

# CAL DUNHAM BUELO

Aquatic ecosystems, algal blooms, data science



## EDUCATION

- 2021  
|  
2016  
● **University of Virginia, Dept. of Environmental Sciences**  
Ph.D., Advisor: Dr. Michael Pace Charlottesville, VA
- 2014  
|  
2010  
● **University of Wisconsin**  
B.S. in Biology, Mathematics Madison, WI



## EMPLOYMENT

- Present  
|  
2021  
● **Research Associate, Dugan and Hanson Labs**  
University of Wisconsin, Center for Limnology Madison, WI
- 2016  
|  
2014  
● **Research Technician, Pace Lab**  
University of Virginia, Dept. of Environmental Sciences Charlottesville, VA
- 2014  
|  
2011  
● **Undergraduate Researcher, Cascade Research Group**  
University of Wisconsin, Center for Limnology Land O' Lakes, WI and Madison, WI



## PUBLICATIONS

- In Prep  
● **Quantifying disturbance and recovery in estuaries: tropical cyclones and high frequency measures of oxygen and salinity**  
Target Journal: *TBD*
- In Prep  
● **Anticipating blooms: exploring the accuracy of algal bloom initiation forecasts**  
Target Journal: *Water Resources Research* (draft available on request)
- In Review  
● **Evaluating the performance of temporal and spatial early warning statistics of algal blooms**  
Target Journal: *Ecological Applications* (draft available on request)
- In Review  
● **An algorithm for detecting and quantifying disturbance and recovery in high-frequency time series**  
*Limnology and Oceanography: Methods*  
JA Walter, AF Besterman, **CD Buelo**, SJ Tassone, JW Atkins, ML Pace
- 2021  
● **No evidence of widespread algal bloom intensification in hundreds of lakes**  
*Frontiers in Ecology and the Environment*  
GM Wilkinson, JA Walter, **CD Buelo**, ML Pace

## CONTACT INFO

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☎ +1 608-576-8741  
🌐 [calbuelo.com](http://calbuelo.com)  
🐙 [github.com/cbuelo](https://github.com/cbuelo)

## TECHNICAL SKILLS

**R** (base, tidyverse, Shiny, package development)

**Python, SQL, Git, Linux, Bash**

Installation and maintenance of automated water quality sensor systems

*This resume was made with the R package **pagedown**.*

*Last updated on 2021-10-06.*

- **Co-occurrence of aquatic heatwaves with atmospheric heatwaves, low dissolved oxygen, and low pH events in estuarine ecosystems**  
[Estuaries and Coasts](#)  
SJ Tassone, AF Besterman, **CD Buelo**, JA Walter, ML Pace
- **Phytoplankton biomass, dissolved organic matter and temperature drive respiration in whole lake nutrient additions**  
[Limnology and Oceanography](#)  
ML Pace, **CD Buelo**, SR Carpenter
- 2020 ● **Air-water gas exchange in lakes and reservoirs measured from a moving platform by underwater eddy covariance**  
[Limnology and Oceanography: Methods](#)  
P Berg, ML Pace, **CD Buelo**
- 2018 ● **A synthesis of modern organic carbon accumulation rates in coastal and aquatic inland systems**  
[Scientific Reports](#)  
GM Wilkinson, A Besterman, **CD Buelo**, J Gephart, ML Pace
- **Filial cannibalism by largemouth bass (*Micropterus salmoides*): a three-decade natural history record from a small northern temperate lake**  
[Journal of Freshwater Ecology](#)  
CJ Dassow, A Collier, JYS Hodgson, **CD Buelo**, JR Hodgson
- **A modeling analysis of spatial statistical indicators of thresholds for algal blooms**  
[Limnology & Oceanography Letters](#)  
**CD Buelo**, SR Carpenter, ML Pace
- **Early warning signals precede cyanobacterial blooms in multiple whole-lake experiments**  
[Ecological Monographs](#)  
GM Wilkinson, SR Carpenter, JJ Cole, ML Pace, RD Batt, **CD Buelo**, JT Kurtzweil
- 2017 ● **Reversal of a cyanobacteria bloom in response to early warnings**  
[Proceedings of the National Academy of Sciences USA](#)  
ML Pace, RD Batt, **CD Buelo**, SR Carpenter, JJ Cole, JT Kurtzweil, GM Wilkinson
- 2016 ● **Exogenously produced CO<sub>2</sub> more than doubles the flux of greenhouse gases from three north temperate lakes**  
[Geophysical Research Letters](#)  
GM Wilkinson, **CD Buelo**, JJ Cole, ML Pace



