



# MPEX DATA MANAGEMENT



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

**MPEX Science Workshop**

**Boulder, CO**

**19-20 November 2013**



NCAR

# MPEX Project & Data Management Web Site

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## Mesoscale Predictability Experiment (MPEX)

May 15, 2013 to June 15, 2013 **Project Location:**  
From Nevada eastward to the Mississippi River, and South Dakota/Wyoming southward through Texas  
**Project Phase:** Data Preparation  
**What's New?:**

**Coming in November: MPEX Workshop Draft Agenda** (updated 14 November), 19 and 20 November, NCAR/EOL Atrium. See the [MPEX Case Review](#) presentation for more information.

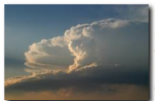
### Project Description:

The Mesoscale Predictability Experiment (MPEX) was conducted within the U.S. intermountain region and high plains during the late spring/early summer of 2013 and included the use of the NSF/NCAR GV, along with the new [Airborne Vertical Atmospheric Profiling System \(AVAPS\)](#) dropsonde system and the [Microwave Temperature Profiler \(MTP\)](#) system, as well as several ground-based mobile upsonde systems, for the field experiment which took place during a 4-week time period from **15 May to 15 June 2013**. The region of interest extended from Nevada eastward to the Mississippi River, and South Dakota/Wyoming southward through Texas (approximately 32.5°- 42.5° N latitude, 90°- 115°W longitude).



### Scientific Objectives

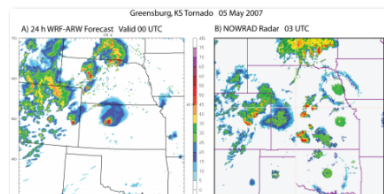
MPEX was motivated by the basic question of whether experimental, sub-synoptic observations could extend convective-scale predictability and otherwise enhance skill in regional numerical weather prediction over a roughly 6 to 24 hour time span. The experimental plan was guided by the following two scientific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



### DATA ACCESS

[MPEX Data Archive](#)  
[MPEX Field Catalog](#)

### FACILITIES & PLATFORMS

[HIAPER](#)

### DATA DOCUMENTATION

[Data Policy](#)  
[Dataset Documentation Guidelines](#)  
[Data Submission Instructions](#)

### PUBLICATIONS

[MPEX Publications](#)

### DOCUMENTS

[MPEX Operations Plan](#)  
[MPEX Proposal](#)  
[MPEX Facility Request](#)  
[NSF/NCAR GV Documentation Summary](#)

### MEETINGS AND PRESENTATIONS

[Meetings and Presentations](#)

### RELATED LINKS

[MPEX Safety Document](#)  
[MPEX Pilot Flight Reports](#)

### MPEX HIAPER FLIGHT OPERATIONS

[MPEX Domain](#)  
[MPEX Flight Hours](#)  
[MPEX Ops Summary](#)  
[MPEX Payload](#)  
[MPEX Schedule](#)

