



SPASSO

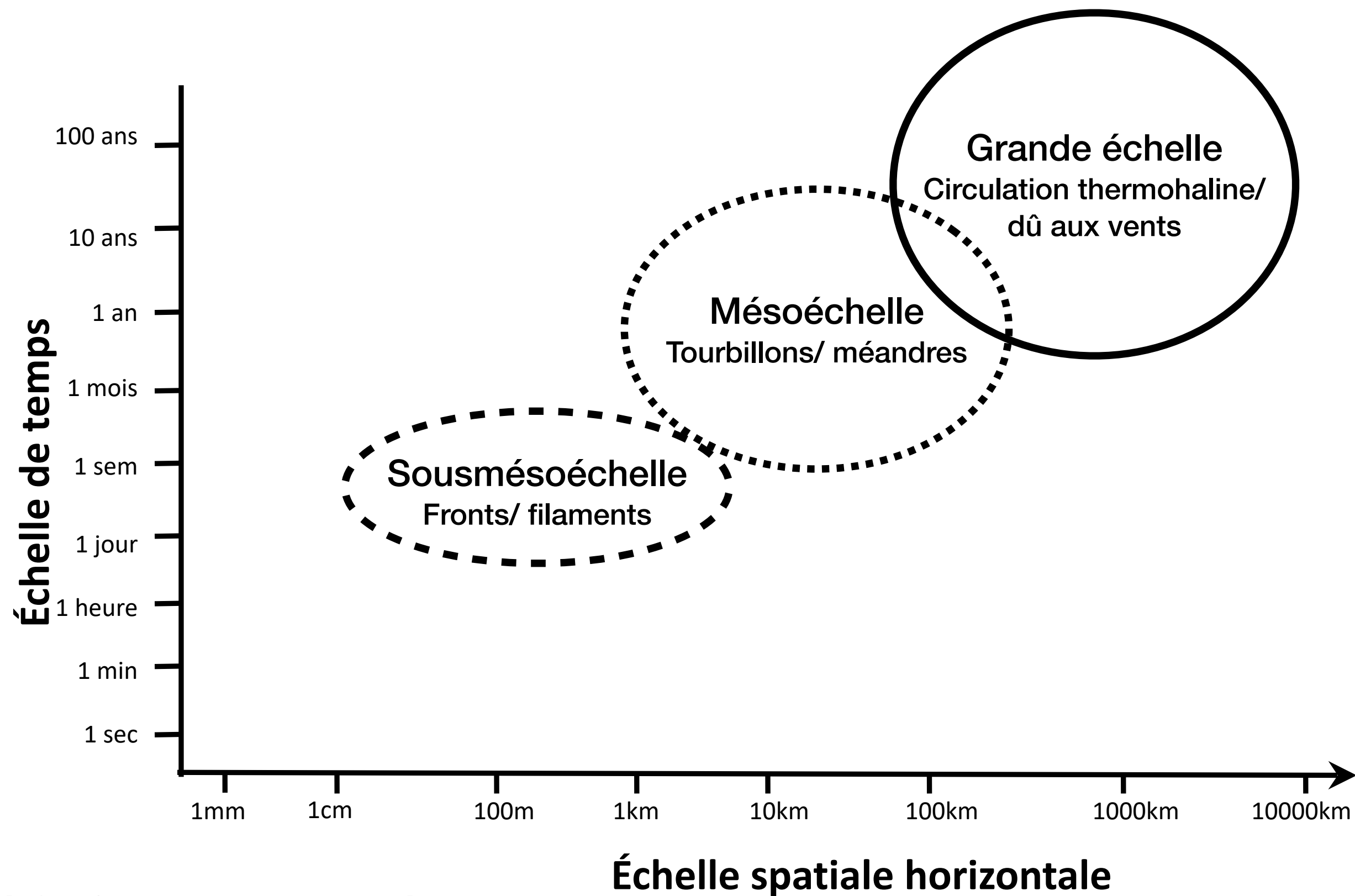
***un outil numérique pour les stratégies
d'échantillonnage adaptative***



Louise Rousselet

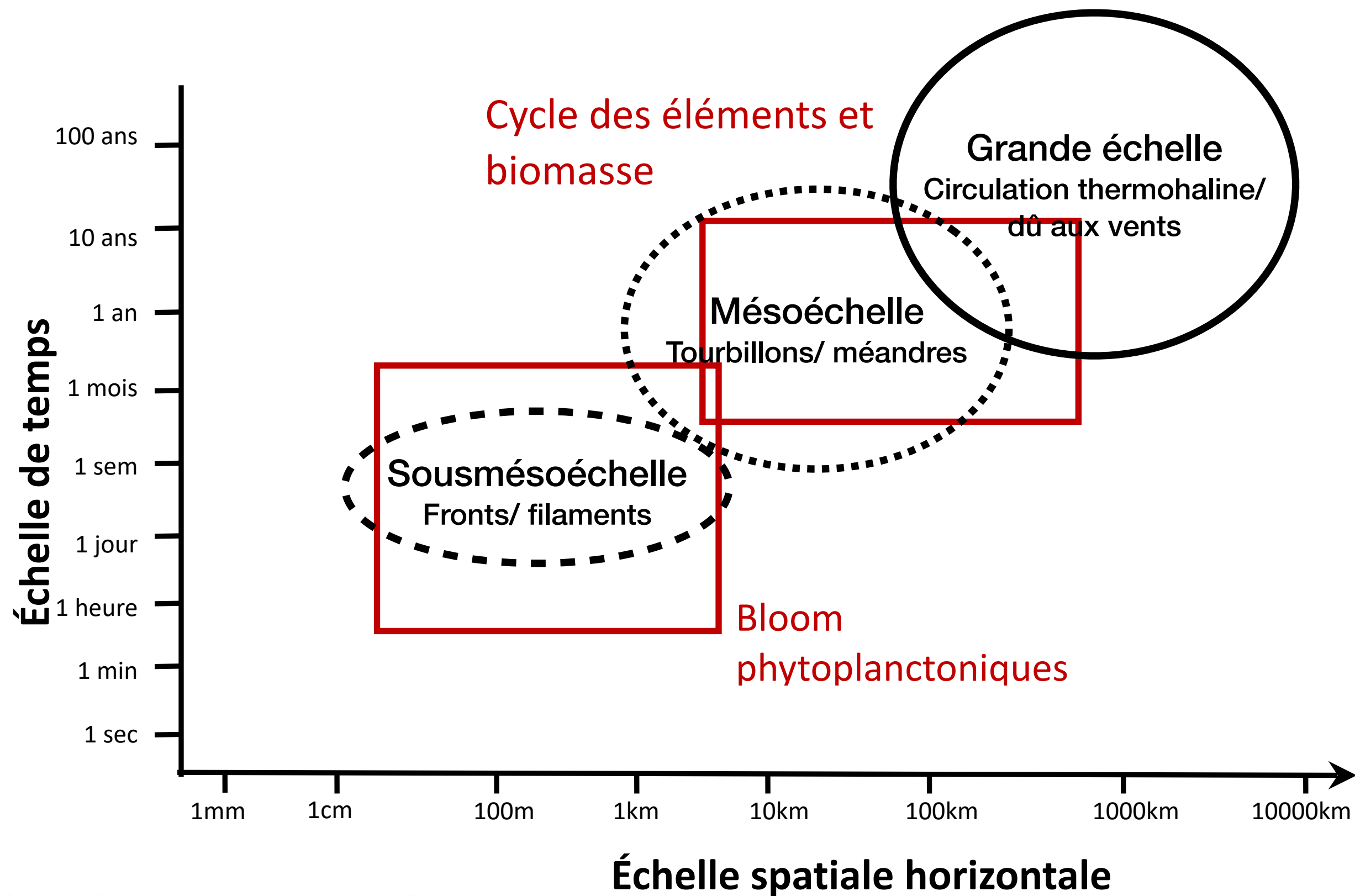


Le défi de l'échantillonnage biophysique



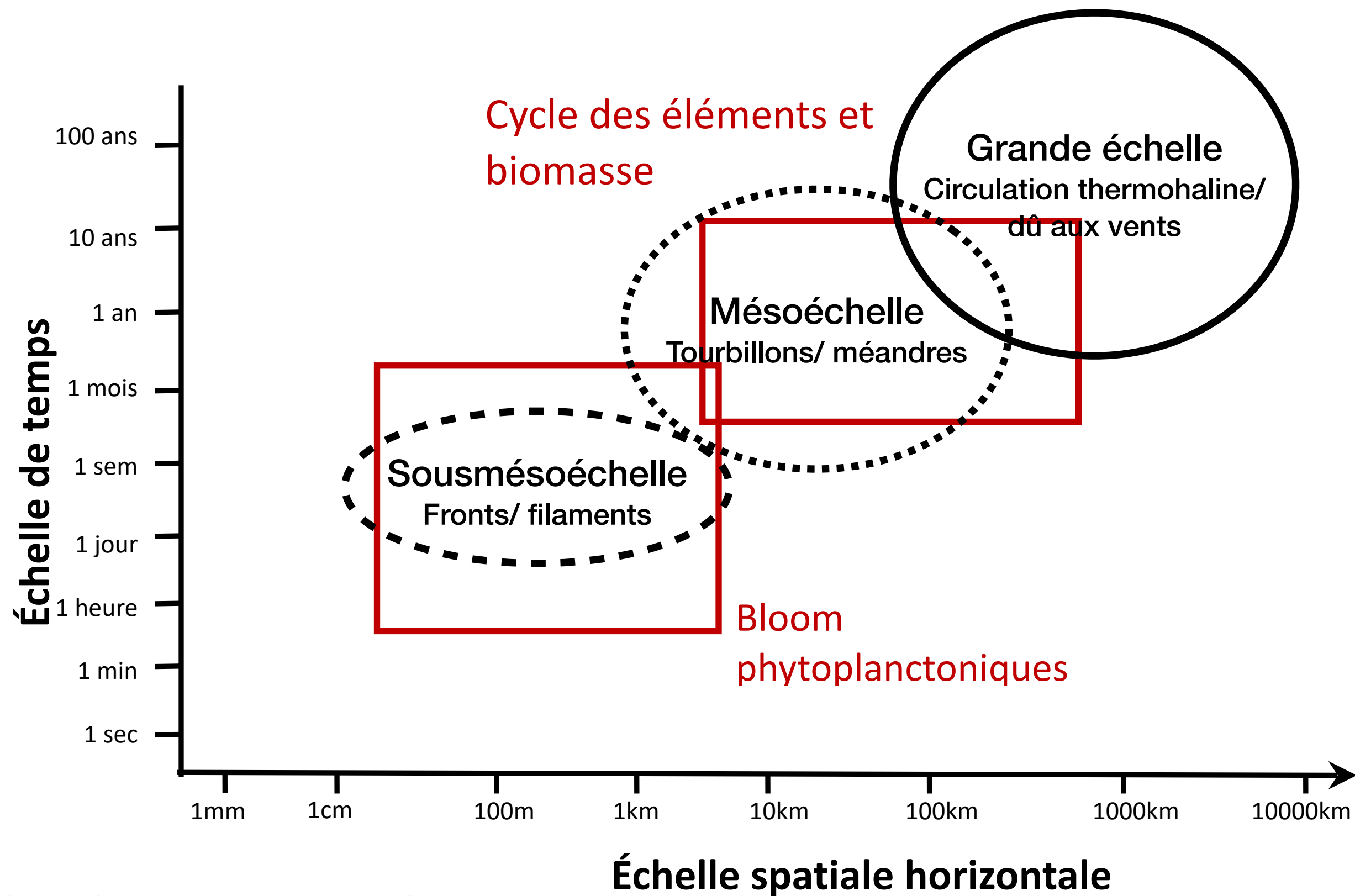
[D'après Dickey 1991, 2003]

