

SOOT Power User Interface (PUI) User Guide:

The following instructions will guide a user through selecting, downloading, and merging data.









The homepage for the [SOOT Power User Interface](#) displays all available campaigns and deployments. To find data, simply select a campaign name or deployment year.

For example, select ACTIVATE's 2020 deployment.

Sub-Orbital Order Tool (SOOT) Power User Interface


Welcome to the [Sub-Orbital Order Tool \(SOOT\)](#) which is designed to promote suborbital research and analysis. Here you can discover and access the airborne and field campaign data archived at the Atmospheric Science Data Center (ASDC). The SOOT Power User Interface is intended for experienced airborne data users and airborne science teams.

Select a campaign and deployment: ?

 ACEPOL 2017	 ACTIVATE 2020 2021 2022	 Aeolus Cal/Val 2019	 AJAX 2011 2012 2013 2014 2015 2016 2017 2018
 ARISE 2014	 CAMP2EX 2018 2019	 CPEX-AW 2021	 DCOTSS 2021 2022

From the campaign's landing page, a user can review the campaign's summary, navigate to another deployment, or review the current selected deployment's data by selecting a platform, e.g., select the UC12 aircraft platform.

View all campaigns

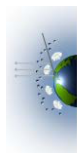
**ACTIVATE**
2020 2021 2022

Select a platform: ?

- ANALYSIS
- MERGE
- SATELLITE
- UC12
- HU25
- MODEL
- TRAJECTORY

SOOT Power User Interface: ACTIVATE

Marine boundary layer clouds play a critical role in Earth's energy balance and water cycle. These clouds cover more than 45% of the ocean surface and exert a net cooling effect. The Aerosol Cloud meTeorology Interactions oVer the western Atlantic Experiment (ACTIVATE) project is a five-year project (January 2019-December 2023) that will provide important globally-relevant data about changes in marine boundary layer cloud systems, atmospheric aerosols and multiple feedbacks that warm or cool the climate. ACTIVATE studies the atmosphere over the western North Atlantic and samples its broad range of aerosol, cloud and meteorological conditions using two aircraft, the UC-12 King Air and HU-25 Falcon. The UC-12 King Air will primarily be used for remote sensing measurements while the HU-25 Falcon will contain a comprehensive instrument payload for detailed in-situ measurements of aerosol, cloud properties, and atmospheric state. A few trace gas measurements will also be onboard the HU-25 Falcon for the measurements of pollution traces, which will contribute to air mass classification analysis. A total of 150 coordinated flights over the western North Atlantic are planned through 6 deployments from 2020-2022. The ACTIVATE science observing strategy intensively targets the shallow cumulus cloud regime and aims to collect sufficient statistics over a broad range of aerosol and weather conditions which enables robust characterization of aerosol-cloud-meteorology interactions. This strategy is implemented by two nominal flight patterns: Statistical Survey and Process Study. The statistical survey pattern involves close coordination between the remote sensing and in-situ aircraft to conduct near coincident sampling at and below cloud base as well as above and within cloud top. The process study pattern involves extensive vertical profiling to characterize the target cloud and surrounding aerosol and meteorological conditions.



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Once the platform is selected, several search filters are available, and a user can begin to select data:

The screenshot shows a search filter interface with three main sections:

- Principal Investigators:** A dropdown menu with a question mark icon and an upward arrow. It lists six names: BRIAN CAIRNS, JOHN HAIR, CHRIS HOSTETLER, SHANE SEAMAN, SNORRE STAMNES, and MELISSA YANG.
- Data IDs:** A dropdown menu with a question mark icon and a "Select All" link with a downward arrow. It contains a list of 15 data IDs, each with a checkbox and a blue link for variables (e.g., `*variables`). The IDs include: ACTIVATE-CAMERA-FORWARD, ACTIVATE-CAMERA-FORWARD-CLOUD-MASKS, ACTIVATE-CAMERA-NADIR, ACTIVATE-DROPSONDE, ACTIVATE-HSRL2, ACTIVATE-HSRL2-AOT, ACTIVATE-HSRL2-CLOUD, ACTIVATE-HSRL2-IMAGES, ACTIVATE-HSRL2-MLH, ACTIVATE-HSRL2-OCEAN, ACTIVATE-METNAV, ACTIVATE-RSP-AER, ACTIVATE-RSP-CLD, ACTIVATE-RSP-L1C, and ACTIVATE-RSP-WTRCLD.
- Start Dates:** A dropdown menu with a question mark icon and a "Select All" link with a downward arrow. It contains three date options: 2019-12-16, 2020-02-10, and 2020-02-13.

