4-16-2005

Comment on "El Niño suppresses Antarctic warming" by N. Bertler et al

Peter T. Doran
University of Illinois at Chicago

John C. Priscu
Montana State University

W. Berry Lyons
Byrd Polar and Climate Research Center

John E. Walsh
University of Alaska Fairbanks

Andrew G. Fountain
Portland State University

See next page for additional authors

Recommended Citation

Doran, P., Priscu, J., Lyons, W., Walsh, J., Fountain, A., McKnight, D., Moorhead, D., Virginia, R., Wall, D., Clow, G., Fritsen, C., McKay, C., & Parsons, A. (2005). Comment on "El Niño suppresses Antarctic warming" by N. Bertler et al. *Geophysical Research Letters, 32* (7), 1-2. https://doi.org/10.1029/2004GL021716

Comment on "El Niño suppresses Antarctic warming" by N. Bertler et al.

Peter T. Doran,[1] John C. Priscu,[2] W. Berry Lyons,[3] John E. Walsh,[4] Andrew G. Fountain,[5] Diane M. McKnight,[6] Daryl L. Moorhead,[7] Ross A. Virginia,[8] Diana H. Wall,[9] Gary D. Clow,[10] Christian H. Fritsen,[11] Christopher P. McKay,[12] and Andrew N. Parsons[13]

Received 8 October 2004; revised 1 December 2004; accepted 24 February 2005; published 8 April 2005.

Citation: Doran, P. T., et al. (2005), Comment on ''El Niño suppresses Antarctic warming'' by N. Bertler et al., *Geophys. Res. Lett.*, *32*, L07706, doi:10.1029/2004GL021716.

[1] The new science presented by *Bertler et al.* [2004] is an important addition to the building literature on Antarctic climate trends, particularly as related to ENSO events. However, we would like to address statements made by Bertler et al. that misrepresent the results of *Doran et al.* [2002a] in our study on climate cooling and its effects on the McMurdo Dry Valley (MDV) ecosystem.

[2] In their introduction *Bertler et al.* [2004] state:

> In 1986 the Long-Term Ecological Research (LTER) project established a network of automatic weather stations throughout the MDV. The data show a strong, seasonally dependent cooling (−0.7°Cpd) [*Doran et al.*, 2002a, 2002b] and were used to support the view that the entire continent is cooling [*Doran et al.*, 2002a].

[3] Their statement that MDV data ''were used to support the view that the entire continent is cooling'' is incorrect because: 1) the MDV data were not used in the continental assessment (which is explicitly stated by *Doran et al.* [2002a]), and 2) we never stated that the entire continent cooled. *Doran et al.* [2002a] evaluated two climate datasets. One is a short-term local MDV meteorological dataset from 1986 to 2000. This dataset showed a clear cooling trend, especially in summer, and was central to the main focus of the paper, which dealt with the ecological impact of this cooling on lakes, streams and soils. The other longer-term data set we evaluated, in order to put the local results into context, was from ''manned'' observations collected around the continent between 1966 and 2000. This longer-term continental data set did not include our MDV data because the latter were not of sufficient duration to be included. Our conclusion from the longer-term continental data set was that about 60% of the continent cooled over this period (66% if the Antarctic Peninsula is excluded). Widespread cooling on the Antarctic Continent during extended periods of the last third of the 20th century has been independently documented [*Kwok and Comiso*, 2002; *Thompson and Solomon*, 2002] and modeled [*Gillett and Thompson*, 2003]. A minor error in the Bertler et al. quote above is that the LTER actually started in 1993 and inherited and expanded the existing meteorological network (project information and data are available at our web site: http://huey.colorado.edu).

[4] In the concluding paragraph, *Bertler et al.* [2004] state:

> Clearly, more research is needed to understand the temporal and spatial variability of the ENSO-Antarctic relationship, its feedbacks and temporal robustness and its links with the Antarctic Oscillation and Circumpolar Wave. However, our results show that the ENSO forcing, primarily in the form of El Niño events, is largely responsible for the observed cooling in the western Ross Sea. It is important to note that the temperature change does not reflect a regional cooling, but a change of the atmospheric circulation that results in an apparent regional cooling. Our data do not support a longer-term cooling of the MDV as suggested by *Doran et al.* [2002a].

[5] The final sentence in the concluding paragraph by *Bertler et al.* [2004] is incorrect because *Doran et al.* [2002a] never stated or suggested that there was a longer-term cooling in the MDV. To the contrary, *Doran et al.* [2002a, Figure 2] clearly show that we documented a warming (∼0.15°Cpd) in the dry valley region using the longer-term continental data set (1966 to 2000). The analyses of *Doran et al.* [2002a] and *Bertler et al.* [2004] should agree on this point because the data used to plot our Figure 2 came from the East Anglia HadCRUT data set, which includes the Scott Base record that Bertler et al. also used to draw their conclusions. The rates of warming presented in the two papers are not in exact agreement because we

