

# Fabrizio Sabba, Ph.D.

Process Engineering Associate  
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**BLACK & VEATCH**

## EDUCATION

Postdoctoral Research Associate	<b>Northwestern University</b> Civil and Environmental Engineering Advisor: <i>Dr. George Wells</i>	Evanston, IL 2018
Ph.D.	<b>University of Notre Dame</b> Major: Environmental Engineering Advisor: <i>Dr. Robert Nerenberg</i>	Notre Dame, IN 2016
M.Sc.	<b>University La Sapienza</b> <i>Summa Cum Laude</i> Major: Environmental and Industrial Biotechnology Advisor: <i>Dr. Roberto Samperi</i> , Co-advisor: <i>Dr. Paige Novak</i>	Rome, Italy 2010
B.Sc.	<b>University of Bari</b> Biotechnology for processes and products innovation Advisor: <i>Dr. Pietro Favia</i> Co-advisor: <i>Dr. Roberto Gristina</i>	Bari, Italy 2007

## PROFESSIONAL EXPERIENCE

Process Engineering Associate	<b>Black &amp; Veatch</b>	New York, NY 2021
Director of R&D	<b>NUVODA</b>	Blacksburg, VA 2017

## RESEARCH EXPERTISE

- Biological Nutrients Removal (BNR) and resource recovery
- Granular sludge and Membrane Biofilm Reactor (MBfR) for wastewater treatment
- Mathematical biofilm modeling
- Artificial biofilm systems
- Biofilm mechanical properties
- Enhanced Biological Phosphorus Removal
- Anammox based processes
- Fate of greenhouse gases in BNR processes

## HONORS AND AWARDS

40 under 40 Award - American Academy of Environmental Engineers and Scientists (AAEES)	2022
Postdoc Professional Development Award	2018-2019
Best presentation at WWTmod Conference, Annecy (France)	2016
Zahm Research Travel Grant	2016
Graduate Student Union Conference Grant	2016
Fellowship Emerging Contaminants Workshop, Marquette University	2015
Notebaert Professional Development Fund	2015
Graduate Student Union Conference Grant	2015
Indiana Water Environment Association (IWEA) Besozzi Scholarship	2014
University of Notre Dame Professional Development Fellowship	2014

## PROPOSALS AND GRANTS EXPERIENCE

Contributed writing and revising NSF-CBET proposal (\$400,000)	2019
Contributed writing and revising EREF proposal (\$300,000)	2018
Contributed writing and revising NSF-Mechanobiology proposal (\$500,000)	2018
Reilly Center Mini-Grant (\$3,500)	2016
Bayer Pre-doctoral Research Fellowship (\$10,500)	2015
Center for Environmental Science and Technology (CEST) Graduate Student Fellowship (\$10,250)	2014

## PEER-REVIEWED JOURNAL PUBLICATIONS

- 33\* **Sabba, F.**, Redmond, E., Ruff, C., Ramirez, M., Campbell, P., Young, M., Downing, L. (2023) Bench scale, modeling and microbial ecology data suggest existence of Comammox clade A and B under different dissolved oxygen concentrations \*Submitted to *ES&T Water*
- 32 Farmer, M., **Sabba, F.**, Jia, Z., Dunlap, P., Barnard, J., Qin, D., Straka, L., Kozak, J. A., Downing L., Wells, G. (2023) Non canonical phosphorus accumulating organisms in a carbon limited sidestream enhanced biological phosphorus removal reactor, accepted in **ES&T Water**
- 31 Klaus, S., Campolong, C., Rosenthal, A., **Sabba, F.**, Baideme, M., Wells, G., DeClippeleir, H., Chandran, K., Bott, C. (2023) Nitrogen polishing in a partial denitrification/anammox MBBR using glycerol, acetate, and methanol, accepted in **Environmental Science: Water Research & Technology**
- 30 Jia, Z., Yuan, Q., Roots, P., **Sabba, F.**, Rosenthal, A. F., Yang, F., Kozak, J. A., Zhang, H., Wells, G. F. (2023) Resource efficient partial nitritation/Anammox and biological phosphorus removal in a single bioreactor under mainstream conditions, accepted in **Bioresource Technology**
- 29 **Sabba, F.**, Kassar, C., McNamara, P., Hunter, G. (2023) Leachate – A key to unlocking the chain of recirculating PFAS forever? **Water Online**
- 28 Candry, P., Godfrey, B.J., Wang, Z., **Sabba, F.**, Dieppa, E., Fudge, J., Balogun, O., Wells, G., Winkler, M-K. H. (2022) Tailoring polyvinyl alcohol-sodium alginate (PVA-SA) hydrogel beads by controlling crosslinking pH and time, **Scientific Reports**, Volume 12, Article number: 20822
- 27 **Sabba, F.**, Farmer, M., Barnard, J., Dunlap, P., Marroquin, S., Giefer, R., Budsberg, D., Downing, L. (2022) Enhancing resource recovery via cranberry syrup waste at the Wisconsin Rapids WRRF: an experimental and modeling study, **Journal of Environmental Management**, 323, 116190
- 26 **Sabba, F.**, Farmer, M., Jia, Z., Di Capua, F., Dunlap, P., Barnard, J., Dongqi Qin, C., Kozak, J. A., Wells, G., Downing, L. (2022) Impact of operational strategies on a sidestream enhanced biological phosphorus removal (S2EBPR) reactor in a carbon limited wastewater plant, **Science of The Total Environment**, Jan 20;857 (Pt 1):159280. doi: 10.1016/j.scitotenv.2022.159280. Epub 2022 Oct 7.
- 25 Di Capua, F, Iannacone, F., **Sabba, F.**, Esposito, G. (2022) Simultaneous nitrification-denitrification in biofilm systems for wastewater treatment: key factors, potential routes, and engineered applications, **Bioresource Technology**, Volume 361, 127702, ISSN 0960-8524, <https://doi.org/10.1016/j.biortech.2022.127702>
- 24 Read-Daily, B., Ben Maamar, S., **Sabba, F.**, Green, S., Nerenberg, R. (2022) Effect of nitrous oxide (N<sub>2</sub>O) on the structure and function of nitrogen-oxide reducing microbial communities, **Chemosphere**, Volume 307, Part 3, November 2022, 135819
- 23 **Sabba, F.**, McNamara, P., Redmond, E., Ruff, C., Young, M., Downing, L. (2022) Lab-scale data and microbial community structure suggest shortcut nitrogen removal as the predominant nitrogen removal mechanism in post aerobic digestion (PAD), **Water Environment Research**, 94, DOI: 10.1002/wer.10762
- 22 McNamara, P., **Sabba, F.**, Redmond, E., Dunlap, P., Worley-Morse, T., Marks, C., Downing, L. (2022) Post aerobic digestion (PAD) is a solids sidestream nutrient removal process that utilizes native carbon: performance and key operational parameters from two full-scale PAD reactors, **Environmental Science: Advances**, 1, 216-228
- 21 Ceconet, D., **Sabba, F.**, He, J., Capodaglio, A. (2022) Integrated experimental and modeling evaluation of removal efficiency and energy consumption for an autotrophic denitrifying biocathode, **Environmental Science: Water Research & Technology**, 8, 1466-1477

