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**Selected Publications**

Wolter, K., M. Hoerling, J.K. Eischeid, G.J. van Oldenborgh, XW Quan, J.E. Walsh, T.N. Chase, and **R.M. Dole**, 2015: How unusual was the cold winter of 2013/14 in the Upper Midwest? *B. Amer. Met. Soc*., **96**, S10-S14, [10.1175/BAMS-D-15-00126.1](http://journals.ametsoc.org/doi/abs/10.1175/BAMS-D-15-00126.1)

Perlwitz, J., M. Hoerling, and **R. Dole**, 2015 (March): Arctic tropospheric warming: Causes and linkages to lower latitudes. *J. Climate*, **28**, 2154–2167, [10.1175/JCLI-D-14-00095.1](http://dx.doi.org/10.1175/JCLI-D-14-00095.1)

Liebmann, B., M. P. Hoerling, C. Funk, Ileana Bladé, **R. M. Dole**, D. Allured, X. Quan, P. Pegion, and J. K. Eischeid, 2014 (December): Understanding recent Eastern Horn of Africa rainfall variability and change. *J. Climate*, **27**, 8630–8645, [10.1175/JCLI-D-13-00714.1](http://dx.doi.org/10.1175/JCLI-D-13-00714.1)

Hoerling, M., K. Wolter, J. Perlwitz, X. Quan, J. Eischeid, H. Wang, S. Schubert, H. Diaz, and **R. Dole**, 2014 (September): [Northeast Colorado extreme rains interpreted in a climate change context](http://www2.ametsoc.org/ams/index.cfm/publications/bulletin-of-the-american-meteorological-society-bams/explaining-extreme-events-of-2013-from-a-climate-perspective/). *Bull. Amer. Meteor. Soc.,* **95**, S15-S18.

**Dole R. M.,** M. P. Hoerling, A. Kumar, J. K. Eischeid, J. Perlwitz, X.-W. Quan, G. N. Kiladis, R. S. Webb, D. Murray, M. Chen, K. Wolter and T. Zhang (March 2014): The Making of an Extreme Event: Putting the Pieces Together. Bull. Amer. Meteor. Soc., **95** (3), 427-440. [10.1175/AMS-D12-00069.1](http://dx.doi.org/10.1175/BAMS-D-12-00069.1)

Vose, R., S. Applequist, M. A. Bourassa, . . ., **R. M. Dole**, et al. (March 2014): Monitoring and Understanding Changes in Extremes: Extratropical Storms, Winds, and Waves. Bull. Amer. Meteor. Soc., **95** (3), 377-386. [10.1175/BAMS-D-12-00162.1](http://dx.doi.org/10.1175/BAMS-D-12-00162.1)

Peterson, T. C., … **R.M. Dole,** and Coauthors, 2013: Monitoring and Understanding Changes in Heat Waves, Cold Waves, Floods, and Droughts in the United States: State of Knowledge. *Bull. Amer.Meteor*. Soc., **94**, 821–834, [10.1175/BAMS-D-12-00066.1](http://dx.doi.org/10.1175/BAMS-D-12-00066.1)

Hoerling M. P., A. Kumar, **R. M. Dole**, J. W. Nielsen-Gammon, J. K. Eischeid, J. Perlwitz, X.-W. Quan, T. Zhang, P. Pegion and M. Chen (May 2013): Anatomy of an Extreme Event. J. Climate, **26** (9), 2811-2832. [10.1175/JCLI-D-12-00270.1](http://dx.doi.org/10.1175/JCLI-D-12-00270.1)

Stott, P. A., M. Allen, N. Christidis, **R. M. Dole**, M. Hoerling, C. Huntingford, P. Pall, J.

Perlwitz, and D. Stone. 2013. Attribution of weather and climate-related events. In: Climate

Science for Serving Society: Research, Modeling and Prediction Priorities, Eds. G. R.

