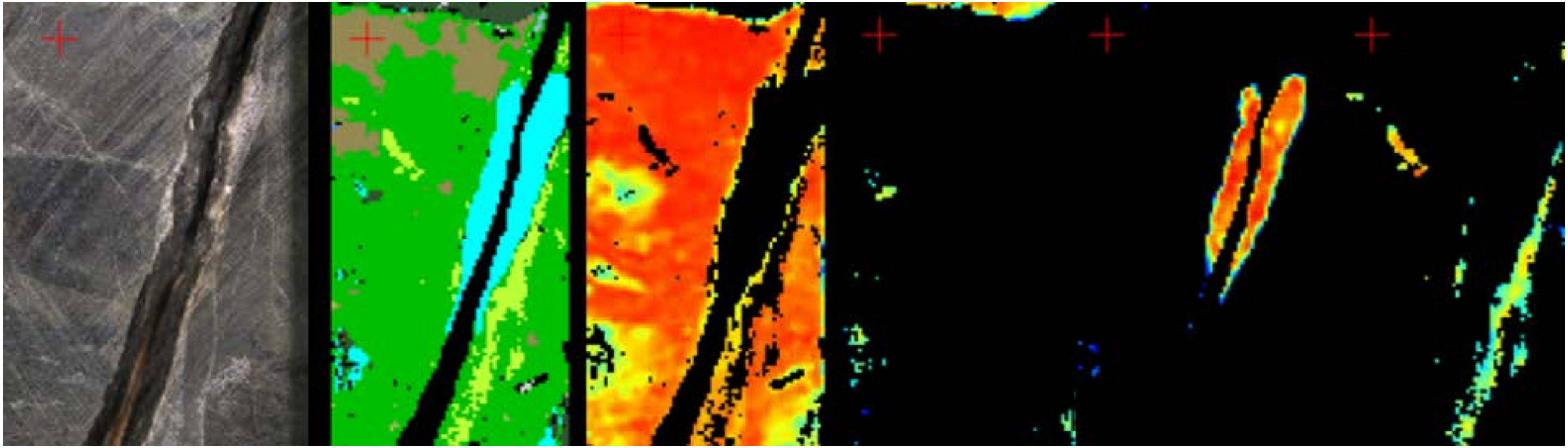


Minnesota DNR Corescan Project

mndnr.gov/corescan

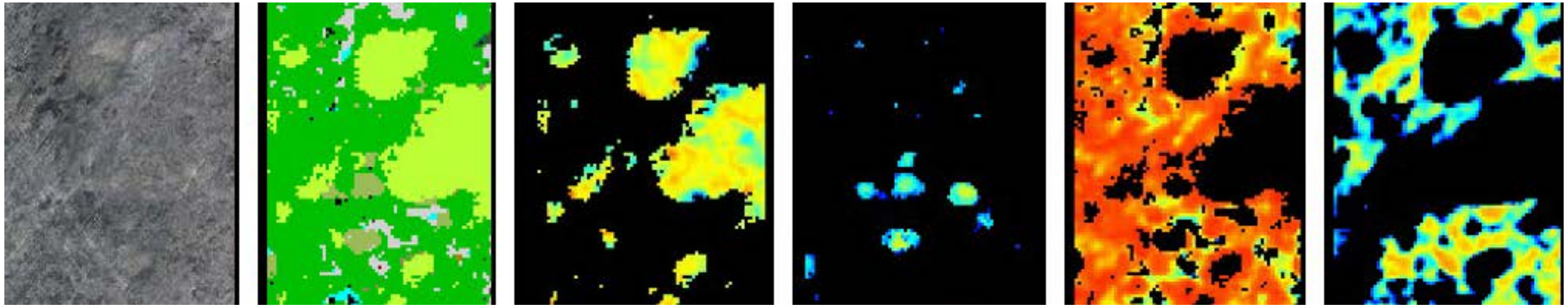
DEPARTMENT OF NATURAL RESOURCES

Minnesota DNR Corescan Project Seminar

1. Project Overview
2. Mobile, Automated Hyperspectral Core Logging
3. Hyperspectral Core Imaging for Institutional Core Repositories
4. Procedure and Deliverables
5. Results from Five Focus Areas
6. Data Visualization and Interpretation Using the Coreshed Virtual Core Library

DEPARTMENT OF NATURAL RESOURCES

DEPARTMENT OF NATURAL RESOURCES



Is Hyperspectral Core Imaging a Useful Tool for Institutional Core Repositories? Insights from the DNR Corescan Project

Don Elsenheimer, Ph.D. | Senior Geologist, Minnesota DNR

DEPARTMENT OF NATURAL RESOURCES

Source: Google Earth

DNR Corescan Project

DEPARTMENT OF NATURAL RESOURCES

- Core selection
- Focus Areas
- Support for an Institutional Core Repository

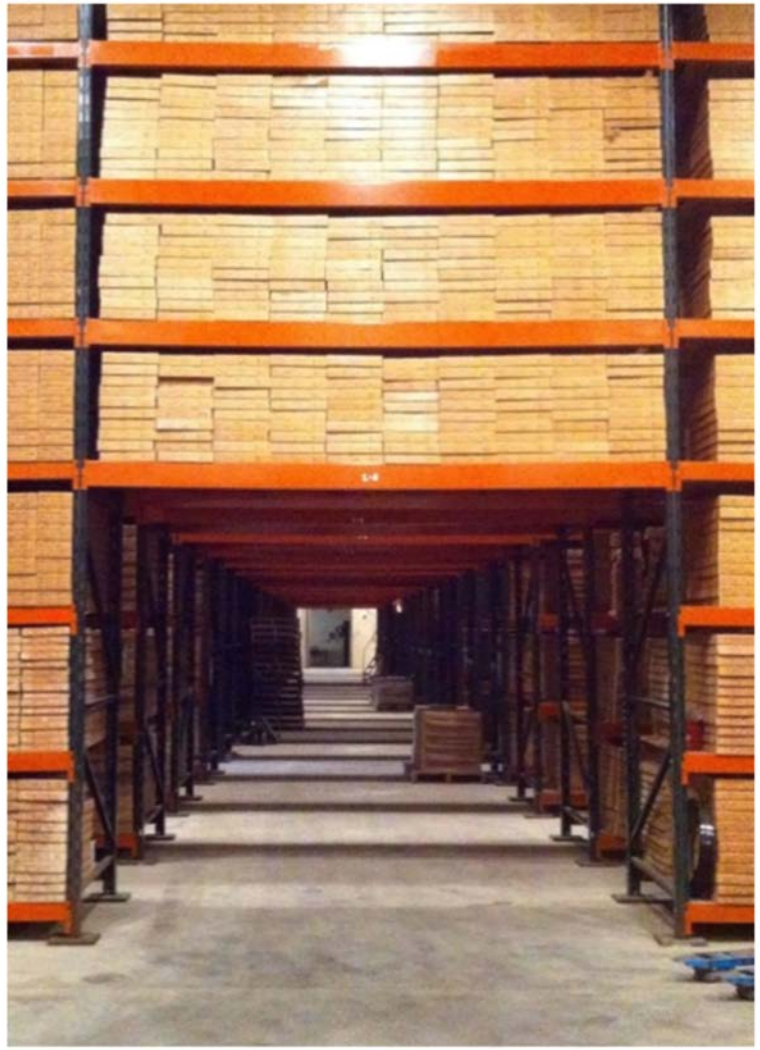
Source: Google Earth

DNR Corescan Project

DEPARTMENT OF NATURAL RESOURCES

- 1,000,000 meters of core
- More than 9,000 drill holes

DNR Drill Core Library

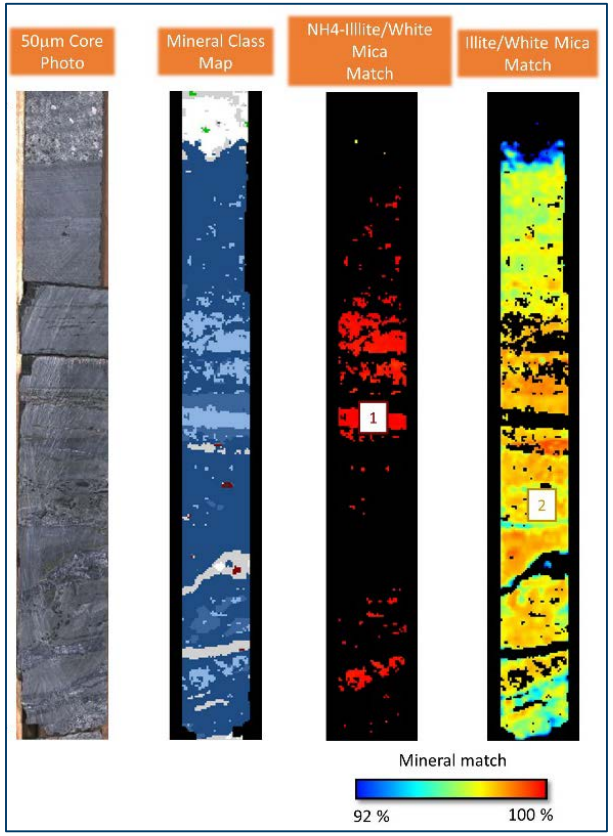


Core Selection

Core Selection

DEPARTMENT OF NATURAL RESOURCES

- Mineral Exploration
- Mapping and Geological Research
- DNR Land Management
- Conservation



