

## **Vikram Madhuvadan Mehta, Ph.D.**

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**Citizenship: U.S.A.**

### **Educational Qualifications**



- ◆ **Ph.D.**; Meteorology; Florida State University, Tallahassee, Florida, U.S.A.; 1990
- ◆ **M.S.**; Meteorology; Florida State University, Tallahassee, Florida, U.S.A.; 1986
- ◆ **Graduate Diploma**; Physics; University of Saskatchewan, Saskatoon, Saskatchewan, Canada; 1984
- ◆ **Graduate Diploma**; Space Sciences and Their Applications; Gujarat University, Ahmedabad, Gujarat, India; 1978
- ◆ **M.Sc.**; Physics; Gujarat University, Ahmedabad, Gujarat, India; 1977
- ◆ **B.Sc.**; Physics; Gujarat University, Ahmedabad, Gujarat, India; 1974

### **Climate and Societal Impacts Research and Applications Experience**

- ◆ Thirty years' experience of climate variability research, especially on natural decadal climate variability and its predictability, and the role of freshwater in ocean and climate variability.
- ◆ Over 10 years' experience of assessment, modeling, and prediction of societal impacts of natural decadal climate variability, especially impacts on water resources, agriculture, and inland water-borne transportation, in the Missouri and Mississippi River Basins.
- ◆ Over 10 years' experience of working with farmers, water managers, government officials, and other stakeholders and policymakers to assess their climate and impacts information needs, and to develop climate adaptation options in the Missouri and Mississippi River Basins.
- ◆ Advisor to the U.S. Army Corps of Engineers about the use of natural decadal climate variability information for management of water resources and inland waterways.

### **Leadership and Management Experience**

- ◆ Founder and Executive Director of CRCES since July 2002; experience of managing up to 10 senior scientists, research associates, research assistants, information technology specialists, and an administrative officer; experience of overseeing financial and administrative management of CRCES.
- ◆ Leader of several multi-disciplinary, multi-institution project teams of up to 40 climate, hydrology, remote sensing, and agriculture scientists; agricultural economists; public participation specialists; and stakeholders such as water managers, farmers, government officials, and academics.
- ◆ Founder and Executive Director of the Indian Centre for Climate and Societal Impacts Research (ICCSIR) from August 2008 to December 2013; experience of managing up to 15 senior scientists, research associates, research assistants, and an administrative officer; experience of overseeing financial and administrative management of ICCSIR.
- ◆ Chairman, Governing Council of the NASA-University of Maryland Joint Center for Earth System Science, Maryland, U.S.A.; 1995-1997.
- ◆ Chairman, Nine international workshops on decadal climate variability (DCV) and predictability; 1996-2009.
- ◆ Chairman, Eight workshops on societal impacts of DCV; 2007-2013.
- ◆ Chairman, International workshop on "Monsoon Climate Variability and Change and Their Impacts on Water, Food, and Health in Western India", in Ahmedabad, Gujarat, India in February 2007.

## Proposal-winning Experience

- ◆ Principal Investigator of 30 CRCES project grants funded by National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Agriculture (USDA) – National Institute for Food and Agriculture (NIFA), U.S. Geological Survey (USGS), U.S. Army Corps of Engineers (USACE) – Institute for Water Resources (IWR), and U.S. Department of Energy (USDOE) since 2002, totaling many millions of dollars.
- ◆ Principal Investigator of 7 funded projects on droughts and their impacts on water, agriculture, and inland water-borne transportation.
- ◆ Principal Investigator of single-institution (CRCES, ICCSIR) and multi-institution (up to four institutions) research projects.
- ◆ Principal Investigator of 4 Indian ICCSIR project grants funded by the Indian National Centre for Ocean Information Services (INCOIS), the Indian Space Research Organization (ISRO), the Ministry of Earth Sciences (MoES), the Government of India - Department of Science & Technology (DST), and private sector entities from 2008 to 2013, totaling many millions of Indian Rupees.

