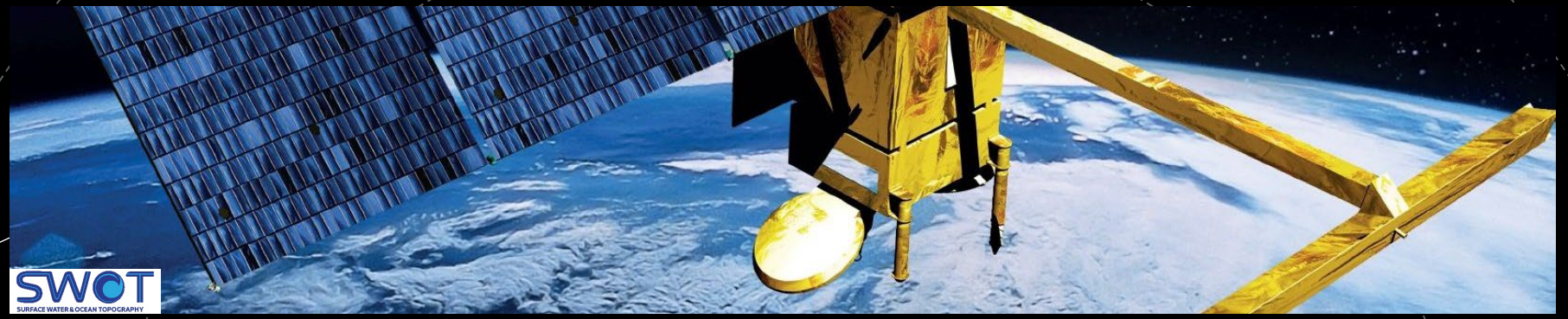


SWOT – PROGRAM STATUS

YANNICE
FAUGERE

CNES Program Manager
Oceanography

DELPHINE
LEROUX

CNES Program Manager
Hydrology,
Continental Cryosphere,
Water Cycle

NADYA
VINOGRADOVA SHIFFER

NASA Ocean Physics
Program

RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

cnes

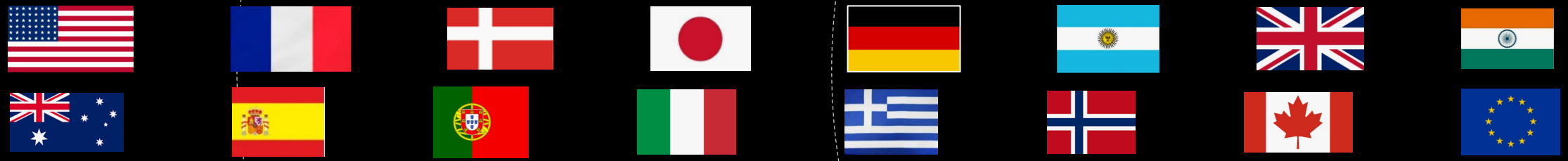
SWOT

NASA

SWOT ST MEETING 2025, ARCACHON, OCTOBER 14, 2025

SCIENCE TEAM 2024-2027

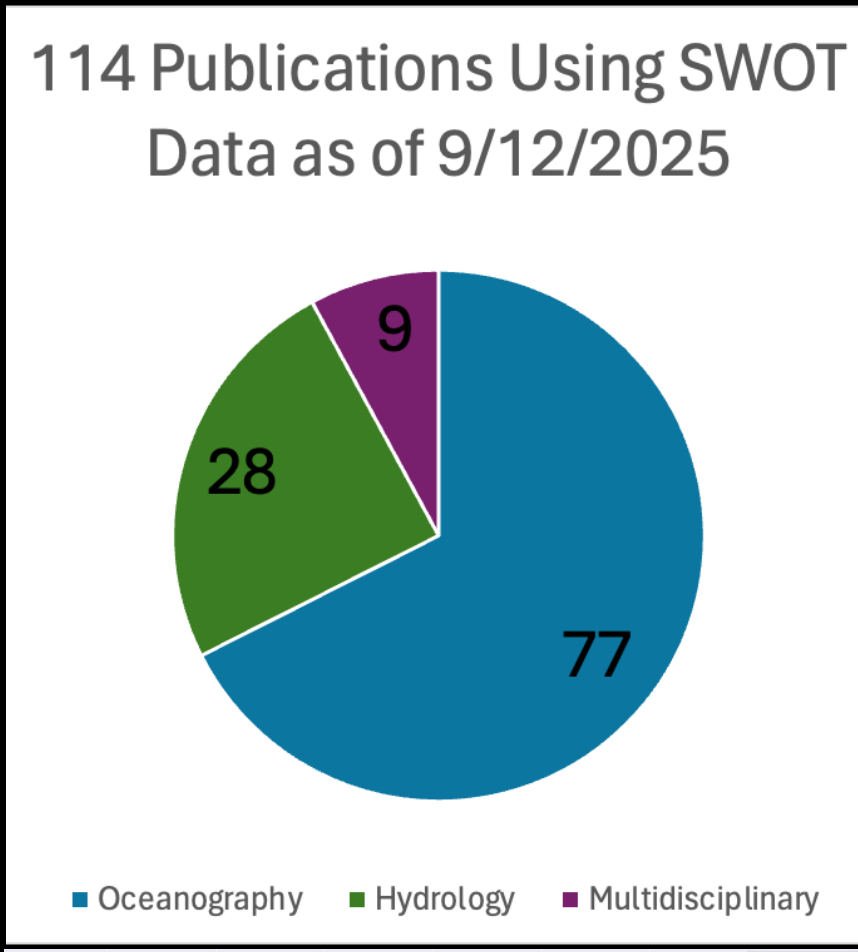
- Project/PI selection through ROSES (US) and TOSCA (FR + Int'l)
  - 120 US members & 106 FR + Int'l members (15 countries represented)
  - Covering 4 themes Ocean, Hydrology, Coastal & Polar
  - Investigating new territories: wetlands, sea ice, sea mounts …

