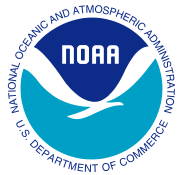




MADIS Airlines for America Briefing



Meteorological Assimilated Data Ingest System (MADIS) FPAW Briefing

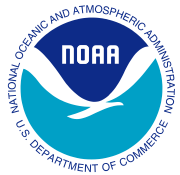
Steve Pritchett

NWS Aircraft Based Observations Program Manager





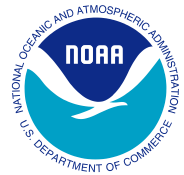
MADIS Defined



- MADIS is a meteorological database and data delivery system that covers the globe. Jointly developed by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) and the Office of Oceanic and Atmospheric Research (OAR) Earth System Research Laboratory (ESRL) Global Systems Division (GSD).
- MADIS started collecting data July 1, 2001 and provides access to all data sets collected since it's start.
 - Purpose:
 - To provide a finer resolution (temporal and spatial), higher quality, easy access observational data system for NOAA and the greater meteorological community.
 - To help improve weather forecasting, by providing support for data assimilation, numerical weather prediction, and other hydrometeorological applications.
 - How:
 - Leverage partnerships with international agencies; federal, state, and local agencies; universities; volunteer networks; and the private sector to integrate their stations with those of NOAA.

