DEEPWAVE DATA MANAGEMENT UPDATE

Steve Williams, Linda Cully, and Scot Loehrer

NCAR Earth Observing Laboratory (EOL)

Computing, Data, and Software Facility (CDS)

DEEPWAVE Science Team Meeting

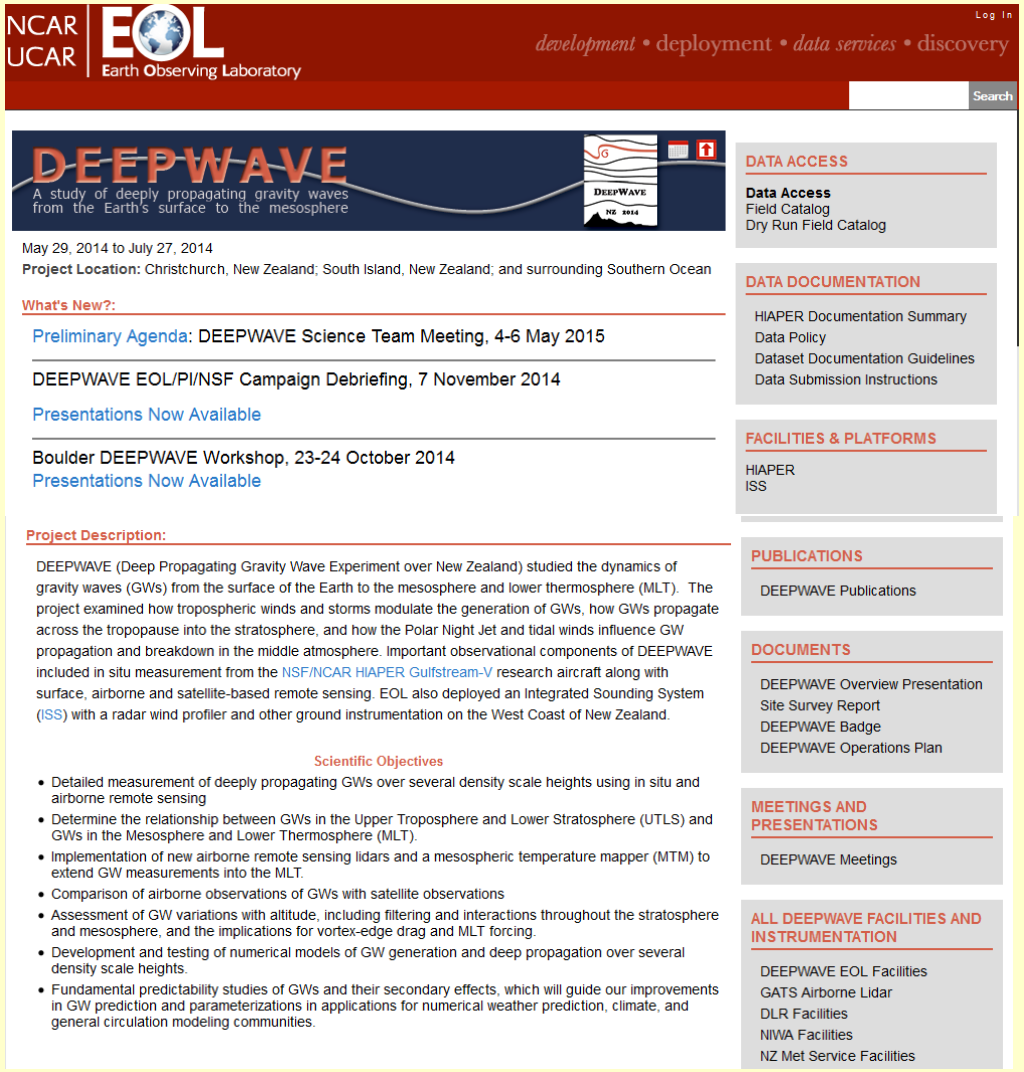
Boulder, CO

4-6 May 2015

EOL DEEPWAVE support sponsored by NSF

NCAR

DEEPWAVE Web Site at NCAR/EOL



NCAR UCAR | EOL Earth Observing Laboratory

development • deployment • data services • 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?:

Preliminary Agenda: DEEPWAVE Science Team Meeting, 4-6 May 2015

DEEPWAVE EOL/PI/NSF Campaign Debriefing, 7 November 2014

Presentations Now Available

Boulder DEEPWAVE Workshop, 23-24 October 2014

Presentations Now Available

Project Description:

DEEPWAVE (Deep Propagating Gravity Wave Experiment over New Zealand) studied the dynamics of gravity waves (GWs) from the surface of the Earth to the mesosphere and lower thermosphere (MLT). The project examined 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 included in situ measurement from the NSF/NCAR HIAPER Gulfstream-V research aircraft along with surface, airborne and satellite-based remote sensing. EOL also deployed 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.

DATA ACCESS

Data Access
Field Catalog
Dry Run Field Catalog

DATA DOCUMENTATION

HIAPER Documentation Summary
Data Policy
Dataset Documentation Guidelines
Data Submission Instructions

FACILITIES & PLATFORMS

HIAPER
ISS

PUBLICATIONS

DEEPWAVE Publications

DOCUMENTS

DEEPWAVE Overview Presentation
Site Survey Report
DEEPWAVE Badge
DEEPWAVE Operations Plan

MEETINGS AND PRESENTATIONS

DEEPWAVE Meetings

ALL DEEPWAVE FACILITIES AND INSTRUMENTATION

DEEPWAVE EOL Facilities
GATS Airborne Lidar
DLR Facilities
NIWA Facilities
NZ Met Service Facilities

- **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 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

DEEPWAVE Data Policy and Data Submission Instructions

FTP: ftp.eol.ucar.edu
Login: anonymous
(*No password required.*)

cd pub/data/incoming/deepwave

(NOTE: This command should be done all in one step.)

It is very important to **send an e-mail to sfw at ucar.edu indicating that the data file(s) have been FTPed**

1. **All investigators participating in DEEPWAVE agree to promptly submit their preliminary processed data and metadata to the main DEEPWAVE Data Archive Center at EOL no later than 29 January 2015** (six months after the end of the field campaign) to facilitate initial instrument inter-comparisons, quality control checks and calibrations, as well as early interpretation of the combined data set. Individual preliminary datasets can be restricted (password protected) at the discretion of the data provider. All archived supporting operational data and products will be open and accessible by the Scientific Community during this period. **The preliminary data submission period is from 29 July 2014 to 29 January 2015**.

2. DEEPWAVE Investigators agree to **submit their final research data and metadata to the EOL within the one-year** period following the conclusion of the field campaign. **The final data submission period is from 29 July 2014 to 29 July 2015**.

3. During the initial data analysis period, defined as a one-year period following the preliminary data submission deadline to the DEEPWAVE archive, DEEPWAVE Principal Investigators (PIs) will have exclusive access to these research data. This initial analysis period is designed to provide an opportunity to quality control the combined data set as well as to provide the PIs, their students and collaborators ample time to analyze and publish their results. **The initial data analysis period is from 29 January 2015 to 29 January 2016**.

4. **All data and metadata in the archive will be considered open to the public domain 18 months following the end of the field campaign** (i.e., on **1 February 2016** and thereafter). However, any research dataset within the DEEPWAVE archive can be opened to the public domain earlier at the discretion of the responsible data provider in consultation with the DEEPWAVE SSC.