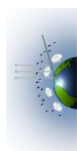
1. Principal Investigators (PIs) are the lead investigators for each dataset. By selecting a PI name, a user can filter down the data IDs to only those for the selected PI. To remove this filter, select the name that appears next to the data IDs header.
2. Data IDs are part of the filename that represent the parameters in the file either by measured parameter (e.g., O3, RH), class of compounds (e.g., VOC), or instrument abbreviation (e.g., PTRMS). For data IDs that include ICARTT files, a user can preview variables within those files using the blue `*variables` link beside the data ID name. A user can select the checkbox next to a Data ID to select all files associated with that data ID for download.
3. Start dates refers to the dates within the deployment and are pulled directly from the filename. A user can select all files for a date by selecting the checkbox beside that date.

NOTE: Start Dates do not filter Data IDs and vice versa.

On the right side of the screen, available data files are visible by expanding each PI dropdown or by selecting "Open All" at the top. Individual file selection is available below each PI dropdown.

The two screenshots show the file selection interface for Brian Cairns:

- The left screenshot shows a list of PI dropdowns: BRIAN CAIRNS (0 / 120 files), JOHN HAIR (0 / 34 files), CHRIS HOSTETLER (0 / 152 files), SHANE SEAMAN (0 / 42 files), and SNORRE STAMNES (0 / 25 files). The SNORRE STAMNES dropdown is circled in red. Below it, a table of files is visible with columns for "Select", "Filename", and "Size".
- The right screenshot shows the expanded view for BRIAN CAIRNS (0 / 120 files). It features a "Collapse All" button circled in red and a table of files with columns for "Select", "Filename", and "Size".

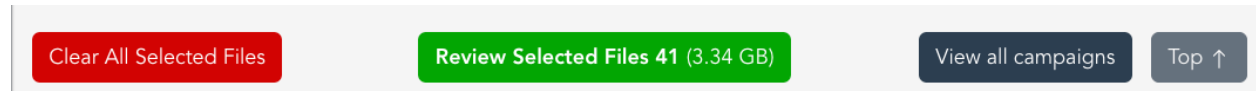


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As data are selected, a bar will appear on the bottom of the screen and remain there as long as data are selected. To review the selected files, click the green button “Review Selected Files,” which displays the number and total size of the selected files. To remove all selected files, click the red button “Clear All Selected Files.” The remaining buttons at the bottom of the page allow the user to navigate back to the homepage by selecting “View all campaigns,” or jump back to the top of the current page by selecting “Top.”



A user can select all data under the data IDs, Start Dates, or PI file table headers. For example, select the dates 2020-02-14 and 2020-02-15 from the Start Dates section, noticing that the files are now able to be reviewed both on the right side of the screen by each PI, as well as accessible in the green button “Review Selected Files”:

MERGE → MODEL
SATELLITE ✕ TRAJECTORY ✕
UC12

Principal Investigators: 6

BRIAN CAIRNS	JOHN HAIR
CHRIS HOSTETLER	SHANE SEAMAN
SNORRE STAMNES	LEE THORNHILL
MELISSA YANG	

Data IDs: 1 Select All

- ACTIVATE-CAMERA-FORWARD
- ACTIVATE-CAMERA-FORWARD-CLOUD-MASKS [*variables]
- ACTIVATE-CAMERA-NADIR
- ACTIVATE-DROPSONDE [*variables]
- ACTIVATE-HSRL2
- ACTIVATE-HSRL2-AOT [*variables]
- ACTIVATE-HSRL2-CLOUD
- ACTIVATE-HSRL2-IMAGES
- ACTIVATE-HSRL2-MLH [*variables]
- ACTIVATE-HSRL2-OCEAN [*variables]
- ACTIVATE-METNAV [*variables]
- ACTIVATE-RSP-AER
- ACTIVATE-RSP-CLD
- ACTIVATE-RSP-L1C
- ACTIVATE-RSP-WTRCLD [*variables]

Start Dates: 1 All | None

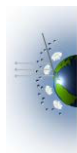
- 2019-12-16
- 2020-02-10
- 2020-02-13
- 2020-02-14
- 2020-02-15
- 2020-02-17

and surrounding aerosol and meteorological conditions.

Open All

BRIAN CAIRNS (8 / 120 files)
JOHN HAIR (2 / 34 files)
CHRIS HOSTETLER (13 / 152 files)
SHANE SEAMAN (4 / 62 files)
SNORRE STAMNES (2 / 25 files)
LEE THORNHILL (10 / 211 files)
MELISSA YANG (2 / 35 files)

Clear All Selected Files Review Selected Files 41 (3.34 GB)



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When ready to download or merge the selected data, click “Review Selected Files.” From here, review the list of selected files. To remove individual files, select the “x” button to the right of each filename.

