

Users Newsletter

Project News

Prepared by E. Bronner and CNES project managers

Ongoing missions

The French-Indian **SARAL** mission is run by CNES and ISRO (Indian Space Research Organization) with the participation of EUMETSAT. SARAL was launched on February 25, 2013. The mission is working without a hitch and has provided valuable Ka-band altimetry results for more than 3 years now. In the summer of 2016, SARAL/AltiKa will pursue its mission with a new geodesic phase. CNES & ISRO have decided to increase the orbit's semi-major axis by 1 km and let SARAL drift (i.e. no maneuvers except for collision avoidance). This move to a drifting orbit will improve geodesy and create new data to enhance Mean Sea Surface (MSS) models.

After more than 8 years in orbit, the CNES/NASA/EUM/NOAA **Jason-2** mission continues to provide high-quality products to the altimetry community. Jason-2 is still the reference mission in the multi-mission SSALTO/DUACS system and will hand over to Jason-3 once intercalibration has been completed in September 2016. In order to optimize the science return (spatial resolution in particular), Jason-2 will be moved to an

“interleaved orbit”. More information about this orbit change will be made available to users during the summer.

Hy-2A, launched in August 2011, is a Chinese mission with French-Chinese collaboration between CNES and CNSA/NSOAS for altimetry (DUACS) and orbitography products (IDS). In August 2015, the decision was taken to deactivate Hy-2A's along-track production in the SSALTO/DUACS multi-mission system because of the degradation of input data. On March 23, 2016, the Hy-2A satellite was moved from its nominal orbit to a geodesic orbit around 2 km higher.

The new orbit has a 168-day cycle with 2,315 orbits in the full cycle.

ESA's **CryoSat-2** ice mission, launched on April 8, 2010, also contributes to the multi-mission SSALTO/DUACS system as a complementary mission for value-added products (Levels 3 & 4).

Missions in the commissioning phase

On February 12, 2016, the **Jason-3** Satellite (launched on January 17 from the Vandenberg base in California) reached its nominal orbit and was placed 80 seconds behind Jason-2 as planned.



Jason-3 – CNES/Mira Production

All of the satellite's equipment and instruments are functioning nominally. The ground segments (CNES, EUMETSAT, NOAA and JPL) have been operational since the launch and the mission control centers are also operating nominally. On March 17, after the GPS upload, the tandem phase started officially.

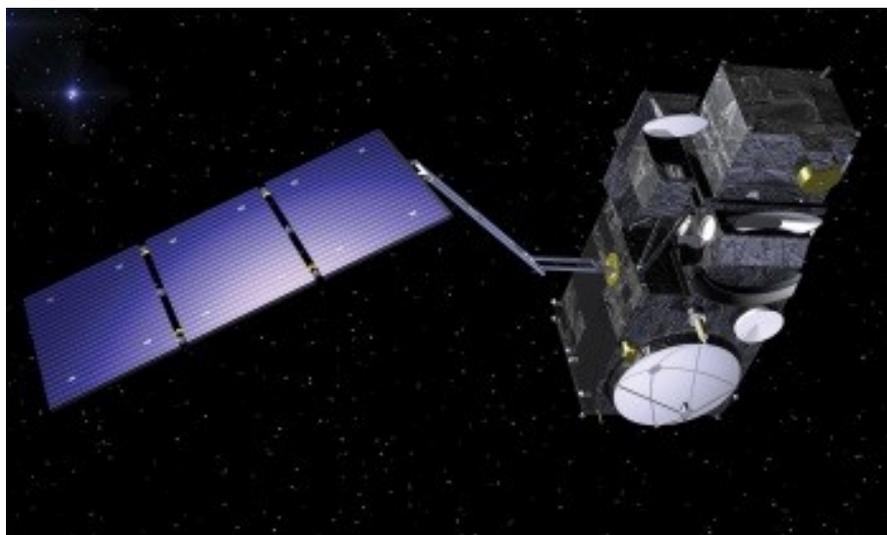
The successful In-orbit Acceptance Review with the four partners (NASA, NOAA, EUMETSAT and CNES) was held in Toulouse from April 12 to 14, 2016. A few weeks after, NOAA Control Center hand-overs with CNES for the routine operations.

The first part of the CAL/VAL phase for assessing the performance of the altimetric and orbitographic products was completed during Workshop 1 on June 21 in Washington, and authorized the dissemination of Jason-3 near-real-time (OGDR) and quasi-real-time products (IGDR) to all users (see page 3).

Jason-3 has thus become the reference mission, meaning that in September, Jason-2 can be moved to an orbit offering better oceanography coverage.

Workshop 2, which will assess the quality of the "precision" altimetry products with a view to authorizing their dissemination, will take place in late October at the OSTST in La Rochelle, France .

Sentinel-3 is an ESA mission designed to measure sea-surface topography, sea- and land-surface temperature, and ocean- and land-surface color. Sentinel-3 belongs to a series of satellites, each covering a different aspect of Earth Observation and monitoring. Sentinel-1 is a SAR-dedicated satellite while Sentinel-2 flies an optical payload, etc. Sentinel-3A was launched on February 27, 2016 and is currently in the commissioning phase. The Mid-Term IOCR (In-Orbit Commissioning Review) was held on May 24-25, 2016 in Toulouse. After the release of official Level 2 altimetric products, a new



Sentinel-3 – ESA

EUMETSAT Service (funded by the European Union and operated jointly by CNES & CLS) will provide L2P/L3 products to AVISO+ and CMEMS users respectively.

