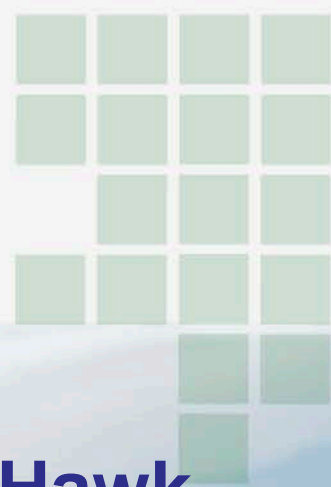




# MPEX DATA MANAGEMENT



**Steve Williams, Linda Cully, Linda Echo-Hawk,  
and Scot Loehrer**

**NCAR Earth Observing Laboratory (EOL)  
Computing, Data, and Software Facility (CDS)**

**MPEX Planning Workshop**

**Boulder, CO**

**13-14 December 2012**



NCAR

# MoPEX Project & Data Management Web Site



## Morris Predictability Experiment (Mo-PEX)



Science



Aircraft Ops



Field Catalog



Data Archive



Outreach

### What's New?

#### December 13-14 Planning Meeting Draft Agenda

#### Project Description

The Mesoscale Predictability Experiment (MPEX) will be conducted within the U.S. intermountain region and high plains during the late spring/early summer of 2013 and will include the use of the NCAR GV, along with the new Airborne Vertical Atmospheric Profiling System (AVAPS) dropsonde system and the Microwave Temperature Profiling (MTP) system for the field experiment which will take place during a 4-week time period from 15 May to 15 June 2013.

#### Scientific Objectives

MPEX is motivated by the basic question of whether

#### Logistics

Logistics Information



Gulfstream V  
(Click Image for Full Resolution)

#### Meetings and Presentations

# MPEX Project & Data Management Web Site

## Mesoscale Predictability Experiment (MPEX)



Science Aircraft Ops Field Catalog Data Archive Outreach

### What's New?

[December 13-14 Planning Meeting Draft Agenda](#)

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#### Scientific Objectives

MPEX is motivated by the basic question of whether experimental, sub-synoptic observations can extend convective-scale predictability and otherwise enhance skill in regional numerical weather prediction over a roughly 6 to 24 hour time span. The experimental plan is guided by the following two scientific hypotheses:

**Hypothesis 1:** Enhanced synoptic and sub-synoptic scale observations and their assimilation into convection-permitting models over the intermountain region during the early morning will significantly improve the forecast of the timing and location of convective initiation as well as convective morphology and evolution during the afternoon and evening to the lee of the mountains and over the High Plains.

**Hypothesis 2:** Enhanced sub-synoptic scale observations in the late afternoon, over regions where the atmosphere has been/is being convectively disturbed, will significantly improve the 6-24 hr forecast of convection evolution and perhaps initiation in downstream regions. Enhanced observations of convective storm-environmental feedbacks will correspondingly improve the synoptic-scale forecast.

Greensburg, Kansas Tornado, 5 May 2007



#### Logistics

Logistics Information



Gulfstream V  
(Click Image for Full Resolution)

#### Meetings and Presentations

[December 13-14 Planning Meeting Draft Agenda](#)

#### Documents

[MPEX Proposal](#)  
[MPEX Facility Request](#)  
[Facility Assessment Table](#)  
[OFAP Cost Analysis](#)  
[OFAP Feasibility Analysis](#)  
[OFAP Response](#)

#### Data Access

[MPEX Data Archive](#)  
[MPEX Field Catalog](#)  
[Draft Data Policy](#)  
[Dataset Documentation Guidelines](#)  
[Data Submission Instructions](#)

