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TERMINOLOGY OF WINTER ATMOSPHERIC PHENOMENA

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A large number of terms are used, sometimes rather loosely, in referring to various weather elements. These references occur within the meteorological community, among external user groups, and among the general public. The following list defines and classifies a number of weather elements, describes their appearance, and denotes their causes as taken from the Glossary of Meteorology and FMH No. 1, Chapter A7. The use of this terminology can get confusing since several different terms can refer to the same phenomenon and many terms are used incorrectly at times. The purpose of this paper is to provide a handy reference to sort out the meanings of and differences between various weather elements. Those elements that are used in hourly aviation observations are so indicated by the official abbreviation in parenthesis.

Classification of Precipitation

Snow Pellets (SP), **Graupel, Soft Hail, Tapioca Snow** - Precipitation consisting of white, opaque ice particles having a snow-like structure, with a diameter of 2 to 5 mm. Crisp and easily crushed, they are thereby different from snow grains (see below). They rebound when they fall on a hard surface and often break up. Snow pellets often fall in showers with the surface temperature at or slightly below freezing. They are formed by accretion of supercooled droplets on a falling ice crystal.

Snow Grains (SG), **Granular Snow** - Precipitation in the form of very small, white, opaque ice particles - the solid equivalent of drizzle. Resemble snow pellets in appearance, but are flatter and more elongated, with diameters generally less than 1 mm. They do not shatter or bounce when they hit a hard surface. They usually fall in small quantities, mostly from stratus and never as showers.

Ice Pellets (IP) - Precipitation of transparent pellets of ice less than 5 mm in diameter whose shapes are not consistent. Ice pellets usually bounce when hitting hard ground. Two types of ice pellets are observed:

(1) **Sleet, Grains of Ice** - Generally transparent solid grains of ice formed from the freezing of raindrops or the refreezing of melted snowflakes when falling through a below-freezing air layer near the surface. This type falls as continuous or intermittent precipitation.

(2) **Small Hail** - Generally clear particles consisting of snow pellets encased in a thin layer of ice, formed by accretion of droplets on the snow pellet or by the melting and refreezing of the snow pellet surface. This type falls as showers.

Freezing Rain (ZR), **Freezing Drizzle** (ZL), **Freezing Fog** - Liquid rain, drizzle or fog that freezes upon impact with the ground or exposed objects, forming a coat of glaze on the exposed locations.

Classification of Suspended Particles

Ice Fog (IF), **Ice-crystal Fog, Frozen Fog, Frost Fog, Frost Flakes, Air Hoar, Rime Fog, Pogonip** - Fog composed of suspended particles of ice. It occurs at very low temperatures, usually in clear, calm weather in high latitudes. The sun is usually visible; often a halo can be seen. Ice fog is rare at temperatures above -20°F and increases in frequency with decreasing temperatures. It is almost always present at air temperatures of -50°F in the presence of a source of water vapor (i.e., - the Yellowstone hot springs, an animal herd, etc.). Unlike fog, ice fog does not produce rime or glaze on cold, exposed objects.

Ice Needle (IC), **Ice Spicule** - A long, thin ice crystal formed by sublimation at temperatures near or below 0°F.

Classification of Surface Phenomena

Glaze, Glaze Ice, Glazed Frost, Verglas - A generally smooth, clear coating of ice formed on exposed objects by the freezing of a film of supercooled water deposited by rain, drizzle or fog. Glaze is denser than rime or hoarfrost (below). Large drop size and rapid accretion favor glaze formation. At the surface, glaze may produce an ice storm. In the air, it may cause clear ice on aircraft. Hail is ordinarily almost entirely composed of glaze, with layers of rime inside. When snow crystals contain a large amount of glaze accretion, ice pellets result.

Rime - An opaque granular deposit of ice formed by rapidly freezing supercooled water on an exposed object. It is denser and harder than hoarfrost (below), but softer and less transparent than glaze (above). Factors favoring rime formation include small drop size, slow accretion and a high degree of supercooling. The opposite effects favor glaze formation. When snow crystals have a large amount of rime accretion, they become snow pellets.

Hoarfrost, White Frost, Crystalline Frost, Hoar, Frost - A deposit of interlocking ice crystals found by direct sublimation on objects. Similar to

dew (below), except that the temperature of the object is below freezing. Forms on objects when air with a dew point temperature below freezing saturates due to cooling. Hoarfrost is more fluffy and feathery than rime. The deposit of ice crystals on the inside of a cold car with people inside is hoarfrost.

Dew - Water condensed onto an exposed object when the temperature of the object has cooled below the dew point of the adjacent air. If the dew point is below freezing, hoar frost will form. Conditions favoring dew formation are: (I) a radiating surface, (2) a calm, clear atmosphere, (3) low specific humidity aloft, and (4) high relative humidity near the surface.

White Dew - Forms as liquid dew, then freezes, leaving a deposit of white, frozen dew drops.

Classification of Storms

Blizzard - In popular usage, any heavy snowstorm accompanied by strong winds. Technically, a blizzard requires either a sustained wind or frequent gusts of greater than 35 mph, low temperatures and reduced visibility to less than 1/4 mile due to falling or blowing snow and lasting for three hours or longer.

Ice Storm, Silver Storm - Any storm characterized by a fall of freezing precipitation, with an attendant formation of glaze when significant with possibly damaging accumulations.