

Walter E. Baethgen

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Profile: Program Manager and Senior Scientist, International and National Environmental Programs

- Over 25 years of demonstrated results in designing, implementing and managing International and National multidisciplinary research and development programs (obtaining funds, strategic planning, strategic alliances and capacity building), monitoring performance, and preparing publications (scientific and for general audiences) and reports.
- Scientific expertise in agricultural systems, natural resources management, risk assessment and risk management (especially associated to climate variability and climate change), and information and decision support systems.

EMPLOYMENT HISTORY

Senior Research Scientist, Director of the Regional and Sectoral Research Program, Leader Latin America/Caribbean, International Research Institute for Climate and Society (IRI), The Earth Institute at Columbia University. Establish, develop and manage IRI's program in climatic related risk assessment and risk management in agriculture/food security, health, water resources and disasters. Lecture in graduate courses (Masters and PhD) on Climate Risk Management in Agriculture, Decision Support Systems in Agriculture. *Columbia University, New York, NY. August 2004 – present*

Senior Research Scientist, Acting Director, Agriculture and Food Security Center, The Earth Institute at Columbia University. Establish research and training activities to advance sustainable agricultural intensification on the ground, with a particular emphasis on developing countries. *Columbia University, New York, NY. September 2016 – December 2017*

Distinguished Lead Scholar, Fulbright Regional Network for Applied Research Program (NEXUS). The program was created to establish a network of experts who would spread learning through academic exchanges, advance policy-oriented research and provide a forum to share best practices. Selected experts engaged in collaborative thinking, analysis, problem-solving and multi-disciplinary research. *Washington, D.C., August 2010 – July 2011.*

Member of CGIAR's Science Council. The main functions included: (i) Enhance and promote the quality, relevance and impact of CGIAR science programs, (ii) help to mobilize the global scientific community around the mission and goals of the CGIAR. *Rome, Italy, June 2006 – July 2008.*

Senior Scientist, Resource Development Division, International Soil Fertility and Agricultural Development Center (IFDC). Design, establish and manage National and International research and development multidisciplinary projects. Activities were concentrated in: Information and Decision Support Systems; Impacts of Climate Variability Change; Risk Assessment and Risk Management in Agriculture and Natural Resources; and Carbon Sequestration in the Agricultural and Forestry Sectors. *Montevideo, Uruguay and M. Shoals, Alabama, EEUU. 1987- January 2004.*

Visiting Scientist, National Environmental Center for Environmental Prediction (NCEP, NOAA) and International Research Center for Climate Prediction (IRI). Application of Tropical Pacific Sea Surface Temperature information in agricultural production of SE USA and the Lower Plains USA. *Camp Springs, Maryland, USA. February 1997-April 1998.*

Scientist, US Environmental Protection Agency/ US Agency for International Development. Project: "*Climate Change and World Food Supply*". *Montevideo, Uruguay, and Washington, D.C., USA. January 1990 - November 1992.*

Regional Project Coordinator for Latin America, IFDC /United Nations Development Program. UNDP/ The World Bank Global Project: "*Fertilizer Strategies for Sustainable Agriculture and Environmental Protection*". Research and Development Division, IFDC, Montevideo, Uruguay, January 1991 - December 1993.

Research Assistant, "Soil and Crop Management" and "Soil Fertility and Soil Chemistry", Department of Crop and Soil Environmental Sciences. Virginia Polytechnic Institute and State University, Blacksburg, VA, March 1983- January 1986

Researcher, Soil and Crop Management, A. Boerger National Agricultural Research Center, Ministry of Agriculture and Fisheries, La Estanzuela, Colonia, Uruguay, March 1979 - December 1982.

Other Activities Related to Climate Variability / Climate Change

- **Lead Author, IPCC**, Intergovernmental Panel on Climate Change, Working Group II. Impacts, Adaptations and Mitigation. Second and Third Assessment Reports (1995 and 2001). **Contributing Author** in the Fourth Assessment Report (2007).
- **Review Editor, IPCC**, Intergovernmental Panel on Climate Change. "Methodological and Technological Issues in Technology Transfer" – Agricultural Sector. (Special Report of Working Group III, IPCC). 2000.
- **Member of the Scientific Advisory Committee, IAI** (Inter-American Institute for Global Change Research). 2010-2014.
- **Member of the Science-Policy Advisory Committee, IAI** (Inter-American Institute for Global Change Research). Present
- **Member of the Scientific Advisory Committee, VAMOS**, Present.
- **Member of the Science Study Group. PLATIN**, WCRP/CLIVAR/VAMOS, Variability and predictability of climate and hydrology, societal impacts of climate change. Present.
- **International Advisory Committee**, International Research Institute for Climate Prediction. Palisades, New York, July 2002
- **Lead National Greenhouse Gas Inventories**, (IPCC methodology). Agriculture and Land Use Change Sectors of Uruguay. Montevideo, 1996, 1998, 2000, 2001, 2002. GEF / UNDP / National Department for the Environment (Uruguay).
- **WMO Expert Team member**, Open Program Area Group - OPAG, "Climate Applications, Information and Prediction Services", ET: "Climate Watches".
- **WMO Expert Team member**, Open Program Area Group-OPAG, "Climate change/climate variability and natural disasters in agriculture". ET: "Impact of climate change/variability on medium to long range prediction for agriculture". Present
- **Advisory Committee Member**, CLIMAG (Research Program for Climate Forecasts Applications in Agriculture) WMO
- **Advisory Committee Member**, International Research Institute for Climate Prediction (IRI), Applications Division.
- **Steering Committee Member**, Inter-American Institute for Global Change Research (IAI). Theme: "*Comparative Studies of Temperate Terrestrial Ecosystems: Developing a Regional Science Plan*". July 1994.
- **Coordinating Committee Member**, "*Trace-Gas Exchange: Mid-Latitude Terrestrial Ecosystems and the Atmosphere*" Activity of the International Global Atmospheric Chemistry Project (TRAGEX/IGAC, IGBP). December 1992 - 2003.