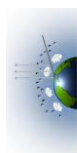
Selected 41 files (3.34 GB)

[Remove All](#)

Filename	Size	Remove
ACTIVATE-CAMERA-FORWARD-CLOUD-MASKS_UC12_20200214_R2.ict	124.69 K B	<input type="checkbox"/>
ACTIVATE-CAMERA-FORWARD_UC12_20200214170407_R0.mp4	748.87 M B	<input type="checkbox"/>
ACTIVATE-DROPSONDE_UC12_20200214_R0_20200930_README.pdf	566.85 K B	<input type="checkbox"/>
ACTIVATE-DROPSONDE_UC12_202002141729_R1.ict	187.73 K B	<input type="checkbox"/>
ACTIVATE-DROPSONDE_UC12_202002141747_R1.ict	173.61 KB	<input type="checkbox"/>
ACTIVATE-DROPSONDE_UC12_202002141826_R1.ict	190.63 K B	<input checked="" type="checkbox"/>
ACTIVATE-DROPSONDE_UC12_202002141925_R1.ict	191.67 K B	<input type="checkbox"/>
ACTIVATE-DROPSONDE_UC12_20200214_R1_THRU20200930-README.pdf	363.89 K B	<input type="checkbox"/>
ACTIVATE-HSRL2-AOT_UC12_20200214_R0.ict	125.39 K B	<input type="checkbox"/>
ACTIVATE-HSRL2-CLOUD_UC12_20200214_R1.h5	237.75 M B	<input type="checkbox"/>
ACTIVATE-HSRL2-IMAGES_UC12_20200214_R3.zip	6.46 MB	<input type="checkbox"/>
ACTIVATE-HSRL2-MLH_UC12_20200214_R0.ict	179.49 K B	<input type="checkbox"/>

[Click here to provide feedback on merge capability.](#)

To download files, a user must have an EarthData Login. When ready to download, click “Download Files” and proceed to the EarthData Login to create or log into an existing account. Once logged in, the page will be directed back to SOOT; review the data download and wait for the packaging to complete. The files will be packaged into a zip file for faster downloading. Once the files are ready to download, select the green download button.



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SOOT Merge User Guide:

The SOOT merge service is a new feature that allows users to align selected data to a common time base. To review merge options, select data as described above. On the selected files screen, select “Merge Files” instead of “Download Files.”



This opens the merge options page.

Merge Options [SOOT PUI Merge User Guide](#)

Selected Variables:

- ACTIVATE-CAMERA-FORWARD-CLOUD-MASKS (1) ▾
- ACTIVATE-HSRL2-AOT (8) ▾
- ACTIVATE-HSRL2-MLH (12) ▾
- ACTIVATE-HSRL2-OCEAN (3) ▾
- ACTIVATE-METNAV (11) ▾
- ACTIVATE-RSP-WTRCLD (12) ▾

Time Base Mode:

Choose a generic time base interval:

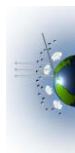
60 sec 30 sec 15 sec 10 sec 5 sec 1 sec

Processing Option:

Mergeable:

Filename	Why are these files able to be merged?
ACTIVATE-CAMERA-FORWARD-CLOUD-MASKS_UC12_20200214_R2.ict	Merge is available for ICARTT (.ict) file formats from the same campaign, target date, launch, and platform.
ACTIVATE-HSRL2-AOT_UC12_20200214_R0.ict	
ACTIVATE-HSRL2-MLH UC12 20200214 R0.ict	

Include Input Files in Download?



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The first merge option is the selection of variables to be included in the merge results. Each merge-able data ID will have a dropdown option for variables. All variables are selected by default. To select individual variables, utilize the checkboxes to the left of the variable names.

Selected Variables:

ACTIVATE-CAMERA-FORWARD-CLOUD-MASKS (1) ▾

ACTIVATE-HSRL2-AOT (8) ▾

Select	Variable Name	Units	Description	Standard Name
<input checked="" type="checkbox"/>	Latitude	deg		Platform_Latitude_InSitu_None
<input checked="" type="checkbox"/>	Longitude	deg		Platform_Longitude_InSitu_None
<input checked="" type="checkbox"/>	GPS_Altitude	m		Platform_Altitude_MSL_InSitu_None

The next option is the time base mode to which the data will be aligned.

1. The default option is a generic 60 second merge. Other generic time base intervals include 30, 15, 10, 5, or 1 second merges.

Time Base Mode:

Choose a generic time base interval:

60 sec 30 sec 15 sec 10 sec 5 sec 1 sec

2. Custom time bases can be selected by changing the Time Base Mode dropdown from "Generic" to "Custom," where any positive numeric custom time base can be entered in the text box.