Le défi de l'échantillonnage biophysique

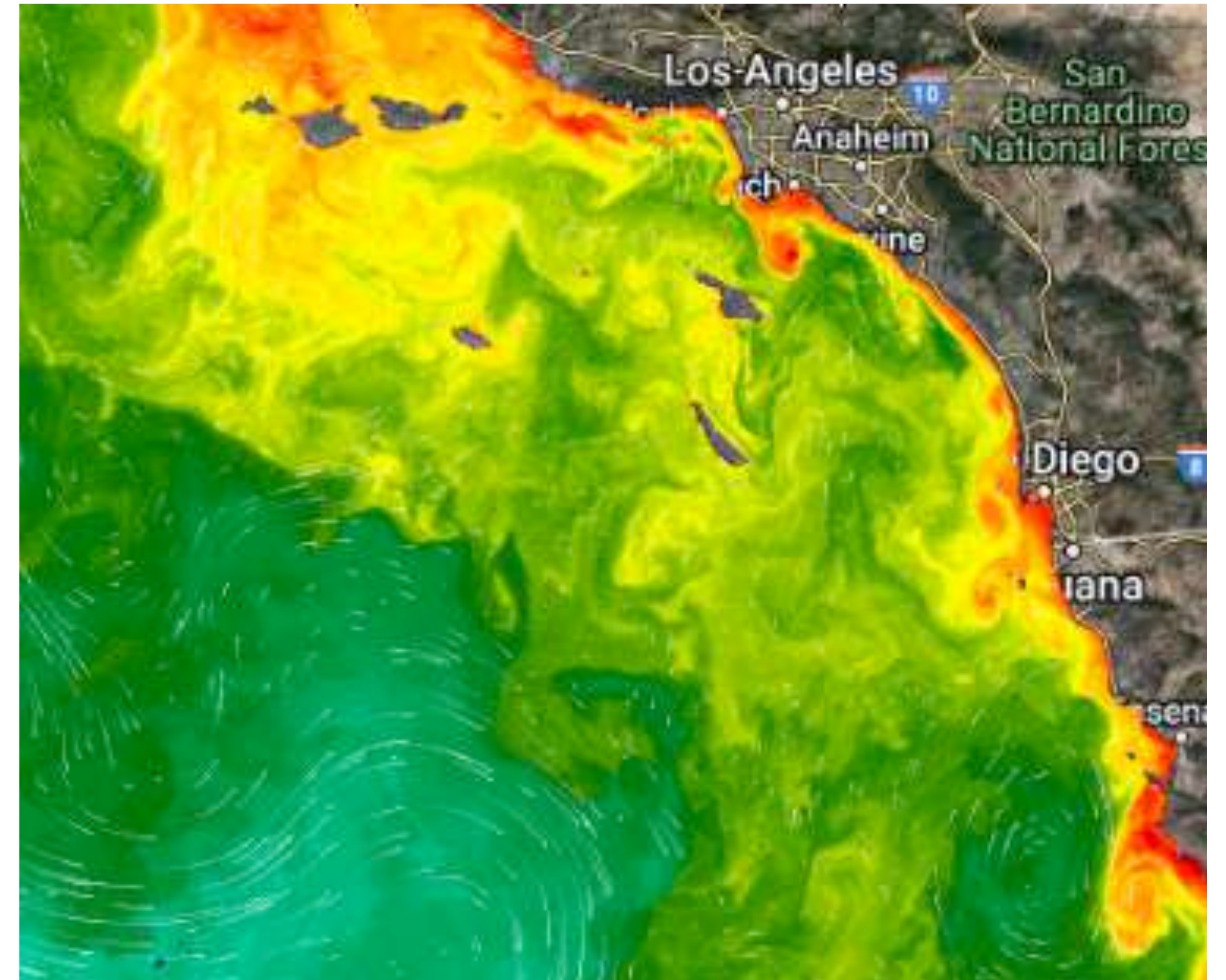


[D'après Dickey 1991, 2003]

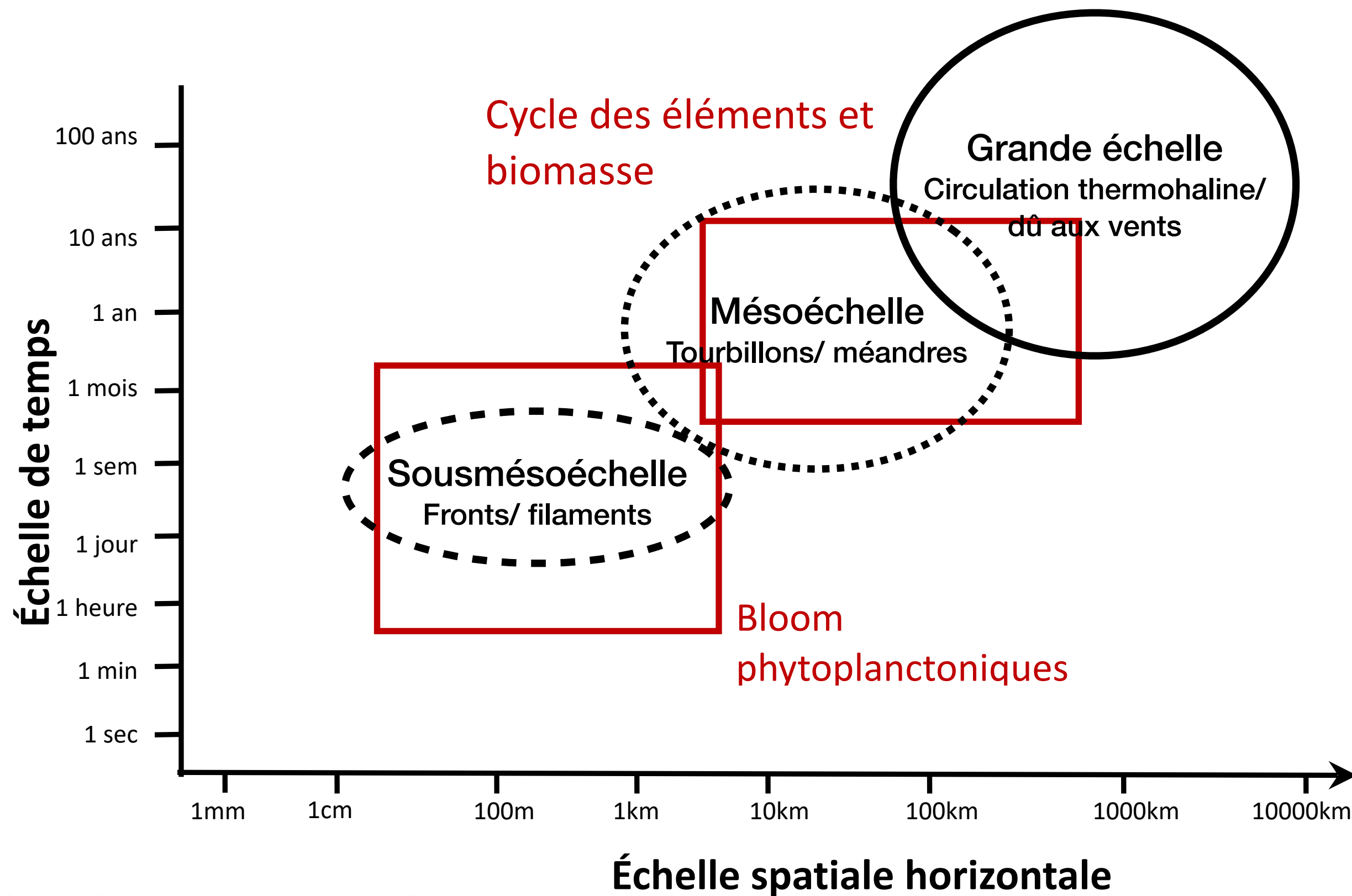
Le défi de l'échantillonnage biophysique



