

**ICESat-2 PROJECT SCIENCE OFFICE REPORT**  
**Monday, November 2, 2020 thru Sunday, November 8, 2020**

RGTs spanned: 594 - 699  
Cycle 9

**SUMMARY:**

All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. SIPS received final calibrated ANC products for September 08 – September 30, 2020; they produced Release 003 L2A and L3A products which were distributed to the SCF. SIPS also started integration testing of SIPS Build 6.0. This build will consist of ASAS V5.4 and will be used to produce Release 004 Science data products.

*A post-launch calibration/validation update:* all of ATL03 release 003 (through 30 Sept 2020) has been validated relative to 88S GPS data; ATL03 is accurate to better than 5.5 cm with better than 13.3 cm of 1-sigma standard deviation (surface measurement precision).

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

**CAMS/POD:**

**CAMS:** Regular CAMS operations: constraint and conjunction monitoring for MW112 and MW113 and mission planning for MW114.

CAMS recommended laser arm for 36985 (TIANHUI1) 310/20:14:43 – 310/20:14:53 (MW113). Event self-mitigated.

CAMS recommended laser arm for 25544 (ISS) 311/18:54:25 – 311/18:54:35 (MW113).

CAMS continues working with the project on ARB09.

**POD:** Regular POD operations continue. Intermediate POD was completed for GPS week 2129. Final POD was completed for GPS week 2127.

Final calibrated ANC products for DoY 252-274 were delivered to SIPS.

**ISF:**

All ATLAS housekeeping data is nominal

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

WTEM Peak to Edge Ratio: 1.215

Laser 2 Temperature Error: -0.26C

SADA in SAILBOAT Mode

Spacecraft orientation: - X

Mission Planning:

MW113 ATS is loaded to the spacecraft and currently operating

MW114 AIP has been delivered, nominal calibrations including monthly TEP stare and Receiver algorithm V10 test; CAMS has delivered preliminary products.

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Activities during the past week:

Real-time activities:

monitoring via telework

ATS activities:

MW\_112 (completed nominally - PSO Activity list attached)

MW\_113 (currently active):

Routine Instrument calibrations, TOOs, Ocean scans and Vegetation Data collection, Segmented RTW scans

Other Activities:

PDB E.0.2 Update

TBS - install and testing on playback ISF server (itos2)

Near-term upcoming activities:

Update the BSM XY Offsets post-DMU63a based on results of AMCS calibrations

Update the USO frequency derivative in ANC27 based on performance trends

Update the SHG temperature setpoint to optimize the laser energy

Testing of receiver algorithm parameter updates

**FLATLAS testing completed on November 4**

**Files uplinked on November 9 with test to be activated during MW\_114 (CAR614)**

Facility:

**Updating ITOS servers to RedHat 7.0 due to EOL of 6.0 at the end of November**

**Install on the primary server (itos1) - scheduled for 11/12**

Tech HW refresh:

ISF Tech Refresh Phase 2 hardware moved to B33 Room F325

Phase 1a setup and testing continues (on-hold for RedHat OS update)

Notes/Issues:

1. ARB09: RMM02 Anomaly - the team continues to analyze events and determine process (automated and manual) updates to mitigate the chance of a recurrence. The team has implemented changes to the manual processes for verification of planning products. The team is providing inputs for independent review board.

LTO Schedule:

Tech refresh updates to be provided to ESMO Scheduler. Update to RedHat 7.0 takes priority.

**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.
- Setup SIPS to start normal delivery of rapid ATL07s to the cooler.
- Received final calibrated ANC products for September 08 – September 30, 2020. Produced Release 003 L2A and L3A products which were distributed to the SCF.
- Delivered Release 001 ATL20 files for November 2018 – June 2020 to NSIDC.
- Started testing of ATL11 delivery to NSIDC on the Acceptance Test cluster. There were some minor issues that we are resolving.
- Attended the ATL04 v5.4 Acceptance Review on Nov 5.
- Attended the ICESat-2/ESDIS Coordination Telecon on Nov. 2. The GridFTP waiver was discussed. Chris Mishaga is working on the waiver requests. Karen Michael will be contacting him about current status.
- Started integration testing of SIPS Build 6.0. This build will consist of ASAS V5.4 and will be used to produce Release 004 Science data products.

