

Claire L. Parkinson
Senior Scientist/Climatologist
NASA Goddard Space Flight Center

Claire L. Parkinson has been a climatologist at NASA's Goddard Space Flight Center since July 1978, with a research emphasis on polar sea ice and its connections to the rest of the climate system and to climate change. Since April 1993, she has additionally been Project Scientist for the Aqua satellite mission, which launched in May 2002 and is transmitting data on many atmospheric, oceanic, land, and ice variables from its suite of six Earth-observing instruments. Although most of her research has centered on the analysis of sea ice from satellite passive-microwave data and the role of sea ice in the global climate system, she has also developed a numerical model of sea ice, has done field work in both the Arctic and the Antarctic, and is the lead author of an atlas of Arctic sea ice from satellite data and a coauthor of two other sea ice atlases. In addition to her sea ice work and her Aqua Project Scientist role, she has coauthored a university-level textbook on three-dimensional climate modeling, has coedited a book on satellite observations related to global change, and is lead editor of a Data Products Handbook for NASA's Earth Observing System. She has also written an introductory text on examining the Earth with satellite imagery and a book on the history of western science from 1202 to 1930. She speaks frequently to teacher and student groups regarding Earth sciences and satellite remote sensing.

Contact Information

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Education

B.A., Mathematics, Wellesley College, Wellesley, Massachusetts, 1970 (with highest honors).
M.A., Climatology, Ohio State University, Columbus, Ohio, 1974.
Ph.D., Climatology, Ohio State University, Columbus, Ohio, 1977.

Research Experience

Compilation and analysis of sea ice data sets from satellite observations; numerical modeling of sea ice; examination of the role of sea ice in the global climate system; Arctic and Antarctic field work; satellite remote sensing; climate change; climate modeling; history of science and mathematics.

Employment

Research Assistant, Institute of Polar Studies, Ohio State University, Columbus, Ohio, 1972-1974.
Teaching Assistant and Instructor, Department of Geography, Ohio State University, Columbus, Ohio, 1973-1976.
Research Assistant, National Center for Atmospheric Research, Boulder, Colorado, 1976-1978.

Research Scientist, NASA Goddard Space Flight Center, Greenbelt, Maryland, 1978-continuing (Senior Scientist since 1987; Aqua Project Scientist since 1993).

Professional Society Memberships

American Association for the Advancement of Science
 American Meteorological Society (Fellow as of 2001)
 American Polar Society
 Oceanography Society
 Phi Beta Kappa (Fellow as of 1997)

Selected Committee, Panel, and Advisory Board Memberships

- Committee on Polar Meteorology and Oceanography, American Meteorological Society, 1984-1986.
- Science Advisory Group for SIR-B (Shuttle Imaging Radar) Investigations over Greenland and Antarctica, 1985-1986.
- Scientific Colloquium Committee, NASA Goddard Space Flight Center, 1986-1999.
- Committee on the History of Atmospheric Sciences, American Meteorological Society, 1988-1990 (chairman, 1990).
- Sea Ice Specialists Panel, Office of Senator Albert Gore, United States Senate, 1990.
- National Oceanic and Atmospheric Administration (NOAA) Advisory Panel on Climate and Global Change, 1990-1995.
- National Science Foundation (NSF) Review Panel for Research on the Voyage of the *Sovetskiy Soyuz* across the Arctic Basin, 1991.
- Climate Research Committee, National Academy of Sciences, 1994-1996.
- Review Panel for the Byrd Polar Research Center, Ohio State University, 1996.
- Earth Observing System (EOS) Science Executive Committee, 1996-2000.
- Ph.D. Committee for Valerie Louis, University of Maryland, 1997-2003.
- Science Advisory Board, Earth & Sky Radio Program, 1998-continuing.
- Science Advisory Board, Soundprint Media Center's 13-part radio documentary series on Exploring Space Science, 1998-2000.
- Ph.D. Committee for Keith Henderson, Ohio State University, 1998-2002 (and Adjunct Professor, Department of Geological Sciences, Ohio State University).
- Oversight Committee for the educational CD-ROM "Welcome to NASA's Earth Science Enterprise," NASA, final product released in August 1999.
- Ice, Cloud, and land Elevation Satellite (ICESat) Science Operations Readiness Review Board, 2002.
- Science Journalism Awards Television Screening Committee, American Association for the Advancement of Science (AAAS), 2002-2005.
- National Research Council Panel on Climate Variability and Change for Earth Science and Applications from Space: A Community Assessment and Strategy for the Future, 2005-2006.

