



Rescuing NASA's Historical Airborne and Field Data for Open Access and Reuse

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50 Years of Suborbital Earth Observations

- NASA studies the Earth with **more than satellites!**
- Air- land- and water-based platforms (mobile and stationary)
- Unique observations, critical to understanding physical processes on a wide range of scales



Supplement satellite observations

Support a variety of science disciplines



All images: NASA

Airborne Data Management Group

The **Airborne Data Management Group (ADMG)** focuses on improving NASA airborne and field data discoverability, access and use. ADMG is part of the Interagency Implementation and Advanced Concepts Team (IMPACT) at Marshall Space Flight Center.

ADMG Primary Tasks:

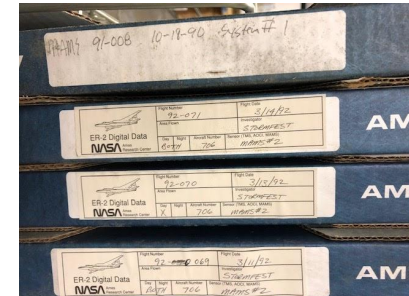
- Take a **full assessment** of NASA Airborne Earth Science data
- Construct a public, centralized, **metadata-rich inventory** of airborne and field investigations, platforms, instruments, and data product access
- Develop systematic **approaches and best practices** that bring **consistency and expediency** to airborne and field data stewardship
- Maintain a **knowledge center** containing important information and document access, and simplified access to **airborne tools** and **use cases**
- Improve communication between the DAACs, airborne campaign investigators, ADMG, and other stakeholders

The Need for a Suborbital Data Inventory

- Heterogeneity abounds:
 - Variables, formats, resolutions, documentation
 - NASA's Distributed Active Archive Centers (DAACs)
 - Discipline-oriented
 - Individual procedures
 - Domain-specific tools
- Inconsistent user/provider experiences across DAACs
→ Creates barriers for cross- and interdisciplinary science
- High risk of loss for unpublished and historical data
 - 50 years of suborbital data (!)
 - Obsolete and/or degrading formats, analog data
 - Fading institutional memory
 - Must be made FAIR:
 - Findable, Accessible, Interoperable, Reuseable



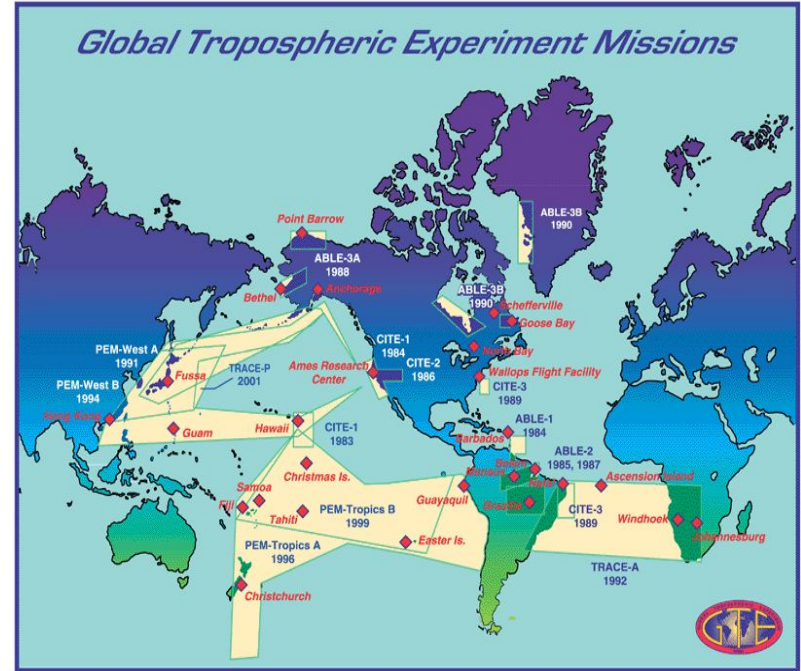
ADMG's data rescue efforts at WFF (top) & Ames (bottom)



All images: ADMG/NASA

Data Archeology

- Historical data can remain valuable if made discoverable, accessible, and reusable.
- ADMG works to locate, recover, and facilitate the transition of historical suborbital data to NASA DAACs.
- ADMG gathers the contextual information and operates as a knowledge center in order to (re)use these historical datasets.



