J. David Neelin

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Born: October 31, 1959, Ottawa, Canada
Citizenship: Canada/U.S. (dual)

Positions

Professor, Dept. of Atmospheric Sciences and Institute of Geophysics and Planetary Physics, UC Los Angeles July 1995–present
[Vice-chair 1/04-present]

Associate Professor, Dept. of Atmospheric Sciences, UC Los Angeles July 1992–July 1995

Visiting Associate Professor, Dept. of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, January 1994–May 1995 (Houghton Lectureship)

Assistant Professor, Dept. of Atmospheric Sciences, University of California, Los Angeles. Sept. 1988–June 1992

Postdoctoral Associate, Dept. of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology. Sept. 1987–Aug. 1988

Education

Doctorate: October, 1987, Princeton University, Geophysical Fluid Dynamics Program

Master of Science: August, 1983, University of Toronto, Department of Physics

Bachelor of Science, Hon.: June, 1981, University of Toronto, Department of Physics

Selected Awards

Fellow, American Meteorological Society, 2003
Fellow, Royal Meteorological Society, 2003
NSF Special Creativity Award 1999-2000
C. L. Meisinger Award of the American Meteorological Society, 1996
Houghton Lectureship, Dept. of Earth, Atmospheric and Planetary Sciences, MIT, 1994–95
Presidential Young Investigator Award 1991-1996

Research Interests

Ocean-atmosphere interaction. El Niño/Southern oscillation; climate variations on interannual and longer time scales. Sea-ice–ocean interaction. Land-surface–climate interaction.

Tropical atmospheric dynamics. Interaction between moist convection and large-scale motions; evaporation-wind feedback; intraseasonal oscillations.

Building atmospheric and ocean-atmosphere models of intermediate complexity; hybrid coupled models; theoretical models of atmospheric and climate phenomena; use of asymptotic methods to simplify more complex models.

Principal Publications

1. Neelin, J. D., and C. A. Lin, 1984: Baroclinic generation of planetary transient and stationary waves from forced stationary waves. *J. Geophys. Res.*, **89**, D5, 7202-7214.

2. Neelin, J. D., and I. M. Held, 1987: Modelling tropical convergence based on the moist static energy budget. *Mon. Wea. Rev.*, **115**, 3-12.

3. Neelin, J. D., I. M. Held and K. H. Cook, 1987: Evaporation-wind feedback and low frequency variability in the tropical atmosphere. *J. Atmos. Sci.*, **44**, 2341-2348.

4. Neelin, J. D., 1988: A simple model for surface stress and low-level flow in the tropical atmosphere driven by prescribed heating. *Q. J. Roy. Met. Soc.*, **114**, 747-770.

5. Lau, N. C., I. M. Held and J. D. Neelin, 1988: The Madden-Julian oscillation in an idealized general circulation model. *J. Atmos. Sci.*, **45**, 3810-3832.

6. Neelin, J. D., 1988: Reply to Comments on an air-sea interaction model of intraseasonal oscillation in the tropics. *J. Atmos. Sci.*, **45**, 3526-3527.

7. Neelin, J. D., 1989: On the interpretation of the Gill model. *J. Atmos. Sci.*, **46**, 2466-2468.

8. Neelin, J. D., 1989: Interannual oscillations in an ocean general circulation model coupled to a simple atmosphere model. *Phil. Trans. Roy. Soc. Lond. A*, **329**, 189-205.

9. Neelin, J. D., 1990: A hybrid coupled general circulation model for El Niño studies. *J. Atmos. Sci.*, **47**, 674-693.

10. Neelin, J. D., 1991: The slow sea surface temperature mode and the fast-wave limit: Analytic theory for tropical interannual oscillations and experiments in a hybrid coupled model. *J. Atmos. Sci.*, **48**, 584-606.

11. Ghil, M., M. Kimoto and J. D. Neelin, 1991: Nonlinear dynamics and predictability in the atmospheric sciences. *Rev. Geophys.*, Supplement, pp. 46-55, U.S. National Report to the International Union of Geodesy and Geophysics 1987-1990.

