

Joel Ducoste
Curriculum Vita
11/26/19

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BRIEF RESUME

1. Include Education:

Ph.D., Environmental Engineering, 1996, University of Illinois, Urbana-Champaign, IL
M.Eng., Mechanical Engineering, 1989, Rensselaer Polytechnic Institute, Troy, NY
B.S., Mechanical Engineering, 1988, Rensselaer Polytechnic Institute, Troy, NY

2. Professional Experience:

Assistant Dean of Graduate Student Advancement, COE, 1/19-Present
Director of College Graduate Student Recruitment and Advancement, NCSU, 1/18-1/19
Professor of Civil Engineering, North Carolina State University, 8/10 – Present
Associate Professor of Civil Engineering, North Carolina State University, 8/04 – 8/10
Assistant Professor of Civil Engineering, North Carolina State University, 8/98 – 8/04
Water Treatment Process Engineer, CH2M HILL, 1996-1998
Graduate Research Assistant, University of Illinois, 1991-1996
Manufacturing Engineer, GE Aircraft Engines, 1989-1991

Visiting Professor Positions

Visiting professor, YangZhou University, YangZhou, China (Summer, 2019)
Visiting professor, Southeast University, Nanjing, China (Summer, 2017)
Visiting professor, Southeast University, Nanjing, China (Summer, 2015)
Visiting professor, Southeast University, Nanjing, China (Summer, 2014)
Visiting professor, Southeast University, Nanjing, China (Summer, 2013)

3. Scholarly and creative activities:

<i>Type</i>	<i>Number</i>
Refereed Journal Article (Published)	78
Refereed Journal Editorial (Published)	1
Refereed Journal Article (Submitted or in revision)	4
Edited Special Issue Refereed Journal (Published)	1
Technical Report, Refereed	8
Conference Proceeding, Refereed	1
Conference Proceeding Edited Book, Refereed	1
Non-Refereed Journal Article (Published)	3
Conference Proceedings	88
Research Presentation, Invited (without paper)	64
Conference Presentations (without paper)	48

4. Professional Society Memberships:

- 1) Member, American Academy of Environmental Engineers and Scientists (2016-Present)
- 2) Member, Water Environment Federation (2011-Present)
- 3) Member, International Ultraviolet Association (2006-2018)
- 4) Member, American Water Works Association (1992-Present)
- 5) Member, Association of Environmental Engineering and Science Professor (1999-Present)
- 6) Member, National Society of Professional Engineers (1991-2002)
- 7) Member, American Society of Engineering Education (2003-2005)

5. Scholarly and Professional Honors:

NC State Academy of Excellence in Global Engagement	2019
Keynote Speaker 34 th Annual NC ONSITE Water Protection Conference	2018
NC State COE Blessis Undergraduate Advising Award	2018
American Academy of Environmental Engineering and Science Excellence in Environmental Engineering and Science University Research Honor Award	2017
Board certified environmental engineer through eminence	2016
Keynote Speaker British Water FOG Forum, Cranfield UK	2015
NSF Advance Scholar Leadership Program	2012
National Academy of Engineering KECKs Future Initiative Symposium Participant	2011
NSF Advance Scholar	2009
National Academy of Engineering Frontier of Engineering Japan Symposium Participant	2008
Fulbright Fellow	2006
FWO Visiting Faculty Scholar at Ghent University, Belgium	2006
NSF Career Award	2001
Marquette Ralph Metcalfe Chair for Minority Scholars Visiting lectureship	2000

Professional Licenses: Engineer-in-Training: Ohio, 1991

6. Professional service on campus:

North Carolina State University and College of Engineering Committees:

- 1) College of Engineering RPT Committee (Chair 2018-2020) (2017-2020)
- 2) University Reappointment, Promotion, and Tenure (RPT) Committee (2016-2018)
- 3) University Mentor Ring Program (2015-2017)
- 4) College of Engineering Leadership Review Committee (2015-2016)
- 5) University Lifelong Faculty Involvement Committee (2015-2018)
- 6) University Diversity Advisory Committee (UDAC) (2014-2016)
- 7) University Faculty Liaison (OIED) (2014-2016)
- 8) College of Engineering Faculty Development & Special Initiatives Faculty Development Committee (2008-2016)
- 9) NSF Advance Scholar (Part of Developing Diverse Departments (3-D) program at NC STATE <http://www.ncsu.edu/odi/advance/>) (2009-2012)

Civil, Construction, Environmental Department Committees:

- 1) EWC Graduate Applications distribution Masters Level (2017-2018)
- 2) CCEE Diversity and Recruiting Committee (Chair) (2016-2018)
- 3) CCEE Energy Cluster Search Committee member (2015-2017)
- 4) CCEE RPT committee (Chair, 2012-2016) (2010-2017)
- 5) ABET Design Committee Chair (2013-2016)
- 6) ABET ENE Coordinator (2006-2012)
- 7) ABET subcommittee member (2005-2010)
- 8) Seminar committee member (2005-2007)
- 9) Awards committee member (2005-2009)
- 10) Executive Committee Member (2005-2006)
- 11) Engineering Open House (1998-1999)
- 12) ABET Subcommittee: Senior Design and Lab (2001-2004)

- 13) Lab Equipment Committee (1999-2010)
- 14) Hydraulics Lab Director (2002-Present)
- 15) WREE group coordinator (2004-2006)

7. Professional service off campus:

- 1) EPA Board of Scientific Counselors Safe and Sustainable water Resources Sub-committee (2018-Present)
- 2) External Advisory board CAEE Dept. NC A&T University (2017-2020)
- 3) AEESP Board of Directors (Elected by Peers) (Vice President, President elect) (2017-Present)
- 4) Member, International Association of Plumbing and Mechanical Officials (IAPMO) standards committee (2016-Present)
- 5) AEESP Environmental Engineering Program representative for CCEE (2016-2018)
- 6) AEESP Membership and Demographics Committee, (chair in 2016) (2015-2017)
- 7) Member, Exploris Middle School Educational Excellence Committee (2014-2015)
- 8) Member, EPA SAB Hydraulic Fracturing Advisory Panel (2013-2016)
- 9) IWA CFD Working Group (2013-Present)
- 10) Board Member, Chartered EPA Science Advisory Board (2012-2018)
- 11) Board Member, International UV Association (2011-2018)
- 12) Adhoc Member, EPA SAB Environmental Economics Advisory Committee (2011-2012)
- 13) Member, WEF FOG Collection Systems Committee (2010-2012)
- 14) Board Member, EPA Science Advisory Board Drinking Water Com. (2009-2015)
- 15) Board Member, EPA SAB Science Technology Awards Committee (2009-2012)
- 16) North Carolina House of Representative Offshore Energy Exploration Study Committee (2009-2010)
- 17) Board Member, North Carolina Fulbright Association (Treasurer) (2008-Present)
- 18) Editorial Board Member, Journal of Environment Engineering ASCE (2007-2015)
- 19) International Population Balance Modeling Organizing Committee (2002-2009)
- 20) International Population Balance Modeling Scientific Committee (2002-2010)

MENTORING ACTIVITIES

Undergraduate Academic Advising:

Each academic year, I advise about 18 undergraduate students on course work and curriculum issues. In addition, each semester and during the summer, I advise 2-6 undergraduate students on research projects sponsored by my NSF grants.

I have been a Park Scholar Faculty Mentor to Matt Authement (ENE 2012) and Caiti Cremer (CHE 2015). I am currently a Park Scholar Faculty mentor to Nehemiah Macdonald (BME 2023) and Daniel Friday (CCEE, 2023)

http://www.ncsu.edu/park_scholarships/experience/mentors.php

I am also the undergraduate and graduate advisor for the following student group:

- 1) COE PENC
- 2) University Fulbright Student chapter
- 3) Minority Engineering Graduate Student Association (MEGSA)

Graduate Advising:

I am advising graduate students in multidisciplinary research activities that include wastewater: (formation of aerobic granulation in activated sludge systems, characterizing the fate of long chain fatty acids in sewer collection system, characterizing co-digestion of grease interceptor waste in anaerobic digestion), municipal solid waste: (characterizing and modeling elevated temperature formation in landfills), renewable fuels: (systems optimization of photo biorefineries for production of jet fuels using microalgae), and plant systems biology: (characterizing and modeling of Lignin biosynthesis metabolic and regulatory pathways, characterizing and modeling of iron homeostasis and regulation in root cells, Modeling the regulatory network of InsP6 signaling in plants).

Graduate Academic Advising:

Chair or co-chair of Committee

Doctorate with Thesis

Name of Student	Degree	Position in committee	Date of Completion
Diyuan Wang	Ph.D.	Chair	May 2021
Amanda Karam	Ph.D.	Co-Chair	May 2020
Samrin Kusum	Ph.D.	Chair	Dec 2020
Dieneye Tolofari	Ph.D. (withdrew)	Chair	Withdrew
Zsiu Hao	Ph.D.	Co-Chair	May 2019
Yi chun Lai	Ph.D.	Co-Chair	May 2019
Joe Weaver	Ph.D.	Co-Chair	May 2017
Punith Naik	Ph.D.	Chair	Aug 2016
Mahbuba Iasmin	Ph.D.	Chair	May 2014
Xia He	Ph.D.	Co-Chair	Dec 2011
David Olukanni	Ph.D. CE Covenant University, Nigeria	Co-Chair	May 2011

Tarek Aziz	Ph.D.	Chair	May 2010
Scott Alpert	Ph.D.	Chair	December 2008
Dong Liu	Ph.D.	Chair	December 2004
Yanjin Liu	Ph.D.	Chair	December 2004

Master of Science with Thesis

Name of Student	Degree	Position in committee	Date of Completion
Lochan Basnet	M.S. w/thesis	Chair	August 2017
Amanda Karam	M.S. w/thesis	Chair	May 2016
Richard Jenny	M.S. w/thesis	Chair	Dec. 2014
Roya Yousefelahiyeh	M.S. w/thesis	Chair	Dec. 2014
Mehrnoosh Esismiamirabadi	M.S. w/thesis	Chair	August 2012
Hunter Long	M.S. w/thesis	Chair	May 2012
Colleen Bowker	M.S. w/thesis	Chair	December 2010
Erin Gallimore	M.S. w/thesis	Chair	December 2010
Kiseok Jang	M.S. w/thesis	Chair	May 2008
Xi Zhao	M.S. w/thesis	Chair	May 2007
Brannon Richards	M.S. w/thesis	Chair	December 2004
Carolina Baeza	M.S. w/ thesis	Chair	July 2003
Cory Hopkins	M.S. w/ thesis	Chair	July 2002
Veronica A. Ortiz	M.S. w/ thesis	Chair	December 2001
Daniel K. Peplinski	M.S. w/ thesis	Chair	December 2000

Master of Civil or Environmental Engineering no Thesis

Name of Student	Degree	Position in committee	Date of Completion
Adam Smith	MCEZ	Chair	May 2018
Ryan Peterson	MCEZ	Chair	May 2018
Pooja Deshpande	M.ENE w/Proj.	Chair	May 2017
Catherine McMillan	M.ENE. w/proj.	Chair	May 2016
Krysta Cione	MCEZ	Chair	May 2017
Divya Malyala	MCE Project	Chair	May 2016
Jorge Pesantez Sarmiento	MCE	Chair	May 2016
Keller Schnier	MCEZ	Chair	May 2016
Daniel Paynter	MCEZ	Chair	May 2016
Andrew Schimenti	MCEZ	Chair	May 2016
Madhu Chakravarthula	MCE	Chair	Dec 2015
Andria Pena	MENE Project	Chair	May 2015
Michele Tudor	MENEZ	Chair	May 2015
Lily Kalantar	MENEZ	Chair	May 2014
Chris Nelson	MENE	Chair	May 2014
Qian Wang	MENE	Chair	May 2014
Alberto Muniz	MENEZ	Chair	May 2014

