**Curriculum Vita October 2015**

**Roger S. Pulwarty Ph.D.** 1711 Grove Street Boulder Colorado 80302

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**Date of Birth:** 14 March 1960

**Selective Service:** Exempt (became a US citizen after the age of 25)

###### Education

BS Atmospheric Sciences (Honors. 1986). York University. Toronto, Canada

PhD (Climate Science, 1994). University of Colorado, Boulder (under Professors H. Riehl and R. Barry). Dissertation title *“The Annual Cycle of Convection over the Tropical Americas”*

###### Employment and Professional activities

**Title:**

**12/18/14-present:** Senior Science Advisor for Climate NOAA Ocean and Atmospheric Research

*Primary Tasks:* Provide vision, leadership, planning and strategic direction to interdisciplinary

research priorities and design, program development including climate information and risk management with national and international multidisciplinary teams in Drought and Water Resources, Extremes and Health, Coastal Inundation, Marine Ecosystems, and climate services

**07/2007-present:** Director, National Integrated Drought Information System. NOAA Climate Program Office Earth System Research Laboratory, Boulder Colorado 80305

*Primary Tasks:* Develop and Lead multiagency and multistate teams to research and

implement regional drought early warning information systems across

the US pursuant to Public Law 109-430 (The NIDIS Act). The NIDIS

Act was reauthorized by the President in March 2014 (PL 113-086).

*Additional activities:* Co-lead NOAA Societal Challenge on Drought and Water Resources. Provide guidance on regional climate services activities to RCSDs, RCCs, and national and international partners. Co-develop interagency Memoranda of Understanding with NOAA partners including the USDA, Western Governors Association. Develop input to and provide Congressional testimonies and on NOAA perspectives in proposed congressional legislation and on scientific priorities for climate research monitoring and adaptation.

**08/2010-04/04/14:** Division Director, Climate and Societal Interactions Division/Climate

Assessments and Services Development NOAA Climate Program Office

*Primary Tasks:* Provide vision, leadership, strategic planning, supervision, research

direction to grants programs and managers in this Division including the

Regional Integrated Sciences and Assessments, Sectoral Applications

and Research, Coasts and Climate, and the International Research and

Applications Programs. Develop an exceptional, nationally recognized

and dedicated workforce.

**06/2002-06/2007:** Deputy Director, Western Water Assessment, CIRES University of Colorado, Boulder.

**10/1998-05/2002:** Program Director: Regional Integrated Sciences and Assessments Program.

NOAA Office of Global Programs. Silver Spring MD. Co-developed and the first director of the

RISAs.

**08/1994-09/1998:** Research Scientist III. CIRES, University of Colorado Boulder

***Present Committee Memberships:***

Chair WMO/Commission on Climatology Climate Services Information System, Global Climate Observing System Steering Committee (2010-present); Interagency Working Group on Traditional Ecological Knowledge (EPA-lead); WMO Integrated Working Group on Water, Food Security and Climate; GEO Water Resources Task Force; Western States Water Council Federal Advisory Committee; AGU Natural Hazards Committee;

Senior Visiting Lecturer-the University of the West Indies; Professor-Adjunct University of Colorado (supervised four Dissertations and six Masters Degrees focused on climate adaptation)

***Other (ongoing):*** US Delegation to the UN World Conference on Disaster Risk Reduction, World Water Forum and other USG representation activities. Act in advisory capacities on climate impacts and resilience for several NOAA-partners nationally and internationally including Federal, state and tribal agencies, the Western Governors Association, the Organization of American States, the UNDP, UNEP, the World Bank, the Inter-American Development Bank, Global Framework for Climate Services, and the Caribbean Economic Community. Co-developed the High-Level Ministerial Declaration on National Drought Policy signed by over 80 countries which led to the International Drought management Program now housed in the WMO.

***National and International Assessments***

Convening Lead Author: UN IPCC Fifth Assessment Report Working Group II (Impacts, Adaptation and Vulnerability) Chapter 15 (Adaptation Planning and Implementation) and the Summary for Policymakers 2014

Lead Author*:* USGCRP National Climate Assessment: Indicators 2014; IPCC Special Report on Managing the Risk of Extremes and Disasters to Advance Climate Change Adaptation (SREX) and Summary for Policymakers 2012*;* UNISDR Global Assessment of Disaster Risk Reduction 2011; USGCRP Global Climate Impacts in the United States 2009; USGCRP/CCSP 3.3 Weather and Climate Extremes in a Changing Climate. 2008; IPCC Technical Paper Climate and Water Resources2008IPCC AR4 Working Group II. Contributing author on several IPCC chapters.