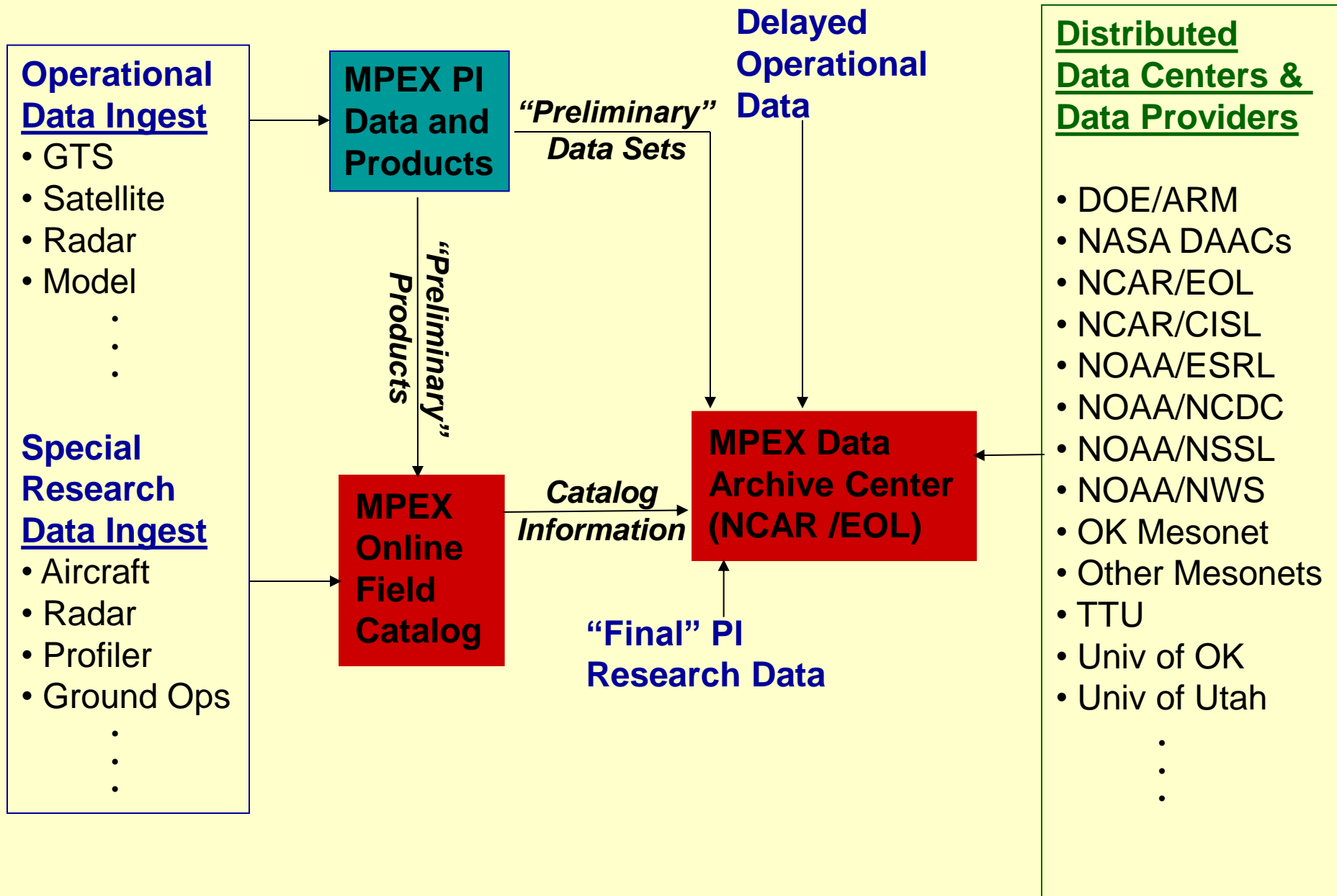
- Project Description
- Logistics
- Data Access & Field Catalog
- Documentation
- Meetings and Presentations
- Publications
- Education and Outreach
- Related Web Pages
- Participants

[http://www.eol.ucar.edu/field\\_projects/mpex/](http://www.eol.ucar.edu/field_projects/mpex/)