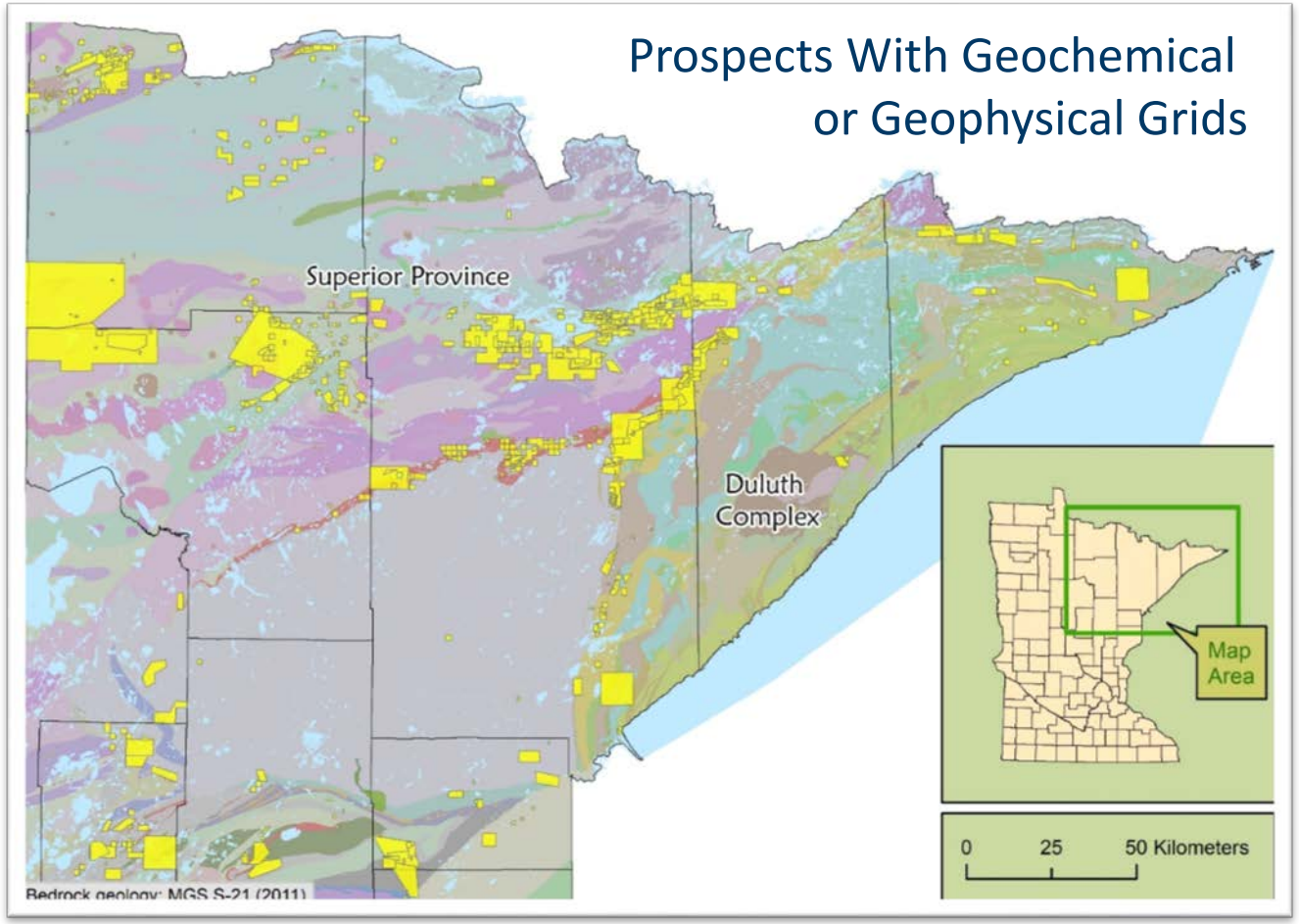
DNR Core Selection

Core Selection Strategies

DEPARTMENT OF NATURAL RESOURCES

- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies

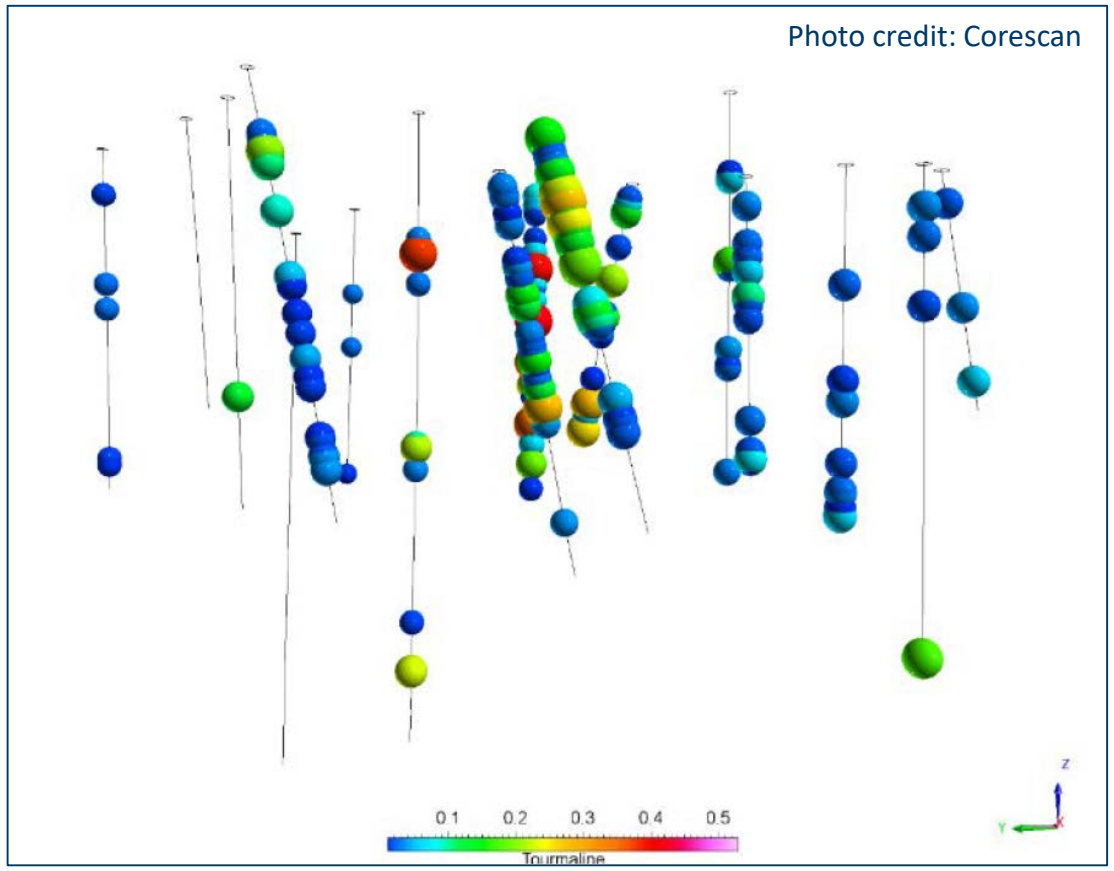


- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies

- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies



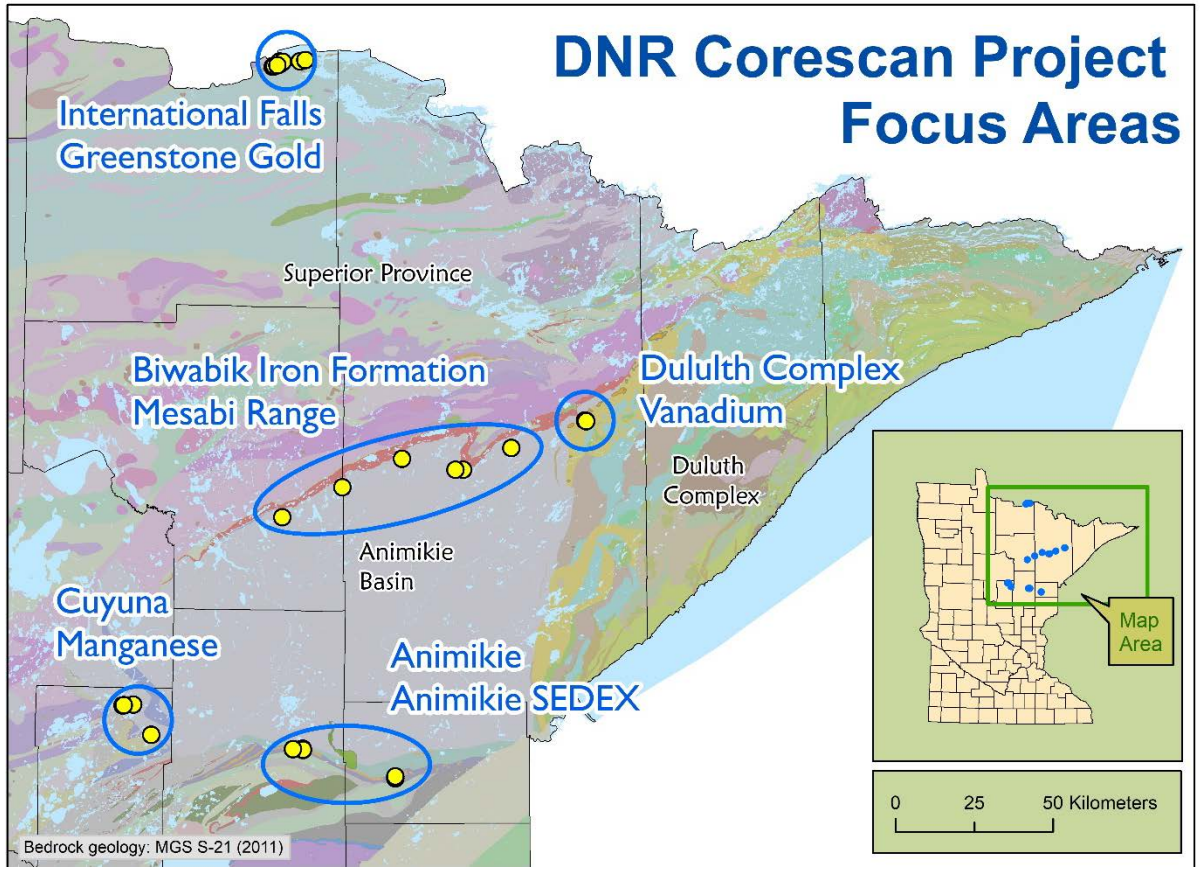
- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies

- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies

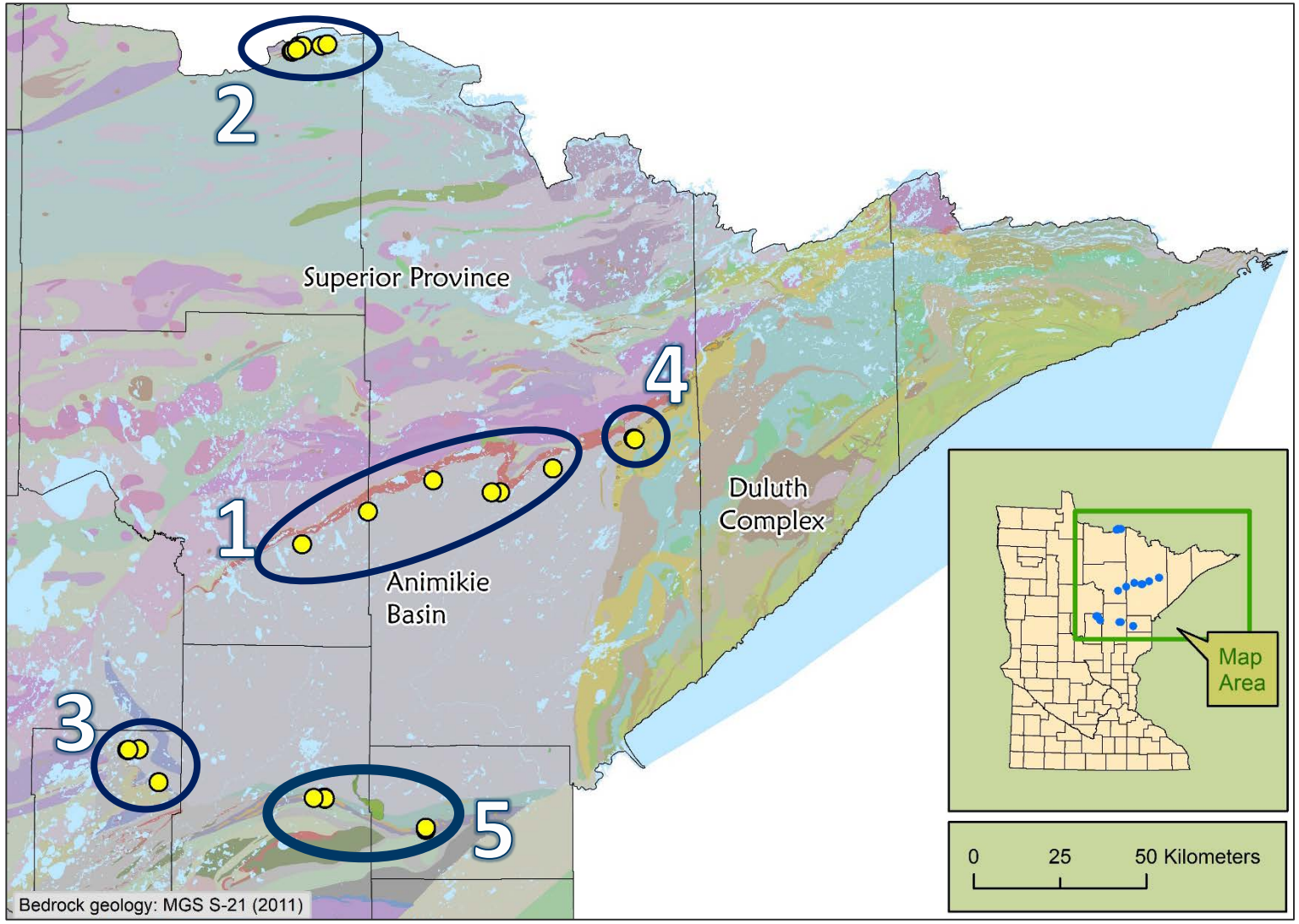
DEPARTMENT OF NATURAL RESOURCES



- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies

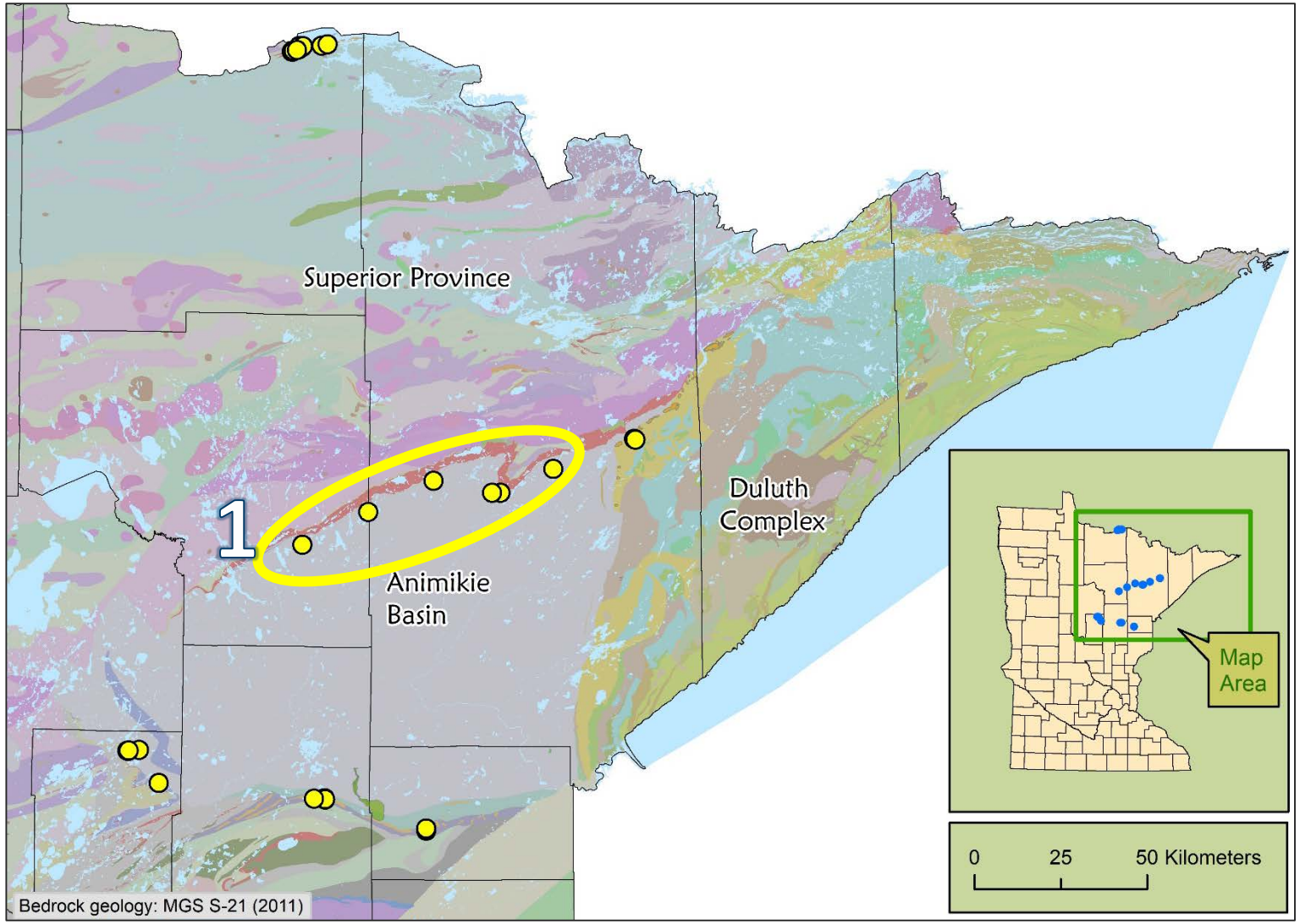
1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. Duluth Complex Vanadium
5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

1. **Biwabik Iron Formation**
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. Duluth Complex Vanadium
5. Animikie &
   Animikie SEDEX

