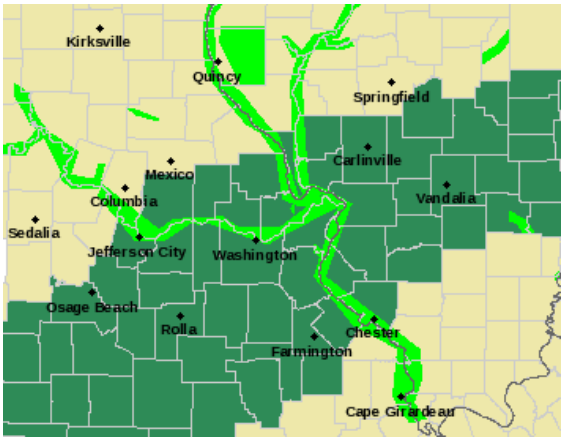
Weather Watches and Warnings

The National Weather Service alerts people about severe and hazardous weather with a system of watches and warnings for a variety of different types of weather. The purpose of this handout is to explain the differences between watches and warnings for severe weather.

For tornadoes and severe thunderstorms, watches are issued by the Storm Prediction Center (SPC) in Norman, Oklahoma. Watches are issued when severe thunderstorm or tornado development is favorable for a given area. Typically, these watches last for six to eight hours. A **Severe Thunderstorm Watch** means that conditions are favorable for Severe Thunderstorms in the watch area. A **Tornado Watch** means that conditions are favorable for Tornadoes in the watch area. However, a watch does not mean you are guaranteed to have severe weather in your area!

Severe thunderstorm and tornado warnings are issued by your local National Weather Service office. Warnings are sent out after confirmation that severe weather is occurring in a particular area via law enforcement, a storm spotter, or through radar imagery. A watch DOES NOT have to precede a warning. A **Severe Thunderstorm Warning** means that thunderstorm is producing 58 mph or stronger winds or hail with a diameter of one inch or greater. A **Tornado Warning** means that there is confirmed tornado on the ground. If either of these is issued for your area, it is crucial to you go inside and take shelter.

There are other types of watches and warnings as well. These are issued for a variety of different types of weather hazards such as flooding, extreme temperatures, fog, winter weather, fires, tropical weather, wind, and more. These are primarily issued by your local National Weather Service Office. All types of watches and warnings are often displayed on some weather maps, particularly those used by the public and used by broadcast meteorologists. They are typically shaded in an appropriate color, which is usually standardized across the weather enterprise. For example, flood related watches and warnings are usually green, winter weather advisories and warnings are usually blue, pink, and purple and severe weather watches and warnings are usually yellow, orange, and red. Some examples are below:



On the left is a hazard map from the National Weather Service, St. Louis, MO. It shows flash flood watches (dark green), and flood warnings (lime green) with remnants of Tropical Storm Bill on their way into the area on June 16, 2015.

