



Sentinel-3A Product Notice – STM L2 Marine

Product Information	
Mission	S3-A
Sensor	SRAL/MWR
Product	L2 NRT, STC and NTC (Marine Products)
Product Notice Details	
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Approval	EUMETSAT Mission Management

Summary
<p>This document is the Product Notice for the public release of Sentinel-3 Surface Topography Mission (STM) Level-2 Near Real Time (NRT), Short Time Critical (STC) and Non-Time Critical (NTC) products generated at the Marine Centre, EUMETSAT.</p> <p>The Notice describes the STM current status, processing baseline, product quality and limitations, and product availability status.</p>



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Processing Information

Processing Baseline

- Processing Baseline (PB) **2.33**
 - SRAL L1 IPF (SR-1): version **06.14**
 - MWR L1 IPF (MW-1): version **06.07**
 - SRAL/MWR L2 IPF (SM-2): version **06.14**
 - The list of Static Auxiliary Data Files that are part of the Processing Baseline can be found at the end of the document.

Description

Status of the Processing Baselines

The installation date of **PB 2.33** is **2018-04-04**. Installation dates and contents of the previous PBs are detailed in the figure below.



Details on how and where to obtain the data can be found in the section Product Availability. Note that the MWR L1 IPF 06.07 was installed in 2018-02-22.

New in this PB

The L2 IPF updates are related to anomaly corrections and to some evolutions detailed below:

- Correction of 5 mm bias between the modelled dry tropospheric correction at zero-altitude (*mod_dry_tropo_zero_altitude_01*) and modelled dry tropospheric correction at the measurement altitude (*mod_dry_tropo_meas_altitude_01*)
- C Band Corrected Longitude (*lon_cor_20_ku*) and C Band Corrected Latitude (*lat_cor_20_ku*) now are defined everywhere as in Ku Band. They are computed over Greenland and Antarctica surfaces and filled with the uncorrected longitude and latitude over other surfaces
- Several fixes for LRM mode (important during S3B commissioning) in the following variables: *ssha_20_ku*, *elevation_ocog_20_ku*, *elevation_ice_sheet_20_ku*, *sea_ice_concentration_20_ku*, *snow_depth_20_ku*, *snow_density_20_ku*. SAR mode data are not affected.
- Ascending Node Crossing (ANX) information in the manifests will be more accurately computed.
- Run time anomalies have been fixed.

L2 Marine Products Quality:

The quality of L2 WAT product for the 3 SRAL parameters (range, SWH, and wind speed) is within the mission requirements.

There are some known limitations that are described in the following sections.

The data is within requirements also in terms of completeness and timeliness.



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The sea ice processing is not yet optimised. Improvements to the sea-ice ground processing are foreseen in the near future.

Known product quality limitations

The Sentinel-3A STM L2 products have some known processing limitations which are reported in the next pages as «Anomalies» or «Notices». Anomalies are related to issues on the processing baseline (e.g. *bugs*) whilst Notices are limitations which are planned to be improved in the medium to long term (e.g. *algorithm evolution, calibration campaigns, etc.*).

Notices on the products

- **Notice #1 – MWR calibration is not completed**

MWR calibration is not completed, so the radiometer measurement values and derived quantities do not have an optimised performance.

The MWR L1 brightness temperatures exhibit a difference of up to 1 K between ascending and descending tracks for the 23.8 GHz channel. Work is ongoing to understand the source of this difference. In the L2 products the radiometer wet tropospheric correction deduced from 5 parameters has not been calibrated yet and should not be used (*rad_wet_tropo_cor_sst_gam_01_ku* and *rad_wet_tropo_cor_sst_gam_01_plrm_ku*).

The composite wet tropospheric correction has not been calibrated yet and should not be used (*comp_wet_tropo_cor_01_ku* and *comp_wet_tropo_cor_01_plrm_ku*).

- **Notice #2 - MWR parameters not computed due to MWR calibration over open ocean**

During MWR calibrations over open ocean, the brightness temperatures for both channels are not computed and set to default values in the product.

As a consequence, 1 Hz parameters derived from the MWR are set to default values, except for the atmospheric attenuation. This affects the wet tropospheric correction, water vapour content, and cloud liquid water content.

Corrected since 01/03/2018 (sensing time), previous data processed may exhibit the issue.