Asrar, J. W. Hurrell, Springer Science+Business Media, Dordrecht 307-337, [10.1007/978-94-007-6692-1\_12](http://dx.doi.org/10.1007/978-94-007-6692-1_12).

Hoerling, Martin P., Jon K. Eischeid, Xiao-Wei Quan, Henry F. Diaz, Robert S. Webb, **Randall**

**M. Dole**, David R. Easterling, 2012: Is a Transition to Semipermanent Drought Conditions

Imminent in the U.S. Great Plains? *J. Climate*, **25**, 8380–8386,[10.1175/JCLI-D-12-00449.1](http://dx.doi.org/10.1175/JCLI-D-12-00449.1)

Galarneau, T., T. Hamill, **R. Dole,** and J. Perlwitz, 2012: A Multi-Scale Analysis of the Extreme

Weather Events over Western Russian and Northern Pakistan During July 2010. *Mon. Wea.*

*Rev*., **140**, 1639-1664, [10.1175/MWR-D-11-00191.1](http://dx.doi.org/10.1175/MWR-D-11-00191.1).

**Dole, R.,** M. Hoerling, J. Perlwitz, J. Eischeid, P. Pegion, T. Zhang, X.-W. Quan, T. Xu, and D.

Murray, 2011: Was there a basis for anticipating the 2010 Russian heat wave? Geophys.

Res. Lett, 38, L06702, [10.1029/2010GL046582](http://dx.doi.org/10.1029/2010GL046582)

Legler, D. and **R.M. Dole**, 2011: Evaluation of reanalyses—developing an Integrated Earth System Analysis (IESA) Capability. EOS Trans. AGU, 92, (20) 172, [10.1029/2011EO200006](http://dx.doi.org/10.1029/2011EO200006)

Liebmann, B, **R. M. Dole**, C. Jones, I. Bladé, and D. Allured, 2010: Influence of choice of time

period on global surface temperature trend estimates, *Bull. Amer. Meteor. Soc.,* **91**, 1485-

1491, [10.1175/2010BAMS3030.1](http://dx.doi.org/10.1175/2010BAMS3030.1)

Brunet, G., M. Shapiro, B. Hoskins, M. Moncrieff, **R. Dole**, G. Kiladis, B. Kirtman, A. Lorenc,

B. Mills, R. Morss, S. Polavarapu, D. Rogers, J. Schaake, and J. Shukla, 2010: Collaboration of the weather and climate communities to advance subseasonal-to-seasonal prediction, *Bull. Amer. Meteor Soc*., **91**, 1397-1406, [10.1175/2010BAMS3013.1](http://dx.doi.org/10.1175/2010BAMS3013.1)

Shapiro, M., J. Shukla, G. Brunet, C, Nobre, M. Béland, **R. Dole**, et al., 2010: An Earth-System

Prediction Initiative for the Twenty-first Century. *Bull. Amer. Meteor. Soc*., **91**, 1377–

1388, [10.1175/2010BAMS2944.1](http://dx.doi.org/10.1175/2010BAMS2944.1)

Trenberth, K.E., **R. Dole**, Y. Xue, K. Onogi, R. Dee, M. Balmaseda, M. Bosilovich, S. Schubert,

W. Large, 2010: *Atmospheric reanalyses: A major resource for ocean product development*

*and modeling*. In proceedings: "OceanObs'09: Sustained Ocean Observations and

Information for Society" Conference (Vol. 2), Venice, Italy, 21-25 September 2009, Hall,

J., Harrison D.E. and Stammer, D., eds., ESA Publication WPP-306.

Solomon, S., **R.** **Dole**, R. Feely, I. Held, W. Higgins, J. Payne, E. Shea, U. Varanasi, and M.