Journal Editor Positions

- Associate Editor, *Geoscience and Remote Sensing Society Newsletter*, Institute of Electrical and Electronics Engineers (IEEE), 1982-1984.
- Associate Editor, *Annals of Glaciology*, International Glaciological Society, vol. 14, 1989.
- Scientific Editor, *Journal of Glaciology*, International Glaciological Society, 1990-1992.
- Guest Editor, Aqua Special Issue of the *Transactions on Geoscience and Remote Sensing*, Institute of Electrical and Electronics Engineers (IEEE), 2002-2003.

Selected Invited Presentations

- British Antarctic Survey, Cambridge, England, December 1983.
- World Meteorological Organization's Meeting of Experts on Sea Ice and Climate Modeling, Geneva, Switzerland, December 1983.
- National Commission on Space Public Forum, Rayburn House Office Building, Washington, D.C., November 1985.
- World Ocean Circulation Experiment Southern Ocean Workshop, Bremerhaven, West Germany, May 1986.
- Senate Subcommittee on Science, Technology, and Space, United States Senate, Washington, D.C., May 13, 1991 (invited witness, testifying on the importance of sea ice research and of monitoring the sea ice cover).
- Fiftieth Anniversary Symposium, Institute of Low Temperature Science, Hokkaido University, Sapporo, Japan, September 11, 1991 (one of three international invited speakers).
- Discussion Meeting on Antarctica and Environmental Change, The Royal Society, London, May 20, 1992.
- Discussion Meeting on Remote Sensing Techniques in Research on Antarctica, The Ciba Foundation, London, May 22, 1992.
- Earth Day Celebrations, Key School, Annapolis, April 22, 1993 (keynote speaker).
- Latin American Conference on Space and Atmospheric Sciences in Antarctica, Serra Negra, Brazil, November 21, 1994 (keynote speaker).
- International Symposium on Arctic Seas: Currents of Change, New London, Connecticut, October 22, 1998.
- Annual Blue and Gold Banquet and Awards Ceremony, Cub Scouts Pack 411, Saint Mathias Church, Prince George's County, Maryland, February 27, 2000 (keynote speaker).
- U.S. Global Change Research Program Seminar Series, Rayburn House Office Building, Capitol Hill, Washington, D.C., February 28, 2000.
- Smithsonian Associates' course on "Exploring the Whole Earth from Space," S. Dillon Ripley Center, Smithsonian, Washington, D.C., March 6, 2000.
- JASON XIII Frozen Worlds program, National Geographic Society, Washington, D.C., January 30, 2002.
- Kilauea Visitor Center, Hawaii Volcanoes National Park, Hawaii, February 5, 2002.
- Annual meeting of the American Association for the Advancement of Science (AAAS), Boston, Massachusetts, February 16, 2002.
- Earth Science Training Session for U. S. Park Rangers, National Capital Region Headquarters, National Park Service, Washington, D.C., March 15, 2002.
- Pre-launch Aqua press conference, NASA Headquarters, Washington, D.C., April 22, 2002.
- Guest Briefing for the May 4, 2002 launch of the Aqua spacecraft, Rancho Santa Barbara Marriott, Buellton, California, May 3, 2002.
- Flight Operations Team plaque ceremony, Goddard Space Flight Center, Greenbelt, Maryland, August 23, 2002 (keynote speaker).
- Opening Session of the Water Environment Federation annual conference, McCormick Place, Chicago, Illinois, September 30, 2002.
- Sustainable Water Resources Roundtable, Alexandria, Virginia, December 11, 2002.
- Discussion Meeting on the Role of the Southern Ocean in Global Processes, The Royal Society, London, July 14, 2003.
- Teacher Thursday: Global Climate Change, Maryland Science Center, Baltimore, Maryland, October 16, 2003.
- Bowie High School Science Fair Banquet and Awards Ceremony, Bowie High

