

PREDICT DATA MANAGEMENT UPDATE AND ISSUES

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NCAR Earth Observing Laboratory (EOL)

Boulder, Colorado

PREDICT 1st Science Workshop

Naval Postgraduate School, Monterey, CA

8-10 June 2011



PREDICT Data Management Web Site at NCAR/EOL



What's New?

Data Submission Instructions

St Croix Operations Center (slideshow)

Overview

Prediction and understanding of tropical cyclogenesis remains one of the most challenging aspects of atmospheric science. A multitude of tropical disturbances emerge from the West African coast every year near the Cape Verde islands, but only a few of these develop into tropical depressions, storms, or hurricanes. To further our understanding of these potentially high impact events,

the PRE-Depression
Investigation of Cloudsystems in the Tropics
(PREDICT) field
experiment will deploy the

NSF/NCAR Gulfstream-V



aircraft in the Atlantic basin in the heart of hurricane season to explore multi-scale interactions in tropical wave-like disturbances that promote or hinder the development of a tropical depression vortex.

People

PREDICT Scientific Steering Committee

Data Access

PREDICT Datasets Master List 2009 PREDICT/GRIP "Dry Run" PREDICT Field Catalog Dataset Documentation Guidelines Data Submission Instructions

Publications

NPS Publications Marsupial Tracking



Meetings

Meetings and Presentations

Documentation

Scientific Program Overview Experimental Design Overview Pre-Field Documentation



Mailing Lists

General PREDICT List PREDICT Forecast Team

- Project Description
- Data Access
- Field Catalog
- Publications
- Meetings
- Documentation
- Participants/Mailing Lists
- Photography
- Education & Outreach
- Related Web Pages



COLLABORATING PROJECTS AND DATA ACCESS

Atlantic Oceanographic and Meteorological Laboratory

Search

Options

HRD Home About AOML About HRD

Programs

- Hurr. Field Proc Science Prois.
- Sfc Wind Analy.
- ASOS
- ▶Joint Programs **Data Sets**

Weather Info

What's New Links



NOAA Oceanio Atmospheric Research



NOAA Aircraft Operations Center

Hurricane Research Division

Intensity Forecasting **EXperiment 2010** (IFEX10)

NOAA's Hurricane Research Division, part of the Atlantic Oceanographic and Meteorological Laboratories located in Miami, FL, is in the midst of a multi-year experiment along with the NOAA Aircraft

Operations Center (AOC) called the Intensity Forecasting Experiment (IFEX). Developed in partnership with NOAA's Environmental Modeling Center (EMC) and its Tropical Prediction Center (TPC/NHC). IFEX is intended to improve our understanding and prediction of hurricane intensity change by collecting observations that will aid in the improvement of current operational models and the development of the next-generation operational hurricane model, the Hurricane Weather Research and Forecasting model (HWRF). Observations will be collected in a variety of tropical disturbances at different stages in their lifecycle, from formation and early organization to peak intensity and subsequent landfall or decay over open water.

During this year, IFEX will be operating in partnership with several other experiments:

• NOAA Ocean Winds Experiment - The goal of the Ocean Winds experiment is to further our understanding of wind direction and speed retrievals at the ocean surface level from microwave remote-sensing measurements in high wind conditions and in the presence of rain. Measurements taken from the Ocean Winds experiment in mature storms will aid in the understanding and improvement of satellite remotely-sensed wind measurements which are currently used operationally by marine forecates and in numerical weather prediction



Intensification **Processes**

Mission Calendar

Reports

Science

Instruments

Flight Tracks

Participants

Tools

Related Links

Image Gallery

GRIP News



The Genesis and Rapid Intensification Processes (GRIP) experiment was a NASA Earth science field experiment in 2010 that was conducted to better understand how tropical storms form and develop into major hurricanes. NASA used the DC-8 aircraft, the WB-57 aircraft, and the Global Hawk Unmanned Airborne System (UAS) configured with a suite of in situ and remote sensing instruments used to observe and characterize the lifecycle of hurricanes

- 30 September 2010 with bases in GRIP Ft. Lauderdale, FL for the DC-8, at

The GRIP deployment was 15 August Real Time Mission Monitor was used to track flights live during

Houston, TX for the WB-57, and at NASA Dryden Flight Research Facility, CA for the Global Hawk. This campaign capitalized on a number of ground networks, airborne science platforms (both manned and unmanned), and space-based assets. The field campaign was executed according to a prioritized set of scientific objectives. In two separate science solicitations, NASA selected a team of investigators to collect NASA satellite and aircraft field campaign data with the goal of conducting basic research on problems related to the formation and intensification of hurricanes.

