

CURRICULUM VITAE

PERSONAL INFORMATION

FIRST & LAST NAME: RICARDO MANTILLA
DATE & PLACE OF BIRTH: January 27, 1976. Bogotá, Colombia
ADDRESS: New Mexico Tech
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Socorro, NM. 87801
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ACADEMIC INFORMATION

UNDERGRADUATED: **CIVIL ENGINEERING - 1999**
Universidad Nacional de Colombia
Major: Hydrology and Hydroclimatology
Thesis Topic: River Networks Geomorphology

GRADUATED: **M.Sc. WATER RESOURCES - 2003**
Universidad Nacional de Colombia
School of Geophysical and Environmental Sciences
Thesis Topic: A Numerical Model to Understand Scaling Properties of Peak Flows

Ph.D. WATER RESOURCES*
University of Colorado at Boulder
Civil & Environmental Engineering Department
Thesis Topic: Physical Basis for Statistical Self-similarity of Peak Flows in Random Self-Similar Networks

* Thesis Defended on Aug. 25th, 2006
* Official Graduation date: May 11th, 2007

COMPLEMENTARY STUDIES

COURSE NAME:	TROPICAL CLIMATOLOGY
GIVEN BY:	Stefan Hastenrath 1996
COURSE NAME:	CLIMATE FORECASTING
GIVEN BY:	Nicholas Graham 1999
SEMINAR NAME:	INTERNATIONAL ENCOUNTER OF HYDROLOGY AND CLIMATOLOGY
GIVEN BY:	Vijay K Gupta, Cecile Penland, Rafael Brass, Stefan Hastenrath, Lilian Posada, Oscar Mesa, Jaime I Vélez and Germán Poveda 1997
WORKSHOP NAME:	2006 UNIDATA USERS WORKSHOP
GIVEN BY:	Unidata Software developers.

RESEARCH ACTIVITIES

PROJECT NAME:	WATER BALANCE OF COLOMBIA
	1996 - 1999
INSTITUTION:	Universidad Nacional de Colombia
PIs :	Oscar Mesa, Germán Poveda y Jaime I. Vélez
ACTIVITIES:	- Software design and development (HidroSIG) - Satellite information analyses - Statistical processing of hydrological and climatic information. - Digital Elevation Models processing.
PROJECT NAME:	CLIMATE (ENSO) - MALARIA CONNECTIONS
	1998 - 2000
INSTITUTION:	Universidad Nacional de Colombia
PIs :	Germán Poveda, Ph.D. Marta Quiñonez, Ph.D. William Rojas, MD.
ACTIVITIES:	- Software design and development (GIS) - Correlation analysis Climate vs. Malaria - Implementation of Malaria outbreaks forecasting models (Neural Networks and Fuzzy Logic)
PROJECT NAME:	SCALING AND ALLOMETRY IN RIVER NETWORKS: COUPLING RAINFALL, TOPOGRAPHY, AND VEGETATION WITH HYDROLOGICAL EXTREMES.
	2001-2006
INSTITUTION:	CIRES
PIs :	Vijay Gupta
ACTIVITIES:	- Hydrologic-data analysis - Downstream hydraulic geometry data analysis - Development of a Numerical Simulation Laboratory.
PROJECT NAME:	DESIGNING A PILOT STUDY FOR FLOODS IN THE WALNUT RIVER BASIN, KS, USING A SCALING FRAMEWORK.
	2003 - 2005
INSTITUTION:	CIRES
PI :	Vijay Gupta
ACTIVITIES:	- Software design and development (CUENCAS) - Data Collection (Field trip to Kansas) - Digital Elevation Models processing.

RESEARCH ACTIVITIES (Continued)

PROJECT NAME: **DEVELOPING A "NUMERICAL LAB" TO TEST SCALING HYPOTHESES FOR HYDROLOGIC EXTREMES**

2003 - 2006

CIRES

INSTITUTION: Vijay Gupta

PIs : - Software design and development (Link-Hillslope based Flow routing module for CUENCAS)

ACTIVITIES: - Walnut Gulch (AZ) peak flows data analysis (test of scaling ideas on real data)

PROJECT NAME: **HYDROLOGICAL SIMULATION OF STREAM FLOWS AND EVAPORATION IN SEMIARID ENVIRONMENTS**

2006-2007

INSTITUTION: New Mexico Tech (EPSCOR Funds)

PIs : Enrique Vivoni

ACTIVITIES: - High performance numerical simulation of hydrologic processes
- Integration of small-scale hydrological processes to basin-scales.

