

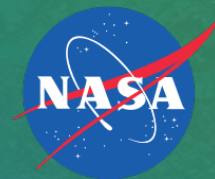
Improving Access to Past & Present NASA Airborne Research Data & Information

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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**



ADMG Primary Focus Areas

Improve Communication & Processes

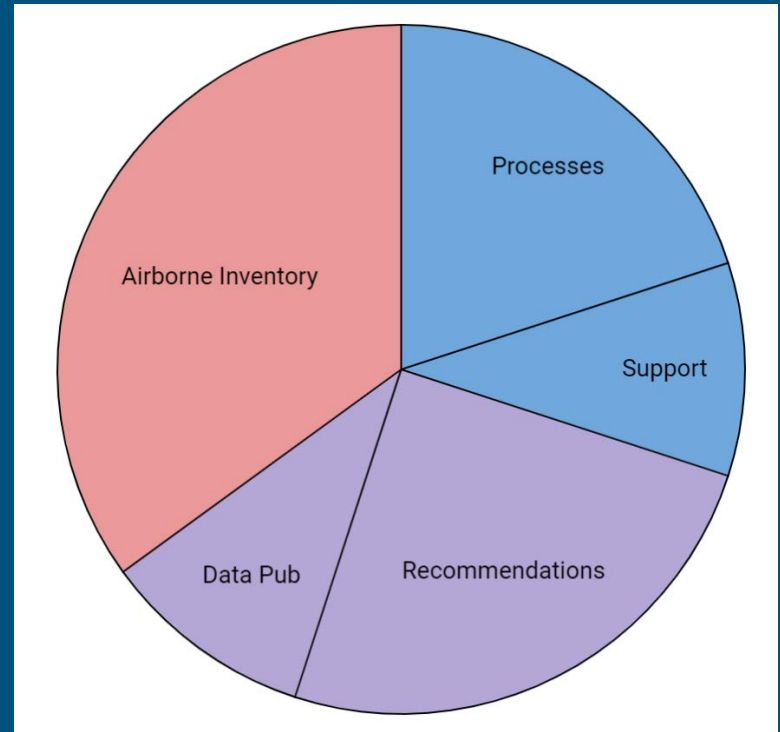
- Develop standardized processes to bring consistency to airborne data stewardship practices
- Support airborne investigation scientists, DAACs, data managers, and data users

Improve Data Management

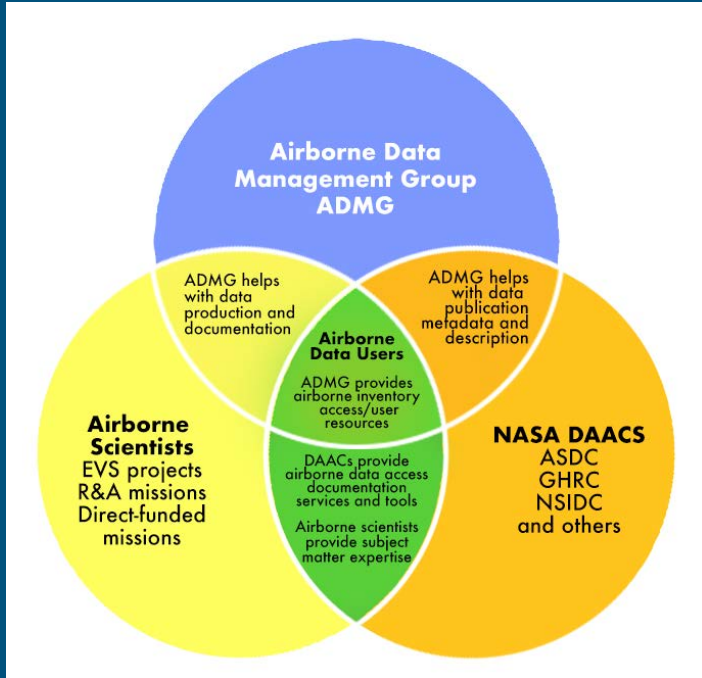
- Locate historical airborne data and work to publish
- Provide recommendations for improving airborne data discovery and use across EOSDIS

