Sources of Hourly Surface Data and Weather Maps for the U.S.

An alternative source to Plymouth State University to get hourly observations is the National Weather Service (NWS). Hourly surface observations at KDFW (Dallas/Fort Worth International Airport), or for any major U.S. airport, can be obtained from a number of sources.

The following table shows data for KDFW for the 24 hours ending 11:53 pm CST, 22 January 2016. Note that some days/times may be missing owing to hardware failure and power outages. Instruments can fail, or they can go offline for routine maintenance.

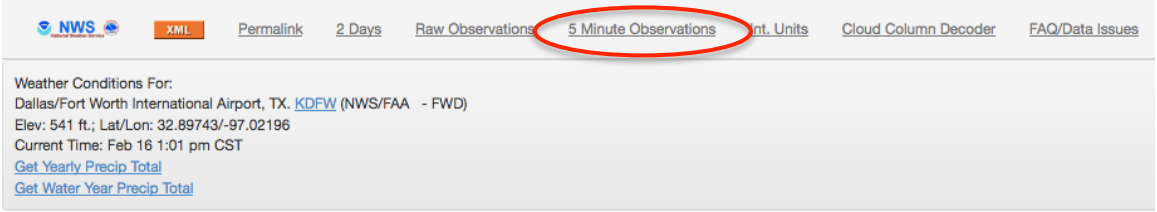
Site of the ASOS weather station at KDFW (red). Instruments are on the east side of the airport grounds in a grassy field, adjacent to a taxiway.

Data from Tucson NWS forecast office for the past 720 hours (30 days) are available at URL http://www.wrh.noaa.gov/mesowest/timeseries.php?sid=KDFW&num=720&banner=NONE.[1]

Time (CST)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Chill (f)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hour (inches)	Precip 3 hour (inches)	Precip 6 hour (inches)	Precip 24 hour (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
22 Jan 11:53 pm CST	32	25	75	24	N	10	10.00		CLR	1026.8	30.32	29.742					44	32	49	32	OK
22 Jan 10:53 pm CST	33	25	72	25	N	10	10.00		CLR	1026.8	30.32	29.742									OK
22 Jan 9:53 pm CST	35	25	66	26	NNW	14	10.00		CLR	1026.8	30.32	29.742									OK
22 Jan 8:53 pm CST	37	25	61	29	NNW	13	10.00		CLR	1027.1	30.32	29.742									OK
22 Jan 7:53 pm CST	39	26	59	30	NNW	16	10.00		CLR	1026.9	30.32	29.742									OK
22 Jan 6:53 pm CST	41	27	56		NNW	14	10.00		CLR	1026.6	30.31	29.732									OK
22 Jan 5:53 pm CST	44	26	49		NNW	16	10.00		CLR	1026.1	30.30	29.722					49	44			OK
22 Jan 4:53 pm CST	47	25	42		NW	15	10.00		CLR	1025.6	30.29	29.713									OK
22 Jan 3:53 pm CST	48	24	39		NNW	16	10.00		FEW250	1025.2	30.28	29.703									OK
22 Jan 2:53 pm CST	48	24	39		NNW	18	10.00		FEW250	1025.0	30.27	29.693									OK
22 Jan 1:53 pm CST	47	24	40		N	18	10.00		FEW250	1025.7	30.29	29.713									OK
22 Jan 12:53 pm CST	46	24	42		NNW	18	10.00		FEW250	1026.5	30.31	29.732									OK
22 Jan 11:53 am CST	44	23	43		NNW	20	10.00		FEW250	1027.4	30.34	29.762					44	35			OK
22 Jan 10:53 am CST	41	25	52		NNW	20	10.00		FEW030	1027.6	30.34	29.762									OK
22 Jan 9:53 am CST	39	25	57	28	N	24	10.00		FEW028	1026.7	30.32	29.742									OK
22 Jan 8:53 am CST	37	26	64	26	NNW	23G30	10.00		FEW028	1025.6	30.28	29.703									OK
22 Jan 7:53 am CST	35	27	72	24	NNW	21G26	10.00		SCT028	1025.4	30.28	29.703									OK
22 Jan 6:53 am CST	35	26	69	24	NNW	20	10.00		SCT025	1024.5	30.25	29.673									OK
22 Jan 6:43 am CST	35	26	69	24	NNW	18G29	10.00		SCT025		30.24	29.663									OK
22 Jan 5:53 am CST	37	27	67	26	NNW	22G29	10.00		BKN025	1023.4	30.22	29.644				0.19	38	37			OK
22 Jan 4:53 am CST	38	27	64	26	NNW	28G38	10.00		OVC024	1022.6	30.20	29.624									OK
22 Jan 3:53 am CST	38	28	67	28	NNW	21G36	10.00		OVC025	1022.0	30.18	29.604									OK
22 Jan 2:53 am CST	38	28	67	27	NNW	22G30	10.00		OVC025	1021.6	30.17	29.594									OK
22 Jan 1:53 am CST	38	27	64	28	NNW	21G30	10.00		OVC025	1021.5	30.16	29.585									OK
22 Jan 12:53 am CST	38	28	67	27	NNW	22G32	10.00		BKN026	1021.5	30.16	29.585									OK
21 Jan 11:53 pm CST	37	28	70	26	NW	21G31	10.00		BKN027 OVC034	1021.9	30.17	29.594					42	37	52	37	OK