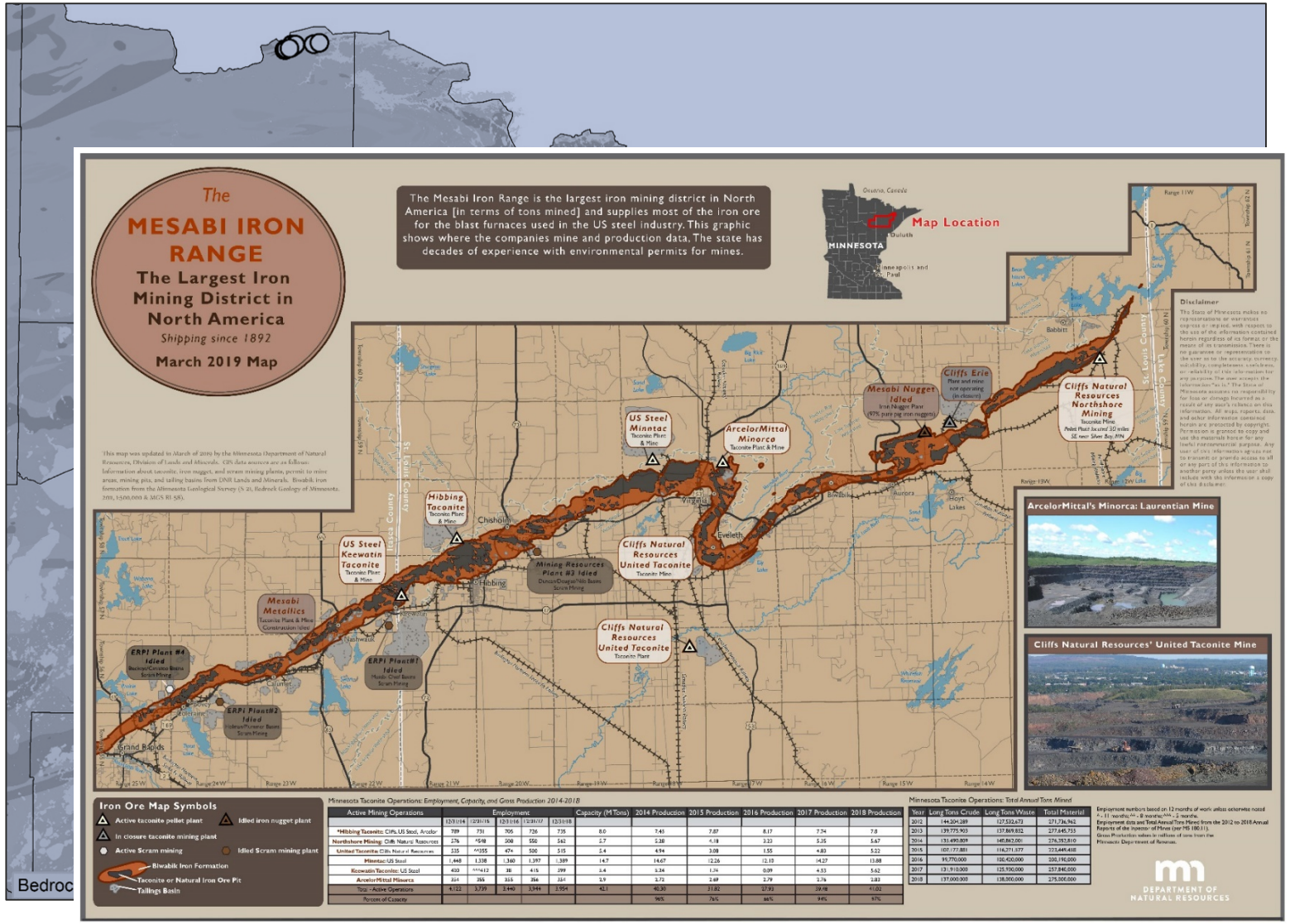


DEPARTMENT OF NATURAL RESOURCES

Focus Areas

1. Biwabik Iron Formation
Mesabi Range

2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. Duluth Complex Vanadium
5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

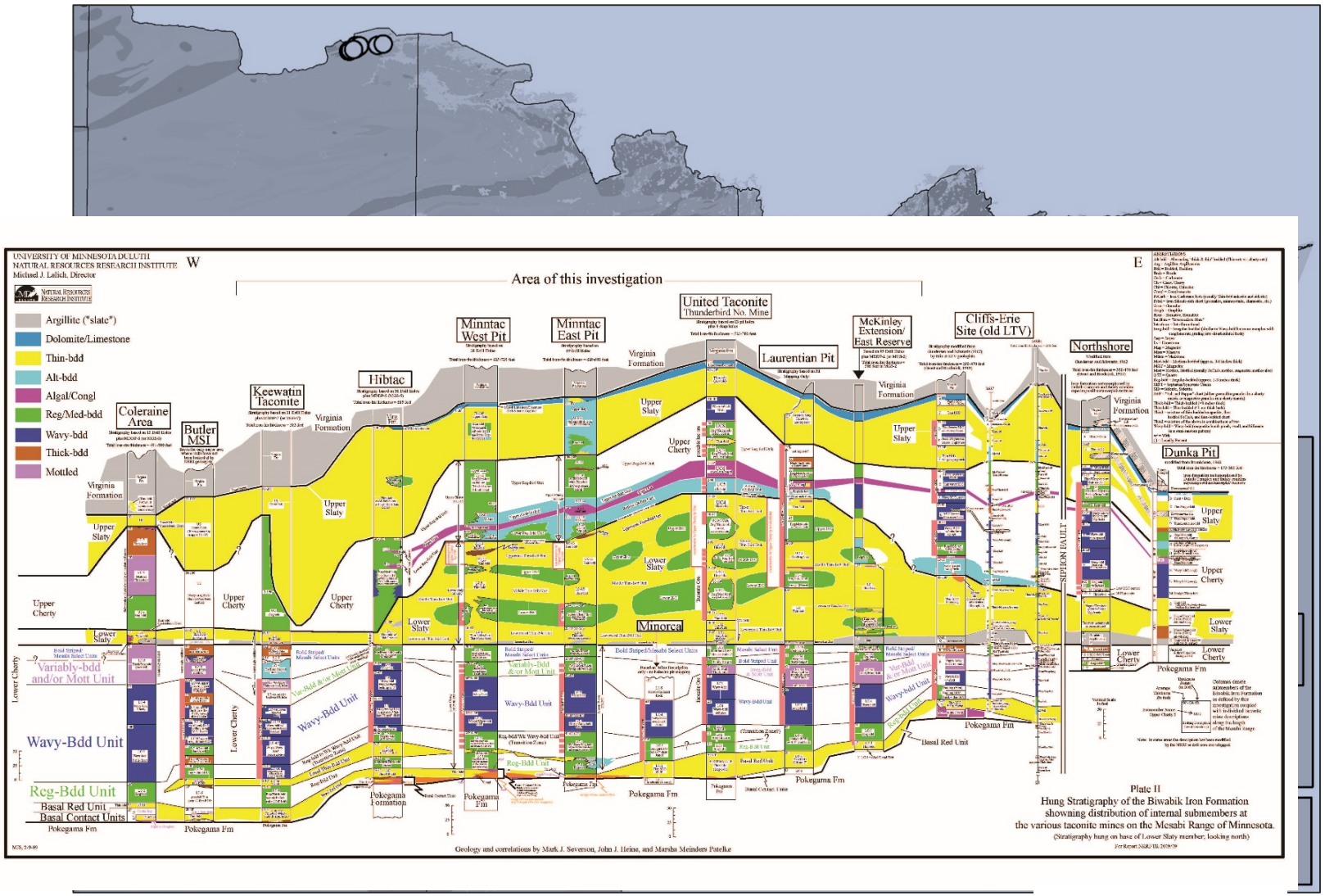
1. Biwabik Iron Formation Mesabi Range

2. International Falls Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadiu

5. Animikie & Animikie SEDEX



Severson et al. (2009)