*Project Lead:* Mainstreaming Adaptation to Climate Change in the Caribbean:

Vulnerability and Capacity Assessment Component. Global Environment Facility/World Bank and Caribbean Economic Community (CARICOM) NOAA\_CARICOM Memorandum of Understanding 2002-2009

**U.S. Senate and House Congressional Testimonies and Briefings**

Full Committee Congressional Testimonies:

“Energy and Water” U.S. Senate Committee on Energy and Natural Resources 25 April, 2013.

“Drought, Fire and Freeze: The Economics of Disasters for America’s Agricultural Producers**”** Senate Committee on Agriculture, Nutrition and Forestry. 14 February, 2013

“Drought Forecasting, Monitoring and Decision-making: A Review of the National Integrated Drought Information System” House Committee on Science, Space and Technology 25 July, 2012

“Water Supply Challenges in the 21st Century”. House Committee on Science, Space and Technology. 14 May 2008

“Intergovernmental Panel on Climate Change Working Group II: Impacts, Adaptation and Vulnerability” House Committee on Science, Space and Technology. 14 April, 2007

NOAA Administrator Deputy Secretary of Commerce support on briefings to the President and Western Governors, and Congressional staff February/March 2014

Briefings to Senate and House Staff House Natural Resources, Senate Environment and Public Works February, 20 2014.

Recent Congressional Briefings:

Direct briefings to House and Senate Committee members including Sens. Feinstein, Boxer, Rep. Napolitano,

“Drought in California” March, 2014. House Subcommittee on Water and Transportation

“The Drought of 2012” 14 December, 2012. Cannon Building Washington DC

“IPCC Working Group II Results: Adaptation” Senate Committee on Energy and Environment Senate Committee on Energy and Environment 14 March 2007

Several NOAA, AGU and AMS “Science on the Hill” invitational briefings

***Awards:*** Co-recipient NOAA Administrator Awards (2009, 2014). Department of Commerce Gold Medal (2010) and Department of Commerce Silver Medal (2014) for achievements in integrating science into decision-making. Gold Medal for Excellence in Applied Sciences and Technology from the Government of Trinidad and Tobago (2013).

**Previous Research Grants sources:** NSF, NASA, World Bank, Global Environment Facility, European Union , UNDP

**Selected Publications**

*Research keywords: Climate variability and change, extremes, adaptation, climate services, risk management, impacts assessment*

Pulwarty, R. Easterling, D, J. Adkins 2016: Financial services for climate risk management in the US. In Cutter S and A. Graubard (eds) Oxford Research Encyclopedia, Natural Hazard Science Oxford University Press (in review)

Lazrus, H, Gough, R., Maldonaldo, J., Pulwarty, R., Shea, E., and Souza, K, 2015: Rising Voices: The move to more fully engage Indigenous perspectives in climate science and policy. *Nature Climate Change* (in review)

Wiener, J, R. Pulwarty, D. Ware, 2015: Bark without bite: The socio-economic context of the 1950s drought. *Weather and Climate Extremes* (accepted-forthcoming)

Wood, E. Schubert, S. Wood, A, Peters-Lidard, C., Mo, K., Mariotti, A and R. S. Pulwarty, 2015: Prospects for advancing drought understanding, monitoring, and prediction. *J. Hydrometeor*, **16**, 1636–1657

Joyette, A, L. Nurse, R. Pulwarty 2015: Disaster risk insurance and catastrophe models in risk-prone Caribbean islands: The Caribbean experience. *Disasters* 39, 3, 467–492

Pulwarty, R. Maia, R. 2015: Adaptation challenges in complex rivers around the world: The Guadiana and the Colorado Basins. *Water Resources Management* **29**, 273-293

Ralph, F.M., Dettinger, M.D., White, A., Reynolds, D., Cayan, D., Schneider, T., Cifelli, R., Redmond, K., Anderson, M., Gehrke, F., Jones, J., Mahoney, K., Johnson, L., Gutman, S., Chandrasekar, V., Lundquist, J., Molotch, N., Brekke, L., Pulwarty, R., Horel, J., Schick, L., Edman, A., Mote, P., Abatzaglou, J., Pierce, R., Wick, G., 2014, A vision of future observations for western US extreme precipitation and flooding: *Journal of Contemporary Water Resources Research and Education*, **153,** 16-32.