12. Neelin, J. D., M. Latif, M. A. F. Allaart, M. A. Cane, U. Cubasch, W. L. Gates, P. R. Gent, M. Ghil, C. Gordon, N. C. Lau, C. R. Mechoso, G. A. Meehl, J. M. Oberhuber, S. G. H. Philander, P. S. Schopf, K. R. Sperber, A. Sterl, T. Tokioka, J. Tribbia and S. E. Zebiak, 1992: Tropical air-sea interaction in general circulation models. *Climate Dynamics*, **7**, 73-104.

13. Neelin, J. D., Z. Hao and F.-F. Jin, 1992: Reply to 'A note on the fast-wave limit and interannual oscillations'. *J. Atmos. Sci.*, **49**, 1950-1953.

14. Jin, F.-F., and Neelin, J. D., 1993: Modes of interannual tropical ocean-atmosphere interaction —a unified view. Part I: Numerical results. *J. Atmos. Sci.*, **50**, 3477-3503.

15. Neelin, J. D., and Jin, F.-F., 1993: Modes of interannual tropical ocean-atmosphere interaction —a unified view. Part II: Analytical results in the weak coupling limit. *J. Atmos. Sci.*, **50**, 3504-3522.

16. Jin, F.-F., and Neelin, J. D., 1993: Modes of interannual tropical ocean-atmosphere interaction —a unified view. Part III: Analytical results in fully coupled cases. *J. Atmos. Sci.*, **50**, 3523-3540.

17. Yang, J.-Y., and J. D. Neelin, 1993: Sea-ice interactions with the thermohaline circulation. *Geophys. Res. Lett.*, **20**, 217-220.

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Principal Publications (continued)

18. Hao, Z., J. D. Neelin and F.-F. Jin, 1993: Nonlinear tropical air-sea interaction in the fast-wave limit. *J. Climate*, **6**, 1523-1544.

19. Liu, W., M. Ghil, J. D. Neelin and C. A. Hall, 1993: A simple coastal ocean model for the Central Californian basin during late Miocene. *Paleoceanogr.*, **8**, 799-810.

20. Neelin, J. D., M. Latif and F.-F. Jin, 1994: Dynamics of coupled ocean-atmosphere models: the tropical problem. *Ann. Rev. Fluid Mech.*, **26**, 617-659.

21. Neelin, J. D., and J.-Y. Yu, 1994: Modes of tropical variability under convective adjustment and the Madden-Julian oscillation. Part I: Analytical results. *J. Atmos. Sci.*, **51**, 1876-1894.

22. Yu, J.-Y., and Neelin, J. D., 1994: Modes of tropical variability under convective adjustment and the Madden-Julian oscillation. Part II: Numerical results. *J. Atmos. Sci.,* **51**, 1895-1914.

23. Jin, F.-F., J. D. Neelin and M. Ghil, 1994: El Niño on the devil's staircase: annual subharmonic steps to chaos. *Science*, **264**, 70-72.

24. Emanuel, K. A., J. D. Neelin and C. S. Bretherton, 1994: On large-scale circulations in convecting atmospheres. *Quart. J. Roy. Meteor. Soc.,* **120**, 1111-1143.

25. Neelin, J. D., and J. Marotzke, 1994: Representing ocean eddies in climate models. *Science*, **264**, 1099-1100.

26. Waliser, D. E. , B. Blanke, J. D. Neelin and C. Gautier, 1994: Shortwave feedbacks and El Niño–Southern Oscillation: Forced ocean and coupled ocean-atmosphere experiments. *J. Geophys. Res.*, **99**, 25109-25125.

27. Dijkstra, H. A., and J. D. Neelin, 1995: On the attractors of an intermediate coupled equatorial ocean-atmosphere model. *Dyn. Atm. Oceans*, **22**, 19-48.

28. Neelin, J. D. and H. A. Dijkstra, 1995: Ocean-atmosphere interaction and the tropical climatology. Part I: The dangers of flux correction. *J. Climate*, **8**, 1325-1342.

29. Dijkstra, H. A. and J. D. Neelin, 1995: Ocean-atmosphere interaction and the tropical climatology, Part II: Why the Pacific cold tongue is in the east. *J. Climate*, **8**, 1343-1359.

30. Syu, H.-H., J. D. Neelin and D. Gutzler, 1995: Seasonal and interannual variability in a hybrid coupled GCM. *J. Climate*, **8**, 2121-2143.