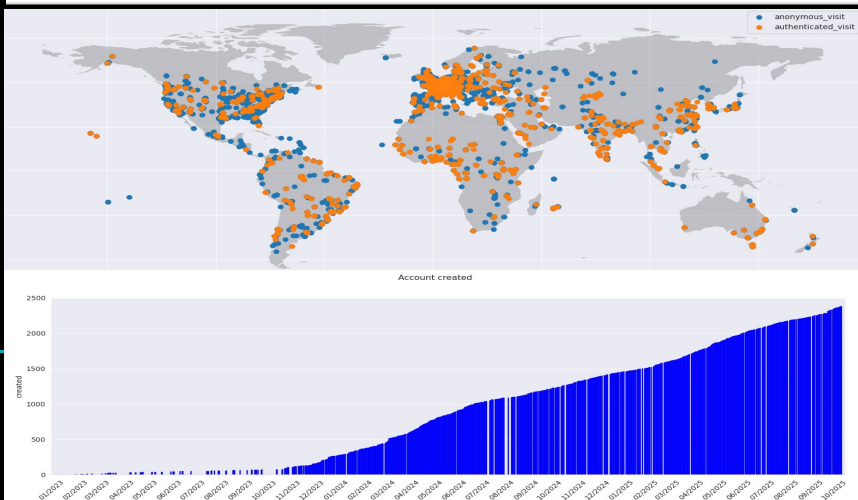


- Strong success of this SWOT ST meeting with more than 400 registrations! Goes beyond ST members, 1st time that it is open to every one

SWOT IS A SUCESS

- Mission : Almost 3 years in orbit and everything works perfectly
- Science: more than 100 publications
- Users
  - Aviso: 1 million products downloaded every month
  - Hydroweb.next: 17,467 visitors, 2387 accounts created, 157 countries
  - PODAAC: same success!



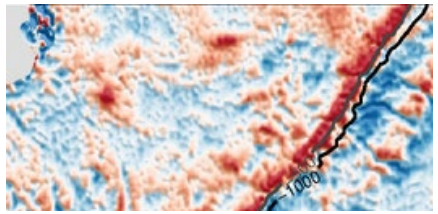


Success for ocean science … with great perspectives in operational oceanography

The Surface Water and Ocean Topography Mission: A Breakthrough in Radar Remote Sensing of the Ocean and Land Surface Water

AGU

Lee-Lueng Fu, Tamlin Pavelsky, Jean-Francois Cretaux, Rosemary Morrow, J. Thomas Farrar, Parag Vaze, Pierre Sengenes, Nadya Vinogradova-Shiffer, Annick Sylvestre-Baron, Nicolas Picot, Gerald Dibarboure … See fewer authors



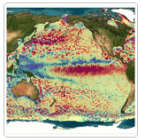
Science

Abyssal marine tectonics from the SWOT mission

YAO YU, DAVID T. SANDWELL, AND GERALD DIBARBOURE Authors Info & Affiliations

Ocean Science

Blending 2D topography images from the Surface Water and Ocean Topography (SWOT) mission into the altimeter constellation with the Level-3 multi-mission Data Unification and Altimeter Combination System (DUACS)



Gerald Dibarboure, Cécile Anadon, Frédéric Briol, Emeline Cadier, Robin Chevrier, Antoine Delepoulle, Yannice Faugère, Alice Laloue, Rosemary Morrow, Nicolas Picot, Pierre Prandi, Marie-Isabelle Pujol, Matthias Raynal, Anaelle Tréboutte, and Clément Ubelmann

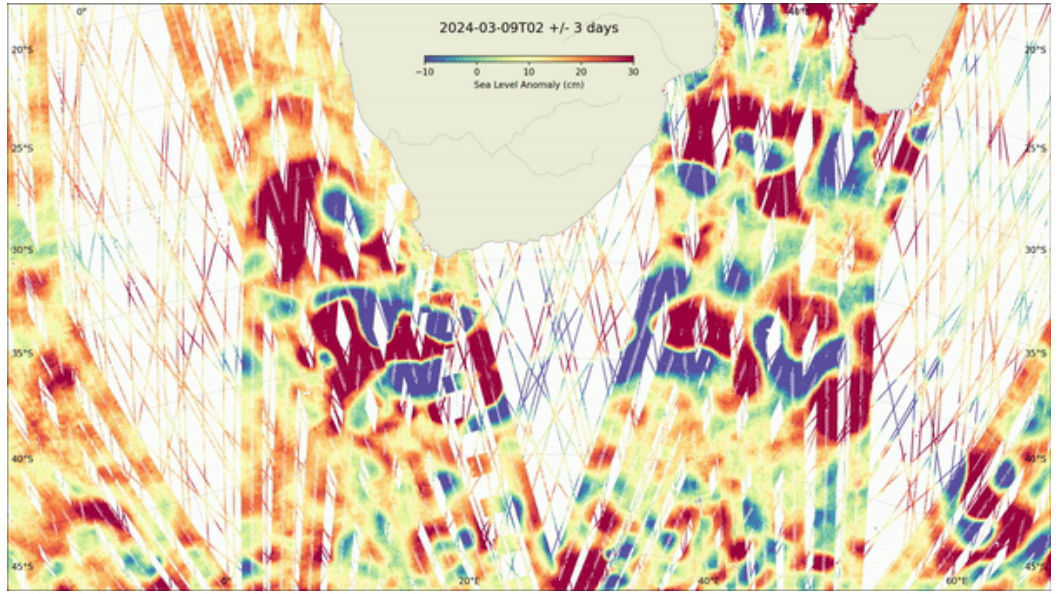
Wide-swath satellite altimetry unveils global submesoscale ocean dynamics

