

ICESat-2 PROJECT SCIENCE OFFICE REPORT

Monday, August 19, 2019 thru Sunday, August 25, 2019

RGTs spanned: 794-899

Cycle 4

SUMMARY:

All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. Members of various PSO elements got together for a one-day retreat hosted at SGT/KBR this week and discussed plans for ATL02/ATL03 data product verification and future work, range bias determination, coordination between CAMS and the ISF, and other topics. "Release 002" data development continues with continued testing at SIPS and the development of a data release plan with the science team.

NSIDC ICESat-2 Metrics through August 18: 1,284 total users of 10 available data products; 759,091 sciences files downloaded. Going by total number of data users (because the compiler of this report may have a slight ATL03 bias), ATL03 reigns supreme this week with 454 users and 133,653 files downloaded! ATL08 is a close 2nd with 453 users and 325,313 files downloaded, followed by ATL06 with 376 users and 244,612 files downloaded.

Another great [Photon Phriday](#) was posted on Friday featuring science team lead Lori Magruder and observing near-shore bathymetry with ICESat-2!

****ELEMENT DETAILS BELOW****

CAMS/POD:

CAMS: Regular CAMS operations continue with constraint and conjunction monitoring for Mission Weeks 49 and 50, and mission planning for Mission Week 51.

CAMS supported multiple ATS loads for Mission Week 49:

- A mini ATS was created for an HIE with the 43906 on August 19, 2019. The mini ATS was not utilized as the event self-mitigated.

POD: Regular POD operations continue. Intermediate POD was completed for GPS weeks 2065 and 2066. Final POD was completed for GPS week 2064. All results appear nominal.

POD generated pointing bias calibration solutions for DoY 226, 227, and 228. These were the first dates with round-the-world scans following the spacecraft quaternion update on DoY 225. Results look as expected.

ISF:

All ATLAS housekeeping data is nominal
Laser 2 is firing at energy level 4 and in science mode

WTEM Peak to Edge Ratio: 1.208
Laser 2 Temperature Error: -0.32C
SADA in Airplane Mode
Spacecraft orientation: - X

Mission Planning:

MW50 ATS is loaded to the spacecraft and currently operating, it includes Veg Track off-points and two orbits of manual TEP

MW51 is being planned, all nominal calibration activities

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Activities during the past week:

Real-time activities:

Executed standing CAR166 to adjust the VBG setpoint temperature :  
2019/232/17:25, 2019/232/22:00, 2019/233/21:33, 2019/234/14:47  
,2019/234/18:08 and 2019/235/20:35

Executed standing CAR91 and to clear routine SBS and SXP errors

Executed the ISF noop proc as part of the AS ground station recertification testing 2019/235/22:15 UTC

ATS activities:

Routine calibration activities, and 2 consecutive orbits of manual mode TEP data collection

Other Activities:

PSO to provided method to randomize location; ISF updating the AIP generation tool to implement

ATLAS\_CCR\_006 Rx Alg Parameter update to V8 Parameter was approved to load to ATLAS. Load schedule dependent upon analysis of bias update - RxAlg team to give go ahead  
Completed review of MOC's LCA and CARA procedures  
Attended the PSO's ATL02/ATL03 summit

Near-term activities:

Continuing to work with ASET and PSO regarding the frequency and location of nominal instrument calibrations

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Notes/Issues:

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LTO Schedule:

- All items remain on schedule
- RSA maintenance agreements are being renewed

**SIPS:**

- The SIPS is operating nominally:
  - o Ingested and distributed Level 0 data to the ISF.
  - o Generated L1A and L1B products and distributed ATL02s to the ISF, POD, and SCF.
  - o Distributed selected ATL01s to the ISF and SCF by special request.
  - o Generated rapids ATL03 using ANC03/04/05 files from the CAMS.
  - o Distributed ATL03 (rapids) to the SCF.
- Received ASAS V5.2.1 patches for atlas\_l3a\_si and atlas\_l3a\_fb for inclusion in SIPS Build 4.2.
- Started Acceptance testing with SIPS Build 4.2.
- As requested by NSIDC, distributed one day of “Release 002” Test products from the SIPS AccTest baseline to NSIDC.
  - o To perform regression testing so that they can bound and scope the impact of the changes.
  - o To test its impact on data services (e.g. subsetting).