- School, Bowie, Maryland, February 12, 2004 (keynote speaker).
- Visiting Scholars Program Evening Lecture, James Madison University, Harrisonburg, Virginia, March 23, 2004.
- Annual Conference of White House Fellows, visiting NASA Goddard Space Flight Center, Greenbelt, Maryland, October 2, 2004.
- Goldthwait Lecture, Byrd Polar Research Center, Ohio State University, Columbus, Ohio, November 12, 2004.
- NASA Explorers Institute, Maryland Science Center, Baltimore, Maryland, November 17, 2004.

Selected Meeting Chairmanships

- Chair, Remote Sensing of the Cryosphere session, International Geoscience and Remote Sensing Symposium (IGARSS '81), Institute of Electrical and Electronics Engineers (IEEE), Washington, D.C., June 8-10, 1981.
- Chair, Sea Ice Session, American Meteorological Society's Second Conference on Polar Meteorology and Oceanography, Madison, Wisconsin, March 1988.
- Cochair, Sea Ice Thickness Workshop, New Carrollton, Maryland, November 19-21, 1991.
- Cochair, Contribution of Satellites to Global Climate Modeling session, annual spring meeting of the American Geophysical Union (AGU), Baltimore, Maryland, May 30, 1997.
- Chair, meetings of the Aqua Science Working Group, 1997-continuing.
- Moderator, forum on Space, Physics, and the Possibilities of the Galaxy, Renaissance Weekend, Hilton Head Island, South Carolina, December 30, 2000.
- Chair, plenary session on Variability in the Earth System, Earth Observing System Investigators' Working Group meeting, San Antonio, Texas, October 30, 2001.
- Chair, Aqua plenary session, Earth Observing System Investigators' Working Group (IWG), Ellicott City, Maryland, November 18, 2002.
- Cochair, three Aqua sessions, annual fall meeting of the American Geophysical Union, San Francisco, California, December 9-10, 2003.
- Chair, session on Time Variations and Teleconnections II, International Conference on the "Central Arctic: Battleground of Natural and Man-Made Climate Forcing," Palisades, New York, January 8, 2004.

Selected Other Experience

- Glaciological field work in Antarctica, December 1973-February 1974.
- Sea ice field work in the Bering Sea, February-March 1981.
- Leader, group effort to produce an Arctic sea ice atlas from satellite passive-microwave data, 1984-1987.
- NASA Affiliate for the NASA/USRA Earth System Science Education program at Ohio State University, 1991-1996.
- Project Scientist, Earth Observing System (EOS) Aqua mission (formerly named PM-1), NASA, 1993-continuing.
- Chief Scientist, NASA Expedition to Resolute Bay, Eureka, and the North Pole, April 1999.
- Member, Editorial Board for the Earth Observatory, a popular, award-winning internet website (earthobservatory.nasa.gov; recognized by *Popular Science* as one of the 50 best science and technology websites, repeat winner of Webby People's Voice Awards, and 2003 winner of the Webby Award for Education from the International Academy of Digital Arts and Sciences), 1999-continuing.
- Host researcher, JASON XIII: Frozen Worlds curriculum, 2001-2002.
- Scientist host for eight live web casts about the Aqua spacecraft, before and after the 2002 Aqua launch, December 2001 – March 2003.
- Rapporteur, Breakout Group 1: Climate Change Science Program Elements, U.S.