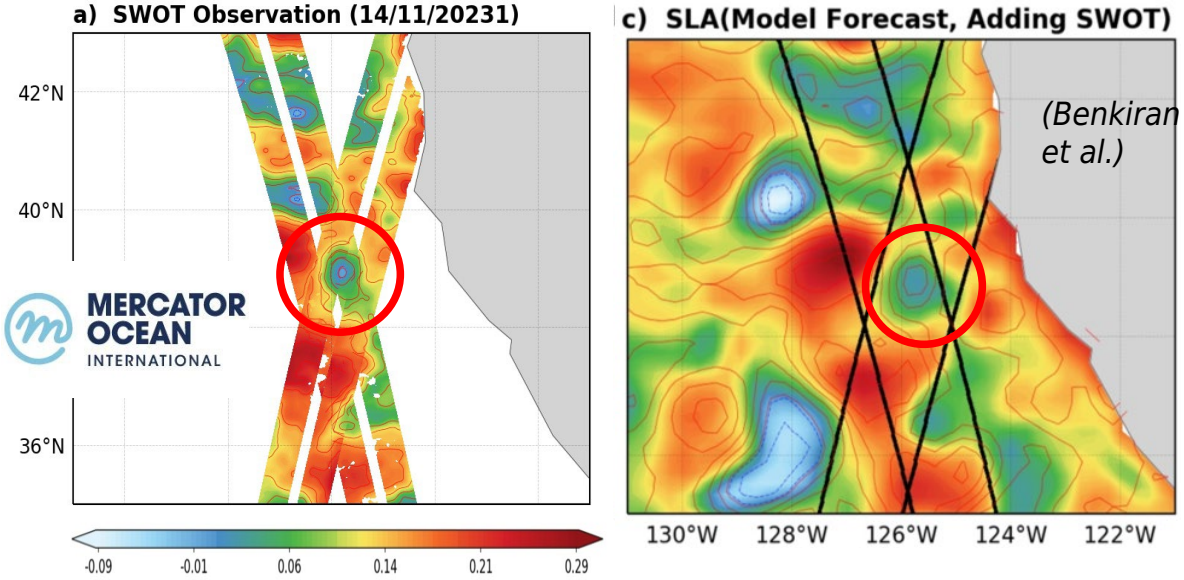
Matthew Archer, Jinbo Wang, Patrice Klein, Gerald Dibarboure & Lee-Lueng Fu

PNAS

Sizing the largest ocean waves using the SWOT mission

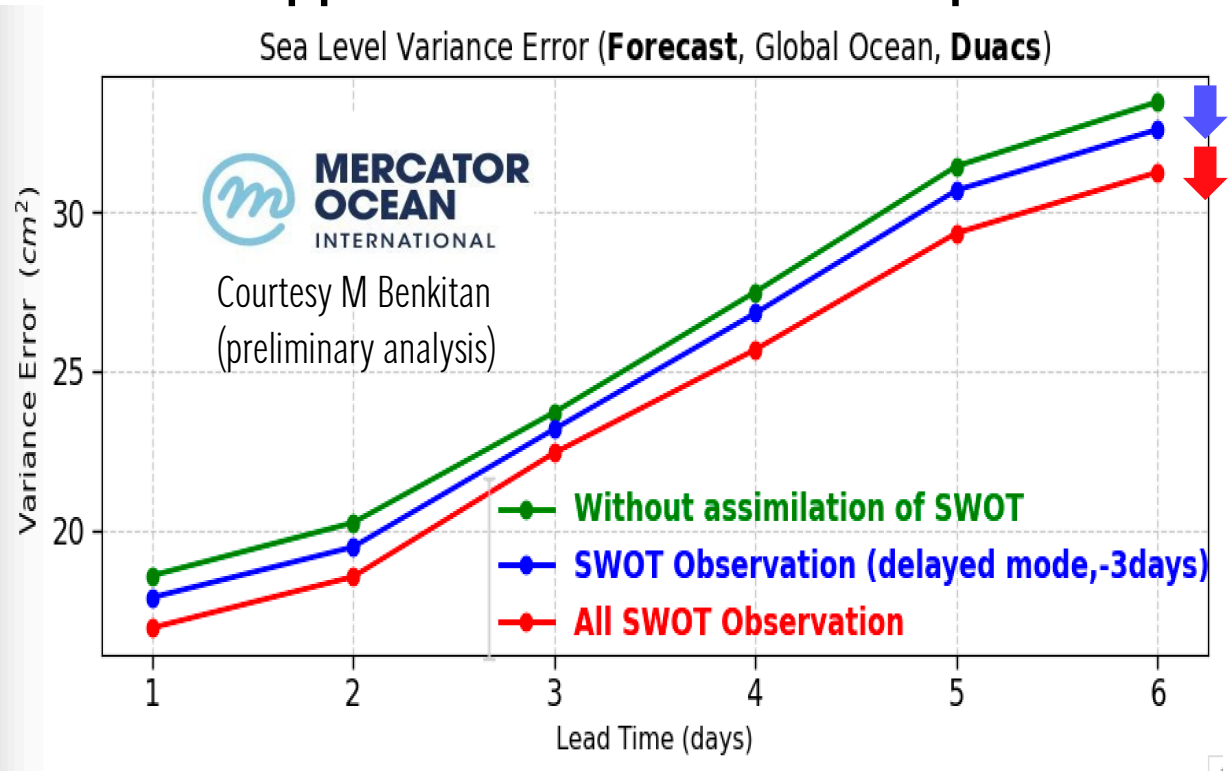
Fabrice Ardhuin, Taina Postec, Mickael Accensi, +6, and Fabrice Collard Authors Info & Affiliations





