Curriculum Vitae

Richard B. Alley

Evan Pugh University Professor of Geosciences
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Selected indicators:

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

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

Heinz Award; Tyler Prize; BBVA Frontiers of Science Award, Seligman Crystal of the International Glaciological Society; Arthur L. Day Prize and Lectureship US National Academy of Sciences; Revelle Medal and Fellowship in American Geophysical Union, and recipient of their Horton Award (Hydrology Section), and Emiliani Lecturer (Paleo. Section), Nye Lecturer (Cryospheric Sciences Section) and Bjerknes Lecturer (Atmospheric Sciences Section); Louis Agassiz 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, Doctor of Science *Honoris Causa* University of Chicago, Doctor of Science *Honoris Causa* University of Wisconsin, Doctor of Humane Letters *Honoris Causa* Albion College, US News and World Reports STEM 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, Powering the Planet, and Energy Quest USA* (2011, 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); Alley, R.B. and R.A. Bindschadler, 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 five House Committees, various senators and representatives (and a Senator of France), travel to Greenland as a speaker and 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.

Formal reviews (papers, promotions, etc.) averaging 2/week; well over 1000 since 1994.

Over 250 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=66, and well over 15,000 indexed citations, well over 17,000 in a Cited Reference Search).

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, 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.

Experience:

Ph.D., 1987, University of Wisconsin (Geology, Minor Materials Science); M.Sc. 1983, B.Sc. 1989 (With Honors, With Distinction, *Summa cum Laude*), Ohio State University (Geology and Mineralogy). Assistant Scientist, University of Wisconsin, 1987-1988; Assistant Professor (1988-1992), Associate Professor (1992-1994), Professor (1994-2000) and Evan Pugh Professor (2000-), Department of Geosciences, Pennsylvania State University.

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 Advisor, 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 ~50 public lectures per year (87 in peak year).

Teaching and Advising:

Average >3 courses/year while at Penn State.

Typically 6 out of 7 on Student Rating of Teaching Effectiveness; University-wide Eisenhower Teaching Award, and both Wilson and Mitchell Teaching Awards of my college, co-lead professor for CAUSE class trip to US southwestern national parks; efforts highlighted in University President's State of the University message in 2006 and used in many other ways including for new-student and new-faculty orientations; film on the trip won a regional Emmy Award.

Numerous senior theses; one senior thesis student won at National Undergraduate Research Conference, two published their theses, one won the Dean Steidle Scholar Award and a Fulbright Fellowship.

Former advisees at various levels now on faculties at University of California Berkeley, University of Washington, Woods Hole Oceanographic Institution, University of Maryland, Temple University, University of New Mexico, Lake Superior State University, Northern Illinois University, New Mexico Tech, University of Utah, Tulane University, and Pennsylvania State University (at both University Park and Dubois campuses); others working for industry and government.

Wrote targeted textbooks for the introductory courses I teach; now provided to students free of additional charge (may have "given away" more than $1 million in textbooks); chosen as a "Textbook Hero" by Penn State Undergraduate Student Government.

PUBLICATIONS. (260 refereed contributions published or in press, in journals or books)

1. Articles Published in Refereed Journals. Authors supervised by Alley are <u>underlined</u>; S. Anandakrishnan also was a post-doctoral fellow with Alley but quickly advanced to professorship at Penn State, and is not underlined. (230 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* **89**C: 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. Perepezko and C.R. Bentley. 1986. Grain growth in polar ice: I. Theory. *Journal of Glaciology* **32**, 415-424.

5. Alley, R.B., J.H. Perepezko 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.

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* **92**B: 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* **92**B: 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* **92**B: 8903-8912.

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* **92**B, 8913-8920.

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. Perepezko 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. Jenssen. 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. Anandakrishnan. 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. 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.

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. Bindschadler, 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.

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. Validitiy 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.

81. Shuman, C.A., R.B. Alley, M.A. Fahnestock, P.J. Fawcett, R.A. Bindschadler, J.W.C. White, P.M. Grootes, S. Anandakrishnan and C.R. Stearns. 1997. Detection and monitoring of stratigraphic markers and temperature trends at the Greenland Ice Sheet Project 2 using passive-microwave remote-sensing data. *Journal of Geophysical Research* **102**(C12), 26,411-26,423.

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84. Alley, R.B., D.E. Lawson, E.B.E. Evenson, J.C. Strasser and G.J. Larson. 1998. Glaciohydraulic supercooling: A freeze-on mechanism to create stratified, debris-rich basal ice. 2. Theory. *Journal of Glaciology* **44**(148), 563-569.

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10. Alley, R.B., D.D. Blankenship and S.T. Rooney. 1990. Sedimentary history of the Ross Embayment: a unified hypothesis from a glaciological perspective. *U.S.G.S. Open File Report 90-309*, 13-23.

11. Alley, R.B. 1990. Ice sheets and climate. *Earth and Mineral Sciences (Pennsylvania State University)* **58**(3), 41-45.

12. Alley, R.B. 1990. West Antarctic collapse--how likely? *Episodes* **13**, 231-238.

13. Blankenship, D.D., R.B. Alley and S.T. Rooney. 1990. Glaciological influences on sedimentological processes in the Ross Embayment. *U.S.G.S. Open File Report 90-309*, 79-89.

14. Alley, R.B. 1991. Formation of ice-stream rafts by recrystallization. *Antarctic Journal of the U.S.* **27**(5): 66-67.

15. Alley, R.B. Ice cores and SeaRISE--What we do (and don't) know. 1991. In West Antarctic Ice Sheet Initiative, Volume 2, Discipline Reviews, p. 111-130. Edited by R.A. Bindschadler. *NASA Conference Publication 3115, vol. 2*, Washington, DC.

16. Alley, R.B. 1991. Is greenhouse effect in ice of the beholder? (Letter to the Editor.) *Physics Today* **44**, 13-15.

17. Alley, R.B. 1992. Sticky spots under ice streams. *Antarctic Journal of the U.S.* **28(**5), 50-51.

18. Alley, R.B. 1992. West Antarctic ice coring: a high-resolution study of climate change. *Eos (Transactions of the American Geophysical Union)* **73**, 115-116.

19. Alley, R.B., G. Bond, J. Chappellaz, C. Clapperton, A. Del Genio, L. Keigwin, and D. Peteet. 1993. Global Younger Dryas? *Eos (Transactions of the American Geophysical Union)* **74**(50), 587-589.

20. Alley, R.B. and D.R. MacAyeal. 1993. West Antarctic ice sheet collapse: chimera or clear danger? *Antarctic Journal of the U.S.* **28**(5), 59-60.

21. Alley, R.B. 1994. Progress in ice-stream basal modeling. *Antarctic Journal of the U.S.* **29**(5): 61-62 (1994).

22. Mayewski, P.A., M. Wumkes, J. Klinck, M.S. Twickler, J.S. Putscher, K.C. Taylor, A.J. Gow, E.D. Waddington, R.B. Alley, J.E. Dibb, P.M. Grootes, D.A. Meese, M. Ram, M. Whalen and A.T. Wilson. 1994. Record drilling depth struck in Greenland. *Eos (Transactions of the American Geophysical Union)* **75**(10), p. 113, 119, 124.

23. Alley, R., P. Mayewski, D. Peel and B. Stauffer. 1996. Twin ice cores from Greenland reveal history of climate change, more. *Eos (Transactions of the American Geophysical Union)* **77**(22), 209-210.

24. Alley, R.B., A. Agustsdottir, S. Anandakrishnan, T. Creyts, K. Cuffey, P. Fawcett, M. Fischer, G. Jablunovsky, W. Kapsner, C. Shuman, M. Spencer, G. Spinelli, and G. Woods. 1995. Physical properties of the GISP2 ice core: research from The Pennsylvania State University. *Arctic Research of the U.S.* **9**, 20-22 (Fall-Winter).

25. Waddington, E.D., D. Morse, R.B. Alley, S. Anandakrishnan, J. Bolzan, G. Clow, K. Cuffey, J. Cunningham, D. Dahl-Jensen, J. Firestone, N. Gundestrup, S. Hodge, C.S. Hvidberg, R. Jacobel, N. Nereson, C. Raymond and K. Taylor. 1995. The role of glacier geophysics in the GISP2 ice core program. *Arctic Research of the U.S.* **9**, 10-19 (Fall-Winter).

26. Alley, R.B., S. Anandakrishnan and K.M. Cuffey. 1996. Subglacial sediment transport and ice-stream behavior. *Antarctic Journal of the U.S.* **31**(5), 81-82.

27. Contributing Author to Chapter 7, Changes in Sea-Level, of Houghton, J.T., et. al., eds. Climate Change 1995, The Science of Climate Change (Published for The Intergovernmental Panel on Climate Change by Cambridge University Press), p. 359-405 (1996).

