

**Ruth Bombaugh, Ph.D.****School Address:**

University of New Mexico - Gallup  
 Upper Division – Teacher Education  
 200 College Street, Gallup, NM 87301  
 Ph: 505-863-7533 Fax: 505-863-7564

**Home Address:**

P.O. Box 4438  
 Gallup, NM 87305

Email: bombbaugh@unm.edu

**EDUCATION**

- 1995 Ph.D. in Educational Studies, University of Michigan, Ann Arbor, MI
- 1968 M.S. in Biology, University of Michigan, Ann Arbor, MI
- 1967 B.A. in Biology, Carleton College, Northfield, MN

**PROFESSIONAL EXPERIENCES**

- 2004 - Lecturer III, University of New Mexico – Gallup, Gallup, NM

**Courses      Taught**

MSET453 Science Program in Elementary School  
 LLSS501 Practitioner Research  
 LLSS595 Advanced Field Experience  
 MSET461 Mathematics Program in Elementary School  
 CIMTE593 Issues in Secondary Education

- Fall 2003 Associate Professor, Cleveland State University, Cleveland, OH

**Courses      Taught**

EVS473 Earth System Science  
 ECE417 Science Methods for Early Childhood Educators

- 1998 - 02 Assistant Professor, Cleveland State University, Cleveland, OH

**Courses      Taught**

EVS206 Global Ecology  
 EDL334 Science Methods - Elementary & Special Ed Teachers  
 EDB303 Teaching and Classroom Management in Middle School  
 EDB304 History and Philosophy of the Middle School  
 EDM317 Science Instruction for Grades 4-9  
 EDT665 GLOBE Certification for Urban Educators  
 EDT409 Integrated Methods / Elementary Certification/ Practicum

- 1998-99 Educational Facilitator for NASA Summer Workshops for Urban Educators. NASA Goddard Space Flight Center, Greenbelt, MD.
- 1996-98 Science Teacher, Whittier Middle School, City of Lorain Public School District, Lorain, OH.
- 1995-96 Assistant Professor, Cornell College, Mt. Vernon, IA.

<u>Courses</u>	<u>Taught</u>
ED207	Educational Psychology
ED315	Science Methods for Elementary School
ED317	Mathematics Methods for Elementary School
ED405	Teaching Seminar

- 1993-95 Teaching Assistant, Peace Corps Fellows/USA Program, Educational Studies Department, School of Education, University of Michigan, Ann Arbor, MI

<u>Courses</u>	<u>Taught</u>
EdS650	Reflective Practice
EdS588	Teaching Experience in Detroit Public Schools, K-12

- 1992-93 Research Assistant, TABS Project, Educational Studies Department, School of Education, University of Michigan, Ann Arbor, MI
- 1974-92 Science Teacher, Langston Middle School, City of Oberlin Public School District, Oberlin, OH.
- 1991 Research-associate. Lawrence Berkeley Laboratories, Berkeley, CA.
- 1973-74 High School Science Teacher, Pathfinder School, Traverse City, MI
- 1968-69 U.S. Peace Corps Volunteer in Chile, South America.
- 1967-68 Research Assistant, Study of Steelhead Trout, School of Natural Resources, University of Michigan, Ann Arbor, MI.

**STATE OF OHIO TEACHING CERTIFICATION – PERMANENT LEVEL**

Physics (7<sup>th</sup> – 12<sup>th</sup> grades)  
 Chemistry (7<sup>th</sup> – 12<sup>th</sup> grades)  
 Biology (7<sup>th</sup> – 12<sup>th</sup> grades)  
 Comprehensive Science (7<sup>th</sup> – 12<sup>th</sup> grades)  
 Spanish (7<sup>th</sup> – 12<sup>th</sup> grades)  
 Mathematics (7<sup>th</sup> – 12<sup>th</sup> grades)  
 Gifted and Talented (K-12<sup>th</sup> grades)

### **HONORS and SCHOLARSHIPS**

Academic Year 2001-2002. Cleveland State University A&S Interdisciplinary Teaching Award.

Cleveland State University Merit Award. AY1998-1999.

