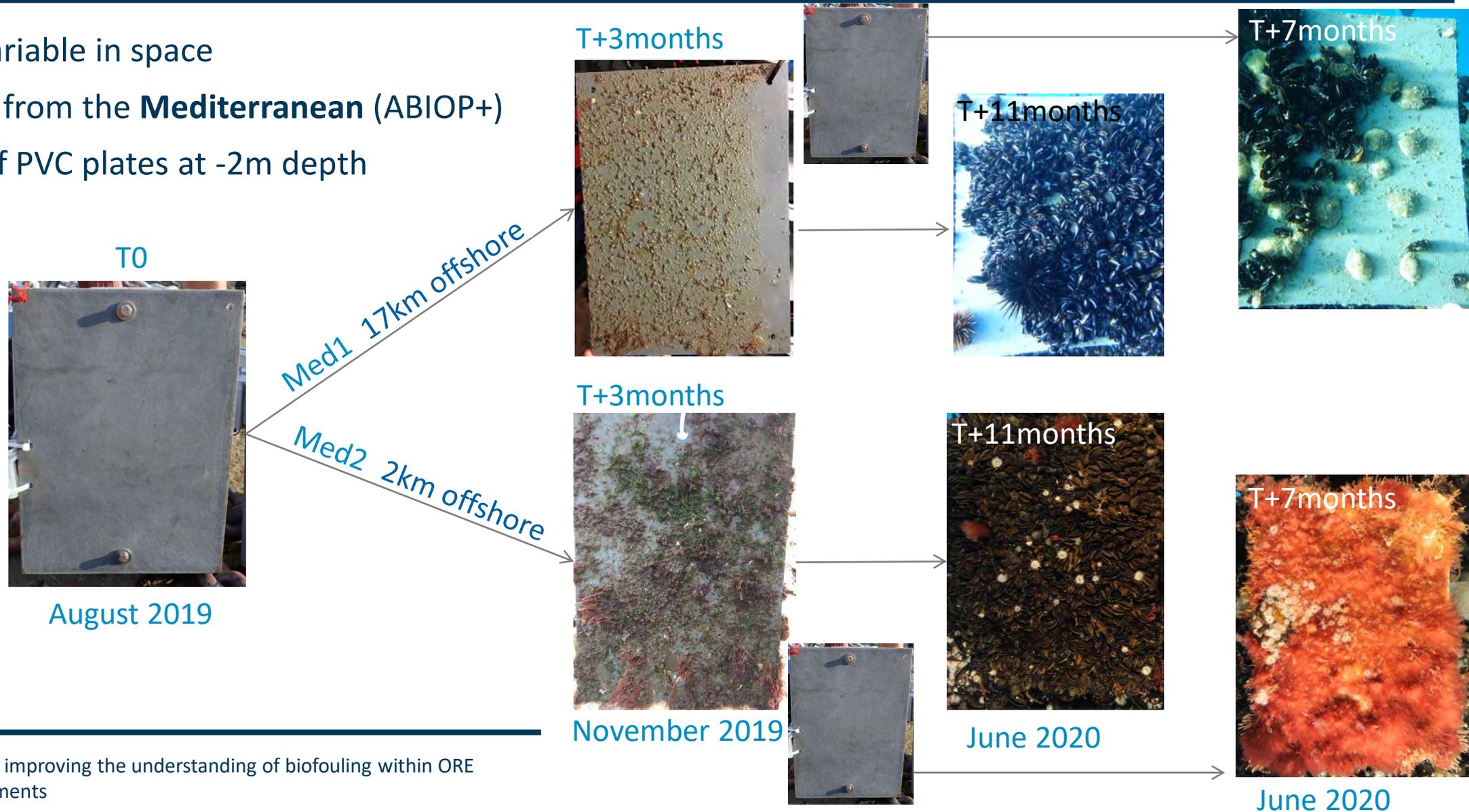
- Highly variable in space



MacLeod A.K., Stanley M.S., Day J.G., Cook E.J. (2016) Biofouling community composition across a range of environmental conditions and geographical locations suitable for floating marine renewable energy generation. *BIOFOULING* Vol. 32: 261-276.

