

J. David Neelin

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Born: October 31, 1959, Ottawa, Canada. Citizenship: Canada and United States (dual)

Positions

Chair, Dept. of Atmospheric and Oceanic Sciences, UCLA, July 2010-2013
Vice-Chair, Dept. of Atmospheric and Oceanic Sciences, UCLA, January 2004-June 2010
Professor, Dept. of Atmospheric and Oceanic Sciences, UCLA, July 1995–present
Associate Professor, Dept. of Atmospheric Sciences, UCLA, 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, UCLA, Sept. 1988–June 1992
Postdoctoral Associate, Dept. of Earth, Atmospheric and Planetary Sciences, MIT, 1987–1988

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 Association for the Advancement of Science, 2012-present
Fellow, American Geophysical Union, 2012-present
Fellow of the John Simon Guggenheim Memorial Foundation, 2007-2008
Professeur Invité, Ecole Normale Supérieure, Paris May-June 2008
Fellow, American Meteorological Society, 2003-present
Fellow, Royal Meteorological Society, 2003-present
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
Princeton Honorary Fellowship, 1986-87
NSERC Postgraduate Scholarship, 1981-83, 1983-86
Canadian Meteorological and Oceanographic Society Award, 1983
McLennan Scholarship, 1981
Hallet Graduating Scholarship for Physical Sciences, 1981
U of Toronto Scholarship for Physical Sciences, 1980
U of Toronto Leonard Scholarship, 1977-81

Selected Affiliations

Canadian Meteorological and Oceanographic Society (Member)
European Geosciences Union (Life Member)
UCLA Center for Canadian Studies (Executive Committee member, 2011-present)
UCLA Institute of the Environment and Sustainability (Affiliate Faculty)

Research Interests

Tropical climate dynamics including El Niño/Southern oscillation; climate variations on interannual and longer time scales; regional precipitation sensitivity including changes under global warming.

Theory for interactions among climate system subcomponents: ocean-atmosphere interaction; sea-ice-ocean interaction; land-surface and vegetation interaction with the physical climate system.

Tropical atmospheric dynamics, including interaction between moist convection and large-scale motions; evaporation-wind feedback; intraseasonal oscillations;

Precipitation processes and their interaction with climate; stochastic representations of moist convection in climate models and observational constraints for testing these.

Building atmospheric and ocean-atmosphere models of intermediate complexity; hybrid coupled models; theoretical models of atmospheric and climate phenomena; asymptotic methods to simplify more complex models; reduction methods for fast optimization and sensitivity studies of climate models.

Service (selected)

NOAA Model Analysis and Prediction Program Task Force (2011-present)

National Academy of Sciences Science & Entertainment Exchange (2012)

Jet Propulsion Laboratory Center for Climate Sciences Advisory Board (2012-present)

International Climate Variability and Predictability Study (CLIVAR) Pacific Panel, 2005-2009

Associate Editor, *Journal of Climate*, 1996-2006

Reviewer, *Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2006

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 Soc. Committee on Hurricanes & Tropical Meteorology & 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

Thesis advisor for doctoral students

Advisee

Jia-yuh Yu (PhD, 1994)

Chia Chou (PhD, 1997)

Hsin-Hsin Syu (PhD, 1997)

Wenjie Weng (PhD, 1998)

Mark S. Roulston (PhD 2000; Cal Tech Advisor Y. Yung)

Johnny W.-B. Lin (PhD 2000)

Katrina Hales (PhD 2005)

Chris Holloway (PhD 2009)

Tyler Ruff (MSc 2011)

Diana Bernstein (PhD 2014, Hebrew University of Jerusalem)

Baird Langenbruner

Xuan Ji (co-advised with CR Mechoso)

Current affiliation

Professor, Culture University, Taiwan

Research Scientist, Academia Sinica, Taiwan

(No longer in research)

Researcher, Motorola

Researcher, Winton Capital

Associate Professor, North Park University

Staff Research Associate, UCLA

Research Fellow, University Reading, UK

Commodity Weather Group, Washington, DC

UCLA

Graduate Student, UCLA

Graduate Student, UCLA

Advisor for 12 postdoctoral scholars (2 co-advised)

Sandeep Sahany	Postdoctoral Associate, UCLA
Sam Stechmann	Assistant Professor, University of Wisconsin-Madison
Baijun Tian	Jet Propulsion Laboratory
Ole Peters	Research Associate, Imperial College London, London UK
Benjamin Lintner	Assistant Professor, Rutgers, The State University of New Jersey
Roel Neggers	KNMI (Royal Netherlands Meteorological Institute)
Hui Su	Jet Propulsion Laboratory
Rong Fu	Professor, University of Texas
Duane Waliser	Principal Scientist, Water and Carbon Cycles, Jet Propulsion Laboratory
Jiayan Yang	Senior Scientist, Woods Hole Oceanographic Institution
Fei-Fei Jin	Professor, University of Hawaii at Manoa

Publication Summary Information

Total peer-reviewed publications: over 140 journal articles, 5 book chapters

One textbook & associated materials (for upper division undergraduate science students)

Papers with over 100 citations (Thomson ISI): 17

H-index: 46 (Thomson ISI); or 54 (Google scholar); i10-index 115

Books

Neelin, J. D., *Climate change and climate modeling*, Cambridge University Press, Cambridge, UK, 282 pp. (2011).

