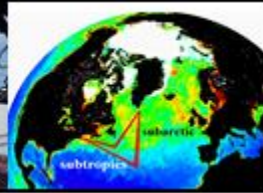
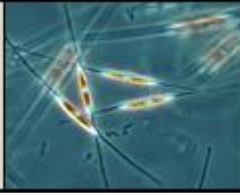


The logo for NAAMES (North Atlantic Algal and Marine Ecosystem Survey) is displayed in a bold, red, sans-serif font with a slight 3D effect.

NAAMES Data Management Overview

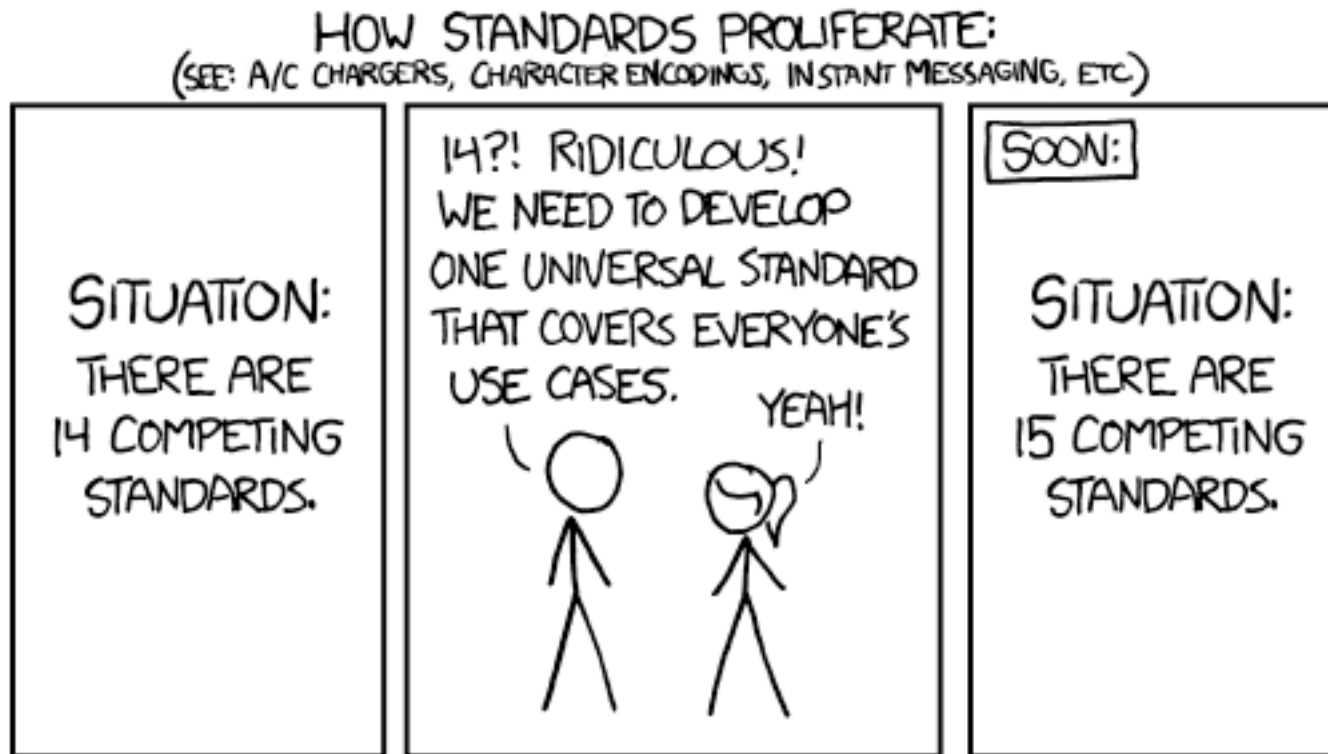
Data Managers: Gao Chen¹ and Chris Proctor²