Kathleen Boone	MENEZ	Chair	May 2014
Leonor Sanchez	MENE	Chair	May 2014
Yi Wang	MENE Project	Chair	May 2013
Christopher Cyril Sandeep Dominic	MENE	Chair	May 2012
Mohammad Shamsul Arafin	MENE	Chair	August 2011
Sara Allen	MCEZ	Chair	May 2011
Siddharth K. Lokineni	MCE	Chair	May 2011
Nandita Akunuri	MCE Project	Chair	December 2010
Vidya Mohandas	MCE Project	Chair	May 2010
Hsien Wang	MCE	Chair	December 2006
Corey Cavalier	MCE Project	Chair	May 2001
Liz Feliberty-Ruperte	MCE Project	Chair	May 2001
Stephen D. Terry	MCE Project	Chair	Transferred to Mech. E.
John E. Schrum	MCE Project	Chair	May 2000

Member of Committee

Doctorate with Thesis

Name of Student	Degree	Date of Completion
Asmita Narode	Ph.D. CCEE	May 2021
Zachary Hopkins	Ph.D. CCEE	May 2018
Mayu Kagawa	Ph.D. CCEE	May 2018
Ling Wang	Ph.D. CCEE	May 2018
Provat Saha	Ph.D. CCEE	May 2017
Zhimin Liu	Ph.D. Bio Ag	May 2017
Johnsie Lang	Ph.D. CCEE	May 2016
Jina Song	Ph.D. Electrical Engineering	May 2014
Hsi-chuan Chen	Ph.D. Forestry	Dec 2012
Jack Wang	Ph.D. Forestry	Dec 2012
Bilgen Yuncu	Ph.D. CCEE	Dec 2010
Rahul Vallabh	Ph.D. Textiles	December 2009
Alfred Rossner	Ph.D. CCEE	Dec 2008
Carolina Baeza	Ph.D. CCEE	Dec 2008
Inchio Lou	Ph.D. CCEE	May 2005
Troy Doby	Ph.D. CCEE	May 2005
Lei Li	Ph.D. CCEE	May 2002
Steve Terry	Ph.D. MAE	May 2005
James Dixon	Ph.D. Chemistry	May 2004
Sumate Chaiprapat	Ph.D. BAE	December 2002
Yi Sun	Ph.D. BAE	December 2002

Masters of Science with Thesis

Name of Student	Degree	Date of Completion
Jasmine Phillips	M.S. Textiles Chemistry	May 2020

Sarang Bhagwat	M.S. CE	Dec 2019
Cody Elington	M.S. ECE	May 2018
Hounwanou Obatayo	M.S. ENE	Dec 2017
Clark Maness	M.S. ENE	May 2016
Jonathan Moreno Lopez	M.S. ENE	Dec 2016
Catalina Lopez Velandia	M.S. ENE	Dec 2016
Amber Gruene	M.S. ENE	Dec 2014
Viking Edeback	M.S. ENE	May 2014
Elisa Arevalo	M.S. ENE	May 2014
Elvin Hossen	M.S. ENE	August 2013
Ling Wang	M.S. ENE	May 2012
Zhao Jin	M.S. CCEE	May 2013
Meredith Fota	M.S. CCEE	August 2012
Leigh-Ann Dudley	M.S. CCEE	August 2012
Anjali Viswakumar	M.S. CCEE	May 2010
Lauren Wellborn	M.S. CCEE	August 2009
Lisa Mitchell	M.S. CCEE	May 2005
Gamze Gulez	M.S. CCEE	May 2005
Alfred Rossner	M.S. CCEE	May 2004
Nicholas Lindow	M.S. CCEE	May 2004
Cameron Long	M.S. CCEE	May 2004
Jon Williams	M.S. CCEE	May 2004
Patricia Quinlivan	M.S. CCEE	May 2001
Alix Rooker	M.S. CCEE	December 2000
Rinav Mehta	M.S. CCEE	December 2000
Thomas Murray	M.S. CCEE	December 2000
Caleb M. Taylor	M.S. CCEE	May 2000
C. Tyrus Clayton Jr.	M.S. CCEE	May 2000
Steven R. Gandy	M.S. CCEE	December 1999
Ryan Smith	M.S. BAE	May 2002
James Howard	M.S. BAE	December 2001
Bin Liu	M.S. BAE	December 1998

Master of Civil Engineering no Thesis

Hyunsuk Hong	MCE Project	May 2009
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Post-Doctoral Fellow Advising:

Name of Student	Date of Completion
Olivier Prat, Ph.D.	August 2005

International Students

Visiting students to NC State:

Adviser to Andres Rivera, University of Valle, Cali Valle Columbia, May-Aug 2016
Adviser to Jean Aoussou, Imperial college of London exchange student GTI program
2012-2013

External committee member:

MS degree: David Gibbons, Dublin University, Belfield Dublin Dec. 2019
MS degree: Ehsan Boute, University of Tehran, Tehran, Iran Dec. 2018
MS degree: Navid Ahmadi University of Tehran, Tehran, Iran Dec. 2018
PhD degree: Ricardo Aguilera, University of Cantabria, Spain May 2021
PhD degree: Andres Rivera, University of Valle, Cali Valle Columbia May 2017

Domestic Students

External committee member

PhD degree: Kiesha Pierre, University of South Florida, Tampa May 2020
PhD degree: Kari Sholtes, University of Colorado, Boulder Aug. 2019

Duke Preparing Future Faculty Program (Mentor)

Mentee: Imari Walker Karega (PhD candidate, CEE Dept)

Adviser for the following award-winning graduate students for research

Yi-Chun Lai, 2nd place 2019 NC AWWA/WEA student poster competition
Amanda Karam, 3rd place 2015 NC AWWA/WEA student poster competition
Ling Wang, 1st place 2014 NC AWWA/WEA student poster competition
Catherine McMillan, 3rd place 2014 NC AWWA/WEA student poster competition
Richard Jenny, 2nd place 2013 NC AWWA/WEA student poster competition
Mehrnoosh Eslamiamirabodi, 3rd place 2012 NC AWWA/WEA Student poster competition
Xia He, W. 2012 Wesley Eckenfelder graduate research award, AAEE
Xia He 1st place 2011 NC AWWA/WEA student poster competition
Ling Wang, 2nd place 2011 NC AWWA/WEA student poster competition
Mohammad Shamsul Arafin, 2nd place 2011 NC AWWA/WEA student poster competition
Erin Gallimore, 1st place 2010 NC AWWA/WEA student poster competition
Antonio Sobremisana, 3rd place 2008 NC AWWA/WEA Student poster competition

RESEARCH AND SCHOLARSHIP

Scholarly Accomplishments

Journal publications (Peer-reviewed)

Published

- 1) Wang, L., Hossen, E., Aziz, T.N., Ducoste, J., de los Reyes III, F.L., 2019, Increased loading stress leads to convergence of microbial communities and high methane yields in adapted anaerobic co-digesters, *Water Research*, 169 (1)
<https://doi.org/10.1016/j.watres.2019.115155>
- 2) Wang, D., Lai, Y., Karam, A.L., de los Reyes III, F.L., Ducoste, J., 2019, Dynamic Modeling of Microalgae Growth and Lipid Production under Transient Light and Nitrogen Conditions, *Environ. Sci. Technol.* 2019, 53, 19, 11560-11568
- 3) Lai, Y., Karam, A., Sederoff, H., Ducoste, J., de los Reyes III, 2018, Relating nitrogen concentrations and continuous light intensity data on the growth and lipid accumulation of *Dunaliella viridis* in a photobioreactor, *Journal of Applied Phycology*,
<https://doi.org/10.1007/s10811-019-01897-4>
- 4) Koryachko, A., Matthiadis, A., Hague, S., Muhammad, D., Ducoste, J., Tuck, J., Long, T., Williams, C., 2019, Dynamic modeling of the iron deficiency modulated transcriptome response in *Arabidopsis thaliana* roots, in silico *Plants*, Volume 1, Issue 1, diz005, <https://doi.org/10.1093/insilicoplants/diz005>
- 5) Weaver, J., J.C. Williams, J. Ducoste, and F. L. de los Reyes III, 2019, Measuring the shape and size of activated sludge particles immobilized in agar with an open source software pipeline. *Journal of Visualized Experiments*. e58963, doi:10.3791/58963)
- 6) Monroe, J., J. Ducoste, and E. Berglund, 2019, Genetic Algorithm–Genetic Programming Approach to Identify Hierarchical Models for Ultraviolet Disinfection Reactors, *Journal of Environmental Engineering*, 145(2), [https://doi.org/10.1061/\(ASCE\)EE.1943-7870.0001492](https://doi.org/10.1061/(ASCE)EE.1943-7870.0001492).
- 7) Wang, J., Matthews, M., Naik, P., Williams, C., Ducoste, J., Sederoff, R., Chiang, V., 2019, Flux modeling for Monolignol Biosynthesis, *Current Opinion in Biotechnology* 2019, 56:187–192
- 8) Weaver, JE, Hong, H., Ducoste, JJ, de los Reyes III, FL, 2018, Controlling aerobic biological floc size using Couette-Taylor Bioreactors, *Water research* 147, 177-183
- 9) Karam, AL, de los Reyes III, FL , Ducoste, JJ, 2018, Development of Photochemical Microsensors for Evaluating Photosynthetic Light Dose Distributions in Microalgal Photobioreactors, *Environmental science & technology* 52 (21), 12538-12545
- 10) Wang, J., Matthews, M., Williams, C, Shi, R, Yang, C, Tunlaya-Anukit, S, Chen, H, Li, Q, Liu, J, Lin, C, Naik, P, Sun, Y, Loziuk, P, Yeh, T, Kim, H, Gjersing, E, Shollenberger, T, Shuford, C, Song, J, Miller, Z, Huang, Y, Edmunds, C, Liu, B, Sun, Y, Lin, Y, Li, W, Chen, H, Peszlen, Y, Ducoste, J, Ralph, J, Chang, H, Muddiman, D, Davis, M, Smith, C, Isik, F, Sederoff, R, Chiang, V, 2018, Improving wood properties for wood utilization

through multi-omics integration in lignin biosynthesis Nature Communications, DOI: 10.1038/s41467-018-03863-z

- 11) Naik PP, Wang JP, Williams CM, Sederoff RR, Chiang VL, Ducoste JJ, 2018, Assessing The Impact of The 4CL Enzyme Complex on The Robustness of Monolignol Biosynthesis using Metabolic Pathway Analysis, PLOS ONE 13(3): e0193896. <https://doi.org/10.1371/journal.pone.0193896>
- 12) Blaney, L., Perlinger, J.A., Bartelt-Hunt, S.L., Kandiah, R., Ducoste J.J., 2017, Another Grand Challenge – Diversity in Environmental Engineering, Environmental Engineering Science, DOI: 10.1089/ees.2017.0337
- 13) Hao, Z., Sun, M., Ducoste, J., Benson, C.H., Luettich, S., Castaldi, M., Barlaz, M.A., 2017, Heat Generation and Accumulation in Municipal Solid Waste Landfills, Environmental Science and Technology, DOI: 10.1021/acs.est.7b01844
- 14) He, X., de los Reyes III, Ducoste, J.J., 2017, A Critical Review of Fat, Oil, and Grease (FOG) in Sewer Collection Systems: Challenges and Control, Critical Reviews in Environmental Science and Technology, <http://dx.doi.org/10.1080/10643389.2017.1382282>
- 15) Wang JP, Tunlaya-Anukit S, Shi R, Yeh TF, Chuang L, Isik F, Yang C, Liu J, Li Q, Loziuk PL, Naik PP, Muddiman DC, Ducoste JJ, Williams CM, Sederoff RR, Chiang VL, 2017, A proteomic based quantitative analysis of the relationship between monolignol biosynthetic protein abundance and lignin content using transgenic *Populus trichocarpa* In: Quideau S & Yoshida K (eds) *Recent Advances in Polyphenol Research, Volume 5*, <https://doi.org/10.1002/9781118883303.ch4>
- 16) Karam, A., McMillan, C., Lai, Y., de los Reyes, F., Sederoff, H., Grunden, A., Ranjithan, R., Levis, J., Ducoste, J., 2017, Construction and Setup of a Bench Scale Algal Photosynthetic Bioreactor with Temperature, Light, pH Monitoring for Kinetic Growth Tests, Journal of Visual Experimentation, 124, DOI: doi:10.3791/55545, URL: <https://www.jove.com/video/55545>
- 17) Yousefelahiyeh, R., Dominic, C.C.S., Ducoste, J., 2017, Modeling Fats, Oil, and Grease Deposit Formation and Accumulation in Sewer Collection Systems, Journal of Hydroinformatics 19.3: 443-455.
- 18) Hao , Z., Malyala, D, Dean, L, Ducoste, J, 2017, Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy for determination of Long Chain Free Fatty Acid concentration in oily wastewater using the double wavenumber extrapolation technique, Talanta, (165), pp 526-532
- 19) Samstag, R.W., Ducoste, J. J., Griborio, A., Nopens, I., Batstone, D.J., Wicks, J.D., Suanders, S., Wicklein, E.A., Kenny, G., Laurent, J., 2016, CFD for Wastewater Treatment: An Overview, Water Science and Technology, 74(3), pp 549-563
- 20) Blaney, L., Kandiah, R., Ducoste, J., Perlinger, J., Bartelt-Hunt, S., 2016, Assessing the Growth and Demographics of Environmental Engineering from 2005-2013, Environmental Engineering Science, 33(8), pp 578-590
- 21) Xiong, J., Fu, D., Singh, R.P., Ducoste, J.J., 2016, Structural Characteristics and Development of the Cake Layer in a Dynamic Membrane Bioreactor, Journal Separation and Purification Technology, 167, pp 88-96