Assimilation of fine scale structures has strong impacts on ocean model forecast performances with more than 15% improvement

Ocean applications: need of an improved latency



Adding SWOT 72H latency

Improving Latency (RT)

Not used
Used for validation
In developpment
research basis
Assimilated indirectly
Assimilated directly

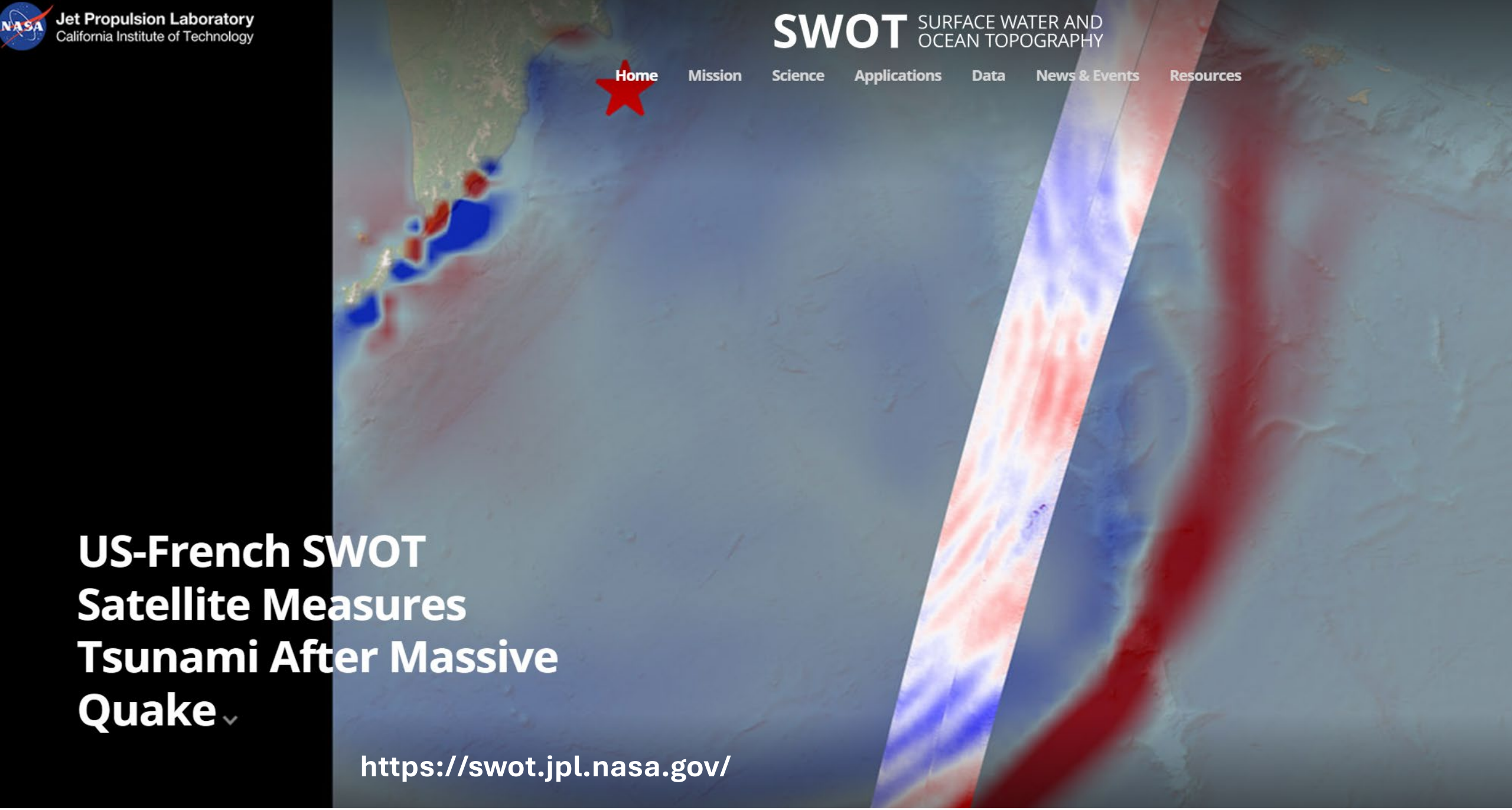
Most of those systems produce forecasts on a daily basis, requiring the arrival of observations to be assimilated within 24h latency (Ocean Models - Ocean Predict). OceanPredict would benefit from SWOT latency improvement