**ASAS:**

L1A/L1B: Developed custom software to examine Tx/Rx issue. Proven useful with a small sample of ATL01 products. Software is currently processing a significantly larger sample of ATL01s to improve statistical significance of the results.

L2A\_ALT: No work.

L2/L3 Atmosphere: Waiting on new overrides to run another test case in ASAS-PG.

L3A Land Ice: No work.

L3B Land Ice: The transfer path of ATL11 via ADAPT->SIPS->NSIDC is in testing.

Sea Ice/Freeboard: Work is underway on ATL21.

L3A Land/Veg: Investigation of issues related to a strong/weak beam crossing is awaiting release 004 ATL03s (which contain roll/pitch/yaw).

Inland Water: Work is underway on ATL22.

Ocean: Work is underway on ATL19.

### **SCF:**

The SCF is operating nominally. Data for releases 003 and R003 are being ingested and distributed. All new finals (9/8 to 9/30) have been ingested. Adding these to the previous batch of finals, the new rough estimate for completion of subscription fulfillment is about 3-4 weeks. A file listing the current SCF data holdings is attached.

\* Data Management -- Rapids being replaced by the incoming new finals were deleted. Ingest of data and fulfillment of subscriptions was monitored, and a few failed jobs were rerun successfully. Work continues on updating ATL10 trending plotting code to add new plots. Some recent server work caused internal network connection issues that were resolved the following day; there was no major impact on operations.

\* Subsetter -- Testing on ASAS v5.4 products continues in preparation for release 004. A few files failed in SDMS, but they were rerun successfully. A look into past control and request files for failed subsetting jobs showed some similarities, but no obvious constant or cause. Findings will be documented, and the issue will continue to be monitored.

\* Visualizer -- Updates to the code to handle ATL20 continue. A new product dataframe for ATL20 was distributed internally for use with the updated software. Initial testing has been positive.

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

Analysis indicates a possibility of minor damage to a Starlink star tracker if the star tracker is pointed at ATLAS and passes within less than 50 cm of the center of an ATLAS beam at a range less than 35 km. Analysis continues, using a wider range of star tracker parameters.

In addition, work continues on:

- Quantifying the expected annual number of back reflections from solar arrays on other spacecraft (e.g. Starlink).
- Transmit/receive data slips
- Investigating and modeling the properties of saturated returns.

### **ATL03:**

Updating documentation for rel004, and continuing investigation of TxRx alignment slip cases; no new TxRx slip cases have been found.

### **Post-Launch Cal/Val:**

- Geolocation based on corner cube retro-reflectors was published: Early ICESat-2 on-orbit Geolocation Validation Using Ground-Based Corner Cube Retro-Reflectors; Remote Sensing; Lori Magruder, Kelly Brunt, Michael Alonzo (<https://www.mdpi.com/2072-4292/12/21/3653>)
- All of ATL03 release 003 (through 30 Sept 2020) has been validated relative to 88S GPS data; ATL03 is accurate to better than 5.5 cm with better than 13.3 cm of 1-sigma standard deviation (surface measurement precision).

- POD3 assessed using 88S GPS data and crossover analysis; both results are comparable to those of release 003.

