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Langley Research Center
Hampton, Virginia 23681-2199

Cloud - Aerosol LIDAR Infrared Pathfinder Satellite Observations (CALIPSO)

Data Management System Operator's Manual

Release 3.1
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Cloud - Aerosol LIDAR Infrared Pathfinder Satellite Observations

Data Management System

Operator's Manual

Release 2.0

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Primary Authors

Tim Murray, Paula Detweiler, Ken Beaumont, Patricia L. Lucker, Brian Getzewich
Science Systems and Applications Inc. (SSAI)
One Enterprise Parkway, Hampton, Virginia 23666

Brian Getzewich
NASA Langley Research Center
Hampton, Virginia 23681-2199

1.0 Running The CALIPSO Automated Processing System (CAPS)

A. Starting CAPS:

There is a graphical user interface (GUI) that runs CAPS on a Unix system. Many default Environment Variables are set in the account calprd .cshrc.

As a side note... those running production do so on a Mac. Therefore, the Xterm application must run in order for the CAPS GUI to run correctly on the monitor. The “custom” command for opening an xterm is the application is (this is all on one line when typing the command):

```
xterm -T CAPS -geometry 190x31+0_400 -title calprd-reggaeCAPS -bg “Midnight Blue” -cr yellow -fg white -fa Monaco -fs 12 -sb -s -sl 1500 -e sh -c “ssh -Y -p22 -l calprd reggae.larc.nasa.gov”
```

The process for logging into the system is as follows:

1. Open an X-terminal window from your desktop computer.
2. Log onto reggae.larc.nasa.gov as “calprd”.
3. Once logged into the production system, type the following commands:
\$CALHOME/CAPS/stations/tkb.ksh &
>> tkb (*this is an alias for the command above*)

You will see the following lines appear in your X-terminal window...

```
/user/calprd> tkb
```

```
/calipso/calprd/CAPS/stations
```

```
[1] 26055
```

```
/user/calprd>
```

← always different process numbers

The command starts up the CAPS GUI. This is the system that controls all stations that are part of the CALIPSO Production System.

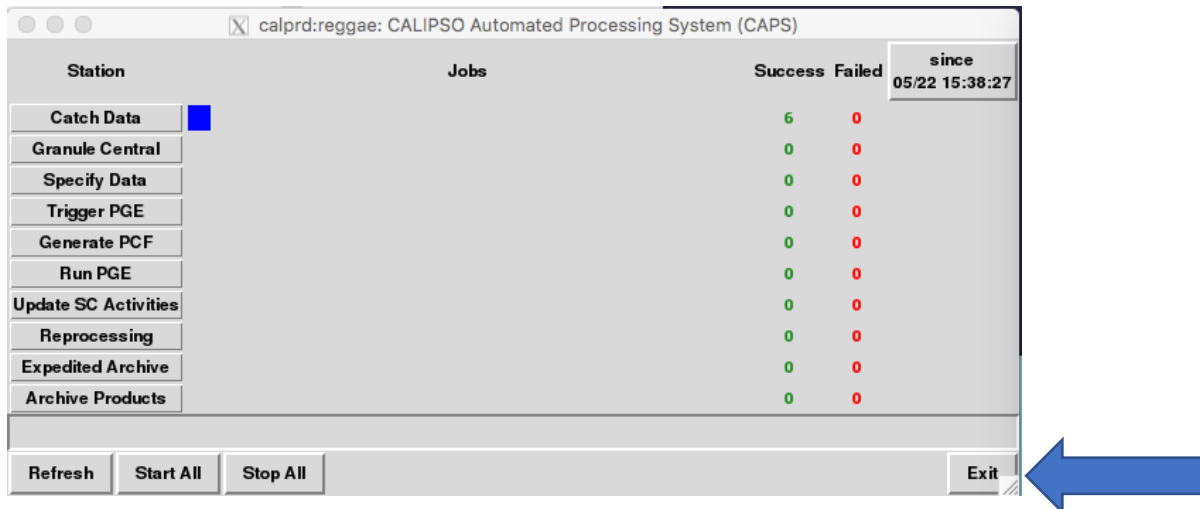
The following window will display in your main window.

Station	Jobs	Success	Failed	since
Catch Data		6	0	05/22 15:38:27
Granule Central		0	0	
Specify Data		0	0	
Trigger PGE		0	0	
Generate PCF		0	0	
Run PGE		0	0	
Update SC Activities		0	0	
Reprocessing		0	0	
Expedited Archive		0	0	
Archive Products		0	0	

Refresh Start All Stop All Exit

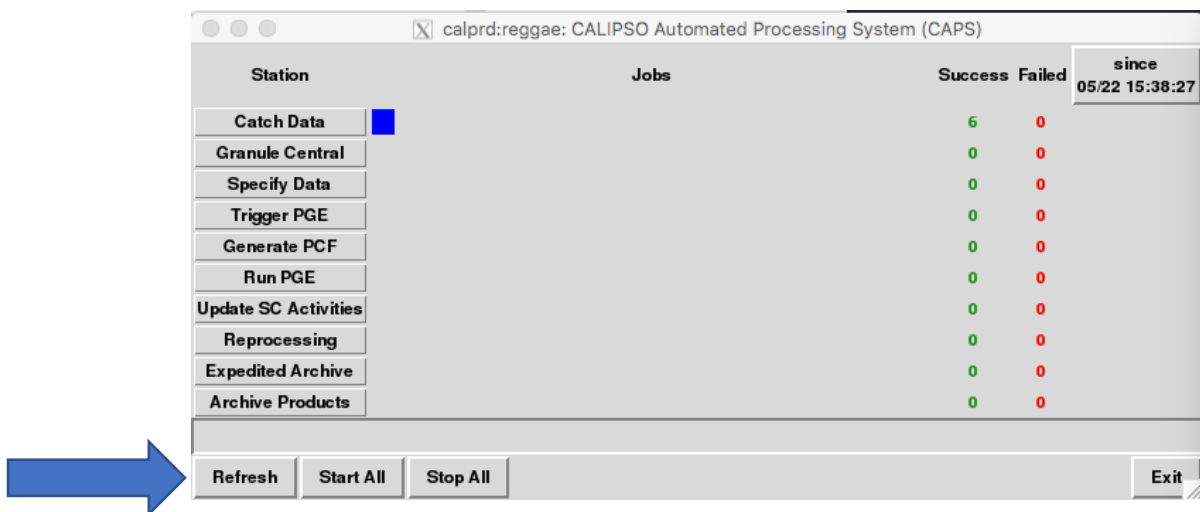
B. Exit CAPS:

To exit out of the GUI, CAPS, just press the “Exit” button. By doing so, no processes will end. All you are doing is closing out the GUI. You should do this before exiting or logging off the reggae system in the X-terminal window.



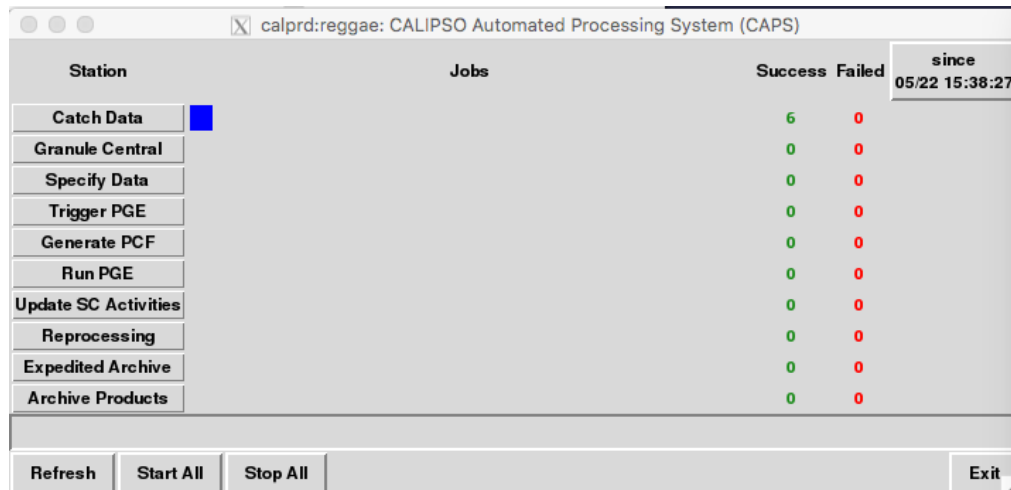
C. Refresh Button:

There may be instances when you are not sure if the window is being updated correctly. By pressing the “Refresh” button, you will see the latest activity on the “calprd” production account.



D. Start All Button:

There are times when all of the CALIPSO production stations will not be running. To begin the stations, press the “Start All” button. You will know that it worked when you see all station buttons go from the color red to the color grey.



