

Postdoctoral Associate
Cornell University
Department of Ecology and Evolutionary Biology
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Stable Isotope and Organic Geochemist, Biogeochemist, and Sedimentary Geologist

Specializing in Carbon and Nitrogen isotopes of organic archives, lipid derived biomarkers, the nutrient dynamics of stratified aquatic basins, and the evolution of the C, N and S cycles through Earth History. Currently working on Phosphate and Methane cycling in subtropical pasturelands.

EDUCATION:**Ph. D. Earth Sciences, Syracuse University - December 2018**

Dissertation: Characterizing ancient chemoclines through the use of pigment biomarkers and sedimentary stable isotope signatures

Advisor: Dr. Christopher Junium

B.Sc. Chemistry, McGill University - May 2013**ACADEMIC APPOINTMENTS:****Postdoctoral Associate**

- Cornell University 2023 - Present
Department of Ecology and Evolutionary Biology
Advisor: Dr. Jed Sparks
- Massachusetts Institute of Technology 2019 - 2023
Department of Earth, Atmosphere, and Planetary Sciences
Advisor: Dr. Roger Summons

Postdoctoral Laboratory Technician

2019

- Syracuse University Department of Earth Sciences
Advisor: Dr. Christopher Junium

Visiting Assistant Teaching Professor

2018

- Syracuse University Department of Earth Sciences

Part Time Instructor

2018

- Syracuse University Department of Earth Sciences

PUBLICATIONS:

- [11] **Uveges, B.T.** and Pearson, A. 2023
Ammonium “nutrient capacitor” model for $\delta^{15}\text{N}$ signatures associated with marine anoxic events. – *Geology*.
<https://doi.org/10.1130/G51527.1>
- [10] **Uveges B.T.**, Izon, G., Ono, S., Beukes, N., Summons, R.E. 2023
Reconciling discrepant minor sulphur isotope records of the Great Oxidation Event – *Nature Communications*.
<https://www.nature.com/articles/s41467-023-35820-w>
- [9] Izon, G., Luo, G., **Uveges B.T.**, Beukes, N., Kitajima, K., Ono, S., Valley, J., Ma, X., Summons, R.E. 2022
Bulk and Grain-Scale Minor Sulfur Isotope Data Reveal Complexities in the Dynamics of Earth’s Oxygenation – *PNAS*.
<https://doi.org/10.1073/pnas.2025606119>
- [8] Ma, J.; Wu C., **Uveges B.T.**, Ding, W., Cui, X, Summons, R.E. 2022
Biomarkers reveal Eocene marine incursions into the Qaidam Basin, north Tibetan Plateau – *Organic Geochemistry*.
<https://doi.org/10.1016/j.orggeochem.2022.104380>
- [7] Cohen, P.A., Junium, C.K., Phillips, Z.K., **Uveges, B.T.** 2021
Carbon cycle dynamics and ecology revealed by the carbon isotopic composition of single organic microfossils during the Late Devonian Biotic Crisis. – *Geobiology*
<https://onlinelibrary.wiley.com/doi/epdf/10.1111/gbi.12482>
- [6] Das, S., Judd E.J., **Uveges B.T.**, Ivany, L.C., Junium, C.K., 2020
Variation in $\delta^{15}\text{N}$ from shell-associated organic matter in modern bivalves: Implications for trophic studies of fossil ecosystems – *Palaeogeography, Palaeoclimatology, Palaeoecology*.
<https://doi.org/10.1016/j.palaeo.2020.110076>
- [5] **Uveges, B.T.**, Junium, C.K., Scholz, C.A., Fulton, J.M. 2020
Chemocline collapse in Lake Kivu as an analogue for nitrogen cycling during Oceanic Anoxic events. – *Earth and Planetary Science Letters*
<https://doi.org/10.1016/j.epsl.2020.116459>
- [4] Judd, E.J., Ivany, L.C., DeConto, R.M., Halberstadt, A.R.W., Miklus, N.M., Junium, C.K., **Uveges, B.T.** 2019
Seasonally resolved proxy data from the Antarctic Peninsula support a heterogeneous middle Eocene Southern Ocean. – *Paleoceanography and Paleoclimatology*.
<https://doi.org/10.1029/2019PA003581>