28. Alley, R.B. 1996. Greenland Ice Sheet, in Schneider, S.H., ed., Encyclopedia of Climate and Weather, Oxford University Press.

29. Alley, R.B., M.K. Spencer and D.E. Voigt. 1997. Visible examination of Siple Dome, West Antarctica shallow cores. *Antarctic Journal of the U.S.* **32**(5), 44-45.

30. Alley, R.B. 1997. Antarctica and sea-level change. *Antarctic Journal of the U.S.*, **32**(2), October, http://www.nsf.gov/cgi-bin/getpub?nsf9824.

31. Alley, R.B. 1997. Acceptance of Horton Award. *Eos* **78**(42), 463-464.

32. Alley, R.B., P.J. Bartlein, P.U. Clark, S.W. Hostetler and A.C. Mix. 1997. Unknowns about climatic variability render treaty targets premature; discussion and reply. *Eos, Transactions, American Geophysical Union* **79**(15), p. 188. For reference to original see Singer, S.F., *Eos, Trans. AGU*, vol. 78, p. 584, 1997.

33. Alley, R.B. 1997. Water, sediment and tidewater glaciers: simplistic review and weakly constrained speculations, in Van der Veen, C.J., ed., *Calving Glaciers, Byrd Polar Research Center Report No. 15*, 51-55.

34. Anandakrishnan, S. and R.B. Alley. 1997. Tidal forcing of basal seismicity of ice stream C, West Antarctica, observed far inland, in Van der Veen, C.J., ed., *Calving Glaciers, Byrd Polar Research Center Report No. 15*, 57-59.

35. Alley, R.B. and M.L. Bender. 1998. Greenland ice cores: Frozen in time. *Scientific American* **278**(2), 80-85.

36. Alley, R.B. 1998. Icing the North Atlantic (News and Views). *Nature* **392**, 335-336.

37. Bindschadler, R.A., R.B. Alley, J. Anderson, S. Shipp, H. Borns, J. Fastook, S. Jacobs, C.F. Raymond and C.A. Shuman. 1998. What is happening to the West Antarctic Ice Sheet? *Eos (Transactions of the American Geophysical Union)* **79**(22), 257, 264-265.

38. Alley, R.B., J. Lynch-Stieglitz and J.P. Severinghaus. 1999. Global Climate Change. *Proceedings of the National Academy of Sciences* **96**, 9987-9988.

39. Alley, R.B. 2000. Ice-core evidence of abrupt climate changes. *Proceedings of the National Academy of Sciences* **97**(4), 1331-1334.

40. Evenson, E.B., D.E. Lawson, G.H. Larson and R.B. Alley. 2000. Glaciohydraulic supercooling, basal freeze-on, stratified basal ice and "deformable till beds": Matanuska Glacier, Alaska. *GSA Today*, **10**(8), 20-21.

41. Alley, R.B. 2000. Warming to a climate of change. *The Times Higher Education Supplement*, Oct. 6, p. 20-21.

42. Alley, R.B. 2001. The key to the past? Concepts. *Nature* **409**, 289.

43. Contributing Author to Chapters 2 and 7, Climate Change 2001: The Scientific Basis, Cambridge University Press and http://www.ipcc.ch/

44. Evenson, E.B., D. Lawson, G. Larson and R.B. Alley, 2001. Matanuska Glacier adds ice and debris at its base. *Witness the Arctic*, Winter 2000/2001, **8**(2), 13.

45. Alley, R.B. 2002. On thickening ice? Perspective. *Science* **295**, 451-452.

46. Alley, R.B. 2003. Comment on 'when earth's freezer door is left ajar', *Eos Transactions of the American Geophysical Union* **84**(33), 315, 2003ES000374.

47. Larson,.G.J., E.B. Evenson, D.E. Lawson, S.L. Ensminger, G. Baker and R.B. Alley. 2003. Glacial Geology of Upper Cook Inlet, Matanuska Glacier and Denali Highway. In Don J. Easterbrook (ed.) *Quaternary Geology of the United States*, pp. 245-264. Desert Research Institute, Reno, Nevada, USA.

48. Alley, R.B. 2004. Implications of abrupt climate change. *Transactions of the American Clinical and Climatological Association* **104**, 305-317.

49. Severinghaus, J.P., J. Jouzel, N. Caillon, T. Stocker, C. Huber, M. Leuenberger, R.B. Alley, J. Chappellaz, J.-M. Barnola and E.J. Brook. 2004. Comment on "Greenland-Antarctic phase relations and millennial time-scale climate fluctuations in the Greenland ice-cores", C. Wunsch. *Quaternary Science Reviews* **23**, 2053-2054.

50. Alley, R.B. 2004. Abrupt Climate Change. *Scientific American* **291**(5), 62-69.

51. Alley, R.B. 2004. Abrupt Climate Changes: Oceans, Ice and Us. *Oceanography* **17**(4), 194-206 (2004).

52. Alley, R.B. 2004. Implications of abrupt climate change. *Transactions of the American Clinical and Climatological Association* 104, 305-317.

53. Schrag, D.P. and R.B. Alley. 2004. Ancient lessons for our future climate. (Perspective). *Science* **306**(5697), 821-822.

54. Alley, R.B., J.T. Andrews, D.C. Barber and P.U. Clark. 2005. Comment on "Catastrophic ice shelf breakup as the source of Heinrich event icebergs" by C. L. Hulbe et al. *Paleoceanography* **20**(1), PA1009 10.1029/2004PA001086.

55. Overpeck, J.T., B.L. Otto-Bliesner, G.H. Miller, R.B. Alley, D.R. Muhs and S.J. Marshall. 2007. Ice sheets and sea level--Response. *Science* **313**(5790), 1044-1045.

56. Alley, R.B. 2007. Geochemistry: "C" ing Arctic Climate with Black Ice (Perspective). *Science* **317**(5843), 1333-1334.

57. Solomon, S., R. Alley, J. Gregory, P. Lemke and M. Manning. 2008. A closer look at the IPCC Report. *Science* **319**(5862) 409-410, doi:10.1126/science.319.5862.409c.

58. Alley, R.B., M. Fahnestock and I. Joughin. 2008. Climate Change: Understanding Glacier Flow in Changing Times. *Science* **322**, 1061-1062.

59. Severinghaus, J.P. and R.B. Alley. 2008. New data on abrupt climate changes, Science eletters, http://www.sciencemag.org/cgi/eletters/321/5889/680,2008.

60. Evenson, E.B., P.A. Burkhart, J.C. Gosse, G.S. Baker, D. Jackofsky, A. Meglioli, I. Dalziel, S. Kraus, R.B. Alley and C. Berti. 2009. Enigmatic boulder trains, supraglacial rock avalanches, and the origin of "Darwin's Boulders," Tierra del Fuego. *GSA Today* **19**(12), 4-10, doi: 10.1130/GSATG72A.1.

61. Vacco, D.A., R.B. Alley and D. Pollard. 2010. Reply to Shulmeister et al. comment on "Glacial advance and stagnation caused by rock avalanches. *Earth and Planetary Science Letters* **298**(3-4), 450-450.

62. Alley, R.B. 2011. Review of Cuffey, K.M. and W.S.B. Paterson, The Physics of Glaciers, *Journal of Glaciology* **57**(202), 383-384.

63. Alley, R.B. 2011. Earth: The Operators' Manual. *Scientist* **25**(4), 74-74.

64. Alley, R.B. and I. Joughin. 2012. Modeling ice-sheet flow. *Science* **336**, 551-552.

65. Alley, R.B. 2013. Watchable wildlife and demand-driven general education. *Journal of General Education* **62**(1), 37-42.

66. Haines-Stiles, G., R.B. Alley and E. Akuginow. In press. Reaching out beyond the usual suspects and traditional media: Re-branding climate change as a problem with a feasible solution. In J.L. Drake et al. (eds.), New Trends in Earth-Science Outreach and Engagement, *Advances in Natural and Technological Hazards Research 38*, DOI 10.1007/978-3-319-01821-8_2, Springer International Publishing Switzerland 2014, p. 21-45.

In-House Publications. (7)

Alley, R.B. 1980. Densification and recrystallization of firn at Dome C, East Antarctica. *Report No. 77*, Institute of Polar Studies, The Ohio State University, Columbus.

Alley, R.B. 1984. A non-steady ice-sheet model incorporating longitudinal stresses. *Report No. 84*, Institute of Polar Studies, The Ohio State University, Columbus.

Jezek, K.C. and R.B. Alley. 1984. Calculating borehole geometry from standard measurements of borehole inclinometry. *Special Report 84-15*, U.S. Army Cold Regions Research and Engineering Laboratory.