The spaceborne and airborne observational capabilities of NASA put it in a unique position to assist the hurricane research community in addressing shortcomings in the current state of the science. The relatively recent launch of several new satellites, the prospect of using a high-altitude UAS for hurricane surveillance, and the emergence of new remote sensing technologies offered new research tools that needed to be explored and validated. Of great importance were new remote sensing instruments for wind and temperature that can lead to improved characterization of storm structure and environment.



The GRIP hurricane field campaign and research project were managed by Dr. Ramesh



The PREDICT Science and GRIP/IFEX Coordination Meeting was held 12-13 November 2009 at the NOAA/AOML Hurricane Research Division, Virginia Key, Florida

Click on the presentation title for the PDF

Participants List

Thursday, 12 Nov 2009 Scientific Hypotheses and Aircraft Assets 8:30 PREDICT M Montgomery 9:00 PREDICT NSF/NCAR Gulfstream-V J Jensen 9:15 GRIP Genesis and Rapid Intensification Processes E Zipser 9:30 GRIP aircraft (NASA DC-8, GlobalHawk) G Heymsfield 9:45 Break 10:00 Intensification Forecast Experiment (IFEX-2010) R Rogers 10:15 IFEX-2010 Aircraft (NOAA P-3s, G-IV) F Marks, others 10:30 Open Discussion of Objectives and Synergies 11:00 Aircraft Coordination Discussion 11:30 Operations Centers (NCAR/EOL) J Meitín 11:45 Lunch (aircraft coordination discussion with FAA -1:00 representative) **Operational Interests and Experimental Support** C Landsea, 1:00 NOAA National Hurricane Center perspective J Beven G Stossmeister 1:15 NCAR/EOL Support (Field Catalog, XChat, etc)

PREDICT EDUCATION AND OUTREACH



PREDICT DATA POLICY

ACCESS TO DATA

All investigators participating in PREDICT must agree to promptly submit their data to the PREDICT Data Archive Center (at EOL) to facilitate intercomparison of results, quality control checks and intercalibrations, as well as an integrated interpretation of the combined data set.

All data shall be promptly provided to other PREDICT investigators upon request.

Data Submission instructions are available on the project management web page (http://www.eol.ucar.edu/projects/predict/)

Investigators are responsible for acquiring, processing, certifying and reducing the data from their instruments and providing required data products and metadata on schedule

PREDICT DATA POLICY

USE OF DATA

Neither measurements nor data products may be published or used in any presentation without the permission of the PI responsible for the measurements.

Any Science Team member preparing a paper for publication which uses measurements and/or data products submitted to the Archive by another group is required to offer co-authorship on the paper to the PI responsible for the parameter(s). Early contact with possible collaborators in development of publication is encouraged to maximize scientific interaction and ensure proper use of PI data.

In all circumstances, the PIs responsible for acquisition of data should be acknowledged appropriately.



PREDICT DATA POLICY

USE OF DATA

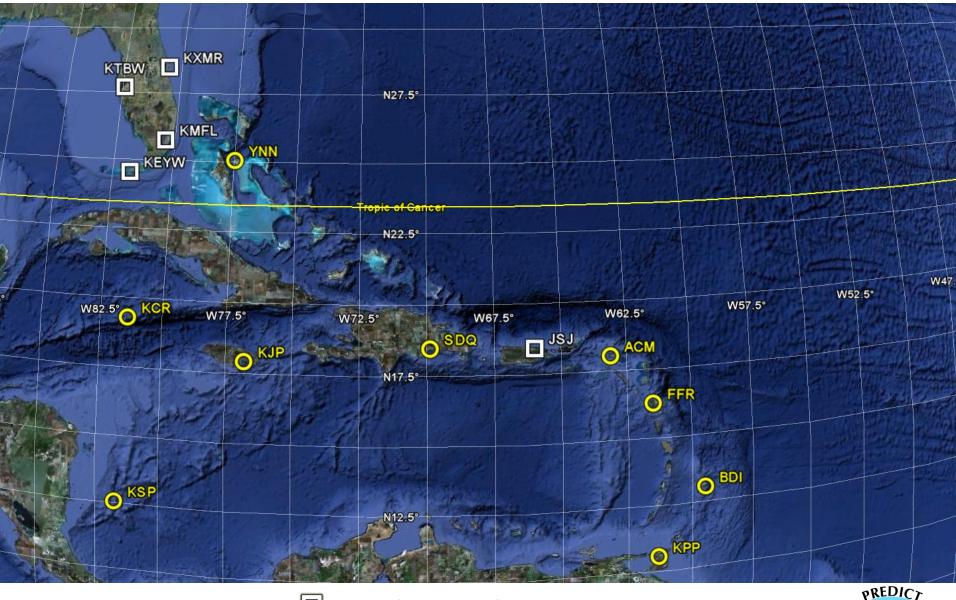
All data will be considered public domain not more than one year following the end of the PREDICT field phase. Data can be opened to the public domain earlier depending on the discretion of the data provider. There will be exceptions where extensive data processing is required.