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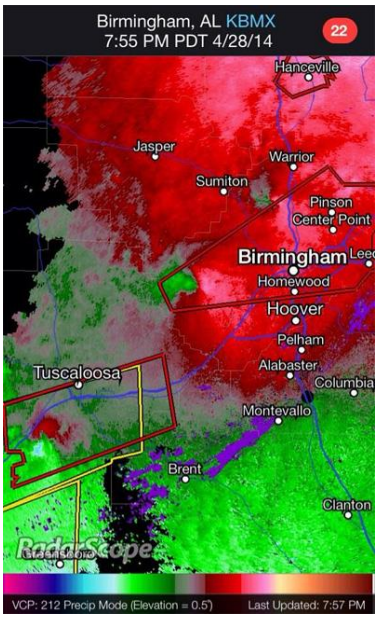
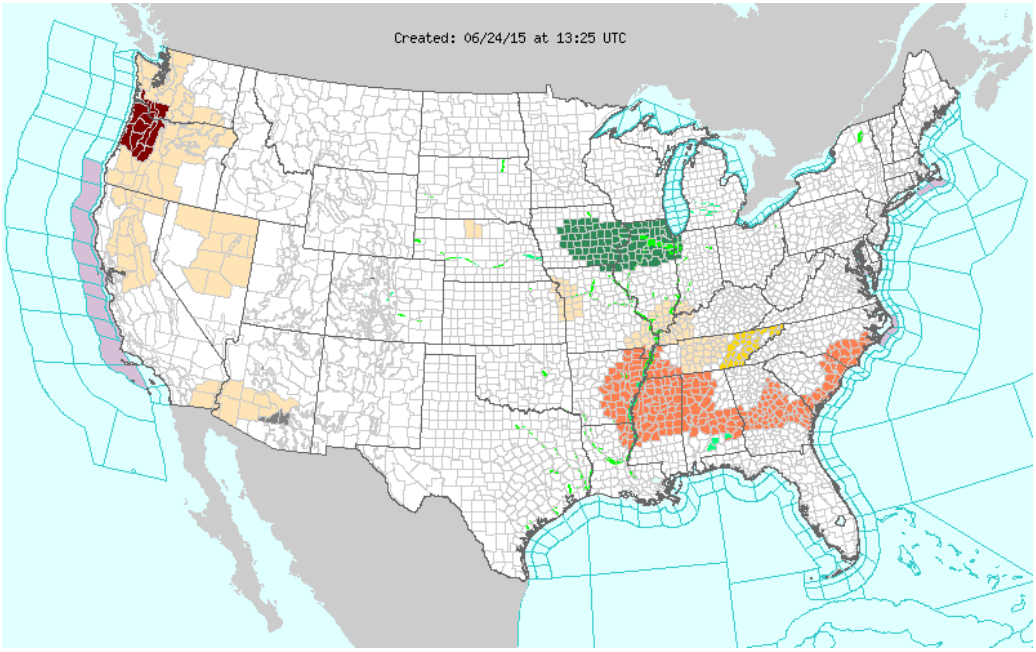
On the right is a velocity radar image viewed on a smartphone app (More on Radar on Worksheet 2-3) from the radar in Birmingham, Alabama. The red shapes are tornado warnings and the yellow shape is a severe thunderstorm warning. This was a from tornado outbreak on April 28, 2014.





Above is a national hazards map from the National Weather Service on June 24, 2015, that shows Flash Flood Watches (dark green) over Illinois and Iowa, Flood Warnings (lime green) nationally, heat advisories (orange) over the Deep South and Mississippi Delta region, excessive heat watches (red) over coastal Oregon, and law enforcement alert (yellow) in eastern Tennessee. The tan regions are Hazardous Weather Outlooks that are not advisories, watches, or warnings, but rather outlooks from the weather service about weather hazards that do not meet watch/advisory requirement. In this map, those regions are mainly in the Northwest, the Desert Southwest, and the Mid-South.

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Below are some examples of common watches and warnings issued around the country (Note: This list is not exhaustive. For a complete list of watches and warnings, go to www.weather.gov/help-map).

Flash Flood Watch- Used to inform public and EMA that sudden flooding conditions are possible but not necessarily certain or imminent.

Flash Flood Warning- Used to inform public and EMA that sudden flooding is occurring or imminent.

Wind Chill Warning- Used to inform public that the wind chill is life threatening

Freeze Warning- Used during the growing season to inform public that temperatures will drop below freezing for an extended period of time.

Blizzard Warning- Issued when a winter storm has winds over 35 mph and blowing/falling snow that reduces visibility to less than a quarter mile for three hours or more.

Dense Fog Advisory- Issued when fog reduces visibility to less than one-eighth of mile over a significant area.

Heat Advisory- Issued for within 12 hours for one of the following: nighttime temperatures of 80°F or higher or daytime heat indices between 105°F and 115°F.

Excessive Heat Watch- Issued when daily heat indices are expected to reach 105°F or higher during the day, combined with nighttime lows of 80°F for two consecutive days. This is upgraded to an **Excessive Heat Warning** within 12 hours of the onset of the conditions.