[1]Department of Earth and Environmental Sciences, University of Illinois at Chicago, Chicago, Illinois, USA.
[2]Land Resources and Environmental Sciences, Montana State University, Bozeman, Montana, USA.
[3]Byrd Polar Research Center, Ohio State University, Columbus, Ohio, USA.
[4]Center for Global Change and Arctic System, University of Alaska Fairbanks, Fairbanks, Alaska, USA.
[5]Department of Geology, Portland State University, Portland, Oregon, USA.
[6]Institute of Arctic and Alpine Research, Boulder, Colorado, USA.
[7]Department of Earth, Ecological and Environmental Sciences, University of Toledo, Toledo, Ohio, USA.
[8]Environmental Studies Program, Dartmouth College, Hanover, New Hampshire, USA.
[9]Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, Colorado, USA.
[10]USGS-Climate Program, Denver Federal Center, Denver, Colorado, USA.
[11]Division of Earth and Ecosystem Sciences, Desert Research Institute, Reno, Nevada, USA.
[12]Space Science Division, NASA Ames Research Center, Moffet Field, California, USA.
[13]Natural Environment Research Council, Swindon, UK.

0094-8276/05/2004GL021716

used slightly different time periods. *Doran et al.* [2002a] also mention the significant lake level rise and ice thinning that occurred in the MDV prior to 1990. Given that we were preparing to relocate permanent field camps uphill due to the rising lake waters in the late 1980s, we are quite aware of the warm period in the valleys before the advent of our instrumental record. In fact, several of the authors of *Doran et al.* [2002a] also co-authored papers documenting the lake level rise and inferred warming prior to 1990 [e.g., *Bomblies et al.*, 2001; *Wharton et al.*, 1992].

References

Bertler, N. A. N., P. J. Barrett, P. A. Mayewski, R. L. Fogt, K. J. Kreutz, and J. Shulmeister (2004), El Niño suppresses Antarctic warming, *Geophys. Res. Lett.*, *31*, L15207, doi:10.1029/2004GL020749.

Bomblies, A., D. M. McKnight, and E. D. Andrews (2001), Retrospective simulation of lake-level rise in Lake Bonney based on recent 21-year record: Indication of recent climate change in the McMurdo Dry Valleys, Antarctica, *J. Paleolimnol.*, *25*, 477–492.

Doran, P. T., et al. (2002a), Antarctic climate cooling and terrestrial ecosystem response, *Nature*, *415*, 517–520.

Doran, P. T., C. P. McKay, G. D. Clow, G. L. Dana, A. G. Fountain, T. Nylen, and W. B. Lyons (2002b), Valley floor climate observations from the McMurdo dry valleys, Antarctica, 1986–2000, *J. Geophys. Res.*, *107*(D24), 4772, doi:10.1029/2001JD002045.

Gillett, N. P., and D. W. J. Thompson (2003), Simulation of recent Southern Hemisphere climate change, *Science*, *302*, 273–275.

Kwok, R., and J. C. Comiso (2002), Southern Ocean climate and sea ice anomalies associated with the Southern Oscillation, *J. Clim.*, *15*, 487–501.

Thompson, D. W. J., and S. Solomon (2002), Interpretation of recent Southern Hemisphere climate change, *Science*, *296*, 895–899.

Wharton, R. A., Jr., C. P. McKay, G. D. Glow, D. T. Andersen, G. M. Simmons Jr., and F. G. Love (1992), Changes in ice cover thickness and lake level of Lake Hoare, Antarctica: Implications for local climate change, *J. Geophys. Res.*, *97*, 3503–3513.

G. D. Clow, USGS-Climate Program, Box 25046, MS 980, Denver Federal Center, Denver, CO 80225, USA.

P. T. Doran, Department of Earth and Environmental Sciences, University of Illinois at Chicago, 845 West Taylor Street, Chicago, IL 60607, USA. (pdoran@uic.edu)

A. G. Fountain, Department of Geology, Portland State University, Portland, OR 97207, USA.

C. H. Fritsen, Division of Earth and Ecosystem Sciences, Desert Research Institute, 2215 Raggio Parkway, Reno, NV 89512, USA.

W. B. Lyons, Byrd Polar Research Center, Ohio State University, 1090 Carmack Rd, Scott Hall, Columbus, OH 43210, USA.

C. P. McKay, Space Science Division, NASA Ames Research Center, Moffet Field, CA 94035, USA.

D. M. McKnight, Institute of Arctic and Alpine Research, 1560 30th Street,Campus Box 450, Boulder, CO 80309, USA.

D. L. Moorhead, Department of Earth, Ecological and Environmental Sciences, 2801 W. Bancroft Street, University of Toledo, Toledo, OH 43606, USA.

A. N. Parsons, Natural Environment Research Council, Polaris House, North Star Avenue, Swindon SN2 1EU, UK.

J. C. Priscu, Land Resources and Environmental Sciences, 334 Leon Johnson Hall, Montana State University, Bozeman, MT 59717, USA.

R. A. Virginia, Environmental Studies Program, Dartmouth College, 6182 Steel Hall, Hanover, NH 03755, USA.

D. H. Wall, Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO 80523, USA.

J. E. Walsh, Center for Global Change and Arctic System Research, University of Alaska Fairbanks, PO Box 757740, Fairbanks, AK 99775-7740, USA.