DEEPWAVE DATA MANAGEMENT

Steve Williams

NCAR Earth Observing Laboratory (EOL)

Computing, Data, and Software Facility (CDS)

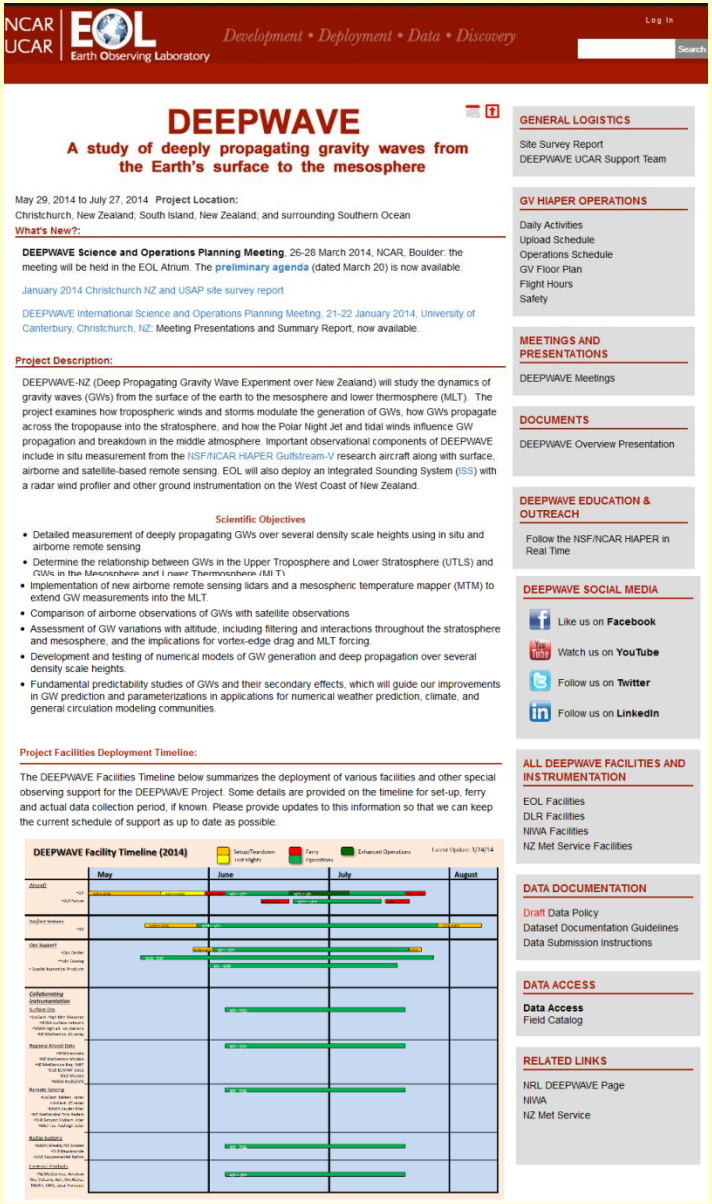
DEEPWAVE Science and Operations Planning Meeting

Boulder, CO

26-28 March 2014

EOL DEEPWAVE support sponsored by NSF

DEEPWAVE Web Site at NCAR/EOL



NCAR UCAR | EOL Earth Observing Laboratory — Development • Deployment • Data • Discovery

Log In | Search

DEEPWAVE

A study of deeply propagating gravity waves from the Earth's surface to the mesosphere

May 29, 2014 to July 27, 2014 **Project Location:**
Christchurch, New Zealand; South Island, New Zealand; and surrounding Southern Ocean

What's New?:

DEEPWAVE Science and Operations Planning Meeting, 26-28 March 2014, NCAR, Boulder: the meeting will be held in the EOL Atrium. The **preliminary agenda** (dated March 20) is now available.

January 2014 Christchurch NZ and USAP site survey report

DEEPWAVE International Science and Operations Planning Meeting, 21-22 January 2014, University of Canterbury, Christchurch, NZ: Meeting Presentations and Summary Report, now available.