31. Jiang, N., J. D. Neelin and M. Ghil, 1995: Quasi-quadrennial and quasi-biennial variability in COADS equatorial Pacific sea surface temperature and winds. *Climate Dynamics,* **12**, 101-112.

32. Mechoso, C. R., A. W. Robertson, N. Barth, M. K. Davey, P. Delecluse, P. R. Gent, S. Ineson, B. Kirtman, M. Latif, H. Le Treut, T. Nagai, J. D. Neelin, S. G. H. Philander, J. Polcher, P. S. Schopf, T. Stockdale, M. J. Suarez, L. Terray, O. Thual, and J. J. Tribbia, 1995: The seasonal cycle over the tropical Pacific in coupled ocean-atmosphere general circulation models. *Mon. Wea. Rev.*, **123**, 2825-2838.

33. Chou, C., and J. D. Neelin, 1996: Linearization of a long-wave radiation scheme for intermediate tropical atmospheric models. *J. Geophys. Res.*, **101**, 15129-15145.

34. Jin, F.-F., J. D. Neelin and M. Ghil, 1996: El Niño/Southern Oscillation and the annual cycle: subharmonic frequency locking and aperiodicity. *Physica D*, 98, 442-465.

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Principal Publications (continued)

35. Yang, J.-Y., and J. D. Neelin, 1997: Sea-ice interaction and the stability of the thermohaline circulation. *Atmosphere–Ocean*, **35**, 433-469.

36. Yu, J.-Y., and J. D. Neelin, 1997: Analytic approximations for moist convectively adjusted regions. *J. Atmos. Sci.*, **54**, 1054-1063.

37. Blanke, B., J. D. Neelin and D. Gutzler, 1997: Estimating the effects of stochastic wind stress forcing on ENSO irregularity. *J. Climate*, **10**, 1473-1486.

38. Emanuel, K. A., J. D. Neelin and C. S. Bretherton, 1997: On large-scale circulations in convecting atmospheres—reply. *Quart. J. Roy. Meteor. Soc.,* **123**, 1779-1782.

39. Neelin, J. D., 1997: Implications of convective quasi-equilibrium for the large-scale flow. In *The physics and parameterization of moist atmospheric convection.* R. K. Smith, ed., Kluwer Academic Publishers, Dortrecht, The Netherlands, pp. 413-446.

40. Yang, J., and J. D. Neelin, 1997: Decadal variability in coupled sea-ice–thermohaline systems. *J. Climate,* **10**, 3059-3076.

41. Yu, J.-Y., C. Chou and J. D. Neelin, 1998: Estimating the gross moist stability of the tropical atmosphere. *J. Atmos. Sci.,* **55**, 1354-1372.

42. Neelin, J. D., D. S. Battisti, A. C. Hirst, F.-F. Jin, Y. Wakata, T. Yamagata, and S. E. Zebiak, 1998: ENSO theory. *J. Geophys. Res.,* **103**, 14261-14290.

43. Weng, W., and Neelin, J. D., 1998: On the role of ocean-atmosphere interaction in midlatitude interdecadal variability. *Geophys. Res. Lett.*, **25**, 167-170.

44. Neelin, J. D., and M. Latif, 1998: El Niño Dynamics. *Physics Today*, **51**, 32-36.

45. Dijkstra, H. A. and J. D. Neelin, 1999: Imperfections of the thermohaline circulation: multiple equilibria and flux correction. *J. Climate,* **12**, 1382-1392.

46. Neelin, J. D., and W. Weng, 1999: Analytical prototypes for ocean-atmosphere interaction at midlatitudes. Part I: coupled feedbacks as sea surface temperature dependent stochastic forcing *J. Climate,* **12**, 697-721.

47. Zeng, N., and J. D. Neelin, 1999: A land-atmosphere interaction theory for the tropical deforestation problem. *J. Climate,* **12**, 857-872.

48. Dijkstra, H. A. and J. D. Neelin, 1999: Coupled processes and the tropical climatology. Part III: Instabilities of the fully coupled climatology. *J. Climate,* **12**, 1630-1643.

