BENJAMIN ZIND HOULTON

Curriculum Vitae

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PROFESSIONAL PREPARATION

Ph.D., Princeton University (*Ecology and Evolutionary Biology*)	2005
Ph.D., Cornell University (*Ecology and Evolutionary Biology*) (no degree conferred, transferred to Princeton University with academic advisor in 2001)	2000 – 2001
M.S., Syracuse University (*Environmental Engineering Science*)	2000
B.S., University of Wisconsin – Stevens Point, College of Natural Resources (*Water Chemistry, Chemistry Minor*)	1998

APPOINTMENTS

The Ronald P. Lynch Dean, College of Agriculture and Life Sciences (CALS), Cornell University (chief academic and administrative officer of Cornell's second largest college, comprising ~360 faculty, >3,600 undergraduate and ~1,000 graduate students, and ~1,300 staff with an annual operating budget of ~$500 million, see https://cals.cornell.edu/)	2020 – present
Professor, Department of Ecology and Evolutionary Biology and Department of Global Development, CALS, Cornell	2020 – present
Affiliate Faculty Member, University of California – Davis	2020 – present
Principal Investigator, Office of the President, University of California	2019 – present
Co-chair, California Collaborative for Climate Change Solutions – a 21st century public-private partnership dedicated to climate mitigation and adaptation solutions, from California to the world (see https://californiaclimatesolutions.org/)	2018 – 2021
Member (appointed by UC President Janet Napolitano*),* University of California Global Climate Leadership Council	2017 – 2020
Director, John Muir Institute of the Environment, University of California – Davis (oversee > 150 staff and 300 faculty affiliates from all UC Davis Colleges and Professional Schools, see http://johnmuir.ucdavis.edu/)	2016 – 2020
Associate Director, John Muir Institute of the Environment, University of California – Davis	2015 – 2016
Professor, University of California – Davis	2016 – 2020
Chancellor's Fellow, University of California – Davis (in recognition of outstanding research and teaching accomplishments)	2013 – 2020
Associate Professor, University of California – Davis	2012 – 2016
Assistant Professor, University of California – Davis	2007 – 2012

Visiting Scientist, CSIRO's Division of Marine and Atmospheric Research, Aspendale, Victoria, Australia — 2006

Postdoctoral Scholar, Stanford University, Biological Sciences, and Carnegie Institution for Science, Department of Global Ecology — 2005 – 2007

SELECTED RESEARCH ARTICLES (*Postdoc or student advisee)

Wang, Ying-Ping, **Houlton, B.Z.** Climate tipping point of nitrogen fixation. *Nature Plants* 8, 196-197 (2022).

Lynas, M., **Houlton, B.Z.**, Perry, S. Greater than 99% consensus on human caused climate change in the peer-reviewed scientific literature. *Environmental Research Letters*, 16 (11), 114005 (2021).

-Altmetric sore = 1963; #7 all time in media attention from this source (ERL); 99th percentile in media attention from all sources published since date of publication.

-Number 2 in total media attention of publications at Cornell University in 2021

Houlton, B.Z., Almaraz, M.*, Aneja, V., Austin, A. T., Bai, E., Cassman, K. G.et al. A world of cobenefits: Solving the global nitrogen challenge. *Earth's Future*,7, 865-872 (2019).

Houlton, B.Z., Morford, S. L.*, Dahlgren, R. A., Convergent evidence for widespread rock nitrogen sources in Earth's surface environment. *Science* (*Research Article*) Vol. 360, Issue 6384, 58-62 (2018).

-News Coverage, Scientific American (interview), Business Insider, the Conversation (Op-ed), others
-Biology Faculty of 1000 Selection

Lennon, E.*, **Houlton B.Z.**, Coupled molecular and isotopic evidence for denitrifier controls over terrestrial nitrogen availability. *Nature-ISMEJ* (2017).

Houlton, B.Z., Marklein A. R.*, and Bai E.* Representation of nitrogen in climate change forecasts *Nature Climate Change* 5 (5): 398-401 (2015).

Morford, S.*, **Houlton, B.Z.,** and Dahlgren, R. A., Increased forest nitrogen and carbon storage from nitrogen-rich bedrock. *Nature* 477, 78-81 (2011).