Hourly reports for KDFW from the above NWS site from 22 January 2016.

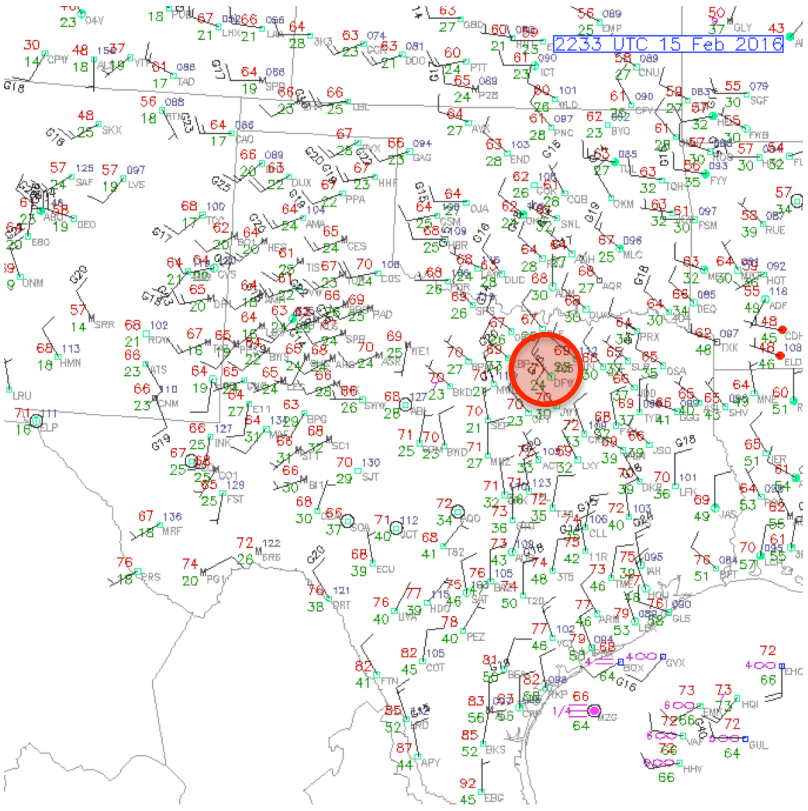
[1] Data every 5 minutes can be obtained by clicking the "5 Minute Observations" at the top of the webpage. (See below.) These data are a great resource for pinpointing the timing of frontal passages and squall lines, the onset of thunderstorms, etc.