# **MPEX DATA POLICY SUMMARY**

- **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**

# Expected MPEX Data Flow

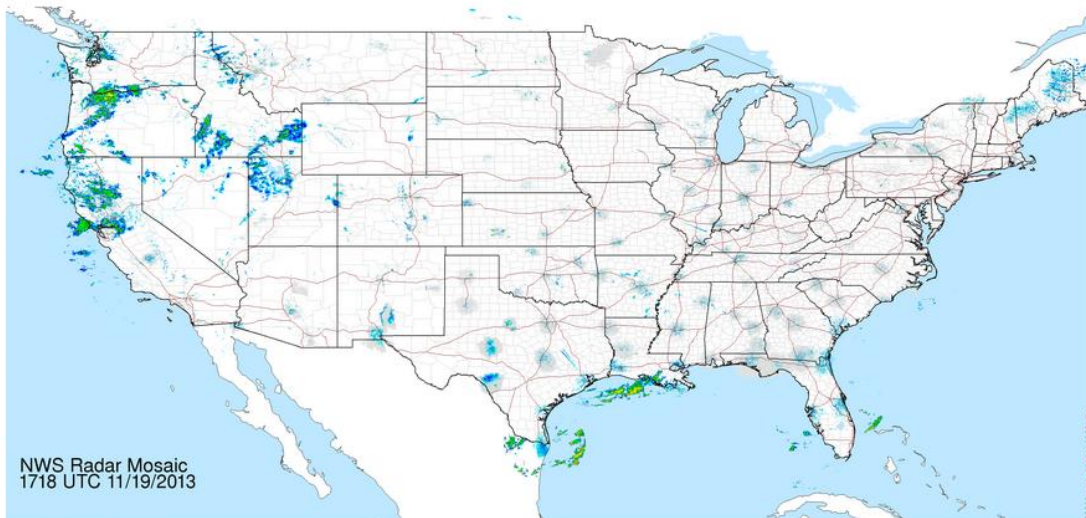




# MPEX Field Catalog

## Mesoscale Predictability Experiment

### Latest National Radar Mosaic



### Current Reports

- [Operations Plan of the Day](#)
- [Facilities Status Summary](#)
- [Weather Discussion](#)

### Tools

- [Catalog Maps \(GIS Tool\)](#)
- [NEXRAD Interactive X-Section](#)
- [Way Point Calculator](#)

### Chatrooms

- [IRC Chat Access](#)
- [Help Documentation](#)
- Get a Password:  
[catalog@eol.ucar.edu](mailto:catalog@eol.ucar.edu)