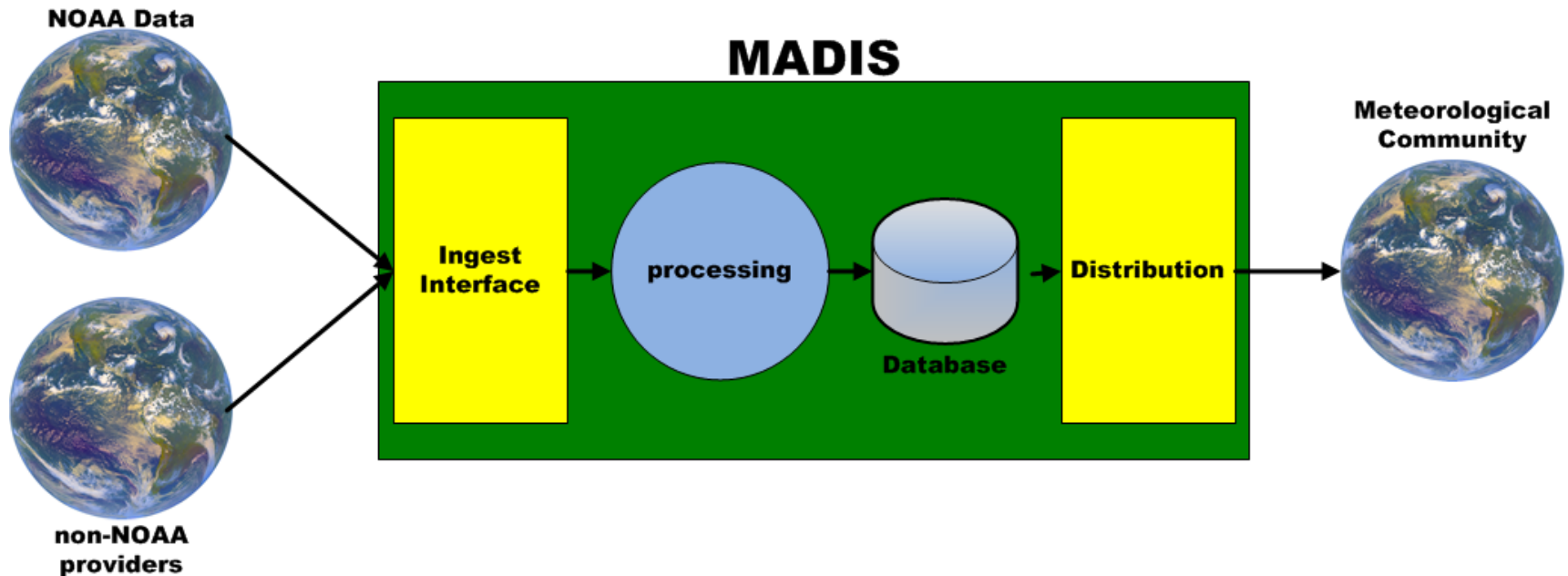


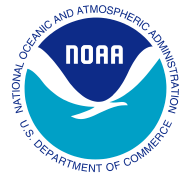
MADIS Operations/Processing



- On January 21, 2015 MADIS became fully operational at the NWS' National Centers for Environmental Prediction (NCEP) Central Operations (NCO) as part of the Integrated Dissemination Program (IDP).
 - Primary Operations at NCO College Park
 - NWS IDP Backup Operations Boulder (mid 2016).
 - Archive supported by National Climate Data Center

<https://madis.ncep.noaa.gov/>





Current Data Capabilities

- 16 Different Data Types
 - Surface
 - Hydro, Mesonet, Maritime, METAR, SAO, Climate, 1 Minute ASOS/AWOS, Mobile Platform Environmental Data (MoPED), and Snow
 - Upper Air
 - Profiler, RAOB, Automated Aircraft Observations, Radiometer, and Satellite (winds, sounding, and radiance)

Green ---- Data available since 2001.
Black ---- Data added after 2001.
- 400+ Observation Types
- 11 GB/Day (Uncompressed) – 823 MB/Day (Compressed)