School of Education Merit Award, University of Michigan, Ann Arbor, Michigan. 1992-1993.

Non-Traditional Fellowship of Rackham School of Graduate Studies, University of Michigan, Ann Arbor, Michigan. 1992-1993.

Educational Studies Program Fellowships, University of Michigan, Ann Arbor, Michigan. 1992-1995.

DOE-TRAC Participant., Lawrence Berkeley Laboratory, Berkeley, CA, Summer 1991.

Ohio Finalist for Christa McAuliffe Fellowship. 1989.

Batelle Award for Ohio Science Teacher of the Year, 1988.

Jerry Acker Outstanding Teacher, Ohio Academy of Science. 1988.

Participant at NEWMAST, NASA's Master Teacher Seminar. 1984.

Recipient for full-tuition scholarship through the federally-funded Great Lakes Sea-grant Program, master degree program, University of Michigan, 1967-1968.

National Science Foundation Scholarship to study limnology at American Colleges of the Midwest field camp in the Quetico-Boundary Waters of northern Minnesota and Canada, 1965.

### **PUBLICATIONS**

#### **Journal Articles (Please note: an asterisk indicates a peer-reviewed journal.)**

\*Almeida, S. & R. Bombaugh. (In print.) Involving school children in the establishment of a long-term plant biodiversity study of an urban green space. *The American Biology Teacher*.

\*Bombaugh, R. & Jefferys, L. (Accepted with revisions). Body data. *Mathematics Teaching in the Middle School*.

\*Bombaugh, R., Sparrow, E., & Mal, T. (Accepted with revisions.) GLOBE phenology and service learning: Linking the university and K-12 classrooms in a web-based student inquiry. *Electronic Journal of Science Education*.

\*Bombaugh, R., Sparrow, E., & Mal, T. (2003.) Using GLOBE plant phenology protocols to meet the national science education standards. *The American Biology Teacher*, 65 (4), 279-285.

- \*Bombaugh, R., Sparrow, E., & Mal, T. (2003.) Using GLOBE's plant phenology to monitor the growing season. *Science Scope*, 24 (6), 20-23.
- \*Bombaugh, R. (2000). From citizen scientists to engineers. *Journal of Professional Issues in Engineering Education and Practice*, 126 (2), 64-68.
- \*Bombaugh, R. (2000). Blast off into space science with fuses.. *Science Scope*, 23 (4), 28-30.
- \*Bombaugh, R. (1999). Science on the fringes. *Science Scope*, 23 (1), 46-47.
- \*Bombaugh, R. (1995). Preying mantises and whole language learning. *Science Scope*, 18 (8), 12-15.
- \*Bombaugh, R. (1995). Coping and growing: Peace Corps fellows enter the urban classroom. *Journal of Teacher Education*, 46 (1), 35-44.
- \*Bombaugh, R. (1993). Body of data. *Science Scope*, 17 (1), 54-57.
- \*Bombaugh, R. (1987). Mastering the science fair. *Science Scope*, 11 (1), 5-9.
- \*Templin, M. and R. Bombaugh. (In print). An innovation in the evaluation of teacher professional development serving reform in science. *Journal of Science Teacher Education*.

### Books.

- Bombaugh, R. (1990). *Science fair success*. Hillside, NJ: Enslow Publishers, Inc.
- Bombaugh, R. (1999). *Science fair success. Revised and Expanded 2<sup>nd</sup> Edition*. Hillside, NJ: Enslow Publishers, Inc

### Reprinted Articles in Books and Book Chapters.

- Bombaugh, R. (2003). Mastering the science fair. *Science Fair Plus: Reinventing an Old Favorite*. Arlington, VI: NSTA Press.
- Bombaugh, R. & Mal, T. (2003). Making it "real" for students: Student/scientist partnerships in our schools. In Berlin, D. F., White, A. L. & Abder-Fraser, P. (Eds.). *Improving science and mathematics education: Insights for a global community*. Columbus, OH: International Consortium for Research in Science and Mathematics Education.
- Bombaugh, R., Reynolds, J., Jefferys, L., Huang, G., Jones, P., Zilichikhis, A., Knapp, M.A., Polstolka, T. (2005). Project asteroids: A grant-writing opportunity to form a learning community for pre-K and 4<sup>th</sup>/5<sup>th</sup> grade literacy. In Berlin, D. F. & White, A. L. (Eds). *Collaboration for the global improvement of science and mathematics education*. Columbus, OH: International Consortium for Research in Science and Mathematics Education.

- Bombaugh, R. & Templin, M. (2003). Urban teachers' professional development reality check 6 & 18 months following a GLOBE teacher-certification workshop. Berlin, D. F., White, A. L., & Abder-Fraser, P. (Eds.). *Improving science and mathematics education: Insights for a global community*. Columbus, OH: International Consortium for Research in Science and Mathematics Education.
- Bombaugh, R. (1987). Mastering the science fair. In National Science Teachers Association's *Science fairs and projects: Grades K-8*. Washington, DC: National Science Teachers Association.
- Bombaugh, R. (1987). Mastering the science fair. In National Science Teachers Association's *Science fairs and projects: Grades 7-12*. Washington, DC: National Science Teachers Association.

#### Papers in Published Conference Proceedings

- R. Bombaugh (2000, February). *GLOBE as a Vehicle for Urban Teachers' Professional Development*. Proceedings of the Eighth Consultation of the International Consortium for Research in Science and Mathematics Education, San Jose, Costa Rica, Central America (Published by the University of Southampton, England and edited by Marcus M. Grace and M. Keith Smith.)
- R. Bombaugh. (2000, January). *Citizen scientists with a satellite connection*. Proceedings of the 2000 National Conference of the Association for the Education of Teachers of Science, Akron, Ohio.
- R. Bombaugh. (1999, October). *Choosing a career at age 13*. Proceedings of the 1999 National Civil Engineering Education Congress, (Charlotte, North Carolina), 113-115.
- Bombaugh, R., Ralston, S., Sowder, H., Shiner, J. (1995, October). *Helping non-traditional students challenge implicit assumptions about the nature of science through supervisory work*. Proceedings of the third international history, philosophy, and science teaching conference. Minneapolis, MN.

#### Presentations (Note: \* indicates peer-reviewed papers at national and international conferences).

- \*Bombaugh, R., Mal, T. & Reynolds, J. (2004, March). *Aprendizaje y observaciones globales en beneficio del medioambiente*. Paper presented at X Conferencia Interactiva Internacional de Enseñanza en Ciencias y Matemáticas. Concepcion, Chile, South America.
- \*Bombaugh, R., Huang, G., Zilichikhis, A., Reynolds, J., Knapp, M., Jones, P., and Jefferys, L. (2004, March). *Proyecto asteroide: La Universidad-escuela de la comunidad relacionada con la educación preescolar*. Paper presented at X Conferencia Interactiva Internacional de Enseñanza en Ciencias y Matemáticas. Concepcion, Chile, South America.

