

Water and the Mining Industry

THE PROBLEM: Mining companies face many water-related challenges, including water scarcity, pollution discharge, water rights issues, and climate variability. If not properly addressed, these challenges can lead to environmental problems, social conflicts, and/or financial threats to the company. The Columbia Water Center recently completed a three-year project sponsored by Norges Bank Investment Management to develop a modeling platform to quantitatively assess mining-related water and environmental risks and their financial implications. In the coming years, we hope to continue improving it.



Project Outputs

The new modeling platform provides investors access to a targeted analysis of water-related mining risk that includes:

- Relevant climate and physical data
- Analysis of the gaps in governance, monitoring, reporting, and verification
- Remediation and mitigation options
- Financial implications of particular risks at the asset and portfolio levels, especially from a climate perspective
- Causal connections between risk factors and financial performance
- Assessment of initiatives involving local communities to avoid conflict related to water resources
- Financial modeling tools for real option analysis to account for risks related to water, climate, commodity prices, and other quantifiable factors.

Types of Risks Included in the Model:

- Tailings dam failures
- Accidents and spills
- Biases in reporting of environmental liabilities and remediation costs
- Extreme climate events and their clustering in time and space
- Water requirements, mining activities and community needs
- Conflicts with local communities
- Potential changes in governance such as rights and regulations
- Cumulative effects of mining on water and financial requirements of remediation

Columbia Water Center

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Future Directions

Environmental Impact Assessments are expensive and not always useful. Because they're only done very early in the life of a project, they consistently underestimate the potential impacts. This can harm companies, investors, and local communities.

With better monitoring and modeling, the Columbia Water Center aims to develop a system that can continuously assess a mine's impacts. This modeling platform would take into account the climate variability of a region over hundreds of years, for instance, and calculate the cumulative effects of an area's pollution legacy. Combined with on-the-ground data, it could be used to create a flexible framework that adapts throughout the life of a mine, to help decision-makers assess potential problems and determine the best solutions.



ABOUT COLUMBIA WATER CENTER

Our mission is to creatively tackle water challenges of a rapidly changing world where water and climate interact with food, energy, ecosystems and urbanization. Combining the rigor of scientific research with the impact of effective policy, we aim to design reliable, sustainable models of water management and development that can be implemented on local, regional and global levels. The Columbia Water Center, in collaboration with other Earth Institute units and external partners, is leading intellectual inquiry into the assessment, understanding and resolution of the global crisis of freshwater scarcity.

CONTACT US

Columbia Water Center
500 West 120th Street, S.W. Mudd 842
Mailcode 4711
New York, NY 10027

(212) 854-1695
water.columbia.edu

