



FUMSECK - Résultats

CNES, MIO, 01/03/2022

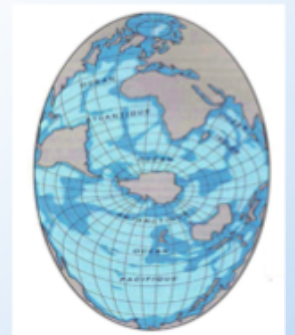
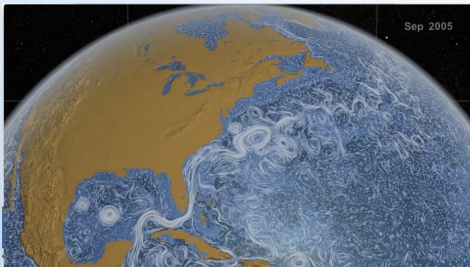
Stéphanie Barrillon (MIO), Jean-Luc Fuda, Andrea Doglioli, Anne Petrenko,
Melilotus Thyssen, Gérald Grégori, Francesco d'Ovidio, Anthony Bosse,
Christophe Yohia, Léo Berline, Frédéric Cyr

Caroline Comby, Roxane Tzortzis, Lloyd Izard, Robin Fuchs

Hubert Bataille, Nagib Bhairy, Michel Lafont

Patrice Le Gal, Margaux Dufosse

and the BIOSWOT collaboration



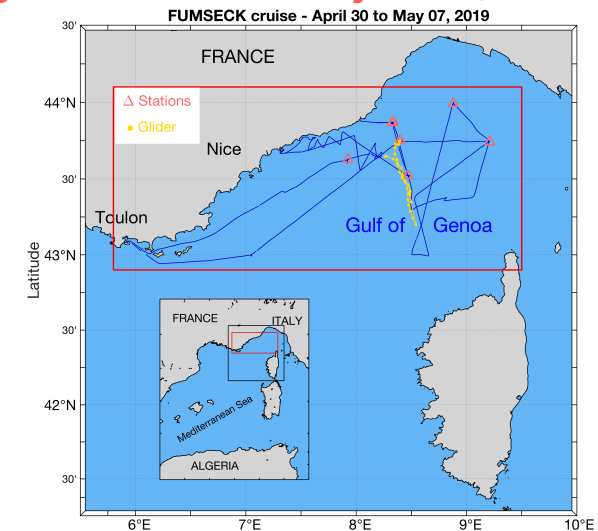
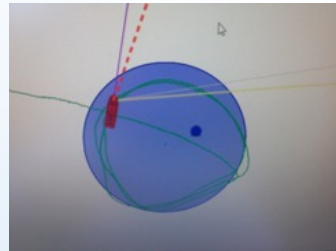
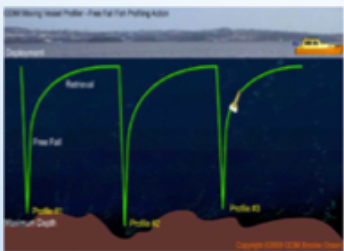
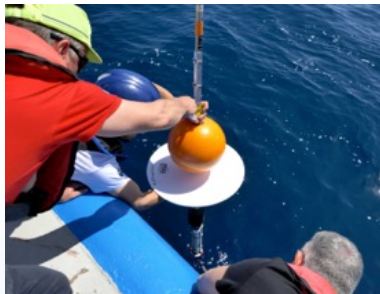


FUMSECK (*Facilities for Updating the Mediterranean Submesoscale - Ecosystem Coupling Knowledge*), 30 avr - 07 mai 2019, mer Ligure. R/V Téthys II (S. Barrillon)

🗨️ Préparation SWOT. Couplage Phys/bio

🗨️ Résultats :

- Mesures vitesses verticales
- Couplage phys-bio



🗨️ Stratégie lagrangienne avec SPASSO

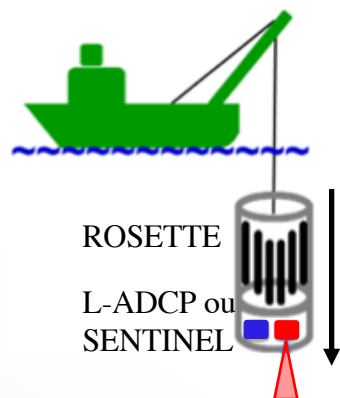


Vitesses verticales océaniques

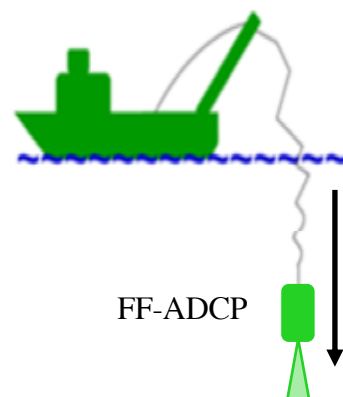
Mesures *in situ* directes (ADCP)

Bathysonde

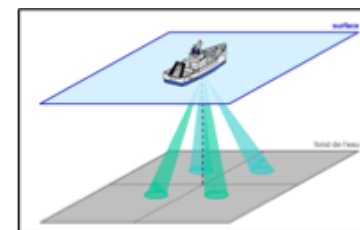
Caroline Comby



Free-Fall

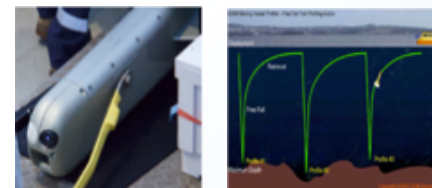


ADCP de coque



Anne Petrenko

Mesures *in situ* indirectes : équation ω

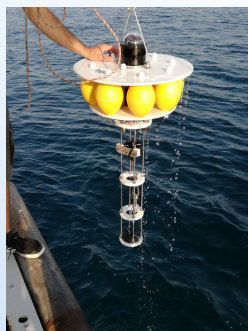


Caroline Comby

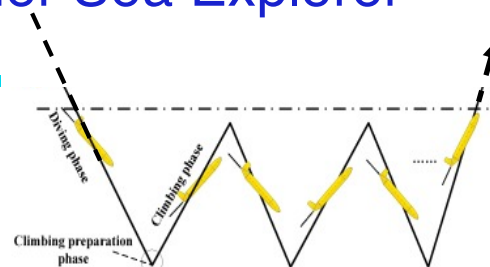
Mesures *in situ* modèle de vol

VVP (Vertical Velocity Profiler)

Jean-Luc Fuda



Glider Sea Explorer



Anthony Bosse, Jean-Luc Fuda

Modélisation Symphonie

Claude Estournel, Patrick Marsaleix,
Caroline Comby, Caroline Ulses

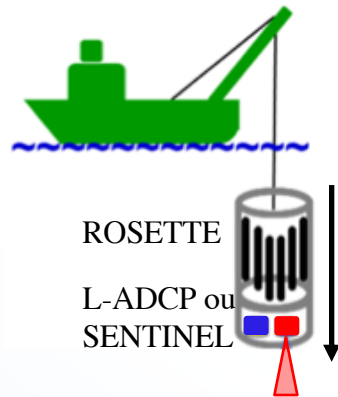


Vitesses verticales océaniques

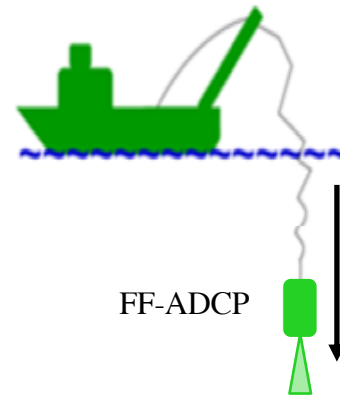
⚓ Mesures *in situ* directes (ADCP)

💬 Bathysonde

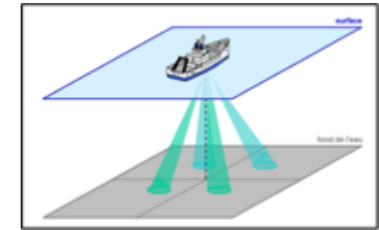
Caroline Comby



💬 Free-Fall

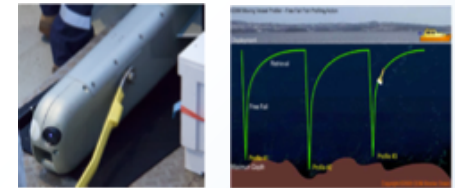


💬 ADCP de coque



Anne Petrenko

⚓ Mesures *in situ* indirectes : équation ω

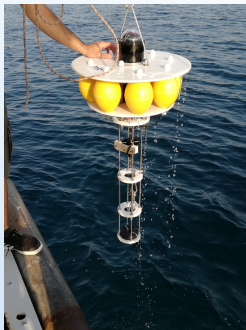


Caroline Comby

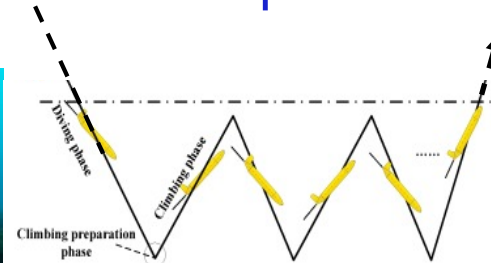
⚓ Mesures *in situ* modèle de vol

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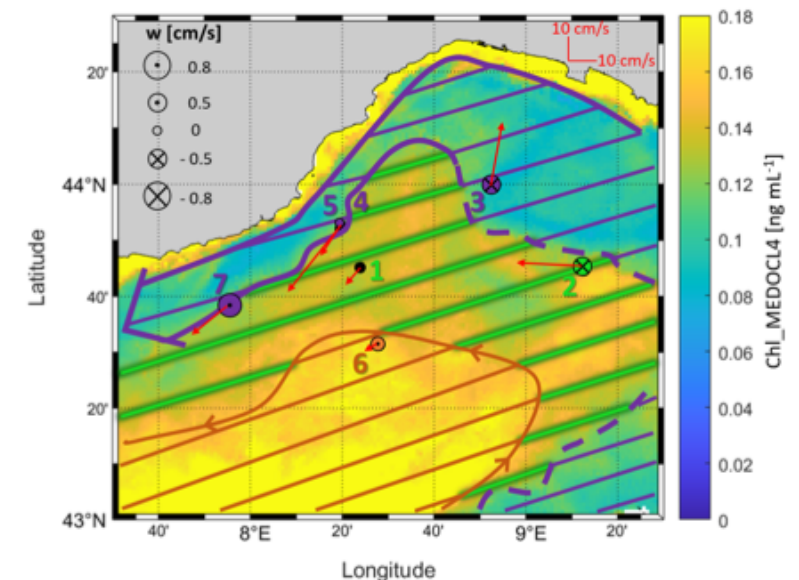
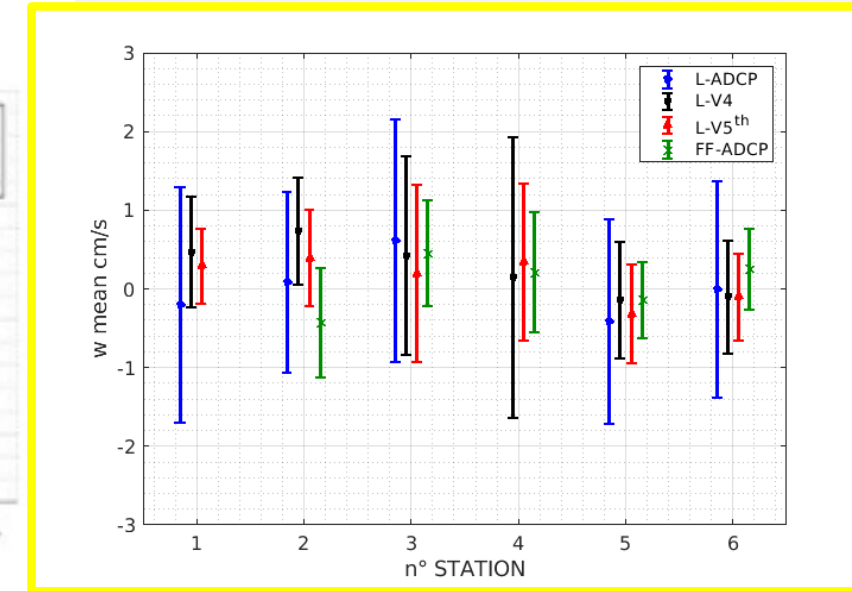
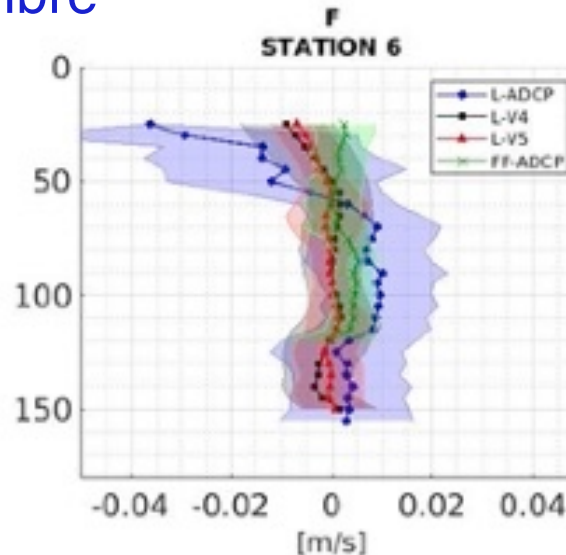
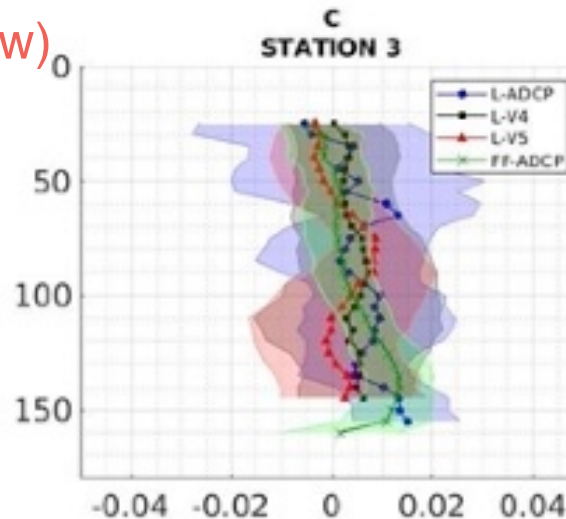
Comby *et al.* (under review)

- 6 stations
- 4 méthodes
 - L-ADCP
 - Sentinel
 - 4 beams + 5^{ème} vert.
 - FF-ADCP

→ Sentinel en chute libre (VVPTest 2022)

Étude erreurs

- Angle dalle
- 5^{ème} faisceau
- Résolution CTD





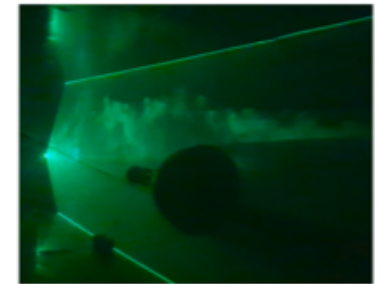
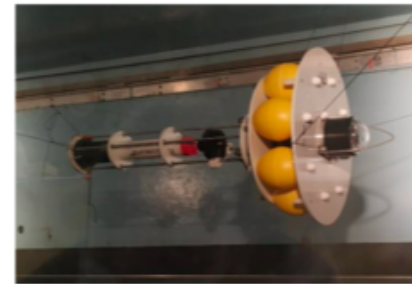
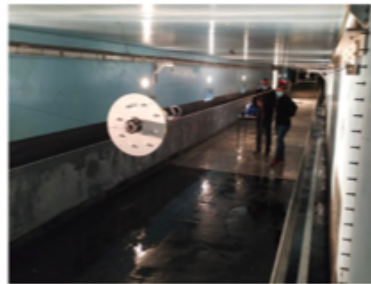
Vitesses verticales VVP

⚓ Fuda *et al.* (EGU)
Vertical Velocity
Profiler (VVP)

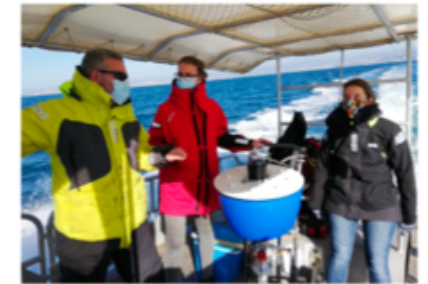
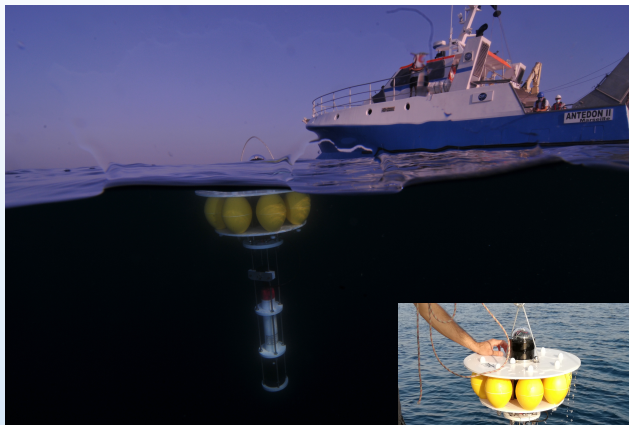
- 💬 2^{ème} prototype
- 💬 RBR Concerto
- 💬 Profileur à hélice

