

BIOGRAPHICAL INFORMATION

Wallace S. Broecker, born November 29, 1931, Chicago, Illinois; A.B. Columbia, 1953; Ph.D. Columbia, 1958; Assistant Professor, Columbia University, 1959; Associate Professor, 1961; Professor, 1964; Newberry Professor of Earth & Environmental Sciences, 1977 to present. Member National Academy of Sciences, 1979. Research interests include paleoclimatology, ocean chemistry, isotope dating and environmental science. Thesis: Application of Radiocarbon to Oceanography and Climatic Chronology.

Books

- 1) Chemical Equilibria in the Earth, W.S. Broecker and V. Oversby, McGraw-Hill, NY, 1971.
- 2) Chemical Oceanography, W.S. Broecker, Harcourt Brace Jovanovich, Inc., NY, 1974.
- 3) Tracers in the Sea, W.S. Broecker and T.-H. Peng, Eldigio Press, NY, 1982.
- 4) How to Build a Habitable Planet, W.S. Broecker, Eldigio Press, NY, 1985
(Japanese, German translations, 1993, Chinese translation, 1998)
- 5) The Glacial World According to Wally, W.S. Broecker, Eldigio Press, NY, 1992; Second Revised Edition, 1995; Third Revised Edition, 2002.
- 6) Greenhouse Puzzles, W.S. Broecker and T.-H. Peng, Eldigio Press, NY, 1992; Revised Edition, 1998.
- 7) Fossil Fuel CO₂ and the Angry Climate Beast, Eldigio Press, NY, 2003.
- 8) The Ocean's Role in Climate Yesterday, Today and Tomorrow, Eldigio Press, NY, 2005.
- 9) A Business Executive's Guide to Global Warming, Eldigio Press, NY, 2005.
- 10) Fixing Climate: What Past Climate Changes Reveal about the Current threat – and How to Counter It, W.S. Broecker and R. Kunzig, Hill and Wang, Farrar, Straus, and Giroux Books, April 2008

Journal Articles

1953 2 (2)

- 1) Kulp, J.L., W.S. Broecker and W.R. Eckelmann, *Age determination of uranium minerals by the Pb-210 method*, Nucleonics, 11:191:21, 1953.
- 2) Kulp, J.L., G.L. Bates, and W.S. Broecker, *Present status of the lead method of age determination of uranium minerals by the Pb-210 method*, Nucleonics, 11:191:21, 1953.

1954 2 (1)

- 3) Grosse, A.V., A.D. Kirshenbaum, J.L. Kulp, and W.S. Broecker, *The natural tritium content of atmospheric hydrogen*, Phys. Rev., 93:250, 1954.

1956 4 (7)

- 4) Broecker, W.S., and J.L. Kulp, *The radiocarbon method of age determination*, Amer. Antiquity, 22:1-11, 1956.
- 5) Broecker, W.S., J.L. Kulp, and C.S. Tucek, *Lamont natural radiocarbon measurements III*, Science, 124:154-165, 1956.

Broecker's CV

- 6) Ericson, D.B., Broecker, W.S., J.L. Kulp and G. Wollin, *Late Pleistocene climates and deep-sea sediments*, Science, 124:3855-389, 1956.
- 7) Carr, Donald R., W.S. Broecker, P. Damon, J.L. Kulp, *The potassium-argon age method, (Chapt.) 16 of Nuclear processes in geologic settings*, Natl. Research Council, Comm. Nuclear Sci., Nuclear Sci. Ser. Rep. no.19, 109-113, 1956.

1957 2 (9)

- 8) Giletti, B. and W.S. Broecker, *A new look at the ocean*, Yale Sci. Mag., May, 1957.
- 9) Broecker, W.S., J.L. Kulp, *Lamont Natural Radiocarbon Measurements IV*, Science, v. 126, no. 3287, 1324-1334, 1957.

1958 3 (12)

- 10) Olson, Edwin A., W.S. Broecker, *Sample contamination and reliability of radiocarbon dates*, N.Y. Acad. Sci. Trans. ser. 2 v. 20, no. 7, p. 593-604, illus., May 1958.
- 11) Broecker, W.S., and Karl Turekian; Bruce Heezen, *The relation of deep sea (Atlantic Ocean) sedimentation rates to variations in climate*, Am. Jour Sci., v. 256, no.7, 503:517, illus., Summer, 1958.
- 12) Broecker, W.S., and P.C. Orr, *Radiocarbon chronology of Lake Lahontan and Lake Bonneville*, Geol. Soc. America Bull. v. 69, no. 8, 1009:1032, illus., Aug. 1958.

1959 10 (20a)

- 13) Broecker, W.S., C.S. Tucek, E.A. Olsen, *Radiocarbon analysis of oceanic CO₂*, Intern. J. Appl. Radiation Isotopes, 7:1:8, 1959.
- 14) Broecker, W.S., E.A. Olson, J. Bird, *Radiocarbon measurements on samples of known age*, Nature, 183:1582, 1959.
- 15) Heezen, Bruce C., W.S. Broecker, M. Ewing, R.J. Menzies, *Stagnation of the Cariaco trench (Venezuela) (abs.)*, Int. Oceanog. Cong., 1st, preprints. 99:102, illus., 1959.
- 16) Broecker, W.S., E. Olson, *C 14 dating of cave formations*, Natl. Speleol. Soc. Bull. v. 21, pt. 1,43, Jan., 1959.
- 17) Broecker, W.S., A.F. Walton, *The geochemistry of C 14 in fresh-water systems*, Geochimica et Cosmochimica Acta v. 16., nos. 1-3, 15-38, 200, illus., May, 1959.
- 18) Broecker, W.S., A.F. Walton, *Re-evaluation of the salt chronology of several Great Basin lakes*, Geol. Soc. America Bull. v. 70, no. 5, 601-618, illus., with discussion by J.H. Feth, 637:640, tables, May, 1959.
- 19) Olson, Edwin A., W.S. Broecker, *Lamont natural radiocarbon measurements*, (Pt.) 5, Am. Jour. Sci. v. 257, no. 6, 464, June, 1959.
- 19a) Broecker, W.S. and E.A. Olson, *Lamont Radiocarbon Measurements VI**, American Journal of Science Radiocarbon Supplement, **Vol. 1**, pp. 111-132, 1959.
- 20) Broecker, W.S., A. Schulert, E.A. Olson, *Bomb Carbon-14 in Human Beings*, Science, vol. 130, no. 3371, 331:332.
- 20a) Broecker, W.S. and A. Walton, *Radiocarbon from Nuclear Tests*, Science, **Vol. 130**, No. 3371, pp. 309-314, August 7, 1959.

Broecker's CV

1960 6 (26)

- 21) Broecker, W.S., E.A. Olson, P.C. Orr, *Radiocarbon measurements and annual rings in cave formations*, Nature, 185:933-94, 1960.
- 22) Broecker, W.S., M. Ewing, B.C. Heezen, *Evidence for an abrupt change in climate close to 11,000 years ago*, Am. J. Sci., 258:429-448, 1960.
- 23) Eckelmann, W.R., W.S. Broecker, J.L. Kulp, *Half-life of Pb-210*, Physical Rev., 118:698-701, 1960.
- 24) Broecker, W.S., R. Gerard, M. Ewing, B.C. Heezen, *Natural Radiocarbon in the Atlantic Ocean*, J. Geophys. Res., 65:2903-2931, 1960.
- 25) Broecker, W.S., E.A. Olson, *Radiocarbon from nuclear tests II*. Science, 132:712-721, 1960.
- 26) Broecker, W.S., *Geochemistry of ocean water*, Am. Geophys. Union Trans. v. 41, no. 2, 259:260, June, 1960

1961 6 (31A)

- 27) Olson, E.A., W.S. Broecker, *Lamont natural radiocarbon measurements VII*, Radiocarbon, 3, 141-175, 1961.
- 28) Olson, E.A., W.S. Broecker, *Lamont natural radiocarbon measurements VIII*, Radiocarbon, 3, 176-204, 1961.
- 29) Broecker, W.S., R.D. Gerard, M. Ewing, B.C. Heezen, *Geochemistry and physics of ocean circulation*, Oceanography, AAAS, 301:322, 1961.
- 30) Broecker, W.S., *Radiocarbon dating of Late Quaternary deposits, South Louisiana: A discussion*, Bull. Geol. Soc. Am. 72:159:162, 1961.
- 31) Broecker, W.S., *Radium-uranium age determinations on marine shells, 3 in 2 problems related to interplanetary matter*, Natl. Acad. Sci., Natl. Research Council Pub. 845 (Nuc. Sci. Ser. Rept. 33) 96-101, illus., 1961.
- 31A) Broecker, W.S., *Age determination on marine carbonate based on inequilibrium in the U^{238} decay series*, reprinted from: Report of the VIth International Congress on Quaternary Warsaw. Vol. I: Commission on the Absolute Age of Quaternary Deposits. 1961.

1962 3 (34)

- 32) Broecker, W.S., *The contribution of pressure induced phase changes to glacial rebound*, J. Geophys. Res., 67:4837-4842, 1962.
- 33) Skok, J., W. Chorney, W.S. Broecker, *Uptake of CO₂ roots of xanthium plants*, The Botanical Gazette, 124:118-120, 1962.
- 34) Eckelmann, Walter R., J.R. Allsup, W.S. Broecker, D.W. Whitlock, *Implications of carbon isotopic composition of total organic carbon of some recent sediments and ancient oils*, Am. Assoc. Petroleum Geol., b, v. 46, no. 5, 699:704, illus., 1962.

1963 8 (42)

- 35) Broecker, W.S., *Radioisotopes and large scale oceanic mixing*, THE SEA, v. II, Ch. 4, 88:108, John Wiley and Sons, Ltd., London, 1963.
- 36) Broecker, W.S., *Radiocarbon ages of Antarctic materials*, The Polar Record, 11:472-473, 1963.
- 37) Giffin, C., A. Kaufman, W.S. Broecker, *Delayed coincide counter for the assay of actinon and thoron*, J. Geophys. Res., 68:1749:1757, 1963.

Broecker's CV

- 38) Broecker, W.S., *A preliminary evaluation of uranium series in equilibrium as a tool for absolute age measurement on marine carbonates*, J. Geophys. Res. 68:2817-2834, 1963.
- 39) Broecker, W.S., W.R. Farrand, *The radiocarbon age of the Two Creeks Forest Bed*, Wisconsin, Bull. Geol. Soc. Am., 74:7955-802, 1963.
- 40) Rocco, G.G., W.S. Broecker, *The vertical distribution of cesium-137 and strontium-90 in the oceans*, J. Geophys. Res., 68:4501-4512, 1963.
- 41) Richards, H.G., W.S. Broecker, *Emerged Holocene South American shorelines*, Science, 141:1044-1045, 1963.
- 42) Broecker, W.S., *$^{14}\text{C}/^{12}\text{C}$ ratios in surface ocean water*, Natl. Acad. Sci., Nat. Res. Council Publ. 1075, 138-149.

1964 1 (43)

- 43) Broecker, W.S., *Radiocarbon dating: A case against the proposed link between river mollusks and soil humus*, Science, 143:596-597, 1964.

1965 7 (50)

- 44) Broecker, W.S., A. Kaufman, *Radiocarbon chronology of Lake Lahontan and Lake Bonneville II*, Bull. Geol. Soc. Am., 76:537-566, 1965.
- 45) Broecker, W.S., D.L. Thurber, *Uranium series dating of corals and oolites from Bahamian and Florida Key limestones*, Science, 149:58-60, 1965. *series ages of Pacific atoll coral*, Science, 149:55-68, 1965.
- 46) Thurber, D.L., Broecker, W.S., R.L. Blanchard, H.A. Potratz, *Uranium series ages of Pacific atoll coral*, Science, 149:55-68, 1965.
- 47) Broecker, W.S., *Isotope geochemistry and the Pleistocene climatic record*, Quaternary of the U.S., Rev. Vol. VIII INQUA Congress, Boulder, Col., 737:753, 1965.
- 48) Kaufman, A., W.S. Broecker, *Comparison of Th-230 and C-14 ages for carbonate materials from lakes Lahontan and Bonneville*, J. Geophys. Res., 70:4039-4054, 1965.
- 49) Broecker, W.S., *Isotope Geochemistry and the Pleistocene climatic record*, in the Quaternary of the U.S., Princeton Univ. Press, 737:753, 1965.
- 50) Broecker, W.S., *An application of natural radon to problems in ocean circulation, in symposium on diffusion in oceans and fresh waters*, Lamont Geol. Observatory of Columbia Univ., 116:145, 1965.

1966 9 (59)

- 51) Broecker, W.S., *Absolute dating and the astronomical theory of glaciation*, Science, 151:299-304, 1966.
- 52) Ku, T.L., W.S. Broecker, *Atlantic deep-sea stratigraphy: Extension of absolute chronology to 320,000 years*, Science, 151:448-450, 1966.
- 53) Broecker, W.S., *Glacial rebound and the deformation of the shorelines of pro-glacial lakes*, J. Geophys. Res., 71:4777-4783, 1966.
- 54) Broecker, W.S., T. Takahashi, *Calcium carbonate precipitation on the Bahama Banks*, J. Geophys. Res., 71:1575-1602, 1966.

Broecker's CV

- 55) Broecker, W.S., E.R. Bonebakker, G.G. Rocco, *The vertical distribution of cesium-137 and strontium-90 in the oceans*, 2, J. Geophys. Res., 71:1999-2003, 1966.
- 56) Broecker, W.S., G.G. Rocco, H.L. Volchok, *Strontium-90 fallout: Comparison of rates over ocean and land*, Science, 152:639-640, 1966.
- 57) Broecker, W.S., *Radioisotopes and the rate of mixing across the main thermoclines of the ocean*, J. Geophys. Res., 71:5827-5836, 1966.
- 58) Bender, M.L., T-L Ku, W.S. Broecker, *Manganese nodules--Their evolution*, Science v. 151, no. 3708, 325-328, illus., 1966.
- 59) Broecker, W.S., D.L. Thurber, *Ratio of total CO₂ to calcium in Tertiary and Quaternary oceans*, Geol. Soc. America Spec. paper 87,18-19, 1966.