DEPARTMENT OF NATURAL RESOURCES

Focus Areas

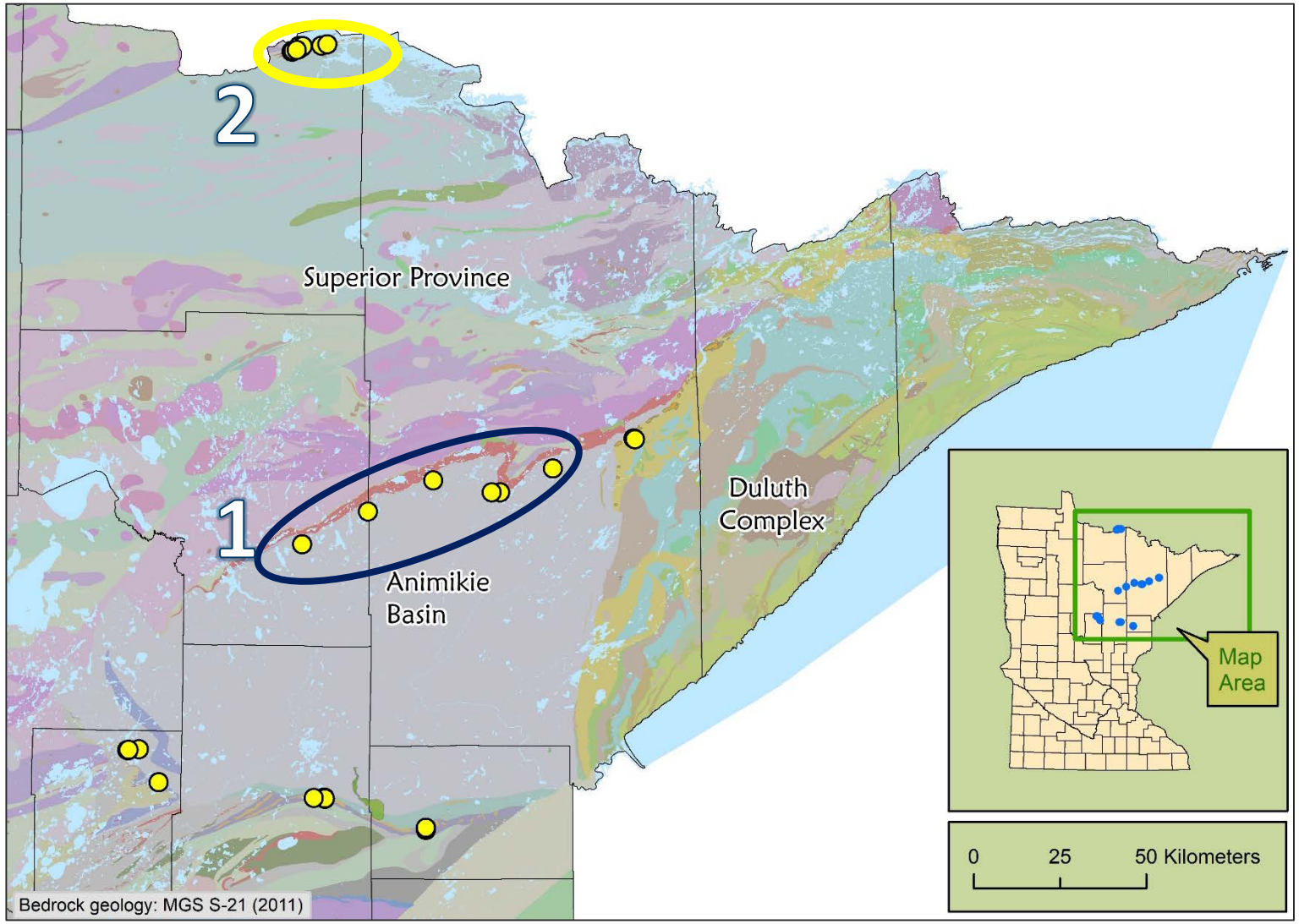
1. Biwabik Iron Formation
   Mesabi Range

2. International Falls
   Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

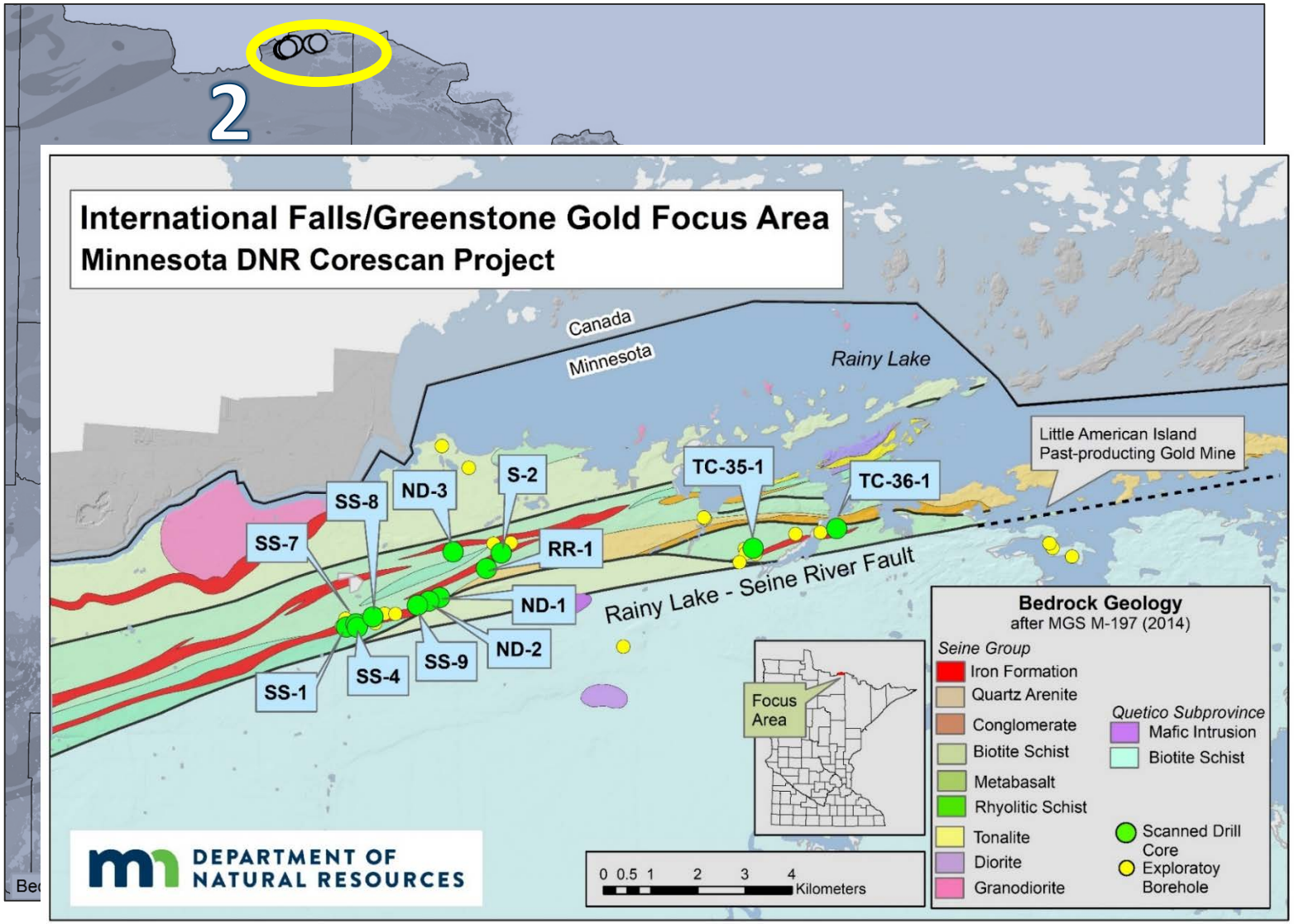
1. Biwabik Iron Formation
   Mesabi Range

2. International Falls
   Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

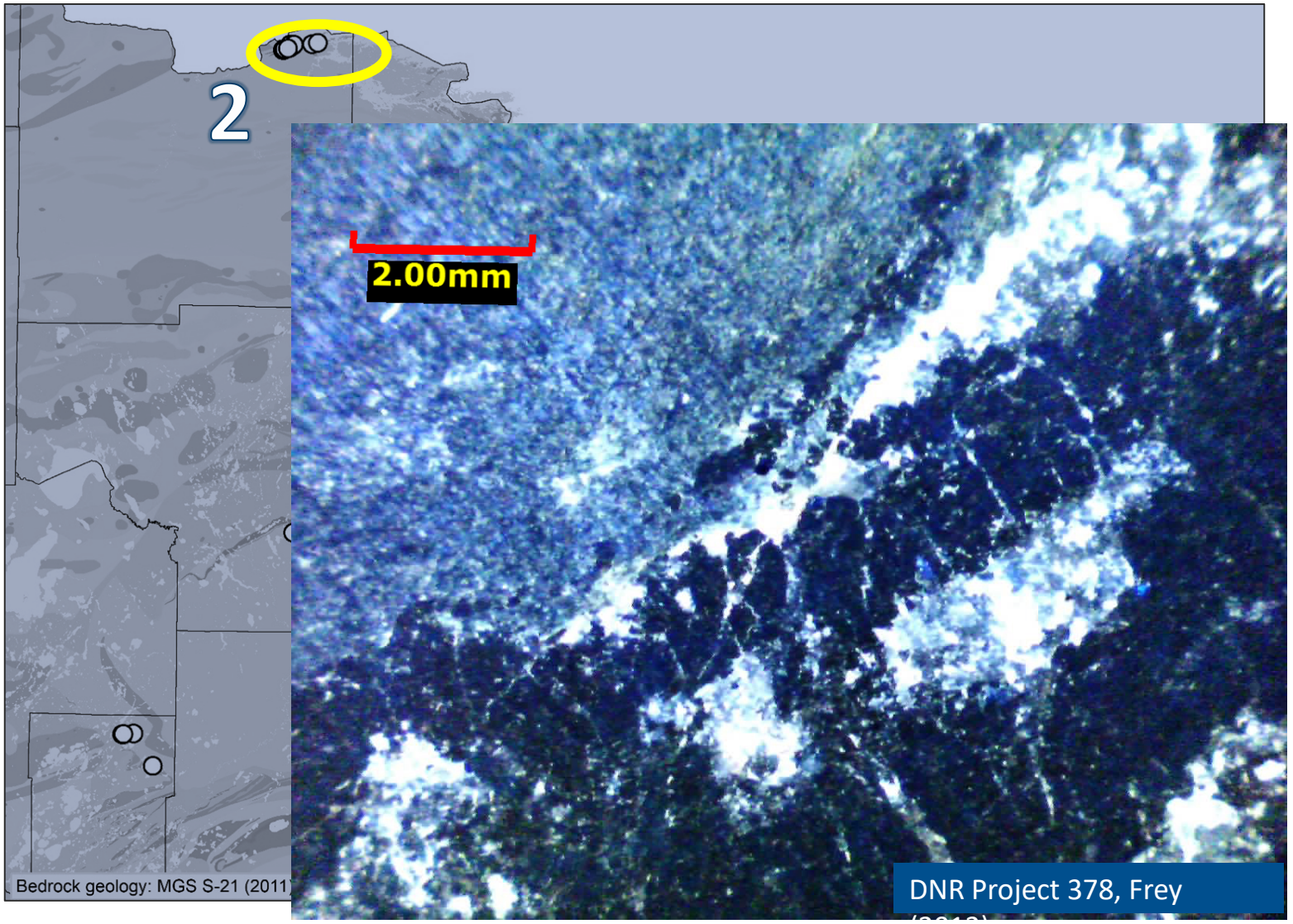
1. Biwabik Iron Formation
   Mesabi Range