Tropical Storm/Hurricane Watch- Issued by the National Hurricane Center when tropical storm conditions (wind speeds greater between 39 and 73 mph) or hurricane conditions (wind speeds of 74 mph or more) are expected on a coastal area within 48 hours. If hurricane strength winds are expected inland, a **Hurricane Force Wind Watch** may be issued.

Tropical Storm/Hurricane Warning- Issued by the National Hurricane Center when tropical storm or hurricane conditions are expected within 36 hours or less. If hurricane strength winds are expected inland with greater certainty, a **Hurricane Force Wind Warning** may be issued.

Sources: National Weather Service, NWS Storm Prediction Center

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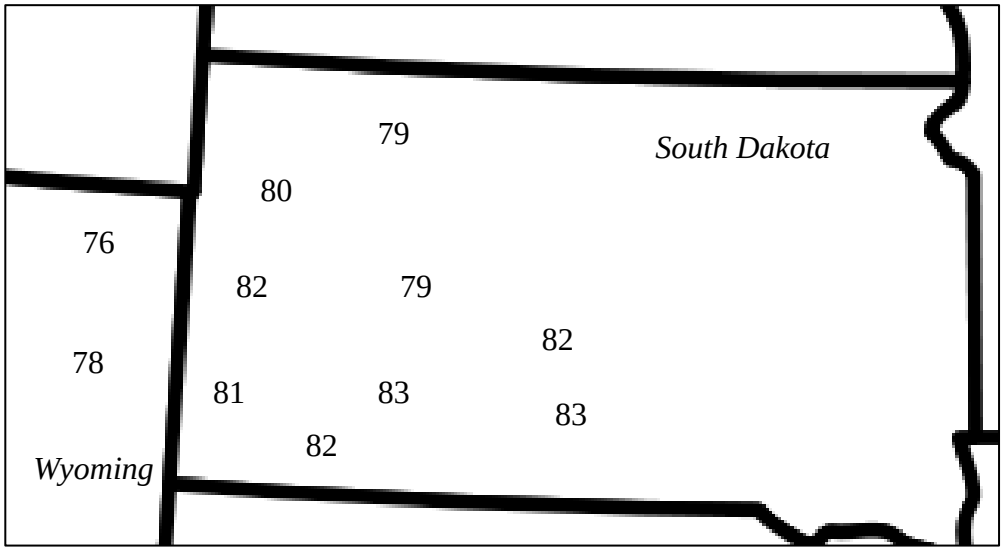
The following questions are designed to help you understand what it may be like for a National Weather Service meteorologist to issue watches/warnings. Each question has a situation that might be considered by the National Weather Service. For each situation determine what type of watch/warning is most appropriate based on your knowledge of weather watches and warnings. You may have to use the website link provided above to look up some of the watches/warnings.

1. Your area was placed under a Severe Thunderstorm Watch by the Storm Prediction Center. As a forecaster, you are specifically concerned about a thunderstorm approaching your county warning area. You look at radar and notice that there is a region indicative of hail falling in your county of interest. You get a call a minute later informing you that the hail is about the size of a quarter (about one inch in diameter) and the system is crossing into the county at this moment. There is no evidence of a tornado. You decide to issue which of the following:

    a. Tornado Watch
    b. Ice Storm Warning
    c. Severe Thunderstorm Warning
    d. Nothing, the storm does not meet any requirements for a watch/warning

2. You are creating a forecast for this evening for western South Dakota and northeastern Wyoming at the Rapid City, SD Weather Forecast Office. It has been fairly warm the past few days but notice that the computer models have been trending on the warm side the past few days. Below is a forecast map for overnight temperatures that you are about to issue:



Circle the region where you would likely issue a Heat Advisory for the upcoming evening. Why did you circle the region you did? Remember the requirements for a heat advisory.