¹NASA Langley Research Center

²NASA Goddard Space Flight Center

- quick ICARTT/SeaBASS format intro for the uninitiated
- data submission schedule & deadlines
- documentation requirements
- data repositories
 - differences for aircraft vs ocean/ship data
- data formats & best practices
- discussions
- file naming convention

**Requirement: submit data in the appropriate standardized format
(i.e., ICARTT/HDF5/SeaBASS),
not as .XLS, .XLSX, .DOC, .WAP, etc**



Submitting data in standardized formats: ICARTT and SeaBASS

SeaBASS Example

ICARTT and SeaBASS files have similar layouts:

Metadata headers

+

Data Matrix

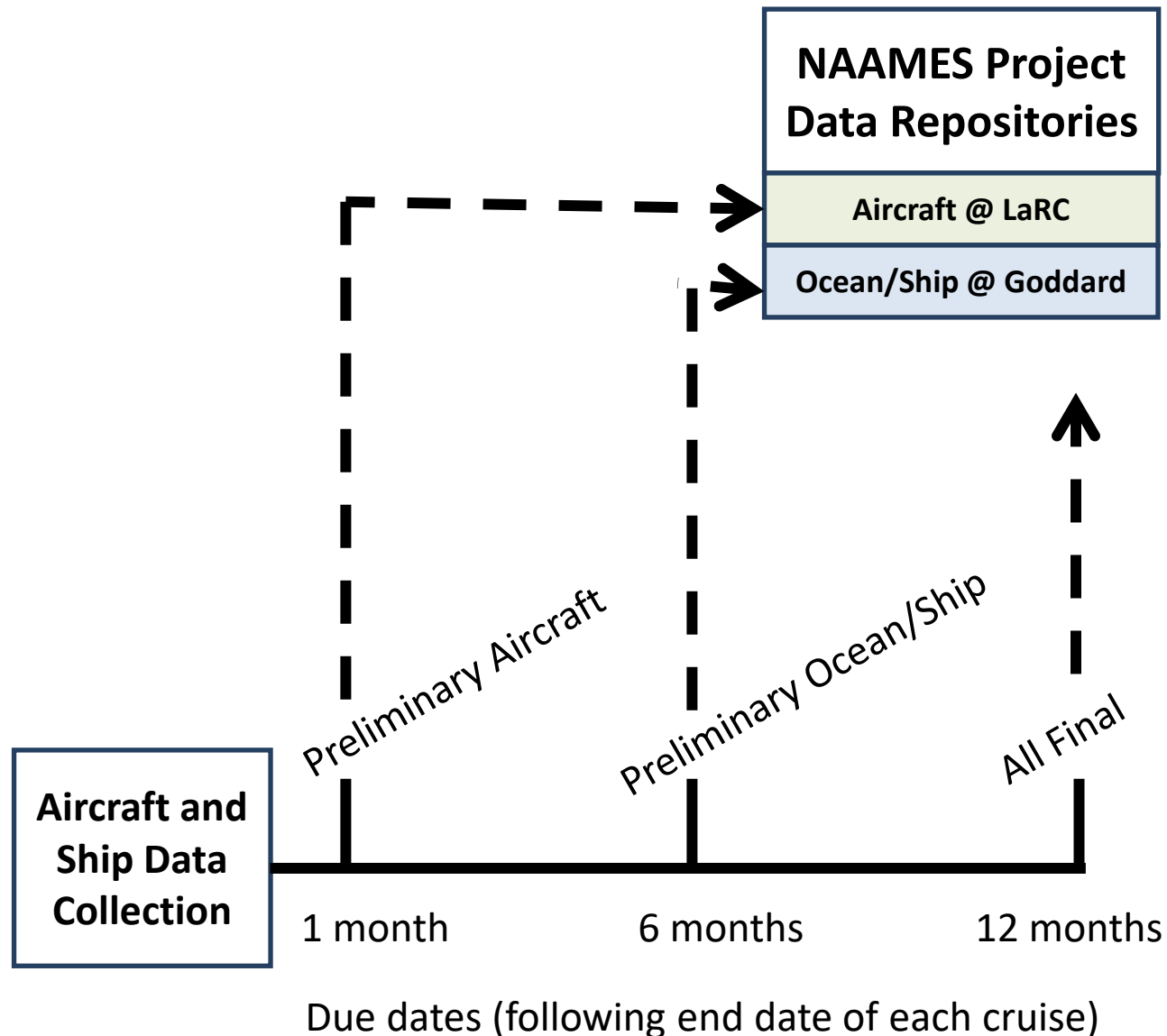
```
/begin_header
/investigators=John_Smith,Mary_Johnson
/affiliations=State_University
/contact=jsmith@state.edu
/experiment=NAAMES
/cruise=nov2015
/station=93.26
/data_status=final
/start_date=20151124
/end_date=20151124
/start_time=16:01:30[GMT]
/end_time=16:30:45[GMT]
!
! COMMENTS
!
! Turner fluorometer last calibrated: 2015-09-12; see documents
!
/missing=-999
/delimiter=comma
/fields=time,lat,lon,depth,CHL,CHL_SD,PHAEO
/units=hh:mm:ss,degrees,degrees,m,mg/m^3,mg/m^3
/end_header
16:01:30,42.135,-72.101,0,2.355,0.310,0.785
16:03:45,42.135,-72.101,5,2.180,0.222,3.185
```

