



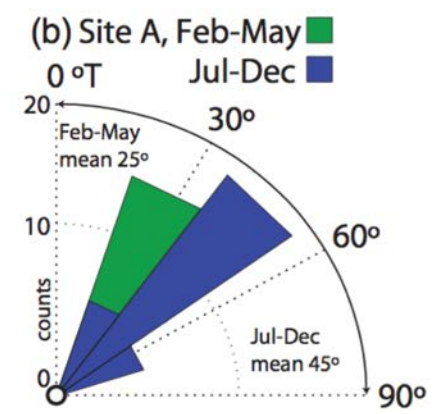
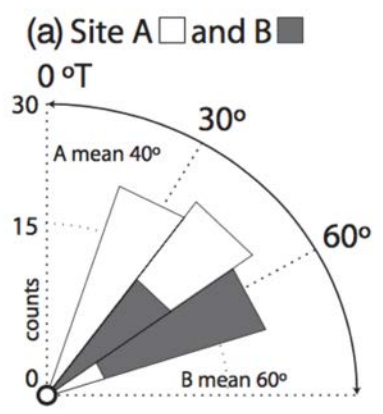
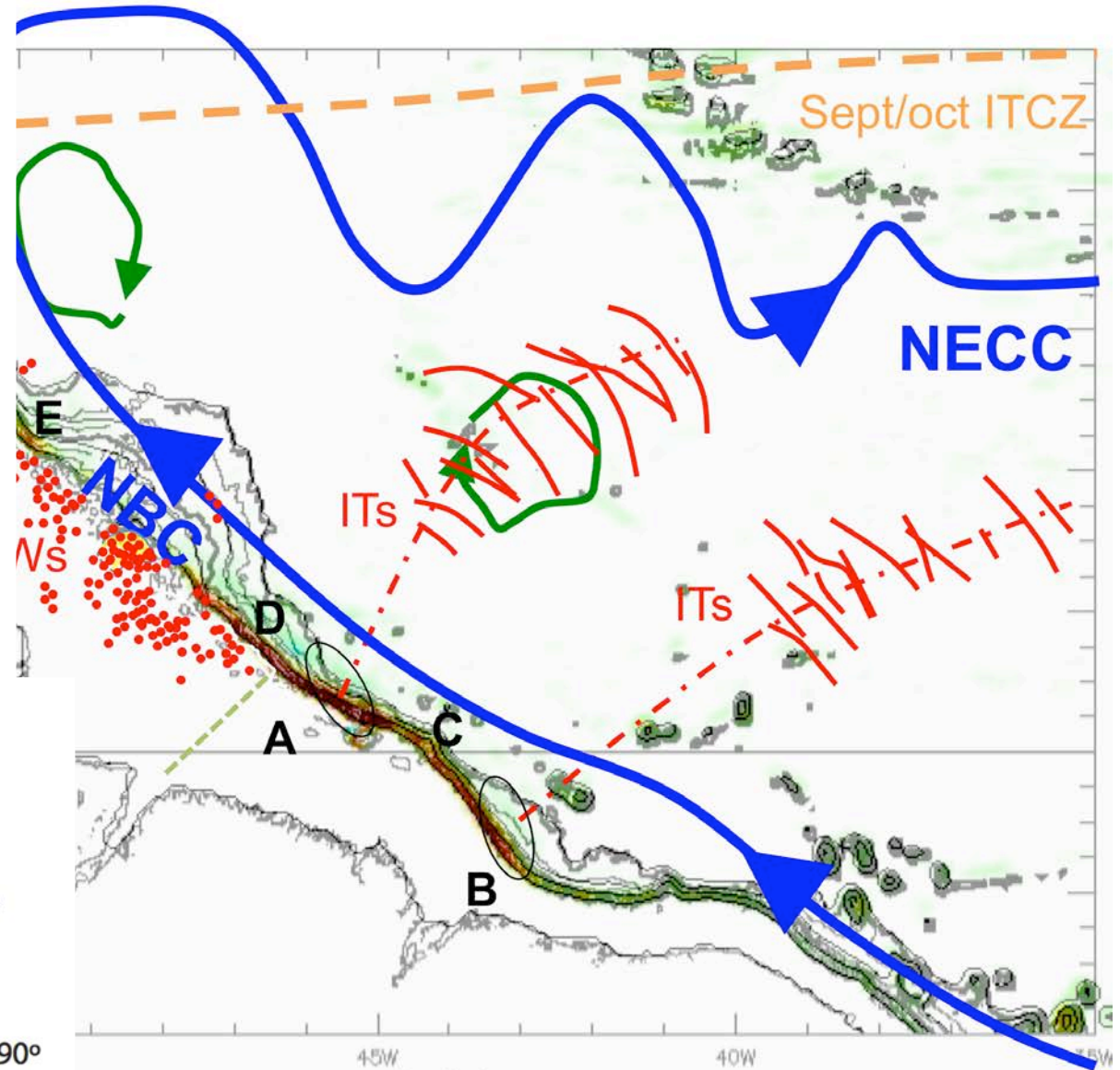
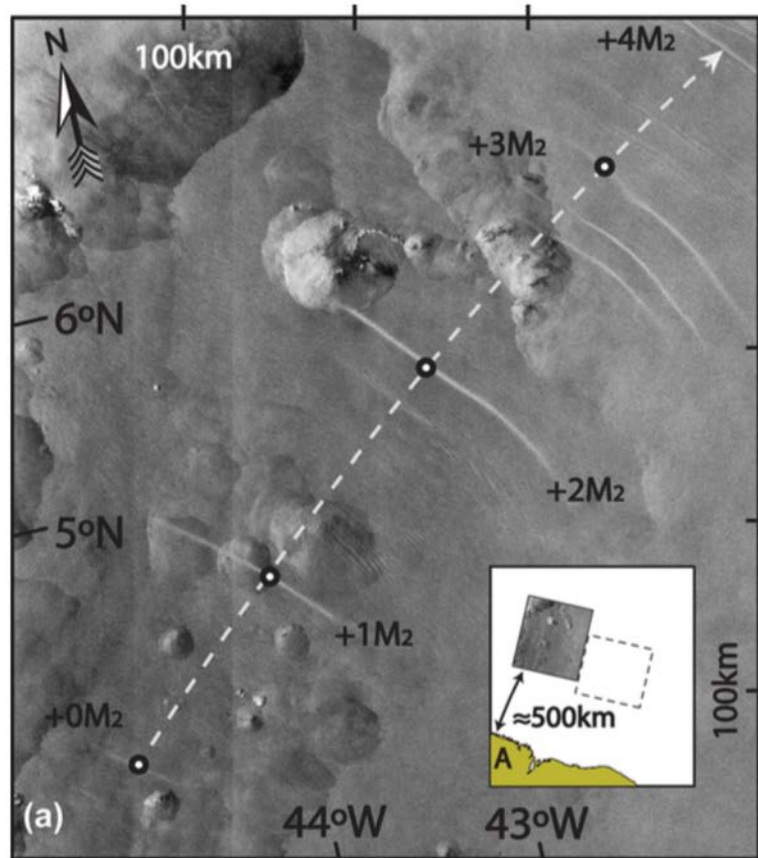
France : A. Koch-Larrouy (IRD), M. Tchilibou (LEGOS), F. Lyard (LEGOS), A. Bertrand (IRD), V. Vantrepotte (LEEISA), I. Dadou (LEGOS), J.F. Ternon (MARBEC), F. Hernandez (IRD), F. Blanchard (LEEISA), A. Le Bourge Dhaussy (LEMAR), S. herbette (LOPS), L. Carrere (CLS), H.Loisel (LOG),

Brazil : M. Araujo (UFPE), F. Lucena Frédou (UFRPE), T. Frédou (UFRPE), A. Costa Da Silva (UFPE), M. Silva (UFPE), R. Swchamborn (UFPE), S. Neumann Leitão (UFPE), M. Kampel (INPG), J. Lee (UFPA), V. Isaac (UFPA), M. Rollnic (UFPA), S. Monteiro (UFPA), J. E. Martilleni Filho (UFPA)

Portugal : J. Magalhaes (FC. UP.), J. C. P. B. T. Da Silva (FC. UP.)

USA: B. Arbic (Univ. of Michigan), M. Buijsman (Univ. of S.Missipi), A. Subramaniam (Lamont), J.P. Montoya (GATECH)

Charaterization of dissipation and propagation of Internal waves on the Amazon Shelf



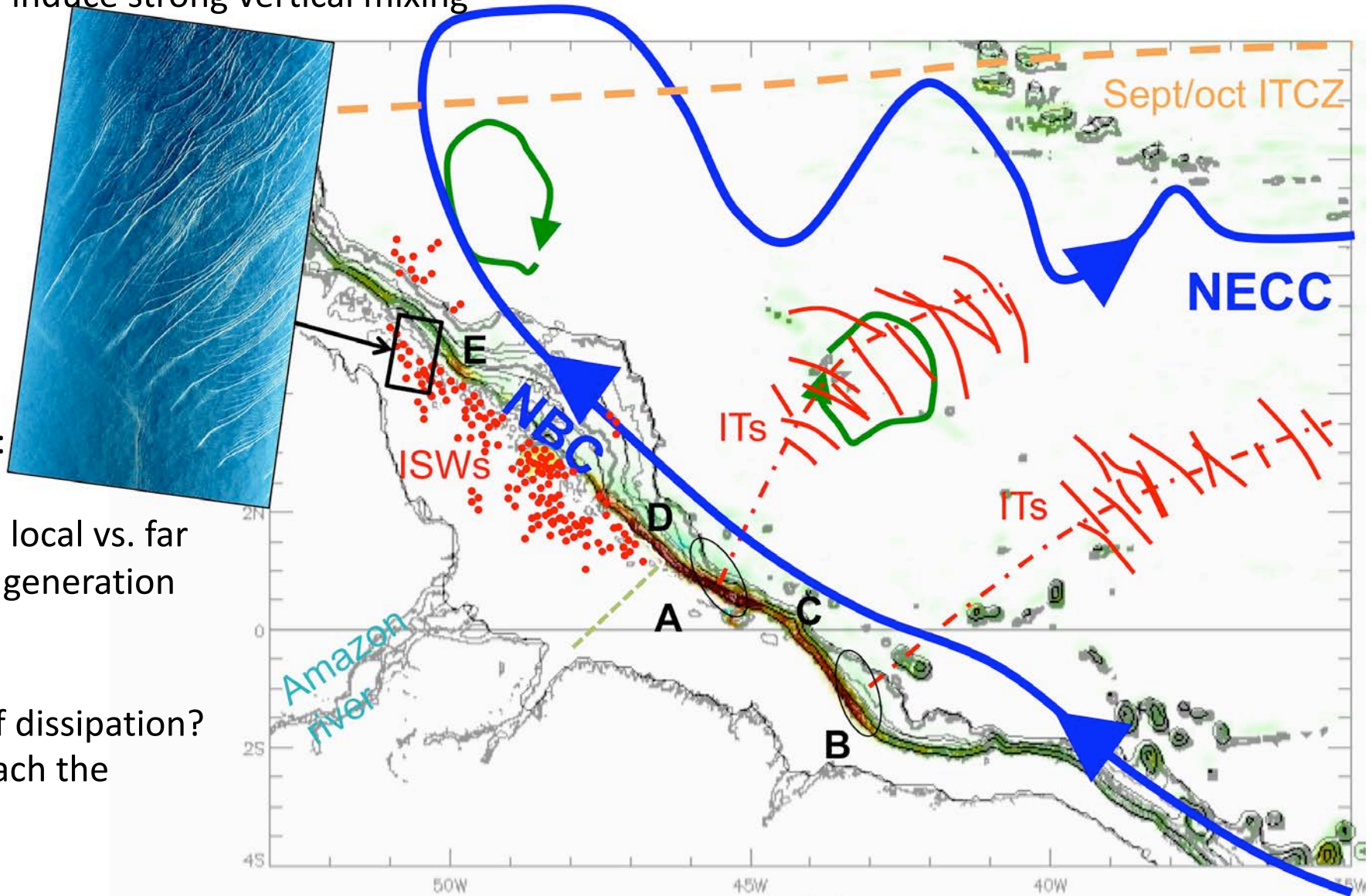
Charaterization of dissipation and propagation of Internal waves on the Amazon Shelf