## International Experience

- ◆ Invited to give keynote address on drought predictability in the High-level Meeting on National Drought Policy, organized by several U.N. agencies (the World Meteorological Organization, the United Nations Convention to Combat Desertification (UNCCD) and the Food and Agriculture Organization of the United Nations (FAO) in Geneva in March 2013.
- ◆ Organized and chaired nine workshops on decadal climate variability and predictability, involving international participants.
- ◆ Invited to give scientific talks in many research and educational institutions in Germany, France, Japan, Australia, India, Italy, Canada, the UK, Switzerland, Austria, China, Brazil, Russia, Spain, and the Ivory Coast on decadal climate variability and its societal impacts.
- ◆ **India:** ICCSIR research projects, among others, on analysis and modeling of variability and long-term changes in rainfall and droughts in western India; and analysis of associations between regional climate variability and many crops grown in Gujarat State; organized scientific workshops in ICCSIR for college and university faculty and post-graduate students on atmospheric science, climate change, and societal impacts such as droughts; undertook a comprehensive survey of the need and requirements of capacity-building in research, education, applications, and outreach in climate science and climate impacts science in India.
- ◆ **India:** Gave 10 lectures on “Climate Analysis and Modeling” as a Visiting Professor in the Physical Research Laboratory in Ahmedabad in December 1996 – January 1997.
- ◆ **India:** As a Research Fellow in the Space Applications Centre (SAC) of the Indian Space Research Organization (ISRO) from December 1979 to September 1982, built and operated microwave radars for research on remote sensing of soil moisture and crops, and analyzed the data; participated in a joint field campaign between SAC-ISRO and DFVLR (West German Space Research Agency) using Side-Looking Airborne Radar for remote sensing of soil moisture and crops in Gujarat State, and analyzed the radar and ground-truth data.
- ◆ **Canada:** As a graduate student research assistant in the Institute for Space and Atmospheric Studies in the University of Saskatchewan, Saskatoon, from October 1982 to July 1984, participated in a field project to deploy VHF radars for remote sensing of the aurora borealis (“the Northern Lights”) and analyzed the radar data.

## Other Professional Experience

- ◆ **Research Scientist**, Climate and Radiation Branch, Laboratory for Atmospheres, NASA-Goddard Space Flight Center, Greenbelt, Maryland; and Department of Meteorology, University of Maryland-College Park, Maryland; March 1990-July 2002.
- ◆ **Visiting Professor**, International Pacific Research Center, University of Hawaii, Honolulu, U.S.A.; June 2001-August 2001.
- ◆ **Fellow**, Supercomputer Computations Research Institute, Florida State University, Tallahassee, Florida, U.S.A.; April 1989-March 1990.

- ◆ **Graduate Student Research Assistant**, Department of Meteorology, Florida State University, Tallahassee, Florida, U.S.A.; August 1984-March 1989.
- ◆ **Research Assistant**, Laboratory for Atmospheres, NASA-Goddard Space Flight Center, Greenbelt, Maryland, U.S.A.; May-August 1986 and May-August 1987.

### **Mentoring and Teaching Experience**

- Mentor, post-doctoral researchers Drs. Boyin Huang, Robert Iacovazzi, and Hui Wang; and research associates Carolina Fayos, Lauren De Kort, and Katherin Mendoza; Center for Research on the Changing Earth System; 2002-present.
- Mentor, post-doctoral researchers Drs. Bakshi Vaid, Vijaya Bhaskar, and Rohit Srivastava; and research associates Dhaval Prajapati and Anuradha Modi; Indian Centre for Climate and Societal Impacts Research, Ahmedabad, India; 2008-2013.
- Member, Ph.D. Committee of Anuradha Modi, Nirma University of Science & Technology, Ahmedabad, India; 2011-2013.
- Member, Ph.D. Committee of Julia Manganello, George Mason University; 2001-2004.
- Teacher, graduate course on Time Series Analysis; Department of Meteorology, University of Maryland – College Park, Maryland; 1994-1996.
- Mentor, undergraduate summer students; Climate and Radiation Branch, NASA-Goddard Space Flight Center, Greenbelt, Maryland; 1992-1995.
- Teaching Assistant, Undergraduate Physics students; Department of Physics, University of Saskatchewan, Saskatoon, Canada; 1983-1984.
- Laboratory Teaching Assistant, Post-Graduate Diploma students; Department of Physics, Gujarat University, Ahmedabad, India; 1978-1979.