1967 4 (63)

- 60) Ku, T.L., W.S. Broecker, *Rates of sedimentation in the Arctic Ocean*, 95-104; In: Progress in Oceanography, v.4, Pergamon Press, Oxford and New York, 1967.
- 61) Broecker, W.S., Y.H. Li, J. Cromwell, *Radium-226 and radon-222: Concentration in Atlantic and Pacific Oceans*, Science, 158:1307-1310, 1967.
- 62) Taddeucci, A., W.S. Broecker, D.L. Thurber, *Th-230 dating of volcanic rocks*, Earth Planet. Sci. Lett., 3:338-342, 1967.
- 63) Ku, Teh-Lung, W.S. Broecker, *Uranium, thorium and protactinium in a manganese nodule*, Earth & Planetary Sci. Letters v. 2, no.4, 317-321, 1967.

1968 5 (68)

- 64) Broecker, W.S., *In defense of the astronomical theory of glaciation*, Meteorological Monographs, 8:1339-1411, 1968.
- 65) Broecker, W.S., D.L. Thurber, J. Goddard, T.L. Ku, R.L. Matthews, K.J. Mesolella, *Milankovitch hypothesis supported by precise dating of coral reefs and deep-sea sediments*, Science, 159:297-300, 1968.
- 66) Ku, T.L., W.S. Broecker, N. Opdyke, *Comparison of sedimentation rates measured by paleomagnetic and the ionium methods of age determination*, Earth Planet. Sci. Lett., 4:1-16, 1968.
- 67) Takahashi, T., W.S. Broecker, Y.H. Li, D.L. Thurber, *Chemical and isotopic balances for a meromictic lake*, Limnology and Oceanography, 13: 272-292, 1968.
- 68) Broecker, W.S., J. Cromwell, Y.H. Li, *Rates of vertical eddy diffusion near the ocean floor based on measurements of the distribution of excess ²²²Rn*, Earth & Planetary Sci. Letters, v.5, no. 2, 101:105, 1968.

1969 5 (73)

- 69) Mesolella, K.J., R.K. Matthews, W.S. Broecker, D.L. Thurber, *The astronomical theory of climatic change: Barbados data*, J. Geol. 77:250-274, 1969.
- 70) Ku, T.L., W.S. Broecker, *Radiochemical studies on manganese nodules of deep-sea origin*, Deep Sea Res. 16:625-637, 1969.
- 71) Li, T.Y., T. Takahashi, and W.S. Broecker, *The degree of saturation of a CO₃ in the oceans*, J. Geophys. Res., 74:5507-5525, 1969.

Broecker's CV

72) Broecker, W.S., T.L. Ku, *Caribbean cores P6304-8 and P63044-9: New analysis of absolute chronology*, Science, 166:404-406, 1969.

73) Broecker, W.S., R.D. Gerard, *Natural radiocarbon in the Mediterranean Sea*, *Limnol. and Oceano.*, 14:883-888, 1969.

1970 12 (85)

74) Broecker, W.S., J. van Donk, *Insolation changes, ice volumes and the 0-18 record in deep-sea cores*, Rev. of Geophys. & Space Physics 8:169-198, 1970.

75) Broecker, W.S., K. Wolgemuth, *Barium in sea water*, Earth Planet. Sci. Lett., 8:372-378, 1970.

76) Broecker, W.S., Y.H. Li, *Interchange of waters between the major oceans*, J. Geophys. Res., 75:3545-3552, 1970.

77) Broecker, W.S., *A boundary condition on the evolution of atmospheric oxygen*, J. Geophys. Res., 75:3553-3557, 1970.

78) Bender, M., T.L. Ku and W.S. Broecker, *Accumulation rates of manganese in pelagic sediments and nodules*, Earth Planet. Sci. Lett., 8:143-148, 1970.

79) Broecker, W.S., *Man's oxygen reserves*, Science, 168:1537-1538, 1970.

80) Broecker, W.S., A. Kaufman, T.L. Ku, Y.C. Chung, H. Craig, *Radium-225 measurements from the 1969 North Pacific GEOSECS station*, J. Geophys. Res. 75:7682-7685, 1970.

81) Broecker, W.S., A. Kaufman, *Near-surface and near-bottom radon results for the 1969 North Pacific GEOSECS Station*, Jour. Geophys. Research, v.75, no. 36, p. 7679-7681, 1970.

82) Thurber, D.L., W.S. Broecker, *The behavior of radiocarbon in the surface waters of the Great Basin, in radiocarbon variations and absolute chronology-Nobel Symposium, 12th, Uppsala, 1969, New York and Stockholm, Almquist and Wiksell, p. 379-398, discussion, . 398:400, 1970.*

83) Broecker, W.S., A. Kaufman, T-L. Ku, *Radium measurements on samples from the GEOSECS Station*, EOS, v. 51, no. 4, 324, 1970.

84) Crittenden, M.D., Jr., W.S. Broecker, A.L. Bloom, *Panel discussion on isostasy*, Can. J. Earth Sci. , v. 7, no. 2, pt 2,727:733, 1970.

85) Volchok, H.L., M. Feiner, H.J. Simpson, W.S. Broecker, V.E. Noshkin, V.T. Bowen, E. Willis, *Ocean fallout; the Crater Lake experiment*, J. Geophys. Res., v.75, no. 6, 1084:1091, 1970.

1971 8 (93)

86) Broecker, W.S., V.M. Oversby, *Chemical Equilibria in the Earth*, McGraw-Hill, N.Y., 319pp. 1971.

87) Thurber, D.L., W.S. Broecker, *The behavior of radiocarbon in the surface waters of the Great Basin, 379-400*, In: Nobel Symposium 12, *Radiocarbon Variations and Absolute Chronology*, (I.U. Olsson, ed.), John Wiley and Sons, Inc., 1971.

88) Broecker, W.S., *Calcite accumulation rates and glacial to interglacial changes in oceanic mixing*, The Late Cenozoic Glacial Ages (K.K. Turekian, ed.) Yale University Press, 1971.

89) Broecker, W.S., *A kinetic model for the chemical composition of sea water*, Quaternary Res., 1:188-207, 1971.

90) Broecker, W.S., T. H. Peng, *The vertical distribution of radon in the BOMEX area*, Earth Planet. Sci. Lett., 11:99-108, 1971.

Broecker's CV

- 91) Broecker, W.S., Y.H. Li and T.H. Peng, *Carbon dioxide - Man's unseen artifact, in: Impingement of Man on the Oceans*, (D. W. Hood, ed.), J. Wiley & Sons, Inc., pp. 287-324, 1971.
- 92) Kaufman, A., W.S. Broecker, T.L. Ku, D.L. Thurber, *The status of U-series methods of mollusk dating*, *Geochim. Cosmochim. Acta*, v. 35,1155:1183, 1971.
- 93) Bender, Michael, W.S. Broecker, V. Gornitz, U. Middel, R. Kay, S-S. Sun, P. Biscaye, *Geochemistry of three cores from the East Pacific Rise*, *Earth Planet. Sci. Lett.* vol. 12, no. 4, 425:433, 1971.

1972 4 (97)

- 94) Broecker, W.S., M. Bender, *Age determination on marine strandlines, In: Calibration of Homiloid Evolution*, (W.S. Bishop and J.A. Miller, eds.) The Wenner-Gren Foundation for Anthropological Res., N.Y, 19-35, 1972.
- 95) Trier, R.M., W.S. Broecker, H.W. Feely, *Radium-228 profile at the second GEOSECS intercalibration station, 1970, in the North Atlantic*, *Earth Planet Sci. Lett.* v. 16,141:145, 1972.
- 96) Schindler, D.W., G.J. Brunskill, S. Emerson, W.S. Broecker, T.H. Peng, *Atmospheric carbon dioxide: Its role in maintaining phytoplankton standing crops*, *Science*, v. 177, 1192:1194, 1972.
- 97) Gieskes, J.M., W.S. Broecker, *Interstitial water chemistry of sediments in the Caribbean Sea*, *Caribb. Geol. Conf., Trans.*, no. 6, p. 493, 1972.

1973 13 (110)

- 98) Simpson, H. James, W.S. Broecker, *A new method for determining the total carbonate ion concentration in saline waters*, *Limnol. & Oceano.*, v. 18, 426:440, 1973.
- 99) Broecker, W.S., A. Kaufman, R.M. Trier, *The residence time of thorium in surface sea water and its implications regarding the rate of reactive pollutants*, *Earth Planet. Sci. Lett.*, v. 20, 35:44, 1973.
- 100) Anderson, T.T., M. Bender, W.S. Broecker, *Surface areas of biogenic carbonates and their relation to fossil ultrastructure and diagenesis*, *J. Sediment. Petrol.*, v.42, 471:477, 1973.
- 101) Kaufman, A., R.M. Trier, W.S. Broecker, *Distribution of ²²⁸Ra in the world ocean*, *J. Geophys. Res.*, v.78, 8827:8848, 1973.
- 102) Broecker, W.S., *The marine chemistry of carbon and its role in oceanographic research*, in *Oceanography; the Last Frontier*, p. 56-66, Basic Books, NY, 1973.
- 103) *Interstitial water studies, Leg 15 - Introduction and summary* W.S. Broecker, *Initial Reports of the Deep Sea Drilling Project*, v. 15, Washington, (U.S. Government Printing Office), 1069:1073, 1973.
- 104) *Interstitial water studies, Leg 15 - Introduction and summary* W.S. Broecker, *Initial Reports of the Deep Sea Drilling Project*, v. 20, Washington, (U.S. Government Printing Office),751:755, 1973.
- 105) *Interstitial water studies, Leg 15 - New Procedures and equipment*, R.M. Horowitz, L.S. Waterman, W.S. Broecker, *Initial Reports of the Deep Sea Drilling Project*, v. 20, Washington, (U.S. Government Printing Office), 757:763, 1973.
- 106) *Interstitial water studies, Leg 15 - Dissolved gases at site 147*, D.E. Hammond, .M. Horowitz, W.S. Broecker, R. Bopp, *Initial Reports of the Deep Sea Drilling Project*, v. 20, Washington, (U.S. Government Printing Office),765:771, 1973.

Broecker's CV

- 107) *Interstitial water studies, Leg 15 - Inert gases*, W. Brian Clarke, R.M. Horowitz, W.S. Broecker, *Initial Reports of the Deep Sea Drilling Project*, v. 20, Washington, (U.S. Government Printing Office), p. 777-781, 1973.
- 108) Broecker, W.S., *Environmental priorities*, Science, 182:435, 1973.
- 109) Emerson, S., W.S. Broecker, D.W. Schindler, *Gas-exchange rates in a small lake as determined by the radon method*, J. Fish. Res. Bd. Canada, v. 30, 1475:1484, 1973.
- 110) Broecker, W.S., *Factors controlling CO₂ content in the oceans and atmosphere*, U.S. A. E. C. Report, *Carbon and the biosphere*, 32-50, 1973.

1974 9 (119)

- 111) Chung, Y., H. Craig, T. Ku, J. Goddard, W.S. Broecker, *Radium-226 measurements from three GEOSECS intercalibration stations*, Earth Planet. Sci. Lett. v. 23, no 1, 116:124, 1974.
- 112) Hamza, M.S., W.S. Broecker, *Surface effect on the isotopic fractionation between CO₂ and some carbonate minerals*, Geochem. Cosmochim. Acta, v. 38, 669:681, 1974.
- 113) Peng, T.H., Takahashi and W.S. Broecker, *Surface radon measurements in the North Pacific Ocean station PAPA*, J. Geophys. Res., v. 79, 1772:1880, 1974.
- 114) Bloom, A. L., W.S. Broecker, J.M.A. Chappell, R.K. Matthews, K.J. Mesolella, *Quaternary sea level fluctuations on a tectonic coast: New 230-Th/234-U dates from the Huon Peninsula, New Guinea*, Quaternary Res., v. 4, 185:205, 1974.
- 115) Broecker, W.S., T.H. Peng, *Gas exchange rates between air and sea*, Tellus, v. 26, 21:35, 1974.
- 116) Broecker, W.S., *"NO", a conservative water-mass tracer*, Earth Planet. Sci. Lett., v. 23, 100:107, 1974.
- 117) Broecker, W.S., S. Broecker, *Carbonate dissolution on the western flank of the East Pacific Rise*, In: *Studies in Paleo-Oceanography, SEPM Memoir*, 20 (W.W. Hay, ed.), 44:57, 1974.
- 118) Broecker, W.S., *Chemical Oceanography*, Harcourt Brace Jovanovich, Inc., N.Y. (K.S. Deffeyes, ed.), 214,pp, 1974.
- 119) Chappell, J., W.S. Broecker, H.A. Polach, B.G. Thom, *Problem of dating upper Pleistocene sea levels from coral reef areas*, in: *Proceedings from the 2nd Intl. Coral Reef Symp.*, vol. 2; 563:571, The Great Barrier Reef Comm. Brisbane, Aust. , 1974.

1975 3 (122)

- 120) Lawrence, J.R., J.M. Gieskes, W.S. Broecker, *Oxygen isotope and cation composition of DSDP pore waters and the alteration of Layer II basalts*, Earth Planet. Sci. Lett. v. 27, no. 1, 1:10, 1975.
- 121) Broecker, W.S., *Floating glacial ice caps in the Arctic Ocean*, Science, v. 188, 1116:1118, 1975.
- 122) Broecker, W.S., *Climatic change: Are we on the brink of a pronounced global warming?* Science, v. 189, 460:463, 1975.

1976 8 (130)

- 123) Chan, L.H., J.M. Edmond, R.F. Stallard, W.S. Broecker, Y.C. Chung, R.F. Weiss, and T.L. Ku, *Radium and barium at GEOSECS stations in the Atlantic and Pacific*, Earth Planet. Sci. Lett., v. 32, 258:267, 1976.
- 124) Takahashi, T., P. Kateris and W.S. Broecker, *A method for shipboard measurement of CO₂ partial pressure in seawater*, Earth Planet. Sci. Lett., v. 32, 451:457, 1976.