- [3] **Uveges, B.T.**, Junium, C.K., Boyer, D.L., Cohen, P.A., Day, J.E. 2019
Biogeochemical controls on black shale deposition during the Frasnian-Famennian biotic crisis in the Illinois and Appalachian Basins, USA, inferred from stable isotopes of nitrogen and carbon, – *Palaeogeography, Palaeoclimatology, Palaeoecology*. Volume 531, Part A, 2019, 108787 ISSN 0031-0182,
<https://doi.org/10.1016/j.palaeo.2018.05.031>
- [2] **Uveges, B.T.**, Junium, C.K., Teece, M.A., Fulton, J.M. 2018
Environmental controls on pigment distributions in the freshwater microbialites of Fayetteville Green Lake. – *Organic Geochemistry* Volume 125, Pages 165-176
<https://doi.org/10.1016/j.orggeochem.2018.08.012>
- [1] Junium, C.K., Dickson, A.J., **Uveges, B.T.** 2018
Perturbation to the Nitrogen Cycle During Rapid Early Eocene Global Warming, – *Nature Communications* 9, 3186.
<https://doi.org/10.1038/s41467-018-05486-w>

Published R Packages:

- Uveges, B.T.** 2022
WrensBookshelf: A Collection of Palettes and Some Functions to Help Use Them.
R package version 0.1.0. <https://CRAN.R-project.org/package=WrensBookshelf>
Development version: <https://github.com/buveges/WrensBookshelf>

Published abstracts can be found at the end of this document

INVITED TALKS AND SEMINARS:

- The Agouron Institute International Geobiology Course 2023
- Dartmouth Earth Sciences Department Winter Seminar Series 2023
- NASA Astrobiology PCE₃ Seminar Series 2021

HONORS AND AWARDS:

- Syracuse University Doctoral Dissertation Prize 2019
 - Awarded by the Syracuse University Graduate School in recognition of superior achievement in completed dissertations
- Vincent E. McKelvey Scholarship 2018
 - For Outstanding Academic Achievement in Earth Sciences
- Syracuse University Earth Science Department Chairs Award 2015
 - Award made in recognition of outstanding service to the department and professional promise

GRANTS AND FELLOWSHIPS:

Simons Collaboration on the Origins of Life (SCOL): Equipment, Instrumentation & Field Work, and Collaborative Studies. *Funding Award Number: 874698 (\$119,000)* 2021

UNOLS Chief Scientist Training Cruise Program (**\$1500**) 2016

Syracuse University Graduate Fellowship (**Four years of full PhD funding**) 2013 - 2018

RESEARCH EXPERIENCE:

Postdoctoral Research Associate 2023-Present

- The Sparks Lab/COIL at Cornell University
 - Uranium concentrations and isotopic ratios in agricultural soils
 - EA-IRMS analyses of C and N isotopes
 - PICARRO isotope analyses of carbon in methane

Postdoctoral Research Associate 2019 – 2023

- The Summons Lab at the Massachusetts Institute of Technology
 - Principle operator and technician of EA-IRMS system
 - MAT-253 GC-C-IRMS (compound specific isotope analyses)
 - Focused on analyses of Archean-Paleoproterozoic sedimentary rocks and kerogens
 - Assisted with upkeep and maintenance of HPLC-MS system
 - Have utilized a range of GC-MS instrumentation in the Summons lab (Pyroprobe, MSD, QQQ-MS etc).

