



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 0.3.6

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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
0.3.6	A.Muir	release of v0.3.6 of the GPP Software for TC1	Completed	17/7/24

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
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Table of Contents

Change Log.....2

Acronyms and Abbreviations.....2

Reference Documents.....2

Table of Contents.....3

1 Introduction.....4

 1.1 Purpose and Scope.....4

2 Release Version Summary4

3 Delivery Components4

4 Installation6

5 Dependencies of this Version7

 5.1 Software Dependencies.....7

 5.1.1 Operating System Dependencies.....7

 5.1.2 Docker Installation7

 5.1.3 Native Installation7

 5.1.4 Hardware Requirements of this Version..... 10

6 Problems Solved in this Version..... 11

7 Known Issues in this Version 11

8 ADF/TDS Versions Included in this Release 11

 8.1 Common ADF 11

 8.2 Land Ice ADF..... 12

 8.3 Inland Waters ADF..... 12

9	Version History.....	13
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1 Introduction

1.1 Purpose and Scope

This is the Software Release Note for v0.3.6 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: 0.3.6, release date: 8/7/2024

Version 0.3.6 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

The GPP software is delivered in a number of different package options for:

- Native Install (on supported Linux OS).
- Docker Install.
- An external ADF/TDS package.

For both of these install options, there is also the option to install:

- Land Ice GPP only.
- Inland Waters GPP only.
- Both Land Ice and Inland Waters GPPs in one package.

The GPP packages for this release comprising of the above options are available for download from the project release portal:

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

Links within the portal are provided below for this release:

Install Type	File	Size
Native Install	clev2er_liiw_both-0.3.6.tar.gz	82MB
	clev2er_liiw_li-0.3.6.tar.gz	82MB
	clev2er_liiw_iw-0.3.6.tar.gz	81MB
	SHA256 checksums (in order):	
	cf5a5e640df87aefa6f8ab9f0542ed50bfb1c2f75445a87c55c61	
	c3687979f19	
	7bb9ca8d90f5ddd173e58ad4bbc25f322ac42ec46a60d4a8a5	
	5df61b030445d9	
	d28065a8980b61b7501a9ec99f6c4b4faf102793182be2915a9	
	f0454dbae39e4	
Docker Install	clev2er_liiw_liiw-0.3.6.docker.tar.gz	0.89GB
	clev2er_liiw_li-0.3.6.docker.tar.gz	0.89GB
	clev2er_liiw_iw-0.3.6.docker.tar.gz	0.89GB
	clev2er_liiw_liiw_with_tds-0.3.6.docker.tar.gz	6.4GB
	clev2er_liiw_li_with_tds-0.3.6.docker.tar.gz	6.3GB
	clev2er_liiw_iw_with_tds-0.3.6.docker.tar.gz	0.89GB
	SHA256 checksums (in order):	
	19f1769153a26767fb8ffab022a09d3083295383aab2e7793d8	
	001024661b73c	
	84ac441a4c1450eb02830e6bdef4144e1652798b4d53229938	
	e4b20fcd8b8791	

	37d701b838855817c15a98c57c1bf7d03000dc23de40c225e af0132397531c0 513ca9ebed163c995dc90e599a6597b7aefc43993c3ce3715f d7ef0548c15187 ede8d796a372f49848ad3d08c3ff3086f9ce15f6e73f0893344e 9de621082e39 ce7d488e3742c37514b4712a5a87ac12f156a41ab76ad1828a af1a7d3933cb80 d3438af5f16337b1832de89c9afd3f4c4a8b5c71e847f7b3ba34 dc7bf74ab3bd	
ADF/TDS Package	testdata_external_both_0.3.6.tar.gz testdata_external_li_0.3.6.tar.gz testdata_external_iw_0.3.6.tar.gz	6.4GB 6.3GB 0.89GB
	SHA256 checksum: 14fc87a0f476ac4c516bd3e2df0ae2fcb075bcfd2d922342d9d5 cfbed5142839 aada39694848e2437f413d16672237d44136d42592bd5186b 065565dd3ecadfc 537f388178e1abea9ca67aa82c2d5cd22ae3a21398b11c90d9 3de5ffb1ceed96	

4 Installation

Software installation procedures are detailed in the CLEV2ER Land Ice and Inland Waters **Software User and Installation Manual** (DD-SUM), [RD-03]. The installation scripts for each install method are provided on the release portal.

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 are provided in the following table:

Package	Version
affine	2.4.0
asciitree	0.3.6
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
xmldict	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
xmldict	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 [RDO3] 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

The location of testdata_external is configurable during installation.

Type	File	Ver	Where	Source	Size
Physical Constants	CR_AX_GR_CST_ _AX_00000000T00 0000_99999999T9 99999_20240201T 000000_____ ____CPOM_SI R_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.

The 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.
0.3.6	08/07/2024	Minor update to improve Docker build scripts.