**ASAS:**

ASAS delivered the ASAS v5.2.1 patch that fixes small issues in sea\_ice and freeboard. The sea-ice bug was a small metadata issue reported by NSIDC. The freeboard bug was an orientation-sensitive issue that caused all ATL10s to fail when ICESat2 was in backward orientation.

ASAS has added Feb 1 – Feb 6 to its functional test datasets in order to improve test coverage for ICESat-2 in backward orientation.

ASAS attended the ATL02/ATL03 summit at KBR HQ. In discussion with the POD/PPD lead, we think there is a small error in the computation of the atmosphere delay correction that is applied to the ATL03 heights. The developer misunderstood a connection between the ATL03A and ATL03G ATBDs. The ATL03A ATBD was written based on processing data from the original ICESat. It had a final step that adjusted the total atmosphere path delay for off-nadir angle. The ATL03G ATBD has initial and final geolocation processes. The final geolocation process applies the computed atmosphere path delay to the ranges to re-adjust the computed heights. The ASAS developer thought that final geolocation process was inclusive of the final step in the ATL03A ATBD. This error was detected because POD/PPD was validating GEDI results using the software that ASAS developed. ASAS and POD/PPD are investigating the issue.

SIPS reported a failed ATL03 job that ASAS is investigating. The investigation turned up an obscure bug relating to the interpolation of the GEOS5-FPIT data that is provided in ANC39. The failure was an array overflow which stopped processing. For the ATL03s that are created, this

does not significantly affect the quality of the ANC39 data. ASAS has fixed this bug. However, when testing the fix, another error appeared relating to the ANC04 degrade\_flag. This issue is still under investigation.

Work on the atmosphere products is focused on ATL09 low-rate blowing snow and improvements to ATL16/17.

Work on the ocean product is focused on along-track distances.

Work is beginning on the sea\_ice and land\_ice L3B PGEs.

Inland water work is focused on detecting subsurface anomalies.

Several development tools used by ASAS (and other subsystems) were upgraded to the latest enterprise releases and are functioning much better than before.

#### **SCF:**

The SCF is operating nominally. Data for releases 001 and R001 are being ingested and distributed. Most operations were stopped Thursday to upgrade the server hosting the database. Normal operations resumed Friday morning and promptly caught up; subset distribution is ongoing. Additional downtime will be needed next week to complete the upgrade, but it is expected to be shorter. With new data products ATL16 and ATL17 expected in release 002, all SCF elements are looking into how to support these products as needed. A file listing the current SCF data holdings is attached.

\* Data Management -- Testing of the Python 3 code continues and is nearing the end. Once complete and any bugs found have been fixed and tested, we will look into preparing the operational server to run a release made in Python 3. The code to parse ISF activities reports was updated following discussions with ISF about updates to the structure of the contents of these reports.

\* Subsetter -- Testing of the Python 3 code is complete and confirmed successful. A new release will be made together the data management scripts when they are ready.

\* Visualizer -- Work continues on converting the code base to Python 3. Initial testing of apps built in Python 3 showed some unexpected but harmless warnings that will be blocked from user view in the future. The Python 3 code will no longer include built-in maps, but the SCF will supply some suitable background maps for users.

#### **ATL02/Instrument Science:**

Preliminary spectral analysis by Christopher Field of the TEP time-of-flight during a two-orbit continuous stare yielded a peak that may be at the orbital frequency. Further analysis is needed to confirm the frequency and determine the amplitude.

