

BIOGRAPHICAL SKETCH

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NAME: Thomas E. Gill

eRA COMMONS USER NAME (credential, e.g., agency login): TEG258

POSITION TITLE: Associate Professor of Geological Sciences and Environmental Science and Engineering

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of California, Davis	B.S.	06/1984	Atmospheric Science
University of California, Davis	Ph.D.	09/1995	Earth Science and Resources
USDA Agricultural Research Service, Lubbock, TX	Postdoctoral	02/1998	Wind Erosion and Water Conservation

A. Personal Statement

My research for over 25 years has focused on atmosphere-lithosphere interaction - particularly aeolian (wind-related) processes (wind erosion, blowing sand and dust storms) and atmospheric aerosols of geological origin, particularly mineral dust; and their roles in biogeochemical cycling, ecosystem and human health, and environmental change. My research uses aspects of geology, meteorology, chemistry, and remote sensing to study the generation, transport, and deposition of mineral aerosols and wind transported materials of geological origin, their management and their impacts on ecosystems and human systems; as well as to investigate the interactions and cycling of materials between the atmosphere, solid earth and biosphere. My research interests also include the environmental geochemistry, source appointment and biogeochemistry of trace elements; mesoscale meteorology and air pollution meteorology; the application of X-ray and elemental analysis techniques in the geosciences; and applications of meteorology to homeland security

B. Positions and Honors**Positions and Employment**

1985- 1995 Postgraduate Researcher, Crocker Nuclear Laboratory, University of California- Davis
 1995- 1998 Physical Scientist, USDA Agricultural Research Service, Lubbock, Texas
 1996- 2005 Adjunct Prof., Geosciences, Texas Tech University, Lubbock
 1998- 2000 Research Associate, Civil Engineering, Texas Tech University, Lubbock
 1999- Adjunct Prof., Institute of Environmental and Human Health, Texas Tech University, Lubbock
 2000- 2004 Research Assistant Prof., Civil Engineering and Geosciences, Texas Tech University, Lubbock
 2004- Associate Prof., Geological Sciences/Environmental Sci. & Engr., University of Texas- El Paso

Other Experience and Professional Memberships

1998- 2000 Chairman, Modeling Subcommittee, Admiral Elmo Zumwalt Jr. Memorial National Center for Countermeasures to Chemical and Biological Threats
 1999- 2000 Member, National Academic Advisory Committee for Owens Lake Dust Mitigation
 2000 University Representative to Physical Sciences and Mathematics Review Panel, State of Texas Higher Education Coordinating Board
 2001- 2002 Member, Federal Interagency Urban Dispersion Modeling Working Group
 2002 Co-Convenor, International Conference on Aeolian Research
 2003- 2005 Participating Guest Researcher, Lawrence Livermore National Laboratory

2011- 2014	Graduate Advisor (Ph.D. and MS programs director), Geological Sciences, Geophysics, and Environmental Science, University of Texas- El Paso
1991-	Switzer Foundation Fellow in the Environmental Sciences
1995-	Co-Editor, The Bibliography of Aeolian Research
2000-	Collaborating Academic Scientist, US Geological Survey
2003-	Professional Geologist, State of Texas, License No. 3496
2004-	Member, International Association of Geomorphologists Natural Hazards Working Group
2008-	Member, QUEST (Quantifying and Understanding the Earth SysTem, British Natural Environment Research Council) Working Group on Dust
2009-	Fellow, Royal Geographical Society (Great Britain)
2012-	Co-Chair, World Meteorological Organization (WMO) Pan American Node for Global Dust and Sand Early Warning System Dust Sources, Compositions & Effects Subgroup
2012-	Associate Editor, <i>Aeolian Research</i>

C. Contribution to Science

As an interdisciplinary earth and environmental scientist, my primary research interest has been to work collaboratively to quantify and delineate aeolian processes- in particular, mineral dust emission and transport- to improve our understanding of the links between the lithosphere, atmosphere, hydrosphere, biosphere, and human systems (anthroposphere). Amongst my prime contributions to knowledge in this field are:

1. *discovering that the basins of saline lakes and their desiccated remnants disproportionately dominate terrestrial dust sources and emissions* [first described in a chapter of my doctoral dissertation published as Gill (1996), a paper which has now gathered over 100 citations; and later quantified in Prospero *et al.* (2002), an ICI highly cited paper], and subsequent research.
 - a. **Gill, Thomas E.**, 1996. Eolian sediments generated by anthropogenic disturbance of playas: human impact on the geomorphic system and geomorphic impacts on the human system. *Geomorphology*, 17: 207-228.
 - b. Cahill, Thomas A., **Thomas E. Gill**, Jeffrey S. Reid, Elizabeth A. Gearhart, and Dale A. Gillette, 1996. Saltating particles, playa crusts and dust aerosols at Owens (dry) Lake, California. *Earth Surface Processes and Landforms*, 21: 621-639.
 - c. Floyd, Kevin W., and **Thomas E. Gill**, 2011. The association of land cover with aeolian sediment production at Jornada Basin, New Mexico, USA. *Aeolian Research* 3(1): 55- 66, doi:10.1016/j.aeolia.2011.02.002
 - d. White, Warren, Nicole P. Hyslop, Krystyna Trzepla, Sinan Yatkin, Randy S. Rarig, Jr., **Thomas E. Gill**, and Lixin Jin, 2015. Regional transport of a chemically distinctive dust: gypsum from White Sands, New Mexico (USA). *Aeolian Research* 16:1-10, doi:10.1016/j.aeolia.2014.10.001.
2. *demonstrating that a significant mass of mineral aerosol is transported across ocean basins from hemisphere to hemisphere* [including Saharan dust transport (Perry *et al.*, 1997) and Asian dust transport (Husar *et al.*, 2001) to North America- each paper with hundreds of citations] . This discovery- the intercontinental transport of dust- was described by Jared Diamond as “one of the five great geographic discoveries of recent decades” in his keynote address to the 2007 annual meeting of the Association of American Geographers.
 - a. Perry, Kevin D., Thomas A. Cahill, Robert A. Eldred, Dabrina D. Dutcher and **Thomas E. Gill**, 1997. Long-distance transport of Saharan dust to the eastern United States. *Journal of Geophysical Research* 102D: 11225-11238.
 - b. Husar, Rudolf B., D.M. Tratt, Bret A. Schichtel, Stephan R. Falke, F. Li, Daniel Jaffe, Santiago Gasso, **Thomas E. Gill**, N.S. Laulainen, F. Lu, Marith C. Reheis, Y. Chun, Douglas Westphal, Bret N. Holben, C. Geymard, Ian McKendry, Norman Kuring, G.C. Feldman, C. McClain, R.J. Frouin, J.

Merrill, David DuBois, Frank Vignola, T. Murayama, Slobodan Nickovic, Willam E. Wilson, Kenneth Sassen, and N. Sugimoto, 2001. The Asian dust events of April 1998. *Journal of Geophysical Research* 106D: 18317-18330. **(ISI Highly Cited Paper)**