Current Data Capabilities

+ - Surface

o - Aircraft

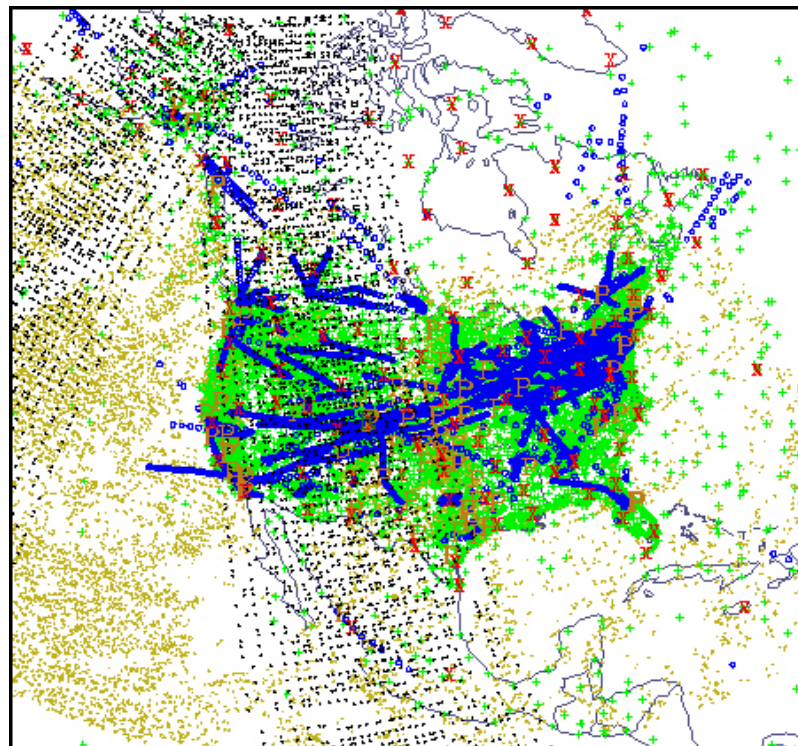
X - Radiosonde

P - Profiler

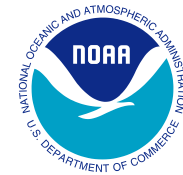
● - GOES Satellite

● - POES Satellite

R - Radiometer

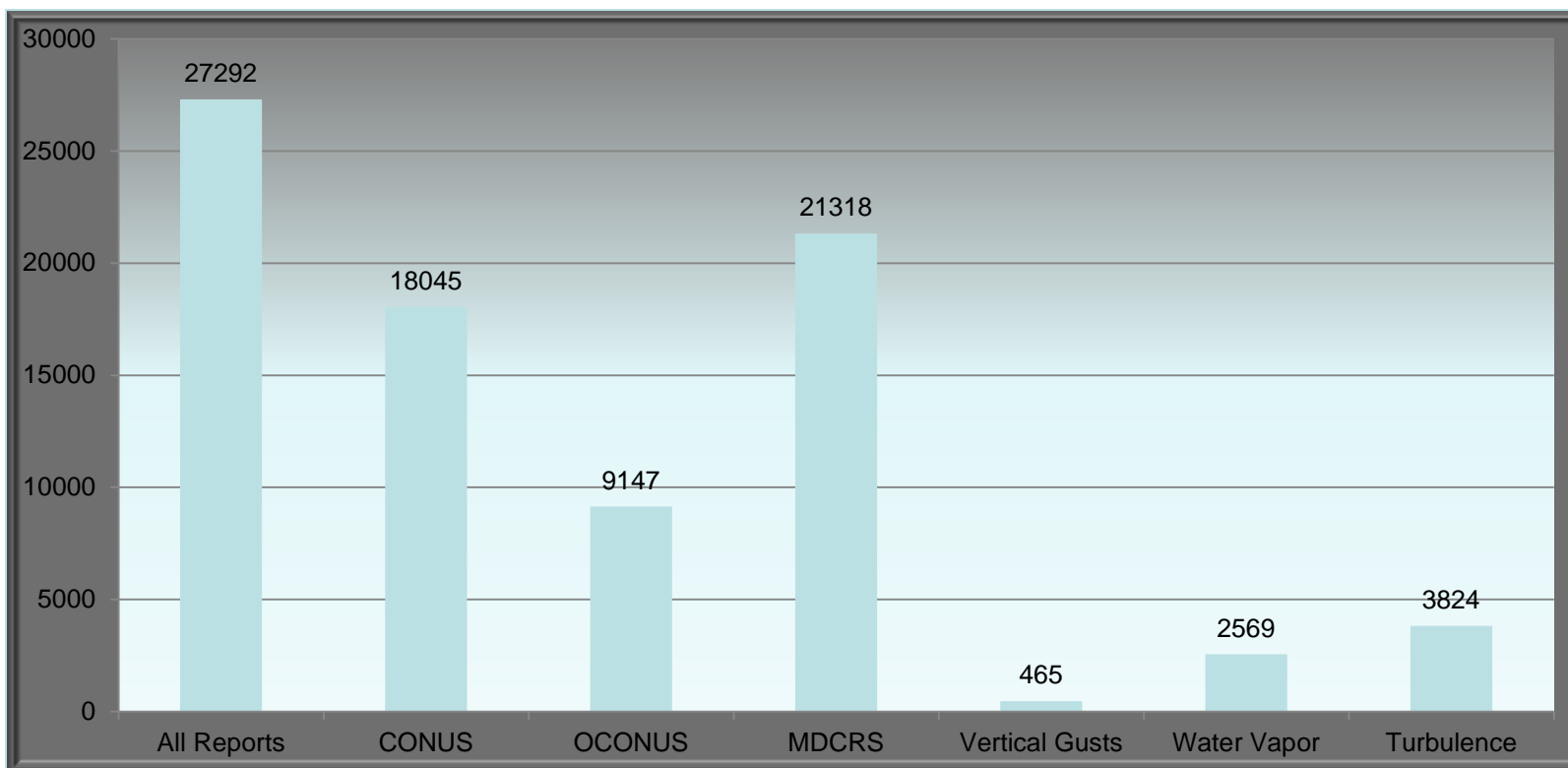


- 66,127 stations from over 160 surface networks producing nearly 13 million observations per day
- 154 Profiler sites (>200,000 observations per day)
- **>650,000 aircraft observations per day**
- Plus global radiosonde and satellite observations



