

ERIC J. MORGAN

Education

- 2011–2015 Dr. rer. nat. | Max Planck Institute for Biogeochemistry / University of Kiel
- Subject: Biogeochemistry (*magna cum laude*)
 - Advisors: Dr. Jošt V. Lavrič and Prof. Dr. Martin Heimann
 - PhD work was completed as a student in the International Max Planck Research School for Global Biogeochemical Cycles, housed at the MPI for Biogeochemistry, degree conferred by Christian-Albrechts-Universität zu Kiel
 - Thesis title: *Continuous Measurements of Greenhouse Gases and Atmospheric Oxygen in the Namib Desert*
- 2005–2007 M.S. | University of Rhode Island, Graduate School of Oceanography
- Subject: Oceanography
 - Advisor: Dr. Rainer Lohmann
 - Thesis title: *Passive Sampling of PCB Activities in Narragansett Bay: Bioaccumulation and Exchange Between Reservoirs*
- 2001–2005 B.A. | American University
- Subject: Environmental Science (*magna cum laude*)
 - Advisor: Dr. Stephen MacAvoy
 - Awards: *Phi Beta Kappa*, Dean's List (for high marks) all semesters, Dean's Scholarship
- 2001–2005 B.A. | American University (*magna cum laude*)
- Subject: Visual Media
 - Studied film, photography, graphic design, and motion graphics, with a focus on documentary film

Employment

- 2015–*present* Postdoctoral Scholar — Scripps Institution of Oceanography
- La Jolla, CA, USA
 - Supervisor: Dr. Ralph Keeling
 - Conducting scientific research on the global carbon cycle, using atmospheric CO₂, δ(O₂/N₂), δ(Ar/N₂), and stable isotopes of CO₂
- 2010–2011 Senior Research Technician — Boston University
- Boston, MA, USA
 - Supervisor: Dr. Robinson Fulweiler
 - Managed coastal biogeochemistry lab; technician for GC–ECD/FID; supervised student researchers; assisted with nutrient, elemental (CHN), and sediment chlorophyll analysis; field work

- 2008–2009 Adjunct Faculty Lecturer — Simmons University
- Boston, MA, USA
 - Supervisor: Dr. Michael Berger
 - Taught laboratory section of general, organic, and analytical chemistry
 - Duties included lecturing, grading, preparing materials, and supervising student work
- 2007–2008 Production Assistant/Intern — 42 Degrees North Films
- Boston, MA, USA
 - Story development and preliminary editing on ethnographic documentary, administrative duties.
- 2006–2008 Research Technician — University of Rhode Island
- Narragansett, RI, USA
 - Supervisor: Dr. Rainer Lohmann
 - Managed laboratory specializing in analysis for persistent organic pollutants (PCBs, PAHs, PBDEs, Dioxins)
 - Primary technician responsible for a GC–MS (gas chromatograph–mass spectrometer)
- 2006–2008 Research Technician — University of Rhode Island
- Narragansett, RI, USA
 - Ran and maintained the URI/GSO CHN laboratory
- 2004–2005 Lab Assistant — US Geological Survey
- Reston, VA, USA
 - Lab Assistant to Nancy Simon, USGS Biogeochemistry Lab. Sediment sample preparation for geochemical analysis, cleaning glassware, general assistance
- 2004–2005 General Education Teaching Assistant — American University
- Washington, DC, USA
 - Assisted Dr. Kiho Kim with undergraduate Oceanography Course. Graded papers and exams, ran study groups

Field Experience

Marine

- 2013–2014 Visiting Scientist, *FS Meteor*, Cruises M99–M104. Installed automated system for continuous atmospheric measurements of CO₂ and CH₄, and discreet flask samples during a series of cruises around southern Africa. Work on instrument system was done in port only.
- 2006–2007 Participated in weekly maintenance of sonde arrays in Narragansett Bay (RI, United States), deploying passive samplers for persistent organic pollutants. Work was conducted with small boats.
- Participated in weekly fish trawls on the *R/V Cap'n Bert*, assisting with sorting, counting, and identifying demersal fish in Narragansett Bay and Rhode Island Sound. Fish were collected and analyzed as part of a bioaccumulation study.
- Chief Scientist, *R/V Endeavor*, Cruise EN–421. Sampled air and water for persistent organic pollutants during transect of the Atlantic Ocean (Crete to United States)

Terrestrial

- 2012–2014 Participated in installation and subsequent maintenance visits to the Namib Desert Atmospheric Observatory in Gobabeb, Namibia, usually in the capacity of lead scientist.
- 2010–2011 Sediment coring and water sampling in salt marshes in NE United States. Subsequent analysis included greenhouse gas fluxes, inorganic nutrients, carbon content, chlorophyll.

