

**ICESat-2 PROJECT SCIENCE OFFICE REPORT**  
**Monday, June 29, 2020 thru Sunday, July 5, 2020**

RGTs spanned: 57 - 160  
Cycle 8

**SUMMARY:**

All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. Data from the ASAS 954a2 functional tests have been transferred to SCF and made available to the Science Team. These functional test data include ATLO2s with improved GPSR IMT precision, ATLO3s with the new free-to-mean tide values and the re-classification of saturated photons, and the derivative upper-level products. The upper level product PGEs were created using a snapshot of the latest development code. **ATBD Leads: please contact your developer to determine what changes were captured in the upper level product PGEs.**

Over the July 4 weekend, ICESat-2 had an planning anomaly (due to human error) that disrupted a planned spacecraft maneuver to avoid possible conjunction with a Russian rocket body. Despite the missed maneuver, we fortunately did not collide with the rocket and all remains nominal with ICESat-2.

**NSIDC ICESat-2 Metrics through June 30:** 2,097 total users of 10 available data products; 6,047,740 sciences files downloaded. ATLO3 is in the lead with 895 unique users of 773,049 files downloaded. ATLO8 is in a close second with 844 unique users and an astounding 2,952,189 files downloaded, and ATLO6 is in third place with 580 unique users and 1,890,436 files downloaded. *ATLO3, ATLO8, and ATLO6 rank #1, #2, & #4, respectively, in terms of number of users of NSIDC DAAC data for 2020!!*

**\*\*ELEMENT DETAILS BELOW\*\***

**CAMS/POD:**

**CAMS:** Regular CAMS operations: constraint and conjunction monitoring for MW094 and MW095 and mission planning for MW096.

CAMS recommended laser arm for 42013 (FLOCK 3P 53) 183/18:15:30 – 183/18:53:40 (MW094)

CAMS recommends laser arm for 25544 (ISS) 186/21:55:18 - 186/21:55:28 (MW095).

CAMS recommends laser arm for 12155 (SL-3 R/B) 186/15:12:00 - 186/15:12:10 (MW095).

CAMS experienced hardware failure between 8-9:30am Saturday 6/27/2020. CAMS switched to the warm spare server and was back to processing by 11:30a, for a 2-3:5hour downtime. The impact of the server switchover was a minor delay in mission monitoring screening for the day.

**POD:** Regular POD operations continue. Intermediate POD was completed for GPS week 2111. Final POD was completed for GPS week 2109.

**ISF:**

All ATLAS housekeeping data is nominal

Laser 2 is firing at energy level 4 and in science mode

WTEM Peak to Edge Ratio: 1.188

Laser 2 Temperature Error: -0.26C

SADA in AIRPLANE Mode  
Spacecraft orientation: - X

Mission Planning:  
MW95 ATS is loaded to the spacecraft and currently operating (PSO Activity List is attached)

MW96 AIP has been delivered, nominal calibrations

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Activities during the past week:

Real-time activities:

**VBG Temperature updated to 62.90 to optimize the laser wavelength: 2020/184/19:48**  
sCAR91 executed to clear flags on the same contact

ATS activities:

MW\_94 (completed):

Update since last report: Updated PSO list attached

**split ATS: LCA51 to mitigate HIE with 42013 (Laser to ARM 2020/183 18:15:20)**

**Updated monthly TEP stare start time to (2020/183 18:24:00)**

MW\_95 (currently loaded and executing):

Routine Instrument calibrations, Ocean scans and Vegetation Data collection, modified RTW

**split ATS: LCA51 to mitigate HIE with 42013 (Laser to ARM 2020/183 18:15:20)**

**Updated monthly TEP stare start time to (2020/183 18:24:00)**

RMM02 - on 2020/185 (July 3, 2020) to avoid physical conjunction with 12155 on July 4 (Burn did not execute but conjunction time passed uneventfully; see note 1)

IA007a on 2020/187 (July 5, 2020)

