Debora Yumi de Oliveira

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EDUCATION

2019-present **PhD in Civil and Environmental Engineering**, University of California, Irvine (UCI), United States
Department of Civil and Environmental Engineering
Focus area: Hydrology and Water Resources
Advisor: Dr. Jasper Alexander Vrugt
January 2019 – September 2022 (expected)
GPA: 4.00/4.00

2016-2018 **Master in Environmental Engineering**, Federal University of Santa Catarina (UFSC), Brazil
Department of Sanitary and Environmental Engineering
Focus area: Hydrology and Applied Hydraulics
Thesis title: *Bayesian inference applied to interception and rainfall-runoff modeling*
Advisor: Dr. Pedro Luiz Borges Chaffe
March 2016 – March 2018
GPA: 10.00/10.00

2010-2015 **Sanitary and Environmental Engineering**, Federal University of Santa Catarina (UFSC), Brazil
Thesis title: *Identification of interception model parameters using an automatic calibration algorithm*
Advisor: Dr. Pedro Luiz Borges Chaffe
March 2010 – September 2015
GPA: 9.03/10.00

2012-2013 **BRAFITEC Exchange Program**, École Nationale Supérieure de Géologie (ENSG), France
Focus area: Water Resources
January 2012 – February 2013
GPA: 15.35/20.00

GRANTS AND AWARDS

2022 AGU 2021 Editors' Citation for Excellence in Refereeing for *Water Resources Research*
2022 Miguel Velez Scholarship, University of California, Irvine, 1 quarter of tuition/stipends ($13,000)
2018 CAPES Fellowship, Ministry of Education of Brazil, 3.5 years of tuition/stipends (~$150,000)
2017 Young Researcher Award (awarded every two years by the Brazilian Water Resources Association)
2015 Medal for Academic Excellence (top graduating student in Sanitary and Environmental Engineering), Federal University of Santa Catarina
2011 BRAFITEC Scholarship (international exchange program between Brazil and France for engineering students), Ministry of Education of Brazil, 1 year of tuition/stipends (~$20,000)

PEER-REVIEWED PUBLICATIONS

In progress

Oliveira, D.Y.; Vrugt, J.A. Diagnostic Bayes: Merging the strengths of Bayesian inference and diagnostic model evaluation. *In preparation.*

Anzolin, G.; Chaffe, P.L.B.; **Oliveira, D.Y.**; Vrugt, J.A.; Rodrigues, R.R.; AghaKouchak, A. Considering uncertainty and nonstationarity in extreme rainfall frequency analysis. *In preparation.*

Vrugt, J.A.; **Oliveira, D.Y.**; Schoups, G.H.W.; Diks, C.G.H. On the use of distribution-free likelihood functions: Generalized and universal likelihood functions, score rules and multi-criteria ranking. *Submitted.*

Oliveira, D.Y.; Vrugt, J.A. The treatment of uncertainty in diagnostic model evaluation: 1. A probabilistic description of measured streamflow records. *Submitted* (in revision).

Oliveira, D.Y.; Vrugt, J.A. The treatment of uncertainty in diagnostic model evaluation: 2. A probabilistic description of hydrologic signatures. *Submitted* (in revision).

Vrugt, J.A.; **Oliveira, D.Y.** Probabilistic interpretation of the Kling-Gupta efficiency. *Submitted* (in revision).

Published

7. David, P.C.; Chaffe, P.L.B.; Chagas, V.B.P.; Dal Molin, M.; **Oliveira, D.Y.**; Klein, A.H.F.; Fenicia, F. (2022). Correspondence between model structures and hydrological signatures: a large-sample case study using 508 Brazilian catchments. *Water Resources Research*, 58, e2021WR030619. https://doi.org/10.1029/2021WR030619

6. Paiva, R.C.; et al. including **Oliveira, D.Y.** (2020). 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. https://doi.org/10.1590/2318-0331.252020200136

5. Franco, A.C.L.; **Oliveira, D.Y.**; Bonumá, N.B. (2020). Comparison of single-site, multi-site and multi-variable SWAT calibration strategies. *Hydrological Sciences Journal*, 65(14), 2376-2389. https://doi.org/10.1080/02626667.2020.1810252

4. Bartiko, D.; **Oliveira, D.Y.**; Bonumá, N.B.; Chaffe, P.L.B. (2019). Spatial and seasonal patterns of flood change across Brazil. *Hydrological Sciences Journal*, 64(9), 1071-1079. https://doi.org/10.1080/02626667.2019.1619081