Airborne

- 2016–2018 Participated in the NASA/NOAA/NSF Atmospheric Tomography Mission 1–4 (ATom1–4), operating the Medusa flask sampler and Airborne Oxygen Instrument (AO2) on a DC-8. Flights were from the Arctic south over the Pacific Ocean to the Antarctic, then north over the Atlantic Ocean back up to the Arctic.
- 2016 Participated in the NCAR/RAF/NSF O₂/N₂ Ratio and CO₂ Airborne Southern Ocean (ORCAS) project, operating the Medusa flask sampler and Airborne Oxygen Instrument (AO2) on a Gulfstream V. Flights were based out of Punta Arenas, Chile, and focused on the region surrounding the Drake Passage.
- 2015 Participated in the NCAR/RAF Airborne Research Instrumentation Testing Opportunity (ARISTO) flight test program, operating the Medusa flask sampler and assisting with the Airborne Oxygen Instrument (AO2) over the course of 4 test flights with a C-130.

Publications

Peer-Reviewed Papers

- Gonzalez, Y.; Commane, R.; Manninen, E.; Daube, B.C.; Schiferl, L.; McManus, J.B.; McKain, K.; Hints, E.J.; Elkins, J. W.; Montzka, S. A.; Sweeney, C.; Moore, F.; Jimenez, J. L.; Campuzano Jost, P.; Ryerson, T. B.; Bourgeois, I.; Peischl, J.; Thompson, C.R.; Ray, E.; Wennberg, P.O.; Crouse, J.; Kim, M.; Allen, H.M.; Newman, P.; Stephens, B.B.; Apel, E.C.; Hornbrook, R.S.; Nault, B.A.; **Morgan, E.**; Wofsy, S. C. Impact of stratospheric air and surface emissions on tropospheric nitrous oxide during ATom. *Atmospheric Chemistry and Physics*, accepted 10 Jun 2021.
- Stephens, B.B.; **Morgan, E.J.**; Bent, J.D.; Keeling, R.F.; Watt, A.S.; Shertz, S.R.; Daube, B.C. Airborne measurements of oxygen concentration from the surface to the lower stratosphere and pole to pole. *Atmospheric Measurement Techniques*, 14(3), 2543–2574, 2021.
- Jin, Y.; Keeling, R.F.; **Morgan, E.J.**; Ray, E. Parazoo, N.C.; Stephens, B.B. A mass-weighted atmospheric isentropic coordinate for mapping chemical tracers and computing inventories. *Atmospheric Chemistry and Physics*, 21, 217–238, 2021.
- Birner, B.; Chipperfield, M.P.; **Morgan, E.J.**; Stephens, B.B.; Linza, M.; Feng, W.; Wilson, C.; Bent, J.B.; Wofsy, S.C.; Severinghaus, J.; Keeling, R.F. Gravitational separation of Ar/N₂ and age of air in the lowermost stratosphere in airborne observations and a chemical transport model. *Atmospheric Chemistry and Physics*, 20, 12391–12408, 2020.
- Ganesan, A.L.; Manizza, M. **Morgan, E.J.**; Harth, C.M.; Kozlova, E.; Lueker, T.; Manning, A.J.; Lunt, M.F.; Mühle, J.; Lavric, J.V.; Heimann, M.; Weiss, R.F.; Rigby, M. Marine Nitrous Oxide Emissions from Three Eastern Boundary Upwelling Systems Inferred from Atmospheric Observations. *Geophysical Research Letters*, 47, e2020GL087822, 2020.
- Nevison, C.; Munro, D.; Lovenduski, N.; Keeling, R.; Manizza, M.; **Morgan, E.**; Rödenbeck, C. Southern Annular Mode influence on wintertime ventilation of the Southern Ocean detected in atmospheric O₂ and CO₂ measurements. *Geophysical Research Letters*, 47, e2019GL085667, 2020.
- **Morgan, E.**; Stephen, B.; Long, M.; Keeling, R.; Bent, J.; McKain, K.; Sweeney, C.; Hoecker-Martínez,

M.; Kort, E. Summertime Atmospheric Boundary Layer Gradients of O₂ and CO₂ Over the Southern Ocean. *Journal of Geophysical Research: Atmospheres*, 124, 13439–13456, 2019.