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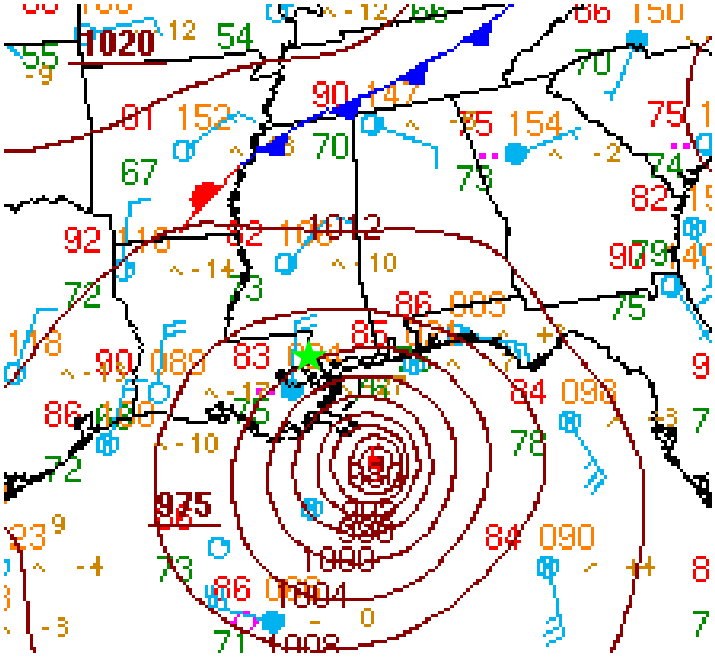
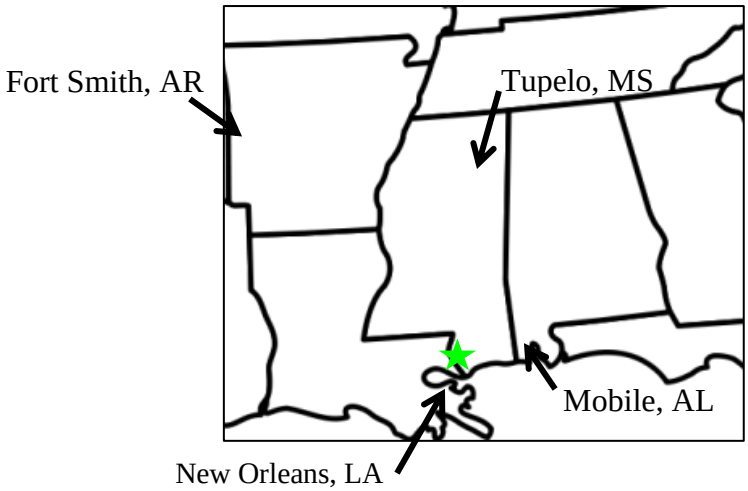
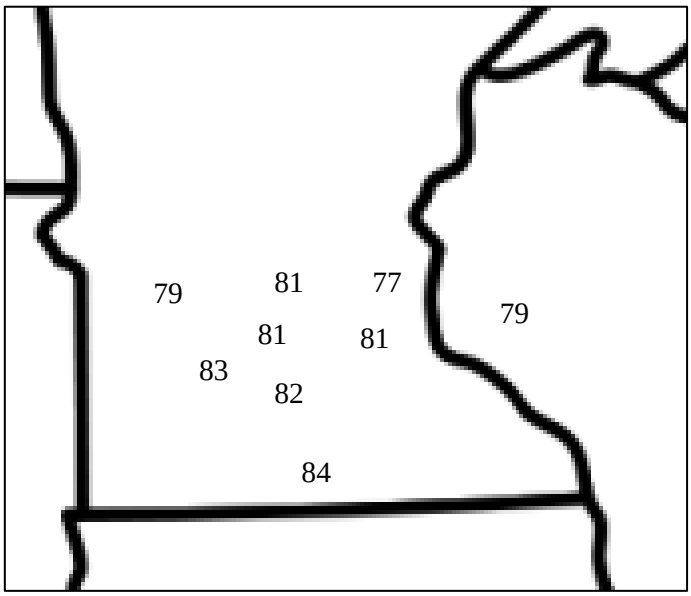
3. Below is a surface map from August 28th, 2012 from 12Z (7am Central Daylight time). It depicts Category 1 Hurricane Isaac approaching the northern Gulf Coast region. The latest track from the National Hurricane Center has the storm making landfall somewhere near the Louisiana-Mississippi border (identified with a star). Using the below map, which of the following advisories are likely in effect? You can select more than one and remember that the further out from the center of the storm, the weaker the winds will be.



