Curriculum Vitae, April 2023

J. David Neelin

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

Positions

Distinguished Professor, Dept. of Atmospheric and Oceanic Sciences, UCLA, July 2016–present

Professor, Dept. of Atmospheric and Oceanic Sciences, UCLA, July 1995–June 2016

Chair, Dept. of Atmospheric and Oceanic Sciences, UCLA, July 2010-2013

Vice-Chair, Dept. of Atmospheric and Oceanic Sciences, UCLA, January 2004-June 2010

Associate Professor, Dept. of Atmospheric Sciences, UCLA, July 1992–July 1995

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

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

Jule G. Charney Medal, American Meteorological Society, 2019
Bert Bolin Global Environmental Change Award/Lecture, American Geophysical Union, 2017
Fellow of the Royal Society of Canada, Elected 2015
Fellow, American Association for the Advancement of Science, 2012-present
Fellow, American Geophysical Union, 2012-present
Distinguished Visiting Lecturer, U Washington, Seattle, 2011
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 Honorific Fellowship, 1986-87
NSERC Postgraduate Scholarship, 1981-83, 1983-86
Canadian Meteorological and Oceanographic Society Award, 1983

Selected Affiliations

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

Research Interests

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

Regional precipitation sensitivity including changes in climatology and extreme event statistics under global warming; ways to ground future projections in understanding of current climate variations.

Pushing process-oriented diagnostics of climate processes toward greater usefulness for constraining climate models, including organizing community efforts into common software framework, advocating common standards

Tropical climate dynamics including El Niño/Southern oscillation; climate variations on interannual and longer time scales.

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

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

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)

Deputy Editor, *Science Advances*, American Association for the Advancement of Science, (2022-present)

Chair, National Oceanic and Atmospheric Administration Model Diagnostics Task Force (2018-2021, 2021-present)

Lead organizer, American Meteorological Society Special Collection on Process-Oriented Diagnostics in CMIP6, 2023

National Ctr. for Atmos. Research, Climate & Global Dynamics Laboratory Advisory Board (2015-2021)

Jet Propulsion Laboratory Center for Climate Sciences Advisory Board (2012-2020)

Textbook and materials (Climate change and climate modeling, Cambridge Univ. Press, 282 pp., 2011)

New Fellows Selection Committee, Earth, Ocean & Atmos. Sci. Div., Royal Society of Canada (2017-2019)

NOAA Model Analysis and Prediction Program Task Force (2011-2015, 2015-2018)

Contributing author, *Fifth Assessment Report, Intergovernmental Panel on Climate Change*, 2013

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

Associate Editor, Journal of Climate, 1996-2006

Reviewer for US National Science Foundation, Department of Energy, National Oceanic and Atmospheric Administration

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

Contributing author, *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 Meteorol. & Climate, 1995-98

University Corporation for Atmospheric Research UCLA representative, 1988-94
American Meteorological Society Committee on Interaction of the Sea and Atmosphere, 1992-95

Postdoctoral scholars advised with current affiliation

Fiaz Ahmed	Assistant Research Scientist, UCLA
Cristian Martinez-Villalobos	Assistant Professor, Universidad Adolfo Ibáñez, (Chile)
Baird Langenbrunner	Research Analyst, Global Energy Monitor
Sandeep Sahany	Assistant Professor, Indian Institute of Technology, Delhi
Sam Stechmann	Professor, University of Wisconsin-Madison
Baijun Tian	Research Scientist, Jet Propulsion Laboratory
Ole Peters	Resident Fellow, London Mathematical Laboratory
Benjamin Lintner	Professor, Rutgers, The State University of New Jersey
Roel Neggers	Professor, University of Cologne, Germany
Hui Su	Scientist, Jet Propulsion Laboratory; Asst. Director, JIFRESSE, UCLA
Duane Waliser	Chief Scientist, Earth Science & Tech. Directorate, Jet Propulsion Lab
Jiayan Yang	Senior Scientist, Woods Hole Oceanographic Institution
Fei-Fei Jin	Professor, University of Hawaii at Manoa

