Improving Access to Past & Present NASA Airborne Research Data & Information

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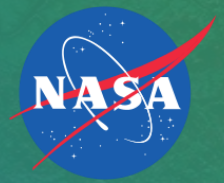

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Introduction to NASA's ADMG

- NASA's ***Airborne Data Management Group*** was established in September 2018 within IMPACT (Interagency Implementation and Advanced Concepts Team) at NASA MSFC
- Initial efforts were somewhat built around previous work by NASA LaRC

ADMG's Primary Role is to **support data producers and DAACs** in making sure that NASA airborne science data are discoverable and usable by the broader research community

Why ADMG?

- NASA conducts airborne investigations to study geophysical features and physical relationships in support of satellite validation and science research. These data are not as well supported as NASA satellite data
- Distributed Active Archive Centers (DAACs) serve discipline-specific communities with specialized tools & information, but there is ***little consistency across DAACs for airborne data stewardship***
- ADMG exists as a knowledge center to improve information distribution, develop best practices, and advise on cross-DAAC tool/technology development
- We ***improve existing communication pathways*** between scientists, DAACs, managers, and users

To best serve all stakeholders, ADMG is separate from DAACs, functioning under the direction of **NASA Earth Science Data Systems**

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ADMG Primary Focus Areas

Improve Communication & Processes

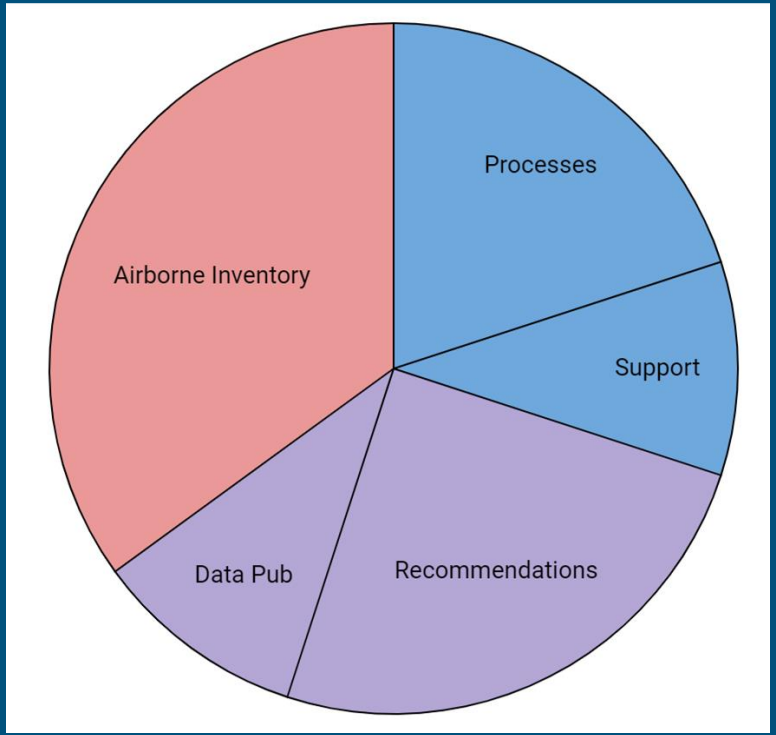
- Develop standardized processes to bring consistency to airborne data stewardship practices
- Support airborne investigation scientists, DAACs, data managers, and data users

Improve Data Management

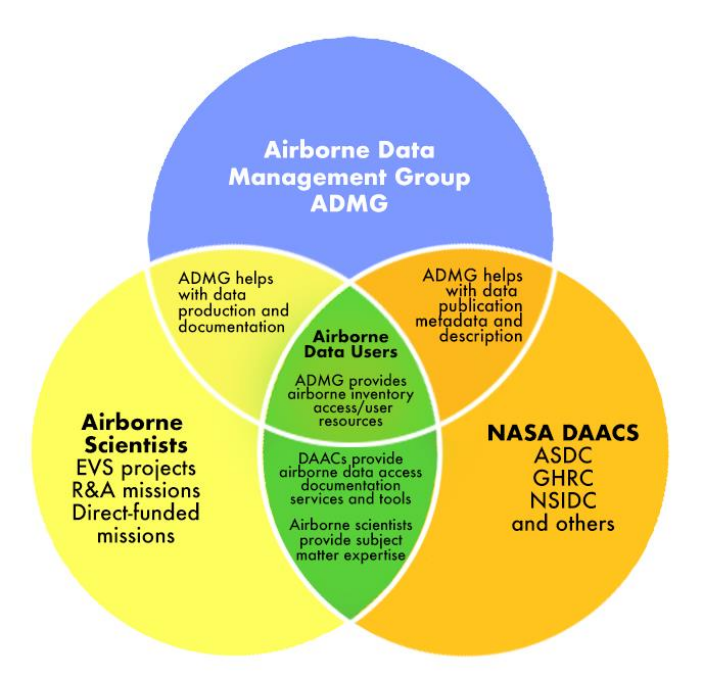
- Locate historical airborne data and work to publish
- Provide recommendations for improving airborne data discovery and use across EOSDIS