3. David, P.C.; **Oliveira, D.Y.**; Grison, F.; Kobiyama, M.; Chaffe, P.L.B. (2019). Systematic increase in model complexity helps to identify dominant streamflow mechanisms in two small forested basins. *Hydrological Sciences Journal*, 64(4), 455-472. https://doi.org/10.1080/02626667.2019.1585858

2. **Oliveira, D.Y.**; Chaffe, P.L.B.; Sá, J.H.M. (2018). Extending the applicability of the generalized likelihood function for zero-inflated data series. *Water Resources Research*, 54, 2494-2506. https://doi.org/10.1002/2017WR021560

1. Sá, J.H.M; Chaffe, P.L.B.; **Oliveira, D.Y.** (2015). 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. https://doi.org/10.21168/rbrh.v20n4.p1008-1018 (in Portuguese)

TEACHING EXPERIENCE

2020 **Teaching Assistant**, CEE20 *Introduction to Computational Engineering Problem Solving*, Fall 2020, University of California Irvine, United States.

2019 **Instructor**, Short course on *Fundamentals of Hydrological Modeling* (12 hours), Federal University of Paraná (UFPR), Brazil. Participants: 20. November 19-20, 2019.

2019 **Instructor**, Short course on *Fundamentals of Hydrological Modeling* (8 hours), XXIII Brazilian Symposium on Water Resources, Brazil. Participants: 30. November 24, 2019.

2017 **Instructor**, Short course on *Bayesian Analysis applied to Hydrology* (6 hours), XXII Brazilian Symposium on Water Resources, Brazil. Participants: 15. November 28-30, 2017.

2016-2017 **Teaching Assistant**, Federal University of Santa Catarina (UFSC), Brazil. One to three lectures per semester on Hydrology and Climatology (interception, runoff generation mechanisms, introduction to hydrological modeling) and one lecture per semester on Water Resources Planning (reservoir management lab session) for undergraduates in Environmental and Sanitary Engineering.

2016 **Instructor**, 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.

MENTORSHIP EXPERIENCE

2019 **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.

2017 **Co-advisor**, 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.

PROFESSIONAL SERVICE

2021 **Selection committee**, Young Researcher Award, XXIV Brazilian Symposium on Water Resources, Brazil.

2019 **Co-convener**, Special session on *Hydrological models as hypothesis of catchment functioning*, XXIII Brazilian Symposium on Water Resources, Brazil.

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

SKILLS

Software: ArcGIS, MATLAB, familiar with R
Language: Portuguese (native), English, French

PRESENTATIONS

Oral presentations

Oliveira, D.Y.; Vrugt, J.A. (2021). Estimating the uncertainty of hydrologic signatures through model-free discharge resampling and its use for model diagnostics. *AGU Fall Meeting*, New Orleans & virtual.

Oliveira, D.Y.; Vrugt, J.A. (2019). Uncertainty in hydrological signatures. *XXIII Brazilian Symposium on Water Resources*, Florianópolis, Brazil. (in Portuguese)

Oliveira, D.Y.; Vrugt, J.A. (2019). The use of hydrological signatures for model calibration. *27th IUGG General Assembly*, Montréal, Canada.

Oliveira, D.Y.; Bartiko, D.; Chaffe, P.L.B. (2018). Uncertainty in flood frequency analysis using stationary and nonstationary models in Southern Brazil. *I Brazilian Symposium on Natural Disasters*, Porto Alegre, Brazil. (in Portuguese)

Oliveira, D.Y.; Chaffe, P.L.B.; Sá, J.H.M. (2017). Impact of the likelihood function on the predictive uncertainty and parameter inference for a rainfall interception model. *XXII Brazilian Symposium on Water Resources*, Florianópolis, Brazil. (in Portuguese)

Oliveira, D.Y.; Chaffe, P.L.B.; Sá, J.H.M. (2016). Why size doesn't matter: The importance of stemflow measurements in the evaluation of interception models. *AGU Fall Meeting*, San Francisco.

Poster presentation

Oliveira, D.Y.; Chaffe, P.L.B. (2019). Embracing parameter correlation in hydrological models: Explicitly accounting for it improves identifiability. *EGU General Assembly*, Vienna, Austria.