Ongoing developments

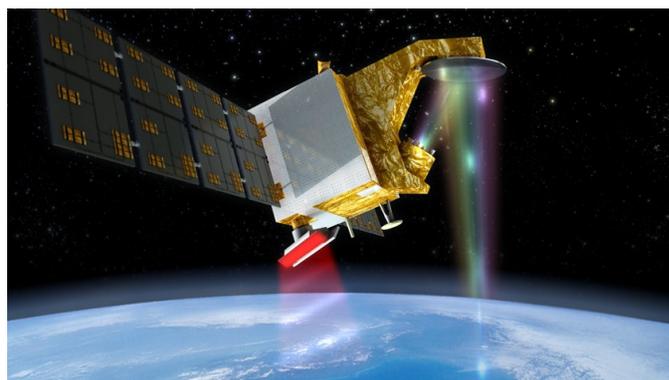
CFOSAT is a French-Chinese oceanography mission (CNES/CNSA) devoted to surface ocean wind and wave observation. The launch is still planned for mid-2018. A prototype SWIM NRT processing chain has now been completed, so the development of operational processing chains has begun at the French Mission Center. Simulated SWIM data will soon be released to PIs for further investigation. Finally, in a few months, the SWIM flight model will be assembled in Thales Alenia Space clean rooms.

SWOT (Surface Water and Ocean Topography) is a French-American mission run jointly by CNES and NASA, with the participation of UKSA and CSA, to study oceanic and inland water surfaces. The program has successfully completed all Phase B reviews, concluding with the Mission PDR in April 2016. NASA officially entered Phase C in May 2016, while CNES's official transition to Phase C will be

approved during the CNES Board of Directors' meeting in early July 2016. Mission progress is nominal, with a first series of compatibility testing between JPL payload elements and CNES-provided hardware. The first meeting of the new SWOT Science Team took place in mid-June 2016 in Pasadena.

Past missions

The CNES/NASA **Jason-1** mission provided good quality data for 11.5 years (10 years on a repetitive orbit + a full 406-day geodetic cycle). The satellite was decommissioned in 2013. The entire mission was reprocessed in 2016 to benefit from new geophysical models and orbit, new algorithms (ICE-1 re-tracking, time tag and altimeter range bias corrections), recomputation of radiometer-derived parameters and finally NetCDF format. The reprocessed data and associated documentation are available as version "E" GDR data products on the AVISO and PODAAC servers.



CFOSAT – CNES/CNSA

Jason-3 Cal/Val in-flight assessment

After its launch on 17 January 2016, Jason-3 successfully reached its operational orbit. But before data could be distributed to users, its instruments and processing systems had to be shown to comply with the mission’s quality standards.

The four partner agencies, CNES, NASA/JPL, EUMETSAT, and NOAA, carried out this calibration/validation phase with help from selected scientists. This article gives a brief roundup of the principal conclusions, resulting mainly from a comparison between Jason-3 and Jason-2 (Jason-2 precedes Jason-3 by 80 seconds).

In Washington, on 21 June 2016, a meeting of the four agencies was held, attended by the scientists who participated in the analysis of data quality. The Cal/Val results were discussed and authorization was given to distribute the Jason-3 “quasi-real time” products (OGDR and IGDR) to all users.

Orbit

The radial performances for Jason-3 OGDR products (2.5 cm) are slightly better than for Jason-2 (2.7 cm) thanks to the new Jason-3 DIODE software. This is considerably better than the 5 cm mission requirement. MOE orbit quality has also been assessed thanks to POE and laser data, and performances are again fully in line with mission requirements. A slightly hemispheric signal is observed between Jason-2 and Jason-3 and is currently under analysis.

Radiometer (AMR)

A drift in the AMR brightness temperatures leads to drift in wet tropospheric correction (approximately 0.5 mm per month), as well as a drift in the sigma0 attenuation (which then impacts the wind and the Sea State Bias and consequently the Sea Surface Height). Jason-3 AMR brightness temperatures are cur-

rently drifting due to noise diodes out-gassing. This drift is expected to decay exponentially and stabilize soon. It will be corrected through ground calibration (JPL ARCS system) in GDR products, also accounting for the new cold sky (pitch maneuver) calibration sequences that are performed every 2 months.

Altimeter

After only a few cycles, Jason-3 OGDRs and IGDRs already satisfy the mission requirements, which can be summarized in the table below.

The dual-frequency ionospheric

rection. The remainder of a Ku-band range bias thus comes down to approximately 31 mm, with Jason-3 measuring a larger range (or a lower sea surface height). A slight geographically-correlated bias as a function of longitude is also observed (see map). The standard deviation of the sea level anomaly differences is only 54 mm. When the dual-frequency ionospheric correction and the radiometer wet tropospheric correction are excluded, and we rely on model corrections instead, then the bias in the sea level anomaly is reduced to -31 mm, and the standard deviation of the differences