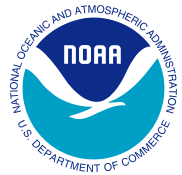
MADIS Automated Aircraft Reports

Average Number of Automated Aircraft Reports/Hour

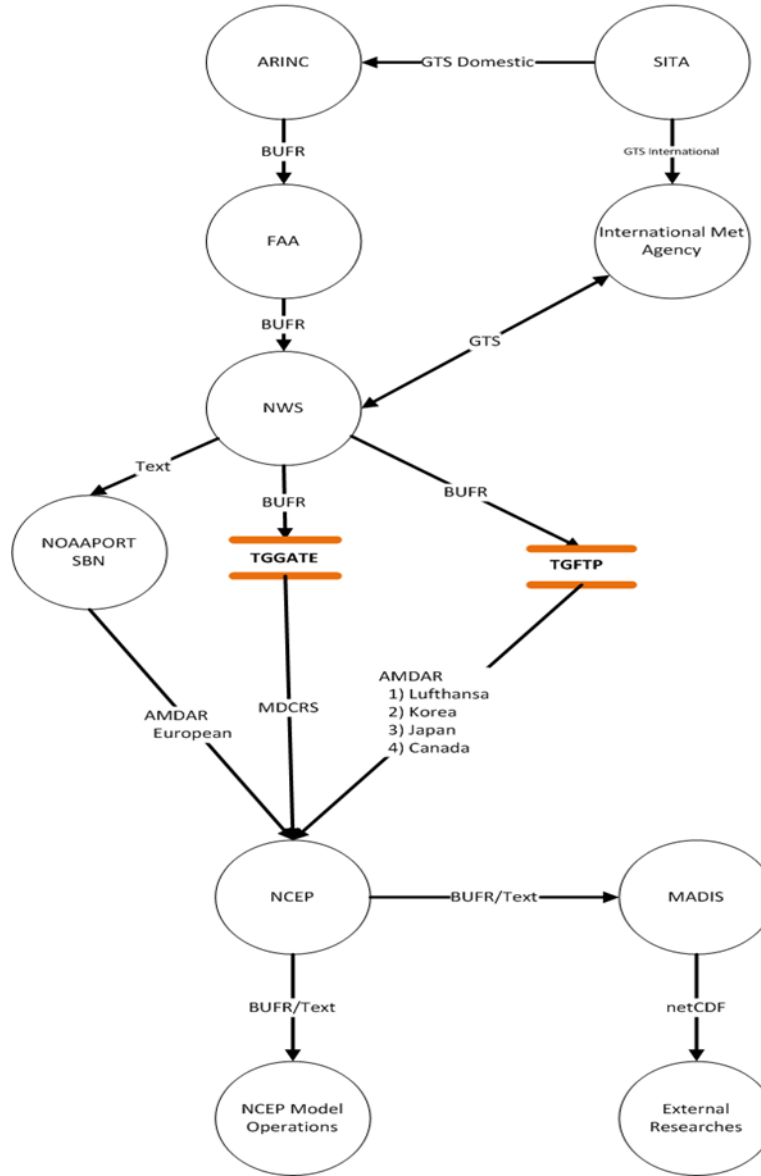


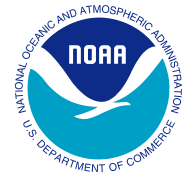


Automated Aircraft Operational Data Flow



Operational AMDAR Data Flow



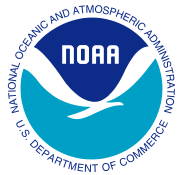


Aircraft Observations Distribution

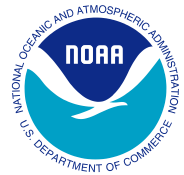
- GTS - aircraft observations from commercial aircraft received by NOAA are distributed over to the Global Telecommunications Systems (GTS) to Meteorological Services to member states of the World Meteorological Organization (WMO) under Resolution 40 of the WMO – free exchange of AMDAR data with no redistribution allowed.
- MADIS and AMDAR Website - aircraft observations from commercial aircraft received by NOAA are made available real time on a restricted basis to:
 - NOAA and the FAA
 - Airlines participating in the US aircraft observations program
 - Academic research institutes with approved aviation projects
- Archived and 48 hour data can be accessed by all