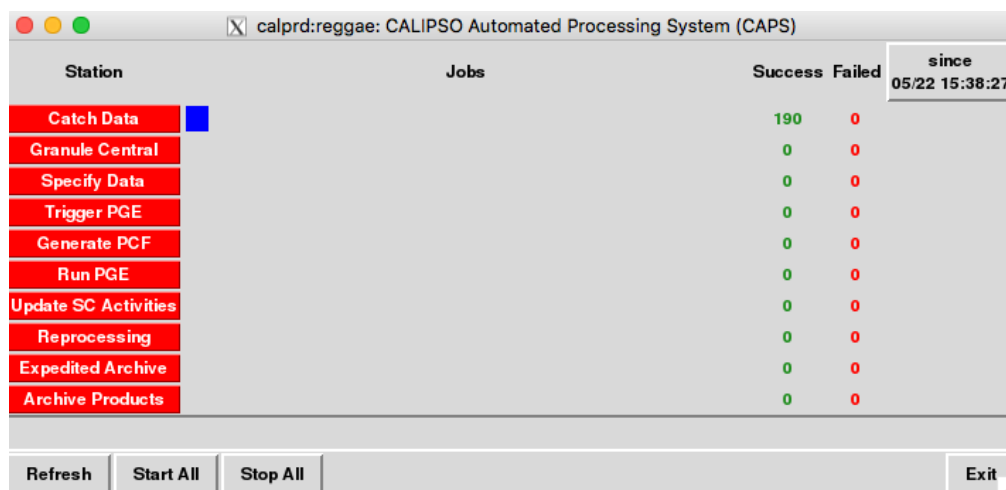
The screenshot shows the CALIPSO Automated Processing System (CAPS) GUI. The window title is 'calprd:reggae: CALIPSO Automated Processing System (CAPS)'. The interface includes a table with columns for Station, Jobs, Success, Failed, and a timestamp 'since 05/22 15:38:27'. The 'Catch Data' station is highlighted with a blue square. Below the table are buttons for 'Refresh', 'Start All', 'Stop All', and 'Exit'. A large blue arrow points to the 'Start All' button.

Station	Jobs	Success	Failed	since 05/22 15:38:27
Catch Data		6	0	
Granule Central		0	0	
Specify Data		0	0	
Trigger PGE		0	0	
Generate PCF		0	0	
Run PGE		0	0	
Update SC Activities		0	0	
Reprocessing		0	0	
Expedited Archive		0	0	
Archive Products		0	0	

*Once you press the “Start All” button, you are able to press the “Exit” button to close the CAPS GUI. Then you are able to log out of reggae in the X-terminal window.

E. Stop All Button:

There are times when all of the CALIPSO production stations will have to stop running. To stop all of the stations’ activities gracefully, press the “Stop All” button. All of the station buttons go from the color grey to the color red.



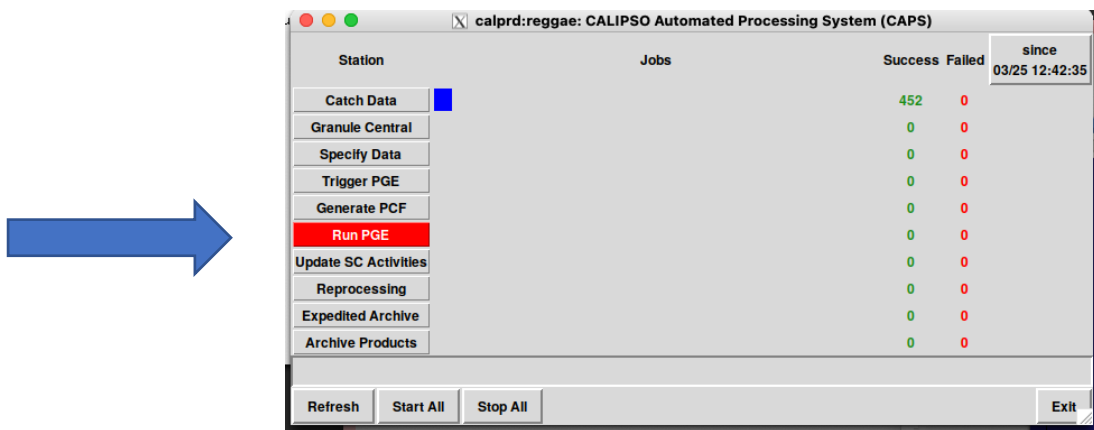
The screenshot shows the CALIPSO Automated Processing System (CAPS) GUI after the 'Stop All' button has been pressed. The window title is 'calprd:reggae: CALIPSO Automated Processing System (CAPS)'. The interface includes a table with columns for Station, Jobs, Success, Failed, and a timestamp 'since 05/22 15:38:27'. The 'Catch Data' station is highlighted with a blue square. Below the table are buttons for 'Refresh', 'Start All', 'Stop All', and 'Exit'. A large blue arrow points to the 'Stop All' button.

Station	Jobs	Success	Failed	since 05/22 15:38:27
Catch Data		190	0	
Granule Central		0	0	
Specify Data		0	0	
Trigger PGE		0	0	
Generate PCF		0	0	
Run PGE		0	0	
Update SC Activities		0	0	
Reprocessing		0	0	
Expedited Archive		0	0	
Archive Products		0	0	

*Once you press the “Stop All” button, you are able to press the “Exit” button to close the CAPS GUI. Then you are able to log out of reggae in the X-terminal window.

F. Stop ONE Station:

There may be a time to stop selected stations. To stop one station, click on the station. In this case, “Run PGE” is selected. Once selected, a new pull-down menu appears just for that specific station. At the bottom of the window, press the STOP button. This is what the CAPS GUI will look like when one station is stopped. The one station button goes from the color grey to the color red.



2.0 Description of Each Station Button in CAPS

The buttons on the left side of the GUI, reference the CAPS workstations. In general, each station wakes up, performs its functions on any new work orders, and creates work orders for downstream workstations. See Appendix I for Failure modes for each station.

A. **Catch Data:**

All input data for CALIPSO processing are delivered to the ASDC. The ASDC ingests, archives, and pushes the data to the CALIPSO production system. CAPS polls the data directories on the production system for new data by looking for the associated ASCII metadata files that accompany all external data. When the station identifies a new data file, it moves the metadata file to \$CALHOME/data/metadata and creates a work order for “Granule Central”.

The “Catch Data” station is self-perpetuating, creating a work order for the next iteration of the data poll before terminating.

B. **Granule Central:**

This station provides entry for new data into the CAPS system by inserting data into the CAPS operational database and creating a work order, one work order per file, for the next station, “Specify Data”.

C. **Specify Data:**

Each work order received refers to one file. Based on the data type of the file, CAPS examines the station configuration file,

\$CALHOME/CAPS/stations/specify_data.cfg

to determine which PGEs utilize this particular data product. Then based on the PGE configuration file,

\$CALHOME/CAPS/stations/specify_data/specify_data_<PGENAME>.cfg

CAPS will:

- Identify which specific instances of a PGE will need this data file
- Create a job in the production history database, if needed
- Create a trigger_pge work order for each job that uses this data file

D. **Trigger PGE:**

Each Trigger PGE work order refers to an individual job. This station will examine the contents of the production history database. If all data dependencies are met, the station creates a work order for the “Generate PCF” station.

- E. Generate PCF:**
This station creates a text file of runtime information (PCF) required to run an instance of a PGE. The PCF serves as the work order for the next station, “Run PGE”.
- F. Run PGE:**
This station runs the PGEs. Upon success, it creates work orders for the “Expedited Archive”, “Archive Products”, and “Granule Central” stations.
- G. Update SC Activities:**
Station is triggered when Payload Health and Status Data files are produced. Station updates the instrument activities database with orbit start and stop times and day/night terminator crossings.
- H. Reprocessing:**
This station handles the bulk reprocessing CALIPSO data apart from the normal flow where data that is produced can trigger downstream subsystems. The reprocessing station will only produce data and not trigger downstream data production.
- I. Expedited Archive:**
This station controls the archival and distribution of all expedited and quicklook files created during production runs.
- J. Archive Products:**
This station controls the archival and distribution of all nominal files created during production runs.

Station	Jobs	Success	Failed	since 03/09 10:18:11
Catch Data		1	0	
Granule Central		0	0	
Specify Data		0	0	
Trigger PGE		0	0	
Generate PCF		0	0	
Run PGE		0	0	
Update SC Activities		0	0	
Reprocessing		0	0	
Expedited Archive		0	0	
Archive Products		0	0	

Refresh Start All Stop All Exit

3.0 Archive Station Configuration

The expedited and archive stations are configured to deliver data to appropriate drop boxes in ANGe.

```
-----
%cfg_remote = ( # NAME HOST          PORT USER  DESTINATION/DIRECTORY
    0 => [ 'ANGe', 'jb114.larc.nasa.gov', '250', 'calout', '/XSan/Incoming/calout/ingest' ],
    1 => [ 'ANGe', 'jb114.larc.nasa.gov', '250', 'calout', '/XSan/Incoming/calout/expedited' ],
    2 => [ 'WEB', 'calops.larc.nasa.gov', '250', 'calprd', '/homedir/calprd/BROWSE_Drop' ],
    3 => [ 'ANGe', 'jb114.larc.nasa.gov', '250', 'calout', '/XSan/Incoming/TS1/calout/ingest' ]
);
-----
```

The nature of a data product dictates which drop box(es) a file is sent to. ANGe treats files sent to different drop boxes differently.

cfg_remote[0] describes the Standard Drop Box

cfg_remote[1] describes the Expedited Drop Box

cfg_remote[2] describes a CALIPSO drop box for Browse imagery and QL data products.

cfg_remote[3] describes an ASDC test Drop Box

The primary distinction between options ‘0’ and ‘1’ is the priority that ANGe assigns to the archive job. The separation of Standard and Expedited archival allows archival operations to continue for Expedited products when Standard operations are held, be it for data delays or operational considerations (BSA). Option ‘2’ is used to deploy browse images to the CALIPSO web site, and Option ‘3’ is only used for testing.

