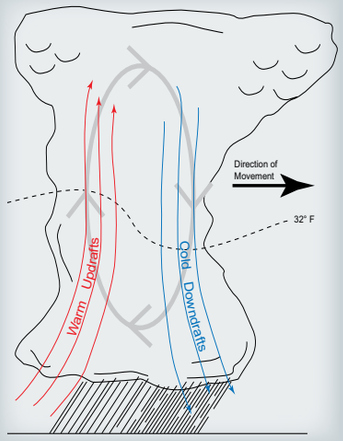
HAIL: SUMMER ICE STORMS

Pea, dime, quarter, golf ball, baseball, softball and grapefruit are the popular descriptions of the size of icy hydrometeors we more commonly know as hail. Hail is one of the most destructive forms of precipitation. Unlike rain, which nourishes crops, hail destroys crops, pummels roofs and vehicles and can seriously injure and even kill people. The World Meteorological Organization estimates hail causes damage worth over $200 million annually to agriculture worldwide. A large hail storm produced over 1.9 billion dollars in property and crop damage near St Louis, Missouri on April 10, 2001. On June 19, 2002, hail killed 25 people and injured hundreds in China's Henan Province. Hail is a weather phenomenon that is as fascinating as it is deadly.

Hail forms in the strong updrafts of towering thunderstorms. All thunderstorms produce ice crystals which grow larger into ice pellets, but these small icy spheres usually melt before hitting the ground as they fall from most thunderstorms. Hail producing thunderstorms, or towering cumulonimbus clouds, form along strong cold fronts or form independently as supercell thunderstorms. These storms tower to altitudes above 50,000 feet above the ground and tap into very cold air aloft which produces ice crystals within the storm. Strong updrafts and gravity force these crystals up and down between warm moist air at the base of the cloud and sub-freezing temperatures at the tops of cloud forming concentric layers of ice on the original ice crystal. The stronger the storm, the stronger the updrafts and therefore the hail stone experiences more up and down cycles within the cumulonimbus cloud, increasing in size on each round trip until the hail stone becomes too heavy to be buoyed by the updrafts, and subsequently falls to the ground. Depending upon the size and density of the hail stone, hail will hit the ground at speeds between 50 and 90 miles per hour. The National Weather Service uses hail size to define thunderstorm severity. Hail greater than ¾ of an inch in diameter is produced by severe thunderstorms. The largest hail stone in the United States fell in Aurora, Nebraska on June 22, 2003, and measured 7 inches in diameter with a total circumference of 17½ inches!



Hail has been observed in every state of the U.S. with the most frequent hail storms occurring in Texas, Oklahoma, and Kansas. Hail also occurs in many other countries worldwide. Some of the world's largest hail falls in India, Pakistan, and China where geography and warm moist climate produce massive outbreaks of severe thunderstorms. In South Carolina, 2681 hail events, with hailstones ¾ inch or greater, during the period 1950-2005 have been reported. The largest recorded hailstone in South Carolina was 4½ inches in diameter and fell in Florence on May 25, 2000, during a hailstorm that caused over six million dollars in property damage. One thousand new cars on a Florence car dealer's lots were pummeled and dented by large hail, shattering windshields and providing windfall business for local auto body repair shops.

South Carolina's Upstate counties have the most frequent occurrence of hail. Greenville and Spartanburg counties have been pummeled by a combined total of 319 hail storms in the 55 year period between1950 and 2005. Two large supercell thunderstorms erupted late in the afternoon of August 20, 1990, sending golf ball-to grapefruit (1"-3.5") - sized hail crashing down on Greenville and Spartanburg counties, damaging thousands of cars and houses. Storm damage estimates approached $10 million in combined property damage from hail, wind, and lightning. According to recorded storm reports, Lexington county is curiously the next favorite target of hail in South Carolina with 132 damaging hailstorms in the last 55 years.

NOAA weather alert radio, commercial radio, and television broadcast warnings of approaching severe thunderstorms and the battering hail they produce. If caught outside, avoid injury from hail by seeking shelter in a sturdy structure or under a reinforced shelter like a highway bridge overpass. Motorists should never drive through a hail storm and should immediately pull over and stop in a safe parking area. Hail reduces visibility and can shatter windshields injuring driver and passengers. Hail is a serious threat to aircraft and flight safety: shattering cockpit windows, destroying antennae, and battering fuselages. The onset of hail is also a precursor to the arrival of nearby tornadic activity. If you are in the path of falling hail, you may also be in the path of a tornado.

Hail does provide important evidence regarding the formation and intensification of severe thunderstorms and atmospheric thermodynamics. Hail is a costly form of severe weather for agriculture, motorists and aviators. Hail is also a dangerous, damaging form of precipitation common to South Carolina throughout the year.