Doctoral students advised

Advisee	**Current affiliation**
Jia-yuh Yu (PhD, 1994)	Professor, Culture University, Taiwan
Chia Chou (PhD, 1997)	Academia Sinica, Taiwan (Deceased)
Hsin-Hsin Syu (PhD, 1997)	(No longer in research)
Wenjie Weng (PhD, 1998)	Researcher, Motorola
Mark Roulston (PhD 2000; CalTech)	University of Exeter
Johnny W.-B. Lin (PhD 2000)	Associate Professor, North Park University
Katrina Hales (PhD 2005)	Lecturer, CSU Channel Islands
Chris Holloway (PhD 2009)	Associate Professor, University of Reading, UK
Tyler Ruff (MSc 2011)	Commodity Weather Group, Washington, DC
Diana Bernstein (PhD 2014, HUJI)	Assistant Professor, Marine Science, U. Southern Mississippi
Baird Langenbrunner (PhD 2015)	Associate Editor, Nature Climate Change
Xuan Ji (PhD 2016, co-advised)	Senior analyst, Union Bank
Kevin Quinn (PhD 2017)	Northrup-Grumman
Kathleen Schiro (PhD 2017)	Assistant Professor, U Virginia
Yi-Hung Kuo (PhD 2021)	Postdoctoral researcher, Princeton University/Geophysical Fluid D
Todd Emmenegger	Graduate Student, UCLA
Surabhi Biyani	Graduate Student, UCLA (co-advised)

Publication Summary Information
Total peer-reviewed publications: over 225 journal articles, 5 book chapters
One textbook & associated materials (for upper division undergraduate science students)
H-index: 80 (Google scholar) or 64 (Web of Science) i10-index 197
Papers with over 100 citations 67 (Google Scholar)

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., Latif, M., Allaart, M. A. F., Cane, M. A., Cubasch, U., Gates, W. L., Gent, P. R., Ghil, M., Gordon, C., Lau, N. C., Mechoso, C. R., Meehl, G. A., Oberhuber, J. M., Philander, S. G. H., Schopf, P. S., K. R. Sperber, A. S., Tokioka, T., Tribbia, J. & Zebiak, S. E. 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).

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

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[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).

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[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, Dortrecht, The Netherlands, 1997).

[40] Yang, J. & Neelin, J. D. Decadal variability in coupled sea-ice–thermohaline systems. *J. Climate* **10**, 3059–3076 (1997).

[41] Yu, J.-Y., Chou, C. & Neelin, J. D. Estimating the gross moist stability of the tropical atmosphere. *J. Atmos. Sci.* **55**, 1354–1372 (1998).

[42] Neelin, J. D., Battisti, D. S., Hirst, A. C., Jin, F.-F., Wakata, Y., Yamagata, T. & Zebiak, S. E. ENSO theory. *J. Geophys. Res.* **103**, 14261–14290 (1998).

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[44] Neelin, J. D. & Latif, M. El Niño dynamics. *Physics Today* **51**, 32–36 (1999).

[45] Dijkstra, H. A. & Neelin, J. D. Imperfections of the thermohaline circulation: multiple equilibria and flux correction. *J. Climate* **12**, 1382–1392 (1999).

[46] Neelin, J. D. & Weng, W. Analytical prototypes for ocean-atmosphere interaction at midlatitudes. Part I: Coupled feedbacks as sea surface temperature dependent stochastic forcing. *J. Climate* **12**, 697–721 (1999).

[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).

[52] Dijkstra, H. A. & Neelin, J. D. Imperfections of the thermohaline circulation: Latitudinal asymmetry and preferred northern sinking. *J. Climate* **13**, 366–382 (2000).

[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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[64] Chou, C. & Neelin, J. D. Mechanisms limiting the southward extent of the South American summer monsoon. *Geophys. Res. Lett.* **28**, 2433–2436 (2001).

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

[68] Lin, J. W.-B. & Neelin, J. D. Considerations for stochastic convective parameterization. *J. Atmos. Sci.* **59**, 959–975 (2002).

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[70] Su, H. & Neelin, J. D. Teleconnection mechanisms for tropical Pacific descent anomalies during El Niño. *J. Atmos. Sci.* **59**, 2694–2712 (2002).

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

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[73] Mechoso, C. R., Neelin, J. D. & Yu, J.-Y. Testing simple models of ENSO. *J. Atmos. Sci.* **60**, 305–318 (2003).

[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).

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

[78] Roulston, M. S. & Neelin, J. D. Non-linear coupling between modes in a low-dimensional model of ENSO. *Atmosphere-Ocean* **41**, 217–231 (2003).

[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).

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[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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[99] Neggers, R., Neelin, J. D. & Stevens, B. Impact mechanisms of shallow cumulus convection on tropical climate dynamics. *J. Climate* **20**, 2623–2642 (2007).

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