

ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, May 11 2020 thru Sunday, May 17, 2020

RGTs spanned: 695-801
Cycle 7

SUMMARY:

All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. ICESat-2 performed a successful yaw flip very early on the morning of 14 May from the +X flying direction (forward) to the -X flying direction (backward); SIPS and others in the PSO ensured that the data granule boundaries were correctly generated at the time of the maneuver.

Operations continued nominally, in our ninth week of telework, with no major disruptions.

NSIDC ICESat-2 Metrics through May 17: 1,890 total users of 10 available data products; 5,083,062 sciences files downloaded. ATL03 is in the lead with 783 unique users of 585,745 files downloaded. ATL08 is in a close second with 761 unique users and an astounding 2,560,477 files downloaded, and ATL06 is in third place with 513 unique users and 1,594,049 files downloaded.

****ELEMENT DETAILS BELOW****

CAMS/POD:

CAMS: Regular CAMS operations: constraint and conjunction monitoring for MW087 and MW088 and mission planning for MW089.

CAMS is ensuring that RTW scans are not scheduled over AIS and GIS regions and that the RGT is being tracked per the PSO's request.

CAMS recommended laser arm for 43195 (NUSAT4) 132/14:45:26 - 132/14:45:36 (MW087)

CAMS recommended laser arm for 41613 (FLOCK2P 8) 133/14:10:54 - 133/14:11:04 (MW087)

CAMS recommended laser arm for 44416 (QUANTUM RADAR 3) 133/20:00:28 - 133/20:00:38 (MW087)

CAMS ran numerous screenings for HIE w/ 42037 (FLOCK 3P 38) for DOY 137 (MW088) in support of DMU48b, RMM002. HIE self-mitigated.

POD: Regular POD operations continue. Intermediate POD was completed for GPS week 2104. Final POD was completed for GPS week 2102.

ISF:

All ATLAS housekeeping data is nominal

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

WTEM Peak to Edge Ratio: 1.179

Laser 2 Temperature Error: -0.26C

SADA in AIRPLANE Mode

Spacecraft orientation: - X

Mission Planning:

MW88 ATS is loaded to the spacecraft and currently operating (PSO Activity List is attached)