- *News and Views by E.A. Schuur, Nature*
- *Biology Faculty of 1000 selection*
- *Elizabeth Sulzman Award (best paper in the Biogeosciences, ESA)*
- *Press Coverage by NPR (morning edition), BBC's "The Naked Scientist" among others*

Houlton, B.Z., and Bai, E.*, Imprint of denitrifying bacteria on the global terrestrial biosphere. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 106 (51): 21713 - 21716 (2009).

- *Biology Faculty of 1000 selection*

Wang, Y. P., and **Houlton, B.Z.**, Estimates of global nitrogen fixation: Implications for global climate change. *Geophysical Research Letters* 36: L24403 (2009).

- *Press coverage by Nature, MSNBC/Today, Discovery*

Houlton, B.Z., Wang, Y. P., Vitousek, P. M., and Field, C. B., A unifying framework for di-nitrogen fixation in the terrestrial biosphere. *Nature* 454 (7202): 327-U34 (2008).

- *News and Views by E.A. Davidson*
- *Biology Faculty of 1000 selection*
- *Press coverage by Christian Science Monitor, Environmental Research Web, among others*

Houlton, B.Z., Sigman, D. M., Schuur, E. A., and Hedin, L. O., A climate-driven switch in plant nitrogen acquisition within tropical forest communities. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 104 (21): 8902 - 8906 (2007).

- *Biology Faculty of 1000 selection*

Houlton, B.Z., Sigman, D. M., and Hedin, L. O., Isotopic evidence for large gaseous nitrogen losses from tropical rainforests. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 103 (23): 8745-8750 (2006).

- *Biology Faculty of 1000 selection*
- *Gene E. Likens Award (best paper in the Biogeosciences, ESA)*

OTHER RESEARCH ARTICLES *(*POSTDOC OR STUDENT ADVISEE)*

Xu, P., Li, G., **Houlton, B.Z.**, Ma, L., Ai, D., Zhu, L., Luan, B. Zhai, Hu, S., Chen, A., Zheng, Y. Role of Organic and Conservation Agriculture in Ammonia Emissions and Crop Productivity in China. *Environmental Science & Technology*, 56(5), 2977-2989 (2022).

Kanter, D.R., Wagner-Riddle, C., Groffman, P.M., Davidson, E., Galloway, J.N., Gourevitch, J.D., van Grinsven, HJM, **Houlton, B.Z.**, Keeler, B., Ogle, S., Pearen, H., Rennert, K.J., Saifuddin, M., Sobota, D.J., Wagner, G. Improving the social cost of nitrous oxide. *Nature Climate Change*, 11, 1008-1010 (2021).

Almaraz, M., Wong, M.Y., Geoghegan, E.K., **Houlton, B.Z.** A review of carbon farming impacts on nitrogen cycling, retention and loss. *Annals of the New York Academy of Sciences*, 1501 (1) 1-2-117 (2021).

Wang, M., **Houlton, B.Z.**, Wang, S., Ren, C., van Grinsven, HJM, Chen, D., Xu, J., Gu, B. Human-caused increases in reactive nitrogen burial in sediment of global lakes. *The Innovation*, 2 (4), 100158 (2021).

Oliver, E.E., **Houlton, B.Z.**, Lipson, D.A. Controls on soil microbial carbon use efficiency over long-term ecosystem development. *Biogeochemistry*, 152 (2), 309-325 (2021).

Metson, G.S., Chaudhary, A., Zhang, X., **Houlton, B.Z.**, Oita, A., Raghuram, N., Read, Q.D., Bouwman, L., Tian, H., Uwizeye, A. Nitrogen and the food system. *One Earth*, 4 (1), 3-7 (2021)

Sun, L., Wang, C., Haoming, Y., Liu, D., **Houlton, B.Z.**, Wang, S., Zeng, X., Bai, E., Fang, Y., Jia, Y. Biotic and abiotic controls on dinitrogen production in coastal sediments. *Global Biogeochemical Cycles*, e2021GB007069 (2021).

Dass, P., **Houlton, B.Z.**, Wang, Y., Warlind, D., Morford, S., Bedrock weathering controls on terrestrial carbon-nitrogen-climate interactions. *Global Biogeochemical Cycles*, e2020GB006933 (2021).

Khalsa, Sat Darshan S.; Smart, David R.; Muhammad, Saiful; Armstrong, Christine M.; Sanden, Blake L.; **Houlton, B.Z.**; Brown, Patrick H. Intensive fertilizer use increases orchard N cycling and lowers net global warming potential. *Science of The Total Environment*, 722:137889 (2020).