Standard products are typically flagged:

'LID_L1' => [1, 0, 0, 0],

Expedited and QL:

'LID_L1_Exp' => [0, 1, 0, 0],

'LID_L1_QL' => [0, 1, 1, 0],

Browse:

'LIDAR_Browse' => [1, 0, 1, 0],

'LIDAR_Browse_Exp' => [0, 1, 1, 0],

These stations should be ‘stopped’ during ANGe outages. The individual stations can be stopped in the GUI or a job to accomplish this can be submitted with the UNIX “at” command.

```
# MMDDHHSS
```

```
> at -t 09200800 -f /user/calprd/bin/stop_station
```

The script ‘stop_station’ can be edited to stop selected or all stations.

4.0 Monitoring Tools

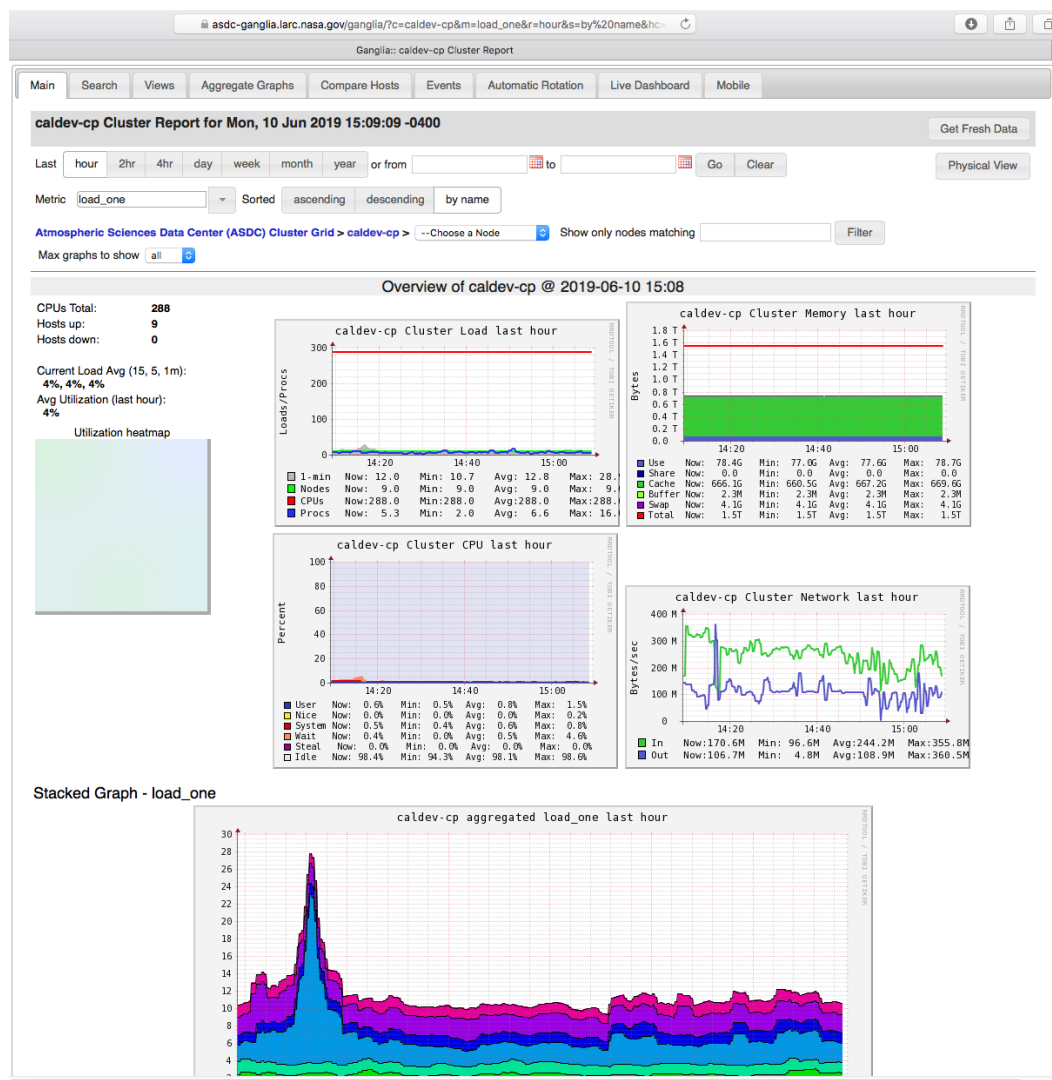
A. Ganglia:

This is a very useful web based tool for getting information such as memory usage, disk space and cpu utilization. The url is at

<https://asdc-ganglia.larc.nasa.gov/ganglia/>

Scroll down to the bottom of the web page to select which CALIPSO system you are interested in viewing (*caldev-cp* (development/test/some minor production) or *reggae* (production)).

The interface is easy to navigate with graphs showing the clusters current resources at a glance and display graphs in the last hour, day, week, month or year.



B. Data Availability Tool:

There are two web pages used to account for CALIPSO Products. There is an external public page and an internal page. The Data Availability Tool (public version) represents the files in the ASDC archive that are orderable by the general public. The DPO File Count Web Page (internal version) is the full accounting of files in the DPO that CALIPSO produced, including those not generally available. These pages allow for a generalized tracking of CALIPSO production.

The **Public** Version of the Data Availability Tool is:

https://www-calipso.larc.nasa.gov/tools/data_avail

The **Internal** Version of the Data Availability Tool is:

<https://caldev-cp.larc.nasa.gov/data-avail-internal/>

A cron job on the *caldev-cp* system generates text files that are used by the above web pages to fill in file listings. The cron job runs every 6 hours and re-generates the daily text files for the last 21 days. The daily text files are found:

`/calipso-data/data/SUMMARY/WHOLE`

and are named: `Daily_summary-2013-10-01.txt`

`/calipso-data` is a mount to an ASDC maintained Internal Persistent Volume (IPV) system. Data from this directory are mirrored to the systems that serve the Public Facing CALIPSO website.

Occasionally we must perform a manual update for a particular data day that is no longer regularly updated by the cron. To do so, log onto *reggae*:

```
>> ssh -Y -p22 -l calprd reggae.larc.nasa.gov
>> ac yyyy mm dd      → this updates a particular data day
-or-
>> run_mission.csh     → this command updates ALL files for the entire mission
>> run_mission_monthly.csh → does the same for monthly files.
```

The script 'backfill_2' can be run to control the extent of the regeneration of daily text files, and is typically only used when the website is updated to include more products.

To show all of the cron jobs running on *reggae*, enter the command:

```
>> crontab -l
```

5.0 Daily Procedures

A. Monitoring Standard Browse Processing

Nominal browse images can be viewed at:

https://www-calipso.larc.nasa.gov/products/lidar/browse_images/production/

The Data Release Version defaults to the most current. Selecting the desired version and hitting “Go” will display a calendar similar to the Expedited Browse Page.

Processing lag typically runs 2-3 days behind ‘today’.

B. Monitoring Expedited Browse Processing:

CALIPSO is no longer supporting the Expedited Browse web pages.

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PRODUCTS - CALIPSO EXPEDITED Browse Images

As part of the A-Train / C-Train satellite constellation, CALIPSO provides profile observations of cloud and aerosols and IR imagery of high cirrus clouds in this region. These measurements are combined with other A-Train / C-Train satellite measurements and detailed observations from aircraft and ground-based instruments to better understand the formation and evolution of tropical clouds and how aerosols affect the climate system.

Expedited CALIPSO browse images have a processing latency of about 12 hours. These products use degraded attitude information, a simple calibration scheme based on climatology and are made available to support operational forecasting activities.

