Dept. of Mathematical
Sciences   256 Urb. Valles de Añasco
P.O. Box 9000   Añasco, PR 00610
Mayaguez, PR 00681   Phone: (787) 424-8487
(787) 832-4040 x 2660   Email: karen.rios3@upr.edu

Karen R. Ríos-Soto

EDUCATION

Biometry/Mathematical Biology Ph.D.
Biological Statistics and Computational Biology
Cornell University
432 Warren Hall
Ithaca, NY 14853
August 2008

Mathematics B.S./B.A.
Mathematics Department
University of Puerto Rico-Mayaguez Campus
Mayaguez, PR
June 2002

TEACHING EXPERIENCE and POSITIONS HELD

University of Puerto Rico at Mayaguez
Assistant Professor
Faculty of Arts and Sciences
Department of Mathematical Sciences
P.O. Box 9018
Mayaguez, PR 00681-9018
Fall 08 – Present

Arizona State University
Adjunct Assistant Professor
Mathematical, Computation, and Modeling Science Center (MCMSC)
Tempe, AZ 85287
Fall 09- Present

Mathematical and Theoretical Biology Institute
Summer Director
Arizona State University
Tempe, AZ 85287
Summers 2010, 2011, 2012

Arizona State University
Instructor
College of Liberal Arts and Sciences
Department of Mathematics and Statistics
PO Box 871804
Tempe, AZ 85287-1804
Fall 2006 – Spring 08

Courses Taught

Undergraduate Level:
Pre-Calculus I and II, Calculus I and II for engineering, Calculus I and II for biologist, Undergraduate Seminar, Mathematical Analysis (Calculus III and Differential Equations), Lineal Algebra, Research with Undergraduates, Mathematical Biology (at MTBI)

Graduate Level:
Stochastic Processes, Discrete Chaos, Intermediate Differential Equations, Introduction to Non-linear Dynamics and Chaos, Graduate Seminar

Journal Referee
Advances in Differential Equations for Control Processes
Through Dr. Haiyan Wang from Arizona State University

Biomedical Signal Processing and Control
Through Editor in Chief, Dr. Robert Allen

Training

High School Teachers – CRECE Program Fall 2011
Elementary and Middle School Teachers – AFAMaC program-UPRM Fall 2010
Puerto Rican Mathematical Olympics Team – Instructor Fall 2011

Module for Teachers

Radicals and Exponents – AFAMaC module – May 2012

RESEARCH EXPERIENCE

Mathematical and Theoretical Biology Institute (MTBI)
Summer Director 2010, 2011, 2012
Supervised research projects of undergraduates and graduate students
Faculty 2009
Graduate student assistant 2006-2008 (ASU) - Completed four
    technical reports, research co-director of several projects and my
    own research
Teaching Assistant 2003-2005 (Los Alamos National Laboratory/ASU)
Advance Student 2001-2002 (Cornell University)
New Student 2000 (Cornell University)

Los Alamos National Laboratory
June–December 2003
Graduate Research Assistance
Theoretical Division (CNLS)
Los Alamos, NM

Summer Institute in Mathematics for Undergraduates (SIMU)
New student 1999 (University of Puerto Rico-Humacao Campus)
Completed a technical report

AWARDS

2012 SACNAS NATIONAL CONFERENCE
Undergraduate Students Poster Presentation Award
MTBI 2012 summer research group, for the project:
Competition Model between the Invasive Sahara Mustard and Native
Plants in the Sonoran Desert
October 13, 2012
Seattle, WA

DOE SRS Scholarship for undergraduate student Emmie Román
($2240)
Scholarship to do undergraduate research during the 2nd semester of
2011-2012 and summer 2011
January, 2012

Research Incentive Funds for the Academic Year 2011-2012
with Dr. Erwin Suazo ($900)
Faculty of Arts and Sciences-UPRM
December 2011

NIH Grant Writer's Initiative (GWI)
Selected as one of eight (8) participants for the 2012 GWI Program-
UPRM
December 2011

