ECOSTRESS data description

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ECOSTRESS data are released in HDF5 format, complete with datasets and attribute information. This first preliminary data release includes scenes processed with an early algorithm build, and **is provisional and not intended for scientific analysis or publication. If you generate results that you feel are worthy of publication, please coordinate with us first, per the ECOSTRESS Early Adopters Charter.** New versions of these datasets will be made available incrementally with changes to the processing, and as such, these images **should not be considered final**.

A full description of the data format will be described in User Guides and Product Specification Documents. However, the user may be interested in particular fields, such as:

L1B_RAD:
/Radiance/radiance_1
/Radiance/radiance_2
/Radiance/radiance_3
/Radiance/radiance_4
/Radiance/radiance_5

L1B_GEO:
/Geolocation/latitude
/Geolocation/longitude

Frequently Asked Questions

Why are some scenes incomplete?
During the first acquisitions in the In-Orbit Checkout Phase, acquisitions were made manually, with operator-determined start and stop times. As such, data were not acquired as whole scenes (see Figure 1).

The research was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

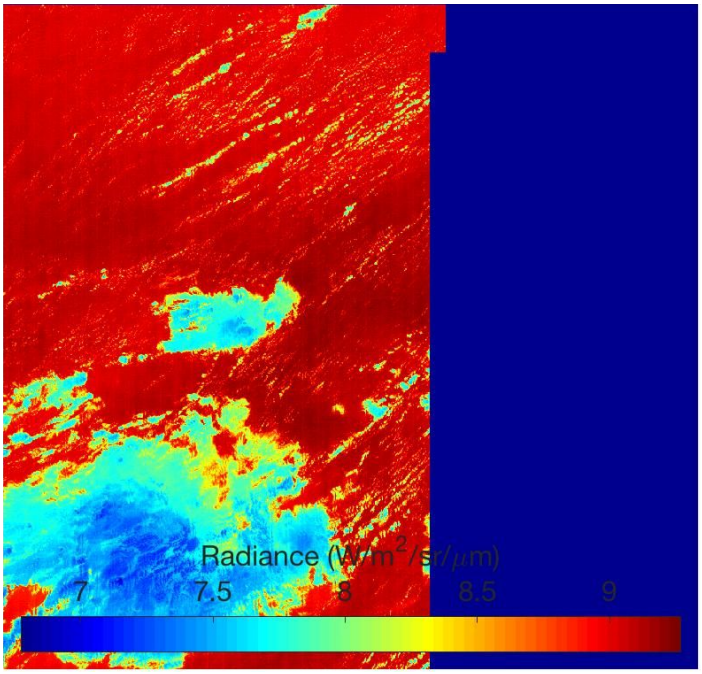

Figure 1: This is a partial scene (also called a "runt scene") where the data acquisition was not long enough to fill the standard ECOSTRESS scene size.

Why are there small patches of missing data?
Data is transferred in "packets", which represent data bundles. Occasionally, a single patch is corrupted as it is transferred from the instrument to the ground data system (Figure 2).

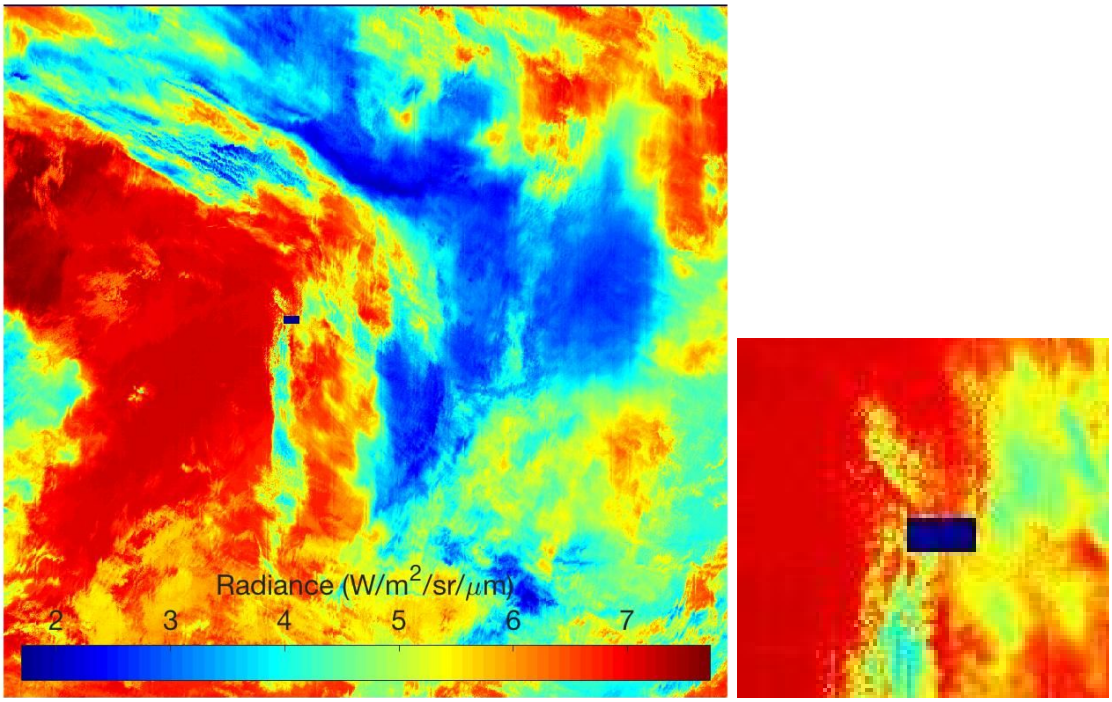

Figure 2: In the center of this scene, there is a small block of missing data. This packet was corrupted on transfer to the ground.