- Climate Change Science Program Planning Workshop for Scientists and Stakeholders, 2002.
- Co-convenor of five Aqua sessions at the December 8-12, 2003 meeting of the American Geophysical Union, San Francisco, California.

Selected Honors and Awards

- Election to Phi Beta Kappa, Wellesley College, 1969.
- Election to Sigma Xi, Wellesley College, 1970.
- Lewis Atterbury Stimson Award in Mathematics, Wellesley College, 1970.
- Charles Clifford Huntington Award in Geography, Ohio State University, 1976.
- Exceptional Performance Award, Goddard Space Flight Center, 1979.
- NASA Group Achievement Award to the authors of *Antarctic Sea Ice, 1973-1976*, NASA, 1982.
- Peer Award for Best Paper, Laboratory for Atmospheric Sciences, Goddard Space Flight Center, 1984.
- Inclusion of sole-authored *Breakthroughs* in *Library Journal's* list of 100 outstanding science and technology books of 1985.
- Peer Award for Leadership, for the book *Arctic Sea Ice, 1973-1976*, Laboratory for Oceans, Goddard Space Flight Center, 1988.
- Group Award for coeditorship of the *Atlas of Satellite Observations Related to Global Change*, Laboratory for Hydrospheric Processes, Goddard Space Flight Center, 1993.
- Peer Award for Outstanding Education/Outreach, Laboratory for Hydrospheric Processes, Goddard Space Flight Center, 1997.
- Outstanding Teamwork Award and "Best of the Best" Teamwork Award, to the 1999 NASA North Pole Expedition Team, Goddard Space Flight Center, 2000.
- Elected a Fellow of the American Meteorological Society, 2000 (effective 2001).
- NASA Group Achievement Award to the Earth Observatory Web Page Team, 2001.
- NASA Exceptional Service Medal, for educational outreach, 2001.
- Aviation Week & Space Technology* 46th annual Aerospace Laurels Award for Outstanding Achievement in the Field of Space, to Phil Sabelhaus, Claire Parkinson, Martin Mohan, and Dana Southward, for the Aqua spacecraft mission, 2003.
- Outstanding Teamwork Award, to the Aqua Mission Team, Goddard Space Flight Center, May 2003.
- Peer Award for Outstanding Education/Outreach, from the Goddard Laboratory for Hydrospheric Processes, Goddard Space Flight Center, July 2003.
- NASA Outstanding Leadership Medal, National Aeronautics and Space Administration, August 2003.
- Goldthwait Polar Medal, Byrd Polar Research Center, Ohio State University, November 2004.

Media Coverage

In the past several years, Claire's sea ice research has received press coverage in the *New York Times*, the *Washington Post*, *USA Today*, *The Times* of London, *The Ottawa Citizen*, and dozens of other newspapers, plus in *Focus* magazine, *Time* magazine, US Airways' *Attaché* magazine, on ABC's *World News Tonight*, and on numerous radio shows, including appearances by her on National Public Radio's *Morning Edition*, *Earth and Sky Radio*, Norway's National Broadcasting Radio, and live on *The Diane Rehm Show* and on *Sporting Nature*.

Since early 2002, Claire has also been interviewed by numerous media regarding the Aqua spacecraft, launch, and data, with quotes from her appearing in *The New York Times*, *Aviation Week and Space Technology*, *Space News*, and the Japanese newspaper

Nishinippon Shimbun, among dozens of print sources, and audio and video segments appearing, for instance, on the British Broadcasting Company's *Today Show* and on *The Weather Channel*.

Publications (divided to Refereed Books, Refereed Articles, and Selected Other Reports and Articles)

Refereed Books

Zwally, H. J., J. C. Comiso, C. L. Parkinson, W. J. Campbell, F. D. Carsey, and P. Gloersen, 1983: *Antarctic Sea Ice, 1973-1976: Satellite Passive-Microwave Observations*, NASA SP-459, National Aeronautics and Space Administration, Washington, D.C., 206 pp.