Select Year: | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 |

2020

January							February							March							April											
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S					
				01	02	03	04						01		01	02	03	04	05	06	07					01	02	03	04			
05	06	07	08	09	10	11		02	03	04	05	06	07	08	08	09	10	11	12	13	14					05	06	07	08	09	10	11
12	13	14	15	16	17	18		09	10	11	12	13	14	15	15	16	17	18	19	20	21					12	13	14	15	16	17	18
19	20	21	22	23	24	25		16	17	18	19	20	21	22	22	23	24	25	26	27	28					19	20	21	22	23	24	25
26	27	28	29	30	31			23	24	25	26	27	28	29	29	30	31										26	27	28	29	30	

May							June							July							August											
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S					
						01	02								01	02	03	04									01					
03	04	05	06	07	08	09		07	08	09	10	11	12	13	05	06	07	08	09	10	11					02	03	04	05	06	07	08
10	11	12	13	14	15	16		14	15	16	17	18	19	20	12	13	14	15	16	17	18					09	10	11	12	13	14	15
17	18	19	20	21	22	23		21	22	23	24	25	26	27	19	20	21	22	23	24	25					16	17	18	19	20	21	22
24	25	26	27	28	29	30		28	29	30					26	27	28	29	30	31						23	24	25	26	27	28	29
31																											30	31				

September							October							November							December												
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S						
						01	02	03	04	05					01	02	03	04	05	06	07						01	02	03	04	05		
06	07	08	09	10	11	12		04	05	06	07	08	09	10	08	09	10	11	12	13	14						06	07	08	09	10	11	12
13	14	15	16	17	18	19		11	12	13	14	15	16	17	15	16	17	18	19	20	21						13	14	15	16	17	18	19
20	21	22	23	24	25	26		18	19	20	21	22	23	24	22	23	24	25	26	27	28						20	21	22	23	24	25	26
27	28	29	30					25	26	27	28	29	30	31	29	30												27	28	29	30	31	

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NASA Official: Charles R. Trepte

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6.0 Debugging Browse Image Issues

A. Standard Browse Files:

When processing the CALIPSO data, the final products are the browse images that appear on the CALIPSO web site. The nominal lidar browse images can be viewed at the following URL:

https://www-calipso.larc.nasa.gov/products/lidar/browse_images/production/

At the bottom of this web page, select the version. The version for this example is Version 3.30.

A calendar will then appear within the browser window. All of those calendar days that are highlighted in blue represent a processed day. Data images can be viewed by selecting a calendar day.

The most recent data appears at the top.

If a job has run, but there are only partial images displayed check to see if the output tar is available:

```
>> cd /calipso/calprd/data/output/Browse/yyyy-mm-dd/
```

```
>> ls
```

The file should resemble: CAL_LIDAR_Browse-ValStage1-V3-30/yyyy-mm-ddTHH-MM-SSZ.tar

Copy this file to the web server:

```
>> bscp CAL_LIDAR_Browse-ValStage1-V3-30/yyyy-mm-ddTHH-MM-SSZ.tar
```

NOTE: If other granules are missing, perform the copy command on those missing granules in chronological order of production.

If there is no tar file for the job, it probably didn't run. Check for the L2 LIDAR product in /calipso/calprd/data/output/L2_LID/YYYY-MM-DD

If the L2 VFM product is there, the browse job can be triggered and run:

```
> cd /calipso/calprd/data/output/L2_LID/YYYY-MM-DD
```

```
> create_sd_wo CAL_LID_L2_VFM-ValStage1-V3-30.2016-06-01T08-54-43ZD.hdf
```

```
> mvsd DO.NEWDATA.LID_L2_VFM.<TIMESTAMP>.<PROD_TIME>.wo
```

If there is no L2 VFM product present, check for the L1 LIDAR product in /calipso/calprd/data/output/L1_LID/YYYY-MM-DD

if the L1 Product is there, the L2 job can be triggered and run:

```
> cd /calipso/calprd/data/output/L2_LID/YYYY-MM-DD
```

```
> create_sd_wo CAL_LID_L1-ValStage1-V3-30.2016-06-01T08-54-43ZD.hdf
```

```
> mvsd DO.NEWDATA.LID_L1.<TIMESTAMP>.<PROD_TIME>.wo
```

When triggering browse jobs, its best to stop the run_pge station and examine the PCF prior to execution to ensure that the proper files are matched to the PGE. The PCF can be edited before execution if there is a miss match. Specifically look at the LID associated with the L2 LIDAR VFM and make sure the timestamps match. The PCFs appear in

/calipso/calprd/CAPS/stations/run_pge and have the form:

DO.RUN_LIDAR_Browse_D.3.30.22.2016163103000.pcf

B. Creating Browse Jobs:

Browse jobs can be created from the command line. The operator must know the type of Browse job as well as the year, Julian DOY and the job time in HHMMSS format (YYYYDOYHHMMSS). The script create_job.pl performs the necessary actions to create a job and send the PCF to the run_pge station.

- create_job.pl LIDAR_Browse_D 2016163111045
 - o Creates a daytime browse job for June 11, 2016 @ 11:10:45AM
- create_job.pl LIDAR_Browse_Exp 2016163103000
 - o Creates an expedited browse job for Jun 11, 2016 @ 10:30:00 AM

When creating browse jobs, it's best to stop the run_pge station and examine the PCF prior to execution to ensure that the proper files are matched to the PGE. The PCF can be edited before execution if there is a mismatch. Specifically look at the L2 LIDAR file and make sure the timestamps match.

C. Creating Any Jobs:

Any job can be created:

- create_job.pl <PGENAME> <YYYYDOYHHMMSS>

- create_job.pl L2_LID_PSC 2016166000000

- create_job.pl L1_LID_Exp 2016166103000

Examine ~/bin/create_job.pl to determine which jobs can be created in this manner.

Use command:

- ia YYYY MM DD

to determine granule start times.

Use command:

- da

to compare data between the DPO and reggae.

7.0 Restarting Failed Jobs

7.1 General Restart Procedure

Jobs fail for any number of reasons. To restart a failed job, log in to reggae and launch the CAPS GUI.

Failed jobs will show as red boxes aligned with the respective station, in this case 'run_pge'.

- >> cd /calipso/calprd/CAPS/stations/
- >> cd run_pge

The next command will list all those processes that failed. The file names will have the prefix FAILED.RUN_ in the name.

```
>> ls FAILED.RUN*
FAILED.RUN_LIDAR_Browse.2.01.09.2008138000000.4747361
...
```

To restart all jobs:

```
>>re-run-bad
```

To restart a subset of failed job(s), call re-run-bad with a string that is shared only with the jobs that you want to re-run. This example will use the string 'LIDAR'. All those failed jobs that contain the string LIDAR will be re-submitted. Be careful when performing this command.

```
>>re-run-bad LIDAR
```

Once the command is entered through the command line, the process(es) will appear back in the stations window as blue square, then green when they start running.

7.2 Granule Central Failure

If there is a failed job in the station called "Granule Central", it usually means that an Ephemeris job failed here. To correct the failed ephemeris job, do the following...

```
>> cd /calipso/calprd/data/input/L0/AttEph/
```

In this directory, look for the ephemeris data file associated with the failed job. Copy its metadata file from the metadata repository to the directory above. The metadata file has the .SFDU extension in the name. Copying the metadata file triggers CAPS to again attempt to ingest the ephemeris file. Upon success, the failed work order can be deleted from the granule_central station

```
>> cp /calipso/calprd/data/metadata/faileddatafilename.SFDU /calipso/calprd/data/input/L0/AttEph/
```

8.0 Deleting Jobs

There are instances where a job will need to be killed and/or deleted from the database.

To display the jobs that the nominal CAPS is running:

```
> js
```

```
WARNING: MYSQL_OPT_RECONNECT is deprecated and will be removed in a future version.
```

```
SQL statement = select RunStatus, RunCreate, RunStart, JobId from JobStatus order by RunStatus, JobId;
```

```
L1_LID_Exp.3.41.29.2020003103000      DATA_HOLD 2025-01-16 14:51:17
```

```
...
```

Select the job to delete from the database:

```
>> delete_job.pl L1_LID_Exp.3.41.29.2020003103000
```

If the job has not run, the PCF should be removed from the run_pge station.

Lastly, for a failed job, the FAILED directory in the run_pge station should be removed.

9.0 Things to know...

- Data are received/downlinked from Alaska.
- Alaska forwards the data to USN in Pennsylvania. Pennsylvania sends the data to the ASDC.
- Each file sent to ASDC from USN contains 90 minutes of data.
- Each orbit is 99 minutes in length. Each orbit contains both daytime and nighttime data.
- Because Alaska is five hours behind Virginia, in one data day, we should receive 0 to 19 hours of data. The remaining hours of a day will be received in the next data day delivery.

10.0 Points of Contact:

ASDC

Lindsay Parker

E-mail: lindsay.parker-1@nasa.gov

Phone: 757-864-5826

USN

Steve Voglewede

E-mail: voglewede@uspacenet.com

MOCC at LaRC

Ron C. Verhappen

E-mail: ron.verhappen@nasa.gov

Phone: 757-864-2405

CALIPSO Data Management

Brian J. Getzewich

E-mail: brian.j.getzewich@nasa.gov

Phone: 757-864-9024

Sharon Rodier

E-mail: Sharon.d.rodier@nasa.gov

Phone: 757-778-3030

CALIPSO Production

Tim Murray

E-mail: timothy.d.murray@nasa.gov

Phone: 757-864-1359

Ken Beaumont

E-mail: kenneth.i.beaumont@nasa.gov

11.0 INPUT Data Sets Delivered To ASDC:

Here is the list of external products that are pushed to the ASDC on behalf of CALIPSO. All files are pushed to the ASDC.