- 20 Cerruti, M., Guo, B., Delatolla, R., de Jonge, N., de Vos van Steenwijk, A. H., Kadota, P., Lawson, C. E., Mao, T., Oosterkamp, M. J., **Sabba, F.**, Stokholm-Bjerregaard, M., Watson, I., Frigon, D., Weissbrodt, D. G. (2021) Plant-wide systems microbiology for the wastewater industry, Manuscript accepted in **Environmental Science: Water Research & Technology**, 7, 1687-1706
- 19 Liou, H.-C., **Sabba, F.**, Wang, Z., Wells, G., Balogun, O. (2021) Layered Viscoelastic Properties of Granular Biofilms, **Water Research**, 202, 117394, <https://doi.org/10.1016/j.watres.2021.117394>
- 18 Roots, P., Rosenthal, A., Wang, Y., **Sabba, F.**, Jia, Z., Yang, F., Zhang, H., Kozak, J., Wells, G. (2020) Pushing the limits of solids retention time for enhanced biological phosphorus removal: Process characteristics and Accumulibacter population structure, **Water Science & Technology**, 82 (8): 1614–1627
- 17 Won, Y., Stein, G., Sadman, K., **Sabba, F.**, Shull, K., Gray, A.K. (2020) Polyelectrolyte complex sacrificial membrane functionalized with chitosan derivatives for enhanced fouling control, **Langmuir**, 36 (43): 12784–12794
- 16 Ceconet, D., **Sabba, F.**, Devecseri, M., Callegari, A., Capodaglio, A.G. (2020) *In situ* groundwater treatment with BES: a critical review and future perspectives, **Environment International**, 137:105550
- 15 Gao, H., Zhao, H., Zhou, L., **Sabba, F.**, Wells, G.F. (2020) Differential kinetics of nitrogen oxides reduction leads to elevated N<sub>2</sub>O production by a nitrite fed granular denitrifying EBPR bioreactor, **Environmental Science: Water Research & Technology**, 6 (4), 1028-1043
- 14 Roots, P., **Sabba, F.**, Rosenthal, F. A., Wang, Y., Yang, F., Kozak, A. J., Zhang, H., Wells, G. (2020) Integrated shortcut nitrogen and biological phosphorus removal from mainstream wastewater: process operation and modeling, **Environmental Science: Water Research & Technology**, 6:566-580
- 13 Liou, H.-C., **Sabba, F.**, Packman, A., Rosenthal, A., Wells, G., Balogun, O. (2019) Towards mechanical characterization of granular biofilms by optical coherence elastography measurements of circumferential elastic waves, **Soft Matter**, 15(28): 5562-5573
- 12 Wang, Y., **Sabba, F.**, Bott, C., Nerenberg, R. (2019) Using kinetics and modeling to predict denitrification fluxes in elemental sulfur (S<sup>0</sup>) based biofilms, **Biotechnology and Bioengineering**, 116(10):2698-2709
- 11 Roots, P.; Wang, Y., Rosenthal, A., Griffin, J., **Sabba, F.**, Petrovich, M., Yang, F., Kozak, J., Zhang, H., George Wells (2019) Comammox Nitrospira are the dominant ammonia oxidizers in a mainstream low dissolved oxygen nitrification reactor, **Water Research**, 157(15):396-405
- 10 Liou, H.-C., **Sabba, F.**, Packman, A., Wells, G., Balogun, O. (2019). Nondestructive characterization of soft materials and biofilms by measurement of guided elastic wave propagation using optical coherence elastography. **Soft Matter**, 15: 575-586
- 09 Yoon, H., Joon Song, M., Kim, D. D., **Sabba, F.**, Yoon, S. (2019) A serial biofiltration system for effective removal of low-concentration nitrous oxide in oxic gas streams: mathematical modelling of reactor performance and experimental validation, **Environmental Science & Technology**, 19:53(4):2063-2074
- 08 **Sabba, F.**, Terada, A. Wells, G., Nerenberg, R. (2018) Nitrous oxide emissions from biofilm processes for wastewater treatment, **Applied Microbiology and Biotechnology**, 102(22):9815–9829
- 07 Łagód, G., Guz, Ł., **Sabba, F.**, Sobczuk, H. (2018) Detection of wastewater treatment process disturbances in bioreactors using the e-nose technology, **Ecological Chemistry and Engineering S.**, 25(3):405-418
- 06 **Sabba, F.**, Picioreanu, C., Nerenberg, R. (2017) Mechanisms of nitrous oxide (N<sub>2</sub>O) formation and reduction in denitrifying biofilms, **Biotechnology and Bioengineering**, 114(12):2753-2761
- 05 **Sabba, F.**, DeVries, A., Druschel, G., Bott C., Nerenberg R. (2016) Potential use of sulfite as a supplemental electron donor for water and wastewater denitrification. **Reviews in Environmental Science and Bio/Technology**, 15(4):563-572
- 04 Read-Daily, B.L., **Sabba, F.**, Pavissich, J.P., Nerenberg, R. (2016) Kinetics of nitrous oxide (N<sub>2</sub>O) reduction by *Paracoccus pantotrophus*. **Applied Microbiology and Biotechnology Express**, 6(1):85
- 03 **Sabba, F.**, Picioreanu, C., Boltz, J.P., Nerenberg, R. (2016) Predicting nitrous oxide (N<sub>2</sub>O) emissions from nitrifying and denitrifying biofilms: a modeling study, **Water Science & Technology**, 75(3):530-538
- 02 Szaja, A., Łagód, G., Jaromin-Gleń, K., **Sabba, F.** (2016) Bioaugmentation of a sequencing batch reactor with archaea for the treatment of reject water. **Journal of Water Chemistry and Technology**, 38(4):238-243