- Internal waves generation on the shelf and shelf break
- Some propagate others no
- The will induce strong vertical mixing

Questions :

Dissipation local vs. far away from generation sites?

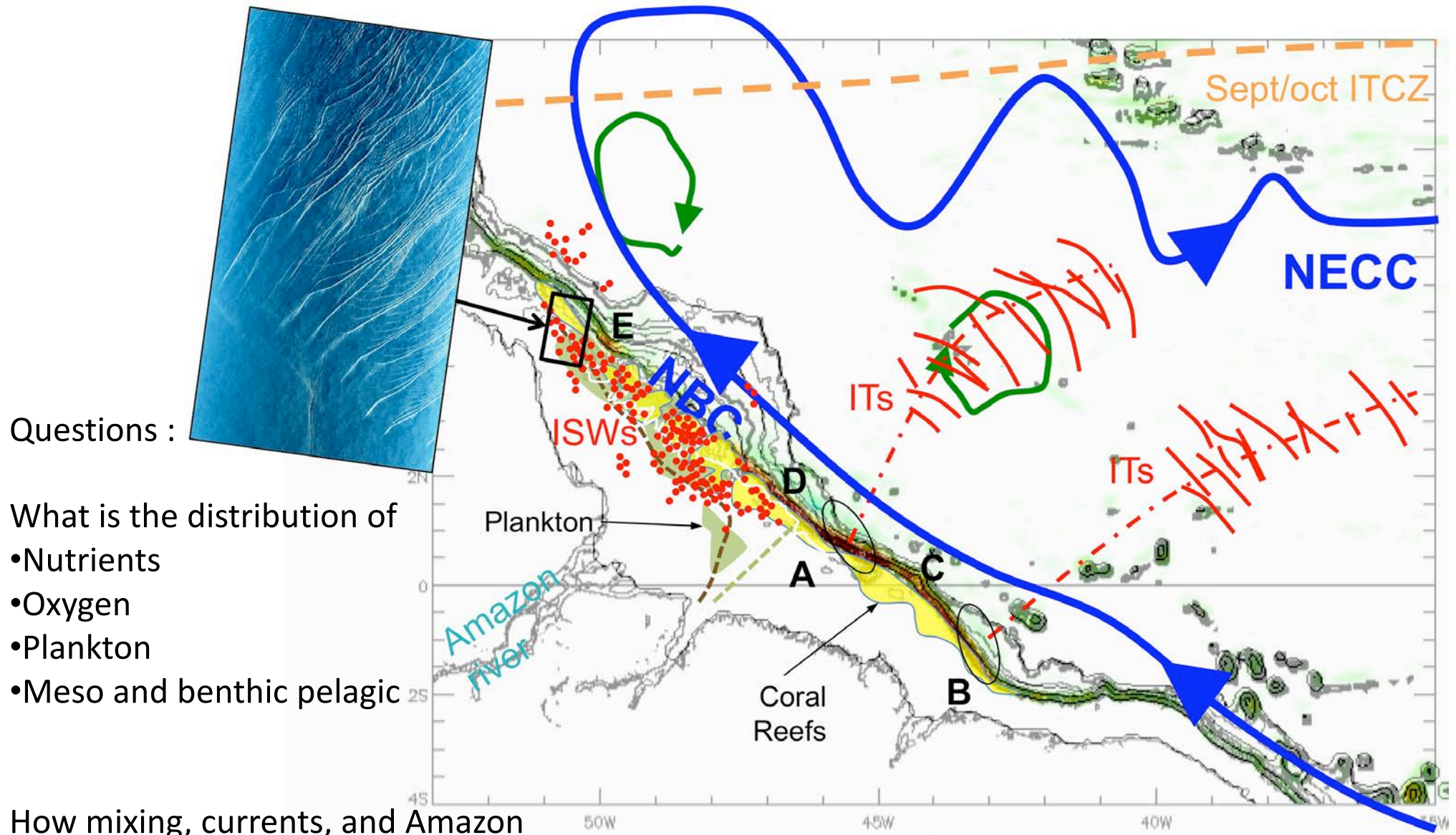
Intensity of dissipation?
Could it reach the surface ?



Impact of mixing on biogeochemistry and ecosystem

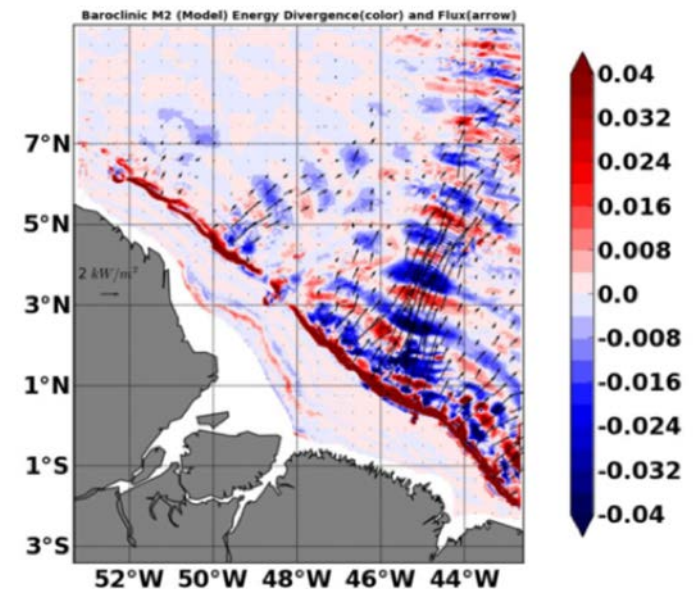
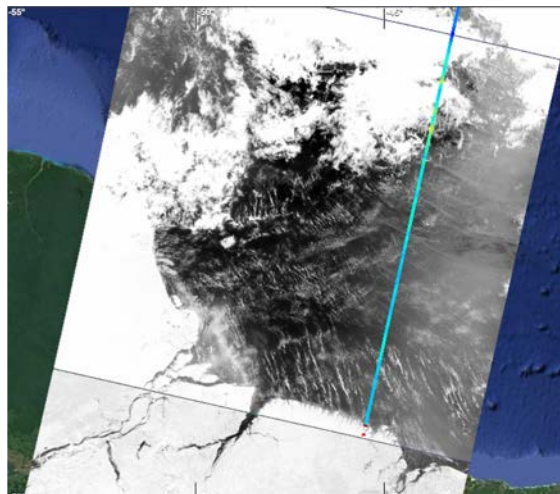
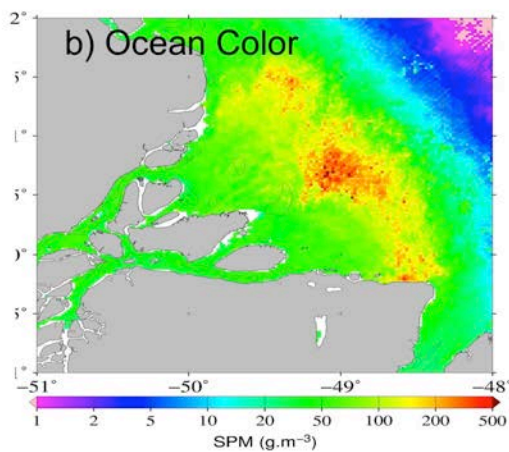
Coral reefs and Plankton bloom may be influenced by this mixing