Broecker's CV

- 125) Takahashi, T., P. Kateris, W.S. Broecker and A.E. Bainbridge, *An evaluation of the apparent dissociation constants of carbonic acid in seawater*, Earth Planet. Sci. Lett., v. 32, 458:467, 1976.
- 126) Broecker, W.S., T. Takahashi and Y. Li, *Hydrography of the Central Atlantic - I. The two degree discontinuity*, Deep-Sea Res., v. 23, 1083:1104, 1976.
- 127) Broecker, W.S., J. Goddard, J. Sarmiento, *The distribution of 226-Ra in the Atlantic Ocean*, Earth Planet. Sci. Lett. v. 32, 220:235, 1976.
- 128) Sarmiento, J., D. Hammond and W.S. Broecker, *The calculation of the statistical counting error for radon-222 scintillation counting*, Earth Planet Sci. Lett., v. 32, 351:356, 1976.
- 129) Sarmiento, J., H.W. Feely, W.S. Moore, A.E. Bainbridge and W.S. Broecker, *The relationship between vertical eddy diffusion and density gradient in the ocean*, Earth Planet. Sci. Lett., v. 32, 357:370, 1976.
- 130) Broecker, W.S., T. Takahashi, *The solubility of calcite in sea water*, *Thermodynamics in geology*, Oxford, UK, Sept. 17-27, 1976.

1977 7 (137)

- 131) Torgersen, T., Z. Top, W.B. Clarke, W.J. Jenkins and W.S. Broecker, *A new method for physical limnology-tritium-helium-3 ages-results for Lakes Erie, Huron and Ontario*, Limnol. & Oceanog., v. 22, 181:193, 1977.
- 132) Broecker, W.S., *The Hazards of Coal Dependence*, Natural History Magazine, **Vol. 86**, No. 8, pp. 8-19, October, 1977.
- 133) Broecker, W.S. and T. Takahashi, *Neutralization of Fossil Fuel CO₂ by Marine Calcium Carbonate*, In: *The Fate of Fossil Fuel CO₂ in the Oceans*, (Neil Andersen and A. Malahoff, eds), 213-241, 1977.
- 134) Sundquist, E., D.K. Richardson, W.S. Broecker, T-H. Peng, *Sediment mixing and carbonate dissolution in the Southeast Pacific Ocean in: The Fate of Fossil Fuel CO₂ in the Oceans*, (Neil Anderson and A. Malahoff, eds.), Plenum Press, NY, 429:454. 1977.
- 135) Takahashi, T., W.S. Broecker, *Mechanisms for calcite dissolution on the sea floor*, in: *The Fate of Fossil Fuel CO₂ in the Oceans*, (Neil Anderson and A. Malahoff, eds.), Plenum Press, NY, 455:477, 1977.
- 136) Peng, T.-H., W.S. Broecker, G. Kipphut, N. Shackleton, *Benthic mixing in sea cores as determined by C-14 dating and its implications regarding climate stratigraphy and the fate of fossil fuel CO₂*, In: *The Fate of Fossil Fuel CO₂ in the Oceans*, (Neil Andersen and A. Malahoff, eds), Plenum Press, N.Y., 355:374, 1977.
- 137) Broecker, W.S., T. Takahashi, *The relationship between lysocline depth and in situ carbonate ion concentration*, Deep-Sea Res. v. 25, 65:95, 1977.

1978 9 (146)

- 138) Broecker, W.S. and A. Bainbridge, *An Abyssal Shear Zone*, J. Geophys. Res., v. 83, 1963:1966, 1978.
- 139) Peng, T.H., J. Goddard, W.S. Broecker, *A direct comparison of C-14 and 230-Th ages at Searles Lake, Calif.*, Quaternary Res., v. 9, 319:329, 1978.
- 140) Hoffert, M.I., W.S. Broecker, *Apparent vertical eddy diffusion rates in the pycnocline of the Norwegian Sea as determined from the vertical distribution of tritium*, Geophys. Res. Lett., v. 5, 502:504, 1978.
- 141) Broecker, W.S., T.H. Peng and M. Stuiver, *An estimate of the upwelling rate in the Equatorial Atlantic based on the distribution of bomb radiocarbon*, J. Geophys. Res., v. 83, 6179:6186, 1978.

Broecker's CV

- 142) Sarmiento, J., Broecker, W.S. and P.E. Biscaye, *Excess bottom radon-222 distribution in deep ocean passages*, J. Geophys. Res., v. 84, 1145:1154, 1978.
- 143) Broecker, W.S., *The cause of glacial to interglacial climatic change*, in: *Evolution of Planetary Atmospheres and Climatology of the Earth*. Centre National d'Etudes Spatiales (France), 165-177, 1978.
- 144) Peng, T.H. and W.S. Broecker, *Effect of sediment mixing on the rate of calcite dissolution by fossil fuel CO₂*, Geophys. Res. Lett., v. 5, 349:352, 1978.
- 145) Broecker, W.S., T-H. Peng, *Applications of atom counting to oceanography*, Conf. Radiocarbon Dating Accel., proc. 1, 294:313, 1978.
- 146) Hesslein, R., D. Schindler, G.W. Kipphut, W.S. Broecker, P.H. Santschi, *Geochemical analysis of trace elements in lakes of the Experimental Lakes area*, Ontario, Canada. Intl. Cong. on Sedimentology 10, vol. 1 (A-L), 304, 1978.

1979 9 (155)

- 147) Broecker, W.S., and H.G. Ostlund, *Property distributions along the $s_q = 26.8$ isopycnal in the Atlantic Ocean*, J. Geophys. Res., v. 84, 1145:1154, 1979.
- 148) Peng, T.H., W.S. Broecker, G. Mathieu, Y.H. Li and A.E. Bainbridge, *Radon evasion rates in the Atlantic and Pacific Oceans as determined during the GEOSECS program*, J. Geophys. Res., v. 84, 2471:2486, 1979.
- 149) Bender, M., R. Fairbanks, F. Taylor, R. Matthews, J. Goddard, W.S. Broecker, *Uranium-series dating of the Pleistocene reef tracts of Barbados, West Indies*, Geol. Soc. Amer. Bull., Pt. 1, v. 90, 577:594, 1979.
- 150) Broecker, W.S., *Revised estimate for the radiocarbon age of North Atlantic Deep Water*, J. Geophys. Res., v. 84, 3218:3226, 1979.
- 151) Broecker, W.S., T. Takahashi, H. Simpson, T. Peng, *Fate of fossil fuel carbon dioxide and the global carbon budget*, Science, v. 206, 409:418, 1979.
- 152) Peng, T.H., W.S. Broecker and W.H. Berger, *Rates of benthic mixing in deep sea sediment as determined by radioactive tracers*, Quaternary Res., v. 11, 141:149, 1979.
- 153) Quay, P.D., W.S. Broecker, R.H. Hesslein, E.J. Fee, D.W. Schindler, *Whole lake tritium spikes to measure horizontal and vertical mixing rates*, I.A.E.A., Panel Proc. Ser. STI/PUB/511, 175-193, 1979.
- 154) Hesslein, R.H., R.D. Quay, M. Thomas, W.S. Broecker, *A whole lake gas exchange experiment using carbon-14 and radon-222 as tracers*, I.A.E.A., Panel Proc. Ser. STI/PUB/511, 251-254, 1979.
- 155) Hesslein, R.H., D.W. Schindler, W.S. Broecker, G. Kipphut, *Fates of metal radiotracer additions in experimental enclosures in lakes and in a whole lake*, I.A.E.A., Panel Proc. Ser. STI/PUB/511, 261-271, 1979.

1980 17 (172)

- 156) Sarmiento, J.L., W.S. Broecker, *Ocean floor 222 Rn standing crops in the Atlantic and Pacific oceans*, Earth Planet. Sci. Lett. v.49, no. 2, 341:350, 1980.
- 157) Broecker, W.S., T-H. Peng, *The distribution of bomb-produced tritium and radiocarbon at GEOSECS Sta. 347 in the eastern North Pacific*, GEOSECS collected papers, 1976:79, Earth Planet. Sci. Lett., v. 49, no. 2, 453:462, 1980.

Broecker's CV

- 158) Broecker, W.S., T. H. Peng, and T. Takahashi, *A strategy for the use of bomb-produced radiocarbon as a tracer for the transport of fossil fuel CO₂ into the deep-sea source regions*, Earth Planet. Sci. Lett., v. 49, 463:468, 1980.
- 159) Broecker, W.S., T. Takahashi, and M. Stuiver, *Hydrography of the Central Atlantic-II Waters beneath the Two-Degree Discontinuity*, Deep Sea Res., v. 27, 397:419, 1980.
- 160) Broecker, W.S., T.H. Peng and T. Takahashi, *The Bay of Bengal - a major nutrient source for the deep Indian Ocean*, Earth Planet. Sci. Lett., v. 49, 506:512, 1980.
- 161) Broecker, W.S., *The distribution of 3-He anomalies in the deep Atlantic*, Earth Planet. Sci. Lett., v. 49, 513:519, 1980.
- 162) Broecker, W.S., T.H. Peng, G. Mathieu, R. Hesslein and T. Torgersen, *Gas exchange rate measurements in natural system*, Radiocarbon, v. 22, 676:683, 1980.
- 163) Peng, T-H., and W.S. Broecker, *Gas exchange rates for three closed-basin lakes*, Limnol. Oceanog. v. 25, 789:796, 1980.
- 164) Broecker, W.S., T.H. Peng, and R. Engh, *Modeling the carbon system*, Radiocarbon, v. 22, 565:598, 1980.
- 165) Broecker, W.S. and T.H. Peng, *Seasonal variability in the ¹⁴C/¹²C ratio for surface ocean water*, Geophys. Res. Lett., v. 7, 1020:1022, 1980.
- 166) Broecker, W.S. and T. Takahashi, *Hydrography of the Central Atlantic-III. The North Atlantic deep-water complex*, Deep-Sea Res., v. 27, 591:613, 1980.
- 167) Takahashi, T., W.S. Broecker, S.R. Werner and A. Bainbridge, *Carbonate chemistry of the surface waters of the world oceans, in: Isotope Marine Chemistry*, (E.D. Goldberg, Y. Horibe and K. Saruhashi, eds.) 291-326. Uchida Rokakuho Publ., Tokyo, 1980.
- 168) Quay, P.D., W.S. Broecker, R. Hesslein and D.W. Schindler, *Vertical diffusion rates determined by tritium tracer experiments in the thermocline and hypolimnion of two lakes*, Limnol. & Oceanog., v. 25, 201:218, 1980.
- 169) Santschi, P.H., W.S. Broecker, Y. Li, J. Bell and S. Carson, *Radioactive and stable trace metals in Narragansett Bay, R.I., in: Natural Radiation Environment III*, (T.F. Gesell and W.M. Lowder, eds.), 514-528, 1980.
- 170) Sarmiento, J. and W.S. Broecker, *Ocean floor Rn-222 standing crops in the Atlantic and Pacific Oceans*, Earth Planet. Sci. Lett., v. 49, 341:350, 1980.
- 171) Broecker, W.S., *Status of C 13/ C 12 research on tree rings, in: Proceedings of the Intl. meeting on stable isotopes in tree-ring research*, G. Jacoby, Ed., 69, 1980.
- 172) Santschi, P.H., W.S. Broecker, *228 Ra in the Central Indian and Wharton basins of the Indian Ocean*, EOS, v. 61, no. 46, 987:988, 1980.

1981 7 (179)

- 173) Broecker, W.S., *Geochemical tracers and ocean circulation, in: Evolution of Physical Oceanography*, eds., B.A. Warren and C. Wunsch, 434-460, MIT Press, Cambridge, MA, 1981.
- 174) Takahashi, T., W.S. Broecker and A. Bainbridge, *Supplement to the alkalinity and total carbon dioxide concentration in the world oceans*, Carbon Cycle Modeling, Scope 16, (B. Bolin, ed.) J. Wiley & Sons, 159:199, 1981.

Broecker's CV

- 175) Broecker, W.S. and T.H. Peng, *A strategy for the development of an improved model for the uptake of fossil fuel CO₂ by the ocean*, in: Carbon Cycle Modeling, Scope 16, (B. Bolin, ed.) J. Wiley & Sons, 223:226, 1981.
- 176) Takahashi, T., W.S. Broecker, A.E. Bainbridge, *The alkalinity and total carbon dioxide concentration in the world oceans*, in: Carbon Cycle Modeling, Scope 16, 271:286, 1981.
- 177) Broecker, W.S. and T. Takahashi, *Hydrography of the Central Atlantic-IV, Intermediate waters of Antarctic origin*, Deep-Sea Res., 28A:177:193, 1981.
- 178) Broecker, W.S., *Glacial to interglacial changes in ocean and atmosphere chemistry*, in: *Climatic Variations and Variability: Facts & Theories*, (A. Berger, ed.) 111:121, D. Reidel Pub. Co., Holland, 1981.
- 179) Stuiver, M., A. Rebell, J.C. White, W.S. Broecker, *Radioisotopes; isotopic indicators of age/growth in tropical trees*, Bulletin, Yale University School of Forestry and Env'l. Studies, 75:82, 1981.

1982 6 (185)

- 180) Broecker, W.S., *Glacial to interglacial changes in ocean chemistry*, Prog. Oceanogr., v. 11, 151:197, 1982.
- 181) Torgersen, T., G. Mathieu, R. Hesslein and W.S. Broecker, *Comparison of the Rn-222 and He-3 gas exchange methods in a small lake*, J. Geophys. Res., v. 87, 546:556, 1982.
- 182) Broecker, W.S., *Ocean chemistry during glacial time*, Geochim. Cosmochim. Acta, v. 46, 1689:1705, 1982.
- 183) Broecker, W.S. and T.H. Peng, *Tracers in the Sea*, Eldigio Press, Palisades, N.Y., 690, pp., 1982.
- 184) Torgersen, T., G. Mathieu, R. Hesslein and W.S. Broecker, *Gas exchange dependency on diffusion coefficient: direct Rn-222 and He-3 comparisons in a small lake*, J. Geophys. Res., v. 87, 546:556, 1982.
- 185) Sarmiento, J.L., C.G. Rooth, W.S. Broecker, *Radium 228 as a tracer of basin wide processes in the abyssal ocean*, Jour. Geophys. Research v. 87, no. 12, 9694:9698, 1982.