Postdoctoral Laboratory Technician 2019

- Syracuse University Geobiology, Astrobiology, Paleoclimate, Paleoceanography (SU-GAPP) Lab
 - Responsible for operation and maintenance of instrumentation and assistance with general science applications and data collection
 - This included nano-EA-IRMS and uHPLC-MS instrumentation
 - Assisted with sample acquisition including:
 - Lake water samples for isotope biomarker analysis
 - Shipboard and ice platform lake sediment core acquisition

Graduate Research Assistant 2015-2017

- SU-GAPP Lab.
 - General laboratory assistant

Instrumental and Coding Expertise:

Overall, I have extensive experience in repairing, maintaining, and augmenting scientific instrumentation, particularly mass spectrometers. Detailed below are select models that I have/am currently working with.

- Isoprime 100, and Thermo-Finnegan Delta Plus XP Isotope Ratio Mass Spectrometers (**IRMS**)
- Elementar Vario Isotope Cube, and Fisons NC1000 Elemental Analyzers (**EA**)
- **Nano-EA-IRMS** coupled system modified for nanomolar N and C isotope measurements
- NA-Fisons **EA**
- Thermo Scientific Ultimate 3000 High Performance Liquid Chromatography system (**HPLC**) with UV-Vis diode array detector (**DAD**)
- Thermo Scientific LCQ Fleet Liquid Chromatography Mass Spectrometer (**LC-MS**)
- McLane WTS-LV Filtration System – Received training at McLane in Woods Hole, MA
- Proficient in data analysis and visualization using R, and the Tidyverse family of packages among others

Selection of Field Work and Sample Collection Experience

American Museum of Natural History (AMNH) 2022

- Co-led planning and execution of sampling campaign targeting sedimentary rock cores housed at the AMNH.
- Cores were drilled by the Agouron Geobiology Institute, targeting the Great Oxidation Event in the Kaapvaal Craton of South Africa.
- Sampling was designed for targeted multiple sulfur isotope measurements by SIMS, and for Re-Os geochronology.

American Museum of Natural History 2020

- Assisted with the cataloging and transfer of drill cores from their shipping cases into museum storage boxes and racks.
- Cores were drilled by the Agouron Geobiology Institute, targeting the Great Oxidation Event in the Kaapvaal Craton of South Africa.

KT Boundary Sampling on the Mullinax Family Brazos Rose Ranch – Texas 2019

- Member of field team focused on sampling of Upper Cretaceous and lower Paleogene sediments exposed along the Brazos River and its tributaries in Falls County, Texas

Water Column Sampling of Glacier Lake – Fayetteville NY 2019

- Water column sampling and sonde redox profiling of a meromictic lake to assess carbon and sulfur cycling dynamics.

Ice Platform Sediment Core Collection – Oneida Lake NY 2019

- Assisted with the collection of sediment cores from Oneida lake to explore local Holocene climate history.
- Cores were collected from an ice-anchored coring rig near the center of the lake.

Shipboard Scientist 2016

- R/V Blue Heron: University National Oceanographic Laboratory System (UNOLS) Chief Scientist Training Cruise
 - BH16-09 Leg 2 on Lake Michigan
 - Focus: Organic Geochemistry and Sedimentology

High Resolution Sampling of the Frasnian-Famennian Biotic Crisis 2015

- Led the planning and execution of field campaign to collect a high-resolution sample set from the Walnut Creek outcropping of the Late Devonian Kellwasser Events and surrounding shale intervals in Silver Creek, NY.

Alden Shale Sample Collection 2014

- Co-led trip to sample concretions from an outcrop of the Alden shale in Western NY.

Sampling the Kellwasser Event Shales Across a Spatial Gradient 2014

- Participated in sampling expedition to collect shales from various outcroppings of the Kellwasser Events (Frasnian-Famennian Biotic Crisis) across Western NY (Beaver Meadow Creek, Irish Gulf, Walnut Creek and Pt. Gatriot).

