# Mark Alan Cochrane

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## I. Education

1994-1998 **Ph.D. Ecology, The Pennsylvania State University**
1989-1993 **S.B. Environmental Engineering Science, Massachusetts Institute of Technology**

## II. Professional Experience

2017-present **Professor, Appalachian Laboratory, University of Maryland Center for Environmental Science.** Interdisciplinary research combining ecology, remote sensing, forest management, climate science and other fields of study to provide a landscape perspective of dynamic processes involved in land-cover change.

2005-2017 **Professor, Geospatial Sciences Center of Excellence, appointed in the Department of Natural Resource Management, South Dakota State University.** Research emphasizing climate change, human dimensions of land-cover change, forest management and the potential for sustainable development. Teaching of Wildland Fire Science and Climate Change.

1995-present **Associate Researcher, Instituto do Homem e Meio Ambiente na Amazônia (IMAZON).** Advisor, technical consultant and researcher. Work emphasizing the human role in land cover and land use change in the Amazon. Recent work on natural resource planning, climate change and biodiversity conservation.

1999-present **Senior Research Scientist, Center for Global Change and Earth Observations (CGCEO) Michigan State University.** Research focusing on understanding spatial patterns, interactions and synergisms between multiple physical and biological factors that affect ecosystems. (adjunct since 2005)

2003-2007 **Adjunct Professor, Department of Geography, Michigan State University.** Teaching (Fire and Ecosystems; Monitoring the Biosphere from Space; Introduction to Earth Systems Science), Graduate Advisor and Committee Member.

1998-1999 **Postdoctoral Fellow, Woods Hole Research Center (WHRC)** Researcher and supervisor for various projects investigating and modeling fire susceptibility in Amazonian forests. Experimental design for large-scale rainfall exclusion experiments.

1998-1999 **Associate Researcher, Instituto de Pesquisa Ambiental da Amazônia (IPAM)** Researcher and supervisor for several research projects in Amazônia.

1997-1998 **Consultant, Woods Hole Research Center (WHRC)** Supervisor and coordinator for various ecological research projects.

1993-1995 **Marine Electronics Technician, Antarctic Support Associates (NSF contract)** Provided field support for numerous NSF-funded scientific expeditions.

1992-1993 **Internship, Massachusetts Coastal Zone Management Office**

Designed and developed an integrated model of the physical and chemical transport processes of PCBs.

1983-1989 **Electronics Technician, United States Navy**
1986-1989 **USS H.H. Hess TAGS-38, Survey System Supervisor**
1984-1986 **USS Ohio SSBN 726, Navigation Supervisor**

# III. Honors

Faculty Award for Global Engagement for Excellence in International Research 2015 – South Dakota State University
National Science Foundation (NSF) Fellowship 1996-1998
Pennsylvania State University Graduate School Fellowship 1994-1995
Braddock Award Pennsylvania State University 1994-1997
Sigma Xi MIT chapter since 1993
Dean A. Horn Award for best MIT undergraduate marine research project 1991-1992

# IV. Research

## A. Area of professional expertise

Interdisciplinary work combining ecology, remote sensing, and other fields of study to provide an Earth systems perspective of the dynamic processes involved in global change. Globally recognized expert on wildfire in tropical and temperate ecosystems and linkages to human land-use and management. Ongoing research investigating disturbance regime changes resulting from various forms of global change, including climate change, forest degradation and the mitigating effects of forest management.

## B. Publications

ISI - *Citations 7,439; h-index 32 – January 2, 2020*
*ResearcherID A-1735-2018*
Google Scholar - *Citations 14,045; h-index 42; i10-index 95 – January 2, 2020*
*https://scholar.google.com/citations?hl=en&user=_xlQmtIAAAAJ&view_op=list_works*

**1. JOURNAL PUBLICATIONS**: (* = PI-funded projects, underlined = student, *italics* = post doc)

*Wedeux, B.M.M., M. Dalponte, M. Schlund, S. Hagen, **M.A. Cochrane**, L.L.B. Graham and D.A. Coomes. (In press) Complex dynamics of a human-modified tropical peat swamp forest revealed by repeat lidar surveys. *Global Change Biology*.

*Goldstein, J.E., L. Graham, S. Ansori, Y. Vetrita, A. Thomas, G. Applegate, A.P. Vayda, B.H. Saharjo and **M. A. Cochrane**. (In press). Beyond slash-and-burn: The roles of human activities and fire fuels in peat fires in Central Kalimantan, Indonesia. *Singapore Journal of Tropical Geography*.

*Liu, J., B.M. Sleeter, Z. Zhu, T.R. Loveland, T. Sohl, S.M. Howard, C.H. Key, T. Hawbaker, S. Liu, B. Reed, **M.A. Cochrane**, L. Heath, H. Jiang, D.T. Price, J.M. Chen, D. Zhou, N.B. Bliss, T. Wilson, J. Sherba, Q. Zhu, Y. Luo and B. Poulter. (In press) Critical land change information enhances understanding of carbon balance in the U.S. *Global Change Biology*.

*Vetrita, Y. and **M.A. Cochrane**. 2020. Fire Frequency and Related Land-use and Land-cover Changes in Indonesia's Peatlands. *Remote Sensing* 12(1), 5; https://doi.org/10.3390/rs12010005

*Sinclair, A.L., L.L.B. Graham, *E.I. Putra*, B.H. Saharjo, G. Applegate, S.P. Grover and **M.A. Cochrane**. 2020. Peat bulk density is influenced by distance from drainage canal in a degraded tropical peatland. *Science of the Total Environment* 699:134199.

**Putra, E.I.*, **Cochrane M.A.**, B.H. Saharjo, L. Graham, A. Thomas, G. Applegate, A. Saad, E. Setianto, S. Sutikno and A. Prayitno. 2019. Developing Better Understanding on Tropical Peat Fire Occurrences and Dynamics. *IOP Conf. Series: Earth and Environmental Science* 394: 012044 doi:10.1088/1755-1315/394/1/012044

*Lu, X., X. Zhang, F. Li and **M.A. Cochrane**. 2019. Investigating Smoke Aerosol Emission Coefficients using MODIS Active Fire and Aerosol Products - A Case Study in the CONUS and Indonesia. *Journal of Geophysical Research – Biogeosciences* 124 (6): 1413-1429 doi:10.1029/2018JG004974

**Putra, E.I.*, D.A.F. Hafni, A.A.N. Harahap, **M.A. Cochrane** and B.H. Saharjo. Assessing rainfall pattern, groundwater level, and peat hydraulic conductivity for effective peat prevention measure. 2019. *IOP Conference Series: Earth and Environmental Science* 284: 01202 doi:10.1088/1755-1315/284/1/012021

**Cochrane, M.A.** 2019. Burning questions about ecosystems. *Nature Geoscience* 12: 86-87. DOI: 10.1038/s41561-019-0306-x

Dwomoh, F.K., M.C. Wimberly, **M.A. Cochrane** and I. Numata. 2019. Forest Degradation Promotes Fire during Drought in Moist Tropical Forests of Ghana. *Forest Ecology and Management* 440: 158-168. https://doi.org/10.1016/j.foreco.2019.03.014

*Murphy, B.P., L.D. Prior, **M.A. Cochrane**, G.J. Williamson and D.M.J.S. Bowman. 2019. Biomass consumption by surface fires across Earth's most fire-prone continent. *Global Change Biology* 25, 254-268 DOI: 10.111/gcb.14460

**Putra, E.I.*, M.S. Imanudin, D.A. Fadhillah, **M.A. Cochrane**, L.Graham, B.H. Saharjo and H. Hayasaka. 2018. Referensi tinggi muka air tanah bagi pencegahan kebakaran gambut di Indonesia. *Seminar Nasional Hari Air Sedunia* 1(1), 65-71. e-ISSN: 2621-7449.

**Putra, E.I.*, **M.A. Cochrane**, Y. Vetrita, L. Graham and B.H. Saharjo. 2018. Determining critical groundwater level to prevent degraded peatland from severe peat fire. *IOP Conference Series: Earth and Environmental Science* 149 012027 doi: 10.1088/1755-1315/149/1/012027

*Jayarathne, T., C.E. Stockwell, A.A. Gilbert, K. Daugherty, **M.A. Cochrane**, K.C. Ryan, *E.I. Putra*, B.H. Saharjo, A.D. Nurhayati, I. Albar, R.J. Yokelson and E.A. Stone. 2018. Chemical characterization of fine particulate matter emitted by peat fires in Central Kalimantan, Indonesia, during the 2015 El Nino. *Atmospheric Chemistry and Physics* 18, 2585-2600 https://doi.org/10.5194/acp-18-2585-2018

*Benami, E., L.M. Curran, **M. Cochrane**, A. Venturieri, R. Franco, J. Kneipp and A. Swartos. 2018. Oil palm land conversion in Pará, Brazil from 2006-2014: Evaluating the 2010 Brazilian sustainable oil palm production program. *Environmental Research Letters* 13: 034037

Sparks, A.M., C.A. Kolden, A. M.S. Smith, L. Boschetti, D.M. Johnson and **M.A. Cochrane**. 2018. Fire intensity impacts on post-fire response of temperate coniferous forest net primary productivity. *Biogeosciences* 15, 1173-1183 https://doi.org/10.5194/bg-15-1173-2018

Numata, I., S.S. da Silva, **M.A. Cochrane** and M.V.N. d'Oliveira. 2017. Fire and edge effects in a fragmented tropical forest landscape in the southwestern Amazon. *Forest Ecology and Management* 401: 135-146.

*Prior, L.D., B.P. Murphy, G.J. Williamson, **M.A. Cochrane**, W.M. Jolly and D.M.J.S. Bowman. 2017. Does inherent flammability of grass and litter fuels contribute to continental patterns of landscape fire activity? *Journal of Biogeography* 44(6) 1225-1238. doi:10.1111/jbi.12889

Bowman, D.M.J.S., G.J. Williamson, C.A. Kolden, A.M.S. Smith, J.T. Abatzoglou and **M.A. Cochrane**. 2017. Human population vulnerability to globally extreme wildfires. *Nature Ecology and Evolution* 1: 0058 DOI: 10.1038/s41559-016-0058.

Numata, I., K. Khand, J. Kjaersgaard, **M.A. Cochrane** and S.S. da Silva. 2017. Evaluation of Landsat-Based METRIC Modeling to Provide High-Spatial Resolution Evapotranspiration Estimates for Amazonian Forests. *Remote Sensing* 9(1) 46; doi:10.3390/rs9010046.

Bueno da Costa, O., E.A.T. Matricardi, M.A. Pedlowski, **M.A. Cochrane**, L.C. Fernandes and H. Angelo. 2017. Land use displacements by soybean plantations in the Western Brazilian Amazon state of Rondônia. *Acta Amazonica* 47(1) 29-38.

L.S. Wijedasa, J. Jauhiainen, M. Könönen, M. Lampela, H. Vasander, M.C. LeBlanc, S. Evers, T.E.L. Smith, C.M. Yule, H. Varkkey, M. Lupascu, F. Parish, I. Singleton, G.R. Clements, S.A. Aziz, M.E. Harrison, S. Cheyne, G.Z. Anshari, E. Meijaard, J.E. Goldstein, S. Waldron, K. Hergoualc'h, R. Dommain, S. Frolking, C.D. Evans, M.R.C. Posa, P. H. Glaser, N. Suryadiputra, R. Lubis, T. Santika, R. Padfield, S. Kurnianto, P. Hadisiswoyo, T.W. Lim, S.E. Page, V. Gauci, P.J. van der Meer, H. Buckland, F. Garnier, M.K. Samuel, L.N.L.K. Choo, P. O'Reilly, M. Warren, S. Suksuwan, E. Sumarga, A. Jain, W.F. Laurance, J. Couwenberg, H. Joosten, R. Vernimmen, A. Hooijer, C. Malins, M.A. Cochrane, B. Perumal, F. Siegert, K.S.-H. Peh, L.-P. Comeau, L. Verchot, C.F. Harvey, A. Cobb, Z. Jaafar, H. Wösten, S. Manuri, M. Müller, W. Giesen, J. Phelps, D.L. Yong, M. Silvius, B.M.M. Wedeux, A. Hoyt, M. Osaki, H. Takashi, H. Takahashi, T.S. Kohyama, A. Haraguchi, N.P. Nugroho, D.A. Coomes, L.P. Quoi, A. Dohong, H. Gunawan, D.L.A. Gaveau, A. Langner, F.K.S. Lim, D.P. Edwards, X. Giam, G. van der Werf, R. Carmenta, C.C. Verwer, L. Gibson, L. Grandois, L.L.B. Graham, J. Regalino, S.A. Wich, J. Rieley, N. Kettridge, C. Brown, R. Pirard, S. Moore, B.R. Capilla, U. Ballhorn, H.C. Ho, A. Hoscilo, S. Lohberger, T.A. Evans, N. Yulianti, G. Blackham, Onrizal, S. Husson, D. Murdiyarso, S. Pangala, L.E.S. Cole, L. Tacconi, H. Segah, P. Tonoto, J.S.H. Lee, G. Schmilewski, S. Wulffraat, E.I. Putra, M.E. Cattau, R.S. Clymo, R. Morrison, A. Mujahid, J. Miettinen, S.C. Liew, S. Valpola, D. Wilson, L. D'Arcy, M. Gerding, S. Sundari, S.A. Thornton, B. Kalisz, S.J. Chapman, A.S.M. Su, I. Basuki, M. Itoh, C. Traeholt, S. Sloan, A.K. Sayok & R. Andersen. 2017. Denial of long-term issues with agriculture on tropical peatlands will have devastating consequences. *Global Change Biology* 23(3) 977-982. doi: 10.1111/gcb.13516.

*Freeborn, P.H. W.M. Jolly, and **M.A. Cochrane**. 2016. Impacts of changing fire weather conditions on reconstructed trends in U.S. wildland fire activity from 1979 to 2014. *Journal of Geophysical Research – Biogeosciences* 121, doi:10.1002/2016JG003617.

*Stockwell, C.E., T. Jayarathne, **M.A. Cochrane**, K.C. Ryan. E.I. Putra, B.H. Saharjo, A.D. Nurhayati, I. Albar, D.R. Blake, I.J. Simpson, E.A. Stone and R.J. Yokelson. 2016. Field measurements of trace gases and aerosols emitted by peat fires in Central Kalimantan, Indonesia during the El Niño. *Atmospheric Chemistry and Physics* 16(18): 11711-11732. doi:10.5194/acp-16-11711-2016

Boer, M.M., D.M.J.S. Bowman, *B.P. Murphy*, G.J. Cary**, M.A. Cochrane**, R.J. Fensham, M.A. Krawchuk, O.F. Price, V. Resco de Dios, R.J. Williams, and R.A. Bradstock. 2016. Changes in climate water balance drive transformational shifts in Australian fire regimes. *Environmental Research Letters* 11(6): 065002.

*Williamson, G.J. L.D. Prior, W.M. Jolly, **M.A. Cochrane**, B.P. Murphy and D.M.J.S. Bowman. 2016. Measurement of inter- and intra-annual variability of landscape fire activity at a continental scale: the Australian case. *Environmental Research Letters* 11(3): 035003 doi:10.1088/1748-9326/11/3/035003

Smith, A.M.S., C.A. Kolden, T.B. Paveglio, **M.A. Cochrane**, D.M.J.S. Bowman, M.A. Moritz, A.D. Kliskey, L. Alessa, A.T. Hudak, C.M. Hoffman, J.A. Lutz, L.P. Queen, S.J. Goetz, P.E. Higuera, L. Boschetti, M. Flannigan, K.M. Yedinak, A.C. Watts, E.K. Strand, J.W. van Wagtendonk, J.W.

Anderson, B.J. Stocks and J.T. Abatzoglou. 2016. The science of firescapes: achieving fire resilient communities. *BioScience* 66(2): 130-146.

*Thompson, M.P., *P. Freeborn*, J.D. Rieck, D.E. Calkin, J.W. Gilbertson-Day, **M.A. Cochrane** and M.S. Hand. 2016. Quantifying the influence of previously burned areas on suppression effectiveness and avoided exposure: A case study of the Las Conchas fire. *International Journal of Wildland Fire* 25(2): 167-181.

*Silveira, J.M., J. Louzada, J. Barlow, R. Andrade, L. Mestre, R. Solar, S. Lacau and **M.A. Cochrane**. 2015. A multi-taxa assessment of biodiversity change after single and recurrent wildfires in a Brazilian Amazon forest. *Biotropica* 48(2) 170-180. doi: 10.1111/btp.12267

*Jolly, W.M., **M.A. Cochrane**, *P.H. Freeborn*, Z.A. Holden, T.J. Brown, G.J. Williamson, and D.M.J.S. Bowman. 2015. Climate-induced variations in global wildfire danger from 1979 to 2013. *Nature Communications* 6, Article number: 7537. doi:10.1038/ncomms8537 **(Cited > 400 times)**

**Murphy, B.*, **M.A. Cochrane**, and J. Russell-Smith. 2015. Prescribed burning protects endangered tropical heathlands of the Arnhem Plateau, northern Australia. *Journal of Applied Ecology* 52(4): 980-991. doi:10.1111/1365-2664.12455

**Freeborn, P.H.*, **M.A. Cochrane** and W.M. Jolly. 2015. Relationships between fire danger and the daily growth of active incidents burning in the northern Rocky Mountains, USA. *International Journal of Wildland Fire* 24: 900-910. http://dx.doi.org/10.1071/WF14152

J.G. Goldammer, S.J. Pyne, T.W. Swetnam, C. Whitlock, B.J. Stocks, M.D. Flannigan, A.I. Sukhinin, E. Ponomarev, L. Hinzman, F.S. Chapin, M. Fukuda, S. Page, J. Rieley, A. Hoscilo, A. Spessa, U. Weber, **M.A. Cochrane**, J.M. Moreno, V.R. Vallejo, E. Chuvieco, R.J. Williams, R.A. Bradstock, G.J. Cary, L.D. Neal, J. Enright, A.M. Gill, J. Handmer, K.J. Hennessy, A.C. Liedloff, C. Lucas, M.A. Moritz, M.A. Krawchuk, J.E. Keeley, W.S.W. Trollope, C. de Ronde, M.O. Andreae, G. van der Werf, K. Thonicke, J.G. Dans, V. Lehsten, R. Fisher, M. Forrest, L. Gowman, M. Wotton, W.J. de Groot, A. González-Cabán, M. Statheropoulos, S. Karma, W.J. Bond, G.F. Midgley, C.O. Justice, I. Csiszar, L. Boschetti, S. Korontzi, W. Schroeder, L. Giglio, K.P. Vadrevu, and D. Roy. 2015. Vegetation Fires and Global Change. Challenges for Concerted International Action. A White Paper directed to the United Nations and International Organizations. In: *Planet@Risk*, 3(1): 45-57, Davos: Global Risk Forum GRF Davos.

*Andrade, R.B., J. Barlow, J. Louzada, F.Z. Vaz-de-Mello, J. Silveira and **M.A. Cochrane**. 2014. Tropical forest fires and biodiversity: Dung beetle community and biomass responses in a northern Brazilian Amazon forest. *Journal of Insect Conservation*. DOI 10.1007/s10841-014-9719-4

*Barber, C.P., **M.A. Cochrane**, C.M. Souza Jr., and W.F. Laurance. 2014. Roads, deforestation, and the mitigating effect of protected areas in the Amazon. *Biological Conservation* 177: 203-209. **(Cited > 200 times)**

**Freeborn, P.H.*, **M.A. Cochrane** and M.J. Wooster. 2014. A Decade Long, Multi-scale Map Comparison of Fire Regime Parameters Derived from Three Publically Available Satellite-based Fire products: A Case Study in the Central African Republic. *Remote Sensing* 6(5): 4061-4089.

*Bowman, D.M.J.S., *B.P. Murphy*, G.J. Williamson and **M.A. Cochrane**. 2014. Pyrogeographic models, feedbacks and the future of global fire regimes. *Global Ecology and Biogeography, 23, 821-824*.

**Freeborn, P.H.*, M.J. Wooster, D.P. Roy and **M.A. Cochrane**. 2014. Quantification of MODIS fire radiative power (FRP) measurement uncertainty for use in satellite-based active fire characterization and biomass burning estimation. *Geophysical Research Letters* 41(6): 1988-1994.

*Kumar,S., D.P. Roy, **M.A. Cochrane**, C. Souza Jr., C.P. Barber, and L. Boschetti. 2014. A quantitative study of the Proximity of Satellite Detected Active Fires to Roads and Rivers in the Brazilian Tropical Moist Forest Biome. *International Journal of Wildland Fire* 23(4) 532-543.

Roos, C.I., D.M.J.S. Bowman, J. Balch, P. Artaxo, W.J. Bond, **M. Cochrane**, C.M. D'Antonio, R. DeFries, F.H. Johnston, M.A. Krawchuk, C.A. Kull, M. Mack, M.A. Moritz, S. Pyne, A.C. Scott and T.W. Swetnam. 2014. Pyrogeography, historical ecology, and the human dimensions of fire regimes. *Journal of Biogeography* 41(4): 833-836. doi:10.1111/jbi.12285.

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*Andrade, R.B., J. Barlow, J. Louzada, L. Mestre, J. Silveira, F.Z. Vaz-de-Mello and **M.A. Cochrane**. 2014. Biotic congruence in humid tropical forests: a multi-taxa examination of spatial distribution and responses to forest disturbance. *Ecological Indicators* 36: 572-581.

*Souza, C., J.V. Siqueira, M. Sales, A.V. Fonseca, J. Ribeiro, *I. Numata*, **M.A. Cochrane**, C. Barber, D. Roberts and J. Barlow. 2013. 10-year Landsat classification of deforestation and forest degradation in the Brazilian Amazon. *Remote Sensing* 5(11) 5493-5513 doi:10.3390/rs5115493. **(Cited > 100 times)**

**Cochrane, M.A.** 2013. Introduction to 'The Disappearance of the Tropical Forests of Africa'. *Fire Ecology* 9(2): 1-2.

*Bowman, D.M.J.S., *B.P. Murphy*, M.M. Boer, Bradstock, G.J. Cary, **M.A. Cochrane**, R.J. Fensham, M.A. Krawchuk, O.F. Price and R.J. Williams. 2013. Forest fire management, climate change and the risk of catastrophic carbon losses. *Frontiers in Ecology and the Environment* 2, 66-68.

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*Mestre, L., **M.A. Cochrane** and J. Barlow. 2013. Long-term changes in bird communities after wildfires in the Central Brazilian Amazon. *Biotropica* 45(4): 480-488.

*Silveira, J.M., J. Barlow, L.A.M. Mestre, R.B. Andrade, S. Lacau, R. Zanetti, and **M.A. Cochrane**. 2013. The responses of leaf litter ant communities to wildfires in the Brazilian Amazon: a multi-region assessment. *Biodiversity and Conservation*. 22: 513-529. DOI 10.1007/s10531-012-0426-8

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***Cochrane, M.A.**, C.J. Moran, M.C. Wimberly, A.D. Baer, M.A. Finney, K.L. Beckendorf, J. Eidenshink, and Z. Zhu. 2012. Estimation of wildfire size and risk changes due to fuels treatments. *International Journal of Wildland Fire* 21(4): 357-367. http://dx.doi.org/10.1071/WF11079.

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*Barlow, J. L. Parry, T.A. Gardner, J. Ferreira, R. Carmenta, E. Berenguer, I.C.G. Veira, L. Aragao, C. Souza and **M.A. Cochrane**. 2012. The critical importance of considering fire in REDD+ programs. *Biological Conservation*. 154(SI): 1-8. http://dx.doi.org/10.1016/j.biocon.2012.03.034

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**Books:**

Applegate, G., L.L.B. Graham, A. Thomas, A. Yunan, Didie, Agus, Ato, B.H. Saharjo and **M.A. Cochrane.** 2018. Fire Scene Evaluation Field Manual. Penerbit IPB Press, Bogor, Indonesia, 106pp.

**Cochrane, M.A.** 2009. *Tropical Fire Ecology: Climate Change, Land Use and Ecosystem Dynamics*. Springer-Praxis, Heidelberg, Germany, 645pp.

Gutman, G., Janetos, A.C., Justice, C.O., Moran, E.F., Mustard, J.F., Rindfuss, R.R., Skole, D., Turner II, B.L., and **Cochrane, M.A.** (Eds.) 2004. *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface*. Kluwer Academic Publishers, 461pp.

**Cochrane, M.A.** (UNEP) 2002. Spreading Like Wildfire – Tropical Forest Fires In Latin America And The Caribbean: Prevention, Assessment And Early Warning. United Nations Environment Program, Regional Office for Latin America and the Caribbean. 96pp. (also published in Spanish 109pp).

**Book Chapters** (N = 16)**:**

**Cochrane, M.A.** 2013. Current fire regimes, impacts and the likely changes – V: Tropical South America. Pp 101-114 in J.G. Goldammer ed. *Vegetation Fires and Global Change: Challenges for Concerted International Action a White Paper directed to the United Nations and International Organizations*, Kessel Publishing House, Remagen, Germany.

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Kodandapani, N., **M.A. Cochrane** & R. Sukumar. 2009. Forest fire regimes and their ecological effects in seasonally dry tropical ecosystems in the Western Ghats, India. Pp. 335-354 in M.A. Cochrane, ed. *Tropical Fire Ecology: Climate Change, Land Use and Ecosystem Dynamics*. Springer-Praxis, Heidelberg, Germany.

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Skole D.L., **M.A. Cochrane**, E.A.T. Matricardi, W. Chomentowski, M. Pedlowski and D. Kimble. 2004. Pattern to Process in the Amazon Region: measuring forest conversion, regeneration and degradation. Pp. 77-95 in *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface* (Gutman et al. eds). Kluwer Academic Publishers.

Csiszar, I., C.O. Justice, A.D. Mcguire, **M.A. Cochrane**, D.P. Roy, F. Brown, S.G. Conard, P.G.H. Frost, L. Giglio, C. Elvidge, M.D. Flannigan, E. Kasischke, D.J. McCrae, T.S. Rupp, B.J. Stocks, and D.L. Verbyla. 2004. Land Use and Fires. Pp. 329-350 in *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface* (Gutman et al. eds). Kluwer Academic Publishers.

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**White Papers:**

International Union of Forest Research Organizations, 2018. Global Fire Challenges in a Warming World. Robinne, F.-N., Burns J., Kant P., de Groot B., Flannigan M.D., Kleine M. and D.M. Wotton (eds.). Occasional Paper No. 32. IUFRO, Vienna, 2018. (**contributing author**)

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**Cochrane, M.A.** and C.J. Moran. 2011. Past, Present, and Future Climates for South Dakota: Observed climatic variation from 1895-2010 and projected climate change to 2099. Provided as support materials for the South Dakota Wildlife Action Plan, South Dakota Department of Game, Fish and Parks. 160p.

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**Cochrane, M.A.** 2006. Is the Amazon really at risk of dieback under projected climate change? Provided as material to support the Coalition for Rainforest Nations negotiations at the United Nations Framework Convention on Climate Change (UNFCCC) Workshop on Reducing Emissions from Deforestation in Developing Countries (Rome, Italy 30 August – 1 September 2006).

**Proceedings:**

Ryan, K.C., A.P. Vayda, T.C. Jessup and M.A. Cochrane. Ignitions for Peat Fires in Indonesia: A Critical Look. In: Hood, S.M., Drury, S., Steelman, T. and R. Steffans, eds. In Preparation. The Fire Continuum – preparing for the future of wildland fire: Proceedings of the Fire Continuum Conference. 21-24 May 2018; Missoula, MT. Proceedings RMRS-P. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Online.

Moran, C.J. and M.A. Cochrane. 2011. Mountain Pine Beetles, Mitigation Treatments and Fire Behavior in Ponderosa Pine Forests of the Black Hills, South Dakota, USA. Proceedings of the South Dakota Academy of Science 90: 197.

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Cochrane, M.A. and C.M. Souza. 2006. Fire dynamics and human land use in the Brazilian Amazon. Proceedings of the 3rd International Fire Ecology and Management Congress, San Diego CA, November 13-17 2006.

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**Technical documents and contributions:**

Wang C., J. Qi, D.L. Skole, M.A. Cochrane and Matricardi, E.A.T. 2003. *Tropical Forest Degradation and Recovery: Estimation and Validation of Canopy Cover with Landsat and IKONOS Imagery*. CGCEO/RA01-03/w. Michigan State University, East Lansing, Michigan.

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Nepstad D.C., Veríssimo A., Alencar A., Lefebvre P., Schlesinger P, Cochrane M.A., Lima E., Silva Jr. U.L., Moutinho P., Brown I.F., Nobre C., Mendoza E., Stone T. 1999. Cryptic impoverishment of Amazonian forests through logging and fire. Presented by Mark Cochrane at the Forum "Forests and Atmosphere – Water – Soil" Workshop: Forests after the Kyoto Protocol -- Their potential role as sources and sinks of trace gases, especially carbon dioxide. Soltau, Germany. July 2-5, 1999. Forests in Focus: Forest and Atmosphere-Water-Soil NNA-Reports vol. 12, Special Issue 4, pg. 115-120.

Nepstad, D.C., Moreira, A. & Alencar, A. 1999. Flames in the Rainforest: Origins, Impacts and Alternatives to Amazonian Fire. (World Bank, Pilot Program for the Conservation of the Brazilian Rainforest, Brasília). Acknowledged contributor, including the book cover.

**Editor:**

Special section editor: *Synergistic Effects in Fragmented Landscapes*. Published in Conservation Biology 2001 15(6) 1488-1535. Included several research papers presented at the symposium "Synergistic Effects in Fragmented Landscapes" chaired by William F. Laurance and Mark A. Cochrane at the Society for Conservation Biology 2000 Annual Meeting at The University of Montana in Missoula from 9-12 June 2000. Cochrane (2001) was selected as the cover article.

Editor for (Section II) Observations of Land Cover and Land Use Change: Case Studies (10 chapters), in *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface* (Gutman et al. eds). Kluwer Academic Publishers (2004) 461pp.

**Published interview:** Lead article.

Cochrane, M.A. 2002. New protection for the Amazon. *Environmental Review* 9(12): 1-8.

**Review Commentator** for *Science and Technology – Building the Future of the World's Forests*. International Union of Forest Research Organizations (IUFRO) Occasional Paper 15. Contributions to the Third Session of the United Nations Forum on Forests in Geneva, Switzerland, 26 May – 6 June 2003.

**Book reviews:**

Cochrane, M.A. 2004. Making Sustainability Accessible And Achievable, a review of Developing Ecological Consciousness. Path to a Sustainable World. Uhl, C. 2003. Rowman & Littlefield Publishing Group, Inc., Lanham, MD. 375 pp. (349 + xxiv). ISBN 0-7425-3291-7. *Conservation Biology* 18: 1446-1447.

Cochrane, M.A. 2002. Review of Footprints in the Jungle: Natural Resource Industries, Infrastructure and Biodiversity Conservation. Eds I.A. Bowles and G.T. Prickett., Oxford, UK: Oxford University Press, 2001. 331 pp. *Environmental Conservation*. 29: 111-112.

## C. Contracts and Grants

**Awarded >$17,000,000 in Federal Funds with >$10,000,000 as Principal Investigator**

**Current Research Grants**:

NASA (**Cochrane PI**) Land Cover and Land Use Change Grant ($749,641) 2020-2023. Land-use transitions in Indonesian peatlands.

NASA (**Cochrane PI**) Carbon Monitoring Science Grant ($1,442,946) 2020-2023. Effectiveness and monitoring of large-scale carbon-loss mitigation activities in Indonesia's peatlands.

NASA (**Cochrane PI**), Carbon Monitoring Science Grant ($1,310,995) 2018-2021. Continuation and expansion to a national-scale of the "Filling a critical gap in Indonesia's national carbon monitoring, reporting, and verification capabilities for supporting REDD+ activities: Incorporating, quantifying and locating fire emissions from within tropical peat-swamp forests" Project. (80NSSC18K0235)

**Previous Research Grants:**

NASA (**Cochrane PI**), Carbon Monitoring Science Grant ($185,748) 2016-2017. Continuation and expansion to a national-scale of the "Filling a critical gap in Indonesia's national carbon monitoring,

reporting, and verification capabilities for supporting REDD+ activities: Incorporating, quantifying and locating fire emissions from within tropical peat-swamp forests" Project. (NNX17AC95G)

NASA (M. Wimberly PI), SERVIR Applications Grant ($628,713) 2016-2019. Monitoring and projecting environmental change in fragmented tropical landscapes.

NASA (I. Numata PI), Research Grant ($602,349) 2014-2017. Assessing vulnerability and responses of forest edges to drought in Amazonia.

NASA (**Cochrane PI**), Interdisciplinary Research in Earth Science Grant – Carbon Monitoring Science ($2,202,393) 2013-2017. Filling a critical gap in Indonesia's national carbon monitoring, reporting, and verification capabilities for supporting REDD+ activities: Incorporating, quantifying and locating fire emissions from within tropical peat-swamp forests. (NNX13AP46G)

NASA (**Cochrane PI**), Interdisciplinary Research in Earth Science Grant ($1,950,144) 2011-2014. Shifting Fire Regimes of the US, Australia and Brazilian Amazonia: The Roles of Climate Change, Land Use and Mitigation Efforts. (NNX11AB89G)

NASA (**Cochrane PI**), Applications Grant ($150,027) 2012-2014. Wildfire risk and treatment effectiveness of protecting highly valued resources and assets with fuels management. (NNH11ZDA001N-FIRES)

NASA (**Cochrane PI**), Quantifying Fuel Treatment Effectiveness Over Time and in Extreme Weather Conditions ($30,000/annually renewed 2014-2017). Fellowship proposal for Christopher Moran. (Declined)

NASA (**Cochrane PI**), Interdisciplinary Research in Earth Science Grant ($1,111,163) 2007-2012. Biodiversity Implications of Forest Disturbance and Related Landscape Dynamics in the Brazilian Amazon. (NNX07AF16G)

JFSP (**Cochrane PI**), Research Grant ($656,370) 2006-2012. Fuel Treatment Effectiveness in the United States. (07CRAG0001)

NASA (**Cochrane PI**), Applied Remote Sensing for Conservation Monitoring ($30,000/annually renewed 2008-2012). Fellowship for Christopher Barber.

NASA (M. Hansen PI), Research Grant ($556,373) 2006-2008. Establishing a Global Monitoring System Using Multi-Resolution and Multi-Temporal Remotely Sensed Data Sets.

NASA New Investigator Program, (**Cochrane PI**) Research Grant ($327,287) 2002-2005. The Synergism of Fire, Forest Fragmentation and Selective Logging in the Brazilian Amazon.

USAID (flow through IMAZON), (**Cochrane PI**) Research Grant ($260,116) 2003-2007. Sustainable Communities and Landscapes: A proposed Program to Sustain Natural Ecosystems and Enhance Local Livelihoods.

NASA (D. Skole PI), Research Grant ($4,167,405) 2003-2008. A Global Tropical Forest Information Center – TRFIC-2.

NASA (D. Skole PI), Research Grant ($591,672) 2004-2007. What is the Global Rate and Extent of Tropical Deforestation?

NASA (J. Qi PI), Research Grant ($763,065) 2004-2007. Land Use and Land Cover Dynamics of China in Support of GOFC/GOLD and NEESPI Sciences.

## D. Presentations (underlined = student, *italics* = post doc)

December 9-13, 2019. San Francisco, CA USA. **Cochrane, M. A.**, *Y. Vetrita*, L. Graham, A. Sinclair, X. Lu, E.I. Putra, R.J. Yokelson, X. Zhang, K. Eshleman and B.H. Saharjo. From satellites to soils: quantifying and accounting for sources of uncertainty in carbon emission estimates from fires in Indonesian peatlands. Oral presentation at *AGU Fall Meeting 2019*.

December 9-13, 2019. Lu, X., X. Zhang, F. Li and **Cochrane, M.** Automated Detection of Global Fire Smoke Plumes Using VIIRS Corrected Reflectance, *AGU Fall Meeting 2019*.

29 November 2019. Bogor, Indonesia. Oral presentation. Putra, E.I., A. Saad, R.A. Zuhri, E. Setianto, L. Graham, B.H. Saharjo and **Cochrane M.A.** Assessing the changing groundwater level in palm oil plantation, peat protection forest and burnt peatland for better peat fire prevention measures. 2nd International Conference on Natural Resources and Environmental Conservation, Bogor – Indonesia.

November 12-14, 2019. La Jolla, CA. Oral presentation. **Cochrane, M.A.**, B.H. Saharjo, X. Zhang, K. Eshleman, E.I. Putra, *Y. Vetrita* and X. Lu. Effectiveness and monitoring of large-scale carbon-loss mitigation activities in Indonesia's peatlands. NASA Carbon Monitoring System Science Team Meeting and Applications Workshop.

> Poster presentation: **Cochrane, M.A.**, B.H. Saharjo, X. Zhang, R.J. Yokelson, E.I. Putra, *Y. Vetrita*, X. Lu and S. Hagen. Filling a critical gap in Indonesia's national MRV capabilities for supporting REDD+ activities: Incorporating, quantifying and locating fire emissions from within tropical peat-swamp forests.

1-3 October, 2019. Bogor, Indonesia. Poster presentation. Putra, E.I., **Cochrane M.A.**, B.H. Saharjo, L. Graham, and K.G. Lestari. Assessing Fires Season Length and Hydrology Factors Affecting Indonesian Peat Fires. 2nd International Conference on Environment and Forest Conservation, Bogor, Indonesia

22-27 September 2019. Cape Town, South Africa. Oral presentation. Graham, L.B., A. Thomas, G. Applegate, B.H. Saharjo, and **M. Cochrane**. *Improving Indonesia's tropical peat-fire emissions monitoring as a restoration tool.* Presented at the Society of Ecological Restoration 2019: 8th World Conference on Ecological Restoration.

22-27 September 2019. Cape Town, South Africa. Poster presentation. Thomas, A., L.B. Graham, G.B. Applegate and **M. Cochrane**. *Empowering Local Communities through Targeted Tree Identification Recourses of Tropical Peat Swamp Forest Reforestation.* Presented at the Society of Ecological Restoration 2019: 8th World Conference on Ecological Restoration.

September 11, 2019. Bogor, Indonesia. Oral presentation. Vetrita, Y., and **M.A. Cochrane**. Fire Frequency and Related Land Land Cover Changes in Indonesia's Peatlands. 2nd International Conference of Tropical Silvaculture (September 10-11, 2019).

September 11, 2019. Bogor, Indonesia. Poster presentation. Putra, E.I., **Cochrane M.A.**, B.H. Saharjo, L. Graham, A. Thomas, G. Applegate, A. Saad, E. Setianto, S. Sutikno and A. Prayitno. Developing Better Understanding on Tropical Peat Fire Occurrences and Dynamics. 2nd International Conference of Tropical Silvaculture (September 10-11, 2019).

September 10, 2019. Bogor, Indonesia. Invited keynote presentation. **Cochrane M.A.**, Vetrita, Y., L. Graham, A. Sinclair, X. Lu, *E.I. Putra*, R.J. Yokelson, X. Zhang, K. Eshleman and B.H. Saharjo. Fire and Carbon Emissions in Indonesian Peatlands. 2nd International Conference of Tropical Silvaculture (September 10-11, 2019).

September 10, 2019. Bogor, Indonesia. Oral presentation. Putra, E.I., A.F. Dinda, Hafni, A.N. Amirah, Harahap, B.H. Saharjo, L. Graham and **M.A. Cochrane**. Peat Fire Risk Assessment in Central

Kalimantan, Indonesia Using The Standardized Precipitation Index (SPI). 2nd International Conference of Tropical Silvaculture (September 10-11, 2019).

September 10, 2019. Bogor, Indonesia. Oral presentation. L. Graham, A. Thomas, Ramadhan, J. Regalino, E.I. Putra, G. Applegate, B.H. Saharjo and **M. Cochrane**. *The Importance of Landscape Environmental Monitoring when Designing Reforestation Activities: A Case Study of Tropical Peatlands*. 2nd International Conference of Tropical Silvaculture (September 10-11, 2019).

September 9, 2019. Bogor Agricultural University (IPB). Bogor, Indonesia. Invited Presentation. **Cochrane M.A.** Fire in Tropical Forests and Peatlands.

September 5, 2019. Jambi University. Jambi, Indonesia. Invited Presentation. **Cochrane M.A.** Fire in Tropical Forests and Peatlands.

July 17, 2019. Depok, Indonesia. *Vetrita, Y.*, **M.A. Cochrane**, Suwarsono, A. Zubaidah, M. Priyatna, K.D. Ayu, and S. Sulma. Evaluating the Accuracy of four MODIS Burned Area Products for Assessing Tropical Peatland Fires. Orally presented at Sinas Inderaja (a national seminar on Remote Sensing).

April 3-7, 2019. Washington, DC, USA. Invited presentation. **Cochrane, M.A.**, I. Numata and S.S. Silva. Vegetation outcomes from altered fire regimes: insights from tropical forests. Contribution to the *Fire-driven vegetation change* session of the American Association of Geographers Annual Meeting.

February 25-27, 2019. Manila, Philippines. Poster presentation. Thomas, A., L. Graham, G.B. Applegate and **M. Cochrane**. Developing Tree Identification Recourses for Local Communities in Tropical Peatland Swamp Forest Restoration. Presented at the International Conference, Forest and Landscape Restoration: Making it Happen.

December 10-14, 2018. Washington DC, USA. **Cochrane, M.A.**, L. Graham, R.J. Yokelson, and B.H. Saharjo. Tropical Peat Fire Behavior, Emission Factors and Challenges for Making Regional Carbon Emission Estimates. Oral Presentation at the AGU Fall Meeting 2018.

December 10-14, 2018. Washington DC, USA. Saharjo, B.H., *E.I. Putra*, and **M.A. Cochrane**. Understanding Indonesian peat fire typology for fire control and prevention measure. Poster presented at AGU Fall Meeting 2018.

December 10-14, 2018. Washington DC, USA. *Putra, E.I.*, **M.A. Cochrane**, D.A.F. Hafni, A.A.N. Harahap, L. Graham, and B.H. Saharjo. Assessing Rainfall Pattern, Groundwater Level and Peat Hydraulic Conductivity for Effective Peat Fire Prevention Measure. Poster presented at AGU Fall Meeting 2018.

December 10-14, 2018. Washington DC, USA. Lu, X. X. Zhang, F. Li and **M.A. Cochrane**. Investigating Smoke Emission Coefficients using MODIS Fire Radiative Energy and Smoke Aerosols. Poster presented at AGU Fall Meeting 2018.

November 21-22, 2018. Palangka Raya, Indonesia. Thomas, A., L. Graham, G. Applegate and **M. Cochrane**. Developing targeted tree identification resources for local communities involved in tropical peatland re-vegetation efforts. Tropical Peat Ecology and Restoration International Conference.

November 21-22, 2018. Palangka Raya, Indonesia. Graham, L. Applegate, G., **M. Cochrane**, B.H. Saharjo, Mendham, D., and N. Sakuntaladewi. Combining knowledge, data, and working together to address Indonesia's haze crisis. Tropical Peat Ecology and Restoration International Conference.

November 21-22, 2018. Palangka Raya, Indonesia. Ramadhan, A. Thomas, L. Graham, G. Applegate, *E.I. Putra*, K. Ryan, B.H. Saharjo and **M. Cochrane**. Consistent nation-wide data collection on Indonesia's tropical peat fires. Tropical Peat Ecology and Restoration International Conference.

November 6-7, 2018. Bogor, Indonesia. *Putra, E.I.*, **M.A. Cochrane**, D.A. Fadhillah, Hafni, Amirah, A.N. Harahap, L. Graham, and B.H Saharjo. Assessing Rainfall Pattern, Groundwater Level and Peat Hydraulic Conductivity for Effective Peat Fire Prevention Measure. The 5th International Symposium on LAPAN-IPB Satellite for Food and Environmental Science 2018 (LISAT-FSEM 2018).

September 1, 2018. Bandung, Indonesia. *Putra, E.I.*, D.A.F., Hafni, A.A.N. Harahap, L. Graham, B.H. Saharjo, and **M.A. Cochrane**. Precipitation pattern analysis using TRMM data for peat fire risk assessment. Paper presented at the 1st International Conference on Tropical Meteorology and Atmospheric Sciences (ICTMAS) Bandung, Indonesia. 1 September 2018.

July 31, 2018, Depok, Indonesia. Vetrita, Y., Suwarsono, A. Zubaidah, and **M.A. Cochrane**. *Toward a need of Indonesia's peatlands systematically burned area map: Comparison of a single variable and multivariable methods*. Presented at the 5th Indonesian National Seminar of Remote Sensing.

July 25-28, 2018. Brisbane, Australia. Graham, L. Applegate, G., **M. Cochrane**, B.H. Saharjo, Mendham, D., and N. Sakuntaladewi. Addressing Indonesia's haze crisis through a multi-sector, interdisciplinary program based on accurate primary data field-research. Society of Ecological Restoration, Australasia Conference.

July 25-28, 2018. Brisbane, Australia. Thomas, A., L. Graham, G. Applegate, *E.I. Putra*, K. Ryan, B.H. Saharjo and **M. Cochrane**. Implementing Nation-wide Tropical Peat Fire Monitoring in Indonesia. Society of Ecological Restoration, Australasia Conference.

July 2-4, 2018. Vienna, Austria. **Cochrane, M.A.** Invited presentation. Forest Fire Management Practices in Developing Tropics. Forest Fires and Climate Change Global Expert Workshop, International Union of Forest Research Organizations.

May 21-24, 2018. Missoula, MT. Ryan, K. Applegate, G., Graham, L.L.B., Andri, T., and **M.A. Cochrane**. Peatland Fires: Field Reference Conditions – Challenges and Research Needs. The Fire Continuum Conference (Association for Fire Ecology and International Association of Wildland Fire).

May 21-24, 2018. Missoula, MT. Ryan, K. A.P. Vayda, T.C. Jessup and **M.A. Cochrane**. Causes of Indonesian Peat Fires: Implications for Research and Policy. The Fire Continuum Conference (Association for Fire Ecology and International Association of Wildland Fire).

March 20, 2018. Palembang, Indonesia. *Putra, E.I.*, M.S. Imanudin, D.A.F. Hafni, **M.A. Cochrane**, L. Graham, B.H. Saharjo, and H. Hayasaka. Referensi tinggi muka air tanah bagi pencegahan kebakaran gambut di Indonesia (Reference of Groundwater Level for peat fire prevention in Indonesia). Paper presented at National Seminar on World Water Day 2018.

March 15, 2018, Brookings, SD. Vetrita, Y., **M.A.Cochrane**, Suwarsono, A. Zubaidah, S. Zulma. 2018. *Fire Frequency Analysis for Indonesian Peatlands and the Relationship to Land Cover Change over the Last Fourteen Years.* 49th Annual South Dakota State Geography Convention.

February 13, 2018. Catocin Mountain Park, Thurmont MD. Invited Keynote Presentation. **Cochrane M.A.** Managing Wildland Fire in a Time of Global Change. Central Appalachian Fire Learning Network, Potomac Headwaters Workshop.

December 11-15, 2017. New Orleans, LA. AGU Fall Meeting Poster Presentations

Stockwell, C., T.S. Jayarathne, D. Goetz, I.J. Simpson, V. Selimovic, P. Bhave, D.R. Blake, **M.A. Cochrane**, K.C. Ryan, *E.I. Putra*, B. Saharjo, E.A. Stone, P.F. DeCarlo and R.J. Yokelson. Field Measurement of Trace Gases and Aerosols Emitted by Undersampled Combustion Sources Including Wood and Dung Cooking Fires, Garbage and Crop Residue Burning, and Indonesian Peat Fires.

*Putra, E.I.*, **M.A. Cochrane**, B.H. Saharjo, R. Yokelson, C.E. Stockwell, Y. Vetrita, X. Zhang, S.C. Hagen, A. Nurhayati and L. Graham. New Approach in Modeling Indonesian Peat Fire Emission.

Nurhayati, A.D., R. Dewi, S. Sulma, *E.I. Putra*, **M.A. Cochrane**, B.H. Saharjo. Estimation of Forest and Land Fire Severity Using Landsat 8 Imagery in Riau Province, Indonesia.

November 29, 2017. Solomons, MD. Invited Presentation. **Cochrane, M.A.** The Role of Wildland Fire in a Time of Global Change. Chesapeake Bay Laboratory Seminar Series. University of Maryland Center for Environmental Science.

November 13-16, 2017. Sioux Falls, SD. Poster presented at: William T. Pecora Memorial Remote Sensing Symposium—Pecora 20.

Vetrita, Y., **M.A.Cochrane**, Suwarsono, A.Zubaidah, *E.I.Putra*. Assessing Three Satellite-derived Burned Area Products and Combining with Medium Resolution Data for Characterizing Peatland Fires. (*Third place student poster competition*).

October 11, 2017. Bogor Agricultural University (IPB). Bogor, Indonesia. Invited Presentation. **Cochrane M.A.** The Importance of Fire in Indonesia's Peatlands.

October 9-11, 2017. Bogor, Indonesia. Invited Presentation. **Cochrane M.A.** Filling a Critical Gap in Indonesia's National Carbon Monitoring, Reporting, and Verification Capabilities: Quantifying and Locating Fire Emissions from within Tropical Peat-swamp Forests. Presented at the 4th International Symposium on LAPAN-IPB Satellite (LISAT) 2017.

June 15-17, 2017. Sioux Falls, SD. Poster presented at: 96th Annual Graduate Women in Science National Conference.

Vetrita, Y. and **M.A.Cochrane**. Fire Frequency and Intensity Analyses for Indonesian Peatlands and Their Relationships to Land Cover Change over the Last Fourteen Years.

April 5-9, 2017. Boston MA. Poster presentations at Annual Meeting of the American Association of Geographers.

*Putra, E.I.*, Y. Vetrita, **M.A. Cochrane**, I. Albar, and L. Graham. Understanding Indonesian Peat Fire Occurrences and Tendencies.