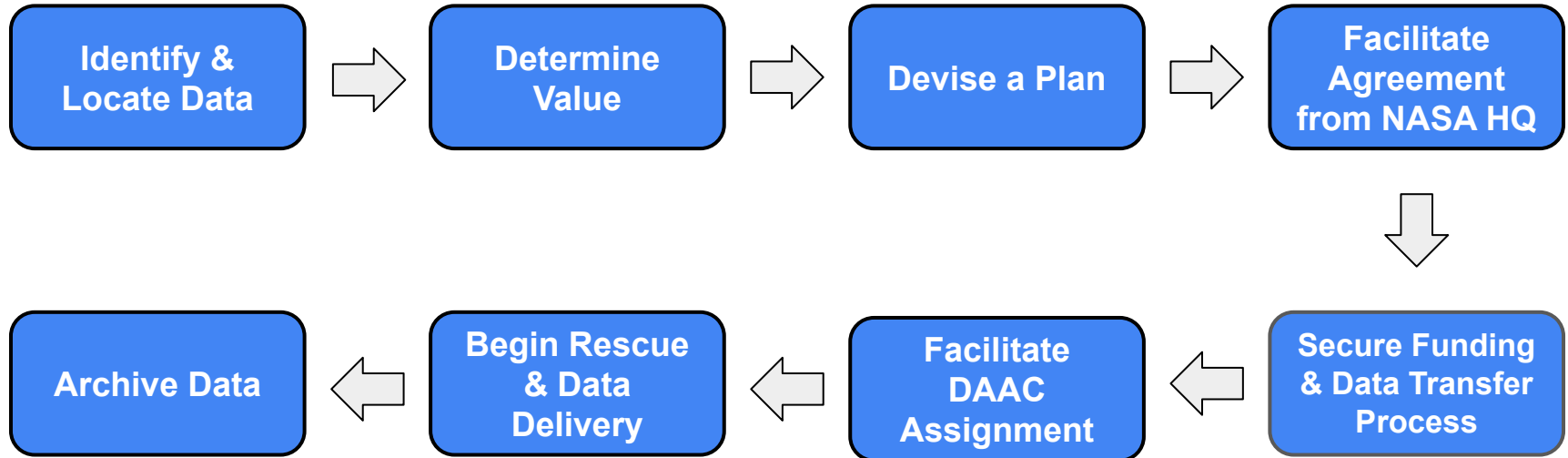
Data Rescue vs. Data Recovery

Data rescue: the act of finding and transferring data from a non-public place to a publicly accessible and supported repository. May require data transformation from analog to digital format(s).

Data recovery: the process of restoring data that has been lost, accidentally deleted, corrupted or made inaccessible.



ADMG Data Rescue Process



ER-2 Air Photos

What: High-resolution photos taken nadir view from ER-2 during 1970s-2000s

Value: Photos could be used for land cover change studies.

Effort: More than 6000 photos that required special equipment for digitization, process to take more than 5 years.

Outcome: Data delivery direct to NASA cloud with DAAC support for tool development making image discovery and exploration easy.



P-3 Campaign History

What: Paper records at Wallops Flight Facility (WFF) of detailed information about P-3 campaign history from 1991-present.

Value: P-3 flight information prior 2007 is not digitize and difficult to locate.

Effort: Traveled to WFF and recorded metadata about P-3 campaigns, scanned flight plan documents.

Outcome: Added metadata to CASEI and provided detailed history to Airborne Science Program for better access to this information.