SERVICE:

Reviewer of manuscripts and proposals for:

- *GSA Bulletin*
- *NASA Exobiology Program – External Reviewer*
- *ASP Lewis and Clark Fellowships*
- *Rapid Communications in Mass Spectrometry*
- *Science Advances*
- *NASA – Mars Sample Lander – Participating Scientist Program*
- *Geobiology*
- *Earth and Planetary Science Letters (EPSL)*
- *Geology*
- *PloS one*
- *Island Arc*
- *Journal of Marine and Petroleum Geology*
- *Organic Geochemistry*

Other Service:

John M. Hayes Award Committee member (three-year term) 2023
Member/contributor of the MIT U.R.G.E pod 2020 - 2021
President of SU department Geology Club 2015 - 2017
Organizer of Central New York Earth Science Student Symposium (CNYESSS) 2015 - 2017

TEACHING/MENTORING EXPERIENCE:

University Teaching:

EAPS 12.S493: Mass Spectrometry for Organic Geochemists (MIT) – Lecture and methods course that covered the “nuts and bolts” of GC-, IR-, and HPLC-MS techniques and their application to organic geochemistry. Focused on the process of taking a sample from rock/sediment/biomass to an interpreted biomarker mass spectrum or delta value.

- Co-Instructor (four weeks of lectures and associated activities) 2021

EAPS 12.158/458: Molecular Biogeochemistry (MIT) – Evaluation and discussion of the biosynthesis and diagnostic structural features of organic compounds with particular emphasis on those molecules which form chemical fossils that can be preserved in sediments. Structured around the biosynthetic and phylogenetic origins of recalcitrant biomolecules, the ways we analyze them, and their application as paleoenvironmental proxies.

- Guest lecturer on the topic of general stable isotopes of H/C/O/N/S and compound specific analyses. 2020, 2021

EAR 105: Earth Science (SU) – Lecture and recitation class for non-majors that emphasized tectonics, continental surfaces, and climate.

- Primary Instructor: 150 students 2018
- Teaching Assistant: 320 students in lecture section, 100 in recitation 2016, 2017

EAR 317: Sedimentary Processes and Systems (SU) – Required upper-level course for Earth Science majors with associated laboratory exercises, and field trips. Key topics included: Ancient sedimentary rocks and their modern analogs; Physical and chemical aspects of sedimentation and diagenesis; Introduction to sedimentary basins; Economic resources of sedimentary systems.

- Primary Instructor: 10 students 2018
- Teaching Assistant: 10 students 2016

EAR 111: Climate Change Past and Present (SU) – Intro-level class for non-majors. Introduction to the science of climate change with emphasis on the major drivers of global climate, measuring change, forecasting future climate, and the role of human activities in present climate.

- Primary Instructor: 10 students 2018

K-12 Teaching:

Long-term Substitute/Assistant: 2013

Newark Central Schools, Newark NY

- High School Earth Science class
- Main responsibility was preparing students for NY State Regents Exam, but also coordinated some lecture and laboratory activities

Substitute Teacher: 2012-2013

- Grade level ranged from 3 - 12
- Subjects taught include: Earth Science, Chemistry, Biology, Math (Algebra and Calculus/Precalculus), and English

Mentoring:

- Mentor for MIT UROP students (undergraduate) 2020-2023
pursuing research projects
 - Kate Przydzial – MIT Senior Thesis: A Microbial Survey of Lake Kivu: Mechanisms of Nitrogen Cycling
 - Mila Matney – ongoing work investigating the C and N isotope compositions of fossilized melanin.
 - Yeji Cho – Summer MIT UROP working on OAE nitrogen cycling
- MIT ESAC Peer Mentoring Program mentor for 2020-2022
two post-grads graduate students
- Acted as unofficial mentor for graduate students and 2019-Present
new postdocs (MIT)
- As a senior graduate student, acted as unofficial mentor to 2015-2019
junior lab members/undergrad-grad students (SU)

PUBLISHED ABSTRACTS:

Junium C.K., **Uveges B.T.**

Nitrogen biogeochemistry during Oceanic Anoxic Events and hyperthermals, perspective from deeper in geologic time – Invited Talk
AGU Fall Meeting 2023

Logie, T., Files S., Bhattacharya, T., **Uveges, B.T.**, Junium, C.K.,
Investigating the Anomalous Isotopic Record of the North American Epeiric Seas
Using Multiple Lipid Biomarkers
AGU Fall Meeting 2023

Millikin A.E.G., **Uveges B.T.**, Izon G., Rooney A.D.
Re-Os geochronology of the Deutschland Formation: Implications for
Paleoproterozoic glaciation and oxygenation
Goldschmidt 2023

Uveges B.T. and Przydzial K., Husain, F., Dumit, D., Scholz C.A., Junium C.K, and
Summons R.E.
Chemocline collapse in Lake Kivu as an analogue for nitrogen cycling and shallow
photic zone euxinia during Oceanic Anoxic Events
Gordon Research Conference – Organic Geochemistry 2022

Logie, T., Junium, C.K., Bhattacharya, T., **Uveges, B.T.**
Pristane and Phytane Carbon Isotope Analysis of the Lower Kellwasser Event in the
Appalachian Basin
Gordon Research Conference – Organic Geochemistry 2022

Uveges B.T., Izon, G., Ono, S., Beukes, N., Luo, G., Summons, R.E.

Constraining fluctuations in atmospheric oxygen in the wake of the Great Oxidation Event(s)

Goldschmidt 2022

Uveges, B., Izon, G., Ono, S., Beukes, N. & Summons, R.

Event, Episodes, or Endurance? Reframing the Geochemical Record of Atmospheric Oxygenation. Oral presentation at the Northeast Geobiology Symposium, 2022. MIT, Cambridge, USA.

Uveges, B.T.; Junium, C.K.; Izon, G; Summons, R.E.

Reconstructing Basin-Scale Nutrient Dynamics at the Dawn of Planetary Oxygenation: Insights from New Agouron Institute Drill Cores. – Oral presentation *AGU Fall Meeting 2021* Abstract ID: 869321

Junium, C.K.; Cohen, P. A; **Uveges, B.T.**, 2020

Single organic microfossils carbon isotopes during the Late Devonian biotic crisis, insights into ecology and carbon cycle dynamics. *GSA 2020 Connects Online* ID: 357745

Junium, C.K.; Cohen, P. A; Phillips, E.K.; **Uveges, B.T.**, 2019

Carbon cycle dynamics and ecology revealed by the carbon isotopic composition of single organic microfossils during the Devonian Frasnian-Famennian biotic crisis. *GSA Annual Meeting* in Phoenix, Arizona, USA-2019

Uveges, B.T.; Junium, C.K.; Teece, M.A.; Fulton, J.M., 2018

Environmental controls on pigment distributions in the freshwater microbialites of Fayetteville Green Lake. *Gordon Research Conference: Organic Geochemistry*.

Junium, C. K.; Cohen, P. A; Phillips, E.K.; **Uveges, B. T.**, 2018

Single acritarch cell carbon isotope analyses: implications for geobiology. *Goldschmidt - Boston*. Oral presentation: 1213

Cohen, P. A; King Phillips, E.J.; Kelly, A.; Boyer, D.L; **Uveges, B. T.**; Junium, C. K., 2018

Using carbon isotopes, trace metals, and microfossils to understand the Late Devonian Kellwasser events. *Goldschmidt - Boston*. Poster presentation: 457

Judd, E.J.; Ivany, L.C., DeConto, R.M., Halberstadt, A.R.W., Miklus, N.M., Junium, C.K., **Uveges, B.T.**, 2018 Middle Eocene seasonality: Insights from the geochemistry of fossil bivalves and driftwood. *Goldschmidt - Boston*. Poster Presentation: 1211