President Obama Honors Outstanding Science, Math, and
Engineering Mentors ($25,000)
For MTBI Summer REU program
November 2011

Modern Math Workshop
Travel Award to attend the workshop in Anaheim, CA
$950
September 2010

MTBI Directorship and Service Award
August 2010

MTBI Service Award
9 years of Service with the MTBI Undergraduate Summer Program
August 2009

Mathematics of a New Generation
Travel Grant to give research presentation at the 2009 SACNAS
Conference
$1500
May 2009

Graduate Student Fellowship
SUNY Fellowship for Minorities
Cornell University
Ithaca, NY
December 2004 – December 2006

Student Poster Presentation Award
The Effects of Mass Transportation during a Deliberate Release of
Smallpox
Joint Mathematics Meeting (AMS, MAA, AWM & NAM)
Baltimore, MD
January 2003

Graduate Student Fellowship
Alfred P. Sloan Foundation
Cornell University
Ithaca, NY
June 2002 –December 2004

Student Poster Presentation Award
A Mathematical Model for Lung Cancer: The Effects of Second Hand
Smoke and Education
SACNAS National Conference
Atlanta, GA
October 2000

Alliance for Minority Participation (AMP)
Scholarship for Undergraduates Students
University of Puerto Rico-Mayaguez
Mayaguez, PR
2000, 2001, 2002

Cornell University Travel Grants: 2003, 2004, and 2005

GRANTS

SBTI: Active Learning Experiences in Biostatistics
Role: Co-PI
NIH (pending) $750,306.00
Submitted: April 2012

Up-to-the-Minute Reports on Mathematical Biology
Invitation for Session Talk on Mathematical Epidemiology
SACNAS 2012 Travel Grant $1500
October 2012

A mathematical study of the attractiveness of the human body: golden ratios, symmetry and neoclassical canons
DOE SRS Scholarship for undergraduate student Emmie Román
through Dr. Ingrid Padilla from Chemical Engineering at UPRM
Role: Advisor
$2240
January 2012

Separation of Variables and Explicit Solutions for Evolution Equations
Research Incentive, jointly with Dr. Erwin Suazo UPRM
$900
December 2011

Epidemic Spread of Influenza Viruses, the Impact of Transient Populations on Disease Dynamics
Presentation of Research work at AWM/SIAM Workshop
Travel Grant
$900
December, 2011

PUBLICATIONS/RESEARCH

* refers as undergraduate student at time of research
** refers as graduate student at time of research

A Particulate Matter (PM10) Diffusion Model and its Impact on Lung Diseases
Rios-Soto, K.R. and De la Pava, E.
In preparation

Minimum Speeds and Traveling Wave for a Discrete-Time Epidemic Model with Non-Monotone Growth Functions
Rios-Soto, K.R., Wang, H. and Castillo-Chavez, C.
In preparation

A. Referred Publications:

Epidemic Spread of Influenza Viruses: The Impact of Transient Populations on Disease Dynamics
Rios-Soto, K.R., Song, B. and Castillo-Chavez, C.
To appeared in *Mathematical Biosciences and Engineering Journal*
Volume **8**, Number 1 (2011).

Epidemic Spread in Populations at Demographic Equilibrium
Rios-Soto, K.R.**, Castillo-Chavez, C., Neubert, M., Titi, E.S., and Yakubu, A-A.
Modeling The Dynamics of Human Diseases: Emerging Paradigms and Challenges. Gumel A. (Chief Editor), Castillo-Chavez, C., Clemence,
D.P. and R.E. Mickens
AMS CONM **410** (2006) 297-309.

Raves Clubs, and Ecstasy: The Impact of Peer Pressure
Baojun, S., Garsow-Castillo, M., **Rios-Soto, K.R.**,** Mejran, M., Henson, L., and Castillo-Chavez, C.
Mathematical Biosciences and Engineering Journal.
Volume **1**, Number 3 (2006) 249-266.

Some Remarks on Fitzpatrick and Flynn's Groebner Basic Technique for Pade Approximations
Little, J.B., Ortiz, D., Ortiz-Rosado, R., Pablo, R., and **Rios-Soto, K.R.***
Journal of Symbolic Computation **35** (2003) 451-461.