CONGRESS & SEMINARS

2005 AGU FALL MEETING

Physical Origins of Statistical Scale Invariance or Scaling in Peak Flows in Real River Networks
San Francisco, California - USA - 2005

AGU HYDROLOGY DAYS 2004

Scaling of Peak Flows with Respect to Drainage Area During Single Rainfall Events
Fort Collins, Colorado - USA - 2004

HYDROFRACTALS '03

Testing Physical Hypotheses on Channel Networks Using Flood Scaling Exponents
Ascona - Switzerland - 2003

XV INTERNATIONAL CONGRESS FOR TROPICAL MEDICINE AND MALARIA

El Niño-Southern Oscillation (ENSO) related to malaria transmission.
Modeling entomological-climatic interaction of malaria transmission through System Dynamics.
Cartagena - Colombia - 2001

XIX COLOMBIAN SEMINAR OF HYDRAULICS AND HYDROLOGY

On the existence of Hack's Law in Colombian Basins
Villa de Leyva - Colombia - 2000

VII IBERO AMERICAN CONGRESS OF GEOGRAPHICAL INFORMATION SYSTEMS

Hidro-Sig : A GIS Tool to Estimate Hydrologic Balances in Colombia
Mérida - Venezuela - 1999

IN ENGLISH:

Statistical Scaling for Peak Flows and Hydrograph Properties in Random Self-similar River Networks: Constant Velocity Case. R. Mantilla, Troutman, B.M. and Gupta, V.K. Submitted to WRR. (2007)

Properties of Embedded Topological Rooted Trees in 2-Dimensional Regions. R. Mantilla and Gupta, V.K. Submitted to WRR. (2007)

Spatial Variability of Hillslope Vertical Profile and its effect on Runoff Generation Mechanisms: Implications for Land Surface Models. R. Mantilla, J. D. Gomez, C. Aragon, and E. Vivoni. In preparation. (2007)

Role of Coupled Flow Dynamics and Real Network Structures on Hortonian Scaling of Peak Flows. Ricardo Mantilla, Vijay K. Gupta and Oscar J. Mesa. *Journal of Hydrology*, Volume 322, Issues 1-4, 2006.

A GIS Framework to Investigate the Process Basis for Scaling Statistics on River Networks. Ricardo Mantilla, Vijay K. Gupta. *IEEE - Geoscience and Remote Sensing Letters*, Volume 2, Number 4, 2005.

Linking Long-Term Water Balances and Statistical Scaling to Estimate River Flows along the Drainage Network of Colombia. Germán Poveda, Jaime I. Vélez, Oscar J. Mesa, L. Adriana Cuartas, O. Janet Barco, Ricardo Mantilla, J. Freddy Mejía, Carlos D. Hoyos, Jorge M. Ramírez, Blanca A. Botero, María I. Mejía, Lina I. Ceballos, Manuel D. Zuluaga, Juan D. Giraldo, Diana I. Quevedo. *J. Hydrologic Engrg.*, Volume 12, Issue 1, pp. 4-13 (January/February 2007).

HidroSIG: An Interactive Digital Atlas of Colombia's Hydro-climatology. Germán Poveda, Oscar J. Mesa, Ricardo Mantilla, Jorge M. Ramirez. *Journal of Hydroinformatics* Vol 9 No 2 pp 145–156, 2007.

Recurrence Plots and Unstable Periodic Orbits. Elizabeth Bradley and Ricardo Mantilla, *Chaos: An Interdisciplinary Journal of Nonlinear Science*. Volume 12, Issue 3, pp. 596-600. September 2002.