Used by CALIPSO:

MOCC Post Processed Ephemeris
DAS D5CALIP1 - Scalar Climatological Parameters
DAS D5CALIP2 - Profile Climatological Parameters
USN AttEph02
USN AttEph03
USN HouseKpg
USN IIR_01_LZ, IIR_01_QL
USN Lidar_02_LZ, Lidar_02_QL
USN Lidar_03_LZ, Lidar_03_QL
USN Lidar_04_LZ, Lidar_04_QL
USN WFC_01_LZ, WFC_01_QL

Not used by CALIPSO, but sent to us anyway.

MOCC Predicted Ephemeris
USN AttEph01
USN Geode_06
USN HouseK02
USN Lidar_01_LZ, Lidar_01_QL
USN Lidar_17_LZ, Lidar_17_QL

Files after processing are delivered to the following folks in FTP staged area...

Data are staged to an FTP server for pickup by ICARE, IIR TEC and CloudSat. Only the data/metadata files are placed there. They do not receive any additional notification file.

The data are staged in one directory, but each group has their own login to it. They each only pull the data they are interested in even though there is more data out there. The data are staged for 10 days before being cleaned up. They each hit the site several times a day.

Data files staged are, the data only get placed on the server if it is produced and delivered to the ASDC:

IIR TEC: IIR LZ and QL data, DPREP output
ICARE: IIR L1-L2, Lidar L1-L2, WFC L1, GMAO
CloudSat: Lidar L1-L2

12.0 Acronyms

ASDC	Atmospheric Science Data Center
CALIPSO	Cloud - Aerosol LIDAR Infrared Pathfinder Satellite Observations
CAPS	CALIPSO Automated Processing System
FTP	File Transfer Protocol
GGEO	Gridded Geostationary Narrowband Radiances
GUI	Graphical User Interface
ICARE	
IDL	Interface Definition Language
IIR	Imaging infrared Radiometer
MOA	Meteorological, Ozone, and Aerosols (data product)
MOCC	Mission Operations Control Center
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PGE	Product Generation Executive
S4P	Simple, Scalable, Script-based Science Processor
SCF	Science Computing Facility
USN	

13.0 Directory Schema on Production System

/calipso/calprd/data/input/

L0/

Level 0 data for AttEph, IIR, LIDAR, WFC

WFC/

Wide Field Camera data

ancillary/

dynamic and static data

restage/

restaging of data files

/calipso/calprd/data/output/

AttEph/

Attitude

Browse/

Browse

Browse_Exp/

Expedited Browse

FAILED/

Failed jobs

L0_PHSD/

Level 0 Production History

L1_IIR/

Level 1 IIR

L1_LID/

Level 1 Lidar

L1_WFC/

Level 1 Wide Field Camera

L2_IIR/

Level 2 IIR

L2_LID/

Level 2 Lidar

PH/

Production History

14.0 Julian Day Calendar - Nominal Year

Julian Date Calendar (PERPETUAL)													
Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	001	032	060	091	121	152	182	213	244	274	305	335	1
2	002	033	061	092	122	153	183	214	245	275	306	336	2
3	003	034	062	093	123	154	184	215	246	276	307	337	3
4	004	035	063	094	124	155	185	216	247	277	308	338	4
5	005	036	064	095	125	156	186	217	248	278	309	339	5
6	006	037	065	096	126	157	187	218	249	279	310	340	6
7	007	038	066	097	127	158	188	219	250	280	311	341	7
8	008	039	067	098	128	159	189	220	251	281	312	342	8
9	009	040	068	099	129	160	190	221	252	282	313	343	9
10	010	041	069	100	130	161	191	222	253	283	314	344	10
11	011	042	070	101	131	162	192	223	254	284	315	345	11
12	012	043	071	102	132	163	193	224	255	285	316	346	12
13	013	044	072	103	133	164	194	225	256	286	317	347	13
14	014	045	073	104	134	165	195	226	257	287	318	348	14
15	015	046	074	105	135	166	196	227	258	288	319	349	15
16	016	047	075	106	136	167	197	228	259	289	320	350	16
17	017	048	076	107	137	168	198	229	260	290	321	351	17
18	018	049	077	108	138	169	199	230	261	291	322	352	18
19	019	050	078	109	139	170	200	231	262	292	323	353	19
20	020	051	079	110	140	171	201	232	263	293	324	354	20
21	021	052	080	111	141	172	202	233	264	294	325	355	21
22	022	053	081	112	142	173	203	234	265	295	326	356	22
23	023	054	082	113	143	174	204	235	266	296	327	357	23
24	024	055	083	114	144	175	205	236	267	297	328	358	24
25	025	056	084	115	145	176	206	237	268	298	329	359	25
26	026	057	085	116	146	177	207	238	269	299	330	360	26
27	027	058	086	117	147	178	208	239	270	300	331	361	27
28	028	059	087	118	148	179	209	240	271	301	332	362	28
29	029		088	119	149	180	210	241	272	302	333	363	29
30	030		089	120	150	181	211	242	273	303	334	364	30
31	031		090		151		212	243		304		365	31

15.0 Julian Day Calendar - Leap Year Only

Julian Date Calendar (FOR LEAP YEARS ONLY)													
Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	001	032	061	092	122	153	183	214	245	275	306	336	1
2	002	033	062	093	123	154	184	215	246	276	307	337	2
3	003	034	063	094	124	155	185	216	247	277	308	338	3
4	004	035	064	095	125	156	186	217	248	278	309	339	4
5	005	036	065	096	126	157	187	218	249	279	310	340	5
6	006	037	066	097	127	158	188	219	250	280	311	341	6
7	007	038	067	098	128	159	189	220	251	281	312	342	7
8	008	039	068	099	129	160	190	221	252	282	313	343	8
9	009	040	069	100	130	161	191	222	253	283	314	344	9
10	010	041	070	101	131	162	192	223	254	284	315	345	10
11	011	042	071	102	132	163	193	224	255	285	316	346	11
12	012	043	072	103	133	164	194	225	256	286	317	347	12
13	013	044	073	104	134	165	195	226	257	287	318	348	13
14	014	045	074	105	135	166	196	227	258	288	319	349	14
15	015	046	075	106	136	167	197	228	259	289	320	350	15
16	016	047	076	107	137	168	198	229	260	290	321	351	16
17	017	048	077	108	138	169	199	230	261	291	322	352	17
18	018	049	078	109	139	170	200	231	262	292	323	353	18
19	019	050	079	110	140	171	201	232	263	293	324	354	19
20	020	051	080	111	141	172	202	233	264	294	325	355	20
21	021	052	081	112	142	173	203	234	265	295	326	356	21
22	022	053	082	113	143	174	204	235	266	296	327	357	22
23	023	054	083	114	144	175	205	236	267	297	328	358	23
24	024	055	084	115	145	176	206	237	268	298	329	359	24
25	025	056	085	116	146	177	207	238	269	299	330	360	25
26	026	057	086	117	147	178	208	239	270	300	331	361	26
27	027	058	087	118	148	179	209	240	271	301	332	362	27
28	028	059	088	119	149	180	210	241	272	302	333	363	28
29	029	060	089	120	150	181	211	242	273	303	334	364	29
30	030		090	121	151	182	212	243	274	304	335	365	30
31	031		091		152		213	244		305		366	31

16.0 Environment Variables and aliases set in .cshrc

Here is a partial list of Environment Variables to be set in the .cshrc. These are needed to allow the proper operation of CAPS.

```
setenv CALHOME /calipso/calprd
setenv CALHOST caldata
setenv CALDBNM CAPS_DB
setenv CALDBUS calprd
setenv CALOPSDB calops
setenv CALDBPS XXXXXX
setenv CALENV /common/env/calipso_dev_env_TK520.csh
```

```
bscp /usr/bin/scp !^ calprd@caldev-cp.larc.nasa.gov:user/calprd/BROWSE_Drop
    Copy a browse tar file to drop directory
cdbr cd /calipso-data/data/BROWSE
    review IPV Browse directories
convhdf /user/kbeaumont/hdf2ncf4_converter/h4tonccf_nc4
    hdf4 to netcdf converter
ssh1 ssh reggae001
ssh2 ssh reggae002
    etc ssh to compute node ##
statar ls -l $CALHOME/CAPS/stations/archive | grep DO | wc -l;
```

See ~/.alias for complete list of aliases.

17.0 CAPS Failure modes

1. CAPS

- a. If all stations are shown in red, click the start all button.

2. CAPS Station: data_catcher

There are several failure modes for this station.