Xu, Peng; Chen, Anping; **Houlton, B.Z.**; Zeng, Zhenzhong; Wei, Song; Zhao, Chenxu; Lu, Haiyan; Liao, Yajun; Zheng, Zhonghua; Luan, Shengji. Spatial variation of reactive nitrogen emissions from China's croplands codetermined by regional urbanization and its feedback to global climate change. *Geophysical Research Letters*, *47*(12), e2019GL086551 (2020).

Sena-Souza, João Paulo**; Houlton, B.Z.**; Martinelli, Luiz Antônio; Bielefeld Nardoto, Gabriela. Reconstructing continental-scale variation in soil δ15N: a machine learning approach in South America. *Ecosphere*, 11(8), e03223 (2020).

Peng, J., Wang, Y. P., **Houlton, B.Z.,** Dan, L., Pak, B., & Tang, X. Global carbon sequestration is highly sensitive to model-based formulations of nitrogen fixation. *Global Biogeochemical Cycles*, *34*(1), e2019GB006296 (2020).

Dynarski, K. A.*, & **Houlton, B.Z.** Isotopic constraints on plant nitrogen acquisition strategies during ecosystem retrogression. *Oecologia*, *192*(3), 603-614 (2020).

Wooliver, R., Pellegrini, A. F., Waring, B., **Houlton, B.Z.,** Averill, C., Schimel, J., ... & Schweitzer, J. A. (2019). Changing perspectives on terrestrial nitrogen cycling: The importance of weathering and evolved resource-use traits for understanding ecosystem responses to global change. *Functional Ecology*, *33*(10), 1818-182 (2019).

Sanchez, D., **Houlton, B.Z.,** Silver, W. UC experts can lead on carbon dioxide removal. *California Agriculture* (2019).

Goulden, S. K.*, Ohkouchi, N., Freeman, K. H., Chikaraishi, Y., Ogawa, N. O., Suga, H., ... & **Houlton, B.Z. (senior author)**. Strong correspondence between nitrogen isotope composition of foliage and chlorin across a rainfall gradient: implications for paleo-reconstruction of the nitrogen cycle. *Biogeosciences*,*16*(19) (2019).

Sabo, R. D., Clark, C. M., Bash, J., Sobota, D., Cooter, E., Dobrowolski, J. P., **Houlton, B.Z.,** et al. Decadal shift in nitrogen inputs and fluxes across the contiguous United States: 2002–2012. *Journal of Geophysical Research: Biogeosciences*, 124, 3104– 3124 (2019).

Dynarski, K. A.*, Morford, S. L.*, Mitchell, S. A.*, & **Houlton, B.Z. (senior author)**. Bedrock nitrogen weathering stimulates biological nitrogen fixation. *Ecology*, *100*(8), e02741 (2019).

Houlton, B.Z., Lund J., Sacramento Summary Report. *California's Fourth Climate Change Assessment*. (peer reviewed) Publication number: SUM-CCCA4-2018-002 (2018).

Dass P. D.*, **Houlton, B.Z.,** Wang, Y. P., Warlind, D., Grasslands may be a more reliable carbon sinks than forests in California. *Environmental Research Letters*. (2018).

Almaraz, A.*, Bai, E., Wang, C., Trousdell, J., Conley, S., Faloona, I., **Houlton, B.Z.** Agriculture is a major source of NOx pollution in California. *Science Advances* (2018).

Cookingham, J.*, **Houlton, B.Z.,** Plant-soil feedbacks on free-living nitrogen fixation over geological time. *Ecology* (2018).

Dynarski, K. A.*, and **Houlton, B.Z.,** Nutrient limitation of terrestrial free-living nitrogen fixation. *New Phytologist* (2018).

Wang, C., **Houlton, B.Z.**, Liu, D., Hou, J., Cheng, W & Bai, E. Stable isotopic constraints on global soil organic carbon turnover. *Biogeosciences* 14(4), 987-995 (2018).

Cookingham, J.*, **Houlton B.Z.**, Brewer S. Iron regulation of biological nitrogen fixation in karst tropical forest. *Ecology* (2017).

De Sousa-Neto, E., Lins, S.*, Martins, S., Piccolo, M., Ferreira, M., De Camargo, P., **Houlton, B.Z.,** Martinelli, L. Litterfall mass and nutrient fluxes over an altitudinal gradient in the coastal Atlantic Forest, Brazil. *Journal of Tropical Ecology (*2017).