Principal Publications (Refereed articles and book chapters)

- [1] Neelin, J. D. & Lin, C. A. Baroclinic generation of planetary transient and stationary waves from forced stationary waves. *J. Geophys. Res.* **89 (D5)**, 7202–7214 (1984).
- [2] Neelin, J. D. & Held, I. M. Modelling tropical convergence based on the moist static energy budget. *Mon. Wea. Rev.* **115**, 3–12 (1987).
- [3] Neelin, J. D., Held, I. M. & Cook, K. H. Evaporation-wind feedback and low frequency variability in the tropical atmosphere. *J. Atmos. Sci.* **44**, 2341–2348 (1987).
- [4] Neelin, J. D. A simple model for surface stress and low-level flow in the tropical atmosphere driven by prescribed heating. *Quart. J. Roy. Meteor. Soc.* **114**, 747–770 (1988).
- [5] Lau, N. C., Held, I. M. & Neelin, J. D. The Madden-Julian oscillation in an idealized general circulation model. *J. Atmos. Sci.* **45**, 3810–3832 (1988).
- [6] Neelin, J. D. Reply to Comments on an air-sea interaction model of intraseasonal oscillation in the tropics. *J. Atmos. Sci.* **46**, 3526–3527 (1988).
- [7] Neelin, J. D. On the interpretation of the Gill model. *J. Atmos. Sci.* **46**, 2466–2468 (1989).
- [8] Neelin, J. D. Interannual oscillations in an ocean general circulation model coupled to a simple atmosphere model. *Phil. Trans. Roy. Soc. Lond. A* **329**, 189–205 (1989).
- [9] Neelin, J. D. A hybrid coupled general circulation model for El Niño studies. *J. Atmos. Sci.* **47**, 674–693 (1990).
- [10] Neelin, J. D. 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 (1991).
- [11] Ghil, M., Kimoto, M. & Neelin, J. D. Nonlinear dynamics and predictability in the atmospheric sciences. *Rev. Geophys.* **36 (Suppl.)**, 46–55 (1991). U.S. National Report to the International Union of Geodesy and Geophysics 1987-1990.
- [12] Neelin, J. D. *et al.* Tropical air-sea interaction in general circulation models. *Climate Dynamics* **7**, 73–104 (1992).

