SOUTH CAROLINA'S "WINTERY MIX"

South Carolina's unique geographical location yields a climate that is a pleasant mix of the tropics and the four seasons. This mixed climate produces moderate winter weather that rarely delivers the snowy landscapes found in the New England states. Winter average temperatures range from the mid-30s in the mountain counties in the northwest corner of the state to the mid-50s along the coast. Single digit temperatures are extremely rare across South Carolina but in the higher elevations temperatures can briefly dip well below zero. The lowest temperature South Carolina ever recorded occurred in January 1985 when the thermometers at Caesars Head dropped to –19 degrees Fahrenheit.

Measurable statewide snowfall is a rare South Carolina event. Snow occurs most frequently in the mountainous Upstate counties during the winter months with some of the higher elevations receiving, on average, 6-8 inches annually. Caesars Head again wins the South Carolina snow event record with a 28.9-inch snowfall that fell February 15-17, 1969. South Carolina's record 24-hour snow event didn't occur in the mountains but near the central town of Rimini where 24 inches of snow fell in 24 hours starting on February 9, 1973. Snow rarely accumulates along the coastline but in 1989 Charleston was treated to a rare White Christmas. Eight inches fell on December 24 blanketing the Coastal City with record-breaking accumulation.

South Carolina winters more commonly produce a mixed bag of winter precipitation. Winter storms frequently bring a mixture of rain, freezing rain, and ice pellets, also known as sleet. If temperatures are cold enough, this wintery mix can accumulate on trees, lawns, and roads. Bridges are the first to freeze and become slick with ice because cold air has chilled both the top and underside of the bridge. Slick bridges and roadways are very dangerous for motorists who are traveling too fast for the icy conditions, causing multi-car wrecks and fender benders. Freezing rain also

Phillip Jones

accumulates and weighs down trees and power lines. Pine trees are very susceptible to broken branches weighted down by the heavy ice. These broken branches fall, ripping down power lines, blocking roads, and damaging roofs.

South Carolina usually feels the chill of the wintery mix in January or February but can see it as early as November. One of the most recent ice storms occurred January 26-27, 2004, causing $23.2 million dollars in damage, debris removal, and utility repair. Ice accumulations of one quarter to three quarters of an inch ripped branches off trees, caused major power outages and significant damage to numerous homes in the Upstate and Pee Dee. Tree damage was so widespread the State of South Carolina declared a forest disaster.

What causes this damaging wintery mix? Large, cold, and dry continental polar air masses force arctic air up against the Appalachian Mountains. This cold air is wedged along the Appalachians which act like a large dam. Warmer, moister air from offshore Atlantic waters is forced up and over this wedge of dammed air. The warm air can also form layers within the cold wedge. This lifting forces water to precipitate out as rain, quickly cooling to become snowflakes. If the arctic air mass is cold enough, the snowflakes will fall as snow. If the snow falls through layers of warm, cool, and cold air the wintery mix is produced. The snow can melt on the way down and become rain. If it finds a cold layer at the surface, the rain can be cooled below freezing and still remain liquid. This curious property of water is called super-cooling. Super-cooled rain quickly freezes on contact. Wires, bridges, and branches are quickly coated in layers of clear ice.

The components of the wintery mix will vary with depth of the cold, arctic wedge. If the wedge is shallow, the over-running air could sprinkle out snow that partially melts and falls to the ground as ice pellets. It is not uncommon as the warm and cold air clash to see periods of rain followed by periods of sleet and freezing rain turning into snow at night as the cold wedge deepens. Likewise, the wintery mix can start out as all snow then change to sleet and freezing rain as the wedge becomes shallow or dissipates. Forecasting these wintery mix events is very complicated and always guaranteed to give the forecaster a headache, but these icy events will always be a part of South Carolina's special climate.

Michael Foster

Phillip Jones