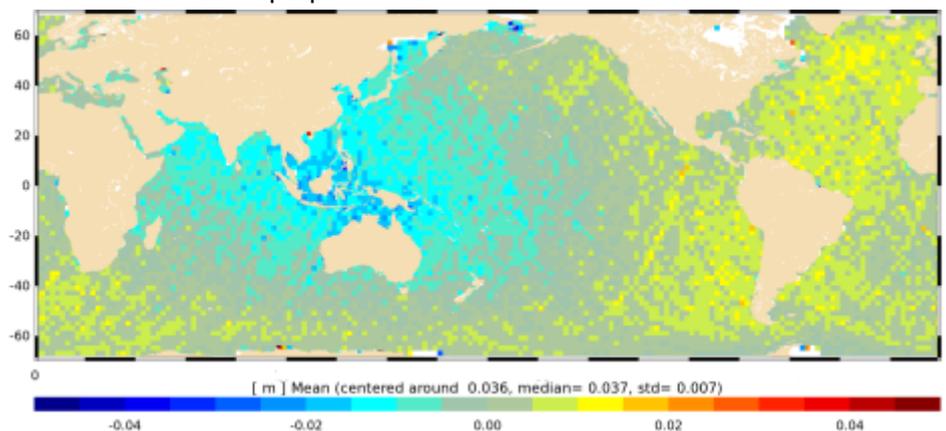
	IGDR performance	IGDR requirement
Altimeter (range) noise [cm]	1.7	1.7
SWH [cm]	10.6	10% or 50 cm
sigma0 [dB]	0.08	0.7
Wind speed [m/s] (wrt ECMWF)	-0.4 ± 1.34	1.6
Wind speed [m/s] (wrt Jason-2)	-0.4 ± 0.4	1.6

corrections show a 1 cm relative bias between Jason-2 and Jason-3. This bias is likely linked to biases in the Ku- and C-band ranges and can be explained by the accuracy of the ground characterization of the internal path delay on both bands (in the region of a few cm).

The comparison of sea level anomaly between Jason-3 and Jason-2 gives a bias of -36 mm, which is partly due to the 9 mm bias in the ionospheric correction and -4 mm bias in the wet tropospheric cor-

rections show a 1-Hz error for the combination of range and orbit of approximately 29 mm for both missions.

Mono mission as well as multi-mission crossovers have been routinely computed. Jason-3’s performance is fully in-line with that of Jason-2. The cross-over analysis with SARAL IGDRs (3.5 cm) and CryoSat-2 NOAA products (5.67 cm) also shows very good comparison with Jason-3.



SLA using ECMWF wet tropo - IGDR J-3 differences with J-2 cycles 0 to 009

Transition Aviso+ towards CMEMS for SSALTO/Duacs products

The European Copernicus Marine Environment Monitoring Service (CMEMS, previously known as MyOcean during its demonstration phase) is now responsible for the processing and distribution of certain altimetry products formerly distributed by Aviso+. Aviso+ now focuses on the distribution of innovative products whereas CMEMS is dedicated to operational products and services. The SSALTO/Duacs (M)SLA Heights data (except the Mozambique area and climatologies) are now distributed from the CMEMS catalogue. The scientific content has not changed. Note that (M)ADT Heights products and geostrophic currents will be con-

cerned by the transition on April 2017. For the time being they will continue to be distributed by AVISO+.

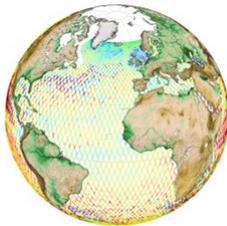
We therefore plan to close the access to (M)SLA Heights in the coming weeks. We would like to re-

mind you to register with CMEMS as soon as possible, as we are not legally permitted to transfer your details to CMEMS directly.

All the CMEMS links are listed below:

- For questions regarding (M)SLA-H products, please contact: serVICEDesk.cmems@mercator-ocean.eu
- Concerning the other (M)ADT-H and UV geostrophic velocities products, contact aviso@altimetry.fr
- [Online catalogue](#) of all CMEMS products
- [Registration](#) for access to CMEMS products
- [CMEMS Service commitments and license](#)
- User manuals (PUM) associated with the [\(M\)SLA-H products distributed by CMEMS](#) and [with the SLA-H products for assimilation](#)

Correspondance tables between Aviso+ (blue) and CMEMS (green) products



Along-track Sea Level Anomalies in Near-Real-Time and in Delayed-Time (NRT-SLA-H and DT-SLA-H) for regions Arctic, Black Sea, European Seas, Mediterranean Sea, Global coverage, with the CMEMS services FTP/DGF/WMS (no Subsetter).

in Near-Real Time

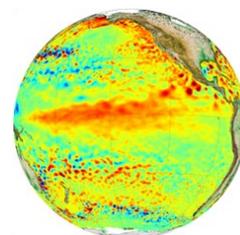
AVISO+	CMEMS
Along-track SLA-H NRT in Global area	SEALEVEL_GLO_SLA_L3_NRT_OBSERVATIONS_008_017
Along-track SLA-H NRT in Mediterranean	SEALEVEL_MED_SLA_L3_NRT_OBSERVATIONS_008_019
Not distributed by Aviso+	SEALEVEL_MED_SLA_ASSIM_L3_NRT_OBSERVATIONS_008_021
Along-track SLA-H NRT in Black Sea	SEALEVEL_BS_SLA_L3_NRT_OBSERVATIONS_008_022
Along-track SLA-H NRT in Europe	SEALEVEL_EUR_SLA_L3_NRT_OBSERVATIONS_008_024
Along-track SLA-H NRT in Arctic	SEALEVEL_ARC_SLA_L3_NRT_OBSERVATIONS_008_025

in Delayed-Time (REP for REPROCESSING)