Pulwarty, R., M. Sivakumar, 2014: Information systems in a changing climate: Early warnings and drought risk management. *Weather and Climate Extremes* **3**, 14-21

Wilhite, D. M. Sivakumar, R. Pulwarty, 2014: Managing drought risk in a changing climate: The role of National Drought Policy. *Weather and Climate Extremes* **3**, 4-13

Vaughan, L. J. Furlow, W. Higgins, C. Nierenberg, R. Pulwarty, 2014

[US Investments in International Climate Research and Applications: reflections on contributions to interdisciplinary climate science and services, development, and adaptation](http://www.earth-perspectives.com/content/1/1/23)Earth Perspectives 2014, **1**:23

IPCC 2014: Summary for Policymakers. In: Climate Change 2014: IPCC Working Group II Impacts, Adaptation and Vulnerability. Working Group II contribution to the IPPC Fifth Assessment Report. Cambridge University Press. 32 pp.

Mimura, N., Pulwarty R., Duc, D., Elshinnawy, I.. Redsteer, M., Huang, H., Nkem , J., Sanchez-Rodriguez, R., 2014: Adaptation Planning and Implementation. In: Climate Change 2014: IPCC Working Group II Impacts, Adaptation and Vulnerability. Working Group II contribution to the IPPC Fifth Assessment Report . Cambridge University Press

Birkmann, J. S. Cutter, ….R. Pulwarty, 2013: Scenarios for vulnerability: Opportunity and constraints in the context of climate change and disaster risk management. Climatic Change **121**, 1-16 doi:10.1007/s10584-013-0913-2, online first

Sivakumar, M. D. Wilhite, R. Pulwarty, R. Stefanski, 2013: The High-Level Ministerial Meeting and Declaration on National Drought Policy (HMNDP). *Bull. Amer. Meteor. Soc*. (electronic publication)

Moss, R, …Pulwarty, R. Behar, D. (and 15 authors) 2013: Come hell and high water: The Need for Practice-Relevant Climate Adaptation Science *Science* **432**, 696-698

Pozzi, W…..Pulwarty, R…(co-authors), 2013: Towards Global Drought Early Warning Capability: Expanding international cooperation for the development of a framework for global drought monitoring and forecasting *Bulletin of the American Meteorological Society* **94**, 776-785

Mariotti,, A, Schubert,S., Pulwarty, R, Huang, J., Barrie, D, 2013: Advancing drought understanding, monitoring and prediction. *Bull. American. Met. Soc*. **94**, 186-188

Pulwarty, R., and J. Verdin, 2013: Crafting early warning systems. in Birkmann (eds)

*Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient*

*Societies* United Nations University Press Tokyo

Cardona, O. van Aalst, Birkmann , J, Fordham, M., McGregor, G., Perez , R Pulwarty, R., Schipper, L., Bach Tan Sinh, 2012: Determinants of Risk: Exposure and Vulnerability. Chapter 2 In IPCC Managing the Risks of Extremes and Disaster to Advance Climate Change Adaptation. Cambridge Press

pp. 65-108

Cutter, S. Osman-Elasha, B Campbell, J., So-Min Cheong, S., McCormick, S., Pulwarty, R.,

Supratid, S., Ziervogel, G., 2012: Managing the Risks from Climate Extremes at the Local Level. Chapter 5 in IPCC Special Report on Managing the Risks of Extremes and Disaster to Advance Climate Change Adaptation. Cambridge Press pp. 291-338

IPCC, 2011: Summary for Policymakers. In: IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Field, C. Barros, V., Stocker, T., Qin, D., Dokken, D., Ebi, K.Mastrandrea, M., Mach, K, Plattner, G., Allen, S., Tignor, M. and P. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and NewYork, NY, USA

Martinez, R. Hemming, D., Pulwarty, R., and others, 2012 Improving climate risk management at local levels – techniques, case studies, good practices and guidelines for World Meteorological Organization Members. InTech Electronic Books

Nakashima, D. et al 2012. Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. Paris, UNESCO, and Darwin, UNU, 120 pp.

