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# KATABATIC WIND EFFECTS ON ICE CORE SITE METEOROLOGY IN THE DRY VALLEYS, ANTARCTICA

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Automatic weather station (AWS) data collected between October 2004 and December 2005 on two glacier accumulation zones in the Dry Valleys, Antarctica (Clark and Commonwealth Glaciers) are used to examine the role of katabatic winds on ice core site meteorological conditions. Mean air temperatures (2m height) for the period of measurement are similar on the Clark and Commonwealth (-19.2 and -19.7°C respectively), with much higher variability observed at both sites during the winter and early spring (March – September). Higher wind speeds are also measured at both sites during the winter period, and while mean wind speeds were roughly equal at both sites (2.5 and 2.4 m/s), individual wind events on the Commonwealth Glacier have higher velocities (20-25 m/s vs. 10-15 m/s on the Clark Glacier). Many of the high wind velocity events are associated with warming on both glaciers, and in several cases winter temperatures approach summer values (up to -5°C). Based on the similar timing of these wind and temperature events on both glaciers, as well as wind direction data, we interpret this phenomenon to represent katabatically induced warming of air moving down the valley systems and impacting the glacier accumulation zones. As these events affect the mean annual temperature measured at the site via AWS, but not necessarily the snow and firn temperatures, potential errors in the calculation of proxy-based transfer functions (e.g., snow stable isotope values) based on either temperature measurement must be considered. We compare these results to other meteorological data collected in the Dry Valleys by the Long-Term Ecological Research (LTER) group, and examine the local vs. regional effects of katabatic wind regimes on both valley floors and glacier surfaces. Ice core paleoclimate reconstructions from the Dry Valleys require that katabatic wind effects be considered, and we explore the possibility of deriving proxy records of past katabatic wind variability based on glaciochemical data.