Parkinson, C. L., 1985: *Breakthroughs: A Chronology of Great Achievements in Science and Mathematics*, G. K. Hall, Boston, 576 pp.

Washington, W. M., and C. L. Parkinson, 1986: *An Introduction to Three-Dimensional Climate Modeling*, University Science Books, Mill Valley, California, and Oxford University Press, Oxford, England, 422 pp. [Translated into Chinese, 1991; second edition, 2005, 353 pp.]

Parkinson, C. L., J. C. Comiso, H. J. Zwally, D. J. Cavalieri, P. Gloersen, and W. J. Campbell, 1987: *Arctic Sea Ice, 1973-1976: Satellite Passive-Microwave Observations*, NASA SP-489, National Aeronautics and Space Administration, Washington, D.C., 296 pp.

Gloersen, P., W. J. Campbell, D. J. Cavalieri, J. C. Comiso, C. L. Parkinson, and H. J. Zwally, 1992: *Arctic and Antarctic Sea Ice, 1978-1987: Satellite Passive-Microwave Observations and Analysis*, NASA SP-511, National Aeronautics and Space Administration, Washington, D.C., 290 pp.

Gurney, R. J., J. L. Foster, and C. L. Parkinson, editors, 1993: *Atlas of Satellite Observations Related to Global Change*, Cambridge University Press, Cambridge, England, 470 pp.

Parkinson, C. L., 1997: *Earth from Above: Using Color-Coded Satellite Images to Examine the Global Environment*, University Science Books, Sausalito, California, 176 pp.

Parkinson, C. L., and R. Greenstone, editors, 2000: *EOS Data Products Handbook, Volume 2: ACRIMSAT, Aqua, Jason-1, Landsat 7, Meteor 3M, QuikScat, QuikTOMS, and VCL*, Goddard Space Flight Center, Greenbelt, Maryland, 253 pp.

Refereed Articles

Parkinson, C. L., 1973: Ambivalence in alternating symmetric groups, *The American Mathematical Monthly*, 80, 190-192.

Harton, L., Jr., C. L. Parkinson, and L. Brown, 1974: Annotated Bibliography of Geographic Diffusion Studies, *Studies in the Diffusion of Innovations*, Discussion Paper No. 11, Department of Geography, Ohio State University, 44 pp.

Hughes, T., C. Parkinson, and H. Brecher, 1974: Ice dynamics study of a glacial surge induced by the August 1970 eruption on Deception Island, Antarctica, *Andean and Antarctic Volcanology Problems*, proceedings of a symposium held in Santiago, Chile, September 1974, International Association of Volcanology and Chemistry of the Earth's Interior, 112-133.

Washington, W. M., A. J. Semtner, Jr., C. L. Parkinson, and L. Morrison, 1976: On the development of a seasonal change sea-ice model, *Journal of Physical Oceanography*, 6, 679-685.

Parkinson, C. L., 1978: A theoretical study of the latitudinal variation of time-integrated water albedos, *Discussion Paper No. 62*, Department of Geography, Ohio State University, 29 pp.

Parkinson, C. L., and W. M. Washington, 1979: A large-scale numerical model of sea ice, *Journal of Geophysical Research*, 84, 311-337.

Parkinson, C. L., and W. W. Kellogg, 1979: Arctic sea ice decay simulated for a CO₂-induced temperature rise, *Climatic Change*, 2, 149-162.

Parkinson, C. L., and W. M. Washington, 1980: Summary of a large-scale sea-ice model, *Sea Ice Processes and Models* (edited by R. S. Pritchard), University of Washington Press, Seattle, 224-233.

Parkinson, C. L., and G. F. Herman, 1980: Sea ice simulations based on fields generated by the GLAS GCM, *Monthly Weather Review*, 108, 2080-2091.