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

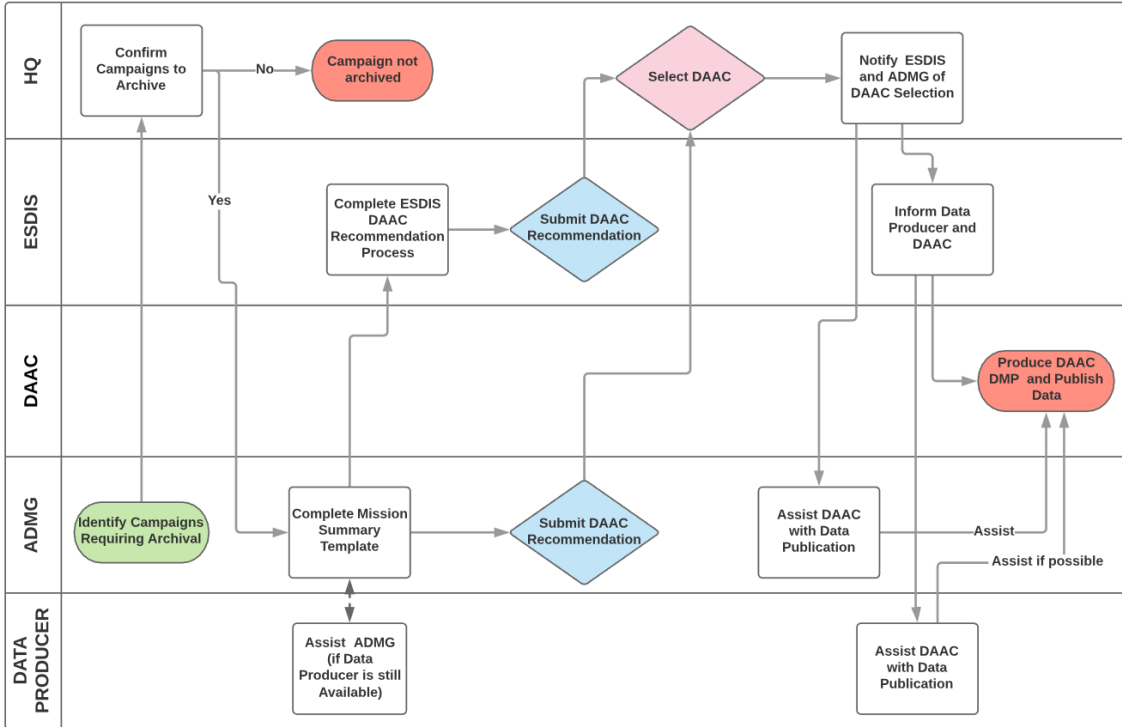
- Participate in *Earth Venture Suborbital (EVS)-3 meetings* from the start through planning phase
- Assist data producers and DAACs in creating *Data Management Plans (DMPs)*, facilitating use of good metadata and standards
- Serve as a primary data/metadata/archival information *resource* for teams 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