DMU054a on 2020/188 (July 6, 2020)

Other Past Activities:

Near-term upcoming activities:

DMU055a on 2020/188 (July 13, 2020)

Tech HW refresh:

Starting procurement for ISF Tech Refresh Phase 2 to complete during FY20

Facility:

RSA Token re-order - notified tokens delivered to GSFC

RSA licenses renewed

Notes/Issues:

**1. Post RMM02 data indicated the slews occurred but not the burn; analysis showed a Veg track activity executed during the burn; root cause analysis found the MTL used to build the SAT did not include the RMM02 and none of the SAT or subsequent reviews caught that or the offending Veg Track.**

2. ISF to review and comment on latest draft of ESMO CM Process Document

LTO Schedule:

All items remain on schedule. Draft dates for Tech Refresh provided to ESMO scheduler.

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#### SIPS:

- The SIPS is operating nominally:
  - Ingested and distributed Level 0 data to the ISF.
  - Generated L1A and L1B products and distributed ATL02s to the ISF, POD, and SCF.
  - Distributed selected ATL01s to the ISF and SCF by special request.
  - Generated rapids ATL03, ATL04, ATL06, ATL07, ATL08, ATL09, and ATL10 using ANC03/04/05 files from the CAMS.
  - Distributed the ATL01 and ATL02 Data products to NSIDC.
  - Distributed the rapid Science Data products to the SCF.
- There was a delay in getting the rapid ANC03/04/05 files during the weekend due to a hardware failure on the CAMS' primary server. All rapid data processing was caught up by Monday afternoon. SIPS redelivered some ATL02s to the ISF as one of their disks became full due to the backlog with CAMS.
- Reprocessed Rel 003 ATL09s from April 22 – May 4, 2020 due to updated snow maps files (ANC30) at NOAA.
- Reprocessed and distributed Release 003 ATL08s for this period to NSIDC. Also reprocessed any impacted L3A products.
- Distributed Release 003 ATL06s from Apr 5 through May 13, 2020 to NSIDC.

#### ASAS:

Data from the 954a2 functional tests have been transferred to SCF and made available to the Science Team. These functional test data include ATL02s with improved GPSR IMT precision, ATL03s with the new free-to-mean tide values and the re-classification of saturated photons, and the derivative upper-level products. The upper level product PGEs were created using a snapshot of the latest development code. Please contact your developer to determine what changes were captured in the upper level product PGEs.

PSO has requested two additional days of functional test data (July 26 2019 and August 8 2019) for the evaluation of saturation within melt ponds. These data will be transferred to SCF upon completion.

For the ATL02 GPSR IMT fix, ASAS has requested ATL01s for 11/11/2018 05:00-09:00:00. These data will be processed into ATL02s and delivered to POD for evaluation.

ASAS has requested 3 months of ATL10s be transferred to ASAS-PG for the purposes of testing the ATL20 PGE. After ingest and processing, the ATL20s will be provided to the Sea Ice team and NSIDC for evaluation.

For atmosphere, the L2A surface signal algorithm results from functional testing are under evaluation, as well as the L3A low-rate blowing snow. Development is in underway on code to read the new ANC45 input file.

An issue discovered in production ATL09s was traced to bad ANC30 (snow/ice coverage) files retrieved from NOAA. The curator of those data has been contacted and is working the issue. ASAS will mitigate

this issue in the future by (1) developing code to perform QA upon ingest of the ANC30s and (2) updating the PGE to replace bad values with defaults based on the ATL03 surface type flag.

The L3B atmosphere work continues on template and grid size changes.

The ATL11 team is working improvements to the QA utility and exception handling. PSO is working with ASAS and the ATL11 team to define the roles, responsibilities and processes required for formal ATL11 production and delivery.

The software for interpolating roll/pitch/yaw for ATL03 is in development. ASAS has created the tiled/indexed MERIT DEM and has written an interface to retrieve interpolated heights. The required code modifications have been completed that will allow MERIT to replace GMTED (on a test basis) in the next Functional Test run.

