August 1, 2023

# **JPL**

**Jet Propulsion Laboratory**

California Institute of Technology

AUTHORS: Gregory Halverson

SUBJECT: ECOSTRESS Collection 2 Level 2-3-4 Tiled and Gridded Products **v1.10.2** Delivery Memo – Rev 1

1. **Introduction**

This is a delivery of the Level 2-3-4 Tiled and Gridded Products subsystem for ECOSTRESS Collection 2 Cloud-Enabled PCS operation, named **version 1.10.2** for Integration and Testing in ECOSTRESS SDS **Build** **0710**. This Python software package includes PGEs that generate tiled and gridded forms of ECOSTRESS radiance and surface temperature, runs the STARS data fusion system, and processes the JPL evapotranspiration ensemble (JET) and disALEXI-JPL evapotranspiration workflows.

1. **Capabilities and Features**

* Compatibility with shapely 2
* Streamlining Docker image
* Fixing issues with Julia on Linux

1. **Build/Run Requirements**

The tiled and gridded products subsystem is designed to run in a python 3 conda environment using Miniconda:

<https://docs.conda.io/en/latest/miniconda.html>

For cloud-enabled operations, this subsystem also runs within a Docker container:

<https://www.docker.com/products/docker-desktop>

1. **Build Instructions**

**GitHub**

To install this software, first clone the ECOSTRESS-Collection-2 repository from the ECOSTRESS GitHub team page.

$ git clone git@github.jpl.nasa.gov:halverso/ECOSTRESS-Collection-2.git

Navigate to the directory this created:

$ cd ECOSTRESS-Collection-2

**Docker**

These are instructions for running this system using Docker containers.

The Docker image for this system is kept in an Artifactory repository:

cae-artifactory.jpl.nasa.gov:16001/gov/nasa/jpl/ecostress/sds/pge/pge-eco-level-2-3-4

The 16001 port is for local testing. Use port 16002 for Integration & Testing procedures, and 16003 for deployment.

To login to Artifactory:

docker login cae-artifactory.jpl.nasa.gov:16001/gov/nasa/jpl/ecostress/sds/pge/pge-eco-level-2-3-4

To pull the image from Artifactory:

docker pull cae-artifactory.jpl.nasa.gov:16001/gov/nasa/jpl/ecostress/sds/pge/pge-eco-level-2-3-4

To tag the image:

docker tag cae-artifactory.jpl.nasa.gov:16001/gov/nasa/jpl/ecostress/sds/pge/pge-eco-level-2-3-4 pge-eco-level-2-3-4

**Conda**

These are instructions for running this system natively using conda.

Use the  make install script to produce the ECOSTRESS  environment:

(base) $ make install

This should produce a conda environment called ECOSTRESS in your Anaconda installation. An environment is a separate python installation with a particular set of packages installed.

To update your installation of the evapotranspiration environment, first update your copy of the distribution repository:

$ git pull

Then update the ECOSTRESS environment using the make reinstall-hard script:

(base) $ make reinstall-hard

1. **Testing**

Unit tests are included to ensure that the system is operational. To run the unit tests, use nosetests inside the ecostress-l3-download-preprocess directory cloned from github:

$ nosetests -v

1. **Usage of Libraries and Executables Created in this Build**

**Docker**

The entry-points to execute the PGEs in the Docker image are BASH shell scripts named after each PGE with a .sh extension under a directory called PGE. To run a PGE with Docker:

docker run --rm -it -e PYTHONUNBUFFERED=1 -v /project/sandbox/halverso/ECOSTRESS\_15801\_013\_docker:/working\_directory -v /project/sandbox/halverso/ECOSTRESS\_15801\_013\_docker/L2G\_L2T\_RAD\_LSTE\_output:/L2G\_L2T\_RAD\_LSTE\_output pge-eco-level-2-3-4 /bin/bash /pge/L2G\_L2T\_RAD\_LSTE.sh /working\_directory/ECOv002\_L2G\_L2T\_RAD\_LSTE\_15801\_013\_20210419T215859\_0700\_01\_docker.xml

**Conda**

The ECOSTRESS conda environment needs to be activated to run the PGEs.

(ECOSTRESS) $ conda activate ECOSTRESS

The conda environment includes a command-line entry-point named after each PGE that accepts the filename of the XML run-config as its argument.

(ECOSTRESS) $ L2G\_L2T\_RAD\_LSTE run-config.xml

1. **Change Requests and Problem Reports**

There are no change requests or problem reports at this time.

1. **Liens and Waivers**

There are no leans or waivers at this time.

1. **Miscellaneous Instructions or Information**

The entry-point for level 1 and 2 processing is now L1\_L2\_RAD\_LSTE instead of L2T\_L2G\_RAD\_LSTE