

# CHRISTOPHER JOHN CHURCHILL, Ph.D.

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## **PROFESSIONAL EXPERIENCE**

### **U.S. GEOLOGICAL SURVEY**

Texas Water Science Center  
North Texas Program Office  
501 West Felix Street, BLDG 24  
Fort Worth, Texas 76115

January 2009 to present  
40+ hours/week

#### ❖ HYDROLOGIST / PROJECT CHIEF (GS-1315-12-1); 2009 to present

- Project manager and team lead for high-profile multidisciplinary research projects including *Zebra Mussel Monitoring Program for Texas*, *Cyanotoxins Methods Assessment Project*, *Pharmaceuticals and Personal Care Products Study*, and *Nutrients Modeling Studies* with reimbursable/appropriated funding provided by seven cooperators. Total budget over \$6.6M
- Responsible for planning, designing, organizing, implementing, directing, and managing all aspects of multidisciplinary programs including managing budget/expenditures, contracting, solving technical issues, supervising staff, implementing guidance, managing databases, and presenting/publishing in-depth technical reports with results, interpretation, and conclusions
  - *Zebra Mussel Monitoring Program for Texas; 2010 to present*: Design and execute state-wide program for population/reproduction ecology and life-history study of invasive zebra and quagga mussels and associated water quality
  - Ensure compliance with state and national policies, laws, and regulations regarding research on invasive species including obtaining annual permit from state regulatory agency
    - Increased working budget by almost 420% (\$167K to \$698K) in five years
    - Study area has expanded from two reservoirs to 16 across the state
    - \$4.7M budget to date; Cooperatively funded by North Texas Municipal Water District, Dallas Water Utilities, Trinity River Authority, West Central Texas Municipal Water District, Canadian River Municipal Water Authority, Greenbelt Municipal & Industrial Water Authority, and the U.S. Geological Survey
  - *Cyanotoxins Methods Assessment Project; 2015 to present*: Design and implement state-wide field and laboratory methods assessment study for cyanobacteria, cyanotoxins, taste-and-odor compounds, and associated water quality with identification of land-use practices
    - Cooperator has funded this project an additional two years (FY 18 and 19) with potential for future funding extensions
    - \$600K budget to date; Funded by the Texas Commission on Environmental Quality
  - *Pharmaceuticals and Personal Care Products Study; 2009 to present*: Implement and report interpretive assessment of data set for five-year study on pharmaceuticals, personal care products, and compounds of emerging concern in the Trinity River Basin, Texas

- Promoted to Project Chief to manage and analyze data and publish report
- \$840K budget to date; Cooperatively funded by Dallas Water Utilities and the U.S. Geological Survey
- Nutrients Modeling Studies; 2015 to present: Design and execute holistic nutrients studies in north Texas reservoirs to assist funding cooperator in modeling point- and non-point nutrient loadings
  - Increased working budget by almost 250% (\$101K to \$251K) in three years
  - \$478K budget to date; Cooperatively funded by Dallas Water Utilities and the U.S. Geological Survey
- Collect, review, analyze, and interpret ecological, biological, chemical, and water-quality data for multiple data-collection programs
- Create, modify, and adapt standards, methods, and standard operating procedures (SOPs), as needed, to meet project goals and needs of funding cooperators and partners
- Supervise, train, and mentor interdisciplinary team of 10+ in field and laboratory environments to ensure successful execution and timely completion of ecological and water-quality programs
- Train staff in the application of modified methods including a novel artificial substrate for quantification of zebra mussel settlement and cohort dynamics
- Serve as technical advisor at local, state, and federal levels for ecological, environmental, and cultural resource issues including cyanobacteria, harmful algal blooms, nutrient loadings and eutrophication, dreissenid mussel ecology, and alterations to water quality
- Propose new ecological, biological, and water resource studies and projects including development of scopes of work and budgetary cost estimates ensuring compliance with established environmental protection standards
- Represent agency while conducting extensive interactions with government agencies, funding cooperators, stakeholders, private interests, professional organizations, and the general public
- Report project objectives, methods, results, and interpretation, both orally and in writing, to management, funding cooperators, stakeholders, partner agencies, consultants, media, academic institutions, including universities, and the general public in a timely manner
- Update and consult with higher-level management on planning, development, and execution of water resource studies and ecological investigations on a quarterly basis and as needed
- Coordinate with personnel within agency and at state and national levels to develop study plans, design methods, and recommend practical, cost-effective mitigation plans for ecological studies
- Work with minimal supervision and coordinate with multiple levels of management to ensure projects and deliverables are completed within proposed temporal and budgetary limits
- Communicate with peers and management to identify complex issues on multiple projects and develop natural resource management plans to implement corrective actions
- Work with employees, management, customers, and stakeholders to facilitate consensus and ensure successful completion of project goals within budgetary constraints
- Analyze univariate and multivariate water-quality and ecological datasets by using statistical software packages including R, SAS, SigmaPlot, MiniTab, Statistica, and SigmaStat
- Plan, coordinate, and conduct rapid-response work for the *Zebra Mussel Monitoring Program for Texas* and *Cyanotoxins Methods Assessment Project*