Members of the Siple Coast Project Steering Committee (R.B. Alley, C.R. Bentley, R.A. Bindschadler, D.D. Blankenship, N. Humphrey and I.M. Whillans, major authors). 1988. *Science Plan for the Siple Coast Project*. Byrd Polar Research Center, The Ohio State University, Columbus.

Members of the Ice Core Working Group (P.M. Grootes, Chair; R.B. Alley, C. Davidson, R.G. Fairbanks, S. Hodge, P. Mayewski, E. Saltzman, L. Thompson members). 1989. *U.S. Global Ice Core Research Program: West Antarctica and Beyond.*

Alley, R.B., ed. 1992. *Science plan for WAISCORES Deep Ice Coring in West Antarctica*. U.S. Ice Core Working Group.

Bindschadler, R.A., ed. 1993. First Annual West Antarctic Ice Sheet (WAIS) Science Workshop, *NASA Conf. Publication 3222*, Rapporteur for all sessions R.B. Alley.

Research Reports to Sponsor.

Alley, R.B. and D.W. Kirkland. 1982. Origin and migration of natural gas in the Sacramento Basin, CA. **Mobil Field Research Proprietary Memo**.

COMMUNITY SERVICE/COMMITTEES

Chair, Committee of Visitors, National Science Foundation Office of Polar Programs, 1993. Member, National Science Foundation Division of Polar Programs Advisory Committee, 1992-1994.

Member, West Antarctic Ice Sheet Initiative Steering Committee, 1992-2010.

Member, West Antarctic Ice Sheet WAIS-2000 Working Group, 1992-1995.

Member, West Antarctic Ice Sheet Ice Cores (WAISCORES) Steering Committee, 1994-2010. Member, Global Younger Dryas committee of Past Global Changes of International Geosphere-Biosphere Program, 1993. Member, Geology editorial board, 1993-2001; again 2003-2005. Member of Society Council, International Glaciological Society, 1993-1996, and again 2003-2005.

West Antarctic Ice Sheet Cores Initiative, representative to Past Global Changes of the International Geosphere/Biosphere Program, 1993-98.

Intergovernmental Panel on Climate Change: contributing author to one chapter, and reviews of three chapters at several levels of review, 1994-95. Participant in writing meeting, 1995. Extensive review, 2000. A Lead Author of one chapter and contributing author to second, and lead author of Summary for Policymakers and Technical Summary, 2004-2006.

NSF Review Panel of National Ice Core Laboratory, 1993.

Member, NSF Review Panel for Antarctic Glaciology, 1988-1990.

Member, NSF Review Panel for Arctic Glaciology, 1989-1990.

Member, NSF Review Panel for Greenland Ice Sheet Project 2, 1990.

Member, NSF Review Panel for Geoscience-Math Interdisciplinary Studies, 1991.

Member, NASA Working Group on Radar Altimetry over Ice Sheets, 1988.

Member, Polar Research Board of National Academy of Sciences, 1997-2002.

Member, Greenland Ice Sheet Project 2 Executive Committee, 1996-2001.

Member, Ice Core Working Group Executive Committee, and Sample Allocation Committee, National Ice Core Laboratory, 1996-1997.

Member, National Ice Core Laboratory Sample Allocation Committee, 1998-2006.

Member, Quaternary Science Reviews editorial board, 1997-2006.

Member, Arctic Consortium of the US Arctic Logistics Working Group, 1997.

Member, Antarctic External Review Panel (the "Augustine Panel"), 1996-1997.

Member, ARCUS (Arctic Research Consortium of the US) Board of Directors, 1997-1999.

Member, National Science Foundation Earth System History Steering Committee, 1998-2001.

Member, American Geophysical Union, Review Panel for journal Paleoceanography, 1997-98.

Member, organizing committee, American Geophysical Union Chapman Conference on Millennial-Scale Climate Change, 1998.

Member, steering committee, Processes of Last Glacial Maximum Climate, of IMAGES (International Marine Global Change Study, a marine component of IGBP/PAGES), 1997-2001.

Member, SCICOM of IMAGES, 2002-2003.

Co-Chair, Project Planning Workshop, Abrupt Climate Change: What can the Academy Contribute; Board on Atmospheric Science and Climate, Ocean Studies Board and Polar Research Board, Fri, Jan 22, 1999, NRC/NAS/NAE Georgetown Campus, Washington, DC

Invited session chair, National Academy of Science Frontiers of Science meeting, Nov. 19-21, 1998, Irvine, CA. Selected as best presentation, to be presented again at American Association for the Advancement of Science meeting in April, 1999.

Member, International Commission on Snow and Ice Working Group on Physics of Ice-Core Records, 1998-99.

Member, Paleoceanography and Paleoclimatology Committee of AGU, 1998-2005.

Member, US PAGES/CLIVAR working group 1999-2003.

Member, Board of Directors, Climate System History and Dynamics (Canada), 1999-2001.

Chair, National Research Council ad hoc Committee on Abrupt Climate Change Panel, 2000-2002.

Member, Ice Core Working Group, 1988-1991, 2000-2005. (Alternate 1997-2000.) Chair, Ice Core Working Group, 1991.

Member, Scientific Working Group on Physical Properties for the GISP2 core (advisory to NSF), 1988-89.

Member, Sea-Level Response to Ice Sheet Evolution (SeaRISE) Steering Committee (funded by NSF), 1990.

Member, Siple Coast Project Steering Committee (advisory to NSF), 1988-90.

Member, Scientific Advisory Committee, Institute of Arctic and Alpine Research (University of Colorado), 2001.

Member, NOAA Abrupt Climate Change Panel, 1999-2004.

Program Committee, Earth System Processes meeting of Geological Society of America, Edinburgh, Scotland, 2001.

Assistant Scientific Editor, Annals of Glaciology v. 35.

Member, Ad hoc Advisoty Committee of the International Commission on Snow and Ice (ICSI), 2004

Member, Advisory Panel, NOVA:Leading Edge by WGBH, Boston, 2002-05

Advisory panel, NSF-funded Earth and Sky radio, 2002-12.

Member of Expert Content Group, Climate Change Exhibit, Koshland Science Museum, National Academy of Sciences, 2003-2004. 2003

Member, organizing committee, International Participation in Ice Core Sciences (IPICS) Workshop and committee member, 2003-2005.

Member, Ice Coring and Drilling Services (contractor of NSF) Science Advisory Board, 2001-2003.

Member, Steering Committee, Comer Global-Change Fellows and follow-on committees, 2003-2014.

Member, and Impacts Group member, Earth Institute, Columbia University, 2004-2006.

Member, NSF GEO Planning Committee, 2006-2008.

Member, Antarctic Integrative and System Sciences (AISS) Committee and writing team, 2007.

Member, CCSP Arctic Paleoclimates Report team, 2006-2008.

Member, USGS panel to evaluate National Ice Core Lab, 2008.

Member, National Research Council Committee on Environment and National Security, 2009-2012.

Member, MEDEA, 2009-2014.

Member, National Research Council on Abrupt Climate Change, 2012-2014.

Member, AAAS Committee on Climate Change, 2013-2014.

--PUBLIC LECTURES (785)

Presentations at Technical Meetings (if more than one presentation, number indicated before date) (209)

Third International Symposium on Antarctic Glaciology, Columbus (1981)
Ohio Academy of Sciences, Wooster (1981)
Symposium on Ice and Climate Modelling, Evanston, IL (1983)
Ohio Academy of Sciences, Columbus (1983)
Snow Symposium IV, US Army CRREL, Hanover, NH (1984)
Seventh Symposium on the Physics and Chemistry of Ice, Grenoble (2; 1986)
Second Symposium on Remote Sensing in Glaciology, Cambridge, UK (1986)
American Quaternary Association, Champaign, IL (1986)
Symposium on Ice-Core Analysis, Bern (1987)
International Quaternary Association, Ottawa (1987)
Symposium on the Physical Basis of Ice Sheet Modelling, Vancouver (1987)
Symposium on Facies Models & Ice Dyn., Margin Mid-Continent Ice Sheet, Columbus, OH (1988)
Symposium on Ice Dynamics, Hobart (2; 1988)
American Geophysical Union (Fall, 1988)
The Global Water Cycle, University Park (1988)
American Geophysical Union (Spring, 1988)
Symposium on Ice and Climate, Seattle, WA (2; 1989)
Northeast Regional Meeting of the Geological Society of America, Syracuse (2; 1990)
Symposium on Ice-Ocean Mechanics and Dynamics, Hanover, NH (1990)
American Geophysical Union (2; 1990).
Second Forum for Continental Scientific Drilling, San Francisco, CA (1991).
American Geophysical Union (2; 1991)
Fifth International Symposium on Antarctic Glaciology, Cambridge, UK (1993)
American Geophysical Union (3; 1992)
Midwest Glaciologists (1992)
Lamont-Doherty Earth Observatory (2; 1993)
Goddard Institute for Space Studies (1993)
Midwest Glaciologists (1993)
West Antarctic Ice Sheet Workshop (1992)
Fifth International Symposium Antarctic Glaciology (1993)
American Geophysical Union (3; 1993)
American Physical Society (1994)
Midwest Glaciologists (1994)
European Ice Sheet Modeling Initiative Bremerhaven (1994)