⚓ Caractérisation dynamique (sillage)

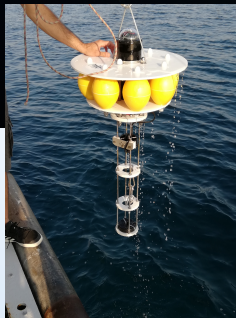
Grande soufflerie de Luminy (30/04/21)



Rade de Marseille (17/02/21, 20/04/21, 23/04/21, 24/08/21)

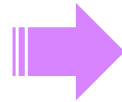


Fosse d'essais de la COMEX à Marseille (02/06/21, 03/06/21, 21/09/21)

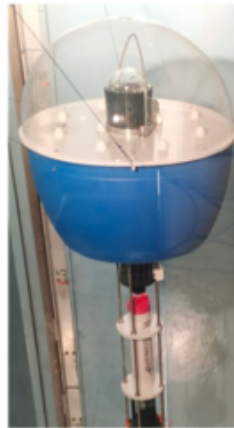


+ stage M. Dufosse

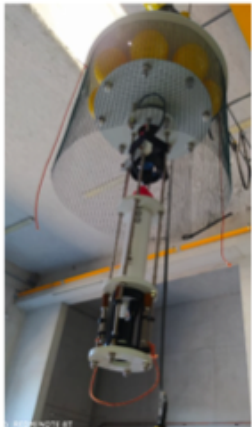
Effets de sillage - solutions testées



Carène basse



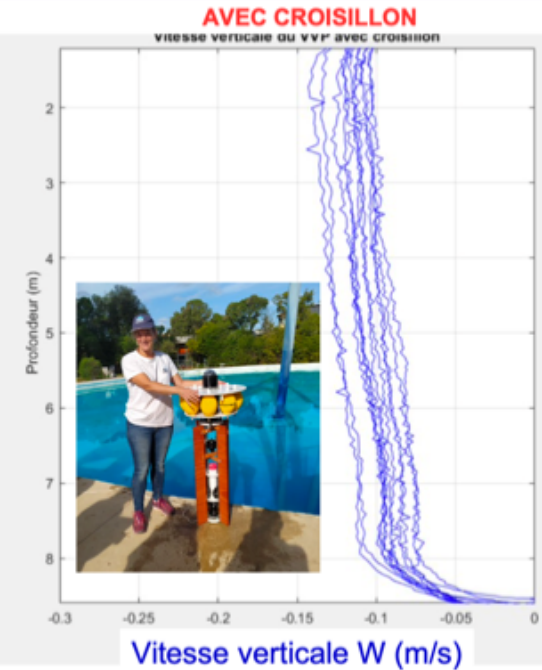
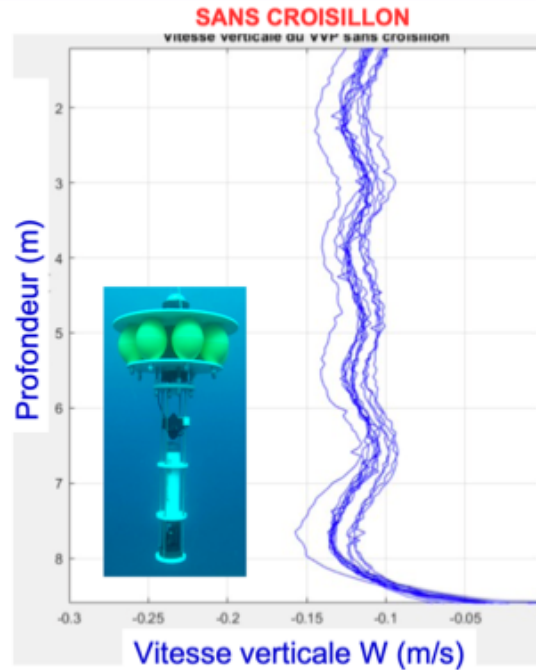
Carènes haute et basse