MW89 has been delivered, nominal calibrations including daytime AMCS Cals

~~~~~  
Activities during the past week:

Real-time activities:

No realtime commanding was performed due to GSFC Stage 4 status

ATS activities:

MW87 - LCA37, 38, 39 were planned and executed - updated MW87 PSO Activity list is attached  
Routine Instrument calibrations, Ocean scans and Vegetation Data collection, modified RTW scans to avoid scan over the poles

Daytime AMCS Calibrations:

2020/135:13:53:58

2020/135:19:59:52

VBG Temperature updates to optimize the laser wavelength

Commands to clear errors and reset stats

Update LRS parameters for -X direction (note parameter update occurred ~20 hours after Yaw flip)

Other Activities:

Yaw Flip 003 - Spacecraft Yaw to -X flying direction

DMU048a 2020/135 ISF set ILRS NOGO/GO flags around the activities.

Near-term activities:

Generated plot of executed AMCS Cal locations

Routine maintenance reboot of operational servers - ITOS server reboots require on-site presence; request to be sent to Jim Irons

Tech HW refresh:

On hold due to Stage 4 status

Facility:

RSA Token re-order - notified tokens delivered to GSFC

Critical patching completed via telework

Q2 patch and scan planned for June

Notes/Issues:

~ Network monitoring graphs were not running as expected due un-necessary mail log rotate files being generated resulting in 2.5 mill mail log files clogging the log file processing. The log rotate script was updated to not generate the mail rotate logs.

LTO Schedule:

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

**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, ATL04, ATL06, ATL07, ATL08, ATL09, and ATL10 using ANC03/04/05 files from the CAMS.
- o Distributed the ATL01 and ATL02 Data products to NSIDC.
- o Distributed the rapid Science Data products to the SCF.
- Produced rapid L2A and L3A data products for May 14<sup>th</sup> (yaw flip maneuver) on May 16<sup>th</sup> and distributed them to the PSO. Also ensured that the data granule boundaries were correctly generated at the time of the maneuver.
- Produced ATL07 and ATL10 products on AccTest for evaluation by the PSO.

### **ASAS:**

The 954a1 functional test reports are available at [https://gs614wphoton.wff.nasa.gov/asas/test\\_reports/index.html](https://gs614wphoton.wff.nasa.gov/asas/test_reports/index.html). The updated browse code seems to significantly improve the memory footprint of the browse product generation. Improved QA checking has uncovered an unfilled dimension scale in ATL02. Developers continue to evaluate their test products.

For atmosphere, work is proceeding on L2A ATM cal\_method3 constants and surface finding. Work is progressing on L3A low-rate blowing snow. Significant improvements regarding discontinuities within the ATL09 density matrices have been made. Work is commencing on new requirements derived from the updated L3B ATM ATBD.

The ATL11 team is preparing to deliver a test XML metadata file to NSIDC for evaluation. Work is underway to incorporate browse products into ATL11. New VMs were created in ADAPT for ATL11 testing/processing.

Land development is awaiting an ATBD update relating to the ATL03 saturation flags.

The land ice refactor is progressing well. The refactored Tx pulse shape correction code is providing good results with the ATBD lead-provided D2/D3 unit test sets. The refactored initial photon selection and along-track segment fitting code is providing good results with the same D2/D3 test sets. (Still chasing a difference of 4 fitted photons out of 78,666,799 possible matches.)

The sea ice team has resolved the issues regarding differences in products created by ASAS code vs those created in the ATBD test environment. The code to produce release 003 ATL07s and ATL10s is being packaged as ASAS v5.3.3 hotfix.

Work is progressing 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. Work also continues on the ATL20 browse products.

For inland water, the DEM from ATL03 has been added to the ATL13 product. In addition, several custom debug datasets for examining the deconvolution have been created for ATBD lead analysis. Preliminary work is commencing for the L3B inland water product.

For ocean, work continues on the L3B ocean product.

#### **SCF:**

The SCF is operating nominally. Data for releases 003 and R003 are being ingested and distributed. Full granule subscriptions are caught up and current, but subsetting subscriptions are still running. Some test data for ATL07 has been obtained and made available for evaluation by relevant users. A file listing the current SCF data holdings is attached.

\* Data Management -- ATL10 trending remains disabled as work continues to update the code to operate with the latest version of the product. In initial testing, calculations appear to be correct, but plotting has not been verified yet and may need additional work. Final updates to rSCF documentation are being made as feedback is received from SCF staff.