DAAC SELECTION PROCESS - HISTORICAL CAMPAIGN MISSIONS

ADMG Feb 15, 2019



- 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

141

72%

LaRC: % of campaigns archived at DAACs

ADMG: number of identified campaigns

159

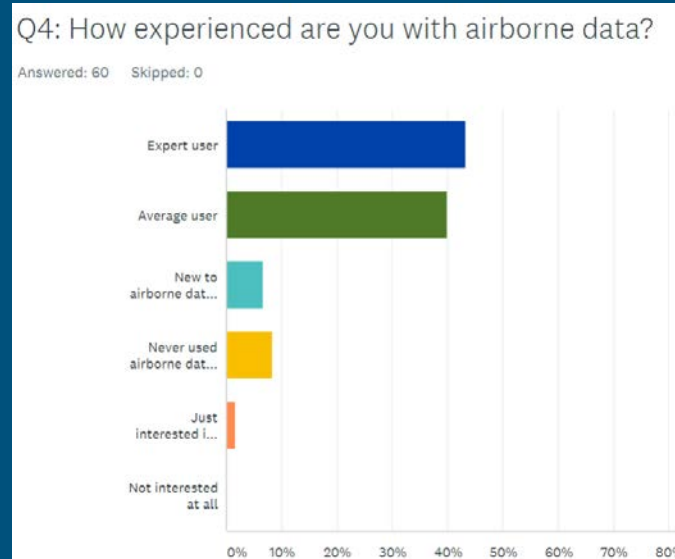
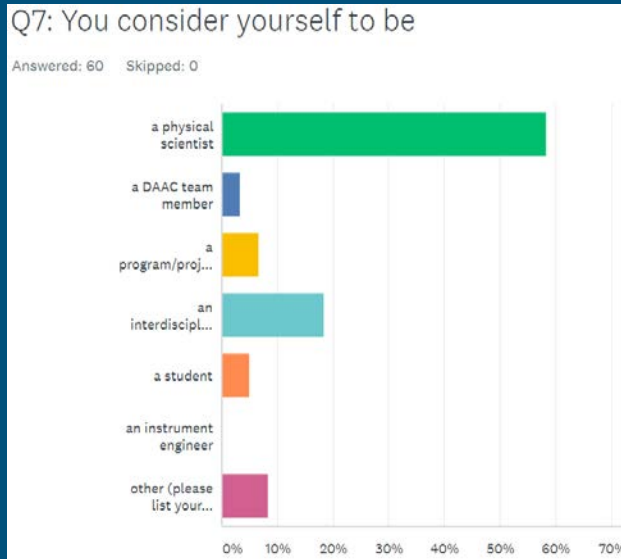
72%

ADMG: % of campaigns archived at DAACs

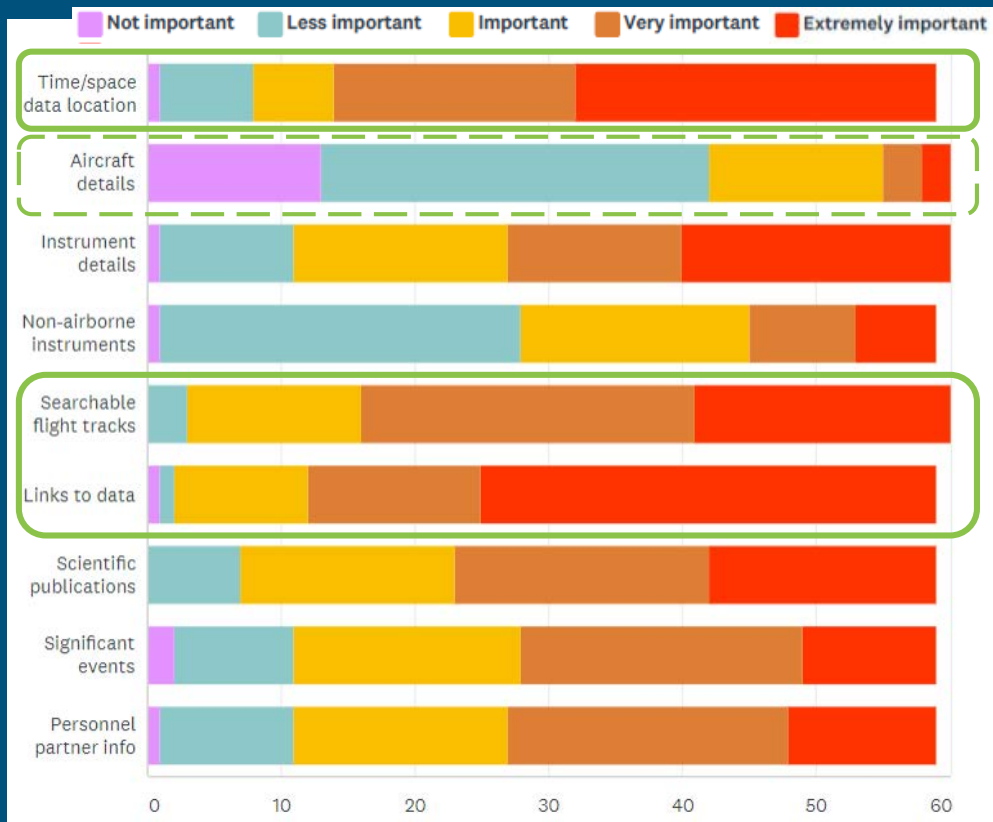


Improve Data Access: Airborne Inventory

- 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:

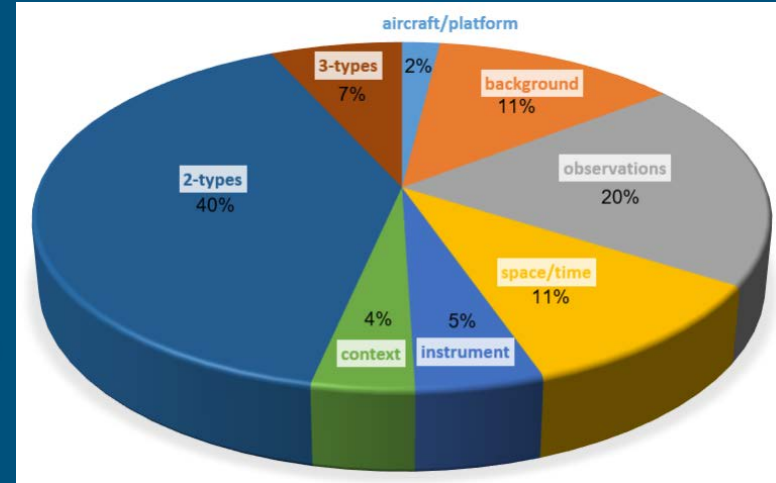
- 1 - Links to data
- 2 - Time/space data location
- 3 - Searchable flight tracks
- 4 - Scientific publications
- 5 - Instrument details
- 6 - Personnel & partner info
- 7 - Significant events
- 8 - Non-airborne instruments
- 9 - Aircraft details

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:

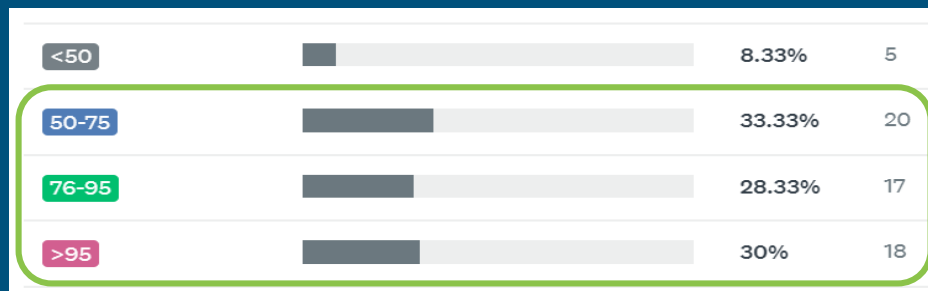
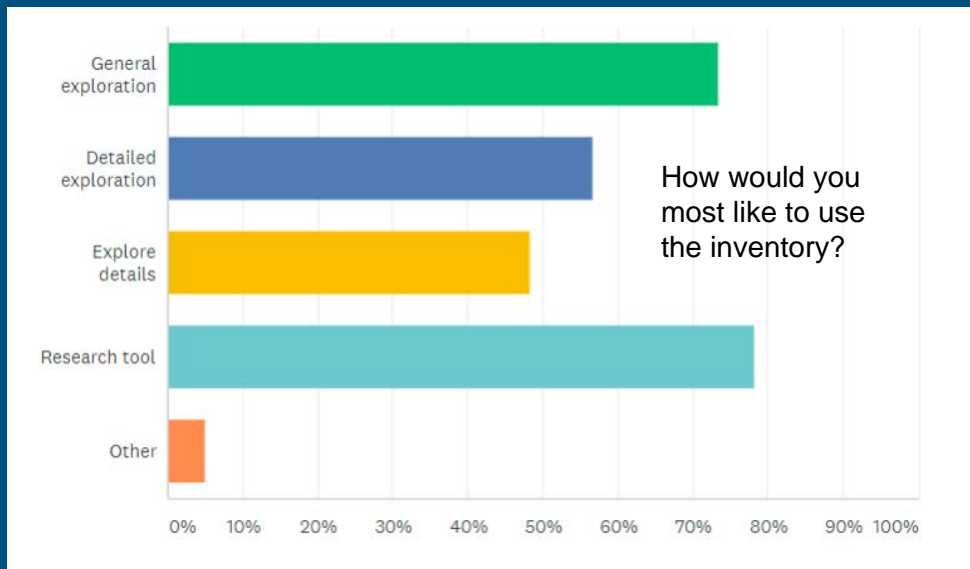
- **Observations:** seeks data relating to specific type of observation(s)
- **Aircraft/platform:** seeks info on specific aircraft(s) or platform(s)
- **Instrument:** seeks data collected with a specific instrument
- **Space/time:** seeks data collected in a defined region of space or period of time
- **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*