- 22) Iasmin, M., Dean, L., Ducoste, J., 2016, Quantifying Fat, Oil, and Grease Deposit Formation Kinetics, Water Research, 88(1), pp 786-795
- 23) Wicklein, E., Batstone, D., Ducoste, J., Laurent, J., Griporio, A., Wicks, J., Samstag, R., Saunders S., Potier, O., Nopens, I., 2016, Good Modeling Practice in Applying Computational Fluid Dynamics for WWTP Modeling, Water Science & Technology, 73(5), pp 969-982
- 24) Jenny, R., Jasper, M., Simmons, O.D., Shatolov, M., Ducoste, J., 2015, Heuristic Optimization of a Continuous Flow Point of Use UV-LED Disinfection Reactor using Computational Fluid Dynamics, Water Research, 83: 310-318
- 25) Koryachko, A., Matthiadis, A., Muhammad, D., Foret, J., Brady, S.M., Ducoste, J., Tuck, J., Long, T., Williams, C., 2015, Clustering and Differential Alignment Algorithm: Identification of Early Stage Regulators in the Arabidopsis thaliana Iron Deficiency Response, Plos one, Vol 3-4, pp 20-29
- 26) Koryachko, A., Matthiadis, A., Ducoste, J., Tuck, J., Long, T., Williams, C., 2015, Computational approaches to identify regulators of plant stress response using high-throughput gene expression data, Current Plant Biology, Vol 3-4, pp 20-29
- 27) Ducoste, J., Alpert, S., 2015, Computational Fluid Dynamics Modeling Alternatives for UV-Initiated Advanced Oxidation Processes, Water Quality Research Journal of Canada, 50(1), pp 4-20
- 28) Nopens, I., Torfs, E., Ducoste, J., Vanrolleghem, P., Gernaey, K., 2015, Population balance models: a useful complementary modelling framework for future WWTP modelling, Water Science & Technology, Vol 71 No 2 pp 159–167
- 29) Laurent, J., Samstag, R., Ducoste, J., Griporio, A., Nopens, I., Batstone, D., Wicks, J., Saunders S., Potier, O., 2014, A protocol for the use of computational fluid dynamics as a supportive tool for wastewater treatment plant modelling, Water Science & Technology, Vol 70 No 10 pp 1575–1584
- 30) Jenny, R., Simmons, O.D., Shatolov, M., Ducoste, J., 2014, Modeling a Continuous Flow Ultraviolet Light Emitting Diode Reactor using Computational Fluid Dynamics, Chemical Engineering Science, 116: 524-535
- 31) Fu, D., Singh, R.P., Kai, H., Ducoste, J.J., 2014, Enhanced Nitrogen Removal by Rice Husk Amended Dynamic Membrane Bioreactor, Journal of Env Eng ASCE, 140(11), DOI: 10.1061/(ASCE)EE.1943-7870.0000840
- 32) Chen, H., Song, J., Wang, J.P., Lin, Y., Ducoste, J., Shuford, C.M., Liu, J., Li, Q., Shi, R., Nepomuceno, A., Isik, F., Muddiman, D.C., Williams, C., Sederoff, R.R., Chiang, V.L., 2014, Systems Biology of Lignin Biosynthesis in *Populus trichocarpa*: Heteromeric 4-Coumaric Acid:Coenzyme A Ligase Protein Complex Formation, Regulation, and Numerical Modeling, Plant Cell, doi: <http://dx.doi.org/10.1105/tpc.113.119685>
- 33) Wang, J.P., Naik, P.P., Chen, H., Shi, R., Lin, C., Liu, J., Shuford, C.M., Li, Q., Sun, Y.H., Tunlaya-Anukit, S., Williams, C.M., Muddiman, D.C., Ducoste, J.J., Sederoff, R.R., Chiang, V.L., 2014, Complete Proteomic-Based Enzyme Reaction and Inhibition Kinetics Reveal How Monolignol Biosynthetic Enzyme Families Affect Metabolic Flux and Lignin in *Populus trichocarpa*, Plant Cell, doi: <http://dx.doi.org/10.1105/tpc.113.120881>

- 34) Iasmin, M., Dean, L., Lappi, S., Ducoste, J., 2014, Factors that influence the Properties of FOG deposit formation in sewer collection systems, Water Research, 49(1), pp 92-102
- 35) Dominic, C., Szakasits, M., Dean, L., Ducoste, J., 2013, Understanding the Spatial Formation and Accumulation of Fats, Oils, and Grease Deposits in the Sewer Collection System, Water Science and Technology, 68(8) pp 1830–1836
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- 57) *Alpert, S., Knappe, D., Ducoste, J.J., 2007, Incorporation of Micromixing models within CFD Simulations of UV Advanced Oxidation Processes, American Water Works Association National Conference, Toronto, Canada, June 4-8, CD-ROM
- 58) *Bohrerova, Z., H, G.I., Bohrerova, Mohanraj, M., Ducoste, J.J and Linden, K.G, 2005, Experimental Measurements of Fluence distribution in a UV Reactor using Fluorescent Microspheres, Proceedings American Water Works Association Water Quality Technology Conference, Quebec City, Quebec. CD-ROM
- 59) *Mamane-Gravetz, H, Ducoste, J.J and Linden, K.G, 2005, Impact of Particles on UVC Light Penetration in Natural and Engineered Systems, Proceedings International Ultraviolet Association Conference, Whistler, British Columbia, May 24-27, 10 pgs
- 60) *Ducoste J.J., , D., Liu, K.G., Linden, Zuzana, H., Mamane-Gravetz, 2005, Impact of Influent Pipe Configuration on UV Reactor Performance: Is the Elbow Truly the Worst Case Hydraulic Condition, Proceedings WEF Disinfection Conference, Phoenix, AZ, February 6-9
- 61) *Ducoste, J.J., K.G., Linden, D., Rokjer, 2004, Numerical Prediction of the Reduction Equivalent Fluence Bias, Proceedings AWWA Water Quality Technology Conference, San Antonio, TX, November 14-18
- 62) *Ducoste, J.J. and Y., Liu, 2004, Numerical Prediction of Mixing Performance for Chloramines Formation , Proceedings AWWA Water Quality Technology Conference, San Antonio, TX, November 14-18
- 63) *Prat, O., Ducoste, J.J., 2004, Modeling Spatial Distribution of Floc size in Turbulent Processes Using Quadrature Method of Moment and Computational Fluid Dynamics. 2nd International Conference on Population Balance Modeling, Valencia, Spain, May 5-7
- 64) *Richards, B.H., C, Baeza, J. Ducoste, 2004, Assessing Sequential Disinfection Performance in a Flow Through System Using a Non-Biological Surrogate, Proceedings, AWWA Research Symposium in Baltimore, Maryland, April 18-20,
- 65) *Liu, Y., J. Ducoste, 2003, Using CFD Model to Analyze Mixing Performance for the Formation of Chloramines, Proceedings NC AWWA/WEF Annual Conference, Greensboro, NC, November 17-20, 12 pgs.
- 66) *Baeza, C., B.H. Richards, J. Ducoste, 2003, Evaluation Of Sequential Disinfection Strategy in Drinking Water Treatment using a Non-Biological Surrogate, NC AWWA/WEF Annual Conference, Greensboro, NC, November 17-20, 12 pgs.
- 67) *Rokjer, D., M. Valade, D. Keesler, M. Borsykowsky, J. Ducoste, 2003, Medium Pressure UV Reactor Models for Validation Purposes, Proceedings AWWA Water Quality and Technology Conference, Philadelphia, PA, 22 pgs.
- 68) *Hulsey, R., H. Mackey, J. Neemann, K. Linden, J. Ducoste, 2003, Implementing UV into Large Water Treatment Plants, Proceedings International Ultraviolet Association Conference, Vienna, Austria, July 9-11., 10 pgs
- 69) *Ducoste, J.J., D. Liu, J. Shanshan, K.G. Linden, 2003, Evaluation of UV Fluence Rate Distribution Models, Proceedings International Ultraviolet Association Conference, Vienna, Austria, July 9-11., 10 pgs

- 70) *Jin, S., J.J. Ducoste, K.G. Linden, 2002, Determination of fluence rate distribution in UV reactors using spherical actinometry and mathematical analysis approaches, Proceedings American Water Works Association WQTC Conference, Seattle, WA, November 10-14., 15 pgs
- 71) *Hopkins, C., J.J. Ducoste, 2002, Characterizing The Spatial Variation In Particle Aggregation Due To Heterogeneous Turbulence In A Flocculation Reactor, NC AWWA/WEF Annual Conference, Winston-Salem, NC, November 17-20, 12 pgs.
- 72) *Ducoste, J.J., D. Liu, K. Linden, 2002, Modeling Drinking Water UV Disinfection Reactors using PHOENICS: Comparison between Eulerian and Lagrangian Approach, Proceedings, Phoenix User Conference, Moscow, Russia, September 21-28, 15 pgs.
- 73) Ortiz, V. and J.J. *Ducoste, 2002, Characterization of Drinking Water Treatment Chemical Mixing Performance using CFD, Proceedings Joint CSCE/EWRI of ASCE International Conference, Niagara Falls , Ontario , Canada July 21 – 24, 15 pgs.
- 74) *Ducoste, J.J. and K. Linden, 2002, An Alternative Approach to Determining Dose Distribution and Microbial Inactivation in UV Reactors using Computational Fluid Dynamics (CFD), Proceedings American Water Works Association National Conference, New Orleans, LA, June 17-21, 20 pgs.
- 75) *Doby, T., D. Loughlin, F. de los Reyes, J. J. Ducoste, 2002, Use of Design Scenarios and Chance-Constrained Genetic Algorithm for Wastewater Treatment Plant Design, Environmental & Water Resources Systems, Analysis (EWRSA) Symposium, in conjunction with the Water EWRI Conference, Roanoke, Virginia, USA, on May 19-22, 20 pgs.
- 76) Doby, T., D. *Loughlin, J. Ducoste, and F. L. de los Reyes III 2001, System-Wide Optimization of Wastewater Treatment Unit Processes Using a Distributed Genetic Algorithm, Environmental and Water Resources Institute/ASCE World Water and Environmental Resources Congress, May 20-24, Orlando FL. 15 pgs.
- 77) *Peplinski, D. and Ducoste, J.J., 2001, Lessons for Applying Computational Fluid Dynamics Modeling to Disinfection Clearwells, Environmental and Water Resources Institute/ASCE World Water and Environmental Resources Congress, May 20-24, Orlando FL, 10 pgs.
- 78) *Terry, S.D. and Ducoste, J.J., 2000, Modeling density current events in drinking water sedimentation processes using CFD, Proceedings NCAWWA/WEA Conference, Charlotte, NC, 10 pgs.
- 79) *Ducoste, J.J. Carlson, K., Bellamy, W., Carlson, M., 1999, A Systematic Approach to Reactor Hydraulic Characterization: Part 1 of the Integrated Disinfection Design Framework Protocol, Proceedings AWWA Water Quality and Technology Conference, Tampa, FL., 10 pgs.
- 80) *Ducoste, J.J., Daigger, G.T., Smith, R., 1999, Evaluation of Stacked Secondary Clarifier Design using Computational Fluid Dynamics, Proceedings Water Environment Federation Technology Conference, New Orleans, LA., 10 pgs.
- 81) *Peplinski, D. and Ducoste, J.J., 1999, Enhancement of Computational Fluid dynamics (CFD) Modeling of Clearwell Performance, Proceedings NCAWWA/WEA Conference, Asheville, NC., 10 pgs.

