

Curriculum Vitae
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Richard B. Alley

Evan Pugh University Professor of Geosciences
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Experience:

B.Sc. 1980 (With Honors and Distinction, *Summa cum Laude*), and M.Sc. 1983, The Ohio State University (Geology and Mineralogy)

Ph.D., 1987, University of Wisconsin (Geology, Minor Materials Science)

Assistant Scientist, University of Wisconsin, 1987-1988

Assistant Professor (1988-1992), Associate Professor (1992-1994), Professor (1994-2000) and Evan Pugh University Professor (2000-), Department of Geosciences, Pennsylvania State University.

Selected indicators:

Recipient of Prominent Awards for Teaching, for Research, and for Service

Member, U.S. National Academy of Sciences, and Foreign Member, The Royal Society.

Heinz Award; Tyler Prize; BBVA Frontiers of Science Award in Climate Change, Seligman Crystal of the International Glaciological Society; Wollaston Medal of the Geological Society of London; Arthur L. Day Prize and Lectureship of the US National Academy of Sciences; Revelle Medal and Fellowship in American Geophysical Union, and recipient of their Climate Communication Prize, Horton Award (Hydrology Section), and Emiliani Lecturer (Paleo. Section), Nye Lecturer (Cryospheric Sciences Section), Bjerknes Lecturer (Atmospheric Sciences Section) and Public Lecturer; Louis Agassiz Medal (now Weertman Medal, Cryospheric Section) of the European Geosciences Union; Schneider Award for Science Communication; Public Service Award and Fellowship in the Geological Society of America, and the Easterbrook Award of their Quaternary Geology and Geomorphology Section; American Geological Institute Award For Outstanding Contribution To Public Understanding of the Geosciences; Pennsylvania Geographical Society Distinguished Geographer Award; Renewable Natural Resources Foundation Sustained Achievement Award; Friend of the Planet Award of National Center for Science Education, Fellow in American Association for the Advancement of Science and their Public Engagement with Science Award, and Fellow in American Academy of Arts and Sciences, Honorary Member American Meteorology Society, Doctor of Science *Honoris Causa* University of Chicago, Doctor of Science *Honoris Causa* University of Wisconsin, Doctor of Humane Letters *Honoris Causa* Albion College, Goldthwait Polar Medal, US News and World Reports STEM Hall of Fame, Presidential Scholars Foundation Roosevelt "Rosey" Thompson Award, Phi Beta Kappa Visiting Lecturer, Punxsutawney Weather Discovery Center Hall of Fame.

Evan Pugh University Professorship and Faculty Scholar Medal of the Pennsylvania State University, recipient of the highest University-wide teaching award (the Eisenhower Award) and the College of Earth and Mineral Sciences Wilson Teaching Award, Mitchell Innovative Teaching Award and Faculty Mentoring Award.

D.&L. Packard Fellowship, Presidential Young Investigator Award, and G. Comer Mentorship.

'Capstone' publications include: Author of *Earth: The Operators' Manual*, 2011, Norton, which informed the three-hour PBS TV series for which I was Presenter and Science Editor: *Earth: The Operators' Manual* (2011); *Powering the Planet* (2012); and, *Energy Quest USA* (2012). Also author of *The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future*, Princeton University Press, 2000 (winner of national Phi Beta Kappa Science book award and a 2001 Choice Award winner, released in paperback 2002, translated into Japanese and Spanish, reissued with a new Preface 2014); Alley, R.B. and R.A. Bindshadler, eds., *The West Antarctic Ice Sheet: Behavior and Environment*, American Geophysical Union, Antarctic Research Series v. 77, 2001; and chair, National Research Council Panel on Abrupt Climate Change, which produced *Abrupt Climate Change: Inevitable Surprises*, National Academy Press, 2002. Also *The Fate of Greenland* (P. Conkling, R. Alley, G. Denton and W. Broecker; MIT Press) (2011 American Publishers Awards for Professional and Scholarly Excellence—PROSE Award—in Earth Science, and Phi Beta Kappa Science award). *Planet Ice: A Climate for Change*, photography by James Martin, text by Chouinard, Y., Cassasa, G., Alley, R., Stirling, I., Jans, N., Coburn, B. and Ehrlich, G., 2009, Braided River (Mountaineers Books), Seattle, WA, received the Independent Publisher Book Awards "Most Likely to Save the Planet" Award, 2010, and the Atmospheric Librarians International Choice Award 2009.

