ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, December 9, 2019 thru Sunday, December 15, 2019

RGTs spanned: 1117-1223
Cycle 5

Items of Note:
All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. SIPS Successfully completed Acceptance testing of SIPS Build 4.3 consisting of SDMS V6.17 (no ASAS changes). These are mostly SDMS enhancements and some fixes (nothing critical). Several PSO elements and members of the science team/science community presented updates and science results from ICESat-2 at the annual fall meeting of the American Geophysical Union in San Francisco; additionally, the mission held three town hall meetings (general mission overview, applied sciences, and hydrology applications) to further the spread of ICESat-2 information in the scientific community.

NSIDC ICESat-2 Metrics through December 15: 2,976 total users of 10 available data products; 2,297,113 sciences files downloaded. ATL08 is once again in the lead with 1,304 users and 777,249 files downloaded! ATL03 remains in 2nd place with 976 users of 252,127 files, and ATL06 is in 3rd this week with 660 users and 1,075,686 files downloaded.

Our phinal Photon Phriday premiered this week on social media. Science team member Ben Smith discussed the ability of ICESat-2 to monitor and track changes of glaciers in the Cascade Mountains in the Pacific Northwest. Stay tuned in the spring for more special, intermittent Photon Phriday posts!

ELEMENT DETAILS BELOW

CAMS/POD:
CAMS: Regular CAMS operations: constraint and conjunction monitoring for MW065 and MW066 and mission planning for MW067.
CAMS recommended Laser ARM for HIE event with 25544 (ISS) doy344(MW065) that self-mitigated
CAMS recommended Laser ARM for HIE event with 44533 (SEEKER) for doy345(MW065).
CAMS recommended removal of inclination burn from MW066 due to Radiator-Sun violation.
CAMS continues to target the moorings at 36.0259 lat, -125.105 lon per the Science Team request.

POD: Regular POD operations continue. Final POD was completed for GPS week 2080. All results appear nominal.

ISF:
All ATLAS housekeeping data is nominal

Laser 2 is firing at energy level 4 and in science mode
WTEM Peak to Edge Ratio: 1.129
Laser 2 Temperature Error: -0.23C
SADA in SAILBOAT Mode
Spacecraft orientation: + X

Mission Planning:
MW66 ATS is loaded to the spacecraft and currently operating.
MW67 is being planned, nominal calibrations
Updated and attached MW65 to include LCA23
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Activities during the past week:

Real-time activities:
CAR91 and CAR102 to clear routine SBS, SXP errors
Supported ground station recertification

ATS activities:

Routine Instrument calibrations, Ocean scans and Vegetation Data collection.

Other Activities:
Prepared a mini-SAT to mitigate LCA23 44533 (SEEKER) 11-Dec-2019 17:20:57 ((2019/345)
with Laser to ARM mode for 10.5 seconds.
Prepared a SAT with a -5 deg roll for HIE19 which subsequently self-mitigated.

ISF tech refresh:
- Presented the ISF HW Refresh Plan to EMSO and PSO.

Near-term activities:
Continuing to work on the ISF tech refresh
Perform TCS failover contingency operations (i.e., fail over to backup server practice)
Powered down FLATLAS 12/12.

Notes/Issues:

NA

LTO Schedule:
All items remain on schedule

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 rapid Science Data products to the SCF.
- Successfully completed Acceptance testing of SIPS Build 4.3 consisting of SDMS V6.17 (no ASAS changes). These are mostly SDMS enhancements and some fixes (nothing critical).
- The SIPS B4.3 ORR will be scheduled on the week of Dec. 16.

ASAS:
ASAS developers continue to work the top priority issues as identified by their respective ATBD lead.

ASAS presented a poster at AGU 2019.

A hotfix for the PCE2 anomalous Tx fine counts was used to generate test data that is in evaluation.

A new series of functional test data (ASAS v5.3a2) was generated last week and is being reviewed by the team.

L1B work involves verifying the improved QA and modified receiver sensitivity equation.

ATL03 work is focused on verifying the POD/PPD degrade flags and the implementation of the saturation fraction parameters. Initial coding of the saturation fraction algorithm is complete and a sensitivity study will be performed to determine the correct height threshold for detecting photon 'clusters'.

The Atmosphere L3B developer is generating ATL16s and ATL17s to test newly coded parameters.

The Land Ice code is being tested to verify the atmosphere flags read from ATL09. A change was made in atlas_libs that now allows Land Ice (or actually any PGE) to ignore those ATL03 segments with a non-zero podppd_flag. Some missing unit tests were developed and passed.

The Land/Veg developer on improved ground finding.

The sea ice/freeboard is working on the L3B sea ice products.

The Land Ice ATL11 L3B code is being modified to work in a production environment. The developer is working on getting the correct Python environment set up on the Adapt cluster.

The inland water developer is working on the computation of wind speed and passing ATL09 met data to ATL13.

The ocean developer continues to work on the improved manager. Preliminary evaluation of the functional test results are promising.