- 82) *Ducoste, J.J. and Brauer, R., 1999, Computational Fluid Dynamics Model of WTP Clearwell: Evaluation of Critical Parameters Influencing Model Performance, Proceedings, ASCE-CSCE Environmental Engineering Conference, Norfolk, VA., 10 pgs.
- 83) *Carlson, K.H., Bellamy, W., Pier, D., Ducoste, J., Carlson, M., 1999, Implementation of the Integrated Disinfection Design Framework, Proceedings American Water Works Association National Conference, Chicago, IL., 10 pgs.
- 84) *Ducoste, J.J. and Clark, M.M. 1997, The Influence of Tank Size and Impeller Type on Flocculation, Proceedings of the American Water Works Association National Conference, Atlanta, Georgia., 10 pgs.
- 85) *Hagstrom, J.P., Crozes, G., Reddy, S., Verghes, V., Clark, M.M., Ducoste, J.J., Burns, C. 1997, The Use of Computational Fluid Dynamics for Improving Clearwell Design for CT Compliance, Proceedings of the American Water Works Association Computer Conference, Austin, Texas., 10 pgs.
- 86) *Crozes, G., Hagstrom, J.P., Clark, M.M., Ducoste, J.J., Hermanowicz, S.W., Huntamer, J., 1996, Hydraulic Modeling for Improved CT Contactor Design, Proceedings of the American Water Works Association Annual Conference, Toronto, Ontario, 10 pgs.
- 87) *Clark, M.M. and Ducoste, J.J. 1996, A Journey in Understanding Mixing and Flocculation, Proceedings of the American Water Works Association Virginia Section, Williamsburg, Virginia., 1 pg.
- 88) *Ducoste, J.J., Clark, M.M., Weetman, R.J., 1995, The Evaluation of the Fluid Mechanics Generated in the Flocculation Process: Effects of Tank Size and Impeller Type, Proceedings of the American Water Works Association National Conference, Anaheim, California, 10 pgs.

Invited Presentations (No Paper)

- 1) Ducoste, J.J., 2019, Designing Efficient Grease Abatement Systems, National Precast Concrete Association Annual Conference, Louisville, KY, March 2
- 2) Ducoste, J.J., 2018, A life's Journey in Being a Transformative Agent of Change, Florida State University, Tallahassee, FL, November 19
- 3) Ducoste, J.J., 2018, The Art of a graduate school Application: What's in the mind of Faculty, University of Alabama Huntsville, AL, November 13
- 4) Ducoste, J.J., 2018, Tips/information to successfully navigate graduate school Application/Decision and Fellowship Opportunities, University of North Carolina Charlotte, NC, October 30
- 5) Ducoste, J.J., 2018, Tips/information to successfully navigate graduate school Application/Decision and Fellowship Opportunities, St Augustine College, Raleigh, NC, October 25
- 6) Ducoste, J.J., 2018, Assessing Surface Characteristics to reduce the adhesion of Fats, Oils, and Grease Deposits, North Carolina ONSITE Water Protection Conference, October 16, (Keynote Speaker)

- 7) Ducoste, J.J., 2018, Slip Sliding away: Minimizing FOG Deposit Adhesion to Sewer Surfaces, North Carolina ONSITE Water Protection Conference, August 16, CMOM Conference, Austin, TX August 20
- 8) Ducoste, J.J., 2018, Development of Photochemical Microsensors for Evaluating Light Distributions within Algal Photosynthetic Bioreactors, Clemson University, Clemson, SC April 13
- 9) Ducoste, J.J., 2018, Building your Academic Brand, Academic and Research Leadership Network Symposium, Pittsburgh, PA, March 23-24
- 10) Ducoste, J.J., 2017, Raising the Value of Water: A strategy for Greater Public Health Protection, Seminar at Shaw University, Raleigh, NC
- 11) Ducoste, J.J., 2017, Drinking Water Treatment: What Happens from Source to Tap, Seminar at St Augustine University, Raleigh, NC
- 12) Ducoste, J.J., 2017, Holy Dish Pan Hands Batman, there are Soaps in the Sewers: Fats, Oil, and Grease Issues in Sewer Systems, Seminar at University of South Florida, Tampa, FL
- 13) Ducoste, J.J., 2016, Grease Removal Devices: Challenges in the Removal of FOG Emulsions and the Impact of Food Service Establishment Operations, 32 Annual Onsite Water Protection Conference, Raleigh, NC
- 14) Ducoste, J.J., 2016, Game Changer: A New Technique for Measuring the Performance of Grease Interceptors, CMOM Conference, Austin, TX
- 15) Ducoste, J.J., 2016, Drinking Water Treatment: What Happens from Source to Tap, Durham Technical Community College, Durham NC
- 16) Ducoste, J.J., 2015, Internal and External Grease Interceptors: Challenges in the Removal of FOG Emulsions and the Impact of Food Service Establishment Kitchen Operations, Keynote Speaker, FOG New Times New Solutions Conference Cranfield University UK
- 17) Ducoste, J.J., 2015, How Restaurant Kitchen Practices Influence FOG Deposit Formation in Sewer Collection Systems, Invited Presentation, CMOM Conference, Austin, TX
- 18) Ducoste, J.J., 2014, Evaluation of Alternative Herbicides for Root Control: Should we be worried about their impact on Wastewater Treatment Plants?, Invited Presentation, CMOM Conference, Austin, TX
- 19) Ducoste, J.J., 2014, Data and CFD to Compare Horizontal and Vertical/enclosed UV Reactors, IUVA Specialty Conference UV Disinfection for Wastewater and Reuse Program, Irvine, CA
- 20) Ducoste, J.J., 2013, New Tools to Assess the Potential Risk of FOG deposit Accumulation in a Wastewater Collection System, Invited Presentation, CMOM Conference, Austin, TX

- 21) Ducoste, J.J., 2012, Modeling the removal of EDC chemicals using Advance Oxidation, WEFTEC, New Orleans, LA
- 22) Ducoste, J.J., 2012, Fat, Oil, and Grease (FOG) in Sanitary Sewer Systems: Factors that influence Deposit formation, Invited Presentation at NC Annual Onsite Water Protection Conference, Raleigh NC
- 23) Ducoste, J.J., 2012, Chemical and Hydraulic Factors that influence the formation of FOG Deposits in Sewer Collection Systems, Invited Presentation, CMOM Conference, Austin, TX
- 24) Ducoste, J.J., 2012, Modeling Advance Oxidation Processes for Optimizing Reactor Performance, Invited Presentation, IUVA Conference, Washington, DC
- 25) Ducoste, J.J., 2012, Numerical Approach to Modeling UV Disinfection Processes: A State of the Art Review, Southeast University, Nanjing, PR China
- 26) Ducoste, J.J., 2012, Using Computational Fluid Dynamics Modeling to guide design decisions, AWWA UVCFD Presentation Sue Bach Email, Dallas, TX, June 10-14
- 27) Ducoste, J.J., 2011, Fat, Roots, Oil, and Grease (FROG) in Sanitary Sewer Systems: Is a Sustainable Sewer system in Jeopardy, Invited Presentation at NC Annual Onsite Water Protection Conference, Raleigh NC
- 28) Ducoste, J.J., 2011, Velocity Profiles and their Relevance in UV Reactor Validation, IUVA workshop, Tracy CA,
- 29) Ducoste, J.J., 2010, Fat, Roots, Oil, and Grease (FROG) in Sanitary Sewer Systems: Is a Sustainable Sewer system in Jeopardy, Invited Presentation at NC Annual Onsite Water Protection Conference, Raleigh NC
- 30) Ducoste, J.J., 2010, Can CFD Answer Hydraulic Questions and make Validation more broadly applicable?, Invited Presentation at AWWA Nation Conference Workshop: UV Today – Ten Years Post-*Cryptosporidium*– Myths and Reality
- 31) Ducoste, J.J., 2010, Fats Roots Oil and Grease in US Sewer Systems: An overview, Invited Presentation at FOGS Buildup and Removal: Problems and Solutions Workshop Cranfield University, UK
- 32) Ducoste, J.J., 2010, Simulating the UV/H₂O₂ Advanced Oxidation Process using Computational Fluid Dynamics, Invited Presentation, Rensselaer Polytechnic Institute, Troy, NY
- 33) Ducoste, J.J., 2010, Grease Interceptors vs Under the Sink Grease Traps: Who won the Taste Test of Removing influent Fats, Oils, and Grease, Invited Presentation, CMOM Conference, Austin, TX
- 34) Ducoste, J.J., 2009, Assessment of Root Control Methods and Root Regrowth in a Pilot Scale Sanitary Sewer, Invited Presentation, CMOM Conference, Austin, TX

- 35) Ducoste, J.J., 2009, Analysis of Field Grease Interceptors, Invited Presentation, CMOM Conference, Austin, TX
- 36) Ducoste, J.J., 2009, The Intricacies of Analyzing/Designing Ultraviolet UV Disinfection Reactors using CFD, Invited Presentation, Water Reuse Workshop, Polytechnic University at Bari, Taranto, Italy
- 37) Ducoste, J.J., 2009, Population Balance Modeling in CFD Simulations, Invited Presentation, Water Reuse Workshop, Polytechnic University at Bari, Taranto, Italy
- 38) Ducoste, J.J., 2009, Computational Fluid Dynamics Modeling for Unit Process simulations in Drinking Water Treatment, Invited Presentation, Water Reuse Workshop, Polytechnic University at Bari, Taranto, Italy
- 39) Ducoste, J.J., 2009, Analysis of Fat, Oil, and Grease (FOG) in Sanitary Sewer Systems: Challenges to a Sustainable system, Invited Presentation, Villanova University, Villanova, PA
- 40) Ducoste, J.J., 2009, CFD Modeling for UV Disinfection and UV-Initiated Advanced Oxidation Processes, Invited Presentation, Disinfection 2009, Atlanta, GA
- 41) Ducoste, J.J., 2009, Simulating Ultraviolet Advance Oxidation Processes in Continuous Flow UV Reactors, Invited Presentation, University of Michigan, Ann Arbor, MI
- 42) Ducoste, J.J., 2008, Analysis of FOG and Roots in Sewer Collection systems, Invited Presentation, Water Environment Research Foundation Forum, Clearwater Beach, FL
- 43) Ducoste, J.J., 2008, Analysis and Design of Grease Interceptors, Invited Presentation, Water Environment Technology Conference, Workshop 115, Chicago, IL
- 44) Ducoste, J.J., 2008, FAT, Roots, Oil, and Grease (FROG) in Sanitary Sewers: Results from a Recent WERF Sponsored Study, Invited Presentation, Water Environment Research Foundation Webinar
- 45) Ducoste, J.J., 2008, An Introduction to Population Balance Modeling, Invited Presentation, MBR Training Seminar, Ghent University, Belgium
- 46) Ducoste, J.J., 2008, An Overview of Computational Fluid Dynamics Modeling, Invited Presentation, MBR Training Seminar, Ghent University, Belgium
- 47) Ducoste, J.J., 2008, Some Thoughts on CFD Modeling for Membrane Bioreactor Processes, Invited Presentation, 2nd Workshop CFD Modeling for MBR Applications, Ghent University, Belgium
- 48) Ducoste, J.J., 2008, Analysis of FAT, Roots, Oil, and Grease (FROG) in Sanitary Sewers, Invited Presentation, CMOM Conference, Austin, TX
- 49) Ducoste, J.J., 2008, Modeling UV reactors in Drinking Water Systems, Invited Presentation, Chemical Engineering Department, Mississippi State University

