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Drought and its variable attributes

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Drought is a phenomenon with a great deal of internal structure and this has important implications for water resources and prediction This presentation examines this issue largely through the utilization of information on droughts affecting the Canadian Prairies. The spatial scales of the most intense portions of such droughts are typically of order 100-400 km although less intense regions extend farther. The drought regions furthermore are not always hot; there are almost always periods of dry conditions within which temperatures are substantially below normal. As well, the number of consecutive dry days is sometimes no different in a severe drought than under normal conditions. In such drought situations, there are many small precipitation events but few if any major events. When precipitation does occur, it can either be long-duration and low intensity or short-duration and high intensity. Which one occurs has major implications for runoff. Furthermore, virga is often common in drought situations indicating that precipitation is produced aloft but does not reach the surface. And, some droughts experience strong winds which can induce dust storms. The dusty environment acts to reflect solar radiation and may inhibit precipitation processes; both of these factors act to enhance the drought. Collectively, these many, variable attributes imply that the notion of a single type of drought is inappropriate; hydrologic impacts will depend to a considerable degree on the precise nature of drought being experienced.