Suggested acknowledgement: The xxxx data was gathered as part of the the PRE-Depression Investigation of Cloud-systems in the Tropics (PREDICT) project. The primary sponsor of PREDICT was the US National Science Foundation. The acquisition of the xxxx data was carried out by Dr. Yyyyy using the zzzz instrument and was funded by ????

Or acknowledge that data was obtained from the PREDICT Data Archive at NCAR/EOL, i.e. "Data provided by NCAR/EOL under sponsorship of the National Science Foundation.

http://data.eol.ucar.edu/"

PREDICT Region Radiosonde Locations



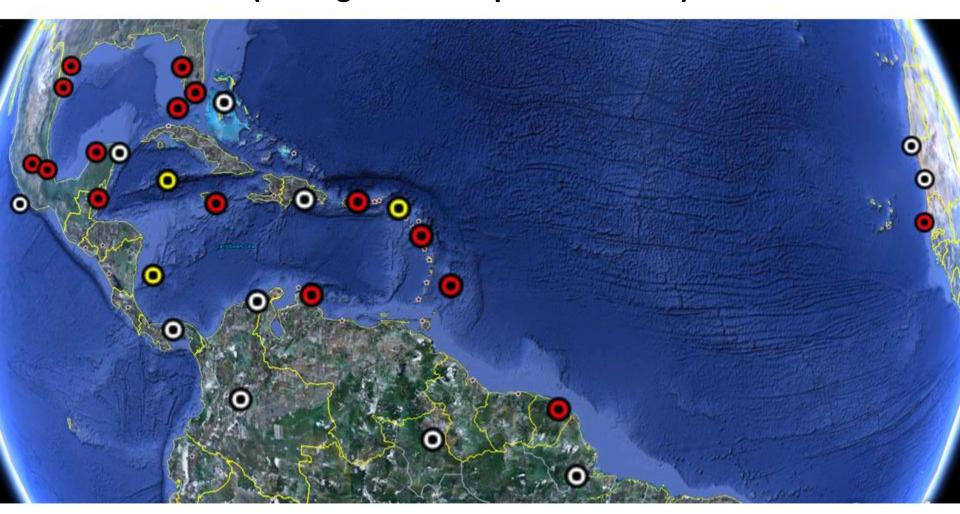
00 and 12 UTC observations

12 UTC observations (ACM spotty on GTS)



PREDICT UPPER AIR GTS DATA INVENTORY

(15 August – 30 September 2010)



30 Stations (1863 Soundings)

Red: 50-100 Soundings

White: 24-49 Soundings

Yellow: 1-6 Soundings

NWS High Vertical Resolution Stations:

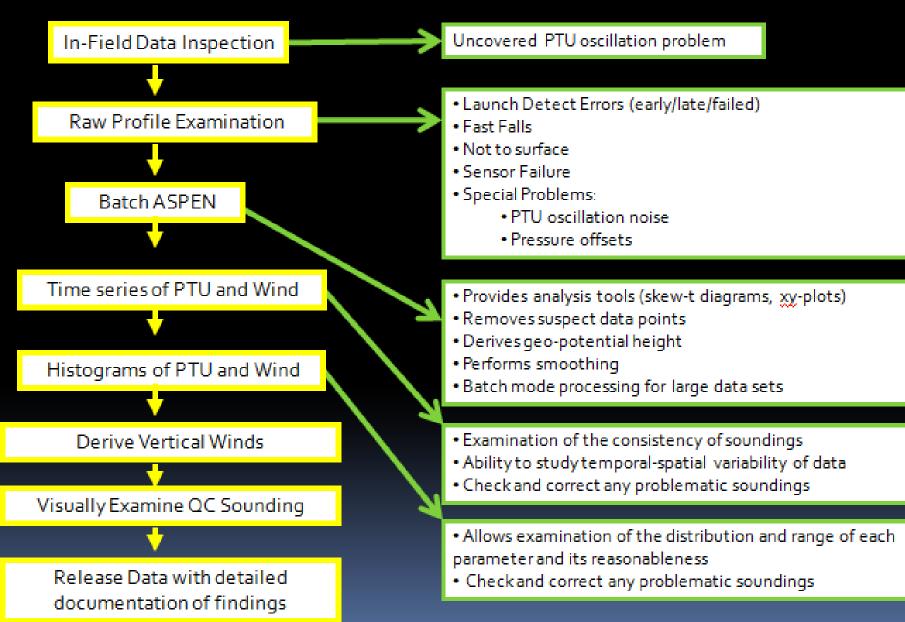
Key West, Miami, Tampa Bay

Brownsville, Corpus Christi

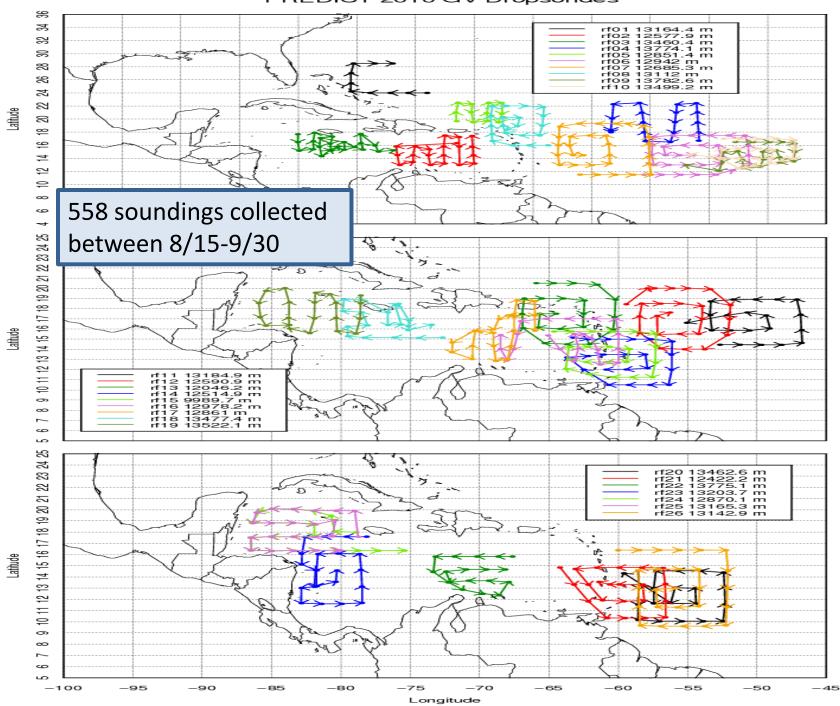
San Juan



Quality Control of Dropsonde data



PREDICT 2010 GV Dropsondes

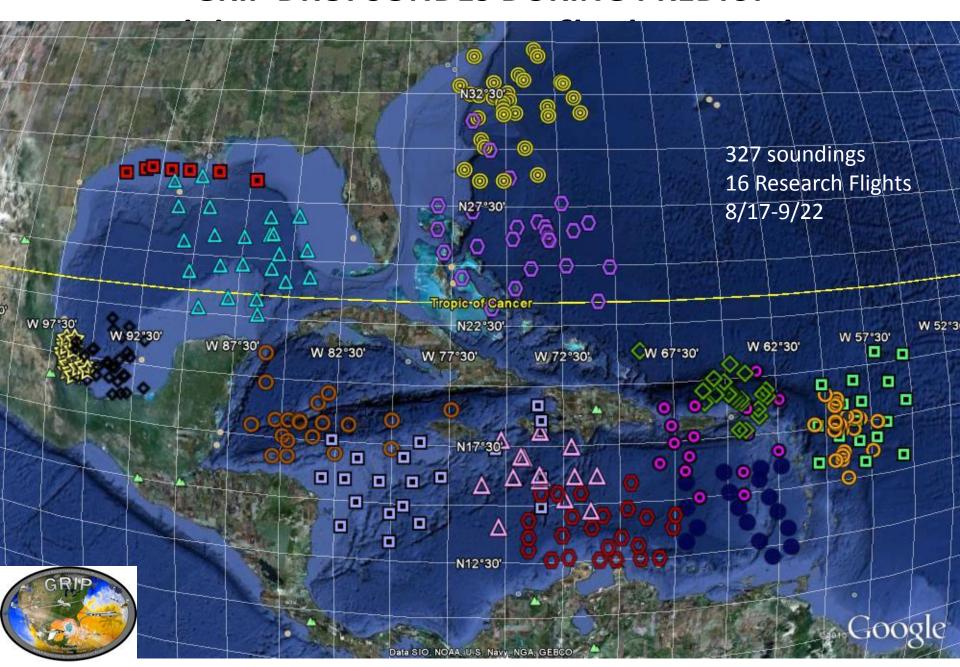


PREDICT Dropsonde Results and Statistics

- > 568 dropsondes were deployed, 558 are included in the final data archive
- > 11 soundings were affected by the PTU oscillation error and contain sparse data
- > One sounding experienced interference from another sonde started on the same frequency . Some data was lost during this time
- ➤ 9 soundings experienced large, temporary offsets in the pressure, temperature and humidity
- ➤ 8 soundings failed to transmit to the surface
- ➤ 21 soundings were "fast fall" soundings, and 20 were "partial fast-fall"