University Corporation for Atmospheric Research

Regional maps for the U.S. with surface station plots having the KDFW observation can be obtained from a copy and paste of the following link IF the data remain in the NCAR archives… up to one week under ideal circumstances. For example, to obtain the map for a local time that is closest to 15 Feb 2016, 2200 UTC (4:00 pm CST), navigate to http://weather.rap.ucar.edu/surface/displaySfc.php?region=abi&endDate=20160215&endTime=22&duration=0. Note how I put the proper UTC date/time of endDate=20160215 and endTime=22. What appears is a map with a time of "2233 UTC 15 Feb 2016". Do not let the time label of 22:33 fool you. The map with the 2200 UTC reports is labeled with the UTC time when the computer generated the plot, which is usually 30 to 45 minutes past the hour.

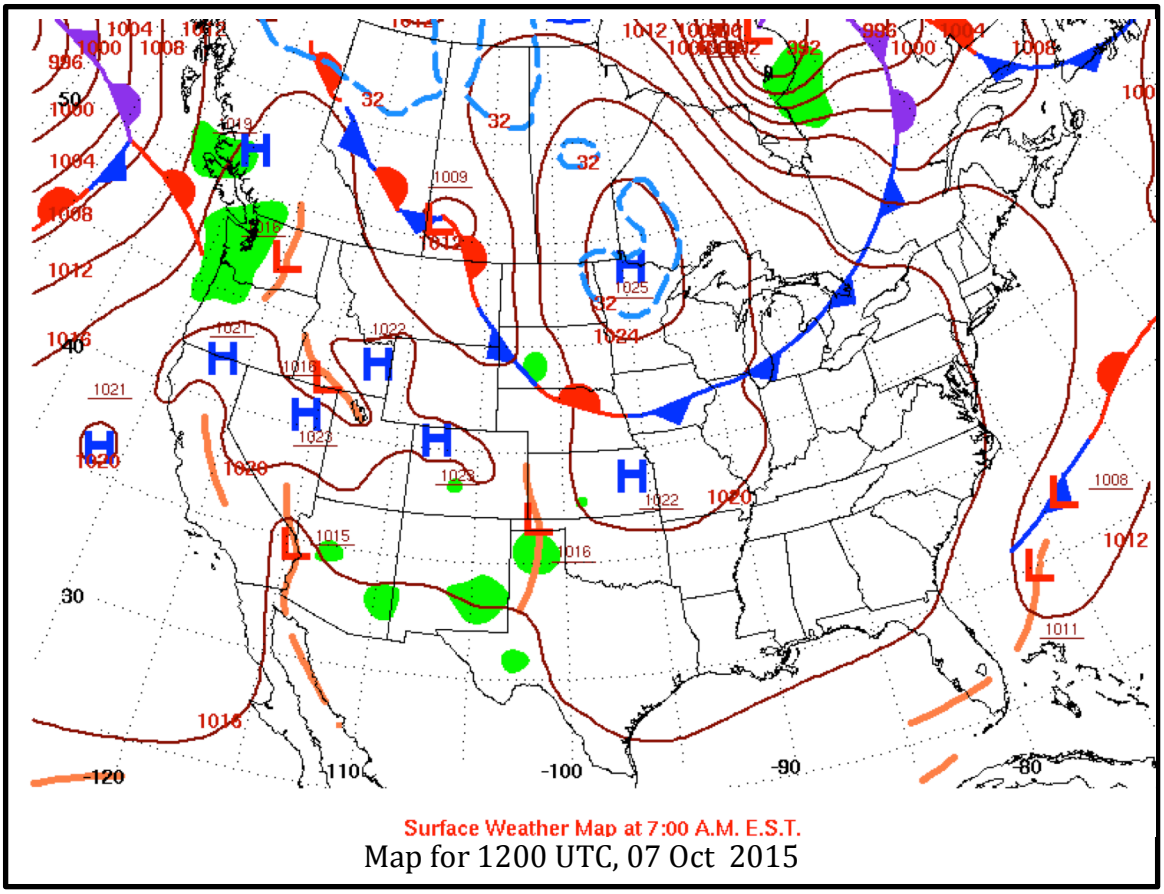
To obtain plots for other dates and times, you must edit the "endDate" and "endTime" strings accordingly. For example, to obtain the surface plot closest to 16 Feb 2016 for 2200 UTC (if the date has not been purged or is not in the future!), you would change the endDate string to 20160216" Again, maps older than 7 days are permanently purged from their system. Maps for the central and eastern U.S., where the density of weather stations is much higher than in the West, may seem rather cluttered and difficult at first to find the station plot for the airport that you desire. Solution: know your geography of major cities: e.g. DFW is enclosed by the red circle.