Wang, C.*, **Houlton B.Z.**, Dai W., and Bai E.* Growth in the global N_2 sink attributed to nitrogen fertilizer inputs over 1860 to 2000. *Science of the Total Environment* (2017).

Morford, S., **Houlton B.Z.,** and Dahlgren, R. A. Modeling geochemical and tectonic controls on rock nitrogen fluxes across temperate biomes. *Global Biogeochemical Cycles* (2016).

Huang, W., **Houlton B.Z.**, Marklein A. R.*, Liu J., and Zhou G. Elevated CO_2 decreases plant N/P across diverse terrestrial biomes. *Scientific Reports* (2016).

- Biology Faculty of 1000 selection

Marklein, A. R.*, Cookingham J. B.*, Enders S. K.*, Gonzalez D. J. X.*, van Huysen T. L.*, Izquierdo J. I.*, Light D. R.*, Liptzin D.*, Miller K. E.*, Morford S. L.*, Norton R. A.*, **Houlton B.Z.** Global forest nutrient supply tracks leaf litter decomposition. *Global Ecology and Biogeography* (2016).

Mnich M.*, and **Houlton B.Z.** Role of fie, grazing and forest clearing on $^{15}N/^{14}N$ balances of diverse terrestrial ecosystems. *Oecologia* (2016).

Hinckley, E., Bonan G., Bowen G., Colman B., Duffy P., Goodale C., **Houlton B.Z.,** Marín-Spiotta E., Ogle K., Ollinger S., Paul E., Vitousek P., Weathers K., Williams D. The soil and plant giogeochemistry sampling design for the National Ecological Observatory Network (NEON). *Ecosphere* (2016).

Zaehle, S., Jones C. D., **Houlton B.Z.**, Lamarque J-F, and Robertson E. Nitrogen availability reduces CMIP5 projections of 21st century land carbon uptake. *Journal of Climate* 28: 2494-2511 (2015).

Houlton, B.Z. Nitrogen Fixation: Fixing evolution in global forests. *Nature Plants* (2015).

Houlton, B.Z., and Morford S. L.* A new synthesis for terrestrial nitrogen inputs. *Soil* 1 (1): 381-397 (2015). (***Inaugural issue***)

Morford S.*, **Houlton B.Z.** and Dahlgren R. A. Direct quantification of long-term rock nitrogen inputs to temperate forests. *Ecology* doi.org/10.1890/15-0501 (2015).

Fang, Y, Koba K., Makabe A., Takahashi C., Zhu W., Hayashi T., Hokari A. A., Urakawa R., Bai E., **Houlton B.Z.**, Xi C., Zhang S., Matsushita K., Tu Y., Liu D., Zhu F., Wang Z., Zhou G., Chen D., Makita T., Toda H., Liu X., Chen Q., Zhang D., Li Y., Muneoki Y. Microbial denitrification dominates nitrate losses from forest ecosystems. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 112: 1470-1474 (2014).

Cleveland, C. C., **Houlton, B.Z.**, Smith, B., Marklein, A.*, Reed, S., Parton, W., Del Grosso, S., and Running, S. Patterns of new vs. recycled production in the terrestrial biosphere *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 110 (31): 12733-12737 (2013).

Zhou, G, **Houlton, B.Z**., Wang, W, Huang, W, Xiao, Y, Zhang, Q, Liu, S, Cao, M, Wang, X, Wang, S, Zhang, Y, Yan, J, Liu, J, Tang, X, Zhang, D. Substantial reorganization of China's tropical and subtropical forests: Evidence from permanent plots. *Global Change Biology* 20(1): 240-250 (2013).

Albarracín, M. V., Six, J., **Houlton, B.Z.,** Bledsoe, C. S. Nitrogen fertilization field study of carbon-13 and nitrogen-15 transfers in ectomycorrhizas of Pinus sabiniana. *Oecologia* 173(4): 1439-1450 (2013).

Izquierdo, J.*, **Houlton, B.Z.,** and van Huysen, T.*, Evidence for progressive phosphorus limitation during long-term ecosystem development: Evaluation of a biogeochemical paradigm. *Plant and Soil* 367: 135-147 (2013).