B. Technical Reports (Graduate and Undergraduate Research Mentorship):

Competition Model between the Invasive Sahara Mustard and Native Plants in the Sonoran Desert
Dahlin D.*, Koning E.*, Laubmeier A.*, and Wehn A.* Advisor: **Rios-Soto, K.R.**
MTBI-Technical Report 2012
MTBI-#pending

A mathematical study of the attractiveness of the human body: golden ratios, symmetry and neoclassical canons
Emmie Román-Meléndez*, Advisor: **Ríos-Soto, K.R**.
Undergraduate Research at UPRM

Assessing the Levels of Unreporting in the 2009 A-H1N1 Influenza Epidemic in Lima, Peru
Chowell D.**, Espinoza B.*, Patterson O.**, Requena D.**, Salas M.*
Advisor: **Rios-Soto, K.R.**
MTBI-Technical Report 2011
MTBI-08-05M

Modeling the Impact of Batrachochytrium Dendrobatidis in the Life History Dynamics of Eleutherodactylus Coqui Under Seasonality
Meléndez-Rosario, G.** and Advisor: **Ríos-Soto, K.R.**
MTBI-Technical Report 2010
MTBI-07-10M

Immigration Laws and Immigrant Health : Modeling the Spread of Tuberculosis in Arizona
Cantron, L.*, La Forgia, A.*, Padilla, D.*, Castro, R.**, Advisors: **Ríos-Soto, K.R.** and Song, B.
MTBI-Technical Report 2010
MTBI-07-06M

The Cursed Duet: Dynamics of HIV-TB Co-infection in South Africa
Chowel-Puente, D.*, Jiménez-González*, B., Smith, A., **Ríos-Soto, K.R**.** and Song, B.

MTBI-Technical Report 2007
MTBI-04-08M

A Theoretical Framework for a Three-State Spatial Population Model
Bettelheim, M.*, Houle, J.*, Librado, F.*, Advisor: Hiebeler, D. and
Graduate student Assistant: **Ríos-Soto, K.R.****
MTBI-Technical Report 2006
MTBI-03-05M

An Epidemiological Approach to the Spread of Political Third Parties
Calderon, K.*, Orbe, C.*, Panjwani, A.,* Romero, D.M.*, Advisor:
Kribs-Zaleta, C., and Graduate Student Assistant: **Ríos-Soto, K.R.****
MTBI-Technical Report 2005
MTBI-02-02M

C. Technical Reports as a student:

U.S.A. the Fast Food Nation: Obesity as an Epidemic
Evangelista, A.M., Ortiz, A., **Rios-Soto, K.R.,** and Urdapilleta, A.
Mathematical and Theoretical Biology Institute (MTBI)
Technical Report (MTBI-01-03M)
Los Alamos National Laboratory – Arizona State University
Los Alamos, NM Summer 2004

*The Effects of Mass Transportation during a Deliberate Release of
Smallpox*
Huerta, E., **Rios-Soto, K.R.,** and Salivia, G.
MTBI Cornell University Technical Report (BU-1618-M)
Biological Statistics and Computational Biology
Cornell University, Ithaca, NY, Summer 2002
Extended version published in Bioterrorism: Mathematical Modeling
Applications in Homeland Security (2003).

Raves, Clubs, and Ecstasy: The Impact of Peer Pressure
Castillo-Garsow, M., Henson, L., Mejran, M., and **Rios-Soto, K.R.**
MTBI Cornell University Technical Report (BU-1581-M)
Biological Statistics and Computational Biology
Cornell University, Ithaca, NY, Summer 2001

A Mathematical Model for Lung Cancer: The Effects of Second-Hand Smoke and Education
Acevedo-Estefania, C., Gonzalez, C., **Rios-Soto, K.R.**, and Summerville, E.
MTBI Cornell University Technical Report (BU-1525-M)
Biological Statistics and Computational Biology
Cornell University, Ithaca, NY, Summer 2000