49. Chou, C., and J. D. Neelin, 1999: Cirrus-detrainment-temperature feedback. *Geophys. Res. Lett.,* **26**, 1295-1298.

50. Weng, W., and Neelin, J. D., 1999: Analytical prototypes for ocean-atmosphere interaction at midlatitudes. Part II: mechanisms for coupled gyre modes. *J. Climate,* **12**, 2757-2774.

51. Zeng, N., J. D. Neelin, W. K.-M. Lau, and C. J. Tucker, 1999: Enhancement of interdecadal climate variability in the Sahel by vegetation interaction. *Science*, **286**, 1537-1540.

52. Dijkstra, H. A. and J. D. Neelin, 2000: Imperfections of the thermohaline circulation: Latitudinal asymmetry and preferred northern sinking. *J. Climate,* **13**, 366-382.

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Principal Publications (continued)

53. Neelin, J. D., and N. Zeng, 2000: A quasi-equilibrium tropical circulation model—formulation. *J. Atmos. Sci.,* **57**, 1741–1766.

54. Zeng, N., J. D. Neelin, and C. Chou, 2000: A quasi-equilibrium tropical circulation model—implementation and simulation. *J. Atmos. Sci.,* **57**, 1767–1796.

55. Lin, J. W., J. D. Neelin, and N. Zeng, 2000: Maintenance of tropical intraseasonal variability: impact of evaporation-wind feedback and midlatitude storms. *J. Atmos. Sci.,* **57**, 2793–2823.

56. Neelin, J. D., F.-F. Jin, and H.-H. Syu, 2000: Variations in ENSO phase-locking. *J. Climate,* **13**, 2570–2590.

57. Syu, H.-H., and J. D. Neelin, 2000: ENSO in a hybrid coupled model. Part I: sensitivity to physical parameterizations. *Climate Dynamics*, **16**, 19–34.

58. Syu, H.-H., and J. D. Neelin, 2000: ENSO in a hybrid coupled model: Part II: prediction with piggyback data assimilation. *Climate Dynamics*, **16**, 35–48.

59. Zeng, N., J. D. Neelin, C. Chou, J. W.-B. Lin and H. Su, 2000: Climate and variability in a quasi-equilibrium tropical circulation model. In *General circulation Modeling: Past, Present, and Future*. D. A. Randall, ed., Academic Press, pp. 457-488.

60. Zeng, N. and J. D. Neelin, 2000: The role of vegetation-climate interaction and interannual variability in shaping the African Savanna. *J. Climate,*, **13**, 2665-2670.

61. Roulston, M. S., and J. D. Neelin, 2000: The response of an ENSO model to climate noise, weather noise and intraseasonal forcing. *Geophys. Res. Lett.,* **27**, 3723-3726.

62. Lin, J. W.-B., and J. D. Neelin, 2000: Influence of a stochastic moist convective parameterization on tropical climate variability. *Geophys. Res. Lett.,* **27**, 3691–3694.

63. Perigaud, C. M., C. Cassou, B. DeWitte, L.-L. Fu and J. D. Neelin, 2000: Using data and intermediate coupled models for seasonal-to-interannual forecasts. *Mon. Wea. Rev.* **128**, 3025-3049.

64. Chou, C., and J. D. Neelin, 2001: Mechanisms limiting the southward extent of the South American summer monsoon. *Geophys. Res. Lett.,* **28**, 2433-2436.

65. Su, H., J. D. Neelin, and C. Chou, 2001: Tropical teleconnection and local response to SST anomalies during the 1997-1998 El Niño. *J. Geophys. Res.,* **106**, *D17*, 20,025–20,043.

66. Chou, C., J. D. Neelin, and H. Su, 2001: Ocean-atmosphere-land feedbacks in an idealized monsoon, *Quart. J. Roy. Meteor. Soc.,* **127**, 1869-1891.

67. Sun, C., Z. Hao, M. Ghil and J. D. Neelin, 2002: Data assimilation for a coupled ocean-atmosphere model. Part I: Sequential state estimation. *Mon. Wea. Rev.*, **130**, 1073–1099.

68. Lin, J. W.-B., and J. D. Neelin, 2002: Considerations for stochastic convective parameterization. *J. Atmos. Sci.*, **59**, 959-975.