1983 5 (190)

- 186) Peng, T.-H., W.S. Broecker, H.D. Freyer and S. Trumbore. *A deconvolution of the tree ring based ¹³C record*, J. Geophys. Res., v. 88(C6), 3609:3620, 1983.
- 187) Broecker, W.S., *The Ocean*, Scientific American, v. 249, no. 3, 146:161, 1983.
- 188) Santschi, P. H., P. Bower, U.P. Nyfeller, A. Azevedo, and W.S. Broecker, *Estimates of the resistance to chemical transport posed by the deep-sea boundary layer*, Limnol. Oceanogr., v. 28, no. 5, 899:912, 1983.
- 189) Bloom, A.L. W.S. Broecker, J.M. Chappell, R.K. Matthews, K.J. Mesolla, *Quaternary sea-level fluctuation on a tectonic coast; new ²³⁰Th/²³⁴U dates from the Huon Peninsula, New Guinea*, Intl. Geol. Correlation Programme, China Natl. Comm., 4:15, 1983.
- 190) Broecker, W.S., *El oceano*, Investigacion y Ciencia 86, 90-101, 1983.

1984 12 (202)

- 191) Broecker, W.S. and T.-H. Peng, *Gas Exchange Measurements in Natural Systems; in "Gas Transfer at Water Surfaces"*, Eds., W. Brutsaert and G.H. Jirka, D. Reidel Pub. Co. Holland, 479:493, 1984.
- 192) Santschi, P.H., U.P. Nyfeller, P. O'Hara, M. Buchholtz and W.S. Broecker, *Radiotracer uptake on the sea floor: Results from the MANOP chamber deployments in the eastern Pacific*, Deep-Sea Res., v. 31, no. 5, 451:468, 1984.

Broecker's CV

- 193) Broecker, W.S. *Terminations: in Milankovitch and Climate*, Part 2, Eds. A.L. Berger, et al., D. Reidel Pub. Co., Holland, 687-698, 1984.
- 194) Broecker, W.S. and T. Takahashi, *Is there a tie between atmospheric CO₂ content and ocean circulation? In "Climate Processes and Climate Sensitivity"*, Geophys. Monograph 29, Maurice Ewing v.5, Eds. J.E. Hansen and T. Takahashi, AGU, Washington, D.C., 314:325, 1984.
- 195) Broecker, W.S. and T.-H. Peng, *The Climate-Chemistry Connection: in "Climate Processes and Climate Sensitivity"*, Geophys. Monograph 29, Maurice Ewing V5, Eds. J.E. Hansen and T. Takahashi, AGU, Washington, D.C. 327:336, 1984.
- 196) Li, Y.H., T.-H. Peng, W.S. Broecker and H.G. Ostlund, *The average mixing coefficient for the oceanic thermocline*, Tellus, 36B, 212:217, 1984.
- 197) Peng, T.-H. and W.S. Broecker, *Ocean Life Cycles and the Atmospheric CO₂ content*, J. Geophys. Res. v. 89, 8170:8180, 1984.
- 198) Broecker, W.S., *Carbon dioxide circulation through ocean and atmosphere*, Nature, v. 308, 602, 1984.
- 199) Broecker, W.S., A. Mix, M. Andree, H. Oeschger, *Radiocarbon measurements on coexisting benthic and planktic foraminifera shells; potential for reconstructing ocean ventilation times over the past 20,000 years*, in: Proceedings of the Third Intl. Symp. on Accel. Mass Spectrometry, Anderson, H.H., S.T. Picraux, Eds., 331:339, 1984.
- 200) Andree, M., J. Beer, H. Oeschger, W.S. Broecker, A. Mix, N. Ragano, P. O'Hara, G. Bonani, H. J. Hofmann, E. Morenzone, M. Nessi, M. Suter, W. Woelfli, *14 C measurements on foraminifera of deep sea core V28-238 and their preliminary interpretation*, in: Proceedings of the Third Intl. Symp. on Accelerator Mass Spectrometry, Anderson, H.H., S.T. Picraux, eds., 340:345, 1984.
- 201) Peng, T.-H., W.S. Broecker, *The impacts of bioturbation on the age difference benthic and planktonic foraminifera in deep sea sediments*, in: Proceedings of the Third Intl. Symp. on Accelerator Mass Spectrometry, Anderson, H.H., S.T. Picraux, eds., 346:352, 1984.
- 202) Broecker, W.S., T.-H. Peng, *The climate-chemistry connection*, in: Geophysical Monograph 29, 327:336, 1984.
- 1985** 13 (215)
- 203) Broecker, W.S., D. Peteet and D. Rind, *Does the ocean-atmosphere have more than one stable mode of operation*, Nature, v. 315, 21:25, 1985.
- 204) Broecker, W.S., T.-H. Peng, H.G. Ostlund and M. Stuiver, *The distribution of bomb radiocarbon*, J. Geophys. Res. v. 90, 6953:6970, 1985.
- 205) Broecker, W.S., T. Takahashi and T. Takahashi, *Sources of flow patterns of deep waters as deduced from potential temperature, salinity and initial phosphate concentration*, J. Geophys. Res., v. 90, 6925:6939, 1985.
- 206) Takahashi, T., W.S. Broecker and S. Langer, *Redfield ratio based on chemical data from isopycnal surfaces*, J. Geophys. Res., v. 90, 6907:6924, 1985.
- 207) White, J.W.C., E.R. Cook, J.R. Lawrence and W.S. Broecker, *The D/H ratios of sap in trees: Implications for water sources and tree ring D/H ratios*, Geochim. Cosmochim. Acta, v. 49, 237:246, 1985.
- 208) Wanninkhof, R., J.R. Ledwell and W.S. Broecker, *Gas exchange wind speed relation measured with sulfur hexafluoride on a lake*, Science, v. 227, 1224:1226, 1985.

Broecker's CV

- 209) Peng, T.-H. and W.S. Broecker, *The utility of multiple tracer distributions in calibrating models for uptake of anthropogenic CO₂ by the ocean thermocline*, J. Geophys. Res., v. 90, 7023:7035, 1985.
- 210) Broecker, W.S., C. Rooth and T.-H. Peng, *Ventilation of the deep northeastern Atlantic*, J. Geophys. Res., v. 90, 6940:6944, 1985.
- 211) Somayajula, B.L.K., W.S. Broecker and J. Goddard, *Dating Indian Corals by U-Decay-Series methods*, Quat. Res., v. 24, 235:239, 1985.
- 212) Herczeg, A.L., W.S. Broecker, R.F. Anderson, *A new method for monitoring temporal trends in the acidity of fresh waters*, S. Schiff, D.W. Schindler, Nature, v.315, no. 6015, 133:135, 1985.
- 213) Andree, M, J. Beer, H. Oeschger, A. Mix, W. S. Broecker, N. Ragano, P. O'Hara, G. Bonani, H.J. Hofmann, E. Morenzoni, M. Nessi, M. Suter, W. Wolfli, in: *The carbon cycle and atmospheric CO₂; natural variations Archean to present*, Sundquist, E, W.S. Broecker, eds., Geophysical Monograph 32, 143:153, 1985.
- 214) Takahashi, T. J. Olafsson, W.S. Broecker, J. Goddard, D.W. Chapman and J. White, *Seasonal variability of the carbon-nutrient chemistry in the ocean area west and north of Iceland*, Rit Fiskideildar, no. 9, 20:36, 1985.
- 215) Andrée, M., J. Beer, H. Oeschger, A. Mix, W. Broecker, N. Ragano, P. O'Hara, G. Bonani, H.J. Hofmann, E. Morenzoni, M. Nessi, M. Suter, and W. Wölfli, *Accelerator Radiocarbon ages on foraminifera separated from deep-sea sediments*, reprinted from The Carbon Cycle and Atmospheric CO₂: Natural Variations Archean to Present, Geophysical Monograph 32, American Geophysical Union, 1985.
- 1986** 13 (228)
- 216) Andree, M., H. Oeschger, W.S. Broecker, N. Beavan, A. Mix, G. Bonani, H.J. Hofmann, E. Morenzoni, M. Nessi, M. Suter and W. Wolfli, *AMS radiocarbon dates on foraminifera from deep sea sediments*, Radiocarbon, v. 28, 424:428, 1986.
- 217) Broecker, W.S., *Oxygen isotope constraints on surface ocean temperatures*, Quat. Res., v. 26, 121:134, 1986.
- 218) Clark, D.L., M. Andree, W.S. Broecker, A. Mix, et al., *Arctic ocean chronology confirmed by accelerator ¹⁴C dating*, Geophys. Res. Lett., v. 13, 319:321, 1986.
- 219) Koster, R., J. Jouzel, R. Suozzo, G. Russell, W. Broecker, D. Rind, and P. Eagleson, *Global sources of local precipitation as determined by the NASA/GISS GCM*, Geophys. Res. Lett., v. 13, 121:124, 1986.
- 220) Broecker, W.S. and T.-H. Peng, *Carbon Cycle: 1985, Glacial to interglacial changes in the operation of the global carbon cycle*, Radiocarbon, 28, No. 2A, 309:327, 1986.
- 221) Broecker, W.S., W.C. Patzert, J.R. Toggweiler, M. Stuiver, *Hydrography, chemistry and radioisotopes in the southeast Asian basins*, J. Geophys. Res., v. 91, 14345:14354, 1986.
- 222) Broecker, W.S., J.R. Ledwell, T. Takahashi, R. Weiss, L. Merlivat, L. Memery, T.H. Peng, B. Jahne and K.O. Munnich, *Isotopic versus micrometeorologic ocean CO₂ fluxes: A serious conflict*, J. Geophys. Res. v. 91, 10517:10527, 1986.
- 223) Andree, M., H. Oeschger, W. Broecker, N. Beavan, M. Klas, A. Mix, G. Bonani, M. Suter, W. Wolfli, T.H. Peng, *Limits on the ventilation rate for the deep ocean over the last 12,000 years*, Climate Dynamics, 1986, v. 1, 53:62.
- 224) Broecker, W.S., T.-H. Peng, and G. Ostlund, *The distribution of bomb tritium in the ocean*. J. Geophys. Res. v. 91, 14331:14344, 1986.

Broecker's CV

- 225) Broecker, W.S., *How to Build a Habitable Planet*, ELDIGIO Press, Palisades, New York, 291, 1986.
- 226) Rind, D., D. Peteet, W. Broecker, A. McIntyre, and W. Ruddiman, *The impact of cold North Atlantic sea surface temperatures on climate: Implications to the Younger Dryas cooling (11-10K)* Climate Dynamics v. 1, 3:33, 1986.
- 227) Ledwell, J.R., A.J. Watson, and W.S. Broecker, *A deliberate tracer experiment in Santa Monica Basin*, Nature, v. 323, 322:324, 1986.
- 228) Buchholtz, M.R., P.H. Santschi, W.S. Broecker, *Comparison of radiotracer K D values from batch equilibration experiments with in-situ determinations in the deep-sea using the MANOP Lander; the importance of geochemical mechanisms in controlling ion uptake and migration*, Elsevier Appl. Sci. Publ., 192:206, 1986.

1987 11 (238A)

- 229) Broecker, W.S., Commentary, *Unpleasant surprises in the greenhouse?* Nature, v. 328, 123:126, 1987.
- 230) Peng, T.-H., and W.S. Broecker, *C/P Ratios in Marine Detritus*, Global Biogeochemical Cycles, v. 1, 155:161, 1987.
- 231) Broecker, W.S., and T.H. Peng, *The role of CaCO₃ compensation in the glacial to interglacial atmospheric CO₂ change*, Global Biochem. Cycles, v. 1, 15:39, 1987.
- 232) Peng, T.-H., T. Takahashi, W.S. Broecker, and J. Olafsson, *Seasonal variability of carbon dioxide, nutrients and oxygen in the northern North Atlantic surface water: Observations and a model*, Tellus, 39b, 439:458, 1987.
- 233) Wanninkhof, R., J.R. Ledwell, W.S. Broecker and M. Hamilton: *Gas exchange-wind speed relationship on Mono and Crowley Lake, California*, J. Geophys. Res., v. 92, 14,567:14,580, 1987.
- 234) Broecker, W.S., T.-H. Peng, *The Oceanic Salt Pump: Does It Contribute to the Glacial-Interglacial Difference in Atmospheric CO₂ Content?* Global Biogeochemical Cycles, v. 1, 251:259, 1987.
- 235) Broecker, W.S., M. Andree, W. Wolfli, and H. Oeschger, *Timing of the Glacial-Holocene Transition in the South China Sea*, Nature, v. 333, 156:158, 1987.
- 236) Broecker, W.S., *The Biggest Chill*, Natural History Magazine, 74-82, Oct. 1987.
- 237) Jouzel, J., G.L. Russell, R.J. Suozzo, R. Koster, J.W.C. White and W.S. Broecker, *Simulations of the HDO and H₂O Atmospheric Cycles using the NASA GISS General Circulation model: The Seasonal Cycle for Present-Day Conditions*, J. Geophys. Res. v. 92, 14,739:14,760, 1987.
- 238) Broecker, W.S., *Paleocean circulation rates as determined from accelerator radiocarbon measurements on hand-picked foraminifera*, Terra Cognita v. 7, no.1, 43:44, 1987.
- 238A) Broecker, W.S., *Beating the Big Battalions: Publishers are not Serving Some of their Authors or Student Customers as Well as They Might Think*, Nature, **Vol. 326**, p. 207, March 12, 1987.

1988 9 (245B)

- 239) Broecker, W.S., M. Andree, G. Bonani, W. Wolfli, H. Oeschger and M. Klas, *Can the Greenland climatic jumps be identified in records from ocean and land?* Quaternary Res., v. 30, 1:6, 1988.
- 240) Broecker, W.S., R. Wanninkhof, A. Herczeg, T.-H. Peng, G. Mathieu, S. Stine, and M. Stuiver, *The radiocarbon budget for Mono Lake; an unsolved mystery*, Earth & Planet. Sci. Lett., v. 88, 16:26, 1988.