- a. Occasionally, a metadata file for a new product contains some bad characters. In this case, simply restart the processing by clicking on the failed job and click restart.
- b. Upon a production system failure, the polling job in the station is showing as failed.
 - i. Remove the FAILED* job in \$CALHOME/CAPS/stations/data_catcher
 - ii. copy ~/bin/DO.REPEAT_DATA_POLLING.20100715090854.wo into \$CALHOME/CAPS/stations/data_catcher
- c. Upon a production system failure, the polling job in the station is showing as running.
 - i. Remove the RUNNING* job in \$CALHOME/CAPS/stations/data_catcher
 - ii. copy ~/bin/DO.REPEAT_DATA_POLLING.20100715090854.wo into \$CALHOME/CAPS/stations/data_catcher

3. CAPS Station: gran_central

There are several failure modes for this station.

- a. A job shows failed. Click the failed job and restart.
- b. If a). doesn't correct the problem, most likely, the ASDC delivered the metadata file before the actual data file. CAPS cannot recover from this through the GUI.
 - i. Click the failed job, and examine the log file to determine the file that is causing the problem.
 - ii. Copy the corresponding metadata file into the appropriate L0 input directory.
 - iii. More details to follow.
 - iiii. From the CAPS GUI, remove the failed job
- c. From the command line, execute: > re-run-bad-gran

These errors should be covered by a cron job.

4. CAPS Station: specify_data

This station has no failure modes that are not related to a systemic failure. If needed:

- a. At the command line: > re-run-bad-sd

5. CAPS Station: trigger_pge

This station has no failure modes that are not related to a systemic failure. If needed:

- a. At the command line: > re-run-bad-trig

6. CAPS Station: generate_pcf

This station has no failure modes that are not related to a systemic failure. If needed:

- a. At the command line: > re-run-gen

7. CAPS Station: run_pge

This station has a variety of failure modes:

- a. For any browse job,
At the command line: > re-run-bad LIDAR_B

These errors should be covered by a cron job.

All other job failures can be re-run with

- c. At the command line: > re-run-bad <PGENAME>

8. CAPS Station: Update SC Activities

This station has no known failure modes.

9. CAPS Station: Reprocessing

This station has a variety of failure modes:

- a. More details to follow

10. CAPS Station: Expedited

- a. This station has a variety of failure modes:

- b. At the command line: > re-run-ear

11. CAPS Station: Archive

- a. This station has a variety of failure modes:

- b. At the command line: > re-run-ar

18.0 ANGe Dropbox

ssh from calprd@reggae

```
>> ssh -p 22 -l calout@xfr140.larc.nasa.gov
```

Can use alias xfr for this.

```
>> date;cd ~/ingest;ls -l
```

```
>> examine
```

gives you a list of what is in the dropbox to be archived, along with PDRs and .met files.

19.0 Trouble Shooting

With ongoing issues with logging into caliop-cp at certain times, some expedited jobs are ‘lost’ and not properly reporting that the jobs couldn’t run correctly.

Review the Internal Data Availability page. For a particular day, if there is disagreement between the number of L1A files and L1 LIDAR Expedited files, then some files probably didn’t run correctly. Looking on the NAS, determine which Expedited files didn’t get generated:

```
ls -l /calipso/calprd/data/output/L1A_LID/YYYY-MM-DD
ls -l /calipso/calprd/data/output/L1_LID/YYYY-MM-DD
```

As calprd on reggae, execute:

```
> create_job.pl L1_LID_Exp YYYYJJHHMMSS
```

where

YYYY is year.

JJJ is Julian day of the year

HHMMSS is the time stamp of the file, typically 133000, 150000, 163000, 1800000, or 193000

To run a job for May 5, 2018 T16:30:00 is

```
➤ create_job.pl L1_LID_Exp 2018125163000
```

Assuming no further login issues, this will trigger all downstream jobs.

Occasionally, the Expedited Browse images may also get ‘skipped’.

Identification of missing data can be accomplished by looking at the Exp Browse web page or looking on the NAS:

```
ls -l /calipso/calprd/data/output/Browse_Exp/YYYY-MM-DD
```

Expedited Browse jobs can be created in the same manner:

```
➤ create_job.pl LIDAR_Browse_Exp 2018125163000
```

20.0 Reviewing ANGe drop box:

Log into xfr140

```
ssh -p 22 -l calout xfr140.larc.nasa.gov
```

The command script 'review' looks at the MOCC, expedited, ingest and usn dropboxes. 'ingest' is where CALIPSO puts data. Empty looks like this:

```
> review
../calmocc/ingest/calmocc/prod:
total 128
drwxrwxr-x 2 producers 16676 May  4 03:13 ./
drwxrwx--- 5 producers 2127 Jan 26 2016 ../

../expedited:
total 960
drwxrwx--- 2 producers 876047 May  4 09:04 ./
drwxr-x--- 12 producers 2155 May  4 10:52 ../

../ingest:
total 12544
drwxrwxr-- 3 producers 11607245 May  4 08:36 ./
drwxr-x--- 12 producers 2155 May  4 10:52 ../
drwxr-xr-x 2 producers 2063 Feb  9 2017 test_drop/

../usn/ingest/usn:
total 576
drwxrwx--- 4 producers 344145 May  4 06:57 ./
drwxrwx--- 3 producers 2060 Aug 20 2008 ../
drwxr--r-- 2 staff    2064 Sep  7 2012 102908/
drwxr-xr-x 2 jboss    2050 Sep  7 2012 hold/
```

If there were data files, they would be listed under the appropriate drop box.

Forcing DAP update:

It normally occurs at 0000, 0600, 1200 and 1800 hours.

```
> ssh -Y -p22 -l calprd caldev-cp.larc.nasa.gov
> ac YYYY MM DD
```

will run the script for the data day.

21.0 Extra Commands to Help Troubleshooting System

>> cd to calprd's home directory to type the following commands. Just type in
>> cd

>> mrdata → shows 10 days of data that were delivered to production machine

>> mrdata L0 → shows what Level 0 data has come in for the last 10 days

>> mrdata L0 10 → shows the Level 0 data that has come in for the last 10 days

>> mrdata L0full → shows all Level 0 full 2, 3, 4, IIR, and WFC for the last 10 days

>> mrdata FPIT → shows GMAO data files

>> mdpo → 10 days of data that were delivered on the DPO

>> data_status.csh yyyy mm dd x → where yyyy is the four digit data year, mm is the two digit data month, dd is the two digit data day, and x is the number of total days starting with the identified day and then going backwards. This command lists all of the files that were delivered. It identifies the number of files delivered for that expected day. Therefore, you need to know how many delivered data files are expected for each data product. In most cases, the number of files is 16 (one for each orbit track).

If a job failed in the Archive Station, run the command in any directory on reggae,

>> re-run-ar

This normally clears up the Archive Station's failed jobs.

EXPEDITED BROWSE Copies to Web Disk

Log onto reggae as calprd.

>> cd /calipso/calprd/data/output/Browse_Exp/YYYY-MM-DD

>> bscp _____tar ← provide tar file name here to be copied over to web disk

** Note: there is a cron job that runs every five minutes to untar the browse package. Best to bscp last tar file produced to get latest maps and text file with all image/path information generated.

STANDARD BROWSE Copies to Web Disk

Log onto reggae as calprd.

>> cd /calipso/calprd/data/output/Browse/YYYY-MM-DD

>> bscp _____tar ← provide tar file name here to be copied over to web disk

**** Note:** there is a cron job that runs every five minutes to untar the browse package. Best to bscp last tar file produced to get latest maps and text file with all image/path information generated.

To force untar command for browse images to display on web pages rather than waiting for the cron job, do:

Log onto caldev-cp as calprd and enter untar (script) anywhere.