5. **A list of DEEPWAVE Investigators will be provided by the project science leadership to EOL** and will include the PIs directly participating in the field experiment as well as collaborating scientists and agencies who have provided guidance and data in the planning and analysis of DEEPWAVE data. All DEEPWAVE investigators will have equal access to all data. All data shall be promptly provided to other DEEPWAVE investigators on the above specified list upon request. However, the **DEEPWAVE science leadership will be responsible for approving any data requests from investigators not included on the list.**

6. **During the initial data analysis period, the responsible data provider must be notified first of the intent to use their data**, in particular if data are to be provided to a third party (e.g., journal articles, presentations, research proposals, other investigators). It is strongly encouraged that the responsible data provider(s) be invited to become collaborators and/or co-authors on any projects, publications and presentations. If the contribution of the data product is significant to the publication, the PIs responsible for generating a measurement or a data product should be offered the right of co-authorship. Any use of the data should include an acknowledgment or preferably a citation (e.g. Digital Object Identifiers or DOIs). The **EOL expects to be assigning DOIs for all final datasets submitted to the main archive at EOL**. In all circumstances, the responsible data provider(s) should be acknowledged appropriately.

7. All acknowledgments of DEEPWAVE data and resources should identify: (1) DEEPWAVE; (2) The providers who collected the particular datasets being used in the study; (3) The relevant funding agencies associated with the collection of the data being studied, and (4) the role of EOL or relevant data archive center, and (5) use of any relevant DOIs.

8. The EOL will be responsible for the long-term data stewardship of the DEEPWAVE archive.

DEEPWAVE Field Catalog

A Study of Deeply Propagating Gravity Waves from the Earth's Surface to the Mesosphere

DEEPWAVE NZ 2014

Home | Maps | Reports | Status | Products | Missions | Tools & Links | Data Access | Help

Status

The DEEPWAVE Field Campaign took place between 5/24 - 7/27/2014 in and around the New Zealand. The base of operations was located at the USARP base, Christchurch Airport. The NSF/NCAR-GV and the DLR Falcon were the research aircraft involved. Major ground-based research facilities were located at Hokitika, Lauder and Haast as well as in Tasmania near Hobart.

For a summary of these operations and related products, please click on the **"Missions"** link above.

To replay previous cases via the Field Catalog GIS tool, click on Catalog Maps.

https://catalog.eol.ucar.edu/deepwave

DEEPWAVE Field Catalog Statistics

- Reports/Summaries (Status, Mission, and Operations)

  318 documents

- Research Platform Products (Aircraft and Upper Air)

  5,940 products

- Operational Products (Satellite, Surface, and Radar)

  42,514 products

- Model Output Imagery (Analysis and Forecast Fields)

  1,956,258 products

- Catalog Maps Products (GIS)

  38,167 products

- TOTALS: 2,044,579 Files (401.26 GB)

http://catalog.eol.ucar.edu/deepwave/

DEEPWAVE Data Archive (Master List)

DATA BY CATEGORY

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

DATA BY SITE

- Hobart, Tasmania
- Hokitika, South Island, New Zealand
- Lauder, South Island, New Zealand

DEEPWAVE Data Sets

Data Set Name (Responsible Group/PIs shown in parentheses)	Date Posted	Info
Accompanying Archives		
Environment Canterbury Regional Council (ECAN) Data Catalogue [(ECAN)]	2014-10-21	README
Field-Phase Image Gallery [(Rockwell et al (NCAR-EOL)]	2014-10-29	
Global Atmosphere Watch (GAW) Lauder Station Information and Data [(GAWSIS)]	2014-10-16	README
National Institute of Water and Atmospheric Research (NIWA) National Climate Database [Uddstrom, Michael (NIWA)]	2014-10-30	README
NDACC Measurements at the Lauder Station Public Data [Querel, Richard (NDACC)]	2014-10-16	README
NIWA Atmosphere Data Web Site [(NIWA)]		README
Stable Boundary Layer Experiment (STABX) Project Data Archive [Katurji, Marwan, Jack Baggaley (Univ. of Cantebury NZ)]		README
Aircraft		
DEEPWAVE Field Catalog Aircraft Imagery [(NCAR/EOL)]	2014-10-30	
Global Aircraft Meteorological DAta Relay (AMDAR) programme [(WMO)]	2014-10-21	README
New Zealand Meteorological Service AMDAR Data [Kreft, Peter (NZMS)]		

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

DEEPWAVE DATA ARCHIVE METRICS (as of 3 May 2015)

Top 10 Dataset By Order Count

These are the top 10 datasets by order count. It includes all datasets associated with the DEEPWAVE project. The rightmost column is the total number of unique email addresses that have requested the dataset.

