great.) On the other hand, for sulfur dioxide removal by rain droplets, several relevant theoretical investigations are available, which are based on the acceptable assumption that, for purposes of regional transport modelling, the sulfur dioxide in the air is in equilibrium with that in the rain (see, for example, Hales and Dana, 1979a; Barrie, 1981). Figure 2, for example, taken from Barrie (1981), shows the predicted functional dependence of W, for sulfur dioxide, on rainwater pH and temperature. In going from 25 to 0°C, for example, W increases roughly by a factor of four. It should be noted that in much of northeastern America precipitation tends to be somewhat more acidic in summer than winter (e.g., Pack and Pack, 1979), so from Figure 2 the expected difference between the winter- and summer-time values of W for rain would be even greater than predicted on the basis of temperature alone. For example, for a unit increase in pH and a change in temperature from 25 to 0°C, which might be representative of the seasonal variation at some of the stations in the northeastern U.S.A. (Pack and Pack, 1979), the predicted increase in W is one order of magnitude. Limited experimental measurements of sulfur dioxide in precipitation support the above arguments (Hales and Dana, 1979). As a matter of interest, Figure 3 gives the North American percentage frequency of hourly temperatures below 0°C in January and 10°C in July, and above 10°C in January and 21°C in July, from which the importance of the above temperature effect can be estimated.

For the case of <u>particulate sulfur</u>, very few data are available on which to base conclusions about winter- and summertime differences in wet deposition, and our understanding of the details of rain and snow interactions with particles is not nearly as complete as for the case of sulfur dioxide. The existing theories are of little help if one wants to go beyond order-of-magnitude washout rate estimates. The only work where a direct experimental comparison of rain and snow scavenging coefficients has been made, for particles comparable in size to sulfates, is that of Graedel and Franey (1975). They found below-cloud Λ values for snow to be twenty times or more than those for rain. However, Graedel and Franey's interpretation of their data has been questioned by Slinn (1976).

Knutson and Stockham (1977) have developed equations for the scavenging coefficient of snow from laboratory study results with single