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ACADEMIC HISTORY

- 1977 -- BA Physics, U.C. San Diego (Revelle College), *summa cum laude*.
1979 -- MS Civil Engineering, Massachusetts Institute of Technology
"Numerical Modeling of Aquifer Systems under Uncertainty: A Second Moment Analysis"
1991 -- MS Atmospheric Sciences, University of California, Los Angeles
1997 -- Ph.D., Atmospheric Sciences, University of California, Los Angeles, advisor: Michael Ghil, *"Variations of Continental Climate and Hydrology on Diurnal-to-Interdecadal Scales"*
- 1985—Master's committee, Betsy Frick, University of Nevada, Reno
"Quantitative Evaluation of Ground-water Flow in Steptoe Valley, Nevada"
1986—Master's committee, Paul McBeth, University of Nevada, Reno
"Hydrogeologic Significance of LANDSAT Lineaments in the Great Basin"
2004—Doctoral committee, Jessica Lundquist, Scripps Institution of Oceanography
"Diurnal Cycles of Streamflow in the Western United States"
2009--Master's committee, Sam Haber, Scripps Institution of Oceanography
"Isotopes of Helium, Hydrogen and Carbon as Groundwater Tracers in Aquifers along the Colorado River"
2009—Master's committee, Charles Briscoe, Scripps Institution of Oceanography
"Environmental, Economic and Energy Impacts of Desalination Plants in Southern California"
2010—Doctoral committee, Theresa Carpenter, Scripps Institution of Oceanography
"Southern California Flash Flood Frequencies and Climate Variability"

PROFESSIONAL HISTORY

- 1979-81: Engineer-scientist, Camp Dresser & McKee, Inc., Walnut Creek, California: *Water-resources consulting & groundwater modeling*
Resource evaluations, groundwater flow/transport modeling, and water quality management studies for DOE nuclear-waste programs, Guam EPA, water-quality districts, and chemical industry.
- 1981-89: Hydrologist, U.S. Geological Survey, Carson City, Nevada: *Groundwater*
Assessments, modeling & hydrogeologic framework of groundwater resources, flow and chemistry in Great Basin bedrock and alluvial aquifers; and District Groundwater Specialist, including program development & review, and representation of USGS to public, Legislature and State Engineer.
- 1989-90: USGS Graduate Studies Program, UCLA Atmospheric Sciences.
- 1991-96: Research Hydrologist, California District, USGS, San Diego, CA: *Hydroclimatology*
Studies of sensitivity of water resources of California to interannual-decadal climate variations and change by historical analyses and simulations of snowmelt/watersheds. Analyses of freshwater-inflow variations to San Francisco Bay. Analysis of large-scale basis and predictability of global, hemispheric, and Western US hydroclimatic variations using historical and paleo-records of atmospheric circulations, trace gases, ocean temperatures, streamflow, ground water, and water quality. Nonlinear dynamics of land-air interactions. Co-developer of UCLA Singular-Spectrum-Analysis Toolkit, 1995. Developer of NOAA CDC Global Streamflow dataset.
- 1997-2001: Research Hydrologist, California District, USGS, & Research Associate, Climate Research Division, Scripps Institution of Oceanography, La Jolla, CA: *Hydroclimatology*
Continuation of studies of global, Western, and Sierra Nevada hydroclimatology of precipitation and streamflow. Weather and climate downscaling. Medium-range streamflow forecasting, Sierra Nevada, and long-range streamflow forecasting nationwide. Simulations of streamflow & aquifer responses to climate, including use of insolation variations. DOE Accelerated Climate Prediction Initiative simulations of Sierra Nevada sensitivities to climate changes. Co-PI, NOAA-funded California-Nevada Applications Program (CNAP) for regional integrated science and assessment of

climate applications.

2002-present: Research Hydrologist, Branch of Western Regional Research, USGS, & Research Associate, Climate Research Division, Scripps Institution of Oceanography, La Jolla, CA: Hydroclimatology & climate change

Studies of global, Western North American, and Sierra Nevadan hydroclimatology of precipitation, snowpack, streamflow & groundwater. Developed constructed-analogs downscaling, component-resampling, & derived-distribution approaches as tools for evaluating global-change and short-term climate predictions and consequences. Evaluation of climate-change projections for changes in western climates, large-scale Pacific-basin climate modes, flood statistics, streamflow & groundwater recharge. Development of innovative hydrometeorological monitoring methods, Yosemite National Park. Continuation of climate-applications assessments within CNAP & extension to State-funded California Climate Change Center. Co-designer, 21st Century Extreme Storm Observations Network for California. Team leader, ARkStorm scenario development, USGS Multi-Hazards Program. Co-PI, DOI's Southwest Climate Science Center and National Integrated Drought Information System's Southern California Pilot Study. Methods contributor, Climate Central/US Bureau of Reclamation Bias-corrected & Downscaled CMIP3/CMIP5 Climate Projections archive.