- Conduct site investigations and field surveys at study sites across the state including reservoirs, rivers and streams, water treatment plants, balancing reservoirs, and terrestrial systems
- Build support for USGS programs/studies in public and private sectors and other Science Centers

Total responsible budget by federal fiscal year

2009	\$105,000
2010	\$362,000
2011	\$432,000
2012	\$532,000
2013	\$620,300
2014	\$661,185
2015	\$728,850
2016	\$1,013,550
2017	\$945,150
<u>2018</u>	<u>\$1,215,750</u>
TOTAL	\$6,615,785

❖ BIOLOGY SPECIALIST; 2016 to present

- Serve as statewide discipline expert and senior-level technical advisor and reviewer for ecological, biological, and water-quality programs and studies, technical products, and reports
- Develop, improve, administer, and ensure compliance with goals and objectives of quality-assurance/quality-control plans, work plans, scopes of work, and agency programs and policies
- Co-Investigator on NASA-led multi-agency project *Integrating Satellite Observations into Decision Making for Water-Quality Management*, which develops algorithms for satellite imagery to detect/predict water-quality anomalies including harmful algal- and cyanobacterial blooms in inland waters
- Coordinate with Center offices including Austin, Houston, and San Antonio to ensure personnel are available and trained to assist with investigations
- Consult with funding cooperators and state and federal agencies regarding ecosystem and watershed restoration and control and mitigation of water-quality and ecosystem issues
- Collaborate with USGS, BOR, EPA, FWS, and other federal, state, academic, and local ecology, biology, and water-quality specialists to ensure field methods are consistent and contemporary
- Collaborate with personnel in the South Atlantic Water Science Center to develop SuperFly software for use in limnological studies including the *Zebra Mussel Monitoring Program* and *Nutrients Modeling Studies*
- Develop new procedures and methods for environmental and ecological studies
- Review and ensure timely compliance with policies, standard field methods, procedures, and techniques by implementing updated guidance available in the National Field Manual, Techniques and Methods publications, OWQ Technical Memoranda, and other agency documents
- Evaluate quality-control data from water-quality and biological studies to assess data quality and resolve potential data-quality problems

- Coordinate and facilitate meetings, webinars, and conference sessions and focus groups at local, state, federal, and international levels

**TARRANT COUNTY COLLEGE**

August 2014 to present

Trinity River Campus

8 hours/week

300 Trinity Campus Circle

Fort Worth, Texas 76102

❖ ADJUNCT PROFESSOR

- Courses taught: *Biology for Majors* (BIOL1406), *Biology for Majors Laboratory* (BIOL1406L)
- Prepare and deliver instruction to students in classroom and laboratory settings
- Evaluate student performance and learning
- Advise and mentor students on academic and vocational curricula
- Aid in the development of curricula

**WAL-MART**

April 2002 to July 2004

2700 Central Freeway

48+ hours/week

Wichita Falls, Texas 76306

❖ ASSISTANT MANAGER

- Managed “Top 10%” SuperCenter including supervising 75+ employees on overnight shift
- Responsible for operations, human resources, budget, and all departments during rotating assignments, which included daytime and overnight shifts
- Managed multiple projects in high-stress environment ensuring completion within specified time and budget parameters

**EDUCATION****2013 Ph.D.** Environmental Science; University of North Texas, Denton, TexasDissertation: “Population dynamics of zebra mussels (*Dreissena polymorpha*) in a north Texas reservoir: implications for invasions in the southern United States”