Several Land/Veg changes have been approved by the ASAS CCB and will be included in the next functional test.

The refactored Land Ice code is in the late testing phase. Unit tests have been written , successfully executed and documented for all major science algorithms. With PSO/ATBD Lead approval, the next ASAS Functional Test will include ATL06s produced by the refactored PGE.

ATL20 development is wrapping up and ASAS is preparing to deliver example data to the Sea Ice team and NSIDC. Development on ATL21 should begin shortly.

For inland water, testing continues on spectral analysis. The developer has completed work on the tide-free/mean-tide changes and is working on surface slope. A product template for the ATL22 L3B inland water product has been delivered to the ATBD lead for review.

Ocean development is focused on ignoring ATL03 inputs when the podppd\_flag indicates degraded solutions.

**SCF:**

The SCF is operating nominally. Data for releases 003 and R003 are being ingested and distributed. Subsetting subscriptions are still being processed, but full granule subscriptions have caught up. All of the release 954a2 test data have been copied by ASAS to the SCF and are now available for users to evaluate. A file listing the current SCF data holdings is attached.

\* Data Management -- A modification to the code that extracts browse images from the browse HDF5 files has been made to allow skipping ANC products. This has been tested successfully, and we expect to make the update in operations next week. Work continues on ATL10 trending; the updated code appears to be working correctly, but we are testing to confirm this.

\* Subsetter -- The file that failed last week due to temporary database connection issues was rerun successfully. Everything proceeded normally this week.

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

Analysis was initiated to determine the characteristics of returns from Starlink spacecraft if they intersect the ATLAS beams during their ascent maneuvers, and assess the hazard, if any, to ATLAS.

In addition, work continues on:

- Investigating and modeling the properties of saturated returns.
- Evaluating the latest analysis of ATLAS range bias.
- Writing up the results of the study of variation of range bias on orbital and seasonal time scales.
- Re-examining the temperature dependence of the ATLAS transmitted beam divergence.
- Investigating and explaining “interesting” behavior revealed by the expanded ATLAS QA screening process.
- Improving the process for calibrating transmitter-receiver alignment.

### **ATL03:**

Identifying high-priority items in the works for release 004 continues, including a new DEM for land surface type (MERIT), signal confidence modification for saturated conditions, implementation of the free-to-mean tide conversion equations for EGM2008 and solid earth (crustal) tides, roll/pitch/yaw being provided at the geolocation segment rate, and modifications for geophysical corrections to be tide-free. Continuing to explore long-term data including radiometry performance over ice sheets, beam incidence angles, and saturation fractions.

## **ISF ACTIVITIES MISSION WEEK 095**

- \* 2020/184:06:01:21.0000 AMCS Cal over open ocean Duration 2 minutes
- 2020/184:07:32:56.0000 OCEANscan Duration 22 minutes
- \* 2020/184:09:09:55.0000 AMCS Cal over open ocean Duration 2 minutes
- \* 2020/184:10:41:24.0000 TEP data collection Grid 395 Duration 3 minutes
- \* 2020/184:12:13:04.0000 TEP data collection Grid 429 Duration 3 minutes
- \* 2020/184:12:41:41.0000 TEP data collection Grid 32 Duration 3 minutes
- \* 2020/184:13:55:12.0000 TEP data collection Grid 318 Duration 3 minutes
- 2020/184:14:25:06.0000 TOO TOOid 1536 RGT 110 offpoint 4.52deg Duration 2 minutes
- \* 2020/184:15:42:31.0000 TEP data collection Grid 135 Duration 3 minutes
- \* 2020/184:16:55:56.0000 TEP data collection Grid 422 Duration 3 minutes
- \* 2020/184:17:03:47.0000 TEP data collection Grid 313 Duration 3 minutes
- \* 2020/184:17:14:12.0000 TEP data collection Grid 169 Duration 3 minutes
- \* 2020/184:17:25:15.0000 TEP data collection Grid 24 Duration 3 minutes
- 2020/184:18:20:48.0000 TOO TOOid 1543 RGT 113 offpoint 4.63deg Duration 2 minutes
- \* 2020/184:18:53:43.0000 TEP data collection Grid 94 Duration 3 minutes
- 2020/184:19:20:11.0000 OCEANscan Duration 22 minutes
- 2020/184:19:48:50.1770 Updated VBG setpoint to 62.90 degrees Duration 1 minutes