2. International Falls
   Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

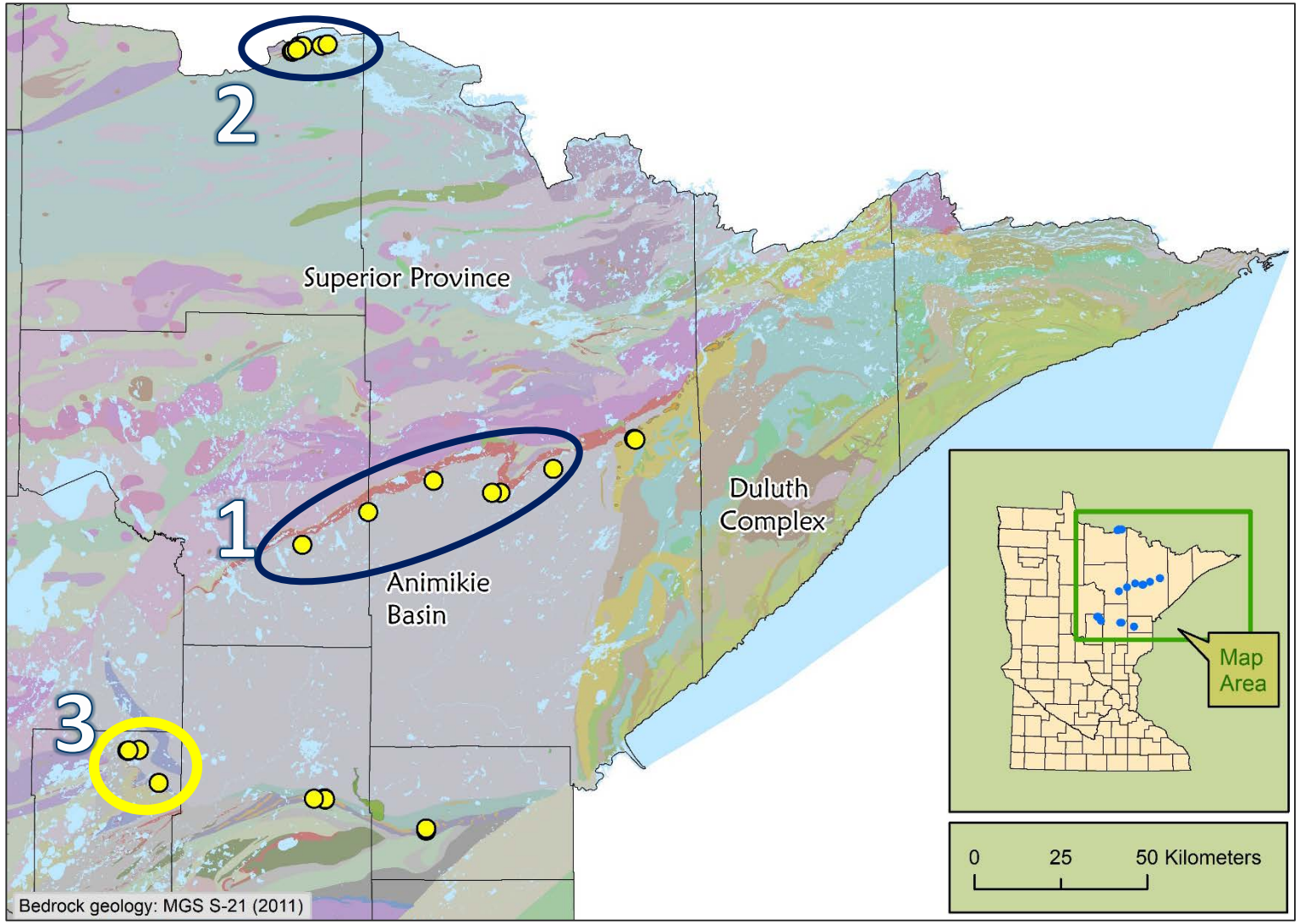
5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

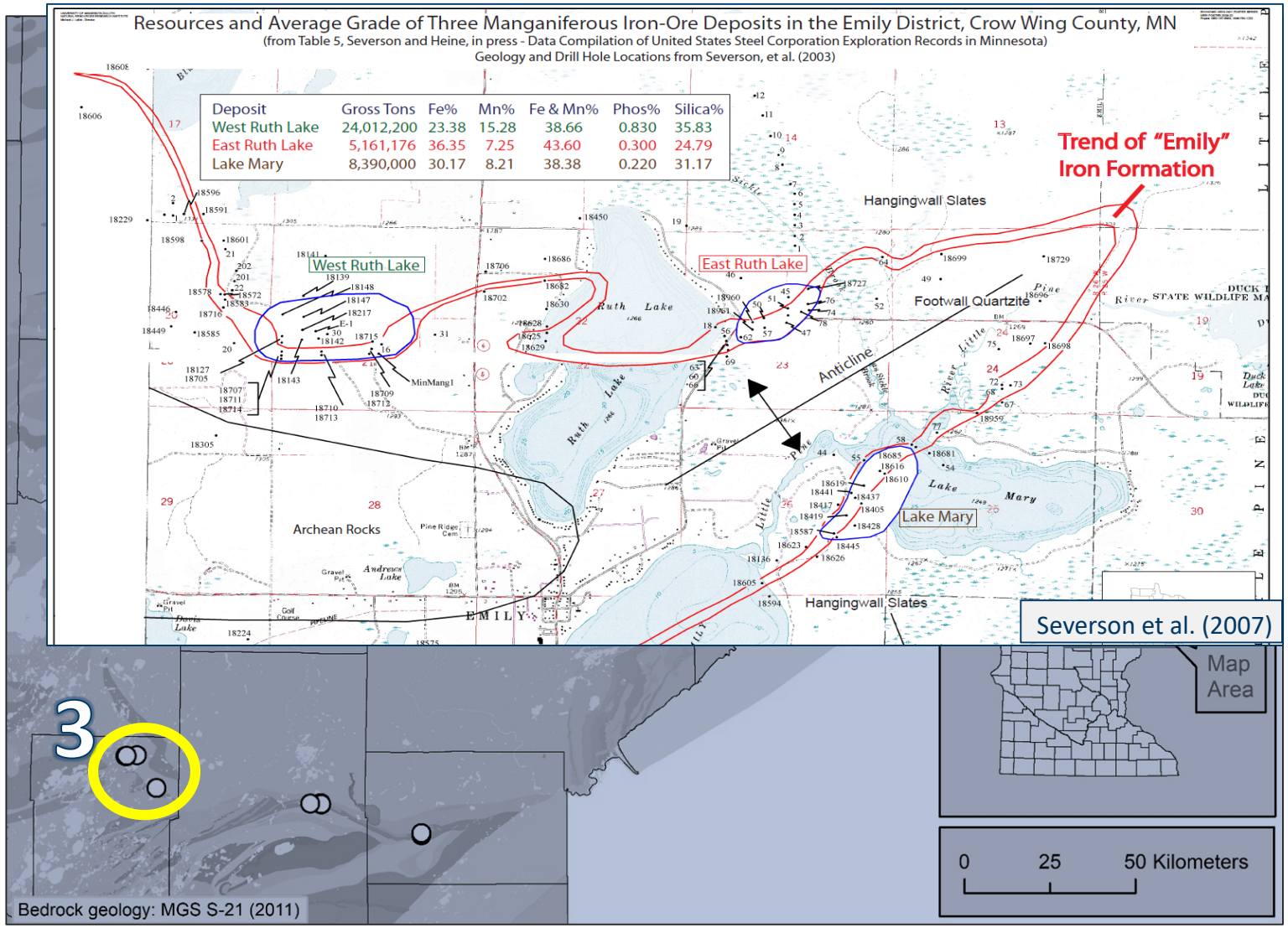
1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. **Cuyuna Manganese**
4. Duluth Complex Vanadium
5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