GPA: 4.0

**2007 M.S.** Molecular Biology; Midwestern State University, Wichita Falls, TexasThesis: “Generation of a venom gland cDNA bank and identification of a novel gene from the diamondback water snake *Nerodia rhombifera rhombifera*”

GPA: 4.0

**1998 B.S.** Biology; Midwestern State University, Wichita Falls, Texas

Chemistry minor

**RESEARCH INTERESTS**

Invasion ecology, aquatic ecology, limnology, water quality, hydrology, wildlife biology, population and community ecology, environmental chemistry, aquatic toxicology, and statistics

**PUBLICATIONS**

- Churchill CJ, Quigley DP (2018) Downstream dispersal of zebra mussels (*Dreissena polymorpha*) under different flow conditions in a coupled lake-stream ecosystem. *Biological Invasions*  
<https://doi.org/10.1007/s10530-017-1613-z>
- Churchill CJ (2018) Assessment of Field and Laboratory Methods for the Detection and Analyses of Cyanobacteria/Cyanotoxins in Selected Texas Reservoirs Quality Assurance Project Plan, Phase II, 123 pp
- Churchill CJ, Hoeinghaus DJ, La Point TL (2017) Environmental conditions increase growth rates and mortality of zebra mussels (*Dreissena polymorpha*) along the southern invasion front in North America. *Biological Invasions* 19: 2355-2373
- Churchill CJ, Quigley DP (2017) Biological and physical data for zebra mussel (*Dreissena polymorpha*) veligers collected from a coupled lake-stream ecosystem in North Texas, 2012-2014. U.S. Geological Survey Data Release. <https://doi.org/10.5066/F7CF9N9T>
- Kramer AR, Graham JL, and Churchill CJ (2017) Phytoplankton data for 18 Texas reservoirs, August through October, 2016. U.S. Geological Survey Data Release. <https://doi.org/10.5066/F7J965BH>
- Churchill CJ (2017) U.S. Geological Survey website for the Zebra Mussel Monitoring Program for Texas. <https://txpub.usgs.gov/ZMMP>
- Churchill CJ (2016) Assessment of Field and Laboratory Methods for the Detection and Analyses of Cyanobacteria/Cyanotoxins in Selected Texas Reservoirs Quality Assurance Project Plan, 101 pp
- Churchill CJ (2013) Spatio-temporal spawning and larval dynamics of a zebra mussel (*Dreissena polymorpha*) population in a north Texas reservoir: implications for invasions in the southern United States. *Aquatic Invasions* 8: 389-406
- Churchill CJ, Baldys S (2012) USGS Zebra mussel monitoring program for north Texas. U.S. Geological Survey Fact Sheet 2012-3077, 6pp
- Baldys S, Churchill CJ, Mobley CA, Coffman DK (2010) Bromide, chloride, and sulfate concentrations and loads at U.S. Geological Survey streamflow-gaging stations 07331600 Red River at Denison Dam, 0733550 Red River at Arthur City, and 07336820 Red River near DeKalb, Texas, 2007-09. U.S. Geological Survey Scientific Investigations Report 2010-5120, 30pp
- Churchill CJ, Baldys S, Mobley CA, Gunn de Rosas C, Quigley DP (in review) Compounds of emerging concern in potable and wastewater treatment plants in Dallas and downstream in the Trinity River, Texas, 2009-2013. U.S. Geological Survey Scientific Investigations Report
- Churchill CJ, Trevino JT (in draft) Compounds of emerging concern in Dallas source waters and downstream in the Trinity River, Texas, 2009-2013. U.S. Geological Survey Scientific data release
- Churchill CJ (in draft) Comparison of Field and Laboratory Methods for Cyanobacteria, Cyanotoxins, and Taste-and-Odor Compounds in Texas Reservoirs, 20 pp

**CONFERENCE PRESENTATIONS**

- Churchill CJ (2016) Zebra mussel population crashes observed during extreme climate events in Texas. International Symposium of the North American Lake Management Society
- Churchill CJ (2016) In one end, in the other: a case study of multiple zebra mussel introductions in a Texas reservoir exemplifies the importance of holistic, lake-wide monitoring. International Symposium of the North American Lake Management Society

Churchill CJ (2016) Occurrence and dispersal of invasive zebra mussels through municipal water transfer pipelines and lake/stream potable source waters under different reservoir levels and downstream flow conditions. National Monitoring Conference