New Developments in Aircraft Observation Distribution



- Beginning late in 2015 Aircraft Observations from Aircraft equipped with WVSS sensors will be publically available in real time:
 - MADIS restrictions will be removed by November for WVSS equipped Aircraft to allow public access to the MDCRS plus WVSS data sets from 132 aircraft
 - NOAA AMDAR Website (part of MADIS by Dec 31 2015) restrictions will be removed by February or March 2016
 - NOAAPort Satellite Broadcast Network (SBN) data encryptions to be removed for WMO header containing WVSS equipped aircraft.
- All other aircraft based observations to remain restricted access with encrypted files on the SBN

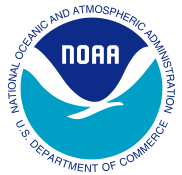


Automated Aircraft Specific Information

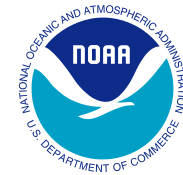
- Data
 - https://madis.ncep.noaa.gov/madis_acars.shtml - Description
 - https://madis.ncep.noaa.gov/acars_variable_list.shtml - Variables
 - https://madis.ncep.noaa.gov/madis_acars_qc.shtml - Quality Control on Observations
 - https://madis.ncep.noaa.gov/madis_acars.shtml#restrict - Restrictions
- User Resources
 - https://madis.ncep.noaa.gov/data_application.shtml - Data Application
 - Three Distribution Protocols supported
 - FTP (public/archive)
 - HTTPS
 - LDM
 - https://madis.ncep.noaa.gov/madis_api.shtml - Application Interface Information
 - <https://madis-data.noaa.gov/AMDARDisplay/> - Development test site for AMDAR Display



Application Interface



- The Application Interface has tools that allow users to:
 - FTP scripts to acquire real-time or archived data.
 - Dump programs for accessing the data of interest from the netCDF files model after the MADIS Surface Dump utility.



Surface Dump

Firefox | MADIS dataset c... | 25 National Oceanic... | webTA: Login: c... | NSD: NOAA Staff... | Shared with me... | AMDAR Data Dis... | MADIS Meteorol... | ESRL-GSD Secure... | +

https://madis-data.noaa.gov/public/sfcdumpguest.html

Most Visited | Customize Links | Free Hotmail | Windows Marketplace | Windows Media | Windows

Disable | Cookies | CSS | Forms | Images | Information | Miscellaneous | Outline | Resize | Tools | View Source | Options

MADIS **MADIS Meteorological Surface Text/XML Viewer**

Time Selection

20010701_1600 Nominal time in GMT (YYYYMMDD_HHMM or enter 0 for current time)

Station Selection

<input type="radio"/> Get stations within state's box	<input type="radio"/> Get stations within latitude/longitude corners	<input type="radio"/> One Station	<input checked="" type="radio"/> Get all stations
AK (State)	0.0 (SW corner latitude - south) 0.0 (SW corner longitude - west) 90.0 (NE corner latitude - north) 0.0 (NE corner longitude - east)	(Site ID e.g. KDEN)	

Provider Selection

All providers Select providers groups and/or mesonets

Variable Selection

Standard surface variables (TD,RH,T,DD,FF,FFGUST,ALTSE) Select variables All variables

Quality Control Selection

Return observations passing level 1

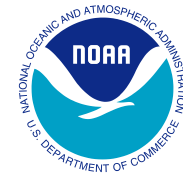
Output Selection

Text XML CSV (No QC) CSV (QC desc) CSV (QC full)

For CSV missing value use -99999.000000 blanks

Click to submit your request. Click to clear your request or to start over.