Role of Cryosphere in Global Change Meet (1994)
American Meteorological Society (1995)
American Geophysical Union (2; spring 1995)
West Antarctic Ice Sheet meeting (1995)
Sea Level Rise Workshop Miami (1995)
Abrupt Climate Change Workshop LDEO (1995)
Paleoclimates Arctic Lakes and Estuaries Workshop (1996)
Arctic System Science All-Hands Meeting Snowbird Utah (2; 1996)
American Geophysical Union Spring (2; 1996)
Geological Society of America (1996)
West Antarctic Ice Sheet Workshop (1996)
Greenland Ice Sheet Project Workshop Napa Valley CA (1996)
American Geophysical Union (1996)
NSF-NOAA Holocene Workshop LDEO (1997)
Tidewater Glacier Workshop Ohio (1997)
West Antarctic Ice Sheet Meeting (1997)
American Geophysical Union Spring Meet (1997)
American Geophysical Union Fall Meet (3; 1997)
Past Global Changes Open Science Meeting London (1998)
Termination-II Workshop Lamont Doherty Earth Observatory (1998)
Chapman Conf. American Geophysical Union Millennial Climate Change Snowbird Utah (1999)
Chapman Conference West Antarctic Stability Maine (1999)
Deformation of Glacial Materials London (1999)
West Antarctic Ice Sheet Meeting (1999)
West Antarctic Ice Cores Meeting (1999)
NOAA Abrupt Climate Change Panel LDEO (1999)
Geological Society of America (2 and session co-convenor, 1999)
American Geophysical Union (1999)
Geological Soc. America First Field Forum, Matanuska Glacier, AK (present., coorganize; 2000)
Midwest Glaciologists Meeting (2000)
EPILOG ice-age meeting (2000)
West Antarctic Ice Sheet Meeting (2000)
American Geophysical Union (spring, 2000)
West Antarctic Ice Cores Meet (2001)
Gordon Conference on Chemical Oceanography, NH (2001)
West Antarctic Ice Sheet Meeting (2001)
Mineralogical Society of America Short Course on Stable Isotopes (2001)
American Geophysical Union (session chair and presenter) (2; 2001)
Heinrich Event Workshop, Lamont-Doherty Earth Observatory (2001)
NOAA Abrupt Climate Change Field Conference New Zealand (2; 2002)
Easterbrook Distinguished Geoscientist Award Presentation, Geological Society of America (2002)
Cesare Emiliani Lecture, American Geophysical Union (2002)
American Geophysical Union (2002)
Siple Dome, Antarctic Principal Investigators Meeting (2002)
West Antarctic Ice Sheet Meeting (2002)
Gordon Conference on Atmospheric Chemistry, Big Sky, Montana (2003)

West Antarctic Ice Sheet meeting (2003)
NOAA Abrupt Climate Change Panel Meeting (2003)
Royal Society (UK) Discussion Meeting on Abrupt Climate Change, London (2003)
NOAA CORC-ARCHES Sea Level Miniconference, Lamont-Doherty Earth Observatory (2003)
Binghamton Geomorphology Symposium (2003)
American Geophysical Union (2; 2003)
Gary Comer Abrupt Climate Change Panel (2004)
Siple Dome Deep Ice Core PIs Meeting, Reno, NV (3; 2004)
NOAA Abrupt Climate Change Panel (2004)
West Antarctic Ice Sheet Meeting (2004)
Geological Society of America (2004)
American Geophysical Union (2; 2004)
Nye Lecture at American Geophysical Union (2004)
NOAA CORC-ARCHES Flickers Miniconference, Lamont-Doherty Earth Observatory (2005)
NASA Sea-Level Workshop (2005)
Gary Comer Abrupt Climate Change Panel (2005)
West Antarctic Ice Sheet Meeting (2005)
Gary Comer Fellowship/Mentorship Meeting (2005)
North Central Section, Geological Society of America (Keynote; 2005)
Snowmass (Colorado) Workshop on Abrupt and Catastrophic Climate Change (2006)
International Symposium on Cryospheric Indicators of Global Climate Change (3; 2006)
Abrupt Climate Change Panel (2006)
Third International Fire Ecology and Management Congress, San Diego (Keynote; 2006)
Glaciology Symposium for Garry K.C. Clarke (2006)
Lamont-Doherty Earth Observatory (2006)
Midwest Glaciological Meeting (2006)
Geological Society of America (2006)
European Geosciences Union (2006)
Ice-sheet-modeling workshop (2007)
West Antarctic Ice Sheet Meeting (2007)
American Geophysical Union (3; 2007)
West Antarctic Ice Sheet Cores Divide meeting (2007)
Abelson Advancing Science Seminar AAAS (2007)
Gary Comer Abrupt Climate Change Conference (2007)
Abrupt Climate Change Conference (2007)
Pennsylvania Geographical Society (2007)
NOAA/GFDL ice-sheet-modeling workshop (2007)
West Antarctic Links to Sea-Level Estimation Workshop (WALSE) (2007)
West Antarctic Ice Sheet Cores Divide meeting (2008)
West Antarctic Ice Sheet Meeting (2008)
American Quaternary Association Meeting (2008)
CReSIS panel (2008)
Abrupt Climate Change, Columbia (2008)
Abrupt Climate Change, Madison (2008)
AAAS (2009)
West Antarctic Ice Sheet Cores Divide meeting (2009)

PAGES Open Science Meeting (2009)
AGU Chapman Conference on Abrupt Climate Change (2009)
Abrupt Climate Change, Wisconsin (2; 2009)
American Geophysical Union (3; 2009)
American Geological Institute (2009)
WHOI Sea-Level Rise (2009)
American Geophysical Union (3; 2010)
University Turbine Systems Research Workshop Penn State (2010)
SACNAS IPY Symposium (2010)
West Antarctic Ice Sheet Meeting (2010)
Abrupt Climate Change, Wisconsin (2; 2010)
NSF Sea-Level Rise Workshop (2010)
Chevron Research (2010)
American Geophysical Union (4; 2011)
Abrupt Climate Change, Wisconsin (2; 2011)
West Antarctic Ice Sheet Divide Core, San Diego (2011)
Scientific Committee on Antarctic Research Open Science Meeting, Portland (4, 2012)
American Geophysical Union (3; 2012)
West Antarctic Ice Sheet Cores Divide Meeting (2012)
Abrupt Climate Change, Wisconsin (2, 2012)
Dealing with Climate Change, Arizona State (2, 2013)
American Association for the Advancement of Science (2, 2013)
AGU Chapman Conference on Communicating Climate Science (4, 2013)
International Symposium on Radioglaciology, Lawrence, Kansas Keynote (2013)
7th International Workshop on Ice Drilling Technology, Madison, Wisconsin (special evening lecture) 2013
WAIS Divide Meeting (2013)
West Antarctic Ice Sheet Meeting (2013)
Abrupt Climate Change Meeting, Wisconsin (2, 2013)
Glaciers and volcanoes FESD San Francisco (2013)
AGU Fall Meeting and associated events, including special hour-long lecture (5, 2013)

Presentations to Government Officials and Advisory Boards (97)

US Vice President A. Gore (1994)
Director of Office of Polar Programs of National Science Foundation (1993)
US Global Change Research Program Seminar Dirksen Senate Office Building (1998)
Discussion with agency reps., bipolar view of abrupt climate change, Washington DC (1998)
Smithsonian Institution Polar Connections (1998)
Director of National Science Foundation Office of Polar Programs (2000)
American Association for the Advancement of Science (2001)
National Academy of Sciences Capitol Hill staff briefing (2002)
Senate Committee (Hon. J. McCain, chair) (2003)
Revelle Lecturer, National Academy of Sciences Ocean Studies Board (2004)
American Association Advancement Science Climate Change Science Seminar (2004)
Environmental and Energy Study Institute Capitol Hill brief., Abrupt Climate Change (2004)

