Jacob R. Price, Ph.D. Candidate, M.S.
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https://jacobrprice.github.io/

EDUCATION

Ph.D. Environmental Engineering **exp. 2018**
Drexel University, Philadelphia, PA

M.S. Environmental Engineering, Certificate in Stormwater Management 2013
Temple University, Philadelphia, PA

Pennsylvania State University, University Park, PA 2007
B.S. Mathematics, Statistics Minor

RESEARCH EXPERIENCE

Research Assistant 2013 – Present
Department of Civil, Architectural, and Environmental Engineering
Drexel University, Philadelphia, PA
Advisor: Christopher M. Sales, Ph.D.

- Adapted the High Density Bioreactor (HDBR) to function as a photobioreactor (PBR)
- Examined bioremediation and resource recovery from synthetic secondary wastewater at the laboratory scale
- Investigated the interactions connecting oxidized and reduced nitrogen and organic carbon transformations
- Demonstrated the driving nutrient forces underlying changes in microbial community composition within PBRs
- Explored the impact of wastewater effluent on microbial diversity and community structure within effluent receiving streams
- Generated nucleic acid products for sequencing on Sanger, Illumina, and PacBio SMRT Cell technologies
- Developed or optimized molecular methods for use with the specific sample types found within the Sales Laboratory

Research Assistant 2010 – 2013
Department of Civil and Environmental Engineering
Temple University, Philadelphia, PA
Advisor: Michel C. Boufadel, Ph.D., P.E.

- Evaluated the efficacy of treating recalcitrant oil found within beaches as a result of the Exxon Valdez Oil Spill with modified subsurface nutrient injection techniques
- Provided independent observational reports to the United States Coast Guard in response to the British Petroleum Deepwater Horizon Oil Spill
- Assessed the nutrient and chemical composition of river and pore-water in the Delaware River shorelines
- Led and participated in equipment installation and sample collection from remote sites including those found in Prince William Sound and along the Gulf of Mexico coast
- Carried out Most Probable Number (MPN) analysis to quantify the abundance of polycyclic aromatic hydrocarbon degraders, alkane degraders, and total heterotrophs within oil-contaminated sediments
- Supervised a team of graduate and undergraduate students in the analysis of nutrient and chemical analysis of water and sediment samples for several studies investigating
  - Biodegradation of Dispersed Alaska North Slope Crude Oil
  - British Petroleum Deepwater Horizon Oil Spill
  - Delaware River Basin Commission Nutrient Characterization

Technical Advisor 2013
Center for Natural Resource Development and Protection
Department of Civil and Environmental Engineering
New Jersey Institute of Technology, Newark, NJ
Advisor: Michel C. Boufadel, Ph.D., P.E.

- Assisted in moving NRDP laboratory equipment from Temple University to the New Jersey Institute of Technology
- Packaging, transportation, installation, function checking laboratory instruments
- Trained graduate students on instrument operation
- Advised on laboratory methods and safety procedures

HONORS, AWARDS, & FELLOWSHIPS

International Society for Microbial Ecology Travel Grant 2016
2016 meeting of the International Society for Microbial Ecology
Montreal, Quebec, Canada

The Claudio Elia Memorial Fellowship 2015-2016
Drexel University, Philadelphia, PA

Graduate Assistance in Areas of National Need (GAANN) 2014-2015
Grand Challenges Fellowship
Drexel University, Philadelphia, PA

The Koerner Family Award in Civil, Architectural, and Environmental Engineering 2014-2015
Drexel University, Philadelphia, PA

Scientists as Teachers; Teachers as Scientists Graduate Fellowship 2012-2013
National Science Foundation Award Number 0841377
Temple University, Philadelphia, PA

PEER-REVIEWED PUBLICATIONS

1. **Price, J.R.**, and C.M. Sales. 2018. Nutrient availability can drive both deterministic and divergent responses in microbial community composition within engineered ecosystems. **(In Preparation)**
2. **Price, J.R.**, and C.M. Sales. 2018. Integrative predictions of major nutrient fluxes enables modeling of community kinetics within a mixed microbial community. **(In Preparation)**
3. **Nan, Y.* & Price, J.R.***, Wang, Y., Cheng, M., Keshani Langroodi, S., Woloszynek, S., Rosen, G.L., and C.M. Sales. 2018. Evidence of predation and parasitism affecting EBPR performance through microbial community instability. **(In Preparation)**
4. **Price, J.R.**, Ledford, S.L., Ryan, M.O., Toran, L., and C.M. Sales. 2018. Wastewater treatment plant effluent introduces recoverable shifts in microbial community composition in receiving streams. *Sci Tot Environ*. doi: 10.1016/j.scitotenv.2017.09.162
5. Sniffen, K.D., **Price, J.R.**, Sales, C.M., and M.S. Olson. 2017. Influence of scale on biomass growth and nutrient removal in an algal-bacterial leachate treatment system. *Environ. Sci. Technol.* doi:10.1021/acs.est.7b03975

