Anderson Abstract

How is abrupt (paleo) climate change transmitted to the mid latitude Southern Hemisphere?

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Paleoclimate records indicate a teleconnection between abrupt changes originating in the Northern Hemisphere and various expressions that leave imprints in the Southern Hemisphere. Changes in Atlantic Meridional Overturning Circulation and the reorganization of atmospheric circulation have each been proposed as primary mechanisms linking the hemispheres, but the precise mechanism remains unresolved. Changes in the Southern Westerly Winds (SWW) have also been proposed to regulate the exchange of CO_2 between the deep ocean and the atmosphere. However, climate models show little (and inconsistent) change in the SWW, while carbon cycle models exhibit little (and inconsistent) response of atmospheric CO_2 to imposed changes in the SWW. This presentation will review marine and terrestrial paleoclimate records that have been interpreted to provide evidence for shifts in the SWW, especially during northern hemisphere stadials. Special attention will be given to model-data comparisons corresponding to Heinrich Stadial 1 (roughly 18,000 to 14,700 years ago, as Earth emerged from the last ice age). The presentation is intended to stimulate discussion and further work to reconcile models with paleoclimate records.