SCF:
The SCF is operating nominally. Data for releases 002 and R002 are being ingested and distributed. The next batch of release 002 data (about Sep. 5 to Nov. 7) is expected next week. We plan to delete some of the current rapid products, since the incoming 002 final products will take precedence over them, to ensure there is sufficient space for the new data. A file listing the current SCF data holdings is attached.

* Data Management -- Trending calculations for ATL04 failed due to problems with the data in a release R002 input file that passed one QA check, which is in the data file, but failed two others, which are not. A manual database edit worked around this issue, and trending is running again. Since this appears to be a rare event, happening only once in over one year, we are monitoring the situation.

* Subsetter -- Some code modifications to how the software decides if an output file has changed are being tested. When finished, this should resolve a bug that is allowing users to receive empty subsetted files.

* Visualizer -- Work on the high-priority JIRA issues is underway, with the goal of making another software release early next year, after which it would be brought into a maintenance mode.

ATL02/Instrument Science:
Two Instrument Science posters were presented at the AGU Fall Meeting in San Francisco:

Katie Gosmeyer (615/ADNET) gave a poster presentation entitled, "Characterizing Error in the Verification Procedure of the ICESat-2 ATLAS Instrument's Level-1B Product".

Tony Martino (615) gave a poster presentation on "ICESat-2/ATLAS at one year: observed and predicted instrument performance".

Christopher Field began working out the source of ATLAS "afterpulses" in stray reflections in the receiver.

In addition, work continues on:

* Investigating the mechanism of "jumps" in the TEP TOF

* Reprocessing I&T data using the latest EMG fit method.

- 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.

- Development of an algorithm for estimation of OFM transmittance peak shift from 2-step VBG sweep data.

ATL03:
Several posters at the AGU Fall Meeting in San Francisco discussed ATL03, including (but not limited to) on-orbit performance analyses of the ATL03 geolocated photon cloud, an overview of ICESat-2 data and reference products for general data users, and ICESat-2 validation efforts using geolocated photon data at White Sands Missile Range and at the GPS array set up at 88S. Minor text updates for the release 003 ATBD continue.

The 88S Antarctic Traverse team departed Maryland and began their journey to complete the third GPS traverse in support of ICESat-2 ground validation.

ISF ACTIVITIES MISSION WEEK 066:

* Not in science mode
^ Could affect science data quality

* 2019/346:01:08:51.0000 TEP data collection Grid 298 Duration 3 minutes
  2019/346:02:10:00.0000 Stellar window dump Duration 90 minutes
* 2019/346:04:01:59.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/346:05:33:35.0000 OCEANscan Duration 22 minutes
* 2019/346:07:10:33.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/346:10:29:23.0000 TEP data collection Grid 248 Duration 3 minutes
  2019/346:13:12:44.0000 TOO TOOid 1245 RGT 1170 offpoint 0.22 deg Duration 2 minutes
* 2019/346:13:30:08.0000 TEP data collection Grid 135 Duration 3 minutes
* 2019/346:13:35:21.0000 TEP data collection Grid 207 Duration 3 minutes
  2019/346:17:20:41.0000 OCEANscan Duration 22 minutes
* 2019/346:18:13:00.0000 TEP data collection Grid 128 Duration 3 minutes
* 2019/346:20:26:31.0000 TEP data collection Grid 431 Duration 3 minutes
* 2019/346:21:33:31.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/346:22:53:15.0000 TEP data collection Grid 85 Duration 3 minutes
* 2019/346:23:07:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/347:02:01:11.0000 TEP data collection Grid 81 Duration 3 minutes
* 2019/347:02:07:04.0000 TEP data collection Grid 152 Duration 3 minutes
  2019/347:03:00:00.0000 Laser window dump Duration 2 minutes
* 2019/347:03:36:19.0000 AMCS Cal over open ocean Duration 2 minutes