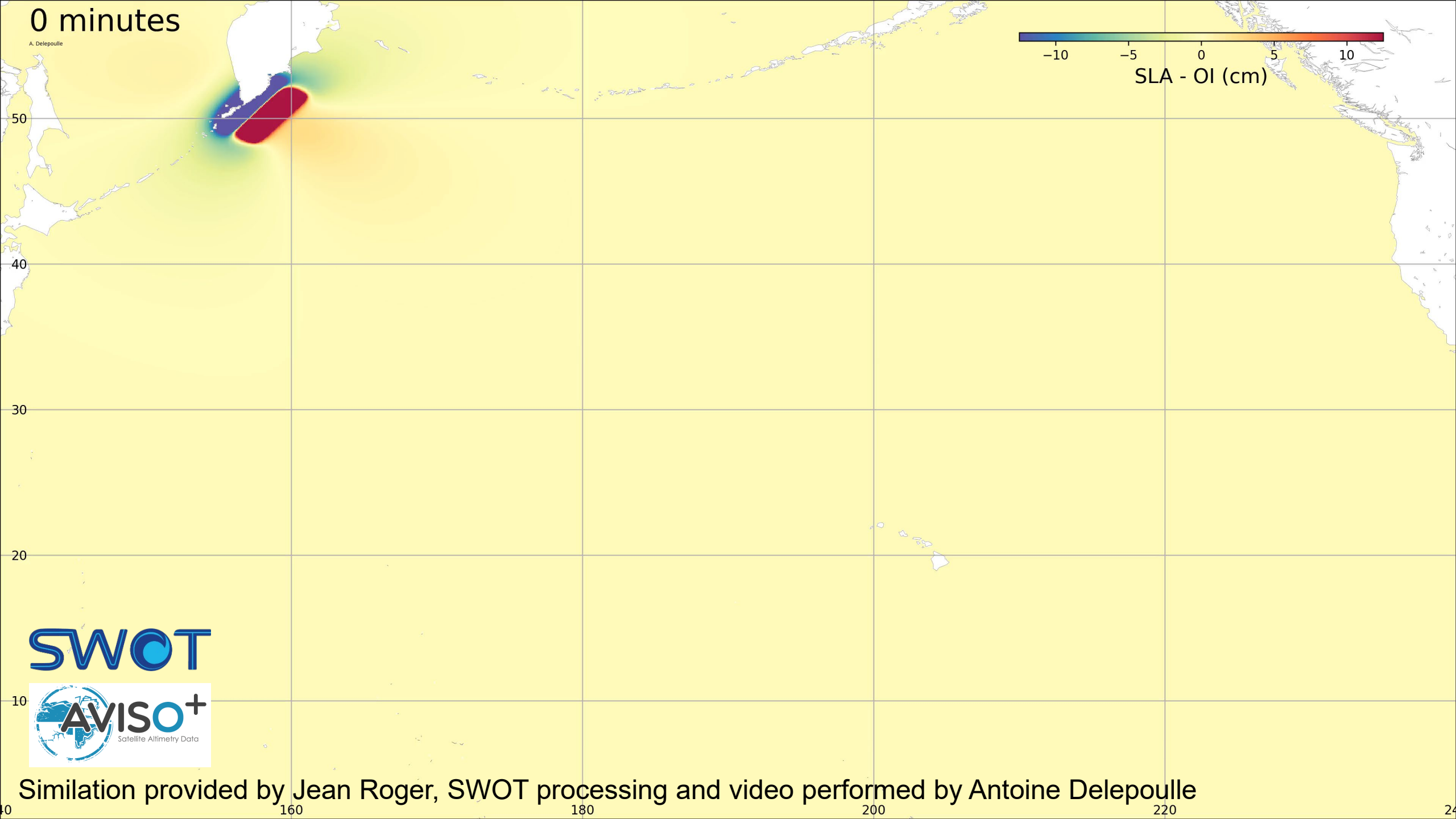
Current SWOT Latency : between 47 and 61 hours

Coming SWOT Latency (by the end 2025) : between 22 and 36 hours

OceanPredict Advancing the science of ocean prediction oceanpredict.org/

Center/Institute	NRT and DT System Name	Nadir (Jason-3)	SWOT
BoM (CSIRO) (Aust.)	OceanMAPS		
CHM-REMO (Brazil)	RODAS		
ECCC (Canada)	GIOPS (global 1/4°)		
	RIOPS (Pac-Arctic-NAtl 1/12°)		
	CIOPS (East&West Coast, 1/36°)		
ECMWF (UK)	OCEAN5 Global 1/4		
	ECWAM		
INCOIS (India)	RAIN (1/12 degree)		
	INCOIS-GODAS (1/2X1/4 global)		
	HYCOM (1/12 degree)		
	SWAN		
	WAVEWATCH III (1 degree)		
JMA (Japan)	MOVE (Global)		
	MOVE (Regional)		
	Wave DA Systems		
Mercator Ocean (Fr)	GLO12 (Global 1/12°)		
	IBI36 (Regional 1/36°)		
MET Norway	TOPAZ5 (Pan-Arctic)		
	WAM3km		
Met Office (UK)	FOAM global and regional (1/4 and 1/12 degree)		
	FOAM shelf (1.5 km)		
	Coupled DA (1/4 degree)		
	WaveWatchIII		
NASA GEOS (US)	S2Sv2 global 1/2		
	S2Sv3 MERRA2 Ocean 1/4		
NOAA (US)	RTOFS-DA		
	WCOFS		
CMCC (Italy)	GOFS16 (global 1/16°)		
	MEDFS		
	BSFS		
KIOST (Korea)	OPEM(Northwest Pacific regional 1/24 degree)		
NOAA (US)	GLORe		

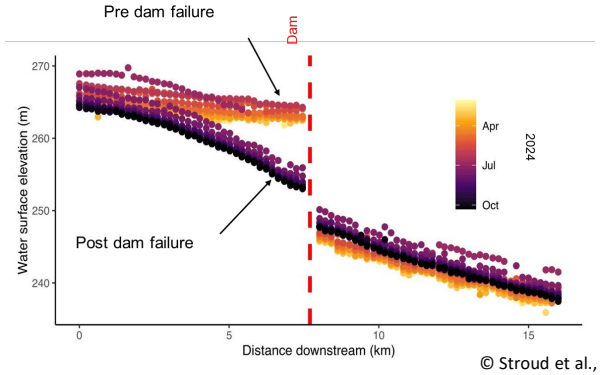

Jet Propulsion Laboratory
California Institute of Technology
SWOT
SURFACE WATER AND
OCEAN TOPOGRAPHY
Home
Mission
Science
Applications
Data
News & Events
Resources
US-French SWOT Satellite Measures Tsunami After Massive Quake
https://swot.jpl.nasa.gov/



Similation provided by Jean Roger, SWOT processing and video performed by Antoine Delepoulle