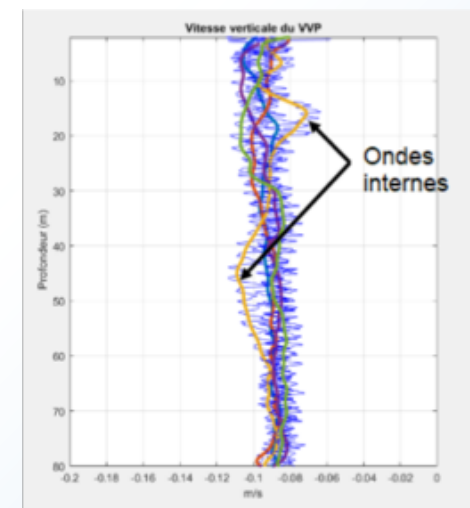
Jupe grillagée



Croisillon / Ailettes



Ondes internes





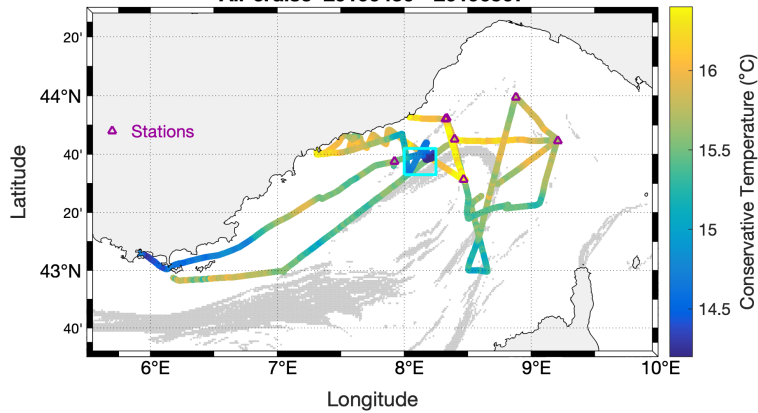
Couplage Physique - Biologie



Masses d'eau

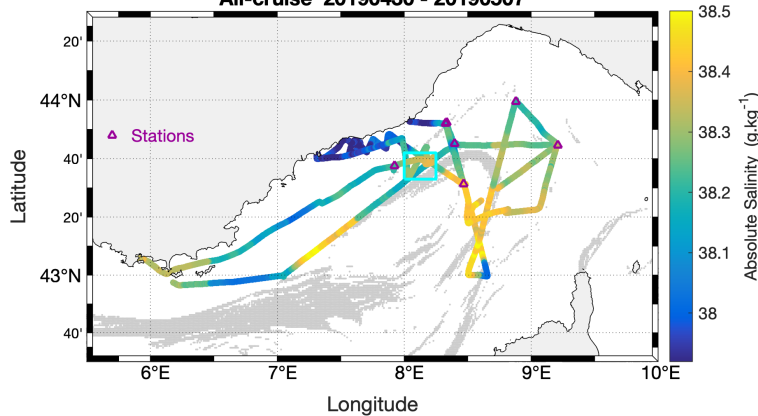
Température surface

All-cruise 20190430 - 20190507

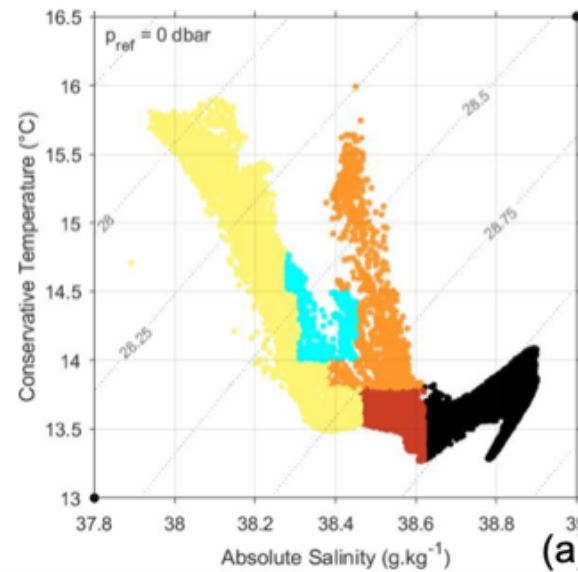


Salinité surface

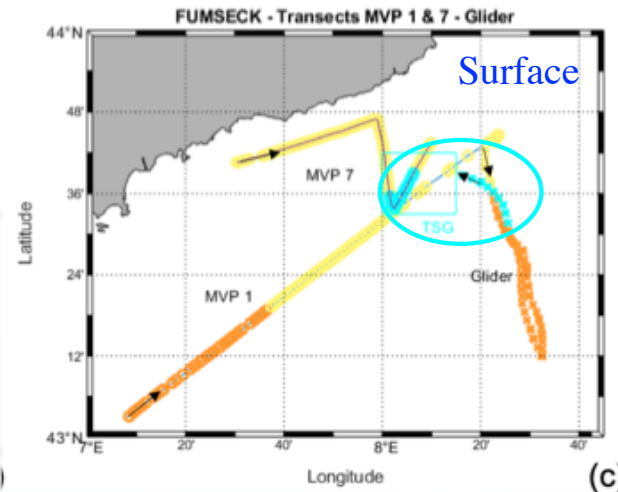
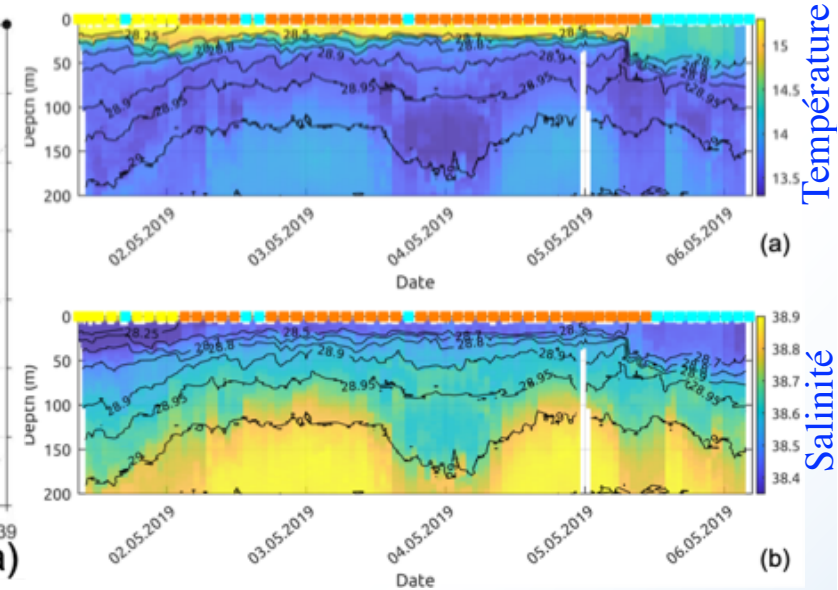
All-cruise 20190430 - 20190507