Invited presentations/testimony to US government officials in multiple administrations including US Vice President, President's Science Advisor, two Senate and six House Committees, various senators and representatives (and a Senator of France), travel to Greenland as speaker and resource expert with 10% of U.S. Senate, informal briefing of a larger group of senators, and briefings of additional cabinet-level officials.

Inquiries from the press averaging daily; appeared frequently on television (BBC, Nova, etc.), radio (NPR, etc.), print (NYTimes, etc.); arguably one of the most active voices in translation of Earth sciences to the popular press. Major TV appearances are listed at <https://www.imdb.com/name/nm1580868/>

Formal reviews (papers, promotions, etc.) averaging 2/week; well over 1000 in total.

Numerous and high-impact public presentations, over 1200 in total.

Well over 300 refereed publications (and over 60 additional publications including books and popularizations), most first-authored by me or advisees; listed as a "Highly Cited" researcher by ISI's Web of Science (h=81, well over 36,500 citations; h=80 and well over 24,000 citations excluding IPCC reports) (higher numbers on Google Scholar).

Main research contributions (personal, with students and post-docs):

Provided key data and interpretations helping demonstrate that regional to global climate changes larger than any experienced by agricultural or industrial humans have occurred repeatedly, in decades to as little as a single year; helped reveal mechanisms and possibility of recurrence;

Through data analysis and modeling of ice sheets and glaciers, helped understand ice-bed interactions with implications for flow changes affecting sea level with potential for large and rapid rise, and for interpretation of geological records, climatic changes and mountain-belt evolution;

Contributed extensively to the toolbox for measurement of ice-core properties, and accurate and confident conversion to well-dated histories of temperature, accumulation rate, and other paleoclimatic variables.

Field Experience:

Three field seasons in Antarctica (geology 1978, glaciology 1984, 1985); eight in Greenland (glaciology 1985, 1989-1992; glacial geology 2003 and twice in 2005), three in Alaska (glaciology 1995, 2000, 2002), two in Utah (geology 1979, 1981); one in Wyoming (glacial geology, 2008); much work (many months in total) in National Ice Core Laboratory, Denver.

Service:

Extensive ongoing or past service at numerous levels, including international (participant in Nobel-Peace-Prize-winning IPCC process on climate change including lead author of the cryospheric chapter and writing team of the Summary for Policymakers and Technical Summary for Working Group I of the Fourth Assessment, as well as participating in Second and Third Assessments; wrote statement based on IPCC used in final document from UN COP16 Climate Change Conference report from Cancun, Mexico), US Government (advice to officials in NOAA, NSF, EPA, CCSP, State Department, etc.; wrote blurb on Antarctic research used by US President in a speech; advice to US Vice President, President's Science Advisors, and to Senators, etc.), National Research Council (chaired Committee on Abrupt Climate Change, served on Polar Research Board, Committee on Environment and National Security, Revelle Lecturer of Ocean Studies Board, chaired committee on redesign of climate-change museum exhibit, etc.), served or serving various research organizations (national and international, including past service to Board of Arctic Consortium of the US, chair of Ice Core Working Group, steering committee of West Antarctic Ice Sheet project, vice president of International Glaciological Society), and university (member or chair of many committees at departmental, college, and university levels). Presenting more than 50 public lectures per year (87 in peak year).