- > 7 soundings experienced failure of one or more sensors, resulting in data loss
- > Launch detect errors:
 - ▶7 early launch detects
 - ≥ 2 failed launch detects
 - ≥29 late launch detects



GRIP DROPSONDES DURING PREDICT

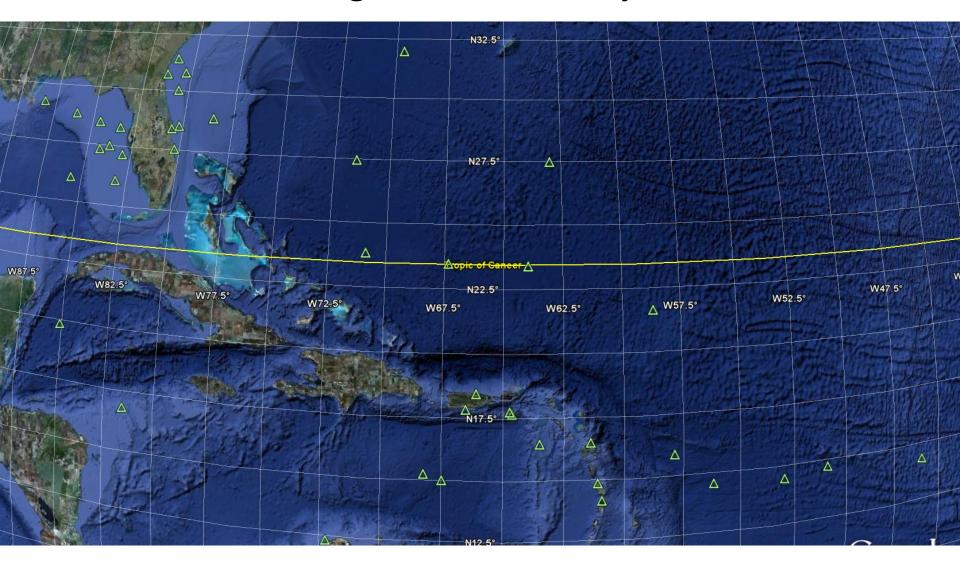


GRIP Dropsonde Results and Statistics

- > 342 dropsondes were deployed, 327 are included in the final data archive
- > 78 soundings were affected by the PTU oscillation error and contain sparse data
- ➤ 3 soundings experienced interference from another sonde started on the same frequency
- ➤ 34 soundings failed to transmit to the surface
- > 9 soundings were "fast fall" soundings, and 8 were "partial fast-fall"
- > Launch detect errors:
 - ▶7 early launch detects
 - >4 failed launch detects
 - ➤0 late launch detects (greater than 1½ second)