Coupling between Annual and ENSO Timescales in the Malaria-Climature Association in Colombia. G. Poveda, W. Rojas, M. L. Quiñones, I. D. Vélez, R. Mantilla, D. Ruiz. *Environmental Health Perspectives*. Volume 109, Number 5, May 2001.

Seasonality in ENSO-related Precipitation, River Discharges, Soil Moisture, and Vegetation Index in Colombia. Poveda, Germán; Jaramillo, Alvaro; Gil, Marta María; Quiceno, Natalia; Mantilla, Ricardo. *Water Resour. Res.* Vol. 37, No. 8, p. 2169, 2001.

IN SPANISH:

An analysis of Hack's Law for Basins in Colombia. Ricardo Mantilla, Oscar Mesa y Germán Poveda. *Avances*. No. 7. Nov, 2000.

Estimation of Evaporation in Colombia. Janet Barco, Adriana Cuartas, Oscar Mesa, Germán Poveda, Jaime I. Vélez, Ricardo Mantilla, John Freddy Mejía, Carlos D. Hoyos, Blanca Botero y María I. Montoya. *Avances* No. 7. Nov, 2000.

HidroSig: A Software for Estimating Water Budgets in Colombia. *Proceedings of VII Ibero-American Congress of Geographical Information Systems*. Merida, Venezuela. 1999

Spatial and Temporal Distribution of Precipitation In Colombia. Freddy Mejía, Oscar mesa, Germán Poveda, Jaime Vélez, Carlos Hoyos, Ricardo Mantilla, Janet Barco, Adriana Cuartas, María Montoya, Blanca Botero. *Dyna*.. Vol. 127. 1999

Geometrical, Topological And Morphometrical Characterization Of Magdalena and Atrato River Basins. *Proceedings of XII Colombian Seminar of Hydraulics and Hydrology*. Cali, Colombia. 1997.

AWARDS AND DISTINCTIONS

2005 - 2006 GRADUATE RESEARCH FELLOWSHIP

PHYSICAL UNDERSTANDING OF SCALING PROPERTIES OF PEAK FLOWS

Advisor: Vijay Gupta, Ph.D

HONORED DEGREE THESIS: Second place in the Undergraduate Thesis National Contest

MULTISCALE ANALYSIS OF MORPHOMETIC PROPERTIES AND FLOODS ON COLOMBIAN RIVER NETWORK

Advisors: Oscar Mesa, Ph.D and German Poveda, Ph.D

LEON DE GREIFF AWARD TO OUTSTANDING UNDERGRADUATE RESEARCH

MULTISCALE ANALYSIS OF MORPHOMETIC PROPERTIES AND FLOODS ON COLOMBIAN RIVER NETWORK

Advisors: Oscar Mesa, Ph.D and German Poveda, Ph.D

SECOND PLACE IN THE CONTEST OF THE SCIENCE AND TECHNOLOGY 1999

Project: Water Balance of Colombia

Directed by: Oscar Mesa, Ph.D and German Poveda, Ph.D

WORK EXPERIENCE

1996 - 1999

Research Assistant at the Universidad Nacional de Colombia

Project Name: Water Balances in Colombia

PIs: Oscar Mesa and German Poveda

1998 - 2000

Research Assistant at the Universidad Nacional de Colombia

Project Name: ENSO - Malaria

PIs: German Poveda, William Rojas and Martha Quiñones

Spring 2001

Teaching Assistant at the University of Colorado at Boulder

Fluid Mechanics

Professors: John Crimaldi and Vijay Gupta

Summer 2001

Research Assistant at the University of Colorado at Boulder

Project Name: Recurrence Plots and Unstable Periodic Orbits

PI: Elizabeth Bradley

Summer 2002

Research Assistant at the USGS

Project Name: Floods and River Networks

PI: Brent Troutman

Fall 2001 - 2006

Research Assistant at the University of Colorado at Boulder

Project Name: Scaling Structure of Floods

PI: Vijay Gupta

2006 - Present

Postdoctoral Research Associate at New Mexico Tech

Project Name: Hydrological Processes in Semi-arid Environments

PI: Enrique Vivoni

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