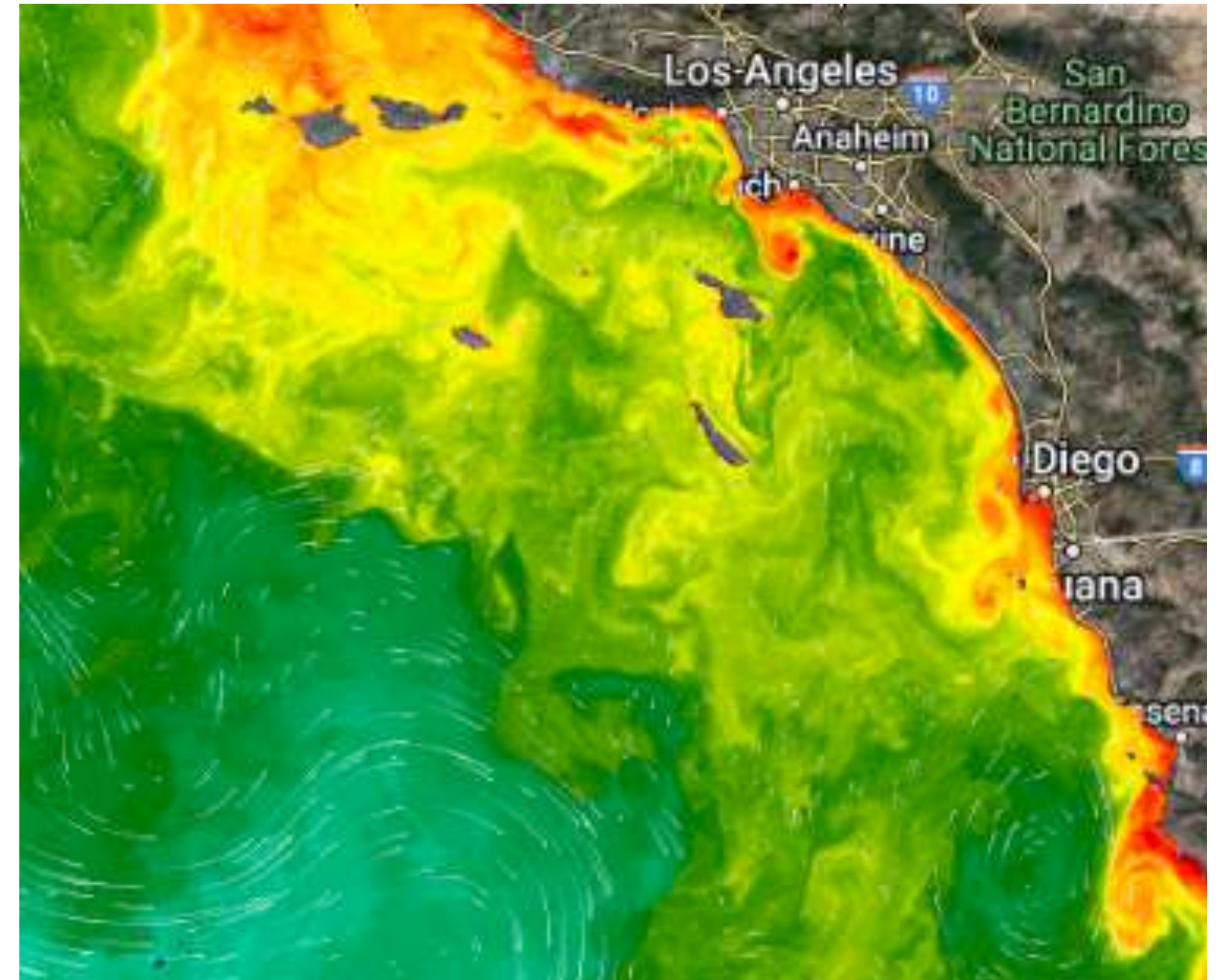
[D'après Dickey 1991, 2003]



Le défi de l'échantillonnage biophysique



[D'après Dickey 1991, 2003]



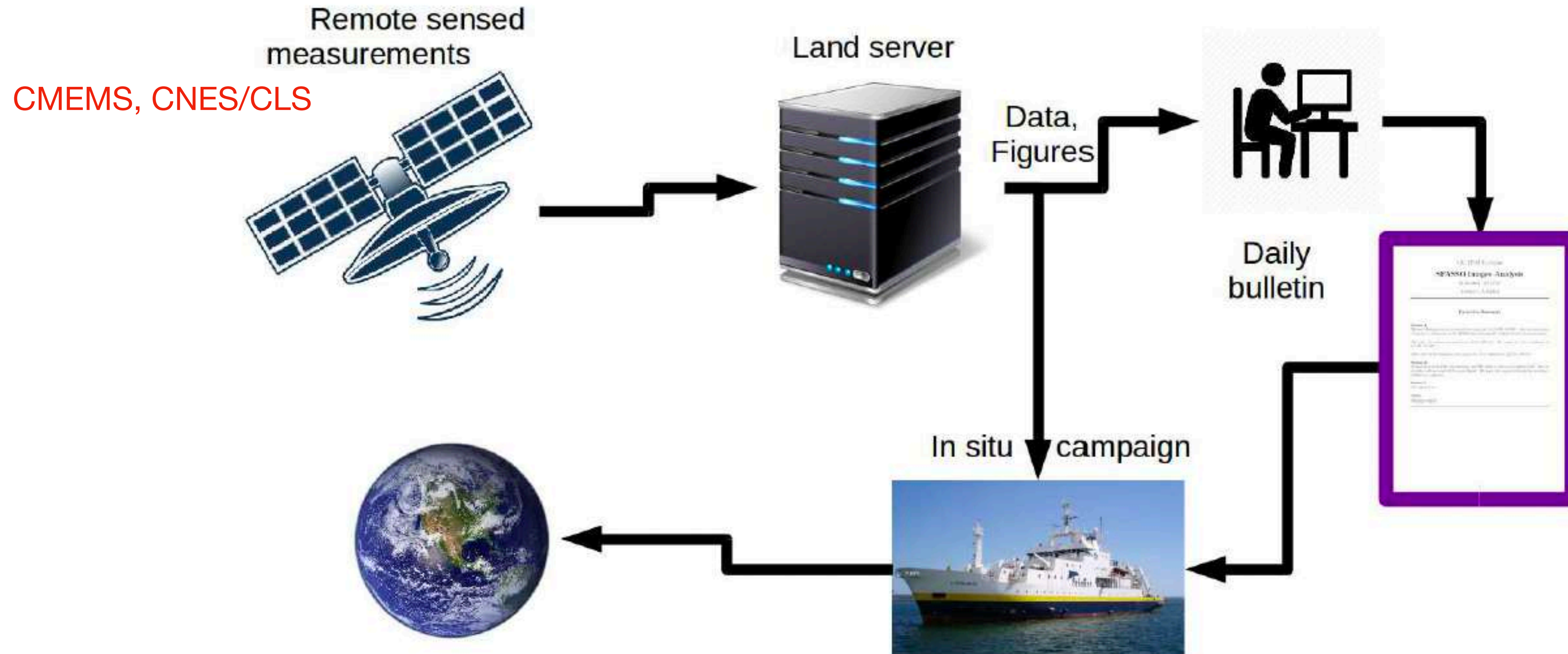
« Leur taille représente une **barrière d'observations** [...] » [From McWilliams, 2016]

“Les courants sous-mésoéchelle sont en constante formation, évolution et mouvement à des échelles de quelques jours à semaines ce qui les rend **particulièrement difficile à échantillonner et modéliser.**”

[From Lévy, 2018]

Un outil numérique Python: SPASSOv2.0

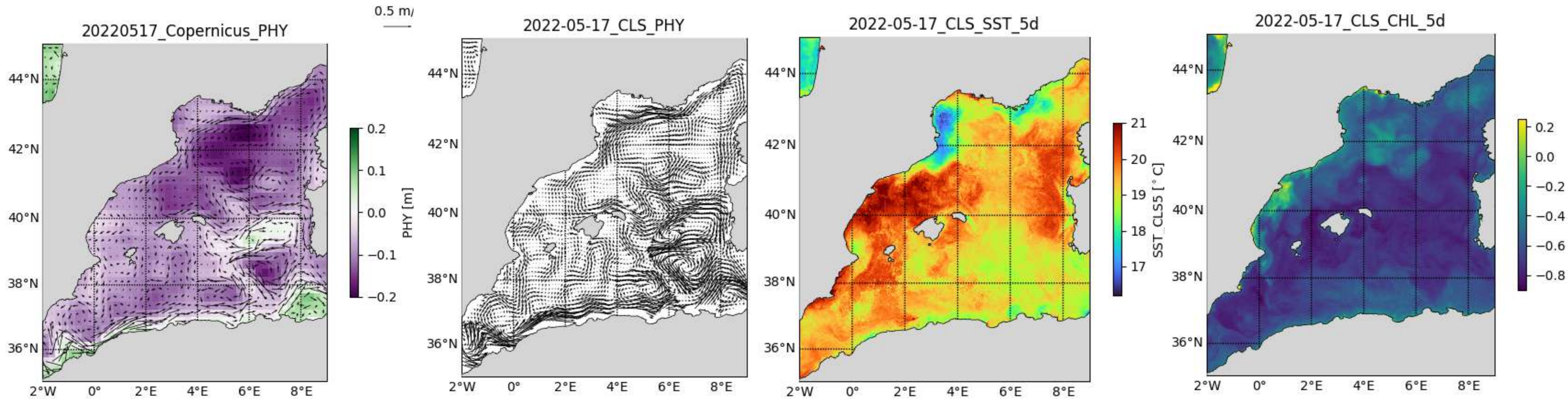
- *Software Package for an Adaptive Satellite-based Sampling for Oceanographic cruises (SPASSO)*