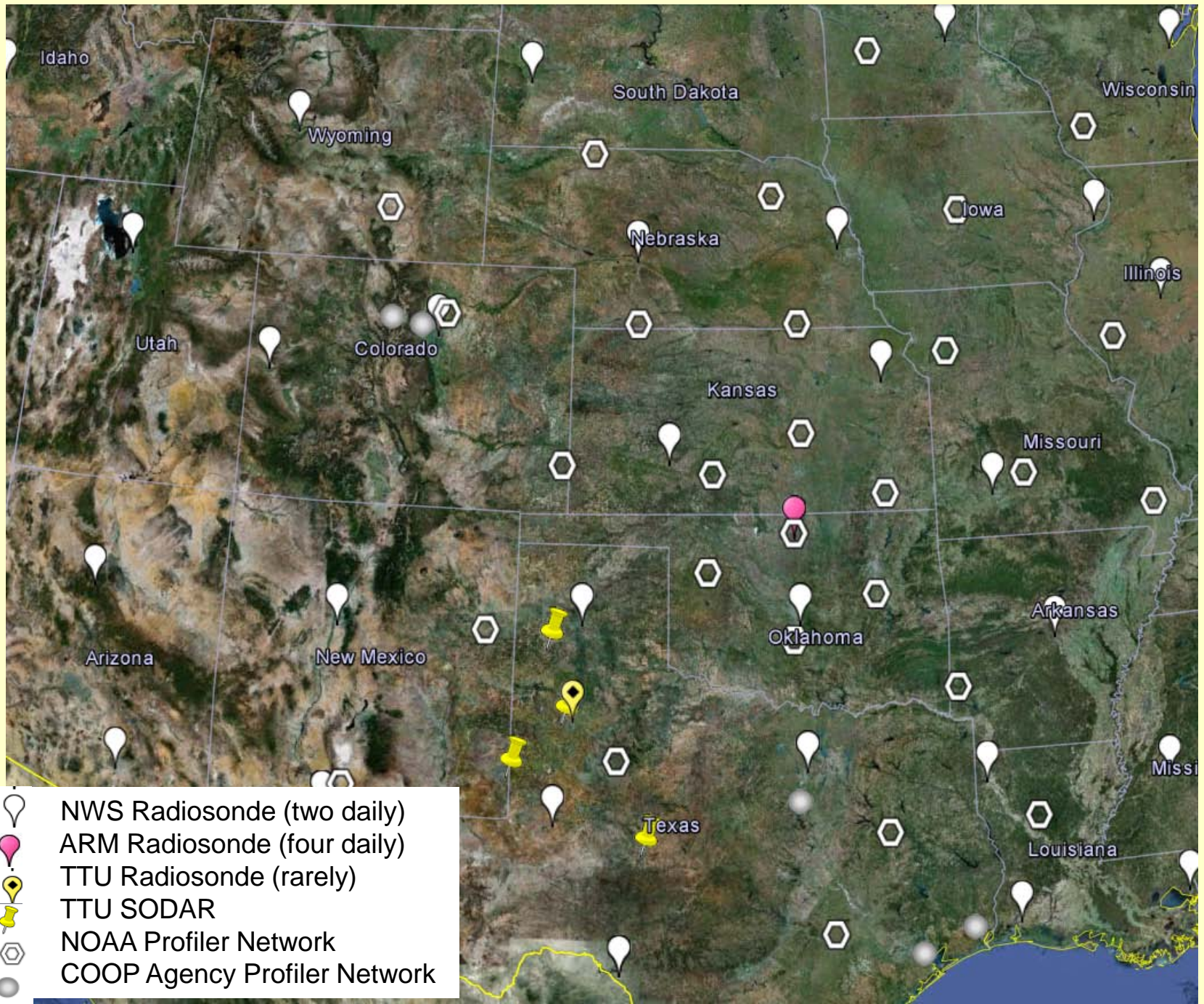


Photo by Bob Henson, NCAR  
(Click Image for Full Resolution)

- [Project Description](#)
- [Logistics](#)
- [Data Access & Field Catalog](#)
- [Documentation](#)
- [Meetings and Presentations](#)
- [Publications](#)
- [Education and Outreach](#)
- [Related Web Pages](#)
- [Participants](#)