PUBLICATIONS. (318 refereed contributions published or in press, in journals or books)

1. Articles Published in Refereed Journals. (281 articles published)

1. Alley, R.B., J.F. Bolzan and I.M. Whillans. 1982. Polar firn densification and grain growth. *Annals of Glaciology* **3**, 7-11.
2. Alley, R.B. and I.M. Whillans. 1984. Response of the East Antarctic ice sheet to sea-level rise. *Journal of Geophysical Research* **89C**: 6487-6493.
3. Jezek, K.C., R.B. Alley and R.H. Thomas. 1985. Rheology of glacier ice. *Science* **227**(4692): 1335-1337.
4. Alley, R.B., J.H. Porepezko and C.R. Bentley. 1986. Grain growth in polar ice: I. Theory. *Journal of Glaciology* **32**, 415-424.

5. Alley, R.B., J.H. Porepezko and C.R. Bentley. 1986. Grain growth in polar ice: II. Application. *Journal of Glaciology* **32**, 425-433.
6. Alley, R.B., D.D. Blankenship, C.R. Bentley and S.T. Rooney. 1986. Deformation of till beneath ice stream B, West Antarctica. *Nature* **322**, 57-59.
7. Blankenship, D.D., C.R. Bentley, S.T. Rooney and R.B. Alley. 1986. Seismic measurements reveal a saturated, porous layer beneath an active Antarctic ice stream. *Nature* **322**, 54-57. <https://doi.org/10.1038/322054a0>
8. Alley, R.B. Three-dimensional coordination number from two-dimensional measurements: a new method. *Journal of Glaciology* **32**, 391-396.
9. Alley, R.B., D.D. Blankenship, C.R. Bentley and S.T. Rooney. 1987. Till beneath ice stream B. 3. Till deformation: evidence and implications. *Journal of Geophysical Research* **92B**: 8921-8930.
10. Alley, R.B., D.D. Blankenship, S.T. Rooney and C.R. Bentley. 1987. Till beneath ice stream B. 4. A coupled ice-till flow model. *Journal of Geophysical Research* **92B**: 8931-8940.
11. Blankenship, D.D., C.R. Bentley, S.T. Rooney and R.B. Alley. 1987. Till beneath ice stream B. 1. Properties derived from seismic travel times. *Journal of Geophysical Research* **92B**: 8903-8912. <https://doi.org/10.1029/JB092iB09p08903>
12. Rooney, S.T., D.D. Blankenship, R.B. Alley and C.R. Bentley. 1987. Till beneath ice stream B. 2. Structure and continuity. *Journal of Geophysical Research* **92B**, 8913-8920. <https://doi.org/10.1029/JB092iB09p08913>
13. Alley, R.B. 1987. Firn densification by grain-boundary sliding: a first model. *Journal de Physique* **48**(C1), 249-254.
14. Alley, R.B. 1987. Geometry of polar firn for remote sensing. *Annals of Glaciology* **9**, 1-4.
15. Bentley, C.R., S. Shabtaie, D.D. Blankenship, S.T. Rooney, D.G. Schultz, S. Anandakrishnan and R.B. Alley. 1987. Remote sensing of the Ross ice streams and adjacent Ross Ice Shelf, Antarctica. *Annals of Glaciology* **9**, 20-29.
16. Alley, R.B. 1988. Concerning the deposition and diagenesis of strata in polar firn. *Journal of Glaciology* **34**, 283-290.
17. Alley, R.B. 1988. Fabrics in polar ice sheets: development and prediction. *Science* **240**, 493-495.
18. Alley, R.B. and C.R. Bentley. 1988. Ice-core analysis on the Siple Coast of West Antarctica. *Annals of Glaciology* **11**, 1-7.
19. Alley, R.B. and B.R. Koci. 1988. Ice-core analysis at site A, Greenland: preliminary results. *Annals of Glaciology* **10**, 1-4.
20. Alley, R.B., J.H. Porepezko and C.R. Bentley. 1988. Long-term climate changes from crystal growth (Comment). *Nature* **332**, 592-593.