Images satellites NRT

- *SPASSO*

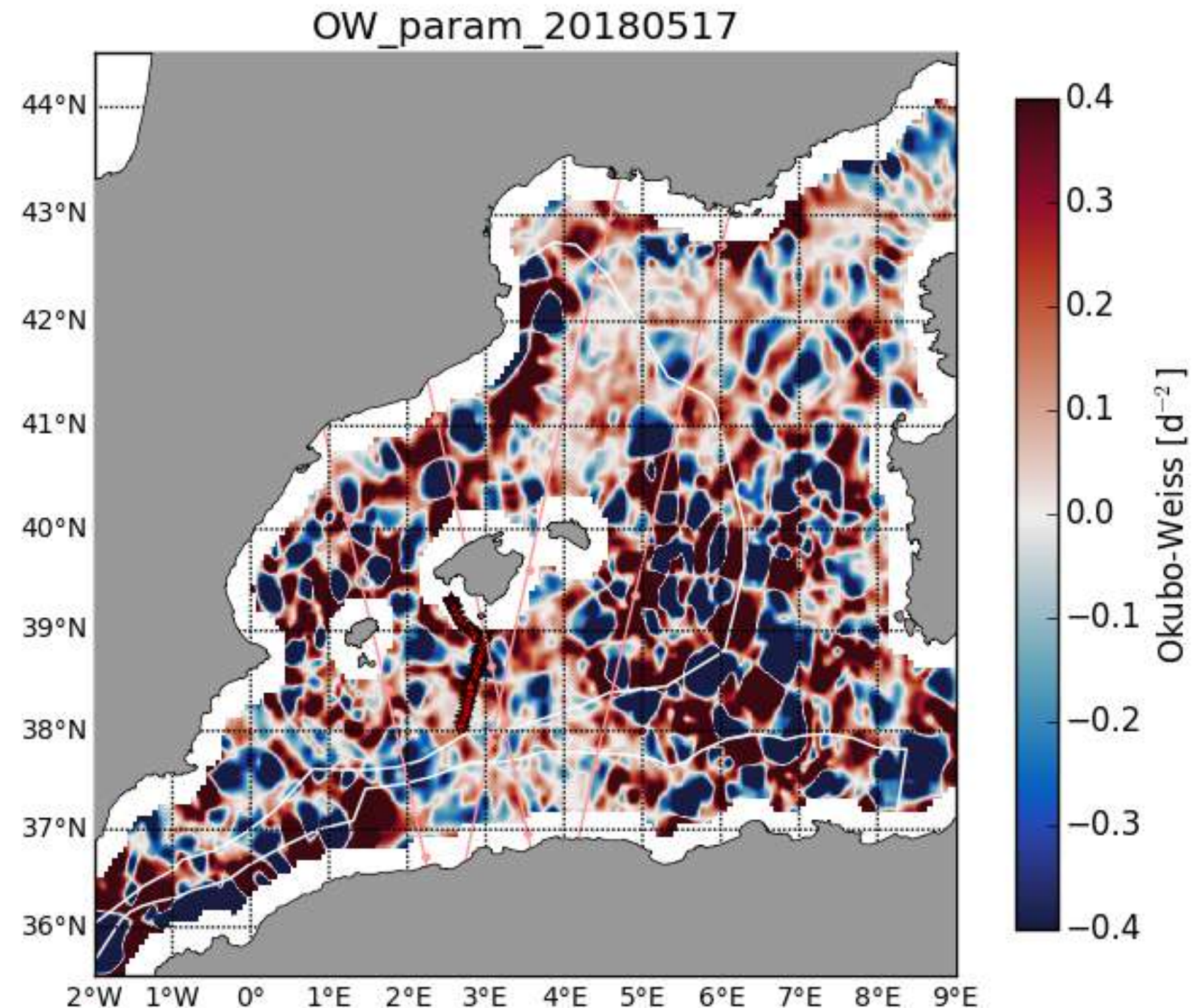
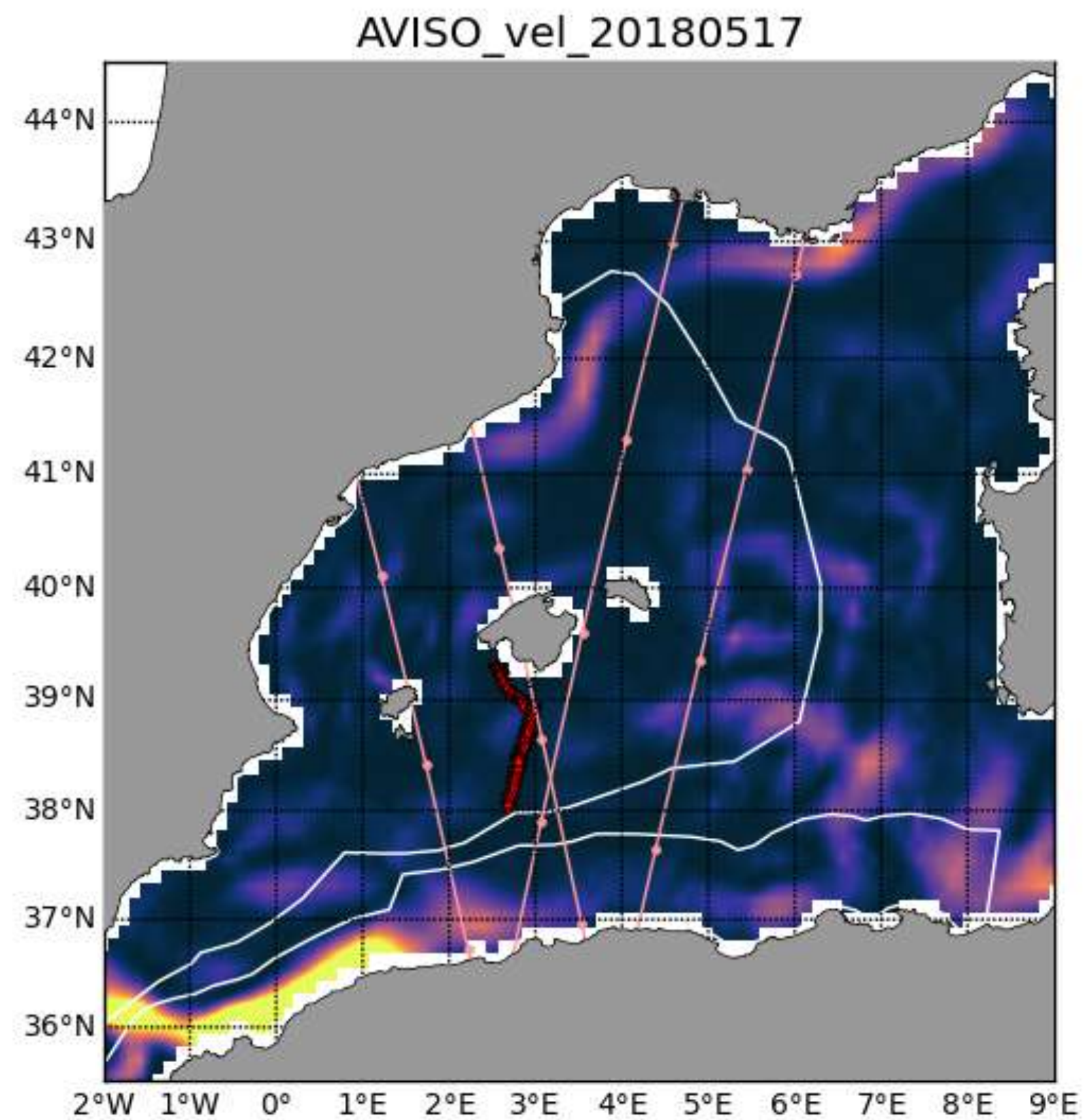
→ Courants, SST et CHL



Diagnostiques de la dynamique physique

- *SPASSO*

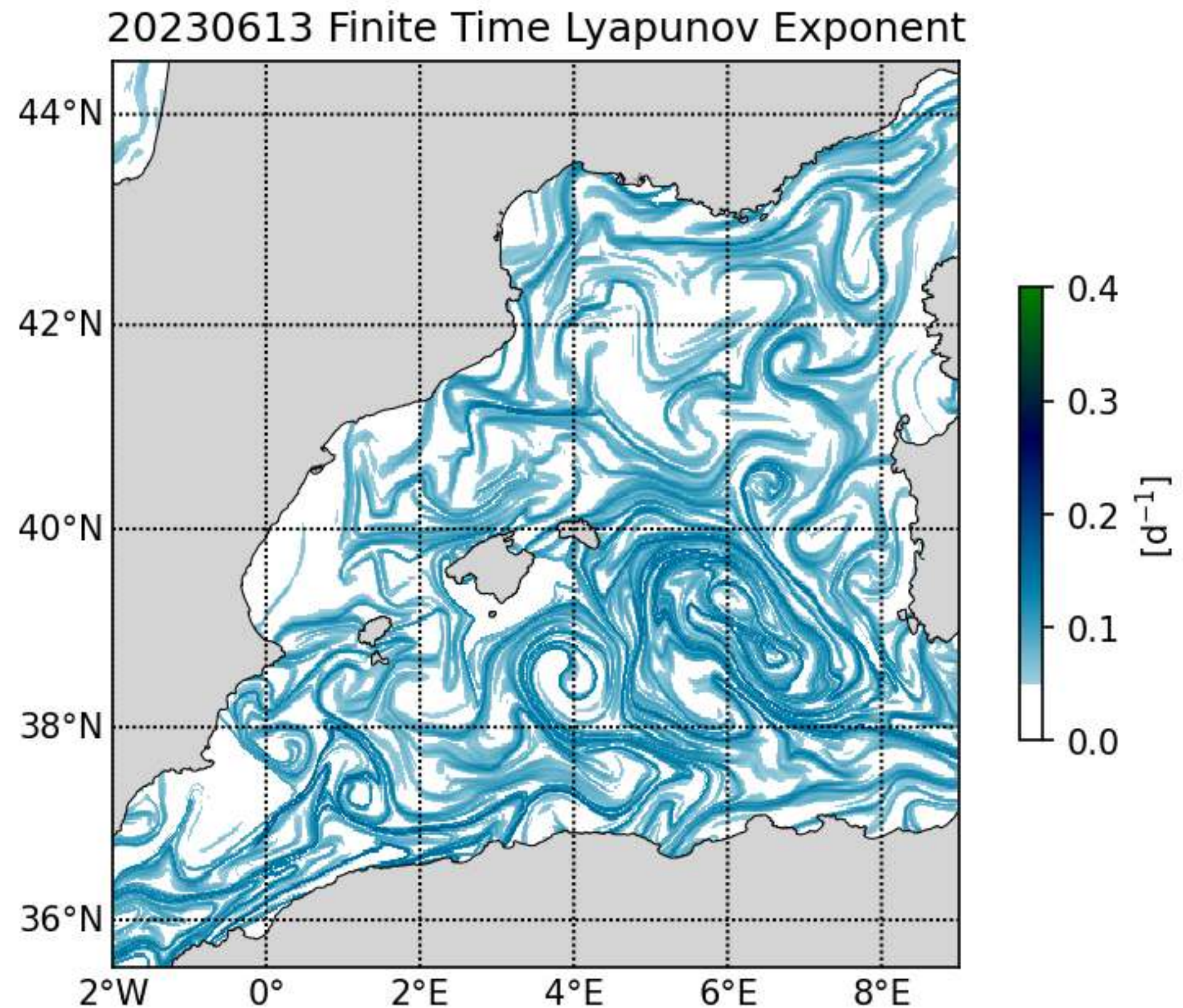
→ Eulérien: Énergie cinétique & paramètre d'Okubo-Weiss