Project Description:

DEEPWAVE-NZ (Deep Propagating Gravity Wave Experiment over New Zealand) will study the dynamics of gravity waves (GWs) from the surface of the earth to the mesosphere and lower thermosphere (MLT). The project examines how tropospheric winds and storms modulate the generation of GWs, how GWs propagate across the tropopause into the stratosphere, and how the Polar Night Jet and tidal winds influence GW propagation and breakdown in the middle atmosphere. Important observational components of DEEPWAVE include in situ measurement from the NSF/NCAR HIAPER Gulfstream-V research aircraft along with surface, airborne and satellite-based remote sensing. EOL will also deploy an Integrated Sounding System (ISS) with a radar wind profiler and other ground instrumentation on the West Coast of New Zealand.

Scientific Objectives

- Detailed measurement of deeply propagating GWs over several density scale heights using in situ and airborne remote sensing
- Determine the relationship between GWs in the Upper Troposphere and Lower Stratosphere (UTLS) and GWs in the Mesosphere and Lower Thermosphere (MLT)
- Implementation of new airborne remote sensing lidars and a mesospheric temperature mapper (MTM) to extend GW measurements into the MLT
- Comparison of airborne observations of GWs with satellite observations
- Assessment of GW variations with altitude, including filtering and interactions throughout the stratosphere and mesosphere, and the implications for vortex-edge drag and MLT forcing.
- Development and testing of numerical models of GW generation and deep propagation over several density scale heights.
- Fundamental predictability studies of GWs and their secondary effects, which will guide our improvements in GW prediction and parameterizations in applications for numerical weather prediction, climate, and general circulation modeling communities.

Project Facilities Deployment Timeline:

The DEEPWAVE Facilities Timeline below summarizes the deployment of various facilities and other special observing support for the DEEPWAVE Project. Some details are provided on the timeline for set-up, ferry and actual data collection period, if known. Please provide updates to this information so that we can keep the current schedule of support as up to date as possible.

DEEPWAVE Facility Timeline (2014) — May | June | July | August

GENERAL LOGISTICS
Site Survey Report
DEEPWAVE UCAR Support Team

GV HIAPER OPERATIONS
Daily Activities
Upload Schedule
Operations Schedule
GV Floor Plan
Flight Hours
Safety

MEETINGS AND PRESENTATIONS
DEEPWAVE Meetings

DOCUMENTS
DEEPWAVE Overview Presentation

DEEPWAVE EDUCATION & OUTREACH
Follow the NSF/NCAR HIAPER in Real Time

DEEPWAVE SOCIAL MEDIA
Like us on **Facebook**
Watch us on **YouTube**
Follow us on **Twitter**
Follow us on **LinkedIn**

ALL DEEPWAVE FACILITIES AND INSTRUMENTATION
EOL Facilities
DLR Facilities
NIWA Facilities
NZ Met Service Facilities

DATA DOCUMENTATION
Draft Data Policy
Dataset Documentation Guidelines
Data Submission Instructions

DATA ACCESS
Data Access
Field Catalog

RELATED LINKS
NRL DEEPWAVE Page
NIWA
NZ Met Service

- **Project Description**
- **Data Access & Field Catalog**
- **Publications**
- **Documentation**
- **Meetings and Presentations**
- **Mailing Lists**
- **Education and Outreach**
- **Related Web Pages**
- **PI and Contact Information**

