



Appendix C: Basics of Weather Radar

Radar

One of the best tools for observing ongoing weather is National Weather Service Radar. There are many different sources for radar data, including radar.weather.gov. Additionally, America's Weather Enterprise offers options for monitoring radar data. Here is a link for these additional resources: <https://www.weather.gov/enterprise/> Having multiple sources for radar information could be beneficial if one of your options is down.

There are many different types of radar products used by professional meteorologists, such as reflectivity, velocity, storm relative motion, estimated rainfall rates, estimated hail size, etc. The list is long. Please contact your local weather service office if you would like radar training on these different products.

There are a few important things to remember about radar:

1. Be sure the radar data you're looking at is current! Always check the timestamp.
2. Radar data does not give information about lightning. The lightning data is detected using a different source of information.
3. Know where you are located on the radar display. Some applications allow you to plot your location on the map.
4. Some radar programs use automated computer algorithms to predict hail size, rotation in thunderstorms, and potential tornadoes. Do not rely on this data as it is prone to error.
5. What you see on radar does not always translate to what is actually happening at the surface. The farther away you are from the radar, the larger the potential difference.

Radar Reflectivity

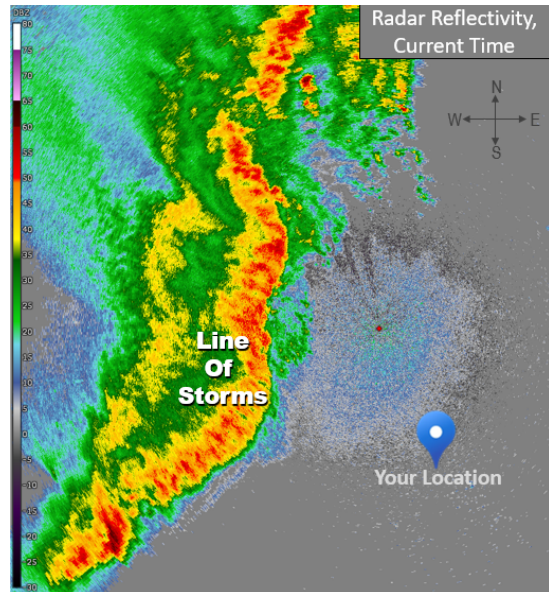
What it is - Reflectivity is the most common radar product. It can show where storms are located, and can be useful for determining if storms are close to your event. Weather radars send out a beam of energy and measure how much energy gets "reflected" back by the precipitation particles (rain, hail, snow, ice, sleet), and then puts this information on a map.

How it works - When there are large amounts of rain or hail in a thunderstorm, a lot of energy gets reflected back to the radar, and the "radar return" shows colors of yellow, orange, and red. These brighter colors usually mean more intense precipitation. But, a radar measures precipitation in the cloud, and can't see how much of the precipitation is actually reaching the ground. At far distances, the radar beam could be 10,000 ft or more above the ground. It is important to contact your local weather service office if you have questions about the radar data you are looking at.



Example - The image to the right is radar reflectivity showing a line of storms. The warmer colors (yellow, orange, red) indicate higher values of reflectivity, which often translate to heavier rain and/or hail.

In this example, the blue icon indicates your location, and the line of storms is to your west. The latest radar images can be looped to see how the storms are moving over time. Remember, storm motion varies, so please contact your local national weather service office for questions about storm motion.



Using Radar to Answer Common Questions

	What to use	What to do
<i>Where are the storms?</i>	Reflectivity	<ol style="list-style-type: none"> 1. Check the timestamp, is it current? 2. Determine where you are on the radar and where the storms are.
<i>Are the storms moving toward me?</i>	Reflectivity Loop	<ol style="list-style-type: none"> 1. Check the timestamp, is it current? 2. Determine where you are on the radar. 3. Loop the images to determine if the storms are moving toward or away from you.
<i>When will storms reach me?</i>	Reflectivity Loop	<ol style="list-style-type: none"> 1. Check the timestamp, is it current? 2. Loop the radar images. 3. Check the begin and end time of the loop for a first guess of how far the storms have moved during the time of the loop, and how far they need to go to reach you. 4. Contact your local weather service office for a detailed forecast on time-of-arrival.