### Project Time

UTC	Tues, Nov 19, 17:42 Z	Boulder, CO	Tues, Nov 19, 11:42 AM
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**Phone Numbers**  
 Operations Center: 303-497-2019  
 Operations Status Message: 303-497-1040  
 Teleconference: 1-866-740-1260  
 Teleconference: 303-248-0285 (Denver Local)  
 Access Code: 4978635

**External Webpages**  
[MPEX](#)  
[EOL](#)  
[EOL/CDS](#)  
[EOL/FPS](#)

**Catalog Resources**  
[Field Catalogs](#)  
[Catalog User Guide](#)  
[Upload Documents](#)  
[Contact Us](#)

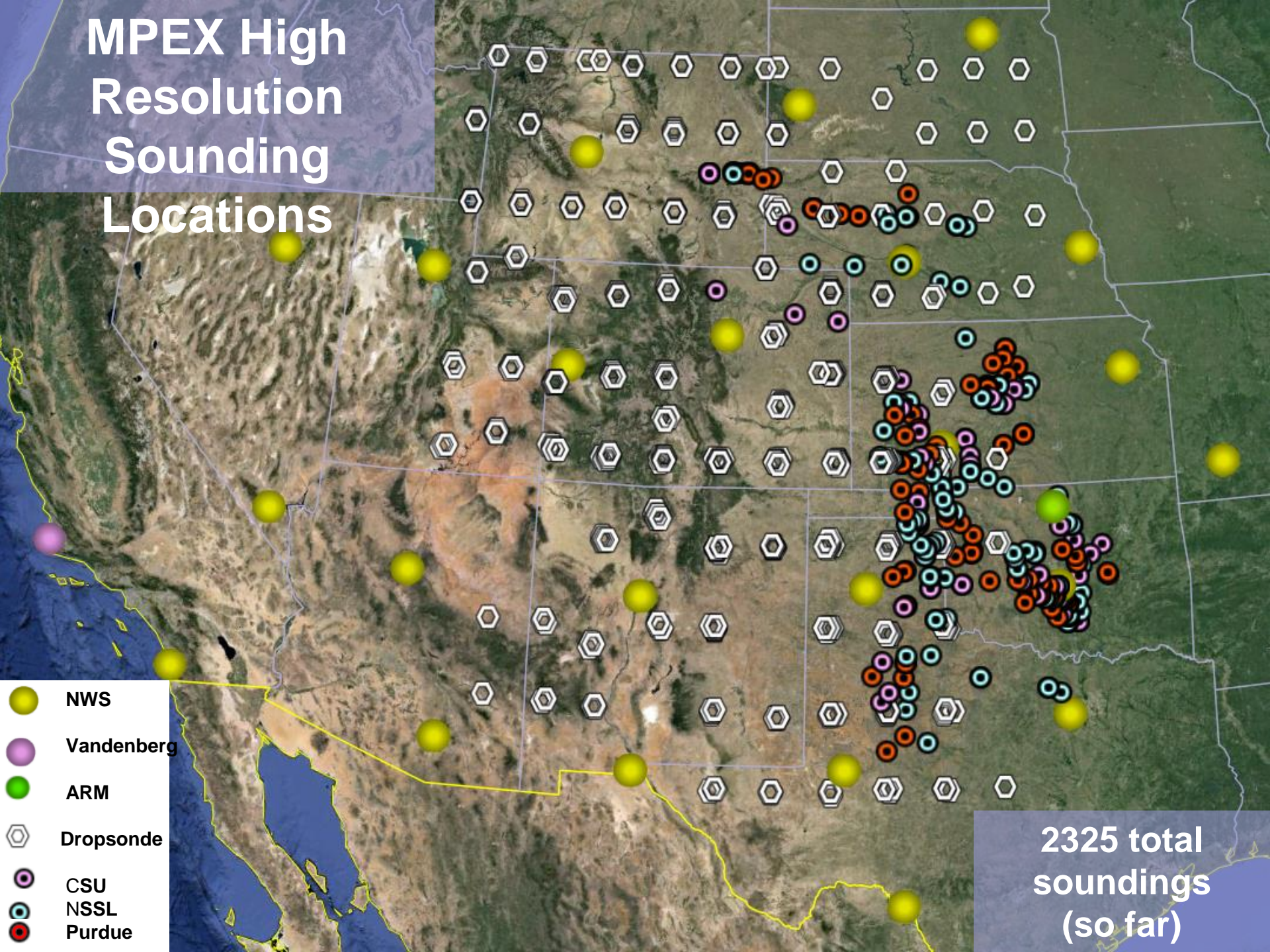
**Social**  
[EOL Facebook](#)  
[IRC Chat Access](#)  
 Request IRC Password:  
[catalog@eol.ucar.edu](mailto:catalog@eol.ucar.edu)