More information, including other formatting rules and standardized headers:

ICARTT: <http://www-air.larc.nasa.gov/missions/etc/lcarttDataFormat.htm>

SeaBASS: <http://seabass.gsfc.nasa.gov/wiki/article.cgi?article=metadataheaders>

NAAMES Data Submission Schedule



Aircraft final data will be transferred to ASDC starting from the 3rd project year

NAAMES Data Submission Schedule

- Preliminary data due to project Data Repositories:
 - [1 month](#) after each flight for aircraft measurements
 - [6 months](#) after cruise end for ocean/ship measurements
 - Final data due [12 months](#) after the end of each deployment. Publically available:
 - Aircraft data @ LaRC Data Repository
 - Ocean/ship data @ SeaBASS (directly linked to ocean/ship Data Repository)
 - Final/Permanent data archive location (i.e., NASA DAAC)
 - Aircraft data transferred to ASDC starting 3rd project year
 - Ocean/ship data remain @ SeaBASS (OB.DAAC)
 - Documentation material:
 - Aircraft data documentation starting from [3rd project year](#) (coinciding with data transfer to DAAC)
 - Ocean/Ship documentation [due 12 months](#) after deployment (same as final data)
- Include:
- Primary instrument output (if applicable)
 - Data processing algorithms and codes and calibration records (if applicable)
 - QA/QC procedures
 - Instrument description (publication) and deployment notes
 - Ancillary data and other necessary information for data processing

Documentation Material Example (Aircraft)

- Project Requirements:

- “By the Investigation Closeout, the <<investigation name>> Investigation shall deliver all data products, along with the scientific algorithm software, coefficients, and ancillary data used to generate these products, to the <<designated NASA Earth Science Division-assigned Distributed Active Archive Center(s) (DAACs)>>”
- The primary goal is to maintain reprocessing capability by the Co-Is

DISCOVER-AQ Example for SMPS Aerosol Size

Distribution measurement:

- SMPS raw instrument output with accompanying ancillary data, including flow, ambient temperature and pressure
- Data processing and analysis code, including inversion code to correct mobility diameters for ambient temperature and pressure
- All procedures for data QA/QC
- Deployment notes about inlet and flow configuration as well as calibration times and questionable/bad data notes
- Publication citation about instrument working principle and description of instrument and measurement

DISCOVER-AQ Example for Airborne PILS sampling with off-line analysis:

- Log files of sample collection times
- Auxiliary data files (flow rate, temperature, pressure)
- Back-up files of chromatograms for each sample (generated by IC software)
- Calculated ion concentrations for each sample (generated by IC software)
- Data processing code
- Word document detailing analysis and data processing procedure
- Additional QC notes (i.e. periods where data has not been archived due to calibrations, etc)

For each deployment the relevant (aircraft measurement) files will be bundled and submitted to ASDC directly. No specific format requirements for documentation files.