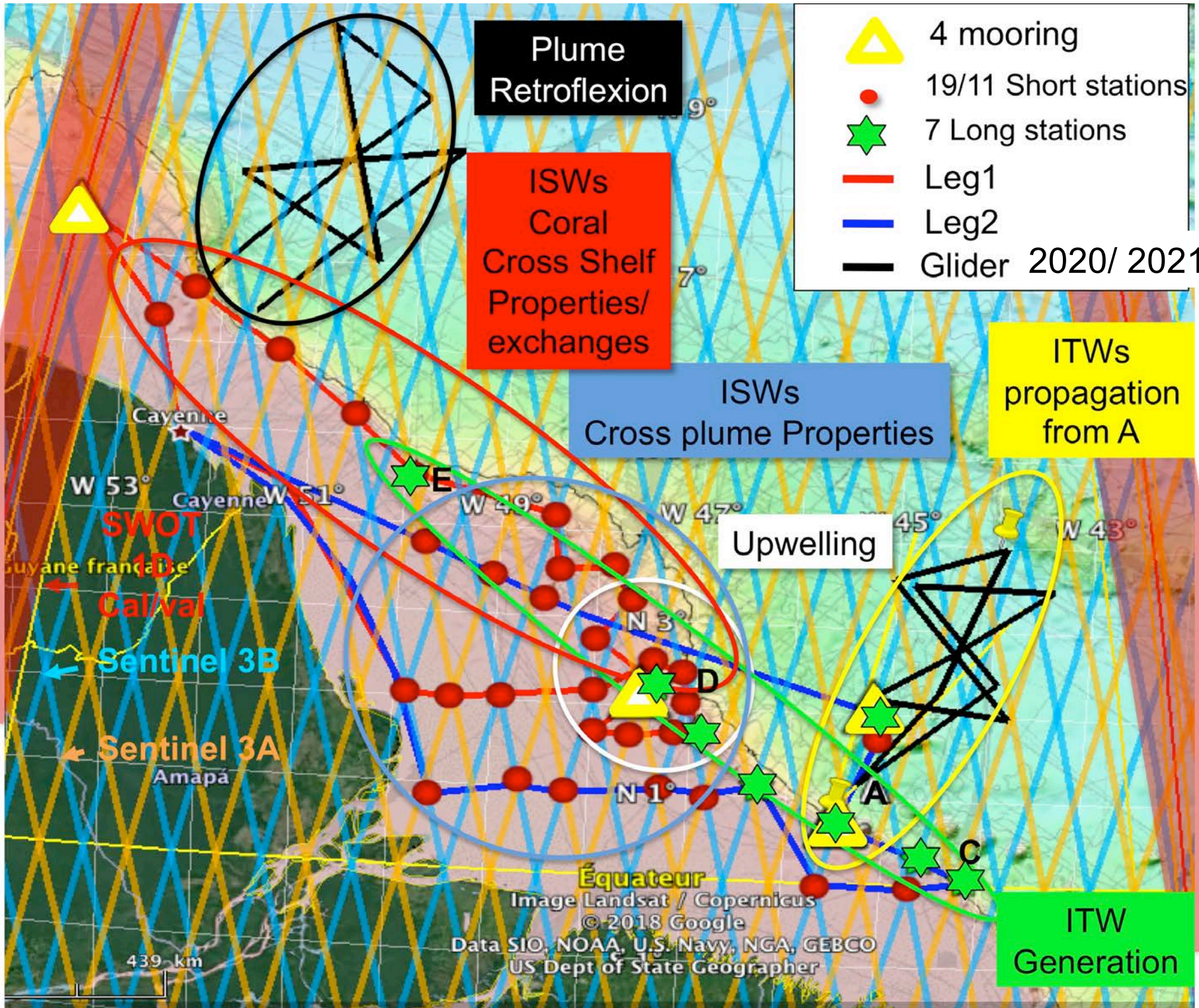
They might also be influenced by the Amazon Plum and the currents



AMAZOMIX approach

- Cruise on board of N/O ANTEA
Programmed for Sept 2020
- Modelisation (NEMO, ROMS, coll. HYCOM)
- Multi sensors Satellite analysis (SSH, SST, Ocean Color, SAR)





STATIONS

Long Stations : Intense 12h / and 2 at night

Short stations : 4h

Turbulence



Sampling for

O₂, N, P, Si ...

- Turbidity, MES, Chla
- C and N isotopes
- POM, DOM, POC, DOC, CDOM
- Zooplancton
- Necton, Neuston
- DIC, TALK, pH
- u-pCO₂ (surface continue)
- coraux

Acoustic + trawling



Alternate VMP and CTD/LADCP

Grappe optique => Validation Couleur de l'eau

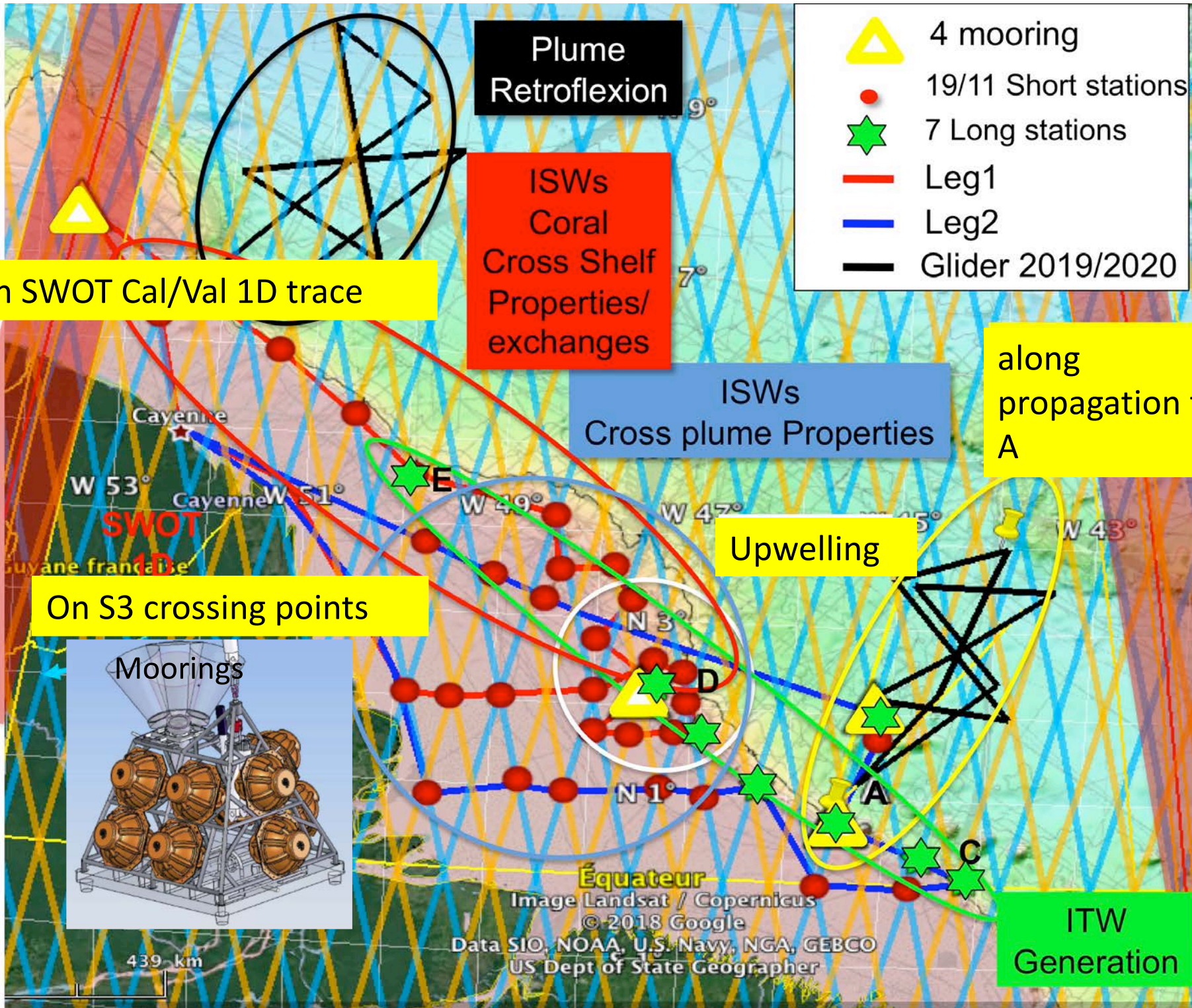


TRIOS « above water »

TRIOS Radeau

Mesure ASD

Grappe optique



Plume Retroflexion

ISWs
Coral
Cross Shelf
Properties/
exchanges

ISWs
Cross plume Properties

Upwelling

along
propagation from
A

ITW
Generation

- △ 4 mooring
- 19/11 Short stations
- ★ 7 Long stations
- Leg1
- Leg2
- Glider 2019/2020

SWOT Cal/Val 1D trace

On S3 crossing points

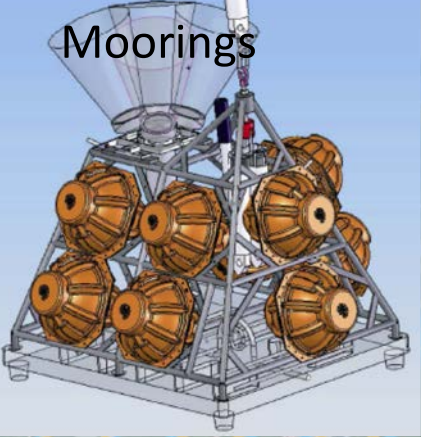
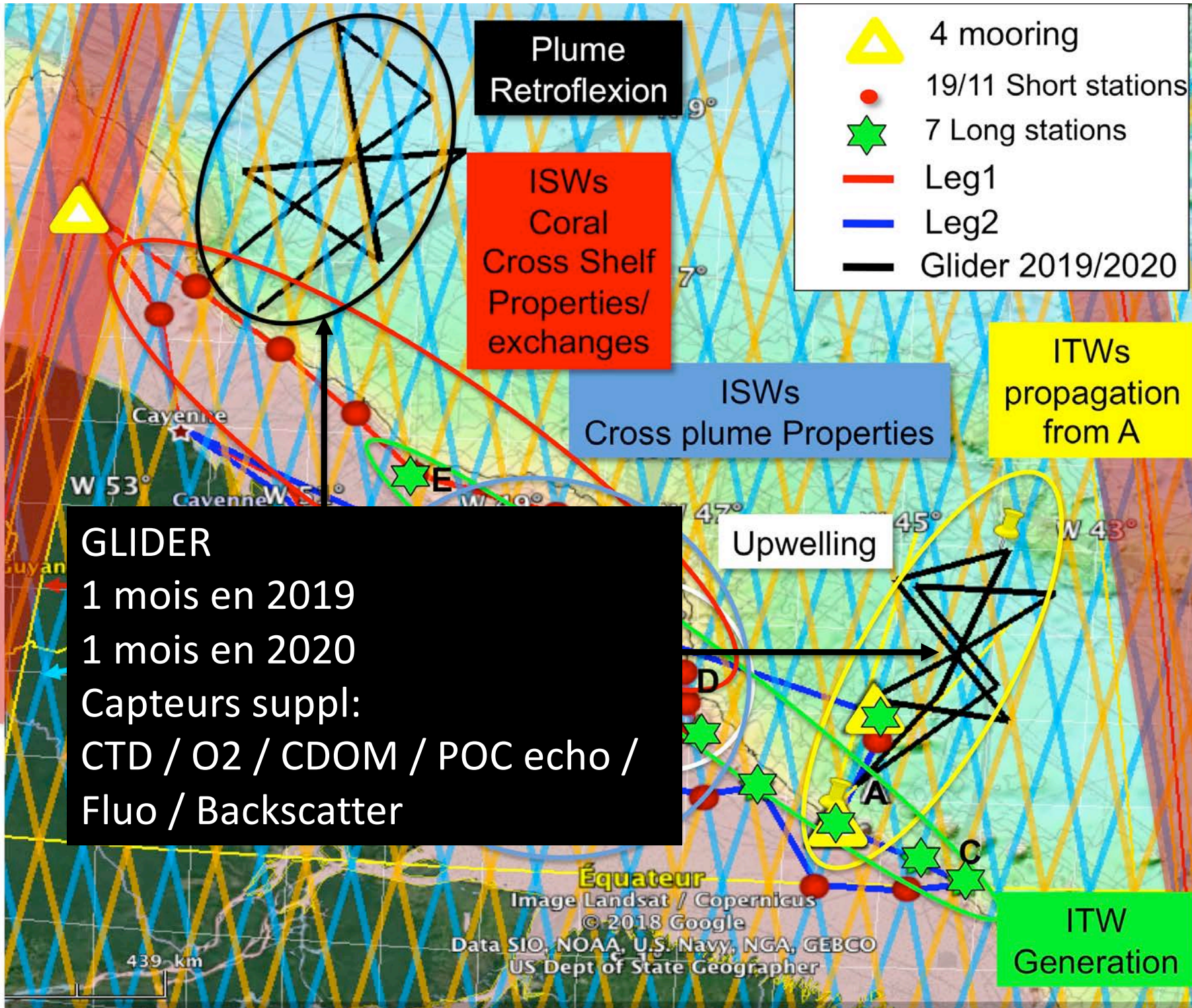


