



# Sergio Velasco Ayuso

## POSTAL ADDRESS

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## Main research lines

- Microbial ecology
- Ecology of terrestrial desert ecosystems
- Ecology of continental water systems
- Groundwater ecology
- Water quality

## Work experience

### POSTDOCTORAL RESEARCH ASSISTANT, SCHOOL OF LIFE SCIENCES, ARIZONA STATE UNIVERSITY (AUGUST 2013-ONWARDS)

- Analysis of the structure and function of microbial communities of terrestrial desert ecosystems
- Ecological processes and patterns of biological soil crusts
- Analyses of the effect of climate change on terrestrial desert ecosystems

### TECHNICIAN, AREA OF AQUATIC ECOLOGY, INSTITUTE FOR WATER RESEARCH, UNIVERSITY OF GRANADA, GRANADA, SPAIN (MARCH 2012-JUNE 2013)

- Sampling campaigns in aquatic systems and *in situ* experiments
- Analyses of physicochemical variables of freshwater systems
- Analyses of microbiological variables in freshwater systems (CARD-FISH, epifluorescence microscopy, flow cytometry)

### ASSISTANT RESEARCHER, DEPARTMENT OF ECOLOGY, UNIVERSITY OF GRANADA, GRANADA, SPAIN (SEPTEMBER 2011-NOVEMBER 2011)

- Evaluation of changes in functional diversity of microbial food webs in high-mountain lakes
- Field assistant
- Laboratory assistant

### ASSOCIATE RESEARCHER, CENTER FOR HYDROGRAPHIC STUDIES, CEDEX, MINISTRY OF PUBLIC WORKS, MADRID, SPAIN (MARCH 2007-FEBRUARY 2011)

- Evaluation of the impacts of climate change on the ecological status of water bodies according to the European Water Framework Directive (EU-WFD, 2000/60/EC)
- Updating of river, reservoir and lake ecotypes according to the European Water Framework Directive (EU-WFD, 2000/60/EC)
- Identification of pressures and impacts caused by dams on the ecological status in running freshwater systems

### ASSISTANT RESEARCHER, DEPARTMENT OF ECOLOGY, UNIVERSIDAD AUTÓNOMA DE MADRID, MADRID, SPAIN (JANUARY 2007-FEBRUARY 2007)

- Evaluation of the impacts of alien species on the structure and functioning of Mediterranean marsh systems
- Field assistant

### FELLOWSHIP RESEARCHER, DEPARTMENT OF ECOLOGY, UNIVERSIDAD AUTÓNOMA DE MADRID, MADRID, SPAIN (NOVEMBER 2002-OCTOBER 2006)

- Analysis of the structure and function of groundwater microbial communities inhabiting sandy aquifer systems

- Study of groundwater quality in sandy aquifer systems
- Monitoring of groundwater piezometric levels in sandy aquifer systems

**PRE-M.SC. RESEARCH ASSISTANT, DEPARTMENT OF ECOLOGY, UNIVERSIDAD AUTÓNOMA DE MADRID, MADRID, SPAIN (JULY 2002-AUGUST 2002)**

- Evaluation of water quality in Mediterranean wetlands
- Functional classification of Mediterranean wetlands
- Field assistant

**ASSISTANT RESEARCHER, DEPARTMENT OF ECOLOGY, UNIVERSIDAD AUTÓNOMA DE MADRID, MADRID, SPAIN (JULY 2001-AUGUST 2001)**

- Evaluation of chemical and biological quality in waters and sediments of private hydrotherapy centers
- Field assistant
- Laboratory assistant

## **Education**

- Ph.D. in Biological Sciences, Department of Ecology, Universidad Autónoma de Madrid, Madrid, Spain (September 24<sup>th</sup>, 2010). Thesis titled *The Aquifer of Doñana as an Ecological System: Structure and Function of its Microbial Communities*
- M.Sc. in Ecology and Environmental Sciences, Department of Ecology, Universidad Autónoma de Madrid, Madrid, Spain (March 3<sup>rd</sup>, 2005). Project titled *The Functional Role of the Microbial Community of the Aquifer Almonte-Marismas in Doñana (Huelva, Spain)*
- Graduate in Biology, Universidad Autónoma de Madrid, Madrid, Spain (August 29<sup>th</sup>, 2001)

## **Honors and awards**

- Second best Ph.D. Thesis during 2010-2011. Iberian Society for Limnology (AIL)

## **Participation in R + D projects**

- *Achieving dryland restoration through the deployment of enhanced biocrusts to improve soil stability, fertility and native plant recruitment* (Financial entity: SERDP, Department of Defense, SERDP RC02-046, USA)
- *Accumulative impact of several stressors on trophic interactions in aquatic systems: solving non-additive ecological surprises* (Financial entity: CICYT, Ministry of Science and Innovation, CICYT CGL2008-01127/BOS, Spain)
- *Analysis of the autoecological information of biological indicators and its response under different scenarios of climate change* (Financial entity: CEDEX, Ministry of Public Works, CEDEX 44-407-1-001, Spain)
- *Updating of ecotypes of surface water bodies and technical assistance in the classification of ecological status; reference conditions and characterization of water bodies: rivers, lakes and reservoirs* (Financial entity: CEDEX, Ministry of Public Works, CEDEX 44-407-1-002, Spain)
- *Effects of dams and reservoirs in the estuary of the river Guadiana (Huelva, Spain)* (Financial entity: CEDEX, Ministry of Public Works, CEDEX 44-407-1-002, Spain)

- *Disturbances in the ecological resilience of a Mediterranean marsh ecosystem caused by the presence of an alien species, the American red crayfish (Procambarus clarkii)* (Financial entity: CICYT, Ministry of Education and Science, CICYT CGL2006-14121/BOS, Spain)
- *Management and conservation tools for water resources in the area of Doñana using wetland functional evaluation techniques* (Financial entity: CICYT, Ministry of Science and Technology, CICYT REN2001-1293-C02/HDI, Spain)
- *Evaluation of ecological and biogeochemical functions in wetlands of the Doñana area (Huelva, Spain)* (Financial entity: CICYT, Ministry of Science and Technology, CICYT HID97-0321-C02-01, Spain)
- *Evaluation of biological and chemical quality in waters and sediments of the spa El Raposo (Zafra, Badajoz, Spain)* (Financial entity: General Foundation of the Universidad Autónoma de Madrid, FUAM 22/01, Spain)

## **Publications**

- S. Velasco Ayuso, P. Carrillo Lechuga & J. M. Medina-Sánchez (2012). *Extracellular enzyme activities as indicators of nutrient limitation in high-mountain lakes* (in progress)
- S. Velasco Ayuso, M. E. Cristóbal Rodríguez & M. Toro (2012). *Modelling stream water temperature using air temperature data in Spain* (in progress)
- M. E. Cristóbal Rodríguez, S. Velasco Ayuso, A. Justel & M. Toro (2012). *A new method for estimating taxa robust optima and tolerance in limnological studies* (in progress)
- CEDEX (2012). *Impacts of Climate Change on Water Resources and Water Bodies: Study of the Effect of Climate Change in the Ecological Status of Water Bodies*. Final technical report made for the Spanish Ministry of Public Works
- S. Velasco Ayuso, A. I. López-Archilla, C. Montes & 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
- S. Velasco Ayuso, A. I. López-Archilla, C. Montes & M. C. Guerrero (2010). *Microbial activities in a coastal, sandy aquifer system (Doñana Natural Protected Area, SW Spain)*. *Geomicrobiology Journal*, 27: 409-423
- M. Toro, S. Robles, I. Tejero, M. E. Cristóbal Rodríguez, S. Velasco Ayuso, J. R. Sánchez & A. Pujante (2009). *Group 32. Ecological types number 1-32 and running freshwaters: lotic systems*. *Ecological Tools for the Conservation of Habitat Types of European Interest*. Ministry of Environment, Agriculture and Fish, Spain. ISBN 978-84-491-0911-9
- S. Velasco Ayuso, M. C. Guerrero, C. Montes & A. I. López-Archilla (2009). *Spatiotemporal distribution of a microbial community in a coastal, sandy aquifer system (Doñana, SW Spain)*. *Geobiology*, 7: 66-81
- S. Velasco Ayuso, P. Acebes, A. I. López-Archilla, C. Montes & 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

- CEDEX (2009). *Impacts of Climate Change on Water Resources and Water Bodies: Study of the Effect of Climate Change in the Ecological Status of Water Bodies*. Partial technical report made for the Spanish Ministry of Public Works
- CEDEX (2008). *Impacts of Climate Change on Water Resources and Water Bodies: Study of the Effect of Climate Change in the Ecological Status of Water Bodies*. Partial technical report made for the Spanish Ministry of Public Works
- 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*, 147: 123-139

### **Contributions to meetings and workshops**

- S. Velasco Ayuso, M. E. Cristóbal Rodríguez, M. Peg Cámara & M. Toro (2010). *Effects of climate change on freshwater biological communities: a case study in the Júcar River basin (Spain)*. BioFresh Biodiversity Trend Analysis Workshop, Barcelona, Spain, 13-15 October 2010 (oral presentation)
- M. E. Cristóbal Rodríguez, S. Velasco Ayuso, M. Peg Cámara & M. Toro (2010). *Effects of climate change on the variables that control the spatial and temporal distributions of benthic macroinvertebrate communities in Spanish streams*. Meeting on Climate Change and Invasive Modelling, BioFresh Project (Biodiversity of Freshwater Ecosystems), Toulouse, France, 12-14 July 2010 (oral presentation)
- M. E. Cristóbal Rodríguez, A. Justel, M. Toro & S. Velasco Ayuso (2009). *Tolerance and robust optima of taxa in limnological studies*. XII Spanish Conference on Biometry, Cádiz, Spain, 23-25 September 2009 (oral presentation)
- S. Velasco Ayuso (2008). *Effects of climate change in the ecological status of water bodies: modelization of the answer of biological communities under different scenarios of climate change*. Workshop scheduled in the Center for Hydrographic Studies, CEDEX, Ministry of Public Works, Madrid, Spain, October 7<sup>th</sup>, 2008 (oral presentation)
- M. E. Cristóbal Rodríguez, S. Velasco Ayuso & M. Toro (2008). *Fluvial macroinvertebrate autoecology information and climate change*. XIV Conference of the Iberian Limnological Society, Huelva, Spain, 12-18 September 2008 (poster presentation)
- S. Velasco Ayuso, M. E. Cristóbal Rodríguez & M. Toro (2008). *Proposal of hydrological variables ecologically relevant in the distribution of fluvial benthonic macroinvertebrate communities*. XIV Conference of the Iberian Limnological Society, Huelva, Spain, 12-18 September 2008 (poster presentation)
- S. Velasco Ayuso, A. I. López-Archilla, C. Montes & M. C. Guerrero (2005). *The functional role of the microbial community in the Almonte-Marisma's aquifer system (Doñana, SW Spain)*. ASLO Summer Meeting, Santiago de Compostela, Spain, 19-24 June 2005 (poster presentation)
- P. Acebes, S. Velasco Ayuso, A. I. López-Archilla, M. C. Guerrero & C. Montes (2004). *The microbial community in the Almonte-Marisma's aquifer system (SW Spain)*. XII Conference of the Spanish Limnological Society, Porto, Portugal, 5-9 July 2004 (oral presentation)

- S. Velasco Ayuso, P. Acebes, A. I. López-Archilla, C. Montes & M. C. Guerrero (2003). *The microbial community of the Almonte-Marisma's aquifer system: an ecological overview*. XIX National Conference on Microbiology, Santiago de Compostela, Spain, 21-25 September 2003 (poster presentation)
- S. Velasco Ayuso, P. Acebes, A. I. López-Archilla, M. C. Guerrero & C. Montes (2003). *Hydroecological aspects of the microbial community in the Almonte-Marisma's aquifer system (Doñana, SW Spain)*. Symposium for European Freshwater Sciences, SEFS3, Edinburgh, Scotland, UK, 13-18 July 2003 (poster presentation)

### **Assistance to conferences, seminars and workshops**

- Assistance to the *Second International Workshop on Biological Soil Crusts: Biological Soil Crusts in a Changing World (Biocrust 2013)*, Madrid, Spain, 10-13 June 2013
- Assistance to the *I National Conference on Climate Change*. Universidad Carlos III de Madrid, Madrid, Spain, 25-27 April 2007
- Assistance to the *Scientific Conference on the Green Project of River Guadamar: an Answer to the Aznalcóllar Mine Spill*. Universidad Autónoma de Madrid, Madrid, Spain, 20-23 April 2000

### **Invited presentations in courses and seminars**

- S. Velasco Ayuso (2010). *Effects of climate change on freshwater ecosystems*. Seminar of 1 hour taught in the International Course on General and Applied Hydrology, unit IV, Center for Hydrographic Studies, CEDEX, Ministry of Public Works, Madrid, Spain, June 18<sup>th</sup>, 2010
- S. Velasco Ayuso (2009). *The modelization of the ecological status of water bodies*. Seminar of 3 hours taught in the Master in Water Management and Rivers, unit V, University of Zaragoza, Zaragoza, Spain, June 19<sup>th</sup>, 2009
- S. Velasco Ayuso (2007). *Effects of climate change in the ecological status of water bodies*. Seminar taught in the Center for Hydrographic Studies, CEDEX, Ministry of Public Works, Madrid, Spain, October 14<sup>th</sup>, 2007

### **Assistance to courses and seminars**

- Course on *Analysis of ecological data using R*. University of Granada General Foundation, 22-26 October 2012, 32 hours
- Course on *Introduction to R: data management, plots and regression*. Remedial2 Foundation, 24-26 January 2011, 9 hours
- Course on *Statistical methods for quality control*. CEDEX, Ministry of Public Works, 13-17 September 2010, 20 hours
- *II International course on multivariate analysis for the study of biological communities*. Institute of Environmental Hydraulics, University of Cantabria, 14-17 September 2009, 32 hours
- *III International course on ecological modelling*. Iberian Limnological Society and Spanish Society of Terrestrial Ecology, 10-15 November 2008, 50 hours

- Course on *Basic Access*. CEDEX, Ministry of Public Works, 15-19 October 2007, 25 hours
- Course on *Advanced Excel*. CEDEX, Ministry of Public Works, 1-11 October 2007, 30 hours
- Course on *R*. CEDEX, Ministry of Public Works, 25-28 September 2007, 20 hours
- *XIII Course on applied limnology: reservoirs, wetlands and rivers*. Center for Hydrographic Studies, CEDEX, Ministry of Public Works, 26-30 March 2007, 35 hours
- Course on *Statistical methods applied to environmental sciences*. National Museum of Natural History, 24-29 June 2002, 32 hours
- Course on *Water and wastewater analysis*. Department of Employ, Government of Madrid, 15 November 2001-1 February 2002, 250 hours
- Course on *Introduction to techniques and applications of remote sensing in ecological sciences*. National Museum of Natural History, 3-5 December 2001, 20 hours
- Course on *Introduction and applications of geographical information systems in ecological sciences*. National Museum of Natural History, 19-30 November 2001, 45 hours
- Course *The origin of species*. La Caixa Foundation, 8-10 March, 18 hours

### **Short stages in foreign centers**

- Short stage of 3 weeks in the laboratory of the professor Robert L. Sinsabaugh studying the extracellular enzyme activities in desert soils (University of New Mexico, Albuquerque, NM, USA) (2006)
- Short stage of 12 weeks in the laboratory of the professor David L. Balkwill studying the molecular taxonomy of microorganisms inhabiting groundwater systems and its application to the management of water quality (Florida State University, Tallahassee, FL, USA) (2006)

### **Languages**

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

### **Social skills and competences**

- Good skills to work in multidisciplinary studies
- Good abilities to transmit concepts and ideas in national and international meetings

### **Organizational skills and competences**

- Good abilities to organize, coordinate and teach seminars

- Good skills to head field sampling campaigns coordinating several working teams
- Wide hourly and geographical flexibility

### **Technical skills and competences**

- Good command to use equipment for evaluating aquatic systems in the field
- Good command to use analytical instrumentation for evaluating aquatic systems in the laboratory
- Excellent command of sampling techniques in aquatic systems

### **Computer skills and competences**

- Proficiency user of *Windows* applications
- Proficiency user of *Mac* applications
- Specific software: statistical (*R*, *Statistica*, *SPSS*, *Systat*, *Minitab*, *Primer*, *PC-ORD*, *Sigmastat*), GIS (*Grass*, *Idrisi*, *ArcMap*, *CartaLinx*, *Geostatistics*), database management (*Access*), modelling (*Stella*), graphs and plots (*SigmaPlot*, *Grapher*, *R*) and management of bibliography (*EndNote*, *Mendeley*)

### **Other skills and competences**

- *Geomicrobiology Journal* reviewer
- Collaborator in WWF/Adena (1998-2000)
- Driving license B
- Hobbies: films, books, music and outdoor activities
- Member of the Iberian Limnological Society from 2008
- Member of the Spanish Microbiological Society since 2011
- Member of the American Society for Limnology and Oceanography since 2011
- Member of the American Society for Microbiology since 2011
- Member of the International Society for Microbial Ecology since 2011

### **References**

- Presentación Carrillo Lechuga. Professor, Department of Ecology, University of Granada. Telephone: +34 958 241 000 (ext 20002), e-mail: [pcl@ugr.es](mailto:pcl@ugr.es)
- Manuel Toro Velasco. Head of the Department of Hydric Environment and Ecology, Center for Hydrographic Studies, CEDEX. Telephone: +34 913 358 001, e-mail: [manuel.toro@cedex.es](mailto:manuel.toro@cedex.es)
- Robert L. Sinsabaugh. Professor, Department of Biology, The University of New Mexico. Telephone: +1 505 277 3407, e-mail: [rlsinsab@unm.edu](mailto:rlsinsab@unm.edu)
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