Consultancies in the Public Sector

- **Inter-American Development Bank / Ministry of Agriculture and Fisheries of Uruguay**. Explore the feasibility for establishing an Agricultural Insurance Program. Montevideo, March-June 2000.
- **US AID/Government of Guatemala**. Development of an Information and Decision Support System for the agricultural sector of Guatemala. Guatemala City, April 1997; August 1998; February 2000.
- **Inter-American Development Bank/IICA/CNPAB (EMBRAPA), Brazil**, Assist scientists in the analysis of long-term databases, calibrate and apply simulation models for studying nutrient dynamics and for assessing sustainability in pasture-based systems. Train scientist in simulation modeling. Seropedica, Brazil, May 1996 - June 1996.
- **United Nations Industrial Development Program (UNIDO) - Ministry of Industry of Paraguay**. Perform National and regional fertilizer demand projections for a fertilizer plant to be established in Paraguay. Asuncion, 1996.
- **International Atomic Energy Agency (IAEA, United Nations)**. Elaborate work plans and supervise research activities in a 5-year International Coordinated Research Program (research conducted in Latin America, Asia, Africa and Europe): "*The use of nuclear techniques for optimizing nitrogen fertilization of irrigated wheat for optimizing fertilizer application and consequently reduce environmental contamination*". Vienna, November 1993 – November 1997.
- **National Commission for Global Change of Uruguay**. Provide technical advice in agricultural and environmental issues, elaborate research plans and prepare proposals. Montevideo, Uruguay. September 1994 - May 1997.
- **GEF/World Bank - UNDP Project: "Conservation of Biodiversity and Sustainable Development of the Wetlands of Eastern Uruguay (PROBIDES)"**. Provide technical advice to staff members in the area: "Sustainable Development". Rocha, Uruguay. September 1994 - August 1995.
- **Food and Agriculture Organization (FAO/ United Nations)**. Project: "*Barley Production Improvement in Uruguay*", FAO/UNDP URU 88/001. Montevideo, Uruguay, May 1989 - January 1991.

Consultancies in the Private Sector

- **Advisor**, MOSA, a barley grain and malt producing/exporting company, owned by an International corporation. Provide technical advice and training for the Marketing and Agronomy Divisions. Uruguay, September 1994 - March 1999.
- **Consultant**, AgrEvo (Hoescht/Schering Argentina). Provide technical advice for the Fertilizer Division; Give technical presentations on fertilizer use for agronomists and farmers. Buenos Aires, Argentina. July 1996 and September 1997.
- **Consultant**, PEQUIVEN Fertilizer Business Unit, subsidiary of Petróleos de Venezuela S.A. Consultancy for adapting PEQUIVEN to non-subsidized market conditions. Maracay and Morón, Venezuela, October 1993 - March 1994.

Editor, Reviewer

- **Editorial Board Member**, *Agricultural Systems*. Elsevier Science. Amsterdam The Netherlands.
- **Editorial Council Member**, Journal of the International Hydrological Programme for Latin America and the Caribbean United Nations Educational, Scientific and Cultural Organization (UNESCO)
- **Proposal Review Panelist**, Inter-American Institute for Global Change Research (IAI), *Initial Science Program (ISP)*, and *Research Planning/Start-up Grants*.
- **Program Reviewer**, NOAA OGP, *Environment, Science and Development (ESD) Program*.
- **Research Proposal Reviewer**, National Science Foundation (NSF), USA, Program: *Regional Inst. - Global Change*.
- **Research Proposal Reviewer**, Environmental Research and Technology, DLR, Bonn, Germany.
- **Member of the International Evaluation Committee**, Evaluation of the Paraná Research Center, of INTA (National Agricultural Research Institute of Argentina). Paraná, Argentina.
- **Reviewer of research articles** in *Agronomy J.*, *Soil Sci. Soc. Am. J.*, *Climatic Change*, *J. Climate Change*, *Int. J. Climatology*, *Nature Climate Change*, *PNAS*, Scientific peer-reviewed journals in Argentina, Brazil, Chile and Uruguay

Instructor

- **Lecturer**, *International Research Institute for Climate and Society (IRI)*, *Columbia University*. Lectures on Climate Risk Management, Adaptation to Climate Variability and Change, in Columbia's graduate programs. M.A. in "Climate and Society", PhD in "Sustainable Development", MPA in "Development Practice" (New York, 2004 – present).
- **Instructor**, *International Research Institute for Climate and Society (IRI)*. Training programs on "Climate Risk Management in Agriculture". Several locations, 2004 - Present
- **Instructor**, *IFDC - ICASA*. Training programs on "Information and Decision Support Systems and Simulation Models". Brazil, Argentina, Uruguay, Ecuador, Guatemala, USA (Several locations, 1995-Present)
- **Instructor**, *International Geosphere Biosphere Program (IGBP)* – Global Analysis, Interpretation and Modelling (GAIM). GAIM-LBA Modeling Workshop. Training on "Applications of the Century model to study carbon dynamics" in LBA research activities. Cachoeira Paulista, SP, Brazil.
- **Instructor**, *International Research Institute for Climate Prediction (IRI)*. Training program on: "Agricultural Applications of Seasonal to Interannual Climate Predictions", Lamont-Doherty Earth Observatory, New York, March 1995.
- **Instructor**, *National Center for Agro-Biological Research (EMBRAPA)*, Brazil. Training program for Latin American researchers and graduate students. "The Use of Simulation Models in Research on Sustainable Agriculture". July 1994.
- **Teaching Assistant**. *Department of Crop and Soil Environmental Sciences, Virginia Polytechnic Institute and State University*. Courses: "Computer Applications to Agriculture"; "Soil Fertility and Fertilizers"; "Introductory Soils", Blacksburg, Virginia, September 1984, 1985, and 1986.

EDUCATION

Ph.D., Crop and Soil Environmental Sciences, June 1987.
Virginia Polytechnic Institute and State University.

M.Sc., Crop and Soil Environmental Sciences, (Minor: Statistics), December 1984
Virginia Polytechnic Institute and State University.

B.Sc., Agricultural Engineering, December 1978
Universidad de la Republica, Uruguay.