- [13] Neelin, J. D., Hao, Z. & Jin, F.-F. Reply to ‘A note on the fast-wave limit and interannual oscillations’. *J. Atmos. Sci.* **49**, 1950–1953 (1992).
- [14] Jin, F.-F. & Neelin, J. D. Modes of interannual tropical ocean-atmosphere interaction—a unified view. Part I: Numerical results. *J. Atmos. Sci.* **50**, 3477–3503 (1993).
- [15] Neelin, J. D. & Jin, F.-F. 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 (1993).
- [16] Jin, F.-F. & Neelin, J. D. Modes of interannual tropical ocean-atmosphere interaction—a unified view. Part III: Analytical results in fully coupled cases. *J. Atmos. Sci.* **50**, 3523–3540 (1993).
- [17] Yang, J.-Y. & Neelin, J. D. Sea-ice interactions with the thermohaline circulation. *Geophys. Res. Lett.* **20**, 217–220 (1993).
- [18] Hao, Z., Neelin, J. D. & Jin, F.-F. Nonlinear tropical air-sea interaction in the fast-wave limit. *J. Climate* **6**, 1523–1544 (1993).
- [19] Liu, W., Ghil, M., Neelin, J. D. & Hall, C. A. A simple coastal ocean model for the Central Californian basin during late Miocene. *Paleoceanogr.* **8**, 799–810 (1993).
- [20] Neelin, J. D., Latif, M. & Jin, F.-F. Dynamics of coupled ocean-atmosphere models: The tropical problem. *Ann. Rev. Fluid Mech.* **26**, 617–659 (1994).
- [21] Neelin, J. D. & Yu, J.-Y. Modes of tropical variability under convective adjustment and the Madden-Julian oscillation. Part I: Analytical results. *J. Atmos. Sci.* **51**, 1876–1894 (1994).
- [22] Yu, J.-Y. & Neelin, J. D. Modes of tropical variability under convective adjustment and the Madden-Julian oscillation. Part II: Numerical results. *J. Atmos. Sci.* **51**, 1895–1914 (1994).
- [23] Jin, F.-F., Neelin, J. & Ghil, M. El Niño on the devil’s staircase: Annual subharmonic steps to chaos. *Science* **264**, 70–72 (1994).
- [24] Emanuel, K. A., Neelin, J. D. & Bretherton, C. S. On large-scale circulations in convecting atmospheres. *Quart. J. Roy. Meteor. Soc.* **120**, 1111–1143 (1994).
- [25] Neelin, J. D. & Marotzke, J. Representing ocean eddies in climate models. *Science* **264**, 1099–1100 (1994).
- [26] Waliser, D. E., Blanke, B., Neelin, J. D. & Gautier, C. Shortwave feedbacks and El Niño–Southern Oscillation: Forced ocean and coupled ocean-atmosphere experiments. *J. Geophys. Res.* **99** (C12), 25109–25125 (1994).
- [27] Dijkstra, H. A. & Neelin, J. D. On the attractors of an intermediate coupled equatorial ocean-atmosphere model. *Dyn. Atm. Oceans* **22**, 19–48 (1995).
- [28] Neelin, J. D. & Dijkstra, H. A. Ocean-atmosphere interaction and the tropical climatology. Part I: The dangers of flux correction. *J. Climate* **8**, 1325–1342 (1995).
- [29] Dijkstra, H. A. & Neelin, J. D. Ocean-atmosphere interaction and the tropical climatology, Part II: Why the Pacific cold tongue is in the east. *J. Climate* **8**, 1343–1359 (1995).
- [30] Syu, H.-H., Neelin, J. D. & Gutzler, D. Seasonal and interannual variability in a hybrid coupled GCM. *J. Climate* **8**, 2121–2143 (1995).
- [31] Jiang, N., Neelin, J. D. & Ghil, M. Quasi-quadrennial and quasi-biennial variability in COADS equatorial Pacific sea surface temperature and winds. *Climate Dynamics* **12**, 101–112 (1995).
- [32] Mechoso, C. R. *et al.* The seasonal cycle over the tropical Pacific in coupled ocean-atmosphere general circulation models. *Mon. Wea. Rev.* **123**, 2825–2838 (1995).
- [33] Chou, C. & Neelin, J. D. Linearization of a long-wave radiation scheme for intermediate tropical atmospheric models. *J. Geophys. Res.* **101**, 15129–15145 (1996).
- [34] Jin, F.-F., Neelin, J. D. & Ghil, M. El Niño/Southern Oscillation and the annual cycle: Subharmonic frequency locking and aperiodicity. *Physica D* **98**, 442–465 (1996).
- [35] Yang, J.-Y. & Neelin, J. D. Sea-ice interaction and the stability of the thermohaline circulation. *Atmosphere–Ocean* **35** (4), 433–469 (1997).
- [36] Yu, J.-Y. & Neelin, J. D. Analytic approximations for moist convectively adjusted regions. *J. Atmos. Sci.* **54**, 1054–1063 (1997).