Broecker's CV

- 241) Broecker, W.S., M. Andree, W. Wolfli, H. Oeschger, G. Bonani, J. Kennett, and D. Peteet, *The chronology of the last deglaciation; Implications to the cause of the Younger Dryas event*. *Paleoceanography*, v. 3, 1:19, 1988.
- 242) Broecker, W.S., M. Andree, M. Klas, G. Bonani, W. Wolfli and H. Oeschger, *New Evidence from the South China Sea for an Abrupt Termination of the Last Glacial Period about 13,100 Years Ago*, *Nature*, v. 333, No. 6169, 156:158, 1988.
- 243) Broecker, W.S., M. Klas, N. Beavan, G. Mathieu, A. Mix, M. Andree, H. Oeschger, W. Wolfli, M. Suter, G. Bonani, H.J. Hofmann, M. Nessi, and E. Morenzoni, *Accelerator Mass Spectrometry Radiocarbon Measurements on Marine Carbonate Samples from Deep Sea Cores and Sediment Traps*, *Radiocarbon*, v. 30, 261:295, 1988.
- 244) Broecker, W.S., D. Oppo, W. Curry, M. Andree, W. Wolfli, and G. Bonani, *Radiocarbon based chronology for the $^{18}O/^{16}O$ record for the last deglaciation*, *Paleoceanography*, v. 3, 509:515, 1988.
- 245) Broecker, W.S., M. Andree, H. Oeschger, W. Wolfli, G. Bonani, M. Klas, A. Mix, and W. Curry, *Preliminary estimates of the radiocarbon age of deep water in the glacial ocean*, *Paleoceanography*, v. 3, no. 6, 659:669, 1988.
- 245A) Broecker, W.S. and S. Stine, *Mono Lake's Radiocarbon Budget: An Unsolved Enigma*, *EOS*, **Vol. 69**, No. 23, June 7, 1988.
- 245B) Broecker, W.S., M. Andree, G. Bonani, W. Wolfli, M. Klas, A. Mix, and H. Oeschger, *Comparison Between Radiocarbon Ages Obtained on Coexisting Planktonic Foraminifera*, *Paleoceanography*, **Vol. 3**, No. 6, pp. 647-657, December 1988.
- 1989** 8 (253)
- 246) Broecker, W.S., *Some thoughts about the radiocarbon budget for the glacial Atlantic*, *Paleoceanography*, v. 4, 213:220, 1989.
- 247) Koster, R., W.S. Broecker, J. Jouzel, B. Suozzo, G. Russell, D. Rind, J.W.C. White, *The global geochemistry of bomb produced tritium; general circulation models compared to the real world, accepted*, *Jour. Geophys. Res.*, v. 94, 18, 305:18,326, 1989.
- 248) Broecker, W.S., *The salinity contrast between the Atlantic and Pacific Oceans during glacial time*, *Paleoceanography*, v.4, 207:212, 1989.
- 249) Wahlen, M., N. Tanaka, R. Henry, B. Deck, J. Zeglen, J.S. Vogel, J. Southon, A. Shemesh, R. Fairbanks, and W. S. Broecker, *Carbon-14 methane sources and in atmospheric methane: The contribution from fossil carbon*. *Science*, v. 245, 286:290. 1989.
- 250) Broecker, W.S., J. Kennett, S. Trumbore, G. Bonani, and W. Wolfli, *The routing of Laurentide ice-sheet meltwater during the Younger Dryas cold event*, *Nature*, v. 341, 319:321, 1989.
- 251) Broecker, W.S., S. Trumbore, G. Bonani, W. Wolfli and M. Klas, *Anomalous AMS radiocarbon ages for foraminifera from high deposition rate ocean sediments*, *Radiocarbon*, v. 31, 157:162, 1989.
- 252) Broecker, W.S., and G.H. Denton, *The role of ocean-atmosphere reorganizations in glacial cycles*, *Geochimica et Cosmochimica Acta*, v. 53, 2465:2501, October, 1989.
- 253) Broecker, W.S., and T-H. Peng, *The Cause of Glacial to Interglacial Atmospheric CO₂ Change: A Polar Alkalinity Hypothesis*, *Biogeochemical Cycles*, v. 3 215:239, 1989.

Broecker's CV

1990 10 (263)

- 254) Broecker, W.S. and G.H. Denton, *What Drives Glacial Cycles?* Scientific **V. 262**, No. 1, 48-56, American, Jan. 1990.
- 255) Anderson, R.F., Y. Lao, W.S. Broecker, S.E. Trumbore, H.J. Hofmann, and W. Wolfli. *Boundary scavenging in the Pacific Ocean: a comparison of ^{10}Be and ^{231}Pa .* Earth & Planet. Sci. Lett., 96:287-304, 1990.
- 256) Peng, T.-H., T.L. Ku, J. Southon, C. Measures, and W. S. Broecker, *Factors Controlling the Distribution of ^{10}Be and ^9Be in the Ocean.* In: **From Mantle to Meteorites, A Garland of Perspectives: A Festschrift for Devendra Lal**, edited by K. Gopalan, V. K. Gaur, B. L. K. Somayajulu, and J. D. Macdougall, Indian Academy of Sciences, Bangalore, India. p.201-204, 1990.
- 257) Broecker, W.S., T.-H. Peng, J. Jouzel, and Gary Russell, *The magnitude of global fresh water transports of importance to ocean circulation*, Climate Dynamics, v. 4, 73:79, 1990.
- 258) Broecker, W.S., M. Klas, E. Clark, S. Trumbore, G. Bonani, W. Wolfli and S. Ivy, *Accelerator Mass Spectrometric radiocarbon measurements on foraminifera shells from deep sea cores*, Radiocarbon v. 32, no. 2, 119:133, 1990.
- 259) Broecker, W.S., *Salinity history of the Northern Atlantic during the last deglaciation*, Paleoceanography, v. 5, no. 4, 459:467, August 1990.
- 260) Broecker, W.S., G. Bond, M. Klas, G. Bonani, and W. Wolfli, *A salt oscillator in the glacial North Atlantic? 1. The Concept*, Paleoceanography, vol. 5, No. 4, 469:477, August 1990.
- 261) Broecker, W.S., T.-H. Peng, S. Trumbore, G. Bonani, W. Wolfli, *The distribution of radiocarbon in the glacial ocean*, Biogeochemical Cycles v. 4, 103:117, 1990.
- 262) Birchfield, G.E., W.S. Broecker, *A salt oscillator in the glacial northern Atlantic? Part II: A 'Scale Analysis' Model*, Paleoceanography, vol. 5, no. 6, 835-843, December 1990.
- 263) Broecker, W.S., Comment on "*Iron Deficiency Limits Phytoplankton Growth in Antarctic Waters*" by John H. Martin et al. Global Biogeochemical Cycles, v. 4, 3:4, 1990.

1991 10 (273)

- 264) Broecker, W.S., A. Virgilio, and T.-H. Peng, *Radiocarbon age of water in the deep Atlantic revisited*, Geophys. Res. Lett., vol. 18, no. 1, 1:3, Jan. 1991.
- 265) Peng, T.-H., and Broecker, W.S., *Dynamical limitations on the Antarctic iron fertilization strategy*, Nature, v. 349, 227:229, 1991.
- 266) Broecker, W.S., S. Blanton, and T. Takahashi, W. Smethie and G. Ostlund, *Radiocarbon decay and oxygen utilization in the deep Atlantic Ocean*, Global Biogeochemical Cycles, v. 5, 87:117, 1991.
- 267) Jouzel, J., R.D. Koster, R.J. Suozzo, G.L. Russell, J.W.C. White, and W.S. Broecker, *Simulations of the H_2O and H_2^{18}O atmospheric cycles using the NASA/GISS General Circulation Model: Sensitivity experiments for present-day conditions*, Journal of Geophys. Research, vol. 96, no. D4, 7495:7507, 1991.
- 268) Broecker, W.S., M. Klas, E. Clark, G. Bonani, S. Ivy and W. Wolfli, *The influence of CaCO_3 dissolution on core top radiocarbon ages for deep-sea sediments*, Paleoceanography, vol. 6, no. 5, 593:608, 1991.
- 269) Broecker, W.S., *Keeping Global Change Honest*, Global Biogeochemical Cycles, vol. 5, no. 3, 191:192, 1991.

Broecker's CV

- 270) Toggweiler, J.R., K. Dixon, and W.S. Broecker, *The Peru upwelling and the ventilation of the South Pacific thermocline*, Journal Geophys. Research, vol. 96, no. 20, 467:497, 1991.
- 271) Broecker, W.S., *The Great Ocean Conveyor*, Oceanography, v. 4, 79:89, 1991.
- 272) Peng, T.-H., and W.S. Broecker, *Factors limiting atmospheric CO₂ reduction by iron fertilization*, Limnology and Oceanography. vol. 36, no. 8. December 1991.
- 273) Oxburgh, R., W.S. Broecker, and R.H. Wanninkhof, *The Carbon Budget of Mono Lake*, Global Biogeochemical Cycles, v. 5, no. 4, 359:372, 1991.
- 1992** 23 (294B)
- 274) Broecker, W.S., G. Bond, M. Klas, E. Clark, J. McManus, *Origin of the Northern Atlantic's Heinrich events*, Climate Dynamics, v. 6, 265:273, 1992.
- 275) Broecker, W.S., *Global Warming on Trial*, Natural History, 6:11, April 1992.
- 276) Broecker, W.S. and T.-H. Peng, *Interhemispheric transport of CO₂ by ocean circulation*, Nature, v.356, 587:589, 1992.
- 277) Zauker, F. and W.S. Broecker, *The influence of atmospheric moisture transport on the fresh water balance of the Atlantic drainage basin: GCM simulations and observations*, Jour. Geophys. Res. v. 97, 2765:2774, 1992.
- 278) Stute, M., P. Schlosser, J.F. Clark, and W.S. Broecker, *Paleotemperatures in the southwestern United States derived from noble gases in ground water*, Science, v. 256, 1000:1002, 1992.
- 279) Broecker, W.S., Thomas Stocker, *NADW Formation as a branch of the hydrological cycle*, EOS Transactions, American Geophysical Union, v. 73, no. 18, 202:203, 1992.
- 280) Broecker, W.S., *The strength of the Nordic heat pump, 13,500 to 9500 B.P.*, in *The Last Deglaciation: Absolute and Radiocarbon Chronologies*, ed., E. Bard and W.S. Broecker, NATO ASI Series, v. 12, Springer-Verlog, 173, 1992.
- 281) Broecker, W.S. and T.-H. Peng, *Dynamic constraints on CO₂ uptake by an iron-fertilized Antarctic*, *Modeling the earth system*, from OIES Global Change Institute, ed. Dennis Ojima, 77:105, 1992.
- 282) Broecker, W.S., *Defining the boundaries of the BOA warm and YD cold isotope episodes*, Quaternary Research, v. 38, 135:139, 1992.
- 283) Broecker, W.S., Bard, E., *The Last Deglaciation: Absolute and Radiocarbon Chronologies*, NATO ASI Series (Series 1: Global Environmental Change, Vol.2), 1992.
- 284) Lao, Y., R.F. Anderson, W.S. Broecker, S.E. Trumbore, H.J. Hofmann, W. Wolfli, *Increased production of cosmogenic ¹⁰Be during the last glacial maximum*, Nature, v. 357, 576:578, 1992.
- 285) Broecker, W.S., F. Woodruff, *Discrepancies in the oceanic carbon isotope record for the last fifteen million years?* Garrels Memorial Collection, Geochimica et Cosmochimica Acta, v. 56, 3259:3264, 1992.
- 286) Peng, T.-H., W.S. Broecker and H.G. Östlund, *Dynamic constraints on CO₂ uptake by an iron-fertilized Antarctic, in modeling the Earth system*. Papers arising from the 1990 OIES Global Change Institute, ed. by Dennis Ojima, 77-105, UCAR, 1992.
- 287) Broecker, W.S. and E. Maier-Reimer, *The influence of air and sea exchange on the carbon isotope distribution in the sea*, Biogeochemical Cycles, v. 6, 315:320, 1992.

Broecker's CV

- 288) Lao, Y., R.F. Anderson, W.S. Broecker, S.E. Trumbore, H.J. Hofmann, W. Wolfli, *Transport and burial rates of ^{10}Be and ^{231}Pa in the Pacific Ocean during the Holocene period*, Earth and Planetary Science Letters, v. 113, 173:199, 1992.
- 289) Broecker, W.S., and Jeff Severinghaus, *Global Change: Diminishing oxygen*, Nature, v. 358, 710:711, 1992.
- 290) Broecker, W.S., *Upset for Milankovitch theory*, Nature, vol. 359, 779:780, 1992.
- 291) Bond, G., H. Heinrich, W. S. Broecker, L. Labeyrie, J. McManus, J. Andrews, S. Huon, R. Jantschik, S. Clasen, C. Simet, K. Tedesco, M. Klas, G. Bonani and S. Ivy, *Evidence for massive discharges of icebergs into the North Atlantic ocean during the last glacial period*, Nature, v. 360, 245:249, 1992.
- 292) Stocker, T.F., D.G. Wright and W.S. Broecker, *The influence of high-latitude surface forcing on the global thermohaline circulation*, Paleoceanography, v. 7, no.5, 529:541, 1992.
- 293) Bond, G., Broecker, W.S., R. Lotti and J. McManus, *Abrupt color changes in isotope stage 5 in North Atlantic deep sea cores: Implications for rapid change of climate-driven events*, in Start of a Glacial, NATO ASI Series, v. 3, ed. by G.J. Kukla and E. Went, Springer-Verlag, 1992.
- 294) Lao, Yong, R.F. Anderson, W.S. Broecker, *Boundary scavenging and deep-sea sediment dating: Constraints from excess ^{230}Th and ^{231}Pa* , Paleoceanography, v. 7 no. 6, 783:798, 1992.
- 294A) Broecker, W.S., *Discovery of a large offset in the radiocarbon time scale*, Eos, vol. 73, no. 3, pg. 32, 1992.
- 294B) Peng, T.-H., W.S. Broecker, *Reconstruction of radiocarbon distribution in the glacial ocean (in Radiocarbon after four decades: An interdisciplinary perspective, Editors: R.E. Taylor, A. Long, and R. Kra. Springer-Verlag, New York, 1992), pgs. 75-92, 1992.*
- 1993** 11 (305)
- 295) Lao, Yong, R.F. Anderson, W.S. Broecker, H.J. Hofmann, W. Wolfli, *Particulate fluxes of ^{230}Th , ^{231}Pa and ^{10}Be in the northeastern Pacific Ocean*, Geochimica et Cosmochimica Acta, v. 57, no. 1, 205:217, 1993.
- 296) Harrison, K., W.S. Broecker and G. Bonani, *A strategy for estimating the impact of CO_2 fertilization on soil carbon storage*, Global Biogeochemical Cycles, v.7, no.1 69:80, 1993.
- 297) Broecker, W.S., *An oceanographic explanation for the apparent carbon isotope-cadmium discordancy in the glacial Antarctic?* Paleoceanography, v. 8, no. 2, 137:139, 1993.
- 298) Broecker, W.S., G. Bonani, C. Chen, E. Clark, S. Ivy, M. Klas, T.-H. Peng, *A search for an Early Holocene CaCO_3 Preservation Event*, Paleoceanography, v. 8, no. 3, 333:339, 1993.
- 299) Peng, T.-H., W.S. Broecker, E. Maier-Reimer, *The Distribution of ^{32}Si in the World Ocean; Model compared to observation*, Global Biogeochemical Cycles, v. 7, no. 2,463:474, 1993.
- 300) Bond, G., W. Broecker, S. Johnsen, J. Jouzel, L. Labeyrie, J. McManus and G. Bonani, 220, 1995.
- 301) Broecker, W.S., and T.-H. Peng, *Does the ^{13}C Budget Provide a Useful Constraint on the Uptake of Fossil Fuel CO_2 by the Ocean?*, Global Biogeochemical Cycles, V. 7, No. 3, 619:626, 1993.
- 302) Oxburgh, R. and W.S. Broecker, *Pacific Carbonate Dissolution Revisited*, Palaeogeography, Palaeoclimatology, Palaeoecology, V. 103, No. ½, 31:40, 1993.
- 303) Harrison, K., W.S. Broecker, G. Bonani, *The Effect of Changing Land Use on Soil Radiocarbon*, Science, V. 262, 725:726, 1993.