\* Subsetter -- Updates required to work with the latest version of the ATL10 product are ready to be put into operations. Two other pending changes will also be brought into operations at the same time. Since subsetting must not be running at the time the code is updated, this will be done next week with a controlled pause in processing.

\* Visualizer -- The software has been updated to v8.0 and adds the ability to have a top x-axis under certain conditions. Apps have been made, and a release of the software will follow the completion of testing. Note that this is planned to be the last release from active development; support will continue with bug fixes and maintenance (e.g., new and/or updated product dataframes) as needed.

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

Preliminary evaluation of the new CAL 08 (Range Bias) showed good matching with on-orbit observations of the Transmitter Echo. The next step will be comparison with known elevation measurements.

In addition, work continues on:

- Writing up the results of the study of variation of range bias on orbital and seasonal time scales.
- Modeling the behavior of the ATLAS receiver during extreme saturation events.
- Investigating and explaining “interesting” behavior revealed by the expanded ATLAS QA screening process.
- Improving the process for calibrating transmitter-receiver alignment.

#### **ATL03:**

Work continues on saturation signal editing, hopefully for a rollout in release 004.

### **ICESat-2 Data Validation:**

-ATL03 surface elevation data, from Oct 2018 to Mar 2020, has been assessed relative to data from the 88S traverse. The biases for all 6 spots range between 0 cm and +5 cm, with surface measurement precisions ranging from 7.5 cm to 10.5 cm.

-ATL06 surface elevation data, from Oct 2018 to Mar 2020, has also been assessed relative to data from the 88S traverse. The biases for all 6 spots range between -2 cm and +3 cm, with surface measurement precisions ranging from 5.5 cm to 7.0 cm.

### ISF ACTIVITIES MISSION WEEK 088

^ 2020/135:01:49:03.0000 Yaw Flip 003 to -X flying direction Duration 21 minutes  
\* 2020/135:03:25:25.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/135:05:30:40.0000 TOO TOOid 1449 RGT 743 offpoint 4.52deg Duration 2 minutes  
\* 2020/135:06:45:31.0000 TEP data collection Grid 152 Duration 3 minutes  
\* 2020/135:08:06:59.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/135:09:38:34.0000 OCEANscan Duration 22 minutes  
\* 2020/135:11:15:33.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/135:11:38:52.0000 TEP data collection Grid 1 Duration 3 minutes  
^ 2020/135:12:00:00.0000 Adjusting the VBG Setpoint to 62.87 to optimize the laser wavelength  
Duration 5 minutes  
^ 2020/135:12:05:00.0000 Adjusting the VBG Setpoint to 62.84 to optimize the laser wavelength  
Duration 5 minutes  
\* 2020/135:13:00:04.0000 TEP data collection Grid 215 Duration 3 minutes  
\* 2020/135:13:53:58.0000 AMCS Cal over open ATLANTIC ocean once in daylight Duration 2 minutes  
^ 2020/135:14:03:07.0000 DMU048a Duration 60 minutes  
\* 2020/135:17:53:24.0000 TEP data collection Grid 63 Duration 3 minutes  
\* 2020/135:19:25:04.0000 TEP data collection Grid 97 Duration 3 minutes  
\* 2020/135:19:59:52.0000 AMCS Cal over open ocean once in daylight Duration 2 minutes  
\* 2020/135:20:48:55.0000 TEP data collection Grid 239 Duration 3 minutes  
2020/135:21:25:50.0000 OCEANscan Duration 22 minutes  
2020/135:22:15:00.0000 Update LRS parameters post Yaw flip to -X direction Duration 1 minute  
\* 2020/135:22:33:38.0000 TEP data collection Grid 92 Duration 3 minutes  
\* 2020/136:00:10:33.0000 TEP data collection Grid 54 Duration 3 minutes  
\* 2020/136:01:29:11.0000 TEP data collection Grid 268 Duration 3 minutes  
\* 2020/136:01:39:36.0000 TEP data collection Grid 124 Duration 3 minutes  
\* 2020/136:02:59:45.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/136:04:27:18.0000 TEP data collection Grid 408 Duration 3 minutes  
\* 2020/136:07:48:57.0000 TEP data collection Grid 223 Duration 3 minutes  
\* 2020/136:07:54:23.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/136:09:15:37.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/136:09:38:56.0000 TEP data collection Grid 4 Duration 3 minutes  
2020/136:09:47:56.0000 TOO TOOid 1450 RGT 761 offpoint 4.54deg Duration 2 minutes  
2020/136:10:47:12.0000 OCEANscan Duration 22 minutes  
2020/136:12:13:44.0000 Segmented RTW Part 1 Duration 38 minutes  
2020/136:13:03:13.0000 Segmented RTW Part 2 Duration 35 minutes  
2020/136:13:43:41.0000 Segmented RTW Part 3 Duration 14 minutes

\* 2020/136:14:00:53.0000 TEP data collection Grid 321 Duration 3 minutes  
\* 2020/136:15:26:13.0000 TEP data collection Grid 428 Duration 3 minutes  