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Why are there stripes in the data? We have identified at least four artifacts in the data that can cause apparent striping. We will continue to address these issues, but in their provisional state, if it cannot be fixed by geolocation, we are going to document them.

a) Detectors in TIR bands 1 and 5 and the SWIR band were damaged during testing, before launch. This will result in 8 lines of missing data every 128 lines in the across-track direction in those bands, and an error code of -9998 for the missing pixels (Figure 3).

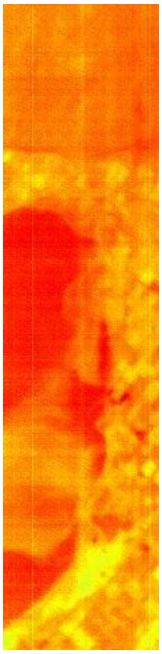

Figure 3: A zoom of band 1 shows where missing data lines are imperfectly filled using a neural network.

b) Because of the detector placement on the instrument, there are occasions when data seen by band 1 are not seen by other bands. This missing data is flagged with the error code of -9997.

c) In the last instance, what can appear as striping is not due to missing data. ECOSTRESS is a push-whisk instrument, which means that a scene is made up of 44 scans, stacked in the along-track direction. Each of these scans has an overlap, and so before geolocation, some apparent spatial discrepancies may be observed. This will be visually corrected through geolocation. (Note that all data is still correct as presented; it is simply the visualization that may be difficult to understand. See Figure 4)

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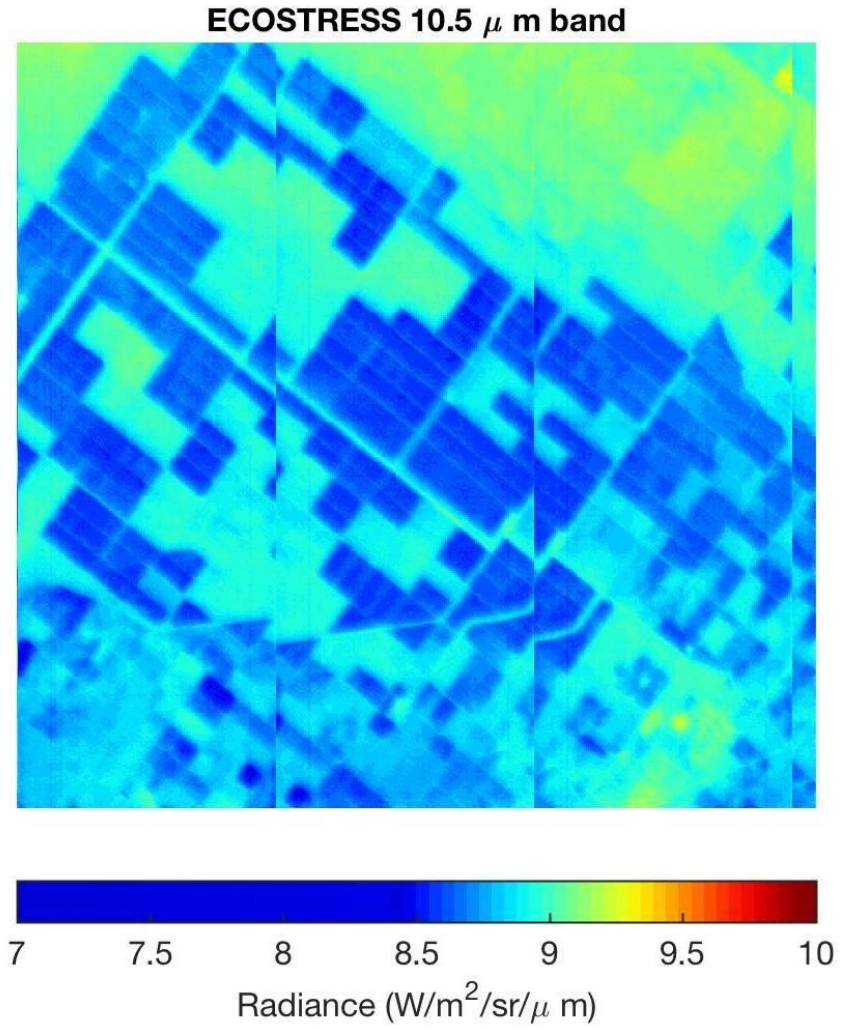

Figure 4: The overlap between scanlines is apparent in the agricultural fields. Geolocation will result in a spatially contiguous scene.

d) In addition, the ISS has on one previous occasion changed yaw so that scans are accumulated in reverse order (see Figure 5). Again, this will be visually corrected through geolocation.

