CNES updates since CGMS-53 and report to medium to long term plans on Earth Observation

Presented to CGMS-54 plenary session
Murielle Lafaye

Coordination Group for Meteorological Satellites

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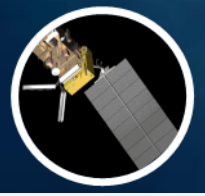
Executive summary

- CNES satellite systems in exploitation
- Overview on the planning of CNES satellites systems
- Data & products distribution

MISSIONS IN EXPLOITATION (FEBRUARY 2026)

IR Sounding

IASI 2/Metop B - 2012



IASI-NG/Metop SG A1 - 2025

🚀 12 août 2025

IASI 3/Metop C - 2018

Ocean & Hydrology

SMOS - 2009

SWOT - 2022

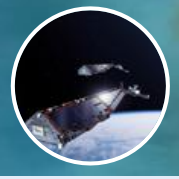
Altimetry

Hy-2 B/C/D

Jason 3 - 2016

Sentinel-6A - 2020

Magnetic Field



Swarm - 2013

Cryosat-2 - 2010

CFOSAT - 2018

Sentinel-3A - 2016

Defence /

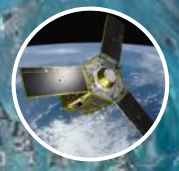
CSO 1 - 2018

CSO 2 - 2020

CSO 3 - 2025

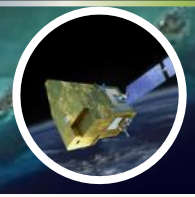
Optical Imagery

Pléiades 1 A - 2011

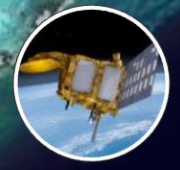


Pléiades 1 B - 2012

Carbone



MicroCarb - 2025



Saral-AltiKa 2013

Sentinel-3B - 2018

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CNES satellite systems in exploitation

- **IASI / IASI-NG (launched 13th august 2025 on EPS-SG A1)**
  - IASI-B & IASI-C : Exploitation of the instruments is nominal
  - Intercalibration IASI-C & IASI-NG : from mid- April to mid-June, Tandem flight Metop-C & EPS-SG-A1
  - IASI Sounder Scientific Working Group : meeting 8-9 December 2025; next meeting 2-3 July 2026

- **MICROCARB**
  - Ice contamination : impacts components of the instrument and validation activities
  - Calibration phase 1 : finding the optmimal operating point => **Cal-Val 1 extended**

- **SMOS**
  - Satellite is stable and operational within some GPS jamming
  - SMOS-Ocean / FRESH : annual scientific meeting 30th March – 1st April 2026
  - Quality Working Group : meeting 19-21 May 2026

- **SWOT**
  - Review for Mission extension : mission extended until 2029
  - New publications in oceanography and hydrology
  - Reprocessing : LR data done, HR data in progress

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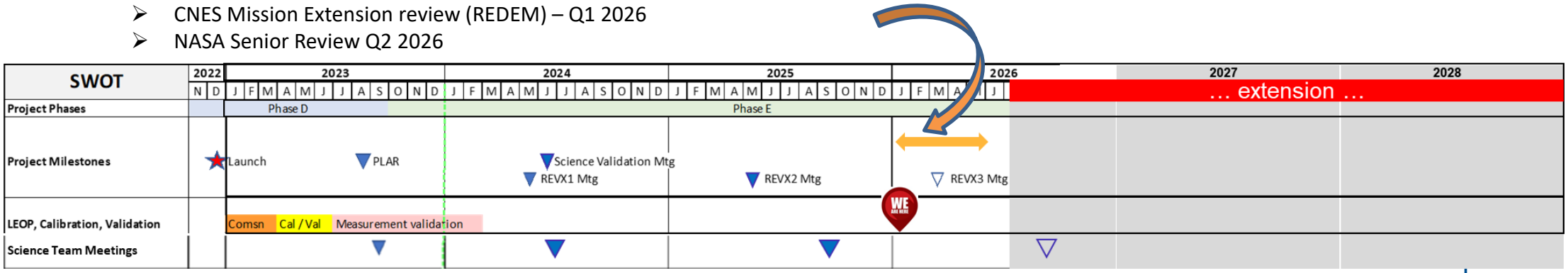
Overview - Planning of CNES satellite systems