Diagnostiques de la dynamique physique

- *SPASSO* couplé à **LAMTA** (*L*Agrangian Manifolds Tracking Algorithm)

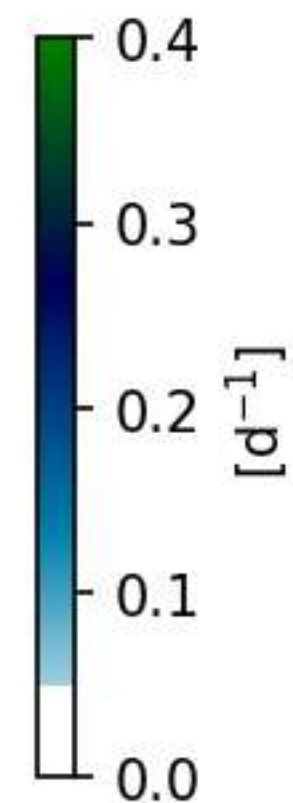
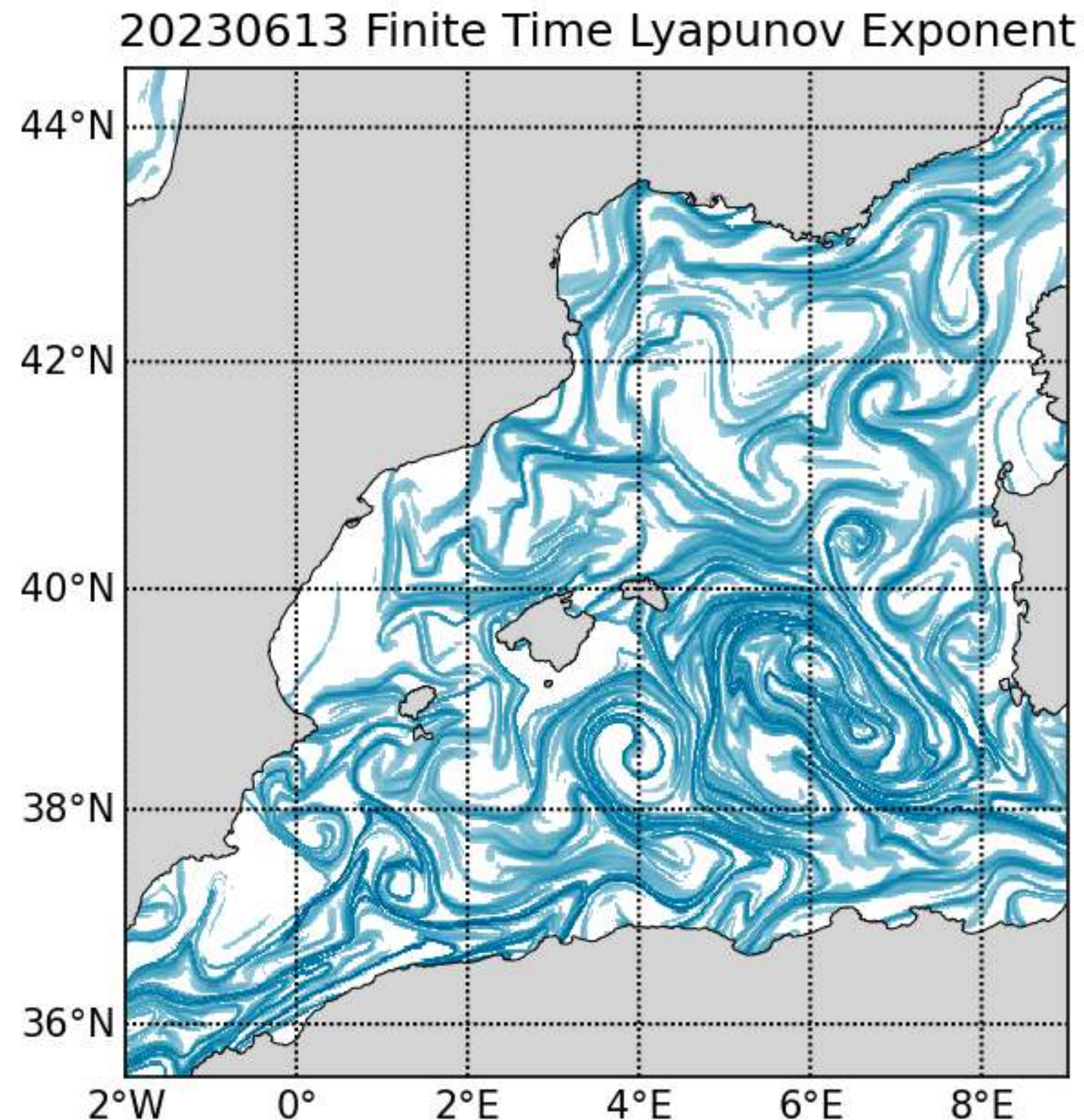
→ Lagrangien: Exposants de Lyapunov



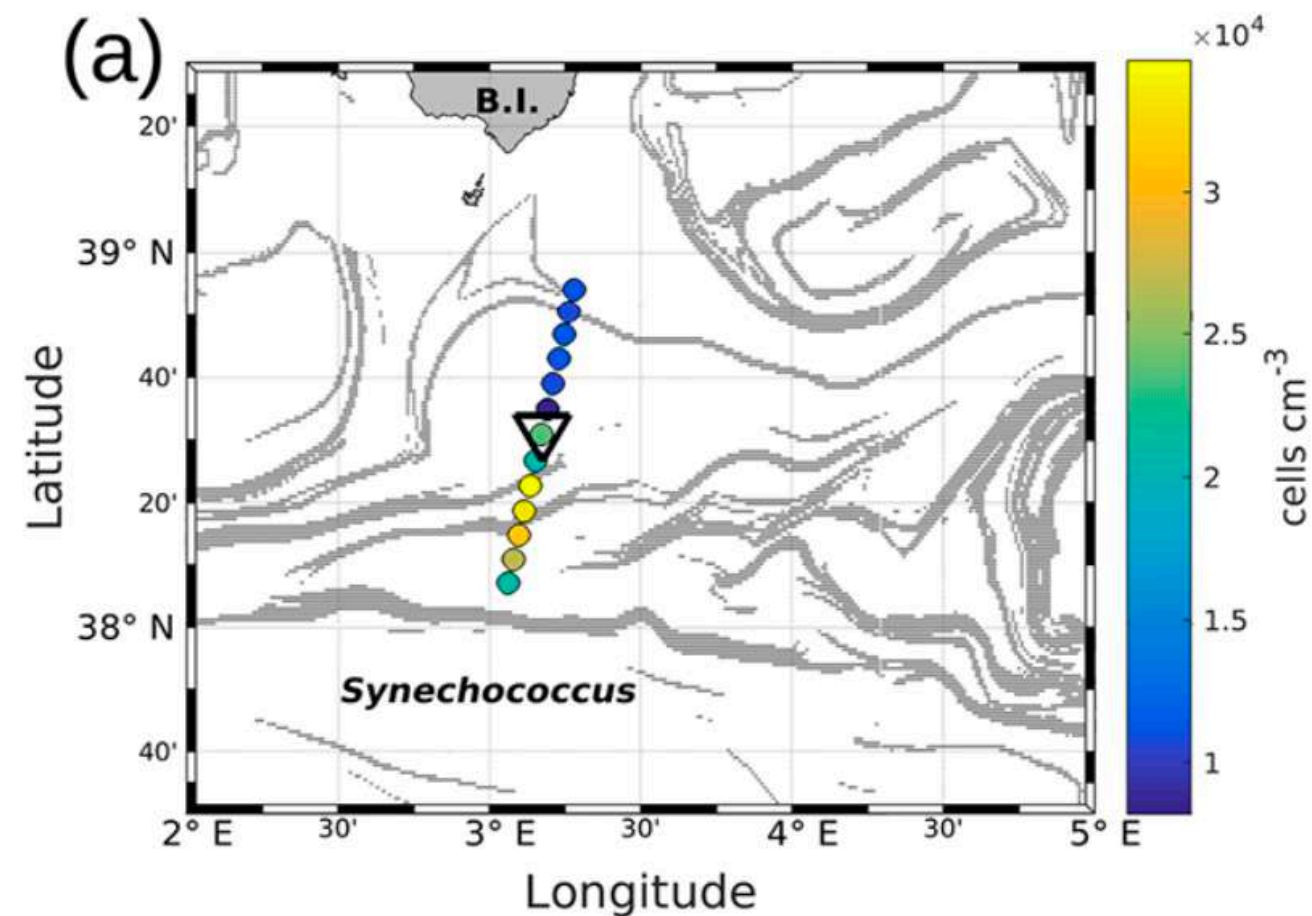
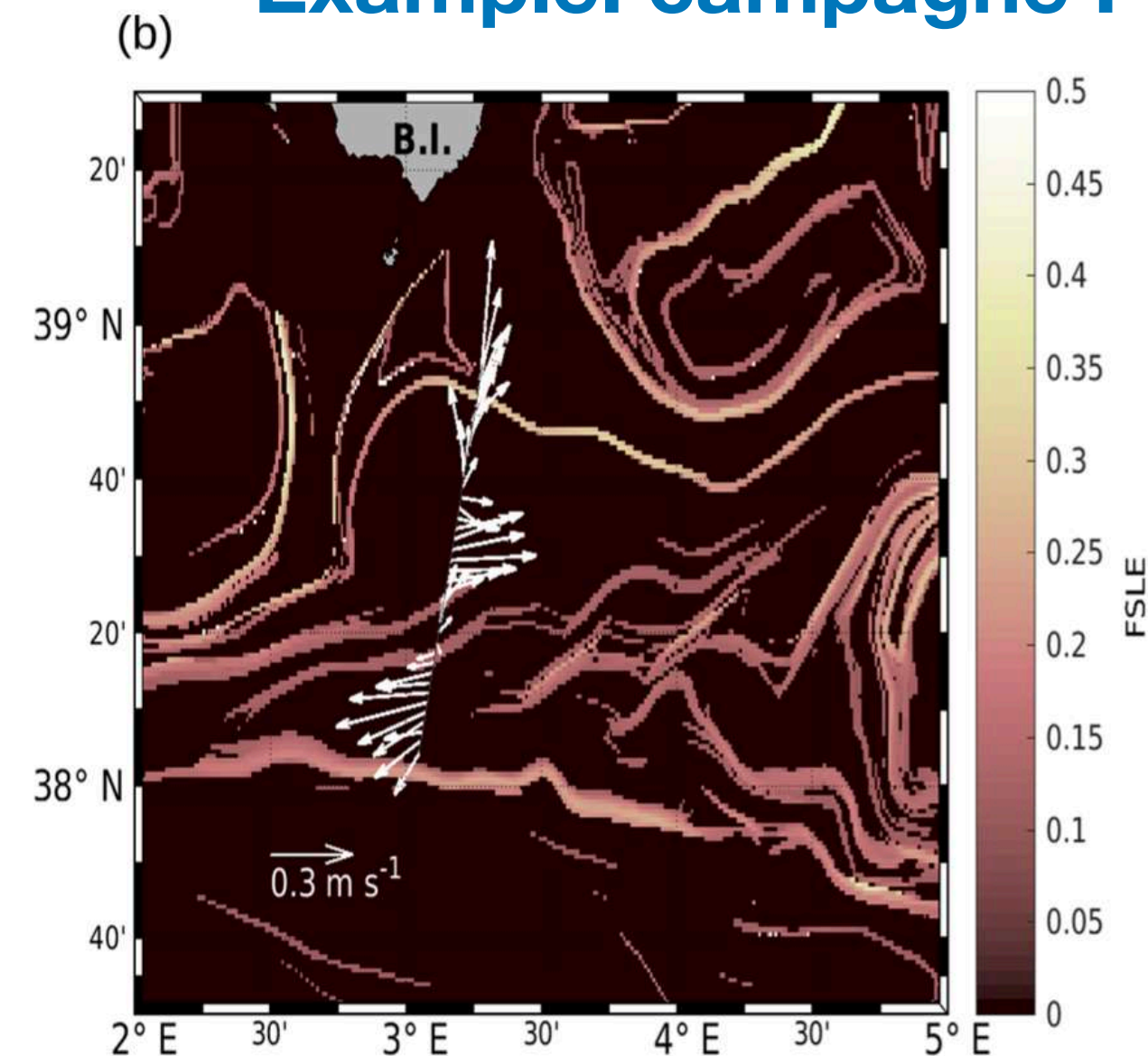
Diagnostiques de la dynamique physique

