# DEBORA YUMI DE OLIVEIRA

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## EDUCATION

**Ph.D., Civil and Environmental Engineering** — March 2023 (expected)
*University of California, Irvine (UCI)* — *Irvine, United States*

- Focus area: Hydrology and Water Resources
- Dissertation: On model diagnostics: statistical underpinning and epistemic errors
- Advisor: Jasper Alexander Vrugt, Ph.D.
- 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: Pedro Luiz Borges Chaffe, Ph.D.
- 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: Pedro Luiz Borges Chaffe, Ph.D.
- 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
*University of California, Irvine (UCI)* — *Irvine, United States*

- Main research project: On model diagnostics: statistical underpinning and epistemic errors

**Graduate Student Researcher** — March 2016 – August 2018
*Federal University of Santa Catarina (UFSC)* — *Florianópolis, Brazil*

- Main research project: Bayesian inference applied to interception and rainfall-runoff modeling
- Involvement in a variety of research projects related to hydrologic modeling, flood analysis, and field-based studies on subtropical forested catchments

**Undergraduate Research Assistant** — September 2014 – March 2016
*Federal University of Santa Catarina (UFSC)* — *Florianópolis, Brazil*

- Research project: Identification of interception model parameters using an automatic calibration algorithm

**Undergraduate Research Assistant** July 2011 – December 2011
*Federal University of Santa Catarina (UFSC)* *Florianópolis, Brazil*

· Research project: Biostimulation of BTEX biodegradation in diesel/biodiesel blend-contaminated groundwater

**Undergraduate Research Assistant** April 2011 – June 2011
*Federal University of Santa Catarina (UFSC)* *Florianópolis, Brazil*

· Research project: Performance of a full-scale sequencing batch reactor (SBR) on aerobic granular sludge for urban wastewater treatment

**Undergraduate Research Assistant** December 2010 – March 2011
*Federal University of Santa Catarina (UFSC)* *Florianópolis, Brazil*

· Research project: Performance of a pilot anaerobic sludge digester under different operating strategies

## TEACHING EXPERIENCE

**Teaching Assistant** Fall 2022
*Dept. of Civil and Environmental Engineering, University of California, Irvine (UCI)*

· ENGRCEE 20 "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** Fall 2020
*Dept. of Civil and Environmental Engineering, University of California, Irvine (UCI)*

· ENGRCEE 20 "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
*Dept. of Sanitary and Environmental Engineering, Federal University of Santa Catarina (UFSC)*

· 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
*Dept. of Sanitary and Environmental Engineering, Federal University of Santa Catarina (UFSC)*

· 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 Sanitary and Environmental 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.

## HONORS AND AWARDS

**AGU 2021 Editors' Citation for Excellence in Refereeing** 2022

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

**Miguel Velez Scholarship** Spring 2022

· 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 (∼$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 (∼$20,000)

## PROFESSIONAL SERVICE

**Selection committee** 2021

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

**Board member** 2020 – 2021
*Early Career Technical Committee, Brazilian Water Resources Association (ABRHidro)*

· Co-organized events to bring together early career water resources scientists and professionals, such as "Os dois lados da revisão de artigos científicos: como revisar e como responder aos revisores" (in Portuguese) and "Your manuscript has been rejected! Principais erros em artigos submetidos" (in Portuguese)

**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)

## 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. On the Selection of Hydrologic Signatures: Sensitivity to Aleatory Errors and Temporal Stability. *In preparation.*
3. **de Oliveira**, D. Y. & Vrugt, J. A. The Treatment of Uncertainty in Diagnostic Model Evaluation: A Probabilistic Description of Hydrologic Signatures. *Submitted (in revision).*

### Published

1. **de Oliveira**, D. Y. & Vrugt, J. A. The Treatment of Uncertainty in Hydrometric Observations: A Probabilistic Description of Streamflow Records. *Water Resources Research,* e2022WR032263. doi:10.1029/2022WR032263.
2. 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).
3. 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).
4. Vrugt, J. A., **de Oliveira**, D. Y., Schoups, G. & Diks, C. G. On the use of distribution-adaptive likelihood functions: Generalized and universal likelihood functions, scoring rules and multi-criteria ranking. *Journal of Hydrology,* 128542. ISSN: 0022-1694. doi:10.1016/j.jhydrol.2022.128542 (2022).
5. 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).

6. 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).

7. 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).

8. 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).

9. **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).

10. 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).

## 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 Iguaçu, 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** February 2021
*American Meteorological Society (AMS), United States*

**MGB-IPH Large-Scale Hydrological Model** August – September 2020
*Institute of Hydraulic Research (IPH/UFRGS), Brazil*

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

**Basic SWAT course: Sediment modeling** August 2015
*Federal University of Santa Catarina (UFSC), Brazil*

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