Houlton, B.Z., Boyer, B., Finzi, A., Galloway, J., Leach, A., Liptzin, D.*, Melillo, J., Rosenstock, T. S., Sobota, D., and Townsend, A. R., The US Nitrogen Synthesis: Nitrogen-use Efficiency among Economic Sectors and Nitrogen by Climate Risks Nationwide. In: *A Technical Report to the US National Climate Assessment* Ed. Suddick, E.C., Davidson, E.A., Woods Hole Research Center, 149 Woods Hole Road, Falmouth, MA, 02540-1644 USA (2012). (peer reviewed)

Houlton, B.Z., Boyer, B., Finzi, A., Galloway, J., Leach, A., Liptzin, D.*, Melillo, J., Rosenstock, T. S., Sobota, D., and Townsend, A. R., Intentional vs. unintentional nitrogen use in the United States: Trends, efficiency, and implications. *Biogeochemistry* 114: 11-23 (2012).

Townsend, A. R., Vitousek, P. M., and **Houlton, B.Z.** The climate benefits of better nitrogen and phosphorus management. *Issues in Science and Technology 28 (2): 85-91* (2012).

Bai, E.*, **Houlton, B.Z.**, and Wang, Y. P., Isotopic identification of nitrogen hotspots across Earth's terrestrial ecosystems. *Biogeosciences* 9 (8): 3287-3304 (2012).

Marklein, A.*, and **Houlton, B.Z.,** Nitrogen inputs accelerate phosphorus cycling rates across a wide variety of terrestrial ecosystems. *New Phytologist* 193 (3): 696-704 (2012).

- *Biology Faculty of 1000 selection*

Cleveland, C. C., Townsend, A. R., Taylor, P., Alvarez-Clare, S., Bustamante, M. M. C., Chuyong,G., Dobrowski,S. L., Grierson, P., Harms, K. E., **Houlton, B.Z.**, Marklein, A.*, Parton, W., Porder, S., Reed, S. C., Sierra, C. A., Silver, W. L., Tanner, E. V. J., and Wieder, W. R., Relationships among net

primary productivity, nutrients and climate in tropical rainforest: A pan-tropical analysis. *Ecology Letters* 14 (9): 939-947 (2011).

Houlton, B.Z., Biogoechemistry and nutrient cycles. In: Encyclopedia of Theoretical Ecology (2011). (peer reviewed book chapter)

Finzi, A. C., Austin, A. T., Cleland, E. E., Frey, S., **Houlton, B.Z.**, and Wallenstein, M. D., Alteration of coupled biogeochemical cycles in response to global change in the terrestrial biosphere. *Frontiers in Ecology and the Environment* 9 (1): 61-67 (2011).

Townsend, A. R., Cleveland, C. C., **Houlton, B.Z.**, Alden C. B., and White, J. W. C., Multi-element regulation of the tropical forest carbon cycle. *Frontiers in Ecology and the Environment* 9 (1): 9-17 (2011).

Houlton, B.Z., and Driscoll, C. T., The effect of ice storms on the biogeochemistry and hydrology of forest ecosystems. In: Hydrology and Biogeochemistry: Synthesis and Future Research Directions (2011). (peer reviewed book chapter)

Vitousek, P. M., Porder, S., **Houlton, B.Z.**, and Chadwick, O., Terrestrial phosphorus limitation: Mechanisms, implications and nitrogen-phosphorus interactions. *Ecological Applications* 20 (1): 5-15 (2010).

Houlton, B.Z., and Field, C. B., Nutrient limitations of carbon uptake: From leaves to landscapes in a California rangeland ecosystem. *Rangeland Ecology and Management* 63: 120-127 (2010).

Cleveland, C. C., **Houlton, B.Z.**, Neill, C., Reed, S., Townsend, A. R., and Wang, Y. P., Using indirect methods to estimate symbiotic nitrogen fixation: A case study from an Amazonian rain forest. *Biogeochemistry* DOI10.1007/s10533-009-9392-y (2010).

Bai, E.*****, and **Houlton, B.Z.**, Coupled isotopic and process-based modeling of gaseous nitrogen losses from tropical rainforests. *Global Biogeochemical Cycles* 23: (GB2011) (2009).

Kaiser, J., Hastings, M. G., **Houlton, B.Z.,** Rockmann, T., and Sigman, D. M., Triple oxygen isotope analysis of nitrate using the denitrifier method and thermal decomposition of N_2O. *Analytical Chemistry* 79: 599-607 (2007).

