Implications of the deuterium excess record from the Siple Dome ice core

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Deuterium excess is a proxy for conditions in the regions providing the moisture to ice core sites, and is derived from the combination of deuterium and oxygen isotope records. Correcting for moisture source conditions is fundamental to interpreting temperature from the raw isotopes. Comparing the deuterium excess record from the Siple Dome ice core in West Antarctica with other Antarctic deuterium excess records reveals that Antarctica receives moisture from various regions whose signals are preserved despite strong circum-Antarctic atmospheric circulation. Using the Siple Dome deuterium excess record as a proxy for conditions over the subtropical to polar Pacific Ocean provides us with a long, continuous, highly-resolved and well-dated indicator of sea surface conditions which can be compared with other data, such as sea surface temperature records and reconstructions, to further inform us about the moisture source region. The Siple excess record can also be compared with more distant climate proxies, such as the GISP2 isotope record, ultimately providing insight into extra-Antarctic climate, including ENSO and millennial-scale climate change.