- *SPASSO* couplé à **LAMTA** (*L*Agrangian *M*anifolds *T*racking *A*lgorithm)

→ Lagrangien: Exposants de Lyapunov → **délimitent régions contrastées**



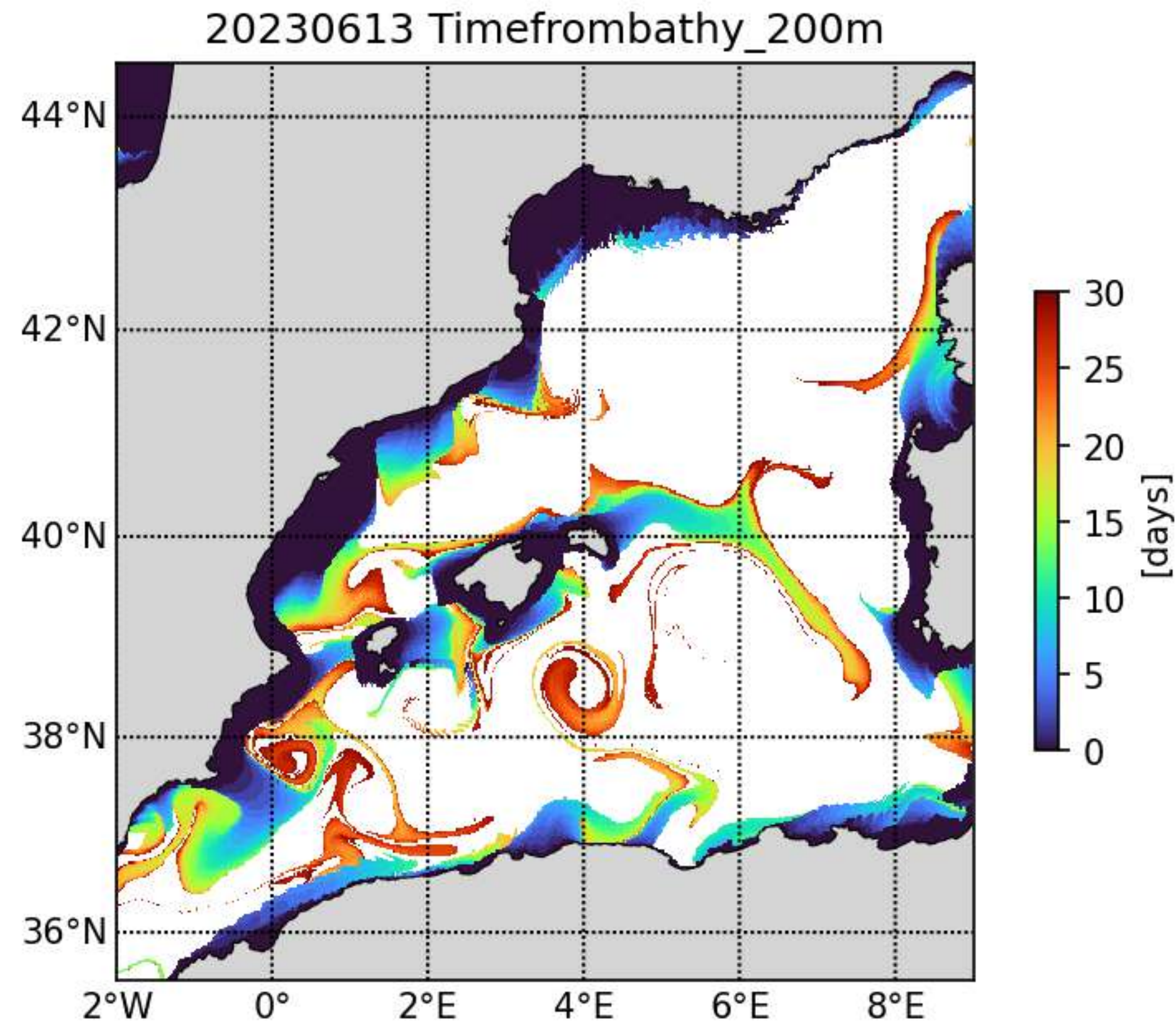
Example: campagne **PROTEVSMED-SWOT** (2018)