ATL02 work is focused on preparing the version of ATBD and “Known Issues” document to accompany Release 002.

In addition, work continues on:

- Re-analysis of TEP and MA/AT return times of flight during instrument thermal/vacuum testing, using the latest TOF computation methods
- A new method for analyzing the results of on-orbit AMCS calibrations. The current method does not separate return from background, and is usable only for AMCS calibrations done over the night side of the earth. The new method will allow AMCS calibrations to be done usefully over the day side as well.
- Analysis of the time variations of the TEP time of flight at longer-than-orbital time scales.
- Investigation of apparent change in Spot 3 TEP strength after the late June/early July safehold
- Estimation of OFM transmittance peak shift from 2-step VBG sweep data

#### **ISF ACTIVITIES MISSION WEEK 050:**

\* Not in science mode

^ Could affect science data quality

- \* 2019/234:01:32:45.0000 TEP data collection Duration 3 minutes
- \* 2019/234:02:00:00.0000 2 orbits of TEP calibration Duration 190 minutes
- \* 2019/234:09:29:20.0000 AMCS Cal over open ocean Duration 2 minutes
- 2019/234:11:01:04.0000 OCEANscan Duration 22 minutes
- \* 2019/234:12:38:02.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2019/234:15:45:11.0000 TEP data collection Duration 3 minutes
- \* 2019/234:17:15:38.0000 TEP data collection Duration 3 minutes
- \* 2019/234:18:49:56.0000 TEP data collection Duration 3 minutes
- \* 2019/234:20:24:13.0000 TEP data collection Duration 3 minutes
- \* 2019/234:21:58:31.0000 TEP data collection Duration 3 minutes
- 2019/234:22:48:09.0000 OCEANscan Duration 22 minutes
- \* 2019/234:23:32:48.0000 TEP data collection Duration 3 minutes
- \* 2019/235:01:07:05.0000 TEP data collection Duration 3 minutes
- \* 2019/235:02:41:23.0000 TEP data collection Duration 3 minutes
- \* 2019/235:03:01:00.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/235:04:34:23.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/235:09:03:48.0000 AMCS Cal over open ocean Duration 2 minutes
- 2019/235:10:35:25.0000 OCEANscan Duration 22 minutes