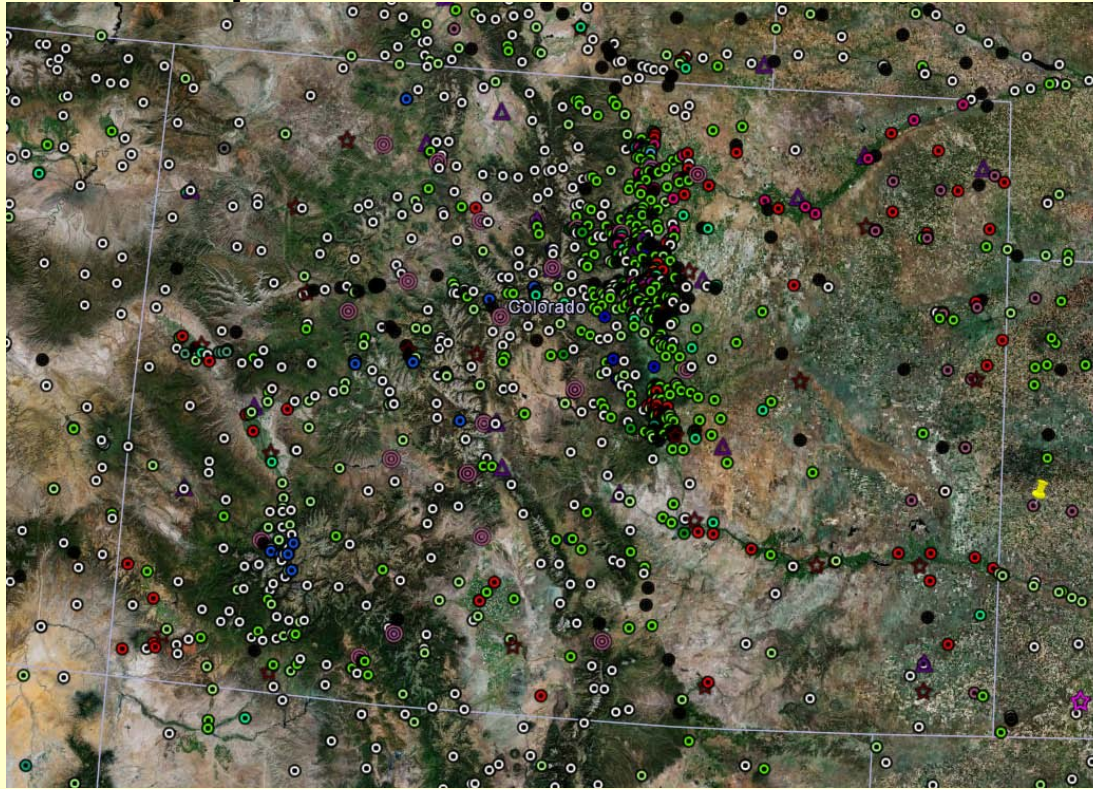
<http://www.eol.ucar.edu/projects/mpex/>

# Radiosonde and Profiler Networks





## Example of Surface Mesonets in Colorado



**Climate/Weather** – ASOS, AWOS (Fed and Non-Fed), Climate Reference Network, Air Force Academy, Weather for You, Anything Weather, GPSMET, Citizen Weather Observer Program

**Water** – ALERT (Denver Metro and Ft. Collins), Northern Colorado Water Conservancy District, Denver Water, HADS

**Snow** - SNOTEL, Colorado Avalanche Information Center

**Air Quality** - Northeast Metro Pollution Prevention Alliance, Colorado Department of Public Health, EPA AirNOW

**Agriculture** - High Plains Climate Network, CoAgMet, Colorado Association for Viticulture and Enology

**Transportation** – CO DOT

**Fire Weather** – RAWS

**Soils** – SCAN

**Energy** - NREL

# **MPEX DATA POLICY SUMMARY (*Proposed*)**

[http://www.eol.ucar.edu/projects/mpex/dm/data\\_policy.html](http://www.eol.ucar.edu/projects/mpex/dm/data_policy.html)

- **All investigators must agree to promptly submit their processed “preliminary” data to the MPEX archive no later than 15 December 2013**
- **All “preliminary” data shall be provided to other MPEX Investigators upon request (restricted as appropriate)**
- **During the initial 1-year data analysis period, data may be provided to a third party only with the permission of the investigator(s) who collected the data**
- **All data will be considered public domain not more than one year following the end of the MPEX data submission deadline (16 December 2014)**
- **Any use of the data will, at a minimum, include acknowledgment. Co-authorship TBD with the investigator(s) who collected the data**