- 50) Ducoste, J.J., 2008, Analysis of Grease Interceptors for the Removal of FAT, Oil, and Grease (FOG): Are they Sufficient to Stop FOG related Sanitary Sewer Overflows, Invited Presentation, Civil and Environmental Engineering Department, Arizona State University
- 51) Ducoste, J.J., 2008, Analysis of Fat, Oil, and Grease Deposits in Sanitary Sewer Systems, Invited Presentation at Borchardt Conference, University of Michigan, Ann Arbor, MI
- 52) Ducoste, J.J., 2006, Modeling the Regulatory Behavior of *E coli* in Heterogeneous Substrate Environment, University of Ghent, Belgium, Biomath Department
- 53) Ducoste, J.J., 2006, Modeling Flocculation in Secondary Clarifiers using Quadrature Method of Moments, Water Environment Federation Technology (Weftec) Workshop, Dallas, Texas.
- 54) Ducoste, J.J., 2006, The Impact of Upstream turbulence characteristics on Ultraviolet (UV) Disinfection Reactors Performance, Invited Presentation at Purdue University, Department of Chemical Engineering
- 55) Ducoste, J.J., 2005, The Intricacies of Designing Ultraviolet (UV) Disinfection Reactors using Numerical Models, Invited Presentation at ATLANTIUM LTD, Har Tuv, Israel
- 56) Ducoste, J.J., 2005, Simulation of Flocculation in Stirred Vessels using Quadrature Method of Moments: Evaluation of Lagrangian versus Eulerian Approaches, Invited Presentation at Department for Applied Mathematics, Biometrics and Process Control, Ghent University, Ghent, Belgium
- 57) Ducoste, J.J., 2005, Impact of Upstream Hydraulic Structures on UV Reactor Performance, Invited Presentation at Borchardt Conference, University of Michigan, Ann Arbor, MI
- 58) Ducoste, J.J., 2004, Numerical Prediction of the Reduction Equivalent Fluence Bias, Invited Presentation at Degremont North American Research & Development Center, Richmond, VA
- 59) Ducoste, J.J., 2004, Characterization of Dose Distribution in UV Reactors, Invited Presentation at Pennsylvania State University Department of Civil Engineering
- 60) Ducoste, J.J., 2003, The Intricacies of using Numerical Models for Analyzing/Designing Ultraviolet UV Disinfection Reactors, Invited Presentation at North Carolina Central University Environmental Engineering Science Program
- 61) Ducoste, J.J., 2001, An Overview of Computational Fluid Dynamics Modeling for Evaluation of Water and Wastewater Treatment Process Performance, Invited Presentation at Duke University Department of Civil and Environmental engineering
- 62) Ducoste, J.J., 2000, Modeling Flocculation in Water Treatment Processes: Impact of Tank Size and Impeller Configuration, Invited Presentation, Engineering Foundation on Population Balance Modeling of Particulate Systems, Kailua-Kona, Hawaii. (A portion of the invited speakers conference fees are waived by the conference organizers.)

- 63) Ducoste, J.J., 2000, IDDF Approach to Enhanced Reactor Hydraulic Characterization, Invited Presentation, Department of Civil and Environmental Engineering, Marquette University, (Seminar part of the Metcalf Chair)
- 64) Ducoste, J.J., 2000, Water Scarcity in the 21st Century: Has Time Come for Water Reuse, Invited Presentation, Public Forum at Marquette University, (Seminar part of the Metcalf Chair)

Presentations (No Paper)(* = Presenter)

- 1) *Hao, Z., Ducoste, J., Barlaz, M., 2018, A Spatial Variation Model Describing Generation, Accumulation, and Propagation of Heat in Municipal Solid, Global Waste Management Symposium, Indian Wells CA Feb 11-14
- 2) *Cranos Williams, Alexandr Koryachko, Anna Matthiadis, Durreshahwar Muhammad, Siobhan M. Brady, Joel Ducoste, James Tuck, Terri A. Long, 2017, Integrative Dynamic Modeling Using Diverse Biological Datasets, Crops In Silico Symposium and Workshop, University of Oxford, UK, June 12.
- 3) *Karam, A.L., Ducoste, J.J., de los Reyes III, F.L., 2017, Development of Photochemical Microsensors for Evaluating Light Distribution within Microalgal Photosynthetic Bioreactors, AEESP Conference, Ann Arbor Michigan, June 22-24
- 4) *de los Reyes, F. L. III, L. Wang, P. Shen, J. Yeh, T. Aziz, and J. Ducoste (2016). Directing microbial community assembly in anaerobic reactors: implications for increasing methane yields and improving start-up. WRRRI Conference, March 17-18, 2016, Raleigh, NC
- 5) *Hao, Z., Sun, M., Ducoste, J., Barlaz, M., Benson, C., Castaldi, M., Luettich, 2016, Understanding and Predicting Temperatures in Municipal Solid Waste Landfills, Global Waste Management Symposium, January 31-February 3, Indian Wells, CA
- 6) *Cranos Williams, Alexandr Koryachko, Anna Matthiadis, Durreshahwar Muhammad, Jessica Foret, Siobhan M. Brady, Joel Ducoste, James Tuck, Terri A. Long., 2016, “Clustering and Differential Alignment Algorithm: Identification of Early Stage Regulators in the A. thaliana Iron Deficiency Response.” Pittcon Conference, Atlanta, GA, March 2016.
- 7) Anna Matthiadis, Alexandr Koryachko, Durreshahwar Muhammad, Jessica Foret, Siobhan M. Brady, Joel Ducoste, James Tuck, Cranos Williams, and Terri A. Long., 2016, “Computational prediction of regulatory relationships: New players in the Arabidopsis thaliana iron deficiency response.” Salt & Minerals Symposium, American Society of Plant Biology (ASPB) Annual Meeting, Austin, TX, July 2016.
- 8) *Wang, L, Hossen, E., Aziz, T.N., Ducoste, J., de los Reyes, F.L., 2015, How to train your digester - Using step and pulse feeding of grease waste to increase community resistance and methane yield above 336%, Student Platform Presentation Speaker, Air & Waste Management Association (A&WMA), 108th Annual Conference & Exhibition, Raleigh NC
- 9) *Wang, L, Hossen, E., Aziz, T.N., Ducoste, J., de los Reyes, F.L., 2015, How to train your digester - Step and pulse feeding of grease interceptor waste increased community resistance and methane yield by up to 350%, “Fresh Ideas” Poster session, Annual Conference & Exposition (ACE), American Water Works Association (AWWA), Anaheim, California

- 10) Anna Matthiadis, Alexandr Koryachko, Durrreshahwar Muhammad, Jessica Foret, Siobhan M. Brady, Joel Ducoste, James Tuck, Cranos Williams, and Terri A. Long., 2015, Algorithm application to identify novel regulators in the Arabidopsis thaliana iron deficiency response. Systems Biology and New Approaches Session, International Conference on Arabidopsis Research (ICAR), Paris, France, July, 2015.
- 11) Anna Matthiadis, Alexandr Koryachko, Durrreshahwar Muhammad, Jessica Foret, Siobhan M. Brady, Joel Ducoste, James Tuck, Cranos Williams, and Terri A. Long. "Algorithm application to identify novel regulators in the Arabidopsis thaliana iron deficiency response." Ionomics Workshop, International Conference on Arabidopsis Research (ICAR), Paris, France, July, 2015
- 12) Wang, L., Hossen, E.H., Aziz, T.N., Ducoste, J., Bullard, M., de los Reyes, F.L., 2014, Step and Pulse Feeding Of Anaerobic Co-Digesters Treating Thickened Waste Activated Sludge and Grease Interceptor Waste, Water Resources Research Institute Annual Conference, Raleigh, NC, March 19
- 13) Anna Matthiadis, Alexandr Koryachko, Durrreshahwar Muhammad, Joel Ducoste, James Tuck, Cranos Williams, and Terri Long., 2014, "Using a systems biology approach to identify key transcriptional regulators in the Arabidopsis thaliana iron deficiency response." 9th International BioMetals Symposium, Poster Presentation, Duke University, July 2014.
- 14) Weaver, J., Ducoste, J., de los Reyes, F.L., 2014, Influencing Aerobic Granulation through Variable Shear in an Eccentric Couette Micro-Reactor, NC AWWA/WEA Conference, Winston Salem NC, Nov 16-19
- 15) *He, X., Ducoste, J., de los Reyes, F., 2012, A Comprehensive Mechanistic Model Showing How Fat, Oil, and Grease (FOG) Deposits Form in Sewer Lines, NC AWWA-WEA Annual Conference Raleigh, NC., Nov. 11-14
- 16) *Wang , Y., Ducoste, J., Challenges in the Measurements of Fat, Oil and Grease in Food Service Establishment Waste Streams, 2012, NC AWWA-WEA Annual Conference Raleigh, NC., Nov. 11-14
- 17) *Song, J., Chen, H., Shuford, C.M., Li, Q., Shi, R., Muddiman, D.C., Williams, C.M., Ducoste, J., Sederoff, R.R., Chiang, V.L., 2012, Mechanistic Modeling Frameworks for Multiple Enzyme Regulation in Metabolic Pathway, KSEA South Atlantic Regional Conference, Nov 15-17
- 18) *Aziz, T.N., Wang, L., Long, J.H., Ducoste,J.J., de los Reyes, III, F.L., 2012, Sustainable Energy from Grease Interceptor Waste Co-Digestion, NC AWWA-WEA Annual Conference Raleigh, NC., Nov. 11-14
- 19) *Iasmin, M., Ducoste, J., 2012, Factors that Influence the Physical and Chemical Characteristics of Fat, Oil, and Grease Deposits in Sewer Systems, North Carolina Water Resources Research Institute, March 28
- 20) *He, X., de los Reyes, F.L., Ducoste, J., 2012, How do Fat, Oil, and Grease Deposits form in Sewer Lines, North Carolina Water Resources Research Institute, March 28

- 21) Aziz*, T.N., Long, J.H., Wang, L., de los Reyes, F.L., Ducoste, J.J., 2012, Exploring Sustainable Energy from Grease Interceptor Waste, WRRRI Annual Conference & NCWRA Symposium, Raleigh, NC.
- 22) *Williams, C.M., Chen, H., Song, J., Ducoste, J., Shuford, C.M., Li, Q., Liu, J., Shi, R., Muddiman, D.C., Sederoff, R.R., Chiang, V.L., 2012, Predictive Models of Regulatory and Metabolic Pathways for Monolignol Biosynthesis in *Populus trichocarpa*, Plant & Animal Genome XX Conference, Jan. 14-18, San Diego, CA
- 23) *He, X., Ducoste, J., de los Reyes, F.L., 2011,, How are Fat, Oil and Grease (FOG) Deposits Formed in Sewer Lines?, NCAWWA/WEA, Nov 15,16, Winston-Salem, NC
- 24) *Karami, B., de los Reyes, F., Ducoste, J., 2011, Studying Formation of Nitrifying Aerobic Granules and Effect of Shear Distribution on Granulation NCAWWA/WEA, Nov 15,16, Winston-Salem, NC
- 25) *Arafin, M., Ducoste, J., 2011, Modeling and experimental Evaluation of UV LED Reactor using Computational Fluid Dynamics (Poster), NCAWWA/WEA, Nov 15,16, Winston-Salem, NC (3rd prize award)
- 26) *Ducoste, J., 2011, Water and Waste Treatment Process on Steroids: Using Computational Fluid Dynamics to Drive out Unit Process Inefficiencies, KECKS Futures Initiative, Nov 10-13, Irvine, CA
- 27) Sobriminsana*, Ducoste, de los Reyes, 2011, Combining CFD, floc dynamics, and biological reaction kinetics to model carbon and nitrogen removal in an activated sludge system, WRRRI, March 21, Raleigh, NC
- 28) Gallimore*, Ducoste, Assessment of Grease Abatement Systems, WEF Sewer Collection System Conference, NCAWWA/WEA, Nov 15,16, Winston-Salem, NC
- 29) Vallabh, R., Seyam, A.M.*, Banks-Lee, and Ducoste, J., Tortuosity in Fibrous Porous Media, the Proceedings of the 7th International Conference of Textile Research Division, National Research Center, Cairo, Egypt, October 10-12, 2010.
- 30) Vallabh, R., Seyam, A.M.*, Banks-Lee, and Ducoste, J., Tortuosity of Nonwoven Structures, the 7th International Conference of Textile Research Division, National Research Center, Cairo, Egypt, October 10-12, 2010.
- 31) Vincent Chiang*, Ron Sederoff, John Ralph, Joel Ducoste, Fikret Isik, Cranos Williams, David Muddiman, Lignin proteome, metabolome, enzymology, biochemistry, transgenics, structural chemistry, and systems modeling, Forest Biotechnology Industry Research Consortium (FORBIRC) Annual Meeting McKimmon Center, NCSU, May 26-28, 2010
- 32) Cranos Williams*, Joel Ducoste, Jina Song, Fikret Isik, Ron Sederoff and Vincent Chiang Predicting regulatory control of lignin biosynthesis using signaling graph methodology Forest Biotechnology Industry Research Consortium (FORBIRC) Annual Meeting McKimmon Center, NCSU, May 26-28, 2010
- 33) Joel Ducoste*, Cranos Williams, Jina Song, His-Chuan Chen, Fikret Isik, Ron Sederoff and Vincent Chiang, Regulatory constrained flux balance analysis of monolignol biosynthesis

