

Resumé and Curriculum Vitaé

James H. Butler

Global Monitoring Division
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EDUCATION

- Ph.D. 1986. Oceanography (Chemical), Oregon State University, Corvallis, Oregon.
M.S. 1975. Natural Resources, Humboldt State University, Arcata, California.
B.A. 1970. Cellular and Organismal Biology (Chemistry minor), University of California at Santa Barbara, California

EMPLOYMENT

- Aug08-Pres **US Senior Executive Service.** Director, Global Monitoring Division, NOAA Earth System Research Laboratory (NOAA/ESRL). Responsible for leading NOAA global monitoring efforts for long term monitoring of greenhouse and ozone depleting gases, surface radiation, aerosols related to climate, and baseline air quality.
- Jul 89-Aug08 **Research Chemist 3204 ZP 05 02.** National Oceanic & Atmospheric Administration,, Boulder, Colorado. Responsible for measurement and evaluation of trace gases in the atmosphere and oceans. Project Leader for global flask sampling network for numerous greenhouse gases and ozone depleting gases in the atmosphere and for oceanographic and air/sea exchange studies.
- Assignments within this position:**
- January 2007 – Aug 2008. Acting Director, Global Monitoring Division, NOAA /ESRL
Feb 2006 – Dec 2007 Acting Deputy Director for Research and Programs, NOAA/ESRL.
May 2005-Feb 2006. Deputy Director, Global Monitoring Division (formerly CMDL), NOAA/ESRL
Nov 2003-Apr 2005 Acting Director, NOAA Strategic Planning Office, Silver Spring, Maryland –
Nov 2002-Jun 2003 Staff Scientist, US Climate Change Science Program Office (CCSP), Washington DC
Jul 1989-Nov 2002 Project leader, trace gas measurements in the atmosphere, ocean, and polar firm air
- Jun 86-Jul 89 **Research Associate.** University of Colorado, Cooperative Institute for Research in Environmental Sciences, Boulder, Colorado. Measurement and evaluation of trace gases in the atmosphere and oceans. Project Leader for joint US/USSR research on gas and aerosols. Project Leader for measurement of weakly electrophilic gases. Installed instruments for automated, *in-situ* measurement of atmospheric gases at the South Pole, Antarctica.
- Sep 82-Jun 86 **Research Assistant.** College of Oceanography, Oregon State University, Corvallis, Oregon. Study of nutrient distributions and atmospheric trace gases dissolved in seawater. Evaluation of production and consumption mechanisms and air-sea exchange for N₂O, CH₄, CO, and H₂. Also taught General Chemistry and Marine Chemistry laboratory courses to graduates and undergraduates.
- Sep 79-Sep 82 **Lecturer II.** Department of Oceanography, Humboldt State University, Arcata, California. Taught courses in chemical oceanography, radioecology, technical writing, marine resources management; directed field cruises and independent studies.
- Sep 75-Sep 79 **Project Manager, Laboratory Director.** Environmental Analysts, Inc. (Environmental Research Consultants), Arcata, California. Project manager for feasibility studies, impact assessments, and oceanographic field studies. Set up laboratory and obtained certification from EPA and FDA for over 100 analyses of water, wastewater, and shellfish.
- Jan 74-Mar 75 **Graduate Assistant.** Department of Oceanography, Humboldt State University. Teaching assistant for biological oceanography and marine radioecology.
- Jan 71-Jun 73 **Graduate Research Assistant.** HSU Foundation, and Lawrence Radiation Laboratory (now Lawrence Livermore Laboratory), California. Senior investigator for study of radionuclide transport in Humboldt Bay.

MEMBERSHIPS AND SERVICE

Science Advisory Board , Integrated Carbon Observing System (ICOS), (2016 – Pres)
Science Advisory Board, IAGOS for GMES Environmental Services, (2014-2016)
Science Advisory Board, In-service Aircraft Global Observing System (IAGOS), (2011 – Pres; Chair, 2014 – Pres)
World Meteorological Organization Commission for Atmospheric Sciences (2009 – Pres)
GCOS Atmospheric Observation Panel for Climate (AOPC), World Meteorological Organization, Geneva (2005 – Pres)
Carbon Cycle Interagency Working Group (CCIWG) in support of the US Climate Change Science Program, (2005 – Pres)
AAAS Nominating Committee 2011-2013.
Agency Executive Committee (AEC) for CCSP Deliverable 2.2, State of the Carbon Cycle (2005 – 2008)
Advisory Board , Organics over the Ocean Modifying Particles in Both Hemispheres (OOMPH), European Union,
Framework 6 Programme for Sustainable Development, Global Change and Ecosystems (2004 – 2010)
Scientific Advisory Group for Greenhouse Gases, WMO Global Watch Programme, Geneva, CH (2003 – 2009)
NOAA Leadership Competencies Development Program, Federal Executive Center, Charlottesville, Va (2003 – 2005)
Editorial Board, Global Biogeochemical Cycles (1998-2001)
Adjunct Associate Professor, University of Miami (1993-2012)
American Geophysical Union (1984-Pres)
American Association for the Advancement of Science (1979-Pres)
The Oceanography Society, Charter Member (1988-Pres)
Sigma Xi (1985-Pres)