SELECTED OTHER PROFESSIONAL ACTIVITIES

- **Department of Interior Superior Service Award**, 2005, for exceptional contributions to hydroclimatology in the USGS. **Research Advisor**, USGS Surface-Water Hydrology Discipline, 2009-2013. **USGS Global Change Strategic Science Planning Team**, 2010-2012. **USGS Committee**, Report to Congress on a Program for Periodic Assessments of the Nation's Water Availability, Fall 2001 and Summer 2003 (origin of USGS Water Census Program). **Internal Review Team** for USGS Water Resources Division Strategic Plan, October 1997.
- **Co-lead author**, Water-sector chapter of National Climate Assessment Synthesis Report, 2012-2013. **Organizing committee and contributing author**, Southwest Regional Climate Assessment, 2011-2012. **Steering Committee**, CLIVAR PACE Postdoctoral Program, 2008-2012. **Science Steering Group** for US Global Water Cycle Interagency Working Group, 2004-. **US CCSP Committee for Science & Assessment Product 5.3** (Decision support & evaluations of seasonal-interannual forecasts & observations), 2006-2008.
- **California Department of Water Resources (DWR) Climate Science Service Award**, 2007. California Water Plan Update **Climate Change Technical Advisory Group**, 2008-2009, and California DWR Climate Change Technical Advisory Group, 2012-2014. **Project management team**, California Department of Water Resources 21st Century Observations, Modeling and Decision Support Systems for Enhanced Flood Response and Emergency Preparedness Program, 2008-2013. **Central Valley Flood Management Planning Program Climate-Change Working Groups**, 2009-2011. **Climate Change Advisor**, CALFED Bay-Delta Program, 2006-2009. **Editor**, CALFED State of Bay-Delta Science report, 2007-2008. **Member**, CALFED Water-Management Science Board, 2004-2005.
- **NOAA Office of Oceanic and Atmospheric Research Outstanding Scientific Paper Awards**, 2007 and 2009. **Program committee and contributing author**, NOAA Research Council Water Cycle Science Challenge Workshop, 2011. **NASA Science Review Board**, Surface-Water Oceanic Topography (SWOT) Mission, 2014- .
- **Venice Sustainability Advisory Panel**, Venice, Italy, UC San Diego Sustainability Solutions Institute, 2008-09, 2010-13. **Tahoe Science Consortium Committee of Scientists**, 2014- .
- **Member**, American Meteorological Society Annual Partnership Topic team on Integrated Water Resources, 2012-13. **Modeling Advisory Committee**, Water Utilities Climate Alliance's (WUCA's) Piloting Utility Modeling Applications (PUMA), 2010- . **Contributing author**, Urban Climate Change Research Network (UCCRN) Assessment Reports on Climate Change in Cities (ARC3), 2008-2009, 2013-2014. **Contributing author**, Seasonal-to-Interannual Climate Forecast Needs--Users' Perspectives, World Climate Conference 3, 2009.
- **Executive committee**, National Phenological Network Implementation Team, 2005-2007.

- **Reviewer**, National Intelligence Estimate, Geopolitical Implications of Climate Change, 2007.
- **Program chair & fundraiser**, Annual Pacific Climate (PACLIM) Workshops, 1998-2004. **Organizing committees**, biennial MTNCLIM Workshops, 2004-2012.
- **Vice President's National Performance Review Award**, 1996, for leadership in Mojave Desert Ecosystems planning efforts. **Leader** of the Physical Sciences Subgroup of Mojave Desert Science-Data Management Interagency Working Group, 1995-96.
- **Hydroclimate representative**, USGS National Ground-water Climate-Response Network Design Committee, 1995-97. **Climate group co-leader**, NRC Committee on Hydrologic Science's Workshop on Groundwater Fluxes across Interfaces, Green Bay, 2002.
- **Associate Editor**, Water Resources Research, 1998-2000; J. Hydro-meteorology, 2011-2012.