Image Landsat / Copernicus
© 2018 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
US Dept of State Geographer

439 km



Plume Retroflexion

ISWs
Coral
Cross Shelf
Properties/
exchanges

ISWs
Cross plume Properties

ITWs
propagation
from A

Upwelling

ITW
Generation

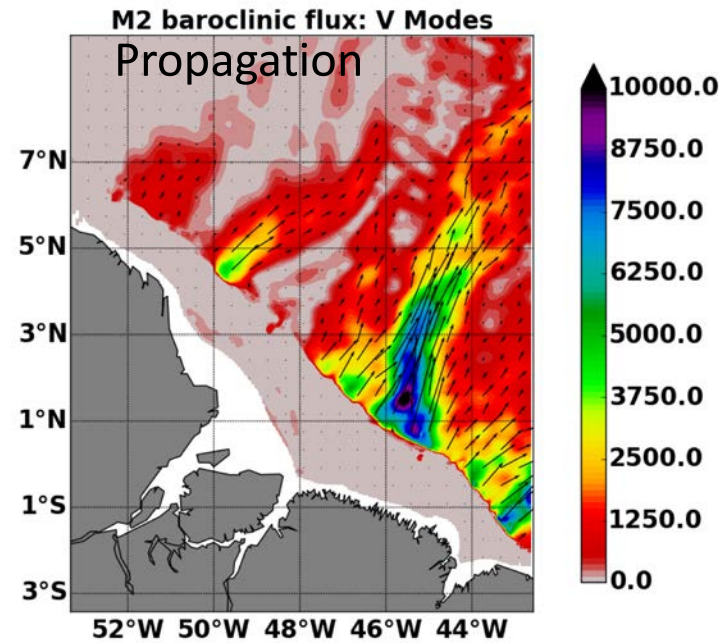
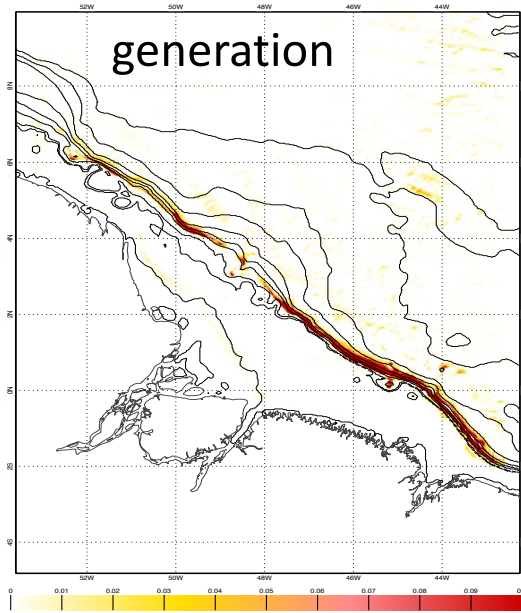
GLIDER
1 mois en 2019
1 mois en 2020
Capteurs suppl:
CTD / O2 / CDOM / POC echo /
Fluo / Backscatter

- △ 4 mooring
- 19/11 Short stations
- ★ 7 Long stations
- Leg1
- Leg2
- Glider 2019/2020