- **Notice #3 - Mean values of Ku band and C band sigma0**

The Ku-band sigma0 in all modes (LRM, PLRM and SAR) has been biased to be aligned with the mean value for Envisat (10.8 dB without the atmospheric attenuation). A system bias of -25.95 dB was applied to SARM Ku-band and of -2 dB to the LRM and PLRM Ku band. Note that up to processing baseline PB 2.9 (including) this value was set to -25.65 dB.

Note also that the sigma0 derived from ice sheet retracers exhibits a mean value close to 42 dB.

The C-band sigma0 in all modes (LRM and PLRM) has not been biased and exhibit a mean value around 11 dB which is lower by 4 dB compared to Jason-2.

Since PB 2.24 the sigma0 is corrected for attenuation. Data processed with older versions were **not** corrected for attenuation. This was done only before injection into algorithms like for the retrieval of wind speed.

- **Notice #4 - Noise on the dual frequency ionospheric correction**

The higher noise of the C band range inherent to the PLRM processing contributes to a high noise in the dual frequency ionospheric correction.



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- **Notice #5 – Sea State Bias (SSB) is still not optimized for Sentinel-3A**

The SSB correction has not been tuned for Sentinel-3A and contains Jason-2 SSB solution.

- **Notice #6 – Some geophysical flags have not been tuned for Sentinel-3A**

Some geophysical flags were derived from Envisat mission and have not been tuned for Sentinel-3A. The rain flag is currently based on Envisat flag and it has not been tuned for Sentinel-3A mission. The ocean/sea ice flag is currently based on Envisat flag and it has not been tuned for Sentinel-3A mission.

- **Notice #7 - Numerical Overflow for the Waveform Peakiness Parameters**

("EUM/Sen3/NCR/3569")

The SAR Ku Waveform Peakiness field (*peakiness_2_20_ku*) is affected by numerical overflow (i.e. padded to *_FillValue*) when it takes values above 32.767. Same limitation is present in PLRM mode and C Band (*peakiness_1_20_plrm_ku*, *peakiness_1_20_c*, *peakiness_2_20_c*).

Corrected since PB 2.27, previous data processed may exhibit the issue.

- **Notice #8 - Numerical Overflow for the Waveform MQE Parameter**

("EUM/Sen3/NCR/3570")

The SAR Waveform MQE field (*mqe_ocean_20_ku*) is affected by numerical overflow (i.e. padded to *_FillValue*) when it takes values above 3.2767. Same limitation is present in PLRM mode and C Band (*mqe_ocean_plrm_ku* and *mqe_ocean_20_c*).

Corrected since PB 2.27, previous data processed may exhibit the issue.

- **Notice #9 – Platform angles invalid during manoeuvres ("EUM/Sen3/NCR/2720")**

The satellite platform angles were not large enough to accommodate the angles during a manoeuvre.

Corrected as part of PB 2.24. Previous data processed may exhibit default values for the angles, depending on the manoeuvre.

- **Notice #10 – CNES/CLS 15 MSS is set to default values in certain zones**

("EUM/Sen3/NCR/3484")

The MSS CNES-CLS15 is set to default value over inland waters, the Beaufort Sea, certain Antarctica regions, and over land. This means it cannot be used to provide a global SSHA. In case the user wants to use this MSS instead of the default DTU15, they should be aware of this.

- **Notice #11 – Shortcoming in SWH measurement at low wave height**

At low wave heights, below 1.5 meter, a significant number (around 4 % of the cases) of SAR 20Hz SWH measurements (*swh_ocean_20_ku*) take a value of 0. This is observed for the case of open ocean and without sea ice. This appears to be related to the fitting mechanism used, and a solution is being investigated. During the averaging to 1 Hz measurements, the 20 Hz values set to 0 are considered valid and included in the 1 Hz averaging, thus lowering the value of the averaged 1 Hz measurements at low wave height.

A different averaging mechanism can be performed by an interested user starting from the 20Hz SWH, using the association indexes between 1 Hz and 20 Hz measurements and excluding the 20 Hz SWH measurements set to the boundary value of 0.