MVP & glider



Glider



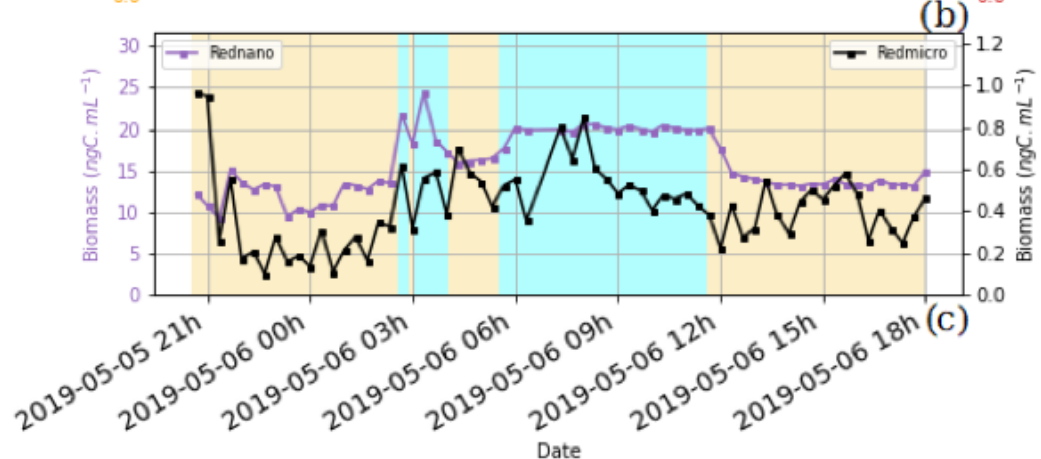
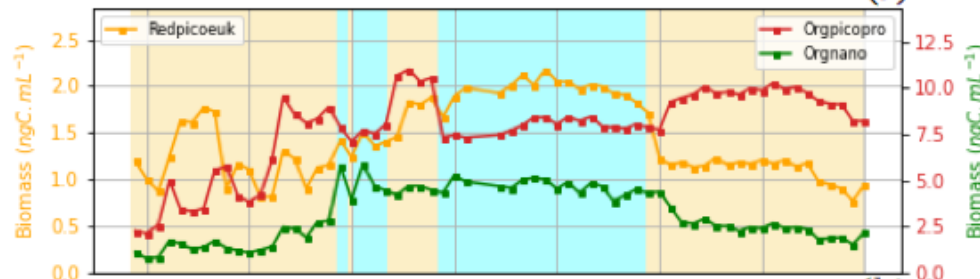
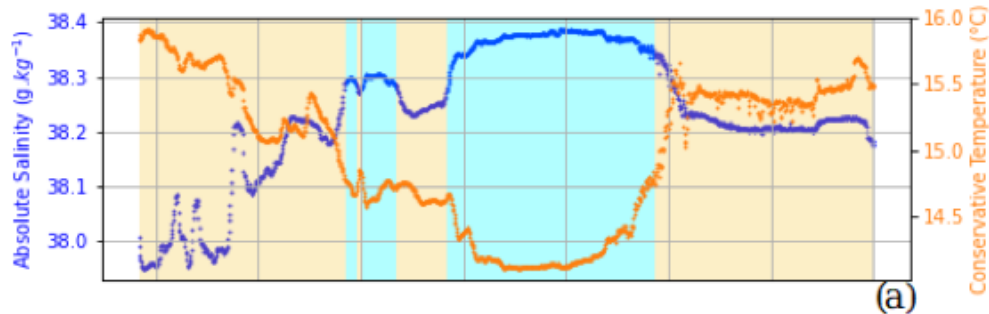
- Événement impulsif localisé, tempête
- Eau plus froide en surface, provenant de 60m



Couplage Physique - Biologie



Réaction biogéochimique et phytoplancton



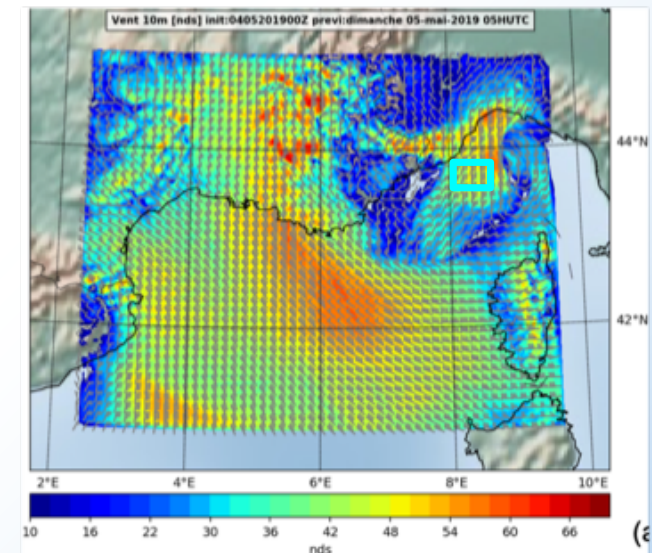
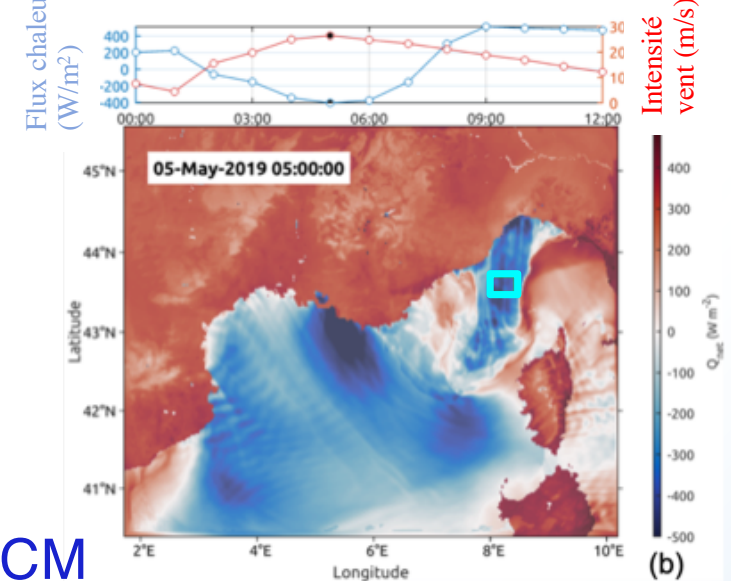
• Dilution DCM par mélange