\* 2020/136:18:38:30.0000 TEP data collection Grid 387 Duration 3 minutes  
\* 2020/136:20:29:49.0000 TEP data collection Grid 132 Duration 3 minutes  
2020/136:22:34:28.0000 OCEANscan Duration 22 minutes  
\* 2020/137:02:34:06.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/137:04:39:28.0000 TOO TOOid 1456 RGT 773 offpoint 0.07deg Duration 2 minutes  
\* 2020/137:05:43:47.0000 TEP data collection Grid 298 Duration 3 minutes  
\* 2020/137:08:49:58.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/137:10:21:33.0000 OCEANscan Duration 22 minutes  
\* 2020/137:11:57:17.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/137:15:09:32.0000 TEP data collection Grid 320 Duration 3 minutes  
\* 2020/137:16:37:53.0000 TEP data collection Grid 390 Duration 3 minutes  
\* 2020/137:19:47:10.0000 TEP data collection Grid 385 Duration 3 minutes  
2020/137:22:08:49.0000 OCEANscan Duration 22 minutes  
\* 2020/138:00:55:51.0000 TEP data collection Grid 17 Duration 3 minutes  
\* 2020/138:02:08:27.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/138:02:30:00.0000 Laser window dump Duration 2 minutes  
\* 2020/138:03:42:44.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/138:05:28:33.0000 TEP data collection Grid 154 Duration 3 minutes  
\* 2020/138:08:24:18.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/138:08:56:36.0000 TOO TOOid 1452 RGT 791 offpoint 4.53deg Duration 2 minutes  
2020/138:09:55:54.0000 OCEANscan Duration 22 minutes  
\* 2020/138:11:32:53.0000 AMCS Cal over open ocean Duration 2 minutes  
\* 2020/138:11:50:56.0000 TEP data collection Grid 108 Duration 3 minutes  
\* 2020/138:16:23:23.0000 TEP data collection Grid 246 Duration 3 minutes  
2020/138:21:43:09.0000 OCEANscan Duration 22 minutes  
\* 2020/138:22:43:08.0000 TEP data collection Grid 200 Duration 3 minutes  
\* 2020/139:00:04:23.0000 TEP data collection Grid 378 Duration 3 minutes  
\* 2020/139:03:17:05.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
\* 2020/139:03:23:24.0000 TEP data collection Grid 229 Duration 3 minutes  
\* 2020/139:03:28:37.0000 TEP data collection Grid 157 Duration 3 minutes  
\* 2020/139:03:33:50.0000 TEP data collection Grid 85 Duration 3 minutes  
\* 2020/139:04:52:29.0000 TEP data collection Grid 299 Duration 3 minutes  
\* 2020/139:06:28:18.0000 TEP data collection Grid 261 Duration 3 minutes  
\* 2020/139:07:58:39.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/139:09:30:15.0000 OCEANscan Duration 22 minutes  
\* 2020/139:11:07:14.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/139:11:39:30.0000 TOO TOOid 1453 RGT 808 offpoint 4.59deg Duration 2 minutes  
\* 2020/139:16:08:09.0000 TEP data collection Grid 102 Duration 3 minutes  
\* 2020/139:16:12:44.0000 TEP data collection Grid 30 Duration 3 minutes  
\* 2020/139:17:37:13.0000 TEP data collection Grid 172 Duration 3 minutes  
2020/139:21:17:30.0000 OCEANscan Duration 22 minutes  
\* 2020/139:22:21:18.0000 TEP data collection Grid 164 Duration 3 minutes  
\* 2020/140:00:04:52.0000 TEP data collection Grid 18 Duration 3 minutes  
\* 2020/140:01:10:24.0000 TEP data collection Grid 413 Duration 3 minutes  
\* 2020/140:01:33:53.0000 TEP data collection Grid 88 Duration 3 minutes  
\* 2020/140:02:51:26.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes

\* 2020/140:04:21:36.0000 TEP data collection Grid 372 Duration 3 minutes  
\* 2020/140:07:44:02.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/140:09:04:35.0000 OCEANscan Duration 22 minutes  
\* 2020/140:10:41:34.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/140:12:05:24.0000 Segmented RTW Part 1 Duration 37 minutes  
2020/140:12:54:50.0000 Segmented RTW Part 2 Duration 35 minutes  
2020/140:13:35:19.0000 Segmented RTW Part 3 Duration 14 minutes  
\* 2020/140:14:02:59.0000 TEP data collection Grid 177 Duration 3 minutes  
\* 2020/140:15:38:43.0000 TEP data collection Grid 139 Duration 3 minutes  
2020/140:16:15:00.0000 Stellar window dump Duration 90 minutes  
\* 2020/140:18:48:27.0000 TEP data collection Grid 134 Duration 3 minutes  
\* 2020/140:20:12:20.0000 TEP data collection Grid 276 Duration 3 minutes  
2020/140:20:39:37.0000 TOO TOOid 1454 RGT 829 offpoint 4.53deg Duration 2 minutes  
\* 2020/140:22:04:55.0000 TEP data collection Grid 21 Duration 3 minutes  
2020/140:22:26:08.0000 OCEANscan Duration 22 minutes  
\* 2020/140:23:31:20.0000 TEP data collection Grid 127 Duration 3 minutes  
\* 2020/141:02:25:46.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes  
2020/141:07:39:43.0000 TOO TOOid 1457 RGT 836 offpoint 0.03deg Duration 2 minutes  
\* 2020/141:08:41:37.0000 AMCS Cal over open ocean Duration 2 minutes  
2020/141:10:13:13.0000 OCEANscan Duration 22 minutes  
2020/141:15:31:05.0000 TOO TOOid 1455 RGT 841 offpoint 4.54deg Duration 2 minutes  
2020/141:22:00:28.0000 OCEANscan Duration 22 minutes