Pade Approximation in Two Variables Using Groebner Basis Technique
Ortiz-Rosado, R., Pablo, R., and **Rios-Soto, K.R.**
Technical report for the Summer Institute of Mathematics for Undergraduates (SIMU)
Mathematics Department
University of Puerto Rico-Humacao Campus
Humacao, PR, summer 1999

INTERNATIONAL EVENTS AND PRESENTATIONS

Blackwell Tapia Conference
Poster Presentation
ICERM/ Brown University
Providence, RI
November 9-10, 2012

Field of Dreams Conference
Mesa, AZ
November 2-4, 2012

SACNAS Annual Meeting
Invited Oral Presentation
Seattle, WA
October 10-14, 2012

MSEIP Program
Invited Speaker on Performing Research with Undergraduate
Arecibo, PR
October 5, 2012

UPRM Biotechnology Week
Biomathematics program talk
Mayaguez, PR
September 18, 2012

SIAM Annual Meeting
Minneapolis, MN
July 11-14, 2012

AWM Mathematical Biology Workshop
Oral Presentation
Minneapolis, MN
July 9-10, 2012

2012 NIH Regional Seminar
Indianapolis, IL
April 17-18, 2012

Department of Mathematical Sciences-UPRM Colloquium
Oral Presentation
Mayaguez, PR
March 15, 2012

SIDIM XXVII
Oral Presentation
Mayaguez, PR
March 2-3, 2012

NIH-Grant Writing Retreat
Mayaguez, PR
January 27-29, 2012

NSF Workshop *Science: Becoming the Messenger*
San Juan, PR
December 12, 2011

*7mo Congreso de la Sociedad Latinoamericana de Biología Matemática
Oral Presentation and Workshop
Armenia, Colombia
August 8-12, 2011

2011 Interdisciplinary Workshop for Undergraduate Students and Faculty
SAMSI
Raleigh, NC
May 16-18, 2011

SIDIM XXVI
Oral Presentation
Humacao, PR
February 26-27, 2011

Woman in Academia II : Collaborations for Success
Mayaguez, PR
February 4, 2011

SACNAS National Conference
Anaheim, CA
September 30-October 3, 2010

Modern Math Workshop
Anaheim, CA
September 29-30, 2010

Society for Industrial and Applied Mathematics (SIAM) Annual Meeting
Invited Oral Presentation
Pittsburgh, PA
July 12-16, 2010

Conference on Computational and Mathematical Population Dynamics
Invited Oral Presentation
Bordeaux, France
May 31-June 4, 2010

Career Options for Underrepresented Groups in Mathematical Sciences
Invited Oral Presentation
Minnesota, MN
March 25-27, 2010

Junior Technical Meeting/ PRISM 2010
Mayaguez, PR
March 13, 2010

SIDIM XXV
Oral Presentation
February 26-27, 2010

Workshop for Woman in Academia
Aguadilla, PR
January 29-30, 2010

NIMBioS Tutorial – Optimal Control and Optimization for Biologists
Knoxville, TN
December 15-17, 2009

SACNAS National Conference
Invited Speaker
Dallas, TX
October 15-18, 2009

Fostering Diversity in Statistics
JSM Pre-Conference Diversity Workshop
Washington D.C.
August 1, 2009

Society for the Industrial and Applied Mathematics (SIAM) Annual Meeting
Poster Presentation
Denver, CO
July 6-10, 2009

Keynote Speaker in Spring 2009 Pre-College Research Symposium
UMET Campus San Juan, PR
May 23, 2009

Career Options for Woman in Mathematics- IMA Institute
Minneapolis, MN
April 2-4, 2009

SIDIM XXIV
Oral Presentation
Rio Piedras, PR
March 6-7, 2009

Talk to student at the MARC Program in UPRM
Mayaguez, PR
February 23, 2009

Fourth Transdiciplinary Research Conference on Computational Modeling
Mayaguez, PR
December 5-6, 2008