Meet the Scientist, Koshland Science Museum, National Academy of Sciences (2004)
American Association for the Advancement of Science (2005)
Second Forum for Continental Scientific Drilling, San Francisco, CA (1991)
Committee on Glaciology of Polar Research Board (1992)
Executive Committee of Past Global Changes (1993)
JASON (1994)
NASA EOS (1994)
NSF Polar Programs Lithosphere Working Group (1994)
American Association for Advancement of Science (1995)
Paleoclimates Arctic Lakes and Estuaries Workshop (1996)
Arctic System Science All-Hands Meeting Snowbird Utah (2; 1996)
International Trans-Antarctic Science Expedition Meeting Baltimore (1996)
Deep Ice Center Workshop UCa Berkeley (1997)
Arctic Forum Washington DC (1998)
Polar Research Board (1999)
NSF Site Visit Panel Penn State (1999)
NSF Site Visit Panel UCalifornia Berkeley (1999)
National Academy of Sciences, Washington, DC (1999)
US Nat. Acad. Science Commission on Geosciences, Environment & Resources, Ottawa Canada (1999)
Polar Research Board (2001)
FASTDRILL workshop keynote speaker (2002)
Future of US Ice Coring Symposium (2002)
CLIVAR SSC Meeting Boulder CO (2002)
International Program in Ice Core Sciences (2004)
NOAA Climate and Global Change Working Group Meeting (2004)
NSF GEO Advisory Committee Meeting (2004)
NSF Site Visit Team, University of Kansas (2004)
SEARCH Planning Meeting (NSF) (2005)
Climate Change Science Project Arctic Scoping Meeting, Denver (2005)
Pennsylvania House of Representatives Environment Committee (2005)
American Meteorological Society Capitol Hill presentation (2006)
Two presentations, discussions with White House, other officials (2006)
French Senator (2006)
Pennsylvania State House Environmental Resources and Energy Committee (2006)
Pennsylvania Consortium for Interdisciplinary Environmental Policy (2006)
National Air and Space Museum (2006)
NSF/GEO Distinguished Lecturer (2006)
Natl. Res. Coun. study Surface Temperature Reconstructions for the Past 1,000-2,000 Years (2006)
US House of Representatives Science Committee (2007)
US Senate Science Committee (2007)
US House of Representatives Energy Committee (2007)
Personal briefing, US Senator (2007) Personal briefing, US Representative (2007)
Personal briefing, US Senator (a different one) (2007)
US House of Representatives Committee on Science and Technology (2007)
US Senate staff members (pre-Greenland briefing) (2007)
Ten US Senators (in Greenland) (2; 2007)

AISS Planning Workshop (NSF) (2007)
USGS Geology Science Strategy Team (telecon talk) (2007)
National Academy Joint meeting of boards on Atm. Sci. & Clim., and Clim. Res. Comm. (2007)
CCSP, OSTP (2008)
Informal briefing to twelve US Senators (2008)
New Zealand Ambassador to US (2008)
NSF/NAS IPY (2008)
US Government OSTP and CCSP (2008)
Candidate for Congress (now member) (2008)
State of Pennsylvania Forestry (2009)
MEDEA (2009)
Arctic Research Commission (2009)
National Academy of Sciences International Polar Year (2009)
Subcommittee on Energy and Environment, US House Committee on Science and Technology (2010)
U.S. House of Representatives Select Committee on Energy Independenceand Global Warming (2010)
Capitol Hill briefing sponsored by 13 learned societies (2010)
MEDEA (2011)
National Academy IPY Meeting (2011)
National Science Foundation (2011)
Governing Board of National Research Council, Woods Hole (2011)
Smithsonian Institution (2; 2012)
Tri-agency (NSF, NASA, NOAA) Climate Change Education Principal Investigators Meeting (2012)
Pennsylvania House Democratic Policy Committee, Independence Seaport Museum, Philadelphia (2012)
National Research Council Abrupt Climate Change (2012)
National Research Council MEDEA (2013)
Earth to Sky workshop for National Park Service and Fish and Wildlife Service (2013)
Sandia National Laboratory (2013)
Science, Technology and Policy Forum, National Academy of Sciences discussion forum with US Senators (2013)
National Academy of Sciences Google Hangout on Climate Change (2013)
National Academy of Sciences Briefing for Sponsors (2013)
National Academy of Sciences Briefing, President's Science Advisor and OSTP staff (2013)
National Academy of Sciences Briefing for US House of Representatives Science Committee staff (2013)
National Academy of Sciences Report Webex (2013)
Pennsylvania House Democratic Policy Committee (2013)

Presentations to University-Wide and Departmental Colloquia (multiple talks indicated by #; many of these were named lectures, those I recall are indicated) (201)

Syracuse University Geo (1990)
University of Illinois Geo (1990)
US Coast Guard Academy, New London, CT (1990)
Lehigh University Geo (1991)
UMinnesota Geo (2; 1992)
Climate Center Visitor, Lamont-Doherty Earth Observatory (2; 1993)
MIT Earth (1994)

Harvard Geo (1994)
NASA/Goddard (1994)
Rice Geo (1995)
Ohio University Physics and Geo (1995)
Cornell Geo (1995)
University of Wisconsin Geo Weeks Lecturer (2, 1995)
University of Texas at Austin Institute for Geophysics (1996)
University of Colorado Geo (1996)
University of Colorado INSTAAR (1996)
USGS Denver (1996)
Ohio State University First Goldthwait Polar Lecturer (1996)
University of Washington Quaternary Research Center (3; 1997)
Watkins Visiting Professor, Wichita State University (4; 1997)
University of Michigan Geo (1997)
Stout Lecturer University of Nebraska (1997)
University of New Mexico Geo (1997)
Princeton University Geo (2; 1997)
Distinguished Visiting Lecturer Old Dominion University (3; 1998)
Glenn G. Bartle Memorial Lecturer Binghamton University Geo (3; 1998)
Ohio University Physics (1998)
Distinguished Scientists Lecture Series Trinity University, San Antonio, TX (2; 1999)
Woods Hole Oceanographic Institution (1999)
University of Wisconsin Sustainable Development Symposium (1999)
National Center for Atmospheric Research (2000)
University of South Carolina Geo (2; 2000)
Crosby Lecturer, Massachusetts Institute of Technology (3; 2000)
Woods Hole Oceanographic Institution (2000)
Global Warming symposium, James A. Baker III Institute, Rice University (2000)
Yale Geo (2000)
Fermilab (2001)
Lamont-Doherty Earth Observatory (2001)
Kibbe Science Symposium, Bowdoin College (2001)
Rice University (2; 2000)
Mindlin Lecturer, University of Washington (2; 2001)
Scripps Institution of Oceanography (2001)
Lehigh University, Earth (2001)
Penn State Hazleton (2002)
Oregon State University Geo (2002)
Lewis and Clark College Geo (2002)
Sigma Xi and Geo, Indiana University of Pennsylvania (2; 2002)
Princeton University STEP (2002)
Woods Hole Oceanographic Institution Abrupt Change Forum (2002)
Jones Seminar, Dartmouth College (2002)
Woods Hole Oceanographic Institution (2; 2002)
Southampton (UK) Oceanography Centre (2003)
Distinguished Science Lecture, Susquehanna University (2003)

T. Mylan Stout Lecture, University of Nebraska (2003)
Math/Science Edu. Init. & College Arts&Sci. Special Lect., Univ. of Nebraska (2003)
St. Olaf College Science Symposium (2003)
Bucknell College Environment (2003)
CIRES Distinguished Lecture Series, University of Colorado (2003)
John Hopkins University Geo (2003)
University of Michigan Geo (2003)
Chesley Lecturer, Carleton College (3; 2004)
Convocation Speaker, Berea College (2004)
Lafayette College (2; 2004)
Potter Lecturer, Dickinson College (2; 2005)
21st Century Challenges for Earth Sciences, Univ of Wisconsin Geo (2005)
Bates College (2; 2005)
Colby College (2; 2005)
Old Dominion University NewPAGE Lecturer (2; 2005)
Climate Center Distinguished Lecturer, Purdue University (2; 2005)
Harrington Symposium on Abrupt Climate Change, University of Texas (2005)
Flint Lecturer, Yale University (3; 2005)
President's Distinguished Lecture Series, University of Vermont (3; 2005)
Presidential Lecture Series, Rice University (3; 2005)
Lamont Doherty Earth Observatory (2006)
Brossman Science Lectureship, Millersville University (2; 2006)
Starr Lecturer, MIT (2; 2006)
Alfred-Wegener Institut, Germany (2006)
University of Bremen, Germay (2006)
CReSIS webcast (2006)
Illinois State Geological Survey (2; 2006)
Woods Hole Oceanographic Institution (2; 2006)
Washington and Lee University (2; 2006)
College of Wooster (2; 2007)
Penn State Lehigh Valley (2007)
World Universities Network webcast (2007)
Denver Museum of Science and Nature (2; 2007)
Princeton University (2; 2007)
Adrian College (2007)
University of Hawaii Manoa (3; 2007)
PennFuture/Gwynedd Mercy College (2007)
Bucknell University (2007)
Carnegie Institution of Washington (2007)
University of Delaware (2; 2008)
Victoria University of Wellington, New Zealand (2; 2008)
Lehigh University (2008)
Old Dominion University (2008)
Ursinus College (2008)
Elizabethtown College (2008)
Augsburg College (2009)