Time Base Mode:

Enter custom data interval (seconds):

3. The third option is "Data ID Time Base," which allows the selection of a time base from the time interval of a selected file. This section requires the selection of a base file for each mergeable data ID, meaning that each campaign and platform merge will need its own selected file. A user can select a time base from the selected data IDs or from the associated navigation/housekeeping file.

Time Base Mode:

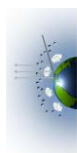
Choose a dataID to use as the time base for each campaign-platform below:

ACTIVATE-UC12

✓ Please select base file
 ACTIVATE-CAMERA-FORWARD-CLOUD-MASKS
 ACTIVATE-HSRL2-AOT
 ACTIVATE-HSRL2-MLH
 ACTIVATE-HSRL2-OCEAN
 ACTIVATE-METNAV
 ACTIVATE-MetNav
 ACTIVATE-RSP-WTRCLD

The final merge option is the selection of processing type. By default, the merge will process average only, but users can also select an additional option to process for average, standard deviation, and number of points.

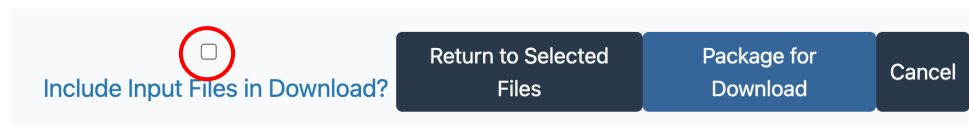
Processing Option:



Below the Processing Option section, the selected files will be listed out, in either the Mergeable or Non-Mergeable lists. This informs the user of what files are mergeable and why. Reasons for why files are not mergeable include:

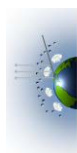
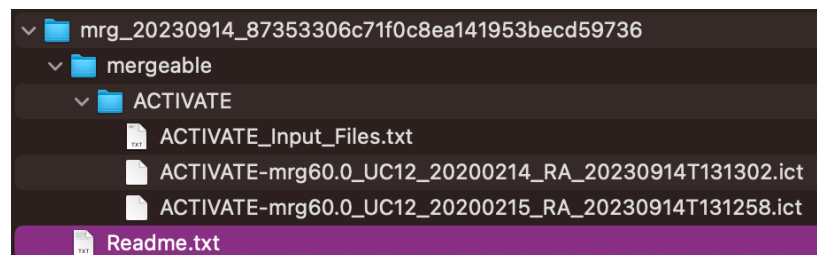
1. Non-Mergeable platforms including analysis, dropsondes, merge, model, pandora, radar, satellite, sondes, and trajectory.
2. Non-Mergeable file types including any files that are not in the ICARTT file format. Currently the SOOT Merge is only available for ICARTT files.

Finally, a user can choose to include the selected files to be downloaded alongside the merge results file. By default, the input files will not be included. To download input files with the merge results, simply check the checkbox at the bottom left of the merge options panel.



Once ready to complete and process a merge, press the blue “Package for Download” button. Log into Earthdata when directed (an EarthData Login account is required to download files from SOOT). After being redirected back to the SOOT download page where the status of the merge can be reviewed. The status will go from “Merging...” to “Packaging...” before a green button to “Download” the zipped file appears.

When the zip file is extracted, the results will resemble the folder example below. To better understand the merge results file, review the included “ReadMe.txt” file (also shown below). Regardless of if the input files were selected to download, a text file listing the input file names will be included in the merge results folder.



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Example of the readme:

```
Readme.txt

This zip file contains two folders, one for mergeable files and one for non-mergeable files.

The mergeable folder includes a folder for each campaign for which a merge was performed. If input files were not requested, each campaign folder contains a .txt file listing the files used for the Merge(s) and the merge results file(s). If the inclusion of input files was requested, each campaign folder contains a .txt file listing the files used for the Merge(s) and sub-folders for each merge group, where a merge group includes files that share the same campaign, platform, start date, and launch number.

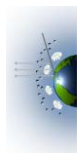
In addition to the files selected for merge, the campaign's Input_Files.txt file will also contain any navigation files that were used in the merge.

The merge group folders contain the merge results file(s) and a directory containing the input files.

The non-mergeable folder includes all files that cannot be merged. Reasons why a file cannot be merged include:
- Files are not in an ICARTT format.
- Files that do not belong to a mergeable platform

The Merge output file naming convention is:
CampaignName-mergeTimeBaseChosen_Platform_DataDate_R0_Launch#(if applicable)_DateTimeFileMerged
Sample file name: ACTIVATE-merged_0_HU25_20210514_R0_L1_20230120T141730.ict

Resources:
- ICARTT file standards: https://www.earthdata.nasa.gov/s3fs-public/imported/ESDS-RFC-029v2.pdf
- Merge methodology document: https://asdc.larc.nasa.gov/documents/soot/soot-merge-functionality-v1.pdf
```



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