Pulwarty, R, Eilerts, and J. Verdin, 2012: Food security in a changing climate: An adaptation perspective. *Solutions* ***3****, 31-34*

Pulwarty, R., Trotz, N., and L. Nurse, 2010: Caribbean Islands in a Changing Climate *Environment* **52**, 16-27

Kenney, D., A. Ray, B. Harding, R. Pulwarty, and B. Udall, 2010: Rethinking vulnerability on the Colorado River. *J. Contemp. Water Res.* **144**, 5-10,

Pulwarty, R., C., Simpson, and C., Nierenberg, 2009: Regional Integrated Sciences and Assessments (RISAs): Crafting assessments for the long haul. In Knight, Jager, J, (eds) Integrated Regional Assessments of Global Climate Change. Cambridge Press 367-394

Schubert, S...R. Pulwarty et al, 2009: CLIVAR Project to assess and compare the

responses of global climate models to drought-related SST forcing patterns. *J.*

*Climate*, **22**, 5251-5272

Meehl G., Goddard, L.R. Pulwarty,.. et al, 2009: Decadal prediction, can it be skillful?,

*Bulletin of the American Meteorological Society*, **90,** 1467-1485

Alvord, C., P., Long, R., Pulwarty and B., 2008 Udall, Climate and Tourism on the

Colorado Plateau. *Bulletin of the American Meteorological Society* **89**: 673-675

Pulwarty, R., S., 2007: Communicating Agro-climatological information, including

forecasts, for agricultural decisions. In Stigter K., 2007 (ed): Guide to Agrometeorological Practices. Commission for Agricultural and Meteorological Practices Geneva 40pp. <http://www.wmo.ch/web/wcp/agm/RevGAMP/>

Pielke, R., Carbone,…..Pulwarty, R., and Coauthors, 1997: Societal aspects of weather: Report of the Sixth Prospectus Development Team of the U.S. Weather Research Program to NOAA and NSF. *Bull. Amer. Meteor. Soc*., **78**, 867–876.

Jain, S., Pulwarty, R., and T., Melis, 2006: Environmental and water decision-making in a changing climate. *EOS* **87**: 139-140

Dalrymple, K, and R. Pulwarty, 2006: Sea-level Rise Implications for the Coast of

Guyana: Sea walls and muddy coasts.*Fourth LACCEI International Latin*

*American and Caribbean Conference for Engineering and Technology (LACCET). p.1-10 (refereed paper)*

Pyke, C., and R., Pulwarty, 2006: Elements of effective decision support for water resources management under a changing climate. *Water Resources* **8**, 8-10

Poveda, G., Waylen, P, and R., Pulwarty 2006: Annual and inter-annual variability of the

present climate in northern South America and southern Mesoamerica. *PALAEO*

*(Journal of Palaeogeography, Palaeoclimatology and Palaeoecology)* **234,** 3-27

Pulwarty, R., Jacobs, K., Dole, R., 2005: The hardest working river: Drought and critical

water problems on the Colorado. In D. Wilhite (ed): Drought and Water Crises. Taylor and Francis Press 249-285

Wilhite, D., and R., Pulwarty, 2005: Drought, crises and water management. In D. Wilhite (eds): Drought and Water Crises. Taylor and Francis Press 289-298

Jacobs, K., and Pulwarty, R., 2004: Climate, science and decision making in water resources. In Lawford, R., (eds): Water: Science, Policy and Management. AGU Press 177-204

Ambrizzi, T., E., Souza, and R. Pulwarty, 2004: The Hadley and Walker regional

circulations and associated ENSO impacts on South American seasonal rainfall. In Diaz, H.., and R., Bradley, l (eds): The Hadley Circulation: Past, Present and Future Kluwer Press 203-238

Pulwarty, R., K., Broad, T., Finan 2003: ENSO forecasts and decision making in Brazil

and Peru. In Bankoff, G., et al (Eds.) Mapping Vulnerability: Disasters, Development and People. Earthscan Publ. pp. 83-98

Pulwarty, R., 2003: Climate and water in the West: Science information and

decision-making. *Water Resources* **124**, 4-12

Pulwarty, R., 2003: Transboundary Streamflow Changes. Chapter 47 In Potter T, and B.