Churchill CJ (2016) Occurrence and dispersal of invasive zebra mussels through municipal water transfer pipelines and lake/stream potable source waters under different reservoir levels and downstream flow conditions. Texas Water Conference

Churchill CJ (2013) Population dynamics of zebra mussels in a north Texas reservoir: implications for invasions in the southwest United States. International Symposium of the North American Lake Management Society

Churchill CJ (2013) Environmental conditions affect zebra mussel survivorship and growth in a warm-water reservoir in the south central United States. International Symposium of the North American Lake Management Society

### **INVITED ORAL PRESENTATIONS (\* served as technical advisor)**

- 2018 \* Canadian River Municipal Water Authority zebra mussel response planning committee meeting, Sanford, Texas
- 2018 \* Brazos River Basin Clean Rivers Program Steering Committee Annual Meeting, Waco, Texas
- 2018 \* Trinity River Authority Strategic Planning Focus Group, Arlington, Texas
- 2017 \* Texas Commission on Environmental Quality Surface Water Quality Monitoring Program Annual Meeting, Bandera, Texas
- 2017 \* Cypress River Basin Clean Rivers Program Stakeholders Meeting, Hughes Springs, Texas
- 2016 \* Texas Parks and Wildlife Department Zebra Mussel Prevention and Management Partner Meeting, Frisco, Texas
- 2015 Texas Academy of Biological Sciences Biotechnology Camp, Fort Worth, Texas
- 2015 \* National Park Service and Lake Amistad Zebra Mussel Advisory Committee, Del Rio, Texas
- 2014 \* Texas Parks and Wildlife Department Zebra Mussel Prevention and Management Stakeholder Meeting, Waco, Texas
- 2014 \* Red River Basin Advisory Committee, Wichita Falls, Texas
- 2014 \* Brazos River Authority Advisory Meeting, Waco, Texas
- 2014 El Centro College, Dallas, Texas
- 2013 USGS Zebra Mussel Monitoring Program webinar, Fort Worth, Texas
- 2013 Texas Master Naturalists Elm Fork Chapter, Denton, Texas
- 2012 \* Dreissena Mussel Early Detection Monitoring Methods and Quality Assurance Workshops, Fort Worth, Texas
- 2011 \* 100<sup>th</sup> Meridian Initiative Joint Missouri/South Central Basin Meeting, Kansas City, Missouri
- 2011 Trinity River Authority, Arlington, Texas
- 2011 Lower Colorado River Authority, Austin, Texas
- 2011 Trinity River Audubon Society, Dallas, Texas
- 2010 \* Lake Texoma Advisory Committee, Pottsboro, Texas

**PROFESSIONAL SERVICE****Course instructor (internal)**

QWDATA/NWIS Database Course  
November 2017, Austin, Texas  
December 2017, Fort Worth, Texas  
March 2018, Raleigh, North Carolina  
Motorboat Operator Certification Course Instructor

**Manuscript reviews (internal)**

Scientific Investigations Reports  
Fact Sheets  
Data Releases  
Proposals for water-quality and biological studies

**Manuscript reviews (external)**

*Aquatic Invasions*  
*Hydrobiologia*  
*Lake and Reservoir Management*

**Book reviews**

*Biology and Management of Invasive Quagga and Zebra Mussels in the Western United States*  
(2015) Wong WH, Gerstenberger SL (eds) 566pp

**Professional grant proposal reviews**

*Biomimetic coats inhibit zebra mussel wet surfaces attachment* (2017); Sam Houston State University Enhancement Research Grant  
*Dispersal of zebra mussels downstream of an invaded reservoir* (2016); Texas Parks and Wildlife Department Wildlife Research Grant  
*Impacts of zebra mussels on reservoir water quality: Spatio-temporal patterns* (2016); Texas Parks and Wildlife Department Wildlife Research Grant  
*Invasion potential of the zebra mussel (Dreissena polymorpha) in streams and rivers of Texas, USA* (2016); Texas Parks and Wildlife Department Wildlife Research Grant

