Minnesota Taconite Workers

Lung Health Partnership

University of Minnesota

Environmental Study of Airborne Particulates in Mesabi Iron Range Communities

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UMD Duluth

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Environmental Study of Airborne Particulates in Mesabi Iron Range Communities

3-year long field study of airborne particulates in communities across the Mesabi Iron Range

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The community study will address the following questions:

1. What are the characteristics of the airborne particulates in the communities that surround taconite operations? Do they differ from the particulates in other communities in Northeastern Minnesota?

2. How many mineral fibers (of various types, shapes, and sizes) and how much airborne metal are residents in Iron Range communities exposed?

3. Have the mineral particles and fibers emitted from taconite operations changed over time in response to increased regulation and the implementation of more effective dust control procedures?

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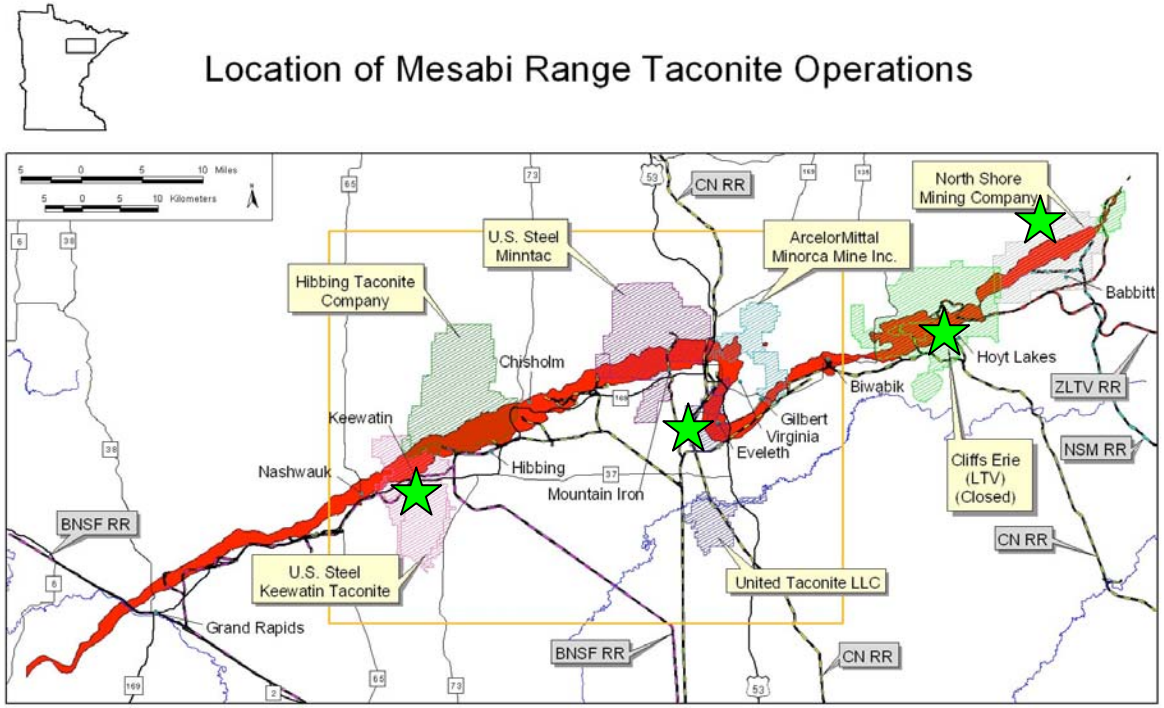
Overview of Approach

- **Implement air sampling programs in Iron Range communities such as Silver Bay, Babbitt, Hoyt Lakes, Biwabik, Eveleth, Chisholm, Hibbing, Keewatin, Nashwauk, and Grand Rapids (also collect samples in Duluth, Ely, Cloquet, St. Paul, and other relevant Minnesota locations for comparison)**



Silver Bay

Overview of Approach (cont'd)

- **Targeted air sampling will be conducted around areas of interest at taconite operations, such as tailing basins, haulage roads, and around the pit during blasting and truck loading**
- **Collecting size-fractionated samples with MOUDI impactor to target small particles that can be deposited in the deepest areas of lung**

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Community Involvement

Samplers will be placed in public locations: on top of schools, courthouses, and libraries.



We will give talks to public about our project and taconite dust in their community, and answer questions.