Forest Biotechnology Industry Research Consortium (FORBIRC) Annual Meeting
McKimmon Center, NCSU, May 26-28, 2010

- 34) Sobriminsana*, Ducoste, de los Reyes, 2010, A Numerical Approach for Modeling Carbon and Nitrogen Removal Under the Influence of Floc Size Distribution, IWA Leading Edge Conference, Pheonix, AZ June 4-8, 2010
- 35) de los Reyes, F., *Ducoste, J., 2010, Factors Affecting the Formation of FOG Deposits in Sewer Lines, Urban Water Consortium Meeting, June 4, Raleigh NC
- 36) Xia*, Ducoste, de los Reyes, 2010, Investigating the Formation of Fat Oil and Grease Deposits in Sewer Collection Systems, WRRRI Conference, Raleigh, NC March 15....
- 37) Alpert, S. M., & Ducoste, J. J., 2009, Validation of CFD Models Simulating the UV/H₂O₂ Advanced Oxidation Process. North Carolina AWWA/WEA Annual Conference, Raleigh, NC.
- 38) *de los Reyes, F., *Ducoste, J., 2009, Factors Affecting the Formation of FOG Deposits in Sewer Lines, Urban Water Consortium Meeting, March 11, Burlington NC
- 39) *Sobremisana, A., F. L de los Reyes III, and J. J. Ducoste (2009) Simultaneous Modeling Carbon and Nitrogen Removal under the Influence of Floc Size Distribution. NC American Water Works Association/Water Environment Association Annual Conference, November 15-18, Raleigh, NC
- 40) Ducoste, J., *Aziz, T., Buckley, T., Movahed, Z., Card, C., Gallimore, E., 2008, Design Considerations for Volume Based Grease Interceptors, Chesapeake Water Environment Association Conference on Collection Systems, November 14, Linthicum, MD
- 41) *Ducoste, J., 2008, Improving our Understanding of Complex Reacting Processes in Water and Wastewater Treatment through Computational Fluid Dynamics, National Academy of Engineering Frontiers of Engineering Conference, November 17-19, Kobe, Japan
- 42) *Sobrimisana A., de los Reyes, F., Ducoste, J., 2008, A Numerical Approach for Modeling Carbon and Nitrogen Removal under the Influence of Floc Size Distribution poster presentation, NCAWWA/WEA 88th Annual Conference, November 16-19, Winston Salem, NC
- 43) *Gallimore, E., Ducoste, J.J., 2008, Performance of Grease Interceptors: Evaluating Design Alternatives, poster presentation, NCAWWA/WEA 88th Annual Conference, November 16-19, Winston Salem, NC
- 44) de los Reyes, F. L., J. Ducoste, M. Hyman, C. Mota, D. Aslett, and H. Hong (2007), New Approaches in Determining the Spatial and Metabolic Interactions of Nitrogen-Transforming Bacteria in Microbial Flocs, NSF MO/MIP Meeting, Mar. 1, Washington, DC
- 45) *Liu, Y. and Ducoste. J.J., 2005, Impact of Turbulent Mixing on Chloramines Formation Proceedings Chesapeake Section AWWA Annual Conference, Dover, DE

- 46) *Richards, B., J.J., Ducoste, 2004, Characterizing Sequential Disinfection in Flow Through Systems, 4th Annual Eastern Regional Conference, New Bern. NC
- 47) *Prat, O., Ducoste, J.J., 2004, Performance Analysis of Quadrature Method of Moments (QMOM) for PBM Systems used in Assessing Flocculation Processes in Water and Wastewater Treatment, 2nd International Population Balance Modeling, Valencia, Spain May 7-9
- 48) *Ducoste, J.J., V., Ortiz, Y., Liu, 2002, A Multifluid Modeling Approach to Characterizing Chemical Dispersion in Drinking Water Treatment, Water Resources Research Institute Annual Conference, Raleigh, NC, April 9

GRANT FUNDING

Sponsored Research:

Development of Test Methods to Characterize Heat Production from Special Wastes Disposed in Landfills

Barlaz (PI), Ducoste (Co-PI), Pour-Ghaz (Co-PI)

EREF

09/01/2018 through 08/30/2020

\$352,020

Attracting Louis Stokes Alliance for Minority Participation (LSAMP) Students to NC State University

Ducoste (PI)

Eastman University Engagement Fund

12/20/18-5/30/19

\$12,000

Travel Funds for Recruiting NC State Bridge to the Doctorate Louis Stokes Alliance for Minority Participation Fellows

Ducoste (PI)

NC State Graduate School

9/15/18-12/31/18

\$1500 (College of Engineering Match \$1500): \$3000

Using Microbial Ecology Theory to Understand Microbial Community Dynamics and Improve Function of Anaerobic Bioreactors

de los Reyes III (PI), Ducoste (Co-PI)

Sponsor: National Science Foundation (NSF)

8/01/18-7/31/21

\$326,736

LSAMP BD: North Carolina State University Preparing Researchers of the Future (PROF) NC-LSAMP

Arden (PI), Ducoste (Co-PI and Director), Charles (Co-PI), Wright (Co-PI)

National Science Foundation (NSF)

7/01/18-6/30/20

\$1,075,000

Title: Optimizing Academic Diversity to achieve Transformative Environmental Engineering and Science Solutions

Joel Ducoste (PI)

Eastman Chemical Company University Engagement Fund

6/1/17-12/31/17

\$10,500

Collaborative Research: Modeling the regulatory network of InsP6 signaling in plants.

Perera (PI), Ducoste (Co-PI), Williams (Co-PI)

National Science Foundation (NSF)

8/15/16-7/31/19

\$310,155

Evaluation of Alternative Binder Material to Reduce Sewer Collection system Infrastructure Maintenance and Enhance Sustainability

Ducoste, J. (PI), Pour-Ghaz (Co-PI)
North Carolina Water Resources Research Institute
03/01/16-02/28/19
\$120,000

Quantifying the Grease Interceptor Effluent Fatty Acid Concentration and Profile: Impact of Pump out Frequency

Ducoste, J. (PI)
Emerson Electric Corporation
08/01/14 - 05/01/16
\$85,106

Closing the Loop- Towards a PSBR Design Framework for Self-Sustained Marine Microalgal-Based Fuel Production

Grunden, A. (PI), Sederoff, H.(Co-PI), Ducoste, J., (Co-PI), de los Reyes, F. (Co-PI), Ranjithan, R., (Co-PI)
NSF EFRI
09/01/2013-08/31/2019
\$1,999,985.00

Inducing Aerobic Granulation in Continuous-Flow Reactors using Shear Variability

de los Reyes, F. (PI), Ducoste, J. (Co-PI)
NSF CBET
299,764.00
08/15/2013- 07/31/2018

CREATIV Dynamic Regulatory Modeling of the Iron Deficiency Response in Arabidopsis thaliana

Williams, C (PI), Long, T. (Co-PI), Tuck, J., Ducoste, J.J. (Co-PI),
NSF,
\$999,790
08/15/12 - 07/31/19

Anaerobic Co-Digestion of Grease Trap Waste

de los Reyes, F.L. (PI), Aziz, T. (Co-PI), Ducoste, J.J. (Co-PI),
Hazen and Sawyer
10,000
6/2012-6/2013

Modeling of Cellulose, Hemicellulose and Lignin-Carbohydrate Complex Formation and Regulation to Understand Plant Cell Wall Structure,

Chiang, Vincent (PI) (Co-PI: Sederoff, Ronald, Chang, Hou-min, Muddiman, David, Williams, Cranos, Isik, Fikret, Ducoste, Joel J., Smith, Christopher),
DOE
\$2,249,825
8/2011-7/2016

Assessment of Alternative Herbicides for Roots Intrusion Treatment

Joel J. Ducoste (PI)

ROOTX

\$28,000

1/2011-9/2013

Fate of Fats, Oils, and Grease (FOG) Deposit Forming Precursors in Sewer Systems

Francis de los Reyes (PI) (Co-PI: Joel Ducoste, NCSU)

WRII

\$50,000

3/2010-3/2012

Sanitary Sewer Overflows and Fats, Oil, and Grease

Allen P. Davis , University of Maryland, (PI) (Co-PI: Joel Ducoste, NCSU, Alba Torrents, University of Maryland)

Washington Suburban Sanitary Commission

\$66,263

6/2010-12/2010

Evaluation of Continuous Flow Ultraviolet Light Emitting Diode Reactors

Joel Ducoste (PI)

NSF-CBET

\$356,795

9/2009-9/2014

An Integrated Approach to Understanding and Reducing Fat Oil and Grease (FOG) Deposit Formation for Sustainable

Joel Ducoste (PI)

EPA-STAR

\$569,568

9/2009-9/2014

Regulation and Modeling of Lignin Biosynthesis

Vincent Chiang (PI, NCSU Forestry) (Co-PI: Ron Sederoff, Forest Biotechnology, Joel Ducoste, CCEE, Fikret Isik, Forestry)

NSF-DBI

\$3,738,869 (\$307,782 to CCEE) (Ducoste will lead the modeling, REU, and Kenan Fellow component of project)

9/2009-9/2014

Factors affecting the formation of fats, oils and grease (FOG) deposits in sewer systems

Francis de los Reyes (PI) (Co-PI: Joel Ducoste, NCSU)

WRII

\$50,000

3/2009-3/2011

Evaluation of Computational Fluid Dynamics (CFD) for Modeling UV-Initiated Advanced Oxidation Processes

Joel Ducoste (PI) (Co-PI: Detlef Knappe, NCSU)

AWWARF

\$150,000

1/2006-12/2009

Characterizing the structure of Fat, oil and Grease Deposits from Sewer Collection systems
J.J. Ducoste (PI) (Co-PI: Kevin Keener, Purdue University)

Altria research

25,000

8/2005-5/2007

Fats, Roots, Oils, and Grease (FROG) in Centralized and Decentralized Systems

J.J. Ducoste (PI) (Co-PI: Kevin Keener, Purdue University; John Groninger, Southern Illinois University; Leon Holt, Town of Cary)

WERF

\$276,000

3/2005-5/2008

Ecophysiology of Nitrifying and Denitrifying Microbial Communities and their Interactions in Microbial Flocs

J.J. Ducoste (Co-PI) (PI: Francis de los Reyes: CCEE, Co-PI: Michael Hyman: Microbiology)

NSF

\$430,000

7/2004-7/2009

REU Supplement to Career: A Unified Approach to Understanding, Education, and Design of Disinfection Processes using Computational Fluid Dynamics

J.J. Ducoste (PI)

NSF

\$6,000

9/2004 to 9/2005

Characterization of Fat, Oil, and Grease Blockages in Sanitary Sewer Collection Systems

J.J. Ducoste (PI) (Co-PI: Kevin Keener in NCSU Food Science)

NCSU Faculty Research and Professional Development Grant

\$20,000

6/2003 to 6/2004

NCSU/NC A & T Program for STEM Enrollment Enhancement

J.J. Ducoste (Co-PI) (PI: John Fountain, MEAS; Co-PIs: Carrie Thomas, MEAS, Robert Borden, CCE; David Haase, Physics; Christine Grant, CHE; Christopher Gould, Physics; Jesus Rodriguez, Math; William Switzer, Chem)