LANGUAGE SKILLS

Fluent in English, Spanish and Portuguese. Conversant in French.

SELECTED MENTORING

- Advisor to Earth Institute Post Doctoral Fellows: Dr. Brenda Lin (2007), Dr. Chao Chen (2009), Dr. Jonathan Hickman, (2010), Gordon McCord (2012), Dr. David Kanter (2014)
- Member of Columbia University PhD Committees: Weston Anderson (2017), Angel Muñoz (2016), Daniel Ruiz (2012). PhD Committees in Uruguay: Gabriela Cruz (2017), Guadalupe Tiscornia (2018)
- M.A. Candidate advisor to Eric Holthaus, IRI, Columbia University
- Line management and supervision of professional researchers and support staff at IRI since 2004.

LIST of SELECTED PUBLICATIONS

- Adler, P.R.; S. Spatari, F. D'Ottone, D. Vazquez, L. Peterson, S. J. Del Grosso, W. E. Baethgen, W. J. Parton. 2018. Legacy effects of individual crops affect N₂O emissions accounting within crop rotations. *Global Change Biology Bioenergy* 10:123–136, doi: 10.1111/gcbb.12462
- G. Cruz, W. E. Baethgen, Bartaburu, M. Bidegain, A. Giménez, M. Methol, Morales, V. Picasso, G. Podestá, R. Taddei, R. Terra, G. Tiscornia, M. Vinocur. 2018. Thirty Years of Multilevel Processes for Adaptation of Livestock Production to Droughts in Uruguay. *Weather, Climate, and Society* 10(1):59-74. doi:10.1175/WCAS-D-16-0133.1
- Gerlak, A.K.; Z. Guido, C. Vaughan, V. Rountree, C. Greene, D. Liverman, A. R. Trotman, R. Mahon, S. Cox, S. J. Mason, K. L. Jacobs, J. L. Buizer, C. J. Van Meerbeeck, W.E. Baethgen. 2018. Building a Framework for Process-Oriented Evaluation of Regional Climate Outlook Forums. *Weath. Clim. and Soc. (AMS)*, 10(2):225-239. DOI: 10.1175/WCAS-D-17-0029.1
- Cobon, D.H.; W. E. Baethgen, W. Landman, A. Williams, E. Archer van Garderen, P. Johnston, J. Malherbe, P. Maluleke, I. Ben Kgakatsi and P. Davis. 2017. Agroclimatology in Grasslands. In: J. L. Hatfield, M. V.K. Sivakumar, J. H. Prueger, editors, 2017. *Agroclimatology: Linking Agriculture to Climate*. Agron. Monogr. 60. ASA, CSSA, and SSSA, Madison, WI. doi:10.2134/agronmonogr60.2014.0059
- Han, E; A.V.M. Ines; W.E. Baethgen. 2017. Climate-Agriculture-Modeling and Decision Tool (CAMDT): A software framework for climate risk management in agriculture. *J. Env. Mod. Soft.* 95:102–114
- Pérez Bidegain M., Piaggio, J. M., Baethgen, W.E., García Préchac F. 2017. Rainfall Erosivity Factor Update in Uruguay. *Agrociencia* 21(2):91-99 ISSN 1510 0839
- Baethgen, W.E.; W.J. Parton; V. Rubio. 2017. Modeling Soil Carbon in Crop-Pasture Rotations of the South American Pampas. *Soil Science Society of America Journal* (in review)
- Giménez, A.; W.E. Baethgen, A. Cal, P. Ceccato, G. Tiscornia, A. Pisón. 2017. Integrated remote sensing and modeling for identifying crops and estimating grain yields (in Spanish) *INIA* (49):45-49
- Loboguerrero, A.M; J. Hansen, W.E. Baethgen and D. Martinez-Baron. 2017. Climate services and insurance: scaling climate-smart agriculture. *Agric. Dev.* (30):31-34
- Fernandes, K., L. Verchot, W. Baethgen, V. Gutierrez-Velez, M. Pinedo-Vasquez, C. Martius. 2017. Heightened fire probability in Indonesia in non-drought conditions: the effect of increasing temperatures. *Environ. Res. Lett.* (12) 5 <https://doi.org/10.1088/1748-9326/aa6884>
- Baethgen, W. E.; M. Berterretche, A. Gimenez. 2016. Informing Decisions and Policy: the National Agricultural Information System of Uruguay. *Agrometeoros* (24): 97-112
- Capa-Morocho, M; A.V.M. Ines; W. E. Baethgen; B. Rodríguez-Fonseca, E. Han; M. Ruiz-Ramos. 2016. Crop yield outlooks in the Iberian Peninsula: connecting seasonal climate forecasts with crop simulation models. *Agric. Systems* (149):75–87
- Kanter, D.R; M.H Schwoob, W. E. Baethgen, J.E. Bervejillo, M. Carriquiry, A. Dobermann, B. Ferraro, B. Lanfranco, M. Mondelli, C. Penengo, R. Saldias, M. E. Silva, J.M. Soares de Lima. 2016. Translating the Sustainable Development Goals into action: A participatory backcasting approach for developing national agricultural transformation pathways. *Global Food Security* (10):71–79
- Lizarralde, C.; V. Ciganda; W. E. Baethgen; A. Quincke. 2016. Nutrient losses in runoff water from contrasting crop rotations. *INIA* 46:43-45 (in Spanish)

