obtained about damaging freezing rain storms in Alaska, perhaps because of the low population density and relatively sparse newspaper coverage in the state.

Extreme ice thicknesses were determined from an extreme value analysis using the peaks-over-threshold method and the generalized Pareto distribution (Hoskins and Wallis 1987, Wang 1991, and Abild et al. 1992). To reduce sampling error, weather stations were grouped into superstations (Peterka 1992) based on the incidence of severe storms, the frequency of freezing rain storms, latitude, proximity to large bodies of water, elevation, and terrain. Concurrent wind-on-ice speeds were back-calculated from the extreme wind-on-ice load and the extreme ice thickness. The analysis of the weather data and the calculation of extreme ice thicknesses are described in more detail in Jones et al. (2002).

This map represents the most consistent and best available nationwide map for nominal design ice thicknesses and wind-on-ice speeds. The icing model used to produce the map has not, however, been verified with a large set of collocated measurements of meteorological data and uniform radial ice thicknesses. Furthermore, the weather stations used to develop this map are almost all at airports. Structures in more exposed locations at higher elevations or in valleys or gorges, for example, Signal and Lookout Mountains in Tennessee, the Ponatock Ridge and the edge of the Yazoo Basin in Mississippi, the Shenandoah Valley and Poor Mountain in Virginia, Mt. Washington in New Hampshire, and Buffalo Ridge in Minnesota and South Dakota, may be subject to larger ice thicknesses and higher concurrent wind speeds. On the other hand, structures in more sheltered locations, for example, along the north shore of Lake Superior within 300 vertical feet of the lake, may be subject to smaller ice thicknesses and lower concurrent wind speeds. Loads from snow or in-cloud icing may be more severe than those from freezing rain (see Section C10.1.1).

Special Icing Regions. Special icing regions are identified on the map. As described above, freezing rain occurs only under special conditions when a cold, relatively shallow layer of air at the surface is overrun by warm, moist air aloft. For this reason, severe freezing rain storms at high elevations in mountainous terrain will typically not occur in the same weather systems that cause severe freezing rain storms at the nearest airport with a weather station. Furthermore, in these regions ice thicknesses and wind-on-ice loads may vary significantly over short distances because of local variations in elevation, topography, and exposure. In these mountainous regions, the values given in Fig. 10-1 should be adjusted, based on local historical records and experience, to account for possibly higher ice loads from both freezing rain and in cloud icing (see Section C10.1.1).

C10.4.4 Importance Factors

The importance factors for ice and concurrent wind adjust the nominal ice thickness and concurrent wind pressure for Risk Category I structures from a 50-yr mean recurrence interval to a 25-yr mean recurrence interval. For Risk Category III and IV structures, they are adjusted to a 100-yr mean recurrence interval. The concurrent wind speed used with the nominal ice thickness is based on both the winds that occur during the freezing rain storm and those that occur between the time the freezing rain stops and the time the temperature rises to above freezing. When the temperature rises above freezing, it is assumed that the ice melts enough to fall from the structure. In the colder northern regions, the ice will generally stay on structures for a longer period of time following the end of a storm resulting in higher concurrent wind speeds. The results of the extreme value analysis show that the concurrent wind speed does not change significantly with mean recurrence interval. The lateral wind-on-ice load does, however, increase with mean recurrence interval because the ice thickness increases. The importance factors differ from those used for both the wind loads in Chapter 6 and the snow loads in Chapter 7 because the extreme value distribution used for the ice thickness is different from the distributions used to determine the extreme wind speeds in Chapter 6 and snow loads in Chapter 7. See also Table C10-1 and the discussion under Section C10.4.6.

Table C10-1 Mean Recurrence Interval Factors

Mean Recurrence Interval	Multiplier on Ice Thickness	Multiplier on Wind Pressure
25	0.80	1.0
50	1.00	1.0
100	1.25	1.0
200	1.5	1.0
250	1.6	1.0
300	1.7	1.0
400	1.8	1.0
500	2.0	1.0
1,000	2.3	1.0
1,400	2.5	1.0