- **Morgan, E.J.**; Lavric, J.V.; Arévalo-Martínez, D.L.; Bange, H.W.; Steinhoff, T.; Seifert, T.; Heimann, M. Air–sea fluxes of greenhouse gases and oxygen in the northern Benguela Current region during upwelling events. *Biogeosciences*, 16, 4065–4084, 2019.
- Asher, E.; Hornbrook, R.S.; Stephens, B.B.; Kinnison, D.; **Morgan, E.J.**; Keeling, R.F.; Atlas, E.L.; Schauffler, S.M.; Tilmes, S.; Kort, E.A.; Hoecker-Martínez, M.S.; Long, M.C.; Lamarque, J.-F.; Saiz-Lopez, A.; McKain, K.; Sweeney, C.; Hills, A.J.; Apel, E.C. Novel approaches to improve estimates of short-lived halocarbon emissions during summer from the Southern Ocean using airborne observations. *Atmospheric Chemistry and Physics*, 19, 14071–14090, 2019.
- Stephens, B. B.; Long, M. C.; Keeling, R. F.; Kort, E. A.; Sweeney, C.; Apel, E. C.; Atlas, E. L.; Beaton, S.; Bent, J. D.; Blake, N. J.; Bresch, J. F.; Casey, J.; Daube, B. C.; Diao, M.; Diaz, E.; Dierssen, H.; Donets, V.; Gao, B.-C.; Gierach, M.; Green, R.; Haag, J.; Hayman, M.; Hills, A. J.; Hoecker-Martínez, M. S.; Honomichl, S. B.; Hornbrook, R. S.; Jensen, J. B.; Li, R.-R.; McCubbin, I.; McKain, K.; **Morgan, E.**, Nolte, S.; Powers, J. G.; Rainwater, B.; Randolph, K.; Reeves, M.; Schauffler, S. M.; Smith, K.; Smith, M.; Stith, J.; Stossmeister, G.; Toohey, D. W.; Watt, A. S. The O₂/N₂ and CO₂ Airborne Southern Ocean (ORCAS) Study. *Bulletin of the American Meteorological Society*, 99(2), 381–402, 2018.
- **Morgan, E.**; Lavrič, J.V.; Seifert, T.; Chicoine, T.; Day, A.; Gomez, J.; Logan, R.; Sack, J.; Shuuya, T.; Uushona, E.G.; Vincent, K.; Schultz, U.; Brunke, E.-G.; Labuschagne, C.; Thompson, R.L.; Schmidt, S.; Manning, A.C.; Heimann, M. Continuous measurements of greenhouse gases and atmospheric oxygen at the Namib Desert Atmospheric Observatory. *Atmospheric Measurement Techniques*, 8(2), 2233–2250, 2015.
- Fagherazzi, S.; Mariotti, G.; **Morgan, E.**; Fulweiler, R.W. The relationships among hydrodynamics, sediment distribution, and chlorophyll in a mesotidal estuary. *Estuarine, Coastal and Shelf Science*, 144, 54–64, 2014.
- Lohmann, R.; Dapsis, M.; **Morgan, E.**; Dekany, V.; Luey, P.J. Determining Air–water Exchange, Spatial and Temporal Trends of PAHs in an Urban Estuary Using Passive Polyethylene Samplers. *Environmental Science and Technology*, 45, 2655–2662, 2011.
- **Morgan, E.** and Lohmann, R. Dietary Uptake from Historically Contaminated Sediments as a Source of PCBs to Migratory Fish and Invertebrates in an Urban Estuary. *Environmental Science and Technology*, 44, 5444–5449, 2010.
- Lohmann, R.; Gioia, R.; Jones, K.; Nizzetto, L.; Temme, C.; Xie, Z.; Schulz-Bull, D.; **Morgan, E.**; Jantunen, L. Organochlorine Pesticides and PAHs in the Surface Water and Atmosphere of the North Atlantic and Arctic Ocean. *Environmental Science and Technology*, 43, 5633–5639, 2009.
- **Morgan, E.** and Lohmann, R. Detecting Air–Water and Surface–Deep Water Gradients of PCBs Using Polyethylene Passive Samplers. *Environmental Science and Technology*, 42, 7248–7253, 2008.
- MacAvoy, S.E.; Carney, R.S.; **Morgan, E.**; Macko, S.A. Stable isotope variation among the mussel *Bathymodiolus childressi* and associated heterotrophic fauna at four cold-seep communities in the Gulf of Mexico. *Journal of Shellfish Research*, 27(1), 147–151, 2008.
- MacAvoy, S.E.; **Morgan, E.**; Carney, R.S.; Macko, S.A. Chemoautolithotrophic production as a fuel for heterotrophs in hydrocarbon seeps: an examination of mobile benthic fauna and seep residents. *Journal of Shellfish Research*, 27(1), 153–161, 2008.