**State and federal public document reviews**

*TPWD Announces New Zebra Mussel Findings in Central Texas Lakes* (2018); Texas Parks and Wildlife Department News Release  
*Zebra Mussels Spreading at Lakes Georgetown, Livingston* (2017); Texas Parks and Wildlife Department News Release  
*Three more Texas lakes affected by Zebra Mussels* (2016); Texas Parks and Wildlife Department News Release  
*TPWD to Standardize Zebra Mussel Classification System* (2016); Texas Parks and Wildlife Department News Release  
*Zebra Mussels Found in Sherman's Lake Dean Gilbert* (2015); Texas Parks and Wildlife Department News Release  
*Zebra Mussels Confirmed in Lake Lavon* (2014); Texas Parks and Wildlife Department News Release  
*Zebra Mussel Resource Document* (2013) 207pp; U.S. Army Corps of Engineers document

*Zebra Mussels Documented in Lewisville Lake* (2013); Texas Parks and Wildlife Department News Release

*Zebra Mussel Test Results on North Texas Lakes Reported* (2012); Texas Parks and Wildlife Department News Release

*Zebra Mussels Found in Lake Ray Roberts* (2012); Texas Parks and Wildlife Department News Release

### **Invited interviews**

City of Grapevine, Texas: *USGS Zebra Mussel Monitoring Program* – August 25, 2017

Fort Worth Star Telegram: *Zebra mussels have arrived in Tarrant County. Now what?* – July 15, 2016

Dallas Morning News: *Zebra mussel larva, DNA found in Lavon Lake* – January 21, 2014

Fort Worth Star Telegram: *Zebra mussels found in Lake Lavon* – January 21, 2014

Texas Tribune: *Zebra Mussels Threaten Central Texas Reservoirs* – October 3, 2013

Texas Tribune: *Boater Education Courses Target Invasive Species* – August 11, 2013

New York Times: *Using the Law to Battle Zebra Mussels and Other Unwanted Pests* – August 10, 2013

Dallas Morning News: *Zebra mussel discovered in Lewisville Lake* – June 20, 2013

### **Professional society (volunteer)**

North American Lake Management Society annual Student Resume Review Board

## **PROFESSIONAL MEMBERSHIPS**

Ecological Society of America

North American Lake Management Society

Freshwater Harmful Algal Bloom Committee

Conference Committee

Phi Kappa Phi Honor Society

## **CERTIFICATIONS**

Watercraft and Equipment Inspector (for dreissenid mussels); U.S. Fish and Wildlife Service, Pacific States Marine Fisheries Commission, and 100<sup>th</sup> Meridian Initiative

Scientific SCUBA diver; U.S. Geological Survey and Professional Association of Diving Instructors

Motorboat Operator; U.S. Department of the Interior

## **RELEVANT COURSEWORK**

General Zoology, Vertebrate Zoology, Comparative Anatomy of Vertebrates, Mammalogy, Araneology, General Botany, Ecological Risk Assessment, Community Ecology, Alpine Ecology, Water Resources, Stream Ecology, Desert Stream Ecology, Aquatic Stress Ecology, Molecular Biology, Advanced Topics in Molecular Biology, Cell Biology, Genetics, Environmental Chemistry, Biochemistry, Organic Chemistry, General Chemistry, Aquatic Toxicology, Sediment Toxicology, Biostatistics, GIS



**RELEVANT TRAINING (INTERNAL)**

Motorboat Operator Certification Course (MOCC) Refresher – February 2018  
Texas Leader Development – October 2017 through August 2018  
AQUARIUS for All Users (USGS-C-17-019) – May 2017  
Leadership Intensive (USGS-OED-L1329) – April 2017  
Guidelines for the Operation and Computation of Records of Continuous Water-Quality Monitors  
(QW2298) – November 2016  
QW Data Toolbox for NWIS Users (QW1297) – May 2016  
Quality Control Sample Design and Interpretation – Feb 2016  
Field Water-Quality Methods for Groundwater and Surface Water (QW1028) – July 2015  
Water-Quality Principles (QW1022) – March 2014  
Motorboat Operator Certification Course (MOCC) / Refresher – October 2012 / February 2018

**LANGUAGES**

Spanish – speak, read, and write with basic competence

**REFERENCES**

**David Hoeinghaus, Ph.D.**

Associate Professor  
Department of Biological Sciences  
Institute of Applied Science  
University of North Texas  
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**Tim Oden**

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Water Science Field Team – Central Region  
U.S. Geological Survey  
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**Jennifer Graham, Ph.D.**

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