Kyle **Bahr**

Sustainable Resource Development · Risk Assessment · Management Consulting · Data Science

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Summary

I bring the value of cutting-edge research to mineral and energy companies interested in developing, maintaining, or regaining their social license to operate. I successfully meet client needs as an independent entrepreneur and by managing teams in academic and corporate settings. My clients and colleagues value their relationships with me because of my ethical integrity, character, confidentiality, reliability, work ethic, and comfortable professionalism, as well as my technical abilities. I am an asset to any organisation interested in expanding their core competency and global credibility.

Relevant Experience

Emergent Analytics

Londonderry, NH USA

Owner and Principal

2012 - Present

- Political risk consulting
  - Political monitoring of Chilean Constitutional Convention using data science techniques to identify relevant environmental and social narratives; developed mineral industry strategies for mitigating resultant risks
  - Conducted corporate sustainability impact assessments and baselines: hybrid solar and wind feasibility studies, stakeholder surveys, livelihood restoration surveys, geothermal exploration, narrative trend analysis of local and international issues
  - Created agent-based stakeholder network evolution model, validated against real-world observations, which predicts stochastic changes in network structures based on strategic civil society initiatives
- Project level consulting and business development
  - Performed emerging conflict identification and risk assessment with natural language processing and Latent Dirichlet Allocation in Spanish and English, reduced analysis time from months to hours, cut costs of social license risk assessment and strategic development by 50% (more than $50,000 savings per contract), new business opportunities for clients previously priced-out
  - Deployed resettlement and livelihood restoration surveys, reducing the acquisition error by 91% from client's previous surveys
  - Conducted group level and asset level stakeholder mapping and social license development work in mining and energy projects on 6 continents
  - Secured social license analysis contracts and designed practical interventions for clients, leading to measurable growth of social license
- Group-level strategy
  - Co-developed revised ESG strategies for multinational mining corporation after loss of social license: conducted C-suite and management interviews and focus groups, news and literature reviews, and automated topic analysis, then identified improvement areas and KPI metrics for successful reputation restoration
  - Delivered reports, conference and management presentations, internal communication materials, corporate statements, data visualizations, and client workshops, under budget and under tight deadlines
  - Created, developed, oversaw and deployed intellectual capital in web application for facilitation of client network mapping workshops (NetWorkshop), and sentiment analysis and topic modeling program (SLaCDA)
- Cultivated global business partnerships through ongoing and completed projects in Bolivia, Colombia, Chile, El Salvador, Mexico, US, Canada, Spain, Finland, Belgium, Poland, Malawi, Australia, Japan, and Indonesia
- Developed partner and client relationships in mining and renewable energy: Rio Tinto, Sumitomo, Kinross, Gold Road, DOWA Holdings, Community Insights Group, O-Trade, Tohoku University, University of Eastern Finland, Universitat Politècnica de València, NASA, the US Department of Energy, and the Colorado School of Mines

Teaching

Tohoku University *Sendai Japan*

Energy and Resource Strategies (graduate) *2017-2019*

- Geothermal energy: Technical and social challenges
- Sustainability and mining
- Nuclear energy
- Fossil fuels

Controversial Issues in Environmental Science (graduate) *2018*

- Rhetorical analysis methods
- Well stimulation (Fracking)
- Agriculture: land use and water impacts

EcoPractice (graduate) *2018*

- Planning, permitting, and environmental impacts
- Social survey techniques
- Environmental business/NGO development

Technical English (undergraduate) *2017-2018*

- Abstract writing
- Presentation development
- Conference session chairing

Missouri University of Science and Technology *Rolla, MO*

Environmental Aspects of Mining (undergraduate) *2015*

- Legal framework for mining in the United States, including permitting
- Sustainability in mine planning
- Operational issues (such as acid mine drainage, environmental management systems, material placement, etc.)
- Reclamation and post-mining land use

Geostatistics (undergraduate) *2017-2018*

- Statistics review
- Resource classification
- Sampling and data management
- Kriging and block estimation
- Estimation performance evaluation

Research Interests

Sustainable mining, renewable energy, natural resource development, space mining, complex systems, machine learning, computational modeling (ABM, DEM, LDA), rock mechanics, tunneling, sustainable economic development, Asia, Latin America

Education

Colorado School of Mines *Golden, CO USA*

Ph.D. in Mining and Earth Systems Engineering (Minor in Science Technology and Engineering Policy) *2006 - 2015*

B.S. in Chemical Engineering (Minor in Public Affairs)

Skills and Attributes

Apps and Programming	MS Office Suite | Google Workspace (Cloud, Sheets, Forms, Docs, etc.) | Python | R SLaCDA (proprietary) | NetWorkshop (proprietary) | LaTeX | Mathematica | UCINet Netlogo (Agent-based) | PFC (Discrete Element Method) | Fulcrum | Inkscape Spyder | Jupyter | Matplotplib | Numpy | Pandas | Scikit-learn | Nltk | NetworkX
Languages	***Native:*** English ***Intermediate:*** Spanish ***Beginner:*** Japanese
Personal Skills	Proposal writing (government and industry) | Problem solving | Systems thinking Networking | Communication (teaching, writing, presentation, interpersonal) Planning | Project management | People management | Budgets | Highly-motivated Strong academic record | Personable | Diligent | Energetic | Reliable

Organizations

2013-2022 **Member,** Society of Mining, Metallurgy, and Exploration (SME) *USA*

2018-2022 **Member,** Computational Social Science Society of the Americas (CSSS) *USA*

2021-2022 **Member,** Canadian Institute of Mining *Canada*

2018-2021 **Member,** International Project Management Association (AEIPRO) *Spain*

2015-2020 **Member,** Geothermal Research Society of Japan *Japan*

2015-2020 **Member,** Geothermal Research Council *USA*

2018-2019 **Member,** Japan Geophysical Union (JPGU) *Japan*

Selected Presentations

Agent-Based Modeling workshop at the 22nd International Congress on Project Management and Engineering *Madrid, Spain*

Organizer and Presenter *Jul. 2018*

- Presentation title: Social networks in agent-based modeling

Doshisha University GRM International Conference "Resource Management for Co-Existence and Cultural Diversity" *Kyoto, Japan*

Invited Lecturer *Jan. 2019*

- Presentation title: Social challenges of geothermal development in Japan

Universidad Católica Boliviana *La Paz, Bolivia*

Invited Lecturer *Jan. 2020*

- Presentation title: Data science techniques for social analytics

Publications

Shuntaro Masuda, Kyle Bahr, Tatsuya Takemori, and Noriyoshi Tsuchiya. Agent Based Simulation with Data Driven Parameterization for Evaluation of Social Acceptance of a Geothermal Development: A case study in Tsuchiyu, Fukushima, Japan. *Scientific Reports [accepted]*, 2022.

Robert G Boutilier and Kyle Bahr. A Natural Language Processing Approach to Social License Management. *Sustainability*, 12(20):1–12, 2020.

Kyle Bahr, Nora Szarka, and Erika Boeing. Renewable Energy: A Technical Overview. In Kathleen Hancock and Juliann Allison, editors, *The Oxford Handbook of Energy Politics*, chapter 3. Oxford University Press, Jun 2020.

Kyle Bahr and Masami Nakagawa. Information Diffusion as a Mechanism for Natural Evolution of Social Networks. In Diane Payne, Johan A. Elkink, and Thomas U. Grund, editors, *Social simulation for a digital society: Applications and Innovations in Computational Social Science*, chapter 5, pages 51–66. Springer Proceedings in Complexity, Cham, Switzerland, 2019. ISBN 9783030302979.

Gregory Trencher, Shirley Vincent, Kyle Bahr, Shogo Kudo, Kate Markham, and Yasuhiro Yamanaka. Evaluating core competencies development in sustainability and environmental master's programs: An empirical analysis. *Journal of Cleaner Production*, 181:829–841, 2018. ISSN 09596526. doi: 10.1016/j.jclepro.2018.01.164.

Shuntaro Masuda, Kyle Bahr, and Noriyoshi Tsuchiya. Agent-based model coupled with Bayesian estimation for evaluation of social acceptance of geothermal development. In *Transactions - Geothermal Resources Council*, volume 41, Salt Lake City, UT, 2017. ISBN 0934412227.

Kyle Bahr, Shuntaro Masuda, Hanae Saishu, Hiromi Kubota, and Noriyoshi Tsuchiya. Adaptation of social license measurement and analysis techniques for geothermal usage and development. In *Transactions - Geothermal Resources Council*, volume 41, 2017. ISBN 0934412227.

Kyle Bahr and Masami Nakagawa. The effect of bidirectional opinion diffusion on social license to operate. *Environment, Development and Sustainability*, 19(4), 2017. ISSN 15732975. doi: 10.1007/s10668-016-9792-9.

Kyle Bahr. *An Agent-Based Approach to Social License Durability*. Phd, Colorado School of Mines, 2015.

Masami Nakagawa, Kyle Bahr, and Derek Levy. Scientific understanding of stakeholders' behavior in mining community. *Environment, Development and Sustainability*, 15(2), 2013. ISSN 1387585X. doi: 10.1007/s10668-012-9389-x.

Kyle Bahr, Christian Frenzel, Masami Nakagawa, and Eric Smiley. Three-Dimensional Discrete Element Modeling of Disc Cutting Applications. In *46th U.S. Rock Mechanics/Geomechanics Symposium*, volume 4, Chicago, IL, 2012. American Rock Mechanics Association. ISBN 9781622765140.