- \* 2019/235:12:12:23.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2019/235:16:49:59.0000 TEP data collection Duration 3 minutes
- \* 2019/235:18:24:17.0000 TEP data collection Duration 3 minutes
- \* 2019/235:19:58:34.0000 TEP data collection Duration 3 minutes
- \* 2019/235:21:32:52.0000 TEP data collection Duration 3 minutes
- 2019/235:22:22:30.0000 OCEANscan Duration 22 minutes
- \* 2019/235:23:07:09.0000 TEP data collection Duration 3 minutes
- \* 2019/236:00:41:26.0000 TEP data collection Duration 3 minutes
- \* 2019/236:02:15:43.0000 TEP data collection Duration 3 minutes
- \* 2019/236:02:35:20.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/236:03:50:01.0000 TEP data collection Duration 3 minutes
- \* 2019/236:04:09:38.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/236:08:40:04.0000 AMCS Cal over open ocean Duration 2 minutes
- 2019/236:10:09:46.0000 OCEANscan Duration 22 minutes
- \* 2019/236:11:46:44.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2019/236:16:24:20.0000 TEP data collection Duration 3 minutes
- \* 2019/236:17:58:37.0000 TEP data collection Duration 3 minutes
- \* 2019/236:19:32:55.0000 TEP data collection Duration 3 minutes
- \* 2019/236:21:07:12.0000 TEP data collection Duration 3 minutes
- 2019/236:21:56:51.0000 OCEANscan Duration 22 minutes
- \* 2019/236:22:41:30.0000 TEP data collection Duration 3 minutes
- 2019/236:23:00:00.0000 Laser window dump Duration 2 minutes
- \* 2019/237:00:15:47.0000 TEP data collection Duration 3 minutes
- \* 2019/237:03:24:21.0000 TEP data collection Duration 3 minutes
- \* 2019/237:03:43:58.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/237:08:28:48.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2019/237:09:46:47.0000 AMCS Cal over open ocean Duration 2 minutes
- 2019/237:11:18:24.0000 OCEANscan Duration 22 minutes
- \* 2019/237:15:58:40.0000 TEP data collection Duration 3 minutes
- \* 2019/237:17:32:58.0000 TEP data collection Duration 3 minutes
- \* 2019/237:19:07:15.0000 TEP data collection Duration 3 minutes
- \* 2019/237:20:41:33.0000 TEP data collection Duration 3 minutes
- \* 2019/237:22:15:50.0000 TEP data collection Duration 3 minutes
- 2019/237:23:05:29.0000 OCEANscan Duration 22 minutes
- \* 2019/237:23:50:07.0000 TEP data collection Duration 3 minutes
- \* 2019/238:01:24:25.0000 TEP data collection Duration 3 minutes
- \* 2019/238:02:58:42.0000 TEP data collection Duration 3 minutes
- \* 2019/238:03:18:19.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/238:09:21:00.0000 AMCS Cal over open ocean Duration 2 minutes
- 2019/238:10:52:44.0000 OCEANscan Duration 22 minutes
- \* 2019/238:12:29:42.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2019/238:15:35:55.0000 TEP data collection Duration 3 minutes
- \* 2019/238:17:07:18.0000 TEP data collection Duration 3 minutes
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- \* 2019/238:20:15:53.0000 TEP data collection Duration 3 minutes
- \* 2019/238:21:50:11.0000 TEP data collection Duration 3 minutes
- 2019/238:22:39:49.0000 OCEANscan Duration 22 minutes
- \* 2019/238:23:24:28.0000 TEP data collection Duration 3 minutes
- \* 2019/239:00:58:45.0000 TEP data collection Duration 3 minutes
- \* 2019/239:02:33:03.0000 TEP data collection Duration 3 minutes
- \* 2019/239:02:52:40.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/239:08:55:20.0000 AMCS Cal over open ocean Duration 2 minutes
- 2019/239:10:27:05.0000 OCEANscan Duration 22 minutes
- \* 2019/239:12:04:03.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2019/239:16:41:39.0000 TEP data collection Duration 3 minutes
- \* 2019/239:18:15:56.0000 TEP data collection Duration 3 minutes
- \* 2019/239:19:50:14.0000 TEP data collection Duration 3 minutes
- \* 2019/239:21:24:31.0000 TEP data collection Duration 3 minutes
- 2019/239:22:14:10.0000 OCEANscan Duration 22 minutes
- \* 2019/239:22:58:49.0000 TEP data collection Duration 3 minutes
- \* 2019/240:00:33:06.0000 TEP data collection Duration 3 minutes
- \* 2019/240:02:07:23.0000 TEP data collection Duration 3 minutes
- \* 2019/240:02:27:00.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2019/240:03:41:40.0000 TEP data collection Duration 3 minutes
- 2019/240:04:02:00.0000 Stellar window dump Duration 90 minutes
- \* 2019/240:08:30:01.0000 AMCS Cal over open ocean Duration 2 minutes
- 2019/240:10:01:25.0000 OCEANscan Duration 22 minutes
- \* 2019/240:11:38:23.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2019/240:16:15:59.0000 TEP data collection Duration 3 minutes
- \* 2019/240:17:50:17.0000 TEP data collection Duration 3 minutes
- \* 2019/240:19:24:34.0000 TEP data collection Duration 3 minutes
- \* 2019/240:20:58:52.0000 TEP data collection Duration 3 minutes
- 2019/240:21:48:30.0000 OCEANscan Duration 22 minutes
- \* 2019/240:22:33:09.0000 TEP data collection Duration 3 minutes