- [37] Blanke, B., Neelin, J. D. & Gutzler, D. Estimating the effects of stochastic wind stress forcing on ENSO irregularity. *J. Climate* **10**, 1473–1486 (1997).
- [38] Emanuel, K. A., Neelin, J. D. & Bretherton, C. S. On large-scale circulations in convecting atmospheres—reply. *Quart. J. Roy. Meteor. Soc.* **123**, 1779–1782 (1997).
- [39] Neelin, J. D. *The physics and parameterization of moist atmospheric convection*, chap. Implications of convective quasi-equilibrium for the large-scale flow, 413–416 (Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997).
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- [47] Zeng, N. & Neelin, J. D. A land-atmosphere interaction theory for the tropical deforestation problem. *J. Climate* **12**, 857–872 (1999).
- [48] Dijkstra, H. A. & Neelin, J. D. Coupled processes and the tropical climatology. Part III: Instabilities of the fully coupled climatology. *J. Climate* **12**, 1630–1643 (1999).
- [49] Chou, C. & Neelin, J. D. Cirrus-detrainment-temperature feedback. *Geophys. Res. Lett.* **26**, 1295–1298 (1999).
- [50] Weng, W. & Neelin, J. D. Analytical prototypes for ocean-atmosphere interaction at midlatitudes. Part II: Mechanisms for coupled gyre modes. *J. Climate* **12**, 2757–2774 (1999).
- [51] Zeng, N., Neelin, J. D., Lau, W. K.-M. & Tucker, C. J. Enhancement of interdecadal climate variability in the Sahel by vegetation interaction. *Science* **286**, 1537–1540 (1999).
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- [53] Neelin, J. D. & Zeng, N. A quasi-equilibrium tropical circulation model—formulation. *J. Atmos. Sci.* **57**, 1741–1766 (2000).
- [54] Zeng, N., Neelin, J. D. & Chou, C. A quasi-equilibrium tropical circulation model—implementation and simulation. *J. Atmos. Sci.* **57**, 1767–1796 (2000).
- [55] Lin, J. W., Neelin, J. D. & Zeng, N. Maintenance of tropical intraseasonal variability: impact of evaporation-wind feedback and midlatitude storms. *J. Atmos. Sci.* **57**, 2793–2823 (2000).
- [56] Neelin, J. D., Jin, F.-F. & Syu, H.-H. Variations in ENSO phase-locking. *J. Climate* **13**, 2570–2590 (2000).
- [57] Syu, H.-H. & Neelin, J. D. ENSO in a hybrid coupled model. Part I: Sensitivity to physical parameterizations. *Climate Dynamics* **16**, 19–34 (2000).
- [58] Syu, H.-H. & Neelin, J. D. ENSO in a hybrid coupled model: Part II: Prediction with piggyback data assimilation. *Climate Dynamics* **16**, 35–48 (2000).
- [59] Zeng, N., Neelin, J. D., Chou, C., Lin, J. W.-B. & Su, H. *General circulation Modeling: Past, Present, and Future*, chap. Climate and variability in a quasi-equilibrium tropical circulation model, 457–488 (Academic Press, 2000).
- [60] Zeng, N. & Neelin, J. D. The role of vegetation-climate interaction and interannual variability in shaping the African Savanna. *J. Climate* **13**, 2665–2670 (2000).

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- [62] Lin, J. W.-B. & Neelin, J. D. Influence of a stochastic moist convective parameterization on tropical climate variability. *Geophys. Res. Lett.* **27**, 3691–3694 (2000).
- [63] Perigaud, C. M., Cassou, C., DeWitte, B., Fu, L.-L. & Neelin, J. D. Using data and intermediate coupled models for seasonal-to-interannual forecasts. *Mon. Wea. Rev.* **128**, 3025–3049 (2000).
- [64] Chou, C. & Neelin, J. D. Mechanisms limiting the southward extent of the South American summer monsoon. *Geophys. Res. Lett.* **28**, 2433–2436 (2001).
- [65] Su, H., Neelin, J. D. & Chou, C. Tropical teleconnection and local response to SST anomalies during the 1997-1998 El Niño. *J. Geophys. Res.* **106** (D17), 20,025–20,043 (2001).
- [66] Chou, C., Neelin, J. D. & Su, H. Ocean-atmosphere-land feedbacks in an idealized monsoon. *Quart. J. Roy. Meteor. Soc.* **127**, 1869–1891 (2001).
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- [74] Chou, C. & Neelin, J. D. Mechanisms limiting the northward extent of the northern summer monsoons over North America, Asia and Africa. *J. Climate* **16**, 406–425 (2003).
- [75] Su, H., Neelin, J. D. & Meyerson, J. E. Sensitivity of tropical tropospheric temperature to sea surface temperature forcing. *J. Climate* **16**, 1283–1301 (2003).
- [76] Lin, J. W.-B. & Neelin, J. D. Toward stochastic moist convective parameterization in general circulation models. *Geophys. Res. Lett.* **30** (4), 1162 (2003).
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- [79] Su, H. & Neelin, J. D. The scatter in tropical average precipitation anomalies. *J. Climate* **16**, 3966–3977 (2003).
- [80] Neelin, J. D., Chou, C. & Su, H. Tropical drought regions in global warming and El Niño teleconnections. *Geophys. Res. Lett.* **30** (24), 2275 (2003).
- [81] Münnich, M. & Neelin, J. D. Where is ENSO stress balanced? *Atmospheric Science Letters* **5**, 35–41 (2004).
- [82] Hales, K., Neelin, J. D. & Zeng, N. Sensitivity of tropical land climate to leaf area index: Role of surface conductance versus albedo. *J. Climate* **17**, 1459–1473 (2004).
- [83] Chou, C. & Neelin, J. D. Mechanisms of global warming impacts on regional tropical precipitation. *J. Climate* **17**, 2688–2701 (2004).
- [84] Su, H., Neelin, J. D. & Meyerson, J. E. *Ocean-Atmosphere Interaction and Climate Variability*, chap. Tropical tropospheric temperature and precipitation response to sea surface temperature forcing, 397–392. No. 147 in Geophysical Monograph Series (Amer. Geophys. Union, 2004).

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