\* 2020/184:23:26:09.0000 TEP data collection Grid 232 Duration 3 minutes  
\* 2020/185:00:54:07.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/185:01:10:52.0000 TEP data collection Grid 85 Duration 3 minutes  
\* 2020/185:02:34:43.0000 TEP data collection Grid 227 Duration 3 minutes  
\* 2020/185:04:03:48.0000 TEP data collection Grid 297 Duration 3 minutes  
\* 2020/185:05:39:26.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/185:07:07:16.0000 OCEANscan Duration 22 minutes  
\* 2020/185:08:44:16.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/185:10:08:04.0000 Segmented RTWscan Part 1 Duration 37 minutes  
2020/185:10:57:18.0000 Segmented RTWscan Part 2 Duration 35 minutes  
2020/185:11:37:46.0000 Segmented RTWscan Part 3 Duration 14 minutes  
\* 2020/185:13:24:19.0000 TEP data collection Grid 391 Duration 3 minutes  
2020/185:16:45:00.0000 Stellar window dump Duration 90 minutes  
\* 2020/185:18:30:41.0000 TEP data collection Grid 59 Duration 3 minutes  
2020/185:18:54:31.0000 OCEANscan Duration 22 minutes  
2020/185:20:16:34.0000 TOO TOOid 1537 RGT 129 offpoint 4.52deg Duration 2 minutes  
^ 2020/185:21:46:08.0000 RMM02 CARA conjunction with 12155 Duration 54 minutes  
\* 2020/186:00:28:27.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/186:03:20:54.0000 TOO TOOid 1545 RGT 134 offpoint 4.62deg Duration 2 minutes  
\* 2020/186:05:28:09.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/186:06:44:19.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/186:08:15:54.0000 OCEANscan Duration 22 minutes  
2020/186:08:50:53.0000 TOO TOOid 1538 RGT 137 offpoint 4.52deg Duration 2 minutes  
2020/186:20:03:08.0000 OCEANscan Duration 22 minutes  
\* 2020/187:00:02:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/187:01:20:53.0000 TOO TOOid 1546 RGT 148 offpoint 4.65deg Duration 2 minutes  
\* 2020/187:06:18:39.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/187:07:50:13.0000 OCEANscan Duration 22 minutes  
\* 2020/187:09:27:13.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/187:11:33:46.0000 TOO TOOid 1539 RGT 154 offpoint 4.52deg Duration 2 minutes  
\* 2020/187:12:48:36.0000 TEP data collection Grid 175 Duration 3 minutes  
\* 2020/187:12:53:50.0000 TEP data collection Grid 103 Duration 3 minutes  
^ 2020/187:14:22:39.0000 IA007 Duration 75 minutes  
\* 2020/187:16:01:31.0000 TEP data collection Grid 99 Duration 3 minutes  
\* 2020/187:17:28:52.0000 TEP data collection Grid 204 Duration 3 minutes  
\* 2020/187:18:53:18.0000 TEP data collection Grid 346 Duration 3 minutes  
2020/187:19:37:27.0000 OCEANscan Duration 22 minutes  
\* 2020/187:20:45:16.0000 TEP data collection Grid 91 Duration 3 minutes  
\* 2020/187:22:06:31.0000 TEP data collection Grid 270 Duration 3 minutes  
\* 2020/187:23:37:08.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/187:23:53:51.0000 TEP data collection Grid 87 Duration 3 minutes  
\* 2020/188:01:12:29.0000 TEP data collection Grid 301 Duration 3 minutes  
\* 2020/188:02:38:56.0000 TEP data collection Grid 407 Duration 3 minutes  
\* 2020/188:04:23:41.0000 TEP data collection Grid 260 Duration 3 minutes  
\* 2020/188:06:03:02.0000 TEP data collection Grid 186 Duration 3 minutes  
2020/188:07:24:32.0000 OCEANscan Duration 22 minutes

