Sergio Velasco Ayuso

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MAIN RESEARCH LINES

- Microbial ecology
- Terrestrial ecology
- Global change
- Soil degradation
- Ecological restoration
- Drylands
- Aquatic resources management
- Water quality
- Limnology
- Groundwater ecology
- Industrial microbiology

WORK EXPERIENCE

Assistant Researcher, Sea and Atmosphere Research Institute, Argentinian National Research and Technology Council — September 2021-Onwards
Keywords: microbial ecology, climate, biological soil crusts, marine microbial communities, land use, global change

R+D+i Lab Manager, Kernel Mycofoods — June 2020-June 2021 (12 months)
Keywords: filamentous fungi, eukaryotes, mycoproteins, microbial industrial production, food sovereignty, bioreactors

Research Assistant, Department of Ecology, Faculty of Exact and Natural Sciences, University of Buenos Aires — April 2019-May 2020 (13 months)
Keywords: global change, ocean, heterotrophic microorganisms, cyanobacteria, data bases, data sharing, large-scale distribution models, neural networks

Postdoctoral Research Associate, Department of Ecology, Faculty of Agronomy, University of Buenos Aires — October 2016-December 2018 (26 months)
Keywords: drylands, biological soil crusts, soil degradation, grazing, aridity, soil gas emissions, nutrient inputs, grasslands

Postdoctoral Research Associate, School of Life Sciences, Arizona State University — July 2013-July 2016 (36 months)
Keywords: drylands, biological soil crusts, soil degradation, soil restoration, soil fertility, 16S rRNA gen

Research Technician, Institute for Water Research, University of Granada — March 2012-June 2013 (15 months)
Keywords: high-mountain lakes, microbial food webs, extracellular enzyme activities, UV radiation, nutrient inputs, global change

Research Assistant, Department of Ecology, Faculty of Sciences, University of Granada — September 2011-November 2011 (3 months)
Keywords: high-mountain lakes, microbial food webs, water quality, hydrology

Technical Consultant, Center for Hydrographic Studies, CEDEX, Spanish Ministry of Public Works — March 2007-February 2011 (48 months)
Keywords: global change, water quality, limnology, species distribution, European Water Framework Directive

Research Assistant, Department of Ecology, Faculty of Sciences, Autonomous University of Madrid — January 2007-February 2007 (2 months)
Keywords: alien species, Mediterranean marshes, water quality, aquatic resources management

Ph.D. Student, Department of Ecology, Faculty of Sciences, Autonomous University of Madrid — November 2002-October 2006 (48 months)
Keywords: groundwater Ecology, groundwater microbial communities, hydrogeology, sandy aquifers, extracellular enzyme activities

Research Assistant, Department of Ecology, Faculty of Sciences, Autonomous University of Madrid — July 2002-August 2002 (2 months)
Keywords: water quality, aquatic resources management

Research Assistant, Department of Ecology, Faculty of Sciences, Autonomous University of Madrid — July 2001-August 2001 (2 months)
Keywords: water quality, aquatic resources management

EDUCATION

- Ph.D. in Biological Sciences (2010). Faculty of Sciences, Autonomous University of Madrid. *The Aquifer of Doñana as an Ecological System: Structure and Function of its Microbial Communities*
- M.Sc. in Ecology and Environmental Sciences (2005). Faculty of Sciences, Autonomous University of Madrid. *The Functional Role of the Microbial Community in the Aquifer of Almonte-Marismas in Doñana (Huelva, Spain)*
- Graduate in Biology (2001). Faculty of Sciences, Autonomous University of Madrid

TEACHING EXPERIENCE

- Co-lecturer, *General Ecology* (2018). Faculty of Agronomy, University of Buenos Aires (undergraduate students)
- Co-lecturer, *General Ecology* (2017). Faculty of Agronomy, University of Buenos Aires (undergraduate students)
- Co-lecturer, MIC 205 *General Microbiology* (2016). School of Life Sciences, Arizona State University (undergraduate students)
- Co-lecturer, *International Course on General and Applied Hydrology, Unit IV* (2010). Center for Hydrographic Studies, CEDEX, Spanish Ministry of Public Works (graduate students)
- Co-lecturer, *Master in Water Management and Rivers, Unit V* (2009). Department of Applied Economy, Faculty of Economy, University of Zaragoza (master students)
- Co-instructor, *Microbial Ecology Lab* (2005). Faculty of Sciences, Autonomous University of Madrid (undergraduate students)

- Co-instructor, *Limnology Lab* (2005). Faculty of Sciences, Autonomous University of Madrid (undergraduate students)

HUMAN RESOURCES TRAINING

- Advisor, lab researcher *Alejandra Ivetth Pérez Álvarez* (2020-2021). Kernel Mycofoods
- Co-advisor, master student *Kira Sorochkina* (2014-2016). School of Life Sciences, Arizona State University
- Co-advisor, lab technician *Corey J. Nelson* (2013-2015). School of Life Sciences, Arizona State University

HONORS AND AWARDS

- *Ecological Research Award* (2015). The Ecological Society of Japan
- *Second Best Ph.D. Thesis Award* (2012). The Iberian Limnological Society

PROJECTS

1. *Biological Soil Crusts, the Living Skin of Soils that Alleviates the Effects of Desertification in Drylands: Present and Future Climatic and Land Use Conditions* (2021-2022). Centre National de la Recherche Scientifique (LITI-AAP2020), main researcher
2. *Characterization of a Sector of the Pampean Aquifer with high As concentrations using Hydrogeophysical, Hydrogeochemical and Water Datation Techniques* (2021-2023). Argentinian Ministry of Science and Technology (PICT 04422/2019), associate researcher
3. *Marine Heterotrophic Bacteria: Abundance Global Patterns and Future Scenarios of Global Change* (2018-2021). Argentinian Ministry of Science and Technology (PICT 2017-3020), assistant researcher
4. *Impacts of Changes in Precipitation Regimes on the Functioning of Ecosystems in Argentina* (2017-2019). University of Buenos Aires (UBACyT 20020160100139BA), assistant researcher
5. *Land-use Intensification in the Pampean Region under a Global Change Scenario* (2016-2018). Argentinian National Research and Technology Council (CONICET PIP 112-2015-0100709), assistant researcher
6. *The BioDesert Project. Biological Feedbacks and Ecosystem Resilience under Global Change: a new Perspective on Dryland Desertification* (2016-2020). European Research Council (ERC-H2020-EU.1.1-EXCELLENT SCIENCE), assistant researcher
7. *Nutrient and Grazing effects on the Functioning of Flooded Pampean Grasslands: Implications for Production and Conservation* (2014-2017). University of Buenos Aires (UBACyT 20020130100423BA), assistant researcher
8. *Resources and Grazing as Control Factors of the Biodiversity and Functioning in Pampean Grasslands* (2014-2017). Argentinian Ministry of Science and Technology (PICT 2014-3026), associate researcher
9. *Achieving Dryland Restoration through the Deployment of Enhanced Biocrusts to Improve Soil Stability, Fertility and Native Plant Recruitment* (2013-2018). US Department of Defense (SERDP RC02-046), associate researcher
10. *Litter Decomposition in Arid Systems* (2013-2015). US National Science Foundation (NSF DEB-1256129), assistant researcher
11. *Microbial Ecosystem Services: Control of Eutrophication Processes in Mediterranean Continental Waters* (2010-2013). Andalucía Regional Government (P09-RNM-5376), associate researcher
12. *Accumulative Impact of Several Stressors on Trophic Interactions in Aquatic Systems: Solving non-Additive Ecological Surprises* (2008-2012). Spanish Ministry of Science and Innovation (CICYT CGL2008-01127/BOS), associate researcher

13. *Effects of Dams and Reservoirs in the Estuary of the Guadiana River (Huelva, Spain)* (2008-2010). Spanish Ministry of Public Works (CEDEX 44-407-1-003), assistant researcher
14. *Updating of Ecotypes of Continental Water Bodies and Technical Assistance in the Classification of their Ecological Status. Reference Conditions and Characterization of Continental Water Bodies: Rivers, Lakes and Reservoirs* (2008-2012). Spanish Ministry of Public Works (CEDEX 44-407-1-002), associate researcher
15. *Analysis of the Autoecological Information of Biological Indicators and their Response Under Different Scenarios of Climate Change* (2008-2012). Spanish Ministry of Public Works (CEDEX 44-407-1-001), associate researcher
16. *Disturbances in the Ecological Resilience of a Mediterranean Marsh Ecosystem Caused by the Presence of an Alien Species, the American Red Crayfish (*Procambarus clarkii*)* (2006-2009). Spanish Ministry of Education and Science (CICYT CGL2006-14121/BOS), assistant researcher
17. *Management and Conservation Tools for Water Resources in the Area of Doñana Using Wetland Functional Evaluation Techniques* (2002-2006). Spanish Ministry of Science and Technology (CICYT REN2001-1293-C02/HDI), associate researcher
18. *Evaluation of Ecological and Biogeochemical Functions in Wetlands of the Doñana Area (Huelva, Spain)* (2000-2004). Spanish Ministry of Science and Technology (CICYT HID97-0321-C02-01), assistant researcher
19. *Evaluation of Biological and Chemical Quality in Waters and Sediments of the El Raposo Spa (Badajoz, Spain)* (2000-2000). General Foundation of the Autonomous University of Madrid (FUAM 22/01), assistant researcher

PUBLICATIONS

1. F. Spirito, **S. Velasco Ayuso**, P. M. Tognetti, M. S. Campana, X. López Zieher, E. J. Chaneton & L. Yahdjian (2022). Long-term grazing and short-term nutrient addition determine C sequestration in humid grasslands. *Manuscript in preparation, Ecosystems*
2. **S. Velasco Ayuso**, G. R. Oñatibia & L. Yahdjian (2022). Soil multifunctionality increases after 60 years of grazing abandonment in Patagonian rangelands. *Submitted manuscript, Functional Ecology*
3. F. T. Maestre, Y. Le Bagousse-Pinguet, M. Delgado-Baquerizo, D. J. Eldridge, H. Saiz, M. Berdugo, B. Gozalo, V. Ochoa, E. Guirado, M. García-Gómez, E. Valencia, J. J. Gaitán, S. Asensio, B. J. Mendoza, C. Plaza, P. Díaz-Martínez, A. Rey, Hang-Wei Hu, Ji-Zheng He, Jun-Tao Wang, A. Lehamnn, M. C. Rillig, S. Cesarz, N. Eisenhauer, J. Martínez-Valderrama, E. Moreno-Jiménez, O. Sala, …, **S. Velasco Ayuso**, … (2022). Livestock grazing controls ecosystem services in global drylands. *Submitted manuscript, Nature*
4. F. M. Ibarbalz, J. J. Pierella-Karlusich, **S. Velasco Ayuso**, N. Visintini, L. Guidi, C. Bowler & P. Flombaum (2022). Phytoplankton community composition in the SW South Atlantic in the context of the global ocean. *Accepted manuscript, Ecología Austral*
5. L. Yahdjian, L. Carboni, **S. Velasco Ayuso** & G. R. Oñatibia (2022). Grazing intensification under climate change scenarios: perspectives of animal production in Patagonian drylands of Argentina. *Metode Science Studies Journal,* https://doi.org/10.720/metode.13.21553
6. A. M. Faist, C. J. Tucker, S. C. Reed, A. J. Antoninka, M. A. Bowker, N. N. Barger, K. Dohrenwend, N. Day, S. Bellagamba, J. Belnap, M. C. Duniway, S. Fick, A. M. Giraldo Silva, C. J. Nelson, J. Bethany, **S. Velasco Ayuso** & F. García-Pichel (2020). *Operation Manual for Biocrust Restoration in Drylands*. Wildlife Conservation Society & Doris Duke Charitable Foundation, pp. 37
7. R. Ochoa-Hueso, E. T. Borer, E. W. Seabloom, S. E. Hobbie, A. C. Risch, S. L. Collins, J. Alberti, H. A. Bahamonde, C. Brown, M. Caldeira, P. Daleo, C. R. Dickman, A. Ebeling,

N. Eisenhauer, E. Esch, A. Eskelinen, V. Fernández, S. Güsewell, B. Gutiérrez-Larruga, K. Hofmockel, R. Laungani, E. Lind, A. López, R. McCulley, J. Moore, P. Peri, S. A. Power, J. Price, S. M. Prober, C. Roscher, J. Sarneel, M. Schütz, J. Siebert, R. Standish, **S. Velasco Ayuso**, R. Virtanen, G. M. Wardle, G. Wiehl, L. Yahdjian & T. Zamin (2020). Microbial processing of plant remains is co-limited by multiple nutrients in global grasslands. *Global Change Biology, 26: 4572-4582, https://doi.org/10.1111/gcb.15146*

8. **S. Velasco Ayuso**, A. M. Giraldo Silva, N. N. Barger & F. García-Pichel (2020). Microbial inoculum production for biocrust restoration: testing the effects of common versus native soil on yield and community composition. *Restoration Ecology, 1-9, https://doi.org/10.1111/rec.131273*
9. A. M Faist, A. J. Antoninka, J. Belnap, M. A. Bowker, M. C. Duniway, F. García-Pichel, C. J. Nelson, S. C. Reed, A. M. Giraldo Silva, **S. Velasco Ayuso** & N. N. Barger (2020). Inoculum and habitat amelioration efforts demonstrate variable influences on biological soil crust recovery across hot and cold deserts. *Restoration Ecology, 1-10, https://doi.org/10.1111/rec.131273*
10. **S. Velasco Ayuso**, G. R. Oñatibia, F. T. Maestre & L. Yahdjian (2020). Grazing pressure interacts with aridity to determine the development and diversity of biological soil crusts in Patagonian rangelands. *Land Degradation and Development, 31: 488-499, https://doi.org/10.1002/ldr.3465*
11. N. M. Machado de Lima, V. M. C. Fernandes, D. W. Roush, **S. Velasco Ayuso**, J. Rigonato, F. García-Pichel & L. H. Zanini Branco (2019). The compositionally distinct cyanobacterial biocrusts from Brazilian savanna and their environmental drivers of community diversity. *Frontiers in Microbiology, 10: 2798, https://doi.org/10.3389/fmicb.2019.02798*
12. D. W. Roush, A. M. Giraldo Silva, V. M. C. Fernandes, N. M. Machado de Lima, C. J. Nelson, S. McClintock, **S. Velasco Ayuso**, K. Klicki, B. Dirks, K. Sorochkina & F. García-Pichel (2018). Cydrasil: a comprehensive phylogenetic tree of cyanobacterial 16S rRNA gene sequences. *GitHub repository, https://github.com/FGPLab/cydrasil, https://doi.org/10.5281/zenodo.1409274*
13. K. Sorochkina, **S. Velasco Ayuso** & F. García-Pichel (2018). Establishing rates of lateral expansion of biological soil crusts for optimal restoration of degraded lands. *Plant and Soil, 429: 199–211, https://doi.org/10.1007/s11104-018-3695-5*
14. **S. Velasco Ayuso**, J. M. Medina-Sánchez, R. Guénon & P. Carrillo Lechuga (2017). Ectoenzyme activity ratios reveal interactive effects of nutrient inputs and UVR in a Mediterranean high-mountain lake. *Biogeochemistry, 132: 71-85, https://doi.org/10.1007/s10533-016-0288-3*
15. **S. Velasco Ayuso**, A. M. Giraldo Silva, C. J. Nelson, N. N. Barger & F. García-Pichel (2017). Microbial nursery production of high-quality biological soil crust biomass for restoration of degraded dryland soils. *Applied and Environmental Microbiology, 83: e02179-16, https://doi.org/10.1128/AEM.02179-16*
16. R. Guénon, T. A. Day, **S. Velasco Ayuso** & R. Gros (2017). Mixing Aleppo Pine and Holm Oak litters increases biochemical diversity and alleviates N-limited microbial activities. *Soil Biology and Biochemistry, 105: 216-226, https://doi.org/10.1016/j.soilbio.2016.11.023*
17. Y. Kamarianakis, **S. Velasco Ayuso**, M. E. Cristóbal Rodríguez & M. Toro Velasco (2016). Water temperature forecasting for Spanish rivers by means of nonlinear mixed models. *Journal of Hydrology: Regional Studies, 5: 226-243, https://doi.org/10.1016/j.ejrh.2016.01.003*

18. K. D. Doherty, A. J. Antoninka, M. A. Bowker, **S. Velasco Ayuso** & N. C. Johnson (2014). A novel approach to cultivate biocrusts for restoration and experimentation. *Ecological Restoration, 33(1): 13-16, https://doi.org/10.3368/er.33.1.13*
19. M. E. Cristóbal Rodríguez, **S. Velasco Ayuso**, A. Justel & M. Toro Velasco (2014). Robust optima and tolerance ranges of biological indicators: a new method to identify sentinels of global warming. *Ecological Research, 29: 55-68, https://doi.org/10.1007/s11284-013-1099-9*
20. M. Toro Velasco, **S. Velasco Ayuso** & M. E. Cristóbal Rodríguez (2012). *Impacts of Climate Change on Water Resources and Water Bodies: Study of the Effect of Climate Change on the Ecological Status of Water Bodies*. Technical Report. Center for Hydrographic Studies, CEDEX, Spanish Ministry of Public Works, pp. 520
21. **S. Velasco Ayuso**, A. I. López-Archilla, C. Montes del Olmo & M. C. Guerrero (2011). Regulation and spatiotemporal patterns of extracellular enzyme activities in a coastal, sandy aquifer system (Doñana, SW Spain). *Microbial Ecology, 62: 162-176, https://doi.org/10.1007/s00248-011-9853-4*
22. **S. Velasco Ayuso**, A. I. López-Archilla, C. Montes del Olmo & M. C. Guerrero (2010). Microbial activities in a coastal, sandy aquifer system (Doñana Natural Protected Area, SW Spain). *Geomicrobiology Journal, 27: 409-423, https://doi.org/10.1080/01490450903480277*
23. M. Toro Velasco, S. Robles, I. Tejero, M. E. Cristóbal Rodríguez, **S. Velasco Ayuso**, J. R. Sánchez González & A. Pujante (2009). Freshwater ecosystems. Group 32. Inland running waters – lotic ecosystems. Ecological types: 1-32 (30 technical files). In VV. AA. *Preliminary Ecological Basis for the Conservation of Habitats of Community Interest in Spain.* Madrid, Spanish Ministry of the Environment, ISBN: 978-84-491-0911-9, pp. 135-554
24. **S. Velasco Ayuso**, M. C. Guerrero, C. Montes del Olmo & A. I. López-Archilla (2009). Spatiotemporal distribution of a microbial community in a coastal, sandy aquifer system (Doñana, SW Spain). *Geobiology, 7: 66-81, https://doi.org/10.1111/j.1472-4669.2008.00183.x*
25. **S. Velasco Ayuso**, P. Acebes, A. I. López-Archilla, C. Montes del Olmo & M. C. Guerrero (2009). Environmental factors controlling the spatiotemporal distribution of a microbial community in a coastal, sandy aquifer system (Doñana, SW Spain). *Hydrogeology Journal, 17: 767-780, https://doi.org/10.1007/s10040-008-0397-8*
26. A. I. López-Archilla, D. Moreira, **S. Velasco Ayuso** & P. López-García (2007). Archaeal and bacterial community composition of a pristine coastal aquifer in Doñana National Park, Spain. *Aquatic Microbial Ecology, 47: 123-139, https://doi.org/10.3354/ame047123*

CONTRIBUTIONS TO MEETINGS AND WORKSHOPS

1. A. M. Giraldo Silva, C. Nelson, J. Bethany, **S. Velasco Ayuso**, N. N. Barger & F. García-Pichel (2019). Development and application of inoculum for biological soil crust restoration in drylands. *4th International Workshop on Biological Soil Crusts*, The University of Queensland, North Stradbroke Island (Minjerrabah), Queensland, Australia, 25-30 August, oral communication
2. L. Yahdjian, F. Spirito, S. Campana, **S. Velasco Ayuso**, P. Tognetti, X. López Zieher, N. Weigandt & E. J. Chaneton (2018). Soil carbon storage in grazed grasslands of the Pampas: an ecosystem service. *RAE XXVIII Annual Meeting*, Ecological Society of Argentina, National University of Mar del Plata, Mar del Plata, Buenos Aires, Argentina, 29 October-2 November, oral communication
3. L. Carboni, M. Ciavattini, G. R. Oñatibia, **S. Velasco Ayuso** & L. Yahdjian (2018). Community idiosincrasia determines the grazing impact on vegetation. *RAE XXVIII*

Annual Meeting, Ecological Society of Argentina, National University of Mar del Plata, Mar del Plata, Buenos Aires, Argentina, 29 October-2 November, poster presentation

4. **S. Velasco Ayuso**, G. R. Oñatibia, L. Carboni, M. Ciavattini & L. Yahdjian (2018). Grazing reduces biocrusts biomass and cover across a regional aridity gradient in Patagonian rangelands. *RAE XXVIII Annual Meeting*, Ecological Society of Argentina, National University of Mar del Plata, Mar del Plata, Buenos Aires, Argentina, 29 October-2 November, oral communication
5. F. García-Pichel, A. M. Giraldo Silva, **S. Velasco Ayuso**, C. J. Nelson (2017). Bioprospecting for the right cyanobacteria in ecological arid soil restoration. *111th International Phycological Congress*, International Phycological Society, University of Szczecin, Szczecin, Poland, EU, 13-17 August, oral communication
6. L. Yahdjian, F. Spirito, X. M. López Zieher, S. Campana, **S. Velasco Ayuso** & E. J. Chaneton (2017). Seasonal grazing mitigates ecosystem impacts of nutrient additions in wet grasslands of Eastern Argentina. *ESA 102nd Annual Meeting*, Ecological Society of America, Portland, OR, USA, 6-11 August, poster presentation
7. A. M. Faist, A. J. Antoninka, N. N. Barger, J. Belnap, M. A. Bowker, M. C. Duniway, A. M. Giraldo Silva, F. García-Pichel, C. J. Nelson, S. C. Reed & **S. Velasco Ayuso** (2016). Advances in biological soil crusts rehabilitation in North American drylands. *ESA 101st Annual Meeting*, Ecological Society of America, Fort Lauderdale, FL, USA, 7-12 August, oral communication
8. F. García-Pichel, A. M. Giraldo Silva, **S. Velasco Ayuso**, C. J. Nelson & N. N. Barger (2016). Ecological dermatology: products to restore the soil skin of arid lands to its natural state and beauty. *ESA 101st Annual Meeting*, Ecological Society of America, Fort Lauderdale, FL, USA, 7-12 August, oral communication
9. C. J. Nelson, A. M. Giraldo Silva, **S. Velasco Ayuso**, N. N. Barger & F. García-Pichel (2016). Creating the seeds of restoration: two approaches to producing compositionally explicit, location-specific biological soil crusts inoculum. *3rd International Workshop on Biological Soil Crusts*, USGS, Moab, UT, USA, 26-30 September, oral communication
10. N. M. Machado de Lima, **S. Velasco Ayuso**, V. M. C. Fernandes, D. W. Roush, L. H. Zanini Branco & F. García-Pichel (2016). Diversity and ecology of cyanobacteria of biological soil crusts in Brazilian savannah. *3rd International Workshop on Biological Soil Crusts*, USGS, Moab, UT, USA, 26-30 September, oral communication
11. K. S. Sorochkina, **S. Velasco Ayuso** & F. García-Pichel (2016). Biological soil crust dispersal rate. *3rd International Workshop on Biological Soil Crusts*, USGS, Moab, UT, USA, 26-30 September, poster presentation
12. N. M. Machado de Lima, **S. Velasco Ayuso**, V. M. C. Fernandes, D. W. Roush, L. H. Zanini Branco & F. García-Pichel (2016). Diversity and ecology of cyanobacteria of biological soil crusts in the Brazilian savannah. *12th Workshop on Cyanobacteria*, Arizona State University, Tempe, AZ, USA, 19-22 May, poster presentation
13. A. Faist, A. J. Antoninka, C. Nelson, A. Giraldo Silva, **S. Velasco Ayuso**, M. A. Bowker, S. C. Reed, M. Duniway, F. García-Pichel, J. Belnap & N. N. Barger (2016). Biocrust inoculum development and soil stabilization strategies to promote biocrust restoration. *3rd International Workshop on Biological Soil Crusts*, USGS, Moab, UT, USA, 26-30 September, oral communication
14. **S. Velasco Ayuso**, A. M. Giraldo Silva, C. J. Nelson & F. García-Pichel (2016). Restoration in arid lands: can we produce biocrusts in greenhouse facilities? *55th Annual Meeting of the American Society of Microbiology: Arizona/Southern Nevada Branch*, American Society for Microbiology, Tempe, AZ, USA, April 16th, poster presentation

15. **S. Velasco Ayuso**, A. M. Giraldo Silva, C. J. Nelson, N. N. Barger, A. J. Antoninka, M. A. Bowker & F. García-Pichel (2016). Key factors controlling the growth of biological soil crusts: towards a protocol to produce biocrusts in greenhouse facilities. *EGU General Assembly*, European Geophysical Union, Vienna, Austria, EU, 17-22 April, oral communication
16. **S. Velasco Ayuso**, A. M. Giraldo Silva, C. J. Nelson, N. N. Barger, A. J. Antoninka, M. A. Bowker & F. García-Pichel (2015). Key factors controlling the growth of biological soil crusts: a protocol to produce biocrust in greenhouse facilities. *13th Biennial Conference of Science and Management on the Colorado Plateau and Southwest Region*, Northern Arizona University, Flagstaff, AZ, USA, 5-8 October, oral communication
17. **S. Velasco Ayuso**, A. M. Giraldo Silva, C. J. Nelson & F. Garcia-Pichel (2015). Water, light and nutrients contribute to the growth of biological soil crusts: towards a protocol to produce biocrusts in greenhouse facilities. *115th ASM General Meeting*, American Society for Microbiology, New Orleans, LA, USA, May 30-June 2, poster presentation
18. F. García-Pichel, A. J. Antoninka, M. A. Bowker, A.M. Giraldo Silva, **S. Velasco Ayuso**, N. N. Barger, J. C. Belnap, S. C. Reed & M. C. Duniway (2015). Restoring the biological crust cover of soils across biomes in arid North America. *EGU General Assembly*, European Geophysical Union, Vienna, Austria, EU, 12-17 April, oral communication
19. **S. Velasco Ayuso**, J. M. Medina-Sánchez & P. Carrillo Lechuga (2015). Extracellular enzyme activities in response to UVR and C:N:P ratios in a high-mountain lake. *ASLO Aquatic Sciences Meeting*, American Society for Limnology and Oceanography, University of Granada, Granada, Spain, EU, 22-27 February, oral communication
20. A. I. López-Archilla, M. C. Coleto, S. Álvarez, **S. Velasco Ayuso**, S. Molla, M. C. Guerrero, F. Barajas, A. Baltanás, C. Montes del Olmo & P. Alcorlo (2014). Towards a functional model of Santa Olalla shallow lake (aeolian sands of Doñana Natural Area) through the quantification of matter and energy flows. *Workshop on Research and Management in Doñana*, University of Sevilla, Sevilla, Spain, EU, 6-7 February, poster presentation
21. **S. Velasco Ayuso**, M. E. Cristóbal Rodríguez, M. Peg Cámara & M. Toro Velasco (2010). Effects of climate change on freshwater biological communities: a case study in the Júcar River basin (Spain). *BioFresh Biodiversity Trend Analysis Workshop*, University of Barcelona, Barcelona, Spain, EU, 13-15 October, oral communication
22. M. E. Cristóbal Rodríguez, **S. Velasco Ayuso,** M. Peg Cámara & M. Toro Velasco (2010). Effects of climate change on the variables that control the spatial and temporal distributions of benthic macroinvertebrate communities in Spanish streams. *BioFresh Project Workshop (Biodiversity of Freshwater Ecosystems)*, University of Toulouse, Toulouse, France, EU, 12-14 July, oral communication
23. M. E. Cristóbal Rodríguez, A. Justel, M. Toro Velasco & **S. Velasco Ayuso** (2009). Taxon tolerance and ecological optima in limnological studies. *XII Spanish Conference on Biometry*, Spanish Society for Biometry, University of Cádiz, Cádiz, Spain, EU, 23-25 September, oral communication
24. M. E. Cristóbal Rodríguez, **S. Velasco Ayuso** & M. Toro Velasco (2008). Effects of climate change on the ecological status of water bodies. *Climate Change and Continental Water Bodies Workshop*, Center for Hydrographic Studies, CEDEX, Spanish Ministry of Public Works, Madrid, Spain, EU, October 14th, oral communication
25. M. E. Cristóbal Rodríguez & **S. Velasco Ayuso** (2008). Effects of climate change on the ecological status of water bodies. *Workshop on River Ecology*. Department of Ecology, School of Sciences, Autonomous University of Madrid, Madrid, Spain, EU, 29 February, oral communication

26. M. E. Cristóbal Rodríguez, **S. Velasco Ayuso** & M. Toro Velasco (2008). Fluvial macro-invertebrate autoecology information and climate change. *XIV Conference of the Iberian Limnological Society*, Iberian Limnological Society, University of Huelva, Huelva, Spain, EU, 12-18 September, poster presentation
27. **S. Velasco Ayuso**, M. E. Cristóbal Rodríguez & M. Toro Velasco (2008). Proposal of hydrological variables ecologically relevant in the distribution of fluvial benthic macro-invertebrate communities. *XIV Conference of the Iberian Limnological Society*, Iberian Limnological Society, University of Huelva, Huelva, Spain, EU, 12-18 September, poster presentation
28. **S. Velasco Ayuso**, A. I. López-Archilla, C. Montes del Olmo & M. C. Guerrero (2005). The functional role of the microbial community in the Almonte-Marisma´s aquifer system (Doñana, SW Spain). *ASLO Summer Meeting*, American Society for Limnology and Oceanography, University of Santiago de Compostela, Spain, EU, 19-24 June, poster presentation
29. P. Acebes, **S. Velasco Ayuso**, A. I. López-Archilla, M. C. Guerrero & C. Montes de Olmo (2004). The microbial community in the Almonte-Marisma´s aquifer system (SW Spain). *XII Conference of the Spanish Society for Limnology*, Spanish Society for Limnology, University of Porto, Porto, Portugal, EU, 5-9 July, oral communication
30. **S. Velasco Ayuso**, P. Acebes, A. I. López-Archilla, C. Montes del Olmo & M. C. Guerrero (2003). The microbial community of the Almonte-Marisma´s aquifer system: an ecological overview. *XIX National Conference on Microbiology*, Spanish Society for Microbiology, University of Santiago de Compostela, Spain, EU, 21-25 September, poster presentation
31. **S. Velasco Ayuso**, P. Acebes, A. I. López-Archilla, M. C. Guerrero & C. Montes del Olmo (2003). Hydroecological aspects of the microbial community in the Almonte-Marisma´s aquifer system (Doñana, SW Spain). *Symposium for European Freshwater Sciences (SEFS3)*, Society of European Freshwater Sciences, University of Edinburgh, Scotland, UK, 13-18 July, poster presentation

INVITED ORAL COMMUNICATIONS

1. **S. Velasco Ayuso** (2019). *Degradation and Restoration in Drylands: Biological Soil Crusts*. Department of Biodiversity, Ecology and Evolution. Faculty of Biological Sciences, Complutense University of Madrid, November 27th
2. **S. Velasco Ayuso** (2019). *Life in the Depths of the Planet: Aquifers as Ecological Systems*. Institute of Hydrology of Plains, Faculty of Agronomy, National University of the Central Buenos Aires Province, September 3rd
3. **S. Velasco Ayuso** (2018). *Grazing Intensity, not Aridity, Controls the Biomass, Abundance and Type Richness of Biological Soil Crusts in Rangelands of the Patagonian Steppe.* Department of Ecology, Faculty of Agronomy, University of Buenos Aires, May 3rd
4. **S. Velasco Ayuso** (2017). *Biological Soil Crusts: How to Use Them for Restoring Degraded Dryland Soils.* Department of Ecology, Faculty of Agronomy, University of Buenos Aires, June 9th
5. **S. Velasco Ayuso** (2016). *Biological Soil Crusts: a Mantle of Fertility in Arid and Semiarid Regions.* Department of Biology, Faculty of Sciences, Autonomous University of Madrid, September 16th
6. **S. Velasco Ayuso** (2016). *Restoring the Living Skin of the Earth through the Deployment of Cultivated Biological Soil Crusts.* Institute of Botany, Czech Academy of Sciences, University of South Bohemia, April 25th

7. **S. Velasco Ayuso** (2016). *Fitting Models to Data to Understand Ecological Communities over Space and Time.* School of Mathematical and Statistical Sciences, Arizona State University, Tempe, March 28th

OUTREACH ACTIVITIES

1. P. Flombaum, F. M. Ibarbalz & **S. Velasco Ayuso** (2021). *The Future of the Microbial Unseen World*, Ciencia Hoy 29(174): 41-45, https://cienciahoy.org.ar/el-futuro-de-un-mundo-invisible-de-microorganismos/
2. **S. Velasco Ayuso** (2019). *Cover Picture, December 2019 (#213)*. Electronic Monthly Agenda of News in Ecology (AMEN), Ecological Society of Argentina (AsAE) (https://asaeargentina.com.ar/amen-online/)
3. **S. Velasco Ayuso** (2018). *Patagonia: it is Possible to Produce and Preserve Simultaneously?* Press and Outreach Activities Service, Faculty of Agronomy, University of Buenos Aires, City of Buenos Aires, Argentina (http://sobrelatierra.agro.uba.ar/patagonia-son-compatibles-produccion-y-restauracion/ and http://sobrelatierra.agro.uba.ar/costras-biologicas-y-los-cespedes-nativos)
4. F. García-Pichel, **S. Velasco Ayuso** & A. M. Giraldo-Silva (2014). *A Microscopic Issue of Unknown Consequences*. The New York Times, New York, NY, USA (https://www.nytimes.com/2014/09/23/science/on-warmer-planet-range-of-soil-microbes-may-change.html?_r=0)

ASSISTANCE TO CONFERENCES AND WORKSHOPS

1. *1st Meeting on Arsenic in Pampean Plains*. Institute of Hydrology of Plains, National University of the Central Buenos Aires Province, Azul, Argentina, 4-8 November 2019
2. *Human Health: Challenges and Opportunities in the -Omic Era*. Science Communication Center (C3), CONICET, Autonomous City of Buenos Aires, Argentina, 2 October 2017
3. *12th Biennial Conference of Science and Management on the Colorado Plateau and Southwest Region.* Northern Arizona University, Flagstaff, AZ, USA, 5-8 October 2013
4. *Second International Workshop on Biological Soil Cruts: Biological Soil Crusts in a Changing World*. Complutense University of Madrid, Madrid, Spain, EU, 10-13 June 2013
5. *I Spanish National Conference on Climate Change*. Carlos III University, Getafe, Spain, EU, 25-27 April 2007
6. *Scientific Conference on the Green Project of River Guadiamar: an Answer to the Aznalcóllar Mine Spill*. Autonomous University of Madrid, Madrid, Spain, EU, 20-23 April 2000
7. *The Origin of Species.* La Caixa General Foundation, Alcobendas, Spain, EU, 8-10 March 1999

ASSISTANCE TO COURSES

1. *Software Carpentry* (2016). European Molecular Biology Laboratory, Heidelberg, Germany, EU, 19-21 September (20 hours)
2. *Analysis of Ecological Data Using R* (2012). General Foundation of The University of Granada, Granada, Spain, EU, 22-26 October (32 hours)
3. *A Short Introduction to R: Data Management, Plots and Regression* (2011). Remedinal-2 Foundation, Autonomous University of Madrid, Madrid, Spain, EU, 24-26 January (9 hours)
4. *Statistical Methods for Quality Control* (2010). CEDEX, Spanish Ministry of Public Works, Madrid, Spain, EU, 13-17 September (20 hours)

5. *II International Course on Multivariate Analysis for the Study of Biological Communities* (2009). Institute of Environmental Hydraulics, University of Cantabria, Santander, Spain, EU, 14-17 September (32 hours)
6. *III International Course on Ecological Modelling* (2008). Catalan Insititute for Agriculture Research, San Carles de la Ràpita, Tarragona, Spain, EU, 10-15 November (50 hours)
7. *Basic Access* (2007). CEDEX, Spanish Ministry of Public Works, Madrid, Spain, EU, 15-19 October (25 hours)
8. *Advanced Excel* (2007). CEDEX, Spanish Ministry of Public Works, Madrid, Spain, EU, 1-11 October (30 hours)
9. *Programming with R* (2007). CEDEX, Spanish Ministry of Public Works, Madrid, Spain, EU, 25-28 September (20 hours)
10. *XIII Course on Applied Limnology: Reservoirs, Wetlands and Rivers* (2007). Center for Hydrographic Studies, CEDEX, Spanish Ministry of Public Works, Madrid, Spain, EU, 26-30 March (35 hours)
11. *Statistical Methods Applied to Environmental Sciences* (2002). Spanish National Museum of Natural History, Madrid, Spain, EU, 24-29 June (32 hours)
12. *Water and Wastewater Quality* (2001-2002). Department of Employment, Regional Government of Madrid, Madrid, Spain, EU, November 2001-February 2002 (250 hours)
13. *Introduction to Techniques and Applications of Remote Sensing in Ecological Sciences* (2001). Spanish National Museum of Natural History, Madrid, Spain, EU, 3-5 December (20 hours)
14. *Introduction and Applications of Geographical Information Systems in Ecological Sciences* (2001). Spanish National Museum of Natural History, Madrid, Spain, EU, 19-30 November (45 hours)

SHORT STAGES

- Short stage of 2 weeks in the laboratory of the *Professor Robert L. Sinsabaugh* (2006). Department of Biology, The University of New Mexico, Albuquerque, NM, USA
- Short stage of 16 weeks in the laboratory of the *Professor David L. Balkwill* (2006). Department of Biomedical Sciences, Florida State University, Tallahassee, FL, USA

LANGUAGES

- Spanish: mother tongue
- English: understanding (proficient user, C2*), speaking (proficient user, C2*), writing (proficient user, C2*)
- French: understanding (independent user, B1*), speaking (basic user, A2*), writing (basic user, A2*)

(*) Common European Framework of Reference for Languages

ADDITIONAL INFORMATION

- *Applied Soil Ecology*, *Archives of Agronomy and Soil Sciences, Rangeland Ecology and Management, Austral Ecology, Scientific Reports, Science of the Total Environment*, *Funcional Ecology, Geomicrobiology, Hydrogeology Journal*, *Plant and Soil*, *Catena, Biogeosciences*, *Algal Research, Journal of Arid Environments* and *Restoration Ecology* reviewer
- International B-B1 driving license
- Member of the *Iberian Limnological Society* (AIL) from 2008
- Member of the *Spanish Microbiological Society* (SEMICRO) since 2011
- Member of the *Association for the Sciences of Limnology and Oceanography* (ASLO) since 2011
- Member of the *American Society for Microbiology* (ASM) since 2011
- Member of the *Spanish Association for Terrestrial Ecology* (AEET) since 2014

- Member of the *Ecological Society of America* (ESA) since 2016
- Member of the *Argentinean Ecological Society* (AsAE) since 2018
- Member of the *Argentinean Limnological Society* (AAL) since 2021

REFERENCES

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- *María Laura Yahdjian*. Professor, Department of Ecology, Faculty of Agronomy, University of Buenos Aires. Telephone: +54 9 11 4573 4257, e-mail: yahdjian@agro.uba.ar
- *Ferran García-Pichel*. Professor, School of Life Sciences, Arizona State University. Telephone: +1 480 727 7534, e-mail: ferran@asu.edu
- *Presentación Carrillo Lechuga*. Professor, Department of Ecology, University of Granada. Telephone: +34 958 241 000, e-mail: pcl@ugr.es
- *Manuel Toro Velasco*. Head of the Department of Hydric Environment and Ecology, Center for Hydrographic Studies, CEDEX, Spanish Ministry of Public Works. Telephone: +34 913 358 001, e-mail: manuel.toro@cedex.es

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