St. Olaf College (2; 2009)
Rutgers (2009)
WHOI (2009)
Brown (2009)
Otterbein College (5; 2009)
Gamow Lecture Colorado (2010)
Byrd Polar Research Center, Ohio State (2010)
York College (2011)
Bard College (2011)
University of Minnesota (2011)
University of St. Thomas (2011)
Hamilton College (2011)
Colgate University (2011)
Portland State University (2011)
Oregon State University George Moore Lecture (2011)
Oregon State University Condon Lecure (2011)
Lafayette College (3; 2012)
MIT Knight Fellows (2012)
Northwestern (2012)
University of Chicago and Northwestern Krumbein Lecture (2012)
University of Washington (4; 2012)
Syracuse University Milton First-Year Lecture (2; 2012)
University of Colorado (2012)
University of Delaware (2012)
Stanford University School of Earth Sciences Distinguished Lecture Series (2012)
West Virginia University (2, 2013)
Washington and Lee SSA5 (2, 2013)
Bloomsburg University (2013)
Wittenberg University IBM Endowed Lecture (3, 2013)
University of New Mexico Caswell Silver Lecture (2, 2013)
University of Wisconsin (2, 2013)
Juniata College (2013)
University of Laverne (2013)
Maryville University (2013)
University of Utah Frontiers of Science (4, 2013)

Additional Public Lectures (Industry, Non-Profit Organizations, etc.) (multiple talks indicated as #) (113)

Antarctican Society, Washington, DC (1991)
Worthington (Oh) High School (2; 1992)
Mobil Oil Dallas (1995)
Pennsylvania Science Teachers Association (1996)
Council for Advancement of Science Writing (1999)
Lucent Technologies/Bell Labs (2000)
Institute for the Northwest, Portland, OR (2002)
Electric Power Research Institute (2002)

First World Universities Network Global Research Seminar (2002)
Swiss Summer School on Glaciers, Riederalp (2002)
American Clinical and Climatological Association (2003)
Gary Comer Fellowship Meeting (2004)
Mississippi Academy and Junior Academy of Sciences (4; 2004)
Climate Change Event, Whitaker Science Center, Harrisburg (2004)
Taming the Climate Symposium, Columbia University (2004)
Camden Technology Conference (2004)
Audubon Society, Bucknell University (2004)
Electric Power Research Institute (2006)
EuroScience Open Forum, Germany (2006)
Native Plants in the Landscape (2006)
Geological Society of America Public Outreach (2006)
University of Vermont, honors class telephone presentation (2006)
Abrupt Climate Change Conference/Gary Comer Memorial (2007)
Polarpalooza, Washington, DC (5; 2008)
Geological Society of America Public Service Award Acceptance (2008)
CReSIS Science-Teacher Workshop Kansas (2008)
CReSIS Science-Teacher Workshop Ohio State (2008)
AMQUA Science-Teacher Workshop (2008)
Geo/Material Science-Teacher Workshops (2008)
Polarpalooza, American Museum of Natural History, and New York Times (5; 2009)
Teacher workshops Earth History and Renewable Energy (2009)
Pocono Mountain East High School (2009)
Perry Middle School, Worthington, Ohio (2; 2009)
FINESSE Science-Teacher Workshop (2010)
ASTE Keynote (2010)
CReSIS Science-Teacher Workshop (2; 2010)
CReSIS summer students Kansas (2; 2010)
SACNAS Science-Teacher Workshop (2010)
Climate Change Education Workshop NSF/NOAA/NASA (2010)
The IPCC and its Findings: Perspectives from Leading Climate Scientists teleconference (2010)
Broecker CV (2010)
SACNAS Keynote (2010)
Fort Worth Sustainable Energy Roundtable, Fort Worth Museum of Science and History (2010)
CReSIS Advisory Board (2011)
Jiangnan University (China) (2011)
Climate Literacy and Energy Awareness Network (2011)
Association of Polar Early Career Scientists virtual poster session (2011)
CReSIS REU students (2011)
WAIS Divide CPL (2011)
Koshland Science Museum (2011)
Sustainable Energy Roundtable Fort Worth (2011)
Oregon Museum of Science and Industry (2) (2011)
Oregon Public Radio Live Online Discussion (2011)
Science Museum of Minnesota (2; 2011)

Fleet Science Museum (San Diego) (2; 2011)
San Diego Science Day (2011)
Heinz Award Comments on Acceptance (2011)
Schneider Award Comments on Acceptance (2011)
Climate Literacy Network (2012)
Climate Literacy Network Teachers' Workshop (2012)
North Carolina Museum of Science and Nature (4; 2012)
ETOM at AAAS (2012)
Pennsylvania Association of Environmental Educators (3; 2012)
Fort Worth Museum of Science and History (5; 2012)
Texas Christian University (including some state lawmakers) (2012)
Geological Society of America's 125th Anniversary Cruise to Antarctica (7; 2012-13)
Undergraduate Research at the Capital—Pennsylvania (2013)
Tyler Prize Discussion with Rachel Maddow, Mario Molina, Thomas Lovejoy and John Holdren (2013)
AMS Diversity Workshop (2013)
UOP Honeywell (2, 2013)
Seattle Science Festival (2013)
Inglewood Middle School, Washington state (6, 2013)
CReSIS REU students (2013)
Pennsylvania Interfaith Power and Light (2013)

Penn State-University Park and other local talks (multiple talks indicated by #) (165)

Geosciences Colloquium (1989)
Geography Colloquium (1989)
Marine Sciences Society (1990)
Hydrosciences Brown-Bag (1990)
Hydrosciences Brown-Bag (1992)
EMS new students (1991)
EMS Interest House (1991)
EMS presentation to Board of Trustees (1991)
Meteorology Students (1991)
Meteorology Students (1992)
Earth System Science Center Hydrological Interest Group (1993)
Goddard Institute for Space Studies (1993)
Lamont Kindergarten (1993)
Hydrosciences Brown-Bag (1993)
Geosciences Colloquium (1994)
Geodynamics Seminar (1995)
Alumni College (1995)
Lamont Elementary School (1996)
SOAR High-School Experience (1996)

Pennsylvania Science Teachers Association (1996)
Sigma Xi (1997)
Irvin Hall EMS Interest House (1998)
Geosciences Colloquium (1997)
Geosciences Club (1997)
Environmental Geochemistry Symposium Keynote (1999)
Geoscience Club (1999)
Mt. Nittany Middle School sixth grade (1999)
Mt. Nittany Christian School (1999)
Houserville fourth grade (1999)
Mt. Nittany Middle School seventh grade (1999)
Sigma Xi (2001)
Geoclub (2001)
Barnes and Noble (2001)
Evan Pugh Address (2000)
Houserville elementary school (2, 2001)
Geosciences (2001)
Meteorology Summer School (2001)
Goddard Forum (2002)
Phi Beta Kappa (2002)
Huddle with the Faculty (2002)
Weather Camp for Teachers (2002)
American Meteorological Society summer camp for precollege teachers (2002)
Weather Camp for 8-10th graders (2002)
Geography Coffee Hour (2002)
State College Area High School classes (2002)
Schlow Public Library, State College (2003)
Mt. Nittany Middle School seventh grade (2003)
Geoclub (2003)
Research Unplugged (2003)
Retired Faculty (2003)
Evan Pugh Professors (2003)
Bachelor of Philosophy Dinner (2004)
Commencement Speaker, Graduate School (2004)
Friends School and Foxdale Retirement Home Residents (2004)
Geosciences Colloquium (2004)
Mt. Nittany Middle School (2004)
Engaging Faculty Outreach Scholarship Conference (2004)
Partners of Penn State Trustees (2004)
State College Area High School earth science classes (2004)
State College Area High School earth-science classes (another bunch, also 2004)
G. Montgomery and Marion Mitchell Lecture for Innovative Teaching (2004)
Alumni Cruise, Alaska (2005)
Astrobiology Teachers Seminar (2005)
Geoclub (2006)
Earth System Science Center (2006)