SACNAS National Conference
Salt Lake City, UT
October 8-12, 2008

XIX Undergraduate Research Symposium
San Juan, PR
September 12-13, 2008

1st Marrakech International Conference held in Morocco
Oral Presentation
January 3-8, 2008

Reunion de Matematicas Aplicadas a la Biologia y Ciencias de Computacion
Invited Speaker for Workshop Presentation on Mathematical Biology
Pachuca, Mexico
December 5-7, 2007

Infinite Possibilities Conference
Raleigh, NC
November 2-3, 2007

2006 Society for the Advancement of Chicanos and Native Americans in Science Conference (SACNAS)
Kansas City, MO
October 10-14, 2007

Mathematical Modeling and Analysis of Populations in Biological Systems
Poster Presentation
Tucson, AZ
October 5-7, 2007

Opportunities in Mathematical Biology for Underrepresented Groups (MBI)
Columbus, OH
March 2007

2006 Blackell-Tapia Conference (IMA Special Workshop)
Oral Presentation: Epidemic Spread in Populations at Demographic Equilibrium
Minneapolis, MN
November 3-4, 2006

2006 Society for the Advancement of Chicanos and Native Americans in Science Conference (SACNAS)
Tampa, FL
October 25-29, 2006

Second Young Researchers Workshop in Mathematical Biology
Poster Presentation: Epidemic Spread in Populations at Demographic Equilibrium
Columbus, OH
March 27-30, 2006

Mathematical Biology Workshop ASU
Oral Presentation: Epidemic Spread in Populations at Demographic Equilibrium
Tempe, AZ
February 3-4, 2006

2005 Society for the Advancement of Chicanos and Native Americans in Science Conference (SACNAS)
Oral Presentation: Epidemic Spread in Populations at Demographic Equilibrium
Denver, CO
September 28- October 2, 2005

XVI Undergraduate Research Symposium (UMET)
Oral Presentation: Raves, Clubs and Ecstasy: The Impact of Peer Pressure
San Juan, PR
September 16-17, 2005

MathFest 2005
August 4-6, 2005
Albuquerque, NM

Symposium 2005: Highlighting Student and Postdoctoral Research
Poster Presentation: Dispersal on Epidemics Discrete in Time and Continuous in Space
August 2-3, 2005
Los Alamos, NM

The European Conference on Mathematical and Theoretical Biology (ECMTB)
Jointly with Society of Mathematical Biology Conference (SMB)
Poster Presentation: Dispersal on Epidemics Discrete in Time and Continuous in Space
Dresden, Germany
July 18-22, 2005

Society for the Industrial and Applied Mathematics Annual Conference (SIAM)
Oral Presentation: Dispersal on Epidemics Discrete in Time and Continuous in Space
July 11-15, 2005
New Orleans, LA

Los Alamos Days 2005
Program of Applied Mathematics
Tucson, AZ
January 28-29, 2005

Special Workshop in Complex Systems
Santa Fe institute
Santa Fe, NM
July 8-9, 2004

Gordon Conference (GRC)
Theoretical Biology & Biomathematics
Poster Presentation: Dispersal on Epidemics: Discrete in Time and
                    Continuous in   Space
Tilton, NH
June 6-11, 2004

2003 SACNAS National Conference
Albuquerque, NM
October 2-5, 2003

Computational and Mathematical Approaches to Homeland Security, Public Health Policy and Control: Challenges Posed by Emerging and Reemerging diseases
Los Alamos, NM
June 30, 2003– July 1, 2003

Iowa Biomathematics Conference
Poster Presentation: Dispersal on Epidemics: Discrete in Time and
                    Continuous in Space
Iowa City, Iowa
November 17-20 2003

Joint Mathematics Meeting (AMS, MAA, AWM & NAM)
(Travel Award Grant from Graduate School at CU)
Poster Presentation: The Effects of Mass Transportation during a
Deliberate Release of Smallpox

Baltimore, MD
January 2003

XIII Undergraduate Research Symposium (UMET)
Poster Presentation: The Effects of Mass Transportation during a
Deliberate Release of Smallpox

San Juan, PR
October 2002

2002 SACNAS Conference
Poster Presentation: The Effects of Mass Transportation during a
Deliberate Release of Smallpox

Anaheim, CA
September 2002

**DIMACS Summer School Tutorial on Dynamic Models of
Epidemiological Problems**.
Center for Discrete Mathematics and Theoretical Computer Science
(DIMACS)
Rutgers University
New Jersey. June 24-27, 2002.

