

Composition et dynamique de la Matière Organique Particulaire (MOP) dans les systèmes côtiers : Une étude spatio-temporelle à l'échelle multisystème

Camilla Lienart*, N Savoye, V David, P Ramond, P Raimbault, S Aubin, E Breton, P Conan, E Feunteun, K Grangeré, V Hanquiez, O Jolly, P Kerhervé, B Lebreton, S Lefebvre, S L'Helguen, L Mousseau, P Richard, P Riera, P Rodriguez-Tress, P-G Sauriau, G Schaal, F Aubert, L Beaugeard, S Bichon, L Bourasseau, M Bréret, T Cariou, K Charlier, P Clauquin, V Cornille, A-M Corre, L Costes, M Czamanski, F Dindinaud, Y Del Amo, H Derriennic, S Ferreira, M Fornier, F Garcia, N Garcia, E Grossteffan, A Gueux, G Guillou, F Guyon, J Jourde, N Lachaussée, M Lafont, V Lagadec, J Lamoureux, E Lecuyer, J-P Lehodey, C Leroux, E Macé, E Maria, A Nowaczyk, M Parra, F Petit, P Pineau, F Rigaut-Jalabert, P Rimmelin-Maury, V Ruiz Gonzales Lamiri, L Seuront, E Sultan