- 01 **Sabba, F.**, Piciooreanu, C., Perez, J., Nerenberg, R. (2015) Hydroxylamine diffusion can enhance N<sub>2</sub>O emissions in nitrifying biofilms: a modeling study. **Environmental Science & Technology**, 49(3):1486–1494

## TEACHING AND CERTIFICATES

Guest Lecturer	Course: <i>Biological Wastewater Treatment</i> Auburn University, AL Level: <b>Graduate</b> ; Class size: <b>10</b> Duty: Delivered one guest lecture	2022
STAR Certificate	Searle Teaching-As-Research (STAR), Northwestern University, IL	2019
Teaching Certificate	Searle Center for Advancing Learning & Teaching, Teaching Certificate Program, Northwestern University, IL	2019
Guest Lecturer	Course: <i>Environmental Engineering Applications 2: Water</i> Northwestern University, IL Level: <b>Undergraduate</b> ; Class size: <b>6</b> Duty: Delivered two guest lectures	2018-2019
Guest Lecturer	Course: <i>Industrial Biochemistry and Environmental Biochemistry Methods</i> University of Bari, Italy Level: <b>Graduate</b> ; Class size: <b>10</b> Duty: Delivered two guest lectures	2017-2019
Guest Lecturer	Course: <i>Environmental Chemistry and Biochemistry</i> University of Bari, Italy Level: <b>Graduate</b> ; Class size: <b>8</b> Duty: Delivered two guest lectures	2016
Teaching Assistant	Course: <i>Wastewater design</i> University of Notre Dame, IN Level: <b>Undergraduate/Graduate</b> ; Class size: <b>10</b> Duty: Held office hours, graded homework and proctored exams	2013
Lab Instructor	Course: <i>Wastewater treatment and design lab</i> University of Notre Dame, IN Level: <b>Undergraduate</b> ; Class size: <b>12</b> Duty: Delivered pre-laboratory lectures and guided experiments	2012
Teaching Assistant	Course: <i>Introduction to environmental engineering</i> University of Notre Dame, IN Level: <b>Undergraduate</b> ; Class size: <b>45</b> Duty: Held office hours, graded homework and proctored exams	2011
Teaching Assistant	Course: <i>Wastewater design</i> University of Notre Dame, IN Level: <b>Undergraduate/Graduate</b> ; Class size: <b>8</b> Duty: Held office hours, graded homework and proctored exams	2011
Teaching Assistant	Course: <i>Methods of civil engineering</i> University of Notre Dame, IN Level: <b>Undergraduate</b> ; Class size: <b>56</b> Duty: Held office hours, graded homework and proctored exams	2010