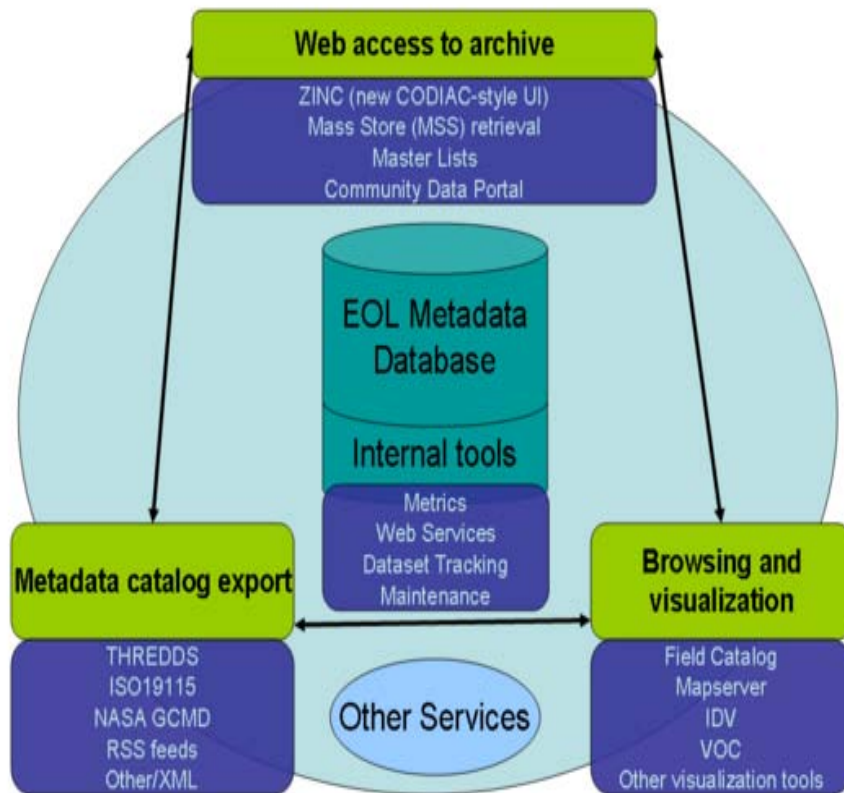
# EOL DATA SERVICES

- **Data Questionnaire**
- **Data Management Plan Documents (e.g. policy/protocol)**
- **Real-time Data Ingest/Display (e.g. Ops Center)**
- **Field Operations Catalog and GIS (e.g. Mapserver, GE)**
- **Data Tracking, Processing, and Quality Assurance**
- **Interactive Data Archive and Distribution (EMDAC)**
- **Web Services**
- **Special Media Products/Services (including Mail lists)**
- **Long-term Archive and Data Stewardship**





## EOL Metadata Database and Cyberinfrastructure (EMDAC)



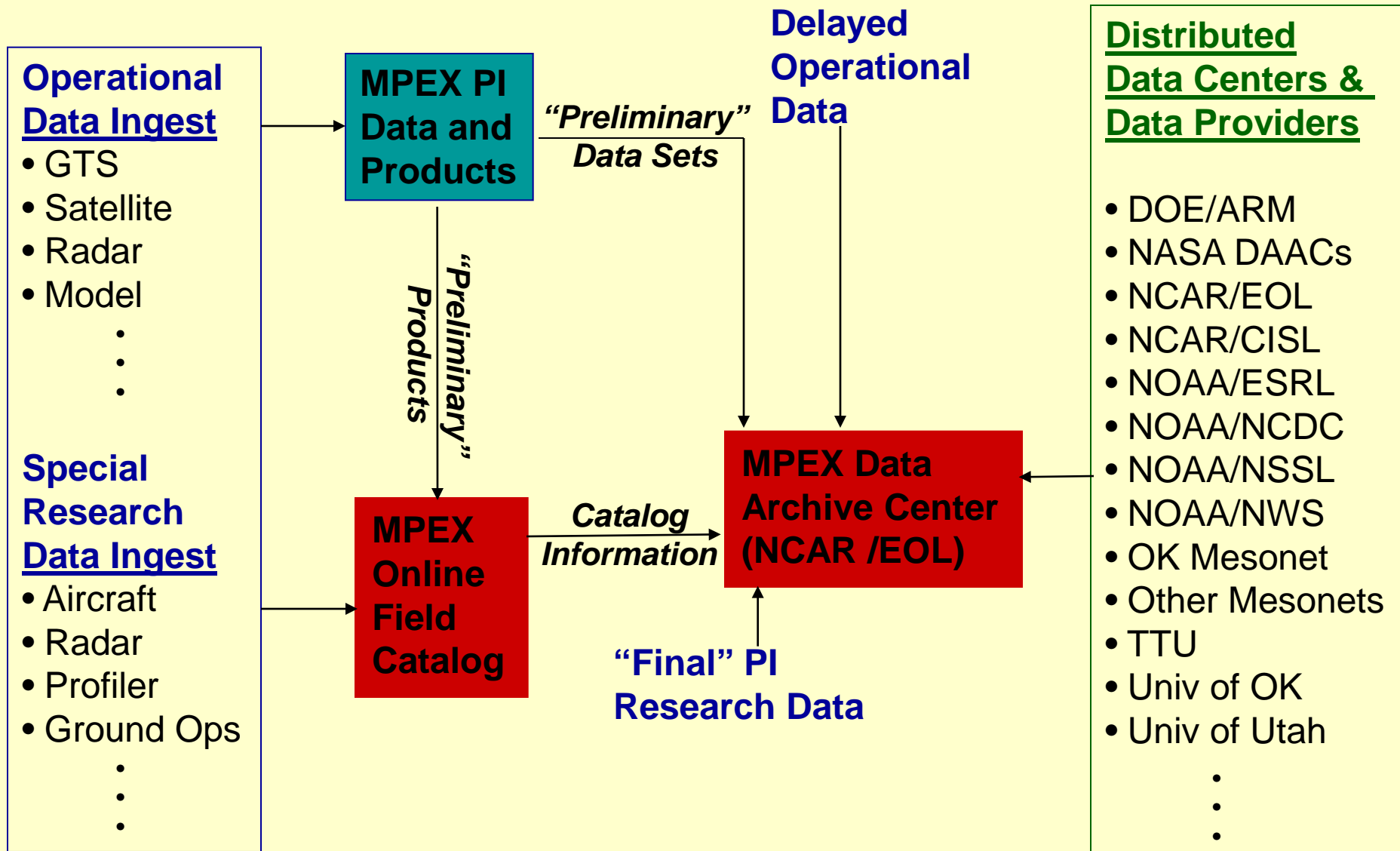
## EOL Data System (EMDAC)