RÉGION
AQUITAINE

université
de BORDEAUX

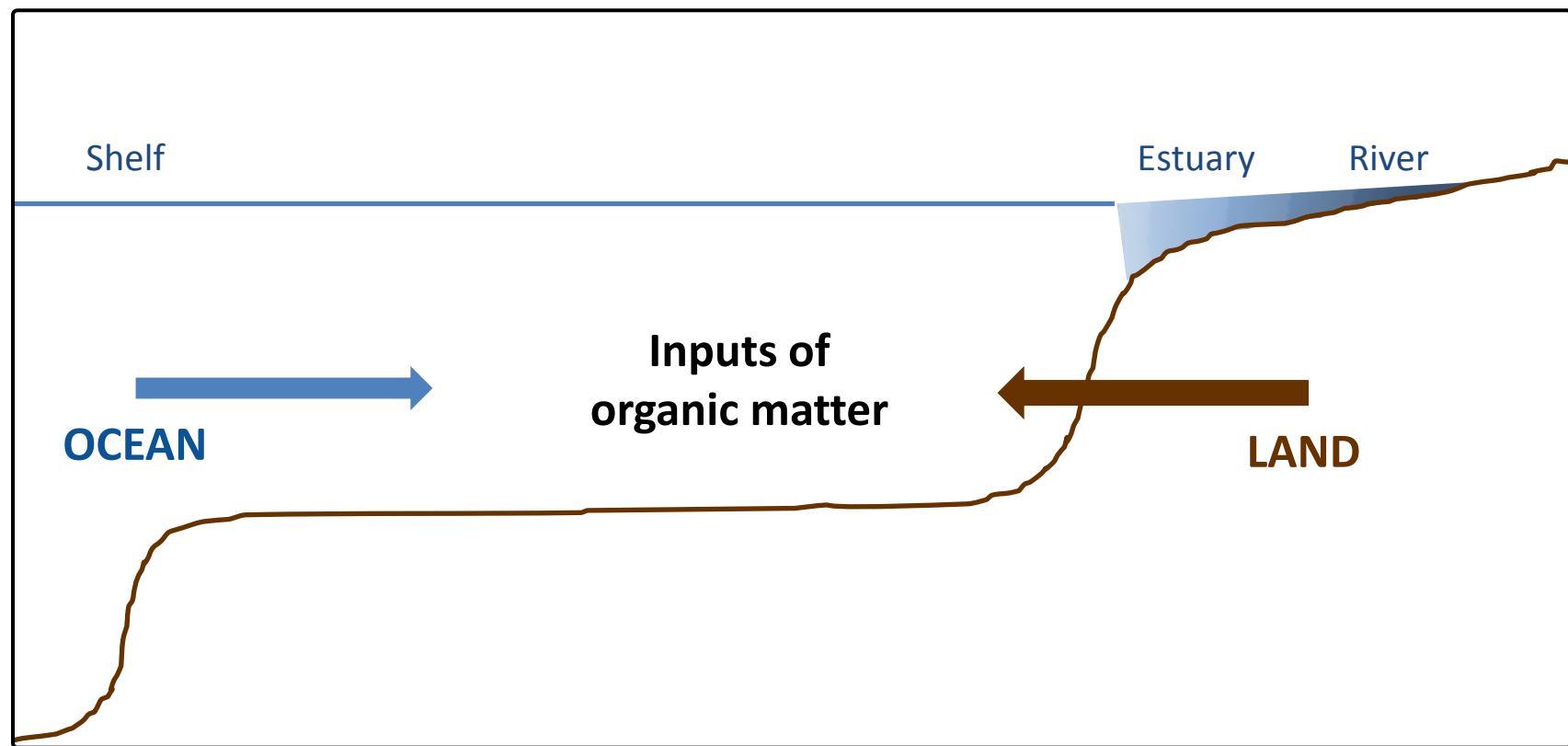
EPOC

Écosphère
Continentele et
Côtière

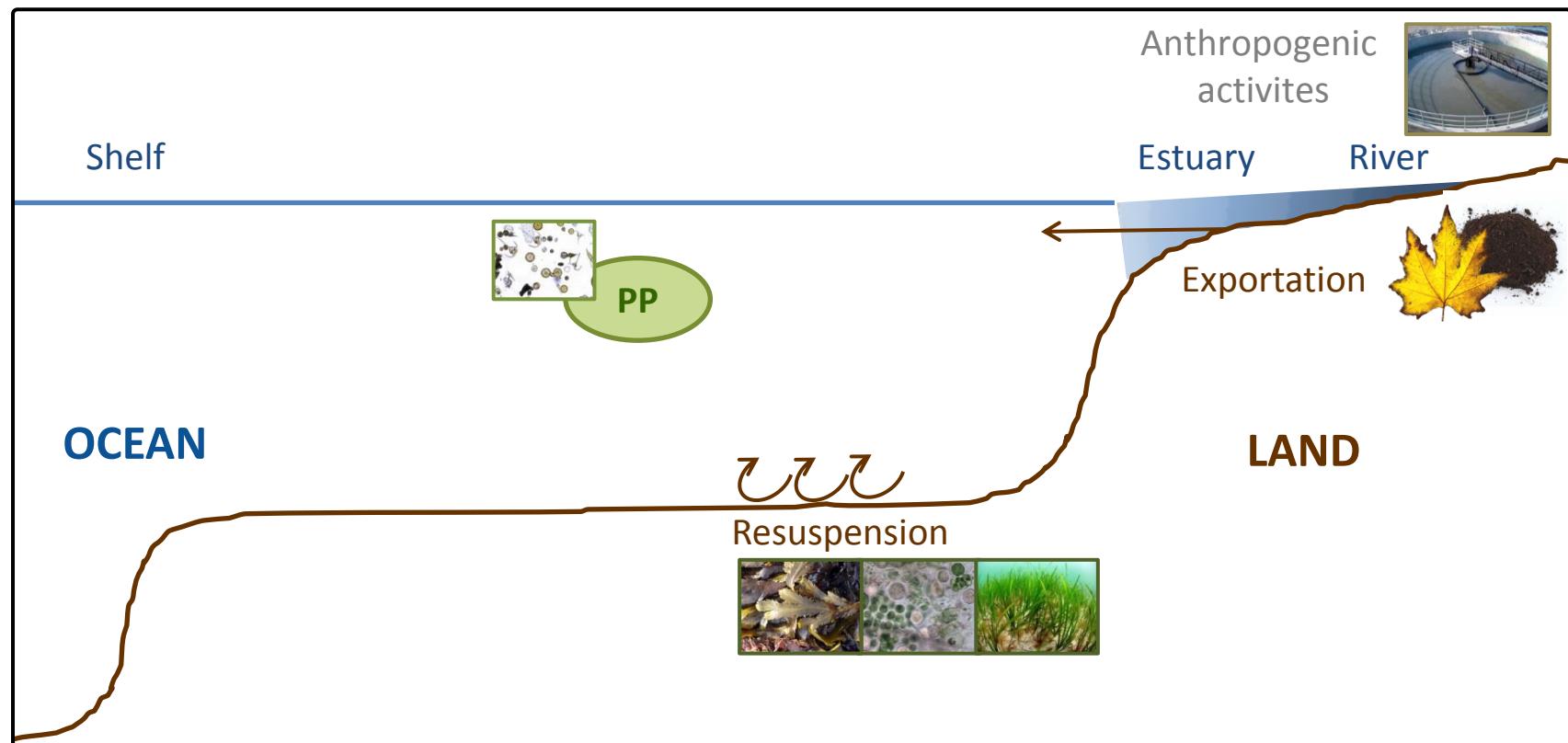
SOMLIT



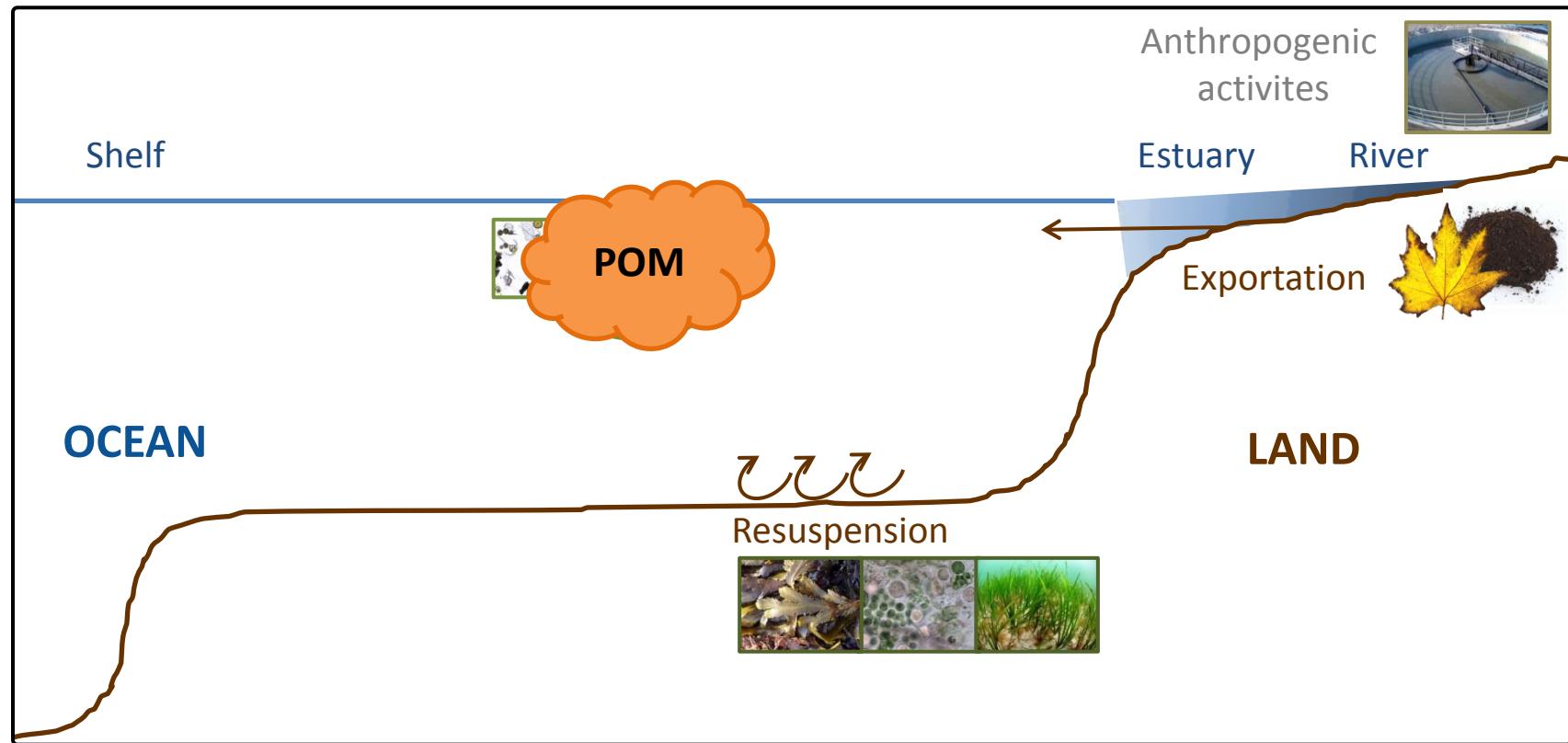
MUSÉUM NATIONA
D'HISTOIRE NATURELLE



Coastal zones = interface



Coastal zones = interface
Many processes

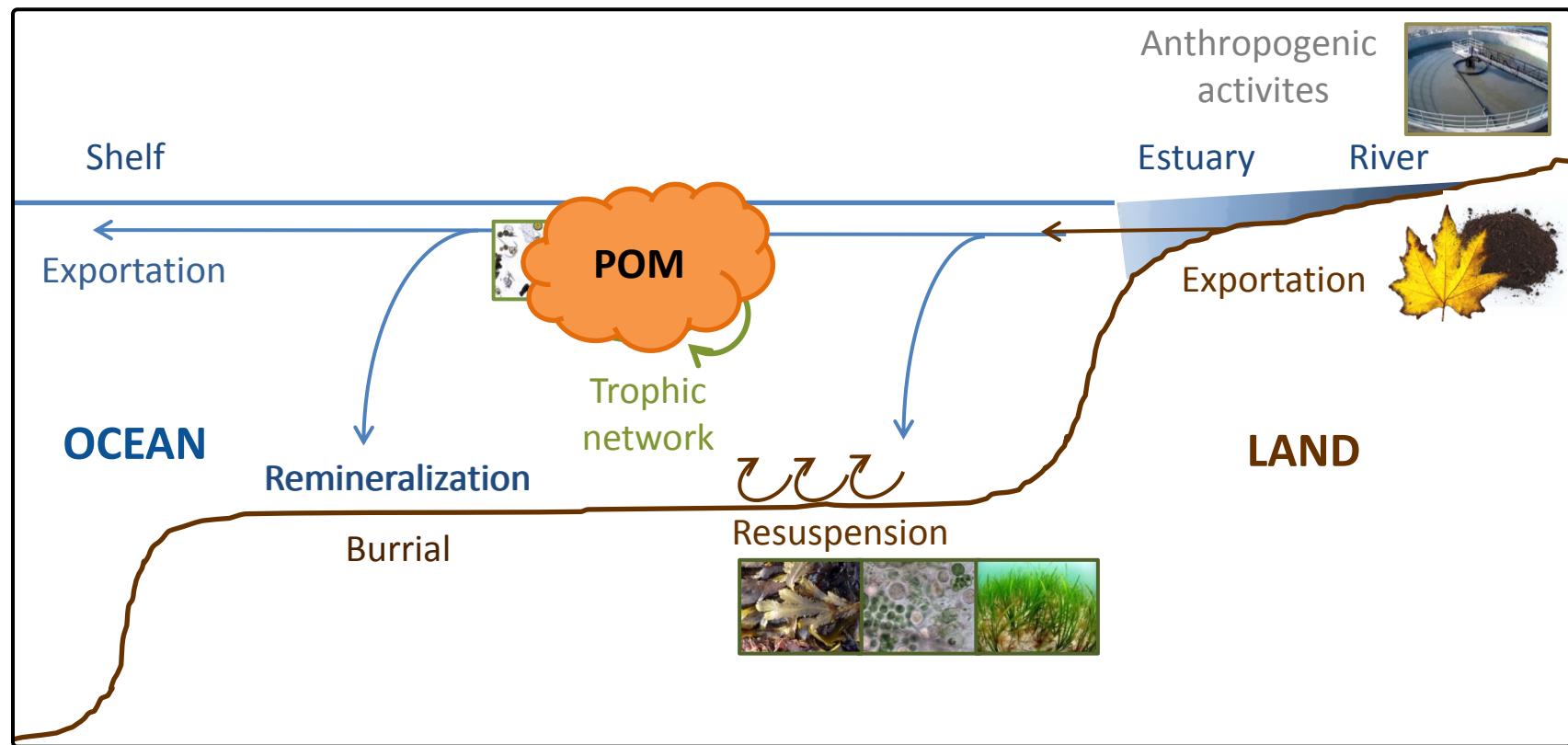


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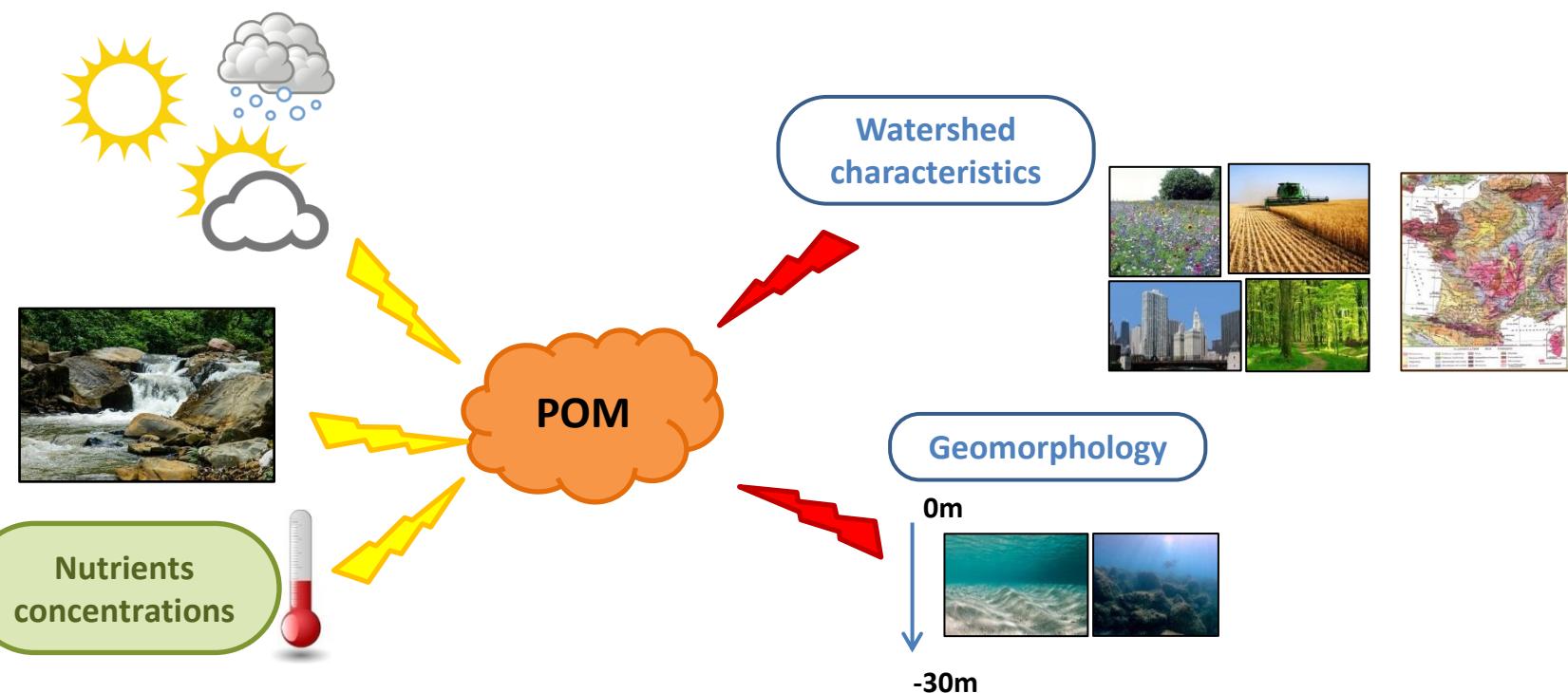
Many processes

Diversity of sources

Particulate Organic Matter (POM) → multiple origins



→ Essential for a good ecosystems
functioning



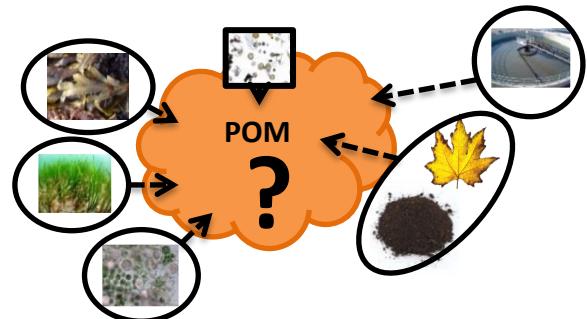
Forcings to POM composition :

Vary in time over the year

Do not vary in time but between stations

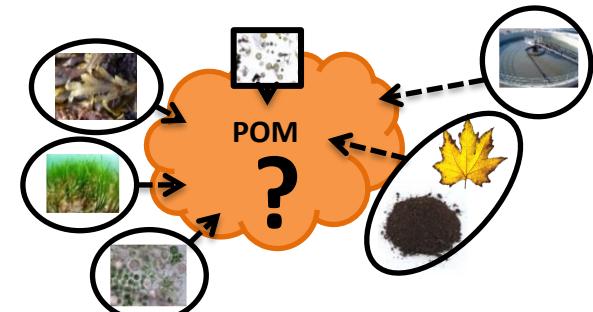
1. What is the **composition of POM** in coastal systems ?

- Characterization of sources
- Spatial variability (local and large scale)
- Temporal variability (seasonal, interannual)



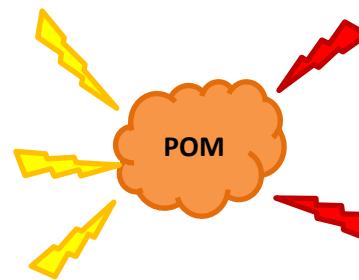
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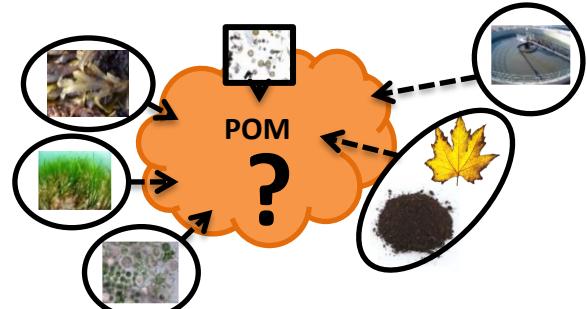
2. What are the **forcings to POM composition** ?

- At local and large scales



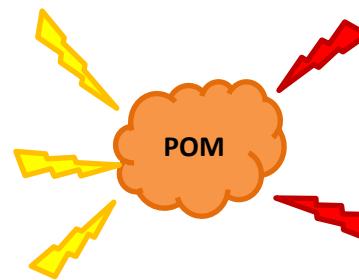
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3. Does it exist a **typology of systems** regarding POM composition and its **variability**?



12 systems, 19 stations



- Weekly to monthly sampled for 1 to 7 years
 - POM descriptors:
POC, PON, Chla, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$
 - Environmental parameters:
 T° , salinity, NO_3^- , NH_4^+ , PO_4^{3-} , SPM, river flows
→ large variability among stations
- Gradients of forcings:
climatic, tidal range, geomorphology, water column depth, oligotrophy vs mesotrophy, etc.)

Tools : elemental and isotopic ratios of C and N (C/N, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$)

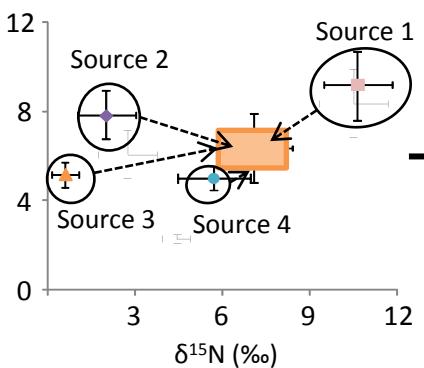
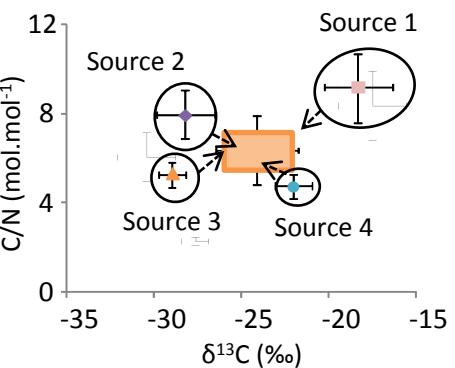
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1) Signature of sources considered depending on station

Selected sources	
Phytoplankton	Pelagic primary producers
Diazotrophs	
Macrophytes	Benthic primary producers
Microphytobenthos	
Continental	
Terrestrial	Continental
Anthropogenic	

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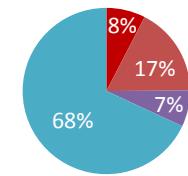
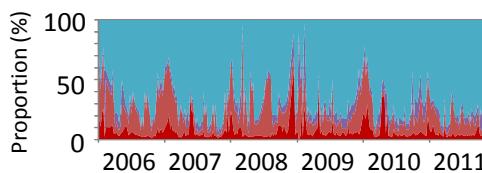
2) Quantify the contribution of each source to the POM pool

Selected sources	
Phytoplankton	Pelagic primary producers
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Mixing model (SIAR)

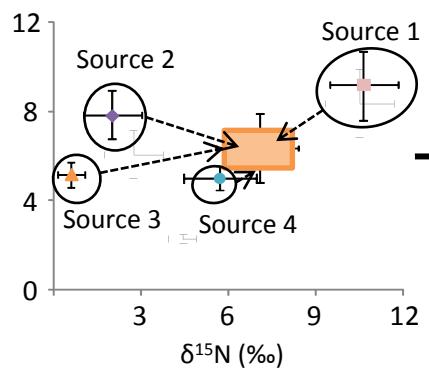
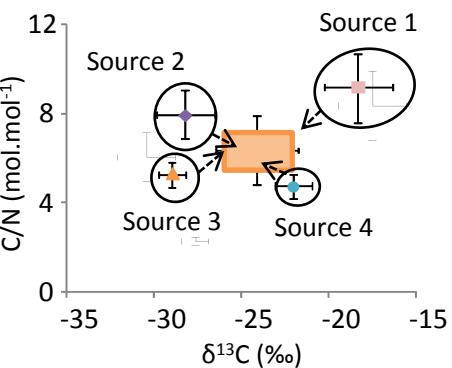
Model outputs :
in % and recalculated in [POC]

- date to date
- mean annual values



Tools : elemental and isotopic ratios of C and N (C/N , $\delta^{13}C$, $\delta^{15}N$)

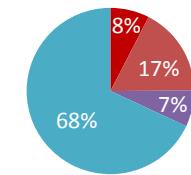
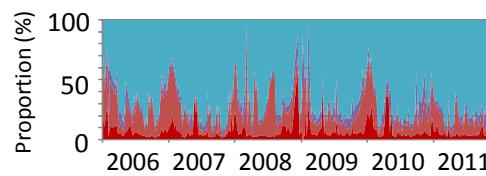
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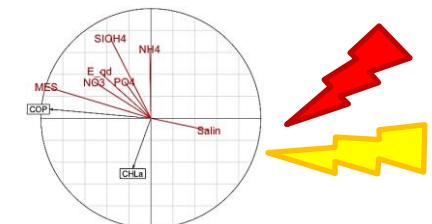
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3) Forcings to POM composition → Multivariate analysis (RDA)