# MPEX Field Catalog

- MPEX was the first project to use version 2.0 of the Field Catalog
  - Issues early on getting reports, models working
  - Navigation not what we hoped for
- First deployment of Catalog Maps with playback capability
  - Catalog Maps not yet able to include Text annotation in Maps
  - Color of icons (wind barbs) makes them difficult to see with sat background
- Some issues that still exist with MPEX Catalog
  - Development versions of HRRR and RAP products spotty
  - 3 of Glen's ensemble products only go out to 9 hours
- New procedure following field campaigns - User Survey. Thanks for your help!
- Field Catalog 2.1 and new navigation paradigm (Thanks to Morris and Chris):

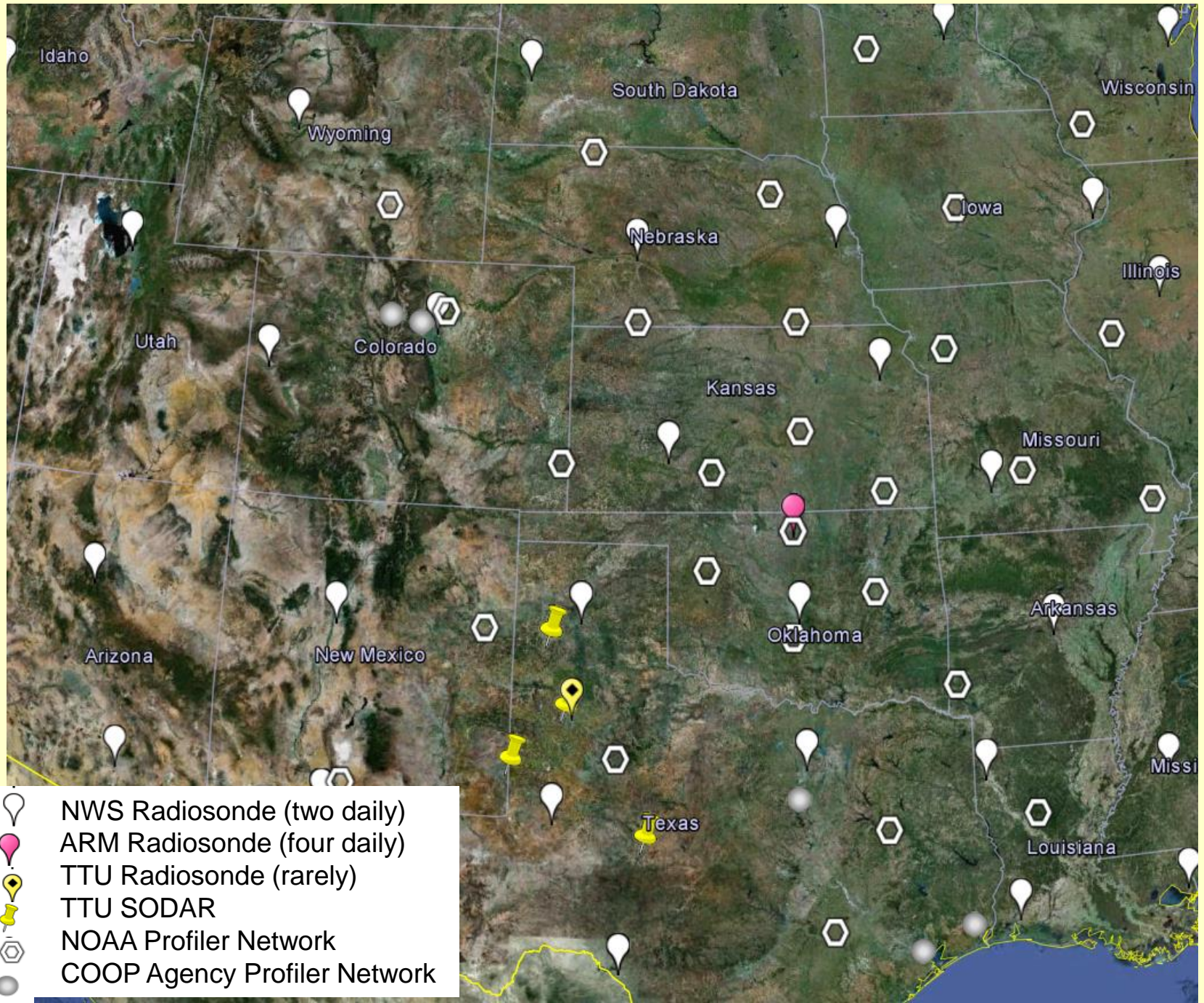
# MPEX High Resolution Sounding Locations









-  NWS
-  Vandenberg
-  ARM
-  Dropsonde
-  CSU
-  NSSL
-  Purdue

2325 total soundings (so far)