NSF

\$399,938 (\$12,006 to CE Dept)

1/2003 to 12/2005

REU Supplement to Career: A Unified Approach to Understanding, Education, and Design of Disinfection Processes using Computational Fluid Dynamics

J.J. Ducoste (PI)

NSF

\$6,000

9/2003 to 9/2004

Analysis of Computational Fluid Dynamics Results for Ultraviolet Reactor Design: A Subcontract to UV Disinfection for Large Water Treatment Plants: AWWA Research Foundation No. 2768

J.J. Ducoste (PI) (AWWARF Co-PIs: Bob Hulsey, Black and Veatch; Karl Linden, Duke University)
Black & Veatch
\$69,000
9/2002 to 12/2004

Career: A Unified Approach to Understanding, Education, and Design of Disinfection Processes using Computational Fluid Dynamics

J.J. Ducoste (PI)
NSF
\$375,000
9/2001 to 8/2008

Hydraulic Characterization of UV Reactors

J.J. Ducoste (PI) (Co-PI: Karl Linden, Duke University)
AWWARF
\$318,017 (\$154,012 to NCSU Civil Engineering Department)
8/2001 to 9/2004

REU Supplement to Career: A Unified Approach to Understanding, Education, and Design of Disinfection Processes using Computational Fluid Dynamics

J.J. Ducoste (PI)
NSF
\$12,000
9/2002 to 9/2003

Analysis of Drinking Water Treatment Dynamic Simulator: An Undergraduate Research Award

J.J. Ducoste (PI)
NCSU
\$2,500
5/2002 to 9/2002

Developing Web-Based CE 596D for Teaching Physical Principles in Environmental Engineering to Campus and Distance Learning Students

J.J. Ducoste (PI)
NCSU Engineering Online
\$5000
5/2002-7/2002

REU Supplement: Career: A Unified Approach to Understanding, Education, and Design of Disinfection Processes using Computational Fluid Dynamics

J.J. Ducoste (PI)
NSF
\$12,250
9/2001 to 9/2002

RARE: Reconfigurable Computing VIA the Internet
J.J. Ducoste (Co-PI) (PI: Clay Gloster, Howard University)
NSF
\$60,723 (Transferred to Howard University)
7/2001 to 6/2002

Development and Integration of Hydraulic Efficiency Module for the Integrated Disinfection Design Framework Model
J.J. Ducoste (PI)
CH2M HILL
\$18,706
10/1998 to 6/2000

Determining Hydraulic Characteristics of Disinfection Contactors
J. J. Ducoste (PI)
NCSU Faculty Research and Professional Development Grant
\$10,000
1/1999 to 12/1999

Research Participant:

Salinity Gradient Energy – An Inexhaustible Clean Energy Resource for North Carolina
Call, D., (PI)
UNC ROI
3/1/15 – 6/30/18
Budget: \$997,965

Understanding and Predicting Temperatures In Municipal Solid Waste Landfills
Barlaz, M. (Co-PI)
EREF
8/15-7/18
\$875,591

NCSU Advance Scholar Program
Marcia Gumpertz, Interim Vice Provost for Diversity and Inclusion
NSF
8/2009 – 8/2012

NSF Kenan Fellow RET Program
Ruben Carbonell, Deborah Mangum (Kenan Institute for Engineering, Technology, and Science)
National Science Foundation
1/2004-1/2007
(Provides 1 teacher for project duration)

NSF Green Processing Undergraduate Research Program
Christine Grant, Steven Peretti (Dept. of Chemical Engineering)
National Science Foundation
1/2000-1/2005
(Provides 1-3 students per year for project duration)

RADAR Report: NCSU accounting system for projects

External Funding						
1999-0316	Development and Intergration of Hydraulic Efficiency Module for the Integrated Disinfection Design Framework Model	Ducoste, Joel J.	Civil Engineering Contracts and Grants	CH2M Hill	\$18,706	01/01/1999 through 11/30/1999
2000-1492	RARE:(Remote Adaptive-Computing Resource on the Internet) Reconfigurable Computing Via the Internet	Gloster, Clay S. Ducoste, Joel J.	Electrical and Computer Engineering C & G	National Science Foundation (NSF)	\$0	05/15/2001 through 12/31/2001
2001-0082	Hydrodynamic Characterization of UV Reactors	Ducoste, Joel J.	Civil Engineering Contracts and Grants	Water Research Foundation	\$318,017	08/01/2001 through 12/31/2004
2001-0111	CAREER: A Unified Approach to Understanding Education & Design of Disinfection Processes Using Computational Fluid Dynamics	Ducoste, Joel J.	Civil Engineering Contracts and Grants	National Science Foundation (NSF)	\$411,250	09/01/2000 through 05/31/2008
2002-0061	Analysis of Computational Fluid Dynamics Results for Ultraviolet Reactor Design: A Subcontract to UV Disinfection	Ducoste, Joel J.	Civil Engineering Contracts and Grants	Black & Veatch	\$69,000	06/15/2002 through 12/14/2004
2002-1762	NCSU/NC A and T Program for STEM Enrollment Enhancement	Fountain, John C. Thomas, Carrie J. Borden, Robert C. Haase, David G. Ducoste, Joel J. Grant, Christine S. Gould, Christopher R. Rodriguez, Jesus	Marine, Earth and Atmospheric Sciences	National Science Foundation (NSF)	\$350,016	01/01/2003 through 12/31/2006

		Switzer, William L.				
2004-0152	Ecophysiology of Nitrifying and Denitrifying Microbial Communities and their Interactions in Microbial Flocs	De Los Reyes III, Francis Lajara Hyman, Michael R. Ducoste, Joel J.	Civil Engineering Contracts and Grants	National Science Foundation (NSF)	\$454,730	08/15/2004 through 07/31/2009
2005-0115	Fats, Roots, Oils, and Grease (FROG) in Centralized and Decentralized Systems	Ducoste, Joel J. Keener, Kevin M.	Civil, Construction and Environmental Engineering	Water Environment Research Foundation (Prime - US Environmental Protection Agency (EPA))	\$276,000	03/01/2005 through 12/05/2008
2005-1743	Evaluation of Computational Fluid Dynamics (CFD) for Modeling UV-Initiated Advanced Oxidation Processes	Ducoste, Joel J. Knappe, Detlef R.	Civil, Construction and Environmental Engineering	Water Research Foundation	\$150,000	01/01/2006 through 07/15/2009
2005-1877	Master Agreement - Scientific, Technical, Research, Engineering, and Modeling Support (STREAMS)	Barlaz, Morton A. Frey, Henry C. Borden, Robert C. Ducoste, Joel J. De Los Reyes III, Francis Lajara Knappe, Detlef R.	Civil, Construction and Environmental Engineering	RTI International (aka Research Triangle Institute) (Prime - US Environmental Protection Agency (EPA))	\$0	09/27/2005 through 09/26/2010
2009-0166	An Integrated Approach to Understanding and Reducing Fat Oil and Grease (FOG) Deposit Formation for Sustainable Sewer Collection Systems	Ducoste, Joel J.	Civil, Construction and Environmental Engineering	US Environmental Protection Agency (EPA)	\$569,568	08/01/2009 through 07/31/2014
2009-1301	Regulation and Modeling of Lignin Biosynthesis	Chiang, Vincent Sederoff, Ronald R. Ducoste, Joel J. Isik, Fikret Muddiman, David C. Williams, Cranos Smith,	Forestry and Environmental Resources	National Science Foundation (NSF)	\$3,722,841	09/15/2009 through 09/30/2015

		Christopher P. Ghiladi, Reza A				
2009-1595	Evaluation of Continuous Flow Ultraviolet Light Emitting Diode Reactors	Ducoste, Joel J.	Civil, Construction and Environmental Engineering	National Science Foundation (NSF)	\$356,795	09/01/2009 through 08/31/2014
2011-0608	Modeling of Cellulose, Hemicellulose and Lignin-Carbohydrate Complex Formation and Regulation to Understand Plant Cell Wall Structure	Chiang, Vincent Sederoff, Ronald R. Chang, Hou-min Muddiman, David C. Williams, Cranos Isik, Fikret Ducoste, Joel J. Smith, Christopher P.	Forestry and Environmental Resources	US Dept. of Energy (DOE)	\$2,249,825	09/01/2011 through 11/30/2017
2011-1826	Assessment of Alternative Herbicides for Roots Intrusion Treatment	Ducoste, Joel J.	Civil, Construction and Environmental Engineering	RootX Corp.	\$28,000	01/01/2011 through 12/31/2012
2012-2860	CREATIV Dynamic Regulatory Modeling of the Iron Deficiency Response in Arabidopsis thaliana	Williams, Cranos Ducoste, Joel J. Long, Terri Tuck, James	Electrical and Computer Engineering	National Science Foundation (NSF)	\$999,758	08/15/2012 through 07/31/2019
2013-1793	EFRI-PSBR: Closing the Loop- Towards a PSBR Design Framework for Self-Sustained Marine Microalgal-Based Fuel Production	Grunden, Amy M. Sederoff, Heike W. Ducoste, Joel J. Ranjithan, Sanmugavadivel De Los Reyes III, Francis Lajara	Microbiology	National Science Foundation (NSF)	\$1,999,985	09/01/2013 through 08/31/2019
2013-1972	Inducing Aerobic Granulation in Continuous-Flow Reactors using Shear Variability	De Los Reyes III, Francis Lajara Ducoste, Joel J.	Civil, Construction and Environmental Engineering	National Science Foundation (NSF)	\$299,764	08/15/2013 through 05/31/2018
2014-2451	Quantifying the Grease Interceptor Effluent Fatty Acid Concentration and	Ducoste, Joel J.	Civil, Construction and	Emerson Electric Company	\$85,106	08/01/2014 through 05/15/2016

	Profile: Impact of Pump out Frequency		Environmental Engineering			
2016-1341	Collaborative Research: Modeling The Regulatory Network Of Inositol Phosphate Signaling In Plants.	Perera, Imara Y. Williams, Cranos Ducoste, Joel J.	Plant and Microbial Biology	National Science Foundation (NSF)	\$310,155	08/15/2016 through 12/31/2019
2018-1028	Using Microbial Ecology Theory to Understand Microbial Community Dynamics and Improve Function of Anaerobic Bioreactors	De Los Reyes III, Francis Lajara Ducoste, Joel J.	Civil, Construction and Environmental Engineering	National Science Foundation (NSF)	\$326,736	08/01/2018 through 07/31/2021
2018-1238	LSAMP BD: North Carolina State University Preparing Researchers of the Future (PROF) NC-LSAMP	Arden, Warwick A. Charles, Roy Anthony Wright, Ashleigh Renee Ducoste, Joel J.	Provost Office	National Science Foundation (NSF)	\$1,075,000	07/01/2018 through 06/30/2020
2019-0040	Development of Test Methods to Characterize Heat Production from Special Wastes Disposed in Landfills	Barlaz, Morton A. Ducoste, Joel J. Pour-Ghaz, Mohammad	Civil, Construction and Environmental Engineering	Environmental Research & Education Foundation	\$352,020	09/01/2018 through 08/30/2020
Total external funding: \$14,423,272						

Internal Funding						
0064-9564	Determining Hydraulic Characteristics of Disinfection Contactors	Ducoste, Joel J.	Civil Engineering Contracts and Grants	NCSU Faculty Research & Professional Development Fund	\$5,000	01/01/1999 through 12/31/1999
0064-9659	Characterization of Fat, Oil, and Grease Blockage in Sanitary Sewer Collection Systems	Keener, Kevin M. Ducoste, Joel J.	Food, Bioprocessing and Nutrition Sciences	NCSU Faculty Research & Professional Development Fund	\$20,000	06/16/2003 through 06/15/2004
2009-0819	Fate of Fats, Oils, and Grease (FOG) Deposit Forming Precursors in Sewer Systems	De Los Reyes III, Francis Lajara Ducoste, Joel J.	Civil, Construction and Environmental Engineering	NCSU Water Resources Research Institute	\$97,500	03/01/2009 through 06/30/2011

2016-0453	Evaluation of Alternative Binder Material to Reduce Sewer Collection system Infrastructure Maintenance and Enhance Sustainability	Ducoste, Joel J. Pour-Ghaz, Mohammad	Civil, Construction and Environmental Engineering	NCSU Water Resources Research Institute	\$120,000	03/01/2016 through 06/30/2019
Total internal funding: \$242,500						

EXTENSION ENGAGEMENT and OUTREACH

A. Scholarly Accomplishments

Collaborating with Professor Lorenzo Liberti, Politecnico di Bari. The project involves the development and validation of computational fluid dynamic models of unit process for water reuse applications. This project is only one phase of a larger project entitled “Integrated Strategies For Municipal Wastewater Productive Reuse In Apulia Region” This multiphase research also involves collaboration with Dr. J. Cotruvo from USEPA Prof. C. Haas from Drexel University, USA, Prof. R. Gehr from McGill Univ., Canada, Prof. H. Shuval from Jerusalem Hadassah Academy, Israel, and Prof. G. Huppes from Leiden Univ., Netherlands.