SWOT

- Cooperation NASA-JPL / CNES / UKSA / CNSA…3 years in orbit
- Measuring water height in
  - Oceans : 1km
  - Lakes : 100m x 100m
  - Rivers : 50m width
- Paving the way towards satellite hydrology
- Demonstrator for operational satellite swath altimetry
- Products delivered on DataTerra/AERIS
- Mission extension 2027- 2029
  - CNES Mission Extension review (REDEM) – Q1 2026
  - NASA Senior Review Q2 2026



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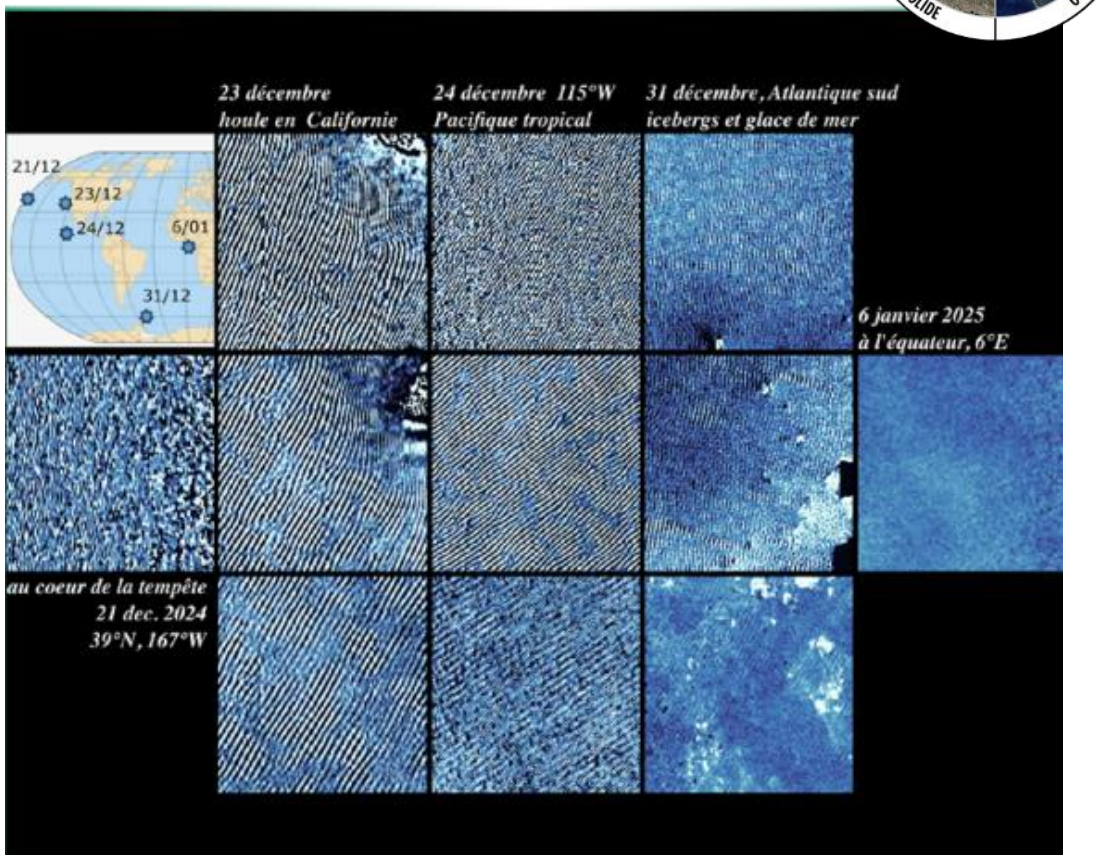
CNES satellite systems in exploitation

PARS TOSCA VAGUE

Laboratoire d'Océanographie Physique et Spatiale (LOPS)

SWOT

- Impressive scientific results Ocean/Hydro/Coastal/Cryo
- High scientific impact & large community (400 persons ST meeting)



PNAS RESEARCH ARTICLE | EARTH, ATMOSPHERIC, AND PLANETARY SCIENCES | OPEN ACCESS

Sizing the largest ocean waves using the SWOT mission

Fabrice Ardhuin[a,1], Taina Postec[a], Mickael Accensi[a], Jean-François Piolle[a], Guillaume Dodet[a], Marcello Passaro[b], Marine De Carlo[c], Romain Husson[c], Gilles Guitton[d], and Fabrice Collard[d]

SWOT CAPTURED HIGHEST OCEANIC WAVES

- Tempest Eddie: Spectacular 19,7m wave propagating on 24,000km between Pacific and South Atlantic
- SWOT measurements led to JONSWP revision for waves energy / length

https://doi.org/10.1073/pnas.2513381122

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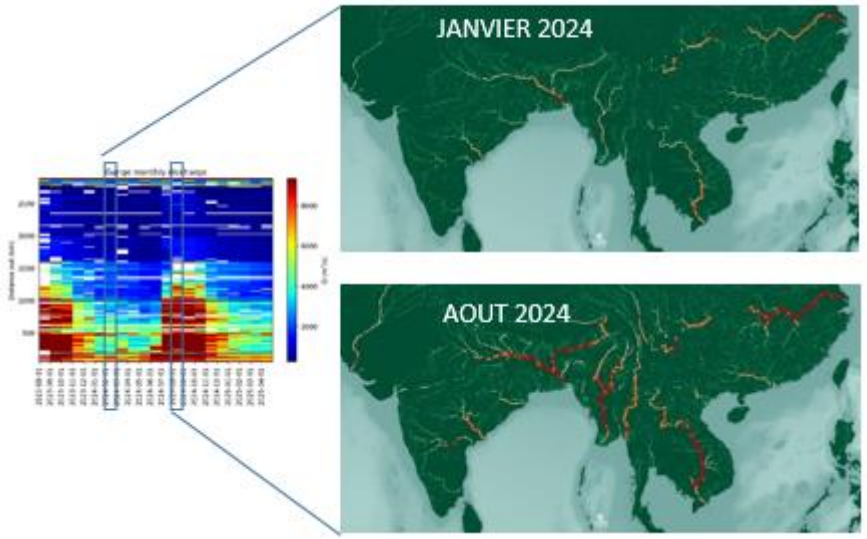
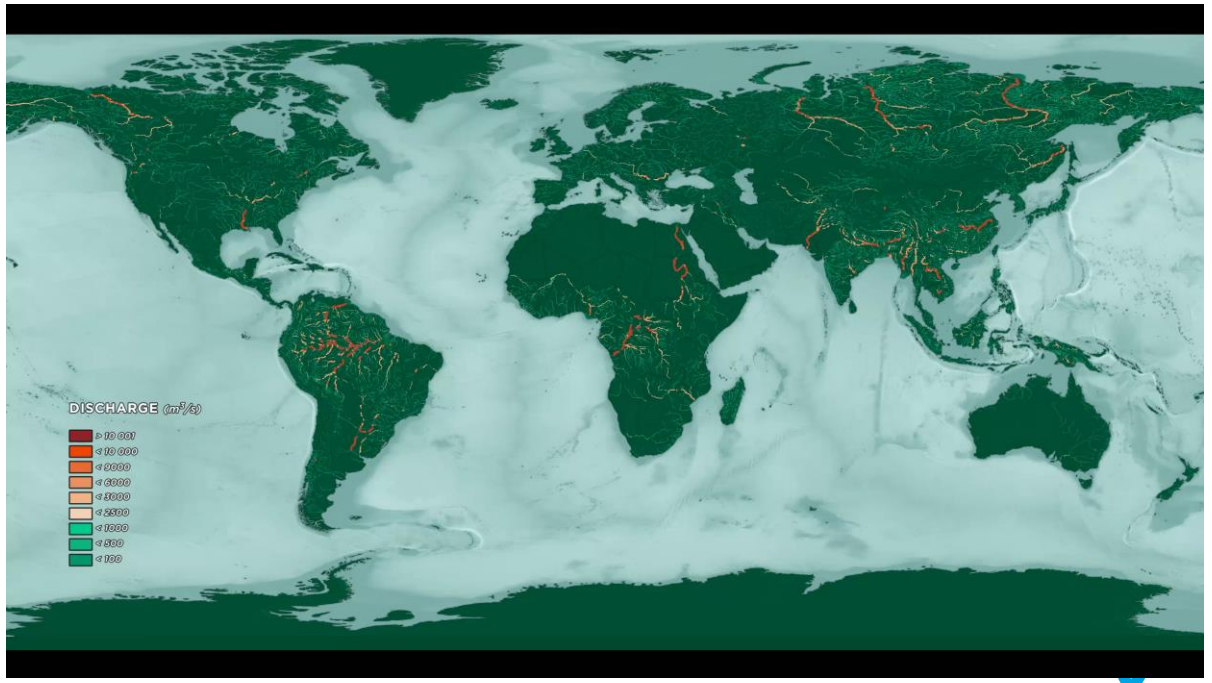
CNES satellite systems in exploitation

SWOT

A WORLD PREMIERE FOR FLOW RATES PRODUCTS

- Hydrology : Flow rates with SWOT observations water height+width+slope
- 6 algotihms : 4 US + 2 FR





Theia Pôle Thématique Surfaces Continentales

hydroweb.next

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OUTPUTS OF OUR SCIENTIFIC PROSPECTIVE

VERY HIGH PRIORITY MISSIONS

~~ODYSEA~~
~~Ocean currents & winds~~

AOS/CO2MODO
Convection, Aerosols & Climate

ECO

CARIOQA
Quantum gravimetry

OG2F
Tahiti Geodetic Reference Observatory

REVALTO
High-revisit Hydrology

Wivern

Cryorad

Coupling, interfaces & various scales interactions

Interactions between internal deep Earth & external envelopes

GENESIS & DORIS Neo
Terrestrial reference

SMOS-HR
Soil moisture & Salinity

Climate cycles & variability

MAGIC/NGGM
Gravity field

BIODIVERSITY

STRATO-FLEET
Balloons & Suborbital

S3-NG-TOPO
Swath Altimetry
for oceanography & hydrology

Ocean Color GEO

C-MIM
Constellation
Infrared atmospheric sounding

Prediction, Digital Twins & hazards

Land-Sea Continuum

Socio-ecosystems & biodiversity

Cfosat-NG
Winds & waves

Swot-Loac

4D-Earth

LÉGENDE

	Coopérations	Copernicus	ESA : FutureEO - Nav	EUMETSAT
Major Priorities				
High Priorities				

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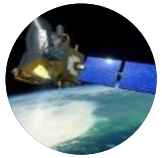
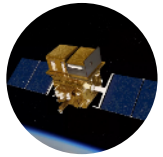
Missions Overview - Planning of CNES satellite systems

Missions in development



MICROCARB
Carbone flux

IASI-NG
Atmospheric composition,
Meteo & Climate



TRISHNA
Surface temperatures,
Evapotranspiration

REVALTO
High revisit hydrology

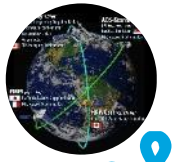
GENESIS
Terrestrial geodetic reference

C3IEL
Convective clouds

MERLIN
Methane sources

S3-NG-Topo
Swath altimetry for oceanography
& hydrology

C²OMODO/~~AOS~~
Clouds, aerosols, convection



MAGIC/NGGM
Gravimetry new generation

CARIOQA
Quantum Gravimetry

2025

2030

2035

CO3D
3D global Stereoscopy

NanoMagSat
Magnetic field

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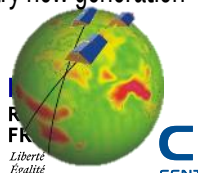
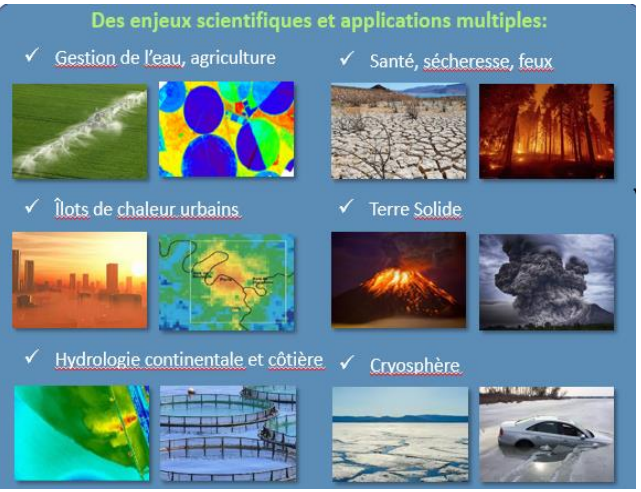


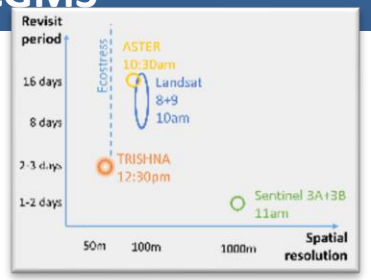
TRISHNA



Context

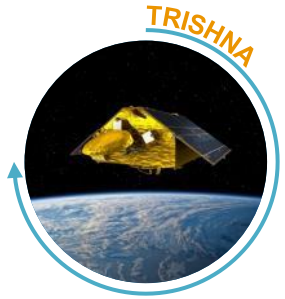
- ✓ CNES/ISRO Partnership for a mission on science & applications
- ✓ Recommanded since 2004 and identified as a high priority SPS2019
- ✓ Prefigurator of Copernicus LSTM
- ✓ Many laboratoires and FR organisms involved
- ✓ Phase C started early 2024