Broecker's CV

- 304) Broecker, W.S. and T.-H. Peng, *Interhemispheric Transport of SCO_2 Through the Ocean*, NATO SI Series, V. I 15, The Global Carbon Cycle, ed. By M. Heimann, 551:570, Springer-Verlag, 1993.
- 305) Broecker, W.S. and T.-H. Peng, *What caused the glacial to interglacial CO_2 change?* NATO SI Series, v. I 15, The Global Carbon Cycle, ed. by M. Heimann, 94:115, Springer-Verlag, 1993.

1994 12 (317)

- 306) White, J.W.C., J. Lawrence, W.S. Broecker, *Modeling and interpreting D/H ratios in tree rings: A test case of white Pine in the northeastern United States*, Geochim. Cosmochim. Acta, v. 58, no 2, 851:862, 1994.
- 307) Stocker, T.F. and W.S. Broecker, *Observation and modeling of North Atlantic deep water formation and its variability. Introduction*, Jour. Geophys. Research, v. 99, no. C6, 12,317,1994.
- 308) Broecker, W.S., G. Bond, J. McManus, *Heinrich events: Triggers of ocean circulation change?* Aussois - NATO volume, Springer-Verlag, 1994.
- 309) Zaucker, F., T.F. Stocker, and W.S. Broecker, *Atmospheric freshwater fluxes and their effect on the global thermohaline circulation*, Jour. Geophys Research, Special Issue on North Atlantic Deep Water Formation: Observ. and Modeling, v.99, no. C6,12,443:12,457,1994.
- 310) Broecker, W.S., T.-H. Peng, *The stratospheric contribution to the bomb radiocarbon inventory*, Global Biogeochemical Cycles, v.8, no. 3, 377:384,1994.
- 311) Broecker, W.S., *Ocean Circulation: An unstable superconveyor*, Nature, v. 367, 414:415,1994.
- 312) McManus, J.F., G.C. Bond, W.S. Broecker, S. Jobnsen, L. Labeyrie & S. Higgins, *High-resolution climate records from the North Atlantic during the last interglacial*, Nature, v. 371, 326:329,1994.
- 313) Stocker, T.F., W.S. Broecker and D.G. Wright, *Carbon uptake experiments with a zonally-averaged global ocean circulation model*, Tellus, 46B, 103:122, 1994.
- 314) Broecker, W.S., *Is Earth Climate Poised to Jump Again?* Geotimes, 16:18,1994.
- 315) Broecker, W.S., *Massive iceberg discharges as triggers for global climate change*, Nature, v. 372, 421:424,1994.
- 316) Severinghaus, J, W.S. Broecker, W.F. Dempster, T. MacCallum and M. Wahlen, *Oxygen Loss in Biosphere 2*, EOS, Transactions, AGU, v. 75, 33, 35:37,1994.
- 317) Gwiazda, R.H., and W.S. Broecker, *The separate and combined effects of temperature, soil pCO_2 and organic acidity on silicate weathering in the soil environment: Formulation of a model and results*, Global Biogeochemical Cycles, v. 8, no. 2, 141:155,1994.

1995 9 (326)

- 318) Heinze, C., and W.S. Broecker, *Closing off the southern ocean surface*, Paleoceanography, v.10, no.1, 49:58, 1995.
- 319) Peng, T-H, and W.S. Broecker, *Estimate of interhemispheric ocean carbon transport based on 211 $^{92}CO_2$ and nutrient distribution*, (TM. Powell and J.H. Steele, eds.), Chapman & Hall, NY, Ecological Time Series, 28:47, 1995.

Broecker's CV

- 320) Sanyal, A., N.G. Hemming, G.N. Hanson, W.S. Broecker, *Evidence for a higher pH in the glacial ocean from boron isotopes in foraminifera*, Nature, v. 373, 234:236, 1995.
- 321) Farley, K.A., E. Maier-Reimer, P. Schiosser and W.S. Broecker, and G. Bonani, *Constraints on mantle ^3He fluxes and deep-sea circulation from an oceanic general circulation model*, Jour, Geophys. Res., v.100, no. B3, 3829:3839,1995.
- 322) Stute, M., J.F. Clark, P. Schlosser, and W.S. Broecker, *A 30,000 yr continental paleotemperature record derived from noble gases dissolved in groundwater from the San Juan Basin, New Mexico*, Quaternary Research, 43, 209:220, 1995.
- 323) Broecker, W.S., T.-H. Peng, S. Sutherland, G. Ostlund, and W. Smethie, *Oceanic radiocarbon: Separation of the Natural and Bomb Components*, Global Biogeochemical Cycles, v. 9, no. 2, 263:288, 1995.
- 324) Broecker, W.S., *Cooling the tropics*, Nature, 376, 212:213, 1995.
- 325) Stute, M., M. Forster, H. Frischkorn, A. Serejo, J.F. Clark, P. Schlosser, W.S. Broecker and G. Bonani, *Cooling of Tropical Brazil (5°C) During the Last Glacial Maximum*, Science, 269, 379:383, 1995.
- 326) Broecker, W.S., *Chaotic Climate*, Scientific American, V. 273, pgs. 62-68, Nov. 1995
- 1996** 13 (339A)
- 327) Gwiazda, R.H., Hemming, S.R., and W.S. Broecker, *Tracking the sources of icebergs with lead isotopes: The provenance of ice-rafted debris in Heinrich layer 2*, Paleoceanography, vol. 11, no. 1 pgs. 77-93, 1996.
- 328) Broecker, W.S., *Paleoclimatology*, Geotimes, February 1996.
- 329) Gwiazda, R.H., Hemming, S.R., and W.S. Broecker, *Provenance of icebergs during Heinrich event 3 and the contrast to their sources during other Heinrich episodes*, Paleoceanographic Currents, vol. 11, no. 4 pgs. 371-78, 1996.
- 330) Broecker, W. S., *Glacial Climate in the Tropics*, Science, vol. 272, pgs. 1902-4,1996.
- 331) Severinghaus, J., Bender, M. L., Keeling, R. F., and Broecker, W. S., *Fractionation of soil gases by diffusion of water vapor, gravitational settling, and thermal diffusion*, Geochimica et Cosmochimica Acta, Elsevier Science Ltd., Pergamon, vol. 60, no. 6, pgs. 1005-18,1996.
- 332) Broecker, W.S., *The biosphere and me*, GSA Today, Vol. 6, No. 7, pp. 1-7, 1996.
- 333) Broecker, W.S., *The once and future climate*, Natural History, Vol. 105, No. 9, pgs. 30-39,1996.
- 334) Sanyal, A., N.G. Hemming, W.S. Broecker, D.W. Lea, H.J. Spero, and G.N. Hanson, *Oceanic pH control on the boron isotopic composition of foraminifera: Evidence from culture experiments*, Paleoceanography, Vol. 11, No. 5, pgs. 513-517,1996.
- 335) Lin, J.C., W.S. Broecker, R.F. Anderson, S. Hemming, J.L. Rubenstone, and G. Bonani, *New $^{230}\text{Th}/\text{U}$ and ^{14}C ages from Lake Lahontan carbonates, Nevada, USA, and a discussion of the origin of initial thorium*, Geochimica et Cosmochimica Acta, Vol. 160, No. 15, pp. 2817-2832, 1996.
- 336) Rutberg, R.L., D.S. Schimel, I. Hajdas, and W.S. Broecker, *The effect of tillage on soil organic matter using ^{14}C : A case study*, Radiocarbon, Vol. 38, No. 2, pp. 209-217, 1996.
- 337) Gwiazda, R.H., S.R. Hemming, W.S. Broecker, T. Onsttot, C. Mueller, *Evidence from $^{40}\text{Ar}/^{39}\text{Ar}$ for a Churchill Province source of ice-rafted amphiboles in Heinrich Layer 2*, Journal of Glaciology, Vol. 42, No. 142, pp. 440-446, 1996.

Broecker's CV

338) Severinghaus, J.P., W.S. Broecker, T.-H. Peng, and G. Bonani, *Transect along 24°N latitude of ¹⁴C in dissolved inorganic carbon in the subtropical North Atlantic Ocean*, Radiocarbon, Vol. 36, No. 3, pp. 407-414, 1996.

339) Broecker, W.S., *Et tu, O₂?*, 21st Century, Issue 2.1, pp. 7 and 14 Fall 1996.

339A) Broecker, W.S., *The Coming Warmup: No Time for Complacency*, 21st Century Columbia University, Issue 1.3, pp.5-6, Winter 1996

1997 9 (348)

340) Broecker, W.S., *Will our ride into the greenhouse future be a smooth one?*, GSA Today, Vol. 7, No. 5, pp. 1-7, 1997.

341) Broecker, W.S. and A. Sanyal, *Magnitude of the CaCO₃ dissolution events marking the onset of times of glaciation*, vol. 12, No. 4, pp. 530-532, Paleoclimatology, August, 1997.

342) Severinghaus, J.P., R.F. Keeling, B.R. Miller, R.F. Weiss, B. Deck, and W.S. Broecker, *Feasibility of using sand dunes as archives of old air*, vol. 102, No. D14, pp. 16,783-16,792, Journal of Geophysical Research, July 27, 1997.

343) Broecker, W.S., *Thermohaline Circulation, The Achilles Heel of our Climate System: Will Manmade CO₂ Upset the Current Balance?*, vol. 278, pp. 1582-1588, Science, Nov. 28, 1997.

344) Broecker, W.S., *Mountain Glaciers: Records of Atmospheric Water Vapor Content?*, vol. 11, No. 4, pp. 589-597, Global Biogeochemical Cycles, December, 1997.

345) Broecker, W.S., *Our burden of responsibility*, (essay) "A Better Future for the Planet Earth: Lectures by the Winners of the Blue Planet Prize", pp. 208-210, The Asahi Glass Foundation, Japan, first edition, October, 1997.

346) Broecker, W.S., *Will our ride into the Greenhouse future be a smooth one?*, (lecture) "A Better Future for the Planet Earth: Lectures by the Winners of the Blue Planet Prize", pp. 211-221, The Asahi Glass Foundation, Japan, first edition, October, 1997.

347) Broecker, W.S., *Future directions of paleoclimate research*, Quaternary Science Reviews, vol. 16, pp. 821-825, 1997.

348) Broecker, W.S., *Protection against excessive global warming*, Earth Matters, pp.4-5, Winter 1997-98.

1998 14 (361A)

349) Lin, J.C., W.S. Broecker, S.R. Hemming, I. Hajdas, R.F. Anderson, G.I. F. Smith, M. Kelley, and G. Bonani, *A reassessment of U-Th and ¹⁴C ages for late-glacial high-frequency hydrological events at Searles Lake, California*, Quaternary Research, vol. 49, pp. 11-23, 1998.

350) McManus, J.F., R.F. Anderson, W.S. Broecker, M.Q. Fleisher, and S.M. Higgins, *Radiometrically determined sedimentary fluxes in the sub-polar North Atlantic during the last 140,000 years*, Earth and Planetary Science Letters, vol. 155, pp. 29-43, 1998.

351) Broecker, W.S., *Paleocean circulation during the last deglaciation: A bipolar seesaw?*, Paleoclimatology, vol. 13, no. 2, pp. 119-121, April 1998.

