CLEV2ER Land Ice and Inland Water

AO/1-11449/22/I-AG

Software Release Note

[DD-SRN]

Ref: CRIS-TN-LIG-GS-5102

CLEV2ER-LIIW GPP Software Version **0.3.1**

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Change Log

Issue	Author	Change	Status	Date
0.2.6	A.Muir	release of v0.2.6 of the GPP Software	Completed	29/6/24
0.3.1	A.Muir	release of v0.3.1 of the GPP Software	Completed	8/7/24

Acronyms and Abbreviations

AD	Applicable Document
GPP	Ground Processor Prototype
IODD	Input Output Data Definition

Reference Documents

Ref. Id	Doc. Title	Date	Version
RD1	Input/Output Data Definition V1, DD-IODD (CRIS-DS-LIG-GS-1103)	03/2024	1.1
RD2	Requirements Specifications, (CRIS-RS-LIG-GS-1001)	03/2024	1.1
RD3	Software User and Installation Manual (CRIS-MA-LIG-GS-5101)	06/2024	0.1
RD4	Algorithm Theoretical Basis Description (CRIS-DS-LIG-GS-2101)	06/2024	1.2

Table of Contents

1 Introduction

1.1 Purpose and Scope

This is the Software Release Note for **v0.3.1** of the CLEV2ER Land Ice and Inland Waters GPP software.

The purpose of a Software Release Note is to detail the delivered L2 GPP software version in terms of dependencies, known/solved problems and status with respect to its approved baseline.

2 Release Version Summary

This Version: 0.3.1, release date: 8/7/2024

Version 0.3.1 is a development release as part of Phase-1 of the CLEV2ER Land Ice and Inland Waters for Technical Checkpoint #1. As a development release it is not expected to be fully featured with respect to the full software requirements [RD-02] but is intended to demonstrate operation of the GPP's algorithm framework at Technical Checkpoint #1 with a few examples of scientific algorithms and a test harness.

3 Delivery Components

Release Portal: http://www.cpom.ucl.ac.uk/downloads/clev2er_liiw

Install Type	File	Size
Docker Install	clev2er_liiw_liiw-0.3.1.docker.tar.gz	0.89GB
	clev2er_liiw_li-0.3.1.docker.tar.gz	0.89GB
	clev2er_liiw_iw-0.3.1.docker.tar.gz	0.89GB
	clev2er_liiw_liiw_with_tds-0.3.1.docker.tar.gz	6.4GB
	clev2er_liiw_li_with_tds-0.3.1.docker.tar.gz	6.3GB
	clev2er_liiw_iw_with_tds-0.3.1.docker.tar.gz	0.89GB
	SHA256 checksums (in order): 939a1c1b683a8267c3e0f9315be111a22254fbc9ec991a09cf5cbd1f038a2ebb 2d22b814fda9a419827c40395e174aba50f0969cbf260a2cd7c1bf2e3d641f9c 907b37c8248395d9b3ebf30753e3f82b4528923f6e246637034fe982fe7fd836	

	f367db172ba402e0ce712a29bc95bf05c3b7108191526e2e9e3495547b70b8dc 1985cfbc178a5c148ed49d284238e431d211a8bdcb9753a9e379e7018ed32162 6971f4474b317078962bdf08edaa4e329e8df194bef52e135a3946244ef3aa06	
Native Install	clev2er_liiw_both-0.3.1.tar.gz clev2er_liiw_li-0.3.1.tar.gz clev2er_liiw_iw-0.3.1.tar.gz SHA256 checksums (in order): 7f886c91e481b19792d44a85fc9357c7618dd4be887b5ebb2ea260cd5590dcda f52c0dcb522c3cae0efce0dcd93565f9da693d8a73bb6ec645424ae8c42018bc 9d769e8cc26357242af49242dfb9a94561168708464e5dc72d732d549bdf35c4	82MB 82MB 81MB
ADF/TDS Package	testdata_external_both_0.3.1.tar.gz testdata_external_li_0.3.1.tar.gz testdata_external_iw_0.3.1.tar.gz SHA256 checksum: cfa689147caead474c70285fcf7c4c362fdcbcf8c25cf3bfc5943ed8f096af07 3085aec08dce1a58df035b72002f934c4b43fabd4f94440894a655c6b052f91f 0ad6a2de3340213516b855862bf0014fc17e2f926e33fc3f30a7f941d5cacedd	6.4GB 6.3GB 0.89GB

4 Installation

Software installation procedures are detailed in the CLEV2ER Land Ice and Inland Waters **Software User and Installation Manual** (D-SUM), [RD-03].

5 Dependencies of this Version

This section defines the software and hardware dependencies of this release.

5.1 Software Dependencies

5.1.1 Operating System Dependencies

This release is designed to install and operate on:

Operating System	Version
Linux	Any Linux released since 2020 Target release: Ubuntu 24.04 LTS
MacOS*	macOS >= 12.4

* system tested on MacOS, but not a requirement, so only supported on a best effort basis.

5.1.2 Docker Installation

For Docker installations of this software release all dependencies are pre-built in the container. For key dependencies used to build the Docker image please refer to the dependencies listed for a native installation.