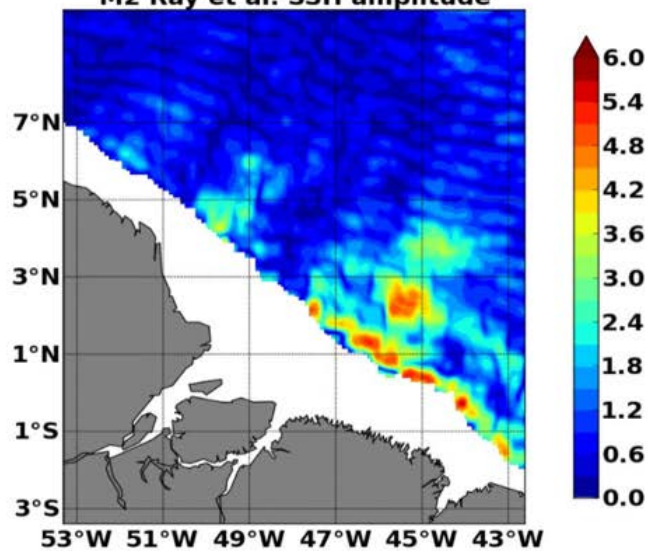
439 km

NEMO 1/36°

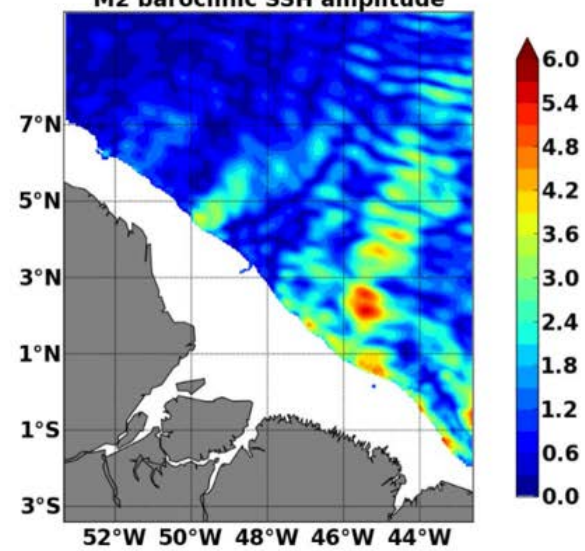
Simulations Performed By J. Jouanno



Baroclinic SSH (M2) : Altimetry vs



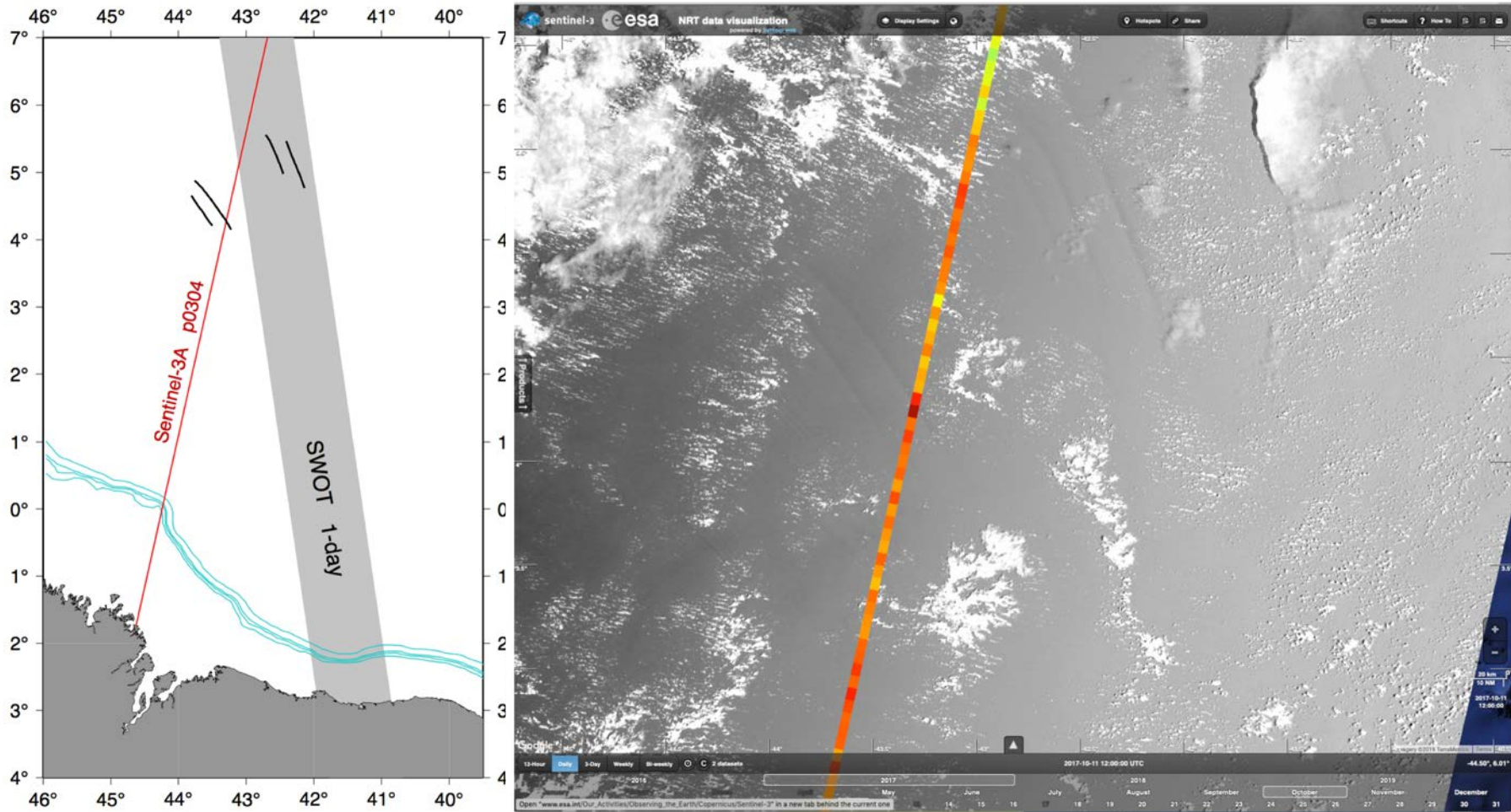
MODEL



M. Tchilibou

Post-doc
@LEGOS

Solitons further away below SWOT 1-D



Slides of Richard Ray

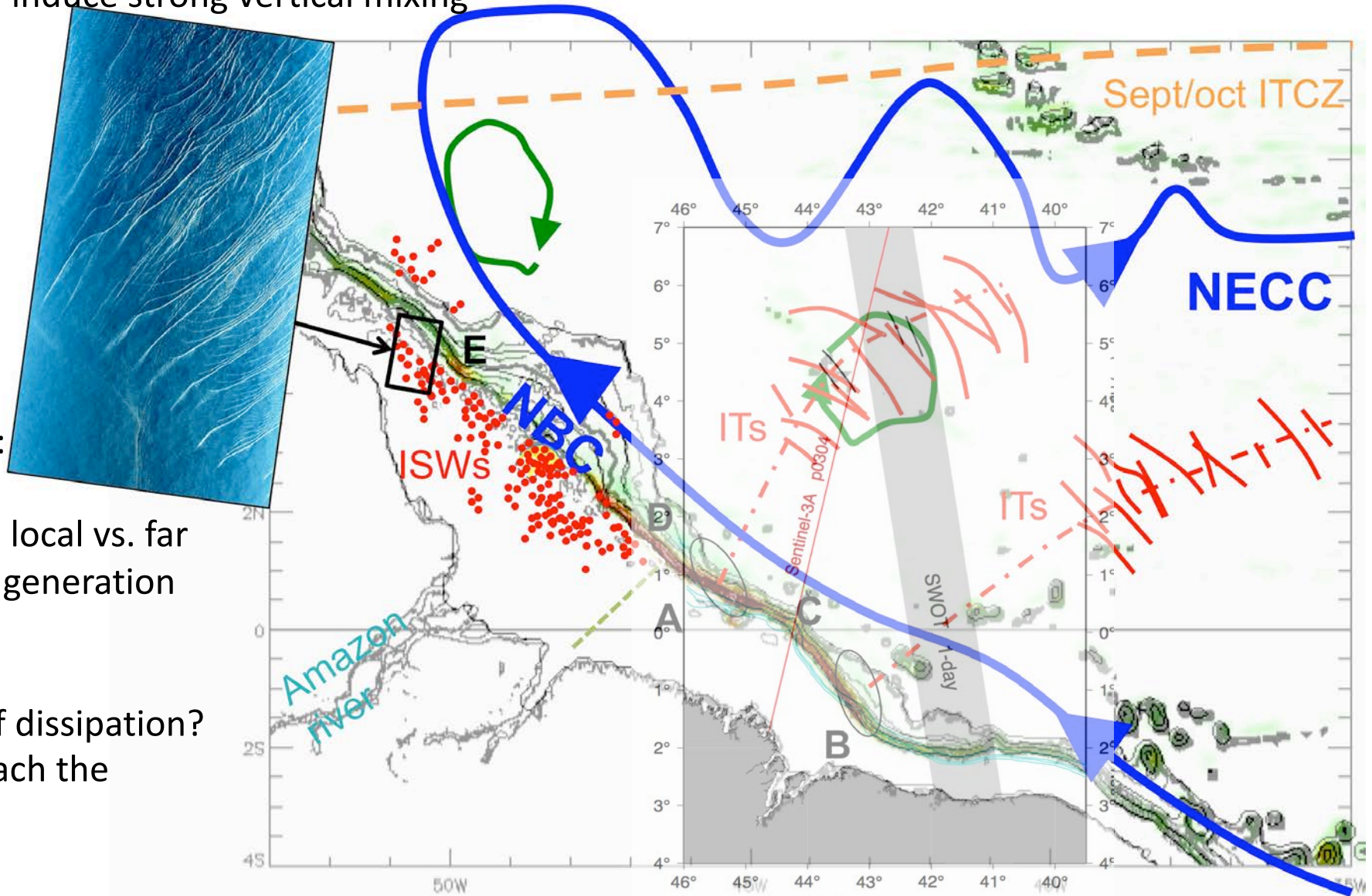
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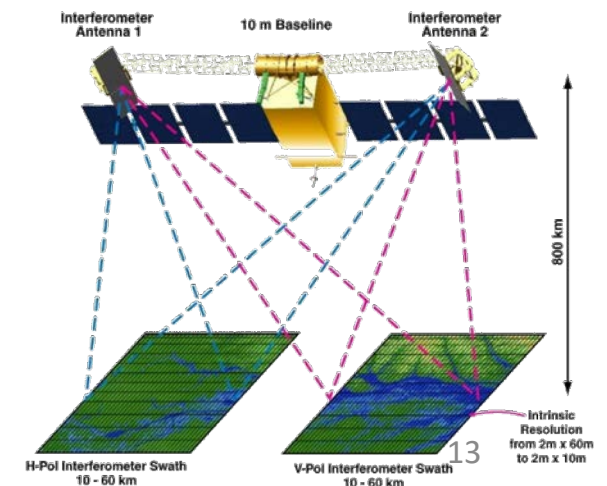


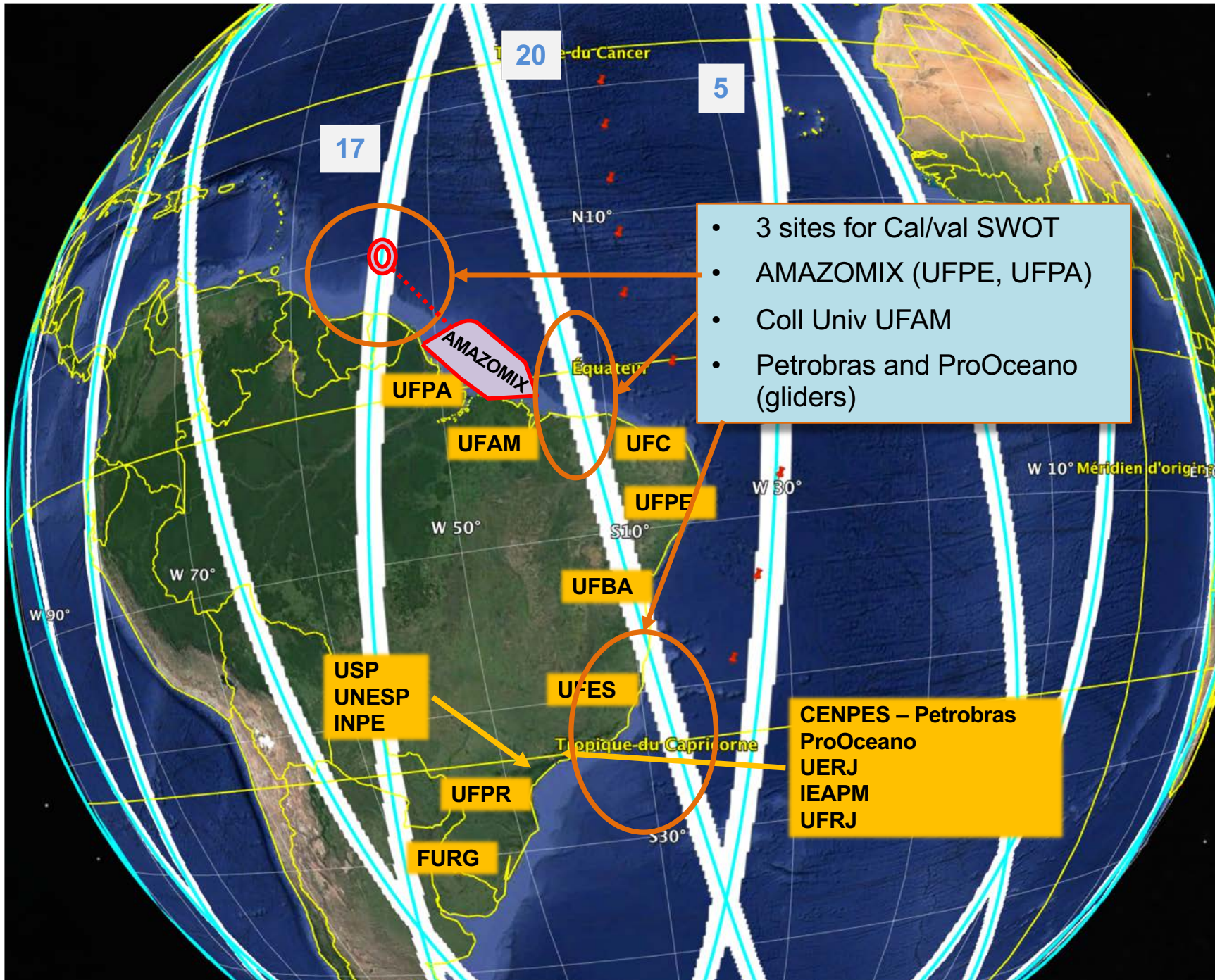
A SWOT-Ocean initiative in Brazil

Proposed by F. Hernandez IRD/LEGOS/UFPE as part of the LMI TAPIOCA
In collaboration with Moacyr Araujo (UFPE) and Carlos Lentini (UFBA)
Support of R. Morrow, SWOT PI, CNES & OMP/LEGOS