6. **Price, J.R.**, Keshani Langroodi, S., Lan, Y., Becker, J.M., Shieh, W.K., Rosen, G.L., and C.M. Sales. 2016. Untangling the microbial ecosystem and kinetics in a nitrogen removing photosynthetic high density bioreactor. *Environ. Sci.: Water Res. Technol*. doi: 10.1039/C6EW00078A
7. **Price, J.R.**, Shieh, W.K., and C.M. Sales. 2015. A Novel Bioreactor for High Density Cultivation of Diverse Microbial Communities. *J. Vis. Exp.* (106), e53443, doi:10.3791/53443

* indicates co-first authorship

ORAL PRESENTATIONS

1. **Price, J.R.** and C.M. Sales. 2018. Examining nutrient uptake and transformation within photosynthetic microbial communities using a high density bioreactor. 255th American Chemical Society National Meeting. New Orleans, La.
2. **Price, J.R.**, Ledford, S.H., Ryan, M.O., Toran, L., and C.M. Sales. 2017. The impact of wastewater treatment plant effluent on the composition of microbial communities within receiving streams. Delaware Watershed Research Conference 2017. Philadelphia, PA.
3. Sales, C.M., **Price, J.R.**, and S. Keshani Langroodi. 2017. Tools from molecular ecology provide an augmentative approach to understanding engineered and natural systems. Philadelphia Symposium on Cross-Disciplinary Analytical Approaches. Philadelphia, PA.
4. Ledford, S.H., **Price, J.R.**, Ryan, M., Perez, L. B., Sales, C.M., and L. Toran. 2016. Using multi-parameter biogeological approach to track the impact of treated sewage discharge on urban streams. 2016 Annual Meeting of the Geological Society of America. Denver, CO.
5. **Price, J.R.** and C.M. Sales. 2015. Microalgae: Harnessing Diverse Metabolisms for Environmental Remediation and Waste Stream Treatment. 2015 Annual Meeting of the Phycological Society of America. Philadelphia, PA.

POSTER PRESENTATIONS

1. **Price, J.R.**, Ledford, S.H., Ryan, M.O., Toran, L., and C.M. Sales. 2017. Wastewater treatment plant effluent introduces recoverable shifts in microbial community composition in urban streams. 2017 Fall meeting of the American Geophysical Union. New Orleans, LA.
2. **Price, J.R.** and C.M. Sales. 2017. Linking ecological aspects to photobioreactor operation and performance. 2017 Annual Meeting of The American Society for Microbiology. New Orleans, LA.
3. **Price, J.R.** and C.M. Sales. 2016. Resolving the relationships between photobioreactor influent, microbial diversity and abundance, and reactor performance within a high density bioreactor. 2016 Meeting of The International Society for Microbial Ecology. Montreal, Canada.
4. Navin, D.V., **Price, J.R.**, and C.M. Sales. 2016. The influence of fluid shear on settling of algal biomass within a high density bioreactor. Hess Undergraduate Scholars Research. Philadelphia, PA.
5. **Price, J.R.**, Shieh, W.K., and C.M. Sales. 2015. A Novel Photobioreactor for Studying Nitrogen Utilization and Transformation by a Mixed Community of Algae and Bacteria Grown at High Cell Densities. Annual Meeting of the Association of Environmental Engineering & Science Professors. New Haven, CT.

6. **Price, J.R.**, Shieh, W.K., and C.M. Sales. 2015. Consumption and Conversion of Nitrogen Species by a Mixed Photosynthetic Community within a High Density Bioreactor. Drexel University Research Day. Philadelphia, PA.
7. **Price, J.R.**, Shieh, W.K., and C.M. Sales. 2015. Nitrogen Removal Dynamics by a Photosynthetic Microbial Community Under High Cell Densities. Annual Meeting of the American Waste Water Association – Pennsylvania Section. Hershey, PA.
8. **Price, J.R.**, and M.C. Boufadel. 2012. The kidney roles of the Delaware River shorelines. Schuylkill Watershed Congress. Pottstown, PA.
9. **Price, J.R.**, Smith, T., and M.C. Boufadel. 2011. The kidney roles of the Delaware River shorelines: Experimental Design. Temple University College of Engineering Research Day and Poster Competition. Philadelphia, PA.