- Fernandes, K.; A. Giannini, L. Verchot, W. Baethgen, M. Pinedo-Vasquez. 2015. Decadal co-variability of Atlantic SSTs and western Amazon dry-season hydroclimate in observations and CMIP5 simulations. *Geophysical Research Letters*. Published online: <http://onlinelibrary.wiley.com/doi/10.1002/2015GL063911/full>
- Muñoz, A., L. Goddard, A. W. Robertson, Y. Kushnir, and W. E. Baethgen, 2015: Cross-time scale interactions and rainfall extreme events in southeastern South America for the austral summer. Part I: Potential predictors. *J. Climate*, 28, 7894–7913, doi:10.1175/JCLI-D-14-00693.1
- Lovino, M.; N. O. García; W.E. Baethgen. 2014. Spatiotemporal analysis of extreme precipitation events in the Northeast region of Argentina (NEA) *J. Hydrol: Regional Studies*. 2:140–158
- Robertson, A.W.; W.E. Baethgen, P. Block, U. Lall, A. Sankarasubramanian, de Assis de Souza Filho, K. M. J. Verbist. 2014. Climate risk management for water in semi-arid regions. *Earth Perspectives* 2014, 1:12
- Goddard, L., W. E. Baethgen, H. Bhojwani, A. W. Robertson. 2014. The International Research Institute for Climate & Society: why, what and how. *Earth Perspectives* 2014, 1:10
- Gutierrez-Velez, V., Uriarte, M., DeFries, R., Pinedo-Vasquez, M., Fernandes, K., Ceccato, P., Baethgen, W., Padoch, C. 2014. Land cover changes interact with climate to change fire regimes in Western Amazonia. *Ecological Applications* 24:1323–1340
- Cruz, G., W.E. Baethgen, V. Picasso, R. Terra. 2014. Analysis of agronomic droughts in two livestock producing regions of Uruguay. Versión. *Agrociencia*. 181:126-132 (In Spanish) ISSN 2301-1548
- Vancutsem, C., Pekel, J.-F., Kayitakire, F., Duveiller, G., Baethgen, W., Ceccato, P. 2013. Mapping winter and summer crops in Uruguay using MODIS time series. *Agro-Geoinformatics* 6621924, pp 292-295.
- Baethgen, W.E. and L. Goddard. 2013. Latin American Perspectives on Adaptation of Agricultural Systems to Climate Variability and Change. IN: D. Hillel and C. Rosenzweig (Eds.): *Handbook of Climate Change and Agroecosystems: Global and Regional Aspects and Implications*. pp 57-72. ICP Series on Climate Change Impacts, Adaptation, and Mitigation Vol. 2. Imperial College Press.
- Chen, C; A. Greene; A. Robertson; W.E. Baethgen; D. Eamus. 2013. Scenario Development for Estimating Potential Climate Change Impacts on Crop Production in the North China Plain. *Int. J. Clim.* Volume 33(15):3124–3140
- Valero, S., Ceccato, P., Baethgen, W., Chanussot, J. 2013. Identification of agricultural crops in early stages using hyperspectral remote sensing images. *International Geoscience and Remote Sensing Symposium (IGARSS)*
- Uriarte, M; M. Pinedo-Vasquez, RS DeFries, K Fernandes, V Gutierrez-Velez, W.E. Baethgen, C. Padoch. 2012. Depopulation of rural landscapes exacerbates fire activity in the western Amazon. *Proceedings of the National Academy of Sciences* 109 (52):21546-21550
- Baethgen, W.E. 2012. Climate Information for Improving Adaptation to Climate Variability and Change. *CLIVAR Exchanges VAMOS* No. 58(17):16-20
- Chen, C.; W. E. Baethgen; A. Robertson. 2012. Contributions of individual variation in temperature, solar radiation and precipitation to crop yield in the North China Plain, 1961–2003. *J. Climatic Change* 116(3-4):767-788
- Del Ponte, E.; A. de Holanda Nunes Maia; T. Veloso Santos; E. J. Martins; W. E. Baethgen. 2011. Early-season warning of soybean rust regional epidemics using El Niño/Southern Oscillation information. *J. Biometeorology*. 55(4):575-583
- Gutiérrez-Vélez, V.; R. DeFries, M. Pinedo-Vásquez, M. Uriarte, C. Padoch, W.E. Baethgen, K. Fernandes, Y. Lim. 2011. High-yield oil palm expansion spares land at the expense of forests in the Peruvian Amazon. *Environ. Res. Lett.* 6(4):1-5

- Fernandes, F.; W. Baethgen, S. Bernardes, R. DeFries, D. G. DeWitt, L. Goddard, W. Lavado, D. Eun Lee, C. Padoch, M. Pinedo-Vasquez, M Uriarte. 2011. North Tropical Atlantic influence on western Amazon fire season variability. *Geoph. Res. Lett.* 38(12):12701
- Chen, C.; W E Baethgen, E. Wang, Q. Yu. 2011. Characterizing spatial and temporal variability of crop yield caused by climate and irrigation in the North China Plain. *Theoretical and applied climatology* 106(3):365-381
- Seager, R., N. Naik, W.E. Baethgen, A. Robertson, Y. Kushnir, J. Nakamura, S. Jurburg, 2010: Tropical Oceanic Causes of Interannual to Multidecadal Precipitation Variability in Southeast South America over the Past Century. *J. Climate*, 23: 5517–5539.
- Aggarwal, P. K., W. E. Baethgen, P. Cooper, R. Gommers, B. Lee, H. Meinke, L. S. Rathore, and M. V. K. Sivakumar, 2010: Managing Climatic Risks to Combat Land Degradation and Enhance Food security: Key Information Needs. *Procedia Environmental Sciences*, 1:305-312, doi: 10.1016/j.proenv.2010.09.01
- Goddard, L., Y. Aitchellouche, W.E. Baethgen, M. Dettinger, R. Graham, P. Hayman, M. Kadi, R. Martínez, and H. Meinke, 2010: Providing Seasonal-to-Interannual Climate Information for Risk Management and Decision-making. *Procedia Environmental Sciences*, 1:81-101, doi: 10.1016/j.proenv.2010.09.007.
- Baethgen, W.E. 2010. Climate Risk Management for Adaptation to Climate Variability and Change. *Crop Sci.* 50(2):70–76
- Vaughan, C. and W. E. Baethgen. 2010. Researching Adaptation: An Overview of Climate Change Adaptation Research in the Gulf of Mexico and Caribbean Basin. IN: “Fighting for Survival: The Vulnerability of America’s Gulf Coast and the Caribbean Basin”, invited paper, The Earth Institute, New Orleans, August 2010.
- Baethgen, W.E.; M. Carriquiry and C. Ropelewski. 2009. Tilting the odds in maize yields: how climate information can help manage risks. *Bull. Am. Met. Soc.* 90(2):179-183
- Baethgen, W.E.; Giménez, A. 2009. Seasonal climate forecasts and satellite information: improving decisions in the Uruguayan agricultural sector. pp:92-94. In: J.Dodd, R.Lambert, A.Lawrence, S.Townsend (Eds.), *Climate Sense*. WMO, Geneva.
- Baethgen, W.E. 2009. Challenges for Incorporating Climate Change in Decision-making and Public Policies for the Agricultural Sector. *IICA Coyuntura*. (In Spanish) http://www.iica.org.uy/online/coyuntura_58_doc.asp
- A. Giménez; J.P. Castaño; W. Baethgen; B. Lanfranco. 2009. Climate Change in Uruguay: impacts and adaptive measures in the agricultural sector. (In Spanish). *INIA Tech Ser 178*, Estanzuela, Uruguay
- Del Ponte, E., J. M. C. Fernandes, W. Pavan and W. E. Baethgen . 2009. A Model-based Assessment of the Impacts of Climate Variability on Fusarium Head Blight Seasonal Risk in Southern Brazil. *J Phytopathol* 157:675–681.
- Alley, M.A., P. Scharf, D.E. Brann, W.E. Baethgen, and J.L. Hammons. 2009. Nitrogen Management for Winter Wheat: Principles and Recommendations. *Ext. Pub. 424- 026*. VA Coop. Ext., Virginia Tech, Blacksburg. Available at: <http://pubs.ext.vt.edu/424/424-026/424-026.html>
- Baethgen, W.E. 2008. Climate Risk Management and Adaptation to Climate Change. In: “Uruguay, Climate Change Here and Now”. Supplementary document for the UNDP Report on Human Development. UNDP Uruguay, Montevideo
- Verbist, K.; G. Soto; W.E. Baethgen and D. Gabriels. 2008. Drought mitigation through prediction for an arid zone in Chile. pp:16-22. IN: D. Gabriels et al. (Eds.), *Combating desertification: assessment, adaptation and mitigation strategies*. UNESCO, Ghent University and Belgian Developkemnt Corporation.
- Hansen, J.W., Baethgen, W., Osgood, D., Ceccato, P. Ngugi, R.K. 2007. Innovations in climate risk management: protecting and building rural livelihoods in a variable and changing climate. *Journal of Semi-Arid Tropical Agricultural Research* 4(1). (Also published online at: <http://www.icrisat.org/Journal/specialproject.htm>)