Crawford, J. P., and C. L. Parkinson, 1981: Wintertime microwave observations of the North Water polynya, *Oceanography from Space* (edited by J.F.R. Gower), Plenum Press, N.Y., 839-844.

Cavalieri, D. J., and C. L. Parkinson, 1981: Large-scale variations in observed Antarctic sea ice extent and associated atmospheric circulation, *Monthly Weather Review*, 109, 2323-2336.

Parkinson, C. L., and D. J. Cavalieri, 1982: Interannual sea-ice variations and sea-ice/atmosphere interactions in the southern ocean, 1973-1975, *Annals of Glaciology*, 3, 249-254.

Parkinson, C. L., and A. J. Gratz, 1983: On the seasonal sea ice cover of the Sea of Okhotsk, *Journal of Geophysical Research*, 88, 2793-2802.

Martin, S., P. Kauffman, and C. Parkinson, 1983: The movement and decay of ice edge bands in the winter Bering Sea, *Journal of Geophysical Research*, 88, 2803-2812.

Parkinson, C. L., 1983: On the development and cause of the Weddell polynya in a sea ice simulation, *Journal of Physical Oceanography*, 13, 501-511.

Zwally, H. J., C. L. Parkinson, and J. C. Comiso, 1983: Variability of Antarctic sea ice and changes in carbon dioxide, *Science*, 220, 1005-1012.

Parkinson, C. L., and R. A. Bindshadler, 1984: Response of Antarctic sea ice to uniform atmospheric temperature increases, *Climate Processes and Climate Sensitivity* (edited by J. E. Hansen and T. Takahashi), Maurice Ewing vol. 5, American Geophysical Union, Washington, D.C., 254-264.

Ling, C. H., and C. L. Parkinson, 1986: Arctic sea ice extent and drift, modeled as a viscous fluid, *Ocean Science and Engineering*, 11, 71-98.

Parkinson, C. L., J. C. Comiso, H. J. Zwally, D. J. Cavalieri, P. Gloersen, and W. J. Campbell, 1987: Seasonal and regional variations of northern hemisphere sea ice as illustrated with satellite passive-microwave data for 1974, *Annals of Glaciology*, 9, 119-126.

Cavalieri, D. J., and C. L. Parkinson, 1987: On the relationship between atmospheric circulation and the fluctuations in the sea ice extents of the Bering and Okhotsk seas, *Journal of Geophysical Research*, 92, 7141-7162.

Parkinson, C. L., 1987: Paradigm transitions in mathematics, *Philosophia Mathematica*, II, 2, 127-150.

Crowley, T. J., and C. L. Parkinson, 1988: Late Pleistocene variations in Antarctic sea ice I: Effect of orbital insolation changes, *Climate Dynamics*, 3, 85-91.

Crowley, T. J., and C. L. Parkinson, 1988: Late Pleistocene variations in Antarctic sea ice II: Effect of interhemispheric deep-ocean heat exchange, *Climate Dynamics*, 3, 93-103.

Parkinson, C. L., 1989: On the value of long-term satellite passive microwave data sets for sea ice/climate studies, *GeoJournal*, 18, 9-20.

Parkinson, C. L., 1989: Dangers of multiyear averaging in analyses of long-term climate trends, *Climate Dynamics*, 4, 39-44.

Parkinson, C. L., and D. J. Cavalieri, 1989: Arctic sea ice 1973-1987: Seasonal, regional, and interannual variability, *Journal of Geophysical Research*, 94(C10), 14,499-14,523.

Parkinson, C. L., 1990: Search for the Little Ice Age in Southern Ocean sea-ice records, *Annals of Glaciology*, 14, 221-225.

Parkinson, C. L., 1990: The impact of the Siberian High and Aleutian Low on the sea-ice cover of the Sea of Okhotsk, *Annals of Glaciology*, 14, 226-229.