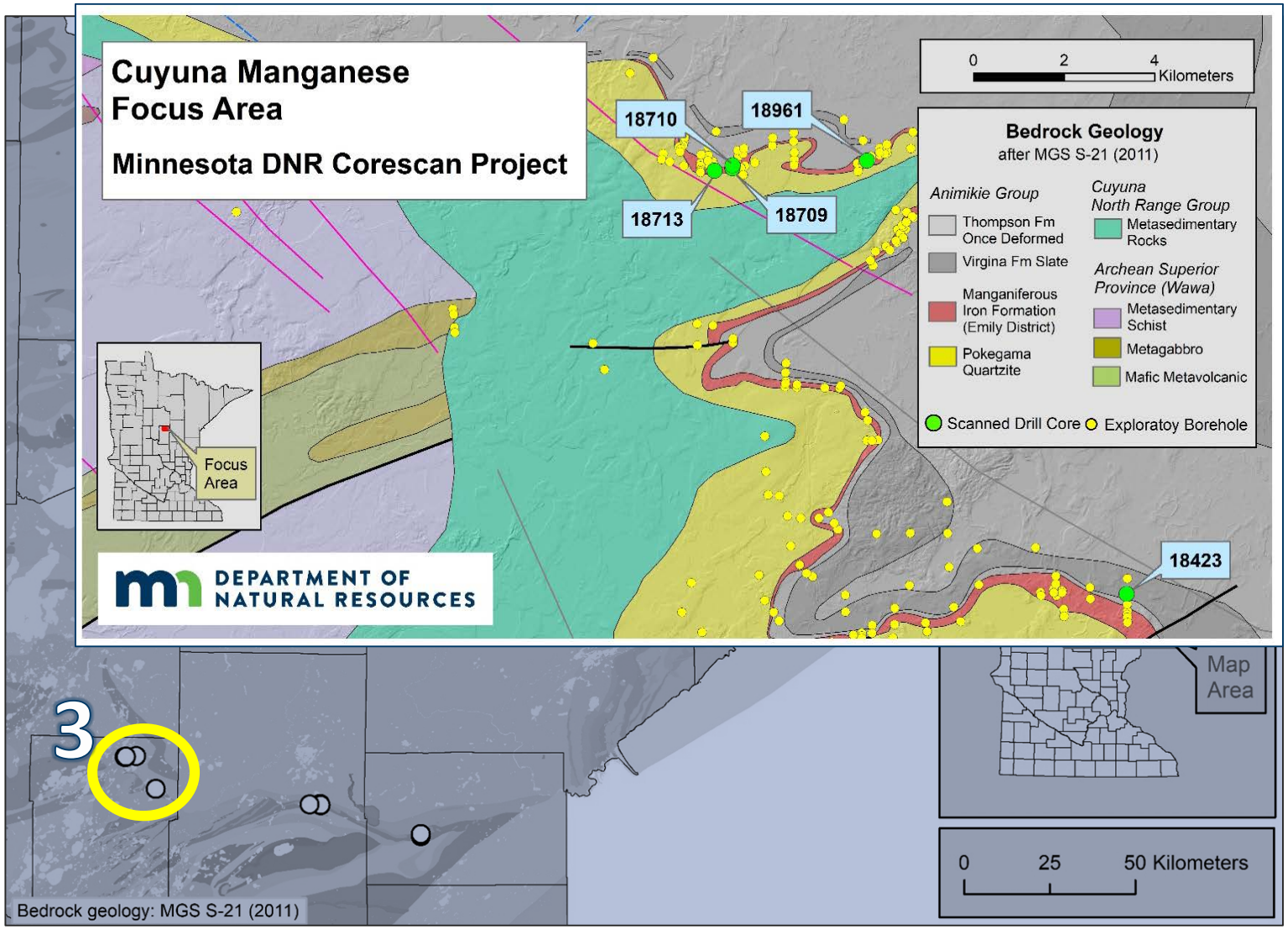
1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. **Cuyuna Manganese**
4. Duluth Complex Vanadium
5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

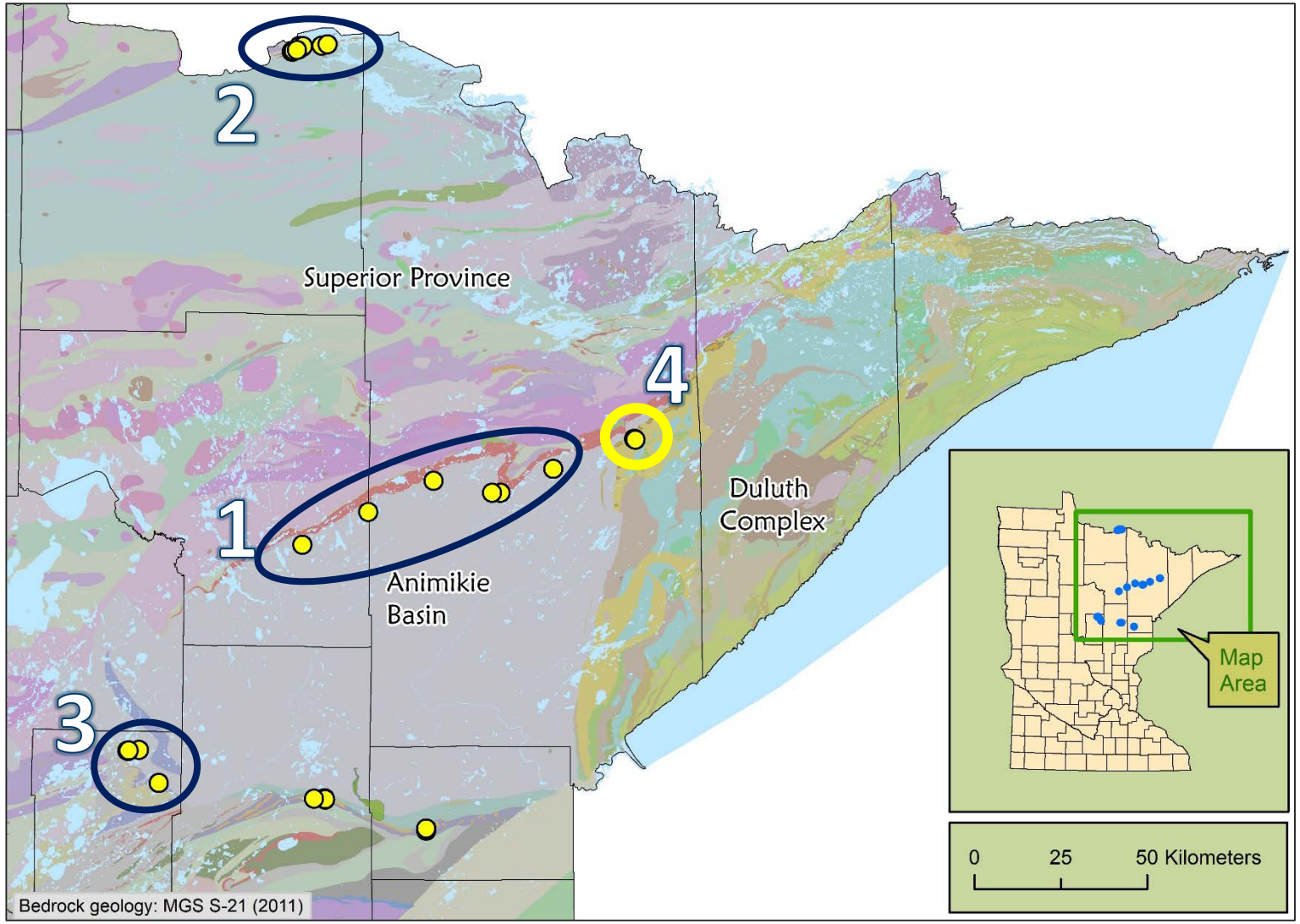
1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. **Cuyuna Manganese**
4. Duluth Complex Vanadium
5. Animikie &
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

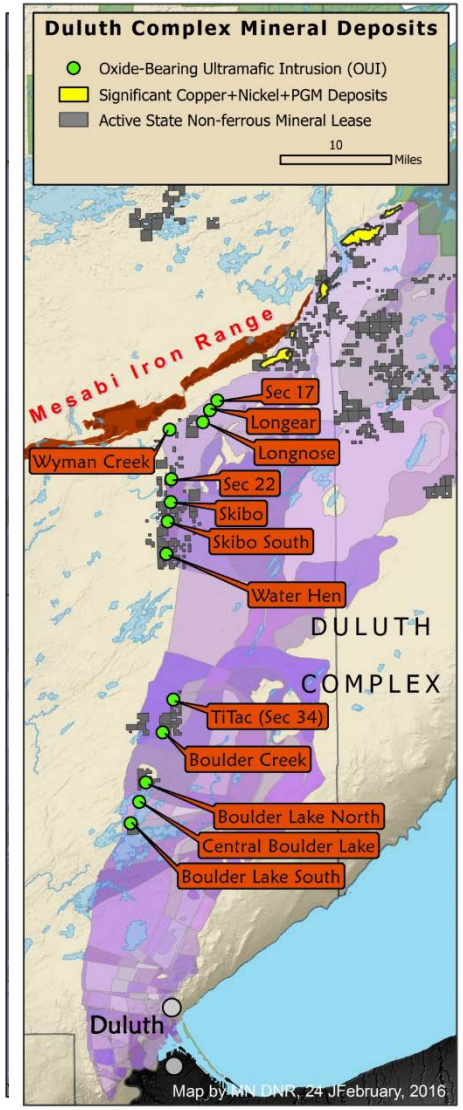
1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. **Duluth Complex Vanadium**
5. Animikie &
   Animikie SEDEX