* 2019/347:04:17:58.0000 TEP data collection Grid 419 Duration 3 minutes
  2019/347:05:07:56.0000 OCEANscan Duration 22 minutes
* 2019/347:06:44:54.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/347:08:21:36.0000 TEP data collection Grid 143 Duration 3 minutes
* 2019/347:09:57:31.0000 TEP data collection Grid 177 Duration 3 minutes
* 2019/347:10:06:19.0000 TEP data collection Grid 284 Duration 3 minutes
^ 2019/347:10:32:09.0000 VBG sweep in science mode in dark over Greenland 61.75 degrees
Duration 3 minutes
* 2019/347:10:35:07.0000 TEP data collection Grid 410 Duration 3 minutes
* 2019/347:12:11:53.0000 TEP data collection Grid 371 Duration 3 minutes
* 2019/347:13:13:34.0000 TEP data collection Grid 243 Duration 3 minutes
  2019/347:13:48:03.0000 TOO TOOid 1244 RGT 1186 offpoint 1.85 deg Duration 2 minutes
^ 2019/347:14:16:43.0000 DMU035 Duration 95 minutes
  2019/347:16:55:01.0000 OCEANscan Duration 22 minutes
* 2019/347:17:43:10.0000 TEP data collection Grid 57 Duration 3 minutes
* 2019/347:17:47:21.0000 TEP data collection Grid 129 Duration 3 minutes
* 2019/347:19:37:17.0000 TEP data collection Grid 342 Duration 3 minutes
  2019/347:19:55:50.0000 RTWscan Duration 90 minutes
* 2019/347:22:34:29.0000 TEP data collection Grid 194 Duration 3 minutes
* 2019/347:22:42:09.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/348:00:20:09.0000 TEP data collection Grid 335 Duration 3 minutes
* 2019/348:01:34:39.0000 TEP data collection Grid 45 Duration 3 minutes
* 2019/348:01:44:01.0000 TEP data collection Grid 189 Duration 3 minutes
* 2019/348:03:13:05.0000 TEP data collection Grid 115 Duration 3 minutes
* 2019/348:03:17:00.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/348:03:28:45.0000 TOO TOOid 1189 RGT 1195 offpoint 2.92 deg Duration 2 minutes
  2019/348:04:42:17.0000 OCEANscan Duration 22 minutes
* 2019/348:06:19:15.0000 AMCS Cal over open ocean Duration 2 minutes
^ 2019/348:10:06:30.0000 VBG sweep in science mode in dark over Greenland 63.75 degrees
Duration 3 minutes
* 2019/348:11:01:55.0000 TEP data collection Grid 103 Duration 3 minutes
* 2019/348:12:35:58.0000 TEP data collection Grid 101 Duration 3 minutes
* 2019/348:14:15:44.0000 TEP data collection Grid 170 Duration 3 minutes
* 2019/348:14:27:24.0000 TEP data collection Grid 313 Duration 3 minutes
* 2019/348:15:44:47.0000 TEP data collection Grid 96 Duration 3 minutes
* 2019/348:15:50:01.0000 TEP data collection Grid 168 Duration 3 minutes
* 2019/348:16:30:41.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/348:17:17:40.0000 TEP data collection Grid 58 Duration 3 minutes
* 2019/348:17:32:08.0000 TEP data collection Grid 273 Duration 3 minutes
  2019/348:18:03:40.0000 OCEANscan Duration 22 minutes
* 2019/348:20:43:19.0000 TEP data collection Grid 304 Duration 3 minutes
* 2019/348:22:12:23.0000 TEP data collection Grid 230 Duration 3 minutes
* 2019/348:22:16:30.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/348:23:41:28.0000 TEP data collection Grid 156 Duration 3 minutes

* 2019/349:03:04:18.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/349:04:19:18.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/349:04:42:36.0000 TEP data collection Grid 400 Duration 3 minutes
  2019/349:05:50:55.0000 OCEANscan Duration 22 minutes
* 2019/349:09:09:21.0000 TEP data collection Grid 214 Duration 3 minutes
^ 2019/349:11:28:12.0000 LCA24 -5 degree slew to mitigate 25544 (ISS) 15-Dec-2019 11:30:53
Duration 3 minutes
  2019/349:11:55:56.0000 TOO TOOid 1247 RGT 1215 offpoint 0.09 deg Duration 2 minutes
* 2019/349:12:23:36.0000 TEP data collection Grid 281 Duration 3 minutes
* 2019/349:15:26:59.0000 TEP data collection Grid 204 Duration 3 minutes
* 2019/349:16:05:12.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/349:16:53:29.0000 TEP data collection Grid 94 Duration 3 minutes
  2019/349:17:38:01.0000 OCEANscan Duration 22 minutes
* 2019/349:19:13:48.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/349:20:17:39.0000 TEP data collection Grid 305 Duration 3 minutes
* 2019/349:21:50:51.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/350:03:53:55.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/350:05:25:16.0000 OCEANscan Duration 22 minutes
* 2019/350:07:02:32.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/350:10:56:43.0000 TEP data collection Grid 337 Duration 3 minutes
* 2019/350:13:32:15.0000 TEP data collection Grid 279 Duration 3 minutes
* 2019/350:15:39:43.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/350:16:13:00.0000 TOO TOOid 1246 RGT 1233 offpoint 0.23 deg Duration 2 minutes
* 2019/350:16:43:26.0000 TEP data collection Grid 310 Duration 3 minutes
  2019/350:17:12:22.0000 OCEANscan Duration 22 minutes
* 2019/350:18:48:19.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/350:21:25:12.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/350:22:59:29.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/351:03:12:22.0000 Laser in ARM mode for LCA25 42024 (FLOCK 3P 71) 17-Dec-2019
03:12:37
* 2019/351:03:28:36.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/351:04:59:37.0000 OCEANscan Duration 22 minutes
* 2019/351:06:37:13.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/351:15:14:14.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/351:16:46:43.0000 OCEANscan Duration 22 minutes
* 2019/351:18:22:51.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/351:21:01:01.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/351:22:33:50.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/352:03:06:44.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/352:04:33:58.0000 OCEANscan Duration 22 minutes
* 2019/352:06:11:55.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/352:10:06:30.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/352:16:23:04.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/352:17:55:21.0000 OCEANscan Duration 22 minutes

2019/352:19:21:52.0000 RTWscan Duration 90 minutes
* 2019/352:22:08:11.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes