Min Gon Chung

Curriculum Vitae
Environmental Data Science Innovation & Inclusion Lab
University of Colorado, Boulder
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EDUCATION

2020 **Ph.D., Environmental Science and Policy & Fisheries and Wildlife**
Michigan State University, East Lansing, MI, USA
Dissertation: Complex Interactions among Ecosystem Services, Human Well-Being, and their Interlinkages to Telecoupling Processes

2013 **M.S., Civil and Environmental Engineering**
Yonsei University, Seoul, South Korea
Thesis: Mapping Ecosystem Services and Statistical Analysis for Ecosystem-Based Management of Coastal Areas

2011 **B.S., Civil Engineering**
Yonsei University, Seoul, South Korea

AREAS OF EXPERTISE: Open data science, coupled human and natural systems, ecosystem services, sustainability, nature-based solutions, climate mitigation and adaptation.

ACADEMIC APPOINTMENTS

2024– Postdoctoral Scholar, Environmental Data Science Innovation & Inclusion Lab, University of Colorado, Boulder, CO, USA (PI: Dr. Jennifer Balch)

2024– Research Associate, Department of Geography and Environmental Sciences, University of Colorado, Denver, CO, USA (funded by USGS John Wesley Powell Center) (PI: Dr. Ben Crawford)

2020–2023 Postdoctoral Scholar, Center for Ecosystem Climate Solutions, University of California, Merced & Irvine, CA, USA (PIs: Dr. Roger Bales & Dr. Mike Goulden)

2014–2020 Research Assistant, Center for Systems Integration and Sustainability, Michigan State University, East Lansing, MI, USA (PI: Dr. Jianguo Liu)

2013–2014 Research Assistant, Korea Environment Institute, Seoul, South Korea.

2011–2013 Research Assistant, Ecological Engineering Laboratory, Yonsei University, Seoul, South Korea (PI: Dr. Hojeong Kang)

TEACHING EXPERIENCE

University of Colorado Denver
October 2024 Guest lecturer, ENVS 6002 – Research Topics in Environmental Science

University of Colorado Boulder
May 2024 Facilitator, ESIIL Innovation Summit
April 2024 Facilitator, Forest Carbon Codefest

University Corporation for Atmospheric Research
August 2023 Instructor, I-Guide Summer School – Advanced Network Analyses

University of California, Merced
Spring 2021 Course designer, ES 240 – Water Resources Plan and Management
Fall 2020 Course designer, ES 200 – Environmental Systems

PUBLICATIONS

Articles in Peer Review Journals:

Chung, M.G., H. Guo, C. Nyelele, B. Egoh, M. Goulden, C. Keske, R. Bales. 2024. Valuation of disturbance on water and carbon fluxes in mixed-conifer mountain forests. *Ecohydrology*. e2642. doi: 10.1002/eco.2642

Nyelele, C., C. Keske, **M.G. Chung**, H. Guo, and B. Egoh. 2023. Using social media data to estimate recreational travel costs: A case study from California. *Ecological Indicators*. 154: 110638. doi: 10.1016/j.ecolind.2023.110638

Nyelele, C., C. Keske, **M.G. Chung**, H. Guo, and B. Egoh 2023. Using social media data and machine learning to map recreational ecosystem services. *Ecological indicators*. 154: 110606. doi: 10.1016/j.ecolind.2023.110606

Quesnel Seipp, K., T. Maurer, M. Elias, P. Saksa, C. Keske, K. Oleson, B. Egoh, R. Cleveland, C. Nyelele, N. Goncalves, K. Hemes, P. Wyrsch, D. Lewis, **M.G. Chung**, H. Guo, M. Conklin, and R. Bales. 2023. A multi-benefit framework for funding forest management in fire-driven ecosystems across the Western U.S. *Journal of Environmental Management*. 344: 118270. doi: 10.1016/j.jenvman.2023.118270

Guo, H., M. Goulden, **M.G. Chung**, C. Nyelele, B. Egoh, C. Keske, M. Conklin, and R. Bales. 2023. Valuing the benefits of forest restoration on enhancing hydropower and water supply in California's Sierra Nevada. *Science of the Total Environment*. 876: 162836. doi: 10.1016/j.scitotenv.2023.162836

Chung, M.G. and J. Liu. 2022. International food trade benefits biodiversity and food security in low-income countries. *Nature Food.* 3: 349-355. doi: 10.1038/s43016-022-00499-7

Chung, M.G., K. Frank, Y. Pokhrel, T. Dietz, and J. Liu. 2021. Natural infrastructure in sustaining global urban freshwater ecosystem services. *Nature Sustainability*. 4: 1068-1075. doi: 10.1038/s41893-021-00786-4

Chung, M.G., Y. Li, and J. Liu. 2021. Global red and processed meat trade and non-communicable diseases. *BMJ Global Health*. 6:e006394. doi: 10.1136/bmjgh-2021-006394

Yang, H., A. Lingmann-Zielinska, Y. Dou, **M.G. Chung**, J. Zhang, J. Liu. 2021. Complex effects of telecouplings on forest dynamics: an agent-based modeling approach. *Earth Interactions*. 26: 15-27. doi: 10.1175/EI-D-20-0029.1

Yang, H., A. Viña, J.A. Winkler, **M.G. Chung**, Q. Huang, Y. Dou, J. Zhang, W. McShea, M. Songer, and J. Liu. 2021. A global assessment of the impact of individual protected areas on preventing forest loss. *Science of the Total Environment*. 777: 145995. doi: 10.1016/j.scitotenv.2021.145995

Chung, M.G., K. Kapsar, K. Frank, and J. Liu. 2020. The spatial and temporal dynamics of global meat trade networks. *Scientific Reports*, 10: 16657. doi: 10.1038/s41598-020-73591-2

Xu, Z., Y. Li, S.N. Chau, T. Dietz, C. Li, L. Wan, J. Zhang, L. Zhang, Y. Li, **M.G. Chung**, and J. Liu. 2020. Impacts of international trade on achieving global sustainable development goals. *Nature Sustainability*. 3: 946-971. doi: 10.1038/s41893-020-0572-z

Zhao, Z., M. Cai, T. Connor, **M.G. Chung**, and J. Liu. 2020. Metacoupled tourism and wildlife translocations affect synergies and trade-offs among Sustainable Development Goals across spillover systems. *Sustainability*, 12: 7677. doi: 10.3390/su12187677

Zhao, Z., M. Cai, F. Wang, J.A. Winkler, T. Connor, **M.G. Chung**, J. Zhang, H. Yang, Z. Xu, Y. Tang, Z. Ouyang, H. Zhang, and J. Liu. 2020. Synergies and tradeoffs among sustainable development goals across boundaries in a metacoupled world. *Science of the Total Evnrionment*, 751: 141749. doi: 10.1016/j.scitotenv.2020.141749

Chung, M.G., A. Herzberger, K. Frank, and J. Liu. 2019. International tourism dynamics in a globalized world: A social network analysis approach. *Journal of Travel Research*, 59: 387-403. doi: 10.1177/0047287519844834

Chung, M.G. and J. Liu. 2019. Telecoupled impacts of livestock trade on non-communicable diseases. *Globalization and Health*, 15: 43. doi: 10.1186/s12992-019-0481-y

Chung, M.G., H. Kang, T. Dietz, P. Jaimes, and J. Liu. 2019. Activating values for encouraging pro-environmental behavior: The role of religious fundamentalism and willingness to sacrifice. *Journal of Environmental Studies and Sciences*, 9: 371-385. doi: 10.1007/s13412-019-00562-z

Herzberger, A., **M.G. Chung**, K. Kapsar, K. Frank, and J. Liu. 2019. Telecoupled food trade affects pericoupled trade and intracoupled production. *Sustainability*, 11: 2908. doi: 10.3390/su11102908

Yang, H., A. Vina, J.A. Winkler, **M.G. Chung**, Y. Dou, F. Wang, J. Zhang, Y. Tang, T. Connor, Z. Zhao, and J. Liu. 2019. Effectiveness of China's protected areas in reducing deforestation. *Environmental Science and Pollution Research*, 26: 18651-18661. doi:

10.1007/s11356-019-05232-9

Chung, M.G., T. Pan, X. Zou, and J. Liu. 2018. Complex interrelationships between ecosystem services supply and tourism demand: General framework and evidence from the origin of three Asian rivers. *Sustainability*, 10: 4576. doi: 10.3390/su10124576

Chung, M.G., T. Dietz, and J. Liu. 2018. Global relationships between biodiversity and nature-based tourism in protected areas. *Ecosystem Services*, 34: 11-23. doi: 10.1016/j.ecoser.2018.09.004. (*Featured in the news media*).

Liu, J., V. Hull, H.C.J. Godfray, D. Tilman, P. Gleick, H. Hoff, C. Pahl-Wostl, Z. Xu, **M.G. Chung**, J. Sun, and S. Li. 2018. Nexus approaches to global sustainable development. *Nature Sustainability*, 1: 466-476. doi: 10.1038/s41893-018-0135-8

Liu, J., Y. Dou, M. Batistella, E. Challies, T. Connor, C. Friis, J.D.A. Millington, E. Parish, C.L. Romulo, R.F.B. Silva, H. Triezenberg, H. Yang, Z. Zhao, K.S. Zimmerer, F. Huettmann, M.L. Treglia, Z. Basher, **M.G. Chung**, A. Herzberger, A. Lenschow, A. Mechiche-Alami, J. Newig, J. Roche, and J. Sun. 2018. Spillover systems in a telecoupled Anthropocene: typology, methods, and governance for global sustainability. *Current Opinion in Environmental Sustainability*, 33: 58-69. doi: 10.1016/j.cosust.2018.04.009

Carlson, A., J. Zaehringer, R. Garrett, R. Felipe, B. Silva, P. Furumo, A.R. Rey, A. Torres, **M.G. Chung**, Y. Li, and J. Liu. 2018. Toward rigorous telecoupling causal attribution: A systematic review and typology. *Sustainability*, 10: 4426. doi: 10.3390/su10124426

Chung, M.G., H. Kang, and S.U. Choi. 2015. Assessment of coastal ecosystem services for conservation strategies in South Korea. *PLoS ONE*, 10: e0133856. doi: 10.1371/journal.pone.0133856

Chung, M.G. and H. Kang. 2013. A review of ecosystem service studies: Concept, approach and future work in Korea. *Journal of Ecology and Environment*, 36: 1-9. doi: 10.5141/ecoenv.2013.001

Book Chapters:

Kang, H., H. Chang, and **M.G. Chung**. 2015. Rapid land use change impacts on coastal ecosystem services: A South Korean case study. *In* Water Ecosystem Services: A Global Perspective, J. Martin-Ortega, R.C. Ferrier, I.J. Gordon, and S. Khan (eds.), Cambridge University Press, Cambridge, UK. pp.119-126.

In Progress, Review, or Revision:

Chung, M.G., M. Goulden, H. Guo, S. Khan, G. Cui, and R. Bales. (internal review). Evapotranspiration management for sustaining water diversion during droughts.

Chung, M.G. and J. Liu. (internal review). Uncovering a complex metacoupled world: Spatio-temporal dynamics of international flows before and during the COVID-19 pandemic.

Chung, M.G., H. Yang, M. Goulden, H. Guo, and R. Bales (internal review). Nature-based

solutions for carbon management in fire-prone forests.

Chung, M.G., C. Hovis, V. Frans, K. Kapsar, A. Torres, Y. Zhang, Y. Li, R. Chen, E. Dean, A. Herzberger, M. Lei, X. Xu, Y. Xing, and J. Liu. (internal review). Integration of distant human-nature interactions into biodiversity conservation.

Li, Y., M. Li, M. Lenzen, A. Malik, B.D. Fath, R. Chen, P. Havlik, **M.G. Chung**, J. Gephart, Z. Xu, J. Gómez-Paredes, O. Azusa, A. Alsamawi, K. Niu, and J. Liu. (under review). Transnational impacts on achieving SDGs at the national and global scales. *Nature Communications*.

Guo, H., M. Goulden, **M.G. Chung**, Q. Xu, C. Nyelele, W. Guo, B. Egoh, M. Conklin, C. Keske, M. Safeeq, and R. Bales. (in revision). Valuing co-benefits of fire regulation through forest restoration in wildfire-vulnerable forests. *Journal of Environmental Management*.

Lee, H., E. Choi, O. Ju, C.O. Hong, Y. Kwak, J. Yun, J. Lee, **M.G. Chung**, S.M. Moon, A. Ho, and H. Kang (submitted). N fertilization can increase the global sustainability of rice production by suppressing CH_4 emissions. *Nature Food*.

PRESENTATIONS

Chung, M.G. Machine learning to predict changes in water diversion under a changing climate. EAS Annual Meeting, Long Beach, CA, USA, August 6th, 2024.

Chung, M.G. Valuation of historical forest management and disturbance on water and carbon fluxes in a productive mixed-conifer mountain forest. AGU Fall Meeting, Chicago, IL, USA, December 16th, 2022.

Chung, M.G. A social network analysis for global flows of ecosystem services. The Interdisciplinary Ph.D. Workshop in Sustainable Development at Columbia University, New York, NY, USA, April 13th, 2019.

Chung, M.G. and J. Liu. Global impacts of meat trade on non-communicable diseases. The Sustainability and Development Conference, Ann Arbor, MI, USA, November 11th, 2018.

Chung, M.G., K. Frank, and J. Liu. Balancing built and natural infrastructure for sustainable freshwater supply to the World's cities. The 2018 IALE Annual Meeting, Chicago, IL, USA, April 9th, 2018.

Chung, M.G. and J. Liu. Global impacts of international food trade on biodiversity: Application of the telecoupling framework. The 20th Annual Conference on Global Economic Analysis, West Lafayette, IN, USA, June 8th, 2017.

Chung, M.G., T. Dietz, and J. Liu. Complex relationships between biodiversity and cultural ecosystem services. The 2017 IALE Annual Meeting, Baltimore, MD, USA, April 10th, 2017. *(poster)*.

Chung, M.G., T. Pan, Y. Yao, and J. Liu. Telecoupled interactions among tourism, ecosystem

services, and human well-being. The 2016 IALE Annual Meeting, Asheville, NC, USA, April 4th, 2016.

Chung, M.G. and J. Liu. International food trade among biodiversity hotspot and non-hotspot countries. The 9th IALE World Congress, Portland, OR, USA, July 6th, 2015. *(poster).*

Chung, M.G. Mapping ecosystem services and spatial statistical analysis of coastal areas for ecosystem-based management. The 4th Korea-Japan Exchange Seminar for Wetland Ecology and Biogeochemistry, Seoul, South Korea, March 5th, 2013.

Chung, M.G. Mapping ecosystem services and spatial statistical analysis of coastal areas. Annual Conference of the Ecological Society of Korea, Chuncheon, South Korea, February 14-15th, 2013. *(in Korean).*

Chung, M.G. Valuing ecosystem services of Korea coastal wetlands. The 3rd Seminar for Wetland Ecology and Biogeochemistry, Kitakyushu, Japan, May 10th, 2012.

Chung, M.G. and H. Kang. Mapping and valuing ecosystem services in Korea coastal wetlands. The 67th Annual Meeting of the Korean Association of Biological Sciences, Daejeon, South Korea, August 16-17th, 2012. *(poster).*

Chung, M.G. The study of coastal wetlands using the concept of ecosystem services. Annual Conference of the Ecological Society of Korea, Chuncheon, Korea, February 16-17th, 2012. *(in Korean).*

SERVICE & AFFILIATIONS

Reviewer:

Nature Cities
Nature Communications
One Earth
PLoS ONE
Ecological Engineering
Sustainable Cities and Society
Ecology and Society
Global Ecology and Conservation
Tourism and Hospitality Management

Workshop Organizer:

2018	Telecoupling framework: Concepts, applications, and hands-on exercise with the new cloud-based telecoupling toolbox. The 2018 IALE Annual Meeting, Chicago, IL, USA.
2017	Network theory workshop: Visualizations of natural resource flows. The 13th Annual Andes Community of Practice Meeting, Sucre, Bolivia.

Invited Speaker:

2016	Global impacts of international food trade on biodiversity. Telecoupling Framework for the Landscape Ecology Community, The 2016 IALE Annual Meeting, Asheville, NC, USA.
2016	Ecosystem services in a coupled human and natural system. National Institute of Ecology. Seocheon, South Korea.
2015	International food trade among biodiversity hotspot and non-hotspot countries. Telecoupling Framework for Studying Cross-Border and Cross-Scale Interactions Workshop, The 9th IALE World Congress, Portland, OR, USA.

GRANTS, FELLOWSHIPS & AWARDS

2020	Innovation in Sustainability Science Award, The Ecological Society of America
2019	The Graduate School Dissertation Completion Fellowship, Michigan State University ($7,000)
2018	Environmental Science and Policy Program (ESPP) Travel Grant Award, Michigan State University ($500)
2018	The Graduate School Travel Funding, Michigan State University ($650)
2018	Travel Funding from the College of Agricultural and Natural Resource, Michigan State University ($400)
2017	ESPP Urban Environment Research Fellowship, Michigan State University ($7,000)
2016–2017	The William W. and Evelyn M. Taylor Endowed Fellowship for International Engagement in Coupled Human and Natural Systems ($2,500)
2016–2017	Sustainable Michigan Endowed Project (SMEP) Scholars, Michigan State University ($25,000)
2016	ESPP Travel Grant Award, Michigan State University ($500)
2015	NASA–MSU Professional Enhancement Award ($780)
2014–2015	ESPP Fellowship, Michigan State University ($28,000)

MEDIA COVERAGE

"Red and processed meat trade linked to diet-related NCDs in Europe." By Flora Southey, Food Navigator, December 23, 2021. Available at: https://www.foodnavigator.com/Article/2021/12/23/Red-and-processed-meat-trade-linked-to-diet-related-NCDs-in-Europe

"The health impact of the global meat trade." By James Kingsland, Medical News Today, November 23, 2021. Available at: https://www.medicalnewstoday.com/articles/the-health-impact-of-the-global-meat-trade

"Increased meat consumption leads to higher rates of serious disease, study finds." By Matthew Rozsa, Salon, November 22, 2021. Available at: https://www.salon.com/2021/11/22/increased-

meat-consumption-leads-to-higher-rates-of-serious-disease-study-finds

“Global rise in red and processed meat trade contributes to diet-related non-communicable disease.” By Emily Henderson, The Medical News, November 21, 2021. Available at: https://www.news-medical.net/news/20211121/Global-rise-in-red-and-processed-meat-trade-contributes-to-diet-related-non-communicable-disease.aspx

"Global spread of red meat consumption is bringing health concerns with it." By Sue Nichols, Technology Networks, November 17, 2021. Available at: https://www.technologynetworks.com/applied-sciences/news/global-spread-of-red-meat-consumption-is-bringing-health-concerns-with-it-355929

"Thirsty cities need a human/nature infrastructure combo." By Sue Nichols, SCIENMAG, October 21, 2021. Available at: https://scienmag.com/thirsty-cities-need-a-human-nature-infrastructure-combo

"What would Jesus do? Quite possibly, recycle." By Sue Nichols, phys.org, September 23, 2019. Available at: https://phys.org/news/2019-09-jesus-possibly-recycle.html

“More biodiversity equals more tourists.” By Virginia Gewin, ESA Dispatches of Frontiers in Ecology and the Environment, January 28, 2019. Available at: https://esajournals.onlinelibrary.wiley.com/doi/10.1002/fee.1995

“More biodiversity means more ecotourism.” By Dana Kobilinsky, the Wildlife Society, December 14, 2018. Available at: https://wildlife.org/more-biodiversity-means-more-ecotourism

"Biodiversity draws the ecotourism crowd." By Sue Nichols, Phys.org, November 8, 2018. Available at: https://phys.org/news/2018-11-biodiversity-ecotourism-crowd.html

SKILLSETS

Programming Skills:
R, Python, ArcGIS, QGIS, EARDAS, GeoDa, STATA, Mplus, and SAS.

Language Skills:
Fluent in English and Native in Korean.