*Primary means for all project scientists and researchers to browse and retrieve data from any EOL-supported projects*

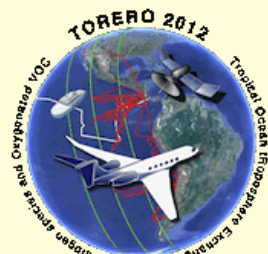
### Features:

- Long-term field project data archival and distribution
- Interactive data browsing, subsetting, and format translation
- Web-based access
- Value-added datasets
- Data documentation







# Expected MPEX Data Flow



# TORERO Data Archive (Master List)



## TORERO Data Sets

Data Set Name (Responsible Group/PIs shown in parentheses)	Date Posted	Info
<b>Aircraft</b>		
<b>Aircraft: NSF/NCAR GV</b>		
<a href="#">GV Aircraft Table of Flights [NCAR-EOL]</a>	New 2012-07-17	
<a href="#">GV AMAX DOAS Report [Volkamer/CU]</a>	New 2012-07-17	
GV AMAX-DOAS Data [Volkamer/CU]		
GV Carbon Monoxide (CO) by VUV Fluorescence Data [Campos/NCAR-ACD]		
GV CN NMASS Aerosol Data [Rogers, Brock/NCAR-RAF,NOAA-ESRL]		
GV CO2 and CH4 (Picarro) Data [Campos/NCAR-ACD]		
<a href="#">GV Digital Camera jpg Imagery (Downward-Looking) [Beaton/NCAR-RAF]</a>	2012-04-17	
<a href="#">GV Digital Camera jpg Imagery (Forward-Looking) [Beaton/NCAR-RAF]</a>	2012-04-17	
<a href="#">GV Digital Camera jpg Imagery (Left-Looking) [Beaton/NCAR-RAF]</a>	2012-04-17	
<a href="#">GV Digital Camera jpg Imagery (Right-Looking) [Beaton/NCAR-RAF]</a>	2012-04-17	
<a href="#">GV Digital Camera Movies with data - final [NCAR-RAF]</a>	New 2012-07-23	
	New	

### DATA BY CATEGORY

- Aircraft
- Ancillary
- Chemistry
- Land Based
- Model
- Oceanography
- Photography
- Radar
- Satellite
- Ship Based
- Upper Air

[Back to TORERO](#)

Email comments & questions to [codiac@ucar.edu](mailto:codiac@ucar.edu)

[http://data.eol.ucar.edu/master\\_list/?project=TORERO](http://data.eol.ucar.edu/master_list/?project=TORERO)

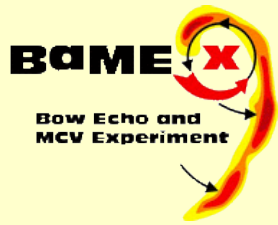
# Composite Data Sets at NCAR/EOL

A **composite dataset** is a collection (over some time period and region) of similar data (e.g. surface meteorological) from a variety of sources, put into a common format, and passed through a uniform quality control.

Why does NCAR/EOL develop composites?