## ISF ACTIVITIES MISSION WEEK 113

\* Not in science mode

^ Could affect science data quality

- \* 2020/310:00:15:57.0000 TEP data collection Grid 239 Duration 3 minutes
- \* 2020/310:00:20:12.0000 TEP data collection Grid 311 Duration 3 minutes
- \* 2020/310:00:25:25.0000 TEP data collection Grid 383 Duration 3 minutes
- \* 2020/310:01:41:44.0000 TEP data collection Grid 129 Duration 3 minutes
- 2020/310:02:23:25.0000 OCEANscan Duration 22 minutes
- \* 2020/310:03:20:58.0000 TEP data collection Grid 199 Duration 3 minutes
- \* 2020/310:04:57:51.0000 TEP data collection Grid 232 Duration 3 minutes
- \* 2020/310:05:08:17.0000 TEP data collection Grid 376 Duration 3 minutes
- \* 2020/310:06:36:15.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2020/310:08:11:06.0000 TEP data collection Grid 300 Duration 3 minutes
- \* 2020/310:09:25:05.0000 TEP data collection Grid 10 Duration 3 minutes
- \* 2020/310:09:30:17.0000 TEP data collection Grid 82 Duration 3 minutes
- \* 2020/310:09:43:19.0000 TEP data collection Grid 261 Duration 3 minutes
- \* 2020/310:09:53:46.0000 TEP data collection Grid 405 Duration 3 minutes
- \* 2020/310:11:02:08.0000 AMCS Cal over open Pacific ocean Duration 2 minutes
- ^ 2020/310:11:25:26.0000 DMU62a for RGT excursion Duration 75 minutes
- \* 2020/310:12:43:28.0000 AMCS Cal over open Pacific ocean Duration 2 minutes
- \* 2020/310:12:57:07.0000 TEP data collection Grid 328 Duration 3 minutes
- 2020/310:14:10:40.0000 OCEANscan Duration 22 minutes
- \* 2020/310:15:43:47.0000 AMCS Cal over open Pacific ocean Duration 2 minutes
- \* 2020/310:16:05:42.0000 TEP data collection Grid 360 Duration 3 minutes
- \* 2020/310:16:28:15.0000 TEP data collection Grid 413 Duration 3 minutes
- \* 2020/310:17:32:05.0000 TEP data collection Grid 250 Duration 3 minutes
- \* 2020/310:18:57:50.0000 TEP data collection Grid 140 Duration 3 minutes
- \* 2020/310:19:09:04.0000 TEP data collection Grid 283 Duration 3 minutes
- \* 2020/310:20:45:57.0000 TEP data collection Grid 317 Duration 3 minutes
- \* 2020/310:22:25:28.0000 TEP data collection Grid 386 Duration 3 minutes
- \* 2020/310:22:45:18.0000 TEP data collection Grid 404 Duration 3 minutes
- \* 2020/310:23:51:56.0000 TEP data collection Grid 276 Duration 3 minutes
- 2020/311:01:57:45.0000 OCEANscan Duration 22 minutes
- \* 2020/311:02:54:17.0000 TEP data collection Grid 200 Duration 3 minutes
- \* 2020/311:03:28:10.0000 TEP data collection Grid 397 Duration 3 minutes
- \* 2020/311:06:03:53.0000 TEP data collection Grid 195 Duration 3 minutes
- \* 2020/311:06:10:36.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
- \* 2020/311:07:27:43.0000 TEP data collection Grid 49 Duration 3 minutes

