

JORGE A. VILLA
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(614) 3164802
The Ohio State University
416 Bolz Hall, 2036 Neil Ave.
Columbus, OH 43210

EDUCATION

The Ohio State University Columbus, OH, USA
Ph.D., Environmental Sciences. 2014
Dissertation: “Carbon Dynamics of Subtropical Wetland Communities in South Florida”
Committee: William J. Mitsch (*Advisor*), Gil Bohrer, James Bauer, Jay Martin.

Universidad Nacional de Colombia Medellín, Colombia
M.Sc., Forests and Environmental Conservation. 2008
Dissertation: “Monitoring and modeling of the hydrological dynamics of wetland created in alluvial gold mining operations”. *Advisor:* Conrado Tobón

Escuela de Ingeniería de Antioquia Envigado, Colombia
B.Eng. Environmental Engineering 2003

TEACHING AND RESEARCH POSITIONS

Current

Visiting Assistant Research Professor, Department of Civil, Environmental and Geodetic Engineering (CEGE).
The Ohio State University 2/2018-present

Previous

Assistant Professor, Faculty of Engineering
Corporación Universitaria Lasallista, Caldas, Colombia 7/2014-2/2018

Head of the Environmental Applied Research Group
Corporación Universitaria Lasallista, Caldas, Colombia 1/2017-3/2018

Coordinator of the ‘Seedbed for Scientists’ in Environmental Research
Corporación Universitaria Lasallista, Caldas, Colombia 7/2014-12/2016

Adjunct Faculty, Forests and Environmental Conservation Graduate Program
Universidad Nacional de Colombia, Medellín, Colombia 8/2015-05/2016

Graduate Research Assistant, Environmental Sciences Graduate Program.
The Wilma H. Schiermeier Olentangy River Wetland Research Park
The Ohio State University
Everglades Wetland Research Park, Naples Botanical Garden 9/2010-5/2014

Adjunct Instructor, Faculty of Engineering
Universidad EAFIT, Medellín, Colombia 7/2009-11/2009

Part-time Faculty, Faculty of Engineering
Corporación Universitaria Lasallista, Caldas, Colombia 2/2009-12/2009

WORK HISTORY

Assistant Director
Fundación Ecolombia. Medellín, Colombia 1/2006-12/2006

Coordinator of 'The Social Project' Unit
Cimenterie Nationale. Fond Mombin, Haiti 10/2003-3/2005

RESEARCH GRANTS

National Science Foundation (DEB) *Pending*
The Ohio State University
"Collaborative Research: Understanding the link between plant community structure and methane fluxes in temperate wetlands"
Co-PI with Tim Morin (Co-PI) - SUNY ESF, Gil Bohrer - OSU, Bahram Salehi - SUNY ESF (\$375,355)

Ohio Water resources Center 7/2019-6/2020
The Ohio State University
"Linking wetland ecological functions: towards a combined-ecosystem service quantification to promote ecosystem health in Lake Erie"
Principal Investigator (\$84,816)

Community Science Program (Lab resources grant) 10/2018-9/2021
Department of Energy Joint Genome Institute
"From genomes to methane production: Targeting critical knowledge gaps in wetland soils"
Co-Investigator, with Kelly Wrighton (PI) - Colorado State U, Chris Miller - UC Denver, Timothy Morin - SUNY ESF, Lauren Kinsman-Costello - Kent State U, Matt Sullivan and Gil Bohrer - OSU (Genome sequencing laboratory resources, \$220,000 in kind)

Intramural Research Grant 2/2015-2/2016
Corporación Universitaria Lasallista
"Climate change perceptions in the rural area of the Caldas municipality"
Co-Investigator with Cristian Ramírez (PI) (\$10,203)

Marine Sciences and Hydrobiological Resources Program Grant 7/2016-7/2018
COLCIENCIAS
"Carbon capture and emissions in wetlands of the lowlands of the Magdalena River"
Co- Investigator, with Flavio H. Moreno (PI) - Universidad Nacional de Colombia (\$101.061)

Marine sciences and Hydrobiological Resources Program Grant 2/2015-2/2018
COLCIENCIAS
"Carbon accumulation and methane emissions in a tropical alpine wetland in Belmira, Antioquia"
Principal Investigator (\$133,580)

AWARDS AND FELLOWSHIPS

Corporación Universitaria Lasallista, Council of the Engineering Faculty 2017
Excellence in Teaching Recognition

Society of Wetland Scientists & RAMSAR 2011
Student Research Award

COLCIENCIAS

Scholarship for Graduate Studies Abroad 2010-2014
“Generación del Bicentenario Francisco José de Caldas” Scholarship

Universidad Nacional de Colombia 2007
Graduate Student Research Grant
“Wetland Creation: An Approach to the Study of Hydrological Functioning and Water Quality”

PUBLICATIONS

Peer-reviewed journal papers (*denotes undergraduate/graduate students I mentored).

1. Russell, S.J., Vines, C.D., Bohrer, G., Johnson, D.R., **Villa, J.A.**, Heltzel, R., Rey-Sanchez, C., Matthes, J.H. (in review). Paired CH₄ concentration and stable isotope measurements identify concentration spikes and source attribution at a hydraulic fracturing field in West Virginia. *Atmospheric Environment*.
2. **Villa, J.A.**, Ju, Y., Stephen*, T., Rey-Sanchez, C., Wrighton, K., Bohrer, G. (in review). Plant-mediated transport in emergent and floating-leaved species of a temperate freshwater mineral-soil wetland. *JGR Biogeosciences*.
3. Bohrer, G., Ju, Y., Arend, K., Morin, T., Rey-Sanchez, ., Wrighton, K., **Villa, J.A.** (2019): Methane and CO₂ chamber fluxes and porewater concentrations US-OWC Ameriflux wetland site, 2015-2018. *AmeriFlux Management Project*. doi:10.15485/1568865
4. **Villa, J.A.**, Ju, Y., Rey-Sanchez, C., Morin, T.H., Wrighton, K., Bohrer, G. 2019. Opposing and complementary relationships between methane and carbon dioxide fluxes in a temperate cattail-dominated freshwater wetland. *JGR Biogeosciences* (Published as early view). <https://doi.org/10.1029/2019JG005167>
5. Pérez Rojas, J.J*., Moreno, F., Quevedo, J.C.*., **Villa, J.A.**, 2019. Soil carbon stocks in fluvial and isolated tropical wetlands from Colombia. *Catena*, 179: 139–148. <https://doi.org/10.1016/j.catena.2019.04.006>
6. **Villa, J.A.**, Mejia, G.M., Velasquez D.*., Botero, A.*., Acosta, S.A.*., Marulanda*, J.M., Osorno*, A.M., Bohrer, G., 2019. Carbon sequestration and methane emissions along a microtopographic gradient in a tropical Andean peatland. *Science of the Total Environment*, 654: 651–661. <https://doi.org/10.1016/j.scitotenv.2018.11.109>
7. **Villa, J.A.**, Bernal, B., 2018. Carbon sequestration in wetlands, from science to practice: An overview of the biogeochemical process, measurement methods, and policy framework.

8. Veber, G., Kull, A., **Villa, J.A.**, Maddison, M., Paal, J., Oja, T., Iturraspe, R., Pärn, J., Teemusk, A., Mander, Ü., 2018. Greenhouse gas emissions in natural and managed peatlands of America: Case studies along a latitudinal gradient. *Ecological Engineering*, 114:34–45. <https://doi.org/10.1016/j.ecoleng.2017.06.068>
9. Parn, J., Verhoeven, J., Butterbach-Bahl, K., Dise, N., Ullah, S., Aasa, A., Egorov, S., Espenberg, M., Järveoja, J., Jauhiainen, J., Kasak, K., Klemedtsson, L., Kull, A., Laggoun-Défarge, F., Lapshina, E., Lohila, A., Lõhmus, K., Maddison, M., Mitsch, W.J., Müller, M., Niinemets, Ü., Osborne, B., Pae, T., Salm, J-O., Sgouridis, F., Sohar, K., Soosaar, K., Storey, K., Teemusk, A., Tenywa, M., Tournebize, J., Truu, J., Veber, V., **Villa, J.A.**, Zaw, S., Mander, Ü. 2018. Nitrogen-rich organic soils under warm well-drained conditions are global nitrous oxide emission hotspots. *Nature Communications*, 9:1135. <https://doi.org/10.1038/s41467-018-03540-1>
10. **Villa, J.A.**, 2017. Evidence of increased soil organic matter accumulation in a tropical alpine wetland after cattle removal. *Ecological Restoration*, 35:213–217. <https://doi.org/10.3368/er.35.3.213>
11. **Villa, J.A.**, Mitsch, W.J., 2014. Carbon sequestration in different wetland plant communities in the Big Cypress Swamp region of southwest Florida. *International Journal of Biodiversity Science, Ecosystem Services & Management*, 11:17–28. <https://doi.org/10.1080/21513732.2014.973909>
12. **Villa, J.A.**, Mitsch, W.J., Song, K., Miao, S., 2014. Contribution of different wetland plant species to the DOC exported from a mesocosm experiment in the Florida Everglades. *Ecological Engineering*, 71:118–125. <https://doi.org/10.1016/j.ecoleng.2014.07.011>
13. **Villa, J.A.** & Mitsch, W.J., 2014. Methane emissions from five wetland plant communities with different hydroperiods in the big cypress region of Florida Everglades. *Ecohydrology and hydrobiology*, 14:253–266. <https://doi.org/10.1016/j.ecohyd.2014.07.005>
14. **Villa, J.A.**, Tobón, C., 2012. Modeling hydrologic dynamics of a created wetland, Colombia. *Ecological Engineering*, 40:173–182. <https://doi.org/10.1016/j.ecoleng.2011.12.005>

Book chapter

15. Pärn, J., Aasa, A., Egorov, S., Filippov, I., Gabiri, G., Gheorghe, I., Järveoja, J., Kasak, K., Laggoun-Défarge, F., Luswata, C., Maddison, M., Mitsch, W., Óskarsson, H., Pellerin, S., Salm, J.-O., Sohar, K., Soosaar, K., Teemusk, A., Tenywa, M., **Villa, J.A.**, Vohla, C., Mander, Ü., 2015. Global Boundary Lines of N₂O and CH₄ Emission in Peatlands, in: Vymazal, J. (Ed.), *The Role of Natural and Constructed Wetlands in Nutrient Cycling and Retention on the Landscape*. Springer International Publishing, pp. 87–102.

Peer Reviewed Conference Abstract

16. Mitsch, W., **Villa, J.**, Li, X., Marchio, D., Pereyra, A., Cabezas, A., Zhang, L., 2017. Comparison of carbon sequestration and methane emissions in different hydrologic and

disturbance conditions in subtropical wetlands. *EGU General Assembly Conference Abstracts*, 19:4144.

Other publications with a Country-level or Latin-American scope:

17. Arroyave-Maya, M.P., **Villa, J.A.**, Posada-Posada, M.I., & Echandía-Arbelaéz, A.F. 2017. Servicios ecosistémicos. In: Benjumea-Hoyos, et al. (Eds), *Estado del recurso hídrico en Antioquia 2012-2015*. CTA, Medellín, pp. 37–63. ISBN: 978-958-8470-42-9.
18. **Villa, J.A.** 2018. Flujos de carbono en un humedal de alta montaña. In: Caselles-Osorio, A., Marçal, S.F., Ovando, X.M.C., Posada García, J.A. (Eds.), *Humedales tropicales, especies invasoras y salud*. On-line, pp. 66–77. ISBN 978-958-48-3828-5.
19. **Villa, J.A.**, 2017. Wetlands classification in alluvial mining zones. *Producción + Limpia* 12: 59–69.
20. Acosta-Rojas, S.A.*, **Villa, J.A.**, 2016. *Trichoderma spp* evaluation as a biologic control in a small cocoa crop. *Journal of Agriculture and Animal Sciences - Corporación Universitaria Lasallista*, 5:10–20.
21. Acosta-Rojas, S.A., **Villa, J.A.***, 2016. Evaluating a mixture of lixivate and *Trichoderma spp.* as biological control of *Moniliophthora roreri* in a small-scale cacao (*Theobroma cacao*) farm. *Vitae - Revista de la Facultad de Ciencias Farmacéuticas y Alimentarias*, 23:S200–S201.
22. Marulanda, J.*, **Villa, J.A.**, 2015. Apparent density and concentration of organic matter in the soil of a high mountain wetland. *Journal of Engineering and Technology – Corporación Universitaria Lasallista*, 4:8–20.
23. Botero, A.*, **Villa, J.A.**, 2016. Determinación de la humificación de la materia orgánica en el suelo de un humedal de alta montaña en un gradiente de niveles de agua, in: *Jóvenes Investigando Con Sentido, Jovial*. Editorial Lasallista, Caldas, pp. 439–444.
24. Acosta-Rojas, S.A., **Villa, J.A.**, 2016. Actividad de la enzima fenol oxidasa en el suelo de un humedal de alta montaña del páramo de Belmira (Antioquia), in: *Jóvenes Investigando Con Sentido, Jovial*. Editorial Lasallista, Caldas, pp. 489–496.
25. Acosta-Rojas, S.A.*, **Villa, J.A.**, 2015. Control biológico como alternativa en enfermedades de plantas, in: *Dinámicas Actuales de Investigación. Los Jóvenes Buscan y Descubren*. Editorial Lasallista, Caldas, pp. 213–220.
26. Bermúdez-Hincapié, J*., Saldarriaga-Rendón, L.F.*, **Villa, J.A.**, 2015. Viabilidad técnica y económica de filtros caseros para mejorar la calidad de aguas de suministro, parcialmente tratadas, in: *Dinámicas Actuales de Investigación. Los Jóvenes Buscan y Descubren*. Editorial Lasallista, Caldas, pp. 155–162.
27. Yepes, A.P., **Villa, J.A.**, 2010. Vegetal replacement after an ecological restoring process in a tropical dry forest fragment (La Pintada, Antioquia). *Revista Lasallista de Investigación*, 7:24–34.

INVITED PRESENTATIONS

1. Villa, J.A. “Carbon accumulation in wetlands: some insights for management and conservation”. 02/2016. *RAMSAR world wetlands day celebration. Universidad de Antioquia* (Medellín, COL)
2. Villa, J.A. & Mitsch, W.J. Methane emissions from different wetland plant communities in the big cypress swamp. 11/2012. *4th annual research symposium, Big Cypress National Preserve* (Ochopee, FL, USA)
3. Villa, J.A. Carbon sequestration in wetlands, measurements and applied studies. 11/2012. *Ecohydrology Institute* (Davis, CA, USA)

CONFERENCE PRESENTATIONS

4. Ju, Y., Villa, J.A., Bohrer, G. Distribution of Plant communities in relation to water level fluctuation at an estuarine Marsh. 6/2019. Poster. *19th Annual Meeting of the American Ecological Engineering Society* (Asheville, NC).
5. Villa, J.A., Ju, Y., Rey-Sanchez, C., Morin, T.H., Bohrer, G. Towards wetland creation and restoration in the Lake Erie basin with reduced feedbacks from methane emissions. 6/2019. Poster. *19th Annual Meeting of the American Ecological Engineering Society* (Asheville, NC).
6. Villa, J.A., Smith, G., Renteria, L., Stegen, J., Wrighton, K., Bohrer, G. Methane and nitrous oxide porewater concentration and flux at the hyporheic zone of a large river. Poster, 5/2019. *Department of Energy – Office of Biological and Environmental Research, 2019 Environmental System Science PI Meeting* (Potomac, MD).
7. Rodríguez-Ramos, J., Borton, M., Smith, G., Solden, L., Daly, R., Villa, J.A., Graham, E., Purvine, S.O., Arntzen, E., Song, H.S., Nelson, W., Lipton, M., Bohrer, G., Stegen, J., Wrighton, K. More than Meets the Eye: Microbial Communities and their Viral Predators Govern Carbon and Nitrogen Transformations in the Hyporheic Zone. *Department of Energy – Office of Biological and Environmental Research, 2019 Environmental System Science PI Meeting* (Potomac, MD).
8. Stephen, T.L., Villa, J.A., Bohrer, G. Measuring greenhouse gas fluxes due to ebullition in a freshwater estuarine wetland. 1/2019, Poster. *American Meteorological Society 18th Annual Student Conference* (Phoenix, AZ).
9. Villa, J.A., Stephen, T., Rey-Sanchez, C.A., Bohrer, G. Relationships between methane flux and carbon fixation in three cosmopolitan wetland plant genera. 12/2018. Poster. *American Geophysical Union Fall Meeting* (Washington D.C.).
10. Solden, L.M., Villa, J.A., Graham, E.B., Purvine, S.O., Tfaily, M., Arntzen, E., Nelson, W.C., Wilkins, M.J., Bohrer, G., Lipton, J., Stegen, J., Wrighton K.C. Microbial Ammonium cycling is critical to nitrogen transformations in Columbia River Sediments. 2018/05. Poster. *Research Summary from the 2018 TES/SBR Joint Investigators Meeting* (Potomac, MD)
11. Villa, J.A., Daly, R., Smith, G., Narrowe, A., Rey-Sanchez, C., Ju, Y., Morin, T., Kinsman-Costello, L., Wrighton, K., Bohrer, G. Understanding the links between nutrient cycling, hydrology and nutrient loading in a Lake Erie estuarine wetland. 2018/09. Poster. *Understanding Harmful Algal Blooms: State of The Science* (Toledo, OH. USA)
12. Villa, J.A. Carbon sequestration and methane emissions in a tropical alpine wetland along a

water table gradient. 2018/05. *SWS annual meeting* (Denver, CO. USA)

13. Villa, J.A., Quevedo, J.C., Moreno, F.H. Methane emissions in two different hydrogeomorphic tropical wetlands in South America. 2018/05. *SWS annual meeting* (Denver, CO. USA)
14. Villa, J.A. Carbon flows in high-altitude tropical wetland. 11/2017. *Congreso Iberoamericano Humedales Tropicales* (Barranquilla, COL)
15. Villa, J.A. Carbon sequestration in a paramo wetland along water table gradient. 10/2017. *IX Congreso de la Red Latinoamericana de Ciencias Ambientales* (San Luis Potosí, MEX)
16. Villa, J.A., Moreno F.H., Quevedo, J.C., Osorno, A.M., Marulanda, J.M. From lowlands to mountain tops: carbon flow and measurements in wetlands of different geomorphic classes for resource management and planning. 08/2016. *5th Ecosummit – Ecological Sustainability* (Montpellier. FR)
17. Villa, J. A., Handler, M., Bernal, B., Bohrer, G. Carbon sequestration in wetlands: Methods to determine accretion rates. 03/2016. *Segundo Congreso Interamericano de Cambio Climático* (Mexico City, MEX)
18. Villa, J.A. & Mitsch, W.J. Carbon sequestration vs methane emissions in four different wetland plant communities of southwest Florida. 05/2014. *Joint aquatic sciences meeting* (Portland, OR. USA)
19. Villa, J.A. & Mitsch, W.J. Diurnal and seasonal variations in methane emissions from different wetland plant communities in southwest Florida. 05/2013 *SWS annual meeting* (Duluth, MN. USA)
20. Villa, J.A. & Mitsch, W.J. Diffuse methane emissions from different wetland plant communities in the big cypress swamp. 09/2012. *4th International Ecosummit* (Columbus, OH, USA)
21. Villa, J.A. & Mitsch, W.J. Determining the role of different wetland plant communities on the export of dissolved organic carbon in the Florida Everglades - a mesocosm experiment. 06/2012. *9th Intecol International Wetlands Conference* (Orlando, FL, USA)

STUDENT MENTORING

Master student

Forests and Environmental Conservation Graduate Program, Universidad Nacional de Colombia:
Julio C. Quevedo (6/2015-current)

Undergrad research projects

Environmental Engineering, Corporación Universitaria Lasallista: Juliana Bermúdez-Hincapié (2-8/2015); Luisa F. Saldarriaga-Rendón (2-8/2015); Sharon A. Acosta-Rojas (2/2015-6/2016); Andrés Botero (2/2016-12/2017). Forest Engineering, Universidad Nacional de Colombia: Jhonatan J. Pérez (1/2018-7/2018).

Department of Civil, Environmental and Geodetic Engineering, The Ohio State University: Kateland Kirk (5-8/2018), Timothy Becker (5-8/2018), Taylor Stephen (SROP, University of Maryland - Baltimore County; 7/2018), Madison Evans (5/2019-7/2019), Sara Quinlin (5/2019-7/2019), Dave DeLoughry (8/2019-current).

Undergraduate research interns

Environmental Engineering, Corporación Universitaria Lasallista: Ana M. Osorno (7/2015-1/2016); Juliana M. Marulanda (7/2015-6/2016); Daniela Velásquez (1/2017-12/2017)

Students in research experience abroad at The Ohio State University

Environmental Engineering, Corporación Universitaria Lasallista: Ana M. Osorno (6-7/2015); Ana M. Restrepo (6-7/2015); Sharon A. Acosta (6-7/2016)

Forests and Environmental Conservation Graduate Program, Universidad Nacional de Colombia: Julio C. Quevedo (7/2018).

Students in research experience abroad at Corporación Universitaria Lasallista

Department of Civil, Environmental and Geodetic Engineering, The Ohio State University: Miriam Handler (6-7/2015), Austin Rechner (2/2017), Camilo A. Rey-Sánchez (7/2017)

Masters committee member

Juliana M. Valencia (Forests and Environmental Conservation Graduate Program, Universidad Nacional de Colombia; 1/2017)

PhD Candidacy examination committee

María F. Cárdenas (Hydraulic Resources Graduate Program, Universidad Nacional de Colombia, 11/2014), Javier E. Carvajal (Environmental Planning & Management of Watersheds Graduate Program, Universidad de Tolima-Colombia, 6/2019).

TEACHING EXPERIENCE

Applied Hydrology (Co-Instructor, Undergraduate-Graduate) The Ohio State University
Environmental Engineering
Fall 2018

Hydrology (Instructor, Undergraduate) Corporación Universitaria Lasallista
Environmental Engineering
2014, 2015, 2016, 2017

Soils (Instructor, Undergraduate) Corporación Universitaria Lasallista
Environmental Engineering
Fall 2016, Spring 2017

Wetlands Ecohydrology (Instructor, Graduate) Universidad Nacional de Colombia
Forests and Environmental Conservation Graduate Program
Fall 2015, Spring 2016

Environmental Modelling (Instructor, Undergraduate) Corporación Universitaria Lasallista
Engineering

Fall 2014

Tropical Ecosystems, (Instructor, Undergraduate)
Engineering
2009, Fall 2014, Spring 2015

Corporación Universitaria Lasallista

Environmental Planning (Instructor, Undergraduate)
Engineering
2009

Corporación Universitaria Lasallista

Ecology and Biodiversity (Instructor, Undergraduate)
Engineering
2009

Corporación Universitaria Lasallista

Ecology (Instructor, Undergraduate)
Engineering
2009

Universidad EAFIT

OTHER SYNERGISTIC ACTIVITIES

Journal referee

Ecological Engineering, Plos One, Revista de Biología Tropical, Hydrology and Earth System Sciences, Limnology and Oceanography, Regional Environmental Change, JGR: Biogeosciences, Science of The Total Environment, Acta Oecologica.

Professional affiliations

Society of Wetland Scientists
American Geophysical Union
Red Latinoamericana de Ciencias Ambientales
Global Lake Ecological Observatory Network

Research communication and social outreach

[Colombian Ecosystems Blog](#) and [Tropical Wetlands Youtube Channel](#)