

ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, June 22, 2020 thru Sunday, June 28, 2020

RGTs spanned: 1336-0056
Cycle 7 into Cycle 8

SUMMARY:

All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. ASAS is working an issue where bad input ANC30s (NOAA Snow/Ice Cover) are causing issues with ATL09. Newer files have been posted to the source site, but SIPS does not currently detect the replacements. Since replacement ANC30s will cause full-reprocessing for everything depending on ATL09, we are working on a more permanent solution. For now, SIPS is retrieving the updated files and reprocessing as required. This issue impacts final data products from 4/22/2020 through 5/4/2020.

Operations continued nominally, in our fifteenth (yikes!) week of telework, with no major disruptions.

****ELEMENT DETAILS BELOW****

CAMS/POD:

CAMS: Regular CAMS operations: constraint and conjunction monitoring for MW093 and MW094 and mission planning for MW095.

CAMS recommended laser arm for 41952 (FLOCK 3P 37) 177/18:31:09 - 177/18:31:19 (MW094)

CAMS recommended laser arm for 41961 (FLOCK 3P 26) 178/04:45:42 - 178/04:45:52(MW094)

POD: Regular POD operations continue. Intermediate POD was completed for GPS week 2110. Final POD was completed for GPS week 2108.

ISF:

All ATLAS housekeeping data is nominal
Laser 2 is firing at energy level 4 and in science mode
WTEM Peak to Edge Ratio: 1.174
Laser 2 Temperature Error: -0.33C
SADA in AIRPLANE Mode
Spacecraft orientation: - X

Mission Planning:

MW94 ATS is loaded to the spacecraft and currently operating (PSO Activity List is attached)

MW95 AIP has been delivered, nominal calibrations

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**Activities during the past week:**

**Real-time activities:**

No realtime commanding was performed due to GSFC Stage 4 status

**ATS activities:**

MW\_93 (completed): No updates since last report

MW\_94:

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

**Includes monthly TEP stare (2020/183 18:14:00)**

DMU053a (2020/177 15:38:57)

**mini-ATS: LCA49 to mitigate HIE with 41953 (Laser to ARM 2020/177 18:30:59)**

**mini-ATS: LCA50 to mitigate HIE with 41961 (Laser to ARM 2020/178 04:45:32)**

Other Past Activities:

Q2 scanning complete - No high findings; couple mediums for CAMS machines that are being resolved.

Near-term upcoming activities:

IA007a on 2020/187 (July 5, 2020)

DMU054a on 2020/188 (July 6, 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:

**~ ITOS for RT T&C unexpectedly stopped running over-night of 6/24/2020; this caused the AOS script to hang; issue resolved via telework (DRs:ISF-625, ISF-626); did not have to go on-site**

~ 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.

#### **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 rapid 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.
- Distributed Release 003 ATL03 and ATL08 for April 5 - May 13, 2020 to NSIDC.
- Distributed Release 003 ATL07 from November 16, 2019 through April 4, 2020 to NSIDC.

#### **ASAS:**

ASAS and SCF are targeting next week for the distribution of the 952a2 products to SCF.

For atmosphere, ASAS is working an issue where bad input ANC30s (NOAA Snow/Ice Cover) are causing issues with ATL09. Newer files have been posted to the source site, but SIPS does not currently detect the replacements. Since replacement ANC30s will cause full-reprocessing for everything depending on ATL09, we are working on a more permanent solution. For now, SIPS is retrieving the updated files and reprocessing as required. Work on ATL09 blowing snow and cloud/aerosol discrimination is ongoing.

The L3B atmosphere work is focused on template and grid size changes.

Interpolation of roll/pitch/yaw (from updated ANC04s) is in work for L2A\_ALT.

The ATL11 team is working more testing within the ADAPT cluster. Complete ATL11 runs for the Arctic, up to Cycle 7, have been completed. Processing for Antarctica is underway. Error checking and exception handling is being improved.