From Tzortzis et al., 2021

Diagnostiques de la dynamique physique

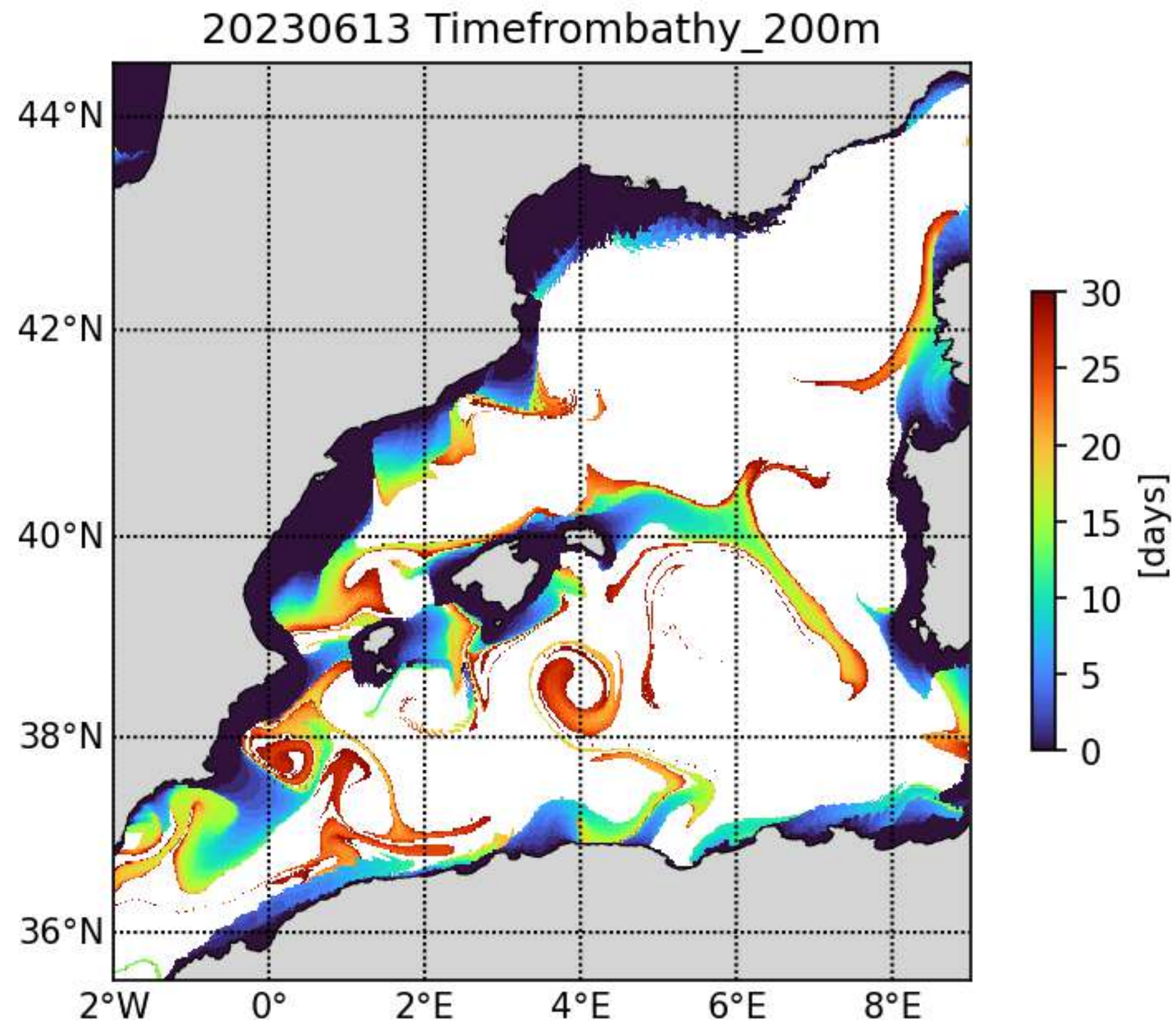
- *SPASSO* couplé à **LAMTA** (*LAgrangian Manifolds Tracking Algorithm*)
 - Lagrangien: âge des masses d'eau depuis contact avec isobathe



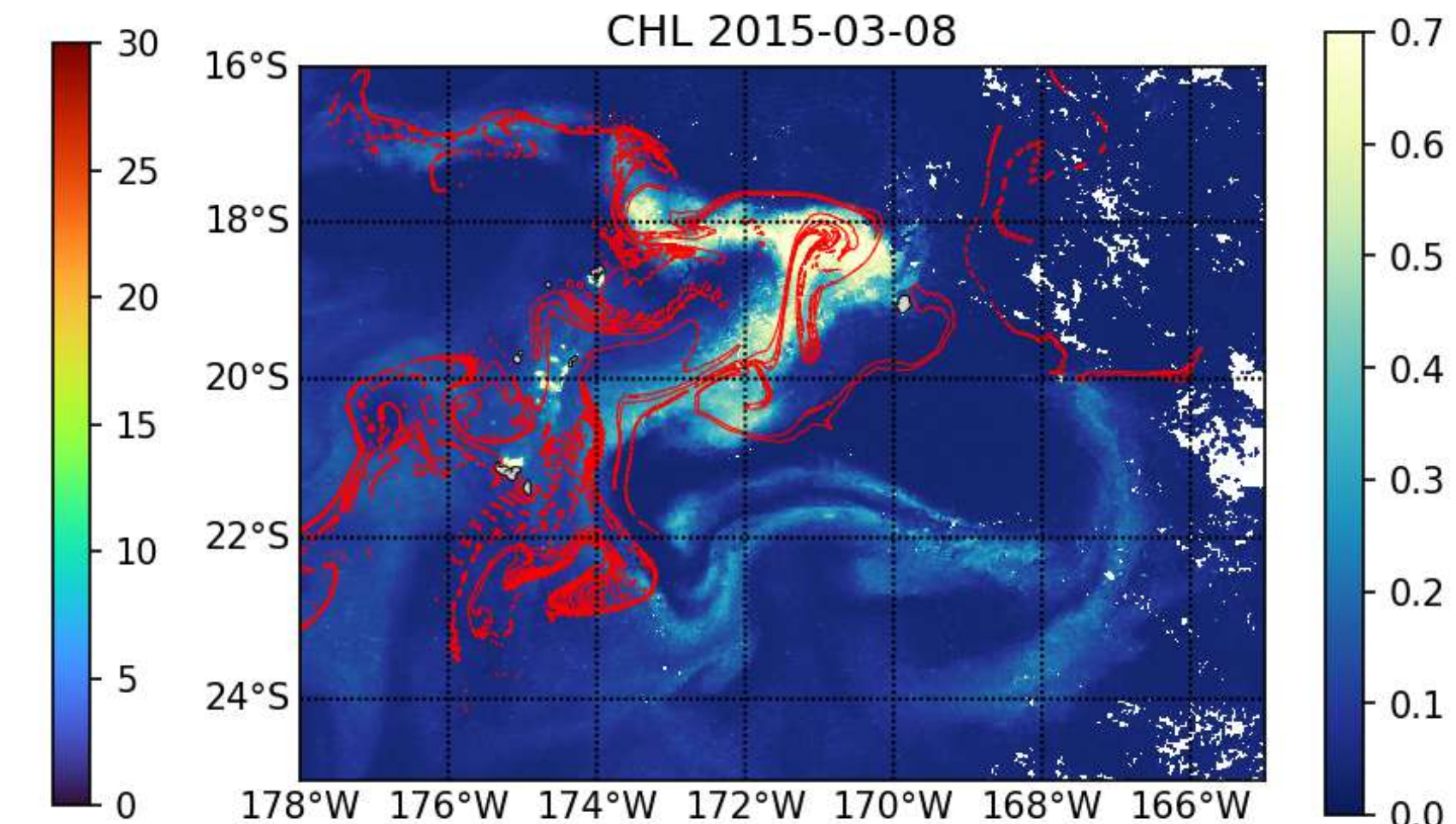
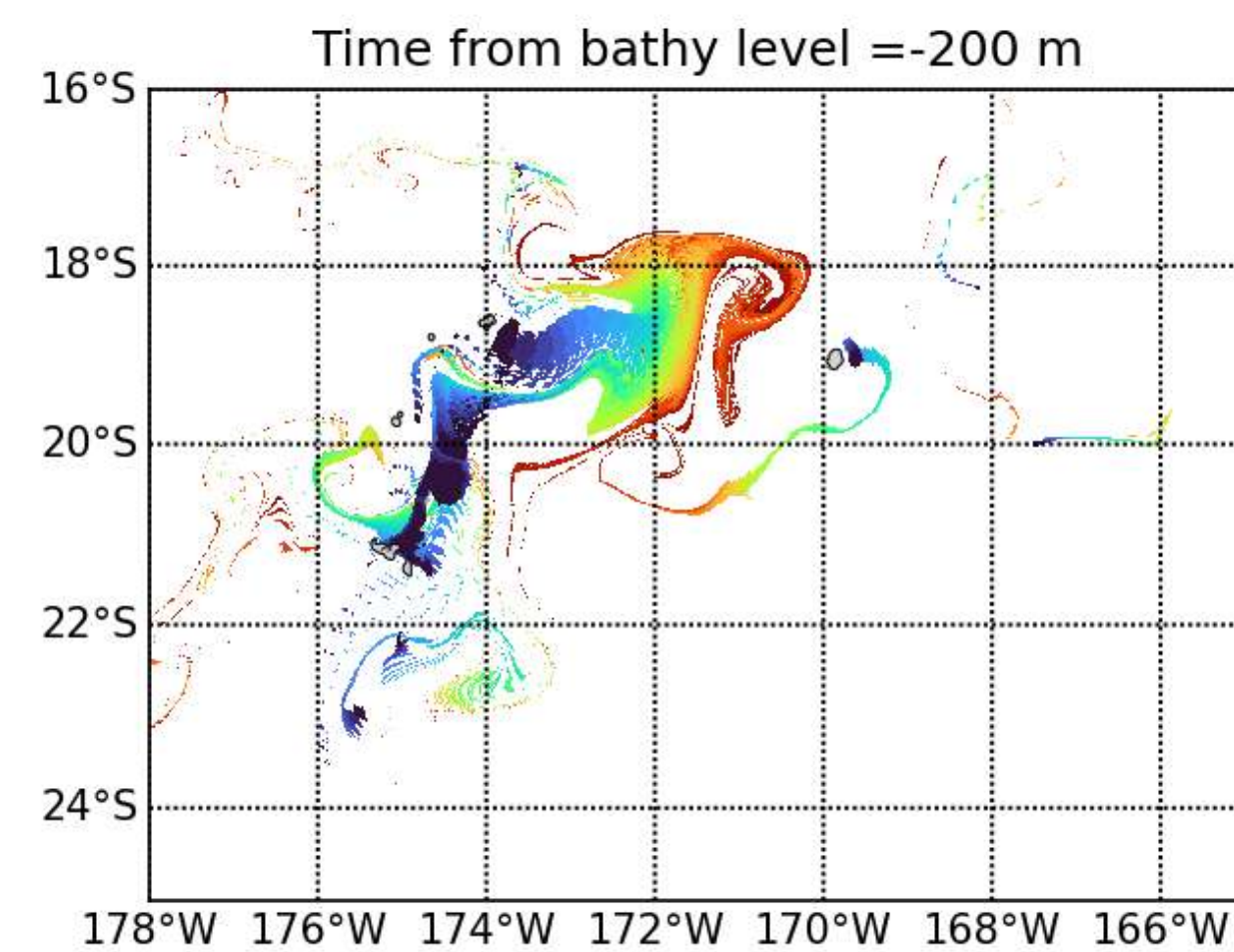
Diagnostiques de la dynamique physique

- *SPASSO* couplé à *LAMTA* (*LAgrangian Manifolds Tracking Algorithm*)

→ Lagrangien: âge des masses d'eau depuis contact avec isobathe → **enrichissement nutritif**



Example: campagne OUTPACE (2015)