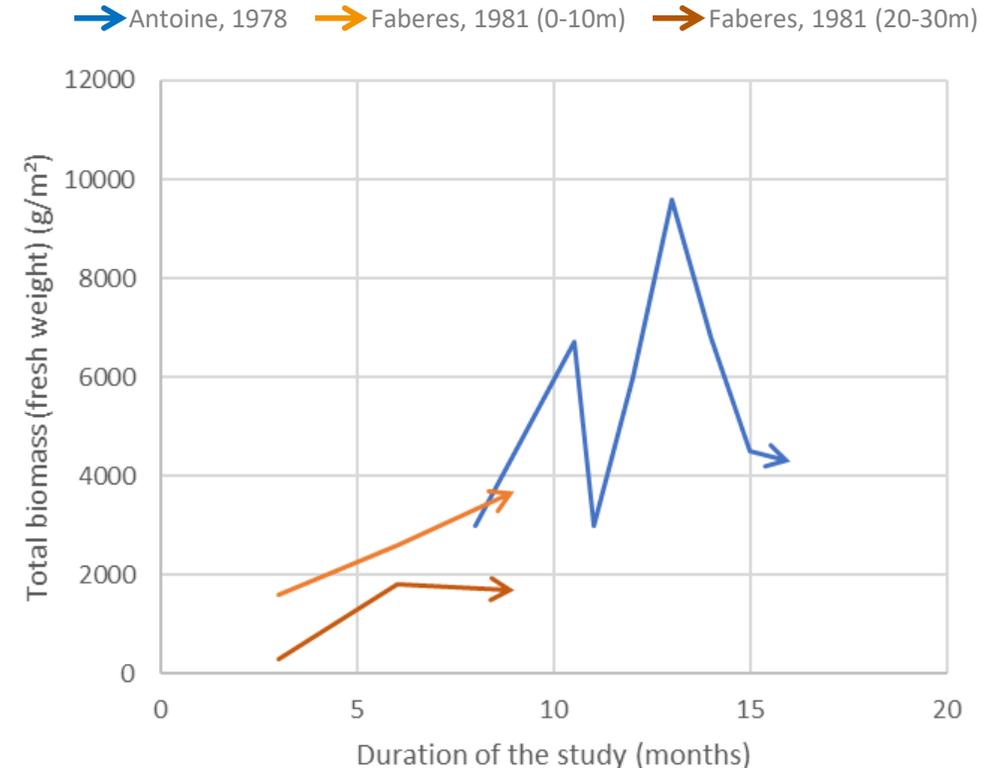
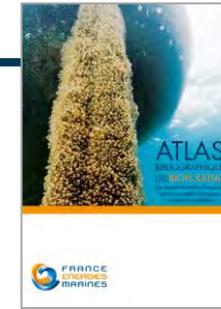
What is biofouling and what are the challenges associated with this phenomenon? *A variable phenomenon*

- Highly variable in space
- Example from the **Mediterranean** (ABIOP+)
- Survey of PVC plates at -2m depth



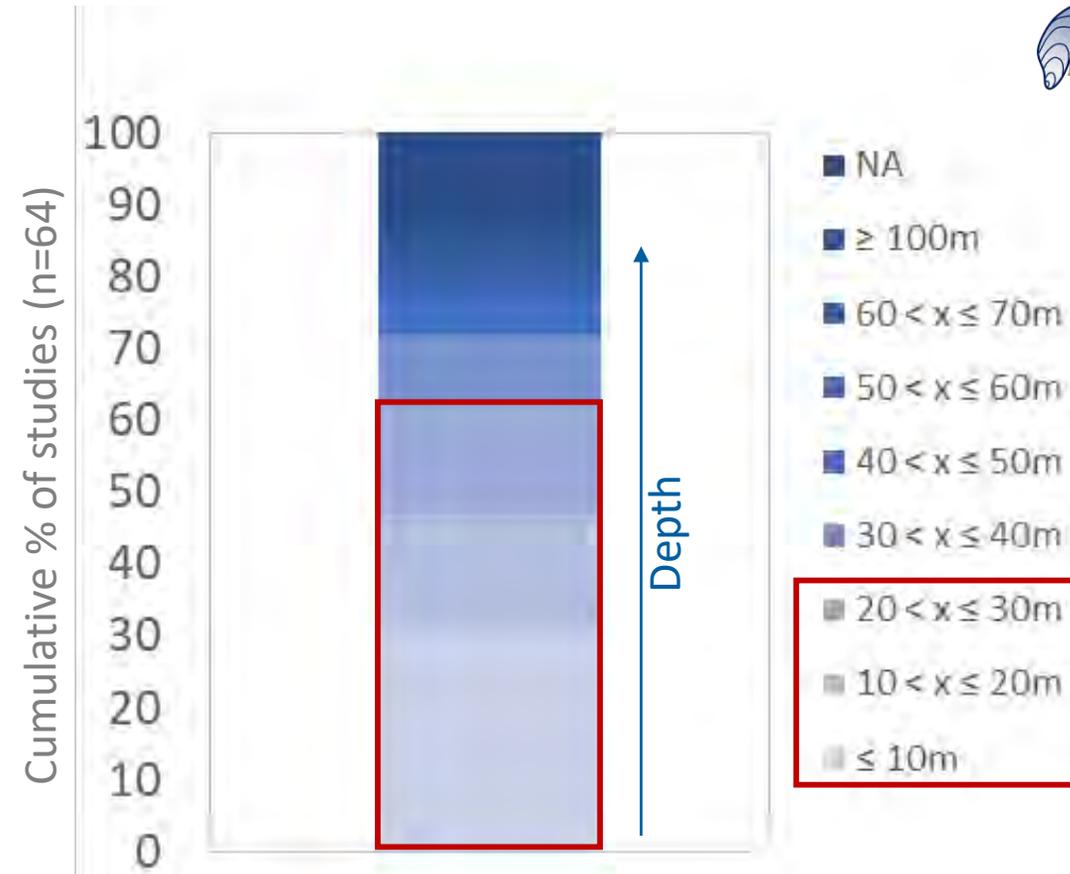
Synthesis of knowledge regarding biofouling along French coasts