Meteorology Student Association (2006)
Office of Physical Plant Leadership (2006)
Penn State Forum (2006)
State College Area High School Community Event (2006)
The People Speak, Schlow Memorial Library (2006)
Teachers Workshop in Meteorology (2006)
University Baptist and Brethren Church (2007)
State College Area High School (2007)
Penn State Ecology Seminar Series (2007)
Penn State Outreach (2007)
Penn State Forum for Future (2007)
Penn State Lippin Lectureship in Ethics (2007)
Penn State Lehigh Valley (2007)
State College Mt. Nittany Middle School (2; 2007)
Dubois Area High School (2007)
Umbaugh Lectureship Penn State Dubois (2; 2007)
University Baptist and Brethern Church Adult Forum (2007)
Penn State Frontiers in Science (2; 2008)
Penn State Focus the Nation (videotaped presentation; 2008)
Penn State Lion Ambassadors (2008)
Corl Street Elementary Fifth Graders (2008)
State College Area High School (4; 2008)
Mount Nittany Middle School (2; 2008)
IPCC seminar (2008)
State Theater Antarctic Event (2008)
Penn State Schuylkill (2; 2008)
Editors Conference (2008)
Pennsylvania Junior Science and Humanities Symposium (2008)
Phi Kappa Phi (2008)
Outreach Conference (2008)
Business Incubator (2008)
Penn State Geography (2008)
Penn State Green Bag Outreach (2008)
LABASH Landscape Architecture (2009)
Evan Pugh Profs (2009)
Leadership Centre County (2009)
Penn State Weather Camp (2009)
State College Area High School (2009)
Penn State Alumni Association Huddle with the Faculty (2010)
Penn State Grand Destiny Kick-Off (2010)
Penn State Weather Camp (2; 2010)
State College Area High School (2010)
Grays Woods Elementary (2010)
Leadership Centre County (2010)
Towpath Naturalist Society (2010)
Penn State School of International Affairs Colloquium (2010)

Geosciences Advisory Committee (2011)
Earth Day (2011)
Technology Management and Policy Graduate Consortium (2011)
Methodist Ministerium (central Pennsylvania) (2011)
Leadership Centre County (2011)
Penn State School of International Affairs Student Colloquium (2011)
Penn State Physics Department Colloquium (2011)
Workshop for Broadcast Meteorologists (2011)
Nuclear Engineering (2011)
Smeal MBA (2011)
Transition Towns Marcellus Symposium (2011)
University Baptist and Brethren Church (2011)
Penn State School of International Affairs Student Colloquium (2012)
Earth and Environmental Systems Institute (2012)
Department of Geosciences (2012)
Transition Towns Marcellus Followup (2012)
State College Rotary Club (2012)
Penn State Extension (2012)
Public Issues Forum (2012)
Penn State Earth and Mineral Sciences Commencement (2012)
Leadership Centre County (2012)
Energy Industry Studies Program (DOE) at Penn State (2012)
PSU Green to Post-Green Seminar VI Architecture (2012)
Light Step-Right Step Festival, State College (2012)
PSU Presidential Leadership Academy, Honors College (2012)
Presidential Leadership Academy, Penn State Honors College (2013)
Penn State School of International Affairs Colloquium (2013)
CarbonEarth, Penn State (2013)
Penn State GEMS Board (2013)
League of Women Voters Workshop, State College (2013)
Penn State Geoclub (2013)
Penn State Office for Research Protections Scholarship and Research Ethics (2013)
Penn State Research Unplugged (2013)
Infinity Charter School, visiting Penn State (2013)
Foxdale Retirement Village, State College (2013)
Penn State CHANCE (2013)
Discovery Space Summer Science Youth Camp, State College (2013)
Penn State STEM Open House (2013)
Penn State Alumni and Friends (2013)
Penn State at National Geographic (2013)
University Women's Book Club, State College (2013)
Penn State Department of Anthropology Colloquium (2013)
Discovery-U Penn State (2013)
DOE EISP visit of energy professionals to Penn State (2013)
Wesley Center, State College (2013)

PENN STATE COMMITTEES

Member, Faculty Senate Committee on review of General Education course proposals, 1999-2001.

Chair, Global Change Theme Committee of University Environmental Consortium, 2000-2001.

Member, University Colloquy III Planning Committee, 1995-1996.

Member, University Committee to select recipients of Faculty Scholar Medal in Science, 2001.

Member, Faculty Senate Subcommittee on Active Learning in General Education courses, 2000-2001.

Member, University Search Committee to select new Dean of College of Earth and Mineral Sciences, 2001-2002.

Chair, University Committee on Faculty Scholar Medal in Physical Sciences, 2002-2003.

Member, University Committee on Honorary Degrees, 2001-2002.

Member, University Committee on selection of Evan Pugh Professors, 2003-2004.

Member, College of Earth and Mineral Sciences Strategic Planning Committee, 1995-1997.

Member, College of Earth and Mineral Sciences Faculty Advisory Committee, 1997-1999

Member, College of Earth and Mineral Sciences Associate Dean for Resident Instruction Search Committee, 1993.

Member, College of Earth and Mineral Sciences Committee to evaluate nominations for Distinguished Professor, 2002.

Member, College of Earth and Mineral Sciences Promotion and Tenure Committee, 2004-2005.

Chair, Committee for Facilitating Interdisciplinary Degrees within the Earth System Science Center, 1993.

Member, Earth System Science Center Report Series Committee, 1992-1995.

Member, Judging Committee, Dept. Geosciences Student Colloquium, 1992-1996, and various times thereafter.

Coordinator, Department of Geosciences Earth Systems Group, including design of departmental brochure, 1991.

Chair, Surficial Processes Curricular Group, 1995-1996.

Chair, Physical Processes at the Earth's Surface Curricular Group, 1997-2001.

Member, organizing committee, Hydrosciences Brown-Bag Seminar, 1990.

Member, Department of Geosciences Undergraduate Program Committee, 1991-1997.

Member, Department of Geosciences Executive Committee, 1991-1997. Member, Department of Geosciences Geophysics Search Committee, 1992.

Chair, Department of Geosciences Geochemical Record of Climate Change Search Committee, 1994

Member, Department of Geosciences Admissions Committee, 1994-1996.

Member, Department of Geosciences Promotion and Tenure Committee, 1994-2002.

Chair, Promotion and Tenure Committee, Department of Geosciences, 2004-2005.

Chair, Department of Geosciences Geomorphology and Surficial Chemistry Search Committee, 1996.

Member, Department of Geosciences/Earth System Science Center Climate Modeling Search Committee, 1996-1997.

Chair, Department of Geosciences Advisory Search Committee for Departmental Head, 1997.

Department of Geosciences Candidacy Rover, 1997-98.

Member, Department of Geosciences Hydrosciences Search Committee, 1997-1998.

Member, Department of Geosciences Geodynamics Search Committee, 1999-2000

Chair, Department of Geosciences Hydrogeology Search Committee, 1999-2000.

Chair, Department of Geosciences Ice and Climate Search Committee, 2000-2001.

Member, Department of Geosciences Graduate Program Committee, 2000-2004.

Member, Department of Geosciences Seismology Search Committee, 2000-2001.

Member, Department of Geosciences ad hoc committee on teaching evaluation, 2001.

Member, Department of Geosciences committee on alternative funding, 2002.

Member, Department of Geosciences Head Search Committee, 2002.

Member, Department of Geosciences Awards Committee.

Member, search committee, Meteorology Department, Climate change modeling, 2003-2004.

Chair, Evan Pugh Professorship selection committee, 2006.

Member, College of Earth and Mineral Sciences Dean Search Committee, 2006-2007.

Member, Earth and Environmental Sciences Institute Planning Committee, 2006.

Member, ad hoc committee on revision of Earth major, Geosciences, 2007.

Member, EESI Steering committee, 2007-2011.

Member, College of EMS ad hoc committee on Angel alternatives, 2008.

Member, University Committee on Honorary Degrees, 2009-2010.

ADVISEES

Graduate Students

Greg Jablunovsky, M.Sc. (1992).

Wanda R. Kapsner, M.Sc. (1994).

Mark P. Fischer, Ph.D. (1994; co-advisor with T. Engelder).

Anna Maria Agustsdottir, Ph.D. (1999).

Peter Burkett, M.Sc. (2000; advisor of record; most advising by S. Anandakrishnan).

Sarah B. Das, Ph.D. (2003).

Todd K. Dupont, Ph.D. (2003).

Byron R. Parizek, Ph.D. (2003); M.Sc. (2000).

David B. Reusch, Ph.D. (2003).

Matthew K. Spencer, Ph.D. (2005); M.Sc. (1999).

David Vacco, Ph.D. (2009).

John Mischler, M.Sc. (2009; co-advisor with T. Sowers).

Knut Christianson, Ph.D. (2013, co-advisor with S. Anandakrishnan).

Patrick Applegate, Ph.D. (2009).

John Fegyveresi, Ph.D. (2015), M.Sc. (2010).

Nathan Amador, Ph.D. (Geography, 2015, co-advisor with A. Carleton)

Nicholas Holschuh , Ph.D. (in progress; co-advisor with S. Anandakrishnan).

