



ESA Sea level CCI

Quarterly progress report: Q1 2013

Reference: CLS-DOS-NT-10-322
Nomenclature: SLCCI-QPR-006
Issue: 1. 0
Date: Mar. 20, 13





| Chronology Issues: | | | |
|--------------------|------------|--------------------|------------|
| Issue: | Date: | Reason for change: | Author |
| 1.0 | 20/03/2013 | First Issue | Y. Faugere |
| | | | |

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1. Executive Summary

1.1. Scope

The Sea Level CCI responds directly to the GCOS requirements for the Sea level ECV (Product O.2 in GCOS-107) through the generation and validation of multi-mission ECV products from the altimeters on TOPEX/Poseidon and Jason series, as well as ERS1/2, Envisat and GFO. To achieve this global objective, the specific objectives for the Sea Level CCI are:

- To involve the Climate research community to improve the understanding of their needs;
- To develop, test and select the best algorithms and standards in order to produce high quality sea level products for climate applications;
- To assess and collect information on the quality and error characteristics of the Sea Level ECV product through the involvement of independent climate research groups;
- To provide a complete specification of the operational production system that should be developed during the phase 2 of the ESA CCI programme.

2. Status of SL ECV Product Generation.

The Sea Level ECV is a multi-satellite merged product from 18 years of altimetry (1993-2010) data from seven missions. The production of the Phase 1 SLCCI ECV products is now completed and available.

3. Initial validation

These products are validated using two approaches. Firstly, a direct comparison between the new ECV and the V0 reference product (Aviso) has been performed using the RRDP infrastructure developed in this project. Then, in the framework of WP4000 an assessment of the product quality is being performed using three different diagnostics:

- comparison of ECV-V0 and ECV-V1 to in-situ data

The ECV-V1 products have been compared to sea level measured by tide gauges and dynamic heights deduced from in-situ hydrological profiles of temperature and salinity. Global comparisons show good agreement between altimetry and in-situ measurements. Comparisons have also been made, separating the different signal time scales (annual, inter-annual, trend).

A regional study in the Lofoten basin has shown reasonable agreement between the sea level trend calculated from hydrographic data and the ECV-V1 based sea level trend.

- comparison of ECV-V0 and ECV-V1 products for ocean indicators calculation. Three different indicators are routinely computed from the ECV-V0 products (Bessieres et al, 2012): The first ocean indicator allows monitoring the state of the Kuroshio current (contracted or extended). The second ocean indicator, dedicated to the Ionian basin in the Mediterranean Sea, allows for the discrimination between the two main circulation patterns of the basin, either anticyclonic (for instance before 1997 or after 2006) or zonal (after 1997 or before 2006). The third indicator follows the El Niño/La Niña events since 1992. We have started to assess the impact of using the ECV-V1 products for computing the Kuroshio state and the Ionian Sea indicators.
- comparison of ECV-V0 and ECV-V1 with climate and ocean model output products. An important issue has been identified regarding the different reference time period of ECV-V0 (1993-1999) and ECV-V1 (1993-2009) and a document has been issued and distributed to the modellers group to clarify this issue.



4. Product access

The ECV products have been made available on the SLCCI ftp site. In order to facilitate the access to the data and associated documentation we have set up a service desk to allow the distribution of the product and the support to users. We have since then received several requests from the international community.

5. Next Steps

The validation activity will continue throughout 2013. A validation meeting will be organized in June 2013, followed by the promotion of the ECV products through the web site, scientific articles and international meetings. The systems engineering team will respond to any required actions following feedback from the review of the System Specification Document and will continue to interact with the System Engineering Working Group.

In parallel with the planned tasks, additional activities are performed in order to improve the SLCCI V1 product. These activities, including new algorithm developments, selection and SLCCI V2 product generation will be performed in 2013.