- \*Bombaugh, R. & T. Mal (2002, March). *Teaching portfolio; A tool for action research*. Paper presented at the Fifth Annual Leadership Development Conference for the NASA Opportunities for Visionary Academics.. Goddard Space Flight Center, Greenbelt, MD.
- Bombaugh, R. & T. Mal. (2002, March). *Project Gaia*. A poster presentation at the Fifth Annual Leadership Development Conference for the NASA Opportunities for Visionary Academics.. Goddard Space Flight Center, Greenbelt, MD.
- \*Bombaugh, R. & T.Mal. (2002, February). *GLOBE urban students join a biodiversity study of their urban greenspace*. Paper presented at the Ninth Consultation of the International Consortium for Research in Science and Mathematics Education. Panama City, Panama, Central America.
- \*Bombaugh, R., Templin, M & Mal, T. (2002, February). *Follow-up assessment of 2-year GLOBE certification program with urban teachers*. Paper presented at the Ninth Consultation of the International Consortium for Research in Science and Mathematics Education. Panama City, Panama, Central America.
- Bombaugh, R. & C. Mosely.. (2001, November). *GLOBE's phenology protocols in urban school settings*. A workshop presented at the Northeast Regional National Science Teachers Association Conference. Columbus, OH.
- Bombaugh, R. (2000, July) *Citizen scientists with a satellite connection: a Dwight D. Eisenhower Professional Development Grant Project.*” Poster presentation at the GLOBE Annual Conference, Annapolis, MD.
- \*Bombaugh, R. (2000, February). *International Partners in GLOBE*. Paper presented at the Eighth Consultation of the International Consortium for Research in Science and Mathematics Education. San Jose, Costa Rica, Central America.
- \*Bombaugh, R. (2000, January). *Citizen scientists with a satellite connection*. Paper presented at the AETS (Association for Educators of Teachers of Science) Y2K Annual Meeting, Akron, OH.
- \*Bombaugh, R. (1999, October). *From citizen scientists to engineers*. Paper presented at the 1<sup>st</sup> Annual ASCE (American Society of Civil Engineers) National Civil Engineering Education Congress, a part of the Annual 2000 ASCE Civil Engineering Conference & Exposition, Charlotte, NC.
- Bombaugh, R. (1998, December). *Project M&M's: From the moon to mars*. Paper presented at the Southwest Regional Conference of the National Science Teachers Association, Albuquerque, NM.
- \*Bombaugh, R. (1996, April). *Peace Corps fellows in their urban classroom: The struggle to build a learning community*. Paper presented at the Annual Meeting of the American Educational Research Association, New York City.

- \*Bombaugh, R. (1996, February). *Body of data: Height + spreadsheet = good science and math*. Paper presented at the International Consortium for Research in Science and Mathematics Education in Belize City, Belize, Central America; and at the Annual Meeting of the Michigan Association for Computer-related Technology Users in Learning, Grand Rapids, MI, March 10-11, 1994 ; and at the Annual Meeting of Michigan Science Teachers' Association, February 25-26, 1994 in Detroit, MI.
- \*Bombaugh, R. (1996, March). *Praying Mantises and Whole Language Learning*. Paper presented at state and national conferences of the National Science Teachers Association in Lansing, MI (March 1995) and St. Louis, MO respectively.
- \*Bombaugh, R. (1995, April). *An ontological analysis of an eighth-grade science classroom of "at-risk" students*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, San Francisco.
- \*Bombaugh, R., Ralston, S., Sowder, H. & Shiner, J. (1995, April). *Trial by fire: A supervisory approach for helping others learn to teach through their own teaching experiences*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.
- Bombaugh, R. (1994, October). *Coping and growing: Peace Corps Fellows enter the urban classroom*. Paper presented at the Annual Meeting of the Midwestern Educational Research Association, Chicago, IL.
- \*Bombaugh, R., Marx, N. & Mahliot, K. (1994, March). *Goals of 4 female students and teacher during piloting of National Geographic Society's Kidsnet 'How Loud is Too Loud?' in 8th grade 'at-risk' classroom*. Paper presented at Annual Meeting of National Association for Research in Science Teaching, Anaheim, CA.
- Bombaugh, R. (1991). *Designing a multimedia studio for the classroom*. Paper presented at the National Science Teachers Association regional conference in Reno, NV, December 5, 1991 and at the DOE-TRAC Culminating Presentations in Berkeley, CA August 8, 1991.
- \*Bombaugh, R. (1988 and 1989). *Mastering the science fair*. Paper presented at local, state, regional and national conferences of the National Science Teachers Association in Cleveland and Columbus, OH, Philadelphia, PA, and Washington DC, respectively.
- \*Ralston, S., Bombaugh, R., Sowder, H., & Shiner, J. (1995, April). *Conceptual changes of three beginning, urban, secondary science teachers' understanding of the nature of science*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, San Francisco.
- \*Templin, M., & Bombaugh, R. (2003, April). *Constellations of quality elements and contexts that implement science reform: Evaluating the quality of a local Cleveland-area professional development effort*. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), Chicago, IL.

Reviews Published in the American Association for the Advancement of Science Journal, *SB&F*.