• Chla et nutriments surface

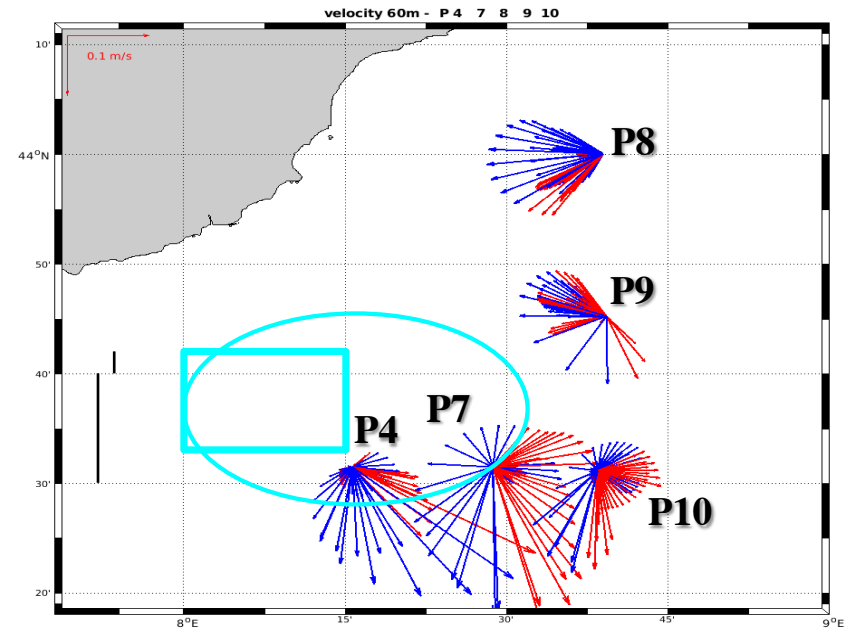
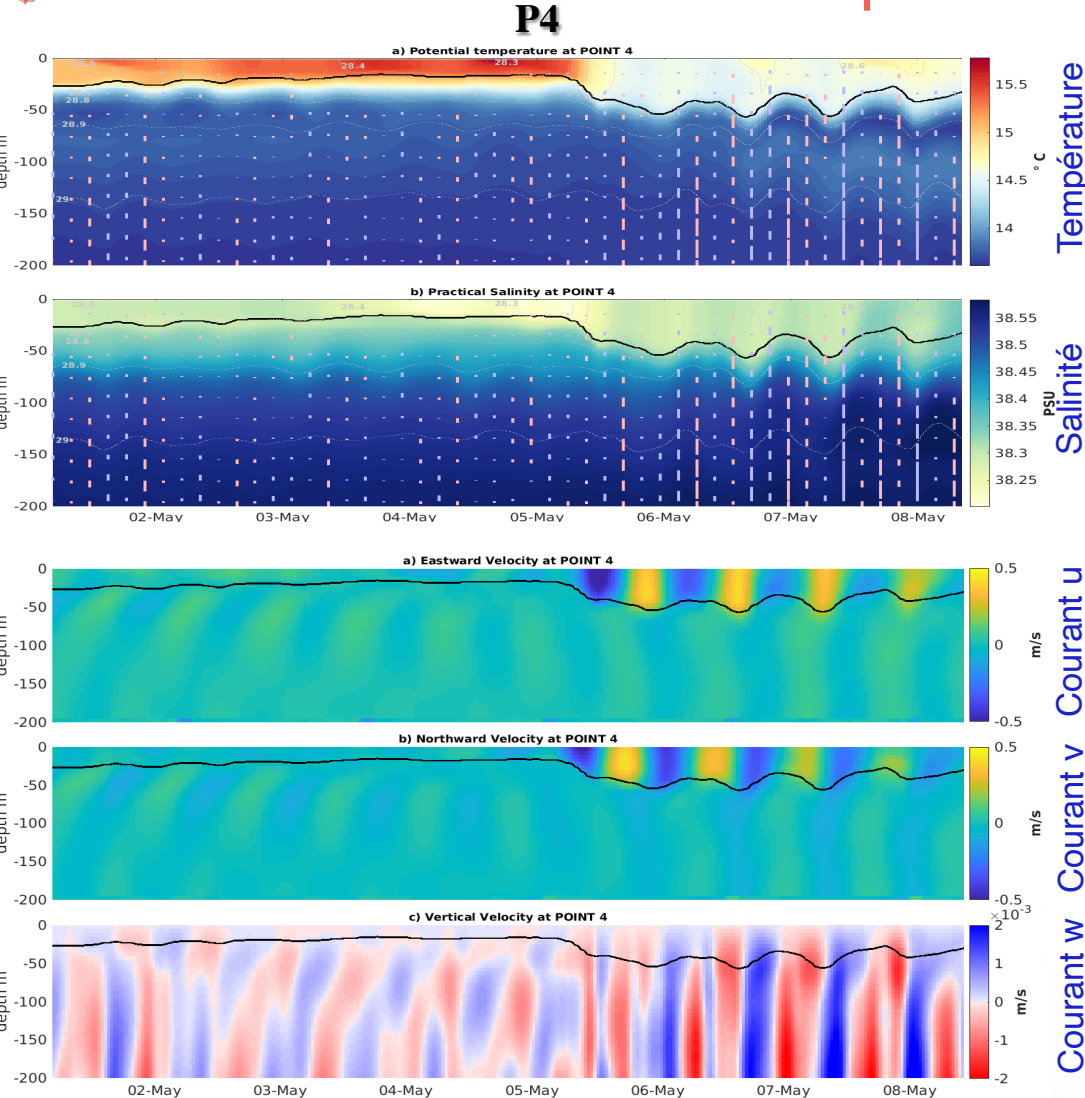
• biomasse sauf orgpicopro

