

2-13-2008

# Alternative Indices for the Warm-Season NAO and Precipitation Variability in West Greenland

Frank A. Aebly

*University of Nebraska - Lincoln*

Qi Hu

*University of Nebraska - Lincoln*

Sherilyn C. Fritz

*University of Nebraska - Lincoln, sfritz2@unl.edu*

Follow this and additional works at: <http://digitalcommons.unl.edu/geosciencefacpub>

 Part of the [Earth Sciences Commons](#)

---

Aebly, Frank A.; Hu, Qi; and Fritz, Sherilyn C., "Alternative Indices for the Warm-Season NAO and Precipitation Variability in West Greenland" (2008). *Papers in the Earth and Atmospheric Sciences*. Paper 1.

<http://digitalcommons.unl.edu/geosciencefacpub/1>

This Article is brought to you for free and open access by the Earth and Atmospheric Sciences, Department of at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Papers in the Earth and Atmospheric Sciences by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Pursuant to the American Meteorological Society Copyright Policy, the full text of this paper may not be posted in this institutional repository. It is, however, available online via the following links:

---

# Alternative Indices for the Warm–Season NAO and Precipitation Variability in West Greenland

Frank A. Aebly, Qi Hu, and Sherilyn C. Fritz

*Department of Geosciences, University of Nebraska–Lincoln, Lincoln, Nebraska*

*Journal of Climate*, Vol. 21, No. 3 (February 2008), pp. 532–541;  
doi 10.1175/2007JCLI1724.1

- [Full-text](#)
- [PDF](#)

The actual URL is: <http://journals.ametsoc.org/doi/pdf/10.1175/2007JCLI1724.1>

## ABSTRACT

Observed precipitation records from Kangerlussuaq, Greenland, and atmospheric variables from the NCEP–NCAR reanalysis were used in a statistical analysis to elucidate controls on the seasonal variation of precipitation and develop indices that may be potentially useful for analyzing precipitation variability in paleoclimate and future climate change investigations. Three distinct patterns of correlation between precipitation and the 500–hPa geopotential height were found to represent three dominant atmospheric patterns that strongly influence precipitation for different times of the year. All three patterns show a relation to the North Atlantic Oscillation signature found in the first empirical orthogonal function of the 500–hPa height field. Spatially dependent indices were developed based on the 500–hPa geopotential field. The correlation coefficients between precipitation at Kangerlussuaq and these indices range from  $-0.38$  for winter to  $0.64$  for the warm season (May–September). The warm–season index herein is the first index reported in the literature that correlates significantly with precipitation during the warm season. Correlations of these indices with precipitation in Oslo, Norway, are high and are of opposite sign to west Greenland indices for the winter and summer months. This indicates that they are good representations of the atmospheric patterns associated with the North Atlantic Oscillation and the west Greenland–northern Europe “seesaw.” High correlations are also found with precipitation measured at Nuuk, Qaqortoq, and Upernavik, Greenland.

(Manuscript received 11 October 2006, in final form 1 June 2007)

Copyright © 2008 American Meteorological Society.