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- **Notice #12 – OCOG retracker to be better tuned for C band**

(“EUM/Sen3/NCR/3970”)

The fields OCOG retracker range (*range_ocog_20_c*) and Sigma Nought in C Band (*sig0_ocog_20_c*) are set to *_FillValue* at a higher rate than expected over Open Ocean. Further parameterization of the OCOG retracker is needed and will be done in a future version of the IPF.

- **Notice #13 - Bad Handling of *_FillValue* for the field *amplitude_ocean_20_plrm_ku***

(“EUM/Sen3/NCR/3972”)

The SRAL L2 field *amplitude_ocean_20_plrm_ku* (stored in the enhanced product) is affected by numerical overflow (i.e. padded to *_FillValue*) when it takes values above 2147.483647

Affects: L2 SRAL NRT/STC/NTC Enhanced datasets.

- **Notice #14 – Bad handling of *_FillValue* for the field *swh_ocean_20_plrm_ku***

(“EUM/Sen3/NCR/3971”)

The field *swh_ocean_20_plrm_ku* is affected by numerical overflow (i.e. padded to *_FillValue*) when it takes values above 32.767

Anomalies

- **Open Anomalies**

The following anomalies are still open and will be resolved as soon as possible.

- **Anomaly “EUM/Sen3/NCR/3448” - GIM Iono Correction occasionally set to *_FillValue***

The ionospheric GIM correction (*iono_cor_gim_01_ku*) can be set to *_FillValue* on certain products that cross the midnight boundary. The post-midnight period of the product will have the GIM iono correction set to the *_FillValue*.

Affects: L2 SRAL STC/NTC

- **Anomaly “EUM/Sen3/NCR/4145” - S3 STM L2 WAT: Errors in the some NetCDF comments in the enhanced measurements**

- the field (enhanced_measurements.nc) *tracker_range_20_plrm_ku* in the NetCDF comment reports that this quantity is corrected for *uso_cor_20_plrm_ku* but this is wrong because the field *uso_cor_20_plrm_ku* does not exist (it should be *uso_cor_20_c*);
- the fields (enhanced_measurements.nc) *net_instr_cor_range_20_plrm_ku*, *net_instr_cor_range_20_ku*, and *net_instr_cor_range_20_c* in the NetCDF comment report that they are corrected for the Doppler Correction (*dop_cor_20_*) but this is untrue because from the L2 STM DPM specifications, it is clear that they are corrected only for the L2 Doppler Correction update (i.e. *dop_cor_20_ – dop_cor_11b_20*);
- the fields (enhanced_measurements.nc) *net_instr_cor_sig0_20_c*, *net_instr_cor_sig0_20_ku*, and *net_instr_cor_sig0_20_plrm_ku* in the NetCDF comment report that they are corrected for the atmospheric attenuation correction (*atm_cor_sig0_*)

Affects: L2 SRAL NRT/STC/NTC Enhanced measurements.

- **Limited product degradation**

The following anomalies are product degradations clearly delimited in time, it is intended that these will be solved in the next reprocessing.



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- **Anomaly “EUM/Sen3/NCR/2893” – Degradation of model dry and wet tropospheric correction during the day 2017-02-08**

Due to unavailability of a meteorological correction file (AX__MA2_AX) during the day 2017-02-08, the model dry (*mod_dry_tropo_cor*) and wet tropospheric correction (*mod_wet_tropo_cor*) are degraded in that day. Since the dry tropospheric correction is directly used to compute sea level anomaly, the measurement of the sea level anomaly (*ssha*) is slightly degraded on 2017-02-08. It affected the STC and NTC data with the sensing of 2017-02-08, including reprocessed data.

- **Anomaly “EUM/Sen3/NCR/3403” – Issue in range positioning the SAR waveform at Greenwich Meridian**

A few 20-Hz geophysical measurements (range, wave height and sigma nought) are systematically padded to _FillValue at Greenwich meridian cross in SAR and PLRM mode. This issue is related to an issue in the OLTC on board of S3A. This affects some 20Hz measurements crossing the meridian, but it is not enough to invalidate the 1-Hz data. It affects about 21 seconds of data per cycle.