- Magrin, G., M. Travasso, W. E. Baethgen and R. Boca. 2007. Improving Applications in Agriculture of ENSO-Based Seasonal Rainfall Forecasts Considering Atlantic Ocean Surface Temperatures. pp. 249-257. In: M. Sivakumar and J. Hansen (eds.) *Climate Prediction and Agriculture Advances and Challenges*. Springer Berlin Heidelberg.
- Roel, A. and W. E. Baethgen. 2007. Towards the Development of a Spatial Decision Support System (SDSS) for the Application of Climate Forecasts in Uruguayan Rice Production Sector. pp 89-97. In: M. Sivakumar and J. Hansen (eds.) *Climate Prediction and Agriculture Advances and Challenges*. Springer Berlin Heidelberg.
- Stauffer, M., W. Baethgen, R.L. Berbara, E. Caetano, A. Castellanos, B. Goebel, M. McClain, R. Menezes, A. Sánchez-Azofeita. 2007. Steering research towards policy relevance. pp 9-20. In: Tiessen, H., et al. Eds. *Communicating Global Change Sciences to Society*. Island Press, Washington.
- Barbosa, H.A., A.R. Huete and W.E. Baethgen. 2007. A 20-year study of NDVI variability over the Northeast Region of Brazil. *Journal of Arid Environments*, 67, 288-307.
- Baethgen, W. E., M. A. Carriquiry, and A Giménez. 2007. Crop yield variability in Uruguay and estimation of funds to compensate for different levels of yield losses. (In spanish) In: W. Baethgen y A. Giménez eds. *Information and Monitoring System for Climate Risk Assessment in Agricultural Production of Uruguay and Paraguay*. Serie Técnica 162. INIA.
- Baethgen, W. E.. 2007. Climate Changes in the Agricultural Sector of Developing Countries: Mitigation, Adaptation and Decision Making. *Multiciencia Journal* (8) 122-136. Also: http://www.multiciencia.unicamp.br/art07_8_i.htm
- Giménez, A., and W.E. Baethgen. 2006. SIMERPA: An Information and Monitoring System for Assessing Climate Risks in Agricultural Production of Paraguay and Uruguay. INIA Tech. Bull. No. 162
- Baethgen, W. E., and M. A. Carriquiry. 2006. Characterization of Yield Variability of Five Rainfed Crops in Uruguay. (in Spanish). *Coyuntura Agropecuaria*. IICA. http://www.iica.org.uy/online/coyuntura_28doc.asp
- Meinke, H.; R. Nelson, P.Kokic, R.Stone1, R. Selvaraju, W. E. Baethgen. 2006. Actionable climate knowledge: from analysis to synthesis. *Clim Res* 33: 101–110.
- Travasso, M. I., G. O. Magrin, W. E. Baethgen, J. P. Castaño, G. R. Rodriguez, J. L. Pires, A.Gimenez, G.Cunha, and M. Fernandes. 2006. Adaptation Measures for Maize and Soybean in Southeastern South America. AIACC Working Paper No. 28. http://www.aiaccproject.org/working_papers/Working%20Papers/AIACC_WP28_Travasso.pdf
- Maia, A. H. N., H. Meinke and W. E. Baethgen. 2006. Better Statistics to Assess the Quality of Analogue-Based Forecast Systems. *Proceedings of 8 ICSHMO, Foz do Iguaçu, Brazil, April 24-28, 2006*, INPE, p. 575-582.
- N. Leary, W. Baethgen, V. Barros, I. Burton, O. Canziani, T. E. Downing, R.J.T. Klein, D. Malpede, J.A. Marengo, L.O. Mearns, R.D. Lasco, and S.O. Wandiga. 2006. A Plan of Action to Support Climate Change Adaptation through Scientific Capacity, Knowledge and Research. AIACC Working Paper No. 23
- Roel, A.; W.E. Baethgen and F. Lago. 2005. El Niño effects on rice yields and prices in Uruguay. *ACA*:41
- Andregnette, B. and W. Baethgen, 2004. "Estimation of the Potential Beef Production in Uruguay". Serie Técnica No. 36, INAC-FUCREA, Montevideo. (In Spanish)
- Baethgen, W. E. and D. L. Martino. 2004. Mainstreaming climate change responses in economic development of Uruguay. In: *OECD Global Forum on Sustainable Development*. Environment Directorate. Environment Policy Committee. ENV/EPOC/GF/SD/RD(2004)2
- Baethgen, W.E.; H. Meinke, A. Gimenez. 2004. Adaptation of agricultural production systems to climate variability and climate change: lessons learned and proposed research approach IN: *Insights and Tools for Adaptation: Learning from Climate Variability*, NOAA-OGP, Washington, D.C.