Colman. (eds.). Handbook of Weather , Climate and Water: Atmospheric

Chemistry, Hydrology and Societal Impacts. J. Wiley and Sons pp. 865-884

Jacobs, K., and R. Pulwarty (2003), Water resource management: Science, planning and

decision-making, In Lawford R et al (eds) Water: Science, Policy, and Management: Challenges and Opportunities, *Water Resources Monograph Series* vol. 16, AGU, Washington, D. C., doi:10.1029/016WM11.

Pulwarty, R. and Melis, T., 2001: Climate extremes and adaptive management on the

Colorado River. *J. Environmental Management* **63***, 307-324*

Wohl, E., Pulwarty, R., and J. Zhang, 2000: Assessing climate impacts. *Proceedings*

*National Academy of Sciences* **97**, 11141-11142

Pulwarty, R., Barry, R., Hurst, C., Sellinger, K., and L., Mogollon, 1998: Precipitation on

the Venezuelan Andes in the context of regional climate. *Meteorology and*

*Atmospheric Physics* **16***, 217-237*

Meehl, G. A., T. Karl, D. R. Easterling, S. Changnon, R. Pielke, Jr., D. Changnon, J.

Evans, P. Y. Groisman, T. R. Knutson, K. E. Kunkel, L. O. Mearns, C. Parmesan, R. Pulwarty, T. Root, R. T. Sylves, P. Whetton, and F. Zwiers, 2000: An introduction to trends in extreme weather and climate events: Observations, socioeconomic impacts, terrestrial ecological impacts, and model projections*. Bulletin of the American Meteorological Society*, **81,** 413-416

Changnon, S., Pielke, R., Changnon, D., Sylves, R., and R., Pulwarty, 2000: Human

factors explain the increased losses from climate and weather extremes. *Bulletin of the American Meteorological Society*, **81**, 437-442

Comfort, L., Wisner, B., Cutter, S., Pulwarty, R., Hewitt, K., Oliver-Smith, A., Peacock,

W., Wiener, J., Fordham, M., and F. Krimgold, 1999: Reframing disaster policy:

The global evolution of vulnerable communities. *Environmental Hazards*

*(Policy Forum)* **1**, 39-44

Pulwarty, R.,S., 1999: Hurricane impacts in the context of climate variability, climate

change and coastal management policy. In, Downing T., Olsthoorn, A. and, R.

Tol, (Eds): Climate, Change and Risk.Routledge, London pp. 173-204

Serreze, M., Clark, M., Armstrong, R., McGinnis, D., and R. Pulwarty: 1999:

Characteristics of western U.S. snowpack from SNOTEL data. *Water Resour.*

*Res.* **35**, 2145-2160

Pulwarty, R., Barry, R., Hurst, C., Sellinger, K., and L., Mogollon, 1998: Precipitation on

the Venezuelan Andes in the context of regional climate. *Meteorology and Atmospheric Physics* **16**, 217-237

Pulwarty, R., Eischeid, J., and H. Pulwarty, 1998: Climate impacts on agricultural yields

and on the sugar industry in the Caribbean: A prototype for applications. In,

Gilbes, F., J., Velez-Arocho Caribbean Countries Needs: Inter-American Institute for Global Change Research. Center for Hemispherical Cooperation and Education in Engineering and Applied Science University of Puerto Rico, Mayaguez pp. 117-130

Pulwarty, R. and K., Redmond, 1997: Climate and salmon restoration in the Columbia

River basin: the role and usability of seasonal forecasts. *Bulletin American Meteorological Society,* **78***,* 381-397

Pielke, R., Kimpel, J., Adams, C., Baker, J., Changnon, S., Keener, R., Leavitt, P.,

McCarthy, J., Miller, K., Murphy, A., Pulwarty, R., Roth, R., Stanley, E., Stewart,

T., Zacharias, T., 1997: The U.S. Weather Research Program: Societal Impacts. *Bulletin of the American Meteorological Society.*  **79**, 867-876

Diaz, H.F., and Pulwarty, R., 1994: An analysis of the time-scales of variability in

centuries-long ENSO-sensitive records. *Climatic Change*, **26,** 317-342

Pulwarty, R., Barry, R.G., Riehl, H.R., 1992: Annual and seasonal patterns of rainfall

variability in Venezuela*. Erdkunde*, **46**(3/4): 273-289

Diaz, H.F., Pulwarty, R., 1992: A comparison of Southern Oscillation and El Niño event

signals in the Tropics. Pp. 175-192 In: Diaz, H., and Markgraf, V., (Eds), 1992: El

Niño: Historical and Paleoclimatic Aspects of the Southern Oscillation, Cambridge University Press, Cambridge, 476 pp.