Westley, 2009: A vision for climate services in NOAA. *Fisheries*, **34**, 607-609, [10.1577/1548-8446-34-12](http://dx.doi.org/10.1577/1548-8446-34-12)

**Dole, R.M.,** 2008: Linking Weather and Climate. In Synoptic-Dynamic Meteorology and Weather Analysis and Forecasting: A Tribute to Fred Sanders.*Meteor. Monogr*., **33**, No. 55, 297-348, [10.1175/0065-9401-33.55.297](http://dx.doi.org/10.1175/0065-9401-33.55.297)

Waliser, D., K. Weickmann, **R. Dole**, S. Schubert, O. Alves, C. Jones, M. Newman, H.-L. Pan,

A. Roubicek, S. Saha, C. Smith, H. Van den Dool, F. Vitart, M. Wheeler, and J. Whitaker,

2006: The Experimental MJO Prediction Project. *Bull. Amer. Meteor. Soc*., **87**, 425-431,

[10.1175/BAMS-87-4-425](http://dx.doi.org/10.1175/BAMS-87-4-425)

Pulwarty, R.S., K.L. Jacobs, and **R.M. Dole,** 2005: The hardest working river: Drought and

critical water problems in the Colorado River Basin. In: Drought and Water Crises: Science, Technology, and Management Issues. D.A. Wilhite, ed., Marcel Dekker, Inc. New

York, NY. pp. 249-286.

Hamill, T.M., R.S. Schneider, H.E. Brooks, G.S. Forbes, H.B. Bluestein, M. Steinberg, D.

Melendez, and **R.M. Dole**, 2005: The May 2003 Extended Tornado Outbreak. *Bull. Amer.*

*Meteor. Soc*., **86**, 531-542, [10.1175/BAMS-86-4-531](http://dx.doi.org/10.1175/BAMS-86-4-531)

Hamill, T.M., R. Schneider, H.E. Brooks, G. Forbes, H. Bluestein, M. Steinberg, D. Melendez,

and **R. Dole**, 2005: Supplement to the May 2003 Extended Tornado Outbreak: Daily Maps.

*Bull. Amer. Meteor. Soc*., **86**, ES3-ES16, [10.1175/BAMS-86-4-HamillA](http://dx.doi.org/10.1175/BAMS-86-4-HamillA)

**Dole, R. M.,** 2003: “Predicting climate variations in the American West: What are our

prospects?” Water and Climate in the Western United States. W.M. Lewis Jr., ed.,

University Press of Colorado, Boulder, CO, pp. 9-28.

Chen, P., M.P. Hoerling and **R.M. Dole**, 2001: The origin of the subtropical anticyclones. *J.*

*Atmos. Sci*., **58**, 1827-1835, [10.1175/15200469(2001)058<1827:TOOTSA>2.0.CO;2](http://dx.doi.org/10.1175/15200469%282001%29058)

**Dole, R.M.,** 2000: “Prospects for Drought Forecasts in the United States.” In: Droughts: A

Global Assessment. D. A. Wilhite, ed., Routledge Publishers, London. Volume 1: pp. 83-

99.

Black, R.X., and **R. M. Dole**, 2000: Storm tracks and barotropic deformation in climate models.

*J. Climate*, **13**, 2712-2728, [10.1175/15200442(2000)013<2712:STABDI>2.0.CO;2](http://dx.doi.org/10.1175/1520-0442%282000%29013%3C2712%3ASTABDI%3E2.0.CO;2)

Wolter, K., **R. M. Dole**, and C.A. Smith, 1999: Short-term climate extremes over the continental

United States and ENSO. Part I: Seasonal temperatures. *J. Climate*, **12**, 3255-3272,

[10.1175/1520-0442(1999)012<3255:STCEOT>2.0.CO;2](http://dx.doi.org/10.1175/1520-0442%281999%29012%3C3255%3ASTCEOT%3E2.0.CO;2)

Cai, M., **R.M. Dole**, K.L. Paine, and J.S. Whitaker, 1996: Dynamics of systematic errors in the

NMC Medium Range Forecast Model. *Mon. Wea. Review*, **124**, 265-276, [10.1175/1520-0493(1996)124<0265:DOSEIT>2.0.CO;2](http://dx.doi.org/10.1175/1520-0493%281996%29124%3C0265%3ADOSEIT%3E2.0.CO;2)

**Dole, R.M.,** 1996: “Blocking.” In: Encyclopedia of Climate and Weather. Oxford University

Press, New York, NY, 10016, pp. 93-99.