Improve Access to Airborne Data & Information

- Create an actively curated NASA Earth Science Airborne Data Inventory
- Serve as knowledge base for airborne science data communities



Improving Communication & Processes

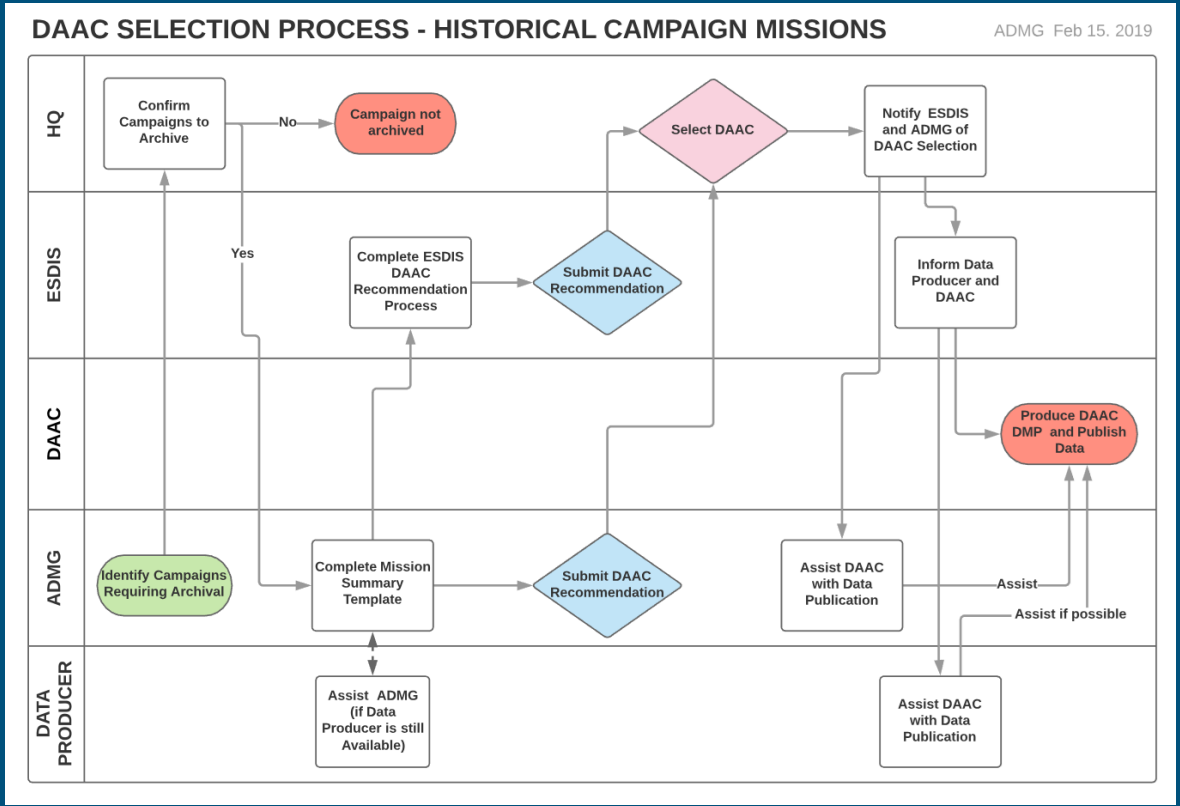


- Serve as ***point-of-contact and resource*** of airborne information
  - data producers, DAACs, ESDIS, project teams, users
- Promote a ***consistent experience*** across multiple DAACs
- Identify and ***help solve issues*** with NASA airborne science data formats, transfer, publication, discovery, & archive/distribution
- Devise ***process improvements*** to yield more efficient data transfer, publication, and archiving
  - suggest best practices for improved data management & stewardship
- Assist with use of standardized formats, metadata, and development of ***Data Management Plans (DMPs)***
- Clarify ***roles and expectations*** to improve communication and collaboration among various airborne data stakeholders