21. Jezek, K.C. and R.B. Alley. 1988. Effect of stratigraphy on radar altimetry data over ice sheets. *Annals of Glaciology* **11**, 60-63.
22. Alley, R.B. 1989. Water-pressure coupling of sliding and bed deformation: I. Water system. *Journal of Glaciology* **35**, 108-118.
23. Alley, R.B. 1989. Water-pressure coupling of sliding and bed deformation: II. Velocity-depth profile. *Journal of Glaciology* **35**, 119-129.
24. Alley, R.B., D.D. Blankenship, S.T. Rooney and C.R. Bentley. 1989. Sedimentation beneath ice shelves: the view from ice stream B. *Marine Geology* **85**, 101-120.
25. Alley, R.B., D.D. Blankenship, S.T. Rooney and C.R. Bentley. 1989. Water-pressure coupling of sliding and bed deformation: III. Application to ice stream B. *Journal of Glaciology* **35**, 130-139.
26. Alley, R.B. 1990. Multiple steady states in ice-water-till systems. *Annals of Glaciology* **14**, 1-5.
27. Alley, R.B. and B.R. Koci. 1990. Recent warming in central Greenland? *Annals of Glaciology* **14**, 6-8.
28. Alley, R.B., E.S. Saltzman, K.M. Cuffey and J.J. Fitzpatrick. 1990. Summertime origin of depth hoar in the Greenland ice sheet, GISP2 Summit site. *Geophysical Research Letters* **17**, 2393-2396.
29. Grootes, P.M., M. Stuiver, T.L. Saling, P.A. Mayewski, M.J. Spencer, R.B. Alley, and D. Janssen. 1990. Oxygen isotope records of the last millenium from the Ross Sea area, Antarctica. *Annals of Glaciology* **14**, 94-98.
30. Alley, R.B. 1991. Deforming-bed origin for southern Laurentide till sheets? *Journal of Glaciology* **37**(125), 67-76.
31. Alley, R.B. and I.M. Whillans. 1991. Changes in the West Antarctic ice sheet. *Science* **254**, 959-963.
32. Alley, R.B. 1991. Sedimentary processes may cause fluctuations of tidewater glaciers. *Annals of Glaciology* **15**, 119-124.
33. Alley, R.B. 1992. Flow-law hypotheses for ice-sheet modeling. *Journal of Glaciology* **38**, 245-256.
34. Cuffey, K.M., R.B. Alley, P.M. Grootes, and S. Anandkrishnan. 1992. Toward using borehole temperatures to calibrate an isotopic paleothermometer in central Greenland. *Global and Planetary Change* **6**(2-4), 265-268.
35. Alley, R.B. 1992. How can low-pressure channels and deforming tills coexist subglacially? *Journal of Glaciology* **38**, 200-207.
36. Taylor, K., R. Alley, J. Fiacco, P. Grootes, G. Lamorey, P. Mayewski and M.J. Spencer. 1992. Ice-core dating and chemistry by direct-current electrical conductivity. *Journal of Glaciology* **38**(130), 325-332.
37. Taylor, K.C., G.W. Lamorey, G.A. Doyle, R.B. Alley, P.M. Grootes, P.A. Mayewski, J.W.C. White and L.K. Barlow. 1993. The 'flickering switch' of late Pleistocene climate change. *Nature* **361**, 432-436.