Windows Taskbar: 6:24 AM 2/25/2013



Sample Text Surface Dump

Firefox | MADIS dataset c... | National Oceanic... | webTA: Login: c... | NSD: NOAA Staff... | Shared with me ... | AMDAR Data Dis... | MADIS Meteorol... | Results | ESRL-GSD Secure... | Bing

https://madis-data.noaa.gov/cgi-bin/textXmlRqt?rdr=https%3A%2F%2Fpublic_madis_public%3Apppppp%40madis-data.noaa.gov%2FmadisPublic1%2Fcgi-bin%2FmadisXmlPul

Most Visited | M Customize Links | M Free Hotmail | Windows Marketplace | Windows Media | Windows

Disable* | Cookies* | CSS* | Forms* | Images* | Information* | Miscellaneous* | Outline* | Resize* | Tools* | View Source* | Options*

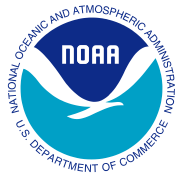
```
var TD          total stns  3160 # non-missing obs  2789
```

	Station	Elev (m)	Lat (N)	Lon (E)	Grid I	Grid J	ObTime	Provider	TD	QCD	QCA	QCR
V-TD	KFGN	328.00	49.32000	-94.8800	0.000	0.000	20010701_1601	OTHER-MTR	278.149994	V	91	0
V-TD	MWCR	3.00	19.28000	-81.3500	0.000	0.000	20010701_1500	OTHER-MTR	298.149994	V	75	0
V-TD	MMMT	40.00	18.10000	-94.5800	0.000	0.000	20010701_1545	OTHER-MTR	297.149994	V	75	0
V-TD	KSME	283.00	37.05000	-84.6100	0.000	0.000	20010701_1600	OTHER-MTR	293.149994	V	91	0
V-TD	KLJF	347.00	45.10000	-94.5000	0.000	0.000	20010701_1559	OTHER-MTR	274.149994	V	91	0
V-TD	KUNU	285.00	43.43000	-88.6900	0.000	0.000	20010701_1600	OTHER-MTR	276.149994	V	91	0
V-TD	KVUJ	186.00	35.42000	-80.1500	0.000	0.000	20010701_1601	OTHER-MTR	295.149994	V	91	0
V-TD	KPNM	298.00	45.56000	-93.5900	0.000	0.000	20010701_1559	OTHER-MTR	275.149994	V	91	0
V-TD	KMDZ	445.00	45.22000	-90.3100	0.000	0.000	20010701_1541	OTHER-MTR	276.149994	V	91	0
V-TD	KTNB	959.00	36.20000	-81.6500	0.000	0.000	20010701_1601	OTHER-MTR	290.149994	V	91	0
V-TD	KDET	191.00	42.42000	-83.0200	0.000	0.000	20010701_1553	ASOS	285.149994	V	91	0
V-TD	KSGR	2.00	29.62000	-95.6500	0.000	0.000	20010701_1553	ASOS	296.149994	V	91	0
V-TD	MMPS	88.00	15.87000	-97.0800	0.000	0.000	20010701_1545	OTHER-MTR	295.149994	V	91	0
V-TD	MMQT	1813.00	20.60000	-100.3800	0.000	0.000	20010701_1545	OTHER-MTR	287.149994	V	91	0
V-TD	KANE	278.00	45.15000	-93.2200	0.000	0.000	20010701_1500	OTHER-MTR	277.149994	V	91	0
V-TD	KCVX	204.00	45.30000	-85.2700	0.000	0.000	20010701_1555	OTHER-MTR	277.149994	V	91	0
V-TD	KJYM	360.00	41.92000	-84.5800	0.000	0.000	20010701_1559	OTHER-MTR	290.149994	V	91	0
V-TD	KLXL	342.00	45.95000	-94.3500	0.000	0.000	20010701_1559	OTHER-MTR	276.149994	V	91	0
V-TD	PAGY	5.00	59.47000	-135.3000	0.000	0.000	20010701_1553	OTHER-MTR	284.149994	V	91	0