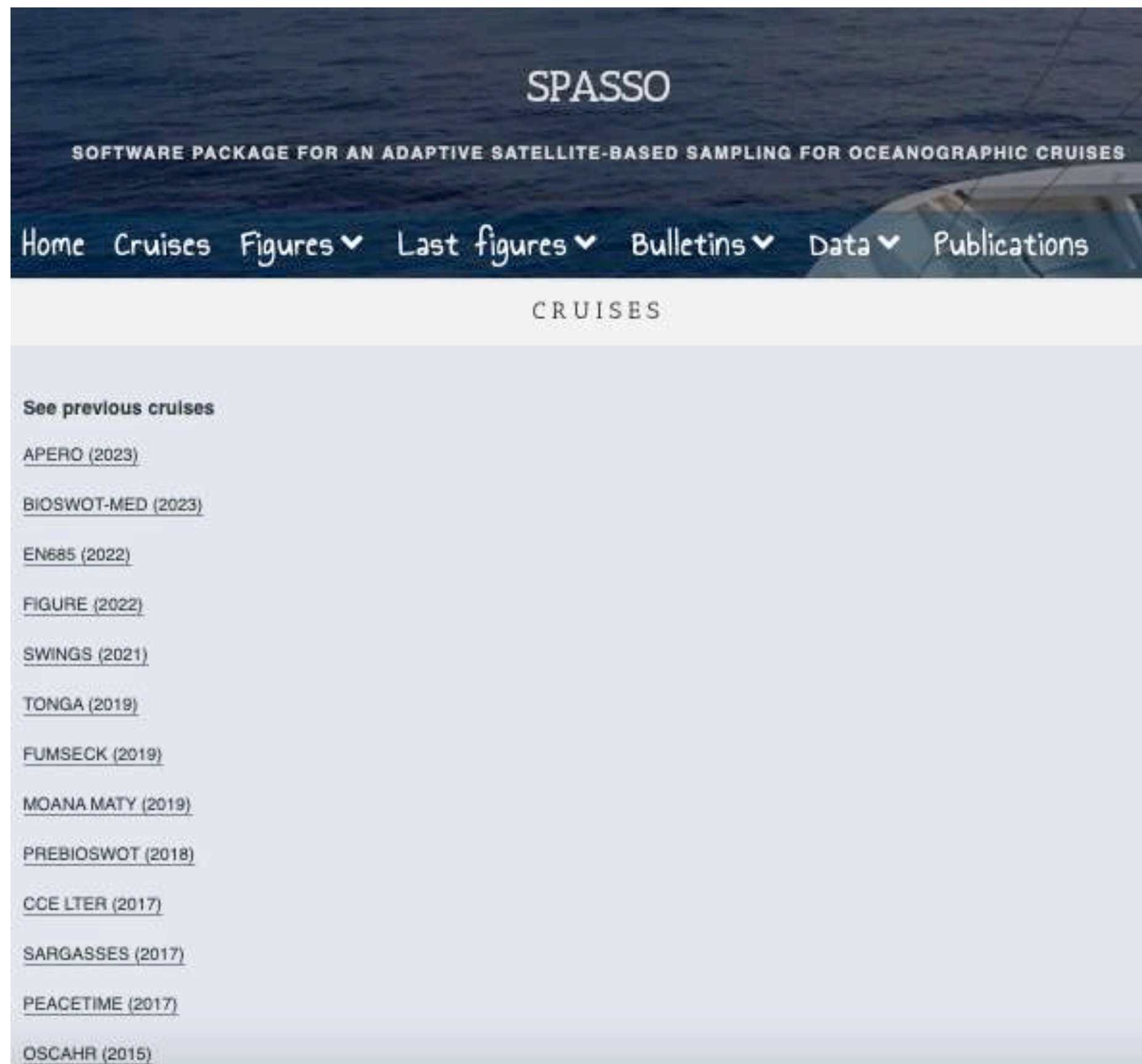


Rousselet et al., en prep.

Mise à disposition des données

Données (netcdf, png, kml...) stockées sur le serveur du MIO et accessibles via le site web:

<https://spasso.mio.osupytheas.fr/> géré par le SIP du MIO



The screenshot shows the SPASSO website interface. At the top, it says "SPASSO" and "SOFTWARE PACKAGE FOR AN ADAPTIVE SATELLITE-BASED SAMPLING FOR OCEANOGRAPHIC CRUISES". Below this is a navigation menu with "Home", "Cruises", "Figures", "Last figures", "Bulletins", "Data", and "Publications". Under the "Cruises" section, there is a list of previous cruises with their respective years: APERO (2023), BIOSWOT-MED (2023), EN685 (2022), FIGURE (2022), SWINGS (2021), TONGA (2019), FUMSECK (2019), MOANA MATY (2019), PREBIOSWOT (2018), CCE LTER (2017), SARGASSES (2017), PEACETIME (2017), and OSCAHR (2015).

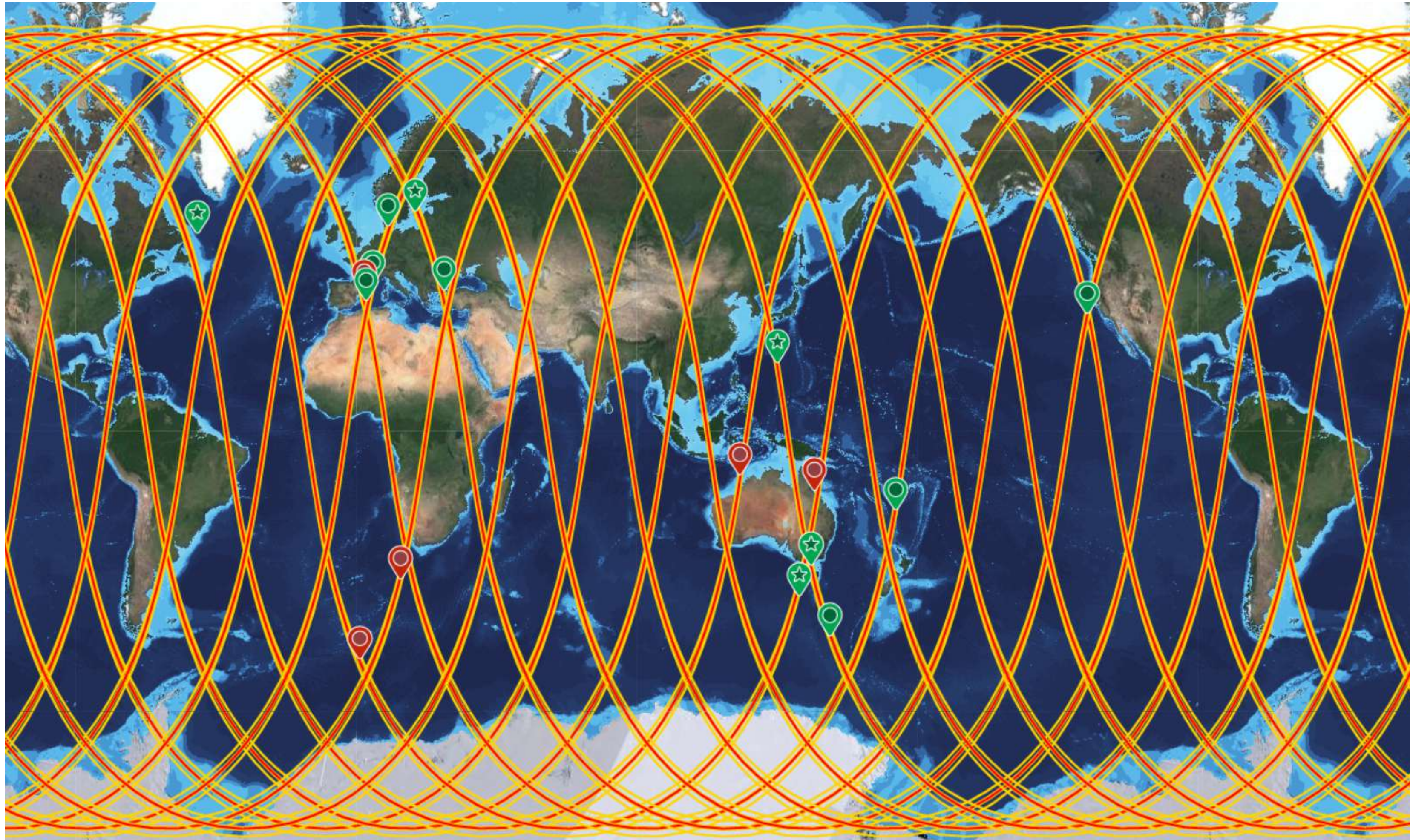
This web directory contains the figures created each 3 hours by SPASSO (Software Package for A Satellite-based Strategy for Oceanographic cruises) treating and analyzing the near-real time data from AVISO, NASA-Oceans

| Parent Directory | filename | size | creation date |
|------------------|--|-------------------|---------------|
| | 20230517_SSTADV_Copernicus_PHY.nc | (978 kilobytes) | 17 May 12:51 |
| | 20230517_TIMEFROMBATHY_Copernicus_PHY.nc | (2912 kilobytes) | 17 May 12:51 |
| | 20230517_OWTRAJ_Copernicus_PHY.nc | (978 kilobytes) | 17 May 12:50 |
| | 20230517_LLADV_Copernicus_PHY.nc | (1946 kilobytes) | 17 May 12:48 |
| | 20230517_FTLE_Copernicus_PHY.nc | (978 kilobytes) | 17 May 12:48 |
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| | 20230517_KE_Copernicus_PHY.nc | (15492 kilobytes) | 17 May 12:40 |
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SWOT: échantillonner les fine-échelles



- SPASSO configuré pour 11 campagnes (Fev-Juin 2023, SWOT-AdAC)
- release Github officielle (SPASSOv2.0, Python) pour une utilisation indépendante
- projet ORCHESTRE



Merci de votre attention



Infos:

<https://www.swot-adac.org/>

<https://spasso.mio.osupytheas.fr/>



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