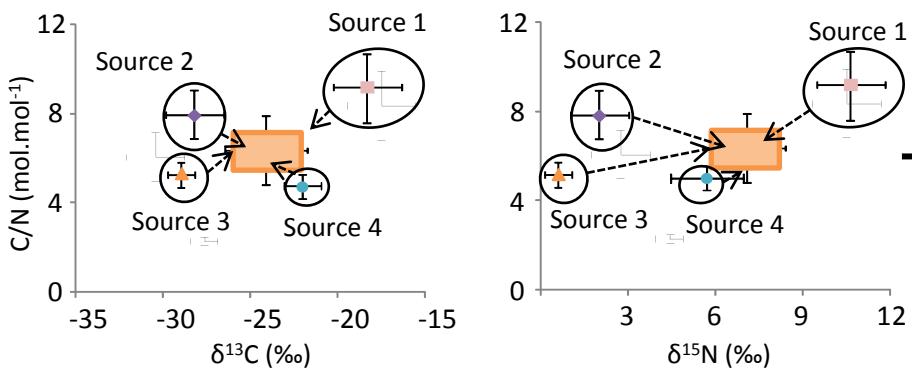


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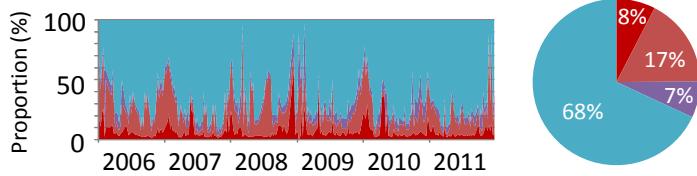
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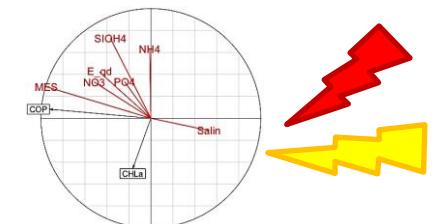


Model outputs :
in % and recalculated in [POC]
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3) Forcings to POM composition → Multivariate analysis (RDA)

4) Typology based on spatial and temporal variability of POM composition using a regionalization method (Souissi et al 2000)

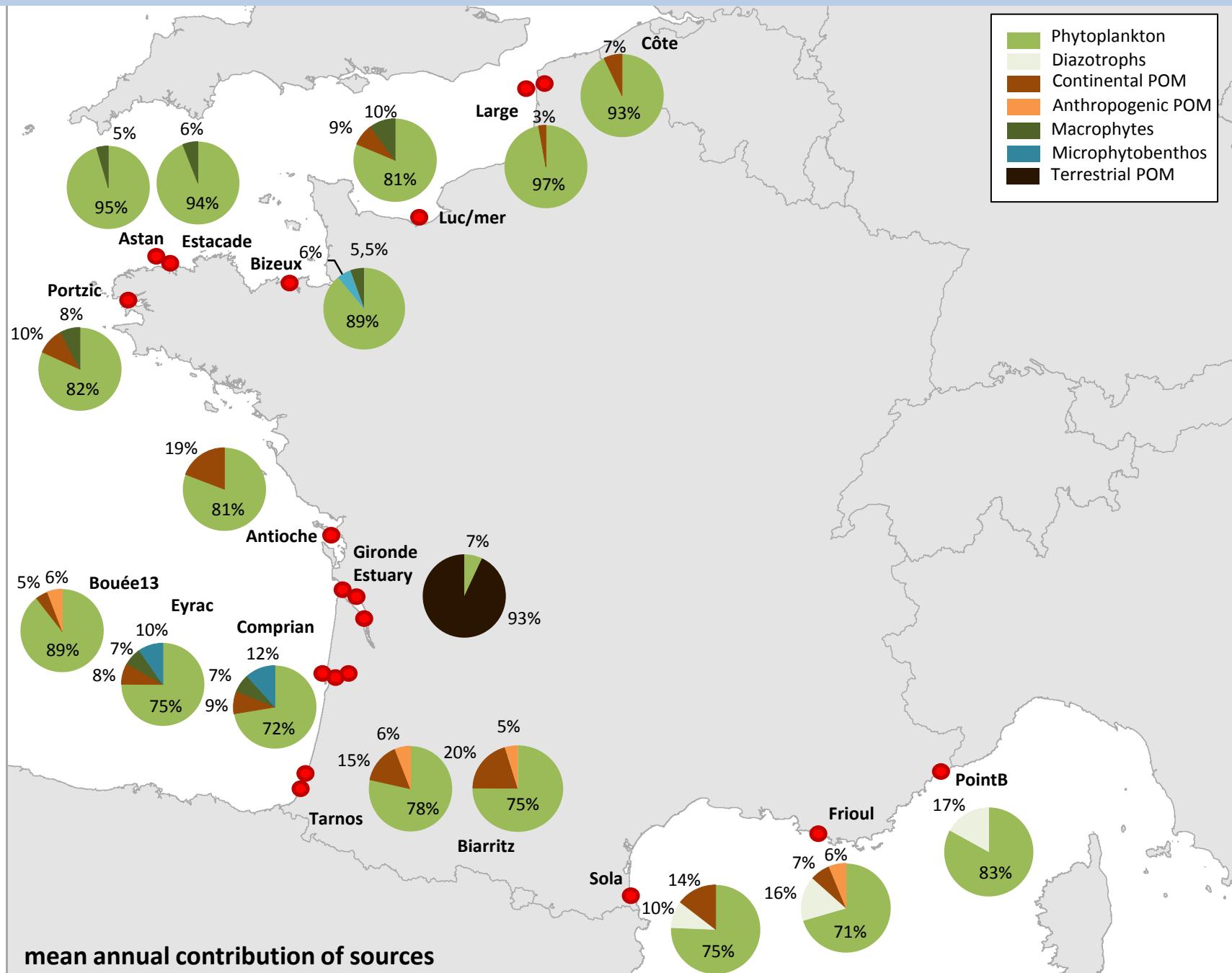


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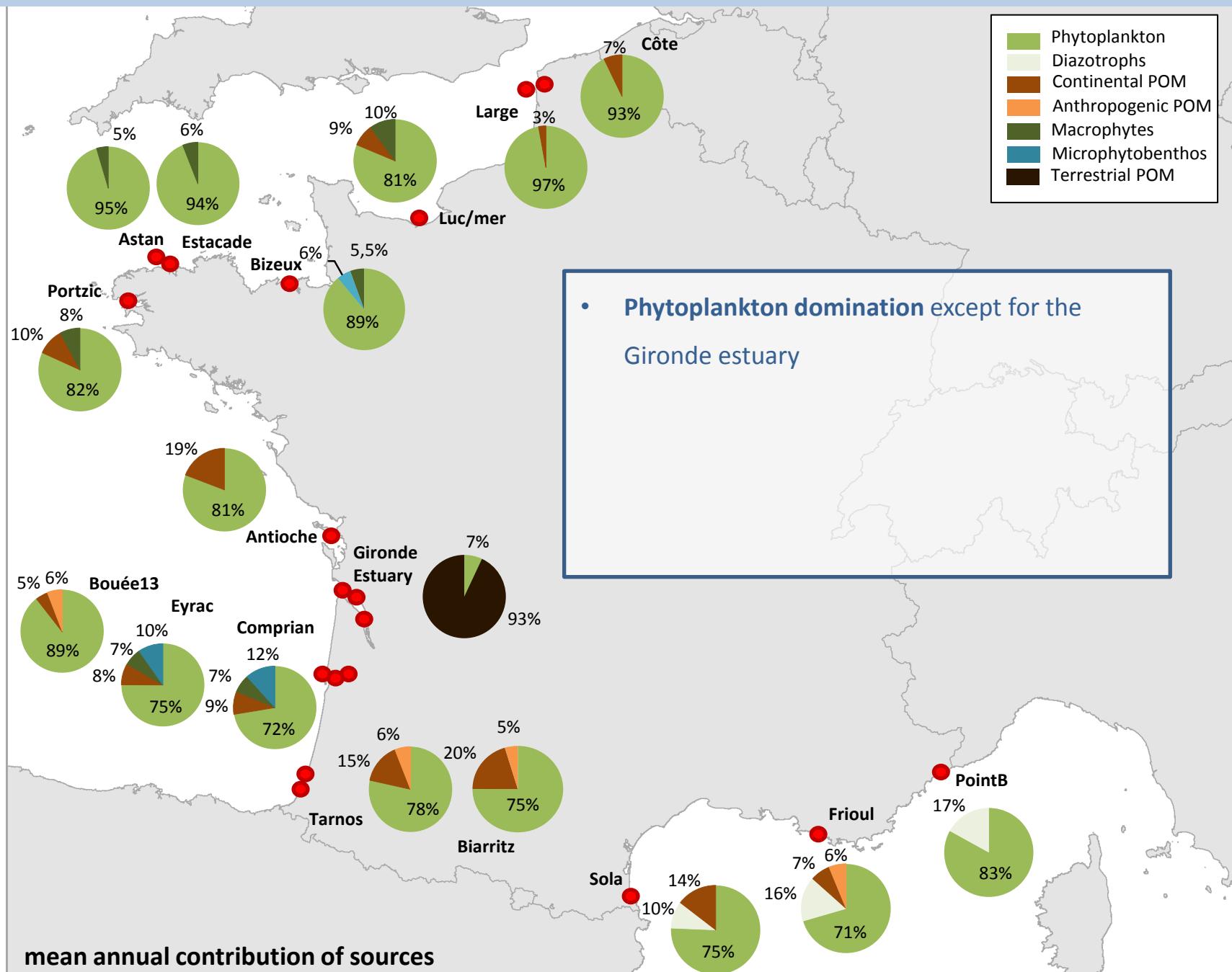


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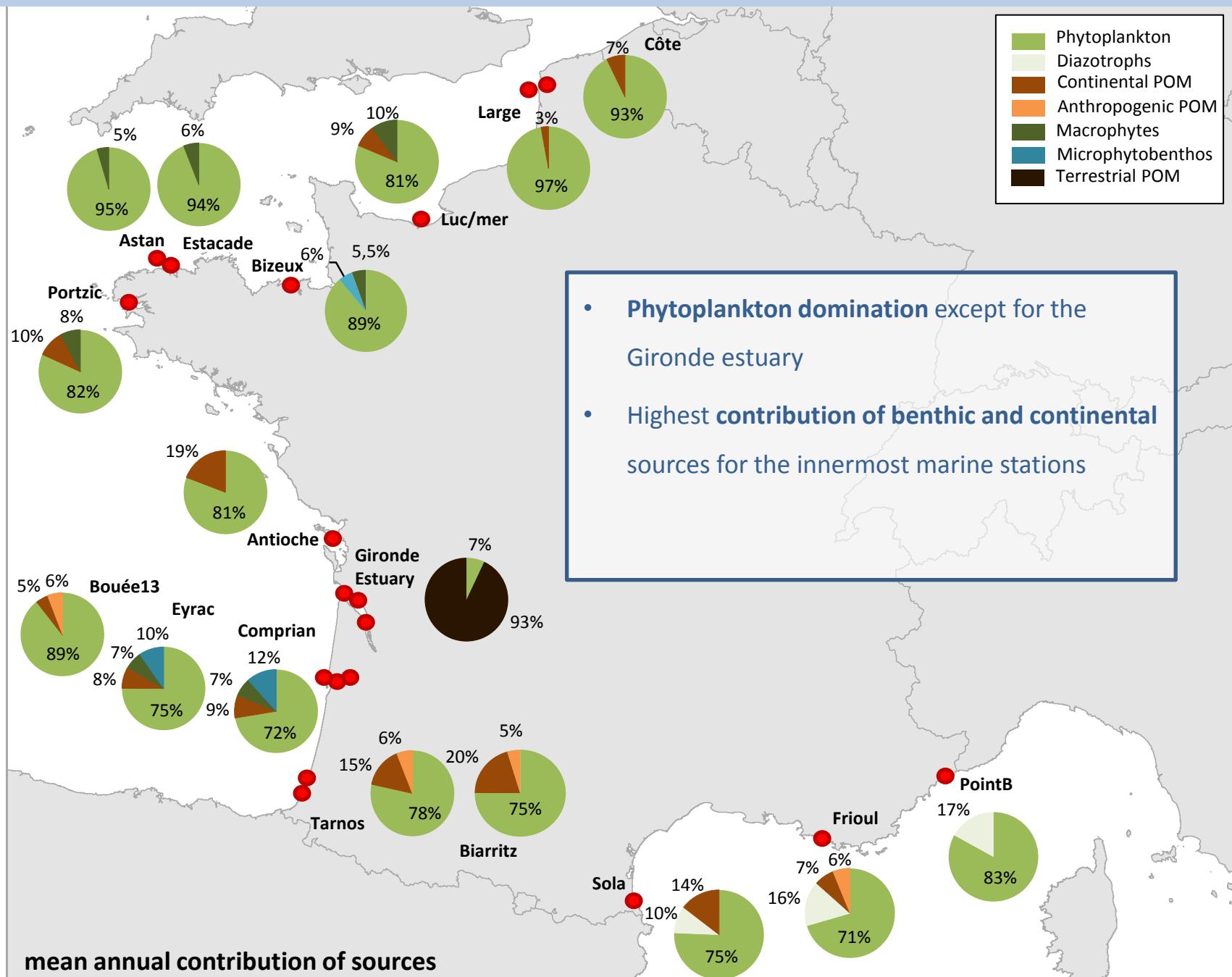


