I I LER MEADOWS	
Applied Mathematician	aria Canada
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RESEARCH INTERESTS	
Dynamical Systems Impulsive Differential Equations Microbiology Ju	ulia Computing Evolution
Epidemiology Mathematical Modeling Mathematical Immunology	
EDUCATION	
PhD: Applied Mathematics McMaster University	
苗 September 2015 – September 2019	🕈 Hamilton, Ontario, Canada
 Thesis Title: Applications of Dynamical Systems to Industrial Microbiology Supervisor: Gail S.K. Wolkowicz 	/
MSc: Applied Mathematics McMaster University	
苗 September 2013 – May 2015	🕈 Hamilton, Ontario, Canada
 Thesis Title: The Existence of Radially Symmetric Vortices in a Ferromagne Supervisor: Stanley Alama 	etic Model of Superconductivity
BSc: Physics Brock University	
i September 2009 – May 2013	🕈 St. Catharines, Ontario, Canada
Thesis Title: First Integrals and Symmetries for Central Force DynamicsSupervisor: Stephen C. Anco	
EXPERIENCE	
Coleman Postdoctoral Fellow Queen's University	
September 2021 - Present	🕈 Kingston, Ontario, Canada
Postdoctoral Researcher University of Idaho	
苗 September 2019 – August 2021	Moscow, Idaho, United States of America

PUBLICATIONS

Peer Reviewed Journal Articles

- 1. Stacey R. Smith?, **Tyler Meadows**, and Gail S.K. Wolkowicz (2024). "Competition in the nutrient-driven self-cycling fermentation process". In: *Nonlinear Analysis: Hybrid Systems* 54, p. 101519
- 2. Felicia-Maria G. Magpantay, Jingjing Mao, Siyuan Ren, Sicheng Zhao, and **Tyler Meadows** (2023). "Revisiting the reinfection threshold". In: *Mathematical Biosciences* 363, p. 109045
- 3. Dylan Hull-Nye, **Tyler Meadows**, Stacey R. Smith?, and Elissa J. Schwartz (2023). "Key factors and parameter ranges for immune control of equine infectious anemia virus infection". In: *Viruses* 15, 691 (3)
- 4. **Tyler Meadows** and Elissa J. Schwartz (2023). "A model of virus infection with immune responses supports boosting CTL response to balance antibody response". In: *Computational and Mathematical Populations Dynamics*, pp. 145–168
- 5. Tyler Meadows and Gail S.K. Wolkowicz (2020). "Growth on multiple interactive-essential resources in a self-cycling fermentor: An impulsive differential equations approach". In: *Nonlinear Analysis: Real World Applications* 56, p. 103157

- 6. Tyler Meadows, Marion Weedermann, and Gail S.K. Wolkowicz (2019). "Global analysis of a simplified model of anaerobic digestion and a new result for the chemostat". In: SIAM Journal of Applied Mathematics 79.2, pp. 668–689
- 7. Ting-Hao Hsu, Tyler Meadows, Lin Wang, and Gail S.K. Wolkowicz (2019). "Growth on two limiting essential resources in a self-cycling fermentor". In: Mathematical Biosciences and Engineering 16.1, pp. 78–100
- 8. Stephen C. Anco, Tyler Meadows, and Vincent Pascuzzi (2016). "Some new aspects of first integrals and symmetries for central force dynamics". In: Journal of Mathematical Physics 57.6, 062901

Submitted Journal Articles

1. Tyler Meadows, Erik R. Coats, Solana Narum, Eva Top, Benjamin J. Ridenhour, and Thibault Stalder (2024). "An Epidemiological model can forecast COVID-19 outbreaks from wastewater-based surveillance in rural communities"

GRANT FUNDED PROJECTS

Using wastewater to predict COVID-19 outbreaks in rural communities | \$118,000 **a** April 1, 2021 – March 31, 2022 University of Idaho Funding Organization: Institute for Modeling, Collaboration, and Innovation (IMCI) Pilot Grant Principal Investigator: Erik R. Coats Role: Postdoctoral Researcher - model development and implementation AWARDS AND HONOURS Scholarships | McMaster University Ontario Graduate Scholarship \$ 10.000 2017 2017 \$ 5,000 Pastor Adeboye Ontario Graduate Scholarship \$ 2.500 Milos Lovotnoy Fellowship 2017 **COURSES TAUGHT** Instructor | Queen's University 2021 - Present Kingston, Ontario, Canada Winter 2023 Introduction to Real Analysis ➢ Applied Mathematics for Civil Engineers 🚞 Fall 2021, Fall 2022, Fall 2023 Modeling Techniques in Biology Winter 2022 ➢ Introduction to Linear Algebra Winter 2021 Instructor | McMaster University 2018 Hamilton, Ontario, Canada Introduction to Differential Equations **iii** Summer 2018 Teaching Assistant | McMaster University 2013 - 2019 Hamilton, Ontario, Canada Introduction to Differential Equations Winter 2019 Crdinary Differential Equations 苗 Fall 2017. Fall 2018 Calculus I 苗 Fall 2015, Fall 2016, Winter 2018 Calculus IV Winter 2017 Calculus II Winter 2016 Mathematical Physics I Winter 2015 **CONFERENCES PRESENTATIONS AND POSTERS**

- Competition in the nutrient-driven self-cycling fermentation process
- Evolution of persister cells

SMB Annual Meeting

🚞 Jun. 2024

2024 CAIMS Annual Meeting

🚞 Jul. 2023

- Microbial competition in a serial transfer culture
- Self-cycling fermentation with multiple nutrients
- Assimilating wastewater-surveillance data into epidemiological models
- Self-cycling fermentation with many possibly inhibitory resources
- Incorporating wastewater surveillance data into epidemiological models
- Using wastewater to predict COVID-19 outbreaks in rural communities
- Analyzing rural community structure using agent-based modeling and topological data analysis
- Self-cycling fermentation with a produced compound
- Growth on multiple essential nutrients in a self-cycling fermentor
- Global analysis of a model of anaerobic digestion and a new result for the chemostat
- Clobal analysis of a model of anaerobic digestion
- Bifurcation analysis of a model of anaerobic digestion

SERVICE

Minisymposium Organizer | 2024 Caims Annual Meeting Minisymposium Organizer | SMB Annual Meeting Chair | Queen's Biomath Seminar Major Admission Awards Reader | Queen's Admissions Student Poster Session Judge | University of Idaho Faculty of Science President | McMaster Science Graduate Student Association Co-President | McMaster Math and Stats Grad Society Vice-President | McMaster Science Graduate Student Association Chair | McMaster AIMS Lab Seminar Chair Selection Committee | McMaster Department of Math and Stats GSA travel grant evaluation committee | McMaster