Wang, Y. P., **Houlton, B.Z.**, and Field, C. B., A model of biogeochemical cycles of carbon, nitrogen, and phosphorus including symbiotic nitrogen fixation and phosphatase production. *Global Biogeochemical Cycles* 21 (1) (2007).

Houlton, B.Z., Driscoll, C. T., Fahey, T. J., Likens, G. E., Groffman P. M., Bernhardt, E., and Buso, D., Nitrogen dynamics in ice storm-damaged forest ecosystems: Implications for nitrogen limitation theory. *Ecosystems* 6 (5): 431-443 (2003).

Open access on-line publications (peer-reviewed and citable)

Bai, E.*, **Houlton, B.Z.**, and Wang, Y. P. Isotopic identification of nitrogen hotspots across Earth's terrestrial ecosystems. *Biogeosciences Discussions* 8 (6): 12113 (2011).

Houlton, B.Z. and Morford S. L. A new synthesis for terrestrial nitrogen inputs. *Soil Discussions* 1 (1): 497-540 (2014).

SELECTED RESEARCH GRANTS (>$10 million USD in lead PI Grants)

1. Houlton, B.Z. (Lead PI), Boudinot, G., Efficacy and Mechanics of SGI's enhanced weathering technology ($199k; 2021 – 2023)

2. **Houlton, B.Z.** (Lead PI), California Strategic Growth Council (Climate Research Program). Working Lands Innovation Center – Catalyzing Negative Carbon Emissions. ($4,7000,000; 2019 – 2023).

3. **Houlton, B.Z.** (Lead PI), Bookhagen B. (co-PI), Chadwick O. A. (co-PI), Dahlgren R. A. (co-PI), Treseder K. (co-PI), Wang Y-P. (co-PI). National Science Foundation (NSF), Integrated Earth Systems, *Bedrock nitrogen and the Earth system: from geobiological mechanisms to climate change forecasts* ($3,000,000; 2014 to 2018).

4. **Houlton, B.Z.** (Sole PI), National Science Foundation (NSF)-CAREER award (the most prestigious early career award administered by US NSF), *Large-scale nitrogen cycles and underrepresented groups: A plan for advancement* ($637,000; 2012 – 2018).

5. **Houlton, B.Z.** (Sole PI), Andrew W. Mellon Foundation, Junior Investigator Award, *An oceanographic-based approach to coupled nutrient cycles on land* ($290,000, 2008).

6. **Houlton, B.Z.** (Lead PI), Alissa K. (co-PI), Springborn M. (co-PI). David and Lucile Packard Foundation, *California nitroscapes: An environmental, social, and economic evaluation of the fate and consequence of excess nitrogen* ($120,000; 2009 – 2012).

7**. Houlton, B.Z.** (Sole PI), Kearney Foundation of Soil Science, Biogeochemical evolution of the pygmy forest ($89,000, 2008 – 2011).

SELECTED HONORS AND AWARDS

- *Named to The Agriculture Power 50 (no. 7) by City and State New York https://www.cityandstateny.com/power-lists/2021/09/agriculture-power-50/185206/*

- *Cap Creal Journalism Award for Best Editorial*, New York State Agricultural Society (2022)

- Research covered by news outlets, including: *The Christian Science Monitor, Chicago Tribune, New York Times, Newsweek, Quartz, Discovery Channel, MSNBC, Nature, Science, Salon, Scientific American, Vox, NBC Universal, The Hill, Business Insider, NPR "Morning Edition" (national program), BBC talk show "The Naked Scientists", CBS – Sacramento, Fox Sacramento*

- *Guest appearance, MSNBC "All in with Chris Hayes" https://www.mediaonestudios.com/videos/ben-houlton-2016-12-14/*

- *Elected Member,* Biology Faculty of 1000, Theoretical Ecology (2016 – present)

- *Appointed Member* (by UC President Janet Napolitano), University of California Global Climate Leadership Council (2017 – 2020)

- *Member*, University of California Applied Research Working Group (2017 – 2020)

- *Chancellor's Fellow,* UC Davis, "In recognition of demonstrated excellence in research and teaching as evidenced by especially high quality and achievement." (2013 – 2018)

- Eight papers cited by *Biology Faculty of 1000* (**Houlton** et al., *PNAS*, 2006; **Houlton** et al., *PNAS*, 2007; **Houlton** et al., *Nature*, 2008; **Houlton** and Bai, *PNAS*, 2009; Morford, **Houlton**, Dahlgren, *Nature*, 2010; Marklein and **Houlton**, *New Phytologist*, 2011, Huang et al., *Scientific Reports*, 2016; **Houlton** et al., *Science*, 2018)

- *Elizabeth Sulzman Award* (ESA) for the most outstanding paper published in the Biogeosciences by a doctoral student (to student advisee Morford -- for Morford, **Houlton**, and Dahlgren, *Nature*, 2011) (2012)

- *NSF-CAREER Award Recipient* (2012 – 2017) "…the most prestigious awards in support of junior faculty who exemplify the role of teacher-scholar through outstanding research, excellent teaching and the integration of education and research within the context of the mission of their organizations."