Kiya Riverman, Ph.D. (in progress; co-advisor with S. Anandakrishnan).

Nathan Stevens, M.Sc. (in progress; co-advisor with B. Parizek).

Host for Anne LeBrocq, University of Bristol, visiting Ph.D. student through World Universities Network, 2004.

Post-Doctoral Scholars

Sridhar Anandakrishnan

Christopher Shuman

Peter Fawcett

Ryan Walker (with S. Anandakrishnan)

Brent Goehring

Atsu Muto (with S. Anandakrishnan)

(In addition, several of the PhD students stayed for at least a little while in a postdoctoral capacity.)

Undergraduate Theses/Projects

Jared Anthony (2003)
Michael Askey (1999)
Robert Austin (1996) Jason Baker (1999)
Maria Buckholz (1996)
Anna Clough (visiting student from Leeds, 2000, published)
Tim Creyts (Honors Senior Thesis, some published, 1996)
Kurt Cuffey (1991) (published)
Philip Dennison (Honors Senior Thesis)
Katie Detwiler (2005)
Janine Fisler (Honors Thesis, 2005; helped with advising)
Keith Gibbs (1992)
Robert Green (1996)
Jodi Hanauer (1999)
Kat Hinkel (2007)
Laura Honis (1991)
Nehe Kyungho Jeon (2010)
Joslin Kwan (1998)
Todd Johnston (Honors Thesis, 2000)
Michael Magnotta (2001)
Linda Mark (1995)

Matt Meckey (2007)
Brock O'Hara (1996)
Michael Osterhout (2001)
Marcus Ross (2001)
Jared Rutt (2001)
Glenn Spinelli (1996) (published)
Nate Stevens (2010-11)
Kaitlin Walsh (2008-09)
Seth Warburton (Meteo, independent study, 2004)
A. Weaver (1990)
Shep Winckler (1994)
William Wood-Jenkins (2001)
Greg Woods (1994) (published)
Dawson Wright (2002)
Sara Yerger (2007)

COURSES TAUGHT

(Resident Instruction, Penn State)

Spring, 1989, Geosc 340, Geomorphology, prepared course, revised some labs.
Fall, 1989, Geosc 111, Introduction to Geosc I, prepared course.
Spring, 1990, two sections of Geosc 20, Planet Earth, prepared course.
Fall, 1990, Geosc 497&597, Ice and Climate, designed course.
Spring, 1991, two sections of Geosc 20, Planet Earth, led rewriting of textbook,
Fall, 1991, Geosc 597, Quaternary Paleoclimatology, designed course.
Spring, 1992, two sections of Geosc 20, Planet Earth, led enhanced TA evaluation.
Fall, 1992, Geosc 497, Ice and Climate.
Spring, 1993, two sections of Geosc 20, Planet Earth.
Fall, 1993, Geosc 497, Quaternary Paleoclimatology.
Spring, 1994, Geosc. 497, Mathematical Modeling in Geosciences (with R. Slingerland and J. Kasting), helped design course.
Spring, 1994, two sections of Geosc 20, Planet Earth.
Fall, 1994, Geosc 497, Ice and Climate.
Spring, 1995, two sections of Geosc 20, Planet Earth.
Fall, 1995, Geosc 497, Quaternary Paleoclimatology.
Spring, 1996, Geosc 340, Geomorphology.
Fall, 1996, Geosc 497, Ice and Climate.
Fall, 1996, Geosc 10, Geology of National Parks, designed course and wrote text.
Spring, 1997, Geosc 340, Geomorphology.
Spring, 1997, Geosc 597, Mathematical Modeling in Geosciences (with J. Kasting)
Fall, 1997, two sections of Geosc 10, Geology of National Parks.
Fall, 1997, Geosc 590, Graduate Seminar/Colloquium, led weekly discussion-class.
Spring, 1998, Geosc 340, Geomorphology (with D. Burbank).
Spring, 1998, Geosc 10, Geology of the National Parks.

Fall, 1998, two sections of Geosc 10, Geology of the National Parks.
Spring, 1999, Geosc 597, Mathematical Modeling in Geosciences (with J. Kasting)
Fall, 1999, two sections of Geosc 10, Geology of the National Parks, revised text.
Fall, 1999, Geosc 548, Advanced Surface Processes (with D. Burbank and B. Voight).
Spring, 2000, Geosc 10, Geology of the National Parks.
Spring, 2000, Geosc 597, Glaciology Seminar.
Fall, 2000, Geosc 203, Physical Processes in Geosciences, course and lab redesign.
Spring, 2001, Geosc 10, Geology of the National Parks.
Spring 2001, Geosc 320, Geology of Climate Change, designed course.
Spring, 2001, Geosc 548, Mathematical Modeling in Geosciences (with J. Kasting)
Fall, 2001, Geosc 340, Geomorphology.
Fall, 2001, Geosc 597, Climate Change Seminar.
Spring, 2002, Geosciences 10, Geology of the National Parks.
Spring, 2002, Geosc 320, Geology of Climate Change.
Fall, 2002, two sections of Geosc 10, Geology of the National Parks.
Fall, 2002, Geosc 340, Geomorphology.
Spring, 2003, Geosc 561, Mathematical Modeling in Geosciences (with J. Kasting)
Spring, 2003, Geosc 320, Geology of Climate Change (with L. Greer and R.K. Campen)
Fall, 2003, two sections of Geosc 10, Geology of the National Parks.
Fall, 2003, Geosc 597, Ice and Climate (with S. Anandakrishnan and D. Pollard)
Spring, 2004, EM SC 470W, CAUSE: National Parks Geology (with E. Spielvogel and S. Anandakrishnan)
Fall, 2004, EM SC 470W, CAUSE: National Parks Geology (with E. Spielvogel and S. Anandakrishnan)
Spring, 2004, Geosc 320, Geology of Climate Change
Fall, 2004, two sections of Geosc 10, Geology of the National Parks.
Fall, 2004, Geosciences 561 (with J. Kasting), Mathematical Modeling in Geosciences
Spring, 2005, Geosc 320, Geology of Climate Change
Spring, 2005, Geosc 561, Mathematical Modeling in Geosciences (with J. Kasting)
Fall, 2005, two sections of Geosc 10, Geology of the National Parks, extensive revision and preparation of online materials.
Spring, 2006, Geosc 320, Geology of Climate Change.
Fall, 2006, two sections of Geosc 10, Geology of the National Parks, and extensive efforts to prepare fully online version to complement blended version.
Spring, 2007, Geosc 320, Geology of Climate Change
Spring, 2007, Geosc 561 (with J. Kasting), Mathematical Modeling in Geosciences
Spring, 2007, Geosc 497A (with S. Anandakrishnan), Ice and Climate (web course to Penn State, Ohio State, U of Kansas, and University of Illinois Chicago
Fall, 2007, Geosc 10 (two blended sections with in-class meetings, plus online sections, total of almost 1000 students).
Spring, 2007, Geosc 320, Geology of Climate Change.
Fall, 2008, Geosc 10 (two blended sections with in-class meetings, plus online sections, total of almost 1000 students).
Fall, 2008, Geosc 497 (with S. Anandakrishnan), Ice and Climate.
Spring, 2009, Geosc 320, Geology of Climate Change.
Spring, 2009, Geosc 561 (with J. Kasting), Mathematical Modeling in Geosciences.
Fall, 2010, Geosc 10 (one blended section, additional online sections, total of almost 800 students)
Fall, 2010, Geosc 597 (with S. Anandakrishnan), Ice and Climate.
Spring, 2011, Geosc 561 (with J. Kasting), Mathematical Modeling in Geosciences.
Spring, 2011, Geosc 320, Geology of Climate Change.

Fall, 2011, Geosc 597, Physics of Ice Cores
Fall, 2011, Geosc 10 (~1100 students)
Spring, 2012, Geosc 320, Geology of Climate Change
Spring, 2012, Geosc 10 (~1100 students)
Fall, 2012, Geosc10 (~1100 students)
Fall, 2012, Geosc 597, Ice and Climate
Spring, 2013, Geosc 320, Geology of Climate Change
Spring, 2013, Geosc 561 (with J. Kasting), Mathematical Modeling in Geosciences
Fall, 2013, Geosc10 (~1100 students)
Fall, 2013, EmSc 100S (first-year seminar)
Spring, 2014, Geosc 320, Geology of Climate Change
Spring, 2014, Energy, Environment, and Our Future, Penn State Coursera MOOC

ADDITIONAL OUTREACH ACTIVITIES. Providing information to the press, government officials, and other groups and individuals takes much time. I have approximately daily press contacts, daily or more-frequent replies to requests for information from other sources, weekly public presentations, and weekly or more-frequent reviews.