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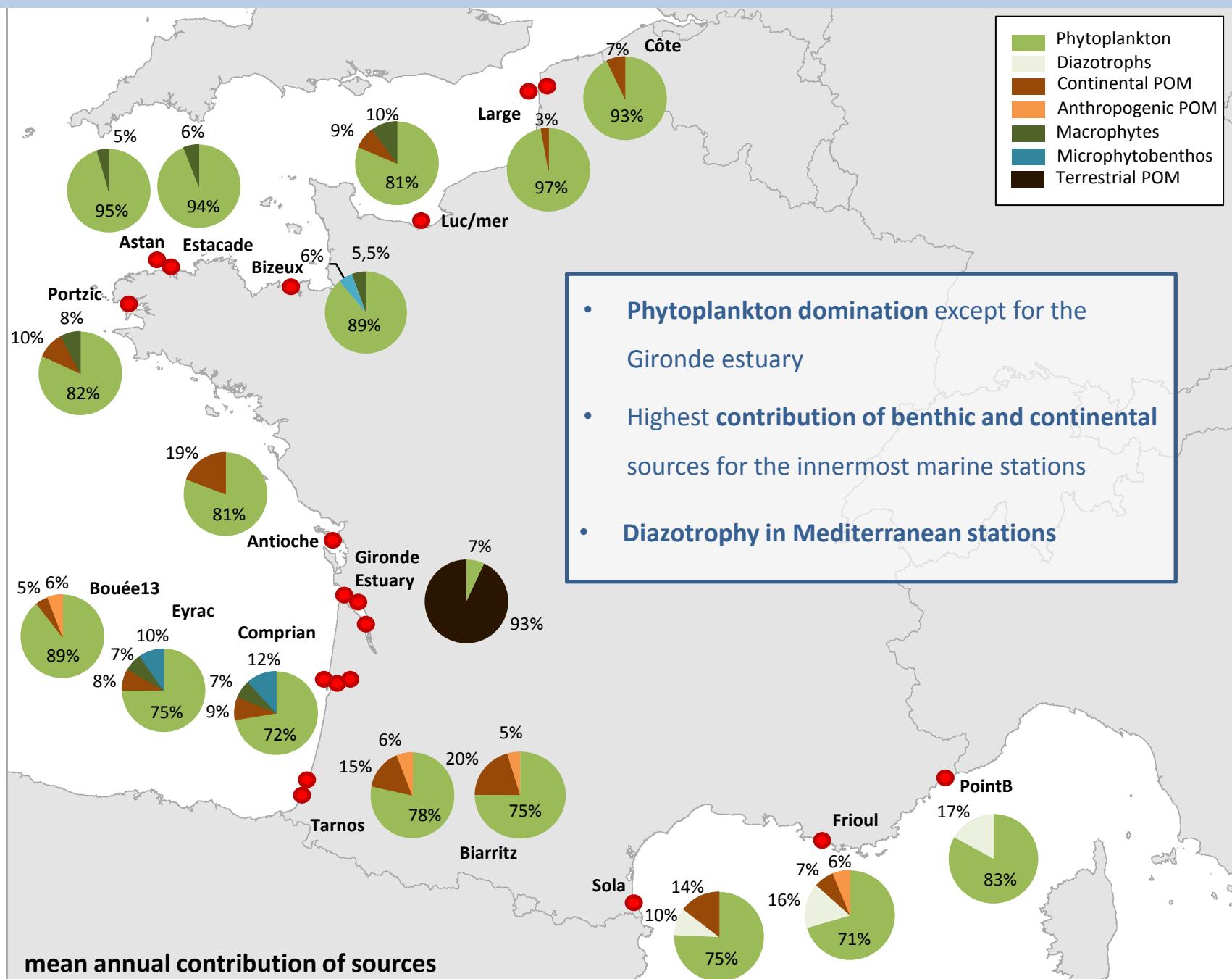
- **Phytoplankton domination** except for the Gironde estuary
- Highest **contribution of benthic and continental** sources for the innermost marine stations

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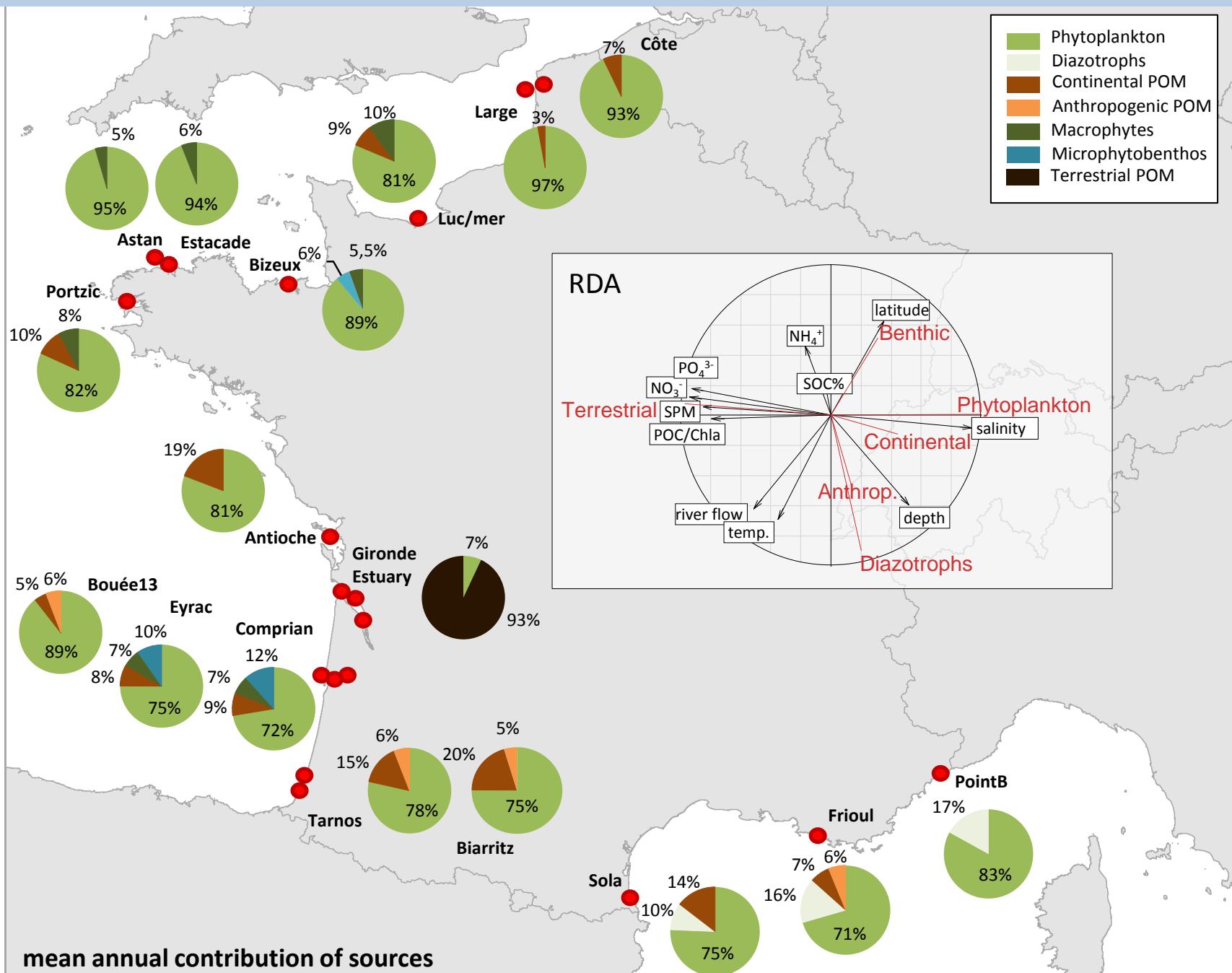
- **Phytoplankton domination** except for the Gironde estuary
- Highest **contribution of benthic and continental** sources for the innermost marine stations
- **Diazotrophy in Mediterranean stations**

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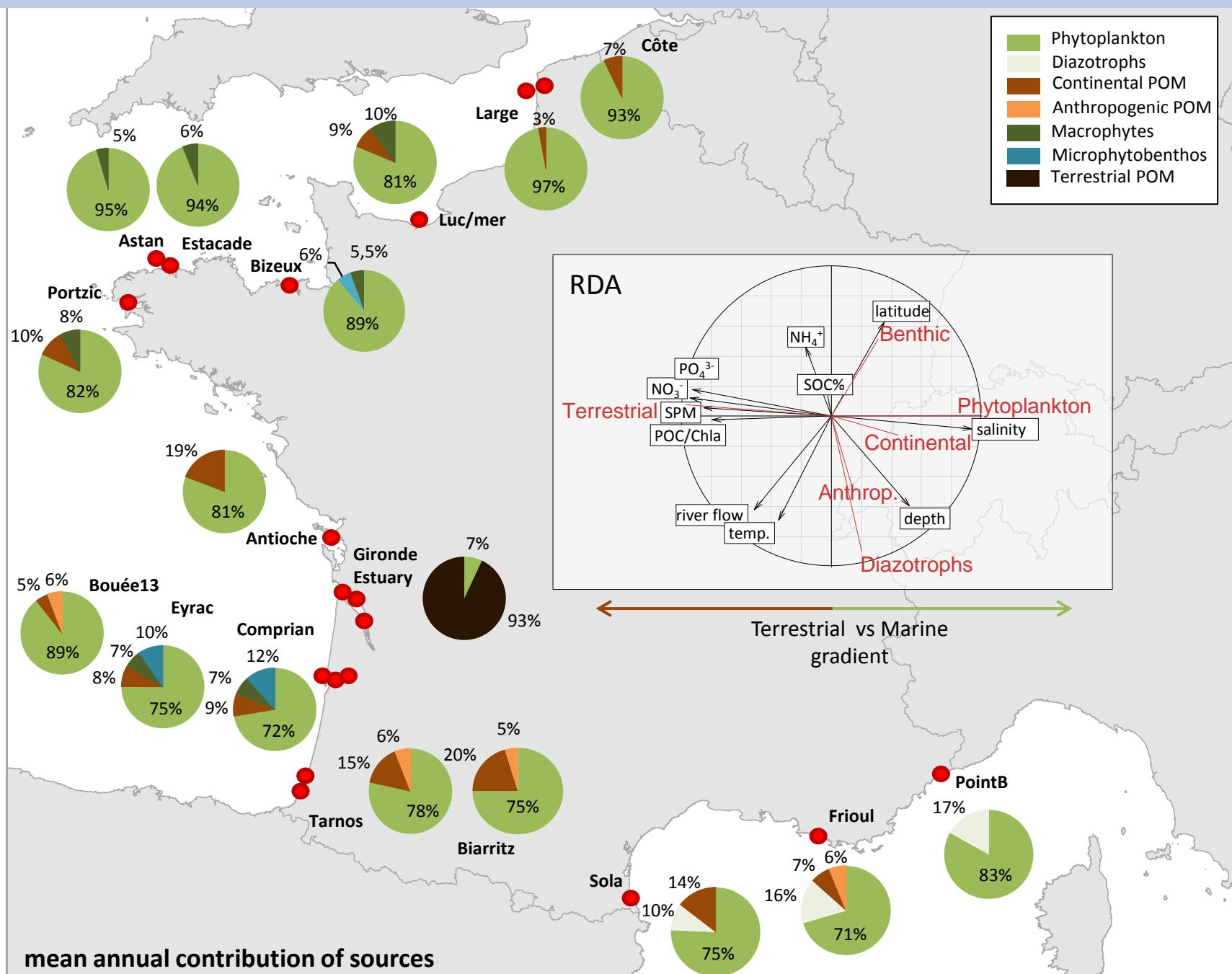


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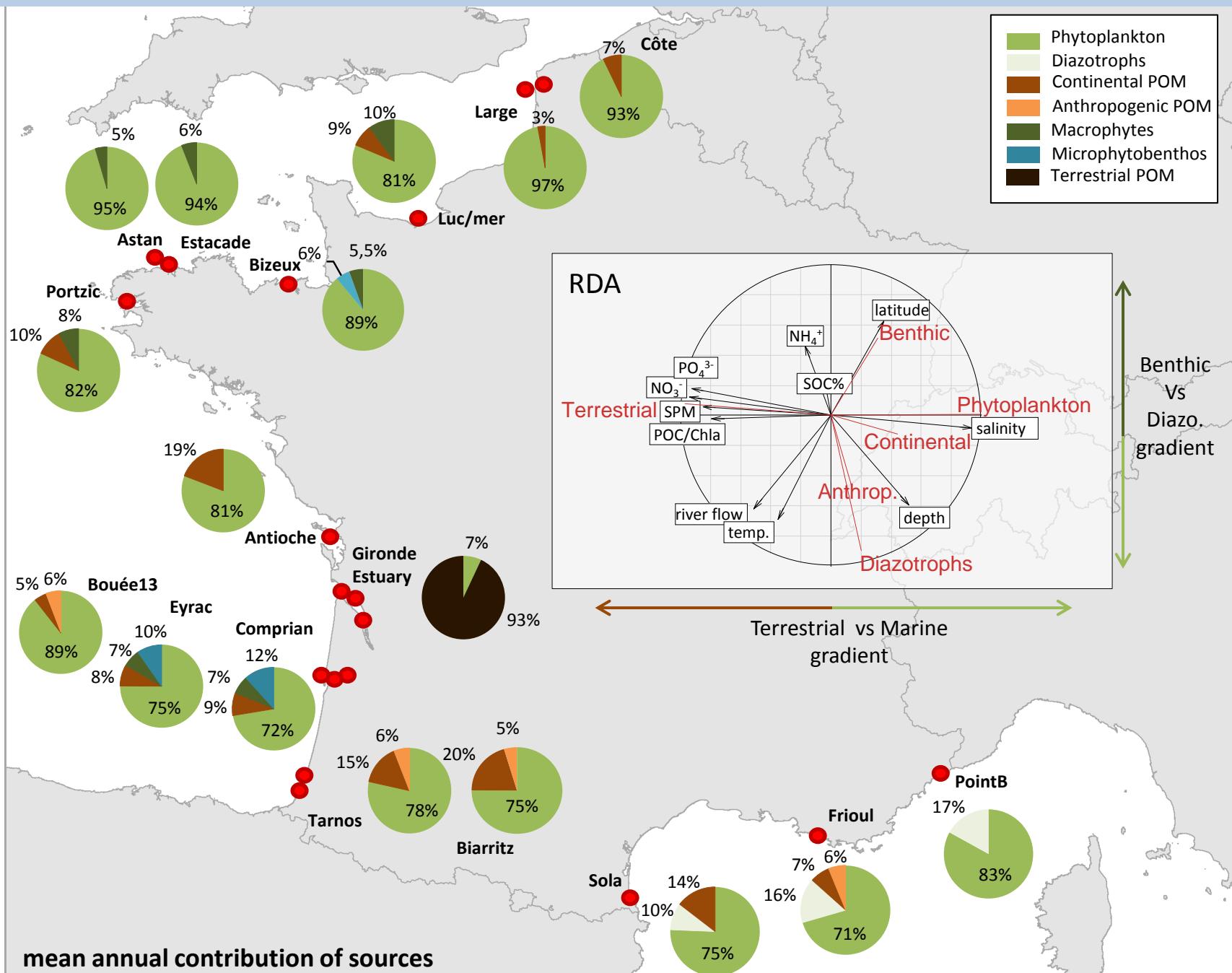


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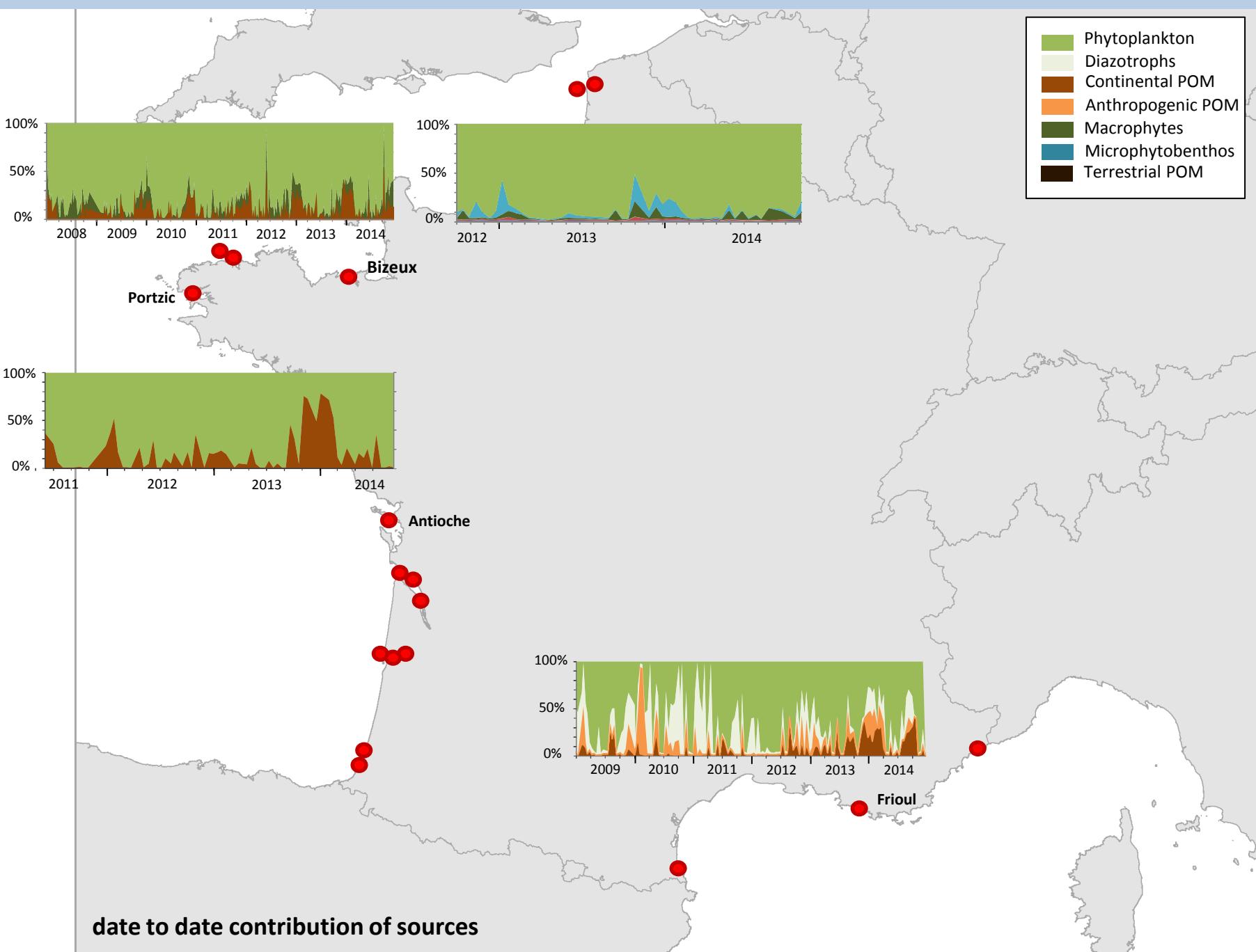


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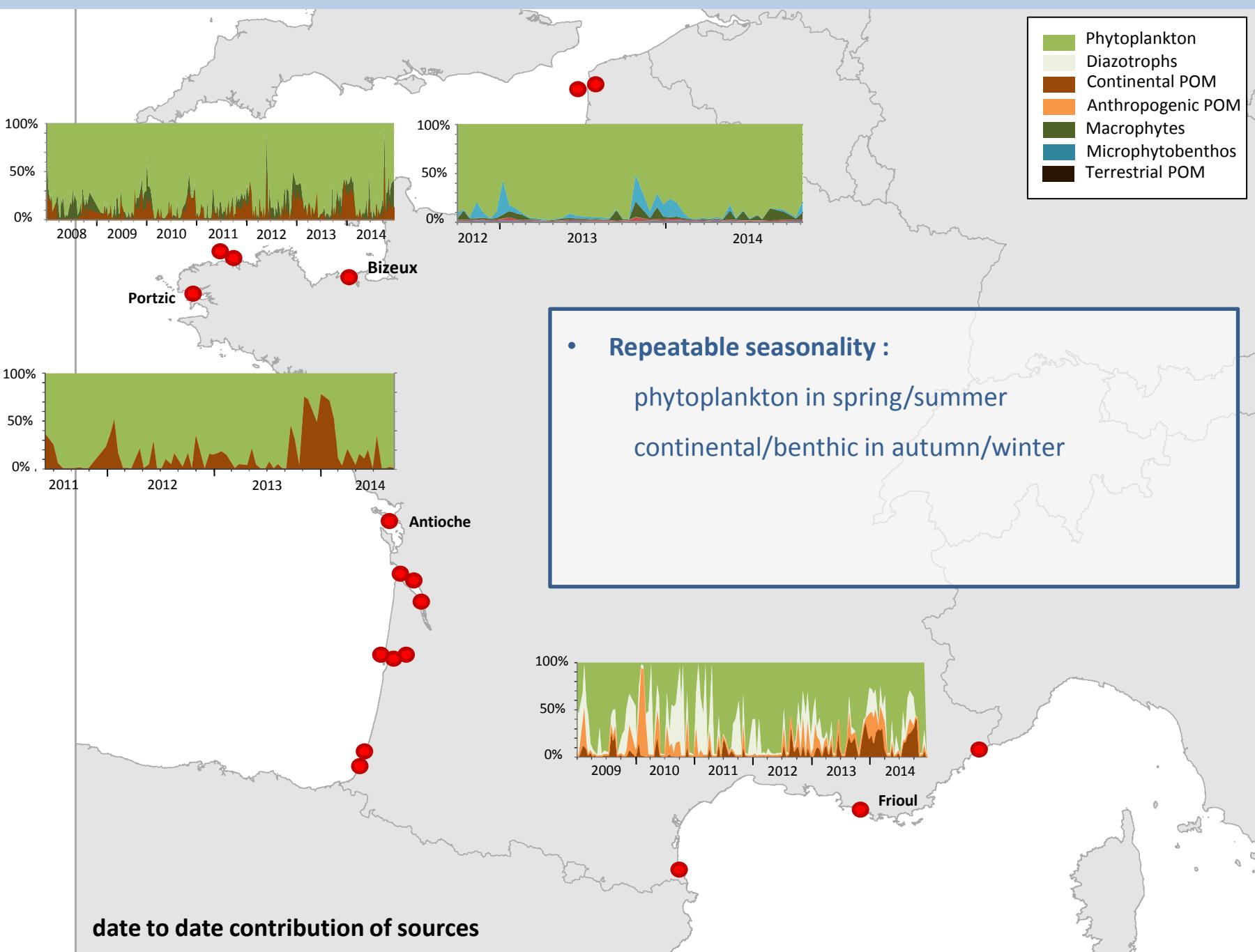
date to date contribution of sources

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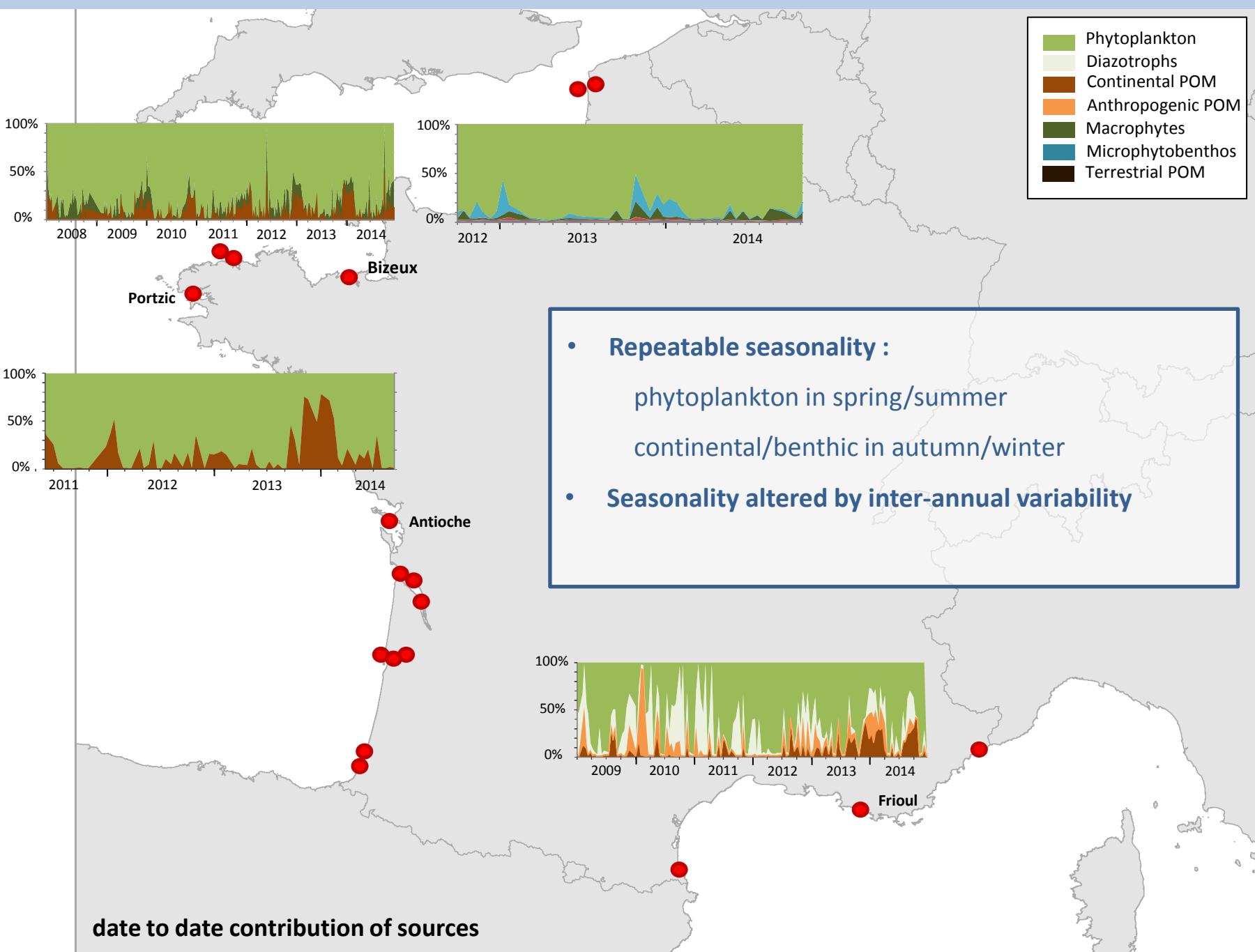


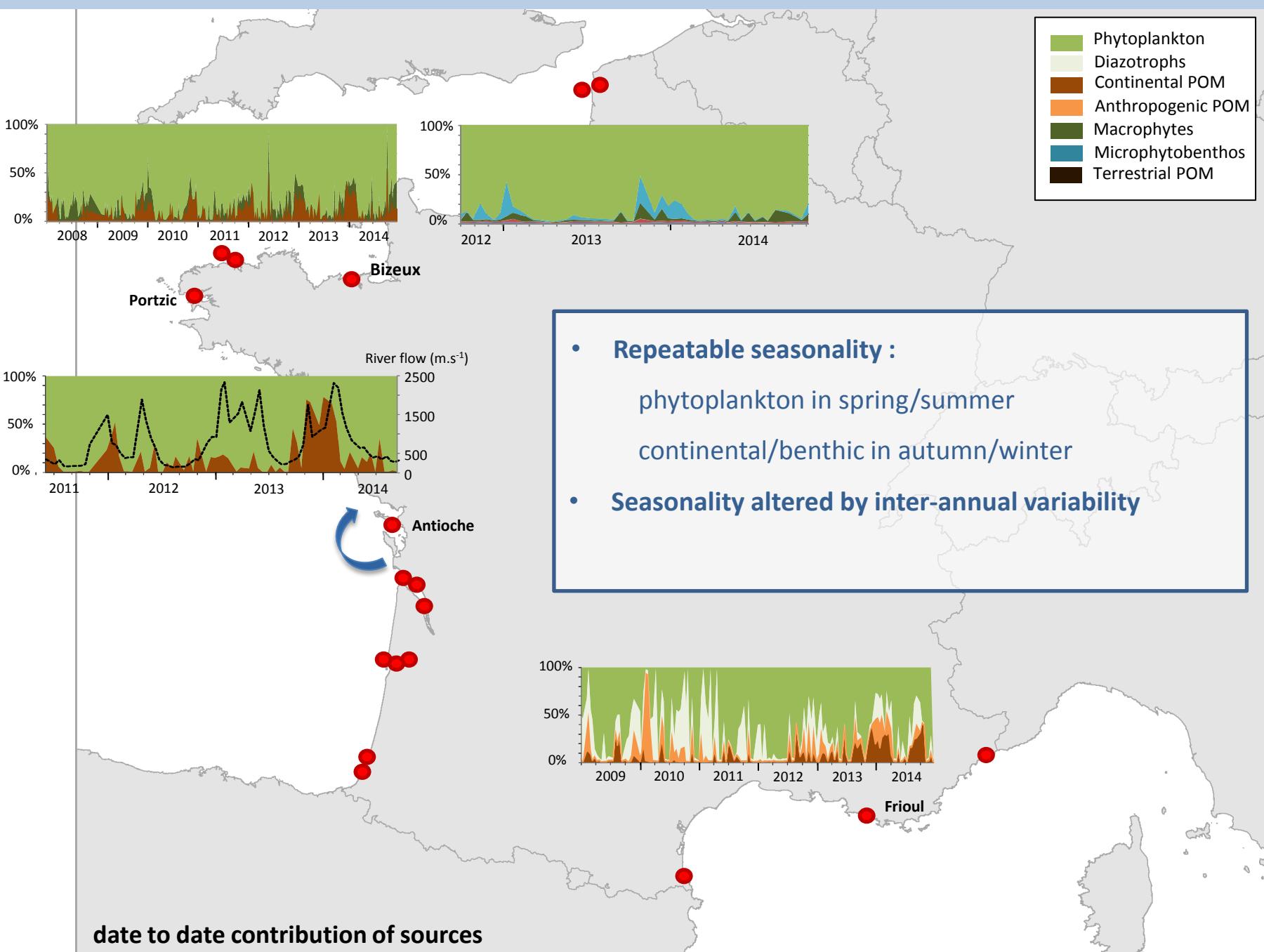
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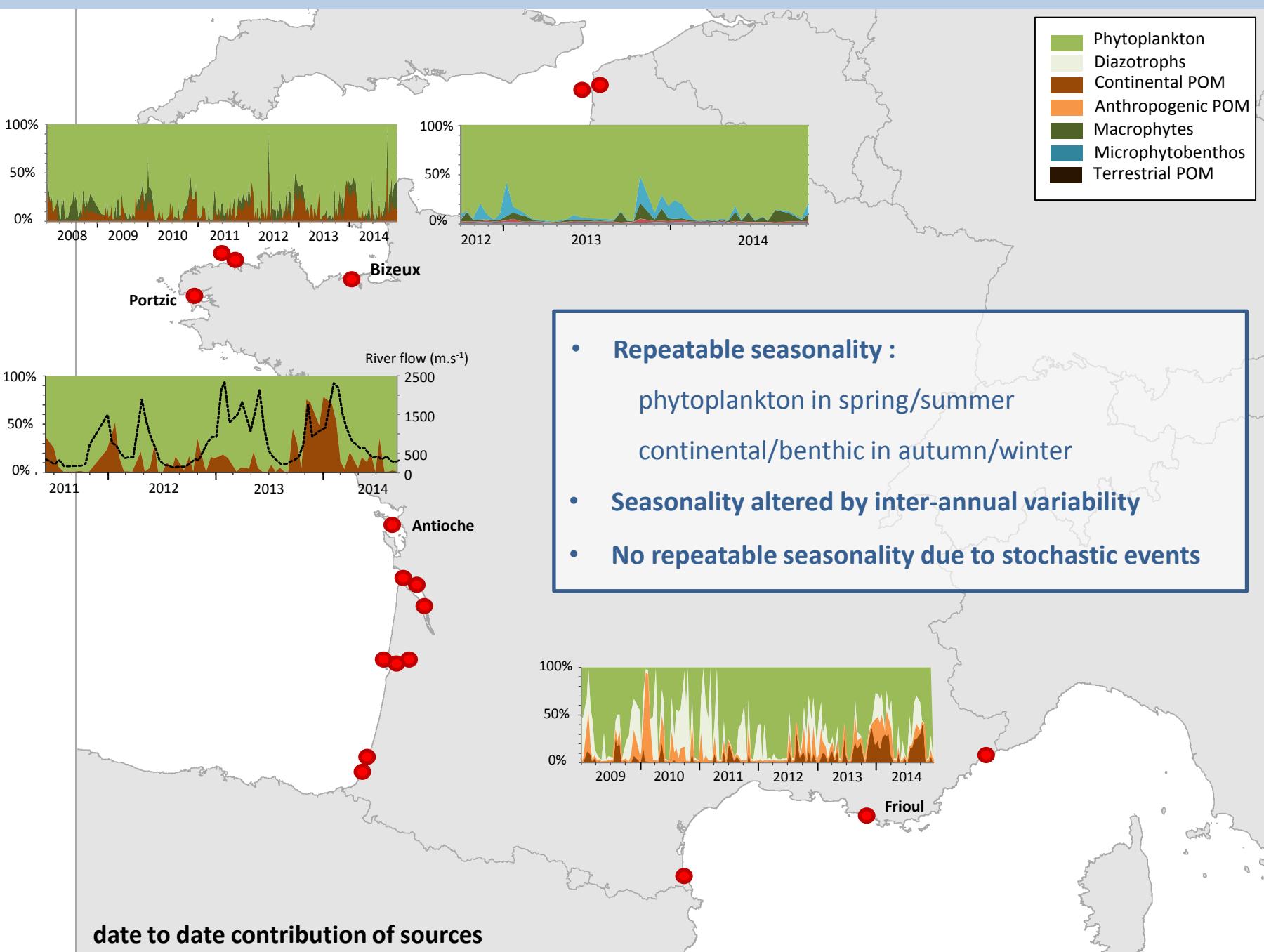
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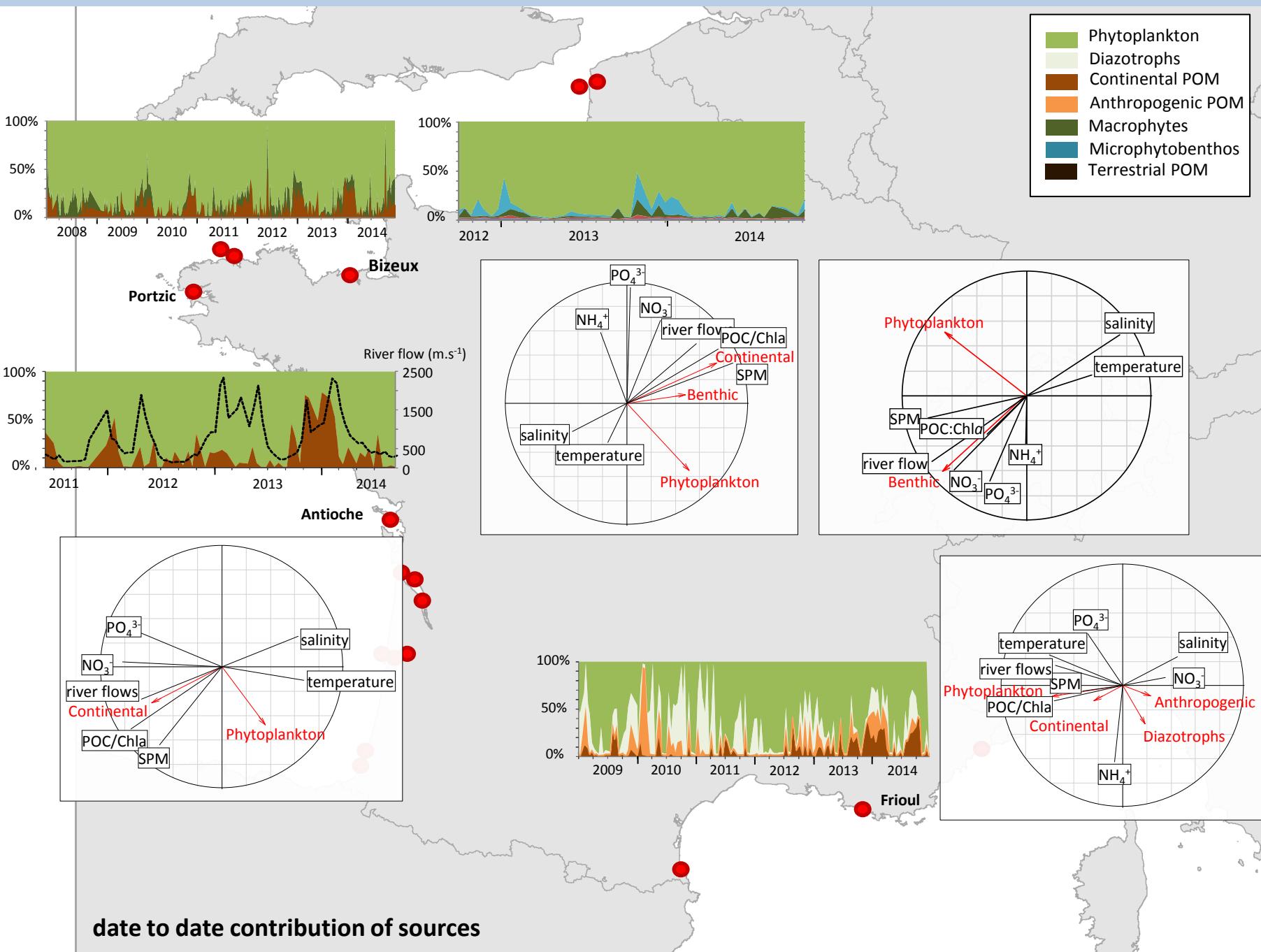


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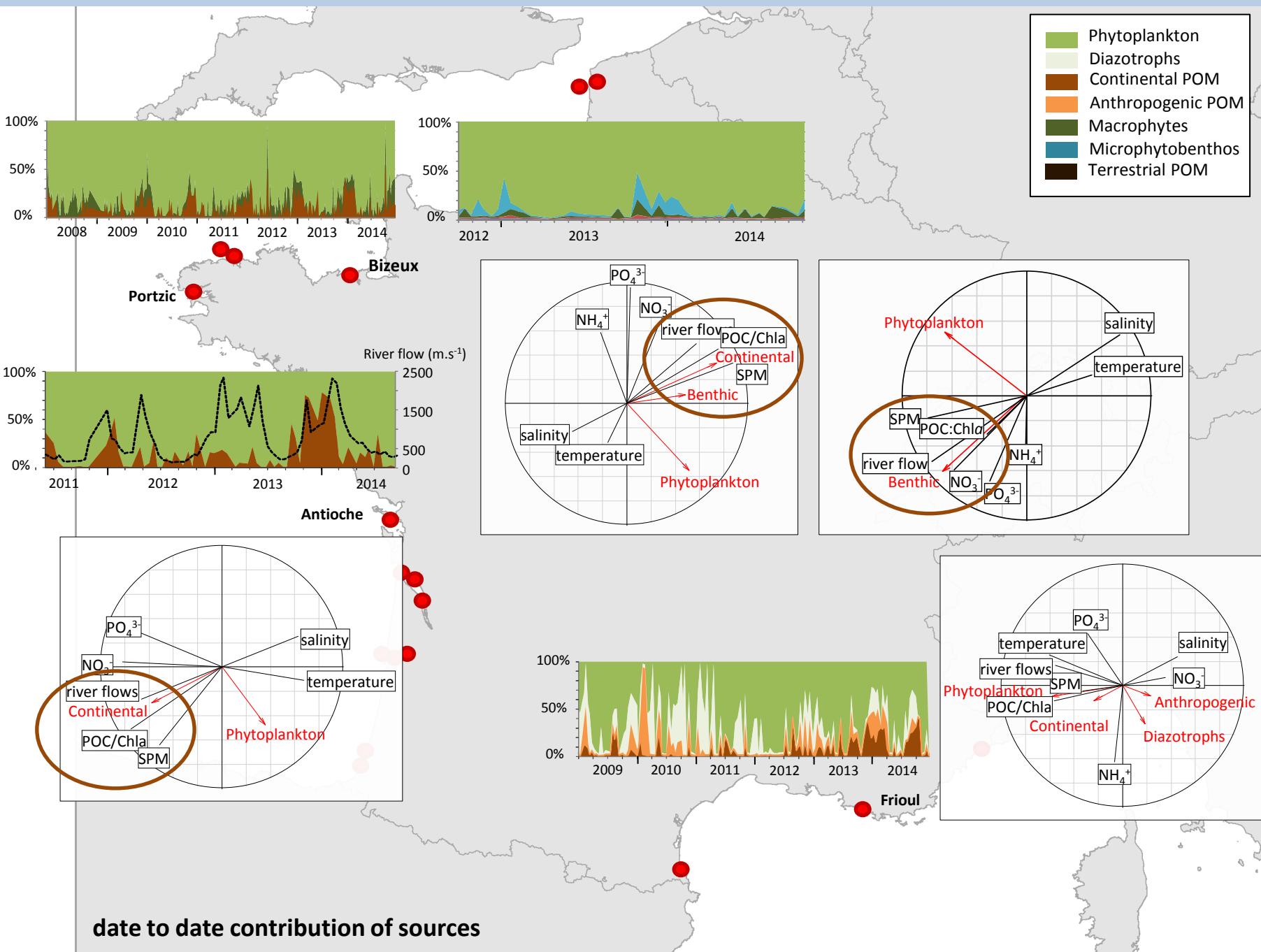


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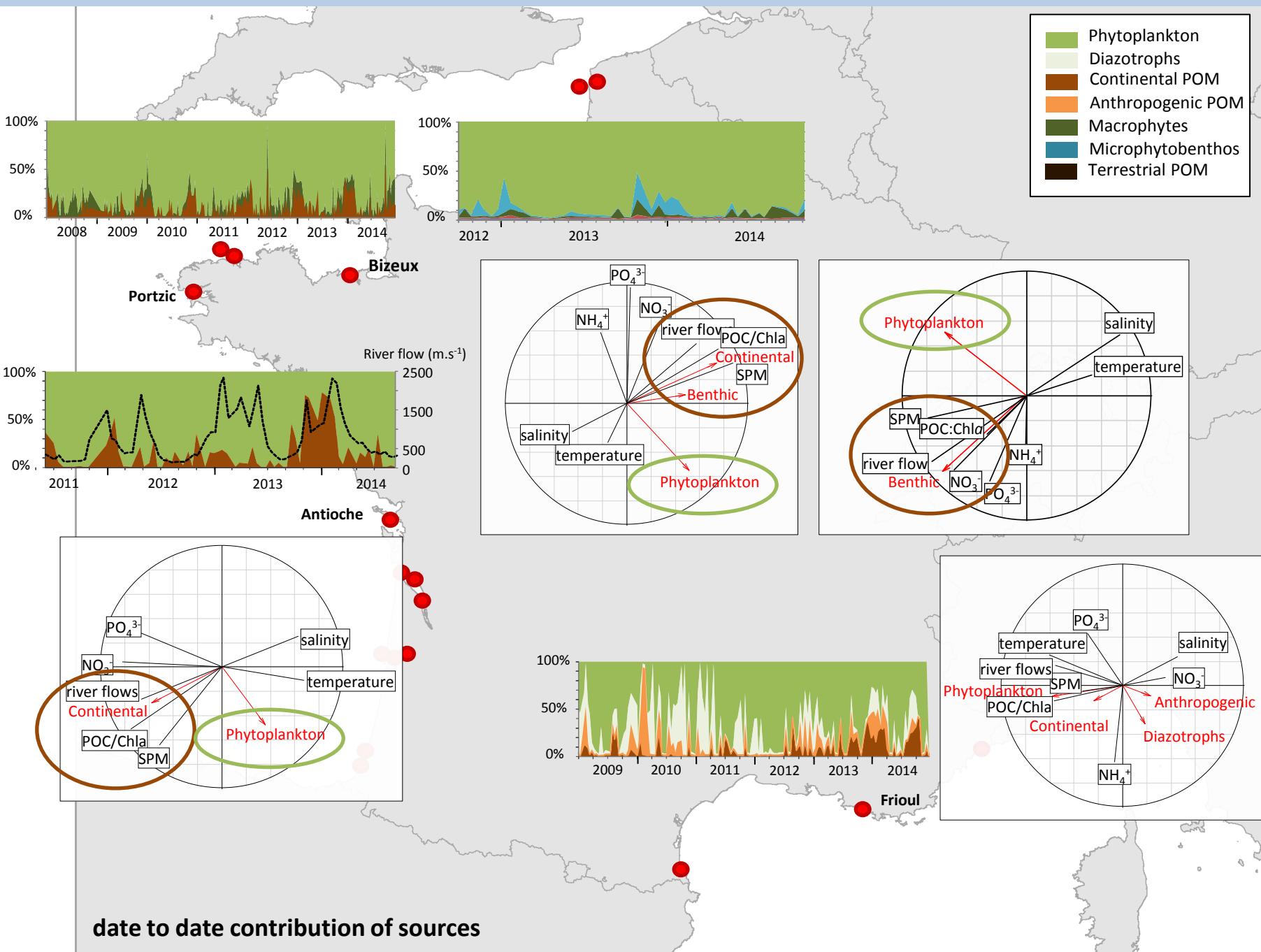


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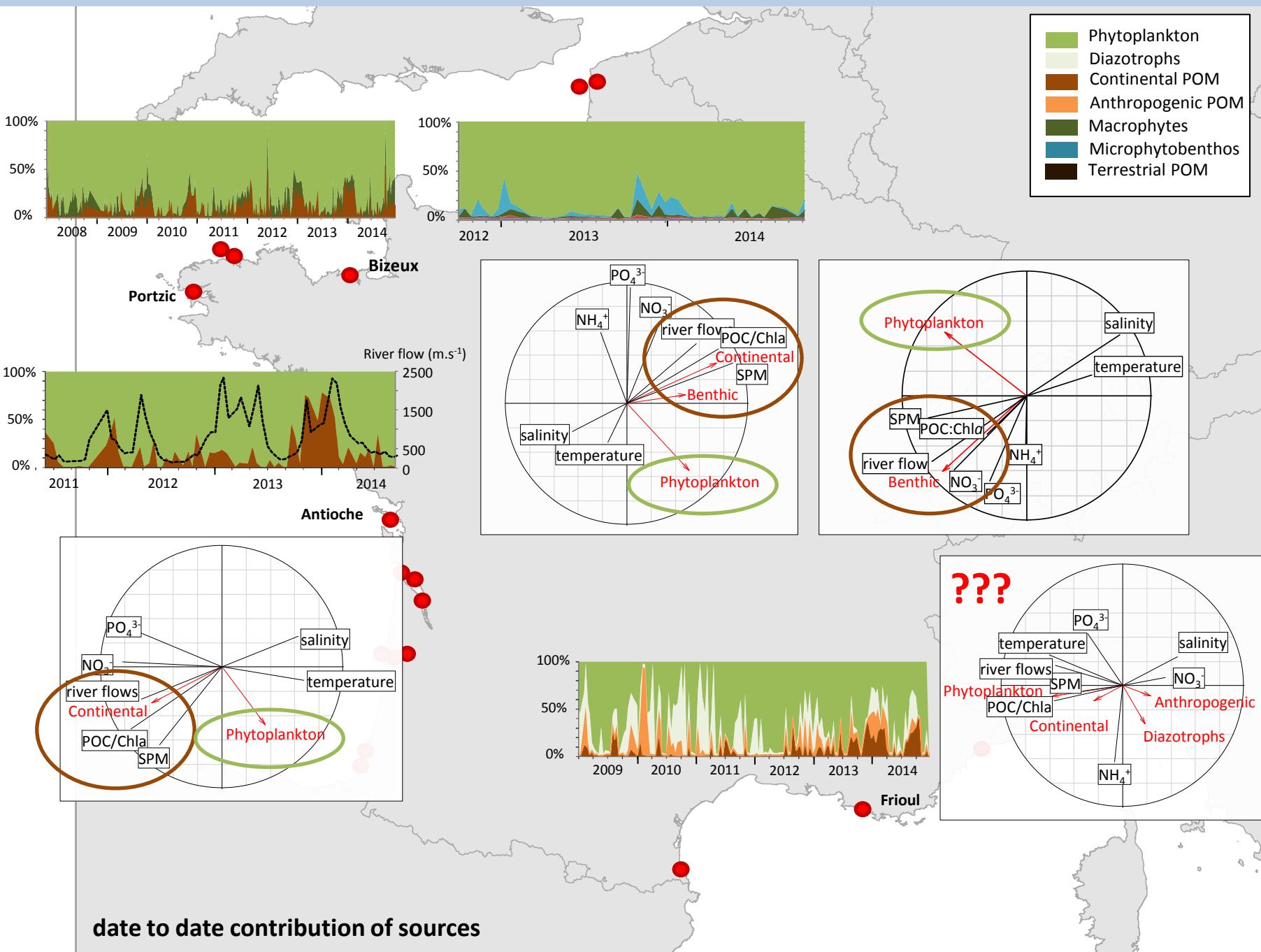


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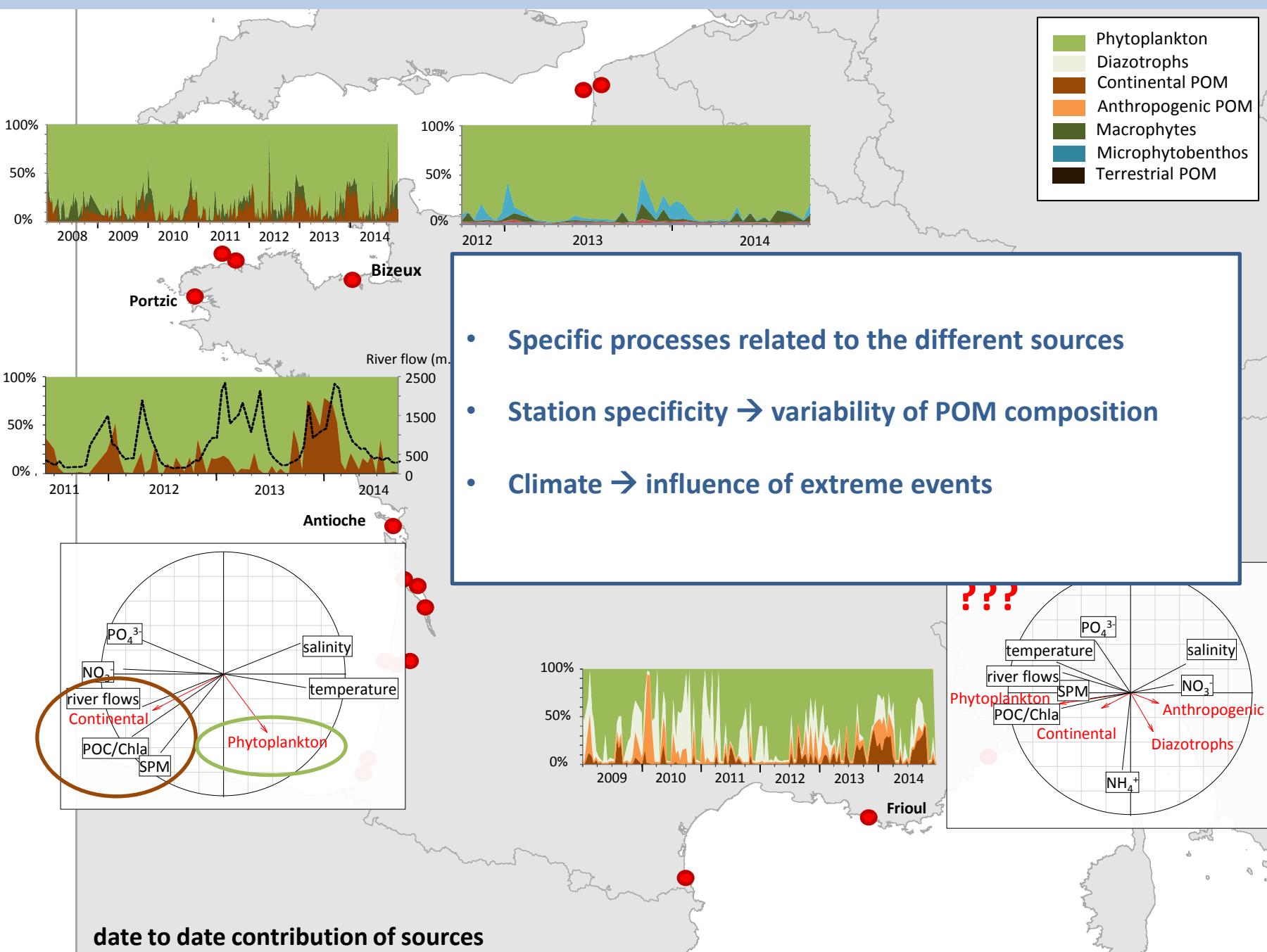