→ **Launch TBC 2027**



Mission concept

- ✓ Global coverage inland & coastal zones
- ✓ Resolution 60m, Revisit 8 days or 3 days (différents angles)
- ✓ TRISHNA product delivery in NRT 12 hours (applications)
- ✓ Imager infrared thermal & visible VNIR-SWIR (7 bands) – LWIR (4 bands)



Mission TIR Agriculture & coastal hydrology

- CDR instrument TIR in june 2025 => successfull
- **Ground segment** : issue to be completed with ATBD (until L3) in september 2026
- Instruments TIR & VSWIR delivery by may 2027
- **Cal/val scientific Plan, to be elaborated with ISRO in june 2026. Super-sites** (Sud-France, Sahel, Inde) to be elected
- **Elaboration ofPreparatory Programme TRISHNA Aval 2025-2030 (e.g. SWOT aval Preparatory Programme)**
- 2026 : Science team meeting (summer 2026) + RDV RAQRS in september
- **Very good dynamique between FR & India, synergies with ST of other missions : ECOSTRESS, ~~SBG~~ EAGLE (NASA) , LSTM (ESA)**

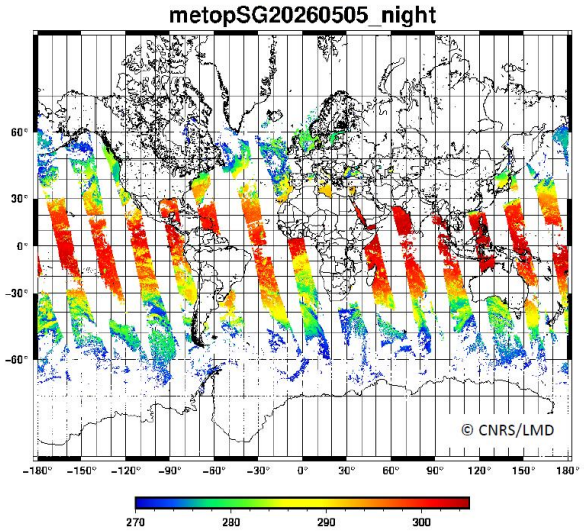
CNES satellite systems in exploitation

IASI-NG

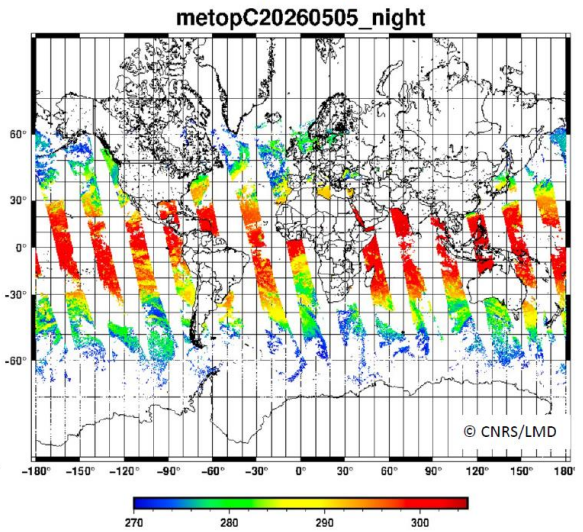
First SST retrieval from IASI-NG – 5th May 2026

Caution: Preliminary evaluation of IASI-NG data during cal/val-Phase-B

IASI-NG/Metop-SG-A1



IASI/Metop-C



- Dissemination of IASI-NG L1c spectra to privileged users started on May 5th 2026.
- Data acquired through AERIS from EUMETSAT Data Store.
- All processing chains processed input spectra smoothly (here SST retrieval at LMD based on Capelle et al. 2022)
  → Evaluation and comparison with IASI at Level 1 and Level 2 can start!

Ackowledgements:

Core Data (EUMETSAT Data Policy issued at Council 110 nov 2025)

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Data & products distribution

HPC / CLOUD PLATFORM & DATA DISSEMINATION POLES

An increasing amont of available data

RE ENFORCE ARTICULATION WITH EUROPEAN PLATFORMS

https://www.data-terra.org

Data & products distribution

Coordination Group for Meteorological Satellites

Horizon Europe Infra-EOSC : GenAI4EU project leader

https://www.data-terra.org

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« Sharing ideas…creating value… »

Thanks !

murielle.lafaye@cnes.fr

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