AVISO+	CMEMS
Along-track SLA-H DT in Global area	SEALEVEL_GLO_SLA_L3_REP_OBSERVATIONS_008_018
Along-track SLA-H DT in Mediterranean	SEALEVEL_MED_SLA_L3_REP_OBSERVATIONS_008_020
Along-track SLA-H DT in Black Sea	SEALEVEL_BS_SLA_L3_REP_OBSERVATIONS_008_023

in Near-Real Time

AVISO+	CMEMS
Merged MSLA-H NRT in Global area	SEALEVEL_GLO_SLA_MAP_L4_NRT_OBSERVATIONS_008_026
Merged MSLA-H NRT in Mediterranean	SEALEVEL_MED_SLA_MAP_L4_NRT_OBSERVATIONS_008_028
Merged MSLA-H NRT in Black Sea	SEALEVEL_BS_SLA_MAP_L4_NRT_OBSERVATIONS_008_030



in Delayed-Time (REP for REPROCESSING)

AVISO+	CMEMS
Merged MSLA-H DT in Global area	SEALEVEL_GLO_SLA_MAP_L4_REP_OBSERVATIONS_008_027
Merged MSLA-H DT in Mediterranean	SEALEVEL_MED_SLA_MAP_L4_REP_OBSERVATIONS_008_029
Merged MSLA-H DT in Black Sea	SEALEVEL_BS_SLA_MAP_L4_REP_OBSERVATIONS_008_031

Merged-Gridded Sea Level Anomalies heights in Near-Real-Time and in Delayed-Time (NRT-MSLA-H and DT-MSLA-H) for regions Black Sea, Mediterranean Sea, Global with the CMEMS services FTP/DGF/Subsetter/WMS.

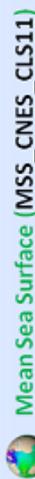
Altimetry products at your service

✓ Sensor products



Geophysical sensor data (S(I)GDR)

✓ Auxiliary products



Mean Sea Surface (MSS_CNES_CLS11)



Dynamic Atmospheric Corrections (DAC)



Tidal model (FES 2012)



Mean Dynamic Topography [global (MDT_CNES-CLS13)]



Absolute calibration tide gauge series

✓ Ocean indicators



ENSO index & maps



Mean Sea Level (MSL)



Kuroshio index



Ionian Sea index

✓ Coastal & hydrology products

Coastal & Hydrology Geophysical Data Records (PISTACH)



Experimental Geophysical Data Records (PEACHI)



Coastal Sea Level Anomalies (X-TRACK)

✓ Wave heights and wind speed



Maps of Wind speed (MWind)



Maps of Significant Wave Heights (MSWH)



Geophysical Data Records (I)GDR)

✓ Sea surface height products



Geophysical Data Records (GDR)



Monomission Corrected Sea Surface Heights (CorSSH)



Ssalto/Duacs Sea Level Anomalies (SLA-H) [Mozambique]



Ssalto/Duacs Maps of Sea Level Anomalies Heights (MSLA-H) [Mozambique]

✓ Derived Sea surface height products



Ssalto/Duacs Maps of Sea Level Anomalies geostrophic velocities (MSLA-UV) [Mozambique]



Ssalto/Duacs Climatology Maps of Sea Level Anomalies (MSLA CLIM) [global]



Lyapunov exponents or Filaments (FSLE)

✓ Sea surface height products



Ssalto/Duacs Sea Level Anomalies (SLA-H) and noise [global + Med + Black Sea+ Europe+ Arctic]



Ssalto/Duacs Sea Level Anomalies for assimilation (SLA-ASSIM-H) [Med + Europe (soon)]



Ssalto/Duacs Maps of Sea Level Anomalies Heights (MSLA-H) [global + Med+ Black Sea]

✓ Sea surface height and derived products



Ssalto/Duacs Maps of Sea Level Anomalies geostrophic velocities (MSLA-UV) [global + Med+ Black Sea]



Ssalto/Duacs Absolute Dynamic Topography (ADT-H) [global + Med]



Ssalto/Duacs Maps of Absolute Dynamic Topography (MADT-H) [global + Med]



Ssalto/Duacs Maps of Absolute geostrophic velocities (MADT-UV) [global + Med]

Color Legend

Distributed by Aviso+



Contact: aviso@altimetry.fr

Distributed by CMEMS



Contact:

servicesdesk.cmems@mercator-ocean.eu

Distributed by

CMEMS from April 2017

Distributed by Aviso+

until end 2017



Contact: aviso@altimetry.fr

Aviso+ User Satisfaction Survey: What are you telling us?

A user satisfaction survey on the products, services and the website is regularly sent to users. This year again¹, many of you took the time to reply. In what follows we present the main trends and the first adjustments we have made as a result.

This newsletter also gives us an opportunity to thank users for taking the time to complete this survey, as well as for the wealth of ideas and comments expressed: these have provided a useful and dynamic basis to help us understand how our products and services are used.

Transition from AVISO+ to CMEMS



Since May 2015, the European Copernicus Marine and Environment Monitoring Service (CMEMS) has progressively been taking over all the processing and distribution of Ssalto/Duacs Near-Real-Time and Delayed-Time MSLA and SLA Heights products. Consequently, their access from Aviso+ data services will be terminated in the coming months. Users were informed about this transition at an early stage, to enable them to anticipate and prepare for these changes.

One of the themes of the survey naturally focused on this issue of the transition of Aviso+ products to CMEMS.