Surface plots for 2100 UTC 22 Jan 2016 from weather.rap.ucar.edu.

NOAA National Centers for Environmental Prediction

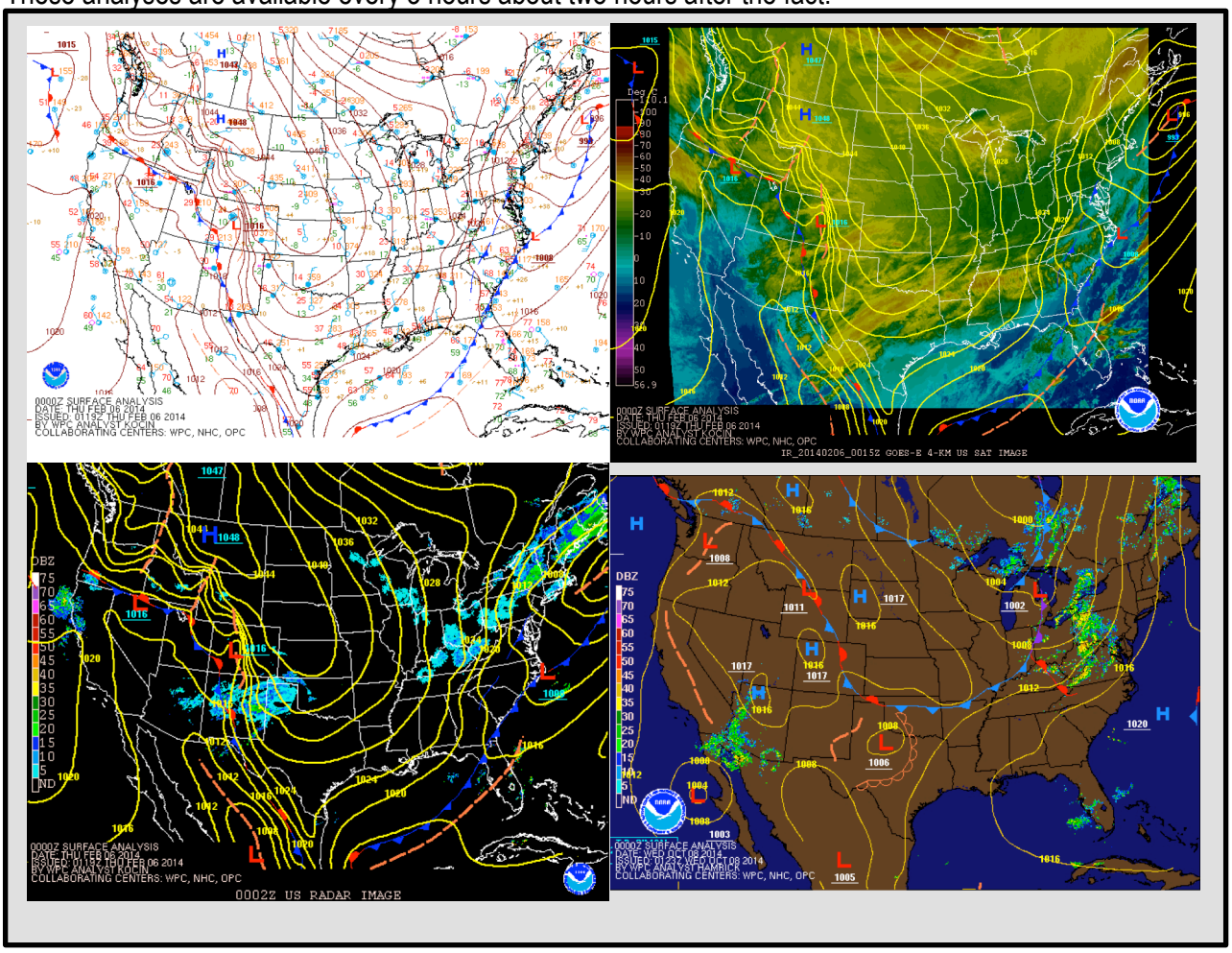
High-quality, daily surface maps for 1200 UTC can be obtained from National Oceanic and Atmospheric Administration (NOAA), National Centers for Environmental Prediction INCEP) at http://www.wpc.ncep.noaa.gov/dailywxmap/index.html. The maps generally run 24 hours behind real-time.