Oliveira, D.Y.; Chaffe, P.L.B.; Sá, J.H.M. (2015). Identification of rainfall interception model parameters using an automatic calibration algorithm. *XXI Brazilian Symposium on Water Resources*, Brasília, Brazil. (in Portuguese)

CONFERENCE PUBLICATIONS

Conference abstracts

10. **Oliveira, D.Y.**; Vrugt, J.A. (2021). 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. AGU Abstract Browser, Abstract H52C-04.

9. Anzolin, G.; **Oliveira, D.Y.**; Chaffe, P.L.B. (2020). Uncertainty and nonstationarity in precipitation frequency analysis in Southern Brazil. In: *II Brazilian Symposium on Natural Disasters*, 2020, virtual. (in Portuguese)

8. **Oliveira, D.Y.**; Vrugt, J.A. (2019). The use of hydrological signatures for model calibration. In: *27th IUGG General Assembly*, 2019, Montréal, Canada. IUGG 2019 Abstracts Book.

7. Chaffe, P.L.B.; **Oliveira, D.Y.**; Bartiko, D.; Chagas, V.B.P. (2019). Prediction of extreme flood events in Brazil: Accounting for uncertainty and (non)stationarity. In: *27th IUGG General Assembly*, 2019, Montréal, Canada. IUGG 2019 Abstracts Book.

6. **Oliveira, D.Y.**; Chaffe, P.L.B. (2019). Embracing parameter correlation in hydrological models: Explicitly accounting for it improves identifiability. In: *EGU General Assembly*, 2019, Vienna, Austria. Geophysical Research Abstracts, EGU2019-1456.

5. David, P.C.; **Oliveira, D.Y.**; Chaffe, P.L.B. (2018). 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. Geophysical Research Abstracts, EGU2018-3520.

4. Innocente, C.; Sá, J.H.M.; Perez, A.B.A.; Arienti, P.F.; **Oliveira, D.Y.**; David, P.C.; Chaffe, P.L.B. (2018). Preliminary investigation of topography and baseflow chemical characteristics in subtropical watersheds. In: *EGU General Assembly*, 2018, Vienna, Austria. Geophysical Research Abstracts, EGU2018-5601.

3. Sá, J.H.M.; **Oliveira, D.Y.**; Perez, A.B.A.; Innocente, C.; David, P.C.; Brighenti, T.M.; Chaffe, P.L.B. (2018). Rainfall interception by Dense Ombrophilous Forest – A study in Subtropical Brazil. In: *EGU General Assembly*, 2018, Vienna, Austria. Geophysical Research Abstracts, EGU2018-11244.

2. Sá, J.H.M.; Chaffe, P.L.B.; **Oliveira, D.Y.**; Giglio, J. N.; Kobiyama, M. (2017). Throughfall patterns of a Subtropical Atlantic Forest in Brazil. In: *EGU General Assembly*, 2017, Vienna, Austria. Geophysical Research Abstracts, EGU2017-2343.

1. **Oliveira, D.Y.**; Chaffe, P.L.B.; Sá, J.H.M. (2016). Why size doesn't matter: The importance of stemflow measurements in the evaluation of interception models. In: *AGU Fall Meeting*, 2016, San Francisco. AGU Abstract Browser, Abstract H52A-08.

Conference papers

14. **Oliveira, D.Y.**; Vrugt, J.A. (2019). Uncertainty in hydrological signatures. In: *XXIII Brazilian Symposium on Water Resources*, Foz do Iguaçu, Brazil. (in Portuguese)

13. Anzolin, G.; **Oliveira, D.Y.**; Chaffe, P.L.B. (2019). Uncertainty in rainfall intensity-duration-frequency curves in the Itajai River basin. In: *XXIII Brazilian Symposium on Water Resources*, Foz do Iguaçu, Brazil. (in Portuguese)

12. Arienti, P.F.; Sa, J.H.M.; **Oliveira, D.Y.**; Chaffe, P.L.B. (2019). Uncertainty analysis of two rainfall interception models applied to a Dense Ombrophilous Forest. In: *XXIII Brazilian Symposium on Water Resources*, Foz do Iguaçu, Brazil. (in Portuguese)

11. Bartiko, D.; **Oliveira, D.Y.**; Bonumá, N.B.; Chaffe, P.L.B. (2019). Uncertainty and nonstationarity in flood frequency analysis in Brazil. In: *XXIII Brazilian Symposium on Water Resources*, Foz do Iguaçu, Brazil. (in Portuguese)

10. David, P.C.; **Oliveira, D.Y.**; Chagas, V.B.P.; Chaffe, P.L.B. (2019). Investigation of the relationship between hydrological model structures and catchment characteristics. In: *XXIII Brazilian Symposium on Water Resources*, Foz do Iguaçu, Brazil. (in Portuguese)

9. Sá, J.H.M.; **Oliveira, D.Y.**; Arienti, P.F.; Perez, A.B.A.; Innocente, C.; Chaffe, P.L.B. (2019). Intra-event variability of the interception process in a Dense Ombrophilous Forest. In: *XXIII Brazilian Symposium on Water Resources*, Foz do Iguaçu, Brazil. (in Portuguese)

8. **Oliveira, D.Y.**; Bartiko, D.; Chaffe, P.L.B. (2018). Uncertainty in flood frequency analysis using stationary and nonstationary models in Southern Brazil. In: *I Brazilian Symposium on Natural Disasters*, 2018, Porto Alegre, Brazil. (in Portuguese)

7. **Oliveira, D.Y.**; Chaffe, P.L.B.; Sá, J.H.M. (2017). Impact of the likelihood function on the predictive uncertainty and parameter inference for a rainfall interception model. *XXII Brazilian Symposium on Water Resources*, Florianópolis, Brazil. (in Portuguese)

6. Bartiko, D.; **Oliveira, D.Y.**; Speckhann, G.A.; Chagas, V.B.P.; Bonumá, N.B.; Chaffe, P.L.B. (2017). Seasonality of annual maximum floods in Southern Brazil. *XXII Brazilian Symposium on Water Resources*, Florianópolis, Brazil. (in Portuguese)

5. David, P.C.; **Oliveira, D.Y.**; Chaffe, P.L.B. (2017). Impact of temporal data resolution on parameter inference for a conceptual hydrological model. *XXII Brazilian Symposium on Water Resources*, Florianópolis, Brazil. (in Portuguese)

4. Innocente, C.; **Oliveira, D.Y.**; David, P.C.; Perez, A.B.A.; Chagas, V.B.P.; Chaffe, P.L.B. (2017). Investigating the representative elementary area concept in small coastal watersheds. *XXII Brazilian Symposium on Water Resources*, Florianópolis, Brazil. (in Portuguese)

3. Sá, J.H.M.; Chaffe, P.L.B.; **Oliveira, D.Y.**; Lisboa, H.M. (2017). Spatial and temporal patterns of throughfall in a coastal Atlantic Forest plot in Southern Brazil. *XXII Brazilian Symposium on Water Resources*, Florianópolis, Brazil. (in Portuguese)

2. **Oliveira, D.Y.**; Chaffe, P.L.B.; Sá, J.H.M. (2015). Identification of rainfall interception model parameters using an automatic calibration algorithm. *XXI Brazilian Symposium on Water Resources*, Brasília, Brazil. (in Portuguese)

1. Sá, J.H.M.; Chaffe, P.L.B.; **Oliveira, D.Y.**; Giglio, J. N.; Kobiyama, M.; Lisboa, H.M. (2015). Identification and characterization of rainfall interception events in a Mixed Ombrophilous Forest plot. *XXI Brazilian Symposium on Water Resources*, Brasília, Brazil. (in Portuguese)

TRAINING

Jan 2022 **Machine Learning in Python for Environmental Science Problems** (15 hours)
American Meteorological Society (AMS), United States

Feb 2021 **Introduction to the WRF-Hydro Modeling System** (8 hours)
American Meteorological Society (AMS), United States

Aug-Sep 2020 **MGB-IPH Large-Scale Hydrological Model** (32 hours)
Institute of Hydraulic Research, Federal University of Rio Grande do Sul (IPH/UFRGS), Brazil

Apr 2016 **Model building, inference and hypothesis testing in hydrology** (36 hours)
Luxembourg Institute of Science and Technology (LIST), Luxembourg

Oct 2015 **TerraMA²: Computational platform for developing systems for monitoring, analysis and alert of environmental data** (32 hours)
Brazilian Institute of Space Research (INPE), Brazil

Aug 2015 **Basic SWAT course: Sediment modeling** (36 hours)
Federal University of Santa Catarina (UFSC), Brazil

Dec 2014 **Basic SWAT course: Hydrologic modeling** (24 hours)
Federal University of Santa Catarina (UFSC), Brazil

PROFESSIONAL ORGANIZATION MEMBER

American Geophysical Union (AGU)
American Meteorological Society (AMS)
Brazilian Water Resources Association (ABRHidro)
International Association of Hydrological Sciences (IAHS)