SELECTED PUBLICATIONS & REPORTS

*[Total numbers of publications: >100 journal articles & book chapters, > 25 government reports & >75 other technical publications. Impact: GoogleScholar lists >10,000 citations to my work in the scientific literature, with 28 of my publications cited more than 100 (most indicated below by **). More than 1,600 citations were made to my work in 2013. h=48 at GoogleScholar.]*

- ** Dettinger, M.D., & Wilson, J.L., 1981, First-order analysis of uncertainty in numerical models of groundwater flow, 1, Mathematical development: Water Resources Research, 17, 149-161.
 - ** Dettinger, M.D., 1989, Reconnaissance estimates of natural recharge to desert basins in Nevada, U.S.A., by using chloride-balance calculations: Journal of Hydrology, 106, 55-78.
 - ** Dettinger, M.D., & Cayan, D.R., 1995, Large-scale atmospheric forcing of recent trends toward early snowmelt in California: Journal of Climate, 8, 606-623.
 - ** Dettinger, M.D., Ghil, M., Strong, C.M., Weibel, W., & Yiou, P., 1995, Software expedites singular-spectrum analysis of noisy time series: Eos, Trans. American Geophysical Union 76(2), pp. 12, 14, 21.
- Dettinger, M.D., & Schaefer, D.H., 1996, Hydrogeology of structurally extended terrain in the eastern Great Basin of Nevada, Utah, and adjacent states from geologic and geophysical models: U.S. Geological Survey Hydrologic-Investigations Atlas HA-694-D, 1 sheet.
- Jeton, A.E., Dettinger, M.D., & Smith, J.L., 1996, Potential effects of climate change on streamflow, eastern and western slopes of the Sierra Nevada, California and Nevada: U.S. Geological Survey Water Resources Investigations Report 95-4260, 44 p.
- Morgan, D.S., & Dettinger, M.D., 1996, Ground-water conditions in Las Vegas Valley, Clark County, NV: 2, Hydrogeology and simulation of ground-water flow: US Geological Survey Water-Supply Paper 2320-B, 124 p.
- ** White, W.B., Lean, J., Cayan, D.R., & Dettinger, M.D., 1997, Response of global upper ocean temperature to changing solar irradiance: Journal of Geophysical Research, 102, 3255-3266.
 - ** Cayan, D.R., Dettinger, M.D., Diaz, H.F., & Graham, N., 1998, Decadal variability of precipitation over western North America: Journal of Climate, 11, 3148-3166.
 - ** Dettinger, M., Cayan, D., Diaz, H., & Meko, D., 1998, North-south precipitation patterns in western North America on interannual-to-decadal time scales: J. Climate, 11, 3095-3111.
 - ** McCabe, G.J., & Dettinger, M.D., 1999, Decadal variability in the relations between ENSO and precipitation in the western United States: International Journal of Climatology, 19, 1399-1410.
 - ** Dettinger, M.D., & Diaz, H.F., 2000, Global characteristics of streamflow seasonality and variability: Journal of Hydrometeorology, 1, 289-310.
 - ** Cayan, D.R., Kammerdiener, S., Dettinger, M.D., Caprio, J.M., & Peterson, D.H., 2001, Changes in the onset of spring in the western United States: Bulletin, American Meteorological Society, 82, 399-415.
- Dettinger, M.D., Battisti, D.S., Garreaud, R.D., McCabe, G.J., & Bitz, C.M., 2001, Interhemispheric effects of interannual and decadal ENSO-like climate variations on the Americas, in V. Markgraf (ed.), Interhemispheric climate linkages: Present and Past Climates in the Americas and their Societal Effects: Academic Press, 1-16.