The software for interpolating roll/pitch/yaw for ATL03 is in development. New ANC04s that include the roll/pitch/yaw datasets have been used within SIPS without any discernable negative impact.

The Land/Veg developer evaluating ATL08s from 954a2 functional testing and examining effects of an increase to the KDTree radius size. ASAS received an updated ATBD from the ATBD Lead.

Unit tests have been developed for the land ice refactor. Unit Test Reports are in work. Additional software was developed to help test ATL06. One program (Fortran) compares two ATL06s and reports differences. This software matches segment\_ids and respects invalid values. Another (Python), overplots like datasets from two ATL06s (or any product, for that matter). Both are proving useful in comparing ATL06s created from the refactored code with the Release 003 ATL06s.

Work is nearing completion on structural changes to ATL20, based on NSIDC provided suggestions, that would make ATL20 more standards-compliant and significantly more usable with earth science-related tools. These changes include a reorganization of the dimension scales and the addition of start and end delta\_time values, as well as the addition of metadata that describe the coordinate reference systems. An updated ATL02 has been sent to NSIDC and ASAS is awaiting results of their evaluation.

For inland water, L3A work is underway regarding the calculation of surface slope error. For the ATL22 L3B inland water product, the developer is writing code to read ATL13 and fill the ATL22 grid indices.

For ocean, the L3A product work is focused on the layer flag. For ATL19, the developer is working on code to fill the ATL19 grids.

NSIDC has requested that projection information be added to the L3B products. ASAS is investigating the standards-compliant methods that can be used to add this information. Preliminary analysis indicates the best path is to add EPSG codes (which uniquely identify standard projections) to the product metadata.

### **SCF:**

The SCF is operating nominally. Data for releases 003 and R003 are being ingested and distributed. Full granule subscriptions are caught up, and subsetting subscriptions are still being processed. Release 954a2 test data for ATL04 and ATL09 have been ingested using the ASAS Playground release process. We are discussing how best to get the rest of the 954a2 test data, since disk space constraints

prevent another Playground release from being used. A file listing the current SCF data holdings is attached.

\* Data Management -- A problem with hold requests not being moved after they were processed turned up again, resulting in them being run multiple times. Fortunately, this did not seem to cause any major problems. A deeper look into the code revealed the cause, and a fix was developed that worked as expected in testing. The code was updated in operations, which should resolve the issue.

\* Subsetter -- One file failed subsetting due to a temporary problem connecting to the database (not a Subsetter issue). The problem resolved itself, and the database has been updated to allow subsetting to rerun on the file. It will be processed automatically when it comes up in the queue.

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

Longer-term analysis of ATLAS beam incidence angles indicates that they have been closer to nominal, and out of the recommended “keep-out” radius around nadir, since improved pointing calibration came into use in the Fall of 2019. There still appears to be a bias, with the weak beams closer to nadir. The investigation continues.

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, 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 094:**

2020/177:00:54:36.0000 TOO TOOid 1529 RGT 1382 offpoint 4.71deg Duration 2 minute