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Overview of Approach (cont'd)

- **Samples of western and eastern Mesabi Range lake sediments will also be collected and studied to reconstruct the historical composition of airborne dust generated by mining activity. Other geological materials will be collected and analyzed as-needed.**

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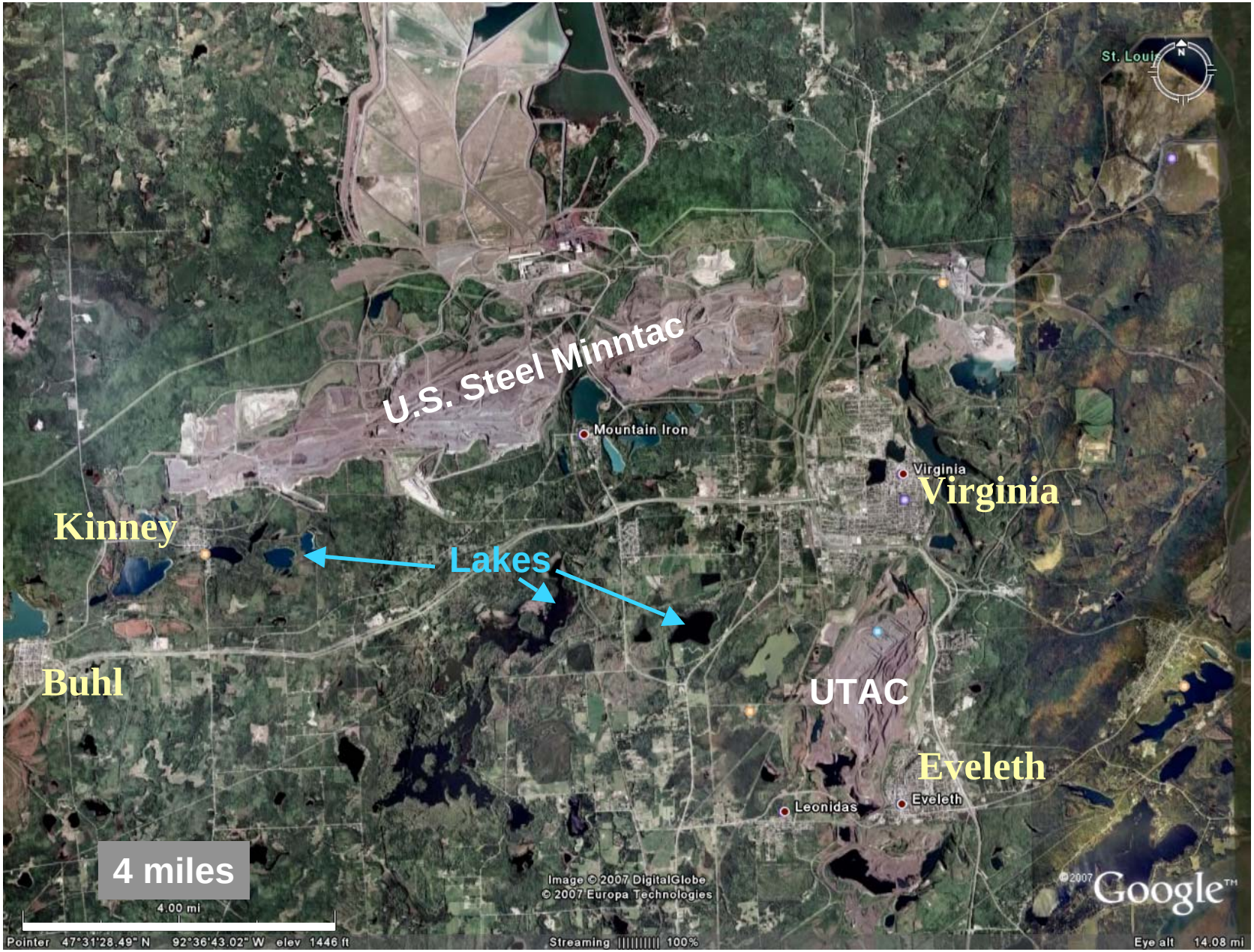
Many lake sampling options are present across Mesabi Range…



Scientific Advisors

- **Scientific Advisory Board (SAB)**
  - Gregory Meeker, Geologist, United States Geological Survey, Denver Microbeam Laboratory, Denver, CO
  - Dr. Daniel Vallero, United States Environmental Protection Agency (U.S. EPA), Office of Research and Development, National Exposure Research Laboratory
  - Paul Middendorf, Ph.D., CIH, Research Industrial Hygienist, Office of the Director, National Institute for Occupational Safety and Health (NIOSH)

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Collaborators and Technical Consultant

- **State and Federal Agency Collaborators**
  - Minnesota Pollution Control Agency (MPCA)
  - Minnesota Department of Health (MDH)
  - Mine Safety and Health Administration (MSHA)
  - U.S. EPA Region 5

- **Technical Consultant**
  - D. Wayne Berman, Aeolus, Inc., PhD, Physical Chemistry, California Institute of Technology, Pasadena, California

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Research Team

- **NRRI Economic Geology Group, University of Minnesota Duluth**
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- **NRRI Center for Water and the Environment, University of Minnesota Duluth**
  - Euan Reavie, PhD
- **Department of Mechanical Engineering, Particle Calibration Laboratory, University of Minnesota Twin Cities Campus**
  - Prof. Virgil Marple, PhD; Bernard Olson, PhD; and student(s)
- **School of Public Health, University of Minnesota Twin Cities Campus**
  - Gurumurthy Ramachandran, PhD

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