- ** Ghil, M., Allen, M.R., Dettinger, M.D., Ide, K., Kondrashov, D., Mann, M.E., Robertson, A.W., Saunders, A., Y.Tian, Varadi, F., & Yiou, P., 2002, Advanced spectral methods for climatic time series: *Reviews of Geophysics*, 40(3), 1003, 1-41.
- ** McCabe, G.J., & Dettinger, M.D., 2002, Primary modes and predictability of year-to-year snowpack variations in the western United States from teleconnections with Pacific Ocean climate: *Journal of Hydrometeorology*, 3, 13-25.
- ** Westerling, A., Brown, T., Gershunov, A., Cayan, D., & Dettinger, M., 2003, Climate and wildfire in the western United States: *Bulletin, American Meteorological Soc.*, 84, 595-604.
- Dettinger, M.D., 2004, Fifty-two years of pineapple-express storms across the West Coast of North America: California Energy Commission PIER Energy-Related Environmental Research Report CEC-500-2005-004, 15 p.
- ** Dettinger, M.D., Cayan, D.R., Meyer, M.K., & Jeton, A.E., 2004, Simulated hydrologic responses to climate variations and change in the Merced, Carson, and American River basins, Sierra Nevada, California, 1900-2099: *Climatic Change*, 62, 283-317.
- Lundquist, J.D., Cayan, D.R., & Dettinger, M.D., 2004, Spring onset in the Sierra Nevada—When is snowmelt independent of elevation?: *J. Hydrometeorology*, 5, 325-340.
- Simpson, J.J., Dettinger, M.D., Gerhke, F., McIntyre, T.J., & Hufford, G.I., 2004, Hydrologic scales, cloud variability, remote sensing and models—Implications for forecasting snowmelt and streamflow: *Weather and Forecasting*, 19, 251-276.
- ** Stewart, I., Cayan, D.R., & Dettinger, M.D., 2004, Changes in snowmelt runoff timing in western North America under a 'Business as Usual' climate change scenario: *Climatic Change*, 62, 217-232.
- ** Dettinger, M.D., 2005, From climate-change spaghetti to climate-change distributions for 21st Century California: *San Francisco Estuary and Watershed Science*, 3(1), article 4.
- Hanson, R.T., & Dettinger, M.D., 2005, Ground-water/surface-water responses to ensembles of global climate simulations, Santa Clara-Calleguas basin, Ventura County, California, 1950-93: *Journal of the American Water Resources Association*, 41, 517-536.
- ** Stewart, I., Cayan, D., & Dettinger, M., 2005, Changes towards earlier streamflow timing across western North America: *Journal of Climate*, 18, 1136-1155.
- ** Bales, R., Molotch, N., Painter, T., Dettinger, M., Rice, R., & Dozier, J., 2006, Mountain hydrology of the western US: *Water Resources Research*, 42, W08432, 13 p.
- ** Knowles, N., Dettinger, M., & Cayan, D., 2006, Trends in snowfall versus rainfall for the Western United States: *Journal of Climate*, 19(18), 4545-4559.
- ** Ralph, F.M., Neiman, P.J., Wick, G., Gutman, S., Dettinger, M., Cayan, D., & White, A.B., 2006, Flooding on California's Russian River—Role of atmospheric rivers: *Geophysical Research Letters*, 33 (L13801), 5 p. [NOAA OAR Outstanding Paper Award, 2007]
- Florsheim, J.L., & Dettinger, M., 2007, Climate and floods still govern California levee breaks: *Geophysical Research Letters*, 34(L22403), 5 p.
- Malamud-Roam, F., Dettinger, M.D., Ingram, B.L., Hughes, M., & Florsheim, J., 2007, Holocene climates and connections between the San Francisco Bay estuary and its watershed—A review: *San Francisco Estuary and Watershed Science*, 5(1), article 3.
- ** Barnett, T.P., Pierce, D.W., Hidalgo, H., Bonfils, C., Santer, B., Das, T., Bala, G., Wood, A., Nozawa, T., Mirin, A., Cayan, D., & Dettinger, M., 2008, Human-induced changes in the hydrology of the western United States: *Science*, 316, 1080-1083.
- ** Cayan, D.R., Maurer, E.P., Dettinger, M.D., Tyree, M., & Hayhoe, K., 2008, Climate change scenarios for the California region: *Climatic Change*, 87(Suppl 1), S21-S42.
- Dettinger, M.D., & Culberson, S., 2008, Internalizing climate change—Scientific resource management and the climate change challenges: *San Francisco Estuary and Watershed Science*, 17 p, <http://repositories.cdlib.org/jmie/sfews/vol6/iss2/art6> .
- ** Funk, C., Dettinger, M., Brown, M., Verdin, J., Michaelsen, J., Barlow, M., & Hoell, A., 2008,