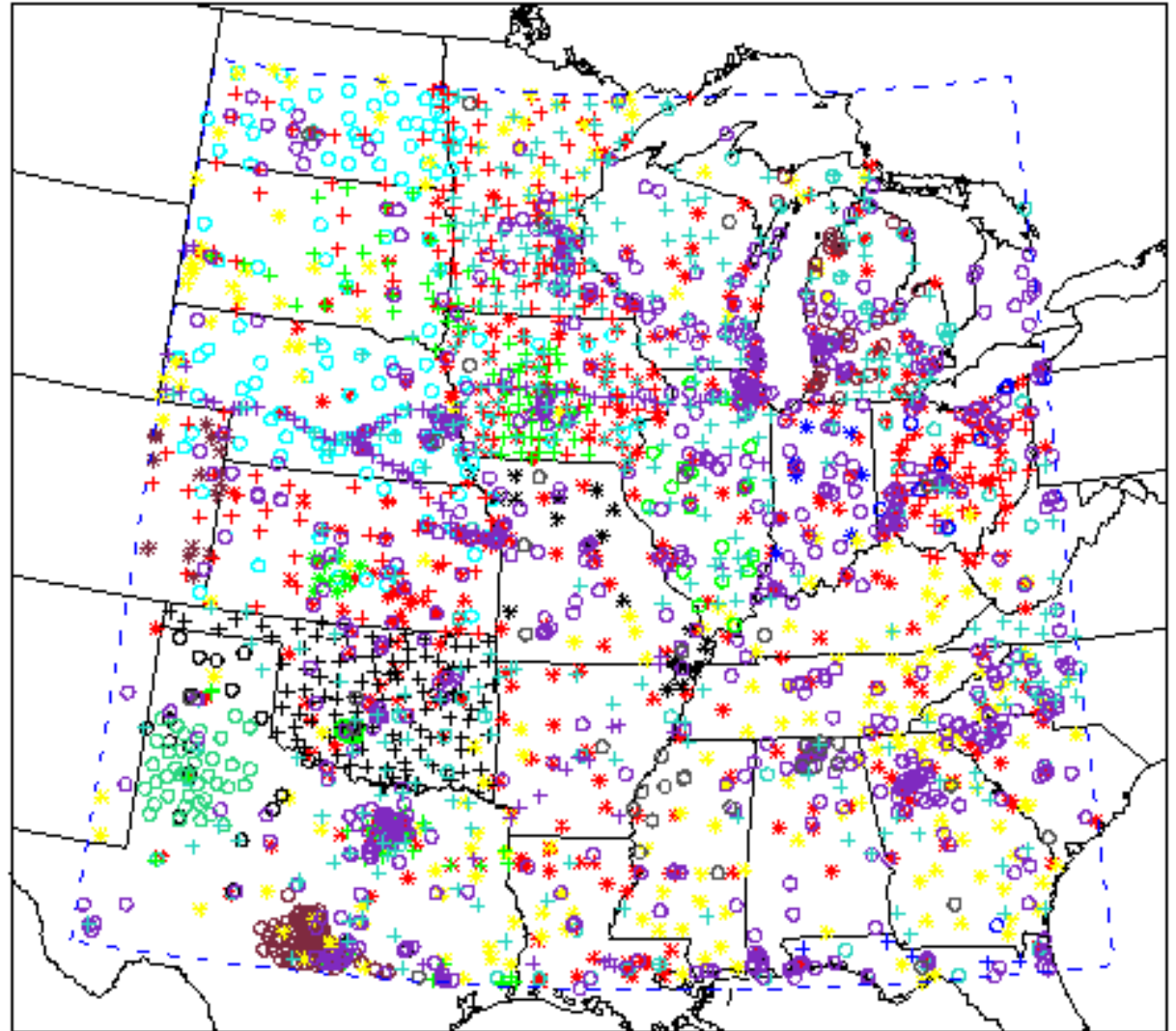
- Provides data in a uniform format with QC.
- Allows determination of network/site problems.
- Useful for model applications.
- Prevents duplication of effort.





# Hourly Surface Meteorological Data Composite (2991 stations)

- 1-min sites (\* 385)
- AWOS (+ 335)
- RAWS (\* 220)
- MesoWest (+ 94)
- HPCN (o 138)
- RWIS (+ 279)
- GPSMET (o 153)
- CO CoAgMet (\* 17)
- FL FAWN (+ 5)
- IA IEM (+ 88)
- IL ICN (o 19)
- IN PAAWS (\* 7)
- KS GWMD5 (\* 10)
- MI MAWN (o 33)
- MO CAWS (\* 21)
- OH OARDC (o 11)
- OK ARS Micro (o 42)
- OK Mesonet (+ 119)
- TX LCRA (o 102)
- TX TNRCC (+ 47)
- West TX Meso (o 39)
- Texas ET (o 23)
- 15 Other Networks (o 804)



# MPEX ARCHIVE DATA SUBMISSION



## MPEX DATA SUBMISSION INSTRUCTIONS

The [MPEX home page](#) contains relevant links to project and data documentation, distributed data access, and other collaborating projects' data sets.

An initial master list of all MPEX international data sets (with links) has been compiled to provide easy access to all MPEX data sets (both operational and research). Data sets are grouped by platform and sorted by data type (i.e., aerosol, cloud properties, radar, satellite, etc.). This list will be updated frequently. It is available directly at [MPEX Master List](#).