69. Stevens, B., J. Duan, J. C. McWilliams, M. Münnich and J. D. Neelin, 2002, Entrainment, Rayleigh friction and boundary layer winds over the tropical Pacific. *J. Climate*, **15**, 30-44.

70. Su, H., and J. D. Neelin, 2002: Teleconnection mechanisms for tropical Pacific descent anomalies during El Niño. *J. Atmos. Sci.*, **59**, 2694-2712.

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Principal Publications (continued)

71. Nogues-Paegle, J., C. R. Mechoso, R. Fu, E. H. Berbery, W. C. Chao, T.-C. Chen, K. Cook, A. F. Diaz, D. Enfield, R. Ferreira, A. M. Grimm, V. Kousky, B. Liebmann, J. Marengo, K. Mo, J. D. Neelin, J. Paegle, A. W. Robertson, A. Seth, C. S. Vera, J. Zhou, 2002: Progress in Pan American CLIVAR Research: Understanding the South American Monsoon. *Meteorologica*, **27** 3-32.

72. Mechoso, C. R., J. D. Neelin and J.-Y. Yu, 2003: Testing simple models of ENSO. *J. Atmos. Sci.*, **60**, 305-318.

73. Chou, C. and J. D. Neelin, 2003: Mechanisms limiting the northward extent of the northern summer monsoons over North America, Asia and Africa. *J. Climate*, **16**, 406-425.

74. Zeng, N., K. Hales, and J. D. Neelin, 2002: Nonlinear dynamics in a coupled vegetation-climate system and implications for desert-forest gradient. *J. Climate*, **15**, 3474-3487.

75. Su, H., J. D. Neelin and J. E. Meyerson, 2003: Sensitivity of tropical tropospheric temperature to sea surface temperature forcing. *J. Climate,* **16**, 1283–1301.

76. Lin, J. W.-B., and J. D. Neelin, 2003: Toward stochastic moist convective parameterization in general circulation models. *Geophys. Res. Lett.,* **30**(4), 1162, doi:10.1029/2002GL016203.

77. Dijkstra, H. A., W. Weijer and J. D. Neelin, 2003: Imperfections of the three-dimensional thermohaline ocean circulation: Hysteresis and unique-state regimes. *J. Phys. Oceanog.,* **33**, 2796-2814.

78. Roulston, M. S., and J. D. Neelin, 2003: Non-linear Coupling Between Modes in a Low-Dimensional Model of ENSO. *Atmosphere-Ocean,* **41**, 217-231.

79. Su, H. and J. D. Neelin, 2003: The scatter in tropical average precipitation anomalies. *J. Climate,* **16**, 3966-3977.

80. Neelin, J. D., C. Chou, and H. Su, 2003: Tropical drought regions in global warming and El Niño teleconnections. *Geophys. Res. Lett.,* **30**(24), 2275, doi:10.1029/2003GL018625.

81. Munnich, M., and J. D. Neelin, 2004: Where is ENSO stress balanced? *Atmospheric Science Letters*, **5**, 35-41.

82. K. Hales, J. D. Neelin and N. Zeng, 2004: Sensitivity of tropical land climate to leaf area index: Role of surface conductance versus albedo. *J. Climate,* **17**, 1459-1473.

Other Research Publications (selected)

14. Latif, M., and J. D. Neelin, 1994: Modelling the El Niño/Southern Oscillation. *Europhysics News*, **25**, 143-146.

25. R. E. Dickinson, V. Meleshko, D. Randall, E. Sarachik, P. Silva-Dias, A. Slingo and others, 1995: Climate Processes. In *Climate Change 1995, The Science of Climate Change, Contribution of Working Group I to the Second Assessment report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, pp. 193-228.

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F28. Kondrashov, D., M. Ghil and J. D. Neelin, 2002-2003: Forecasts of Niño-3 and SOI based on Singular Spectrum Analysis combined with the Maximum Entropy Method, *Experimental Long-Lead Forecast Bulletin*. Center for Ocean-Land-Atmosphere Studies, Calverton, MD. Quarterly contributions.