ACHIEVEMENTS - HYDROLOGY

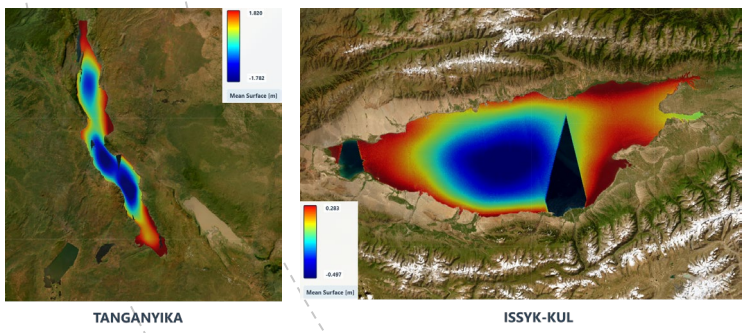
- Hydrology at the global scale!
- River products:
  - SWOT is definitely able to monitor narrow rivers, e.g. partial failure of Rapidan Dam, Minnesota in June 2024



© Stroud et al., in review in GSA Today

© CLS, CNES

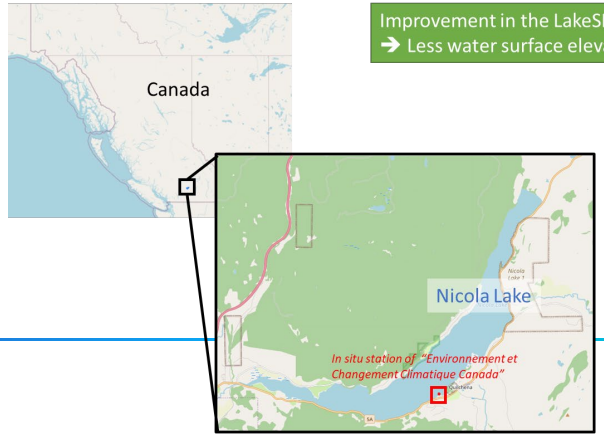
- Lake products:
  - Geoid issues are being quantified, new version will improve considerably over large lakes!
  - Improvements from version C to version D with less outliers



TANGANYIKA

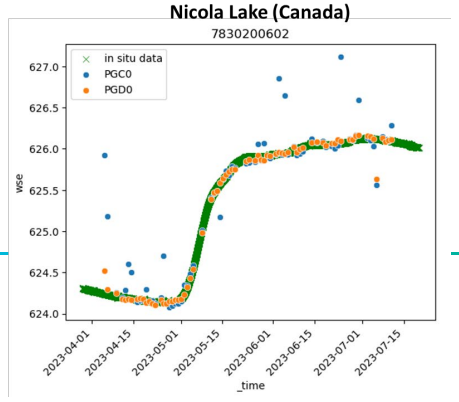
ISSYK-KUL

© François Boy, CNES



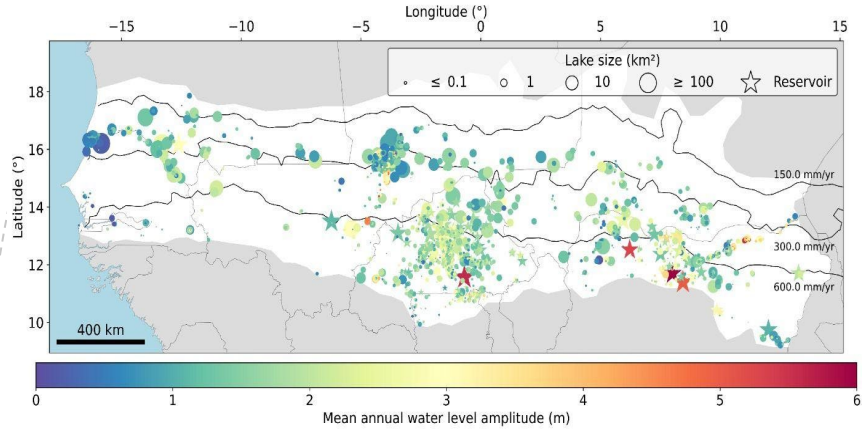
© Claire Pottier, CNES

Improvement in the LakeSP product from version C to version D
➔ Less water surface elevation (WSE) outliers



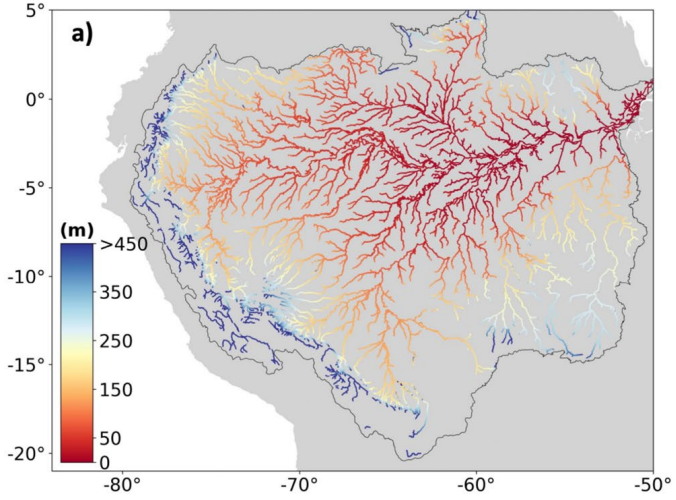
SCIENCE ACHIEVEMENT - HYDROLOGY

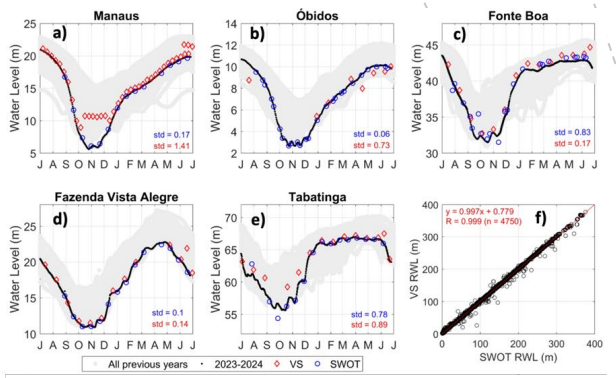
From local to global scale – science achievement at every scale is on its way!