Dissertations & Non-Refereed Publications

- **Morgan, E.** “Continuous Measurements of Greenhouse Gases and Atmospheric Oxygen in the Namib Desert”. Ph.D. Thesis, Christian-Albrechts-Universität zu Kiel, 2015.
- **Morgan, E.** “Passive Sampling of PCB Activities in Narragansett Bay: Bioaccumulation and Exchange Between Reservoirs”. M.S. Thesis, University of Rhode Island, Graduate School of Oceanography, 2007.
- **Morgan, E.** and Lohmann, R. “The PCB Legacy in Narragansett Bay” *Narragansett Bay Journal*, Issue 17, Winter 2010.

Presentations

Conferences & Invited Seminars

- **Morgan, E.**; Manizza, M.; Keeling, R.; Resplandy, L.; Mikaloff-Fletcher, S.; Nevison, C.; Kin, Y.; Bent, J.; Aumont, O.; Doney, S.; Dunne, J.; John, J.; Lima, I.; Long, M. Rodgers, K. “An Atmospheric Constraint on the Seasonal Air-Sea Exchange of Oxygen and Heat in the Extratropics”. NOAA GML Global Monitoring Annual Conference (Virtual), 28 May 2021.
- **Morgan, E.**; Stephens, B.; Birner, B.; Bent, J.; Keeling, R. “Vertical and Interhemispheric Gradients of the Ar/N₂ Ratio in the Troposphere on ATom1–4”. NASA Atmospheric Tomography (ATom) Mission Science Team Meeting, Boulder, CO, USA, 19 November 2019.
- **Morgan, E.**; Stephens, B.; Birner, B.; Bent, J.; Keeling, R. “Signals and Artifacts in $\delta(\text{Ar}/\text{N}_2)$, $\delta(\text{O}_2/\text{N}_2)$, and CO₂ From Twelve Airborne Campaigns”. Invited Talk, Tsukuba APO Workshop, 10 September 2019.
- **Morgan, E.**; Nevison, C.; Manizza, M.; Keeling, R. “The SIO O₂ Program: Constraints on Long-term Carbon Cycle Changes Through Measurements of Atmospheric Oxygen”. NOAA GML Global Monitoring Annual Conference, Boulder, CO, USA, 21 May 2019.
- **Morgan, E.** “Global Measurements of Atmospheric CO₂ and O₂: the Ups and Downs of Science From Research Aircraft”. Guest Lecture, *Perspectives on Ocean Science* (SIO90), University of California, San Diego, CA, USA, 6 June 2018.
- **Morgan, E.** “The Environmental Consequences of Fracking”. Invited Seminar, *Fracking and Fossil Fuels* (CalPIRG Forum and Panel Discussion), University of California, San Diego, CA, USA, 7 December 2017.
- **Morgan, E.** “2°C”. Invited Seminar, *The Future of Energy in California* (CalPIRG Forum and Panel Discussion), University of California, San Diego, CA, USA, 6 June 2017.
- **Morgan, E.**; Stephens, B.; Bent, J.; Long, M.; Sweeney, C.; McKain, K.; Keeling, R. “Summertime Atmospheric Boundary Layer Gradients of O₂ and CO₂ Over the Southern Ocean”. American Geophysical Union Fall Meeting, OS42A-06, San Francisco, CA, USA, 15 December 2016.
- **Morgan, E.**; Stephens, B.; Keeling, R.; *et al.* “An Overview of ORCAS: The O₂/N₂ Ratio and CO₂ Airborne Southern Ocean Study”. Invited Seminar, SOCCOM Annual Meeting, Scripps Institution of Oceanography, La Jolla, CA, USA, 9 May 2016.
- **Morgan, E.**; Lavrič, J.; Arévalo-Martínez, D.L.; Bange, H.W., Steinhoff, T.; Seifert, T.; Heimann, M. “The Influence of Coastal Upwelling on the Variability of Greenhouse Gases and Atmospheric Oxygen at Gobabeb, Namibia”. Invited Seminar, NOAA/ESRL Global Monitoring Division Carbon Cycle and Greenhouse Gases Group, Boulder, CO, USA, 12 April 2016.
- **Morgan, E.**; Lavrič, J.; Heimann, M. “Seasonal Anomalies of Carbon Dioxide, Methane, and Carbon Monoxide at the Namib Desert Atmospheric Observatory”. Invited Seminar, Scripps Institution of

Oceanography, La Jolla, CA, USA, 10 September 2014.