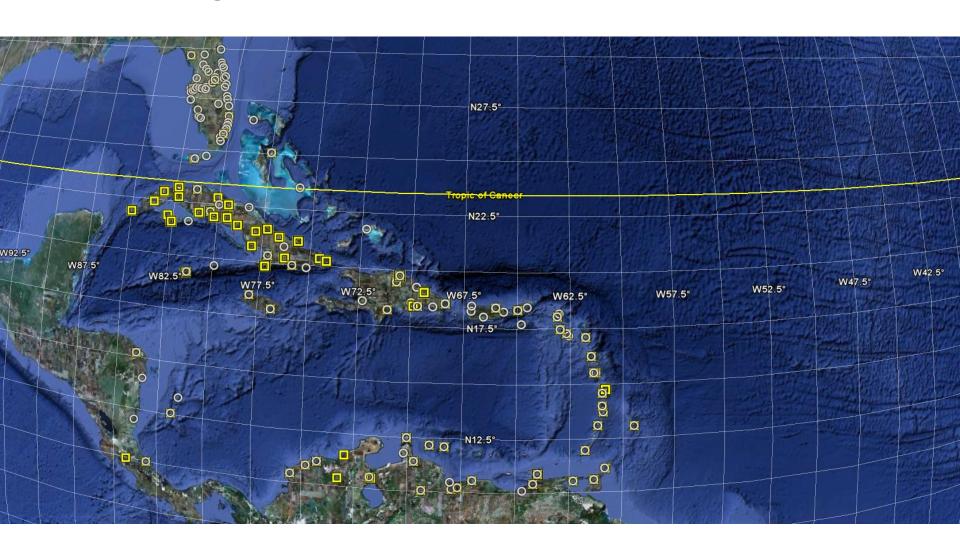


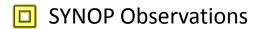
PREDICT Region Moored Buoy Locations

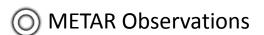




PREDICT Region METAR and SYNOP Observation Locations

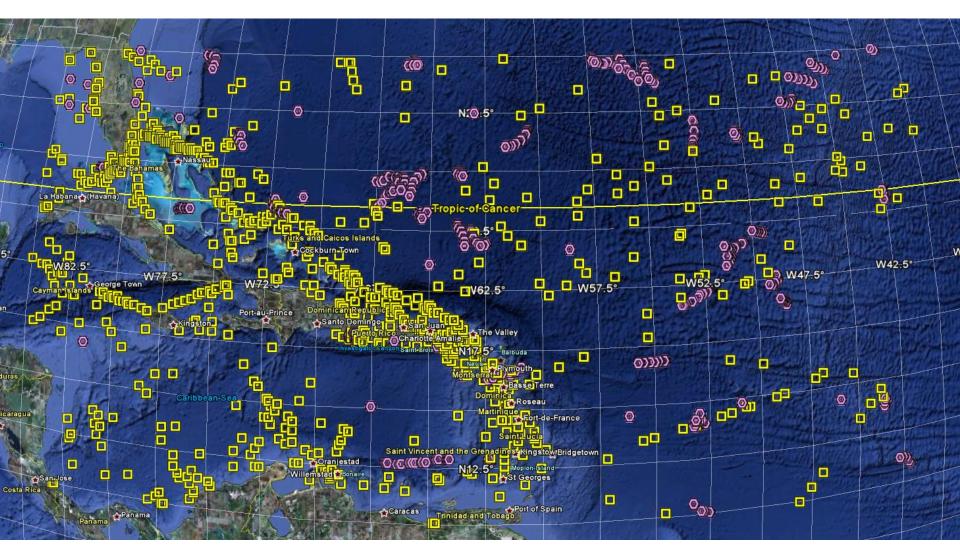








PREDICT Region Ship and Drifting Buoy Observations on GTS*



* Sample 5-day period

Ship Observations

O Drifting Buoy Observations

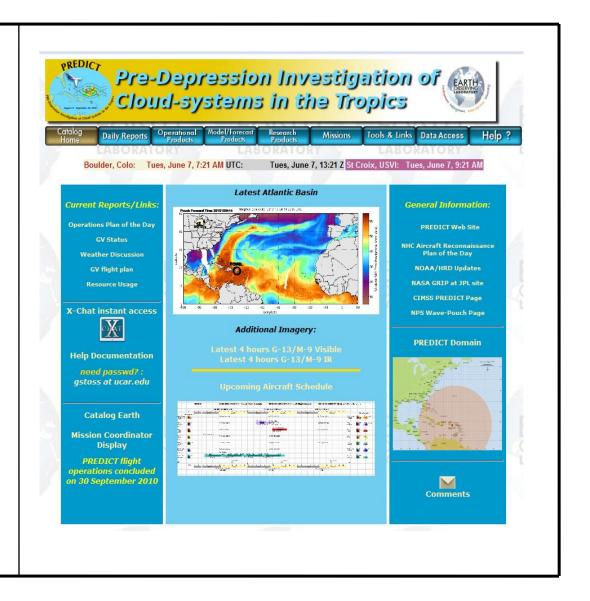




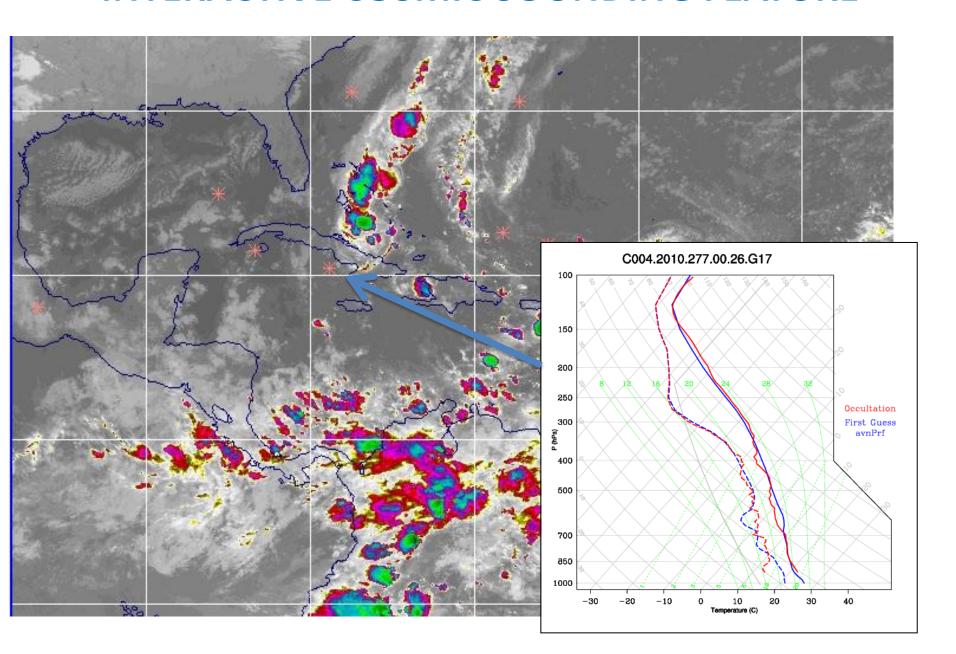
EOL FIELD CATALOG TOOL

In-field tool to ingest and display operational and preliminary research data and project documentation for making real-time decisions and evaluating project progress

- Daily Mission Reports
- Operations Summary
- Facility Status Reports
- Data Analysis Products
- Authoring Tools
- Web-based access



INTERACTIVE COSMIC SOUNDING FEATURE





Catalog Home

Daily Reports

Operational Products Model/Forecast Products Research Products

Missions

Tools & Links

Data Access

Help?