~~V4.x Browse Images Copies to Web Disk~~

~~>> log on as calprd on reggae?~~

~~>> Have Brian provide you with the full path of newly generated tar files.~~

~~>> cd to that directory (provided above)~~

~~>> bscp _____ .tar ← run this command in the order of the browse tar files created to ensure that all files will be displayed correctly using the correct maps and text file information.~~

EXAMPLES OF COMMANDS:

/user/calprd> mrddata L0 10

```
*****
For 2022 03 15 there are    16    Lidar_02_LZ files
*****
For 2022 03 16 there are    15    Lidar_02_LZ files
-rw-r--r-- 1 archive archive 85258856 Mar 16 22:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T00-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85364280 Mar 16 22:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T01-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85482068 Mar 16 23:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T03-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 16 23:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T04-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 17 00:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T07-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 17 01:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T09-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85364280 Mar 17 01:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T10-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 17 01:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T12-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 17 02:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T13-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 17 02:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T15-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 17 02:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T16-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 17 03:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T18-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85364280 Mar 17 03:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T19-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85423328 Mar 17 21:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T21-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 84107496 Mar 17 22:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-16T22-30-00Z_V01.DAT1
*****
For 2022 03 17 there are    16    Lidar_02_LZ files
*****
For 2022 03 18 there are    16    Lidar_02_LZ files
*****
For 2022 03 19 there are    16    Lidar_02_LZ files
*****
For 2022 03 20 there are    16    Lidar_02_LZ files
*****
For 2022 03 21 there are    16    Lidar_02_LZ files
*****
For 2022 03 22 there are    15    Lidar_02_LZ files
```



```

-rw-r--r-- 1 archive archive 85446824 Mar 22 22:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T00-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85482068 Mar 22 23:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T01-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 22 23:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T03-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 22 23:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T04-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85364280 Mar 23 00:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T06-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 01:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T07-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 00:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T09-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 01:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T10-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 02:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T12-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 02:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T13-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85364280 Mar 23 02:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T15-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 03:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T16-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 03:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T18-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 04:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T19-30-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85493816 Mar 23 04:08
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-22T21-00-00Z_V01.DAT1
*****
For 2022 03 23 there are    16    Lidar_02_LZ files
*****
For 2022 03 24 there are     2    Lidar_02_LZ files
-rw-r--r-- 1 archive archive 85446824 Mar 24 22:09
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-24T00-00-00Z_V01.DAT1
-rw-r--r-- 1 archive archive 85340784 Mar 24 22:09
/calipso/calprd/data/input/L0/LIDAR/CALIPSO_Lidar_02_LZ_2022-03-24T01-30-00Z_V01.DAT1
*****
ls: No match.
For 2022 03 25 there are    No data

```

/user/calprd> data_status.csh 2022 03 13 4

```

*****
For 2022 03 13 there are 16  Lidar_02_LZ files    ~ 99 coverage
For 2022 03 13 there are 16  Lidar_03_LZ files    ~ 99 coverage
For 2022 03 13 there are 16  Lidar_04_LZ files    ~ 99 coverage
For 2022 03 13 there are 16  IIR_01_LZ files      ~ 99 coverage

```

```

*****
For 2022 03 14 there are 16 Lidar_02_LZ files ~ 99 coverage
For 2022 03 14 there are 16 Lidar_03_LZ files ~ 99 coverage
For 2022 03 14 there are 16 Lidar_04_LZ files ~ 99 coverage
For 2022 03 14 there are 16 IIR_01_LZ files ~ 99 coverage
*****
For 2022 03 15 there are 16 Lidar_02_LZ files ~ 99 coverage
For 2022 03 15 there are 16 Lidar_03_LZ files ~ 99 coverage
For 2022 03 15 there are 16 Lidar_04_LZ files ~ 99 coverage
missing CALIPSO_IIR_01_LZ_2022-03-15 03-00-00Z
For 2022 03 15 there are 15 IIR_01_LZ files ~ 93 coverage
*****
missing CALIPSO_Lidar_02_LZ_2022-03-16 06-00-00Z
For 2022 03 16 there are 15 Lidar_02_LZ files ~ 93 coverage
For 2022 03 16 there are 16 Lidar_03_LZ files ~ 99 coverage
For 2022 03 16 there are 16 Lidar_04_LZ files ~ 99 coverage
For 2022 03 16 there are 16 IIR_01_LZ files ~ 99 coverage

```

Additonal Documentation

~~1. Static State of CAPS GUI~~

- ~~_____ To launch CAPS and monitor~~
- ~~_____ Open xterm, login to reggae as 'calprd'~~
 - ~~➤ tkb~~
 - ~~➤ top~~
 - ~~Minimize window.~~
- ~~_____~~
- ~~_____ Open second xterm, login to reggae as 'calprd'~~
- ~~_____ CAPS "Run PGE" should be on~~
- ~~_____ CAPS "Archive Product" should be off~~

~~Normally not much will be going on, unless data has recently come in.~~

~~CAPS needs to be in this state, with no processing or archiving going on before switching to any other processing mode.~~

This no longer applies as terminal timeouts have been deprecated.

2. Nominal CAPS Processing after BSA

Exclusive of Ongoing Archival of V4.51 data. This cannot run while that data is being pushed. CAPS will start in the 'Static' state.

CAPS "Run PGE" is on

CAPS "Archive Product" is off

Archive is off since no 'nominal' CAPS products will be archived. We don't want the LIDAR and

LIDAR-derived products archived until we have produced new Correction Factors.

See section 3 for information on how to remove LIDAR and LIDAR-derived products from the archive station

BSA on Oct 14. Nominal data should be produced through Sat Oct 15, data day 288.

On or around 10/17, there should be a failed LIDAR_CF job for Oct 15. Named something like

FAILED.LIDAR_CF.3.41.26.2022288000000

This will appear as a red square in the 'Run PGE' station of the CAPS GUI as well as a directory in

/calipso/calprd/CAPS/stations/run_pge

At this point no further work is required. STOP

If further data is required:

When FAILED.LIDAR_CF.3.41.26.2022288000000 shows up:

- cd /calipso/calprd/data/output/LIDAR_CF
- /calipso/calprd/bin/trigger_cf 2022-10-14 2022-10-15

This will create a "Specify Data" work order and move it into CAPS.

This should create the L1 LID jobs for data day 289.

There will be two more failures, once for each data day 289 and 290.

When FAILED.LIDAR_CF.3.41.26.2022289000000 shows up:

- cd /calipso/calprd/data/output/LIDAR_CF
- /calipso/calprd/bin/trigger_cf 2022-10-14 2022-10-16

This will create a "Specify Data" work order and move into CAPS.

This should create the L1 LID jobs for data day 290.

And then:

When FAILED.LIDAR_CF.3.41.26.2022290000000 shows up:

- cd /calipso/calprd/data/output/LIDAR_CF
- /calipso/calprd/bin/trigger_cf 2022-10-14 2022-10-17

This will create a "Specify Data" work order and move into CAPS.

This should create the L1 LID jobs for data day 291.

After these 3 failures, CAPS should run nominally, producing all CALIPSO products without intervention.

Expedited Archival is unaffected.

The 3 failed LIDAR_CF PGEs can be ignored.

3. Archiving L0 products and L1 IIR products

This is to remove the LIDAR and LIDAR-Derived products produced after the BSA from archive station.

Start doing this on Monday, Oct 17.

Allows archival of L1 IIR and Daily products to be archived.

Start with 'Static' state in CAPS GUI.

Turn CAPS "Run PGE" off

- cd /calipso/calprd/CAPS/stations/archive
- ls -l DO*
 - DO.L0_PHSD*
 - DO.L0*
 - DO.L1_IIR*
 - DO.L1_IIR_Stan*
 - DO.L1_LID*
 - DO.L2_LID*
 - DO.L2_IIR*
 - DO.LIDAR*
- rm -rf DO.L1_LID*
- rm -rf DO.L2*
- rm -rf DO.LIDAR*

Turn CAPS "Archive Product" on

After all jobs are done:

Return to 'Static' state of CAPS GUI

Turn CAPS "Archive Product" off

Turn CAPS "Run PGE" on

- cd /calipso/calprd/CAPS/stations/archive
- cleanlog

This process should be run any time you are starting 'fresh', μ if there are jobs in the archive station that you

didn't place there.

4. Ongoing Archival of V4.51 L1B Data

Exclusive of normal processing after Oct 14th BSA. Meaning this cannot run while CAPS has anything else

going in.

CAPS will start in the 'Static' state.

CAPS “Run PGE” is on
CAPS “Archive Product” is off

Turn off ‘Run PGE’

Turn on “Archive Products”

On reggae:

- `cd /calipso/calprd/CAPS/stations/archive`
- `create_bulk /calipso/calprd/bin/create_archive_wo \`
`"/SCF9/CALIPSO/Development/LIDAR_L1/L1B_LID_V4.51/$YY-MM*/*hdf"`

Will need to update YYYY-MM for current year/month

“” is important

This will create individual archive jobs for each file in the month. ~800 for normal Month.

There may be some failures in the archive station. This is expected. ASDC is aware.

Still in CAPS archive station:

- `re-run-ar`
Re-runs failed archive jobs.
May need multiple executions.

When there are no more jobs in the archive station return CAPS to ‘Static’ state:

Turn off “Archive Products”

Turn on ‘Run PGE’

Data is pushed monthly.

Will probably be into 2017.

5. Monitoring progress of previously pushed V4.51 L1B Data

Monitoring progress of previously pushed V4.51 L1B data

Run > `cd /calipso/calprd/CAPS/stations/archive`

- `mon “arch_status.csh 2017” 60`
`arch_status.csh` checks ‘local’ disk (SCF9) contents against DPO and SCF10.
`mon` is a helper script that runs the “command” every 60 seconds, keeping your window open

If the most recent month is nearly complete pushing data to SCF10, we can submit the next month. Nearly complete is less than about 200 files to be transferred to SCF10.