Broecker's CV

- 352) Broecker, W.S., S. Peacock, S. Walker, R. Weiss, E. Fahrbach, M. Schroeder, U. Mikolajewicz, C. Heinze, R. Key, T.-H. Peng, and S. Rubin, *How much deep water is formed in the Southern Ocean?*, JGR, vol. 103, no. C8, pp. 15,833-15,843, July 15, 1998.
- 353) Donahue, D.J., W. Beck, W.S. Broecker, G. Bonani, A.J.T. Jull, I. Hajdas, E. Malotki, and G. Burr, *Ambiguities in direct dating of rock surfaces using radiocarbon measurements*, Science, June 26, 1998.
- 354) Broecker, W.S. and G. M. Henderson, *The sequence of events surrounding Termination II and their implications for the cause of glacial-interglacial CO₂ changes*, Paleoceanography, vol. 13, no. 4, pp. 352-364, August 1998.
- 355) Broecker, W.S., D. Peteet, and I. Hajdas, *Antiphasing between rainfall in Africa's Rift Valley and North America's Great Basin*, Quaternary Research, vol. 50, pp. 12-20, 1998.
- 356) Broecker, W.S. and A. Sanyal, *Does Atmospheric CO₂ Police the Rate of Chemical Weathering?* **Vol. 12**, No. 3, pp. 403-408, Global Biogeochemical Cycles, September, 1998.
- 357) Broecker, W.S., *The End of the Present Interglacial: How and When?* **Vol. 17**, pp. 689-694, Quaternary Science Reviews, 1998.
- 358) Broecker, W.S., *Flujos*, (in Spanish) pp. 89-93, Atlantica Internacional, 1998.
- 359) Hemming, S.R., P.E. Biscaye, W.S. Broecker, N.G. Hemming, M. Klas, and I. Hajdas, *Provenance change coupled with increased clay flux during deglacial times in the Western Equatorial Atlantic*, Palaeogeography, Palaeoclimatology, Palaeoecology, **V. 142**, pp. 217-230, 1998.
- 360) McCormac, F.G., A.G. Hogg, T.F.G. Higham, J. Lynch-Stieglitz, W.S. Broecker, M.G.L. Baillie, J. Palmer, L. Xiong, J.R. Pilcher, D. Brown, and S.T. Hoper, *Temporal Variation in the Interhemispheric ¹⁴C Offset*, Geophysical Research Letters, **V. 25**, No. 9, pp. 1321-1324, May 1, 1998.
- 361) Hemming, S.R., W.S. Broecker, W.D. Sharp, G.C. Bond, R.H. Gwiazda, J.F. McManus, M. Klas, and I. Hajdas, *Provenance of the Heinrich layers in Core V28-82, Northeastern Atlantic: ⁴⁰Ar-³⁹Ar ages of ice-rafted Hornblende, Pb Isotopes in feldspar grains and Nd-Sr-Pb Isotopes in the fine sediment fraction*, EPSL, v. 164, pp. 317-333, 1998.
- 361A) Broecker, W.S., *The Reminiscences of Wallace S. Broecker (December 29, 1995)*, pp.1-124, in the Oral History Collection of Columbia University (hereafter OHCCU), 1998.
- 1999** 17 (378)
- 362) Fleisher, M., T. Liu, W.S. Broecker, and W. Moore, *A Clue Regarding the Origin of Rock Varnish*, Geophysical Research Letters, **vol. 26**, no. 1, pp. 103-106, January 1, 1999.
- 363) Broecker, W.S., *What if the Conveyor Were to Shut Down? Reflections on a Possible Outcome of the Great Global Experiment*, GSA Today, **vol. 9**, no. 1, pp. 1-6, January, 1999.
- 364) Broecker, W.S., *Climate Change Prediction* (letter to Science), Science, **vol. 283**, January 8, 1999.
- 365) Broecker, W.S., E. Clark, I. Hajdas, G. Bonani, and D. McCorkle, *Core-top ¹⁴C Ages as a Function of Water Depth on the Ontong-Java Plateau*, Paleoceanography, **vol. 14**, no. 1, pp. 13-22, February, 1999.
- 366) Greene, A.M. and W.S. Broecker, *Swiss glacier recession since the Little Ice Age: Reconciliation with climate records*, Geophysical Research Letters, **Vol. 26**, No. 13, pp. 1909-1912, July 1, 1999.
- 367) Broecker, W.S., K. Matsumoto, E. Clark, I. Hajdas, and G. Bonani, *Radiocarbon Age Differences between Coexisting Foraminiferal Species*, Paleoceanography, **Vol. 14**, No. 4, pp. 431-436, August, 1999.

Broecker's CV

- 368) Peacock, S., W. Jenkins, R. Key, and W.S. Broecker, *Assessing the importance of subtropical waters in ventilating the Equatorial Pacific thermocline: a combined transient-tracer approach*, International WOCE Newsletter, No. 35, pp. 18, 21, 23-24, June 1999.
- 369) Broecker, W.S. and E. Clark, *CaCO₃ Size Distribution: A Paleo Carbonate Ion Proxy*, *Paleoceanography*, **Vol. 14**, No. 5, pp. 596-604, October, 1999.
- 370) Broecker, W.S., S. Sutherland, and T.-H. Peng, *A Possible 20th-Century Slowdown of Southern Ocean Deep Water Formation*, *Science*, **Vol. 286**, p. 1132-1135, 5 November, 1999.
- 371) Higgins, S., W.S. Broecker, R.F. Anderson, D.C. McCorkle, and D. Timothy *Excess Sedimentation along the Equator in the Western Pacific*, *Geophysical Research Letters*, **Vol. 26**, No. 23, p. 3489-3492, December 1, 1999.
- 372) Broecker, W.S., *The Role of the Ocean in Climate Change: Past and Future*, Lecture given at Luso-American Development Foundation, Lisbon, Portugal, 30 pp., March 9, 1999.
- 373) Broecker, W.S., J. Lynch-Stieglitz, D. Archer, M. Hofmann, E. Maier-Reimer, O. Marchal, T. Stocker, and N. Gruber, *How Strong is the Harvardton Bear Constraint?*, *Global Biogeochemical Cycles*, **Vol. 13**, No. 4, p. 817-820, December, 1999.
- 374) Broecker, W.S. and S. Peacock, *An ecologic explanation for the Permo-Triassic carbon and sulfur isotope shifts*, *Global Biogeochemical Cycles*, **Vol. 13**, No. 4, p. 1167-1172, December, 1999.
- 375) Broecker, W.S., E. Clark, D.C. McCorkle, T.-H. Peng, I. Hajdas, and G. Bonani, *Evidence for a reduction in the carbonate ion content of the deep sea during the course of the Holocene*, *Paleoceanography*, **Vol. 14**, No. 6, p. 744-752, December, 1999.
- 376) Peacock, S., M. Visbeck, and W.S. Broecker, *Deep water formation rates inferred from global tracer distributions: An inverse approach*, in AGU Monograph entitled (2000) **Inverse Methods in Global Biogeochemical Cycles**, edited by Kasibhatla, P., Heimann, M., Rayner, P., Mahowald, N., Prinn, R. G., & Hartley, Geophysical Monograph Series, Volume 114, approximately 324 pp., American Geophysical Union, Washington, D.C.114, p. 185-194, 1999.
- 377) Hofmann, M., W.S. Broecker, and J. Lynch-Stieglitz, *Influence of a [CO₂(aq)] Dependent Biological C-Isotope Fractionation on Glacial ¹³C/¹²C Ratios in the Ocean*, submitted to *Global Biogeochemical Cycles*, **Vol. 13**, No. 4, pp. 873-883, December, 1999.
- 378) Broecker, W.S., *Better Living Through Geochemistry: Tracking Chemical Clues to Investigate the Earth, Lamont-Doherty Earth Observatory: Twelve Perspectives on the First Fifty Years 1949-1999*, Laurence Lippsett, Editor, Office of Communications and External Relations, L-DEO of Columbia University, publishers, 1st Edition, Chapter 5, pp. 59-73, 1999.
- 2000** 14 (392)
- 379) Broecker, W.S., *Was a Change in Thermohaline Circulation Responsible for the Little Ice Age?*, *Proceedings of the National Academy of Sciences (PNAS)*, Vol. 97, No. 4, pp. 1339-1342, February 15, 2000.
- 380) Broecker, W.S., *Poking the Angry Beast*, *Earth Matters*, pp. 7-9, Winter 1999/2000.
- 381) Liu, T. and W.S. Broecker, *How Fast Does Rock Varnish Grow?*, **V. 28**, no. 2, p. 183-186, *Geology*, February 2000.
- 382) Broecker, W.S., E. Clark, J. Lynch-Stieglitz, W. Beck, L.D. Stott, I. Hajdas, and G. Bonani, *Late Glacial Diatom Accumulation at 9°S in the Indian Ocean*, *Paleoceanography*, **vol. 15**, No. 3, pp. 348-352, June 2000.

Broecker's CV

- 383) Hemming, S.R., R.H. Gwiazda, J.T. Andrews, W.S. Broecker, A.E. Jennings, and T.C. Onstott, *⁴⁰Ar/³⁹Ar and Pb-Pb Study of Individual Hornblende and Feldspar Grains from Southeastern Baffin Island Glacial Sediments: Implications for the Provenance of the Heinrich Layers*, Canadian Journal of Earth Sciences, **Vol. 37**, No. 6, pp.879-890, 2000.
- 384) Liu, T, W.S. Broecker, J.W. Bell, and C.W. Mandeville, *Terminal Pleistocene Wet Event Recorded in Rock Varnish from Las Vegas Valley, Southern Nevada*, Palaeogeography, Palaeoclimatology, Palaeoecology, **Vol. 161**, pp. 423-433, 2000.
- 385) Broecker, W.S., *Abrupt Climate Change: Causal Constraints Provided by the Paleoclimate Record*, Earth Science Reviews, **Vol. 51**, pp. 137-154, 2000.
- 386) Broecker, W.S. and S. Sutherland, *The Distribution of Carbonate Ion in the Deep Ocean: Support for a Post-Little Ice Age Change in Southern Ocean Ventilation*, *G³*, **Vol. 1**, No. 2000GC000039, July 10, 2000.
- 387) Broecker, W.S., *Energy Prudence*. In: **Science for Survival and Sustainable Development, the Proceedings of the Study-Week of the Pontifical Academy of Sciences 12-16 March 1999**, Editors of the Proceedings: V.I. Keilis-Borok, and M. Sánchez Sorondo, Pontifical Academy of Sciences, pp. 145-159, 2000.
- 388) Broecker, W.S. and T.-H. Peng, *Comparison of ³⁹Ar and ¹⁴C Ages for Waters in the Deep Ocean*. In: **Accelerator Mass Spectrometry: Proceedings of the Eight International Conference on Accelerator Mass Spectrometry, Palais Auersperg, Vienna, Austria, 6-10 September 1999**, Editors: W. Kutschera, R. Golser, A. Priller, and B. Strohmaier. Nuclear Instruments and Methods in Physics Research B, **172**, pp. 473-478, 2000.
- 389) Broecker, W.S., A. Sanyal, and T. Takahashi, *The Origin of Bahamian Whitings Revisited*, Geophysical Research Letters, **Vol. 27**, No. 22, pp. 3759-3760, November 15, 2000.
- 390) Hemming, S.R., G.C. Bond, W.S. Broecker, W.D. Sharp, and M. Klas-Mendelson, *Evidence from ⁴⁰Ar/³⁹Ar Ages of Individual Hornblende Grains for Varying Laurentide Sources of Iceberg Discharges 22,000 to 10,500 yr B.P.*, Quaternary Research, **Vol. 54**, No. 3, November 2000.
- 391) Archer, D., G. Eshel, A. Winguth, and W.S. Broecker, R. Pierrehumbert, M. Tobis, and R. Jacob, *Atmospheric ρ CO₂ Sensitivity to the Biological Pump in the*, Global Biogeochemical Cycles, **Vol. 14**, No. 4, pp. 1219-1230, December, 2000.
- 392) Broecker, W.S., *Converging Paths Leading to the Role of the Oceans in Climate Change*, Annual Review of Energy and the Environment, 25:1-19, 2000.
- 2001** 20 (411a)
- 393) Greene, A.M. and W.S. Broecker, *Utility of Glacier Observations in Climate Change Detection and Attribution Studies*, Reprinted from the preprint volume of the **12th Symposium on Global Change Climate Variations**, 14-19 January 2001, Albuquerque, New Mexico by the AMS, Boston, Massachusetts.
- 394) Broecker, W.S., *A Dusty Past*, Reprinted from the preprint volume of the **12th Symposium on Global Change Climate Variations**, 14-19 January 2001, Albuquerque, New Mexico by the AMS, Boston, Massachusetts, pp. 175-176
- 395) Broecker, W.S., *Was the Medieval Warm Period Global?*, Science, **Vol. 291**, No. 5508, pp. 1497-1499, February 23, 2001.
- 396) Broecker, Wallace S., *Are We Headed for a Thermohaline Catastrophe?*, Chapter 4, **Geological Perspectives of Global Climate Change**, American Association of Petroleum Geologists Studies In Geology #47 (Lee C. Gerhard, William E. Harrison, and Bernold M. Hanson, Editors), pp. 83-95, 2001.

Broecker's CV

- 397) Broecker, W.S. and T. Liu, *Rock Varnish: Recorder of Desert Wetness*, GSA Today, **Vol. 11**, No. 8, pp. 4-10, August 2001.
- 398) Broecker, W.S., R.F. Anderson, E. Clark, and M. Fleisher, *Record of Sea-Floor CaCO₃ Dissolution in the Equatorial Pacific*, G³ (Geochemistry, Geophysics, Geosystems), Vol. 2, No. 2001GC000151, June 28, 2001.
- 399) Broecker, W.S., C. Langdon, T. Takahashi, and T.-H. Peng, *Factors Controlling the Rate of CaCO₃ Precipitation on Great Bahama Bank*, Global Biogeochemical Cycles, **Vol. 15**, No. 3, pp. 589-596, September 2001.
- 400) Broecker, W.S., *Glaciers That Speak in Tongues*, Natural History Magazine, **Vol. 110**, No. 8, pp. 60-69, October 2001.
- 401) Broecker, W.S. and E. Clark, *An Evaluation of Lohmann's Foraminifera-Weight Dissolution Index*, Paleooceanography, **Vol. 16**, No. 5, pp. 531-534, October 2001.
- 402) Broecker, W.S., *The Big Climate Amplifier Ocean Circulation-Sea Ice-Storminess-Dustiness-Albedo*, in AGU's Geophysical Monograph Series The Oceans and Rapid Change: Past, Present, and Future Geophysical Monograph 126, 2001.
- 403) Matsumoto, K., W.S. Broecker, E. Clark, D.C. McCorkle, W.R. Martin, and I. Hajdas, *Can Deep Ocean Carbonate Preservation History Inferred from Atmospheric pCO₂ Account for ¹⁴C and %CaCO₃ Profiles on the Ontong-Java Plateau?*, Earth & Planetary Science Letters, **Vol. 192**, pp. 319-329, 2001.
- 404) Broecker, W.S., J. Lynch-Stieglitz, E. Clark, I. Hajdas, and G. Bonani, *What Caused the Atmosphere's CO₂ Content to Rise During the Last 8000 Years?*, G³, **Vol. 2**, No. 2001GC000177, October 2001.
- 405) Broecker, W.S. and E. Clark, *A Dramatic Atlantic Dissolution Event at the Onset of the Last Glaciation*, G³, **Vol. 2**, No. 2001GC000185, November 2001.
- 406) Moore, W., T. Liu, W.S. Broecker, and A. Wright, *Factors Influencing ⁷Be Accumulation on Rock Varnish*, Geophysical Research Letters, **Vol. 28**, No. 23, pp. 4475-4478, December 1, 2001.
- 407) Broecker, W.S., *A Ewing Symposium on the Contemporary Carbon Cycle*, Global Biogeochemical Cycles, **Vol. 15**, No. 4, pp. 1031-1033, December 2001.
- 408) Broecker, W.S. and E. Clark, *Glacial to Holocene Redistribution of Carbonate Ion in the Deep Sea*, Science, **Vol. 294**, pp. 2152-2155, December 7, 2001.
- 409) Broecker, W.S. and S.R. Hemming, *Climate Swings Come Into Focus*, Science, **Vol. 294**, pp. 2308-2309, December 14, 2001.
- 410) Broecker, W.S. and E. Clark, *Reevaluation of the CaCO₃ Size Index Paleocarbonate Ion Proxy*, Paleooceanography, Vol. 16, No. 6, pp. 669-671, December 2001.
- 411) Sutherland, S.C., W.S. Broecker, and T. Takahashi, *Stability of the Boundary Separating Antarctic Bottom Water from North Atlantic Deep Water in the Western South Atlantic*, Geophysical Research Letters, **Vol. 28**, No. 22, pp. 4219-4222, November 15, 2001.