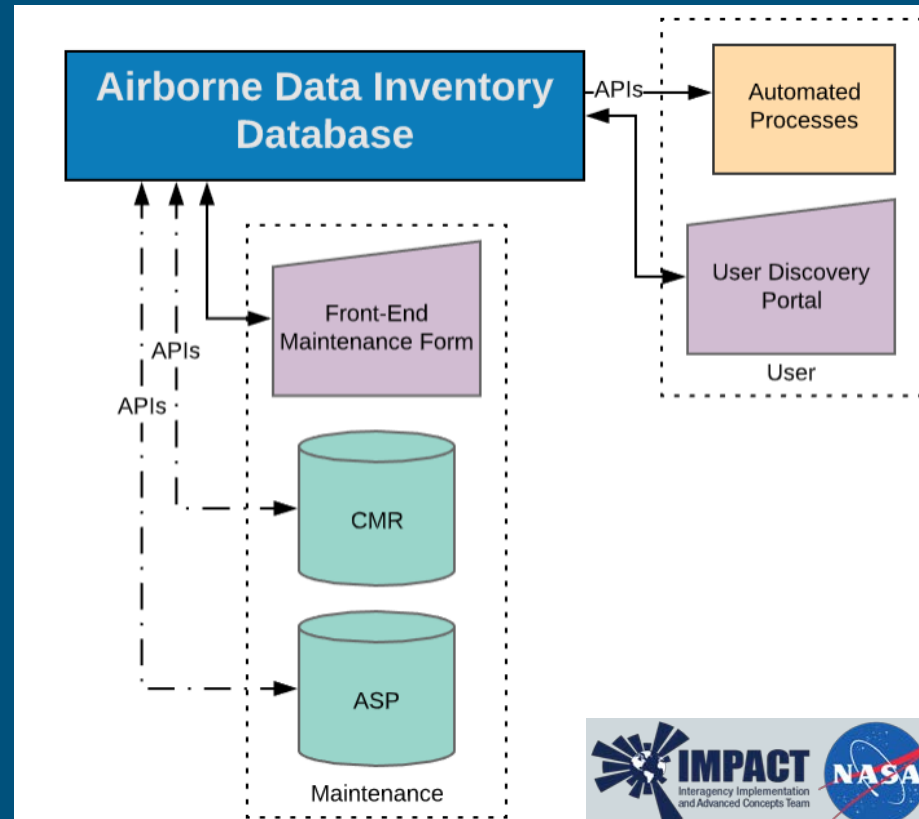


Airborne Inventory - Components

- 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)

→ 11a Thurs - Rm 157 C ←

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!***



Thank You!!

→ 11a Thurs - Rm 157 C ←

*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>



ADMG's Airborne Data Inventory

- Meet user needs - so require user input in development
- Curation of information is vital - time spent on metadata is valuable
- Need additional metadata beyond what is currently available in CMR
- Build a tool they will use

- Why not Earthdata Search? (61% of needed information already in Earthdata Search)
 - Interface - scientists think in queries, want responses in context
 - Vocabulary disconnects
 - “provider” != daac; “provider” = institution
 - 39% of queries not presently possible via Earthdata Search
 - 31% neither Earthdata Search or ADMG's Inventory can answer...but...
 - 21% could be if additional metadata/capability were added to Inventory
 - Time and cost to add additional capability prohibits



ADMG Successes & Plans

FY 2019 Deliverables

- ADMG introduction slide set
- Level of Service model
- DAAC assignment workflow
- Airborne Investigation DMP Guide
- Redesigned DMP approval process
- Inventory needs survey & analysis
- Roles & expectations list for airborne data producers, DAACs, and ADMG
- Various reports to NASA HQ, ESDS

FY 2020 Goals:

- Continue to support process & communication improvements
- Facilitate publication of historical airborne campaign data
- Inventory content, interface, guides/ documentation development
- Use case database: describe specific problems, key contributing issues, potential resolutions
- Updated guidelines, processes; Formalize GCMD & CMR suggestions, including report on effects to DAAC holdings