Flight	Date	System	Operations Area	Maximum Intensity During System Lifetime	Catalog Products	GV Dropsonde kmls	DC8 Dropsonde kmls	Flight Summary	Notes
RF01	Aug 15	Disturbance	Western Atlantic	Disturbance	<u>Operational</u> <u>Model</u> <u>Research</u>	Points 1000mb Winds 925mb Winds 850mb Winds 700mb Winds 500mb Winds 250mb Winds		Mission Scientist Summary Science Director Summary	Shakedown/Investigation of stalled frontal boundary and upper tropospheric shear line in the vicinity of the Bahamas.
RF02	Aug 17	PGI27L	Caribbean	Disturbance	<u>Operational</u> <u>Model</u> <u>Research</u>	Points 1000mb Winds 925mb Winds 850mb Winds 700mb Winds 500mb Winds 250mb Winds		Mission Scientist Summary Science Director Summary	First mission into PGI27L which had only recently begun to develop deep convection.
RF03	Aug 18	PGI27L	Caribbean	Disturbance	<u>Operational</u> <u>Model</u> <u>Research</u>	Points 1000mb Winds 925mb Winds 850mb Winds 700mb		Mission Scientist Summary Science	Second mission into PGI27L during which a large MCS developed in the northeastern part of the flight region.