3. *detecting, quantifying, documenting and understanding why specific landforms become dust sources*, with an emphasis on the Chihuahuan Desert surrounding my current workplace at UTEP. The Chihuahuan Desert is an ideal natural laboratory, since it is one of the most consistent dust-producing regions in the Western Hemisphere, while much of it is quickly and easily accessible and its physiography, geology, and ecology are already well characterized.
 - a. Rivera Rivera, Nancy I., **Thomas E. Gill**, Max P. Bleiweiss, and Jennifer L. Hand, 2010. Source identification of hazardous Chihuahuan Desert dust outbreaks. *Atmospheric Environment* 44: 2457-2468, doi:10.1016/j.atmosenv.2010.03.019
 - b. Bullard, Joanna E., Sandy P. Harrison, Matthew C. Baddock, Nick A. Drake, **Thomas E. Gill**, Grant H. McTainsh, and Youbin Sun, 2011. Preferential dust sources: a geomorphological classification designed for use in global dust-cycle models. *Journal of Geophysical Research- Earth Surface* 116: F04034, doi:10.1029/2011JF002061, 20 pp.
 - c. Baddock, Matthew C., **Thomas E. Gill**, Joanna E. Bullard, Miguel Dominguez Acosta and Nancy I. Rivera Rivera, 2011. Geomorphology of the Chihuahuan Desert based on potential dust emissions. *Journal of Maps* 7: 249- 259, doi:10.4113/jom.2011.1178
 - d. Lee, Jeffrey A., Matthew C. Baddock, Mbongowo J. Mbuh, and **Thomas E. Gill**, 2012. Geomorphic and land cover characteristics of aeolian dust sources in west Texas and eastern New Mexico, USA. *Aeolian Research* 3(4): 459- 466, doi:10.1016/j.aeolia.2011.08.001
4. *improving remote sensing tools and linking remote sensing to aerosol transport modeling to improve inventories of the state, nature and specific source areas of dust aerosols*.
 - a. Prospero, Joseph M., Paul Ginoux, Omar Torres, Sharon E. Nicholson, and **Thomas E. Gill**, 2002. Environmental characterization of global sources of atmospheric soil dust identified with the NIMBUS-7 TOMS absorbing aerosol product. *Reviews of Geophysics* 40: 2-01 – 2-31 (doi: 10.1029/2000RG000095). **(Invited manuscript) (ISI Highly Cited Paper)**
 - b. Lee, Jeffrey A., **Thomas E. Gill**, Kevin R. Mulligan, Miguel A. Dominguez, and Adriana E. Perez, 2009. Land use/land cover and point sources of the 15 December 2003 dust storm in southwestern North America. *Geomorphology* 105(1): 18- 27, doi:10.1016/j.geomorph.2007.12.016
 - c. Rivera Rivera, Nancy I., **Thomas E. Gill**, Kristi A. Gebhart, Jenny L. Hand, Max P. Bleiweiss, and Rosa M. Fitzgerald, 2009. Wind modeling of Chihuahuan Desert dust outbreaks. *Atmospheric Environment* 43 (2): 347- 354, doi:10.1016/j.atmosenv.2008.09.
 - d. Ginoux, Paul, Joseph M. Prospero, **Thomas E. Gill**, N. Christina Hsu and Ming Zhao, 2012. Global scale attribution of anthropogenic and natural dust sources and their emission rates based on MODIS Deep Blue aerosol products. *Reviews of Geophysics* 50:RG3005, 36 pp., doi:10.1029/2012RG000388 **(Invited manuscript)**
5. *demonstrating that mineral dust aerosols by themselves do have human health effects*.
 - a. Grineski, Sara E., Joan G. Staniswalis, Yanlei Peng, Priyangi Bulathsinhala, and **Thomas E. Gill**, 2011. Hospital admissions for asthma and acute bronchitis in El Paso, Texas: Do age, sex, and insurance status modify the effects of dust and low wind events? *Environmental Research* 111(8): 1148- 1155, doi:10.1016/j.envres.2011.06.007

Complete List of Published Work:

<http://scholar.google.com/citations?hl=en&user=z2a7I4EAAAAJ>

D. Research Support

Ongoing Research Support

U.S. EPA IT83509301 Li (PI) 7/01/11- 6/30/16

Buen Ambiente-Buena Salud: Educational Strategies for Addressing Air Quality on the Border

This project initiates an educational program and establishes and funds summer internships for UTEP students relevant to air quality along the USA-Mexico border.

Role: Participant

National Oceanic and Atmospheric Administration NA17AE1625 Fitzgerald (PI) 10/01/11- 9/30/16

NOAA Center for Atmospheric Sciences at the University of Texas- El Paso

This project trains students and funds research in the atmospheric sciences consistent with the goals of and broadening the workforce of NOAA.

Role: Co-Investigator

NASA NNX13A045G Tong (PI) 8/02/13- 8/01/15

Development and testing of dust activity indicators for the Western United States

This project relates land use/land cover to dust sources and evaluates dust transport pathways and dust signatures in aerosol monitoring networks to improve validation and verification of a multi-year dust activity database.

Role: Co-Investigator

Southern Plains Transportation Center 14.1-39 Li (PI) 1/01/15- 12/31/16

Impact of windblown dust on highway safety in the Southern Plains

This project evaluates the impact of dust storms on highway transportation accidents in Oklahoma, Texas, and New Mexico.

Role: Co-PI

Completed Research Support

IDR-Phase II, University of Texas- El Paso Walsh (PI) 8/22/13- 5/31/14

Assessment of aridland aquatic biodiversity using second generation sequencing

This project identified and cataloged the biodiversity of aquatic microinvertebrates dispersed by the wind from desert basins.

Role: Co-PI

NASA NNX09AC38G Chen (PI) 1/1/09- 12/31/12

The Impact of the Saharan Air Layer on Tropical Cyclone Intensification

This project used data parameterization and numerical modeling to determine the impact of Saharan dust on the formation and intensification of hurricanes in the Atlantic.

Role: Co-Investigator