Pulwarty, R, and Cohen, S; 1984: Possible effects of CO2-induced climate change on the world

food system: a review. *Climatological Bulletin* **18,** 33-48

Books

National Research Council 2001: Under the Weather: Climate Ecosystems and Infectious

Disease. National Academy of Sciences Press 142 pp

Diaz, H., Pulwarty, R. (Eds), 1997: Hurricanes: Climate and Socio-economic impacts

Springer-Verlag Pub. Heidelberg 307 pp. *Re-released in paperback 2012*

Selected (Representative) Reports:

Pulwarty, R. et al, 2015: The National Integrated Drought Information System: Structure

Approaches and Accomplishments 2007-2014. US House Science and Technology

Committee Report (forthcoming)

Huang, J Svoboda, M, Wood, A, Schubert, S, Peters-Lidard, C, Wood, E, Pulwarty, R, Mariotti,

A, Barrie, D, 2015: Research to advance national drought monitoring and prediction capabilities. NOAA Interagency Drought task Force. NOAA/Modeling Analysis Predictions and Projections. 29pp.

UNESCO, 2012, Weathering Uncertainty: Traditional Knowledge for Climate Change

Assessment and Adaptation. International Panel of Experts for the Indigenous Peoples, Marginalized Populations and Climate ISBN 978-92-3-001068-3 120pp.

Center for Disease Control and Prevention, 2011: When Every Drop Counts-protecting

public health during drought conditions: A Guide for Public Health Professionals

U.S. Department of Health and Human Services Atlanta 56pp

Pulwarty, R, 2011: Drought information systems: Improving national and international

linkages. In M. Sivakumar (eds) Towards a Compendium of National Drought

Policy. WMO Geneva Publication AGM 12 WAOB 2011 133 pp

IPCC-USGCRP, 2009: Enhancing U.S. Research Contributions to Working Group II of

the IPCC 5th Assessment. Washington DC 20pp

NIDIS 2011: Drought Preparedness for Tribes in the Four Corners Region 42pp.

http://www.drought.gov/workshops/tribal

NIDIS, 2010: *Climate Change, Drought and Early Warning on Western Native Lands*

*Workshop Report 9‐11* *June, 2009* (Jackson Lodge, Grand Teton National Park,

<http://www.drought.gov/workshops/tribal/NIDIS_Jackson_Hole_Report.pdf>

Pulwarty, R and N. Hutchinson, 2009: Vulnerability and Capacity Assessment: A

Guidance Manual for Conducting and Mainstreaming Vulnerability and Capacity

Assessments in the Caribbean. Caribbean Community Climate Centre and CARICOM 60 pp. [www.caribbeanclimate.bz](http://www.caribbeanclimate.bz)

Brekke, L., Kiang, J, Olsen, R., Pulwarty, R., Raff, D., Webb, R. and White, K. 2009.

Climate Change and Water Resources Management USGS 1331, 65p.

Hanna, S., Bishop. R., Holliday, R., Kildow, J., Liverman, D., McCay, B., Miles, E.,

Pielke, R.,Pulwarty, R., 2003: Social Science in NOAA. Report to the NOAA

Science Advisory Board. 30pp. plus Appendices

Pulwarty, R., 2002: Climate Change in the Caribbean: Water, Agriculture, Forestry

Caribbean Planning for Adaptation to Climate Change Project. Organization of

American States and World Bank 35 pp.

Pulwarty, R., 2002: Fisheries and adaptive management in varying environments: Where

are the successes and failures? NSF Inter-American Institute Collaborative Research Network Reports 30 pp.