PREDICT FIELD CATALOG MODEL OUTPUT "GRID"

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

Reports/Summaries (Status, Mission, and Operations)

705 documents and 1,497 image files (0.67 GB)

Research Platform Products (Aircraft, Surface, Upper Air)

4,536 image files (5.10 GB)

Google Earth Products and Maps

191,516 files (98.93 GB)

• Operational Products (Satellite, Surface, Ship, Radar, Upper Air)

244,612 image files (131.0 GB)

• Model Output Imagery (Analysis and Forecast Fields)

259,283 image files (17.0 GB)

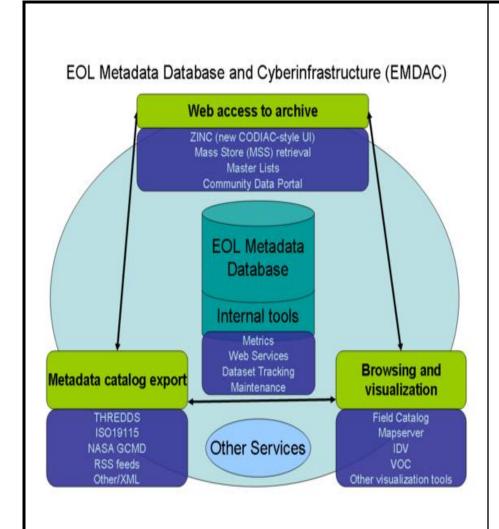
Preliminary Data

4,780 files (2.60 GB)

• TOTALS: 706,929 Files (255.29 GB)



EOL DATA MANAGEMENT



EOL Data Management 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

PREDICT DISTRIBUTED ARCHIVE DATASET "MASTER LIST"



DATA BY CATEGORY

- Accompanying Archives
- Aircraft
- Satellite
- Upper Air

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Email comments & questions to codiac@ucar.edu

Aircraft: NSF/NCAR GV		
AVAPS (Airborne Vertical Atmospheric Profiling System) GPS Dropsonde System [NCAR/EOL]		REA ME
Chemistry Fast Ozone (O3) [Campos NCAR/RAF]		
Cloud Counterflow Virtual Impactor (CVI) [Twohy]		REA ME
Cloud Particle Imager (3V-CPI) [NCAR/RAF]		
Digital Camera Imagery (Forward-facing) [NCAR/RAF]	2010-10-04	REA ME
Digital Camera Imagery (Left-facing) [NCAR/RAF]	2010-10-05	REA ME
Digital Camera Imagery (Right-facing) [NCAR/RAF]	2010-10-05	REA ME
Digital Camera Movies - Preliminary [NCAR/RAF]	Preliminary 2010-10-04	REA ME
Digital Camera mpeg4 Movies - Final [NCAR/RAF]	2011-02-16	REA ME
Flight Tracks (Google Earth .kml files) [NCAR/EOL/RAF]	2011-02-02	
GPS Water Vapor Profiler (GISMOS)		
Microwave Temperature Profiler (MTP) [Mahoney JPL / Haggerty NCAR/RAF]		
Navigation, State Parameter, and Microphysics Flight-Level Data - Low Rate (LRT - 1 sps) [NCAR/RAF]	Updated 2011-05-12	REA ME
NSF/NCAR GV Dropsonde Data (EOL Format) [NCAR/EOL]	2011-02-09	REA ME
PMS-2D Two-dimensional Cloud Probe data [NCAR/EOL/RAF]	Updated 2011-05-20	REA ME
Small Ice Detector Version 2 (SID-2H) [NCAR/RAF]		
Tunable Diode Laser hygrometer (TDL H2O) [Campos NCAR/RAF]		

PREDICT Data Submission Instructions

An initial master list of all PREDICT international data sets (with links) has been compiled to provide easy access to all PREDICT data sets (both operational and research). Data sets are grouped by platform and sorted by data type (i.e., land based, model, radar, etc.). This list will be updated frequently. It is available at: http://data.eol.ucar.edu/master_list/?project=PREDICT.

If you collected data for PREDICT, please review this list to verify that your data set(s) are properly named with the appropriate Principal Investigators (Pls) identified. Please e-mail any corrections, additions, or deletions directly to **sfw at ucar.edu**. If you already have your data sets available on-line, please provide the WWW link or FTP access information. Once your data set (with metadata) is available, a link will be provided from the master list WWW 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 PREDICT Long-term Data Archive at NCAR/Earth Observing Laboratory (EOL). Documumentation/metadata guidelines are available **here**.

Data set (and metadata) submission guidelines are available at: http://www.eol.ucar.edu/projects/predict/dm/data submittal.html, and are shown below.

Please be sure to follow the FTP directions *exactly*. Note that due to security restrictions, you will not be able to use a list command to see the contents of the upper level directories such as /pub.

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

FTP: data.eol.ucar.edu LOGIN: anonymous

PASSWORD: use your e-mail address

cd /pub/incoming/predict

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 NCAR/EOL shipping address below.

PREDICT WEB SITE: http://www.eol.ucar.edu/projects/predict/