a. A Hurricane Warning for New Orleans, LA
b. A Tropical Storm Watch for Fort Smith, AR
c. A Tropical Storm Warning for Mobile, AL
d. A Tornado Warning for Tupelo, MS.



4. You are forecasting the following highs for the Minneapolis/St. Paul metro area:



Which of the following advisories would you issue?

a. Heat Advisory
b. Excessive Heat Warning
c. Wind Chill Advisory
d. No advisory needed

5. The following station model is taken from observations at weather station in Greenville, Mississippi at 10:15am EDT in the middle of June.

Temperatures have been increasing steadily as the day has gone on. The heat index is 103˚F. What weather alert do you think was issued for this day for the Greenville, MS area?

a. Humidity Watch
b. Heat Advisory
c. Dew Point Advisory
d. No advisory was issued

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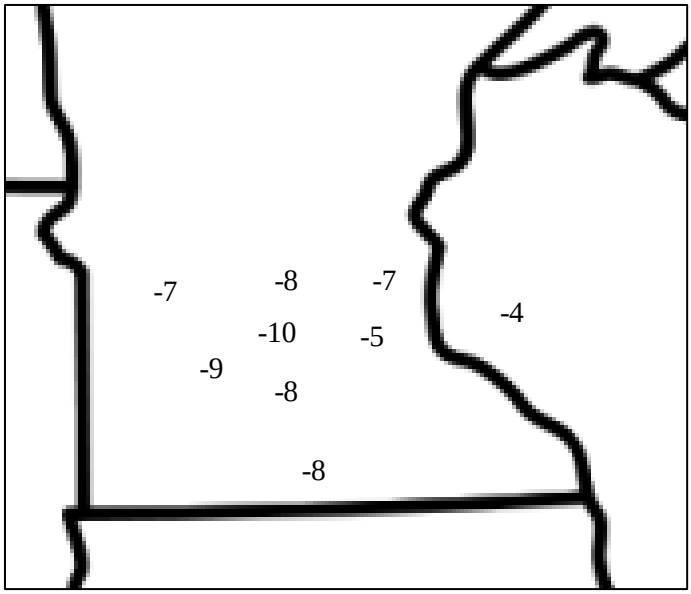
6. You are making a forecast for the Minneapolis/St. Paul area. It has been very wet the past week and fairly significant system is coming into the area tomorrow morning that may drop another 2-4 inches of rain. The last rain event caused some minor flooding in backyards, but you are concerned that additional rain may back up the drainage systems. However, you believe that any flooding would be quick to occur and isolated. Which of the following advisories would you issue?

    a. Flash Flood Watch
    b. Flood Warning
    c. Tsunami Watch
    d. No advisory should be issued

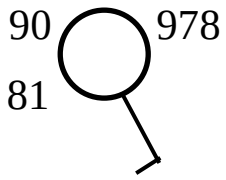
7. The following map depicts temperatures at 11:00pm for the Minneapolis/St. Paul metro area for a January night.