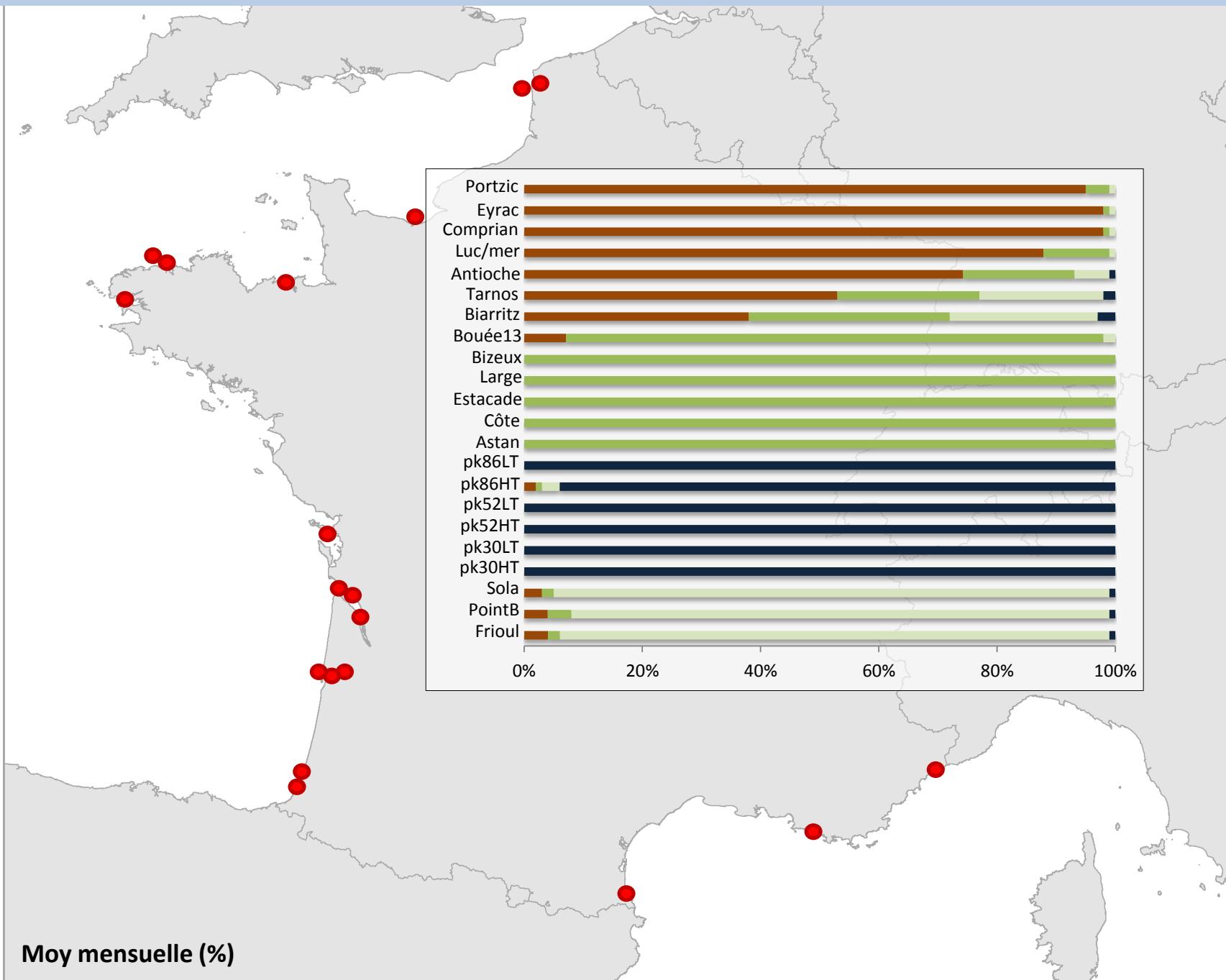
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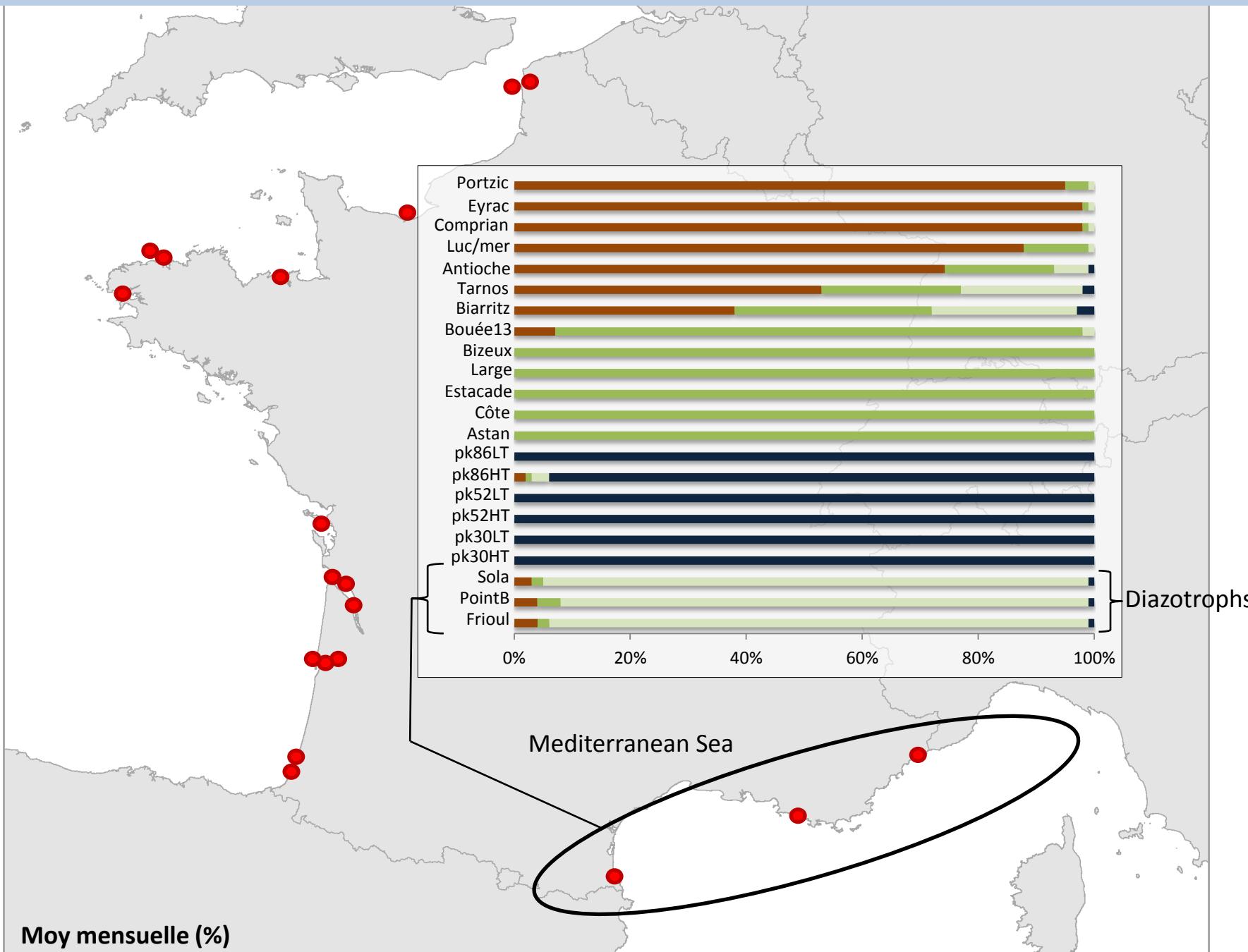


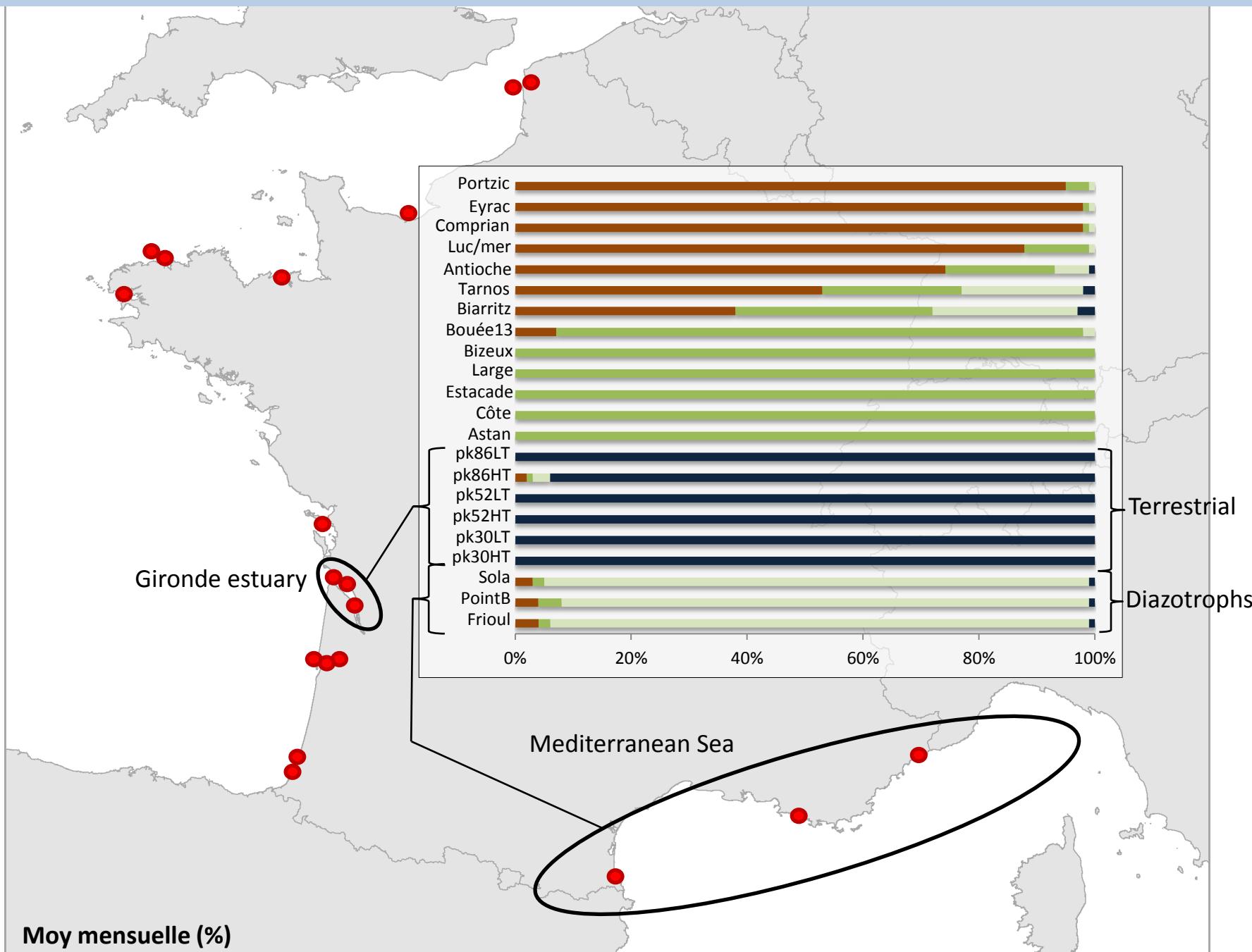
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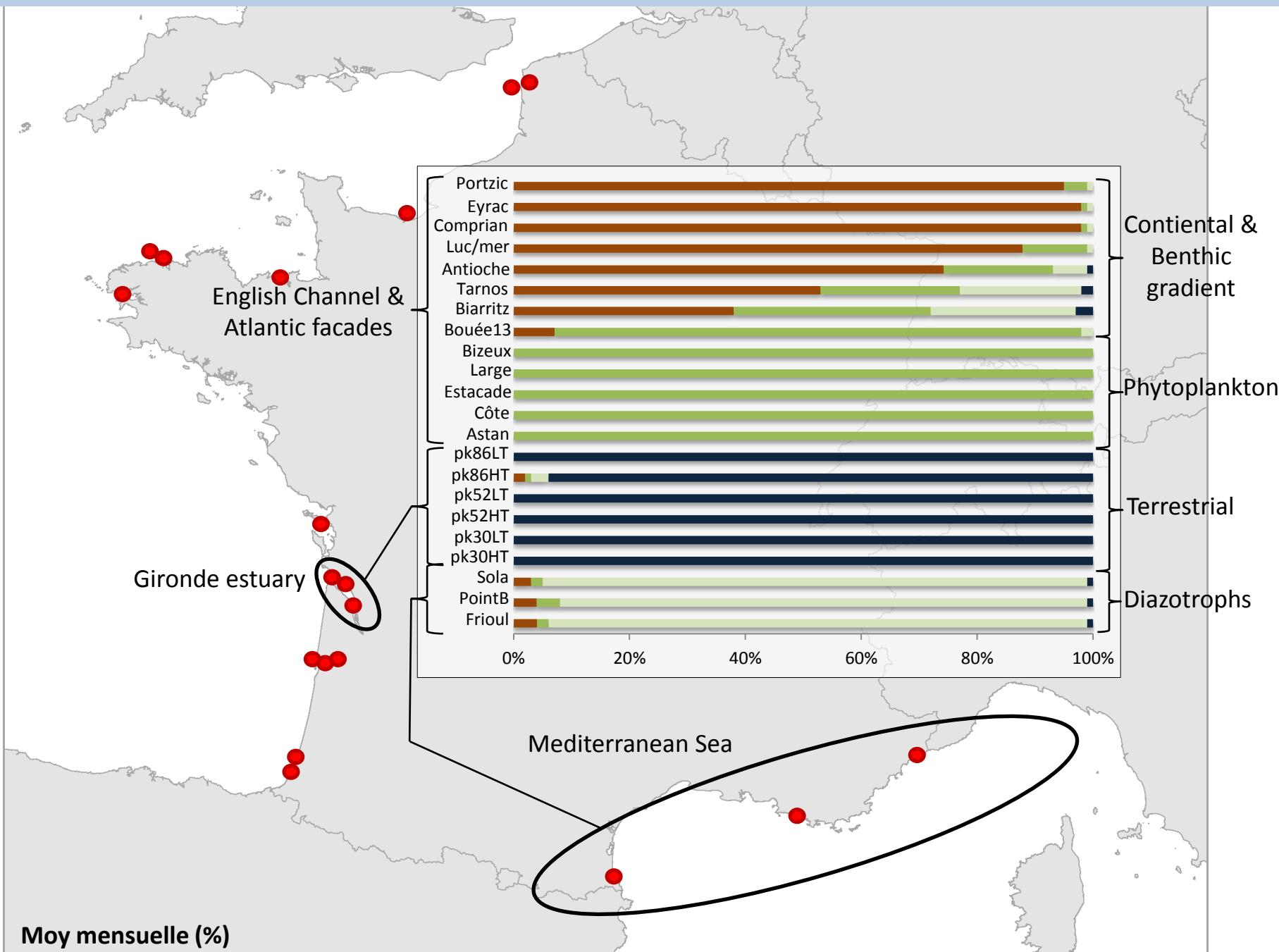
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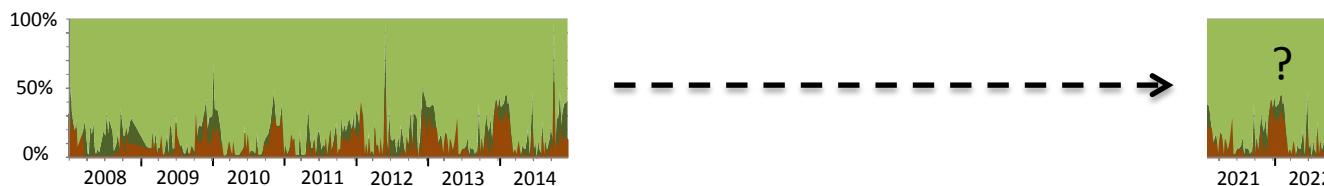




- **Various POM composition** over the French littoral
- **Spatial and temporal variability** of POM composition due to **physical and geomorphological forcings**
- Part of the forcings (river flows, resuspension, stochastic events) are **strongly influenced by local/regional climate**

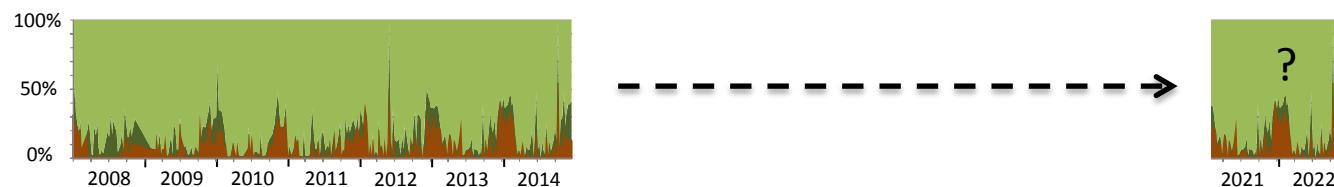
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→ In the context of climat change : **long term evolution of POM composition ?**



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→ In the context of climat change : **long term evolution of POM composition ?**



→ Multiplicity of sources → **selection of the resource by consumers**





Merci pour votre
attention ... Et un
immense merci à
tout le réseau
SOMLIT et MOSLIT
pour votre aide sur
ce projet!