38. Alley, R.B. 1993. In search of ice-stream sticky spots. *Journal of Glaciology* **39**(133), 447-454.
39. Alley, R.B., D.A. Meese, C.A. Shuman, A.J. Gow, K.C. Taylor, P.M. Grootes, J.W.C. White, M. Ram, E.D. Waddington, P.A. Mayewski and G.A. Zielinski. 1993. Abrupt increase in snow accumulation at the end of the Younger Dryas event. *Nature* **362**, 527-529.
40. Anandakrishnan, S., R.B. Alley and E.D. Waddington. 1993. Sensitivity of ice-divide position in Greenland to climate change. *Geophysical Research Letters* **21**(6), 441-444.
41. Mayewski, P.A., L.D. Meeker, S. Whitlow, M.S. Twickler, M.C. Morrison, R.B. Alley, P. Bloomfield and K. Taylor. 1993. The atmosphere during the Younger Dryas. *Science* **261**, 195-197.
42. Shuman, C.A. and R.B. Alley. 1993. Spatial and temporal characterization of hoar formation in central Greenland using SSM/I brightness temperatures. *Geophysical Research Letters* **20**(23), 2643-2646.
43. Shuman, C.A., R.B. Alley and S. Anandakrishnan. 1993. Characterization of a hoar-development episode using SSM/I brightness temperatures in the vicinity of the GISP2 site, Greenland. *Annals of Glaciology* **17**, 183-188.
44. Taylor, K.C., C.U. Hammer, R.B. Alley, H.B. Clausen, D. Dahl-Jensen, A.J. Gow, N.S. Gundestrup, J. Kipfstuhl, J.C. Moore and E.D. Waddington. 1993. Electrical conductivity measurements from the GISP2 and GRIP Greenland ice cores. *Nature* **366**(6455), 549-552.
45. Alley, R.B. and D.R. MacAyeal. 1994. Ice-rafted debris associated with binge/purge oscillations of the Laurentide ice sheet. *Paleoceanography* **9**(4), 503-511.
46. Alley, R.B., S. Anandakrishnan, C.R. Bentley and N. Lord. 1994. A water-piracy hypothesis for the stagnation of ice stream C. *Annals of Glaciology* **20**, 187-194.
47. Anandakrishnan, S. and R.B. Alley. 1994. Ice stream C sticky spots detected by microearthquake monitoring. *Annals of Glaciology* **20**, 183-186.
48. Anandakrishnan, S., J.J. Fitzpatrick, R.B. Alley, A.J. Gow and D.A. Meese. 1994. Shear-wave detection of asymmetric c-axis fabrics in the GISP2 ice core. *Journal of Glaciology* **40**(136), 491-496.
49. Cuffey, K.M., R.B. Alley, P.M. Grootes, J.F. Bolzan and S. Anandakrishnan. 1994. Calibration of the $d^{18}O$ isotopic paleothermometer for central Greenland, using borehole temperatures. *Journal of Glaciology* **40**(135), 341-349.
50. Mayewski, P.A., L.D. Meeker, S. Whitlow, M.S. Twickler, M.C. Morrison, P. Bloomfield, G.C. Bond, R.B. Alley, A.J. Gow, P.M. Grootes, D.A. Meese, M. Ram, K.C. Taylor and W. Wumkes. 1994. Changes in atmospheric circulation and ocean ice cover over the North Atlantic during the last 41,000 years. *Science* **263**(5154), 1747-1751.
51. Zielinski, G.A., P.A. Mayewski, L.D. Meeker, S. Whitlow, M.S. Twickler, M. Morrison, D.A. Meese, A.J. Gow and R.B. Alley. 1994. Record of volcanism since 7000 B.C. from the GISP2 Greenland ice core and implications for the volcano-climate system. *Science* **264**, 948-950.