- Meinke, H., S. M. Howden, W.E. Baethgen, G. L. Hammer, R. Selvaraju and R. C. Stone. 2004. Can climate knowledge lead to better rural policies and risk management practices? IN: Insights and Tools for Adaptation: Learning from Climate Variability, NOAA-OGP, Washington, D.C.
- Meinke, H., L. Donald, P. deVoil, B. Power, W. Baethgen, M. Howden, R. Allan and B. Bates. 2004. How predictable is the climate and how can we use it in managing cropping risks? Invited Symposia Paper, 4th International Crop Science Congress, Brisbane, September 2004.
- Agrawala, S.; A. Moehner, F. Gagnon-Lebrun, W. E. Baethgen, D.L. Martino, E. Lorenzo, M.Hagenstad, J.Smith and Maarten van Aalst. 2004. Development and Climate Change in Uruguay: Focus On Coastal Zones, Agriculture And Forestry. COM/ENV/EPOC/DCD/DAC(2004)2/FINAL. OECD, Paris. <http://www.oecd.org/dataoecd/42/7/32427988.pdf>
- Meinke, H., Y. Abawi, R. C. Stone, G. L. Hammer, A. B. Potgieter, R. A. Nelson, S. M. Howden, W.E. Baethgen and R. Selvaraju. 2003. Climate Risk Management and Agriculture in Australia and beyond: Linking Research to Practical Outcomes. IN: *Asian International Conference on Total Disaster Risk Management*, ADRC and UNOCHA, Kobe, Japan.
- Holger Meinke, S.M. Howden, W.E. Baethgen, G.L. Hammer, R. Selvaraju, R.C. Stone. 2003. Can Climate Knowledge Lead to Better Rural Policies and Risk Management Practices? NOAA workshop: Insights and Tools for Adaptation: Learning from Climate Variability, November 2003
- Rosenzweig, C, W.E. Baethgen; A. Busalacchi; M.A. Cane; D. Rind and C. J. Tucker. 2003. Using Earth Science Tools to Improve Seasonal Climate Prediction for Agriculture. EOM 12:32-35.
- Singh, U; P.W. Wilkens; W.E. Baethgen and T.S. Bontkes. 2002. Decision Support Tools for Improved Resource Management and Agricultural Sustainability. pp 92-117. IN: *Agricultural System Models in Field Research and Technology Transfer*. L.R.Ahuja, L. Ma and T.A. Howell eds.) Lewis Publisher, London, UK.
- Rosenzweig, C., Iglesias, A. and Baethgen, W. (2002): Evaluating climate impacts, adaptation, and vulnerability in agriculture; in Proceedings of Climate Change Vulnerability and Adaptation Assessment Methods, Trieste, Italy, June 3-14, 2002.
- Baethgen, W.E. and A. Giménez. 2002. Seasonal Climate Forecasts and the Agricultural Sector of Uruguay. IN: International Research Institute for Climate Prediction. "ENSO Impacts on Society - Examples of ENSO Impacts". <http://iri.columbia.edu/climate/ENSO/societal/resource/example/Baethgen.html>
- Baethgen, W.E. 2001. Global Warming and Agriculture. Fert. Focus 18:42-48.
- Meinke, H.; W.E. Baethgen, P.S. Carberry, M. Donatelli, G.L. Hammer, R. Selvaraju, and C.O. Stockle. 2001. Increasing profits and reducing risks in crop production using participatory systems simulation approaches. Agric. Systems 70:493-513.
- Baethgen, W.E. and A. Giménez. 2001. Applying seasonal climate forecasts and satellite information for improving decisions in the agricultural sector: the 1999-2000 drought in Uruguay. IN: 2001 Open Meeting of the Human Dimensions of Global Environmental Change Research Community <http://sedac.ciesin.org/openmeeting/downloads/>
- Baethgen, W.E.; R. Faria, A. Giménez, P. Wilkens. 2001. Information and Decision Support Systems for the Agricultural Sector. In Proceedings - Third International Symposium on Systems Approaches for Agricultural Development, Lima, Peru, 8-10 November 1999 [CD-ROM computer file]. International Potato Center (CIP), Lima, Peru.
- Schneider, S.; J. Sarukhan; J. Adejuwon; C. Azar; W.E. Baethgen; C. Hope; R. Moss; N. Leary; R. Richels; J.P. van Ypersele. 2001. Overview of Impacts, Adaptation, and Vulnerability to Climate Change pp 75-103. IN: *Climate Change 2001: Impacts, Adaptation and Vulnerability*, (McCarthy, J. J., Canziani, O., Leary, N. A., Dokken, D. J. and White, K. S. eds.) Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press.