Although 9 out of 10 users consider the information about this transition, given both by email and on the Aviso+ web site, as useful or very useful (89%), few had actually registered for the transfer and/or downloaded the products trans-

ferred to CMEMS. Since access to these products on CMEMS officially became available in January 2016, **fewer than half of the users have changed their habits** by downloading these products from CMEMS

A need to be better informed - and to have the time

The majority of users who have made this change report that they did it either very easily or easily (to 86%). The reasons listed by users to explain why they have not yet changed the way they download their product(s) to CMEMS are not primarily technical. The users emphasise rather the need to be better informed on how these products are shared between Aviso+ and CMEMS, for

clearer identification of the correspondence between products from Aviso+ and CMEMS, and to have the time to change their habits. In view of these findings, Aviso+ has adapted the campaign for informing its users: new information emails have been sent out, and a page on the Aviso+ site and a dedicated article in this newsletter summarise everything there is to know about this transition with, in particular, a correspondence table between the Aviso+ and CMEMS products (see page 4).

The product pages of the Aviso+ website continue to provide indispensable help for users to **link directly** from the products previously published on Aviso+ and that are now on CMEMS (see Figure below).

Product sheet on Aviso+ with links to CMEMS

MSLA - H: Maps of Sea Level Anomalies: Height

Types of dataset: Ssalto/Duacs gridded multimission altimeter products.
Contents: gridded multimission sea surface heights computed with respect to a twenty-year mean.
Condition of access : From May 2015 on, the Copernicus Marine and Environment Monitoring Service (CMEMS) is taking over the whole processing and distribution of those products (formerly distributed by Aviso+, no change in the scientific content).
Description: gridded multimission product, provided in near-real time and in delayed time through the CMEMS data access services.

- MSLA Heights in delayed time product is available since 1993 in the so-called "all set merged" serie: up-to-date datasets with a maximum of satellites at a given time.
- MSLA Heights in near-real-time product is available during a few months at most, from the latest update of the delayed-time product to today.

The informations about the satellites taken into account are given in the NetCDF file global attributes description (named "platform").

Geographic coverage: global. A specific regional product with an improved quality is available in local areas.

Copyright : 1993 - ongoing EU Copernicus Marine Service

Useful links on CMEMS website:

- CMEMS Online Catalogue: list of all Copernicus Marine Service products available.
- CMEMS User Registration Form: to register and access all the products available through the Copernicus Marine Service.
- CMEMS Service commitments and licence: licence to use the CMEMS products
- CMEMS User Handbook: download the Product User Manual.
- CMEMS Service Desk: for any question regarding this product, please contact the CMEMS service desk.

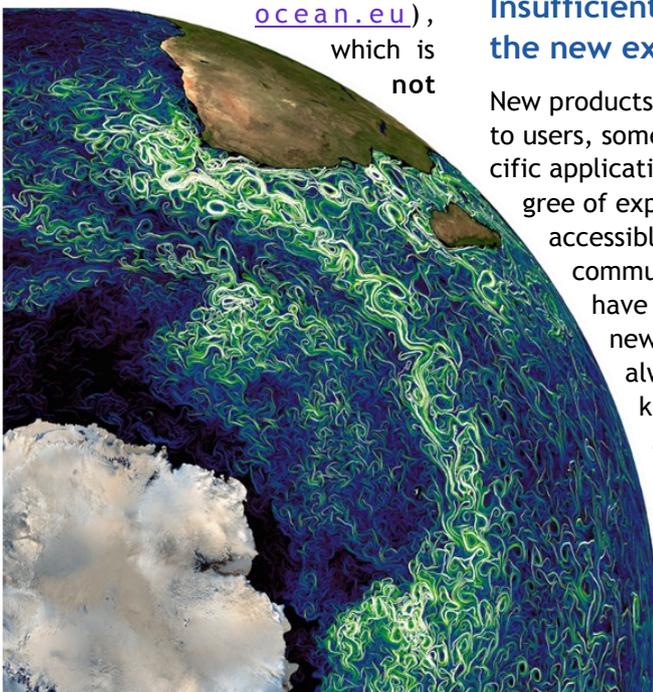
Example of a product sheet on Aviso+ with direct links to CMEMS

¹ The survey ran from 1 April to 2 May 2016; the results discussed relate to this period

Aviso+ and CMEMS: two teams working alongside each other and constantly interacting

We would also like to remind users to report that any difficulties encountered in the procedures for registering with or accessing CMEMS to the CMEMS Service Desk (servicedesk.cmems@mercator-ocean.eu),

which is not



manned by the same team as the Aviso+ Service Desk. To answer all your questions, these two Service Desks, for Aviso+ and CMEMS, work alongside each other and are constantly interacting. If necessary, the CMEMS Service Desk will pass on your questions to the Aviso+ Service Desk, where our experts in altimetry data will answer you.

Insufficient awareness of the new expert products

New products are regularly offered to users, sometimes for very specific applications, requiring a degree of expert knowledge and accessible only to a limited community of users. We have observed that these new products are not always widely-enough known.

The survey covered this question of interest, awareness and ease-of-use regarding specific products: [FSLE](#) filaments, [X-Track](#)

products dedicated to coastal applications, [PISTACH Jason-2](#)² for hydrological products, and [PEACHI Saral](#) products developed using latest-generation algorithms.