Example: Specific ADMG EVS-3 Efforts

- Participate in ***Earth Venture Suborbital (EVS)-3 meetings*** from the start through planning phase
- Assist data producers and DAACs in creating ***Data Management Plans (DMPs)***, facilitating use of good metadata and standards
- Serve as a primary data/metadata/archival information ***resource*** for teams until DAACs are assigned
- Assess and help improve ***timeliness of airborne data transfer***, publication, and archive by helping to remove technical & communications obstacles
- ***Address issues*** that arise pertaining to EVS project data formats, metadata, and documentation to improve data handling and accessibility

Improving Data Management

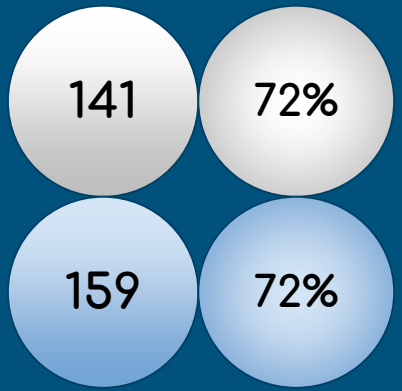


- Devise new ***data publication workflow***
  - Summarize campaigns; gather metadata
  - Function as data producer proxy for historical products
  - Promote discoverability & access
- Locate & ***prioritize historical airborne campaign data*** for archive at appropriate NASA DAACs
- Provide ***recommendations for GCMD keywords & CMR*** improvements
  - Including impacts on DAAC holdings

Improve Data Access: Airborne Inventory

- Take an agency-wide ***Airborne Data Inventory***
- Provide inventory results to scientific community to increase data access
- Add needed metadata such as campaign, flight, aircraft, instrument, and data product metadata