https://www.eol.ucar.edu/field_projects/deepwave

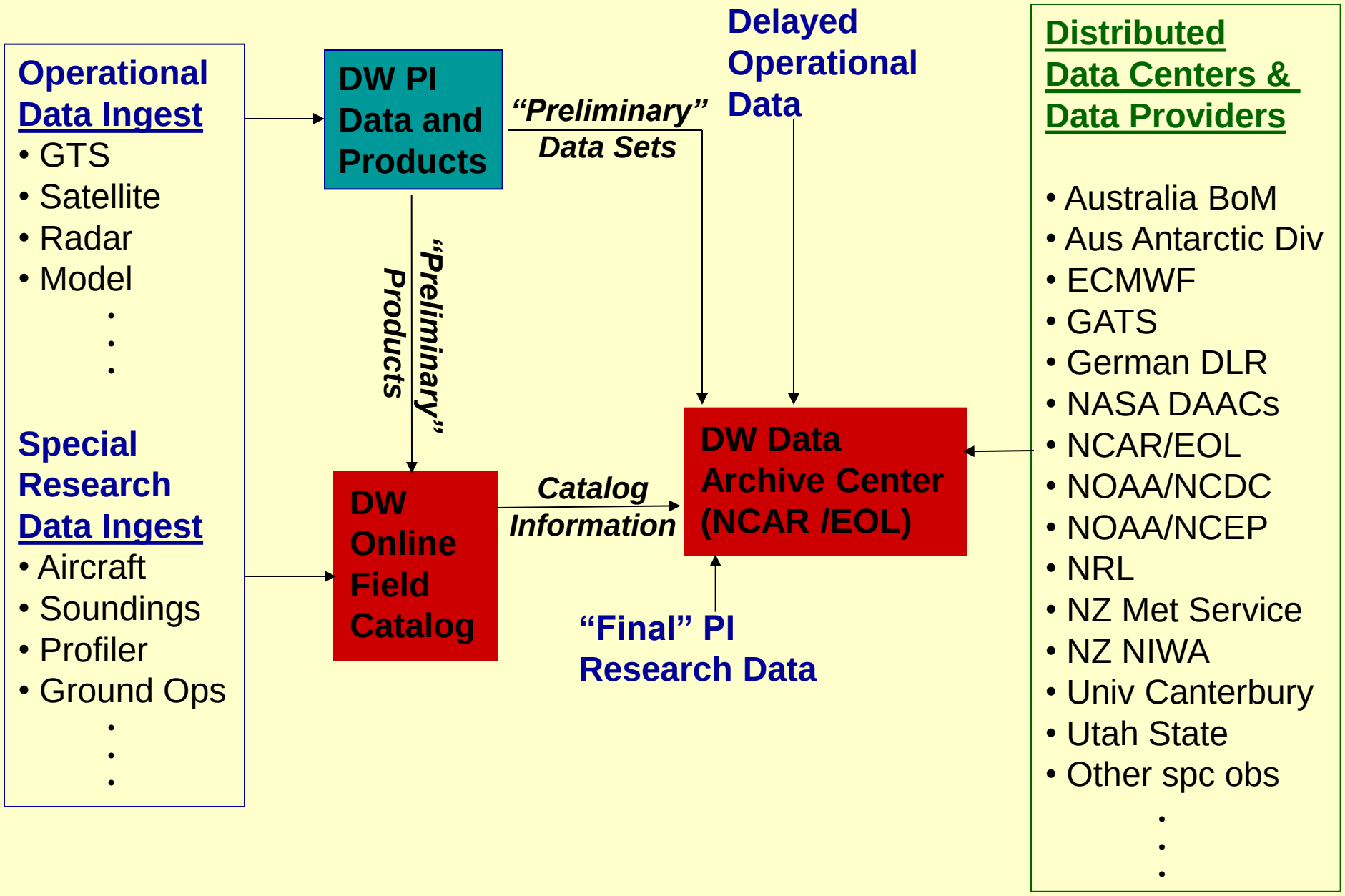
DEEPWAVE DATA POLICY SUMMARY (*Proposed*)

- **All investigators must agree to promptly submit their processed "preliminary" data to the DEEPWAVE archive no later than 29 January 2015**
- **All "preliminary" data shall be provided to other DEEPWAVE 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 DEEPWAVE preliminary data submission deadline (01 February 2016)**
- **Any use of the data will, at a minimum, include acknowledgment. Co-authorship TBD with the investigator(s) who collected the data**