## MENTORING EXPERIENCE

Research Mentor	Northwestern University (co-advised with Dr. George Wells) Master's degree graduate student Mentee: Mr. Zhen Jia (Graduate student) Project: <i>Integrated shortcut nitrogen and biological P removal</i>	2019
Research Mentor	University of Notre Dame (co-advised with Dr. Robert Nerenberg) Research Experience Undergraduate Program (R.E.U.) Mentee: Mr. Carlos Comiotto (Undergraduate student) Project: <i>Sulfite as alternative electron donor for wastewater treatment</i>	2016
Research Mentor	University of Notre Dame (co-advised with Dr. Robert Nerenberg) Research Experience Undergraduate Program (R.E.U.) Mentee: Ms. Mara Gonzalez (Undergraduate student) Project: <i>Effect of dissolved oxygen on nitrous oxide (N<sub>2</sub>O) formation in biofilm systems for wastewater treatment</i>	2014

## CONFERENCE PROCEEDINGS, BOOK CHAPTER, OTHERS

- 15 McNamara, P., **Sabba, F.**, Mosse, L. (2022) PFAS: Are these 'forever' chemicals here to stay in our waters and regulations? Magazine of Central States Water Environment Association (CSWEA), published for Winter 2022
- 14 **Sabba, F.**, McNamara, P., Redmond, E., Ruff, C., Young, M., Downing, L. (2022) Bench scale tests reveal impact of temperature on nitrogen removal in post aerobic digestion-acclimated biomass. Proceedings of the Water Environment Federation, WEFTEC 2022, New Orleans, LA (USA), DOI: [10.2175/193864718825158671](https://doi.org/10.2175/193864718825158671)
- 13 Spérandio, M., Lang, L., **Sabba, F.**, Nerenberg, R., Vanrolleghem, P., Domingo-Félez, C., Smets, B. F., Duan, H., Ni, B.-J., Yuan, Z. (2022) Modelling N<sub>2</sub>O production and emissions, Quantification and Modelling of Fugitive Greenhouse Gas Emissions from Urban Water Systems, DOI: [10.2166/9781789060461\\_167](https://doi.org/10.2166/9781789060461_167)
- 12 Majerek, D., Łagód, G., Szelağ, B., **Sabba, F.** (2021) Use of Hotelling test to evaluate the impacts of treated wastewater discharge on river water quality, MATEC Web of Conferences
- 11 Nerenberg, R., Wang, Y., **Sabba, F.**, Bott, C. (2019) Using kinetics and modeling to predict denitrification fluxes in elemental sulfur-based biofilms, Proceedings of the Water Environment Federation, WEFTEC 2019, Chicago, IL (USA)
- 10 Campolong, C., Klaus, S., Rosenthal, A., **Sabba, F.**, Baidme, M., Wells, G., Wett, B., De Clippeleir, H., Chandran, K., Bott, C. (2019) Comparison of external carbon sources for a polishing partial denitrification/anammox MBBR. Proceedings of the Water Environment Federation, WEFTEC 2019, Chicago, IL (USA), vol. 8, pp. 56-63
- 09 Liou, H.-C., **Sabba, F.**, Wells, G., Balogun, O. (2019) Mechanical characterization of biofilms by optical coherence elastography (OCE) measurements of elastic waves, IEEE IUS International Ultrasonics Symposium, Glasgow, Scotland
- 08 Łagód, G., Piotrowicz, A., Gleń, P., Drewnowski, J., **Sabba, F.** (2019) Modelling of sequencing batch reactor operating at various aeration modes, MATEC Web of Conferences 252, 05013-05018
- 07 **Sabba, F.**, Picioreanu, C., Nerenberg, R. (2018) Modeling nitrous oxide (N<sub>2</sub>O) emissions from denitrifying filters (2018), 6<sup>th</sup> IWA/WEF Water Resource Recovery Modelling seminar (WRRmod2018), 10-14<sup>th</sup> March, Lac Beauport, Québec, Canada
- 06 **Sabba, F.**, Calhoun, J. (2017) Bench-scale comparison of a new mobile biofilm process and traditional IFAS technology, Abstracts of Papers of the American Chemical Society, 254<sup>th</sup> ACS National Meeting, Washington, DC (USA)
- 05 **Sabba, F.**, Calhoun, J. (2017) Treating refinery waste with a novel mobile biofilm process, Abstracts of Papers of the American Chemical Society, 254<sup>th</sup> ACS National Meeting, Washington, DC (USA)

- 04 **Sabba, F.**, Calhoun, J., Johnson, B.R., Daigger, G.T., Kovács, R., Takács, I., Boltz J. (2017) Applications of mobile carrier biofilm modelling for wastewater treatment processes, **Frontiers International Conference on Wastewater Treatment and Modelling**, pp 508-512 Lecture Notes in Civil Engineering, Vol 4. Springer
- 03 **Sabba F.**, Picioreanu C., Perez J., Nerenberg R. (2015) Modeling mechanisms of formation of nitrous oxide (N<sub>2</sub>O) in nitrifying and denitrifying biofilms. Proceedings of the Water Environment Federation, WEFTEC 2015, September 26 – 30, Chicago, IL (USA) 2015 vol. (6), pp. 4898-4904
- 02 Pavissich, J.P., Read-Daily, B.L., Sandberg, K., **Sabba F.**, Nerenberg R. (2012) Nitrous oxide (N<sub>2</sub>O) reduction by denitrifying bacteria: relating kinetics and gene expression. Proceedings of the Water Environment Federation, WEFTEC 2012, New Orleans, LA (USA)
- 01 Wang Y., Pavissich J.P., **Sabba F.**, Bott C., Nerenberg R. (2011) Elemental sulfur (S<sup>0</sup>) as a supplemental electron donor for wastewater denitrification. Proceedings of the Water Environment Federation, WEFTEC 2011, vol. (15), pp. 1590-1597