LaRC: number of identified campaigns



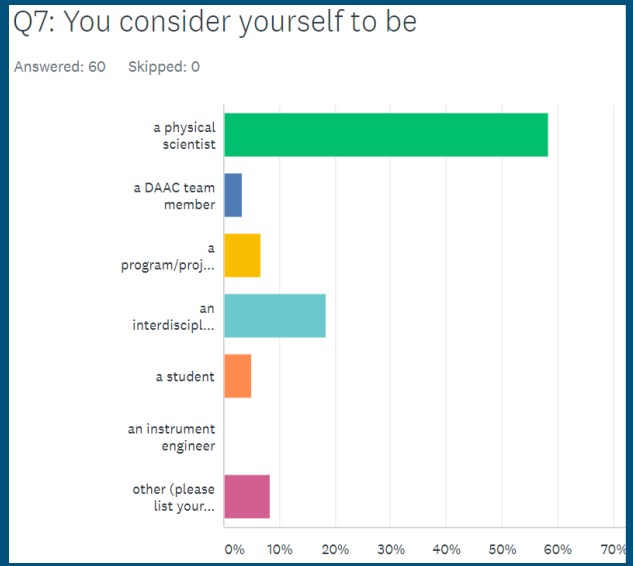
LaRC: % of campaigns archived at DAACs

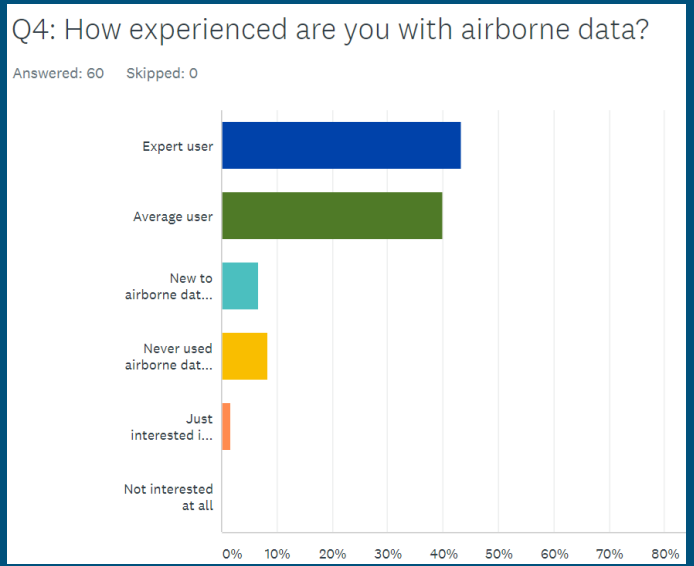
ADMG: number of identified campaigns

ADMG: % of campaigns archived at DAACs

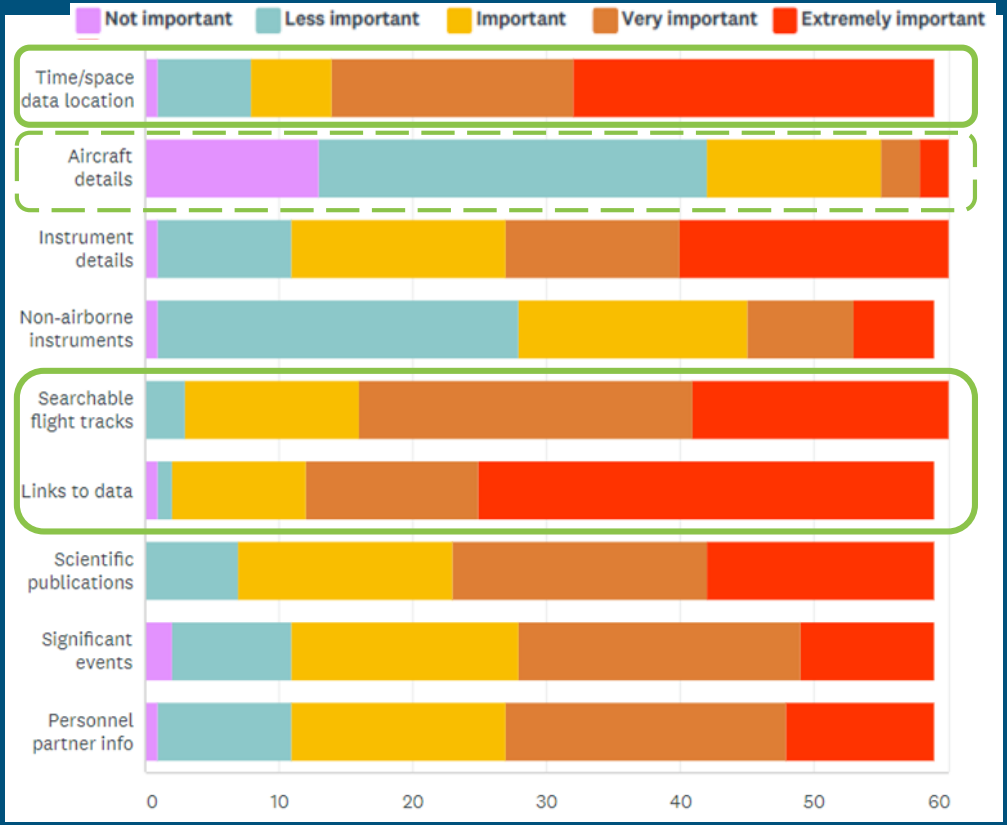
Improve Data Access: Airborne Inventory

- Airborne science data user community interest survey: Aug 2019, 60+ respondents
  - 7 questions, ~4 min
- Responses from ADMG's target user group, with a variety of focus areas





Inventory Survey Results

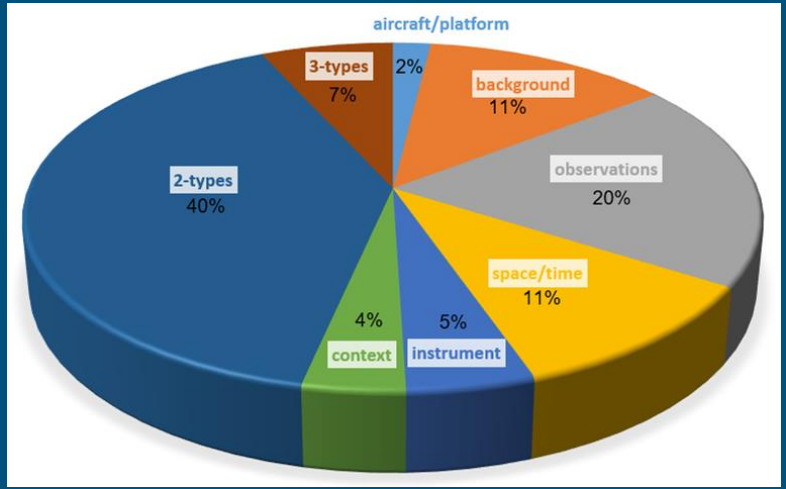


Features Prioritization:

1 - Links to data
2 - Time/space data location
3 - Searchable flight tracks
4 - Scientific publications
5 - Instrument details
6 - Personnel & partner info
7 - Significant events
8 - Non-airborne instruments
9 - Aircraft details

Survey Queries Analysis: Methodology

- 60+ respondents -> 113 open response queries provided
- 11 queries removed: inappropriate or analysis-based
  - E.g.: “How best to work Battle Rhythm to affect safe employment of Airborne Inventory?”
- 102 valid open response queries



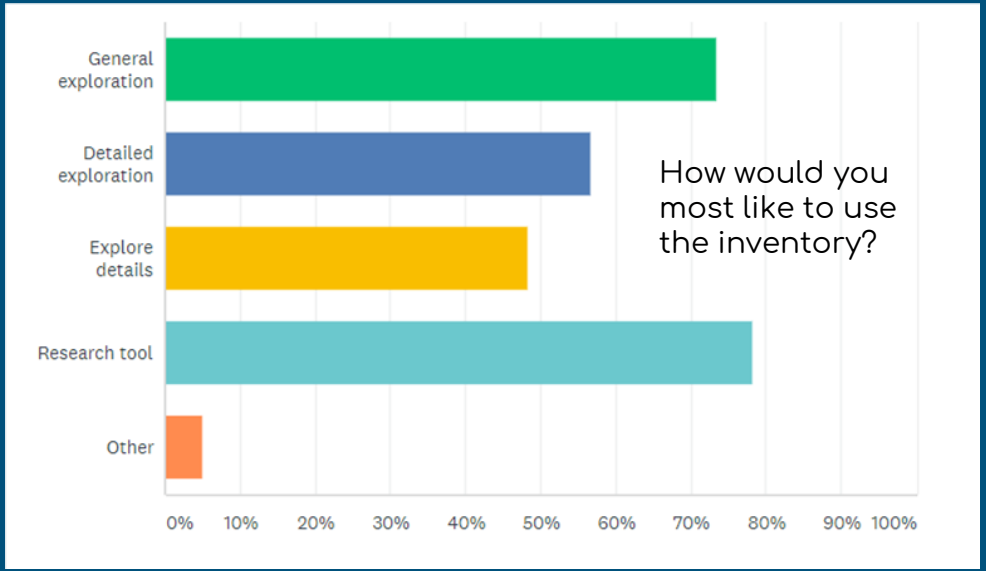
Query Types:

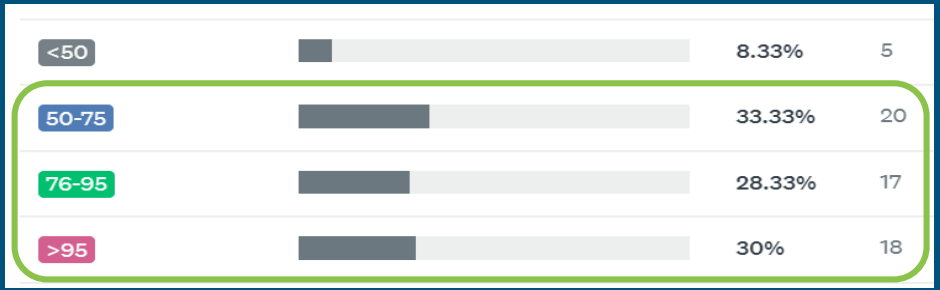
- **Observations:** seeks data relating to specific type of observation(s)
- **Aircraft/platform:** seeks info on specific aircraft(s) or platform(s)
- **Instrument:** seeks data collected with a specific instrument
- **Space/time:** seeks data collected in a defined region of space or period of time
- **Context:** seeks data collected over/in a particular surface type or context (over ice, in a smoke plume)
- **Background:** seeks info on data volume, DAAC, or investigation planning/description info (funder, PIs, etc)
- **Combinations** of the above listed types

Survey Summary

Clear priorities for content, functionality:

- Fixed Response Questions:
  - Least needed: aircraft details
- Free Text Queries:
  - Observations, Space/time
  - Context
- Major Takeaways:
  - Help scientists access info & data quickly
  - Allow for complex questions
  - Prioritize: flight tracks; Less: aircraft details
  - Curation of metadata/time spent is vital – need beyond what's in CMR!