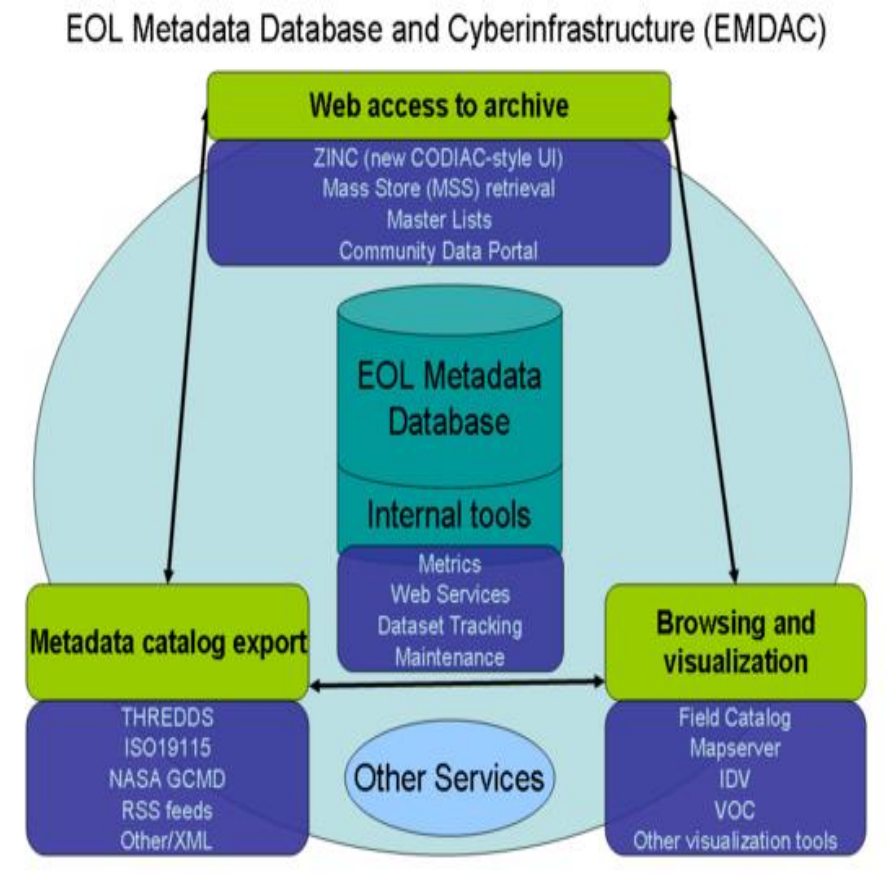
DRAFT DEEPWAVE DATA MANAGEMENT MILESTONES

Event	Deadline
End of Field Campaign	28 July 2014
Preliminary Data Submission	29 January 2015
Final Data Submission	29 July 2015
Initial Data Analysis Period (DEEPWAVE Science Team members have exclusive access to the data during this period.)	29 January 2015 to 29 January 2016
Data becomes Public Domain	1 February 2016

Expected DEEPWAVE (DW) Data Flow



EOL DATA MANAGEMENT



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**

DC3 Data Archive (Master List)

DATA BY CATEGORY

- Accompanying Archives
- Aircraft
- Ancillary
- Hydrology
- Land Based
- Lightning
- Model
- Photography
- Radar
- Satellite
- Upper Air

DATA BY SITE

- Alabama Region
- Colorado Region
- Oklahoma Region

Back to DC3

Email comments & questions

DC3 Data Sets

Data Set Name (Responsible Group/PIs shown in parentheses)	Date Posted	Info
Accompanying Archives		
NASA Langley DC3 Merged Aircraft Dataset Archive [Chen, Gao (NASA-LaRC)]	2012-08-02	README
Aircraft		
Aircraft Meteorological Data Reports (AMDAR) and Aircraft Communications Addressing and Reporting System (ACARS) Data [(ESRL-GSD)]	2012-07-24	README
Aviation Weather Center Convective, Icing, and Turbulence SIGMET Imagery [(NCAR-EOL)]	New 2013-01-07	
Aviation Weather Center Pilot Reports of Icing and Turbulence (PIREPs) Imagery [(NCAR-EOL)]	New 2013-01-07	
DC3 Field Catalog Earth Tool (Replay) [(NCAR-EOL)]	New 2013-01-07	
NASA Langley DC3 Merged Aircraft Dataset Archive [Chen, Gao (NASA-LaRC)]	2012-08-02	README
NOAA NWS Aviation Weather Center Aviation Digital Data Service (ADDS) [(NOAA-NWS-ADDS)]	New 2013-01-17	README
Aircraft: DLR Falcon		
DC3 Mission Summaries [(NCAR-EOL)]	2012-10-23	

http://data.eol.ucar.edu/master_list/?project=DC3

DC3 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 any publications, if available

DC3 DATA SUBMISSION

DC3 Data Submission Instructions

The DC3 Data Archive contains a master list of all DC3 international data sets (with links) and has been compiled to provide easy access to all DC3 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 and is linked in the Data Access section of the **DC3 Project Page**. It is available directly at **DC3 Data Archive**. Please e-mail all corrections, additions, or deletions to the DC3 Data Archive list directly to **Steve Williams**.