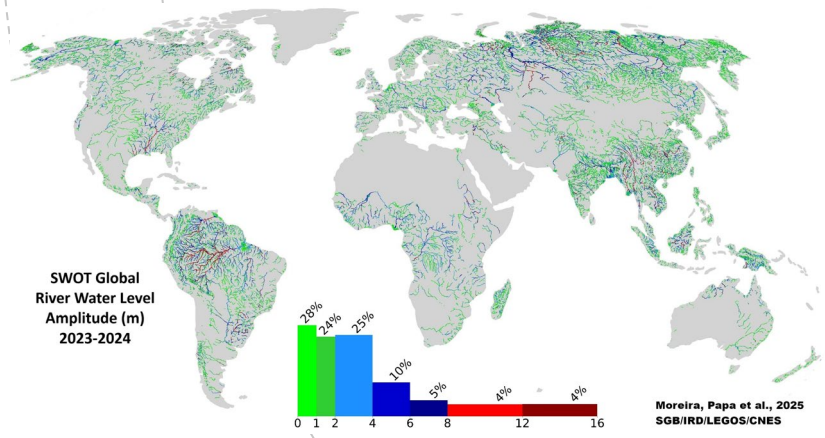
SWOT provides unprecedented lake dynamics – Girard et al., 2025b, IEEE JSTARS

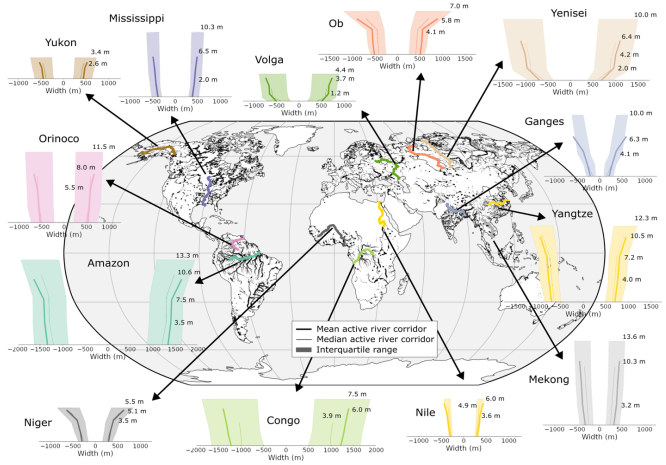
Minimum River Water Level recorded from SWOT in 2023

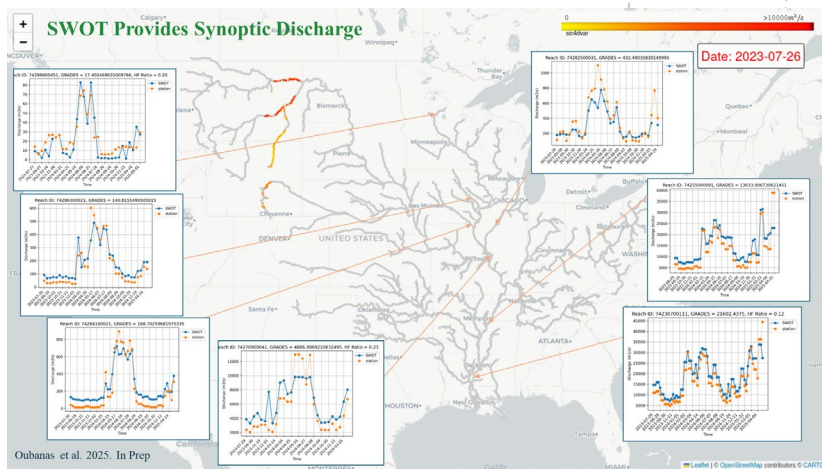




SWOT Captures Extreme Drought on the Amazon Basin in 2023 – Moreira et al., 2025, GRL



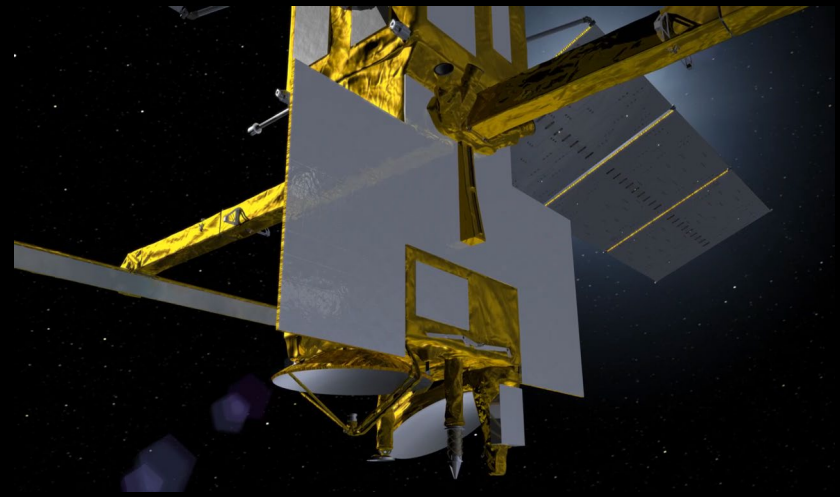




SWOT Observes the Variability of River Corridors Globally – Wade, Cerbelaud et al., in review

WHAT'S COMING UP NEXT

- In 2026:
  - Senior Review
  - REDEM (Mission Extension Review)