AWARDS

Co-author, NOAA Outstanding Scientific Paper Award (2008)
Silver Medal, US Department of Commerce (2008)
Contributing Author, Nobel Peace Prize Award to International Panel for Climate Change (IPCC) and Albert Gore (2007)
Co-Author, NOAA Outstanding Scientific Paper Award (2007)
EPA Stratospheric Ozone Protection Award (2007)
Coauthor, NOAA Outstanding Scientific Paper Award (2000)
Lead Author, NOAA Outstanding Scientific Paper Award (1999)
Lead Author, NOAA Outstanding Scientific Paper Award (1998)
Silver Medal Award, US Department of Commerce (1997)
Outstanding Paper of the Year, Colorado Scientific Society (1997)
Co-author, NOAA Outstanding Scientific Paper Award (1996)
Co-author, NOAA Outstanding Scientific Paper Award (1995)
Co-author, NOAA Outstanding Scientific Paper Award (1994)

CONTRIBUTIONS TO INTERNATIONAL SCIENTIFIC ASSESSMENTS

IPCC Fifth Assessment Report: 2013, Reviewer. International Panel on Climate Change, United Nations Environmental Programme

Scientific Assessment of ozone Depletion: 2010. Contributor to Chapter 1, Ozone-depleting substances, United Nations Environment Programme.

IPCC Fourth Assessment Report, Member of US Government Review Team, 2006-2007.

Scientific Assessment of Ozone Depletion: 2006. Co-author of Chapter 2, Very short-lived species. United Nations Environmental Programme.

Scientific Assessment of Ozone Depletion: 2002. Co-author of Chapter 1, Controlled substances and other source gases; Contributor to Chapter 2, Very short-lived halogen and sulfur substances. United Nations Environmental Programme.

IPCC Third Assessment Report. 2001. Reviewer of chapters in Part I, The Scientific Basis.

Scientific Assessment of Ozone Depletion: 1998. Contributor to Chapter 1, Long-lived Ozone-related Compounds; Co-author of Chapter 2, Short-lived Ozone-related Compounds. United Nations Environmental Programme.

IPCC Second Assessment Report 1995. Contributing Author Working Group I, Scientific Basis.

Consultation of Experts on Reactive Halogen Compounds and Their Possible Effect on Ozone. 1995. Chairman, Reactive Bromine Compounds; Contributor to sections on Iodine, Chlorine, and Fluorine Compounds.

Climate Change 1995; the Science of Climate Change. Contributor to Chapter 2, Radiative Forcing of Climate Change.

International Panel on Climate Change, United Nations Environmental Programme.
Scientific Assessment of Ozone Depletion: 1994. Contributor to Chapter 2, Source Gases; Co-author of Chapter 10, Methyl Bromide. United Nations Environmental Programme.
Trends '93, a Compendium of Data on Global Change. 1994. Co-contributor of halocarbon data, pp 422-473. World Data Center for Atmospheric Trace Gases, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory.

PUBLICATIONS

Book Chapters

Butler, J.H., and J.M. Rodrigues, eds. 1996. Methyl Bromide in the Atmosphere. Edited by C. Bell, N. Price and B. Chakrabarti, p 27-90, In: *The Methyl Bromide Issue*. London: Wiley and Sons, Ltd.
Crill, P.M., J.H. **Butler**, D. Cooper, and P.C. Novelli. 1995. Standard analytical methods for analysis of trace gases in the environment. Edited by P. Matson and B. Harriss, p. 164-205, In: *Methods in Ecology: Trace Gases*. Oxford: Blackwell Science, Ltd.

Published Reviews

Butler, J.H. 2000. Better budgets for methyl halides? *Nature* 403:260-261.
Butler, J.H. 2000. Methyl bromide: An introduction to its use, its impacts and its future. *IGACTivities Newsletter* 19:8-9.
Butler, J.H. 1996. Scientific uncertainties in the budget of atmospheric methyl bromide. *Atmospheric Environment* 30 (7):R1-R3.
Butler, J.H. 1995. Methyl bromide under scrutiny. *Nature* 376:469-470.

