



ESA Sea level CCI

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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.

1.2. Overall Project Status

The SLCCI project is now entering its final phase. The algorithm development and selection tasks have been completed (May 2012). The final choice of the altimetry standards was achieved at the Algorithm Selection Meeting in May 2012 by an independent panel of 10 external international experts. 50 algorithms had been developed and/or tested, and for each algorithm, Round Robin Data Packages (RRDP) were produced, gathering numerous diagnoses about the sea level data over the whole altimetry period (20 years). In Sept 2012 the team successfully completed and released the first version of the SLCCI ECV products in advance of the two significant meetings; "20 Years of Progress in Radar Altimetry" symposium and ESA's CCI Colocation & Mid Term Review. A first assessment showed the significant improvements of the sea level record, approaching the requested quality for climate study applications. Notably, the uncertainty of the global mean sea level derived from ERS-1 / ERS-2 / Envisat using the new CCI standards has decreased to the mm/year level. Following the production of the ECV products, the team will focus on the Task 4 activities (validation) as the main focus for the project during the final year.

In parallel, work has continued on System Engineering activities including an active support to ESA's leadership of the Systems Engineering Working Group (SEWG).

2. Project Status

2.1. Progress in Last Quarter

In this last quarter the project team has first worked on finalising the output of the Algorithm selection meeting. Since the successful Algorithm selection meeting earlier in the year (May 2012), the team have delivered the summary document of the meeting, (Product Validation and Algorithm Selection Report).

Following this, the processing chain, based on the DUACS infrastructure, and associated database has been finalized, taking into account the outcome of the selection meeting. The production of the Phase 1 SLCCI ECV products, started by mid-May 2012, has now been completed and was announced at the "20 Years of Progress in Radar Altimetry" symposium. The team gave a presentation on Day 2 of the symposium and hosted a poster on "Altimetry Error at Climate Scale".



The 'call to media' at this symposium generated positive interest for the results of the project, with as an example, an article appearing on the BBC News website (front page, science section).

The Sea Level ECV is a multi-satellite merged product from 18 years of altimetry data from seven missions. The main highlights presented include the improvements of the altimetry data record at several temporal scales, significant improvement in the Global Mean Sea Level derived from ESA missions (ERS-1&2, Envisat) with the long term trend now closer to the TOPEX/Jason-1/Jason-2 trend, and improvements in the regional Mean Sea Level trends with differences in the range of +/- 2mm/year at a local scale.

The production of the ECV products now allow the Task 4 activities (validation) to begin, and these will be the main focus for the project during the last year.

Regarding System Engineering activity, the System Requirements Document has now been finalised and accepted by ESA, and the work to define SLCCI systems specification is near completion with the System Specification Document (v1) currently being reviewed by ESA. The engineering team have remained active in the System Engineering Working Group and have continued to support ESA in their leadership of the community. The team also presented in the systems session at the CCI Co-location meeting and. At the CCI Mid Term Review meeting, the team collaborated and gave a joint presentation with other system engineers and the data standards working group.

At the CCI Co-location meeting in Rome (Sept 24-26) the team gave a presentation and were active at the Mid Term Review meeting.

2.2. Future Activity in coming 3-6 months

The SLCCI ECV products will then be validated in 2012-2013 as part of the WP4 task. These products will be validated with two approaches. First a direct comparison between the new ECV and the V0 reference product (Aviso) will be performed using the RRDP infrastructure developed in this project. Then assessment of the product quality will be performed through an assimilation exercise and through comparisons with climate and ocean model outputs products. Despite its relatively good maturity, the sea level ECV is not really used by the climate models for their validation. The ESA CCI program represents a very good opportunity to enhance closer links between modeling and observations. Then, and it is probably the most important, the SLCCI team will promote the ECV products through the web site, scientific articles and international meetings such as the 20 year of altimetry meeting in September 2012.

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 addition the team will be planning for their 2nd Annual review meeting in Toulouse on 18-19 Oct.