## SELECTED PRESENTATIONS

- 2021
  - **Change in aquatic ecosystems: advancing resilience concepts towards practical applications**  
CD Buelo. *UVA Environmental Sciences Dissertation Defense*
  - **Evaluating temporal and spatial early warning statistics of algal blooms**  
CD Buelo, ML Pace, SR Carpenter, EH Stanley, DA Ortiz, DT Ha. *ASLO Aquatic Sciences Meeting*
  - **Predicting algal blooms in lakes using early warning statistics and near-term forecasting**  
CD Buelo. *UVA Environmental Sciences Department Seminar*
- 2020
  - **Forecasting Algal Blooms**  
CD Buelo, N Nazemi. *UVA School of Data Science Presidential Fellowship Presentation*
- 2019
  - **Algal blooms and ecosystem metabolism in a managed drinking water reservoir**  
CD Buelo, ML Pace. *UVA Global Water Initiative Graduate Water Symposium Presentation*
  - **Time vs. space: comparing statistical indicators of algal blooms**  
CD Buelo, ML Pace, SR Carpenter. *ASLO Aquatic Sciences Meeting*
- 2018
  - **Lake experiments to test early warnings of resilience loss**  
CD Buelo, ML Pace. *UW Trout Lake Station Weekly Seminar*
  - **Spatial indicators of algal blooms using remote sensing**  
CD Buelo. *Virginia Space Grant Consortium Research Conference*
  - **Algal blooms and ecosystem metabolism in a drinking water reservoir**  
CD Buelo, ML Pace. *EnviroDay: UVA Envi. Sci. Graduate Student Symposium*
- 2017
  - **Storms, algal blooms, and CuSO<sub>4</sub> treatment in a drinking water reservoir**  
CD Buelo, CS Hanley, GM Wilkinson, ML Pace. *Virginia Water Monitoring Council Conference (invited speaker & panelist)*
  - **Spatial resilience indicators of algal blooms**  
CD Buelo, ML Pace, SR Carpenter. *ASLO Aquatic Sciences Meeting*
- 2015
  - **Storms, algal blooms, and CuSO<sub>4</sub> treatment in a drinking water reservoir**  
CD Buelo, CS Hanley, ML Pace, GM Wilkinson. *Water Resources Conference of the Virginias*
  - **Data analysis and visualization with R**  
CD Buelo. *Environmental Electronics Undergrad Course (Guest Lecture)*
- 2014
  - **Trophic cascades, early warnings of regime shifts, and terrestrial subsidies in lakes**  
CD Buelo, JT Kurtzweil. *University of Notre Dame Environmental Research Center Summer Seminar Series*

- 2012 ● **Effects of a food web shift on largemouth bass diet and juvenile growth**  
CD Buelo. *UW-Madison Biology 152 Mentored Research Poster Session (poster presentation)*
- **Changes in fish growth during a trophic cascade**  
CD Buelo. *UW Trout Lake Station Undergraduate Research Seminar*



## HONORS, AWARDS, GRANTS

- 2019 ● **UVA Presidential Fellowship in Data Science**  
\$41,000
- **UVA Dept. of Environmental Sciences Moore Graduate Research Award**  
\$5,000
- 2018 ● **UVA Environmental Resilience Institute Rapid Response Grant**  
\$14,000. PI: Michael Pace, Co-PIs: Alice Besterman and **Cal Buelo**
- **NASA Virginia Space Grant Consortium Graduate Fellowship Renewal**  
\$6,000
- 2017 ● **UVA Dept. of Environmental Sciences Exploratory Research Award**  
\$1,250
- **NASA Virginia Space Grant Consortium Graduate Fellowship**  
\$6,000
- 2016 ● **National Science Foundation Graduate Research Fellowship**  
\$138,000
- 2013 ● **UW College of Agriculture and Life Sciences Irving W. Gerhardt Scholarship**
- 2012 ● **National Science Foundation Research Experience for Undergraduates Award**



## PROFESSIONAL ACTIVITIES

- **Mentoring**
  - Kayla Wernsing, Iowa State University, 2019
  - Sara McCormack, University of Denver, 2019
  - Carson Lambert, University of Virginia, 2019
  - Dat Ha, University of Virginia, 2018-2019
  - Anne Marie Saunders, University of Virginia, 2018
  - Jon Stetler, Paul Smith's College, 2016-2017
  - Meredith Kadjeski, Wells College, 2016
  - Daniel De Jesús, University of Puerto Rico at Cayey, 2016

## ● **Mentoring, cont.**

- Brandon Dobraska, University of Wisconsin, 2016
- Anders Uppgaard, University of Wisconsin, 2015
- Rachel Meulman, University of Virginia, 2015-2016
- Colin Dassow, St. Norbert College, 2014-2015
- Devon Brown, University of Virginia, 2014
- Charlie Hanley, University of Virginia, 2014

## ● **Volunteer**

- UW Trout Lake Open House (2013 - 2016, 2018)
- NSF GRFP Applicant Review Panel, UVA Office of Graduate & Postdoc. Affairs (2017)

## ● **Membership**

- Association for the Sciences of Limnology and Oceanography

## ● **Reviewer**

- Limnology and Oceanography
- Limnology and Oceanography: Methods
- Hydrobiologia