Encyclopedia Contributions

Stratospheric Chemistry and Composition: Halogen Sources, Natural (Methyl Bromide and others), *In Encyclopedia of Atmospheric Science*, 2002
Atmospheric Methyl Bromide, *In Encyclopedia of Global Change*, 2001.

Journal Articles, Symposia Proceedings

Butler, J. H., S. A. Yvon-Lewis, J. M. Lobert, D. B. King, S. A. Montzka, J. L. Bullister, V. Koropalov, J. W. Elkins, B. D. Hall, L. Hu and Y. Liu, (2016), A comprehensive estimate for loss of atmospheric carbon tetrachloride CCl₄ to the ocean., *Atmospheric Chemistry and Physics, Discussions*, , 1-27, 10.5194/acp-2016-311.
Vollmer, Martin K., Jens Mühle, Cathy M. Trudinger, Matthew Rigby, Stephen A. Montzka, Christina M. Harth, Benjamin R. Miller, Stephan Henne, Paul B. Krummel, Bradley D. Hall, Dickon Young, Joil Kim, Jgor Arduini, Angelina Wenger, Bo Yao, Stefan Reimann, Simon O'Doherty, Michela Maione, David M. Etheridge, Shanlan Li, Daniel P. Verdonik, Sunyoung Park, Geoff Dutton, L. Paul Steele, Chris R. Lunder, Tae Siek Rhee, Ove Hermansen, Norbert Schmidbauer, Ray H. J. Wang, Matthias Hill, Peter K. Salameh, Ray L. Langenfelds, Lingxi Zhou, Thomas Blunier, Jakob Schwander, James W. Elkins, **James H. Butler**, Peter G. Simmonds, Ray F. Weiss, Ronald G. Prinn and Paul J. Fraser, (2016), Atmospheric histories and global emissions of halons H-1211 (CBrClF), H-1301 (CBrF), and H-2402 (CBrFCBrF) , *Journal of Geophysical Research: Atmospheres*, 121, 7, 3663-3686, 10.1002/2015JD024488
Ciais, P., A. J. Dolman, A. Bombelli, R. Duren, A. Peregón, P. J. Rayner, C. Miller, N. Gobron, G. Kinderman, G. Marland, N. Gruber, F. Chevallier, R. J. Andres, G. Balsamo, L. Bopp, F.-M. Bréon, G. Broquet, R. Dargaville, T. J. Battin, A. Borges, H. Bovensmann, M. Buchwitz, **J. Butler**, J. G. Canadell, R. B. Cook, R. DeFries, R. Engelen, K. R. Gurney, C. Heinze, M. Heimann, A. Held, M. Henry, B. Law, S. Luyssaert, J. Miller, T. Moriyama, C. Moulin, R. B. Myneni, C. Nussli, M. Obersteiner, D. Ojima, Y. Pan, J.-D. Paris, S. L. Piao, B. Poulter, S. Plummer, S. Quegan, P. Raymond, M. Reichstein, L. Rivier, C. Sabine, D. Schimel, O. Tarasova, R. Valentini, R. Wang, G. van der Werf, D. Wickland, M. Williams and C. Zehner, (2014), Current systematic carbon-cycle observations and the need for implementing a policy-relevant carbon observing system, *Biogeosciences*, 11, 13, , 10.5194/bg-11-3547-2014
Ziska, F. B. Quack, K. Abrahamsson, S. D. Archer, E. Atlas, T. Bell, **J. H. Butler**, L. J. Carpenter, C. E. Jones, N. R. P. Harris, H. Hepach, K. G. Heumann, C. Hughes, J. Kuss, K. Krüger, P. Liss, R. M. Moore, A. Orlikowska, S. Raimund, C. E. Reeves, W. Reifenhäuser, A. D. Robinson, C. Schall, T. Tanhua, S. Tegtmeier, S. Turner, L. Wang, D. Wallace, J. Williams, H. Yamamoto, S. Yvon-Lewis, and Y. Yokouchi., *Global sea-to-air flux climatology for*