Flux chaleur (W/m²)

Wind model



Étude zone influence tempête



- Approfondissement couche mélange
- Intensification 3 composantes vitesse de courant
- Déclenchement oscillations d'inertie

Conclusions

Campagne FUMSECK : résultats

- Développement instrumental et méthodologique physique et biologique dans le cadre des fines échelles océaniques
- Mesures *in situ* des vitesses verticales
- Couplage physique / biologie et mise en lumière d'un événement impulsif au large lié à une tempête
- Préparation BioSWOT-Med

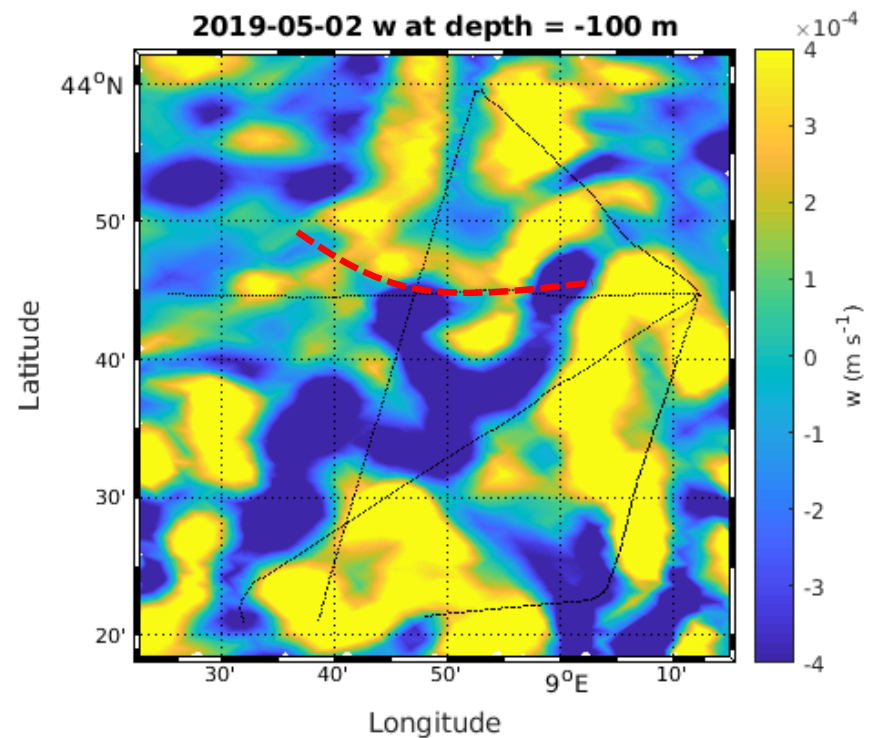
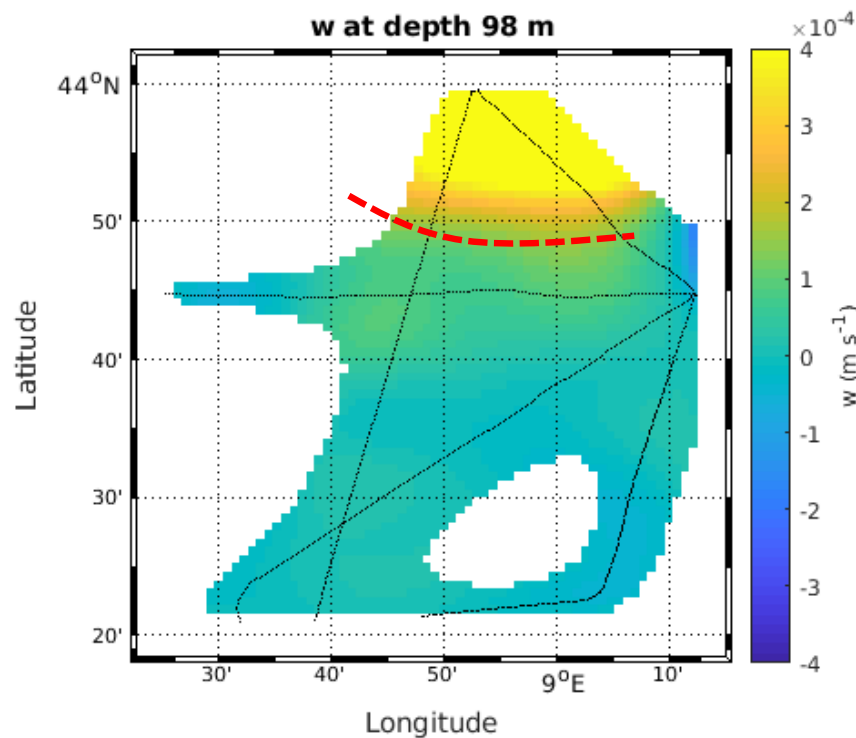


02/12/2021

Équation omega et modélisation



Comparaison omega / modélisation Symphonie



⇒ Modèle Symphonie **cohérent** avec équation- ω sur zone restreinte