\* 2020/177:02:51:24.0000 TEP data collection Grid 227 Duration 3 minutes

\* 2020/177:04:12:38.0000 TEP data collection Grid 405 Duration 3 minutes

\* 2020/177:04:28:17.0000 TEP data collection Grid 189 Duration 3 minutes

\* 2020/177:06:00:01.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/177:07:23:57.0000 OCEANscan Duration 22 minutes  
2020/177:07:58:56.0000 TOO TOOid 1522 RGT 1386 offpoint 4.51deg Duration 2 minute  
\* 2020/177:09:00:56.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/177:10:24:45.0000 Segmented RTWscan Part Duration 37 minutes  
2020/177:11:14:01.0000 Segmented RTWscan Part Duration 34 minutes  
2020/177:11:54:41.0000 Segmented RTWscan Part Duration 13 minutes  
\* 2020/177:13:55:07.0000 TEP data collection Grid 210 Duration 3 minutes  
\* 2020/177:15:28:19.0000 TEP data collection Grid 208 Duration 3 minutes  
^ 2020/177:15:38:57.0000 DMU053a Duration 73 minutes  
^ 2020/177:18:30:59.0000 Put laser in ARM mode for LCA49 41953 (FLOCK 3P 37) 25-Jun-2020 18:31:14  
Duration 1 minute  
\* 2020/177:19:58:08.0000 TEP data collection Grid 382 Duration 3 minutes  
2020/177:20:45:29.0000 OCEANscan Duration 22 minutes  
\* 2020/177:23:17:19.0000 TEP data collection Grid 232 Duration 3 minutes  
\* 2020/177:23:22:22.0000 TEP data collection Grid 160 Duration 3 minutes  
\* 2020/177:23:32:51.0000 TEP data collection Grid 16 Duration 3 minutes  
\* 2020/178:00:45:08.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/178:02:28:20.0000 TEP data collection Grid 192 Duration 3 minutes  
\* 2020/178:04:05:14.0000 TEP data collection Grid 153 Duration 3 minutes  
^ 2020/178:04:45:32.0000 Put laser in ARM mode for LCA50 41961 (FLOCK 3P 26) 26-Jun-2020 04:45:47  
Duration 1 minute  
\* 2020/178:07:00:59.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/178:08:32:35.0000 OCEANscan Duration 22 minutes  
\* 2020/178:10:19:47.0000 TEP data collection Grid 216 Duration 3 minutes  
2020/178:10:41:51.0000 TOO TOOid 1523 RGT 16 offpoint 4.54deg Duration 2 minute  
2020/178:13:03:19.0000 TOO TOOid 1530 RGT 18 offpoint 4.66deg Duration 2 minute  
2020/178:13:45:00.0000 Laser window dump Duration 2 minutes  
2020/178:20:19:50.0000 OCEANscan Duration 22 minutes  
\* 2020/179:00:19:28.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/179:00:25:48.0000 TEP data collection Grid 231 Duration 3 minutes  
\* 2020/179:01:53:46.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/179:03:36:59.0000 TEP data collection Grid 190 Duration 3 minutes  
2020/179:03:59:02.0000 TOO TOOid 1524 RGT 27 offpoint 4.47deg Duration 2 minute  
2020/179:05:01:08.0000 TOO TOOid 1515 RGT 28 offpoint 2.02deg Duration 2 minute  
\* 2020/179:06:35:20.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/179:08:06:55.0000 OCEANscan Duration 22 minutes  
2020/179:09:29:04.0000 TOO TOOid 1531 RGT 31 offpoint 4.66deg Duration 2 minute  
\* 2020/179:09:43:54.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/179:11:40:00.0000 Stellar window dump Duration 90 minutes  
\* 2020/179:14:23:58.0000 TEP data collection Grid 390 Duration 3 minutes  
\* 2020/179:14:47:28.0000 TEP data collection Grid 65 Duration 3 minutes  
2020/179:19:54:10.0000 OCEANscan Duration 22 minutes  
\* 2020/179:23:55:12.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/180:00:13:12.0000 TEP data collection Grid 51 Duration 3 minutes  
\* 2020/180:01:20:31.0000 TEP data collection Grid 410 Duration 3 minutes  
\* 2020/180:01:28:07.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/180:05:54:49.0000 TOO TOOid 1532 RGT 44 offpoint 4.63deg Duration 2 minute

\* 2020/180:06:09:40.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/180:07:41:16.0000 OCEANscan Duration 22 minutes