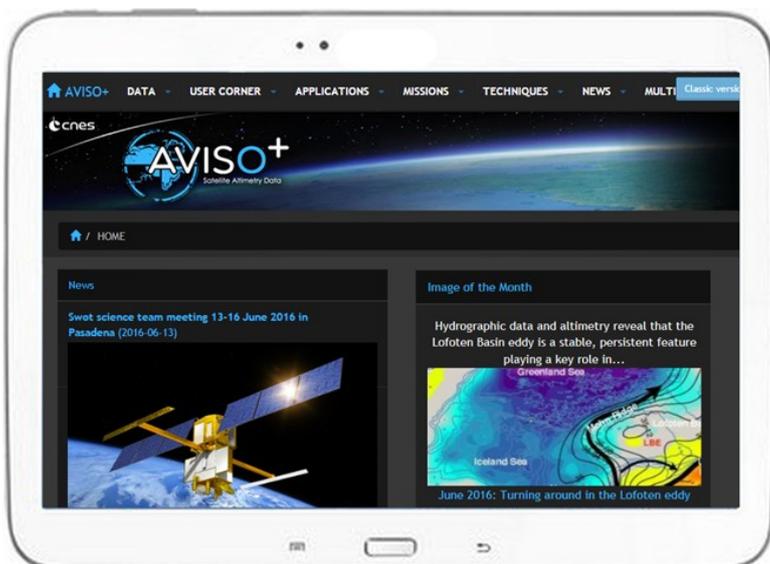
Two-thirds of users declared that they knew very little about any of these four products. However, 35% to 59% of users not previously familiar with these products would be interested in using them. And there is another reason for taking a closer look at these products: respondents who are familiar with them and use them regularly declare that they are relatively simple to master.

²The Jason-2 mission will leave its original orbit, as soon as the calibration of the Jason-3 mission has been qualified.

Figure: Example of FSLE filaments for 2014/05/27. These products provide the exponential rate of separation of particle trajectories initialised nearby and advected by altimetry velocities. FSLE highlights the transport barriers that control the horizontal exchange of water in and out of eddy cores. Credits CNES/CLS/LOcean/CTOH.

Aviso+ web site now available in a mobile version

- mobile.aviso.altimetry.fr
- Or www.aviso.altimetry.fr and by clicking on “Mobile version” on your computer
- or directly available on your mobile device.



- Suitable for low bandwidth,
- Suitable for the visually impaired,
- Also accessible via ordinary computers
- Non-graphic navigation menus
- Simplified presentation
- All headings except the Gallery sub-sites

The Online Data Extraction Service (ODES): great new features and attractive products

New features

Constantly seeking to address its users' needs, AVISO+ is currently working on an updated version of ODES that will benefit from several new features. This new release is planned for the second half of 2016.

The first change will enable referenced/authenticated users to save their research context in the "Favorite searches" menu. This means that users will be able to click once to easily access their categories of products, their preferred area of research, reference period and their usual parameters. A small star on the page will guide them to their favorite searches, which they will be able to manage in the usual ways (searches, downloading, modification or deletion of the query).

Later on, users will be offered an *à la carte* subscription service. These subscriptions will provide real added value as regards "active" products, that is to say the products of an ongoing mission for which the data series is supplemented regularly. When submitting a query, users will be able to ask to subscribe to a preselection for a given product and thus automatically receive all the extractions corresponding to their selection criteria whenever new data become available. Users will be able to save and manage these subscriptions via their account.

Finally, it will also be possible to share a research context and/or a particular query with other users or colleagues. For this purpose, a **permalink** will be created dynamically to save the user's search criteria. Users can then share a copy of the URL by clicking the "Share" button.

New products

The following table recaps the products currently available via ODES. The new products that will soon be added to the catalog are listed in bold blue characters.

Produits	Description	Missions	Status— Access
CORSSH	Along-track corrected sea surface heights	ERS-1, ERS-2, ENVISAT, GFO, J1, J2, TOPEX, SARAL, HY-2A	J3 will be added soon All registered users
Enhanced GDR	Experimental along-track altimetry measurements averaged over 1 second and corrections to apply in delayed time	CS2, J2, SARAL	J3 will be added after GDR release All registered users
Native GDR	Official Geophysical Data Record (standards C, D and E available depending on the mission)	J1, J2, SARAL	Up-to-date for J2/SARAL and on-going for J1 GDR-E reprocessed data All registered users
Native IGDR	Official Intermediate Geophysical Data Record (standard GDR-D)	J2, SARAL	J3 will be added soon All registered users
Native OGDR	Official Operational Geophysical Data Record (standard GDR-D)	J3	Jason-3 PIs until commissioning
PEACHI	Experimental <i>along-track</i> altimeter measurements at 1 and 40 Hz, corrections to apply, in delayed time	SARAL	J2, J3, will be added soon All registered users
PISTACH	Coastal and Hydrological along-track altimetric measurements at 20 Hz, corrections to apply, in near-real time	J2	Soon stopped All registered users
X-TRACK		TP-J1-J2	ERS-2 will be added soon All registered users