If you already have your data sets available on-line, please provide the web link or FTP access information to NCAR Earth Observing Laboratory (EOL). Once your data set (with metadata) is available, a link will be provided from the DC3 Data Archive along with a submission date to track future data set upgrades or revisions (if needed).

Please submit both your data set(s) and accompanying metadata or documentation files to the DC3 Data Archive. Data set documentation guidelines are available by direct link **here**. NCAR EOL has established an anonymous FTP to accept your DC3 data set(s). **To FTP data to the NCAR EOL DC3 anonymous FTP, please use the following instructions:**

FTP: ftp.eol.ucar.edu
Login: anonymous *(No password required.)*
cd /pub/data/incoming/dc3

Once you have FTPed your data set to NCAR EOL, **it is very important to send an e-mail to sfw at 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 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 DC3 archive. Feel free to contact us should you encounter any problems or have any questions.

Steve Williams
DC3 Data Manager

DC3 PROJECT PUBLICATIONS LIBRARY

DC3 Publications

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*

Conference Proceedings

A-D | E-H | I-L | M-P | Q-T | U-Z | *Back to Top*

- Arkinson, Heather, T. Hanisco, M. Cazorla, A. Fried, J. Walega, 2012: In Situ Airborne Measurement of Formaldehyde with a New Laser Induced Fluorescence Instrument. Poster. AGU 2012 Meeting, San Francisco, California, U.S.A., A21H-0154.
- Barth, Mary C., M. Bela, K. Cummings, K. Pickering, T. Lyons, M. Weisman, K. Manning, G. Romine, W. Wang, F. Flocke, A. Weinheimer, T. Campos, T. Ryerson, G. Diskin, G. Sachse, 2012: Tracer and Chemistry Modeling of Thunderstorms for the DC3 Field Experiment. Poster. AGU 2012 Meeting, San Francisco, California, U.S.A., A21H-0152.
- Brock, Charles A., B. Anderson, L. Ziemba, K. Thornhill, R. Moore, A. Beyersdorf, E. Winstead, S. Crumeyrolle, N. Wagner, J. Langridge, M. Richardson, D. Lack, D. Law, T. Shingler, A. Sorooshian, 2012: Continuous Measurement of Particle Hygroscopicity as a Function of Diameter. Poster. AGU 2012 Meeting, San Francisco, California, U.S.A., A11A-0016.
- Bruning, Eric, R. Thomas (2012), Fractal-based lightning channel length estimation from convex hulls of VHF sources, Abstract AE12A-03 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Campuzano Jost, Pedro, D. Day, B. Palm, A. Ortega, P. Hayes, J. Jimenez, 2012: Submicron Aerosol Transport and Aging by Convective Storms During the DC3 Campaign. Poster. AGU 2012 Meeting, San Francisco, California, U.S.A., A21H-0155.
- DiGangi, Joshua, A. O'Brien, M. Diao, C. Hamm, Q. Zhang, S. Beaton, M. Zondlo, 2012: Calibration and Field Deployment of the NSF G-V VCSEL Hygrometer. Poster. AGU 2012 Meeting, San Francisco, California, U.S.A., A31E-0078.
- Hall, Samuel, K. Ullmann, S. Schmidt, B. Kindel, J. Hair, 2012: Actinic flux measurements and photolysis frequencies enhancements near clouds during DC3 and TORERO. Poster. AGU 2012 Meeting, San Francisco, California, U.S.A., A51E-0116.