→ more than half of respondents would use inventory if it *serves their needs*.

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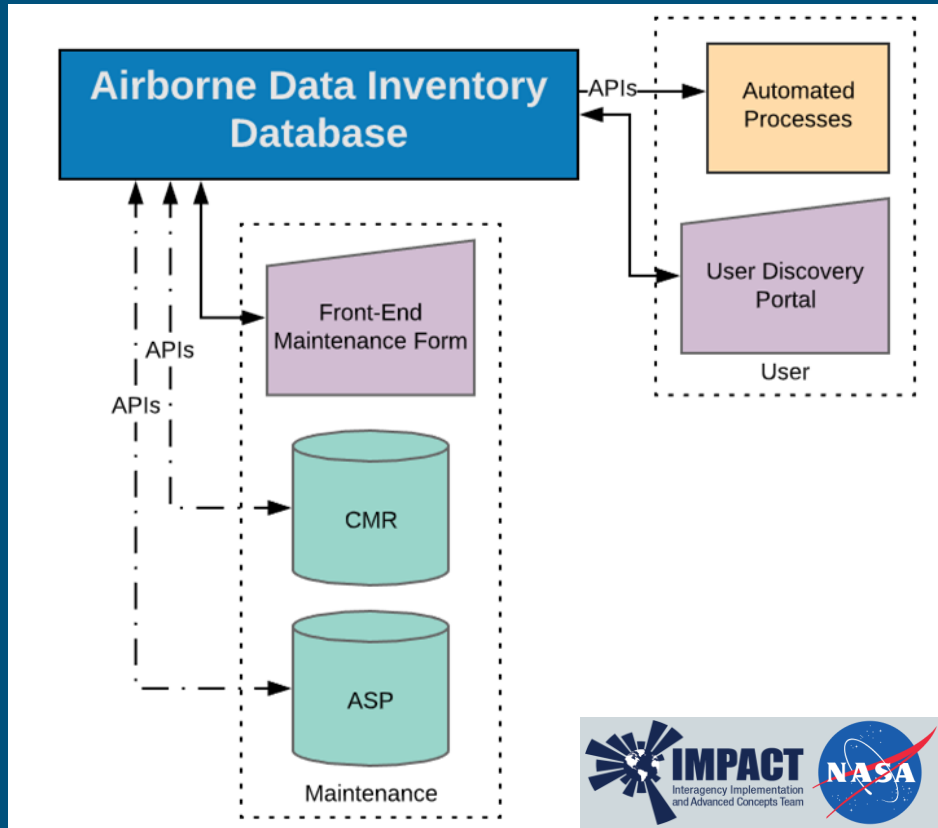
Airborne Inventory - Components

- APIs for database information
  - Ingest from CMR, NASA Airborne Science Program
  - User/computer access to ADMG's inventory database contents
- Maintenance Interface (MI)
  - Internal/restricted
  - Active curation
- Data Discovery Portal
  - Public/user interface (UI)



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J63.3 Construction of an Airborne Data Inventory for Improved Data Discoverability & Access

Summary

- Support data producers and DAACs to ***ensure discoverability & usability of NASA airborne Earth science data*** among various research communities
    - Communication & Processes: Identify & ***resolve communication pathway issues*** among scientists, DAACs, managers, research and applied users
    - Data Management: ***Strive for consistency*** across DAACs for best practices in data publication, description, management, and provided resources/tools
    - Improve Access: ADMG's ***Airborne Data Inventory***; Facilitate publication of historical airborne campaign data
- Interwoven with ***current NASA EVS-3*** projects, and planning for further improvements to EVS-4 procedures
- Airborne data share challenges with other track-based observations
    - ADMG is a resource for the broad airborne community
    - ***YOUR suggestions & ideas welcome!***

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Thank You!!

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J63.3 Construction of an Airborne Data Inventory for Improved Data Discoverability & Access

For more Info:

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https://earthdata.nasa.gov/esds/impact/admg

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