2020/188:08:46:40.0000 TOO TOOid 1547 RGT 168 offpoint 4.75deg Duration 2 minutes  
\* 2020/188:09:01:34.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/188:09:22:12.0000 TEP data collection Grid 72 Duration 3 minutes  
\* 2020/188:14:00:46.0000 TEP data collection Grid 137 Duration 3 minutes  
2020/188:16:23:11.0000 TOO TOOid 1550 RGT 173 offpoint 3.74deg Duration 2 minutes  
^ 2020/188:17:13:52.0000 DMU054a Duration 75 minutes  
\* 2020/188:18:34:52.0000 TEP data collection Grid 239 Duration 3 minutes  
2020/188:19:11:47.0000 OCEANscan Duration 22 minutes  
\* 2020/188:21:43:27.0000 TEP data collection Grid 234 Duration 3 minutes  
\* 2020/188:21:55:38.0000 TEP data collection Grid 54 Duration 3 minutes  
\* 2020/189:00:46:13.0000 TEP data collection Grid 302 Duration 3 minutes  
\* 2020/189:02:12:50.0000 TEP data collection Grid 408 Duration 3 minutes  
2020/189:03:38:09.0000 TOO TOOid 1548 RGT 180 offpoint 4.70deg Duration 2 minutes  
\* 2020/189:04:00:36.0000 TEP data collection Grid 225 Duration 3 minutes  
2020/189:05:59:35.0000 TOO TOOid 1541 RGT 181 offpoint 4.58deg Duration 2 minutes  
2020/189:06:58:52.0000 OCEANscan Duration 22 minutes  
\* 2020/189:08:35:54.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/189:09:59:40.0000 Segmented RTWscan Part 1 Duration 37 minutes  
2020/189:10:48:52.0000 Segmented RTWscan Part 2 Duration 35 minutes  
2020/189:11:29:13.0000 Segmented RTWscan Part 3 Duration 14 minutes  
\* 2020/189:16:32:19.0000 TEP data collection Grid 278 Duration 3 minutes  
\* 2020/189:17:56:09.0000 TEP data collection Grid 420 Duration 3 minutes  
2020/189:18:46:07.0000 OCEANscan Duration 22 minutes  
\* 2020/189:19:48:42.0000 TEP data collection Grid 165 Duration 3 minutes  
\* 2020/190:00:20:06.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/190:02:45:00.0000 Laser window dump Duration 2 minutes  
\* 2020/190:03:26:04.0000 TEP data collection Grid 334 Duration 3 minutes  
\* 2020/190:05:18:01.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/190:06:35:58.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/190:06:48:44.0000 TEP data collection Grid 148 Duration 3 minutes  
2020/190:08:07:29.0000 OCEANscan Duration 22 minutes  
\* 2020/190:10:05:09.0000 TEP data collection Grid 71 Duration 3 minutes  
2020/190:11:25:18.0000 TOO TOOid 1551 RGT 200 offpoint 1.42deg Duration 2 minutes  
2020/190:11:51:02.0000 TOO TOOid 1542 RGT 200 offpoint 4.63deg Duration 2 minutes  
\* 2020/190:15:56:12.0000 TEP data collection Grid 423 Duration 3 minutes  
2020/190:19:54:44.0000 OCEANscan Duration 22 minutes  
\* 2020/190:21:05:11.0000 TEP data collection Grid 55 Duration 3 minutes  
2020/190:23:38:13.0000 TOO TOOid 1549 RGT 208 offpoint 4.75deg Duration 2 minutes  
\* 2020/190:23:54:27.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes