# DEBORA YUMI DE OLIVEIRA

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## **EDUCATION**

## Ph.D., Civil and Environmental Engineering

March 2023 (expected)

Irvine, United States

University of California, Irvine (UCI)

· Focus area: Hydrology and Water Resources

· Dissertation: On model diagnostics: statistical underpinning and epistemic errors

· Advisor: Dr. Jasper Alexander Vrugt

· GPA: 4.00/4.00

## Master's degree, Environmental Engineering

March 2018

Federal University of Santa Catarina (UFSC)

Florianópolis, Brazil

· Focus area: Hydrology and Applied Hydraulics

· Thesis: Bayesian inference applied to interception and rainfall-runoff modeling

· Advisor: Dr. Pedro Luiz Borges Chaffe

· GPA: 10.00/10.00

## Bachelor's degree, Sanitary and Environmental Engineering

September 2015

Federal University of Santa Catarina (UFSC)

Florianópolis, Brazil

· Thesis: Identification of interception model parameters using an automatic calibration algorithm

· Advisor: Dr. Pedro Luiz Borges Chaffe

· GPA: 9.04/10.00

## **BRAFITEC Exchange Program**

January 2012 – February 2013

École Nationale Supérieure de Géologie (ENSG)

Nancy, France

· Focus area: Water Resources/Hydrogeology

· GPA: 15.35/20.00

### ACADEMIC APPOINTMENTS

#### Graduate Student Researcher

January 2019 – present Irvine, United States

University of California, Irvine (UCI)

 $March\ 2016-August\ 2018$ 

Graduate Student Researcher
Federal University of Santa Catarina (UFSC)

Florianópolis, Brazil

## Undergraduate Research Assistant

September 2014 – March 2016

Federal University of Santa Catarina (UFSC)

Florianópolis, Brazil

### HONORS AND AWARDS

### AGU 2021 Editors' Citation for Excellence in Refereeing

2022

· Awarded by the American Geophysical Union (AGU), Water Resources Research editors

- · Awarded by the University of California, Irvine (UCI), Graduate Division
- · 1 quarter of tuition/stipends (\$13,000)

### CAPES Fellowship

January 2019 – June 2022

- · Awarded by the Ministry of Education of Brazil
- · 3.5 years of tuition/stipends ( $\sim$ \$160,000)

## Young Researcher Award

2017

- · Awarded by the Brazilian Water Resources Association (ABRHidro)
- · Best paper presented at the Brazilian Symposium on Water Resources (held every two years) by a lead author under 30 years of age

#### Medal for Academic Excellence

2015

- · Awarded by the Federal University of Santa Catarina (UFSC)
- · Top graduating student in Sanitary and Environmental Engineering

## Recognition of Academic Achievement

2011, 2013, 2014, 2015

- · Awarded by the Federal University of Santa Catarina (UFSC)
- · GPA 9.00 (out of 10.00) or higher in 6 (out of 9) semesters

## **BRAFITEC Scholarship**

January 2012 – December 2012

- · Awarded by the Ministry of Education of Brazil
- · International exchange program between Brazil and France for engineering students
- · 1 year of tuition/stipends ( $\sim$ \$20,000)

## **PUBLICATIONS**

## In progress

- 1. **de Oliveira**, D. Y. & Vrugt, J. A. On Diagnostic Bayes: Bayesian Inference and Diagnostic Model Evaluation. *In preparation*.
- 2. **de Oliveira**, D. Y. & Vrugt, J. A. The Treatment of Uncertainty in Diagnostic Model Evaluation: A Probabilistic Description of Hydrologic Signatures. *Submitted (in revision)*.
- 3. **de Oliveira**, D. Y. & Vrugt, J. A. The Treatment of Uncertainty in Hydrometric Observations: A Probabilistic Description of Streamflow Records. *Submitted (in revision)*.

### Published

- David, P. C., Chaffe, P. L. B., Chagas, V. B. P., Dal Molin, M., de Oliveira, D. Y., Klein, A. H. F. & Fenicia, F. Correspondence Between Model Structures and Hydrological Signatures: A Large-Sample Case Study Using 508 Brazilian Catchments. Water Resources Research 58, e2021WR030619. doi:10.1029/2021WR030619 (2022).
- Vrugt, J. A. & de Oliveira, D. Y. Confidence intervals of the Kling-Gupta efficiency. Journal of Hydrology 612, 127968. ISSN: 0022-1694. doi:10.1016/j.jhydrol.2022.127968 (2022).
- 3. Vrugt, J. A., de Oliveira, D. Y., Schoups, G. & Diks, C. G. H. On the use of distribution-free likelihood functions: Generalized and universal likelihood functions, score rules and multi-criteria ranking. *Journal of Hydrology*, accepted (2022).

- 4. Franco, A. C. L., **de Oliveira**, D. Y. & Bonumá, N. B. Comparison of single-site, multi-site and multi-variable SWAT calibration strategies. *Hydrological Sciences Journal* **65**, 2376–2389. doi:10.1080/02626667.2020.1810252 (2020).
- Paiva, R. C. D., Chaffe, P. L. B., Anache, J. A. A., Fontes, A. S., Araujo, L. M. N., Araujo, A. N., Bartiko, D., Bleninger, T., Amorim, P. B., Buarque, D. C., Carlotto, T., Collischonn, W., Detzel, D. H. M., Fan, F. M., Formiga-Johnsson, R. M., Kobiyama, M., Mannich, M., Marques, G., Michel, G. P., de Oliveira, D. Y., de Oliveira, P. T. S., Pinheiro, A., Ruhoff, A., Siqueira, V. A., Tassi, R. & Zanandrea, F. Advances and challenges in the water sciences in Brazil: a community synthesis of the XXIII Brazilian Water Resources Symposium. Brazilian Journal of Water Resources 25, e50. ISSN: 2318-0331. doi:10.1590/2318-0331.252020200136 (2020).
- 6. Bartiko, D., de Oliveira, D. Y., Bonumá, N. B. & Chaffe, P. L. B. Spatial and seasonal patterns of flood change across Brazil. *Hydrological Sciences Journal* 64, 1071–1079. doi:10.1080/02626667. 2019.1619081 (2019).
- 7. David, P. C., de Oliveira, D. Y., Grison, F., Kobiyama, M. & Chaffe, P. L. B. Systematic increase in model complexity helps to identify dominant streamflow mechanisms in two small forested basins. *Hydrological Sciences Journal* 64, 455–472. doi:10.1080/02626667.2019.1585858 (2019).
- 8. de Oliveira, D. Y., Chaffe, P. L. B. & Sá, J. H. M. Extending the Applicability of the Generalized Likelihood Function for Zero-Inflated Data Series. *Water Resources Research* 54, 2494–2506. doi:10.1002/2017WR021560 (2018).
- 9. Sá, J. H. M., Chaffe, P. L. B. & **de Oliveira**, D. Y. A comparative analysis of the Gash and the Rutter models for the estimation of rainfall interception by Mixed Ombrophilous Forest. *Brazilian Journal of Water Resources* **20**, 1008–1018. ISSN: 2318-0331. doi:10.21168/rbrh.v20n4.p1008-1018 (2015).

### PROFESSIONAL SERVICE

Selection committee 2021

Young Researcher Award, XXIV Brazilian Symposium on Water Resources, Brazil

Co-convener 2019

XXIII Brazilian Symposium on Water Resources, Brazil

· Special session on "Hydrological models as hypothesis of catchment functioning"

## Journal reviewer

- · Water Resources Research
- · Brazilian Journal of Water Resources
- · Revista de Gestão de Água da América Latina (in Portuguese)

### TEACHING EXPERIENCE

#### Teaching assistant

Fall 2022

University of California, Irvine (UCI)

Irvine, United States

- · Course: CEE20 "Introduction to Computational Engineering Problem Solving", undergraduate level
- · Led multiple weekly lab sessions, helped prepare quizzes, developed rubrics for the exams, and graded exams

Teaching assistant
University of California, Irvine (UCI)

Fall 2020 Irvine, United States

- · Course: CEE20 "Introduction to Computational Engineering Problem Solving", undergraduate level
- · Led weekly lab sessions remotely over Zoom, helped prepare quizzes, developed rubrics for the exams, and graded exams

Teaching assistant 2016 – 2017

Federal University of Santa Catarina (UFSC)

Florianópolis, Brazil

- · Course: ENS5105 "Hydrology and Climatology", undergraduate level
- · Prepared and presented one to three lectures per semester on interception, runoff generation mechanisms, and/or introduction to hydrological modeling

Teaching assistant 2016-2017

Federal University of Santa Catarina (UFSC)

Florianópolis, Brazil

- · Course: ENS5165 "Water Resources Planning", undergraduate level
- · Prepared and led one lab session per semester on reservoir management

#### Instructor

- · Short course on "Fundamentals of Hydrological Modeling" (12 hours), Federal University of Paraná (UFPR), Brazil. Participants: 20. November 19-20, 2019. Curitiba, Brazil.
- · Short course on "Fundamentals of Hydrological Modeling" (8 hours), XXIII Brazilian Symposium on Water Resources, Brazil. Participants: 30. November 24, 2019. Foz do Iguaçu, Brazil.
- · Short course on "Bayesian Analysis applied to Hydrology" (6 hours), XXII Brazilian Symposium on Water Resources, Brazil. Participants: 15. November 28-30, 2017. Florianópolis, Brazil.
- · Short course on "Introduction to MATLAB" (8 hours) for undergraduates in Environmental and Sanitary Engineering, Federal University of Santa Catarina (UFSC), Brazil. Participants: 15. March 29-April 01, 2016. Florianópolis, Brazil.

## MENTORSHIP EXPERIENCE

#### Co-advisor

- · Gabriel Anzolin, "Estimation of rainfall intensity-duration-frequency curves in Southern Brazil using stationary and nonstationary models", Bachelor thesis, Federal University of Santa Catarina, Brazil. 2019.
- · Paula Cunha David, "Influence of conceptual model structure on the rainfall-runoff simulation in two forested catchments", Bachelor thesis, Federal University of Santa Catarina, Brazil. 2017.

## CONFERENCES

## Conference abstracts

- 1. Anzolin, G., de Oliveira, D. Y. & Chaffe, P. L. B. Uncertainty and nonstationarity in precipitation frequency analysis in Southern Brazil in II Brazilian Symposium on Natural Disasters, 2020, virtual (2021).
- 2. de Oliveira, D. Y. & Vrugt, J. A. Estimating the uncertainty of hydrologic signatures through model-free discharge resampling and its use for model diagnostics in AGU Fall Meeting, 2021, New Orleans & virtual (2021).
- 3. Chaffe, P. L. B., de Oliveira, D. Y., Bartiko, D. & Chagas, V. B. P. Prediction of extreme flood events in Brazil: Accounting for uncertainty and (non)stationarity in 27th IUGG General Assembly, 2019, Montréal, Canada (2019).

- 4. **de Oliveira**, D. Y. & Chaffe, P. L. B. Embracing parameter correlation in hydrological models: Explicitly accounting for it improves identifiability in EGU General Assembly, 2019, Vienna, Austria (2019).
- 5. de Oliveira, D. Y. & Vrugt, J. A. The use of hydrological signatures for model calibration in 27th IUGG General Assembly, 2019, Montréal, Canada (2019).
- 6. David, P. C., de Oliveira, D. Y. & Chaffe, P. L. B. Increasing complexity in model structure and likelihood function helps to identify dominant streamflow mechanisms: A case study of two small forest basins in Brazil in EGU General Assembly, 2018, Vienna, Austria (2018).
- 7. Innocente, C., Sá, J. H. M., Perez, A. B. A., Arienti, P. F., de Oliveira, D. Y., David, P. C. & Chaffe, P. L. B. Preliminary investigation of topography and baseflow chemical characteristics in subtropical watersheds in EGU General Assembly, 2018, Vienna, Austria (2018).
- 8. Sá, J. H. M., de Oliveira, D. Y., Perez, A. B. A., Innocente, C., David, P. C., Brighenti, T. M. & Chaffe, P. L. B. Rainfall interception by Dense Ombrophilous Forest–A study in Subtropical Brazil in EGU General Assembly, 2018, Vienna, Austria (2018).
- 9. Sá, J. H. M., Chaffe, P. L. B., **de Oliveira**, D. Y. & Giglio, J. N. Throughfall patterns of a Subtropical Atlantic Forest in Brazil in EGU General Assembly, 2017, Vienna, Austria (2017).
- 10. de Oliveira, D. Y., Chaffe, P. L. B. & Sá, J. H. M. Why size doesn't matter: The importance of stemflow measurements in the evaluation of interception models in AGU Fall Meeting, 2016, San Francisco (2016).

## Conference papers

- 1. Anzolin, G., **de Oliveira**, D. Y. & Chaffe, P. L. B. Uncertainty in rainfall intensity-duration-frequency curves in the Itajai River basin in XXIII Brazilian Symposium on Water Resources, Foz do Iguaçu, Brazil (2019).
- 2. Arienti, P. F., Sá, J. H. M., de Oliveira, D. Y. & Chaffe, P. L. B. Uncertainty analysis of two rainfall interception models applied to a Dense Ombrophilous Forest in XXIII Brazilian Symposium on Water Resources, Foz do Iguaçu, Brazil (2019).
- 3. Bartiko, D., de Oliveira, D. Y., Bonumá, N. B. & Chaffe, P. L. B. Uncertainty and nonstationarity in flood frequency analysis in Brazil in XXIII Brazilian Symposium on Water Resources, Foz do Iguaçu, Brazil (2019).
- 4. Bartiko, D., de Oliveira, D. Y., Bonumá, N. B. & Chaffe, P. L. B. Uncertainty in flood frequency analysis using stationary and nonstationary models in Southern Brazil in I Brazilian Symposium on Natural Disasters, 2018, Porto Alegre, Brazil (2019).
- 5. David, P. C., de Oliveira, D. Y., Chagas, V. B. P. & Chaffe, P. L. B. Investigation of the relationship between hydrological model structures and catchment characteristics in XXIII Brazilian Symposium on Water Resources, Foz do Iguaçu, Brazil (2019).
- 6. de Oliveira, D. Y. & Vrugt, J. A. Uncertainty in hydrological signatures in XXIII Brazilian Symposium on Water Resources, Foz do Iguaçu, Brazil (2019).
- 7. Sá, J. H. M., de Oliveira, D. Y., Arienti, P. F., Perez, A. B. A., Innocente, C. & Chaffe, P. L. B. Intra-event variability of the interception process in a Dense Ombrophilous Forest in XXIII Brazilian Symposium on Water Resources, Foz do Iquaçu, Brazil (2019).
- 8. Bartiko, D., **de Oliveira**, D. Y., Speckhann, G. A., Chagas, V. B. P., Bonumá, N. B. & Chaffe, P. L. B. Seasonality of annual maximum floods in Southern Brazil in XXII Brazilian Symposium on Water Resources, Florianópolis, Brazil (2017).

- 9. David, P. C., de Oliveira, D. Y. & Chaffe, P. L. B. Impact of temporal data resolution on parameter inference for a conceptual hydrological model in XXII Brazilian Symposium on Water Resources, Florianópolis, Brazil (2017).
- 10. de Oliveira, D. Y., Chaffe, P. L. B. & Sá, J. H. M. Impact of the likelihood function on the predictive uncertainty and parameter inference for a rainfall interception model in XXII Brazilian Symposium on Water Resources, Florianópolis, Brazil (2017).
- 11. Innocente, C., de Oliveira, D. Y., David, P. C., Perez, A. B. A., Chagas, V. B. P. & Chaffe, P. L. B. Investigating the representative elementary area concept in small coastal watersheds in XXII Brazilian Symposium on Water Resources, Florianópolis, Brazil (2017).
- 12. Sá, J. H. M., Chaffe, P. L. B., **de Oliveira**, D. Y. & Lisboa, H. M. Spatial and temporal patterns of throughfall in a coastal Atlantic Forest plot in Southern Brazil in XXII Brazilian Symposium on Water Resources, Florianópolis, Brazil (2017).
- 13. de Oliveira, D. Y., Chaffe, P. L. B. & Sá, J. H. M. Identification of rainfall interception model parameters using an automatic calibration algorithm in XXI Brazilian Symposium on Water Resources, Brasília, Brazil (2015).
- 14. Sá, J. H. M., Chaffe, P. L. B., **de Oliveira**, D. Y., Giglio, J. N., Kobiyama, M. & Lisboa, H. M. *Identification and characterization of rainfall interception events in a Mixed Ombrophilous Forest plot* in XXI Brazilian Symposium on Water Resources, Brasília, Brazil (2015).

## **TRAINING**

Machine Learning in Python for Environmental Science Problems

January 2022

American Meteorological Society (AMS), United States

Introduction to the WRF-Hydro Modeling System American Meteorological Society (AMS), United States February 2021

MGB-IPH Large-Scale Hydrological Model
Institute of Hydraulic Research (IPH/UFRGS), Brazil

August – September 2020

Model building, inference and hypothesis testing in hydrology Luxembourg Institute of Science and Technology (LIST), Luxembourg April 2016

Basic SWAT course: Sediment modeling Federal University of Santa Catarina (UFSC), Brazil

August 2015

Basic SWAT course: Hydrologic modeling Federal University of Santa Catarina (UFSC), Brazil December 2014