- bromoform, dibromomethane and methyl iodide. *Atmos. Chem. Phys. Discuss.*, 13, 5601-5648, 2013.
- Liu, Yina, Shari A. Yvon-Lewis, Daniel C. O. Thornton, **James H. Butler**, Thomas S. Bianchi, Lisa Campbell, Lei Hu and Richard W. Smith, (2013), Spatial and temporal distributions of bromoform and dibromomethane in the Atlantic Ocean and their relationship with photosynthetic biomass, *Journal of Geophysical Research: Oceans*, 118, 8, , 10.1002/jgrc.20299
- Hu, L., S.A. Yvon-Lewis, J.H. **Butler**, J.M. Lobert, and D.B. King (2013), An improved oceanic budget for methyl chloride. *Journal of Geophysical Research*, 118,1-11, doi:10.1029/2012JC008196.
- Suntharalingam, Parvatha, Erik Buitenhuis, Corinne Le Quéré, Frank Dentener, Cynthia Nevison, **James H. Butler**, Hermann W. Bange and Grant Forster, (2012), Quantifying the impact of anthropogenic nitrogen deposition on oceanic nitrous oxide, *Geophysical Research Letters*, 39, 7, n/a-n/a, 10.1029/2011GL050778
- Montzka, S.A., E.J.Dlugokencky, and J.H.**Butler** (2011), Non-CO₂ greenhouse gases and climate change, *Nature* 476, 45-50
- Jones, C.E, S.J Andrews, L Carpenter, C Hogan, F Hopkins, J Laube, A Robinson, T Spain, S Archer, N Harris, P Nightingale, S O'Doherty, D Oram, J Pyle, **J. H. Butler** and B. D. Hall, (2011), Results from the first national UK inter-laboratory calibration for very short-lived halocarbons, *Atmospheric Measurement Techniques*, 4, , 10.5194/amt-4-865-2011
- Hall, B. D., G. S. Dutton, D. J. Mondeel, J. D. Nance, M. Rigby, **J. H. Butler**, F. L. Moore, D. F. Hurst and J. W. Elkins, (2011), Improving measurements of SF₆ for the study of atmospheric transport and emissions, *Atmospheric Measurement Techniques*, 4, 11, , 10.5194/amt-4-2441-2011
- Xiao, X. et al. (2010), Optimal Estimation of the Surface Fluxes of Methyl Chloride Using a 3-D Global Chemical Transport Model, *Atmospheric Chemistry and Physics* 10.12 (2010) : 5515-5533, doi:10.5194/acp-10-5515-2010.
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- Butler, J. H.**, T.G. Bell, B. D. Hall, B. Quack, L.J. Carpenter and J. Williams, (2010), Technical Note: Ensuring consistent, global measurements of very short-lived halocarbon gases in the ocean and atmosphere, *Atmospheric Chemistry and Physics*, 10, 2, 327-330.
- Hofmann, D.J., J.H. **Butler**, and P.P. Tans (2009), A new look at atmospheric carbon dioxide. *Atmospheric Environment* 43: 2084–2086.
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- Hofmann, D. J., J. H. **Butler**, T. J. Conway, E. J. Dlugokencky, J. W. Elkins, K. Masarie, S. A. Montzka, R. C. Schnell, and P. Tans, 2006: Tracking climate forcing: The Annual Greenhouse Gas Index. *EOS*, Transactions American Geophysical Union, 87, 509-511.
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- Yvon-Lewis, Shari A., James H. **Butler**, Eric S. Saltzman, Patricia A. Matrai, Daniel B. King, Ryszard Tokarczyk, Robert M. Moore, and Jia-Zhong Zhang, Methyl bromide cycling in a warm-core eddy of the North Atlantic Ocean. *Global Biogeochemical Cycles*, 16(4), 1141, doi:10.1029/2002GB001898, 2002.
- Yvon-Lewis, S.A. and J.H. **Butler**. 2002. The Effect of Oceanic Uptake on the Atmospheric Lifetime of Selected Trace Gases. *Journal of Geophysical Research* 107(D20) 4414, doi:10.1029/2001JD001267, 2002
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- Battle, M., M. Bender, T. Sowers, P. Tans, J. **Butler**, J. Elkins, J. Ellis, T. Conway, N. Zhang, P. Lang, and A. Clarke. 1996. Histories of atmospheric gases from the firn at South Pole. *Nature* 383:231-235.
- Montzka, S.A., J.H. **Butler**, R.C. Myers, T.M. Thompson, T.H. Swanson, A.D. Clarke, L.T. Lock, and J.W. Elkins. 1996. Decline in the tropospheric abundance of halogen from halocarbons. *Science* 272:1318-1322.
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- Yvon, S.A., and J.H. **Butler**. 1996. An improved estimate of the oceanic lifetime of atmospheric CH₃Br. *Geophysical Research Letters* 23 (1):53-56.
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- Butler**, J.H., J.W. Elkins, T.M. Thompson, B.D. Hall, T.S. Swanson, and V. Koropalov. 1991. Oceanic Consumption of CH₃CCl₃: Implications for tropospheric OH. *Journal of Geophysical Research*, 96(D12), 22,347-22,355.
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