Documentation/raw data files are not distributed as standard data products, but they can be specially ordered and the Co-Is will be notified.

Documentation Continued (Ocean/Ship)

Documentation requirements are similar for SeaBASS submissions

- Preserve **processing information** (to allow for reprocessing), provide **instrumentation & methods descriptions, calibration info, QA/QC details**, processing code, etc
- No specific file format requirements
- Upload these relevant files in separate subfolder called “documents”

Ocean/Ship Data Repository

Site under construction

Upload data to repository via FTP

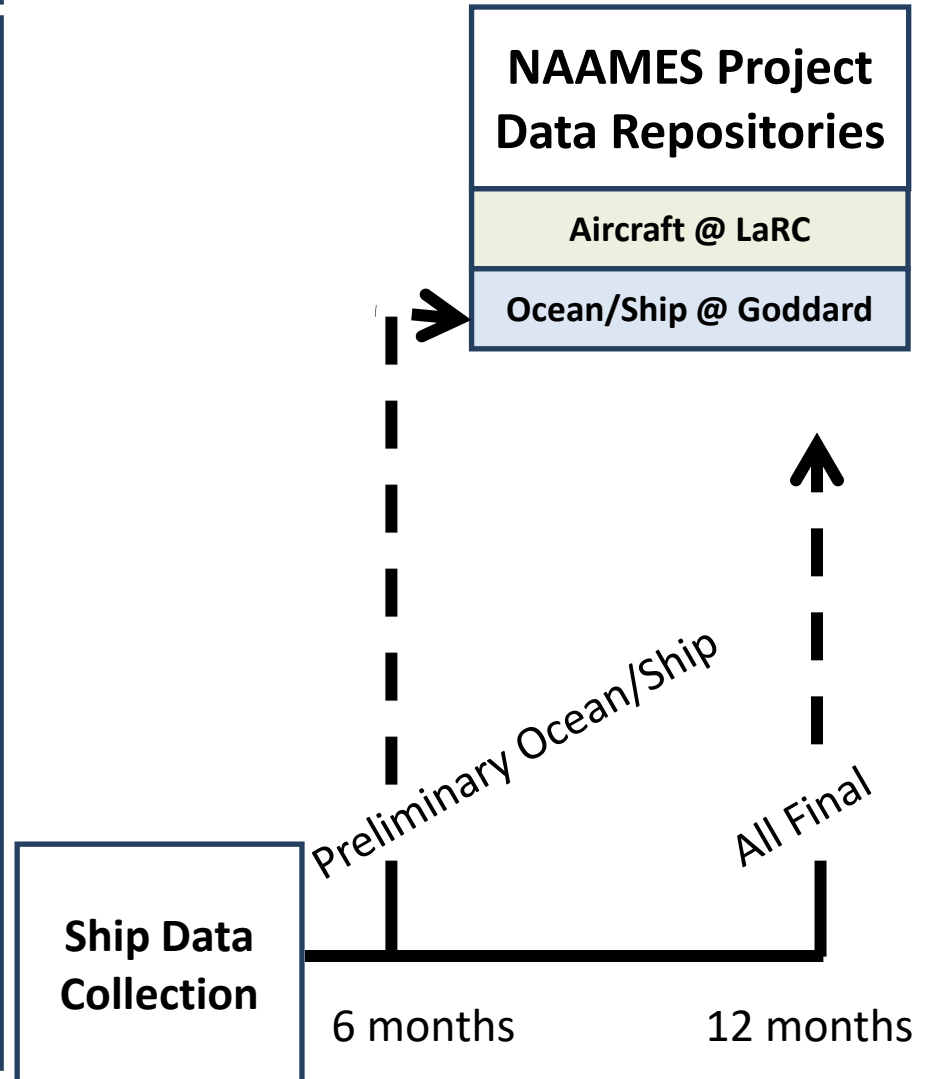
Use SeaBASS format

- Preliminary?