Broecker's CV

411a) Wallace S. Broecker: *Carbon Futures*, Chapter 5 in: Geosphere-Biosphere Interactions and Climate; page 66 – 80, Lennart O. Bengtsson and Claus U. Hammer, eds., New York: Cambridge University Press. 2001.

2002 7 (417A)

412) Broecker, W.S. and E. Clark, *A Major Dissolution Event at the Close of MIS 5e in the Western Equatorial Atlantic*, *G³*, **Vol. 3**, No. 2, February 5, 2002.

413) Hemming, S.R., C.M. Hall, P.E. Biscaye, S.M. Higgins, G.C. Bond, J.F. McManus, D.C. Barber, J.T. Andrews, and W.S. Broecker, *⁴⁰Ar/³⁹Ar Ages and ⁴⁰Ar* concentrations of Fine-Grained Sediment Fractions from North Atlantic Heinrich Layers*, *Chemical Geology*, **Vol. 182**, pp. 583-603, 2002.

414) Broecker, W.S. and E. Clark, *Carbonate Ion Concentration in Glacial-Age Deep Waters of the Caribbean Sea*, *G³*, **Vol. 3**, No. 3, 10.1029/2000GC000231, March 27, 2002.

415) Broecker, W.S., *Dust: Climate's Rosetta Stone*, *Proceedings of the American Philosophical Society*, Vol. 146, No. 1, pp. 77-80, March 2002.

416) Greene, A.M., R. Seager, and W.S. Broecker, *Tropical Snowline Depression at the Last Glacial Maximum: Comparison with Proxy Records Using a Single-Cell Tropical Climate Model*, *Journal of Geophysical Research*, 10.1029/2001JD000670, April 19, 2002.

417) Kukla, G.J., M.L. Bender, J.-L. de Beaulieu, G. Bond, W.S. Broecker, et al, *Last Interglacial Climates*, *Quaternary Research*, Vo. 58, pp. 2-13, 2002.

417A) Broecker, W.S., *Constraints on the Glacial Operation of the Atlantic Ocean's Conveyor Circulation*, *Israel Journal of Chemistry*, **Vol. 42**, pp. 1-14, 2002.

2003 10 (427)

418) Langdon, C., W. Broecker, D. Hammond, E. Glenn, K. Fitzsimmons, S. G. Nelson, T.-H. Peng, I. Hajdas and G. Bonani, *Effect of Elevated CO₂ on the Community Metabolism of an Experimental Coral Reef*, *Global Biogeochemical Cycles*, Vol. 17, No. 1, 1011, doi:10.1029/2002GB001941, 2003

419) Broecker, W.S. and E. Clark, *Pseudo Dissolution of Marine Calcite*, *Earth and Planetary Science Letters*, **Vol. 208**, pp. 291-296, 2003.

420) Broecker, W.S., *Does the Trigger for Abrupt Climate Change Reside in the Ocean or in the Atmosphere?*, *Science*, **Vol. 300**, No. 5625, pp. 1519-1522, June 6, 2003.

421) Broecker, W.S. and E. Clark, *Holocene Atmospheric CO₂ Increase as Viewed from the Seafloor*, *Global Biogeochemical Cycles*, **Vol. 17**, No. 2, doi: 10.1029/2002GB001985, 2003.

422) Broecker, W.S. and E. Clark, *Glacial-Age Deep Sea Carbonate Ion Concentration*, *Geochemistry, Geophysics, and Geosystems (G³)*, DOI number 10.1029/2003GC000506, **Vol. 4**, No. 6, June, 5 2003.

423) Broecker, W.S. E. Clark, and A. Droxler, *Shell Weights from Intermediate Depths in the Caribbean Sea*, *Geochemistry, Geophysics, and Geosystems (G³)*, **Vol. 4**, No. 7, doi:10.1029/2002GC000491, July 15, 2003.

424) Broecker, W.S. and E. Clark, *CaCO₃ Dissolution in the Deep Sea: Paced by Insolation Cycles*, *Geochemistry, Geophysics, Geosystems (G³)*, **Vol. 4**, No. 7, doi: 10.1029/2002GC000450, July 15, 2003.

425) Broecker, W.S. and E. Clark, *The Role of Sonification in Shell Weight Measurements*, *Geochemistry, Geophysics, Geosystems (G³)*, doi:10.1029/2003GC000569, **Vol. 4**, No. 11, November 7, 2003.

Broecker's CV

426) Broecker, W.S. (2003) The Oceanic CaCO₃ Cycle, pp.529-549. In *The Oceans and Marine Geochemistry* (ed. H. Elderfield) Vol. 6 *Treatise on Geochemistry* (eds. H.D. Holland and K.K. Turekian), Elsevier-Pergamon, Oxford.

427) Broecker, W.S. (2003) Radiocarbon, pp.245-260. In *The Atmosphere* (ed. R.F. Keeling) Vol. 4 *Treatise on Geochemistry* (eds. H.D. Holland and K.K. Turekian), Elsevier-Pergamon, Oxford.

2004 3 (430)

428) Broecker, W.S. and E. Clark, *Shell Weights from the South Atlantic*, Geochemistry, Geophysics, Geosystems, **Vol. 5**, No. 3, Q03003m DOI 10.1029/2003GC000625, 11 March 2004

429) Broecker, W.S. E. Clark, I. Hajdas, and G. Bonani, *Glacial Ventilation Rates for the Deep Pacific Ocean*, Paleoceanography, **Vol. 19**, PA2002, doi:10.1029/2003PA000974, 2004.

430) Broecker, W.S., S. Barker, E. Clark, I. Hajdas, G. Bonani, and L. Stott, *Ventilation of Glacial Deep Pacific Ocean*, Science, **Vol. 306**, p. 1169-1172, 12 November 2004.

2005 3 (433)

431) Denton, G.H., R.B. Alley, G.C. Comer, and W.S. Broecker, *The Role of Seasonality in Abrupt Climate Change*, Quaternary Science Reviews, **Vol. 24**, p. 1159-1182, 2005.

432) Lowell, T.V., T.G. Fisher, G.C. Comer, I. Hajdas, N. Waterson, K. Glover, H.M. Loope, J.M. Schaefer, V. Rinterknecht, W.S. Broecker, G. Denton, and J.T. Teller, *Testing the Lake Agassiz Meltwater Trigger for the Younger Dryas*, EOS, **Vol. 86**, No. 40, 4 October 2005.

433) Broecker, W.S., *Global Warming: Take Action or Wait?*, Jökull, No. 55, p. 1-16, 2005.

2006 7 (440)

434) Broecker, W.S. and T.F. Stocker, *The Holocene CO₂ Rise, Anthropogenic or Natural?*, EOS, **Vol. 87**, No. 3, p. 27, 17 January 2006.

435) Broecker, W., S. Barker, E. Clark, I. Hajdas, and G. Bonani (2006), Anomalous radiocarbon ages for foraminifera shells, Paleoceanography, 21, PA2008, doi:10.1029/2005PA001212.

436) Broecker, W.S., *Global Warming: Take Action or Wait?* Chinese Science Bulletin, **Vol. 51**, No. 9, p. 1017 – 1029, doi:10.1007/s11434-006-1017-4, May 2006 (co-publisher: Springer-Verlag GmbH, ISSN: 1001-6538).

437) Broecker, W.S., *Was the Younger Dryas Triggered by a Flood?*, Science, **Vol. 312**, pp. 1146 – 1148, 26 May 2006.

438) Denton, G.H., W.S. Broecker, and R.B. Alley, *The mystery interval 17.5 to 14.5 kyrs ago*, PAGES News, **Vol. 14**, No. 2, pp. 14 – 16, August 2006.

439) Broecker, W.S., *Abrupt Climate Change Revisited*, Global and Planetary Change, **Vol. 54**, Issues 3 – 4, pp. 211 – 215, December 2006.

440) Marchitto, T. M., and W. S. Broecker (2006), *Deep water mass geometry in the glacial Atlantic Ocean: A review of constraints from the paleonutrient proxy Cd/Ca*, Geochem. Geophys. Geosyst., 7, Q12003, doi:10.1029/2006GC001323.

Broecker's CV

2007 9 (449)

- 441) Broecker, W., and E. Clark (2007), Is the magnitude of the carbonate ion decrease in the abyssal ocean over the last 8 kyr consistent with the 20 ppm rise in atmospheric CO₂ content?, *Paleoceanography*, 22, PA1202, doi:10.1029/2006PA001311.
- 442) Liu, T. and W.S. Broecker, *Holocene Rock Varnish Microstratigraphy and Its Chronometric Application in the Drylands of Western USA*, *Geomorphology*, Vol. 84, pp. 1 – 21, 2007.
- 443) Broecker, W. S., and S. Barker (2007), *Reply to comment by L. D. Stott on "Anomalous radiocarbon ages for foraminifera shells": A correction to the western tropical Pacific MD9821-81 record*, *Paleoceanography*, 22, PA1212, doi:10.1029/2006PA001393.
- 444) Broecker, W.S., *CO₂ Arithmetic*, *Science*, **Vol. 315**, no. 5817, p. 1371, 9 March 2007.
- 445) Broecker, W.S. and S. Barker, A 190‰ drop in atmosphere's $\Delta^{14}\text{C}$ during the "Mystery Interval" (17.8 to 14.5 kys), *Earth & Planetary Science Letters*, **vol. 256**, pp. 90 – 99, 2007.
- 446) W.S. Broecker and Rik Wanninkhof, *Mono Lake Radiocarbon: The Mystery Deepens*, *EOS*, **Vol. 88**, No. 12, pp. 141-142, 20 March 2007.
- 447) Broecker, W., E. Clark, S. Barker, I. Hajdas, G. Bonani, and E. Moreno (2007), Radiocarbon age of late glacial deep water from the equatorial Pacific, *Paleoceanography*, 22, PA2206, doi:10.1029/2006PA001359.
- 448) Barker, S., W. Broecker, E. Clark, and I. Hajdas (2007), Radiocarbon age offsets of foraminifera resulting from differential dissolution and fragmentation within the sedimentary bioturbated zone, *Paleoceanography*, 22, PA2205, doi:10.1029/2006PA001354.
- 449) Broecker, W.S., *Musings about the Connection Between Thermohaline Circulation and Climate*. In AGU Geophysical Monograph 173, *Past and Future Changes of the Oceans Meridional Overturning Circulation: Mechanisms and Impacts*, Andreas Schmittner, John C. H. Chiang, and Sidney Hemming, eds. AGU Volume on Thermohaline Circulation, 10.1029/173GM17, 2007.

2008 5 (454)

- 450) Liu, T. and W.S. Broecker, *Rock varnish microlamination dating of late Quaternary geomorphic features in the drylands of western USA*, *Geomorphology*, **93**, pp. 501 - 523, 2008.
- 451) Broecker, W. S. (2008), A need to improve reconstructions of the fluctuations in the calcite compensation depth over the course of the Cenozoic, *Paleoceanography*, 23, PA1204, doi:10.1029/2007PA001456
- 452) Broecker, W. (2008), Excess sediment ²³⁰Th: Transport along the sea floor or enhanced water column scavenging?, *Global Biogeochem. Cycles*, 22, GB1006, doi:10.1029/2007GB003057
- 453) Chiu, T.-C. and W.S. Broecker, *Towards Better Paleo-Carbonate Ion Reconstructions – A New Insight Regarding the CaCO₃ Size Index*, *Paleoceanography*, Vol. 23, PA2216, doi:10.1029/2008PA001599, 2008.
- 454) Liu, T. and W.S. Broecker, *Rock Varnish Evidence for Latest Pleistocene Millennial-Scale Wet Events in the Drylands of Western United States*, *Geology*, **v. 36**, no. 5, p. 403-406, doi:10.1130/G24573A/1, May 2008.

IN PRESS

- Broecker, W.S., *Wally's Quest to Understand the Ocean's CaCO₃ Cycle*, *Annual Reviews of Marine Science*, in press, 6 June 2008.

Broecker's CV

SUBMITTED

Broecker, W.S. and J. Quade, *Dryland Hydrology in a Warmer World: Lessons from the Last Glacial Period*, submitted to Quaternary Science Reviews, 6 May 2008.

Denton, G. H. and W.S. Broecker, *Wobbly Ocean Conveyor Circulation During the Holocene?*, revision submitted to Quaternary Science Reviews, 17 March 2008.

Barker, S., W.S. Broecker, E. Clark, and I. Hajdas, *Radiocarbon Age Offsets Resulting from Differential Dissolution in the Sediment Bioturbation Zone*, revision submitted to *Paleoceanography*, November 2006.

Broecker, W.S., E. Clark and S. Barker, *Near Constancy of the Pacific Ocean Surface to Deep $^{14}\text{C}/\text{C}$ Difference over the Last 20 kyrs*, submitted to Earth & Planetary Science Letters.

Broecker, W.S., *The Mysterious ^{14}C Decline*, submitted to the 50th Anniversary of the Radiocarbon, 16 April 2008.

IN PREPARATION

Liu, T. and W.S. Broecker, *Rock Varnish Evidence for Latest Pleistocene Millennial-Scale Wet Events in the Drylands of Western United States*, in preparation.