Composite Data Sets at NCAR/EOL

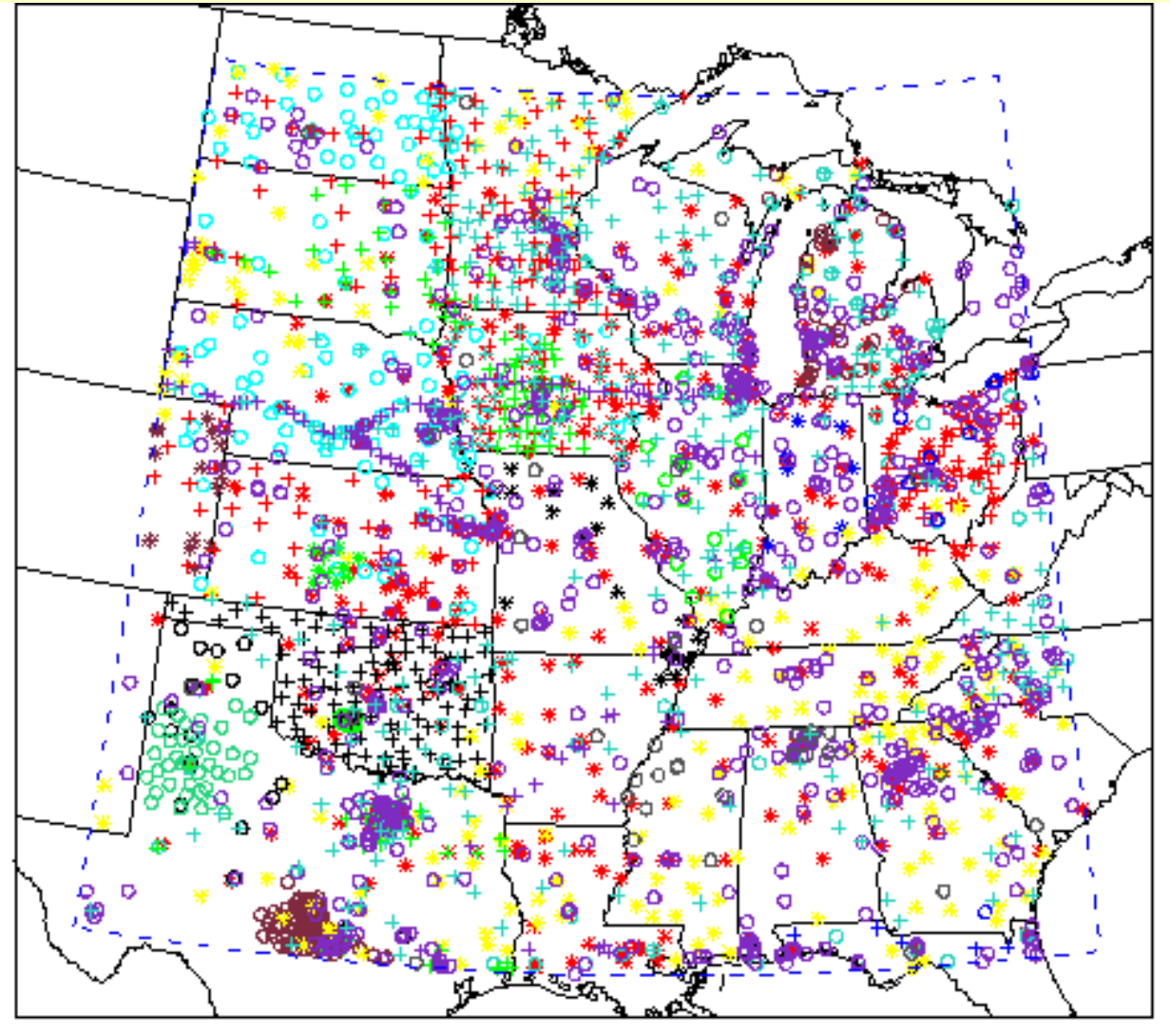
A composite dataset is a collection (over some time period and region) of similar data (e.g. surface meteorological) from a variety of sources, put into a common format, and passed through a uniform quality control.

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)



DEEPWAVE Archive Data

Satellite:

- Aqua-AIRS GW Radiances
- MTSAT-2 Channel Imagery
- Polar Orbiting products beyond Aqua?

Radar:

- New Zealand Radar Reflectivity Data (other products?)

Surface:

- Regional GTS obs - NIWA AWS stations, NZMS stations, ships
- other NZ operational surface networks?