Parkinson, C. L., 1991: Interannual variability of the spatial distribution of sea ice in the north polar region, *Journal of Geophysical Research*, 96 (C3), 4791-4801.

Parkinson, C. L., 1991: Interannual variability of monthly sea ice distributions in the north polar region, *International Conference on the Role of the Polar Regions in Global Change: Proceedings, June 11-15, 1990, Fairbanks, Alaska* (edited by G. Weller, C. L. Wilson, and B. A. B. Severin), Geophysical Institute, University of Alaska, Fairbanks, vol.1, 71-78.

Parkinson, C. L., 1991: Strengths and weaknesses of sea ice as a potential early indicator of climate change, *International Conference on the Role of the Polar Regions in Global Change: Proceedings, June 11-15, 1990, Fairbanks, Alaska* (edited by G. Weller, C. L.

Wilson, and B. A. B. Severin), Geophysical Institute, University of Alaska, Fairbanks, vol.1, 17-21.

Parkinson, C. L., 1992: Interannual variability of monthly Southern Ocean sea ice distributions, *Journal of Geophysical Research*, 97 (C4), 5349-5363.

Parkinson, C. L., 1992: Spatial patterns of increases and decreases in the length of the sea ice season in the north polar region, 1979-1986, *Journal of Geophysical Research*, 97 (C9), 14,377-14,388.

Parkinson, C. L., 1992: Southern Ocean sea-ice distributions and extents, *Philosophical Transactions of the Royal Society*, 338, 243-250.

Gloersen, P., W. J. Campbell, D. J. Cavalieri, J. C. Comiso, C. L. Parkinson, and H. J. Zwally, 1993: Satellite passive microwave observations and analysis of Arctic and Antarctic sea ice, 1978-1987, *Annals of Glaciology*, 17, 149-154.

Parkinson, C. L., and P. Gloersen, 1993: Global sea ice coverage, *Atlas of Satellite Observations Related to Global Change* (edited by R. J. Gurney, J. L. Foster, and C. L. Parkinson), Cambridge University Press, Cambridge, 371-383.

Foster, J. L., and C. L. Parkinson, 1993: Indications and effects of human activities, *Atlas of Satellite Observations Related to Global Change* (edited by R. J. Gurney, J. L. Foster, and C. L. Parkinson), Cambridge University Press, Cambridge, 425-443.

Parkinson, C. L., 1993: Southern Ocean sea-ice distributions and extents, *Antarctica and Environmental Change* (edited by D. J. Drewry, R. M. Laws, and J. A. Pyle), Oxford University Press, Oxford, 43-50. [Republication from the 1992 *Transactions of the Royal Society*, 338, 243-250.]

Parkinson, C. L., 1994: Spatial patterns in the length of the sea ice season in the Southern Ocean, 1979-1986, *Journal of Geophysical Research*, 99(C8), 16,327-16,339.

Rind, D., R. Healy, C. Parkinson, and D. Martinson, 1995: The role of sea ice in 2 x CO₂ climate model sensitivity. Part 1: The total influence of sea ice thickness and extent, *Journal of Climate*, 8(3), 449-463.

Parkinson, C. L., 1995: Recent sea ice advances in Baffin Bay/Davis Strait and retreats in the Bellingshausen Sea, *Annals of Glaciology*, 21, 348-352.

Parkinson, C. L., 1995: Satellite sensing of Antarctic sea ice, *Space and Atmospheric Sciences in Antarctica* (edited by E. B. Pereira and V. W. J. H. Kirchhoff), Brazilian Institute for Space Research (INPE), Sao José dos Campos, 87-105.

Parkinson, C. L., 1996: Louis Agassiz, *Encyclopedia of Climate and Weather* (edited by S. H. Schneider), Oxford University Press, New York, 1, 19-20.

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Parkinson, C. L., 1996: Sea ice, *Encyclopedia of Climate and Weather* (edited by S. H. Schneider), Oxford University Press, New York, 2, 669-675.