## INVITED TALKS

- 16 He, J., **Sabba, F.**, Dickinson, K. (2022) “Getting Published: WEF Author Workshop”, October 25<sup>th</sup>, *\*virtual presentation*
- 15 **Sabba, F.** (2021) “Nondestructive mechanical characterization of biofilms via Optical Coherence Elastography (OCE)”, USA National Committee - IWA, April 7<sup>th</sup>, United States *\*virtual presentation*
- 14 **Sabba, F.** (2021) “The role of biofilms in sustainable waste management”, University of North Carolina Wilmington, February 22<sup>nd</sup>, *\*virtual presentation*
- 13 **Sabba, F.** (2020) “The role of microbial biofilms in sustainable waste management”, Georgia Tech, January 23<sup>rd</sup>, Atlanta, GA
- 12 **Sabba, F.** (2019) “Nitrous oxide (N<sub>2</sub>O) emissions from biofilm processes and sustainable water management” Argonne National Laboratory, July 22<sup>nd</sup>, Lemont, IL
- 11 **Sabba, F.** (2019) “Unveiling mechanisms of nitrous oxide (N<sub>2</sub>O) emissions from biofilm systems”, Northeastern University, January 23<sup>rd</sup>, Boston, MA
- 10 **Sabba, F.** (2018) “Nitrous oxide (N<sub>2</sub>O) emissions from biofilm processes and sustainable water management”, June 18<sup>th</sup>, SUNY ESF, Syracuse, NY
- 09 **Sabba, F.** (2017) “Understanding mechanisms of nitrous oxide (N<sub>2</sub>O) emissions in biofilm systems”, Northwestern University, July 31<sup>st</sup>, Chicago, IL
- 08 **Sabba, F.** (2017) “Predicting nitrous oxide (N<sub>2</sub>O) emissions and denitrification fluxes in biofilm Systems”, University of Washington, July 13<sup>th</sup>, Seattle, WA
- 07 **Sabba, F.** (2017) “Biofilm carriers for wastewater treatment processes and mechanisms of nitrous oxide (N<sub>2</sub>O) formation in biofilm systems”, University of Maryland, June 27<sup>th</sup>, College Park, MD
- 06 **Sabba, F.** (2017) “Investigating mechanisms of nitrous oxide (N<sub>2</sub>O) formation in nitrifying and denitrifying biofilm systems”, Virginia Tech, February 24<sup>th</sup>, Blacksburg, VA
- 05 **Sabba, F.**, Nerenberg, R. (2016) “Mechanisms of nitrous oxide (N<sub>2</sub>O) formation in biofilm systems”, October 5<sup>th</sup>, National Research Council, Rome, Italy
- 04 **Sabba, F.**, Nerenberg, R. (2016) “Biofilms and mechanisms of nitrous oxide (N<sub>2</sub>O) formation”, October 4<sup>th</sup>, National Research Council, Bari, Italy
- 03 **Sabba, F.**, Picioreanu C., Nerenberg R. (2016) “Assessing nitrous oxide (N<sub>2</sub>O) emissions from biofilm systems”, January 5<sup>th</sup>, Lublin University of Technology, Lublin, Poland
- 02 **Sabba, F.**, Picioreanu C., Nerenberg R. (2016) “Predicting nitrous oxide (N<sub>2</sub>O) emissions from biofilm systems and comparison with suspended growth systems”, Polish Academy of Sciences (PAS), January 4<sup>th</sup>, Poland
- 01 **Sabba, F.**, Picioreanu C., Nerenberg R. (2015) “Nitrous Oxide (N<sub>2</sub>O) Emissions in suspended-growth and biofilm systems: a modeling study”, Marquette University, October 17<sup>th</sup>, Milwaukee, WI