\* 2020/311:09:07:14.0000 TEP data collection Grid 118 Duration 3 minutes  
\* 2020/311:09:22:53.0000 TEP data collection Grid 334 Duration 3 minutes  
\* 2020/311:10:40:00.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
\* 2020/311:12:10:47.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/311:13:45:01.0000 OCEANscan Duration 22 minutes  
\* 2020/311:15:19:21.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
\* 2020/311:17:03:55.0000 TEP data collection Grid 214 Duration 3 minutes  
\* 2020/311:17:09:07.0000 TEP data collection Grid 286 Duration 3 minutes  
\* 2020/311:18:45:55.0000 TEP data collection Grid 320 Duration 3 minutes  
\* 2020/311:18:54:15.0000 Put laser in ARM mode for LCA65 25544 (ISS) 06-Nov-2020  
18:54:30 Duration 1 minute  
\* 2020/311:20:07:16.0000 TEP data collection Grid 138 Duration 3 minutes  
\* 2020/311:21:54:36.0000 TEP data collection Grid 315 Duration 3 minutes  
\* 2020/311:21:59:49.0000 TEP data collection Grid 387 Duration 3 minutes  
\* 2020/311:23:26:17.0000 TEP data collection Grid 277 Duration 3 minutes  
2020/312:01:32:07.0000 OCEANscan Duration 22 minutes  
\* 2020/312:02:32:16.0000 TEP data collection Grid 236 Duration 3 minutes  
\* 2020/312:02:42:02.0000 TEP data collection Grid 380 Duration 3 minutes  
\* 2020/312:03:58:43.0000 TEP data collection Grid 126 Duration 3 minutes  
\* 2020/312:05:27:47.0000 TEP data collection Grid 52 Duration 3 minutes  
\* 2020/312:05:44:57.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/312:08:48:42.0000 TEP data collection Grid 227 Duration 3 minutes  
\* 2020/312:10:14:31.0000 TEP data collection Grid 80 Duration 3 minutes  
\* 2020/312:10:18:30.0000 TEP data collection Grid 152 Duration 3 minutes  
2020/312:10:30:43.0000 TOO TOOid 1765 RGT 676 offpoint 2.11deg Duration 2 minutes  
\* 2020/312:11:45:08.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/312:13:19:22.0000 OCEANscan Duration 22 minutes  
\* 2020/312:14:53:42.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
\* 2020/312:15:11:47.0000 TEP data collection Grid 289 Duration 3 minutes  
\* 2020/312:19:54:39.0000 TEP data collection Grid 318 Duration 3 minutes  
\* 2020/312:21:21:08.0000 TEP data collection Grid 208 Duration 3 minutes  
\* 2020/312:21:31:33.0000 TEP data collection Grid 351 Duration 3 minutes  
\* 2020/312:22:50:05.0000 TEP data collection Grid 134 Duration 3 minutes  
2020/313:01:06:28.0000 OCEANscan Duration 22 minutes  
\* 2020/313:03:35:41.0000 TEP data collection Grid 162 Duration 3 minutes  
2020/313:04:07:16.0000 Segmented RTWscan Part 1 Duration 37 minutes  
2020/313:04:56:26.0000 Segmented RTWscan Part 2 Duration 35 minutes  
2020/313:05:36:50.0000 Segmented RTWscan Part 3 Duration 14 minutes  
\* 2020/313:06:53:35.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/313:11:19:29.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/313:12:53:43.0000 OCEANscan Duration 22 minutes  
\* 2020/313:14:28:03.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/313:15:55:00.0000 Stellar window dump Duration 90 minutes  
\* 2020/313:22:29:46.0000 TEP data collection Grid 206 Duration 3 minutes  
2020/314:02:15:06.0000 OCEANscan Duration 22 minutes  
2020/314:03:41:37.0000 Segmented RTWscan Part 1 Duration 37 minutes

2020/314:04:31:07.0000 Segmented RTWscan Part 2 Duration 35 minutes  
2020/314:05:11:34.0000 Segmented RTWscan Part 3 Duration 14 minutes  
\* 2020/314:06:27:56.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/314:10:53:49.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
\* 2020/314:12:28:07.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/314:14:02:21.0000 OCEANscan Duration 22 minutes  
2020/314:16:14:45.0000 Load Rx Alg V10 parameter files to RAM0 Duration 1 minutes  
2020/314:16:17:04.0000 Update SHG Temperature to 49.93C sCAR192 Duration 1  
minutes  
2020/315:01:30:00.0000 Laser window dump Duration 2 minutes  
2020/315:01:49:27.0000 OCEANscan Duration 22 minutes  
\* 2020/315:06:02:17.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/315:10:30:03.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
\* 2020/315:12:02:28.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/315:13:36:42.0000 OCEANscan Duration 22 minutes  
\* 2020/315:15:11:02.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/316:01:23:48.0000 OCEANscan Duration 22 minutes  
\* 2020/316:05:36:38.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/316:11:36:49.0000 AMCS Cal over open Pacific ocean Duration 2 minutes  
2020/316:13:11:03.0000 OCEANscan Duration 22 minutes  
\* 2020/316:14:45:23.0000 AMCS Cal over open Pacific ocean Duration 2 minutes