

## Valeria Ochoa-Herrera, Ph.D.

Environmental Engineering Laboratory (LIA-USFQ)

Universidad San Francisco de Quito

Phone number: 593 2971700 Ext 1208

Email: [vochoa@usfq.edu.ec](mailto:vochoa@usfq.edu.ec)

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### CURRENT POSITION:

- Director of Environmental Engineering Laboratory (LIA – USFQ), Universidad San Francisco de Quito (USFQ), Quito, Ecuador.
- Coordinator of Office of Innovation and Sustainability, Universidad San Francisco de Quito (USFQ), Quito, Ecuador
- Associate Professor in Environmental Engineering, Universidad San Francisco de Quito (USFQ), Quito, Ecuador.
- Environmental Consultant, Universidad San Francisco de Quito (USFQ), Quito, Ecuador.

### PROFESSIONAL INTEREST

Fresh water, biological and physico-chemical wastewater treatment, bioremediation, environmental biotechnology, biofuels and sustainability

### EDUCATION

- |      |   |
|------|---|
| 2008 | Ph.D., Environmental Engineering, University of Arizona (UA), Tucson, AZ, USA.<br>Thesis: “Removal of perfluorooctane sulfonate (PFOS) and related compounds from industrial effluents” |
| 2006 | MSc., Environmental Engineering, University of Arizona (UA), Tucson, AZ, USA.   |
| 2004 | M.A., Analytical Chemistry, University of Arizona (UA), Tucson, AZ, USA.  |
| 2003 | Chemical Engineer, San Francisco of Quito University, Quito, Ecuador.   |

### PROFESSIONAL EXPERIENCE

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|-------------|---|
| 2009 – 2014 | Consultant: Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior (CEAACES), IEP – Petroecuador, Municipality of the city of Riobamba, Ecuador – Drinking water facility, (EP-EMAPAR), Strategic Approach to International Chemical Management (SAICM), Ministry of the Environment in Ecuador (MAE), National Council of Electricity in Ecuador (CONELEC), Pollo Favorito S.A. Enterprise (POFASA), United Nations Development Program (UNDP) |
| 2012 - 2012 | Instructor for IEP - Petroecuador sobre Environmental Monitoring, 60 hours  |

- 2003 – 2008 Research Assistant. Treatment of industrial effluents and development of analytical methods for environmental samples. Department of Chemistry and Chemical and Environmental Engineering, The University of Arizona, Tucson, AZ, USA
- 2001 – 2002 Technical Trainee. Institute for Chemical and Bioengineering ALSTOM Power - Swiss Federal Institute of Technology Zurich, ETH, Switzerland.

## PUBLICATIONS

### Peer review articles

1. **Ochoa-Herrera, V.** Field, J.A, Sierra-Alvarez, R. "Microbial toxicity and biodegradability of perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA) and related compounds" (submitted)
2. Castelo, P., Peñafiel, R. and **Ochoa-Herrera, V.** "Anaerobic digestion of fruit and vegetable wastes from Tumbaco's central market in Ecuador in semi-batch bioreactors – laboratory scale" *Avances en Ciencias e Ingenierías*, **2014**, 7, C10-C14
3. **Ochoa-Herrera, V.**, Ruiz, G., Dávila, A. G., Dischinger, S. and Peñafiel, R. "Sustainable algal growth in bench-scale reactors for biodiesel production in Ecuador". Abstracts of papers of "Sustainability + Energy Mix + Fragile Environment" *World Energy Summit in the Galapagos*, Ecuador, July 20-24.
4. Araujo, C.V.M., Moreira-Santos, M., Sousa, J. P., **Ochoa-Herrera, V.**, Encalada, A. C., Ribeiro, R. "Contaminants as habitat disturbers: PAH-driven drift by andean paramo stream insects" *Ecotoxicology and Environmental Safety*, **2014**, 108, 89 - 94
5. Araujo, C.V.M., Moreira-Santos, M., Sousa, J. P., **Ochoa-Herrera, V.**, Encalada, A. C., Ribeiro, R. "Active avoidance from a crude oil soluble fraction by an Andean paramo copepod" *Ecotoxicology*, **2014**, (DOI 10.1007/s10646-014-1268-9)
6. **Ochoa-Herrera, V.**, Eskew, O., Overbey, K., Palermo, F. and Peñafiel, R. "A baseline analysis of the quality of water resources on San Cristóbal Island, Galápagos " *Proceedings of the 7th Conference "International Perspective on Water Resources and the Environment – 2014 IPWE"*, **2014**
7. Andrade, V. and **Ochoa-Herrera, V.** "Effect of the substrate as electron donor during the microbial sulfate reduction and its posible applications in the biological treatment of acid mine drainage" *Avances en Ciencias e Ingenierías*, **2013**, 5, C31-C38
8. Duenas-Fadic, M. E., **Ochoa-Herrera, V.**, Mendez, M. A., Zambrano, C. H., Torres, F. J. "On the role of vitamin B-12 in the reductive dehalogenation of perfluorinated persistent organic pollutants: A DFT study". Abstracts of papers of the American Chemical Society, 2013. VL 246 MA 123-ENVR PD, 246th National Meeting of the American-Chemical-Society (ACS) CY SEP 08-12, 2013 CL Indianapolis
9. **Ochoa-Herrera, V.**, Riofrío, L. and Peñafiel, R. "Tratamiento físico-químico de los drenajes ácidos de mina con piedra caliza", *II Congreso Internacional de Ambiente, Energías Alternativas, Gestión de Riesgos y Salud Ocupacional*, Quito – Ecuador, **2013**

10. Peñafiel, R., Cerón P., **Ochoa-Herrera, V.** "Remoción de contaminantes de aguas residuales del procesamiento de pieles mediante un reactor de mezcla controlada". *II Congreso Internacional de Ambiente, Energías Alternativas, Gestión de Riesgos y Salud Ocupacional*, Quito-Ecuador, **2013**
11. **Ochoa-Herrera, V.**, Leon , G., Field, J. A. and Sierra-Alvarez, R. "Impact of copper in wastewater in publicly owned treatment works (POTWS)" *Science of the Total Environment*, **2011**, 421-413, 380-385
12. **Ochoa-Herrera, V.** Field, J.A., y Sierra-Alvarez, R. "Development of Analytical Methods to Quantify Perfluorooctane Sulfonate and Related Compounds in the Environment". *Avances en Ciencias e Ingenierías*, **2011**, 2, A2-7.
13. **Ochoa-Herrera, V.** Field, J.A., y Sierra-Alvarez, R. "Determinación de la Persistencia de Compuestos Perfluorinados en Plantas de Tratamiento de Aguas Residuales Municipales mediante LC-MS/MS". *Avances en Ciencias e Ingenierías*, **2010**, 2, A8-A15.
14. Torres, F.J., **Ochoa-Herrera, V.**, Blowers, P. and Sierra-Alvarez, R. "Response to Comment by Sierra Rayne and Kaya Forest on "Ab Initio Study of the Structural, Electronic, and Thermodynamic Properties of Linear Perfluorooctane Sulfonate (PFOS) and its Branched Isomers" [Chemosphere 76 (8) (2009) 1143-1149], *Chemosphere*, **2009**, 77, 1457-1458
15. Torres, F.J., **Ochoa-Herrera, V.**, Blowers, P. and Sierra-Alvarez, R. "Ab initio study of the structural, electronic, vibrational and thermodynamic properties of linear perfluorooctane sulfonate (PFOS) and its branched isomers" *Chemosphere*, **2009**, 76, 1143-1149
16. **Ochoa-Herrera, V.**, Banihani, Q., León , G., Khatri, C., Field, J.A. and Sierra-Alvarez, R. "Toxicity of fluoride on biological systems" *Water Research*, **2009**, 43, 3177-3186.
17. **Ochoa-Herrera, V.** and Sierra-Alvarez, R. 2008. "Removal of perfluorinated surfactants by sorption onto granular activated carbon, zeolite and sludge". *Chemosphere*. **2008**, 72, 1588- 1593.
18. **Ochoa-Herrera, V.**; Sierra-Alvarez, R.; Somogyi A., Jacobsen, N.; Wysocki, V and Field, J.A. 2008. "Reductive Defluorination of Perfluorooctanesulfonate (PFOS)". *Environ. Sci. Technol* **2008**, 42, 3260-3264.