Joint Mathematics Meeting (AMS, MAA, AWM & NAM)
Poster Presentation: Raves, Clubs, and Ecstasy: The Impact of Peer
Pressure

San Diego, CA
January 2002

XII Undergraduate Research Symposium (UMET)
Poster Presentation: Raves, Clubs, and Ecstasy: The Impact of Peer
Pressure

San Juan, PR
October 2001

2001 SACNAS Conference
Poster Presentation: Raves, Clubs, and Ecstasy: The Impact of Peer
Pressure

Phoenix, AZ
September 2001

Junior Technical Meeting
Oral Presentation: A Mathematical Model for Lung Cancer: The Effects
of Second Hand Smoke and Education
Ponce, PR
March 2001

XVI SIDIM (Interuniversity Mathematical Research Seminar)
Poster Presentation: A Mathematical Model for Lung Cancer: The
Effects of Second Hand Smoke and Education
Humacao, PR
February 2001

Joint Mathematics Meeting (AMS, MAA, AWM & NAM)
Poster Presentation: A Mathematical Model for Lung Cancer: The
Effects of Second-Hand Smoke and Education
New Orleans, LA
January 2001

2000 SACNAS National Conference
Poster Presentation: A Mathematical Model for Lung Cancer: The
Effects of Second-Hand Smoke and Education
Atlanta, GA
September 2000

Junior Technical Meeting
Oral Presentation: Pade Approximation in Two Variables Using
Groebner Basis   Technique
San Juan, PR
March 2000

Joint Mathematics Meeting (AMS, MAA, AWM & NAM)
Poster Presentation: Pade Approximation in Two Variables Using
Groebner Basis   Technique
Washington D.C.
January 2000

1999 SACNAS Conference
Poster Presentation: Pade Approximation in Two Variables Using
Groebner Basis Technique
Portland, OR
September 1999

Committees

Student Committees:

Ms. Karina Gelis Cadena
Chair of Graduate Committee in UPRM

Mr. Gerardo López Díaz
Chair of Graduate Committee in UPRM

Mr. Devis Alvarado Zavala
Member of Graduate Committee in UPRM

Mrs. Jessica Trespalacios Julio
Member of Graduate Committee in UPRM

Mr. Jose Escorcia Tafur
Member of Graduate Committee in UPRM

Ms. Glorimar Meléndez-Rosario
Chair of Graduate Committee in UPRM, August 2009-December 2010

Ms. Yetsabel Auccaille Quispe
Member of Graduate Committee in UPRM, graduated May 2011

Ms. Cindy Calderon, M.S.
Member of Graduate Committee in UPRM, graduated June, 2010

Department Committees:
Dept. of Mathematical Sciences-UPRM

      Curriculum Committee (Member): Spring 2011-present

      Applied Mathematics Committee (Member): Fall 2008-present

      Open House Committee (Member): Spring 2009-present

      Graduate Committee (Member): Academic Year 2011-2012

      Activity Committee (President): Academic Years 2010-2011, 2011-2012
      Revision of Departmental Courses Committee (Member): Spring 2011

PROFESSIONAL ASSOCIATIONS

Society of Mathematical Biology (SMB)
Society for Industrial and Applied Mathematics (SIAM)
Association for Women in Mathematics (AWM)
Society for the Advancement of Chicano/Latino and Native American in Science (SACNAS)
Alpha Delta Kappa (ADK)
National Alliance for Doctoral Studies in the Mathematical Sciences
Science PR

ADDITIONAL INFORMATION

Computer Programming/ Software Packages: MATLAB, Maple, XPPAUT, Berkeley- Madonna, LaTeX, PDFTex
Platforms: Unix/Linux, Windows, Mac OS X