Map for 1200 UTC, 07 Oct 2015

If you desire a version of the above map that has station plots too, just click on the map itself when at the link http://www.wpc.ncep.noaa.gov/dailywxmap/index.html.

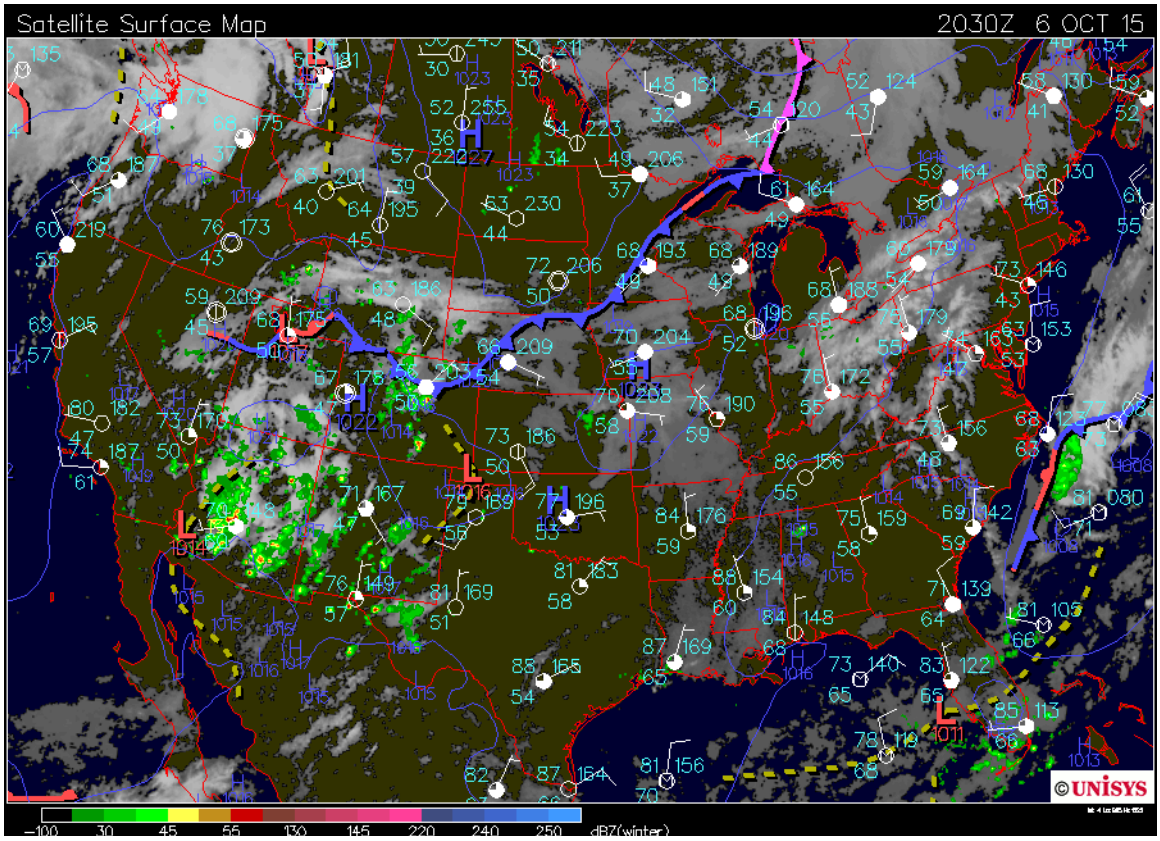
The WPC site is also source for lower-resolution, historical surface weather maps every three hours.. The following links give URL's for maps valid 0000 UTC 08 Oct 2014 with isobars and fronts that also either have station plots, IR satellite imagery or composite radar reflectivity.
http://www.wpc.ncep.noaa.gov/archives/sfc/2014/namussfc2014100800.gif
http://www.wpc.ncep.noaa.gov/archives/sfc/2014/ussatsfc2014100800.gif
http://www.wpc.ncep.noaa.gov/archives/sfc/2014/radsfcus_exp2014100800.gif
http://www.wpc.ncep.noaa.gov/archives/sfc/2014/radsfcus_exp_new2014100800.gif
These analyses are available every 3 hours about two hours after the fact.