#### **Books**

19. **Ochoa-Herrera, V.** "Removal of perfluorooctane sulfonate (PFOS) and related compounds from industrial effluents", pp 1-361, Ph.D. Thesis, The University of Arizona, ISBN: 0549918973

#### **TECHNICAL REPORTS**

1. Velasco, A., **Ochoa-Herrera, V.**, Peñafiel, R Cazorla, M., Parra, R., and. "Sustainability Report of USFQ baseline year 2012". STARS, 2014.
2. Velasco, A., **Ochoa-Herrera, V.**, Cazorla, M., Parra, R., and Peñafiel, R. "Sustainability Report USFQ". STARS, 2013.
3. **Ochoa-Herrera, V.** "Analysis of the Methodology applied for revision and validation of final examination for Environmental Management career at Universidad Andina Simón Bolívar"

Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior (CEAACES), 2013

4. **Ochoa-Herrera, V.** "Analysis of the methodology applied for final examination at Universidad Tecnológica Equinoccial" Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior (CEAACES), 2013
5. Peñafiel, R., **Ochoa-Herrera, V.**, Encalada, A., Suarez, E. "Design of a plan to protect and manage drinking water sources of the city of Riobamba", Municipality of the city of Riobamba, Ecuador – Drinking water facility, (EP-EMAPAR), 2012
6. **Ochoa-Herrera, V.**, Peñafiel, R., Parra, R., Regalado, D., Cerón, P. "Actualization of the National Profile on Chemicals Management in Ecuador" Strategic Approach to International Chemical Management (SAICM), Ministry of Environment, 2011
7. Peñafiel, R., **Ochoa-Herrera, V.**, Regalado, D., Andrade, V. "Design of a National Plan to Storage and Propose Treatment Techniques to eliminate PCB's in the Ecuadorian Electricity Sector, National Council of Electricity in Ecuador (CONELEC), 2011
8. **Ochoa-Herrera, V.**, Peñafiel, R. "Optimization of the Wastewater Treatment Plant (WWTP) of the Pollo Favorito Enterprise (POFASA)", Pollo Favorito S.A. Enterprise (POFASA), 2011
9. **Ochoa-Herrera, V.**, Peñafiel, R., Encalada, A., Regalado, D., Ibarra, C. "Design of a strategy of water sampling, analysis and monitoring to protect natural water sources through the identification and characterization of the analytical capacity installed in four provinces in Ecuador: Bolívar, Los Ríos, Manabí y Esmeraldas", United Nations Development Program (UNDP), 2011

## HONORS AND AWARDS

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|---------|---|
| 03/2011 | Publication considered "top ten" contribution in the understanding of the properties of perfluorooctane sulfonate (PFOS) (BioMedLib) <i>Chemosphere</i> , 2009, 76, 1143-1149 |
| 04/2008 | Doctorate research highlighted in the scientific magazine "Chemical and Engineering News C&EN 2008, 86(14):50-51 ("Defluorinating bioaccumulative PFOS")                      |
| 08/2006 | Outstanding research assistant of the Department of Chemical and Environmental Engineering, University of Arizona, Tucson, AZ, USA.   |

## PROFESSIONAL SERVICES

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|-------------------|---|
| 02/2015 - Current | Co-founder of Women in Science and Engineering at Universidad San Francisco de Quito (WISE – USFQ)  |
| 06/2011 – Current | Member of the Technical Committee of the Strategic Approach to International Chemical Management (SAICM), Ministry of Environment in Ecuador (MAE), Ecuador |
| 05/2010 – Current | Member of the Semiconductor Research Center, SRC, USA.  |
| 01/2007 – 12/2008 | Graduate student representative in the Chemical and Environmental Engineering Safety Committee, University of Arizona, UA                                   |

## TECHNICAL SKILLS

- Languages: Spanish (mother tongue) and English (oral and written).
- Matlab (Math software, process simulations, etc)
- Hands-on experience using High Performance Liquid Chromatograph (HPLC), Gas Chromatograph (GC), Ion Chromatograph (IC), Nuclear Magnetic Resonance Spectrometer (NMR), Atomic Force Microscope (AFM), X-ray Photoelectron Spectrometer (XPS), Infrared Spectrometer (IR) and Inductive Coupled Plasma (ICP).