F29. Meyerson, J. E., H. Su, and J. D. Neelin, 2002-2003: Prediction of Niño-3 SST anomaly in a hybrid coupled model with piggy-back data assimilation initialization, *Experimental Long-Lead Forecast Bulletin*. Center for Ocean-Land-Atmosphere Studies, Calverton, MD. Quarterly contributions.

Service (selected)

Associate Editor, Journal of Climate, 1996-present

Reviewer, *Third Assessment Report of the Intergovernmental Panel on Climate Change*, 1999-2000

Global Ocean-Atmosphere-Land System (GOALS) Panel, Board on Atmospheric Sciences and Climate, National Research Council, 1994–98

Contributor, *Climate Change 1995, The Science of Climate Change*, Contribution of Working Group I to the Second Assessment report of the Intergovernmental Panel on Climate Change.

American Meteorological Society Committee on Hurricanes and Tropical Meteorology and Climate, 1995-98

University Corporation for Atmospheric Research UCLA representative, 1988-94

American Meteorological Society Committee on the Interaction of the Sea and Atmosphere, 1992-95

Tropical-oceans-Global-Atmosphere Program on Seasonal to Interannual Climate Prediction working group, 1992–95

Selected Talks and Lectures

2004: Twenty-Sixth Conference on Hurricanes and Tropical Meteorology, Miami
2003: Stochastic modeling of geophysical flows workshop, Boulder CO (invited)
First EGS-AGU-EUG Joint Assembly, Nice, France (Two invited talks)
2002: International Research Institute, Columbia University (Invited)
Goddard Space Flight Center, Greenbelt MD
Twenty-Fifth conference on Hurricanes and Tropical Meteorology, San Diego
Institute for Pure and Applied Mathematics, UCLA
McGill University, Department of Atmospheric and Oceanic Sciences, Montreal
2001: Courant Institute of Mathematics, Workshop on Tropical Convection and Waves (Invited)
California Institute of Technology
Institute of Geophysical and Planetary Physics, UCLA
AMS Conference on Interaction of the Sea and Atmosphere, San Diego (Invited)
Geophysical Fluid Dynamics Laboratory, Princeton
Goddard Space Flight Center, Greenbelt MD
California Institute of Technology
2000: Canadian Meteorological and Oceanographic Society, Plenary session (Invited)
Pan-American Climate System Workshop, Potomac MD
Max-Planck-Institut für Meteorologie, Hamburg
Postdam Inst. for Climate Impact Research, Potsdam
Royal Meteorological Society 150th Anniversary Conference (Invited)
Workshop on the Madden-Julian Oscillation and ENSO, Princeton (Invited)
McGill University, Centre for Climate and Global Change Research, Montreal
1999: Courant Inst. of Mathematics, Workshop on Stochastic Climate Modeling (Invited)
International Union of Geodesy and Geophysics, Union lecture, Birmingham, UK
International Union of Geodesy and Geophysics, two other talks, Birmingham, UK
University of Utrecht, The Netherlands
NASA Goddard Space Flight Center
National Center for Atmospheric Research
1998: American Geophysical Union, Union session, San Francisco
University of Arizona, Pan-American Climate system meeting
Max-Planck-Institut für Meteorologie, Hamburg
Cambridge University, Geophysical and Environmental Fluid Mechanics Summer School, Dept. of Applied Math and Theoretical Physics
Hadley Centre for Climate Prediction and Research, Bracknell, U.K.
Reading University, U.K.
Lamont-Doherty Earth Observatory, Columbia University
Summer school on "Bifurcations and Pattern Formation in Atmospheric and Ocean Dynamics", Valle d'Aosta, Italy (Invited Lecturer)
Geophysical Fluid Dynamics Laboratory, Princeton
Dept. of Earth System Science, U. C. Irvine
Arakawa Symposium, UCLA
American Meteorological Society, Ninth Conf. on the Interaction of the Sea and Atmosphere
1997: Goddard Inst. for Space Studies, Workshop on Ocean Modeling, New York
IAMAS/IAPSO Symposium on large-scale natural variability in the atmosphere and ocean systems, Melbourne (Invited)
Amer. Meteorol. Soc. (AMS) Seventh Conference on Climate Variations, Long Beach
National Center for Atmospheric Research, Boulder
AMS 22nd Conference on Tropical Meteorology, Fort Collins