Data Policy and Management Plan for SEAC^{4}RS Airborne Field Study

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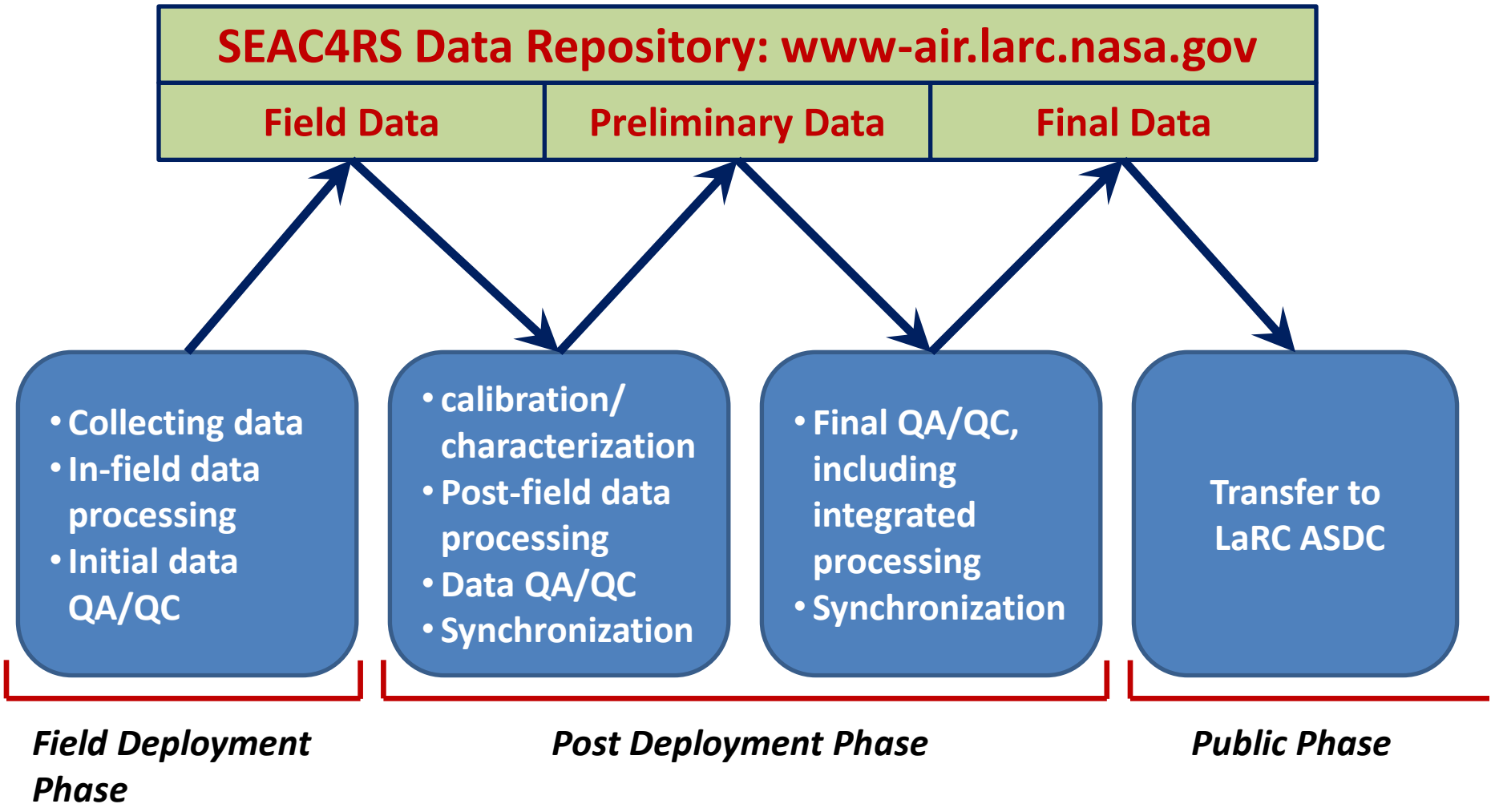
SEAC^{4}RS Data Flow Overview



Proposed SEAC^{4}RS Data Submission Timeline

Phase	Data Type	Deadline	Access Control
Field Deployment	Field Data	24 hour after each flight	Science teams and partners
Post-deployment	Preliminary Data	April 1, 2013	Science teams and partners
Public	Final Data	October 1, 2013	Public

- Exemptions to data submission deadlines may be granted on a case-by-case basis by project leadership
- Field and preliminary data may be obtained by groups outside of the SEAC^{4}RS community per request to project leadership
- Submission deadlines apply to both SEAC^{4}RS and DC3
- Access control will be implemented through a single username and password for both SEAC^{4}RS and DC3

SEAC^{4}RS Data Archive

Data Repository	Operation Period
Field Data Archive	04/20/12 – 03/31/13
Preliminary Data Archive	04/01/13 – 10/01/13
Final Data Archive	04/01/13 –