- N=45 studies (out of 200) in which biofouling has been surveyed in FR areas
- Some examples considering biomass of biofouling
- Biofouling **varies with depth, space and time**



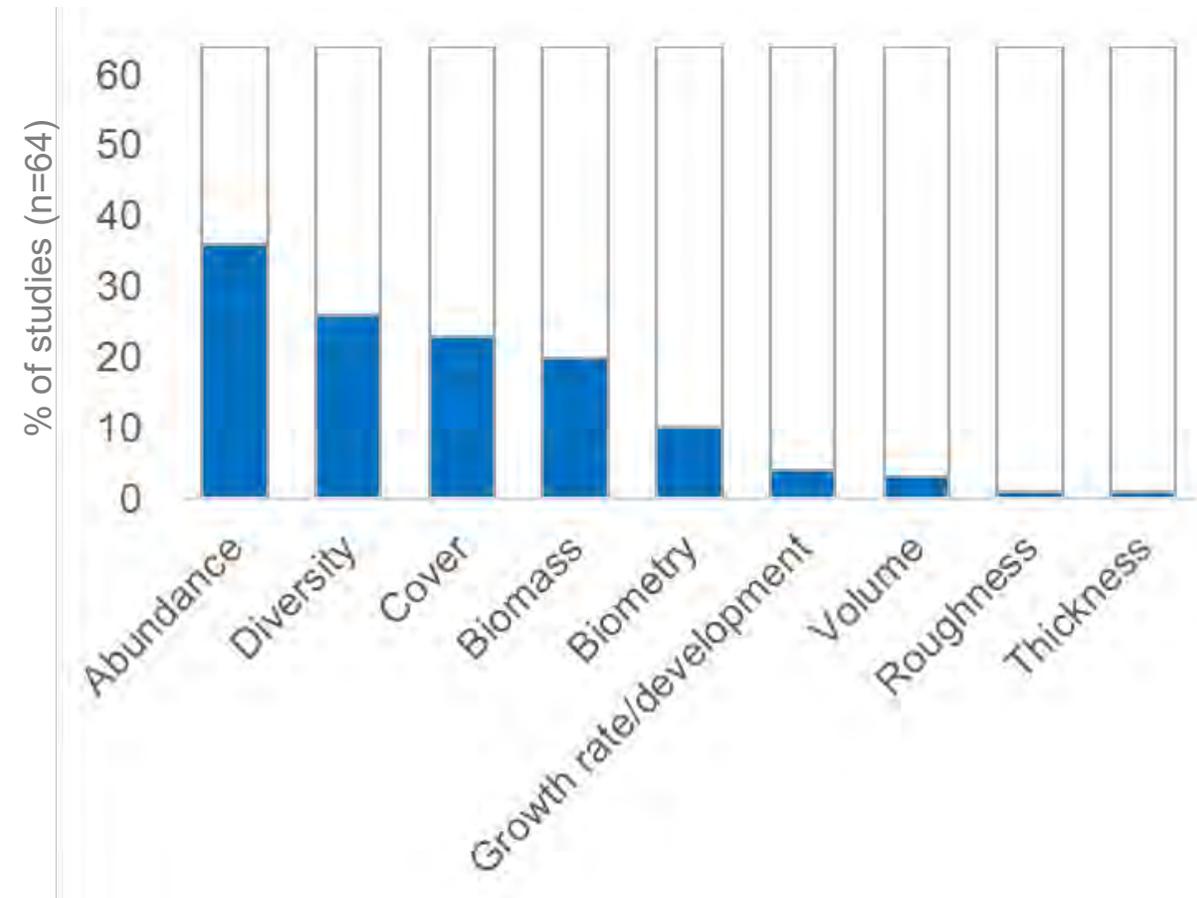
Synthesis of knowledge regarding biofouling along French coasts

- N=64 studies conducted in France (n=40), Europe (n=16), and worldwide (n=8), within which protocols has been explicitly described
- Most of the information regarding biofouling is gathered **at low depth** (close to shore)



Synthesis of knowledge regarding biofouling along French coasts

- N=64 studies conducted in France (n=40), Europe (n=16), and worldwide (n=8), within which protocols has been explicitly described
- Most of the information regarding biofouling is gathered **at low depth** (close to shore)
- Many information on **A, B, div., and cover**
- Very few on **volume, roughness, thickness**



- Need to **survey biofouling in ORE context**, which is special and poorly understood (*offshore, highly dynamic, very few pre-existing surveys, new components/material*)
- Need of **measures** that are **useful for both environmental and engineering** studies:
 - Volume
 - Thickness
 - Biomass
 - Diversity
- Regarding engineering issues, **what measures are really needed, at which accuracy?**
- **Development of specific protocols/methods** for measuring biofouling (key parameters) in challenging systems/context (offshore, low cost, dynamic) while targeting the most sensible components (moorings, dynamic cables, underwater connectors)



Thank you for your attention!