Final data submissions will be managed just like standard SeaBASS submissions. It is **required** to include your documentation (instrumentation descriptions, calibration information, data processing descriptions)

A SeaBASS NAAMES site will contain info and links to final data products and related ocean color satellite data

Final data served publicly via seabass.gsfc.nasa.gov



Airborne Data Repository: DISCOVER-AQ Example



NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

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Airborne Science Data
for Atmospheric Composition



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Tools

Missions

Data

Contact Us

Guidance For Data Users

For responsible scientific use of the data sets provided in this archive, data users are strongly encouraged to carefully study the file headers and directly consult with the instrument PIs. Please acknowledge the data source and offer co-authorship to relevant instrument PIs when appropriate.

| | | | | |
|---------------|-------------------|----------------------|---------------|--------------------|
| P-3B Aircraft | B200 Aircraft | UC-DAVIS Aircraft | Merges | Model / Trajectory |
| Analysis | Satellite | Arvin-DiGiorgio * | Bakersfield * | Clovis * |
| Corcoran * | Fresno * | Hanford * | Huron * | Madera * |
| Oil Dale * | Ground-Other | Parlier * | Porterville * | Shafter * |
| Tranquility * | Visalia Airport * | P-3B Aircraft Videos | | |

» DISCOVER-AQ DOI: 10.5067/Aircraft/DISCOVER-AQ/Aerosol-TraceGas

* Ground Site

Download By Flight/Date:

☐ 20130110

☐ 20130114

☐ 20130116

☐ 20130118

☐ 20130120

☐ 20130121

☐ 20130122

☐ 20130128

☐ 20130130

☐ 20130131

☐ 20130201

☐ 20130203

☐ 20130204

☐ 20130206

☐ 20130208

Bottom



| PI Directory | Last Updated | Parameters | Project Description |
|---------------------------------|--|--------------------------------|--|
| ANDERSON.BRUCE/ | Oct 31, 2014 | + Show VarList | Langley Aerosol Research GroupE |
| BARRICK.JOHN/ | Jun 03, 2013 | + Show VarList | NASA LaRC P3B Data System (PDS) |
| COHEN.RONALD/ | Jun 15, 2013 | + Show VarList | UC Berkeley TDLIF - Thermal Dissociation-Laser Induced Fluorescence of NO2 and related species |
| DISKIN.GLENN/ | Jun 05, 2015  | + Show VarList | |
| FRIED.ALAN/ | Jun 14, 2013 | + Show VarList | NCAR Difference Frequency Generation Absorption Spectrometer (DFGAS) |
| | | + Show VarList | TACO Polarized Imaging Nephelometer - Aerosol Scattering |

Data repository for preliminary and final data will be set up 1 month before 1st deployment

Buttons used to identify data sources: e.g., aircraft and ground sites

DISCOVER-AQ Data DOI

List of flight dates to allow download of all data from the same flight

Data files are organized based on Co-I names

Variable names can be viewed without opening actual data files

Data Format Requirements and Best Practices (Aircraft Data)

- Both aircraft and ground-based measurements are required to report data in either ICARTT or HDF
- The file naming convention and data file submission procedures will be sent out about 1 month before the start of the first deployment
- All data files for the same dataID (part of file name) should have same number of variables and the same variable names

| YANG.MELISSA/ | |
|--------------------------|--|
| Download | Filename |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130118 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130131 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130201 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130204 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130206 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130116 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130120 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130121 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130122 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130128 R0.ict |
| <input type="checkbox"/> | discoveraq-CO2 p3b 20130130 R0.ict |

dataID = discoveraq-CO2

1. UTC, seconds, UTC start time
2. Lat, Degr, Latitude
3. Lon, Degr, Longitude
4. Alt, Feet, Altitude
5. CO2(ppmv), ppmv, Carbon dioxide mixing ratio