CASEI:

The Catalog of Archived Suborbital Earth Science Investigations

- **Detailed information** and data access for airborne and field campaigns
- Explore and discover the **highly-linked** web-based user interface.
- Many **different ways to search** through the detailed information and links



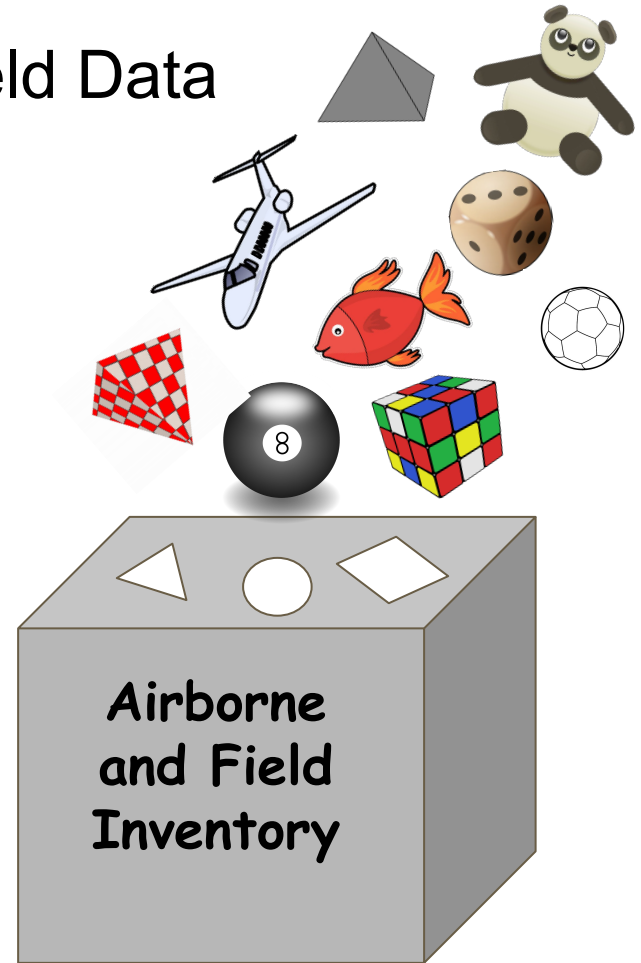
<https://impact.earthdata.nasa.gov/casei/>

Assessment of NASA Airborne and Field Data

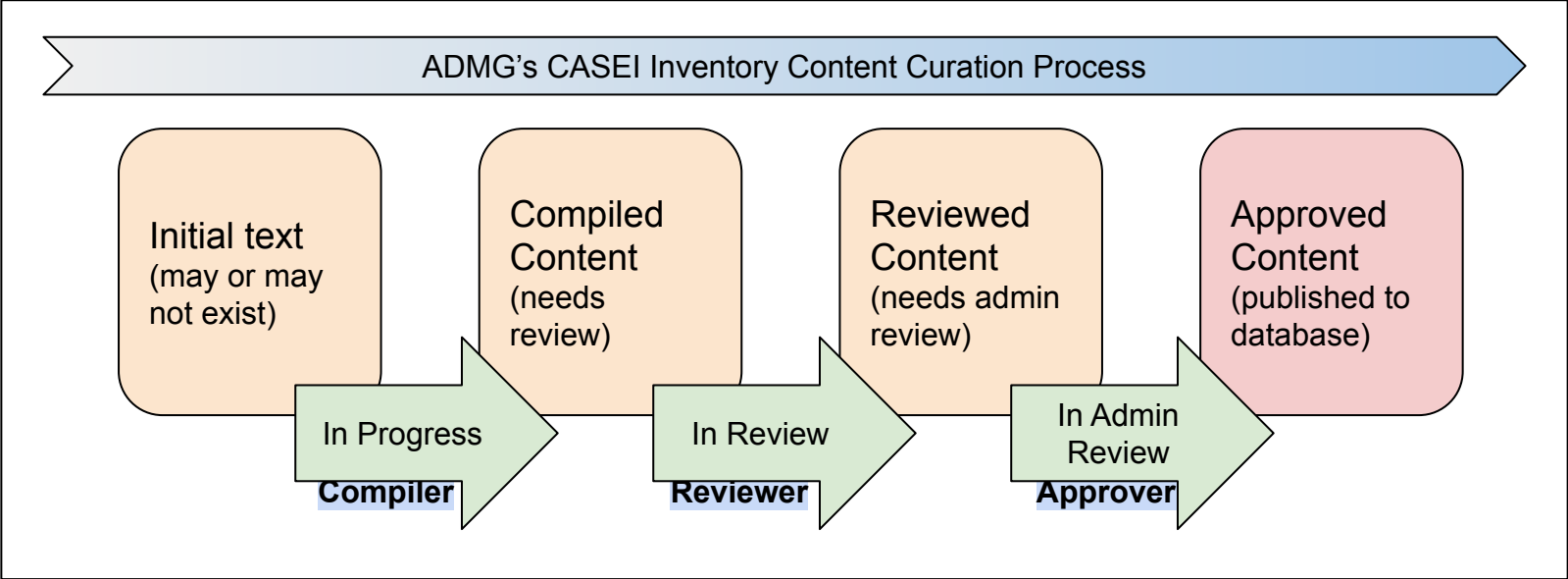
Assessment Goals:

- Identify and **locate all** NASA airborne Earth science activities and data
- **Assign detailed metadata** to improve future use
- **Identify and work to fix issues** with airborne data archival, discovery and access

To date, ADMG has found more than **160** airborne and field activities that belong in CASEI.



CASEI Curation Process



Lessons Learned

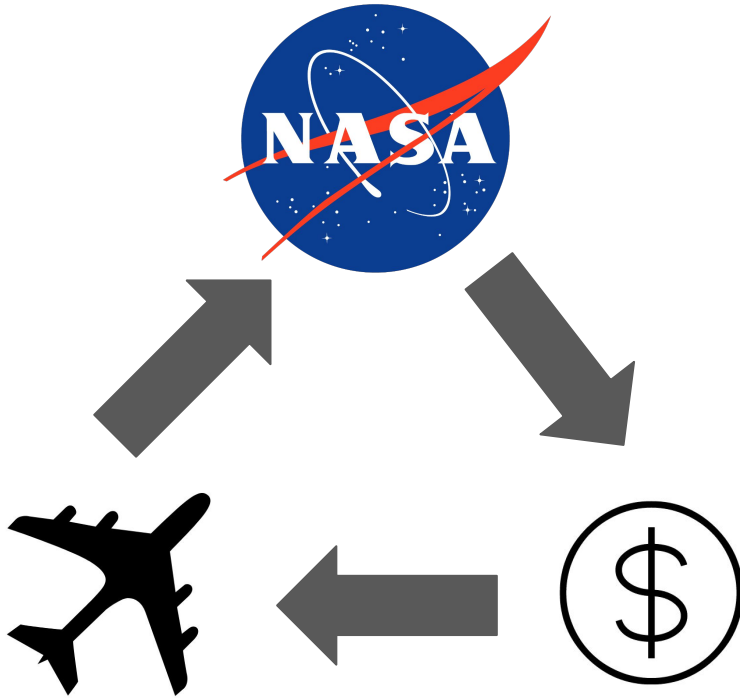
- The transformation of data from analog to digital can be a lengthy and costly process.
- Paper documents need to be organized and handled carefully during digitization.
- Documenting the process is helpful in order to quickly assess future data rescue efforts.



Ongoing Efforts

- GTE DC-8 Videos
 - Nadir, side, and forward-view videos from the Global Tropospheric Experiment program
 - Data is stored on approximately 900 VHS tapes
- 35 years of NASA airborne flight imagery and information
 - Infrared flight imagery
 - Flight log/flight photos
 - Data collected mostly over Central America and United States.

Return on NASA Investment



- NASA over the decades has invested time and resources to collect suborbital data.
- ADMG's data rescue/recovery efforts allow users to access historical data that may have been lost.
- Making this datasets more available leads to a return on NASA's investment and supports open science initiatives.

Explore CASEI! Feedback welcomed!



impact.earthdata.nasa.gov/casei/

Thank you!

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