**Keynotes, Public Lectures, Invited Presentations, Co-convened conferences and workshops**

Invited Presentations include Keynotes and Featured Lectures to international, national, regional and private sector audiences on climatic extremes, variability and change, climate services, food and water security, adaptation, impacts, anduse of scientific information in water resources, insurance, agriculture, and ecosystem management. Interagency presentations are not included. **Convened numerous scientific and collaborative forums and workshops, on climate early warning, disaster risk management, climate services, and adaptation with International, Federal, State, Tribal and private sector partners.**

Recent invited lectures and presentation: Selected Examples (excludes professional interagency presentations and addresses)

*“Drivers of drought”* The Governor of Nevada Drought Forum. 21-23 September 2015 Carson City NV

*“California Drought and the role of ENSO”* Southern California Water Workshop: Protecting our Future.27 August, 2015 Pomona CA

*“The role of professional Scientific Societies in fostering Climate Service”* International Union of Geodesy and Geophysics June 2015

*“Life-cycles of Drought: Science, preparedness and Adaptation*. International Union of Geodesy and Geophysics June 2015

*“Climate and adaptation in complex river basins.* American Water Resources Association New Orleans June 2015

*“GEO: An Americas perspective”.* World Congress on Disaster Risk Reduction Sendai, Japan March, 2015

*“Drought response in the West”* American Association of Environmental Engineers U.S. Press Club Washington DC. February 2015

*“Practice-relevant adaptation science across climate timescales”* American Meteorological Society 5-9 January, 2015 Phoenix AZ

*“Research needs in the Lifecycles of drought”* American Geophysical Union address: 14-19 December, 2015 San Francisco CA

*“Drought in California: Monitoring and Forecasting”* Western Governors Drought Forum 8-9 December 2014 Las Vegas NV

*Keynote address “Climate, water resources and drought in the Western* U.S. 12-14 November, 2014 Engineering News Record Annual Meeting Huntington Beach CA

*“Building Drought Resilience.* World Bank Washington DC 5-6 November, 2014“Building a post 2015 sustainable development agenda for the Americas Organization of American States Washington DC 22-23 October, 2014

*Invited Speaker “Crafting science entrepreneurship to better manage emerging global risks”*

VII Americas Competitiveness Forum. Port of Spain, Trinidad and Tobago 8-10 October, 2014

*Keynote “Climate Services in the United States” UN* World Meteorological Organization Global Framework for Climate Services Geneva Switzerland 7-10 September 2014

*Invited Keynote address “Climate extremes, risk, and adaptation practice”* Chinese Academy of Sciences Beijing China 8-11 September 2014

*“Recent advances in forecasting hazards: climate, drought and early warning”* (invited) Understanding Risk Forum July 1-3 London, UK.

*“Climate risk management and climate services”* WMO Technical Commission Conference: Climate Services: the Legacy of the Climate Prediction and Services Program. UN WMO Heidelberg, June 30-July 3

*“Climate, risk and services”* Keynote at World Climate Research Program-Latin American and the Caribbean Developing, linking and applying climate information. 18-20 March, 2014 Montevideo, Uruguay

*“Developing National Integrated Drought Information Systems: Lessons for Turkey”*

Ankara USAID 4-5 March, 2014

*“Informing climate adaptation decisions: Are we doing and not learning?* Workshop on US-UK collaboration on climate science to support adaptation. Georgia Tech 2014

*“NIDIS: An Update and an Outlook”* American Meteorological Society February 2014 Atlanta GA

*“Global Risks and National Water Security”* American Geophysical Union December 2013 San Francisco

*“Climate change and drought risk management in Mediterranean watersheds”* American Geophysical Union December 2013 San Francisco

*“Climate impacts and Adaptation in the Caribbean-Assessing and using the adaptation assessment models”* UN Development Program and Global Environmental Facility Training workshop for Community-based adaptation 2013 Trinidad

*“ Climate Observations in support of Adaptation”* Global Climate Observing Systems 2013 Offenbach, Germany

*“Aridity, Drought and their Consequences”* and *“Megadroughts”* National Council for Science and the Environment. 2013 Washington DC

*“Climate, Fisheries and Food Security”* Center for Strategic International Studies. 2013 Washington DC

***Training activities***

*2003- present: Assessing Vulnerability to Climate Change in the Caribbean.* Natural Resources Graduate Program*.* University of the West Indies, Barbados

*Graduate-level courses taught* Natural Resources Management, Environmental Change, Meteorology, Climate and Vegetation, Conservation Thought and Practice University of Colorado, Boulder

*Training courses on Climate Risk Management at:* USAID, Inter-American Institute for Global Change Research, Global Environment Facility, The Nature Conservancy, Caribbean Economic Community (15 countries)

UN Development Program and Global Environmental Facility Training workshop for Community-based adaptation March, 2013