If you collected data for MPEX, please review this list to verify that your data set(s) are properly named with the appropriate Principal Investigators (PIs) identified. Please e-mail any corrections, additions, or deletions directly to [Steve Williams](#). If you already have your data sets available on-line, please provide the web link or FTP access information. Once your data set (with metadata) is available, a link will be provided from the master list web page along with a submission date to track future data set upgrades or revisions (if needed).

Please submit your data set(s) (including accompanying metadata or documentation files) to the MPEX Long-term Data Archive at NCAR Earth Observing Laboratory. Data set (and metadata) submission guidelines are available by direct link at: [http://www.eol.ucar.edu/projects/mpex/dm/data\\_documentation\\_guidelines.html](http://www.eol.ucar.edu/projects/mpex/dm/data_documentation_guidelines.html).

To expedite matters, the EOL has established an anonymous FTP capability to accept your MPEX data set(s). The Internet address is:

```
FTP: ftp.eol.ucar.edu  
Login: anonymous (No password required.)  
cd /pub/data/incoming/mpex
```

It is very important to **send an e-mail to [sfw at ucar.edu](mailto:sfw@ucar.edu) indicating that the data file(s) have been FTPed**, along with the file(s) names, data contact information, any data restrictions, and appropriate file documentation (i.e., data formats, descriptions, acknowledgments, and metadata). Documentation files may be e-mailed to [sfw at ucar.edu](mailto:sfw@ucar.edu) directly if preferred. **If password protection is required for these data, please indicate this at the time of submission.** You will receive a unique "user ID" and "password" that can be changed at any time upon request. For users without direct Internet access, or if your data set(s) are too large to FTP, you may send digital file(s) on magnetic or optical media (with documentation) by conventional mail to the EOL shipping address below.

Thank you very much for your assistance in providing final data to the MPEX archive. Feel free to contact me should you encounter any problems or have any questions.

*Steve Williams*  
*MPEX Data Manager*

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# MPEX ARCHIVE DATA DOCUMENTATION

## Data Set Documentation ("Readme") Guidelines

The documentation (i.e., the "Readme" file) that accompanies each project data set is as important as the data itself. This information permits collaborators and other analysts to understand any limitations or special characteristics of the data that may impact its use. Data set documentation should accompany all data set submissions, including both preliminary and final. The following outline and content is recommended and should be adhered to as closely as possible to make the documentation consistent across all data sets.

### Data set Documentation/Readme Outline:

**Title:** This should match the data set name

**Author(s):**

- Name(s) of PI and all co-PIs
- Complete mailing address, telephone/facsimile numbers,
- E-mail address of PIs, and web address (if applicable)
- Similar contact information for data questions (if different than above)

**1.0 Data Set Overview:**

- Introduction or abstract
- Time period covered by the data
- Physical location (including lat/lon/elev) of the measurement or platform
- Data source if applicable (e.g., for operational data include agency)
- Any web address references (i.e., additional documentation such as Project web site)

**2.0 Instrument Description:**

- Brief text (i.e., 1-2 paragraphs) describing the instrument with references
- Figures (or links), if applicable
- Table of specifications (i.e., accuracy, precision, frequency, resolution, etc.)

**3.0 Data Collection and Processing:**

- Description of data collection
- Description of derived parameters and processing techniques used
- Description of quality assurance and control procedures
- Data intercomparisons, if applicable

**4.0 Data Format:**

- Data file structure and file naming conventions (e.g., column delimited ASCII, NetCDF, GIF, JPEG, etc.)
- Data format and layout (i.e., description of header/data records, sample records)
- List of parameters with units, sampling intervals, frequency, range
- Data version number and date
- Description of flags, codes used in the data, and definitions (i.e., good, questionable, missing, estimated, etc.)

**5.0 Data Remarks:**

- PI's assessment of the data (i.e., disclaimers, instrument problems, quality issues, etc.)
- Missing data periods
- Software compatibility (i.e., list of existing software to view/manipulate the data)

**6.0 References:**

List of documents cited in this data set description. Please provide links for on-line publications, if available.