Software Dependency	Version
Docker	Docker Engine or Docker Desktop installed >= version 26.1.3
curl	latest (>= 7.6) for downloading release packages

5.1.3 Native Installation

For native installation (on supported operating systems) of the CLEV2ER GPP software for this release, the key software dependencies are:

Software Dependency	Version
Python	3.11.x
Poetry	latest (>= 1.8.3)
curl	latest (>= 7.6) for downloading release packages
ncdump	latest (optional), for verification/validation
pv	latest (optional). This optional package improves the installation progress readability.

Python package dependency requirements for this version:

Package	Version
affine	2.4.0
asciitree	0.3.3
attrs	23.2.0
cartopy	0.22.0
certifi	2024.2.2
cftime	1.6.3
click-plugins	1.1.1
click	8.1.7
cligj	0.7.2
codetiming	1.4.0
colorama	0.4.6
contourpy	1.2.0
cycler	0.12.1
envyaml	1.10.211231
fasteners	0.19
fonttools	4.49.0
imagecodecs	2023.9.18
imageio	2.34.0
kiwisolver	1.4.5
lazy-loader	0.3
matplotlib	3.8.3
netcdf4	1.6.5
networkx	3.2.1
numcodecs	0.12.1
numpy	1.26.4
packaging	24.0
pillow	10.2.0
pygments	2.17.2
pyparsing	3.1.2
pyproj	3.6.1
pyshp	2.3.1
python-dateutil	2.9.0.post0
pyyaml	6.0.1
rasterio	1.3.9
scikit-image	0.22.0
scipy	1.12.0
setuptools	69.1.1
shapely	2.0.3

six	1.16.0
snuggs	1.4.7
tifffile	2023.12.9
toml	0.10.2
types-toml	0.10.8.20240310
xmltodict	0.13.0
zarr	2.18.2
snuggs	1.4.7
tifffile	2023.12.9
toml	0.10.2
types-toml	0.10.8.20240310
xmltodict	0.13.0

5.1.4 Hardware Requirements of this Version

Each algorithm chain and related tools (gridding tool) have their own minimum recommended hardware (RAM, CPU, Storage) requirement, based on the resources they consume during processing. These have been measured for this release.

GPP Chain	Minimum Memory (RAM) per L1b file	Other Minimum Hardware Requirements	Criteria Used
landice	TBD	TBD	TBD
landice_swath	TBD	TBD	TBD
inlandwaters	TBD	TBD	TBD
land ice gridding tool	TBD	TBD	TBD

Note that the hardware specification used will affect the potential scalability of the GPP as far as multi-processing of a chain (the ability to process multiple L1b files in parallel).

6 Problems Solved in this Version

In this development version the CLEV2ER Algorithm Framework and sample algorithms for Land Ice (POCA and Swath) and Inland Waters have been completed.
This release also includes the first version of the test harness.

7 Known Issues in this Version

As this is a development release, only a small subset of scientific algorithms defined in the ATBD [RD03] for the land ice and inland waters chains have been completed.
No output algorithms to create L2 CRISTAL files have been created yet.

8 ADF/TDS Versions Included in this Release

In this section we detail the ADF and TDS files included in the GPP software package and additional ADF/TDS package (for large files or datasets > 1GB).

8.1 Common ADF

ADF are located in one of two locations referenced in the table.
GPP: $CLEV2ER_BASE_DIR/testdata/adf/common
EXT: $CLEV2ER_BASE_DIR/testdata_external/adf/common
Location of testdata_external is configurable during installation.

Type	File	Ver	Where	Source	Size
Physical Constants	CR__AX_GR_CST__AX_00000000T000000_99999999T999999_20240201T000000_____CPOM_SIR__V01.NC	1.0	GPP	MSSL	4KB

* in this development release, the ADF included is a small subset of the final required ADF

8.2 Land Ice ADF

ADF are located in one of two locations referenced in the table.
GPP: $CLEV2ER_BASE_DIR/testdata/adf/landice
EXT: $CLEV2ER_BASE_DIR/testdata_external/adf/landice.
Location of testdata_external is configurable during installation.

Type	File	Ver	Where	Source	Size
Antarctic Dilated Mask	ant_dilated_grid_mask.nc	1.0	GPP	CPOM/ BedMachine	464KB
Greenland Dilated Mask	grn_dilated_grid_mask.nc	1.0	GPP	CPOM/ BedMachine	532KB
Antarctic DEM: 100m Gapless	GaplessREMA100.zarr GaplessREMA100_flipped.zarr	v2.0	EXT	MSSL Zarr post-processed from https://figshare.com/articles/dataset/Gapless-REMA100/19122212	5.7GB
Antarctic DEM: 1km Gapless	GaplessREMA1km.zarr GaplessREMA1km_flipped.zarr	v2.0	EXT	MSSL Zarr post-processed from https://figshare.com/articles/dataset/Gapless-REMA100/19122212	66MB

* in this development release, the ADF included is a small subset of the final required ADF

8.3 Inland Waters ADF

$CLEV2ER_BASE_DIR/testdata/adf/inlandwaters

Type	File	Version	Source

* in this development release, the ADF included is a small subset of the final required ADF

9 Version History

Version	Date	Description
0.3.0	23/06/2024	Development release for TC1 Algorithm framework + sample algorithms First version of test harness
0.3.1	08/07/2024	Minor update to improve Docker build scripts