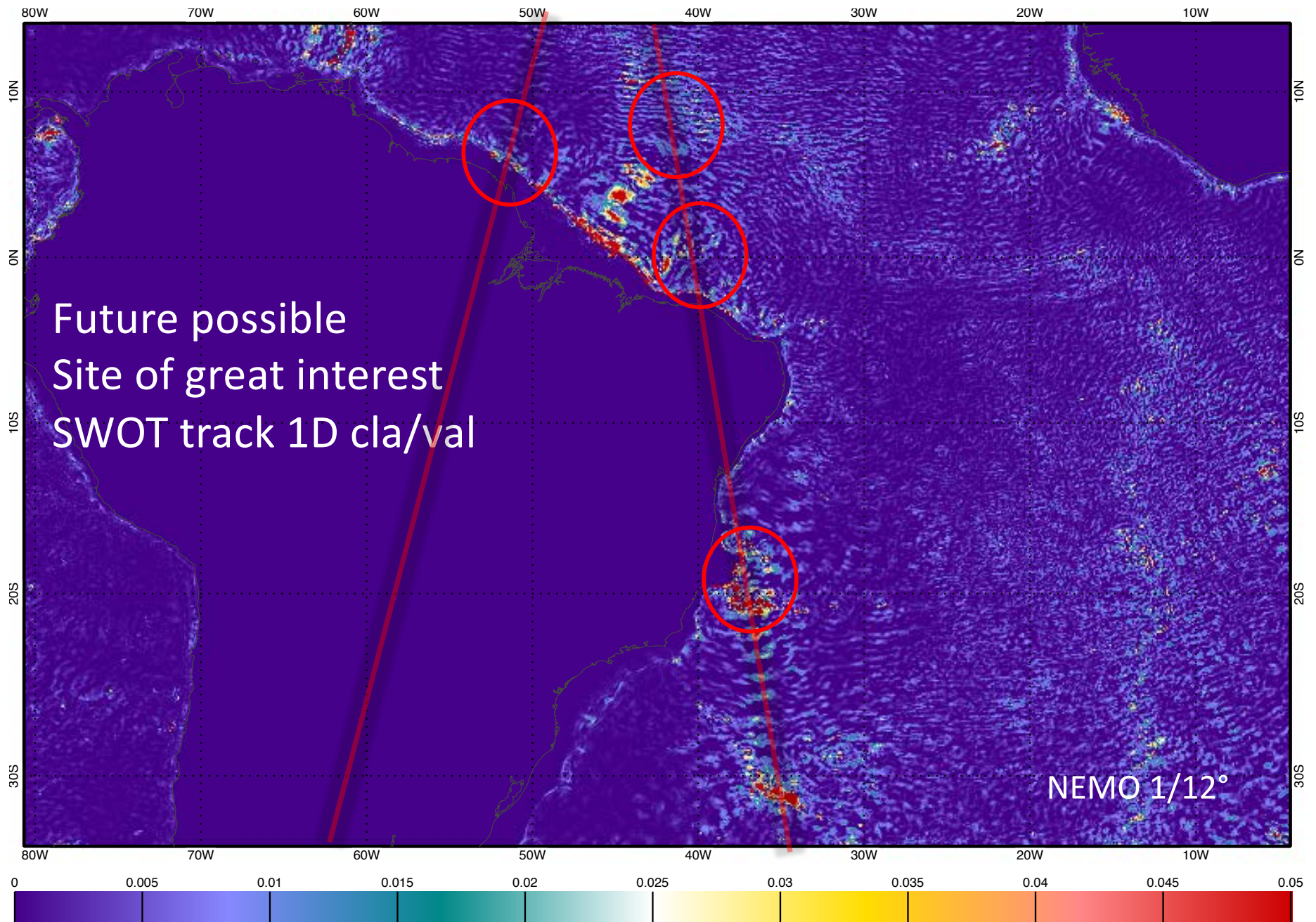
Anticipate CNES-NASA SWOT (Surface Water and Ocean Topography) launch in late 2021 and organize a SWOT-Ocean Brazil group.

1. *Brief summary of first advances in organizing the community in Brazil*
2. *Identify PIs and COIs from propositions*

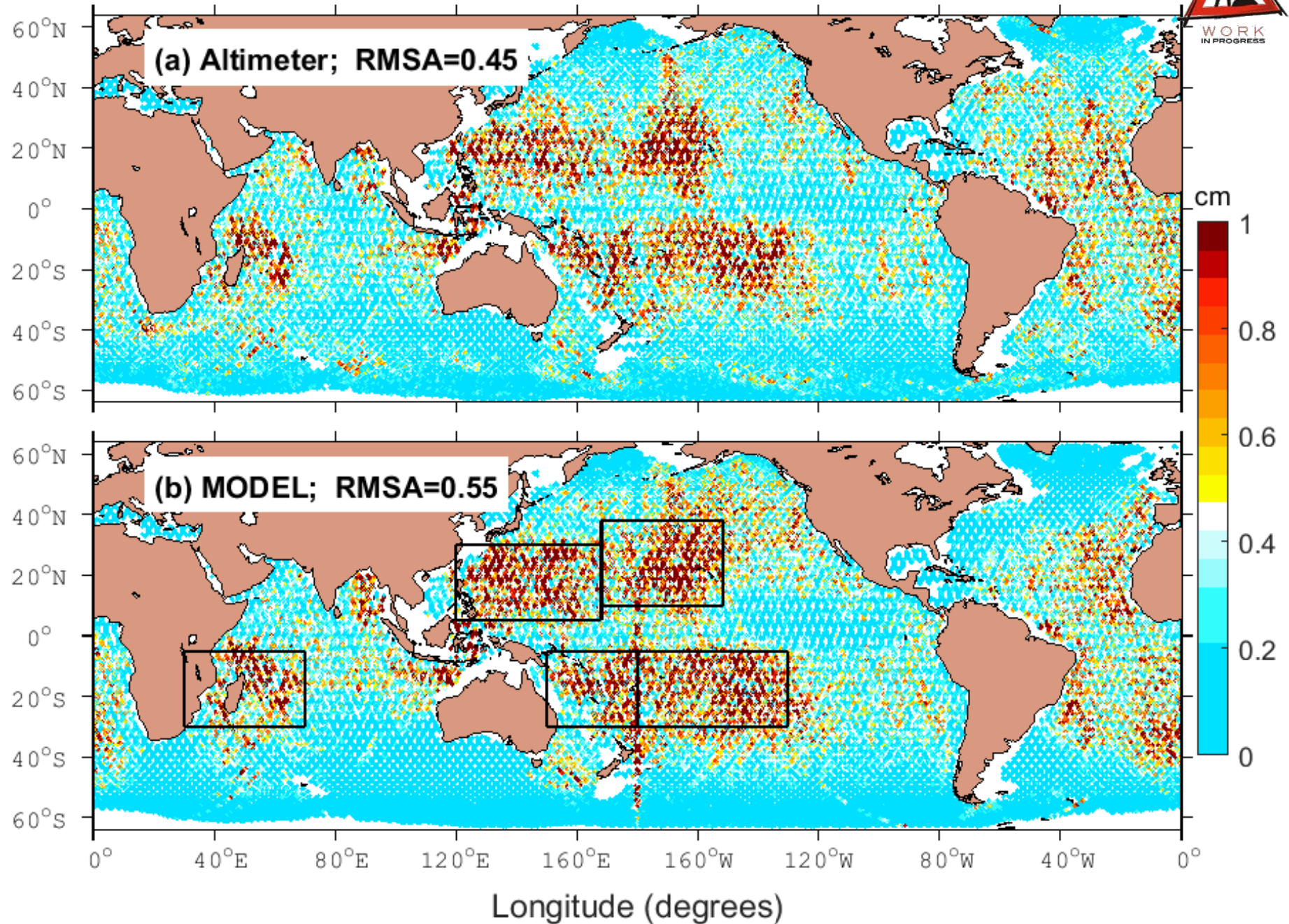




Internal tides dissipation NEMO 1/12°



I – estimation of internal tides – altimetry - models



CONCLUSION

- 2019 : Regional high-scale modelling
- 2020-2021: Define / Implement Scientific Projects
 - AMAZOMIX campaign: Already financed and programmed
 - Brazilian initiatives, with possible collaboration with French co-I
- 2021-2022:
 - Could plan for dedicated campaign dedicated for SWOT CalVal in the three sites of Brazilian Coast
- 2022-2025: SWOT Science Mission: Potential contributions:
 - Assimilation of SWOT data in regional models

Thanks

SWOT Ocean Brazilian initiative:

- 2019: Interest of the Brazilian oceanographers
 - Announcement during 2019 in Brazilian oceanography community
 - **Mailing**
 - Annual **SWOT Science Team 2019 meeting**
 - **SWOT Hydrology meeting during the conference "Space II", to be held in Manaus, Brazil, 4-7**
- 2020: Define / Implement Scientific Program
 - AMAZOMIX campaign (PI Ariane Koch-Larrodé) in conjunction with existing SWOT science projects
 - Brazilian initiatives, with possible collaboration with other countries
- 2021-2022: SWOT CalVal
- 2022-2025: SWOT Science Mission: Product Development
 - Regional high-scale modelling
 - Assimilation of SWOT data in regional models

Carlos Lentini (UFBA)
 Maocyr Araujo (UFPE)
 Marcus Silva (UFPE)
 Alex Costa (UFPE)
 Clemente Tanajura (UFBA)
 Luis Felipe Mendonça (UFBA)
 Antonio Geraldo Ferreira (UFC)
 Renato renatopm@petrobras.com.br
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 Ronald Buss de Souza (CPTEC/INPE)
 Ricardo de Camargo (USP)
 Ilana Wainer (USP)
 Paulo Simionatto Polito (USP)
 Olga Sato (USP)
 Leandro Calado
 Roberto Fontes
 Rollnic (UFPA)
 Milton Kampel
 Wilton Arruda (UFRJ)
 Fabricio Oliveira (FURG)
 Marcelo Sandin Dourado (UFPR)
 Janini Pereira janinipereira@gmail.com
 Mauricio Fragoso, Julio Pellegrini (PROOCEANO)



Tête de mouillage (poids eau +93 kg)
Profondeur : 60 m
4 UCAT (poids eau -8 kg)
Profondeurs : 80, 120, 180, 250 m par ex.

FLOTTEUR ADCP +288kg
AF44 DeepWater Buoyancy 1500m

5 metres de chaine

2 releases (poids eau -50 kg)

15 m
chaine

470 mètres

weight

CTDs
@thermocline



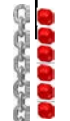
Tête de mouillage (poids eau +93 kg)
Profondeur : 60 m
4 UCAT (poids eau -8 kg)
Profondeurs : 80, 120, 180, 250 m par ex.