B. Technology Transfer

Ducoste, J.J., 2011, Design and Assessment of Grease Abatement Systems, Design Your Own Workshop series, NCSU, December 3, Raleigh N.C.

Ducoste, J.J., 2010, The Intricacies of Designing Ultraviolet (UV) Disinfection Reactors using Numerical Models, Design Your Own Workshop series, NCSU, November 18, Raleigh N.C.

Ducoste, J.J., 2003, The Intricacies of Designing Ultraviolet (UV) Disinfection Reactors using Numerical Models, Design Your Own Workshop series, NCSU, November 18, Raleigh N.C.

Ducoste, J.J., 2002, The Intricacies of Designing Ultraviolet (UV) Disinfection Reactors using Numerical Models, Design Your Own Workshop series, NCSU, December 4, Raleigh N.C.

Ducoste, J.J., 2001, Overview of Integrated Drinking Water Disinfection Design Framework Approach, Design Your Own Workshop series, NCSU, December 5, Raleigh N.C.

C. Recognized Creative and Professional Achievement

D. Public Service

Working with Washington Suburban Sanitation Commission on evaluating Grease Abatement Systems for removal of Fat Oil and Grease Laden waste streams

Associate Editor for Journal of Environmental Engineering ASCE

Moderator of Technical Session at Disinfection 2009 Conference Atlanta, GA

Guest Instructor at Leesville Middle School 8th grade Science Class

Moderator at an NSF Workshop WATERS 08 DC

Speaker at a workshop on Fat, Oil, and Grease for engineers and pretreatment coordinators in NC

Organizer of a Workshop on modeling membrane bioreactors for researchers and scientists at Ghent University

Member of the conference organizing and scientific committee for the 3rd International Conference on Population Balance Modeling, September 2007, Quebec City, Quebec Conference website :<http://modelEAU.org/pbm2007>

Member of the conference organizing and scientific committee for the 2nd International Conference on Population Balance Modeling, May 2004, Valencia (Spain) Conference website:<http://biomath.rug.ac.be/PBM2004>

Developed a proposal/project for the Senior Design Course in Civil Engineering that involves the neutralization of wastewater for a local company: Kennametal. The work is being performed with Lisa Bullard of Chemical Engineering to foster both process and waste treatment solutions and multidisciplinary activities for the students in the design course

Member of Senior Project Review for New York City Department of Environmental Protection (DEP) Catskill Turbidity Control Study

This work involves the evaluation of computer modeling developed for a multi-level Shandaken Tunnel Intake facility and reservoir dredging/Cofferdam removal project. I am also responsible for helping review the technical and economic feasibility and environmental benefits for the alternatives developed through the modeling performed.

Co-chaired the UV Measurement sessions at the IUVA 2nd International Congress on Ultraviolet Technologies in Vienna, Austria, July, 2003

Developed a proposal/project for the Senior Design Course in Civil Engineering that involves the neutralization of wastewater for a local pharmaceutical company: Novo Nordisk.

Member of Senior Project Review for New York City Department of Environmental Protection (DEP) Catskill and Delaware UV Disinfection Facility

This work consists of the evaluation of computer modeling and/or biosimetry testing data developed for validation of the ultraviolet light (UV) reactors to be installed within the New York City Department of Environmental Protection (DEP) Catskill and Delaware UV Disinfection Facility. The Catskill and Delaware system supplies nearly 90% of the 2 billion gallons of drinking water consumed daily in New York City. The DEP has developed a Conceptual Design of the UV disinfection facility that incorporates low pressure high output (LPHO) UV reactors with nominal capacities of 40-mgd. As part of the Conceptual Design, DEP began a modeling program with the basic goal of using modeling as a means for validating full-scale UV reactors.

Member of Senior Project Review for Hydraulic Feasibility and Demonstration-Scale UV Testing at the Richard Miller Treatment Plant

The Greater Cincinnati Water Works (GCWW) requests for professional engineering services to conduct a hydraulic feasibility and cost effective analysis for the purpose of evaluating an optimal location for UV (Ultra Violet) technology installation into the existing treatment process

and to provide recommendations for the most viable and cost effective UV technology for the Richard Miller Treatment Plant (RMTP). The project include services to design and conduct a yearlong demonstration-scale UV study at the RMTP to collect operation and maintenance data including performing feasible microbial inactivation tests and Computational Fluid Dynamics (CFD) modeling.

Performed consulting work for ATLANTIUM Inc and Gas Delivery Systems (GDS) that involved the review of Ultraviolet modeling work performed by both companies. In addition, modeling work was performed by me to review strategies for GDS to improve their UV reactor design.

Provided senior review of the modeling section of the EPA UV Guidance manual

Served as a member of the EPA Science Advisory Board member and related adhoc and subcommittees for 9 years

Currently serve as a member of the EPA Board of Scientific Counselors subcommittee for Sustainable and Safe Water Resources

Serve as an external representative of the Civil, Architecture, and Environmental engineering Department Board of Advisors at NCA&T

Served as an external evaluator for the Civil and Environmental Department Graduate Program Review Wayne State University

Served on the committee to organize the GEM Grad Lab at NC State University during the Spring semester 2018

Committee on developing a pipeline for URM's for Environmental Engineering and Science in NC

Working with Water Environment Federation Introducing Future Leaders to Opportunities in Water (InFLOW) program to broaden participation and inclusion of workforce. Developed video to help encourage effort (https://www.youtube.com/watch?v=cqE-E2_GIMc&list=PLLeo-tHuuDoa54IfYSQxxIejLAhCVQHho&index=4&t=0s)

Executive Board Member of AEESP (Elected Vice President, President-Elect)

Summary of Consulting Services

Fall 1999, Fall 2000, Fall 2003	CH2M HILL	Senior reviewer for CFD models of disinfection contactor designs and UV systems (See Extension section)
Spring 2002, Fall 2002, Fall 2003	Hazen & Sawyer	Senior reviewer for CFD models of UV reactor designs with the city of New York (See Extension section)
Spring 2003	Novo Nordisk	Senior reviewer for waste discharge project. This project was performed through CE 481 senior design course.
Spring 2004	Kennametal	Senior reviewer for waste discharge project. This project was performed through CE 480/481 senior design course.

Fall 2003 and Spring 2004	Hazen & Sawyer	Senior reviewer for CFD models of New York City's Catskill Turbidity Control Study (See Extension section)
Spring 2004	CH2M HILL	Senior reviewer for CFD models of Anaerobic digester project (See Extension section)
Summer 2005	Atlantium	Senior reviewer for CFD models of UV reactor for drinking water disinfection (See Extension section)
Spring 2006		
Fall 2005	GDS Inc	Senior reviewer for CFD models of UV reactor for drinking water disinfection (See Extension section)
Fall 2006	CH2M HILL	Senior Reviewer UV Disinfection System, Cincinnati
Fall and spring 2011	Eaton	Senior reviewer of UV disinfection design of new reactors for Ballasted flocculation
Fall 2011, Spring 2012	WRF	Senior review of UV Validation of UV reactors for NYC
Spring and Summer 2012	Arcadis/ MalcomPirnie	Senior reviewer for UV installation design for City of Rochester NY and Los Angeles CA
Fall 2012, Spring 2013	SETI	Developing CFD models of novel LED reactors
Spring 2014	Arcadis/ MalcomPirnie	Senior reviewer for UV low wavelength assessment of action spectra correction factor design for City of Los Angeles CA
Fall 2016	Emerson electric	Provided consulting on the state of FOG research in sewer collection system
Summer-Fall 2016	Oldcastle Precast	Senior reviewer of new designs for grease interceptors
Spring 2019	Atlantium	Senior reviewer for CFD models of UV reactor for dairy farm industry disinfection

E. Cross-Disciplinary Activities

- Participant in a 3 yr (2004-2007) NSF RET project with Ruben Carbonell and Deborah Mangum (Kenan Institute for Engineering, Technology, and Science). The proposed site will provide science and engineering research projects for 20 middle and high school teachers from multiple school districts in order to develop a cohort of teacher leaders who will bring enhanced knowledge of engineering and technological innovation into their classrooms.
- Participant in a 5 yr (2000-2005) NSF REU project with Christine Grant and Steven Peretti (CHE Dept.). This project involves several researchers from different departments all providing research projects that can be completed by an undergraduate student during the summer months. As a member of this research team, I have provided research projects related to water and wastewater treatment processing and design.
- Collaborating with Amy Grunden (Microbiology), Heike sederoff (Plant Biology) on the development of photobioreactors for microalgae harvesting and production of lipids for biofuels
- Collaborating with Cranos Williams (Electrical Engineering), Terri Long (Plant Biology), John Tuck (Electrical Engineering) on a Biosystems modeling project for Iron deprivation in plants

- Collaborating with Imara Perera (Plant biology), Brian Phillips (Plant Biology), Cranos Williams (Electrical Engineering), and Glenda Gillaspay (Biochemistry Virginia Tech) on Myo-inositol pathway regulation in plant cells
- Collaborated with Jim Burton in Horticulture on the assessment of alternative herbicides for the abatement of roots intrusion in sewer pipe lines
- Collaborated on a proposal involving Marty Hubbe and Orlando Rojas from Pulp and Paper Science and Melissa Pasquinelli from Textile Engineering to understand the structure and reactivity of zero-valent iron nanoparticles, using molecular dynamics simulations. A proposal to NSF was submitted in September 2009.
- Collaborating on an NSF project involving Vincent Chiang and Ron Sederoff from Forestry department, and William Edmonson and Windser Alexander from Electrical engineering on developing biosystem models for the analysis tree plant cell metabolism for the production of lignin.
- Collaborated with Michael Hyman in Microbiology with Francis de los Reyes to understand how the microbial ecology changes with physical floc conditions in an activated sludge reactor.
- Collaborated with the Kenan Institute for Engineering, Technology, and Science as a University mentor for the Kenan Fellows for Curriculum and Leadership Development program. The program involves working with a middle school teacher to integrate water quality and treatment concepts into the K-12 curriculum.
- Collaborated on a project involving fat, oil, and grease deposit formation in sanitary sewers with Kevin Keener in the Food Science department.
- Collaborated on a project to develop a program designed to increase the number of graduates in science, technology, engineering and mathematics (STEM) with John Fountain in MEAS department
- A participant in a 5 yr NSF REU project with Christine Grant and Steven Peretti (CHE Dept.)
- Collaborated on a proposal involving the demonstration and evaluation of a constructed wetland and spray field system for leachate treatment with Sarah Liehr of BAE. The proposal has been submitted to SEAGRANT and is pending
- Collaborated on a project involving modeling nitrogen transport in duckweed ponds for secondary treatment of swine wastewater with Jiayang Cheng of BAE
- Collaborated on two proposals and a project involving the design and implementation of a reconfigurable computer for simulation of turbulent-induced flocculation models with Clay Gloster (formerly of the ECE Dept.)
- Collaborated on Combined Research-Curriculum Development (CRCD) NSF Proposal with Christine Grant NCSU-CHE, Clay Gloster NCSU-ECE, Richard Felder NCSU-CHE, Sandra Williams NCSU-Education, and Fred Boadu DUKE-CE, that looks at using high computing techniques to integrate engineering research into curriculum development.