Comiso, J. C., D. J. Cavalieri, C. L. Parkinson, and P. Gloersen, 1997: Passive

microwave algorithms for sea ice concentration: A comparison of two techniques, *Remote Sensing of the Environment*, 60, 357-384.

Parkinson, C. L., 1997: Ice sheets and sea level rise, *PUMAS: The On-Line Journal of Math and Science Examples*, 02_10_97, PUMAS Collection, <http://pumas.jpl.nasa.gov>.

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Cavalieri, D. J., P. Gloersen, C. L. Parkinson, J. C. Comiso, and H. J. Zwally, 1997: Observed hemispheric asymmetry in global sea ice changes, *Science*, 278, 1104-1106.

Parkinson, C. L., 1998: Length of the sea ice season in the Southern Ocean, 1988-1994, *Antarctic Sea Ice Physical Properties, Interactions and Variability* (edited by M. O. Jeffries), *Antarctic Research Series*, American Geophysical Union, Washington, D.C., vol. 74, pp.173-186.

Barron, E. J., D. Battisti, R. E. Davis, R. E. Dickinson, T. R. Karl, J. T. Kiehl, D. G. Martinson, C. L. Parkinson, S. W. Running, E. S. Sarachik, S. Sorooshian, K. E. Taylor, and P. J. Webster, 1998: Climate and climate change research entering the twenty-first century, in *The Atmospheric Sciences Entering the Twenty-First Century*, National Academy Press, Washington, D.C., pp.272-324.

Cavalieri, D. J., C. L. Parkinson, P. Gloersen, J. C. Comiso, and H. J. Zwally, 1999: Deriving long-term time series of sea ice cover from satellite passive-microwave multisensor data sets, *Journal of Geophysical Research*, 104(C7), 15,803-15,814.

Parkinson, C. L., D. J. Cavalieri, P. Gloersen, H. J. Zwally, and J. C. Comiso, 1999: Arctic sea ice extents, areas, and trends, 1978-1996, *Journal of Geophysical Research*, 104(C9), 20,837-20,856.

Gloersen, P., C. L. Parkinson, D. J. Cavalieri, J. C. Comiso, and H. J. Zwally, 1999: Spatial distribution of trends and seasonality in the hemispheric sea ice covers: 1978-1996, *Journal of Geophysical Research*, 104(C9), 20,827-20,835.

Vinnikov, K. Y., A. Robock, R. J. Stouffer, J. E. Walsh, C. L. Parkinson, D. J. Cavalieri, J. F. B. Mitchell, D. Garrett, and V. F. Zakharov, 1999: Global warming and Northern Hemisphere sea ice extent, *Science*, 286, 1934-1937.

Vinnikov, K. Y., A. Robock, R. J. Stouffer, J. E. Walsh, C. L. Parkinson, D. J. Cavalieri, J. F. B. Mitchell, D. Garrett, and V. F. Zakharov, 2000: Northern Hemisphere sea ice extent: Response to comments by Moritz and Bitz, *Science*, 288, 927a, available at www.sciencemag.org/cgi/content/full/288/5468/927a.

Parkinson, C. L., 2000: Variability of Arctic sea ice: The view from space, an 18-year record, *Arctic*, 53(4), 341-358.

Parkinson, C. L., 2000: Recent trend reversals in Arctic sea ice extents: Possible connections to the North Atlantic Oscillation, *Polar Geography*, 24(1), 1-12.

Parkinson, C. L., D. Rind, R. J. Healy, and D. G. Martinson, 2001: The impact of sea ice concentration accuracies on climate model simulations with the GISS GCM, *Journal of Climate*, 14(12), 2606-2623.

Folland, C. K., T. R. Karl, and 148 other authors, including C. L. Parkinson, 2001: Chapter 2. Observed climate variability and change, in *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* [ed. by J. T. Houghton, et al.], Cambridge University Press, Cambridge, United Kingdom, pp.99-181.

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