All files with the dataID = discoveraq-CO2 have the EXACT number of variables

- The time variable names should indicate if they represent the beginning, mid, or end of the sampling period by using “_start”, “_mid” or “_stop” suffix, e.g., UTC_start
- The file scanner will verify these requirements

Timely support will be provided for dataID registration, data format trouble-shooting, data file name issues, and data download problems. Please contact Gao Chen (gao.chen@nasa.gov, 757-864-2290), Ali Aknan (ali.a.aknan@nasa.gov) and Michael Shook (michael.a.shook@nasa.gov)

Data Format Requirements and Best Practices (Ocean/Ship Data)

- Use SeaBASS format (ASCII format files with mandatory metadata headers above a delimited data matrix)
- Format information provided at <http://seabass.gsfc.nasa.gov> and will also be on the SeaBASS NAAMES website
- Report time in GMT
- Use automated format checking software (FCHECK) prior to submitting your final data files
- Contact Chris Proctor christopher.w.proctor@nasa.gov (301-286-4759) or seabass@seabass.gsfc.nasa.gov with any submission, format, data access, or other questions

Linking Remote Sensing and In Situ Ocean Measurements

- Aircraft remote sensing ocean property measurements:
 - GCAS (Ocean Color): Chl, ag(440), bbp, kd(490), Zeu
 - HSRL (Lidar): kd(532), bbp
 - RSP (Polarimeter): Lw, Chl, ag(410), bbp
- Aircraft remote sensing measurements will be reported in HDF5 or ICARTT format, ship measurements in SeaBASS format
- What kind of tools are needed to facilitate collaboration within the science team?

Data Reporting Discussion

- Option to archive shipboard aerosol data sets with aircraft aerosol data (in ICARTT format)?
- Standardize common aerosol measurement variable names from shipboard and airborne measurements?
- Consistency in in-situ aerosol measurement data reporting?
 - Ambient vs. STP (1013 mb & 273.15K)?
 - $dN/d\log D_p$ for aerosol number size distribution?

NAAMES File Naming Convention

File Naming Structure: dataID_locationID_YYYYMMDD_R#

Example: the filename for the C-130 LGR CO measurement made on November, 15, 2015 flight may be: NAAMES-LGR-CO_C130_20150115_R1.ict

Required for aircraft files, suggested but not required for SeaBASS file names

The only allowed characters are: a-z A-Z 0-9_.- (that is, uppercase and lowercase alphanumeric, underscore, period, and hyphen). Fields are described as follows:

- **dataID:** an identifier of measured parameter/species, instrument, or model (e.g., O3 or SMPS). For NAAMES data files, the Co-Is are required to use “NAAMES-” as prefixes for their DataIDs, i.e., NAAMES-O3, and NAAMES-SMPS.
- **locationID:** an identifier of airborne platform or ground site, e.g., C-130. Specific locationIDs for each deployment will be provided on the NAAMES data repository website.
- **YYYY:** four-digit year
- **MM:** two-digit month
- **DD:** two-digit day (for flight data, the date corresponds to the UT date at take off)
- **R#:** data revision number. For preliminary data, revision number will start from letter “A”, e.g., RA, RB, ... etc. Numerical values will be used for the final data, e.g., R1, R2, R3 ... etc.
- **extension:** “ict” will be the file extension for ICARTT files, “h5” will denote HDF5 files, “sb” for SeaBASS files

Thank you

Merge Example

- Merge files will be created for each aircraft and contain all measurement variables reported in ICARTT format, including the aircraft location and ambient meteorological data
- Data merges are created by averaging/interpolating Co-I data based on the overlap between the Co-I sampling intervals and merge time base
- Merge files will be for both preliminary and final data
- Merge files will be updated to reflect data revisions on the repository

