

**MEA 498/598: National Weather Service Student Internship  
Week 3 Worksheet - Focus on hand analysis**

Name \_\_\_\_\_ Date \_\_\_\_\_  
Shift \_\_\_\_\_ Mentor \_\_\_\_\_

During the next two weeks and hopefully for most of the remaining shifts, you'll perform a hand analysis of surface data. This is an essential activity that will allow you to develop or improve your skills as an operational meteorologist. Conducting a hand analysis allows you to get a much greater appreciation of the surface weather pattern because you actually touch and get involved with the data as opposed to just scanning it with your eyes. The two links below provide a great resource for hand analysis.

<http://www4.ncsu.edu/~nwsfo/internship/handout.unified.sfc.analysis.manual.version.pdf>

<http://www4.ncsu.edu/~nwsfo/internship/handout.op.meteorology.mesoanalysis.pdf>

1) Your first surface map may take some time so be patient and budget up to a half hour of your shift for you to perform your analysis.

We have discussed local observations, data quality, observing systems (ASOS, river gages, RAOB's, satellites, etc.), and hand analysis during your first 3 weeks. Today we will continue to discuss analysis and we'll examine various objective analysis systems we use.

2) In AWIPS we have two objective analysis routines (MSAS and LAPS). Examine the MSAS and LAPS analysis fields in D2D (look under the "Local" menu). How might an objective analysis such as LAPS or MSAS) supplement hand or other analysis?

3) During various weather events we utilize the SPC Mesoscale Analysis web site (<http://www.spc.noaa.gov/exper/mesoanalysis/>) to determine a variety of mesoscale fields.

4) The Real-Time Mesoscale Analysis (RTMA) is an operational objective surface analysis developed by the National Center for Environmental Prediction. The RTMA is an objective analysis incorporating surface observations from various networks such as METAR's, various mesonets, and satellite based winds which is used as an initial verification method for the forecast grids in the NDFD.

The RTMA analysis can be viewed in GFE.

5) Conferring with the AFD and the operations staff, what is the forecast problem of the day? How might a surface analysis be used to help with the forecast problem of the day?

6) Discuss with your mentor the domain of a surface map that will be helpful. Load the surface map on AWIPS (available from the SPC website as well), print the map, and analyze it.

Have your mentor:

- Show you how to load a surface map and print it

In order to help you remember how to print a surface map, in the space below, write down the steps to load and print the map.

7) Analyze the surface map. Typically we use the specifics below to analyze your map

- Contour the surface pressure every 1 or 2 mb with a brown pencil
- Contour the dew point every 5 degrees F with a green pencil
- Indicate any high/low pressure centers
- Indicate any surface fronts or boundaries
- Highlight any precipitation areas
- Indicate the 32 degree isotherm if appropriate

Some best practices to keep in mind

- Use all of the data available to you, printing a hard copy and going into a corner will likely result in a poor analysis
- Use satellite and radar imagery
- Consult local and SPC mesoanalysis fields (sfc theta-e, convergence fields, LI, CAPE, etc)
- Don't be afraid to use model fields to identify developing or transitory features
- Be sure to go back several hours to find these features and ensure continuity

8) Share your analyzed map with your mentor. Tell them what you've found and how it might help with the near/short term forecast. Share a few points of your discussion in the area below. Make a photocopy of your map and attach it to this worksheet. Place your original map on the clipboard with the others or you can attach your map to this sheet.

9) With your mentor, update the WRKSYN (synopsis) product in AWIPS. Keep in mind the synopsis is not an AFD, but rather a general description of the overall synoptic pattern and impact across the region. The length is typically 2 to 3 sentences, don't get too detailed, and understand that the primary audience is the NWR listener but the product is also ingested into the AFD synopsis and the Fire Weather Product.

10) If time permits, work with your mentor and create a social media post. There are a wide range of topics that can be used including...

- a short term forecast update (fog will lifting, skies will be clearing, etc.)
- a local climate topic
- a simple forecast summary of the next few days
- an anniversary of a noteworthy weather event