Affects: L2 SRAL NRT/STC/NTC before 18/12/2017 (**fixed** with update of new zone database file)

- **Anomalies affecting the early mission data acquired in LRM, available as part of the “Spring Reprocessing 2018” produced with IPF SM-2 version 06.12.**

- “EUM/Sen3/NCR/4164” - S3A STM L2 Water: the field *elevation_ocog_20_ku* is always set to _FillValue in LRM mode;
- “EUM/Sen3/NCR/4165” - S3A STM L2 Water: the field *ssha_20_ku* is always set to _FillValue in LRM mode; this occurs because the field *iono_cor_alt_20_ku* (iono dual frequency correction) is always set to Fill Value;
- “EUM/Sen3/NCR/4166” - S3A STM L2 Water: the field *elevation_ice_sheet_20_ku* is set very often (99.99%) to _FillValue in LRM mode. Valid values are expected because the field "range_ice_sheet_20_ku" takes valid values in LRM mode;
- “EUM/Sen3/NCR/4144” - S3 STM L2 WAT: Sea Ice Concentration (*sea_ice_concentration_20_ku*), Snow Depth (*snow_depth_20_ku*), Snow Density (*snow_density_20_ku*) fields are always set to _FillValue in LRM mode.

Anomalies closed in PB 2.33 (IPF SM-2 v06.14).

- “EUM/Sen3/NCR/4167” - S3A STM L2 Water: the fields *range_ocog_20_ku* and *sig0_ocog_20_ku* are often (around 7%) set to _FillValue in LRM mode over open ocean;

- **Closed Anomalies**

- **Anomalies closed in PB 2.33**

- **Anomaly “EUM/Sen3/AR/3404” – ANX cross time not accurately computed**

An error has been detected in the computation of the Ascending Node Crossing (ANX) time that leads to an error of up to 8 seconds in the equator crossing time. This affects L1 and L2. This ANX value is also used internally to generate the start/stop times of the pole to pole passes (STC and NTC), so those too were off by numerous seconds.

Corrected in PB 2.33. Affects data processed with previous versions.



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- **Anomaly “EUM/Sen3/AR/3953” - 5 millimeter bias between zero-altitude dry tropo correction (*mod_dry_tropo_zero_altitude_01*) and measured dry tropo correction (*mod_dry_tropo_meas_altitude_01*)**

This is anomalous because the two dry tropo corrections should be unbiased over open ocean (which is indeed around zero-altitude).

Corrected in PB 2.33. Affects data processed with previous versions.

➤ **Anomalies closed in PB 2.27**

- **Anomaly “EUM/Sen3/NCR/3635” – 1 Hz data without associated 20 Hz measurements**

On some occasions, related to the application of the land-sea mask, there may be 1-Hz time dimension data without associated 20-Hz data in one of the bands, Ku or C. On the indexes recently added to the product with PB 2.24, it will be possible to see index values with `_FillValue`. Users need to ensure that the index read is valid integer, as there might be 1 Hz time tags without associated 20 Hz data for one of the bands.

Affects: L2 SRAL NRT/STC/NTC

- **Anomaly “EUM/Sen3/AR/4029” – Sea-Ice/Ice Noise gate power calculation incorrect**

The noise gate power calculation was incorrect for the Sea-Ice and Ice retrackers, a sum of the power was being used instead of the average.

The noise threshold used was too high, now lowered to the proper value (updated `SR_2_CON_AX`).

Affects: L2 SRAL NRT/STC/NTC before PB 2.27

- **Anomaly “EUM/Sen3/NCR/3706” and “EUM/Sen3/AR/4035” – Correction `_FillValue` is not properly handled for Sea Ice SSHA**

When the corrections are not available the IPF does not properly handle the correction `_FillValue` and uses it in the computation of the Sea Ice SSHA (*sea_ice_ssha_20_ku*).

Affects: L2 SRAL NRT/STC/NTC

➤ **Anomalies closed in PB 2.24**

The following anomalies were closed by the latest processing baselines but are still present in part of the mission dataset available to the users.

- **Anomaly “EUM/Sen3/AR/2273” - Duplicated measurements at granule transition**

Duplicated measurements at 10 minutes granule transition in L2 NRT products.

There are duplicates of 1 Hz measurements (same 1 Hz time tag) between consecutive granules. At granules transition, the last 1 Hz measurement and the first 1 Hz measurement of the following granule may have the same datation. In some cases, the 1 Hz range values (on either or both granules) might be set to default values because there are not enough 20 Hz observations within the granule to compute the 1 Hz range.

This generates about 100 seconds of potentially duplicated data per day (in NRT).

Note that the 20 Hz parameters (range, SWH and `Sigma0`) are not affected.

Corrected in PB 2.24. Affects L2 NRT data processed with previous versions.

- **Anomaly “EUM/Sen3/NCR/2587” - Overflow of the Ku band atmospheric attenuation**



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In the L2 products the atmospheric attenuation in Ku band is set to default values in the products when value exceeds 1.27 dB. Note that for these measurements the wind speed is well calculated.

Corrected in PB 2.24. Affects data processed with previous versions.

- **Anomaly “EUM/Sen3/NCR/2996” – Mismatch between manifest and global attributes.**

The information reported in the SRAL manifest is different from the one reported in the NetCDF global attributes. The majority of the auxiliary data files (ADFs) reported in the manifest are not reported in the global attributes

Corrected in PB 2.24. Affects data processed with previous versions.

- **Anomaly “EUM/Sen3/NCR/3217” - Atmospheric attenuation issue during MWR calibration**

The atmospheric attenuation on Ku band and C band is set to default values for sporadic points located in the fringe of the MWR calibration sequences. These isolated 1 Hz values can be found over open ocean.

As a consequence, wind speed, sea state bias, dual frequency ionospheric correction and *ssha* parameters are set to default value.

Corrected in PB 2.24. Affects data processed with previous versions.

- **Anomaly “EUM/Sen3/NCR/3216” - Bias in Inverse Barometer correction**

There is a bias of 1 cm over open ocean on the inverse barometer correction when comparing to the ECMWF model.

The source of the bias is the calculation of the mean pressure that has to be refined for the handling of the ocean and land grid points.

Corrected in PB 2.24. Affects data processed with previous versions.

- **Anomaly “EUM/Sen3/AR/3219” - Sea Ice discrimination identifying too many floes**

A comparison of Arctic sea ice discrimination statistics during October 2016 between Sentinel-3A and CryoSat shows that S3 processing is identifying four times more floes to leads than CryoSat's discriminator than would be expected during this period. Sentinel-3A discrimination requires further tuning.

Corrected in PB 2.24. Affects data processed with previous versions.

- **Anomaly “EUM/Sen3/NCR/3220” - Residual error on SAR sigma0 for strong radial velocities**

The SAR Ku band SWH from SAMOSA retracker shows an error correlated to SWH, as expected on SAMOSA 2.3 retracker. The maximum magnitude of the error is estimated to 30 cm for the stronger waves.

The SAR range values show a discrepancy of 0.5% SWH compared to PLRM and Jason-2 observations. This will be corrected in the future by the inclusion of the SAMOSA 2.5 retracker.

Corrected in PB 2.24. Affects data processed with previous versions.



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• **Anomaly “EUM/Sen3/NCR/3240” - Iono Gim Correction always set to _FillValue in STC Products**

The ionospheric GIM correction (*iono_cor_gim_01_ku*) is always set to the _Fillvalue on the L2 STC Products and in the global attributes the attribute *xref_iono_data* (input GIM File) is empty.

Corrected in PB 2.24. Affects L2 NRT data processed with previous versions.

• **Anomaly “EUM/Sen3/NCR/3571” – 20 Hz Iono Dual Range Correction frequently set to _FillValue over open ocean**

The 20 Hz ionospheric dual range corrections in SAR and PLRM mode (*iono_corr_alt_20_ku* and *iono_corr_alt_20_plrm_ku*) are frequently set to _FillValue over open ocean. As consequence of this, the 20 Hz *ssha* in SAR and PLRM mode will be set to _FillValue as well.

Corrected in PB 2.24. Affects data processed with previous versions.

• **Anomaly “EUM/Sen3/NCR/3636” – Issue with Quality Flag for Sigma0 (PLRM and SAR)**

The output of the sigma0 quality flag was not correctly set for PLRM, reporting erroneously the SAR value.

Corrected in PB 2.24. Affects L2 data processed with previous versions.

• **Anomaly “EUM/Sen3/NCR/3706” – Wrong value for sea ice range**

In some cases, the sea ice range would be wrong by kilometers due to the application of corrections with _FillValue, which should have been discarded from the processing.

Corrected in PB 2.24. Affects L2 data processed with previous versions.

Current Processing Baseline – Static ADFs

The following list is the complete list of static ADF used by the processors. Any change from the previous processing baseline is highlighted in red. A brief description of the role of each ADF in processing is in the product manifest.

```

MWR L1
S3A_MW_1_SLC_AX_20000101T000000_20991231T235959_20160603T120000_____MPC_O_AL_002.SEN3
S3A_MW___STD_AX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
S3A_MW___CHDNAX_20160216T000000_20991231T235959_20170908T120000_____MPC_O_AL_004.SEN3
S3A_MW___CHDRAX_20160216T000000_20991231T235959_20170908T120000_____MPC_O_AL_004.SEN3

```

```

SRAL L1
S3_AX___CST_AX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
S3A_SR_1_CONCAX_20160216T000000_20991231T235959_20171130T120000_____MPC_O_AL_003.SEN3
S3A_SR_1_CONMAX_20160216T000000_20991231T235959_20180213T120000_____MPC_O_AL_007.SEN3
S3_SR___LSM_AX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
S3A_SR___CHDRAX_20160216T000000_20991231T235959_20180213T120000_____MPC_O_AL_003.SEN3
S3A_SR___CHDNAX_20160216T000000_20991231T235959_20180213T120000_____MPC_O_AL_003.SEN3

```

```

SRAL/MWR L2
S3A_SR_2_CON_AX_20160216T000000_20991231T235959_20180213T120000_____MPC_O_AL_011.SEN3
S3A_SR_2_CCT_AX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
S3A_SR_2_IC01AX_20160216T000000_20991231T235959_20161010T120000_____MPC_O_AL_002.SEN3
S3A_SR_2_IC02AX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
S3A_SR_2_IC03AX_20160216T000000_20991231T235959_20161010T120000_____MPC_O_AL_002.SEN3
S3A_SR_2_IC04AX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
S3A_SR_2_IC05AX_20160216T000000_20991231T235959_20161010T120000_____MPC_O_AL_002.SEN3
S3A_SR_2_IC06AX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
S3A_SR_2_IC07AX_20160216T000000_20991231T235959_20161010T120000_____MPC_O_AL_002.SEN3
S3A_SR_2_IC08AX_20160216T000000_20991231T235959_20161010T120000_____MPC_O_AL_002.SEN3

```




Products Availability

- ☒ Copernicus Online Data Access (<https://codarep.eumetsat.int>) , SRAL L2 NTC Reprocessed Dataset
- ☒ Copernicus Online Data Access (<https://coda.eumetsat.int>), NRT, STC and NTC (see details below)
- ☒ EUMETCast (<https://eoportal.eumetsat.int>), NRT, STC (see details below)
- ☒ EUMETSAT Data Centre (<https://eoportal.eumetsat.int>) , NRT, STC and NTC (see details below)
- ☒ EUMETSAT Online Data Access (<ftp://oda.eumetsat.int>), NRT, STC and NTC (see details below)

Product	EUMETCast	ODA*	CODA**	CODAREP**	EUMETSAT Data Centre
L2 Marine Products (SR_2_WAT)	NRT STC	NRT STC NTC	NRT STC NTC	NTC Reprocessed data	NRT STC NTC

* **ODA** is available only for Copernicus Services and S3VT users

** **CODA** and **CODAREP** are available to all users

Please note that data processed with older versions of the Processing Baseline are still available in CODA/Data Centre – It is not recommended to use them.

Any other useful information

- Note that the SRAL NRT products are 10 minutes length, instead of being dump based as originally specified – this is part of the Product Definition.

References

Sentinel-3 Mission Requirements Traceability Document (MRTD), C. Donlon, EOP-SM/2184/CD-cd, 2011.

<https://sentinel.esa.int/documents/247904/1848151/Sentinel-3-Mission-Requirements-Traceability>

Product Data Format Specification - SRAL and MWR Level 1 products, S3IPF.PDS.003.1, Issue 2.10, Date 28/02/2018

Product Data Format Specification - SRAL/MWR Level 2 Marine products, Ref: S3IPF.PDS.003.3, Issue: 2.12, Date: 05/03/2018

Available in the EUMETSAT site: <https://www.eumetsat.int/website/home/Data/TechnicalDocuments/index.html>

under "Sentinel-3" / "Altimetry"

End of the Product Notice