- Twice nominated for the UC Davis teaching award (2010, 2012)

- *Young Investigator Award*, Andrew W. Mellon Foundation ($300K, 2008)

- Waukesha South High School Hall of Fame (induction for academic and sports accomplishments, 2008)

- *Gene E. Likens Award* (ESA) for the most outstanding paper published in the Biogeosciences (for **Houlton** et al., *PNAS*, 2006) (2007)

- *Buell Award* (best student paper award), honorable mention, The Ecological Society of America's Annual Meeting, Montreal (2005)

- *University Fellowship*, Princeton University (2001 – 2002)

- *Invited Participant*, Technical Advisory Board, New York State Energy Research and Development (2001 – 2002)

- *Best Student Paper Award*, American Water Resources Association's National Meeting, Point Clear, Alabama (1998)

- *Undergraduate Science Research Award*, The Sigma Xi—The Scientific Research Society (1997)

- *Best Student Paper Award*, American Water Resources Association's Wisconsin State Meeting, Green Lake, Wisconsin (1997) (undergraduate)

SYNERGISTIC ACTIVITIES

- *Technical Advisory Group*, New York State Climate Action Council, charged with providing recommendations to the council as it develops a scoping plan to put New York on a path to net-zero emissions by 2050 (2021 – present)
- *Board of Directors*, Boyce Thompson Institute (May 2021 – present)
- *Appointed Member*, Governor Cuomo's Working Group on Diversity and Racial Equity in Agriculture (2020 – 2021)
- *Editor*, Global Biogeochemical Cycles (2020 – present)
- *Scientific Advisor*, Rockefeller Foundation and World Wildlife Fund program on sustainable protein development and planetary health (2018 – 2020)
- *Executive Steering Committee Member*, Center for Healthcare Policy and Research (2019 – 2020)
- Delegate, Global Climate Action Summit (invited by CA Gov. Jerry Brown's office, 2018)
- *Co-Chair*, California Collaborative for Climate Change Solutions, a consortium of CA universities (UC, CSU, Caltech, Stanford, USC) focused on scalable climate solutions (2018 – present)
- *Lead Coordinating Author*, 4th California Climate Assessment, Sacramento Valley Region (2018)
- *Executive Committee Board Member*, USDA California Climate Hub (2017 – present)
- *Associate Editor*, *Global Biogeochemical Cycles* (2014 – 2019)
- NSF-NEON biogeochemistry steering committee (2012 – 2017)
- *Subject Matter Editor*, *Ecology* (2011 – 2020)
- Participant in Research Coordination Network, INTERFACE (2011 – 2015)
- Participant in National Center for Ecological Analysis and Synthesis (NCEAS) workshop on nutrient limitation in the tropics (led by Cleveland C. C. and Townsend A. R.) (2007 – 2012)
- Participant in Research Coordination Network on Nitrogen and Climate Change (led by Davidson E. A.) (2011 – 2015)
- Invited Lecturer, NCAR Advanced Study Program, Carbon-Climate Connections in the Earth System (July 29 – August 16, 2009, Boulder, CO)
- Chair of report on nitrogen x climate interactions report submitted to the National Climate Assessment (**Houlton, B. Z.**, Boyer, B., Finzi, A., Galloway, J., Leach, A., Liptzin, D., Melillo, J., Rosenstock, T. S., Sobota, D., and Townsend, A. R., The US Nitrogen Synthesis: N-use Efficiency among Economic Sectors and N by Climate Risks Nationwide. In: *The Role of Nitrogen in Climate Change and the Impacts of Nitrogen-Climate Interactions...: A Technical Report Submitted to the*

US National Climate Assessment Ed. Suddick, E.C., Davidson, E.A., Woods Hole Research Center, 149 Woods Hole Road, Falmouth, MA, 02540-1644 USA. (2012)