`arch_status.csh` output:

```
create_bulk /calipso/calprd/bin/create_archive_wo "/SCF9/CALIPSO/Development/LIDAR_L1/L1B_LID_V4.51/$YY-MM*/*.hdf"
```

```
Counting L1Bs on /SCF9/CALIPSO/Development/LIDAR_L1/L1B_LID_V4.51
```

```
01 03 04 05 06 07 08 09 10 11 12
```

```
/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016
```

	# L1Bs	# DPO	difference													
01	780	780	0	0	Oct	5	20:40	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/01								
03	501	501	0	0	Oct	6	17:53	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/03								
04	854	854	0	0	Oct	7	06:20	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/04								
05	873	873	0	0	Oct	7	19:38	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/05								
06	865	865	0	0	Oct	8	10:33	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/06								
07	858	858	0	0	Oct	8	22:26	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/07								
08	869	869	0	0	Oct	9	15:16	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/08								
09	871	871	0	0	Oct	10	06:10	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/09								
10	806	806	0	0	Oct	10	22:43	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/10								
11	668	556	-112	0	Oct	11	13:00	/ASDC/CALIPSO/LID_L1-Standard-V4-51/2016/11								

```
/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016
```

	# L1Bs	#SCF10	difference													
01	780	780	0	0	Oct	6	06:01	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/01								
03	501	501	0	0	Oct	7	02:19	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/03								
04	854	854	0	0	Oct	7	14:23	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/04								
05	873	873	0	0	Oct	8	04:40	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/05								
06	865	865	0	0	Oct	8	16:37	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/06								
07	858	858	0	0	Oct	9	08:04	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/07								
08	869	869	0	0	Oct	9	23:18	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/08								
09	871	871	0	0	Oct	10	16:43	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/09								
10	806	806	0	0	Oct	11	08:53	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/10								
11	668	6	-662	-6	Oct	11	13:18	/SCF10/Data_Archive/CALIPSO/LID_L1-Standard-V4-51/2016/11								

At this point, Nov 2016 is being archived.

There are 112 files still not yet pushed to the DPO.

Six(6) files have made it to SCF10.

(-6) at end indicates the deficit of .met files.

6. In case of Emergency

Turn off "Run PGE" in CAPS GUI and leave it off.

Ongoing archival can continue if there are no extraneous LIDAR or LIDAR-Derived products in the

'Archive' Station.

Reprocessing Appendix

LIDAR L2 Example

As user 'calprd' on reggae

1. Update the PGE:

Checkout the code from the repository. Set the CALHOME environment variable to be the parent path to the code ./src directory.

Run 'make' to compile the new executable. There are some warning messages that occur but that do not prevent compilation. Rename the executable to include the repository version number.

```
> cp SIBYL SIBYL.<revision_number>
```

Copy this executable to the PGE within CAPS.

```
> cp SIBYL.<revision_number> /calipso/calprd/CAPS/stations/run_pge/L2_LID/5.00.30/pge/
```

For tracking purposes, retain the SIBYL.<revision_number> executable within the CAPS PGE.

```
> cp /calipso/calprd/CAPS/stations/run_pge/L2_LID/5.00.30/pge/SIBYL.<revision_number>
SIBYL
```

Within the CAPS PGE copy SIBYL.<revision_number> to SIBYL.

CAPS runs 'SIBYL', so it needs to be renamed, but keep the copy.

Update input/output/runtime files.

CAPS stores the cfg file in /calipso/calprd/cfg

/calipso/calprd/cfg/L2_LIDAR for the LL2

CAPS uses input/output/runtime files with a _V5.00 tag in the filename. Verify the contents of

the files in the repository named:

```
cfg/input/LIDAR_L2/level_2_lidar.icfg
cfg/output/LIDAR_L2/output_vfm.ocfg (for all 9 products)
```

Agree with what CAPS uses.

```
/calipso/calprd/cfg/L2_LIDAR/level_2_lidar_V5.00.icfg
/calipso/calprd/cfg/L2_LIDAR/output_vfm_V5.00.ocfg (for all 9 products)
```

If needed, update the PCF template(s) with any new parameters or information.

Check the SSL files

LL2 ocg files in the repository are not named as they are used in the PGE. If there are further changes, will need to add the V5.00 tag.

If there are no further changes to the PCF, Steps 2&3 should be complete already.

2. Generating Reprocessing Work Orders

In /calipso/calprd/wo/L2_LID

```
> bwo.csh L2_LID_D 5.00 2015-01-01 2016-01-01
```

```
> bwo.csh L2_LID_N 5.00 2015-01-10 2016-01-01
```

These create the work orders to create the PCFs.

3. Generating the PCFs

In the CAPS GUI, make sure all stations are 'off' with the red bar.

Copy work order from Work order directory to the 'Reprocessing' station in CAPS.

```
> cpcr /calipso/calprd/wo/L2_LID/DO.REPRO_L2_LID_D.5.00.20160101000000.wo
```

cpcr is an alias to copies the file to the CAPS directory regardless of where you are.

```
/calipso/calprd/CAPS/stations/reprocessing
```

In the CAPS GUI, turn on the 'Generate PCF' station

In the CAPS GUI, turn on the 'Reprocessing' station. Then very quickly turn it off. Like within 10 seconds.

In the 'Reprocessing' Station, remove the files:

DO.RUNREPRO_L2_LID_D.5.00.20160101000000.wo and

RUNREPRO_L2_LID_D.5.00.20160101000000.log

You will need to substitute the date string for what ever year is being worked on.

The first looks very similar to the original work order but isn't. If left to run, it will exercise features of reprocessing that we do not use anymore.

4. Submitting Jobs to run.

PCFs are generally generated in yearly batches and submitted in bulk. It is possible to queue multiple years but takes some finesse.

In /calipso/calprd/CAPS/stations/reprocessing

```
> sub_L2.csh D YYYYMMDD000000
```

```
> sub_L2.csh N YYYYMMDD000000
```

YYYYMMDD is usually 20120101, but 2006 starts Jun 12, so is named 20060612.
Archive station should be off.

5. On-going processing can be viewed

```
> mon queue_status.csh 30
```

This runs a script every 30 seconds that shows:

```
2025 02 20 13:23:38
```

```
workq:
```

```
  Queued/Run: 0
```

```
  Running:   0
```

```
reprocess
```

```
  Queued/Run: 0
```

```
  Running:   0
```

```
  Failed:    4
```

```
  Finish:    0 hours  0 min at about Thu 20 Feb 2025 01:23:38 PM EST
```

It shows how many jobs are queued, running, and if there were any failed jobs.

The last line provides an estimate for when the currently queued/running jobs will finish.

Questions Questions Questions

1) Making sure the correct maps are named and where they need to be

Map should be named:

```
/calipso/calprd/data/ancillary/static/MIRA_LidarRatio532_LUTs_V5-00.h5
```

If they absolutely insist on changing the name, the PCFs will have to be re-generated.

2)same with the updated ocfg(s)

If there are further updates, use 'svn update' in /user/calprd/tdm/1393.LIDAR_L2_V5.00

In /user/calprd/tdm/1393.LIDAR_L2_V5.00/cfg , run

```
>cmp_diff_cfg_l2
```

Input configs

Comparing input/LIDAR_L2/level_2_lidar.icfg

```
/calipso/calprd/cfg/L2_LIDAR/level_2_lidar_V5.00.icfg
```

Repository and CAPS files are the same

.....

It will do this for the relevant icfg, SSL, and ocfg files. If there are any differences, it notes them.

It compares the repository with what is in CAPS:

3)error track if we have a problem

Its pretty seat of the pants. PCFs and log files from failed jobs will be in

```
/calipso/calprd/CAPS/stations/reprocessing/FAILED
```

Leaving the files there is a way to track. If a system hiccup can be identified, the PCF can be

moved back up a directory and resubmitted.
> re_sub.csh <PCF_NAME>
Will submit a single job

4) if I need to restart if we loose a node

PCFs will always

Failed jobs will be found in reprocessing/FAILED

Copy files up a directory and resubmit.

> re_sub.csh <PCF_NAME>
Will submit a single job

> bulk_re_sub.csh "DO.RUNREP_L2_LID_D.5.00.pcf*" or whatever wild card catches the jobs to
be re-run.

If there are only jobs to re-submit in the preprocessing directory (there are no currently
queued/running job), use the procedure out lined in "4. Submitting Jobs to run."
above.

5) Do the expected new maps have the name you expect, will I need to re-do PCF

You shouldn't have to re-generate the PCFs, unless they insist on a new name for it.

If they do insist, edit the PCF templates:

/calipso/calprd/CAPS/stations/run_pge/L2_LID/reproce/pge/L2_LID_?.pcf

There are only 2 templates used, though there are others in that directory.

LID 6054

Generate the PCFs as outlined above.

6. Location Of Logfiles:

Log files for completed runs will be in

/calipso/calprd/data/runlogs/2015-01-01/DO.RUNREP_L2_LID_D.5.00.20150101000000.00*

7. Location of PCFs.

/calipso/calprd/rcf/2015-01-01/DO.RUNREP_L2_LID_D.5.00.20150101000000.00*

8. Checkout

> svn co svn://caldev-cp/calipso/branches/LIDAR_L2_V5.00
> svn co svn://caldev-cp/calipso/trunk