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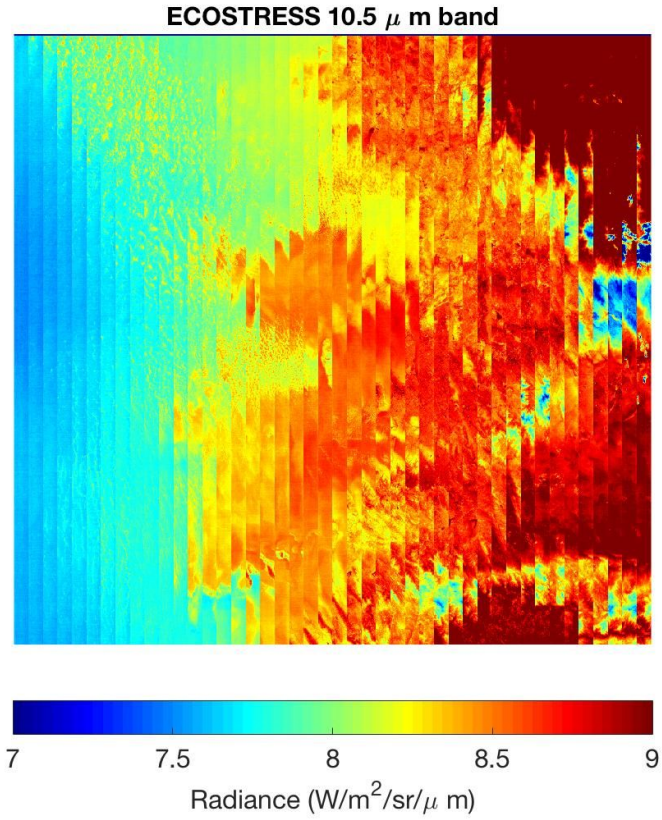

Figure 5: Due to a change in the direction of the instrument (which has only been observed on one occasion), the scans are accumulated out of order. This will be fixed through geolocation.

The SWIR channel looks like static; is there a way to use this data?
We do not recommend using the SWIR channel at this time as it has has some challenges that will be addressed in future releases. The SWIR channel should not be used at this time.

Sometimes there are obstructions in the image. What is this?
Occasionally the ISS has to adjust the position of some of its solar panel arrays. These may pass into the ECOSTRESS field of view, as seen in Figure 6.

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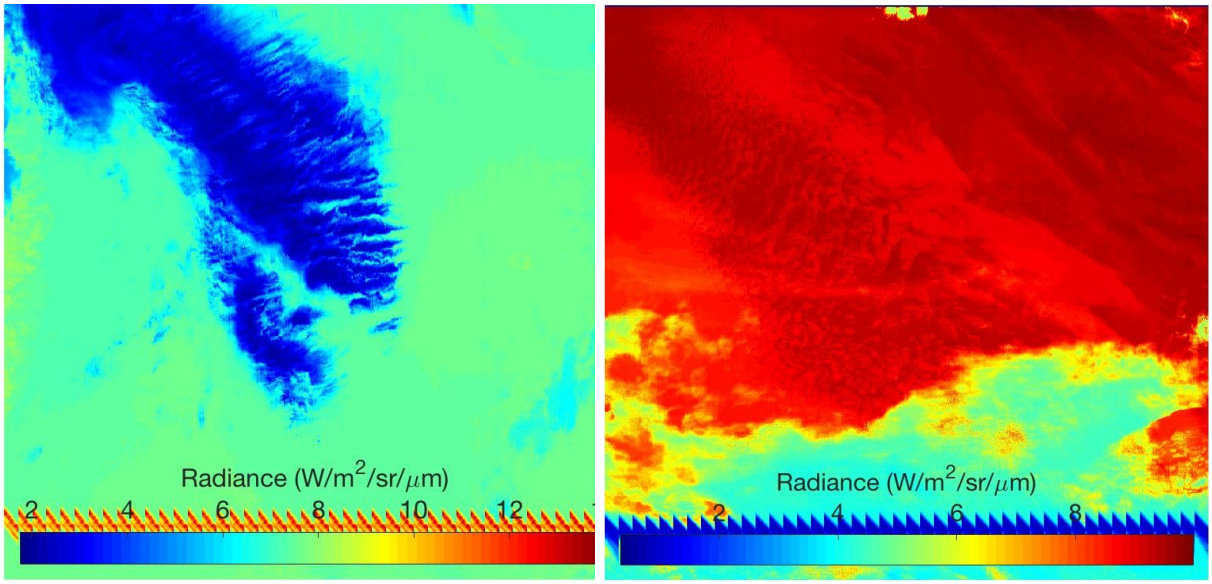

Figure 6: Examples of solar panel obstructions near the bottom of these ECOSTRESS images. The position of the obstruction is non-constant.

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