- *Co-director*, UC Davis EnvironMentors, an outreach program dedicated to enhancing research opportunities for High School students of ethnically diverse backgrounds in STEM fields (2010 – 2020)

- *Co-director*, UC Davis chapter of Strategies for Ecology, Education, Diversity and Sustainability (*SEEDS*), a science-education program developed by the Ecological Society of America (2008 – 2020) to enhance and nurture opportunities for underrepresented groups in ecological science. (**Awarded "Chapter of Year" by ESA, 2014**)

- **Ad hoc journal reviewer for**: *Science*, *Nature, PNAS, Nature Climate Change, Nature Geoscience, Nature Plants, Science Advances, PLOS, Ecology, Ecological Applications, Ecological Monographs, New Phytologist, Ecology Letters, Oecologia, Global Biogeochemical Cycles, Global Change Biology, Ecosystems, Plant and Soil, Biogeochemistry, Biogeosciences, Soil Science Society of America Journal, Journal of Ecology, Geochimica et Cosmochimica Acta, Environmental Science and Technology, Southern African Journal of Botany*

- **Proposal reviewer** (2007 – present): NSF Panelist, NASA Panelist, NSF Ecosystems Ad Hoc, NSF Geosciences Ad Hoc, US-Israel Bi-national Science Foundation Ad Hoc, Kearney Foundation (Panelist and Ad Hoc)

- **Selected invited talks/seminars**: University of Pennsylvania (2004), St. Lawrence University (2004), University of California – Berkley (2007), Indiana University (2007), Miami University (2007), Penn State University (2008), California Academy of Sciences (2008), Boston University (2009), University of Colorado – Boulder (2009), University of California – Davis (2009), University of California – Merced (2010), EU COST Action Meeting (2010; invited plenary, Slovenia), Northern Arizona University (2011), INTERFACE/CLIMMANI Meeting (2011; Iceland), National Academy of Sciences meeting on Carbon Sequestration (2011; Irvine, CA), Carnegie Institution of Science at Stanford University (2012), Biogeomon Meeting (2012; Invited Plenary, Maine, USA), Southern California Coastal Water Research Project (SCCWRP), a meeting-grounds for scientists, municipalities and decision makers (2012), NCAR (2013), University of Western Ontario (Canada) (2013; invited by graduate students), Tokyo University of Agriculture and Technology (2014; one week of lectures to Global Studies Program, and keynote talk at Japanese Research Symposium), Science Europe, Models in Science (2014, Brussels, Belgium), Kyoto University (2016), Kyoto Research Institute for Humanity and Nature (2016), Gothenburg University (2016), Princeton University (2016), Caltech (2018), Cornell University Life Sciences Lecture Series (2019), NREL Colorado State (2020)

POSTDOCTORAL AND GRADUATE ADVISEES: Dr. E. Bai (postdoc, 2008 - 2010), Dr. T. van Huysen (postdoc, 2010 - 2012), Dr. D. Liptzin (postdoc, 2010 - 2012), Dr. A. Marklein (doctorate conferred 2014, postdoc, 2014), Dr. S. Morford (doctorate conferred 2014, postdoc, 2014 - 2015), Dr. P. Dass (postdoc, 2015 – 2019), Dr. M. Almaraz (NSF postdoc, 2016 – 2019), Dr. G. Manogaran (postdoc, 2018 – 2020), Dr. N. Bingham (postdoc, 2019 – present) Dr. S. Enders (doctorate conferred 2015), Dr. J. Cookingham (doctorate conferred 2015), J. Izquierdo (M.S. conferred 2013), E. Lennon (M.S. conferred 2014), M. Mnich (M.S. conferred 2014), S. Mitchell (M.S. conferred 2017), K. Dynarski (doctorate conferred, 2018), R. Walker (MS conferred, 2019), E. Manaigo (graduate student, current), I. Holzer (graduate student, current), A. Yanqiu (graduate student, current), E. Geoghagen (graduate student, current), J. Wang (visiting scholar from Chinese Academy of Sciences, 2014), W. Huang

(visiting scholar from South China Botanical Garden, 2015), S.R. Lins (visiting scholar from University of Sao Paulo, 2016)

ACADEMIC ADVISORS: C. T. Driscoll (M. S.), L. O. Hedin (Ph. D.), P. M. Vitousek (postdoc), C. B. Field (postdoc)