# PROJECT PUBLICATIONS LIBRARY



## Publication References



How to Submit Publication References to this List

Publications

Conferences

Reports

Theses

Other Citation Links

### Publications

[A-D](#) [E-H](#) [I-L](#) [M-P](#) [Q-T](#) [U-Z](#) [Back to Top](#)

- Bryan, G. H., and M. D. Parker, 2010: Observations of a squall line and its near environment using high-frequency rawinsonde launches during VORTEX2. *Mon. Wea. Rev.*, 138, 4076-4097, doi:10.1175/2010MWR3359.1.
- Coniglio, Michael C., 2012: Verification of RUC 0.1-h Forecasts and SPC Mesoscale Analyses Using VORTEX2 Soundings. *Wea. Forecasting*, 27, 667-683, doi:10.1175/WAF-D-11-00096.1.
- Elston, J., B. Argrow, E. Frew, A. Houston, J. Straka, 2011: Evaluation of UAS Concepts of Operation for Severe Storm Penetration using Hardware-in-the-Loop Simulations. *AIAA Journal of Aerospace Computing, Information, and Communication*, 8(9):269-294.
- Elston, J. S., J. Roadman, M. Stachura, B. Argrow, A. Houston, and E. Frew, 2011: The tempest unmanned aircraft system for in situ observations of tornadic supercells: Design and VORTEX2 flight results. *Journal of Field Robotics*, 28: 461-483, doi:10.1002/rob.20394.
- Kosiba, K. A., J. Wurman, P. Markowski, Y. Richardson, P. Robinson, and J. Marquis, 2012: Genesis of the Goshen County, Wyoming Tornado on 05 June 2009 during VORTEX2. *Mon. Wea. Rev.*, Accepted, in press, doi:10.1175/MWR-D-12-00056.1.
- Wakimoto, R. M., N. T. Atkins, and J. Wurman, 2011: The LaGrange Tornado during VORTEX2. Part I: Photogrammetric Analysis of the Tornado Combined with Single-Doppler Radar Data. *Mon. Wea. Rev.*, in press, doi:10.1175/2010MWR3568.1.

### Conference Proceedings

[A-D](#) [E-H](#) [I-L](#) [M-P](#) [Q-T](#) [U-Z](#) [Back to Top](#)

- Atkins, N. T., R. M. Wakimoto, A. McGee, R. Ducharme, and J. Wurman, 2010: The LaGrange tornado during VORTEX2. Part II: Photogrammetry analysis of the tornado combined with dual-Doppler radar data. Preprints, 25th Conf. on Severe Local Storms, Denver, CO, Amer. Meteor. Soc., 6.3.
- Atkins, N., R. M. Wakimoto, and J. Wurman, 2011: The LaGrange Tornado during VORTEX2: Single- and Dual-Doppler Analysis of the Tornado. 35th Conference on Radar Meteorology, Pittsburgh, PA, Amer. Meteor. Soc.
- Bluestein, H., D. Burgess, D. Dowell, P. Markowski, E. Rasmussen, Y. Richardson, L. Wicker, and J. Wurman, 2009: VORTEX2: The





# TROPICAL OCEAN TROPOSPHERE EXCHANGE OF REACTIVE HALOGEN SPECIES AND OXYGENATED VOC (TORERO)

## **TORERO Planning Workshop**

### **Agenda**

October 31 - November 1, 2011  
FL1, Room 2198, EOL Atrium

#### **Day 1 – Monday, October 31**

- 8:00-8:40 *REGISTRATION & CONTINENTAL BREAKFAST*
- 8:40-9:00 **Welcome & Introductions**  
Rainer Volkamer, CU Boulder - TORERO Science Lead  
Al Cooper, NCAR/RAF - NSF/NCAR GV Chief Scientist  
Pavel Romashkin, NCAR/RAF - Project Manager  
Brigitte Baeuerle, NCAR/EOL - Logistics support
- 9:00-9:40 **TORERO – Science Objectives, Platforms and Activities**  
Rainer Volkamer, CU Boulder
- 9:40 **SESSION ONE – TORERO BOUNDARY LAYER OBSERVATIONS**  
CHAIR: Chris Fairall, NOAA/ESRL/PSD  
CO-CHAIR: Byron Blomquist, UHawaii
- 9:40-10:00 **Cruise KA-12-01 aboard RV Ka'imimoana**  
Sean Coburn and Rainer Volkamer, CU Boulder
- 10:00-10:20 **Very short lived halocarbons (VSLH) in air and seawater**  
Lucy Carpenter, University of York, UK
- 10:20-10:40 **Air-Sea Measurements from Ships**  
Chris Fairall, NOAA/ESRL/PSD
- 10:40-11:00 **CO<sub>2</sub> Flux Measurements**

.... Finally, please provide EOL a copy of your PPT presentation for Planning Workshop Documentation.

A PDF copy of your presentation (not the PPT file) will be posted on the MPEX web pages



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*"I'M SORRY, BUT IT SAYS HERE THAT YOU  
DIDN'T MEET YOUR PROJECT DELIVERABLES."*

# Thank you! Questions?

<http://www.eol.ucar.edu/projects/mpex>

**Steve Williams (sfw@ucar.edu)**

**Linda Echo-Hawk (echohawk@ucar.edu)**