Reprocessing by the CTOH of ERS-2 mission data for continental surfaces

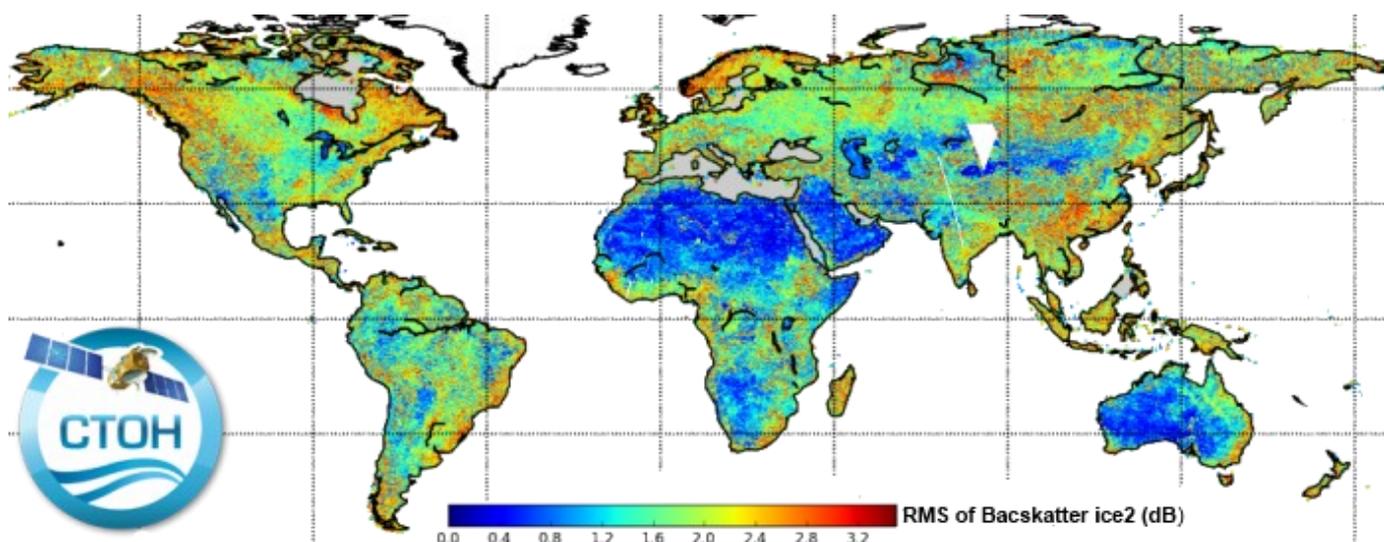
The French Center for Topographic Studies of the Ocean and Hydrosphere (CTOH) is offering a new product dedicated to continental surfaces, including the cryosphere. This product is the result of a complete re-analysis of the altimetry waveforms from the ERS-2 mission

(1995-2003) applying the ICE-2 re-tracker algorithm.

This processing includes the ICE-1 and ICE-2 retracking parameters, updated altimetric corrections, precise DEOS orbits, a new global dry tropospheric correction and a new Doppler correction.

To ensure the long-term continuity of these measurements in order to acquire climate series, each waveform parameter is calculated so as to be comparable with Envisat parameters (2002-2012).

Further information: [News from CTOH](#) on the Aviso+ website



RMS of ICE-2 retracking along-track backscatter covering continental surfaces from May 1995 to June 2003 (cycles 1 to 85)

Cryosat-2 in NetCDF: CTOH distributes a new format for the L2 ESA Baseline-C product

The CTOH distributes a NetCDF version of the ESA's L2 Baseline-C Cryosat-2 ice product.

This new format is very similar to the Jason-2 GDR-D products:

- 1 file per track (including all the altimeter modes: LRM, SAR and SARIN),
- the filename contains the cycle, the sub-cycle, the track and the sub-track numbers,
- every variable is documented with units and comments,
- units are consistent with lengths in meters and time in UTC,
- lon, lat and time are directly available both at 1hz and 20hz,

- duplicate data or data with time inconsistency have been removed.

Moreover, some parameters and geophysical corrections have been added (geoid, DEM, distance to coast, mean sea surface, ..).

The data can be selected by track number, by region and/or by dates, and are provided on request through

<http://ctoh.legos.obs-mip.fr/products/cryosat-2>



Ground tracks for one sub-cycle (29 days) of Cryosat-2

From PISTACH to PEACHI

CNES plans to discontinue its PISTACH prototype by the end of 2016. First released in 2009, PISTACH has been computing experimental coastal and hydrological products daily from Jason-2 S-IGDR products ever since. The prototype's algorithms and models have only been updated once, so the processing chain is now outdated and will soon be taken permanently out of service.

As a backup solution, we suggest that our users switch to the PEACHI prototype that will soon be

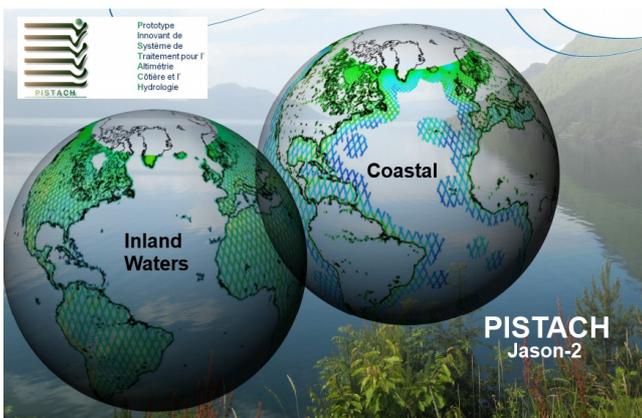
delivering Jason-2, Jason-3 and SARAL along-track altimetry measurements at 1 Hz and 20/40 Hz with a broad range of corrections to be applied in delayed time.

PEACHI products are generated from S-GDR altimeter products with dedicated processing (improvements to conventional satellite radar altimetry parameters lead to more accurate products over various types of surface, including the open ocean, coastal regions, ice and other regions of hydrological interest).

The PEACHI prototype will be featured in the winter issue of the AVISO+ newsletter.

Users should keep in mind that PEACHI products are experimental. Like PISTACH products, they are not produced on an operational basis but are freely distributed without any warranty of any kind.