Winds are expected to blow from the North from 20-30 mph for most of the night. Which of the following advisories might be issued for the region? Assume there is no snowfall and there is no significant snow on the ground.

    a. Blizzard Warning
    b. Heat Advisory
    c. Wind Chill Warning
    d. No advisory should be issued

8. The following station model was taken from observations at New Ulm, Minnesota from a July afternoon.



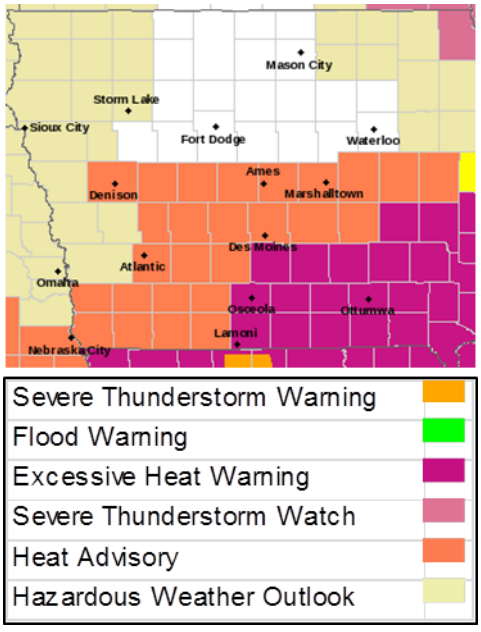
Using what you know about station models and weather advisories, watches, and warnings, answer the following question.

Which of the following advisories do you think was issued for this afternoon?

a. Heat Advisory
b. Wind Advisory
c. Dew Point Advisory
d. Dense Fog Advisory

9. On the right is a hazard map from the National Weather Service in Des Moines, Iowa from July 13, 2015. Based on your knowledge of weather alerts, which of these cities likely had the highest heat index temperature forecasted?

a. Mason City, IA
b. Des Moines, IA
c. Omaha, NE
d. Ottumwa, IA



10. Which of the following warnings do you think is most likely to occur during the mid-February in Minnesota?

a. Frost Advisory
b. Blizzard Warning
c. Tornado Warning
d. Hurricane Warning

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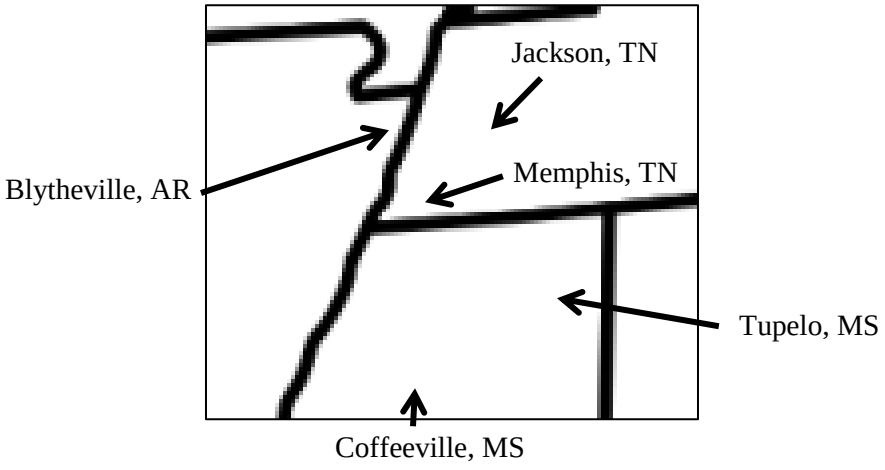
11. You are working for the National Weather Service Office in Memphis, Tennessee, which covers parts of Tennessee, Arkansas, and Mississippi. You come in for your shift and notice that an Excessive Heat Warning was issued by the forecaster who had just left for some of the locations in your county warning area. In the chart below of forecasted Heat Index values for the area, identify the locations most likely under the excessive heat warning.

Location/City	Forecasted Heat Index Temperature (°F)
Memphis, TN	109
Coffeeville, MS	116
Jackson, TN	99
Blytheville, AR	105
Tupelo, MS	105



12. You are watching the weather situation in these three locations for work Based on their station models, which of the following locations is likely under a dense fog advisory? (Circle your answer)

Thief River Falls, MN Minot, ND Duluth, MN

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