Lyon, B.F., and **R.M. Dole**, 1995: A diagnostic comparison of the 1980 and 1988 U.S. summer

heat wave-droughts. *J. Climate*, **8**, 1658-1675 [10.1175/1520-0442(1995)008<1658:ADCOTA>2.0.CO;2](http://dx.doi.org/10.1175/1520-0442%281995%29008%3C1658%3AADCOTA%3E2.0.CO;2)

Whitaker, J.S. and **R.M. Dole**, 1995: Organization of storm tracks in zonally varying flows*. J.*

*Atmos. Sci.,* **52**, 1178-1191 [http://dx.doi.org/10.1175/15200469(1995)052<1178:OOSTIZ>2.0.CO;2](http://dx.doi.org/10.1175/15200469%281995%29052%3C1178%3AOOSTIZ%3E2.0.CO;2)

**Dole, R.M.,** J.S. Whitaker, and K.L. Paine, 1994: Mechanisms for storm track variability. Part I:

Diagnostic studies. In: The Life Cycles of Extratropical Cyclones. S. Gronas and M.A.

Shapiro, Eds. Bergen, Norway, Vol. II, ISBN: 8241901437, pp. 12-17.

Whitaker, J.S., **R.M. Dole**, and K.L. Paine, 1994: Mechanisms for storm track variability. Part II:

Model studies. In: The Life Cycles of Extratropical Cyclones. S. Gronas and M. A. Shapiro,

eds., Bergen, Norway, Vol. II, ISBN: 8241901437, pp. 97-101.

Black, R.X., and **R.M. Dole**, 1993: The dynamics of large-scale cyclogenesis over the North

Pacific Ocean. *J. Atmos. Sci.,* **50**, 421-442,

[10.1175/1520-0469(1993)050<0421:TDOLSC>2.0.CO;2](http://dx.doi.org/10.1175/1520-0469%281993%29050%3C0421%3ATDOLSC%3E2.0.CO;2)

Nielsen, J.W., and **R.M. Dole**, 1992: A survey of extratropical cyclone characteristics during

GALE. *Mon. Wea. Rev.,* **120**, 1156-1167, [10.1175/15200493(1992)120<1156:ASOECC>2.0.CO;2](http://dx.doi.org/10.1175/15200493%281992%29120%3C1156%3AASOECC%3E2.0.CO;2)

Engholm, C.D., E.R. Williams and **R.M. Dole**, 1990: Meteorological and electrical conditions

associated with positive cloud-to-ground lightning. *Mon. Wea. Rev*., **118**, 470-487,

[10.1175/1520-0493(1990)118<0470:MAECAW>2.0.CO;2](http://dx.doi.org/10.1175/1520-0493%281990%29118%3C0470%3AMAECAW%3E2.0.CO;2)

**Dole, R.M**., and R.X. Black, 1990: Life cycles of persistent anomalies. Part II: The development

of persistent negative height anomalies over the North Pacific Ocean. *Mon. Wea. Rev*., **118**,

824-846, [http://dx.doi.org/10.1175/1520-0493(1990)118<0824:LCOPAP>2.0.CO;2](http://dx.doi.org/10.1175/1520-0493%281990%29118%3C0824%3ALCOPAP%3E2.0.CO;2).

**Dole, R.M.,** 1989: Life cycles of persistent anomalies. Part I: Evolution of 500-mb height fields.

*Mon. Wea. Rev*., **117**, 177-211, [10.1175/1520-0493(1989)117<0177:LCOPAP>2.0.CO;2](http://dx.doi.org/10.1175/1520-0493%281989%29117%3C0177%3ALCOPAP%3E2.0.CO;2)

**Dole, R.M**., 1987: Persistent large-scale flow anomalies. Part I: Characteristics of developments.

In: The Nature and Prediction of Extratropical Weather Systems. European Centre for Medium Range Weather Forecasts, Reading, England. Volume II. pp. 27-72.