V-TD	KAOO	458.00	40.30000	-78.3200	0.000	0.000	20010701_1553	ASOS	292.149994	V	91	0
V-TD	KBFM	8.00	30.63000	-88.0700	0.000	0.000	20010701_1553	ASOS	296.149994	V	91	0
V-TD	KCKB	367.00	39.30000	-80.2300	0.000	0.000	20010701_1553	ASOS	294.149994	V	91	0
V-TD	KIOW	204.00	41.38000	-91.3300	0.000	0.000	20010701_1553	ASOS	287.149994	V	91	0
V-TD	KMGM	62.00	32.30000	-86.4000	0.000	0.000	20010701_1553	ASOS	296.149994	V	91	0
V-TD	KFFM	361.00	46.28000	-96.1500	0.000	0.000	20010701_1558	OTHER-MTR	275.149994	V	91	0
V-TD	KHBI	205.00	35.65000	-79.9000	0.000	0.000	20010701_1600	OTHER-MTR	295.149994	V	91	0
V-TD	KBCB	650.00	37.22000	-80.4200	0.000	0.000	20010701_1542	OTHER-MTR	291.149994	V	91	0
V-TD	KEZF	26.00	38.27000	-77.4500	0.000	0.000	20010701_1542	OTHER-MTR	294.149994	V	91	0
V-TD	KFPN	12.00	36.70000	-76.9000	0.000	0.000	20010701_1601	OTHER-MTR	296.149994	V	91	0
V-TD	KMWK	380.00	36.46000	-80.5500	0.000	0.000	20010701_1543	OTHER-MTR	294.149994	V	91	0
V-TD	KERI	225.00	42.08000	-80.1800	0.000	0.000	20010701_1551	ASOS	291.149994	V	91	0
V-TD	KPWM	19.00	43.65000	-70.3200	0.000	0.000	20010701_1551	ASOS	293.149994	V	91	0
V-TD	PAHN	5.00	59.25000	-135.5200	0.000	0.000	20010701_1554	OTHER-MTR	284.149994	V	91	0
V-TD	KRMG	196.00	34.35000	-85.1700	0.000	0.000	20010701_1553	ASOS	294.149994	V	91	0
V-TD	KGYL	302.00	44.75000	-94.0800	0.000	0.000	20010701_1600	OTHER-MTR	275.149994	V	91	0
V-TD	KSUW	206.00	46.41000	-92.0600	0.000	0.000	20010701_1600	OTHER-MTR	277.149994	V	91	0
V-TD	KLWB	702.00	37.87000	-80.4000	0.000	0.000	20010701_1600	OTHER-MTR	292.149994	V	91	0
V-TD	KOLV	122.00	34.98000	-89.7900	0.000	0.000	20010701_1600	OTHER-MTR	292.149994	V	91	0
V-TD	KFVX	125.00	37.35000	-78.4300	0.000	0.000	20010701_1601	OTHER-MTR	298.149994	V	91	0
V-TD	KMFV	15.00	37.65000	-75.7700	0.000	0.000	20010701_1543	OTHER-MTR	295.149994	V	91	0
V-TD	KMRN	387.00	35.82000	-81.6200	0.000	0.000	20010701_1543	OTHER-MTR	292.149994	V	91	0
V-TD	KPBH	449.00	45.70000	-90.4000	0.000	0.000	20010701_1541	OTHER-MTR	274.149994	V	91	0
V-TD	KRHP	518.00	35.20000	-83.8700	0.000	0.000	20010701_1543	OTHER-MTR	293.149994	V	91	0

Windows taskbar showing icons for Internet Explorer, Firefox, Chrome, and other applications. System tray shows 96% battery and time 6:28 AM 2/25/2013.



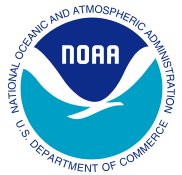
<http://amdar.noaa.gov/>



- Java Displays ported post FOC to MADIS operational systems.
- NWS and GSD working to define home for components of amdar.noaa.gov site.
- <http://amdar.noaa.gov> capability demo:



Questions



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