Lenticulaire (poids eau +391kg)
ADCP 75 kHz long (poids eau -50 kg)

5 metres de chaine

2000 mètres kevlar cable
Ø8.5mm



7 Benthos (poids eau +150 kg)

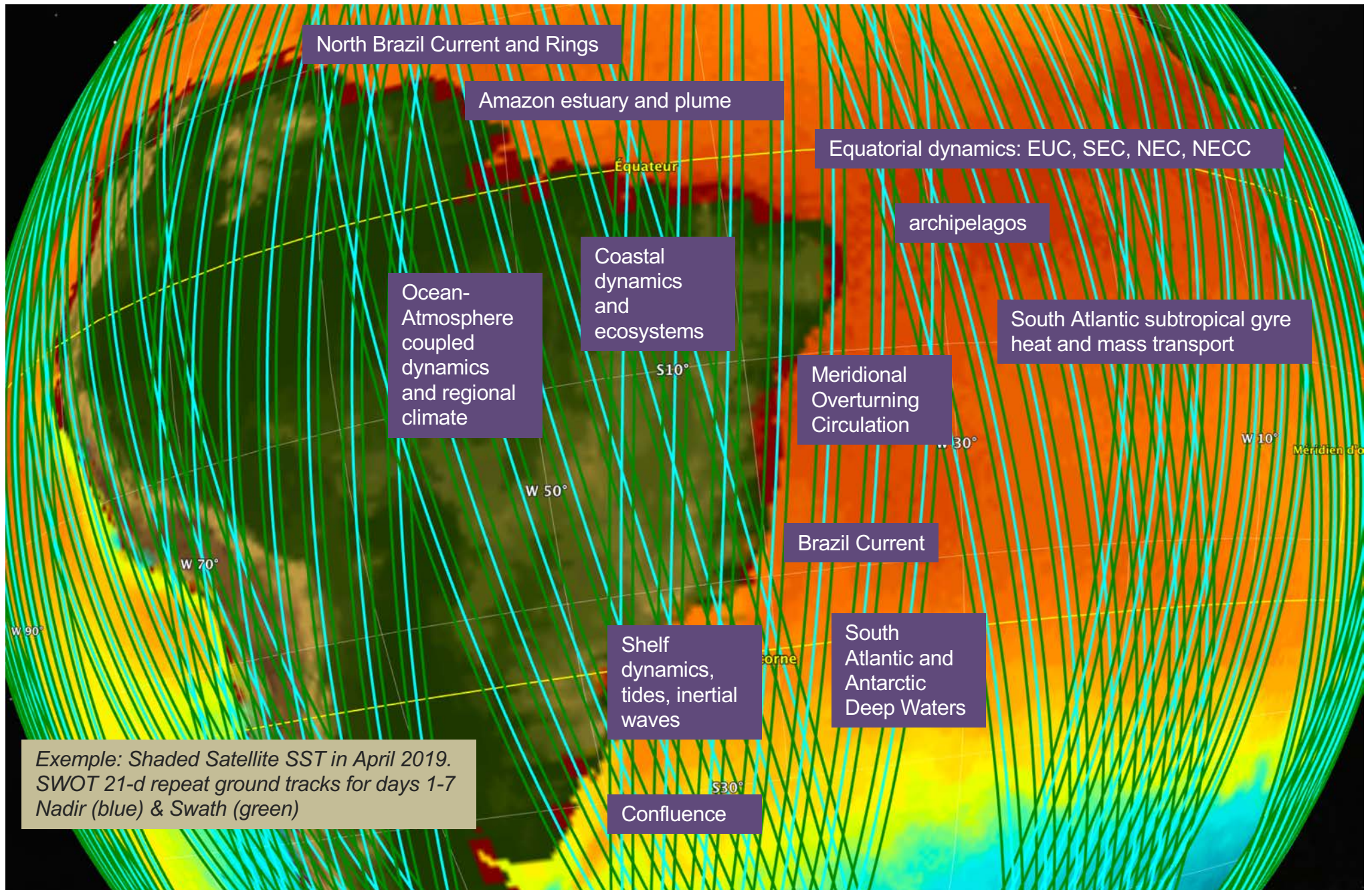


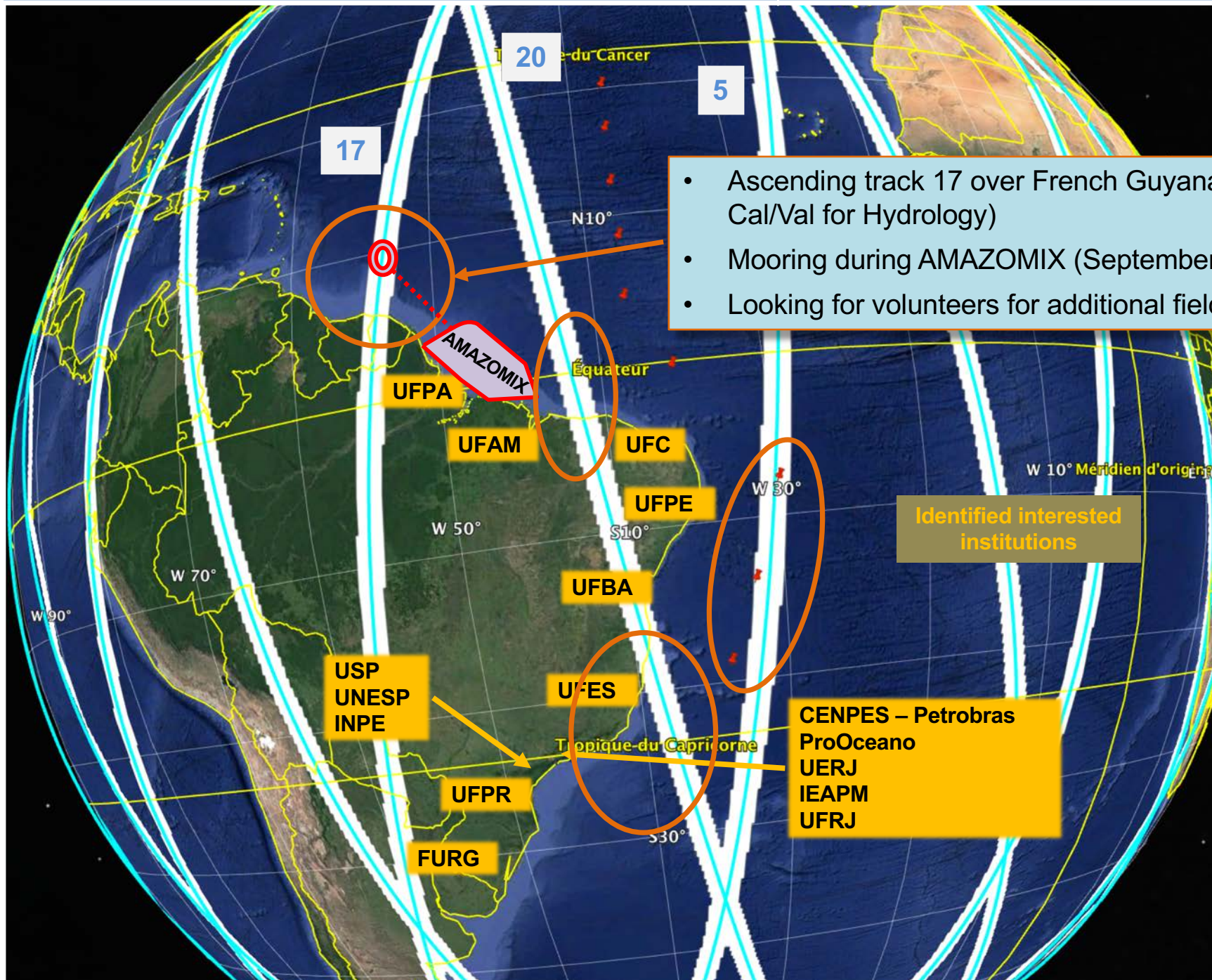
2 releases (poids eau -50 kg)



15 m chaine

2400 metres
weighth

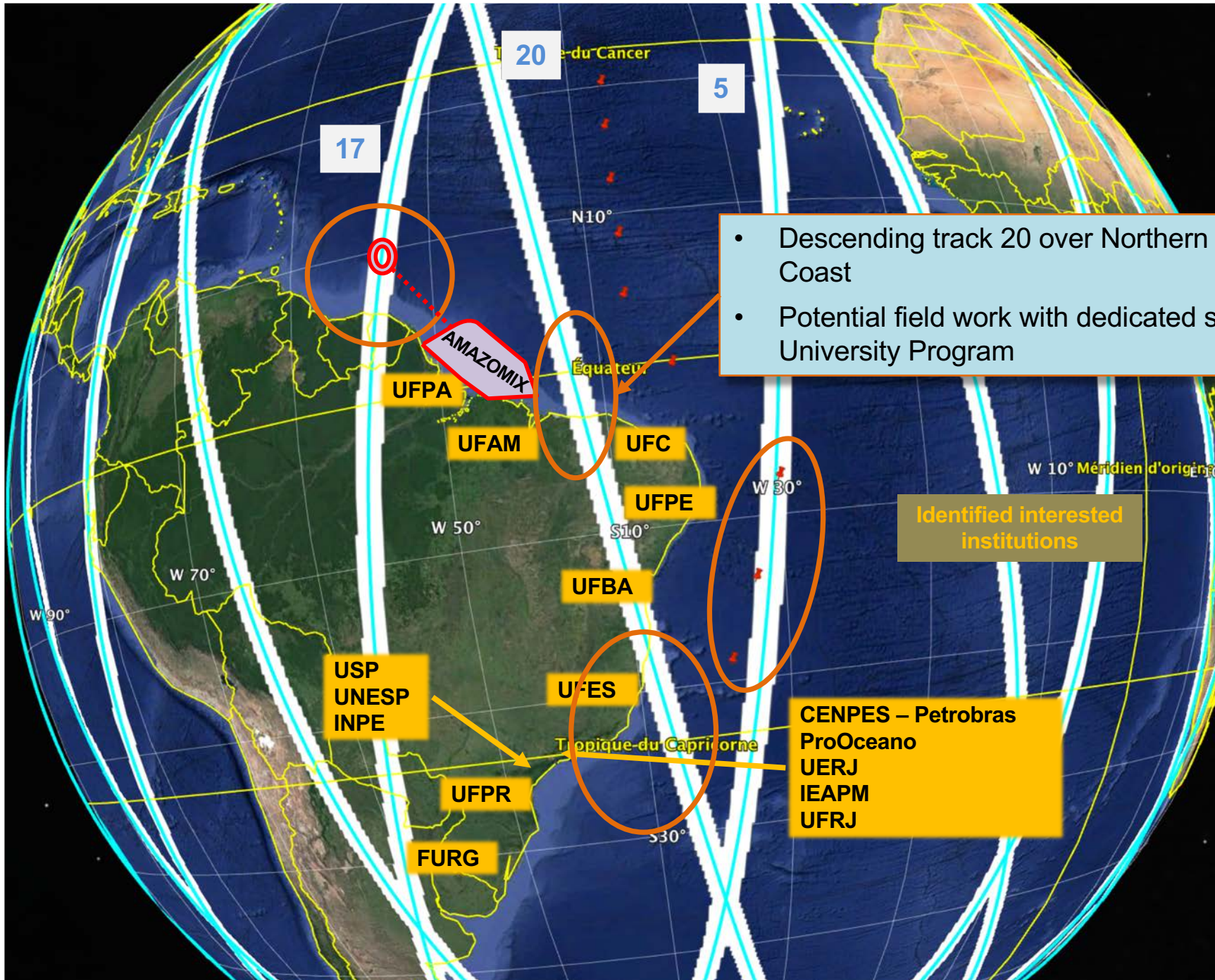




- Ascending track 17 over French Guyana (French Cal/Val for Hydrology)
- Mooring during AMAZOMIX (September 2020-21)
- Looking for volunteers for additional field work