**Dole, R.M**., 1987: Persistent large-scale flow anomalies, Part II: Relationships to variations in

synoptic-scale eddy activity and cyclogenesis. The Nature and Prediction of Extratropical

Weather Systems. European Centre for Medium Range Weather Forecasts, Reading,

England. Volume II, pp. 73-122.

**Dole, R.M.,** 1986: The life cycles of persistent anomalies and blocking over the North Pacific.

*Advances in Geophysics: Anomalous atmospheric flows and blocking*, Academic Press,

Inc., Orlando, 29, 31-69.

**Dole, R.M.,** 1986: Persistent anomalies of the extratropical Northern Hemisphere wintertime

circulation: Structure. Mon. Wea. Rev., 114, 178-207,

[10.1175/1520-0493(1986)114<0178:PAOTEN>2.0.CO;2](http://dx.doi.org/10.1175/1520-0493%281986%29114%3C0178%3APAOTEN%3E2.0.CO;2)

**Dole, R.M**., and N.D. Gordon, 1983: Persistent anomalies of the extratropical Northern

Hemisphere wintertime circulation; geographical distribution and regional persistence

characteristics. *Mon. Wea. Rev*., **111**, 1567-1586,

[10.1175/1520-0493(1983)111<1567:PAOTEN>2.0.CO;2](http://dx.doi.org/10.1175/1520-0493%281983%29111%3C1567%3APAOTEN%3E2.0.CO;2)

**Dole, R.M**., 1983: Persistent anomalies of the extratropical Northern Hemisphere wintertime

circulation. In: Large-Scale Dynamical Processes in the Atmosphere, B.J. Hoskins and R.P.

Pearce, eds., Academic Press, NY, 95-109.

**Dole, R.M.,** and N.D. Gordon, 1983: Asymmetries in persistence between positive and negative

anomalies in persistent anomaly regions. Predictability of Fluid Motions, G. Holloway and

B.J. West, eds., Am. Inst. of Physics, NY, 181-204.

**U.S. and Interagency Research Program Reports**

**Dole**, R.M., M. Hoerling and S. Schubert, 2008: [Reanalysis of Historical Climate Data for](http://data.globalchange.gov/report/ccsp-sap-1_3-2008)

[Key Atmospheric Features: Implications for Attribution of Causes of Observed Change](http://data.globalchange.gov/report/ccsp-sap-1_3-2008).

A Report by the U.S. Climate Change Science Program and the Subcommittee on Global

Change Research. National Oceanic and Atmospheric Administration, National Climatic

Data Center, Asheville, NC. 136 pp.

Schubert, S., **R. Dole**, H. van den Dool, M. Suarez, and D. Waliser, 2002: *Prospects for*

*improving forecasts of weather and short-term climate variability on subseasonal (2-week*

*to 2-month) time scales*. NASA/TM-2002-104606, vol. 23, 171 pp.

**NOAA Science Reports**

*Strengthening NOAA Science*. Findings from the NOAA Science Workshop. April 20-22,

2010. P. Sandifer **and R. Dole**, workshop co-chairs, 61 pp.

*Toward Advancing Understanding and Predictions of Regional Climate Variations and Change*. Findings for the NOAA Science Challenge Workshop, Sep. 20-22, 2011. Prepared for the NOAA Research Council. **R. Dole**, chair. 32 pp.

*Predicting Arctic Weather and Climate and Related Impacts: Status and Requirements for Progress*. Findings from the NOAA Science Challenge Workshop, May 13-15, 2014. Prepared for the NOAA Research Council. **R. Dole**, F. Horsfall, D. Bromwich and P. Clemente-Colon, co-chairs. 34 pp.

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