52. Alley, R.B., A.J. Gow and D.A. Meese. 1995. Mapping c-axis fabrics to study physical processes in ice. *Journal of Glaciology* **41**(137), 197-203.
53. Alley, R.B. and S. Anandakrishnan. 1995. Variations in melt-layer frequency in the GISP2 ice core: implications for Holocene summer temperatures in central Greenland. *Annals of Glaciology* **21**, 64-70.
54. Alley, R.B., R.C. Finkel, K. Nishiizumi, S. Anandakrishnan, C.A. Shuman, G.R. Mershon, G.A. Zielinski and P.A. Mayewski. 1995. Changes in continental and sea-salt atmospheric loadings in central Greenland during the most recent deglaciation. *Journal of Glaciology* **41**(139), 503-514.
55. Alley, R.B., A.J. Gow, S.J. Johnsen, J. Kipfstuhl, D.A. Meese and Th. Thorsteinsson. 1995. Comparison of deep ice cores. *Nature* **373**(6513), 393-394.
56. Bolzan, J.F., E.D. Waddington, R.B. Alley and D.A. Meese. 1995. Constraints on Holocene ice-thickness changes in central Greenland from the GISP2 ice-core data. *Annals of Glaciology* **21**, 33-39.
57. Cuffey, K.M., G.D. Clow, R.B. Alley, M. Stuiver, E.D. Waddington and R.W. Saltus. 1995. Large Arctic temperature change at the glacial-Holocene transition. *Science* **270**, 455-458.
58. Cutler, N.N., C.F. Raymond, E.D. Waddington, D.A. Meese and R.B. Alley. 1995. The effect of ice-sheet thickness changes on the accumulation history inferred from GISP2 layer thicknesses. *Annals of Glaciology* **21**, 26-32.
59. Fischer, M.P., R.B. Alley and T. Engelder. 1995. Fracture toughness of ice and firn determined from the modified ring test. *Journal of Glaciology* **41**(138), 383-394.
60. Kapsner, W.R., R.B. Alley, C.A. Shuman, S. Anandakrishnan and P.M. Grootes. 1995. Dominant control of atmospheric circulation on snow accumulation in central Greenland. *Nature* **373**, 52-54.
61. Shuman, C.A., R.B. Alley, S. Anandakrishnan and C.R. Stearns. 1995. An empirical technique for estimating near-surface air temperatures in central Greenland from SSM/I brightness temperatures. *Remote Sensing of the Environment* **51**, 245-252.
62. Shuman, C.A., R.B. Alley, S. Anandakrishnan, J.W.C. White, P.M. Grootes and C.R. Stearns. 1995. Temperature and accumulation at the Greenland Summit: comparison of high-resolution isotope profiles and satellite passive microwave brightness temperature trends. *Journal of Geophysical Research* **100**(D5), 9165-9177.
63. Alley, R.B. 1996. Towards a hydrological model for computerized ice-sheet simulations. *Hydrologic Processes* **10**, 649-660. [https://doi.org/10.1002/\(SICI\)1099-1085\(199604\)10:4<649::AID-HYP397>3.0.CO;2-1](https://doi.org/10.1002/(SICI)1099-1085(199604)10:4<649::AID-HYP397>3.0.CO;2-1) . Reprinted in Sharp, M., K.S. Richards and M. Tranter, eds., *Glacier Hydrology and Hydrochemistry*, Wiley and Sons, NY, 1998, p. 329-340.
64. Alley, R.B. and G.W. Woods. 1996. Impurity influence on normal grain growth in the GISP2 ice core. *Journal of Glaciology* **42**(141), 255-260.
65. Clark, P.U., R.B. Alley, L.D. Keigwin, J.M. Licciardi, S.J. Johnsen and H. Wang. 1996. Origin of the first global meltwater pulse following the last glacial maximum. *Paleoceanography* **11**(5), 563-577.