## TEACHING COURSES

Universidad San Francisco de Quito (USFQ):

INA 510	Biological Wastewater Treatment, <i>Environmental Engineering</i>
INA 502	Wastewater Treatment, <i>Environmental Engineering</i>
INA 440	Characterization of wastewater and solid waste, <i>Environmental Engineering</i>
INA 410	Process Engineering, <i>Environmental Engineering</i>
INA 330	Environmental Physico-chemistry, <i>Environmental Engineering</i>
INA 210	Mass Balance, <i>Environmental Engineering</i>
BTC 450	Bioremediation, <i>Environmental Engineering and Biotechnology</i>
BTC 460	Biotechnological Process Engineering, <i>Biotechnology and Chemical Engineering</i>
ICV 575	Environmental Engineering, <i>Civil Engineering</i>

## UNDERGRADUATE STUDENTS

- Aldas, Andrea: *Bioremediation of hydrocarbon contaminated-soil – laboratory scale*. Biotechnology, January 8<sup>th</sup>, 2014
- Riofrio, Leslie: *Feasibility study of the design of a biological-physicochemical system for the treatment of acid mine drainage – laboratory scale*. Environmental Engineering, September 30<sup>th</sup>, 2013
- Davila, Ana Gabriela: *Evaluation of optimal conditions for autotrophic growth of Chlorella microalgae for the production of biodiesel*. Environmental Engineering, April 8<sup>th</sup>, 2013
- Schreckinger, Jose: *“Design, installation and monitoring of a volumetric filtration system for the treatment of wastewater from washing of lonas publicitarias and used tires of FUI Reciclado Enterprise”*: Environmental Engineering, December 20<sup>th</sup>, 2012
- Flor, Daniela: *Feasibility study of the design of a biological-physicochemical system for the treatment of acid mine drainage – laboratory scale*. Environmental Engineering, August 16<sup>th</sup>, 2012
- Castelo, Paulina: *Design, set-up and monitoring of anaerobic reactors for the treatment of organic residues from Municipal Market in Tumbaco – laboratory scale*. Biotechnology, May 13<sup>th</sup>, 2012
- Gallardo, Lorena: *Design of a biological- physico-chemical reactor system to treat acid mine drainage at laboratory scale* . Environmental Engineering, October 13<sup>th</sup>, 2011

- López, Jessica: *Design and set-up of an upflow anaerobic sludge blanket reactor (UASB) to treat domestic wastewater in Ecuador*. Chemical Engineering, January 11<sup>th</sup>, 2011
- Valarezo, Natazha: *Effect of biomass concentration and the presence of vegetable oils, salt and hydrocarbons in the activated sludge process*. Environmental Engineering, May 11<sup>th</sup>, 2010
- Andrade, Virginia: *Evaluation of the generation of sulfur by the action of sulfate reducing bacteria and its possible applications in the treatment of acid mine drainage*. Chemical Engineering, May 06<sup>th</sup>, 2010.