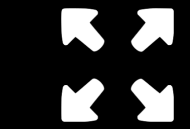


SWOT	2022	2023	2024	2025	2026	2027	2028
	N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J		
Project Phases		Phase D	Phase E			… extension …	
Project Milestones		Launch	PLAR Science Validation Mtg REVX1 Mtg	REVX2 Mtg	REVX3 Mtg		
LEOP, Calibration, Validation		Comsn Cal / Val Measurement validation		WE ARE HERE			
Science Team Meetings							

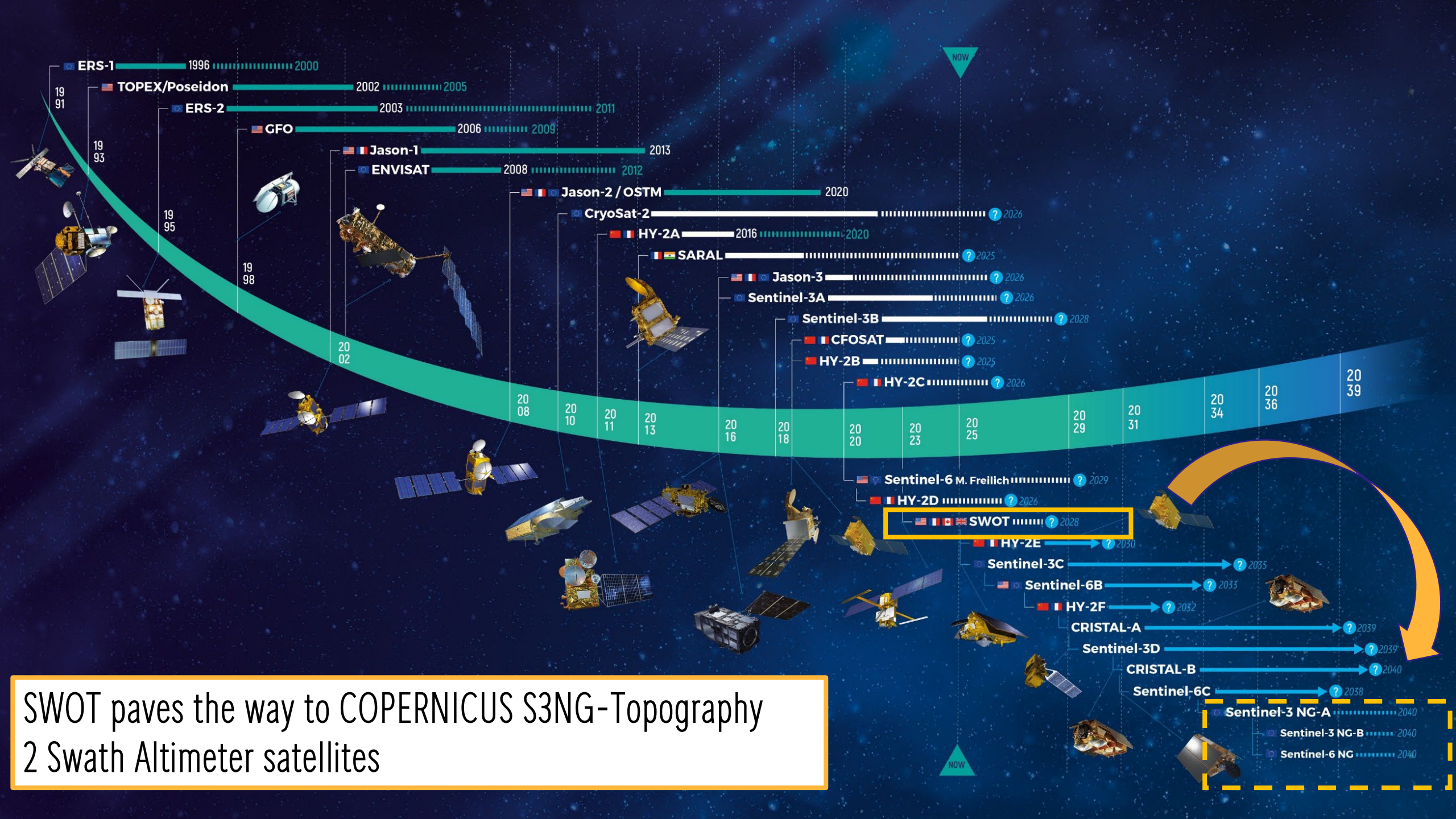
EXPECTED ST OUTCOMES

- Share recent developments (satellite, instrument performances, data processing)
- Share best practices for SWOT data use (in addition to reading the manual ☺)
- Present new discoveries in the mission driver fields and explore new fields

- We encourage you to combine SWOT with other sources of data
- Applications are more and more emerging
- Extend science and applications communities



- Gather arguments to support the continuation of the mission for the next years
- SWOT product latency: discuss the benefits and feasibility of latency improvements (short and long terms)
- Should we use more AI in the official SWOT products? (e.g. denoising)



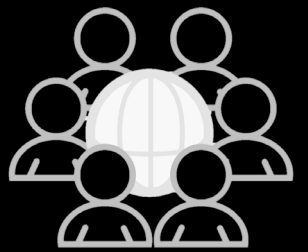
SWOT paves the way to COPERNICUS S3NG-Topography
2 Swath Altimeter satellites

TO CONCLUDE

- We can be proud of the wonderful health of the satellite, the performances of the instruments, the international collaboration
- Science results are beyond expectation this soon after launch

- Milestone has been reached this year with the success of this ST meeting (full house)
- Welcome to the new SWOT users!

- Let’s continue to work together as a community for the future of the wide swath altimetry



THANK YOU TO THE PROJECT & SCIENCE TEAM