BOOK CHAPTERS

1. Woloszynek, S., Zhao, Z., Ditzler, G., **Price, J.R.**, Reichenberger, E., Lan, Y., Chen, J., Earl, J., Keshani Langroodi, S., Ehrlich, G., and G.L. Rosen. 2018. "Analysis Methods for Shotgun Metagenomics". Theoretical and Applied Aspects of Systems Biology. Publisher: Springer. Editors: da Silva, F.A.B., Carels, N., and F.P. Silva. **(In Review)**

NON-PEER-REVIEWED & TECHNICAL PUBLICATIONS

1. **Price, J.R.**, Woloszynek, S., Rosen, G.L., and C.M. Sales. 2017. theseus - An R package for the analysis and visualization of microbial community data. R package. URL: https://cran.r-project.org/web/packages/theseus/
2. **Price, J.R.**, Thompson, T.J., Parish, J. 2015. Automated Parsing of a LabSolutions Batch Results File (ASCII Output) When Using a Spreadsheet or Statistical Package to Summarize Data. Technical Note. Shimadzu Scientific Instruments. doi: 10.13140/RG.2.1.2746.3447.

THESES

1. **J.R. Price.** 2018. Linking complex kinetics and molecular ecology dynamics within a photosynthetic mixed community. Drexel University, Philadelphia, PA. Advisor: Christopher M. Sales. **(In Progress)**
2. **J.R. Price.** 2013. The effects of urbanization on stream channel morphology in southeastern Pennsylvania. Temple University, Philadelphia, PA. Advisor: Robert J. Ryan.

TEACHING EXPERIENCE

Teaching Assistant, Drexel University, Philadelphia, PA

Engineering Process Lab I & II	2014 – 2017
Introduction to Infrastructure Engineering	2014
Groundwater Remediation	2014
Hydraulics	2013 – 2014
Hydrology	2013

Teaching Assistant, Temple University, Philadelphia, PA

Introduction to Engineering	2012
Probability, Statistics, and the Stochastic Method	2011
Mechanics of Fluids	2011

Graduate Fellow, Scientists as Teachers – Teachers as Scientists

Temple University and W.B. Saul Agricultural High School	2012-2013

MENTORING EXPERIENCE

Undergraduate Students

Shannon Belfield (BS ENVE exp. 2021, Drexel University) Drexel STAR Scholars	2017
Daniel Navin (BS ME 2017, Drexel University) Hess Undergraduate Research Scholarship Program	2016
Marina D'Sousa (BS ENVE exp. 2020, Drexel University) Drexel STAR Scholars Freshman Design Project	2016
Fatima Hassan (BS ENVE exp. 2020, Drexel University) Freshman Design Project	2016
Jonas Becker (BS BIO, 2016, Hochschule Bremen, Germany) International Co-op Program	2015 – 2016
Thomas Thompson (BS/MS ENVE 2016, Drexel University) Undergraduate Research Co-op	2015
Aspen Walker (BS/MS ENVE 2015, The University of Pennsylvania) Undergraduate Volunteer	2014-2015

High School Students

Hasan Talouli Franklin Institute STEM Scholars	2016
Bafode Keita Franklin Institute STEM Scholars	2016
Semir Ibrahim Franklin Institute STEM Scholars	2015
Kayin Bankole	2014

Franklin Institute STEM Scholars

OTHER EXPERIENCE

Data Analyst 2009 – 2010
Arkema Incorporated, Philadelphia, PA

Actuarial (Intern followed by) Technician 2006 – 2009
Penn Mutual Life Insurance Company, Horsham, PA

PROFESSIONAL ACTIVITIES

Associations and Memberships

American Association for the Advancement of Science (AAAS)
American Chemical Society (ACS)
Association of Environmental Engineering and Science Professionals (AEESP)
American Geophysical Union (AGU)
American Society for Microbiology (ASM)
American Water Resources Association (AWRA)
American Water Works Association (AWWA)
International Society for Microbial Ecology (ISME)

Community Service and Outreach

Drexel University Point of Contact 2017
Northeast Graduate Student Water Symposium

Ambassador 2015 – Present
ReadCube Ambassador Program

Advising Panelist and Task Force Member 2014 - 2015
Watershed Action Through Engineered Response (W.A.T.E.R.)
W.B. Saul High School of Agricultural Sciences

Ad hoc Outreach Presentations

1. Sales, C.M., **Price, J.R.,** Hamilton, K., Rackes, A., and L. Perez. 2016. Environmental Engineering Workshop. Franklin Institute STEM Scholars. Franklin Institute, Philadelphia, PA.
2. **J.R. Price**. 2015. Potential Uses of Algae in Wastewater Treatment. Gwynedd-Mercy Academy. Ambler, PA.
3. **J.R. Price**. 2013. Investigation of Algal Communities. Walter Biddle Saul Agricultural High School. Philadelphia, PA.