### **Research Interests**

- Assessment and prediction of decadal climate variability and its societal impacts on water, food, energy, and public health.
- Formulation of climate adaptation options for stakeholders and policymakers in water, food, energy, and public health sectors.
- Development of methods and models for generating climate and impacts information for public- and private-sector policymaking.
- Analysis and modeling of decadal-multidecadal climate variability and its predictability.

### **Honors**

- ◆ The **Hind Ratna (Jewel of India) Award**; the Non-Resident Indian Welfare Society of India, New Delhi, 25 January 2015.
- ◆ **Mahatma Gandhi Medal**; the Non-Resident Indian Welfare Society of India, presented in the House of Lords, U.K. Parliament, London, October 2012.
- ◆ **Fellow**; Supercomputer Computations Research Institute, Florida State University; Tallahassee, Florida, U.S.A.; April 1989-March 1990.
- ◆ **ISRO Research Fellow**; Space Applications Center, Indian Space Research Organization; Ahmedabad, Gujarat, India; December 1979-September 1982.

### **Contributions to National and International Research Programs**

- ❖ Member, USDA-National Institute for Food and Agriculture Panel on Land Use and Climate Change; 2016-2017.
- ❖ Member, NASA-Sea Surface Temperature Science Team; 2009-2013.
- ❖ Member, NASA-Physical Oceanography Panel; 2004-2005, 2011.
- ❖ Leader, NASA's Global Precipitation Mission Working Group on Oceans and Marine Boundary Layer; 2001.
- ❖ Member, Science Advisory Council for NASA's Global Precipitation Mission; 2001.
- ❖ Member, Working Group on Long-term, Physical Earth System Variability, NASA Earth Science Vision 2025; 2000-01.

- ❖ Contributor to the EuroCLIVAR-NOAA Atlantic Climate Variability Program; 1998.
- ❖ Contributor to and reviewer of the International CLIVAR Initial Implementation Plan; 1996-98.
- ❖ Contributor to and reviewer of NOAA's Atlantic Climate Change Program; 1992-96.

### **Books and Book Chapter**

- ◆ **Mehta V.M.**, 2017: *Natural Decadal Climate Variability: Societal Impacts*. CRC Press, Taylor & Francis Group, Boca Raton, U.S.A., 326 pages.
- ◆ **Mehta V.M.**, 2019: *Natural Decadal Climate Variability: Phenomena, Mechanisms, and Predictability*. To be published by CRC Press.
- ◆ **Mehta, V.M.**, and M. Latif, 2001: Data requirements for decadal-to-centennial climate variability studies and coupled models. In “*Ocean observations for Climate*”; eds. N. Smith and C. Koblinsky; Bureau of Meteorology, Melbourne, Australia.

### **Selected Refereed Publications**

#### **In Review**

- ◆ **Mehta, V.M.**, K. Mendoza, P. Daggupati, N.J. Rosenberg, and R. Srinivasan, 2017: High-resolution Simulations of Decadal Climate Variability Impacts on Dryland Crop Yields in the Missouri River Basin with the Soil and Water Assessment Tool (SWAT): Spring and Winter Wheat. *Global Change Biology*, in review.