Albar, I., I.N.S. Jaya, B.H. Saharjo, B. Kuncahyo, *E.I. Putra*, and **M.A. Cochrane**. Spatiotemporal Typology of Land and Forest Fire in Sumatra.

December 11-16, 2016. San Francisco, CA. AGU Fall Meeting Poster Presentations:

*Putra, E.I.*, **M.A. Cochrane**, B.H. Saharjo, R. Yokelson, C.E. Stockwell, T. Jayarathne, Y. Vetrita, K.C. Ryan, I. Albar and L. Graham. 2016. Improving the assessment of Indonesian carbon emissions from peat fires.

Numata, I., K. Khand, J. Kjaersgaard, **M.A. Cochrane**, and S. Silva. Determining the dynamics of evapotranspiration from fragmented forests under drought in southwestern Amazonia using Landsat imagery.

Liu, J., B.M. Sleeter, T.R. Loveland, **M.A. Cochrane**, L. Heath, H. Jiang, D.T. Price, J.M. Chen, S.M. Howard, C.H. Key, T. Hawbaker, T. Sohl, S. Liu, D. Zhou, T. Wilson and J. Sherba. 2016. Simulated responses of ecosystem net primary productivity to climate and atmospheric changes in recent decades for the coterminous U.S.

December 5, 2016. Pontificia Universidad Católica de Chile, Santiago, Chile. Invited presentation. **Cochrane M.A.** Fires in Rainforests. Seminar Agronomy and Forest Engineering Department.

November 30, 2016. Frostburg, Maryland. Invited Presentation. **Cochrane M.A.** The Role of Fire in a Time of Change. Seminar Appalachian Lab. University of Maryland Center for Environmental Science.

August 16, 2016. Kuching, Malaysia. Presentation for the Greenhouse Gas Emissions from Natural & Managed Peatlands session. *Putra, E.I.*, **M.A. Cochrane**, Y. Vetrita, L. Graham and B.H. Saharjo. *Degraded Peatlands, Ground Water Level and Severe Peat Fire Occurrences*. 15th International Peat Congress 2016. (**Cochrane** presented)

August 16, 2016. Kuching, Malaysia. Presentation for the Greenhouse Gas Emissions from Natural & Managed Peatlands session. Graham, L., G. Applegate, *E.I. Putra*, K. Ryan and **M. Cochrane**. *Field Research Methodologies for Collecting Peat Fire Data to Enhance Understanding of Tropical Peat Fire Events*. 15th International Peat Congress 2016.

August 16, 2016. Kuching, Malaysia. Presentation for the Greenhouse Gas Emissions from Natural & Managed Peatlands session. Applegate, G., B.H. Saharjo, B. Yokelson, K. Ryan, A.P. Vayda, T. Jessup, Sulistyo, *E.I. Putra*, L. Graham, and **M. Cochrane**. *Quantification and Characterization of Peat Fires and Related Fire-Emission Factors from Tropical Peatlands*. 15th International Peat Congress 2016.
July 7-8, 2016. University of Brasilia, Brazil. Invited Seminar. **Cochrane, M.A.** Climate Change… Challenges, Real and Imagined. Department of Forest Engineering. (in Portuguese)

July 1, 2016. University of Brasilia, Brazil. Invited Presentation. **Cochrane, M.A.** Understanding Global Climate Change and its Misconceptions. Department of Forest Engineering. (in Portuguese)

December 14-18, 2015. San Francisco, CA. AGU Fall Meeting Poster Presentations:

> Numata, I. S.S. Silva and **M.A. Cochrane**. *Analysis of edge effects on highly fragmented forests using forest inventories in Southwestern Amazonia.*
>
> Liu, J., Sleeter, B.M., Zhu, Z., Loveland, T.R., Sohl, T.L., Howard, S.M., Hawbaker, T.J., Liu, S., Heath, L.S., **Cochrane, M.A.**, Key, C.H., Jiang, H., Price, D.T., and J.M. Chen. *Estimating Ecosystem Carbon Stock Change in the Conterminous United States from 1971 to 2010*.

November 30, 2015. Adelaide, Australia. Murphy, B., D. Bowman, **M. Cochrane**, G. Williamson and L. Prior. Where does fire consume the most biomass? Fire Regime Management Symposium at the Ecological Society of Australia Annual Meeting.

November 19, 2015. University of Texas, Austin. Invited Presentation. **Cochrane, M.A.** Climate, land use and land cover change-driven fire regime shifts in tropical forests of the Brazilian Amazon and Indonesian peatlands. Geography Department Seminar.

November 16-18, 2015. Pasadena, CA. NASA Carbon Monitoring Science Team Meeting. Invited Presentation and poster. **Cochrane M.A.**, B.H. Saharjo, and *E.I. Putra*. Incorporating, Quantifying and Locating Fire Emissions from Tropical Peat Lands. (Putra presented)

> **Cochrane M.A.**, B.H. Saharjo, R.J. Yokelson, *E.I. Putra*, A.P. Vayda, K.C. Ryan. *Filling a critical gap in Indonesia's national MRV capabilities for supporting REDD+ activities: Incorporating, quantifying and locating fire emissions from within tropical peat-swamp forests. (poster)*.

November 17, 2015. San Antonio, TX. Invited Presentation Causes and Consequences of Fire Regime Shifts in Subtropical, Temperate, and Boreal Forest Ecosystems Special Session. **Cochrane, M.A.** Climate, Land Use and Land Cover Change-driven Fire Regime Shifts in Tropical Forests of the Brazilian Amazon and Indonesian Peatlands: Causes, Consequences and Divergences. 6th International Fire Ecology & Management Congress.

August 9, 2015. University of Riau, Pekanbaru, Indonesia. Invited Presentation. **M.A. Cochrane**. Above- and Belowground Tropical Rainforest Fire Dynamics.

August 4-7, 2015. Bogor, Indonesia. Invited Presentation. **M.A. Cochrane**. Carbon emissions from peat swamp forest fires of the ex-Mega Rice Project in Kalimantan. International Workshop on Land Use/Land Cover and Air Pollution in Asia.

August 2, 2015. Bogor Agricultural University (IPB). Bogor, Indonesia. Invited Presentation. **M.A. Cochrane**. Fire Dynamics in Tropical Rainforests: From the Brazilian Amazon to Indonesia's Kalimantan.

June 26, 2015. Sioux Falls, SD. Invited Presentation. **Cochrane M.A.** Why Should Public Health Workers Care about Global Climate Change? South Dakota Public Health Association (SDPHA) Annual Conference.

May 5-7, 2015. Minneapolis, MN. *Freeborn, P.*, **M.A. Cochrane** and M. Jolly. Relationships between Daily Fire Danger and Daily Fire activity Characterized across the Continental U.S. Using the MODIS Active Fire and Burned Area Products for the 11th Symposium on Fire and Forest Meteorology.

April 20, 2015. Hyattsville MD. Numata, I., **M.A. Cochrane**, K. Khand, S. Souza da Silva and J. Kjaergaard. Assessing vulnerability and responses of forest edges to drought in the Brazilian Amazon. Poster presented at 2015 NASA CC&E Joint Science Workshop.

April 20, 2015. Hyattsville MD. **Cochrane, M.A.**, B. Saharjo, *E. Putra*, R. Yokelson, A. Vayda, K. Ryan, and *C. Barber*. Filling a critical gap in Indonesia's national carbon monitoring, reporting, and verification capabilities for supporting REDD+ activities: Incorporating, quantifying and locating fire emissions from within tropical peat-swamp forests. Poster presented at 2015 NASA CC&E Joint Science Workshop.

April 9, 2015. Missoula, MT. *Freeborn, P.*, **M.A. Cochrane** and M. Jolly. Satellite – derived metrics for assessing daily relationships between fire danger and fire activity across the Continental U.S. for the Fire Lab Seminar Series.

March 19, 2015. Brookings SD. 46th Annual South Dakota State Geography Convention poster presentations:

> Bartosh, L., **M. Cochrane** and *C. Barber*. *Climate Change on the Coteau des Prairies in Relation to Agriculture Production*. (1st place prize for student presentations)
>
> March 19, 2015. Brookings SD. Swartos, A. and **M.A. Cochrane**. *Mapping Oil Palm Expansion in the Brazilian Amazon*.

March 11, 2015. Kapuas, Kalimantan, Indonesia. **Cochrane, M.A.** Improving peat-fire related MRV capacity in Indonesia. Second Peatland Fire Research Workshop and Stakeholder Meeting.

November 12-14, 2014. Bethesda, MD. **Cochrane, M.A.** Toward improved peat-fire related MRV capacity in Indonesia. NASA CMS Science Team Meeting & Applications Workshop.

August 19-21, 2014. Palangka Raya, Kalimantan, Indonesia. **Cochrane, M.A.** Introduction to peat fire ecology and distinction between peat fires and fires in peatlands. First Peatland Fire Research Workshop and Stakeholder Meeting.

August 19-21, 2014. Palangka Raya, Kalimantan, Indonesia. **Cochrane, M.A.** Pros and cons of MODIS and how it can be used for fire detection and measurements. First Peatland Fire Research Workshop and Stakeholder Meeting.

August 19-21, 2014. Palangka Raya, Kalimantan, Indonesia. **Cochrane, M.A.** Lidar and links to field and modeling work. First Peatland Fire Research Workshop and Stakeholder Meeting.

May 22-26, 2014. Artemas, PA. Invited Presentation. **Cochrane, M.A.** *Climate… and the Future of Humans on Earth*, for the Age of Limits Conference & Conversations on the Collapse of the Global Industrial Model.

May 19-23, 2014. Missoula, MT. *Freeborn, P.*, **M.A. Cochrane** and M. Jolly. *Evaluating Associations between National Fire Danger Rating System (NFDRS) Indices & Daily Wildland Fire Activity*

*Characterized Using Time-series of Agency Incident Reports & Satellite Observations* for the Large Wildland Fires: Social, Political & Ecological Effects Conference.

May 19-23, 2014. Missoula, MT. Jolly, W.M., **M.A. Cochrane**, *P. Freeborn*, L.S. Bradshaw, D.M.J.S. Bowman, Z. Holden and T. Brown. *Persistent and Episodic Changes in Global Wildfire Danger from 1979 to 2012* for the Large Wildland Fires: Social, Political & Ecological Effects Conference.

May 19-23, 2014. Missoula, MT. Thompson, M., **M. Cochrane**, *P. Freeborn*, J. Gilbertson-Day, and J. Riek. *Wildfire Risk and Treatment Effectiveness of Protecting Highly Valued Resources and Assets with Fuels Management*, for the Large Wildland Fires: Social, Political & Ecological Effects Conference.

April 17-18, 2014. Moscow, ID. Invited participation. PHOENIX Science and Technology Center Fire Workshop. University of Idaho, Moscow, ID

November 6, 2013. Pasadena (Jet Propulsion Lab), CA. Invited presentation. **Cochrane M.A**. *Adding tropical peat-swamp forest fire emissions to Indonesia's national carbon MRV system*, given at the NASA Carbon Monitoring System (CMS) Phase-2 Science Team Meeting.

October 10, 2013. Bogor, Indonesia. Invited Presentation. **Cochrane M.A.** *Filling a critical gap in Indonesia's national MRV capabilities for supporting REDD+ activities*, presented at the Forestry Research and Development Agency (FORDA), Ministry of Forestry.

October 4, 2013. Jakarta, Indonesia. Invited presentation. **Cochrane M.A.** *Toward improved peat-fire related MRV capacity in Indonesia*, given as part of the Indonesian Climate Change Center (ICCC) Cluster Workshop.

September 24-26, 2013. Palangka Raya, Kalimantan, Indonesia. Presentation by Cochrane. Applegate, G., F. Masal, T. Jessup, **M. Cochrane**, P. Moore, A.P. Vayda, and K. Ryan. *Improving methods to report and investigate peat fires; a report on the 2012 fires in KFCP area in Central Kalimantan*, for the 4th International Workshop on Wild Fire and Carbon Management in Peat-Forest in Indonesia.

May 13-16, 2013. Calgary, Alberta, Canada. Invited presentation. **Cochrane M.A.**, *C.P. Barber*, *I. Numata*, S.S. Kumar, D.P. Roy and C.M. Souza Jr. *Impact Assessment of Official and Unofficial Roads in Forests of the Brazilian Amazon and the Mitigation Effectiveness of Protected Areas***,** for the forum "A New Generation of Regional Transportation Infrastructural Development" at the 33rd Annual Conference of the International Association for Impact Assessment.

April 30-May 2, 2013. La Jolla, CA. NASA Terrestrial Ecology Science Team Meeting. Poster presentation.

> **Cochrane, M.A.**, D. Bowman, C. Souza Jr., *C. Barber*, *I. Numata*, K. Ryan, J. Liu, *B. Murphy*, G. Williamson, C. Moran, S. Kumar, D. Neyland, E. Arima, *P. Freeborn*, M. Jolly, T. Loveland, M. Wimberly and D.P. Roy. *Climate and Land Use Dynamics Affecting Fire Regimes of the United States, Australia, and Brazilian Amazonia*.

February 22, 2013. USGS EROS, Sioux Falls, SD. Invited presentation, **Cochrane, M.A.** "*Fuel Treatment Effectiveness in the United States: Using MTBS for Assessing Landscape Level Effects of Fuels Treatments on Wildland Fires*". Monitoring Trends in Burn Severity (MTBS) Annual Meeting.

January 21-25, 2013. University of Otago, Dunedin, New Zealand. Invited presentation, **Cochrane, M.A.**, C.J. Moran, M.C. Wimberly, M.A. Finney, J. Eidenshink, and Z. Zhu. "*Fuel treatment effectiveness in the United States: assessing site- and landscape-level effects of fuels treatments on wildland fires*", for the VII Southern Connection Congress.

December 3-7, 2012. Portland, OR. Invited presentation, **Cochrane, M.A.**, C.J. Moran, M.C. Wimberly, J. Eidenshink, Z. Zhu and M.A. Finney. "*Combining remote sensing and spatial modeling to assess site and landscape level effects of fuels treatments on wildland fire*", for the 5th International Fire Ecology and

Management Congress, special session “Assessing Fire Effects with Remote Sensing and Geospatial Technologies”.

December 3-7, 2012. Portland, OR. Invited presentation, **Cochrane, M.A.**, M. Wimberly, J. Eidenshink, M. Finney, C.J. Moran, and Z. Zhu. “*Forest management implications of recent fuel treatment effectiveness assessments for mitigating landscape-level risks from wildfires*”, for the 5th International Fire Ecology and Management Congress, special session “Mitigation of human risk from wildfires: the conundrum of the sword and the shield”.

December 3-7, 2012. San Francisco, CA. AGU Fall Meeting Poster Presentation:

> *Numata, I.* and **Cochrane, M.A.** Spatio-temporal dynamics of forest fragmentation and its potential implications for carbon dynamics in the Brazilian Amazon between 2001 and 2010.

October 2-5, 2012. Palangkaraya, Indonesia. Invited presentation, **Cochrane, M.A.** “*MODIS Fire Detection and Potential Considerations*”; appointed member of the Fourth Fire Management Expert Panel Meeting for the Kalimantan Forests and Climate Partnership (KFCP).

March 27, 2012. Invited Webinar Presentation, **Cochrane, M.A.** “*Effects of Fuels Treatments on Spatial Probabilities of Burning and Final Size of Recent Wildfires across the United States*”. For the Joint Fire Sciences Program, International Association of Wildland Fire, and the Wildland Fire Lessons Learned Center monthly webinar series. http://www.youtube.com/watch?v=vPk40v4jR5M&feature=youtu.be

December 5-9, 2011. San Francisco, CA. AGU Fall Meeting. Poster presentation:

> Kumar, S., D.P. Roy, C. Souza Jr., **M.A. Cochrane** and L. Boschetti. “Assessment of the Proximity of MODIS Active Fire Detections to Roads and Navigable Rivers in the Brazilian Tropical Moist Forest Biome.”

October 3-7, 2011. Alexandria, VA. 2011 NASA Carbon Cycle & Ecosystems Joint Science Workshop. Poster presentations:

> **Cochrane, M.A.**, D.M.J.S. Bowman, *B. Murphy*, K. Ryan, W. Jolly, E. Arima, C. Souza, J. Liu, T. Loveland, M. Wimberly, C. Moran, C. Barber, G. Williamson and D. Roy. “*Shifting Fire Regimes of the Unites States, Australia and Brazilian Amazonia: The Roles of Climate Change, Land Use and Mitigation Efforts*.”
>
> **Cochrane, M.A.**, J. Barlow, C. Souza, D. Roy, E. Arima, *I. Numata*, C. Barber, L. Mestre, S. Sathyachandran, R. Andrade and J. Silveira. “*Biodiversity implications of forest disturbance and related landscape dynamics in the Brazilian Amazon.*”

August 19-22, 2011. Universidad de Ucayali, Pucallpa, Peru. Invited presentation. **Cochrane, M.A.** *Landscape Flammability in Tropical Forests: Controls and Drivers*, for the joint Center for Environmental Research and Conservation (CERC) and Center for International Forestry Research (CIFOR) conference on Fires in Western Amazonia: The Effects of Climatic, Social, Demographic, and Land Use Changes on Fire Incidence and Fire Hazards.

July 4 – July 7, 2011. Palangkaraya, Indonesia. Invited presentation. **Cochrane, M.A.** and K.C Ryan. *Biophysical Controls and Characteristics of Indonesian Peat Fires*. Given as part of the Fire Management Expert Panel Meeting for the Kalimantan Forests and Climate Partnership (KFCP).

June 26 – July 2, 2011. University of Queensland, Brisbane, Australia. Invited presentation. **Cochrane, M.A.**, M. Wimberly, J. Eidenshink, M. Finney, M. Reeves, and Z. Zhu. *Fuel Treatment Effectiveness in the United States*. Given as part of the Australian Centre for Ecological Analysis & Synthesis (ACEAS) workshop on Pyrogeography: Integrating and Evaluating Existing Models of Australian Fire Regimes to Predict Climate Change Impacts.

June 23, 2011. University of Tasmania, Hobart, Australia. Invited presentation. **Cochrane, M.A.** *Deforestation, Forest Degradation and Conservation in the Brazilian Amazon* for the 2011 Plant Science Seminar Series.

June 23, 2011. University of Tasmania, Hobart, Australia. Invited presentation. **Cochrane, M.A.** *Shifting Fire Regimes of the United States, Australia and Brazilian Amazonia: The Roles of Climate Change, Land Use, and Mitigation Efforts*. Stakeholders planning workshop for the mapping of fire in the Australian Alps and Tasmania.

April 8-9, 2011. Oacoma, SD. Poster Presentation. Moran, C.J. and **M.A. Cochrane**. "Mountain Pine Beetles, Mitigation Treatments, and Fire Behavior in Ponderosa Pine Forests of the Black Hills, SD, USA" at the 96th annual meeting of the South Dakota Academy of Science.

April 3-7, 2011. Portland, OR. (oral presentation) Wimberly, M.C., **M.A. Cochrane** and J. Werner. "*Influences of Fuel Treatment Type and Age on Fire Severity in the Western United States*" at the 2011 US-IALE Sustainability in Dynamic Landscapes Symposium.

March 28-30, 2011. University of Cambridge, Cambridge, U.K. (oral presentation) Barlow J., L. Parry, T. Gardner, J. Ferreira, R. Carmenta, E. Berenguer, C. Souza and **M. Cochrane**. "*Fires in Tropical Forests: Implications for REDD+*" presented at the British Ecological Society Annual Symposium 2011: Forests and Global Change.

March 24-25, 2011. Brookings, SD. (invited presentation) Moran, C.J. and **M.A. Cochrane**. "*Mountain Pine Beetles, Mitigation Treatments, and Fire Behavior in Ponderosa Pine Forests of the Black Hills, SD, USA*" at the 42nd Annual South Dakota State Geography Convention.

March 17, 2011. Missoula, MT. Invited Presentation. **Cochrane, M.A.**, M. Wimberly, J. Eidenshink, M. Finney, M. Reeves, Z. Zhu, D. Ohlen, C. Moran, K. Pabst and A. Baer. "*Estimating Changes in Wildfire Size due to Fuel Treatments*". Presented as part of the U.S.F.S. Fire Sciences Lab Seminar Series.

November 29-December 4, 2010. Sendai, Japan. Plenary presentation. Wimberly, M.C. and **M.A. Cochrane**, "*Forest Management for Sustainability in a Changing Environment*". Presented at the International Forum for Adaptability Science II: Technologies for Sustainable Society.

August 22-28, 2010. Campos do Jordao, SP, Brazil. Mestre, L.A.M., J. Barlow, and **M. Cochrane**. "*Structure and change of Amazonian bird communities after wildfire: a ten year study"*. Presented at the XXV International Ornithological Congress.

June 7-11, 2010. Broomfield, CO. (oral presentation) Liu, J, B.M. Sleeter, C.H. Key, Z. Zhu, S. Liu, T.L. Sohl, J.E. Vogelmann, D.T. Price, J.M. Chen, **M.A. Cochrane**, J.E. Eidenshink, S.M. Howard, N.B. Bliss and H. Jiang. "*Estimating Vegetation Carbon Changes In The Western United States Due To Land Use Change, Climate Change, And Natural Disturbance: 1951-2006*" at the 3rd USGS Modeling Conference: Understanding and Predicting for a Changing World.

April 19-24, 2010. Santa Barbara, CA. Invited Presentation. **Cochrane, M.A.** "*The Diminishing Value of What We Think We Know about Managing Landscape Fire*". National Center for Ecological Analysis and Synthesis (NCEAS): Pyrogeography – Fire's Place in Earth System Science.

April 14-18, 2010. Washington D.C. Invited Presentation. **Cochrane, M.A.**, M.C. Wimberly and A.D. Baer. "*Disturbance Interaction between Fuel Treatments and Fire in the United States*". Presented at the Annual Meeting of the Association of American Geographers.

Also,

(oral presentation) - *Numata, I.*, **M.A. Cochrane**, and C.M. Souza Jr. "*Hyperspectral analysis of forest disturbance from forest fires and selective logging"*

(oral presentation) Roberts, D.A., M. Toomey, *I. Numata*, **M. Cochrane** and J.V. Soares. "*A twenty-five year history of land-cover change in Rondonia Brazil, derived from standardized mixture models and decision tree classifiers"*

April 6-8, 2010. University of Leicester, Leicester – UK. Poster presentation: Mestre, L.A.M., J. Barlow, **M. Cochrane**. *The effects of wildfires on bird communities in four regions of the Brazilian Amazon*. Presented at the British Ornithologists' Union Conference on Climate Change & Birds.

April 6-8, 2010. University of Leicester, Leicester – UK. Poster presentation: Mestre, L.A.M., J. Barlow, and **M. Cochrane**. *Bird community change after wildfires in Amazonia: a ten year study*. Presented at the British Ornithologists' Union Conference on Climate Change & Birds.

April 7-8, 2010. University of Nottingham, Nottingham – UK. Oral presentation: Mestre, L.A.M., J. Barlow, and **M. Cochrane**. *Wildfires and Amazonian birds: a comparison on communities from four regions of the Brazilian Amazon*. Presented at the IV Annual Meeting of the British Ecological Society Tropical Ecology Group.

April 7-8, 2010. University of Nottingham, Nottingham – UK. Poster presentation: Mestre, L.A.M., J. Barlow, and **M. Cochrane**. *Bird community change after wildfires in Amazonia: a ten year study*. Presented at the IV Annual Meeting of the British Ecological Society Tropical Ecology Group.

March 25-26, 2010. Brookings, SD. Invited Presentation. **Cochrane, M.A.** "*Deforestation, Forest Degradation & Conservation in the Brazilian Amazon*". 41st Annual South Dakota State Geography Convention.

November 30-December 4, and December 5, 2009. Savannah, GA. Session chair "*Fire Behavior*" for the 4th International Fire Ecology & Management Congress. Also, Board Member of the Association for Fire Ecology participating in the post-Congress board meeting and board elections.

(oral presentation) Wimberly, M.C., **M.A. Cochrane** and A.D. Baer. "*Influences of Fuel Treatment Type and Age on Fire Severity in the Western United States*"

October 6, 2009 Sioux Falls, SD. Poster presentation Stricherz, B. and **M.A. Cochrane** "*Assessing Catastrophic Wildfire Risk in California*". American Society of Photogrammetry and Remote Sensing - Upper Midwest Chapter Annual Meeting 2009.

September 19, 2009 Logan, Utah. Poster presentation Stricherz, B. and **M.A. Cochrane** "*Assessing Catastrophic Wildfire Risk in California*". Presented at the Association of American Geographers Great Plains - Rocky Mountain Division Annual Meeting 2009

August 18-21, 2009: Belém, Brazil. Chair of the "*Biodiversity Implications of Forest Disturbance and Related Landscape Dynamics on the Brazilian Amazon"* Project Meeting funded by the Biological Diversity Program of the Earth Science Division of the NASA Science Mission Directorate.

July 13-17, 2009: Cape Town, South Africa. Invited Presentation: **Cochrane, M.A.**, C.P. Barber, E. Lindquist and C.M. Souza Jr. "*The Spatial Dynamics of Fire in the Amazon Basin and Satellite Needs for Characterizing these Dynamics in the Congo Basin*". Presented at the 2009 IEEE International Geoscience and Remote Sensing Symposium.