To get analyses for a different date/date, change the URL date/time string yyyymmddhh (2014100800) accordingly. For example, to get maps for 1800 UTC on 4 October 2016, paste the following URL's into your browser:
http://www.wpc.ncep.noaa.gov/archives/sfc/2016/namussfc2016100418.gif
http://www.wpc.ncep.noaa.gov/archives/sfc/2016/ussatsfc2016100418.gif
http://www.wpc.ncep.noaa.gov/archives/sfc/2016/radsfcus_exp2016100418.gif
http://www.wpc.ncep.noaa.gov/archives/sfc/2016/radsfcus_exp_new2016100418.gif

University Corporation for Atmospheric Research for Composite Loops

Loops of hourly surface maps with GOES satellite imagery and Doppler radar intensity can be obtained at http://www.mmm.ucar.edu/imagearchive/. (Maps are produced by Unisys Weather, http://www.weather.unisys.com.) The archives of surface, satellite and radar maps are generally posted online within 12 hours of the analysis time. Its menu is straightforward and intuitive to use. I highly recommend that you explore the site. It can be a valuable resource of weather maps for your project. The following is from an hourly loop for 06 OCT 15.



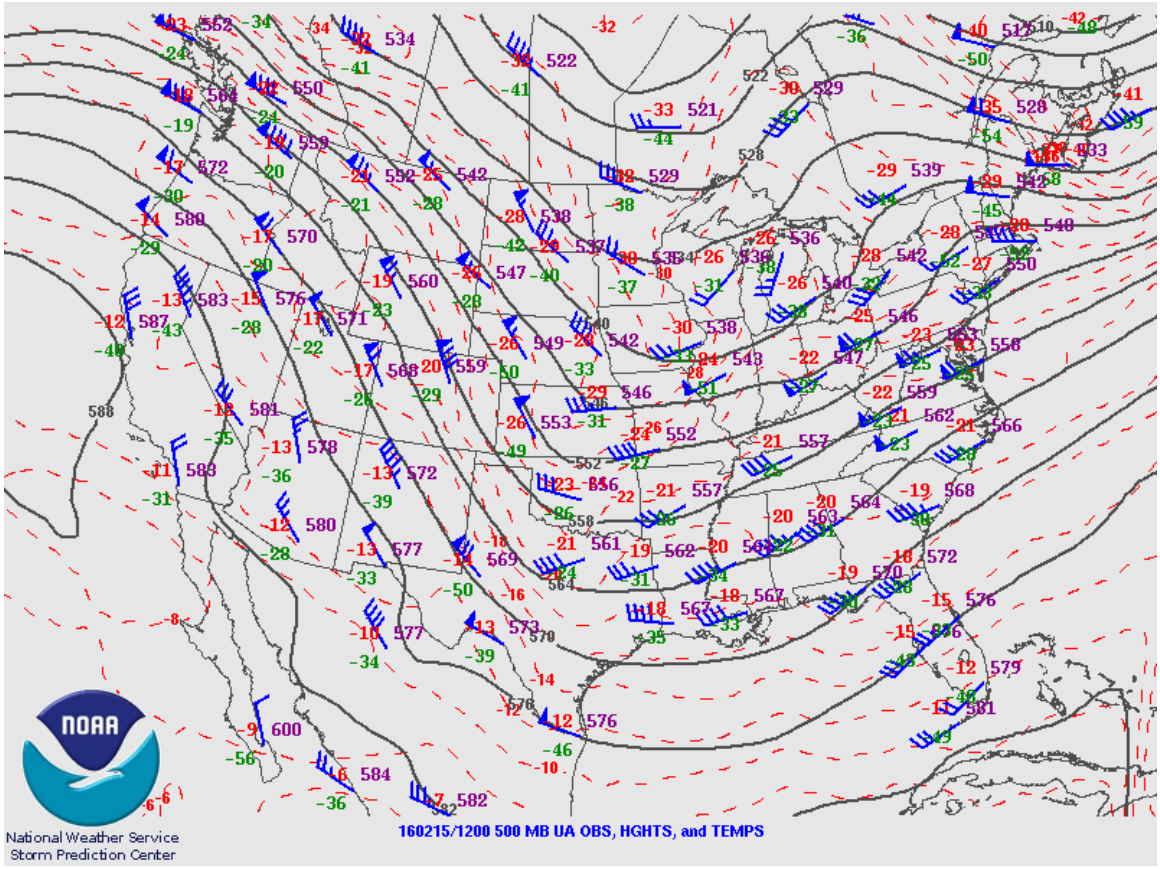
Another site to obtain historic surface weather maps (and upper-air maps too) with station model plots for the U.S. or other regions of the world is Plymouth State College at URL http://vortex.plymouth.edu/u-make.html. The menu is powerful and flexible, but it can seem overwhelming at first to set the menu to get what you want. I only recommend its