#### **Decadal Climate Variability Impacts on Water and Agriculture**

- ◆ Fernandez, M.A., P. Huang, B. McCarl, and **V.M. Mehta**, 2016: Value of decadal climate variability information for agriculture in the Missouri River Basin. *Climatic Change*, **139**, 517-533. DOI 10.1007/s10584-016-1807-x.
- ◆ **Mehta, V.M.**, K. Mendoza, P. Daggupati, R. Srinivasan, N. J. Rosenberg, and D. Deb, 2016: High-resolution Simulations of Decadal Climate Variability Impacts on Water Yield in the Missouri River Basin with the Soil and Water Assessment Tool (SWAT). *J. Hydrometeorology*, **17**, 2455 - 2476.
- ◆ Daggupati, P., D. Deb, R. Srinivasan, D. Yeganantham, V. M. Mehta, and N. J. Rosenberg, 2014: Spatial calibration of hydrology and **crop yields through parameter** regionalization for a large river basin. *Journal of the American Water Resources Association*, **52**, 648 - 666.
- ◆ **Mehta, V.M.**, C. L. Knutson, N. J. Rosenberg, J. R. Olsen, N. A. Wall, T. K. Bernadt, and M. J. Hayes, 2013: Decadal Climate Information Needs of Stakeholders for Decision Support in Water and Agriculture Production Sectors: A Case Study in the Missouri River Basin. *Weather, Climate, and Society*, **5**, 27-42.
- ◆ **Mehta, V.M.**, N. J. Rosenberg, and K. Mendoza, 2012: Simulated Impacts of Three Decadal Climate Variability Phenomena on Dryland Corn and Wheat Yields in the Missouri River Basin. *Agricultural and Forest Meteorology*, **152**, 109-124.
- ◆ **Mehta, V.M.**, N. J. Rosenberg, and K. Mendoza, 2011: Simulated Impacts of Three Decadal Climate Variability Phenomena on Water Yields in the Missouri River Basin. *Journal of the American Water Resources Association*, **47**, 126-135.

#### **Decadal Climate Variability and Predictability**

- ◆ **Mehta, V.M.**, H. Wang, and K. Mendoza, 2018: Predictability of Phases and Magnitudes of Natural Decadal Climate Variability Phenomena in CMIP5 Experiments with the UKMO-HadCM3, GFDL-CM2.1, NCAR-CCSM4, and MIROC5 Global Earth System Models. *Climate Dynamics*, in press, <https://doi.org/10.1007/s00382-018-4321-1>.
- ◆ **Mehta, V.M.**, H. Wang, and K. Mendoza, 2017: Simulations of Three Natural Decadal Climate Variability Phenomena in CMIP5 Experiments with the UKMO-HadCM3, GFDL-CM2.1, NCAR-CCSM4, and MIROC5 Global Earth System Models. *Climate Dynamics*, in press, <https://doi.org/10.1007/s00382-017-3971-8>.
- ◆ Bhandari, S., R. Srivastava, and **Mehta, V.M.**, 2016: Long-term changes in the within-season temporal profile of southwest monsoon over western India. *J. Earth System Science*, **125**, 1313-1319. DOI 10.1007/s12040-016-0736-4.