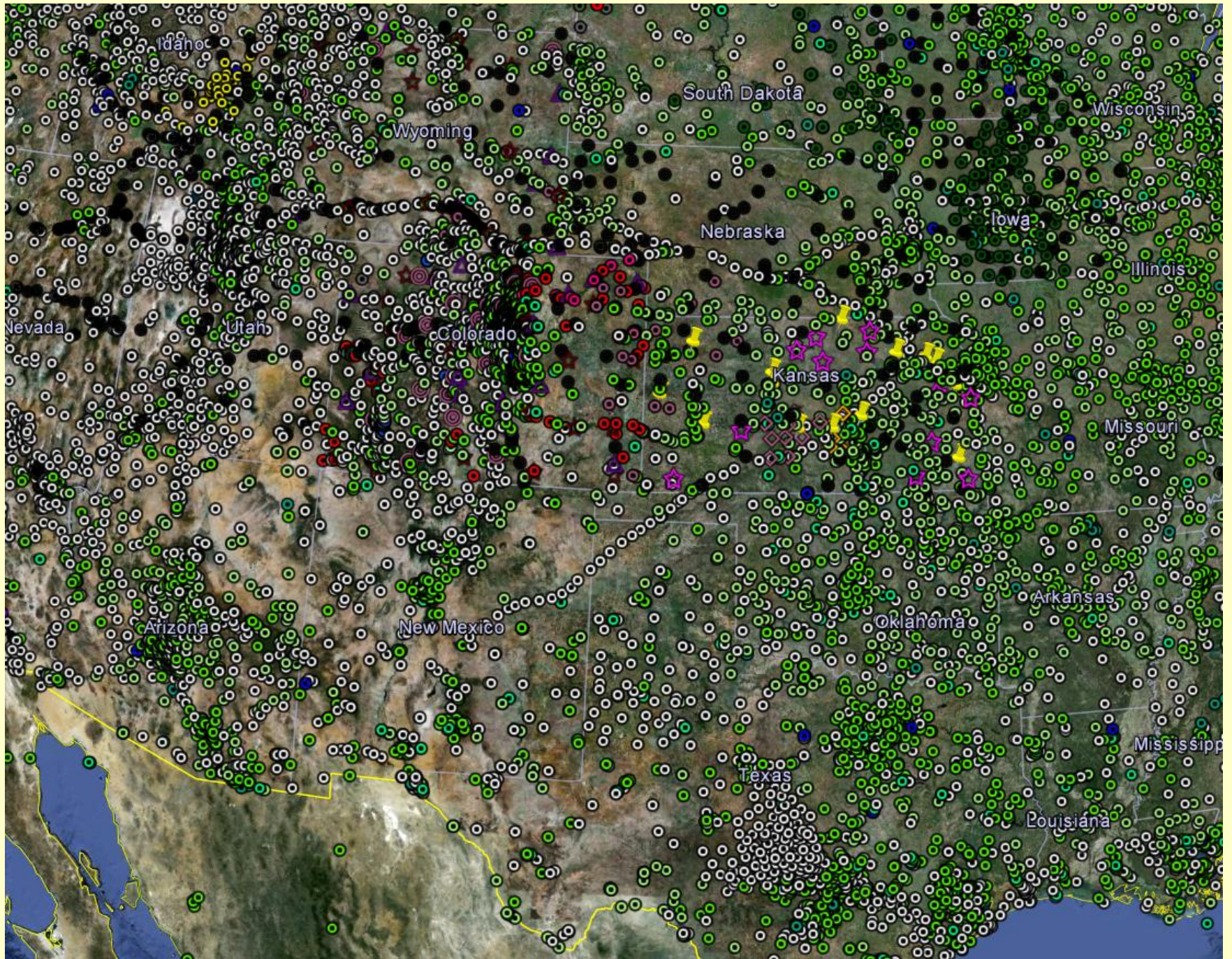
# Radiosonde and Profiler Networks



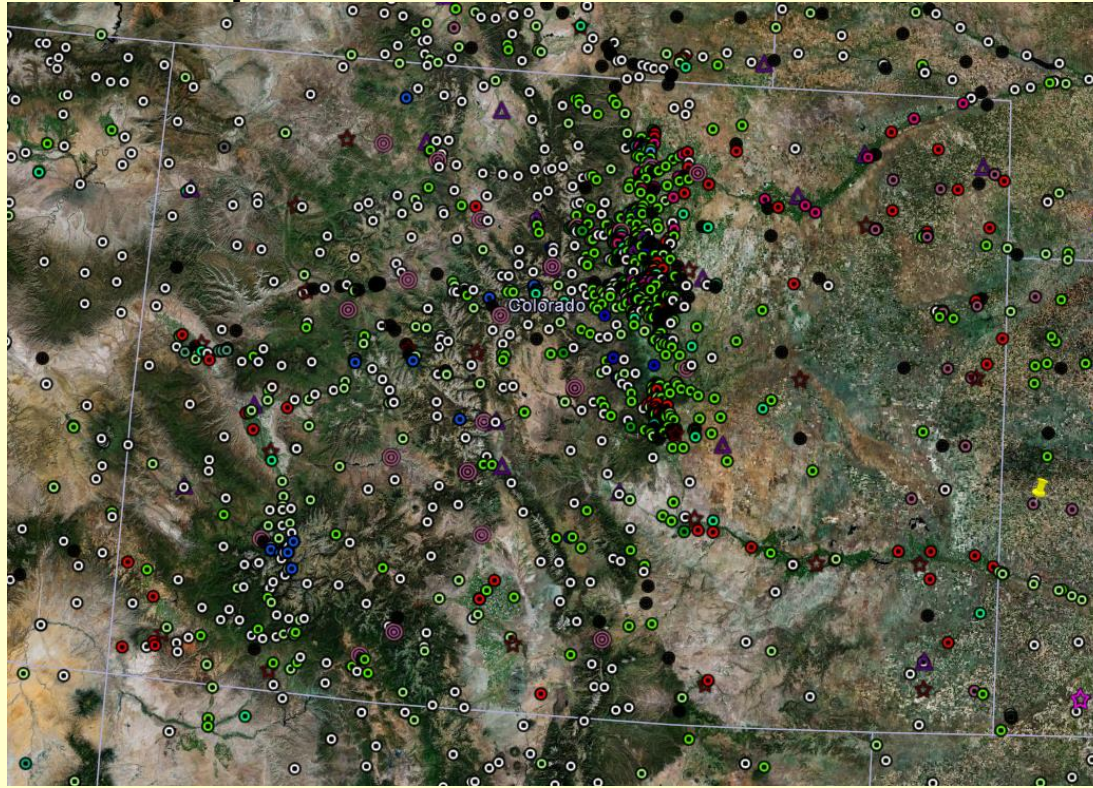
-  NWS Radiosonde (two daily)
-  ARM Radiosonde (four daily)
-  TTU Radiosonde (rarely)
-  TTU SODAR
-  NOAA Profiler Network
-  COOP Agency Profiler Network