Identified interested institutions

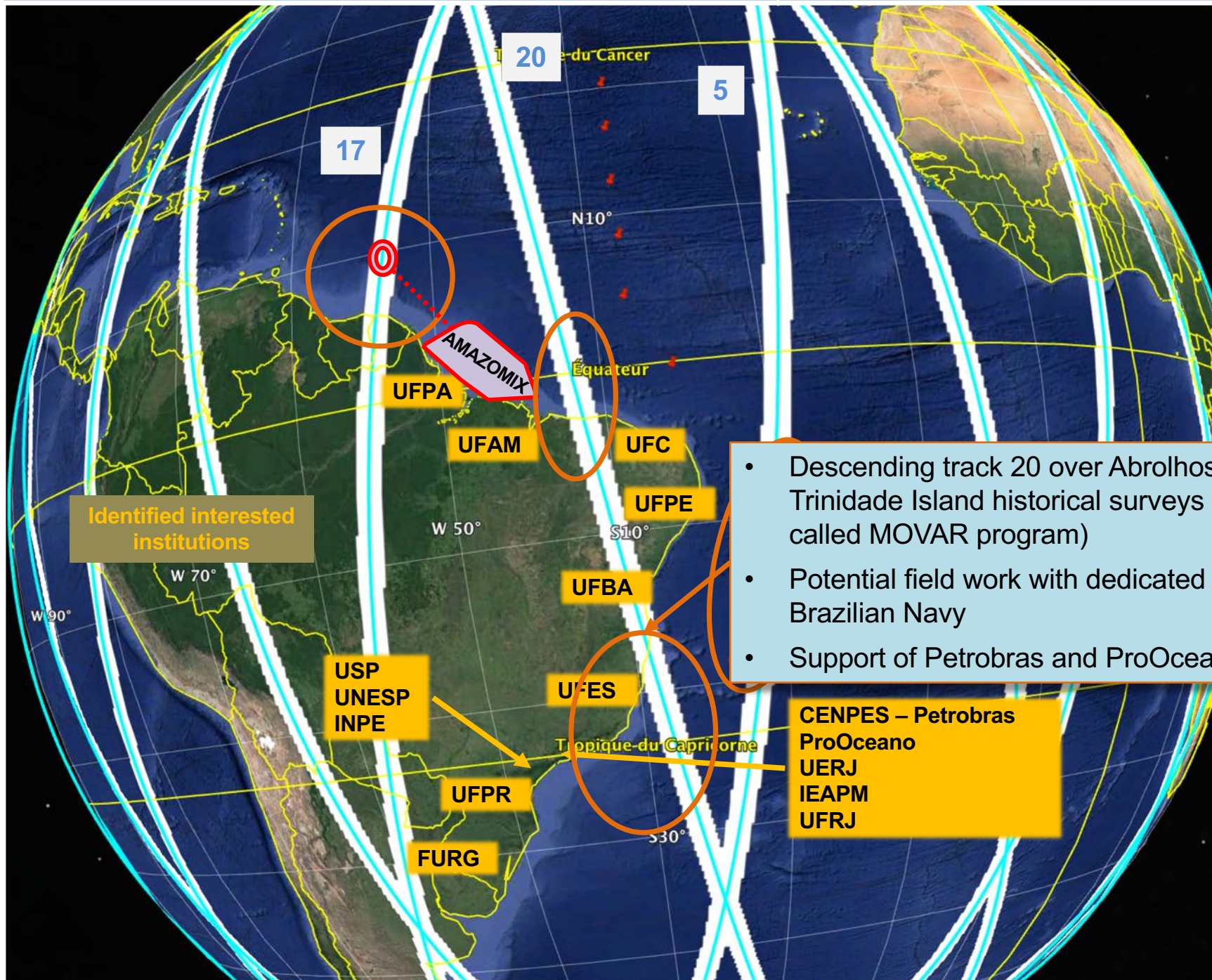
CENPES – Petrobras
 ProOceano
 UERJ
 IEAPM
 UFRJ



- Descending track 20 over Northern Brazilian Coast
- Potential field work with dedicated ship from University Program

Identified interested institutions

CENPES – Petrobras
ProOceano
UERJ
IEAPM
UFRJ

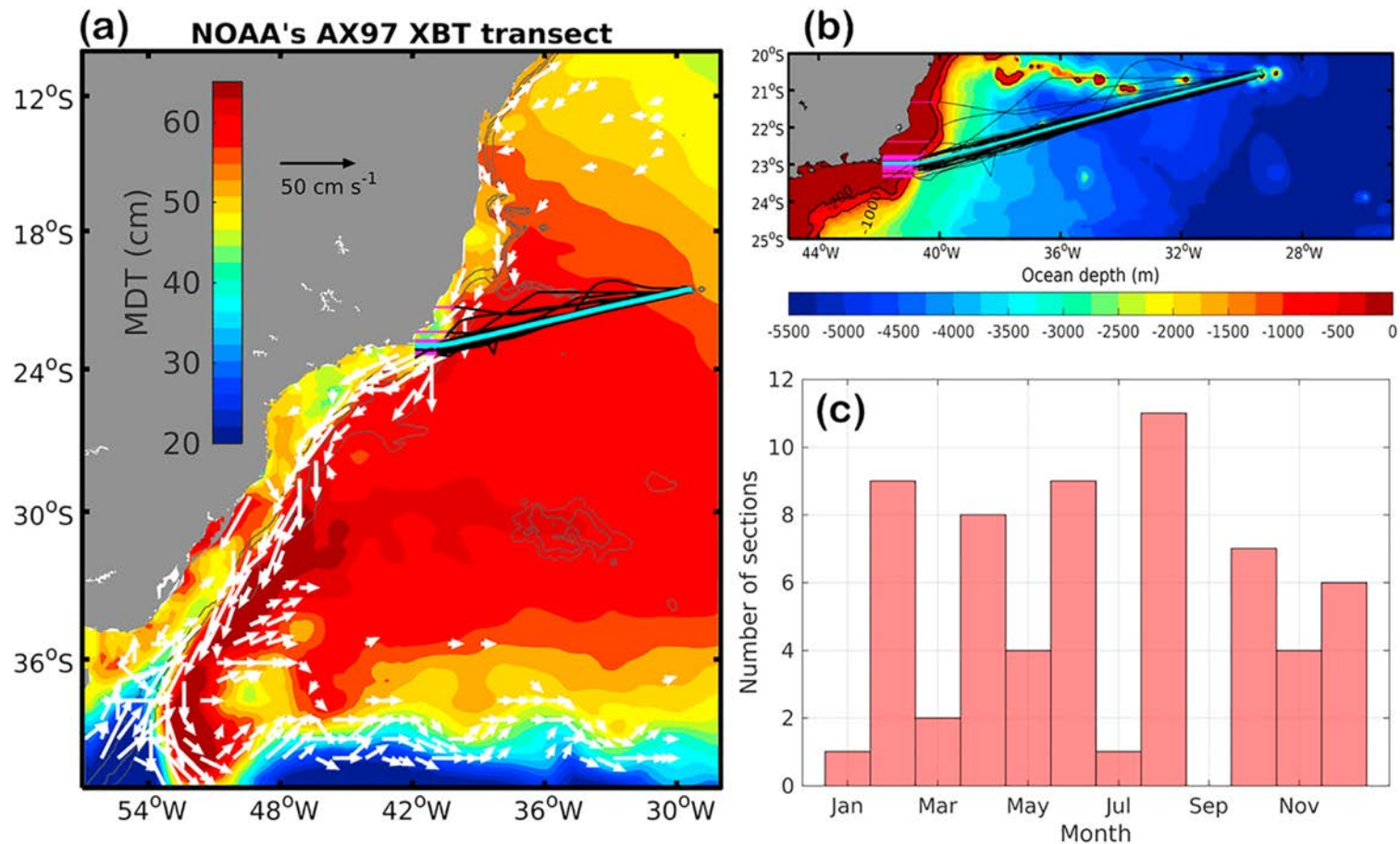


- Descending track 20 over Abrolhos Bank and Trinidad Island historical surveys (AX97, also called MOVAR program)
- Potential field work with dedicated ship from Brazilian Navy
- Support of Petrobras and ProOceano (gliders)

CENPES – Petrobras
ProOceano
UERJ
IEAPM
UFRJ

Abrolhos and Trinidad Island potential Cal/Val Site

- Existing field survey of XBT and series of papers
- Model studies (e.g., Schmid & Majumder, 2018)



Map from Goes et al, (2019, doi: 10.1029/2018JC014809) – Repeat XBT97 line since 2004 – 5 times a year

SWOT Ocean Brazilian initiative:

- 2019: Interest of the Brazilian oceanographic community
 - Announcement during 2019 in Brazilian oceanographic meetings



- **Mailing**
- Announcements of:
 - Annual **SWOT Science Team 2019** meeting (Bordeaux, France, June 2019)
 - **SWOT Hydrology meeting during the conference "South America Water from Space II", to be held in Manaus, Brazil, 4-7 November 2019.**