- ◆ **Mehta, V.M.**, H. Wang, K. Mendoza, and N.J. Rosenberg, 2014: Predictability and Prediction of Decadal Hydrologic Cycles: A Case Study in Southern Africa. *Weather and Climate Extremes*, **3**, 47-53.
- ◆ **Mehta, V.M.**, H. Wang, and K. Mendoza, 2013: Decadal predictability of tropical basin-average and global-average sea-surface temperatures in CMIP5 experiments with the HadCM3, GFDL-CM2.1, NCAR-CCSM4, and MIROC5 global earth system models. *Geophysical Research Letters*, **40**, doi:10.1002/grl.50236.
- ◆ Murphy, J., V. Kattsov, N. Keenlyside, M. Kimoto, G. Meehl, **V. Mehta**, H. Pohlmann, A. Scaife, and D. Smith, 2010: Towards Prediction of Decadal Climate Variability and Change. *Procedia Environmental Sciences*, **1**, 287–304.
- ◆ Wang, H., and **V.M. Mehta**, 2008: Decadal Variability of the Indo-Pacific Warm Pool and Its Association with Atmospheric and Oceanic Variability in the NCEP–NCAR and SODA Reanalyses. *Journal of Climate*, **21**, 5545-5565.
- ◆ **Mehta, V.M.**, M. Suarez, J. Manganello, and T. Delworth, 2000: Oceanic influence on the North Atlantic Oscillation and associated Northern Hemisphere climate variations: 1959-1993. *Geophysical Research Letters*, **27**, 121-124.
- ◆ Power, S., T. Casey, C. Folland, A. Colman, and **V.M. Mehta**, 1999: Interdecadal modulation of the impact of ENSO on Australia. *Climate Dynamics*, **15**, 319-324.
- ◆ Power, S., F. Tseitin, **V.M. Mehta**, B. Lavery, S. Torok, and N. Holbrook, 1999: Decadal climate variability in Australia during the 20th century. *International Journal of Climatology*, **19**, 169-184.
- ◆ Delworth, T., and **V.M. Mehta**, 1998: Simulated interannual to decadal climate variability of tropical and subtropical Atlantic. *Geophysical Research Letters*, **25**, 2825-2828.
- ◆ **Mehta, V.M.**, 1998: Variability of the tropical ocean surface temperatures at decadal-multidecadal timescales, Part I: The Atlantic Ocean. *Journal of Climate*, **11**, 2351-2375.
- ◆ **Mehta, V.M.**, and K.-M. Lau, 1997: Influence of solar irradiance on the Indian monsoon-ENSO relationship at decadal-multidecadal time scales. *Geophysical Research Letters*, **24**, 159- 162.
- ◆ **Mehta, V.M.**, and T. Delworth, 1995: Decadal variability of the tropical Atlantic Ocean surface temperature in shipboard measurements and in a global ocean-atmosphere model. *Journal of Climate*, **8**, 172-190.
- ◆ **Mehta, V.M.**, 1992: Meridionally-propagating interannual to interdecadal variability in a linear ocean-atmosphere model. *Journal of Climate*, **5**, 330-342.
- ◆ **Mehta, V.M.**, 1991: Meridional oscillations in an idealized ocean-atmosphere system, Part I: Uncoupled modes. *Climate Dynamics*, **6**, 49-65.
- ◆ Semazzi, F., **V.M. Mehta**, and Y. Sud, 1989: Reply to “comments on ‘An investigation of the relationship between sub-Saharan rainfall and global sea surface temperatures. *Atmosphere-Ocean*, **27**, 601-605.
- ◆ Semazzi, F., **V.M. Mehta**, and Y. Sud, 1988: An investigation of the relationship between sub-Saharan rainfall and global sea surface temperatures. *Atmosphere-Ocean*, **26**, 118-138.

#### **Freshwater in the Atmosphere-Ocean System**

- ◆ Huang, B., and **V.M. Mehta**, 2010: Influences of Freshwater from Major Rivers on Global Ocean Circulation and Temperatures in the MIT Ocean General Circulation Model. *Advances in Atmospheric Sciences*, **27**, 455-468.
- ◆ **Mehta, V.M.**, A. J. DeCandis, and A. V. Mehta, 2005: Remote sensing based estimates of the fundamental global water cycle, Part I: The annual cycle. *Journal of Geophysical Research-Atmosphere*, **110**, D22103, doi: 10.1029/2004JD005672.
- ◆ Huang, B., **V.M. Mehta**, and N. Schneider, 2005: Oceanic response to idealized net atmospheric freshwater in the Pacific at the decadal timescale. *Journal of Physical Oceanography*, **35**, 2467-2486.
- ◆ Huang, B., and **V.M. Mehta**, 2005: The response of the Pacific and Atlantic Oceans to interannual variations in net atmospheric freshwater. *Journal of Geophysical Research-Oceans*, **110**, C08008, doi: 10/1029/2004JC002830.
- ◆ Huang, B., and **V.M. Mehta**, 2004: The response of the Indo-Pacific Warm Pool to interannual variations in net atmospheric freshwater. *Journal of Geophysical Research-Oceans*, **109**, C06022, doi: 10.1029/2003JC002114.