- Heng, L.K.; P. Moutonnet and W.E. Baethgen. 2001. Optimization of fertilizer application for irrigated wheat systems based on an integration of crop simulation models and nuclear techniques. In: International Consortium for Agricultural Systems Applications (www.icasanet.org/applications/fertilizer.html).
- Baethgen, W.E., 2001. The Experience of Southeastern South America (Mercosur Region). IN: Coping with the Climate: A Way Forward. International workshop, October 16 - 20, 2000, Pretoria, South Africa. IRI Publication IRI-CW/01/1. Palisades, NY.
- Baethgen W. E. y G.O. Magrin. 2000. Applications of Climate Forecasts in the Agricultural Sector of South East South America. (pp. 248-266) *In*: Climate Prediction and Agriculture, Sivakumar, M.V.K. (Ed.), Proceedings of the START/WMO International Workshop, Geneva. Washington, D.C., USA: International START Secretariat.
- Baethgen, W.E. and A. Morón. 2000. Carbon Sequestration in Agricultural Production Systems of Uruguay: Observed Data and CENTURY Model Simulation Runs. Anales de la V Reunión de la Red Latinoamericana de Agricultura Conservacionista, Florianópolis, Brasil, CD Rom.
- Baethgen, W.E. and D.L. Martino. 2000. Greenhouse gas emissions in the agricultural and forestry sectors of Uruguay and opportunities in the Carbon market. Anales de la V Reunión de la Red Latinoamericana de Agricultura Conservacionista, Florianópolis, Brasil. CD Rom.
- Baethgen, W.E. 2000. Optimizing nitrogen fertilizer use: current approaches and simulation models. *In*: Optimizing nitrogen fertilizer application to irrigated wheat (pp.201-214). IAEA-TECDOC-1164. Vienna, Austria.
- Heng, L.K.; W.E. Baethgen and P. Moutonnet. 2000. The collection of a minimum dataset and the application of DSSAT (Decision Support System for Agrotechnology Transfer) for optimizing wheat yield in irrigated cropping systems. *In*: Optimizing nitrogen fertilizer application to irrigated wheat (pp.7-18). IAEA-TECDOC-1164. Vienna, Austria.
- Baethgen, W.E and D.L. Martino. 2000. Greenhouse gas emissions from the agricultural and forestry sectors of Uruguay and opportunities in the carbon market. (In Spanish) *In*: Proceedings of the Latin American Animal Science Society Congress. Montevideo, Uruguay.
- Baethgen, W. E. y G.O. Magrin. 2000. Applications of Climate Forecasts in the Agricultural Sector of South America. In: Proceedings of the International Forum on Climate Prediction (pp. 38-44), Agriculture and Development, April 2000, International Research Institute for Climate Prediction (IRI), Palisades, New York.
- Baethgen, W.E. 1999. Application of Climate Forecasts in the agricultural sector (In Spanish). FUCREA, 204:22-24.
- Baethgen, W.E. 1999. Applying scientific results in the agricultural sector: information and decision support systems. Inter-American Institute for Global Change Research (IAI) Science Forum: Global Change in the Americas. Arlington, VA.
- Bowen, W. T. and W. E. Baethgen. 1998. Simulation as a tool for improving nitrogen management. *In*: Understanding Options for Agricultural Production, G. Y. Tsuji, G. Hoogenboom, and P. K. Thornton (eds.). Kluwer Academic Publishers, Dordrecht, Netherlands. pp. 193–208.
- Rosenzweig, C.; A. Iglesias; G. Fischer; Y. Liu; W.E. Baethgen and J.W.Jones. 1999. Wheat yield functions for analysis of land-use change in China. Environmental Modelling and Assessment, 4:115-132.
- Baethgen, W.E. 1998. Using crop simulation models for studying yield limitations. (In Spanish) *In*: M.M.Kohli and D.L. Martino (eds.) Exploring high wheat yields, 127-148. CIMMYT-INIA, La Estanzuela, Uruguay.
- Baethgen, W.E. 1998. El Niño and La Niña Impacts in Southeastern South America. *In*: Review on the causes and consequences of cold events: A la Niña Summit. Proceedings. M. Glantz (ed.) NCAR, Boulder, CO (<http://www.dir.ucar.edu/esig/lanina/>).
- Morón, A., and W. E. Baethgen. 1998. Micronutrient Status in Dairy Farms of Uruguay. International Soil Science Society Transcripts, Montpellier, France.

- Baethgen, W.E. 1997. Vulnerability of the agricultural sector of Latin America to climate change. *Climate Res.* 9:1-7
- Baethgen, W.E. 1996. Decision Support Systems for Management of Agricultural Production in Uruguay. IFA-PPI Regional Conference for Latin America and the Caribbean. Proceedings. Mexico City, June 1996.
- Baethgen, W.E. Nitrogen Dynamics in Agricultural Systems. 1996. *In: Crop and Pasture Fertilization. CPIA Workshop Proceedings (123-144).* Buenos Aires, Argentina.
- M. M. Alley, Peter Scharf, D. E. Brann, W. E. Baethgen, and J. L. Hammons, 1996. Nitrogen Management for Winter Wheat: Principles and Recommendations. Virginia Tech Publication Number 424-026.
- Reilly, J., W.E. Baethgen, F.E. Chege, S.C. van de Geijn, Lin Erda, A. Iglesias, G.Kenny, D.Patterson, J. Rogasik, R. Ritter, C. Rosenzweig, W. Sombroek and J. Westbrook. 1996. Agriculture in a changing climate: impacts and adaptation, *IN: Changing Climate: Impacts and Response Strategies*, Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press.
- Christianson, C.B.; G. Carmona and W.E. Baethgen. 1996. Effect of concentration of four triamide urease inhibitors in urea on nitrogen efficiency in wheat. *Soil Biol. Biochem* 28:1121-1125.
- Baethgen, W.E., and C.B. Christianson. 1996. Nitrogen fertilization of malting barley for optimum grain yield and adequate industrial quality. *Fertilizer Issues* 25:314-318
- Baethgen, W.E. and G.O. Magrin. 1995. Assessing the impacts of climate change on winter crop production in Uruguay and Argentina using crop simulation models. *IN: C. Rosenzweig et al. (eds.), Climate Change and Agriculture: Analysis of Potential International Impacts.* American Society of Agronomy Special Publication 59, Madison WI, pp 207-228.
- Baethgen, W.E., C.B. Christianson, and A. García Lamothe. 1995. Nitrogen fertilizer effects on growth, grain yield, and yield components of malting barley. *Field Crops Res.* 43:87-99.
- Morón, A. and W.E. Baethgen. 1995. Decomposition and nutrient release from crop and pasture residues in contrasting agricultural production systems. *IN: Driven by Nature Proceedings: 82*, Wye College, University of London.
- Baethgen, W.E., A. Morón and R.M. Díaz-Rosello. 1994. Modeling long-term soil organic carbon changes in six cropping systems of SW Uruguay. *International Soil Science Society Transcripts, Vol 9:300-302.* Acapulco, Mexico.
- Morón, A. and W.E. Baethgen. 1994. Soil organic matter mineralization in four cropping systems. *International Soil Science Society Transcripts, Vol 9:298-299.* Acapulco, Mexico.
- Baethgen, W.E. 1994. Impacts of climate change on barley in Uruguay: yield changes and analysis of nitrogen management systems. *IN: C. Rosenzweig and A. Iglesias (ed.) Implications of Climate Change for International Agriculture: Crop Modeling Study.* USEPA 230-B-94-003, Washington, D.C.
- Christianson, C.B. and W.E. Baethgen. 1994. A procedure for sampling the soil microenvironment at the site of fertilizer application. *Comm. Soil Sci. and Plant Anal.*, 25:3413-3419.
- Baethgen, W.E. 1993. Applications of simulation models in Soil Management and Soil Fertility studies INIA Tech. Bull 42. La Estanzuela, Uruguay.
- Christianson, C.B., W.E. Baethgen, G. Carmona, and R.G. Howard. 1993. Microsite reactions of urea-nBTPT fertilizer on the soil surface. *Soil Biol. Biochem.* 25(8):1107-1117.
- Baethgen, W.E. 1992. Nitrogen Fertilization of Malting Barley in Western Uruguay. *Tech. Bull. No. 24:1-59.* INIA, La Estanzuela, Uruguay.
- Baethgen, W.E. 1992. Nitrogen dynamics in crop-pasture rotations. *IN: Sustainability of Crop-Pasture Rotations in South America*, A. Morón and W.E. Baethgen (eds.), p.3-25. INIA, Montevideo, Uruguay.