However, user feedback is welcome to help us continue improving the quality of our experimental altimetry products.



Prototype for Expertise on Altimetry for Coastal, Hydrology and Ice

PEACHI



Argonautica schools project: Jason-3 competition

As for Jason-1 in 2001 and Jason-2 in 2008, CNES is organizing a Jason-3 competition for primary and secondary school classes on its contribution to environmental and climate research.

Kick-off in November 2016

The competition will be launched during the OSTST conference in early November, when the satellite's first results will be presented.

Classes will be able to publish their contribution on a dedicated website, in the form of articles, interviews with scientists, videos, online games, etc.

Contributions will be welcome in either French or English. CNES will provide participating classes with a competition kit comprising articles, images, etc..



The jury will include scientists, teachers and communication specialists.

The competition may also be offered to our colleagues in other space agencies such as NASA for

distribution within their own networks.

For further information on the competition, please take a look at the CNES [Argonautica](#) web site.

Mission Event File now available on AVISO+

Many things can happen in a satellite's lifetime and the exploitation phase is full of noticeable events that can impact the availability or quality of products.

In order to provide users with complete and transparent information about altimetric satellites, a new "Mission Event" file has been created in News > Operational news and status > Mission events.

This file in Excel format reports all noticeable events: anomaly, product delay, missing file, power out-

age, maneuver, calibration, alarm, etc. It contains the full history since the beginning of the mission for SARAL and Jason-3 and since early 2015 for Jason-2.

This file is updated regularly by operational teams (once a week) and is also available directly on the AVISO+ ftp server.

ftp://avisoftp.cnes.fr/AVISO/pub/jason-2/documentation/event_file/

ftp://avisoftp.cnes.fr/AVISO/pub/saral/documentation/event_file/

For the moment, this file is also available to PIs for Jason-3, while waiting for the end of the commissioning phase before moving to AVISO+.

Don't forget that a "quick look" at the altimetric constellation processed at CNES is available every day via the coloured Operational Status.

start time	stop time	cycle number	system concerned	event type	product impact	details
14/03/2013 06:00:00		1	Altimeter	Altimeter mode change	none	Starting altimeter mode: DIODE acquisition / median tracking
20/03/2013 05:10:03	20/03/2013 08:30:00	1	Altimeter	CAL1 expertise calibration		CAL1 ACT1 : every 10 min during 200 min
21/03/2013 00:00:00		1	Ground segment	Other	None	Start of OGDR delivery to PI's
21/03/2013 05:19:20		1	Altimeter	Altimeter mode change		DIODE acquisition / EDP tracking
23/03/2013 12:13:54		1	Platform	semi major axis maneuver		
27/03/2013 04:51:00		1	Altimeter	CAL2 expertise calibration	data gap	28min missing data
27/03/2013 06:40:00		1	Altimeter	CAL2 expertise calibration	data gap	11min missing data
28/03/2013 00:00:00		1	Ground segment	Other	None	Start of IGDR delivery to PIs
28/03/2013 04:59:20		1	Altimeter	Altimeter mode change		DIODE acquisition / median tracking
04/04/2013 04:38:59		1	Altimeter	Altimeter mode change		DIODE acquisition / MNT tracking
11/04/2013 04:18:46		1	Altimeter	Altimeter mode change		DIODE acquisition / EDP tracking
11/04/2013 04:42:00	11/04/2013 04:59:45	1	Altimeter	CNG calibration I2+Q2	none	over land
13/04/2013 12:53		1	Platform	semi major axis maneuver		
14/04/2013		1	Altimeter	CNG calibration I&Q	none	over land
16/04/2013 15:10	16/04/2013 15:36	1	Platform	cross calibration maneuver		not performed
17/04/2013		1	Altimeter	CNG calibration I2+Q2	none	over land
18/04/2013 05:39		1	Altimeter	Altimeter mode change		DIODE acquisition / median tracking
19/04/2013 09:37	19/04/2013 10:25	2	Platform	cross calibration maneuver		X_cal test over Biak
20/04/2013 04:53		2	Altimeter	CNG calibration I&Q	none	over land
22/04/2013 15:26	22/04/2013 15:54	2	Platform	cross calibration maneuver		
25/04/2013 09:53		2	Platform	Other		pitch maneuver (0.045°) to correct the PF/RF alignment
30/04/2013 14:35	30/04/2013 15:03	2	Platform	cross calibration maneuver		

Events

6-8 Sept. 2016, Frascati, Italy: [Colour and Light in the Ocean from Earth Observation \(CLEO\)](#)

18-25 Sept. 2016, Quingdao, China: [CLIVAR Open Science Conference](#): "Charting the course for climate and ocean research"

26-30 Sept. 2016. Darmstadt, Germany: [Eumetsat Meteorological satellite](#)

31 Oct.– 1 Nov. 2016. La Rochelle, France: *IDS workshop 2016*

31 Oct. 2016. La Rochelle, France: *SAR workshop 2016*

1-4 Nov. 2016. La Rochelle, France: *OSTST meeting 2016*

12-16 Dec. 2016. San Francisco, USA: *2016 Fall meeting*

Aviso+ Users Newsletter

Aviso+, 8-10 rue Hermès

Parc Technologique du Canal

31520 Ramonville st Agne, France

Publication director: E. Bronner, T. Guinle

Editor-in-Chief: C. Maheu

Sub-editor: M. Gasc

Contributors: E. Bronner, N. Picot, C. Maheu, F. Mertz, D. De Staerke

<http://www.avisometry.fr>