### **Decadal Climate and Societal Impacts Research Policy**

- ♦ **Mehta, V.M.**, G. Meehl, L. Goddard, J. Knight, A. Kumar, M. Latif, T. Lee, A. Rosati, and D. Stammer, 2011: Decadal Climate Predictability and Prediction: Where Are We? *Bulletin of the American Meteorological Society*, **92**, 637-640.
- ♦ Rosenberg, Norman J., **Vikram M. Mehta**, J. Rolf Olsen, Hans von Storch, Robert G. Varady, Michael J. Hayes, and Donald Wilhite, 2007: Societal adaptation to decadal climate variability in the United States: CRCES workshop on societal impacts of decadal climate variability in the United States. *Eos – Transactions American Geophysical Union*, **88**, 444.
- ♦ **Mehta, V.**, Y. Kushnir, J. Lean, D. Legler, R. Lukas, A. Proshutinsky, N. Rosenberg, H. von Storch, P. Schopf, and W. White, 2006: The CRCES workshop on decadal climate variability. *Bulletin of American Meteorological Society*, **87**, 1223-1225.
- ♦ **Mehta, V.M.**, E. Lindstrom, A. Busalacchi, T. Delworth, C. Deser, L.-L. Fu, J. Hansen, G. Lagerloef, K.-M. Lau, S. Levitus, G. Meehl, G. Mitchum, J. Susskind, W. White, 2000: Summary of the Proceedings of the NASA Workshop on Decadal Climate Variability. *Bulletin of the American Meteorological Society*, **81**, 2983-2985.
- ♦ **Mehta, V.M.**, and M. Coughlan, 1998: Summary of the Proceedings of the JCESS-CLIVAR Workshop on Decadal Climate Variability. *Bulletin of the American Meteorological Society*, **79**, 301-303.

### **Miscellaneous Topics**

- ♦ Vijay Bhaskar, B., and **V.M. Mehta**, 2010: Atmospheric Particulate pollutants and their Relationship with Meteorology in Ahmedabad. *Aerosol and Air Quality Research*, **10**, 301-315.
- ♦ **Mehta, V.M.**, E.J. Lindstrom, L. de Kort, and A.J. DeCandis, 2006: The Virtual Center for Decadal Climate Variability. *Bulletin of the American Meteorological Society*, **87**, 421-424.
- ♦ Sud, Y. C., G. K. Walker, **V. Mehta**, and K.-M. Lau, 2002: Importance of the Annual Cycles of SST and Solar Irradiance for Circulation and Rainfall: A Climate Model Simulation Study. *Earth Interactions*, **2**, 1-32.
- ♦ Lau, K.-M., **V.M. Mehta**, Y.C. Sud, and G. Walker, 1994: Climatology and natural variability of the global hydrologic cycle in the GLA atmospheric general circulation model. *Journal of Geophysical Research-Atmosphere*, **99**, 1329-1345.
- ♦ Ahlquist, J., **V.M. Mehta**, and A. Devanas, 1990: Intraseasonal zonal wind fluctuations seen through Indian radiosonde observations. *Journal of Meteorology and Atmospheric Physics*, **44**, 11-28.
- ♦ Ahlquist, J., **V.M. Mehta**, A. Devanas, and T. Condo, 1990: Intraseasonal monsoon fluctuations seen through 25 years of Indian radiosonde observations. *Mausam*, **41**, 273-278.
- ♦ **Mehta, V.M.**, and J. Ahlquist, 1986: Interannual variability of 30-50 day activity in the Indian summer monsoon. *Journal of Meteorology and Atmospheric Physics*, **35**, 166-176.
- ♦ Koehler, J., G. Sofko, and **V.M. Mehta**, 1985: A statistical study of magnetic aspect effects associated with VHF auroral backscatter. *Radio Science*, **20**, 689-695.
- ♦ Koehler, J., G. Sofko, and **V.M. Mehta**, 1985: Observations of magnetic aspect effects in auroral radar backscatter. *Canadian Journal of Physics*, **63**, 402-408.

**Invited Seminars and Conference/Workshop Papers: Over 100**