May 5-8, 2009: New York, NY. Invited presentation: **Cochrane, M.A.**, D.P Roy, C.M. Souza Jr., E. Arima, J. Barlow, *I. Numata*, C.P. Barber, J. Silveira, L. Mestre, R. Andrade and S.K. Sathyachandran, "*Biodiversity Implications of Forest Disturbance and Related Landscape Dynamics on the Brazilian Amazon (Year 2)*". Presented at the NASA Biodiversity and Ecological Forecasting Team Meeting.

"*Protected Areas in the Brazilian Amazon: Performance, Pressure, & Efficacy*". C.P. Barber, **M.A. Cochrane**, C. Souza Jr. M.C. Wimberly, T.R. Loveland (Oral Presentation by C.P. Barber with accompanying poster).

April 12-16, 2009: Snowbird, UT. Oral Presentation by C.P. Barber: "*Assessing Deforestation Patterns in Amazonian Conservation Units*". C.P. Barber, **M.A. Cochrane**, C. Souza Jr. Presented at the annual meeting of the US Regional Association of the International Association for Landscape Ecology (US-IALE).

December 15-19, 2008: San Francisco, CA. Poster presentation at the Fall Meeting of the American Geophysical Union

> *I. Numata*, **M.A. Cochrane**, D.A. Roberts, and J.V. Soares. *Spatio-temporal Analysis of Forest Edge Dynamics in Southwestern Amazonia*.
>
> J. Liu, J.E. Voglemann, Z. Zhu, C.H. Key, B.M. Sleeter, D.T. Price, J.M. Chen, **M.A. Cochrane**, J.C. Eidenshink, S.M. Howard, N.B. Bliss, H. Jiang. *Effects of Climate Change and Disturbances on Carbon Sequestration of California Ecosystems*.

May 27-June 6, 2008: Santa Barbara, CA. Invited Presentation: **Cochrane M.A.** "*Fire and land cover change in humid tropics*" at the Pyrogeography & Climate Change meeting for the Kavli Institute for Theoretical Physics and the National Center for Ecological Analysis and Synthesis.

April 28-May 2, 2008: Adelphi, MD. Invited presentation: **Cochrane, M.A.**, D.P Roy, C.M. Souza Jr., J. Barlow and E. Arima. "*Biodiversity Implications of Forest Disturbance and Related Landscape Dynamics on the Brazilian Amazon*" given for the NASA Biodiversity and Ecological Forecasting Team Meeting and participation in the NASA Carbon Cycle and Ecosystem's (CC&E) Joint Science Workshop.

April 15-19, 2008: Boston, MA. Oral presentation: *Numata,I.*, **M.A.Cochrane**, and D.A. Roberts, "*Characterizing forest edge dynamics in Rondônia using Landsat time series data*" presented at the "Using Remote Sensing to Examine Land Use Issues in Latin America" session at the Annual Meeting of the Association of American Geographers (AAG).

April 6-10, 2008: Madison, WI. Oral Presentation: **Cochrane, M.A.**, Wimberly, M.C., Finney, M. Eidenshink, J. and Z. Zhu, "*Evaluating the effectiveness of fuels treatments for mitigating the extent and severity of wildfires in the United States*". Presented at the annual meeting of the US Regional Association of the International Association for Landscape Ecology (US-IALE)

> "*Performance Monitoring for Brazil's Protected Area System*". C.P. Barber, **M.A. Cochrane**, C. Souza Jr. (Oral presentation by C.P. Barber)
>
> "*Methods for Estimating Fuel Treatment Effectiveness: Modeling of the Camp 32, School, and Warm Wildfires Using FARSITE (Fire Area Simulator)*". A.D. Baer, **M.A. Cochrane** and M.C. Wimberly. (Poster)

December 10-14, 2007: San Francisco, CA. Poster presentation at the Fall Meeting of the American Geophysical Union

> M.C. Wimberly, **M.A. Cochrane**, A.D. Baer, and Z. Zhu. *Applying Spatial Statistics to Isolate the Effects of Fuels, Topography, and Weather on Burn Severity.*

September 16 - 20, 2007: Urumqi, China. Participated in the NEESPI/LCLUC Science Team International Regional Meeting on Dryland Processes in Central Asia Under the auspices of the International Geosphere-Biosphere Programme.

> Qi, J., J. Liu, S. Liu, C. Li, J. Messina, **M. Cochrane**, S. Bao, S. Wu, J. Wu, L.Shao, P.Gong, X. Xiao, W. Salas, G. Sun, W. Gao, C. Wang, D. Liu, S. Liu, X. Pan, L. Zheng, J. Feng, L. Tang, Z. Li. 2007. "*Land use and cover dynamics of China in support of GOFC-GOLD and NEESPI sciences*".

June 12-14, 2007: Toronto, Canada. Invited Presentation: **Cochrane, M.A.** "*Deforestation and degradation of tropical forests in the Brazilian Amazon*". Presented at the Reducing Greenhouse Gas Emissions by Conserving Forests Conference.

April 9-13, 2007: Tucson, AZ. Poster presentation by Dr. Michael Wimberly at the International Association for Landscape Ecology, United States Regional Association Meeting:

> Wimberly, M.C., **M.A. Cochrane**, A.D. Baer, and Z.L. Zhu. 2007. "*Fuel Treatment Effectiveness in the United States*".

April 17-19 2007: San Juan, Puerto Rico. Invited Keynote Presentation: **Cochrane, M.A.** "*Fire regime changes and ecosystem responses in tropical landscapes*". Presented at the 1st Caribbean Fire Ecology and Management Symposium.

February 26-30, 2007: Destin, FL. Participated in the 2nd Fire Behavior and Fuels Conference and presented the poster:

> **Cochrane, M.A.**, M. Wimberly, Z. Zhu, M. Finney and M. Reeves. 2007. "*Fuel Treatment Effectiveness in the United States*".

November 27-30, 2006: Coimbra Portugal. Oral Presentation: **Cochrane, M.A.** "*Fire dynamics in tropical moist and wet forests*". 2006. Presented at the V International Conference on Forest Fire Research.

November 13-17 2006: San Diego CA. Invited Plenary Presentation: Cochrane, M.A. 2006. "*Changing fire regimes: Context and Consequences of climate change in Amazonia*". Oral presentation at the 3rd International Fire Ecology and Management Congress.

November 13-17 2006: San Diego CA. Invited Presentation. **Cochrane, M.A.** and C.M. Souza. 2006. "*Fire dynamics and human land use in the Brazilian Amazon*". Oral presentation at the 3rd International Fire Ecology and Management Congress.

November 13-17 2006: San Diego CA. Invited Presentation. **Cochrane, M.A.** and C.M. Souza. 2006. "*The potential for remotely sensed burn severity estimation in tropical forest fires using Landsat imagery"*. Oral presentation at the 3rd International Fire Ecology and Management Congress.

July 19-21, 2006: Santiago Chile. Invited Presentation: **Cochrane, M.A.** 2006 "*Perspectives of Fire Regime Conditions and Abating Fire-related Threats in Tropical Wet Forests: Land use interaction and synergy with forest disturbance in the Brazilian Amazon*". Participation in the Global Fire Assessment Workshop for the Neotropic Realm. Part of the expert panel to assess the state of the world's fire regimes assembled by TNC, UC Berkely, IUCN and WWF (published by TNC as Shlisky et al. 2007).

April 11-13, 2006: University of Maryland. Participated in the NASA Land Cover and Land Use Change (LCLUC) Science team meeting and presented the poster:

> **Cochrane, M.A.**, C.M. Souza, E.A.T. Matricardi, N. Kodandapani, C. Barber, D.L. Skole and J. Qi. 2006. "*The synergism of fire, forest fragmentation and selective logging in the Brazilian Amazon"*.

February 2 - 5, 2005: Harbin, China. Invited presentation, **Cochrane M.A.** "*Spatial Modeling of Fire Regimes: a Geospatial Tool for Predicting Land Cover Change*" at the International Conference on Land-Cover and Land-Use Change Processes in North East Asia.

January 10 -13, 2005: University of Maryland. Invited presentation **Cochrane M.A.** "*The Synergism of Fire, Forest Fragmentation and Selective Logging in the Brazilian Amazon*" at the NASA Land Cover/Land Use Change (LCLUC) Science Team Meeting.

September 27 – 29, 2004: Adelphi, Maryland. Presentation, **Cochrane M.A.** "*Selective Logging and Forest Fragmentation*". Given at the NASA funded, First Symposium for the Earth System Scholars Network.

September 20-24, 2004: Denver, CO. Invited presentation, **Cochrane M.A.** "*New Fire Regimes In Tropical Forests, A Serious Challenge For Natural Resource Management*" for the Predicting, Monitoring, and Managing Wildland Fire in the Twenty-First Century section of the Monitoring Science & Technology Symposium.

July 12-15, 2004: Miami, FL. Invited presentation **Cochrane, M.A.** "*Tropical Rainforest Fire Dynamics: Oxymoron or New Evolutionary Paradigm?*" Cochrane M.A. and S. Otterstrom, chairs. Symposium, Frontiers in tropical ecosystem disturbance dynamics: perspectives on fire – past, present and future, for the "*Geographic and Conceptual Frontiers of Tropical Biology*" meeting of the Association for Tropical Biology and Conservation (ATBC).

May 16-18, 2004: Sigriswill, Switzerland. Invited presentation, **Cochrane, M.A.** "*Fire Dynamics and Landscapes in the Brazilian Amazon*" for the "Global Fire Experts Workshop" held by the Global Fire Partnership (Nature Conservancy (TNC), the World Conservation Union (IUCN) and World Wildlife Federation International (WWF-Int.)).

November 16-20, 2003: Orlando, FL. Invited presentation, **Cochrane, M.A.** "*New fire regimes as spatial agents of land cover change in tropical landscapes: Lessons from the Amazon for natural resource management, conservation and sustainable development*" for the 2nd International Wildland Fire Ecology and Fire Management Congress, special session on "Changing Fire Regimes in Tropical Environments".

December 15-18, 2002: Woods Hole, MA. Invited presentation, **Cochrane, M.A.** "*Using Remote Sensing and GIS to Investigate Alternative Futures in the Brazilian Amazon*" for the Scientific Committee for Problems in the Environment (SCOPE) Forest Management and Conservation in an Information-Rich World Workshop.

October 23-26 2002: Isle-sur-la-Sorgue, France. Invited presentation, **Cochrane, M.A.** "*Synergies and Feedbacks in Tropical Forest Fires*" given at the International Geosphere-Biosphere Programme (IGBP) task force on "Global Analysis, Integration and Modelling (GAIM/TRACES) Fire Workshop".

July 7-10, 2002: Manaus, Brazil. Presentation, **Cochrane, M.A.** "*Selective Logging In the Brazilian Amazon and its Synergy with Fire*" presented at the "2nd International Large-Scale Atmosphere Biosphere Experiment in Amazonia (LBA) Scientific Conference". Also 3 research poster presentations.

April 11-13, 2002: Louvain-la-Neuve, Belgium. Invited presentation, **Cochrane, M.A.** "*Implications of Interaction, Synergy and Changing Disturbance Regimes for Land Use and Cover Change*". Presented at the "Causes/drivers and rates/patterns of fire-driven land change: Land Use and Cover Change Workshop" for the International Human Dimensions Programme On Global Environmental Change (IHDP) and the International Geosphere-Biosphere Programme (IGBP).

February 25-26, 2002: Gainesville, Florida. Invited presentation, **Cochrane, M.A.** "*Selective Logging, Forest Fragmentation and Fire Disturbance: Implications for Conservation*". Presented at Working Forests in the Tropics, University of Florida.

February 11-13, 2002: Toulouse, France. Coordinator for the first international meeting of the Global Observation of Forest Cover/ Global Observation of Land Cover Dynamics (GOFC/GOLD), Land Cover Characteristics and Changes Implementation Team. Including 31 scientists from 12 countries. Author of the subsequent meeting report.

Numerous presentations prior to 2002, including at M.I.T, Harvard, World Bank etc. for which, alas, I didn't maintain detailed records!

