SLBC_cci+

Sea Level Budget Closure - Climate Change Initiative +

System Description Document (SDD)

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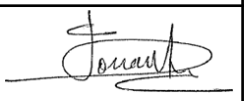
Approved by :	Joël Dorandeu	Magellium	31/03/2025	
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Document evolution sheet

Ed.	Rev.	Date	Purpose of evolution	Observations
1	0	31/03/2025	First version of the document	
1	1	17/06/2025	ESA feedback	

Contents

List of figures and tables

1. Introduction

1.1. Scope and objective

This document is the System Description Document (SDD) for the ESA SLBC_cci+ project ([AD-1] and [AD-2]). This SDD is dedicated to the description of the system which is responsible for the generation of the SLBC product. It contains the description of the system and its outputs.

1.2. Document structure

In addition to this introduction, the document is organised as follows:

- System description
- System output

1.3. Related documents

1.3.1. Applicable documents

Table 1 *List of applicable documents.*

Id.	Name	Description
[AD1]	ESA AO/1-11340/22/I-NB	Call to tender “SEA LEVEL BUDGET CLOSURE_CCI+ (SLBC_CCI+)”
[AD2]	MAG-22-PTF-060_DetailedProposal_V2	Detailed proposal in response to ESA/ESRIN Request for Quotation “SEA LEVEL BUDGET CLOSURE_CCI+ (SLBC_CCI+)” ESA AO/1-11340/22/I-NB [AD-1]
[AD3]	SLBC_CCI-DT-074-MAG_PUG_D3-3	SLBC_CCI+ Product User Guide
[AD4]	SLBC_CCI-DT-076-MAG_UCR_D3-5	SLBC_CCI+ Uncertainty Characterisation Report

1.4. Acronyms

Table 2 *List of abbreviations and acronyms.*

Acronyms	Description
CCI	The ESA Climate Change Initiative
ESA	European Space Agency
SLBC_cci	Sea Level Budget Closure of the ESA Climate Change Initiative (first phase)
SLBC_cci+	Sea Level Budget Closure of the ESA Climate Change Initiative (second phase, this activity)
w.r.t	With respect to

2. System description

The system responsible for producing the SLBC product is developed in Python. It consists of a simple script that collects the various SLB components and their uncertainties, adds them together and stores the result in a netCDF.

This script is parameterized with a configuration file in the form of a YAML to indicate which SL component of the database is required (when different versions of the same component are available) and whether the budget is produced on a global or regional scale.

Due to the simple operations performed by this script (addition of values) and the small size of the various data (monthly time step and 1-degree resolution, e.g. ~ 100MB for each component), there is no particular computer development implemented to manage efficiency (e.g. parallelisation, clustering, etc…).

The system and database are stored on the CNES High-Performance Computing (HPC) infrastructure (called TREX). It is available with a dedicated account for access, but could easily be transferred to any other infrastructure.

The diagram describing the system architecture is shown in Figure 1.

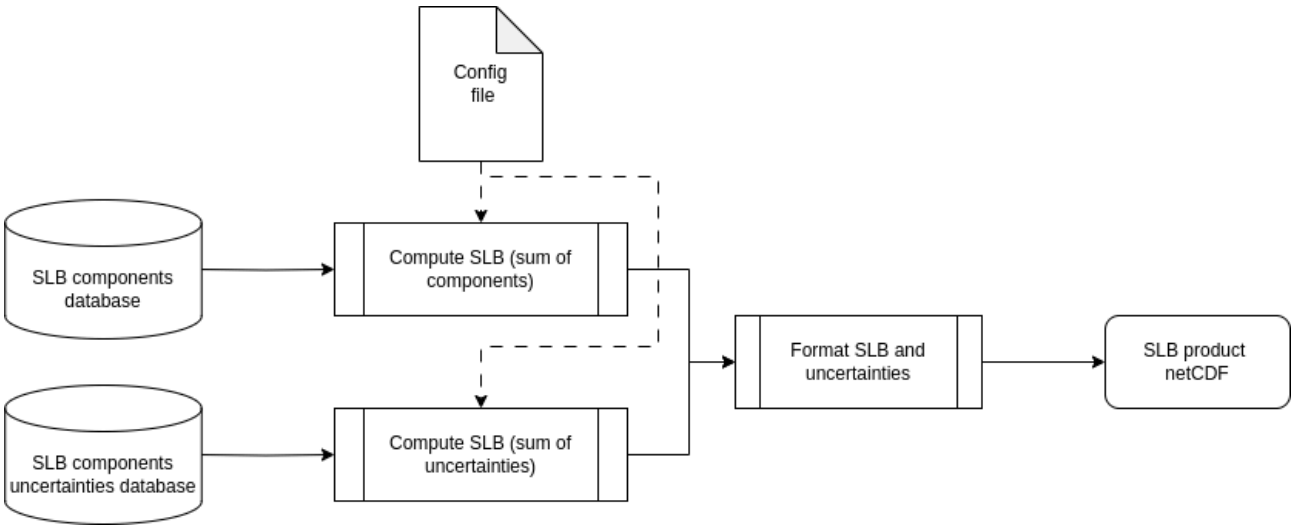

Figure 1 *System architecture diagram*

3. System output

The output of the system is a netCDF file, which is produced once the various SLB components have been summed, along with their uncertainties. This netCDF file is produced w.r.t. the Climate Forecast Convention (CF compliant).

Full details on the contents of the netCDF (variables, dimensions, resolutions, etc.) are given in the product user guide ([AD3]).

This netCDF is stored on the CNES HPC and then manually uploaded to the ESA CCI website.

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