- Bombaugh, R. (2005, May/June) Nancy F. Castaldo's *Sunny Days and Starry Nights: Nature Activities for Ages 2-6*.
- Bombaugh, R. (2002, March/April). Theresa Greenaway's *The Secret World of Ants, The Secret World of Crabs, and The Secret World of Spiders*. Page 365.
- Bombaugh, R. (2001, November/December). Kristin Joy Pratt-Seraflini's. *Salamander rain: A lake and pond journal*. Page 270.
- Bombaugh, R. (2001, March/April). Linda Glaser's *Magnificent monarchs*. Page 79.
- Bombaugh, R. (2001, January/February). Shana Alexander's *Astonishing elephant*. Page 19.
- Bombaugh, R. (1999, September/October). Sally Kneidel's *More pet bugs: a kid's guide to catching and keeping insects and other small creatures*.

**AWARDED GRANTS**

Presidential Initiative Grant through the George Gund and Cleveland Foundations, FY2003. "Project Asteroids: Asteroid Study for a Terrific Elementary Reading Opportunity and Individual Delight in Science." \$40,932 from the George Gund Foundation with \$7,800 in matching funds for a total budget of \$48,732. (Note: Alla Zilichikhis of the CSU Physics Department is Co-PI)

FY2001 Dwight D. Eisenhower Professional Development Grant: "Citizen Scientists with a Satellite Connection". \$39,958 from the Ohio Board Of Regents and \$59,860 in matching moneys from Ohio Space Grant Consortium, GLOBE, CSU and participating school districts for a total budget of \$99,861 (Note: Dr. Tarun Mal in CSU's Biological Geological and Environmental Science is Co-PI.)

George Gund Foundation, September 2001. "Assessment of Biological Diversity in Forested Habitats of Cleveland Metroparks." \$100,000 from the George Gund Foundation with \$192,688 in matching funds including \$64,000 from the Cleveland Metroparks for a total budget of \$292,688. (Note: Dr. Tarun Mal in BGES and Dr. Daniel Petit of the Cleveland Metroparks are also Principal Investigators of this grant.)

FY2000 Dwight D. Eisenhower Professional Development Grant: "Citizen Scientists with a Satellite Connection". \$36,000 from the Ohio Board Of Regents and \$69,689 in matching moneys from Ohio Space Grant Consortium, GLOBE, CSU and participating school districts for a total budget of \$105,407.13 (Note: Dr. Tarun Mal in BGES is Co-PI)

NASA Opportunities for Visionary Academics: "Gaia." July 2001. A NASA seed grant for interdisciplinary planning of an undergraduate Arts and Science course targeted at the freshman/sophomore level. \$26,000. (Note: Dr. Tarun Mal in BGES is Co-PI.)

FY1999 Dwight D. Eisenhower Professional Development Grant: "Citizen Scientists with a Satellite Connection." \$25,944 from OBOR and \$90,678 in matching moneys from Thomas H. White Foundation, Nordson Corporate Foundation, Ohio Space Grant Consortium, GLOBE, CSU and participating school districts, for a total budget of \$116,662.00

Ohio Space Grant Consortium of the Ohio Aerospace Institute, Seed Grant for "GLOBE at CSU", 1999-2000. \$1,000

Ohio Space Grant Consortium of the Ohio Aerospace Institute, Seed Grant for "Project M&M's", 1997-1998 and 1998-1999. \$1,000 and \$2,500 respectively.

Ohio Edison Consumer Power Company Grant, Akron, OH 1997-1998. \$300.

City of Lorain Public Schools Endowment Fund Grant, Lorain, OH, 1996 and 1997. \$700.

Wildlife Preservation Grant in Education, Ohio Department of Natural Resources, 1988.

Equity in Technology Grant from Northeast Ohio Computer Consortium, 1987.

### **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

AERA (American Educational Research Association)

AETS (Association for the Education of Teachers of Science)

ICRSME (International Consortium for Research in Science and Mathematics Education)

OAS (Ohio Academy of Science)

NABT (National Association of Biology Teachers)

NCTM (National Council of Teachers of Mathematics)

NSTA (National Science Teachers Association)

NMSA (National Middle School Association).