## CONFERENCE PRESENTATIONS (\*presenting author)

- 35 Wang, Z., **Sabba, F.**, Candry, P., Godfrey, B., Winkler, M., Balogun\*, O., Wells, G. (2022) Optical coherence elastography demonstrates crosslinking conditions govern mechanical properties of the biofilm encapsulant polyvinyl alcohol-sodium alginate, IWA Processes in Biofilms: Fundamentals to Applications, December 6-8<sup>th</sup>, Phuket (Thailand)
- 34 **Sabba, F.\***, Downing, L., McNamara, P., Redmond, E., Ruff, C., Young, M. (2022) Tests Reveal Impact of Temperature on Nitrogen Removal in Post Aerobic Digestion-acclimated Biomass, WEFTEC, October 10-12<sup>th</sup>, New Orleans, LA (USA)
- 33 Bolognesi, S.\*, Cecconet, D., **Sabba, F.**, Capodaglio, A. (2021) Integrated experimental and modeling evaluation of removal efficiency and energy consumption for an autotrophic denitrifying biocathode – Oral presentation at EU-ISMET2021, September 13-15<sup>th</sup>, Girona (Spain)
- 32 Wang, Z., Liou\*, H-C, **Sabba, F.**, Wells, G., Balogun, O. (2020) Viscoelastic Characterization of Biofilms by Optical Coherence Elastography (OCE) – Oral presentation at IWA Biofilms 2020 Virtual Conference, December 7-9<sup>th</sup>, University of Notre Dame, IN, (USA)
- 31 **Sabba, F.\***, Gao, H., Wells, G. (2020) Coupling Nitrogen Removal with Phosphorus Recovery and Energy Production via Microbial N<sub>2</sub>O Generation from Granular Biofilms – Oral presentation at IWA Biofilms 2020 Virtual Conference, December 7-9<sup>th</sup>, University of Notre Dame, IN, (USA)
- 30 **Sabba, F.\***, Wang, Y., Bott, C., Nerenberg, R. (2019) Using kinetics and modeling to predict denitrification fluxes in elemental sulfur (S<sup>0</sup>) based biofilms - Oral presentation at WEFTEC 2019, September 23-25<sup>th</sup>, Chicago, IL (USA)
- 29 Roots, P.\*, **Sabba, F.**, Rosenthal, A., Wang, Y., Yuan, Q., Yang, F., Kozak, J., Zhang, H., Wells, G. (2019) Single-sludge shortcut N and biological P removal for sustainable mainstream wastewater treatment in temperate climates. WEF Nutrient Symposium, July 23-25<sup>th</sup>, Minneapolis, MN (USA)
- 28 Roots, P.\*, Yang, F., **Sabba, F.**, Rosenthal, A., Kozak, J., Zhang, H., Wells, G. (2019) Elucidating factors for the success or failure of biological phosphorus removal: a comparison between two lab-scale and one pilot/full-scale EBPR processes. WEF Nutrient Symposium, July 23-25<sup>th</sup>, Minneapolis, MN (USA)
- 27 **Sabba, F.**, Roots, P., Rosenthal, A., Wang, Y., Yuan, Q., Yang, F., Kozak, J., Zhang, H., Wells, G. (2019) Integrated shortcut nitrogen and biological phosphorus removal for sustainable mainstream wastewater treatment – Oral presentation at AEESP 2019, May 14–16<sup>th</sup>, Phoenix, AZ (USA)
- 26 **Sabba, F.\***, Wells, F. G. (2019) Assessing the effectiveness of the role of student moderator on confidence and learning in environmental engineering – Poster presentation, Learning and Teaching Spring Symposium, June 12<sup>th</sup>, Northwestern University, IL (USA)
- 25 Roots, P., Rosenthal, A., Wang, Y., Griffin, J., **Sabba, F.**, Yang, F., Kozak, J., Zhang, H., and Wells, G.\* (2018) Comammox Nitrospira dominate ammonia oxidation in a mainstream low dissolved oxygen nitrification reactor – Oral presentation at IWA NRR Conference, November 18-21<sup>st</sup>, Brisbane (Australia)
- 24 **Sabba, F.\***, Picioreanu, C., Nerenberg, R. (2018) Modeling nitrous oxide (N<sub>2</sub>O) emissions from denitrifying filters – Oral presentation at ecoSTP2018 Conference, June 25-27<sup>th</sup>, London (Canada)
- 23 **Sabba, F.\*** (2017) “Improving process control and nitrification of refinery wastewater with kenaf mobile bio-media” – Oral Presentation at WaterJAM 2017, September 11–14<sup>th</sup>, Hampton, VA (USA)
- 22 **Sabba, F.\*** (2017) “Treating refinery waste with a novel biofilm process” – Oral Presentation at ACS 2017 – Biofilm Session, August 20–24<sup>th</sup>, Washington D.C., District of Columbia (USA)
- 21 **Sabba, F.\***, Calhoun, J. (2017) “New mobile biofilm process and traditional integrated fixed film activated sludge (IFAS) technology” – Poster Presentation at AEESP 2017, June 20-22<sup>nd</sup>, Ann Arbor, MI (USA)
- 20 **Sabba, F.\***, Calhoun, J. Boltz, J. (2017) “Applications of mobile carrier biofilm modelling for wastewater treatment processes” – Oral Presentation at FICWTM2017, May 21-24<sup>th</sup>, Palermo, (Italy)
- 19 **Sabba, F.\***, Calhoun, J. (2017) “Improved process control and increased nitrification efficiency of refinery wastewater with mobile bio-media (kenaf)” – Oral Presentation at Biofilm 2017, May 9 -12<sup>th</sup>, Dublin, (Ireland)