## RESEARCH PROJECTS:

- **Ochoa-Herrera, V.** "Drinking Water Quality in San Cristobal Island, Galapagos". *PROYECTOS ESTUDIANTE-PROFESOR PARA LA INVESTIGACIÓN AMBIENTAL (PREPA), SAN FRANCISCO DE QUITO UNIVERSITY– UNIVERSTIY OF NORTH CAROLINA, USA, 2015* (PI)
- **Ochoa-Herrera, V.** and Stewart, J. "Long-term Monitoring Program on Water Quality at San Cristobal, Galapagos." *GALAPAGOS SCIENCE CENTER (GSC) GRANT, USFQ AND UNIVERSITY OF NORTH CAROLINA- CHAPEL HILL, 2015* (PI)
- **Ochoa-Herrera, V.** and Stewart, J. "A 3-month Participatory Pilot Program on Water Quality at San Cristobal, Galapagos." *GALAPAGOS SCIENCE CENTER (GSC) GRANT, USFQ AND UNIVERSITY OF NORTH CAROLINA- CHAPEL HILL, 2014* (PI)
- **Ochoa-Herrera, V.** "Design, installation and set-up of wastewater treatment systems for industrial effluents coming from washing and cleaning of materials for medium size enterprises in Ecuador" *USFQ SMALL GRANTS, 2013* (PI)
- Encalada, A.C., **Ochoa-Herrera, V.**, Peñafiel, R., Suarez, E., Flecker, A., Poff, L., Guayasamin, J. "Long-term sustainability of water resources and biodiversity under scenarios of climate change in the Napo watershed, Ecuador", *USFQ Collaboration Grants, 2012*
- **Ochoa-Herrera, V.**, Peñafiel, R. "Baseline analysis of the quality of drinking water sources in San Cristobal Island, Galapagos". *PROYECTOS ESTUDIANTE-PROFESOR PARA LA INVESTIGACIÓN AMBIENTAL (PREPA), SAN FRANCISCO DE QUITO UNIVERSITY– UNIVERSTIY OF NORTH CAROLINA, USA, 2011*
- Dischinger, S., Ogden, K., **Ochoa-Herrera, V.** Development of sustainable algae growth for biofuels in Ecuador. *UNIVERSITY OF ARIZONA GRANT, USA, 2011*
- **Ochoa-Herrera, V.** Inhibitory effect of anthropogenic compounds such as oil, salt and hydrocarbons in the activated sludge process. *USFQ SMALL GRANTS PROGRAM, 2011* (PI)
- **Ochoa-Herrera, V.** y Castelo, P. "Design and set-up of anaerobic reactors for the treatment of municipal organic residues" *USFQ ENVIRONMENTAL ENGINEERING, 2011* (PI)
- **Ochoa-Herrera, V.**, Peñafiel R., Arboleda, R., "Optimization of a wastewater treatment plant of the food industry" *GRANT PRIVATE INDUSTRY, 2010* (PI)

- Peñafiel R., **Ochoa-Herrera, V.**, Cerón, P. “Development of physic-chemical methods to treat wastewater coming from the tannery industry” *USFQ ENVIRONMENTAL ENGINEERING, 2010*
- Peñafiel R, **Ochoa-Herrera, V.**, Melissa, A. “Feasibility Study of the Capture of Methane in the Palm Oil Mills Effluent for the Generation of Electricity”. *USFQ ENVIRONMENTAL ENGINEERING, 2010*
- **Ochoa-Herrera, V.** Biological treatment of acid mine drainage. *USFQ SMALL GRANTS PROGRAM, 2009 (PI)*

## **COLLABORATORS**

Encalada, Andrea, Universidad San Francisco de Quito (USFQ) (Co-author)

Field, Jim, University of Arizona, Tucson, AZ, USA (Co-author)

Guayasamin, Juan, Universidad Tecnológica Indoamérica, Ecuador (Collaborator)

Maurice, Laurence, IRD, France (Collaborator)

Pascale, Champagne, Queen’s University, Kingston, Canada (Collaborator)

Peñafiel, Ródney, Universidad San Francisco de Quito (USFQ) (Co-author)

Sierra-Alvarez, Reyes, The University of Arizona, Tucson, AZ, USA (Co-author)

Stewart, Jill, University of North Carolina, Chapel Hill, NC, USA (Collaborator)

Suárez, Esteban, Universidad San Francisco de Quito (USFQ) (Collaborator)

Torres, Javier, Universidad San Francisco de Quito (USFQ) (Co-author)

Trueba, Gabriel, Universidad San Francisco de Quito (USFQ) (Collaborator)

Zambrano, Cesar, Universidad San Francisco de Quito (USFQ) (Collaborator)