- Bationo, A.; W.E. Baethgen, C.B. Christianson and A.U. Mokwunye. 1991. Comparison of five soil testing methods to determine phosphorus sufficiency levels in soil fertilized with water-soluble and sparingly soluble-P sources millet production in Niger. *Fertilizer Research* 28:271-279.
- Bationo, A.; C.B. Christianson, and W.E. Baethgen. 1990. Effect of plant density and nitrogen fertilizer rates on pearl millet production in a sandy soil of Niger. *Agron. J.* 82:290-295.
- Baethgen, W.E. and M.M. Alley. 1989. Optimizing Soil and Fertilizer Nitrogen Use for Intensively Managed Winter Wheat I. Crop Nitrogen Uptake. *Agron. J.*, 81:116-120.
- Baethgen, W.E. and M.M. Alley. 1989. Optimizing Soil and Fertilizer Nitrogen Use for Intensively Managed Winter Wheat. II. Critical Levels and Optimum N Fertilizer Rates. *Agron. J.*, 81:120-125.
- Baethgen, W.E.; D. E. Taylor, and M.M. Alley. 1989. Quadratic programming method for determining optimum nitrogen rates for winter wheat during tillering. *Agron. J.* 81:557-559.
- Baethgen, W.E., and M.M. Alley. 1989. A manual colorimetric procedure for measuring ammonium nitrogen in soil and plant Kjeldahl digests. *Comm. Soil Sci. Plant Anal.* 20:961-969.
- Alley, M.M., P. Scharf, D.E. Brann, W.E. Baethgen, and S.J. Donohue. 1989. Efficient N fertilization of winter wheat: principles and recommendations. Virginia Cooperative Extension Publication 424-026.
- Baethgen, W.E. and M.M. Alley. 1987. Nonexchangeable ammonium contribution to plant available N in Virginia Soils. *Soil Sci. Soc. Amer. J.* 51:110-115.
- Martino, D., M. Caldeyro, A. Bozzano, W.E. Baethgen, and R. Diaz. 1986. Nitrogen residuality left by pastures. 1. Effect of botanic composition. 2. Effect of pasture age. (In Spanish) *Inv. Agron.* 7:48-65.
- Alley, M. M., W. E. Baethgen and D. E. Brann. 1986. Nitrogen management for efficient wheat production in Virginia. Proceedings of the Cerone Small Grain Seminar, Nov. 17-19, Toronto, Canada.
- Alley, M. M., W. E. Baethgen and D. E. Brann. 1986. Determining Nitrogen needs for maximum economic wheat yields in humid region. Proc. of the Maximum Wheat Yield Systems Workshop, March 5-7, Denver, Co, Potash and Phosphate Institute, Atlanta, GA.
- Baethgen, W.E. 1982. The research on tillage for wheat in Uruguay: a review. Abstracts of the International Conference on Wheat Production in Southern South America. (In Spanish) La Estanzuela, Uruguay.
- Capurro, E., W.E. Baethgen, A. Trujillo and A. Bozzano. 1982. Yields and NPK response of barley in SW Uruguay. (In Spanish) *CIAAB Misc.* 43: 1-21.
- García, F. and W. E. Baethgen. 1982. Soil and water conservation in Uruguay. Abstracts of the 1982 National Meeting of the Uruguayan Society of Agronomy. (In Spanish) Montevideo. Uruguay.
- Paullier, J; A. Sobredo and W.E. Baethgen. 1982. Nitrogen fertilization of wheat with undersown white clover and tall fescue. (In Spanish) *CIAAB Misc.* 45:1-11
- Baethgen, W.E. and A. Bozzano. 1981. Effects of P fertilization on alfalfa and white clover production. (In Spanish) *CIAAB Misc.* 37: 18-33.
- Baethgen, W.E. 1981. Residual effect of phosphate fertilizer on a crop-pasture rotation. (In Spanish) *CIAAB Misc.* 37:1-7.
- Baethgen, W.E., R. Diaz and A. Bozzano. 1980. Yields and economic results of seven crop-rotation systems. (In Spanish) *CIAAB Misc.* 24:26-39