- **Morgan, E.**; Lavrič, J.; Heimann, M. “The Spatial and Temporal Representativeness of Atmospheric Observations of Greenhouse Gases at the Namib Desert Atmospheric Observatory”. *Geophysical Research Abstracts*, Vol.16, EGU2014-5934. European Geosciences Union (EGU) General Assembly, Vienna, Austria, 28 April 2014.
- **Morgan, E.**; Lavrič, J.; Seely, M.; Heimann, M. “Continuous Measurements of Greenhouse Gases and Related Tracers in the Namib Desert”. 29th Annual Conference of the South African Society for Atmospheric Sciences (SASAS), Durban, South Africa, 26 September 2013.
- **Morgan, E.**; Seifert, T.; Lavrič, J. “Diurnal and Intraseasonal Variability of Greenhouse Gases in the Namib Desert”. Invited Seminar, Council for Scientific and Industrial Research (CSIR) Natural Resources and the Environment, Cape Town, South Africa, 19 September 2013.
- **Morgan, E.** and Lohmann, R. “Determining the Sources of Polychlorinated Biphenyls to Demersal Fish in Narragansett Bay, R.I., USA”. ICES CM 2007/J:15. International Council for the Exploration of the Sea (ICES) Annual Science Conference, Helsinki, Finland, September 2007.

Posters

- **Morgan, E.**; Stephens, B.; Birner, B.; Keeling, R. “Observational Constraints on the Vertical and Inter-hemispheric Gradient of the Ar/N₂ Ratio in the Troposphere”. CT14A-0845. AGU Ocean Sciences, San Diego, USA, 17 Feb 2020.
- **Morgan, E.**; Stephens, B.; Birner, B.; Keeling, R. “Distinguishing Artifacts from Real Variability in Airborne Measurements of $\delta(\text{Ar}/\text{N}_2)$ ”. P33. 19th WMO/IAEA Meeting on Carbon Dioxide, Other Greenhouse Gases, and Related Measurement Techniques (GGMT-2019), Jeju Island, Korea, 2 Sep 2019.
- **Morgan, E.**; Stephens, B.; Keeling, R. “Pacific Ocean Tropospheric $\delta^{13}\text{C}\text{-CO}_2$ and $\delta^{18}\text{O}\text{-CO}_2$ on HIPPO and ATom”. NASA Atmospheric Tomography (ATom) Mission Science Team Meeting, Boulder, CO, USA, 13 November 2018.
- **Morgan, E.**; Stephens, B.; Keeling, R. Bent, J.; McKain, K.; Sweeney, C.; Long, M. “Global Tropospheric Gradients of CO₂ and $\delta(\text{O}_2/\text{N}_2)$ ”. NASA Atmospheric Tomography (ATom) Mission Science Team Meeting, Boulder, CO, USA, 25 July 2017.
- **Morgan, E.**; Stephens, B.; Bent, J.; Long, M.; Sweeney, C.; McKain, K.; Keeling, R. “Tropospheric Gradients of CO₂ and O₂ Over the Southern Ocean”. P304. 10th International Carbon Dioxide Conference, Interlaken, Switzerland, 25 August 2017.
- **Morgan, E.**; Lavrič, J.; Gerbig, C.; Koch, T.; Heimann, M. “Diurnal and Synoptic Variability of Carbon Dioxide and Related Tracers in the Namib Desert”. P193. 9th International Carbon Dioxide Conference, Beijing, China, 4 June 2013.
- **Morgan, E.**; Lavrič, J.; Seely, M.; Heimann, M. “The Namib Desert Atmospheric Observatory (NDAO), a new background site for continuous measurements of greenhouse gases and related tracers in southern Africa”. 17th WMO/IAEA Meeting on Carbon Dioxide, Other Greenhouse Gases, and Related Measurement Techniques (GGMT-2013), Beijing, China, 13 June 2013.
- **Morgan, E.**; Lavrič, J.; Seely, M.; Heimann, M. “Establishment of an atmospheric observatory for trace gases and atmospheric oxygen in Namibia”. *Geophysical Research Abstracts*, Vol.14, EGU2012-5122. European Geosciences Union General Assembly, Vienna, Austria, 24 April 2012.
- **Morgan, E.** and Lohmann, R. “Passive Sampling of Persistent Organic Pollutants in an Urbanized Estuary: Contributions from Different Reservoirs”. 7th Passive Sampling Workshop and Symposium at

USGS in Reston, VA, USA, April 2007.

- **Morgan, E.;** MacAvoy, S.; Carney, R. "Importance of Chemolithoautotrophic Production to Mobile Benthic Predators in the Gulf of Mexico". *Eos, Transactions American Geophysical Union*, Joint Assembly Supplemental Abstracts, 86(18), JH51E-01. American Geophysical Union (AGU) Joint Assembly, New Orleans, LA, May 2005.