\* 2020/180:09:18:15.0000 AMCS Cal over open ocean Duration 2 minutes

\* 2020/180:10:49:43.0000 TEP data collection Grid 395 Duration 3 minutes

\* 2020/180:10:54:57.0000 TEP data collection Grid 323 Duration 3 minutes

\* 2020/180:11:04:49.0000 TEP data collection Grid 179 Duration 3 minutes

\* 2020/180:12:24:01.0000 TEP data collection Grid 393 Duration 3 minutes

\* 2020/180:12:29:14.0000 TEP data collection Grid 321 Duration 3 minutes

\* 2020/180:19:02:30.0000 TEP data collection Grid 94 Duration 3 minutes  
2020/180:19:16:16.0000 TOO TOOid 1525 RGT 52 offpoint 4.52deg Duration 2 minute  
2020/180:19:28:31.0000 OCEANscan Duration 22 minutes

\* 2020/180:20:12:51.0000 TEP data collection Grid 417 Duration 3 minutes

\* 2020/180:23:21:26.0000 TEP data collection Grid 412 Duration 3 minutes

\* 2020/181:01:02:27.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes

\* 2020/181:02:30:00.0000 TEP data collection Grid 408 Duration 3 minutes

\* 2020/181:04:06:55.0000 TEP data collection Grid 369 Duration 3 minutes  
2020/181:05:29:10.0000 TOO TOOid 1533 RGT 59 offpoint 4.63deg Duration 2 minute

\* 2020/181:05:49:42.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/181:07:15:37.0000 OCEANscan Duration 22 minutes

\* 2020/181:08:52:36.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/181:10:16:25.0000 Segmented RTWscan Part Duration 37 minutes  
2020/181:11:05:39.0000 Segmented RTWscan Part Duration 35 minutes  
2020/181:11:46:15.0000 Segmented RTWscan Part Duration 13 minutes

\* 2020/181:19:47:11.0000 TEP data collection Grid 418 Duration 3 minutes  
2020/181:20:37:09.0000 OCEANscan Duration 22 minutes  
2020/181:21:59:13.0000 TOO TOOid 1526 RGT 69 offpoint 4.52deg Duration 2 minute

\* 2020/182:00:31:42.0000 TEP data collection Grid 375 Duration 3 minutes

\* 2020/182:00:36:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes

\* 2020/182:03:59:31.0000 TEP data collection Grid 117 Duration 3 minutes

\* 2020/182:05:31:12.0000 TEP data collection Grid 151 Duration 3 minutes

\* 2020/182:05:37:22.0000 AMCS Cal over open ocean Duration 2 minutes

\* 2020/182:06:52:39.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/182:08:24:14.0000 OCEANscan Duration 22 minutes

\* 2020/182:09:58:25.0000 TEP data collection Grid 396 Duration 3 minutes

\* 2020/182:10:03:38.0000 TEP data collection Grid 324 Duration 3 minutes  
2020/182:13:42:06.0000 TOO TOOid 1527 RGT 79 offpoint 4.51deg Duration 2 minute  
2020/182:14:29:14.0000 TOO TOOid 1534 RGT 80 offpoint 4.65deg Duration 2 minute

\* 2020/182:17:49:03.0000 TEP data collection Grid 385 Duration 3 minutes  
2020/182:20:11:29.0000 OCEANscan Duration 22 minutes

\* 2020/183:00:11:08.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes

\* 2020/183:01:44:35.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes

\* 2020/183:05:10:45.0000 TEP data collection Grid 79 Duration 3 minutes

\* 2020/183:06:26:59.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/183:07:58:35.0000 OCEANscan Duration 22 minutes

\* 2020/183:09:35:34.0000 AMCS Cal over open ocean Duration 2 minutes

\* 2020/183:09:53:37.0000 TEP data collection Grid 108 Duration 3 minutes  
2020/183:10:55:01.0000 TOO TOOid 1535 RGT 93 offpoint 4.67deg Duration 2 minute  
2020/183:13:16:27.0000 TOO TOOid 1528 RGT 94 offpoint 4.51deg Duration 2 minute

- \* 2020/183:18:14:00.0000 TEP Stare 2 orbits of TEP calibration Duration 192 minutes
- \* 2020/183:23:45:29.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2020/183:23:57:00.0000 TEP data collection Grid 159 Duration 3 minutes