- 18 **Sabba, F.\***, Calhoun, J. (2017) “NUVODA’s MOB process reduces biological inhibition, improves BOD, and nutrient removal at Homestead Dairy (Wirtz, VA)” – Poster Presentation at Food and Beverage Environmental Conference 2017, March 26-30<sup>th</sup>, Charleston, SC (USA)
- 17 **Sabba, F.\***, Picioreanu, C., Boltz, J., Nerenberg, R. (2016) “N<sub>2</sub>O emissions from biofilm systems during simultaneous nitrification and denitrification (SND): a modelling study” – Oral Presentation at WEFTEC 2016, September 24-28<sup>th</sup>, New Orleans, LA (USA)
- 16 **Sabba, F.\***, Picioreanu, C., Nerenberg, R. (2016) “Mechanisms of nitrous oxide (N<sub>2</sub>O) formation in heterotrophic and nitrifying biofilms: a modeling study” – Oral Presentation at MEWE 2016, September 4-7<sup>th</sup>, Copenhagen, (Denmark)
- 15 **Sabba, F.\***, Picioreanu, C. Boltz, J.P., Nerenberg, R. (2016) “Nitrous oxide (N<sub>2</sub>O) emissions from biofilm systems during simultaneous nitrification and denitrification (SND): a modelling study” – Oral Presentation at ecoSTP 2016, June 27-30<sup>th</sup>, Cambridge, (United Kingdom)
- 14 **Sabba, F.\***, Nerenberg, R. (2016) “Mechanisms of N<sub>2</sub>O emissions in biofilm systems” – Oral Presentation at 8<sup>th</sup> GSU Research Symposium, April 19<sup>th</sup>, Notre Dame, IN (USA)
- 13 **Sabba, F.\***, Picioreanu, C., Boltz, J., Nerenberg, R. (2016) “Predicting N<sub>2</sub>O emissions from biofilm systems” – Oral Presentation at 5<sup>th</sup> IWA/WEF Wastewater Treatment Modelling Seminar, April 2-6<sup>th</sup>, Annecy (France)
- 12 **Sabba, F.\***, Nerenberg, R. (2015) “Minimizing nitrous oxide (N<sub>2</sub>O) emissions from wastewater treatment” – Oral Presentation at IWEA 2015, November 20<sup>th</sup>, Indianapolis, IN (USA)
- 11 **Sabba, F.\***, Nerenberg, R. (2015) “GHG emissions in BNR processes: a trade-off between oxygen and N<sub>2</sub>O emissions” – Oral Presentation at ND Energy Seminar Series 2015, November 18<sup>th</sup>, Notre Dame, IN (USA)
- 10 **Sabba, F.\***, Picioreanu, C., Perez, J., Nerenberg, R. (2015) “Hydroxylamine diffusion can enhance N<sub>2</sub>O emissions in nitrifying biofilms: a modeling study” – Poster Presentation at Emerging Contaminants Workshop 2015, October 21<sup>st</sup>, Milwaukee, WI (USA)
- 09 **Sabba, F.\***, Picioreanu, C., Perez, J., Nerenberg, R. (2015) “Predicting nitrous oxide (N<sub>2</sub>O) emissions from biofilm systems” – Oral presentation at WEFTEC 2015, September 26-30<sup>th</sup>, Chicago, IL (USA)
- 08 **Sabba, F.\***, Picioreanu, C., Perez, J., Nerenberg, R. (2015) “Predicting nitrous oxide (N<sub>2</sub>O) emissions from biofilm systems” – Poster Presentation at AEESP Conference 2015, Yale University, June 13-17<sup>th</sup>, New Haven, CT (USA)
- 07 **Sabba, F.\***, Picioreanu, C., Perez, J., Nerenberg, R. (2015) “Nitrous oxide (N<sub>2</sub>O) emissions in suspended-growth and biofilm systems: a modeling study” – Oral Presentation at IWA-NNR 2015 Conference, May 18-21<sup>st</sup>, Gdansk (Poland)
- 06 **Sabba, F.\***, Nerenberg, R. (2014) “Sulfite (SO<sub>3</sub><sup>2-</sup>/HSO<sub>3</sub><sup>-</sup>) as electron donor for denitrification” - Poster Presentation at Borchardt Conference 2014, February 25-26<sup>th</sup>, Ann Arbor, MI (USA)
- 05 **Sabba, F.\***, Picioreanu, C., Perez, J., Nerenberg, R. (2014) “Hydroxylamine diffusion can enhance N<sub>2</sub>O emissions in nitrifying biofilms: a modeling Study” – Poster Presentation at Emerging Contaminants Workshop 2014, October 21-22<sup>nd</sup>, Milwaukee, WI (USA)
- 04 Nerenberg R.\*, **Sabba, F.**, Picioreanu C., Read-Daily B. (2014) “Predicting nitrous oxide (N<sub>2</sub>O) emissions from suspended-growth and biofilm systems.” IWA Specialist Conference - Global Challenges: Sustainable Wastewater Treatment and Resource Recovery, 26-30<sup>th</sup> October 2014, Kathmandu (Nepal)
- 03 **Sabba, F.\***, Nerenberg R. (2013) “Sulfite (SO<sub>3</sub><sup>2-</sup>/HSO<sub>3</sub><sup>-</sup>) as electron donor for denitrification” - Poster Presentation at AEESP Conference 2013, July 14-16<sup>th</sup>, Golden, CO (USA)
- 02 Pavissich, J.P., Read-Daily, B.L., Sandberg, K., **Sabba F.**, Nerenberg R.\* (2012) “Nitrous oxide (N<sub>2</sub>O) reduction by denitrifying bacteria: relating kinetics and gene expression.” Proceedings of the Water Environment Federation, WEFTEC 2012, September 29<sup>th</sup> - October 3<sup>rd</sup> New Orleans, LA (USA)
- 01 Wang Y.\*, Pavissich J.P., **Sabba F.**, Bott C., Nerenberg R. (2011) “Elemental sulfur (S<sup>0</sup>) as a supplemental electron donor for wastewater denitrification.” Proceedings of the Water Environment Federation, WEFTEC 2011, pp. 1590-1597(8), October 15-19<sup>th</sup>, Los Angeles, CA (USA)