- **The data archives will hold data from NASA DC-8 and ER-2, and NSF GV, as well as SEAC^{4}RS ozonesonde data**
- **The data archives will host all project-funded model results, satellite data, meteorological forecasts, and back-trajectory calculations. Links will be provided for the data archives of the AERONET and MPL networks**
- **Preliminary and field data will be expunged after their operation periods, respectively**
- **Data revisions will be tracked by revision numbers in ICARTT filenames**

Proposed SEAC^{4}RS Science Data Policy

All DC3 and SEAC^{4}RS participants are requested to accept the following responsibilities:

- Submit data in ICARTT format no later than the specified deadlines
- If unexpected events lead to any delay in data submission, the PI is required to notify the project leadership as soon as issues are known
- **Final data should be submitted to the archive prior to any presentation at scientific conferences (e.g. AGU, AMS) or manuscript preparation, unless explicit authorization is obtained from the program managers**
- All aircraft measurements from a common platform should be synchronized to science team pre-agreed time standard, e.g. DLH for DC-8
- Consult with PIs when using their data in conference/data workshop presentations and/or manuscript
- Invite PIs of any data used to be co-author (particularly during post-deployment research phase)
- PIs should be available to answer questions about their data

SEAC^{4}RS Data Format Requirement

- The data from SEAC^{4}RS field study and DC3 aircraft observations will conform to the International Consortium for Atmospheric Research on Transport and Transformation (ICARTT) data format standards
- ICARTT format has been widely used in airborne field studies since 2004 and is now one of the NASA Earth Science Division approved data system standards
- All incoming data files will be scanned to ensure compliance to the ICARTT format requirements.
- Assistance will be made available to the science team to trouble-shoot issues in generating ICARTT files

SEAC^{4}RS Data Format Requirement

- The ICARTT data files are *self-describing and comma delimited* ASCII files with two sections: data section and metadata section. Detailed description can be found at: http://www-air.larc.nasa.gov/missions/etc/IcarttDataFormat.htm
- ICARTT file header section requires metadata to ensure the data file self-describing feature. The metadata requirements include: data information, measurement description, measurement uncertainty and detection limits.
- ICARTT file names contain revision number for version control. Archived files cannot be overwritten. The revision number will be RA, RB, RC, … for field data and R0, R1, R2, … for the preliminary and final data
- The data file names will be prefixed with "DC3" or "SEAC4RS", respectively
- PI will need to register his/her dataID at the data archive after it is open. The DataID is a short description of measured parameter/species, instrument, or model (e.g., DC3-O3, SEAC4RS-PTRMS, etc)

- **Merge data products**

  The merge files will be generated for DC-8, GV, and Falcon data and will be made available at the data repositories. The merge files will be updated as the data files are revised

- **Data Manager**

  The DC3 and SEAC^{4}RS Data Manager will monitor the data submission status in accordance with the data submission timeline. The data manager will also coordinate the efforts to support implementation of ICARTT format and the production of the data merge files

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Details, Issues we should discuss - need input from PI and flight scientists

- Data Synchronization standards:
  - DC8: DLH
  - GV: VCSEL (primary), NOx (secondary)
  - ER-2: ??????
- Measurement comparison protocol?
  - Blind comparison may be more rigorous, hinder in-field analysis when data submission is delayed
  - From the past experience, open comparison can also be effective
- All aerosol extensive measurements are reported in STP (i.e., 273.15K and 1013 mb), including optical measurements
- 1 sec files start and stop at the common take-off and landing time

Details, Issues we should discuss - need input from PI and flight scientists

- Standardize measurement variable naming convention for all platforms and measurements?

CommonName_Description_Instrument_Platform

For example:

NO2_MR_CLD_DC8: DC8 chemiluminescence detector NO2

NO2_MR_LIF_DC8: DC8 LIF NO2 measurement

NO2_MR_CLD_GV: GV chemiluminescence detector NO2

CN_gt10nm_CPC_D8: particle number density for diameter > 10 nm

A common name table is available and may need to be modified to fit SEAC^{4}RS observations

Questions, comments, advice?

In-field Modeling Analysis (LaRC box model)

-Has been used in-field for multiple aircraft campaigns
(e.g., INTEX-A, INTEX-B, MILAGRO, ARCTAS)
-Tool for aid in determining measurement consistency
-Has proven useful in assessment of progress toward mission objectives

Examples of in-field use

In-field checks on Measurement Consistency

In PEM-Tropics and ARCTAS campaigns, in-field box model results were used by PIs as additional information to help identify measurement/instrument issues during the field deployment phase

In-field assessment of progress toward mission objectives

e.g., in outflow, box modeling has been useful in identification of constituent perturbations from steady state to identify/characterize impacts from convective processes