# Surface Mesonets



## 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

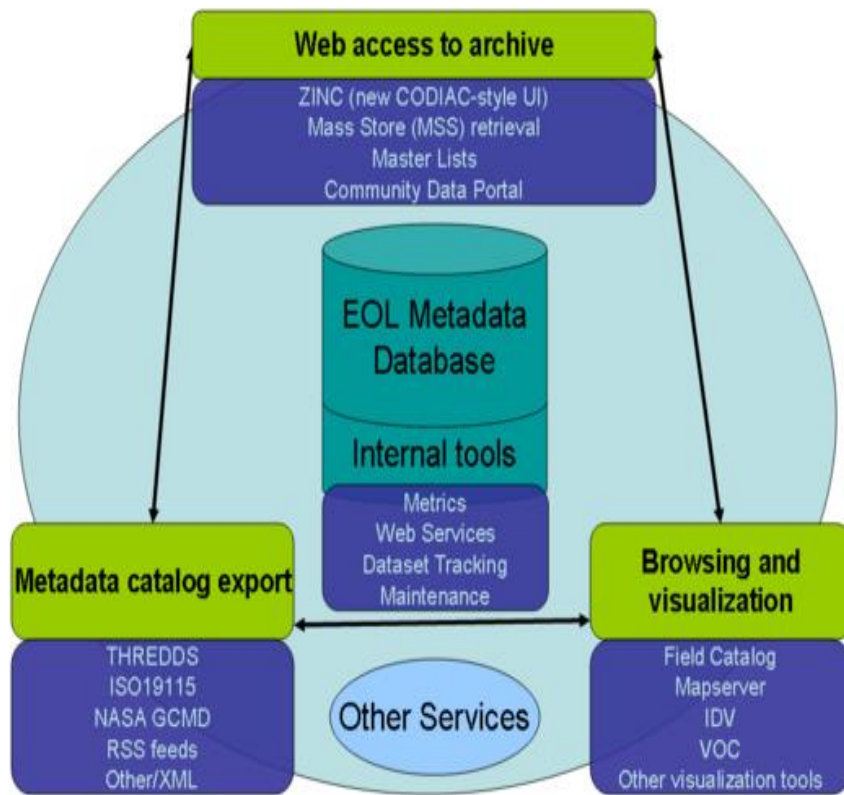
**Transportation** – CO DOT

**Fire Weather** – RAWS

**Soils** – SCAN

**Energy** - NREL

## 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

# MPEX Data Archive (Master List)



## MPEX Data Sets

Data Set Name (Responsible Group/PIs shown in parentheses)	Date Posted	Info
<b>Aircraft</b>		
<a href="#">Aircraft Meteorological Data Reports (AMDAR) and Aircraft Communications Addressing and Reporting System (ACARS) Data [(ESRL-GSD)]</a>	New 2013-10-11	
<b>Aircraft: NSF/NCAR GV HIAPER</b>		
<a href="#">Flight Tracks (Google Earth .kml files) [(NCAR-EOL-RAF)]</a>	New 2013-10-15	
<a href="#">Forward-Looking Digital Camera Imagery [Beaton/(NCAR-EOL-RAF)]</a>	2013-07-10	
<a href="#">Forward-Looking Digital Camera Movies - Preliminary [(NCAR-EOL-RAF)]</a>	2013-07-23	
<a href="#">Forward-Looking Digital Camera Movies with data [(NCAR-EOL-RAF)]</a>		
<a href="#">Low Rate (LRT - 1 sps) Navigation, State Parameter, and Microphysics Flight-Level Data [(NCAR-EOL-RAF)]</a>	New 2013-10-15	
<a href="#">Microwave Temperature Profiler (MTP) [Haggerty(NCAR-EOL-RAF)]</a>	New 2013-10-02	
<a href="#">MPEX Field Catalog Missions Summary [(NCAR-EOL)]</a>	New 2013-10-10	
<a href="#">MPEX Field Catalog Reports [(NCAR-EOL)]</a>	New 2013-10-10	
<a href="#">NSF/NCAR G-V Dropsonde High Resolution Data (EOL Format) [(NCAR-EOL)]</a>	2013-08-01	
<a href="#">NSF/NCAR G-V Dropsonde Mandatory and Significant Level Data (GTS Format) [(NCAR-EOL)]</a>	2013-08-01	
<b>Ancillary</b>		
<a href="#">MPEX 2013 Field Catalog [(NCAR-EOL)]</a>	2013-07-29	
<a href="#">MPEX Chat Logs [(NCAR-EOL)]</a>		
<a href="#">MPEX Field Catalog Missions Summary [(NCAR-EOL)]</a>	New 2013-10-10	

### DATA BY CATEGORY

- Aircraft
- Ancillary
- Land Based
- Model
- Radar
- Satellite
- Upper Air

[Back to MPEX](#)

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

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

# 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.

# MPEX PUBLICATIONS LIBRARY



## Mesoscale Predictability Experiment (MPEX)

### Publication References

How to Submit Publication References to this List

[Publications](#)

[Conferences](#)

[Reports](#)

[Theses](#)

[Other Citation Links](#)

#### Publications

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#### Other Citation Links



# Mesoscale Predictability Experiment (MPEX)

## MPEX Workshop Agenda

*December 13-14, 2012*  
*National Center for Atmospheric Research*  
*Boulder, Colorado*

## MPEX Workshop Summary

Thursday, Dec. 13

- 1:00 PM **Introduction (Morris Weisman)**
- 1:10 PM Upsonde Update (Jeff Trapp)
- 1:30 PM GV Operations in MPEX (Pavel Romashkin RAF)
- 2:00 PM NCAR/NSF GV New Automated Dropsonde System Overview (Terry Hock)
- 2:20 PM **PI Presentations: (10 min each plus discussion)**
- Microwave Temperature Profiler Observations for MPEX (Chris Davis)
- MPEX: NCAR WRF-DART, Realtime Forecasts, Retrospective Case Studies (Glen Romine)
- Real-time Sensitivity Analysis During MPEX (Ryan Torn)
- 3:10 PM **\*\*\*\*\* Coffee Break \*\*\*\*\***
- 3:30 PM **PI Presentations (Continued)**
- NOAA-ESRL/GSD/AMB Participations in MPEX (David Dowell)
- Impact of Dropsonde and MTP Data on Convective Initiation Using WRFVAR (Jenny Sun)
- Upscale Impacts of Convection (Jeff Trapp)
- High Plains Convection: Diurnally Varying Mesoscale-Synoptic Scale Interactions over Complex Terrain during MPEX (Lance Bosart)
- MPEX soundings for the analysis and prediction of heavy precipitation (PPSX Version) (Russ Schumacher)
- What are supercells for? (Chuck Doswell)

.... 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







# Thank you! Questions?

[http://www.eol.ucar.edu/field\\_projects/mpex](http://www.eol.ucar.edu/field_projects/mpex)

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**Greg Stossmeister (gstoss@ucar.edu)**