Uveges, B.T.; Junium, C.K.; Boyer, D.L.; Cohen, P.A.; Day, J.E., 2017

Evidence for the potential influence of chemocline fluctuations on the Frasnian-Famennian Biotic Crisis in the Illinois and Appalachian Basins. *American Geophysical Union Fall Meeting*: Poster ID: PP23A-1297

King Phillips, E. J.; Cohen, P. A.; Junium C. K.; **Uveges, B. T.**, 2017

- Examining the marine isotopic gradient through the late Devonian using microfossils from the Kellwasser horizons. *GSA Annual Meeting in Seattle, Washington, USA*.
DOI: 10.1130/abs/2017AM-307035
- Junium, C. K.; **Uveges, B. T.**; Ivany, L. C.; Martindale, R. C.; Cohen, P. A.; Das, S., Hickey, A. N.; King Phillips, E. J., 2017
New approaches to accessing high-resolution biogeochemical signals from ancient organic materials. *GSA Annual Meeting in Seattle, Washington, USA*
DOI: 10.1130/abs/2017AM-305791
- Demott, L.; Scholtz, C. A.; Junium, C. K.; **Uveges, B. T.**, 2017
Growth history and composition of a lacustrine tufa dome from Winnemucca dry lake, NV, USA. *GSA Annual Meeting in Seattle, Washington, USA*
DOI: 10.1130/abs/2017AM-297516
- Junium, C. K.; **Uveges, B. T.**, 2017
The power of pigments, calibrating chemoclines with chlorophylls and carotenoids. *American Geophysical Union, Fall Meeting*, abstract #B32A-02
- Judd, E. J.; Ivany, L. C.; Miklus, N. M.; **Uveges, B. T.**; Junium, C. K., 2017
Eocene Antarctic seasonality inferred from high-resolution stable isotope profiles of fossil bivalves and driftwood. *American Geophysical Union, Fall Meeting*, abstract #PP11B-1033.
- Hickey, A. N.; Junium, C. K.; **Uveges, B. T.**; Ivany, L. C.; Martindale, R. C., 2017
Carbon and nitrogen isotopic analysis of coral-associated nitrogen in rugose corals of the Middle Devonian, implications for paleoecology and paleoceanography. *American Geophysical Union, Fall Meeting*. abstract #PP13A-1068
- Uveges, B.T.**; Junium, C.K., 2016
Evaluating the isotopic composition and preservation of photosynthetic pigments in Lake Michigan. *American Geophysical Union Fall Meeting*. Poster ID: 184625
- Das, S.; **Uveges, B. T.**; Ivany, L. C.; Junium, C. K., 2016
Ontogenetic variation in $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ in modern bivalves and gastropods. *GSA Annual Meeting in Denver, Colorado, USA*
DOI: 10.1130/abs/2016AM-285365
- Junium, C. K.; **Uveges, B. T.**; Scholtz, C. A., 2016
When chemoclines collapse. *GSA Annual Meeting in Denver, Colorado, USA*
DOI: 10.1130/abs/2016AM-286835
- Hickey, A. N.; **Uveges, B. T.**; Ivany, L. C.; Junium, C. K., 2016
Paleoecological implications of nitrogen and carbon isotopic data from organic material in Devonian rugose corals. *GSA Annual Meeting in Denver, Colorado, USA*
DOI: 10.1130/abs/2016AM-284819

Uveges, B.T.; Junium, C.K.; Boyer, D.L.; Cohen, P.A., 2015

Environmental conditions amidst the Frasnian-Famennian Biotic Crisis: clues from nitrogen isotopes and chlorophyll derivatives. *Geological Society of America Meeting*. Paper Number: 248-12. Oral presentation

Uveges, B.T.; Junium, C.K., Boyer; D.L., Cohen, P.A., 2014

Environmental conditions during the Frasnian-Famennian Mass Extinction inferred from chlorophyll-derived porphyrin biomarkers. *American Geophysical Union Fall Meeting*. Poster ID: PP53A-1186