use for the most patient of students who are driven to learn beyond minimum requirements. Unfortunately, I am not in a position to field individuals' questions or offer tutoring on how to use the site to its fullest capacity. These analyses become available approximately 24-36 hours after the fact.

NOAA Storm Prediction Center (SPC) for Upper-Air Analyses

The NOAA Storm Prediction Center in Norman, OK is my preferred source to obtain upper-air maps in near real-time. Its repository of twice-daily analyses dates back to late 1998. I show the 500 mb analysis for 1200 UTC 15 Feb 2016 and the URL that retrieves it.

http://www.spc.noaa.gov/cgi-bin-spc/getuadata.pl?MyDate1=160215&Time1=12&MyDate2=&Time2=12&align=V&Levels=500.

To obtain the 500 mb map for 0000 UTC 15 Feb 2016, you would change string "MyDate1=160215&Time1=12" to "MyDate1=160215&Time1=00". To get a map for a different level, you would change the parameter "Levels=" to the mandatory pressure levels of either Sfc, 1000, 925, 850, 700, 300 or 250. When you use the site, you must make certain that upper and lower case letters agree with what is shown because the URL is case sensitive.



Hourly analyses and loops are archived at http://www.spc.noaa.gov/exper/ma_archive/index2.html. These are advanced, detailed analyses that are obtained by setting the scroll tabs for the desired times, levels and parameters. Worth exploring if you are the adventuresome type with the interest and drive to delve deep into a subject on your own.