## PROFESSIONAL SERVICE AND AFFILIATIONS

Editor	<i>Biodegradation</i>	2022
Social Media Editor	<i>Water Environment Research (WER)</i>	2022
Early Career Editor	<i>Water Environment Research (WER)</i>	2022
AEESP-SPSC Chair	Chair of the Student Postdoc Service Committee (SPSC) in the Association of Environmental Engineers and Science Professors (AEESP)	Since 2019
ASN 08/A2	Italian National Scientific Habilitation 08/A2	2021
Review Editor	<i>Frontiers in Microbiology, Frontiers in Bioengineering and Biotechnology and Frontiers in Environmental Science</i>	2020
Editor	<i>Water Science &amp; Technology (WS&amp;T)</i>	2019
Committee Member	Center for the Integration of Research, Teaching, and Learning (CIRTL) Northwestern Steering Committee	2019
Ad-hoc Proposal Reviewer	Proposal reviewer for Pennsylvania Sea Grant (PSG), by invitation from Pennsylvania Sea Grant College Program	2019
Ad-hoc Proposal Reviewer	Proposal reviewer for PRELUDIUM, by invitation from National Science Center, Poland	2015
AEESP-SSC Vice-Chair	Vice-Chair of Student Service Committee (SSC) in the Association of Environmental Engineers and Science Professors (AEESP)	Since 2019
AEESP-SSC Secretary Member	Secretary of Student Service Committee (SSC) in the Association of Environmental Engineers and Science Professors (AEESP)	2013-2018
Member	International Water Association (IWA)	Since 2016
Member	American Water Resources Association (AWRA)	2015-2017
Member	Air and Waste Management Association (A&WMA)	2015-2017
Member	Water Environmental Federation (WEF) – Serving as a member of the Student Young Professional Committee (SYPC)	2014-2018
Member	American Water Works Association (AWWA)	2013-2018
Member	American Academy of Environmental Engineers and Scientists (AAEES)	2013-2018
Member	Indiana Water Environment Association (IWEA)	2013 - 2016
Journal Reviewer	<i>Environmental Science &amp; Technology, Water Research, Journal of Hazardous Materials, Environmental Research, Science of the Total Environment, Water Science &amp; Technology, International Journal of Environmental Science and Technology, ACS Sustainable Chemistry &amp; Engineering, Water, Environmental Science: Water Research &amp; Technology, Nature Scientific Reports</i>	Since 2011

## CONFERENCE ORGANIZATION, WORKSHOPS AND PANELS

Scientific Committee	EcoSTP2021 Conference, Milano (Italy)	2021
Organizing Committee	IWA Biofilms 2020 Virtual Conference, University of Notre Dame, IN, USA	2020
Scientific Committee	Water Resource Recovery Modeling Conference (WRR2020), Arosa, Switzerland	2020
Scientific Committee	International Conference of Computational Methods in Engineering Science (CMES), Poland	2019
Conference co-moderator	Co-moderator at WEFTEC Conference, September 23 <sup>rd</sup> -25 <sup>th</sup> , Chicago, IL	2019
Workshop	Invited speaker for oral presentation at WEFTEC Workshop in “Greenhouse Gases Emissions Accounting”, September 21 <sup>st</sup> , Chicago, IL	2019
Workshop	Biofilms Hands-On Workshop, University of Notre Dame, IN, USA	2019
Workshop	Invited speaker for oral presentation at ecoSTP2018 Workshop in “Advances in System Microbiology to Inform Modeling and Operation of Nutrient Recovery and Removal Processes”	2018
Workshop	NSF – Biofilm Mechanical Properties Workshop, University of Notre Dame, IN, USA	2018
Scientific committee	EcoSTP2018 Conference, London (Ontario), Canada	2017
Event organizer	Member of the AEESP Student Service Committee (SSC) that organizes workshops at AEESP Conferences for students pursuing positions in academia	Since 2013
Event organizer	“Greenhouse Gases Awareness Day”, April 14 <sup>th</sup> , Notre Dame, IN	2016
K-12 Judge	K-12 judge at the 2014 and 2015 Northern Indiana Regional Science and Engineering Fair	2014 - 2016
International Ambassador	International Ambassador (I.A.) for University of Notre Dame	2013 - 2016
Workshop	Emerging Contaminants Workshop, October 21-22 <sup>th</sup> , Milwaukee, WI	2014
Workshop	MOTHUR microbial ecology analysis program Workshop, August 26-28 <sup>th</sup> , Detroit, MI	2013