66. Cuffey, K.M. and R.B. Alley. 1996. Erosion by deforming subglacial sediments: Is it significant? (Toward Till Continuity). *Annals of Glaciology* **22**, 126-133. <https://doi.org/10.3189/1996AoG22-1-17-24>
67. Fischer, M.P., D. Elsworth, R.B. Alley and T. Engelder. 1996. Finite element analysis of the modified ring test for determining mode I fracture toughness. *International Journal of Rock Mechanics* **33**(1), 1-15.
68. Shuman, C.A., M.A. Fahnestock, R.A. Bindshadler, R.B. Alley and C.R. Stearns. 1996. Composite temperature record from the Greenland summit, 1987-1994: Synthesis of multiple automatic weather station records and SSM/I brightness temperatures. *Journal of Climate* **9**(6), 1421-1428.
69. Strasser, J.C., D.E. Lawson, G.J. Larson, E.B. Evenson and R.B. Alley. 1996. Preliminary results of tritium analyses in basal ice, Matanuska Glacier, Alaska, U.S.A.: evidence for subglacial ice accretion. *Annals of Glaciology* **22**, 126-133.
70. Alley, R.B., K.M. Cuffey, E.B. Evenson, J.C. Strasser, D.E. Lawson and G.J. Larson. 1997. How Glaciers Entrain and Transport Basal Sediment: Physical Constraints. *Quaternary Science Reviews* **16**, 1017-1038. [https://doi.org/10.1016/S0277-3791\(97\)00034-6](https://doi.org/10.1016/S0277-3791(97)00034-6)
71. Alley, R.B., P.A. Mayewski, T. Sowers, M. Stuiver, K.C. Taylor and P.U. Clark. 1997. Holocene climatic instability: A prominent, widespread event 8200 years ago. *Geology* **25**(6), 483-486.
72. Alley, R.B., A.J. Gow, D.A. Meese, J.J. Fitzpatrick, E.D. Waddington and J.F. Bolzan. 1997. Grain-scale processes, folding, and stratigraphic disturbance in the GISP2 ice core. *Journal of Geophysical Research* **102**(C12), 26,819-26,830.
73. Alley, R.B., C.A. Shuman, D.A. Meese, A.J. Gow, K.C. Taylor, K.M. Cuffey, J.J. Fitzpatrick, P.M. Grootes, G.A. Zielinski, M. Ram, G. Spinelli and B. Elder. 1997. Visual-stratigraphic dating of the GISP2 ice core: basis, reproducibility, and application. *Journal of Geophysical Research* **102**(C12), 26,367-26,381.
74. Anandakrishnan, S. and R.B. Alley. 1997. Stagnation of ice stream C, West Antarctica by water piracy. *Geophysical Research Letters* **24**(3), 265-268.
75. Anandakrishnan, S. and R.B. Alley. 1997. Tidal forcing of basal seismicity of ice stream C, West Antarctica, observed far inland. *Journal of Geophysical Research* **102**(B7), 15183-15196.
76. Dahl-Jensen, D.J. T. Thorsteinsson, R. Alley and H. Shoji. 1997. Flow properties of the ice from the Greenland Ice Core Project ice core: The reason for folds? *Journal of Geophysical Research* **102**(C12), 26,831-26,840.
77. Fawcett, P.J., A.M. Agustsdottir, R.B. Alley and C.A. Shuman. 1997. The Younger Dryas termination and North Atlantic deepwater formation: insights from climate model simulations and Greenland ice core data. *Paleoceanography* **12**(1), 23-38.
78. Gow, A.J., D.A. Meese, R.B. Alley, J.J. Fitzpatrick, S. Anandakrishnan, G.A. Woods and B.C. Elder. 1997. Physical and structural properties of the Greenland Ice Sheet Project 2 ice core: A review. *Journal of Geophysical Research* **102**(C12), 26,569-26,575.

79. Jouzel, J., R.B. Alley, K.M. Cuffey, W. Dansgaard, P. Grootes, G. Hoffmann, S.J. Johnsen, R.D. Koster, D. Peel, C.A. Shuman, M. Stievenard, M. Stuiver and J. White. 1997. Validity of the temperature reconstruction from water isotopes in ice cores. *Journal of Geophysical Research* **102**(C12), 26,471-26,487.
80. Meese, D.A., A.J. Gow, R.B. Alley, G.A. Zielinski, P.M. Grootes, M. Ram, K.C. Taylor, P.A. Mayewski and J.F. Bolzan. 1997. The Greenland Ice Sheet Project 2 depth-age scale: methods and results. *Journal of Geophysical Research* **102**(C12), 26,411-26,423.
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82. Taylor, K.C., R.B. Alley, G.W. Lamorey and P. Mayewski. 1997. Electrical measurements on the Greenland Ice Sheet Project 2 core. *Journal of Geophysical Research* **102**(C12), 26,511-26,517.
83. Taylor, K.C., P.A. Mayewski, R.B. Alley, E.J. Brook, A.J. Gow, P.M. Grootes, D.A. Meese, E.S. Saltzman, J.P. Severinghaus, M.S. Twickler, J.W.C. White, S. Whitlow, and G.A. Zielinski. 1997. The Holocene/Younger Dryas transition recorded at Summit, Greenland. *Science* **278**, 825-827.
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