Upper-Air:

- Regional Soundings in highest resolution (NZ – Australia)
- Special DEEPWAVE Soundings (DLR, NIWA, NZMS, BoM …)
- Sounding “composite” (hi-res and 5-mb)?
- ISS hi-res data
- Dropsonde hi-res data

DEEPWAVE Archive Data

Model Forecasts (selected fields & levels): .

- ECMWF IFS and WRF
- NCEP GFS
- Navy COAMPS 15km
- Navy COAMPS Adjoint
- NIWA (NZLAM, NZCSM, UK cutout)
- WRF
- GATS
- NOGAPS Alpha

Aircraft:

- GV Navigational/Meteorological Data and Camera Imagery
- DLR Navigational/Meteorological Data
- ACARS?

Research Instruments:

- Ground-based Observatory Instrument Data
- GV MTM
- Lauder AMTM

GV FORWARD CAMERA IMAGERY

rf03
06/18/2011

Date	2011-06-18
Start_UTC	18:01:17
GGALT	152.477997
GGLAT	61.191120
GGLON	-150.009445
ATX	9.538824
DPXC	4.124762
PSXC	994.200500
RHUM	68.929268
TASX	84.210617
THDG	345.371521
PITCH	15.693894
ROLL	-0.316044
WSC	2.015230
WDC	311.999756
DP_VXL	4.124762
VMR_VXL	8256.059570

DEEPWAVE Archive Data

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Aircraft:

- GV Navigational/Meteorological Data and Camera Imagery
- DLR Navigational/Meteorological Data
- ACARS?

Research Instruments:

- Ground-based Observatory Instrument Data
- GV MTM
- Lauder AMTM

DEEPWAVE Archive Data

FTP site for “preliminary” or “field data”

- Active during the field campaign
- password-protected to limit access to participants only
- self-organized (planning required)
- Data removed after campaign ends – move to archive?
- Site deactivated after the campaign

Final archive at EOL

- Field Catalog content becomes part of the Archive
- After the campaign, this link is redirected to the archive pages for DEEPWAVE
- Datasets to be uploaded after the campaign ends do not use field FTP site
- See instructions for Dataset submission at http://www.eol.ucar.edu/field_projects/deepwave

NCAR UCAR | EOL Earth Observing Laboratory — Development • Deployment • Data • Discover

DEEPWAVE

A study of deeply propagating gravity waves from the Earth's surface to the mesosphere

International Science and Operations Planning Meeting: Jan 21-22

DEEPWAVE INTERNATIONAL SCIENCE AND OPERATIONS PLANNING MEETING

21-22 January 2014

University of Canterbury

Christchurch, New Zealand

DEEPWAVE Meeting Summary Report

Meeting Presentations

NOTE: Password Required to View Presentations

For a PDF of one of the following presentations, click on the corresponding title. In some cases a PowerPoint Slideshow is also available, for those click on the PPSX after the title. A PowerPoint viewer can be downloaded from Microsoft.

TUESDAY, 21 JANUARY 2014

08:15 - 08:50	Light Breakfast
08:50 - 09:00	Introductions and Local Logistics (Andy Sturman, Ron Smith)
	DEEPWAVE PI presentations
09:00 - 09:30	DEEPWAVE Science Overview (Dave Fritts, GATS) [PPSX]
09:30 - 10:00	Satellite observations of waves in the middle atmosphere (Steve Eckermann, NRL)
10:00 - 10:20	Modeling and predictability of mountain waves (Jim Doyle, NRL)
10:20 - 10:30	Break
10:30 - 11:00	Mountain wave launching and energy diagnostics (Ron Smith, Yale)
11:00 - 11:30	Modeling gravity wave breakdown in the middle atmosphere (Dave Fritts, GATS) [PPSX]
11:30 - 12:00	Results from the 2013 DEEPWAVE Dry Run (Smith, Doyle, Fritts and Eckermann)
12:00 - 13:30	Lunch

…. Finally, please provide a final copy of your PPT presentation for this Planning Meeting Documentation.

A PDF and/or PPSX copy of your presentation (not the PPT file) will be posted on the DEEPWAVE web site (password?)

EARTH OBSERVING LABORATORY — Development Deployment Data Services Discovery