- Warming of the Indian Ocean threatens eastern and southern Africa food security, but could be mitigated by agricultural development: Proceedings, National Academies of Science, 105, doi/10.1073/pnas.0708196105, 11081-11086.
- Healey, M., Dettinger, M., & Norgaard, R. (eds.), 2008, State of the science for the Bay-Delta: CALFED Science Program, 185 p, <http://www.science.calwater.ca.gov/pdf/publications/sbds/>
- Cloern, J.E., Knowles, N., Brown, L.R., Cayan, D., Dettinger, M.D., Morgan, T.L., Schoellhamer, D.H., Stacey, M., van der Wegen, M., Wagner, R.W., & Jassby, A.D., 2011, Projected evolution of California's San Francisco Bay-Delta river system in a century of climate change: PLoS One, 26 p., <http://dx.plos.org/10.1371/journal.pone.0024465>.
- Das, T., Dettinger, M., Cayan, D., and Hidalgo, H., 2011, Potential increase in floods in California's Sierra Nevada under future climate projections: Climatic Change, 109, 71-94, doi:10.1007/s10584-011-0298-z.
- Dettinger, M.D., 2011, Climate change, atmospheric rivers and floods in California—A multimodel analysis of storm frequency and magnitude changes: Journal of American Water Resources Association, 47, 514-523.
- Dettinger, M.D., Ralph, F.M., Das, T., Neiman, P.J., and Cayan, D., 2011, Atmospheric rivers, floods, and the water resources of California: Water, 3, 455-478, <http://www.mdpi.com/2073-4441/3/2/445/>
- Earman, S., & Dettinger, M.D., 2011, Potential impacts of climate change on groundwater resources—A global review: Journal of Water and Climate Change, 2(4) 213-229.
- Major, D.C., Omojola, A., Dettinger, M., Hanson, R., & Sanchez-Rodriguez, R., 2011, Climate change, water and wastewater in cities, in Rosenzweig, C., Solecki, W., Hammer, S., and Mehrotra, S. (eds.), Climate Change and Cities—First Assessment Report of the Urban Climate Change Research Network: Cambridge University Press, 113-143.
- Ralph, F.M., & Dettinger, M.D., 2011, Storms, floods and the science of atmospheric rivers: Eos, Transactions of AGU, 92(32), 265-266.
- Dettinger, M.D., Ralph, F.M., Hughes, M., Das, T., Neiman, P., Cox, D., Estes, G., Reynolds, D., Hartman, R., Cayan, D., & Jones, L., 2012, Design and quantification of an extreme winter storm scenario for emergency preparedness and planning exercises in California: Natural Hazards, 60, 1085-1111.
- Ralph, F.M., & Dettinger, M.D., 2012, Historical and national perspectives on extreme west-coast precipitation associated with atmospheric rivers during December 2010: Bulletin, American Meteorological Society 93, 783-790, doi:10.1175/BAMS-D-11-00188.1.
- Dettinger, M.D., 2013, Projections and downscaling of 21st Century temperatures, precipitation, radiative fluxes and winds over the southwestern US, with a focus on Lake Tahoe: Climatic Change, 116, 17-33, doi:10.1007/s10584-012-0501-x.
- Dettinger, M., and Ingram, L., 2013, The coming megafloods: Scientific American, 308(1), 64-71 (also translated and published in eleven countries internationally).
- Overpeck, J., Garfin, G., Jardine, A., Busch, D., Cayan, D., Dettinger, M., Fleishman, E., Gershunov, A., MacDonald, G., Redmond, K., Travis, W., & Udall, B., 2013, Assessment of climate change in the southwest United States—Summary for decisionmakers: Chapter 1 in Assessment of Climate Change in the Southwest United States, edited by G. Garfin, A. Jardine, R. Merideth, M. Black, and S. LeRoy, 1–20. Washington, DC: Island Press.
- White, A.B., Anderson, M.L., Dettinger, M.D., Ralph, F.M., Hinajosa, A., Cayan, D.R., Hartman, R.K., Reynolds D.W., Johnson, L.E., Schneider, T.L., Cifelli, R., Toth, Z., Gutman, S.I., King, C.W., Gerhke, F., Johnston, P.E., Walls, C., Gottas, D.J., and Coleman, T., 2013, A 21st Century California observing network for monitoring extreme weather events: Journal of Atmospheric and Oceanic Technology, 30, 1585-1603, doi:10.1175/JTECH14, -D-12-00217.1.
- Dettinger, M.D., 2013, Atmospheric rivers as drought busters on the US west coast: Journal of Hydrometeorology, 14, 16 p, doi:10.1175/JHM-D-13-02.1.