Dataset ID	Name	# of Orders	# of Unique Emails
379.003	Low Rate (LRT - 1 sps) Navigation, State Parameter, and Microphysics Flight-Level Data [(NCAR-EOL-RAF)]	14	11
379.033	EOL Quality Controlled Dropsonde Data	11	9
379.028	Hokitika Quality Controlled ISS Radiosonde Data (EOL Format)	7	7
379.026	ECMWF Profiles along GV Flight Track	5	3
379.025	DLR Lauder Radiosonde Data (ESC Format)	4	3
379.008	DEEPWAVE Chat Logs [NCAR/EOL]	4	2
379.034	NSF/NCAR GV HIAPER Uplooking Rayleigh Lidar Data	3	2
379.031	NIWA Haast Surface Meteorological Data	3	1
379.030	NIWA Haast Radiosonde Data (ESC Format)	3	3
379.029	Bureau of Meteorology Macquarie Island Radiosonde Data (ESC format)	3	3

Other Metrics:

Number of Datasets in (Internal and External):	73 (49% available)
Total Disk Space:	1,395 GB
Total File Count:	2,198,821
Total Data Orders:	99
.edu (74%) | .com (16%) | .de (6%) | .mil (2%) | .nz (2%)	
Unique Orders:	30
Total Order Size:	65.1 GB
Total Files Ordered:	3,852

DEEPWAVE 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

DEEPWAVE PROJECT PUBLICATIONS LIBRARY

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

DEEPWAVE 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*

- Alexander, S., and D. Murphy, 2015: The Seasonal Cycle of Lower-Tropospheric Gravity Wave Activity at Davis, Antarctica (69°S, 78°E). J. Atmos. Sci., 72, 1010–1021, doi: 10.1175/JAS-D-14-0171.1
- de la Cámara, A., F. Lott, 2015: A parameterization of gravity waves emitted by fronts and jets. Geophys Res Lett, 42, doi: 10.1002/grl.v42.6, 2071-2078.
- Hendricks, E. A., J. D. Doyle, S. D. Eckermann, Q. Jiang, and P. A. Reinecke, 2014: What Is the Source of the Stratospheric Gravity Wave Belt in Austral Winter?. J. Atmos. Sci., 71, 1583–1592, doi: 10.1175/JAS-D-13-0332.1

CONFERENCE PROCEEDINGS

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

- Doyle, J. D., D. C. Fritts, R. B. Smith, S. D. Eckermann, M. Taylor, A. Doernbrack, M. Uddstrom, P. A. Reinecke, C. A. Reynolds, and Q. Jiang, 2015: An Overview of Gravity Wave Observations and Modeling during DEEPWAVE. Presented at the 95th AMS Annual Meeting, Phoenix, AZ, 5 January 2015. [Recorded

DATA ACCESS

Data Access
Field Catalog
Dry Run Field Catalog

DATA DOCUMENTATION

HIAPER Documentation Summary
Data Policy
Dataset Documentation Guidelines
Data Submission Instructions

PUBLICATIONS

DEEPWAVE Publications

DOCUMENTS

DEEPWAVE Overview Presentation
Site Survey Report
DEEPWAVE Badge
DEEPWAVE Operations Plan

MEETINGS AND PRESENTATIONS

DEEPWAVE Meetings

ALL DEEPWAVE FACILITIES AND INSTRUMENTATION

DEEPWAVE EOL Facilities
GATS Airborne Lidar
DLR Facilities

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