# V. Teaching and Training

Teaching at University of Maryland Center for Environmental Science

MEES 498Q/698Q Global Climate Change, Spring 2020

MEES 660 Ecological Systems (Foundation course), Fall 2019

Prior Teaching at South Dakota State University

GSE-GEOG-NRM 768 Global Climate Change, Spring 2016

GSE-GEOG-WL-BIOL 767 Fire and Ecosystems, Spring 2006, 2007, 2009, 2011, 2013, 2015, 2017

GSE-GEOG-BIOL 792 Introduction to Global Climate Change, Spring 2010, 2012, 2014

GSE 766 Remote Sensing of Fire and other Disturbances, Spring 2008

GSE 790 Geospatial Science and Engineering Seminar, Fall 2016

Lectures for:

NFS 111: Food, People & the Environment

GSE 740: Introduction to Geospatial Science and Engineering

BIOS 790: Ecology and Environmental Biology Seminar

Prior Teaching at Michigan State University

FOR 890 Seminar on Fire and Ecosystems (Forestry)

GEO 824 Monitoring the Biosphere from Space (Geography)

ENT 319 Introduction to Earth System Science (Entomology)

GEO 892 Spectral Mixture Modeling: Theory and Application (Geography)

Lectures for:

GEO 827 Digital Image Processing and Analysis (Geography)

FOR 220 Forests and Global Environment (Forestry)

GEO 498 Disturbance Ecology (Geography)

ISS 310 People and the Environment (Center for Integrative Studies in Social Science)

GEO 825 Geoprocessing (Geography)

**STUDENTS**:

**Primary Advisor/Supervisor:** (Note: Geospatial Science & Engineering (GSE))

| | | |
|---|---|---|
| Dr. Erianto Indra Putra | Post-Doctoral Scientist | UMCES-AL/SDSU |

| | | | |
|---|---|---|---|
| Yenni Vetrita | Doctorate | GSE | South Dakota State |
| Completed 2017 | | | |
| Dr. Erianto Indra Putra | Post-Doctoral Scientist | | South Dakota State |
| Completed 2015 | | | |
| Ashley Swartos | Master's | Geography | South Dakota State |
| Dr. Christopher Barber | Post-Doctoral Scientist | | South Dakota State |
| Completed 2014 | | | |
| Dr. Patrick Freeborn | Post-Doctoral Scientist | | South Dakota State |
| Completed 2013 | | | |
| Dr. Izaya Numata | Post-Doctoral Scientist | | South Dakota State |
| Completed 2012 | | | |
| Rafael Andrade | Doctorate | Biology | South Dakota State |
| Christopher Barber | Doctorate | GSE | South Dakota State |
| Dr. Brett P. Murphy | Research Asst. Professor | | South Dakota State |
| Completed 2011 | | | |
| Luiz Mestre | Doctorate | Biology | South Dakota State |
| Christopher Moran | Master's | Biology | South Dakota State |
| Completed 2010 | | | |
| Kari Pabst | Master's | Geography | South Dakota State |
| Completed 2009 | | | |
| Sarah Arnold | Master's | Geography | South Dakota State |
| Completed 2006 | | | |
| Narendran Kodandapani | Doctorate | Geography | Michigan State |
| Completed 2004 | | | |
| Eraldo Matricardi | Master's | Geography | Michigan State |

Currently serving on additional Graduate Student Committees:

| | | | |
|---|---|---|---|
| Fangjun Li | Doctorate | GSE | South Dakota State |

Previous Graduate Student Committees:

| | | | |
|---|---|---|---|
| Carlos Souza Jr. (external) | Doctorate | Geography | University of California Santa Barbara |
| Carlos Eduardo Rittl Filho | Doctorate | Ecology | INPA/UFAM |
| Narayanaraj Ganapathy | Doctorate | GSE | South Dakota State |
| Stephen Boyte | Master's | Geography | South Dakota State |
| Philip Zylstra (external) | Doctorate | Env. Sci. | University of New South Wales |
| Kiran Timilsina | Master's | Comp. Sci. | South Dakota State |
| Dan Cheng (external) | Master's | GIScience | Clark University |
| Colin Homer | Doctorate | GSE | South Dakota State |
| Sanath Kumar Sathyachandran | Doctorate | GSE | South Dakota State |
| Eric Ariel L. Salas | Doctorate | GSE | South Dakota State |
| Jennifer Styger | Doctorate | Geography | University of Tasmania |
| Jason M. Stoker | Doctorate | GSE | South Dakota State |
| Aaron M. Sparks (external) | Doctorate | Geography | University of Idaho |
| Francis K. Dwomoh | Doctorate | GSE | South Dakota State |

# VI. Academic and community service

**A. Professional Service:**

Editorial Board, *Fire* (2017-present) *Fire* is an international open-access journal about the science, policy, and technology of vegetation fires and how they interact with communities and the environment.

Invited Member (2013 – present) Committee on Earth Observation Satellites (CEOS) Remote Sensing for Biodiversity (RSBC) group tasked with improving interdisciplinary discussions and research developments between Space Agencies, the remote sensing community and the Biodiversity community. This group also highlights, and advocates for, remote sensing parameters that are needed for Biodiversity and Conservation and is part of the CEOS Societal Benefit Area (SBA) Team.

Member (2013-present) NASA Carbon Monitoring Science Team.

Invited Member (2012-2013) Fire Management Expert Panel for the Kalimantan Forests and Climate Partnership (KFCP) Reduced Emissions from Deforestation and forest Degradation (REDD+) project in Central Kalimantan, Indonesia.

President (2004-2010) of the Association for Fire Ecology of the Tropics (AFET – www.tropicalfire.org). AFET is a new section of the Association for Fire Ecology (AFE) established in December 2004. AFET is an international scientific organization focused on fire-ecosystem interaction throughout the tropics. (now incorporated as a subsection of the Association of Fire Ecology (AFE))

Elected board member for the Association for Fire Ecology (AFE) (January 2007-December 2010). The Association for Fire Ecology (AFE) is an organization of professionals dedicated to improving the knowledge and use of fire in land management. AFE fills a critical gap in the distribution of fire science information. It is the goal of AFE to assure that fire applications and fire management actions are informed by sound science and the most innovative ecological thinking.

**Panels and Proposal Reviews for:**

National Science Foundation (NSF)
National Aeronautics and Space Administration (NASA)
National Oceanic and Atmospheric Administration (NOAA)
Joint Fire Science Program (JFSP)
U.S. State Department/CRDF
Natural Environment Research Council (NERC)
Science Foundation Ireland (SFI)
AAAS – Indo-US Science and Technology Forum (AAAS-IUSTF)
Czech Science Foundation
Netherlands Organisation for Scientific Research (NWO)

February 2019: Member of the NASA Terrestrial Ecology Societal Impacts Panel.

April 2018: Member of the NSF Humans, Disasters and Built Environment Panel

September 2016: Member of the NASA-USDA Managed Landscapes Panel.

June 2015: Member of the NASA ABoVE Panel.

Fall 2014: Member of the NSF Macrosystems Panel.

2011-2013: Member of the Senior Advisory Panel for the NSF Geography and Spatial Sciences (GSS) Program.

Spring 2013: Member of the NSF Geography and Spatial Sciences Panel.

Fall 2012: Member of the NSF Geography and Spatial Sciences Panel.

Spring 2012: Member of the NSF Geography and Spatial Sciences Panel.

Fall 2011: Member of the NSF Geography and Spatial Sciences Panel.

January, 2009: Member of the Interagency Joint Fire Sciences Project Panel.

December, 2008: Member of the NASA Land-Cover/Land-Use Change (LCLUC) Panel.

February, 2007: Member of the NASA *Earth System Science Research Using Data and Products from Terra, Aqua, and ACRIMSAT Satellites (EOS recompetition)* Panel.

June, 2004: Member of the NSF *Human and Social Dynamics Program* Panel.

July, 2003: Member of the NASA *EOS Carbon-Ecology-Land-Biodiversity Panel for Earth System Science Research Using Data and Products from Terra, Aqua, and ACRIM Satellites* Panel.

**Reviewer for Scientific Journals:**

*Nature*
*Science*
*Proceedings of the National Academy of Sciences*
*Philosophical Transactions of the Royal Society*
*Nature Climate Change*
*Climate Change*
*Geophysical Research Letters*
*Geographical and Environmental Modelling*
*Journal of Geophysical Research – Atmospheres*
*Nature Geoscience*
*Global Biogeochemical Cycles*
*Remote Sensing of Environment*
*International Journal of Remote Sensing*
*Remote Sensing Letters*
*Photogrammetric Engineering and Remote Sensing (PE&RS)*
*Journal of Applied Remote Sensing*
*International Journal of Applied Earth Observation*
*PLoS ONE*
*Ecology*
*Ecological Applications*
*Ecology and Evolution*
*Ecology Letters*
*Trends in Ecology and Evolution*
*Journal of Ecology*
*Oecologia*
*Landscape Ecology*
*Forest Ecology and Management*
*Fire Ecology*
*Ecosystems*
*Conservation Biology*
*Conservation Letters*
*Environmental Conservation*
*Global Change Biology*
*Global Ecology and Biogeography*
*Global Environmental Change*
*Journal of Ecology*
*Journal of Applied Ecology*
*Journal of Tropical Ecology*
*Austral Ecology*
*African Journal of Ecology*
*Human Ecology*
*Animal Conservation*
*Biotropica*
*Biological Conservation*
*International Journal of Wildland Fire*
*Fire*
*Earth Interactions*
*Singapore Journal of Tropical Geography*
*The Journal of Environment and Development*
*Agriculture, Ecosystems and Environment*
*Landscape and Urban Planning*
*Indian Journal of Community Medicine*

**B. Service to UMCES**

Seminar Chair – Appalachian LaboratorySpring 2018

Promotion Committee 2018

2018 UMCES Convocation at the Appalachian Laboratory as an International Work Session panelist.

November, 2018, Baltimore, MD. Environmental Summit, Sustainable Landscapes and Seascapes panelist.

Promotion Committee 2019

UMCES Mental Health Committee - 2019

Academic Senate, Vice Chair 2019-present

**C. Public Service:**

May 11, 2017. Brookings, SD. Invited Presentation. **Cochrane, M.A.** Global Climate Change is a Local Problem. Brookings Interfaith Council, St. Paul's Episcopal Church.

March 30, 2014. Brooking, SD. Invited Presentation. **Cochrane, M.A.** Global Climate Change: Does it matter here? First Lutheran Church, Brookings, SD.

February 18, 2014. Brookings, SD. Invited Presentation. **Cochrane, M.A.**, Cole-Dai, J., T. Jackson, and D. Todey. The significance of observed climate changes in Brookings since 1896. Brookings City Council.

April 18, 2013. Brookings, SD. Invited Presentation, **Cochrane M.A.** "*Putting Climate Change in Perspective: You Are Already Paying for It*" Science at the Pub.

**Newspaper Editorials:**

Melnick. D.J., M.C. Pearl, and M.A. Cochrane. The Earth Ablaze, New York Times (8/8/18)
Cochrane, M.A. 2017. Paris Climate Agreement, insufficient but not insignificant, Brookings Register (5/9/17)
Cochrane, M.A. 2017. How does climate change show up in your life? Brookings Register (2/23/17)
Cochrane, M.A. 2015. Declining bird populations: Who needs climate change? Brookings Register (5/23/15)
Cochrane, M.A. 2015. Science and religion in step on climate change. Brookings Register (5/6/15)
Cochrane, M.A., T. Jackson, J. Cole-Dai and D. Todey. 2014. Clearing up misconceptions on global warming. *Brookings Register* (3/14/14)
Cochrane, M.A., T. Jackson, J. Cole-Dai and D. Todey. 2014. We are vulnerable to climate change in Brookings. *Brookings Register* (2/17/14)
Cochrane, M.A. 2013. Where is the heat. *Brookings Register* (7/17/13)
Cochrane, M.A. 2013. No place for politics in school science standards. *Argus Leader* (5/5/13)
Cochrane, M.A. 2012. Chronic Climate Change. *Brookings Register* (11/7/12).
Cochrane, M.A. 2012. The 'other $CO_2$ problem'. *Brookings Register* (9/4/12).
Cochrane, M.A. 2011. Can you handle the truth? *Brookings Register* (5/31/11).
Cochrane, M.A. 2011. The real budget that we need to balance. *Brookings Register* (4/27/11).
Cochrane, M.A. 2011. Winter no relief from global warming, just ask skeptical scientists….. *Brookings Register* (4/12/11).
Cochrane, M.A. 2010. On thin ice…… *Brookings Register* (11/3/10).
Cochrane, M.A. 2010. Glaciers….going, going, gone. *Brookings Register* (9/11/10).
Cochrane, M.A. 2010. What you don't know about the Intergovernmental Panel on Climate Change (IPCC) *Brookings Register* (7/19/10).
Cochrane, M.A. 2010. Climate change denial – Ignorance is bliss. *Brookings Register* (6/12/10).
Cochrane, M.A. 2010. How climate change 'skeptics' mislead the public. *Brookings Register* (5/6/10).
Cochrane, M.A. 2010. Skeptical about claims by global warming skeptics? *Brookings Register* (3/26/10).