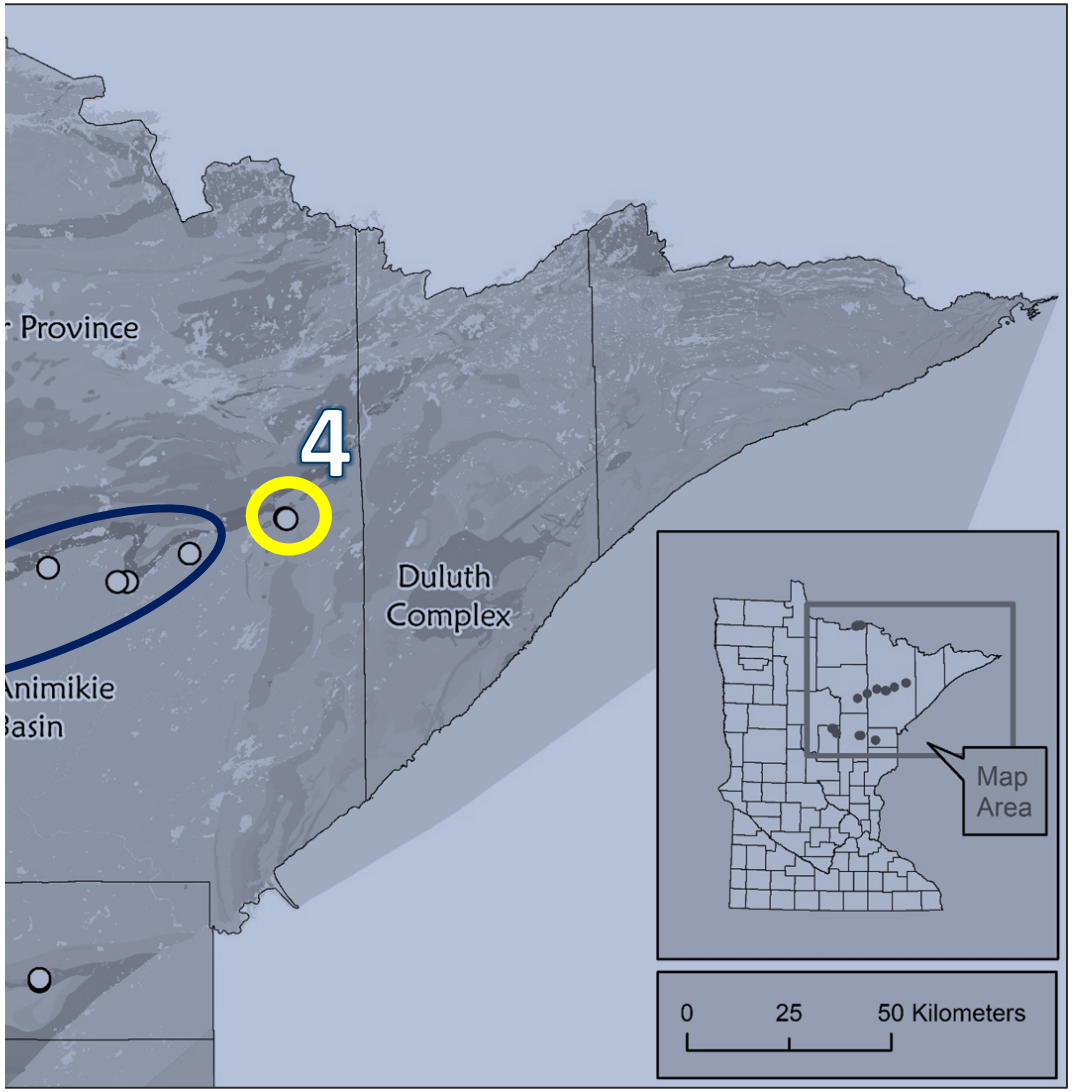


DEPARTMENT OF NATURAL RESOURCES

Focus Areas

1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. **Duluth Complex Vanadium**
5. Animikie &
   Animikie SEDEX

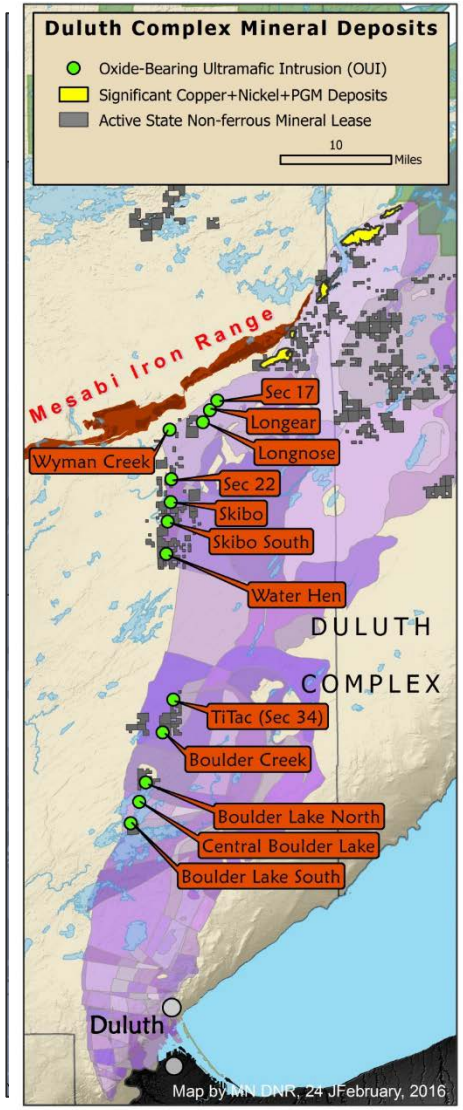


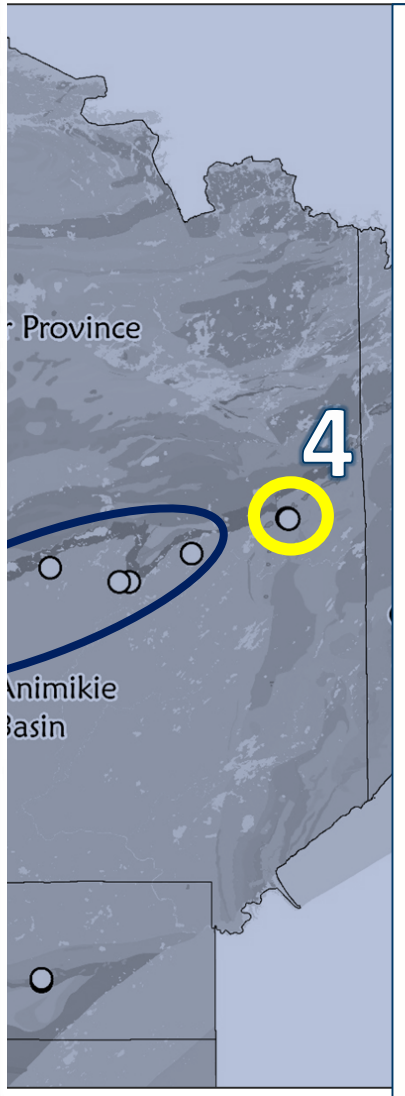


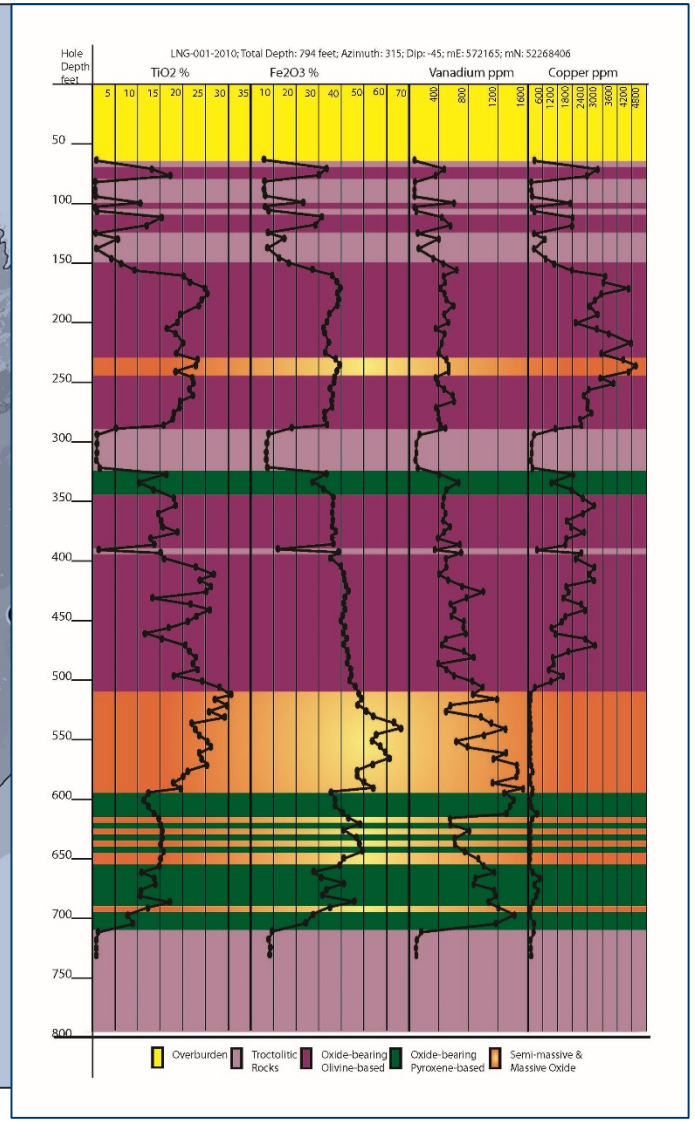
DEPARTMENT OF NATURAL RESOURCES

Focus Areas

1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. **Duluth Complex Vanadium**
5. Animikie &
   Animikie SEDEX



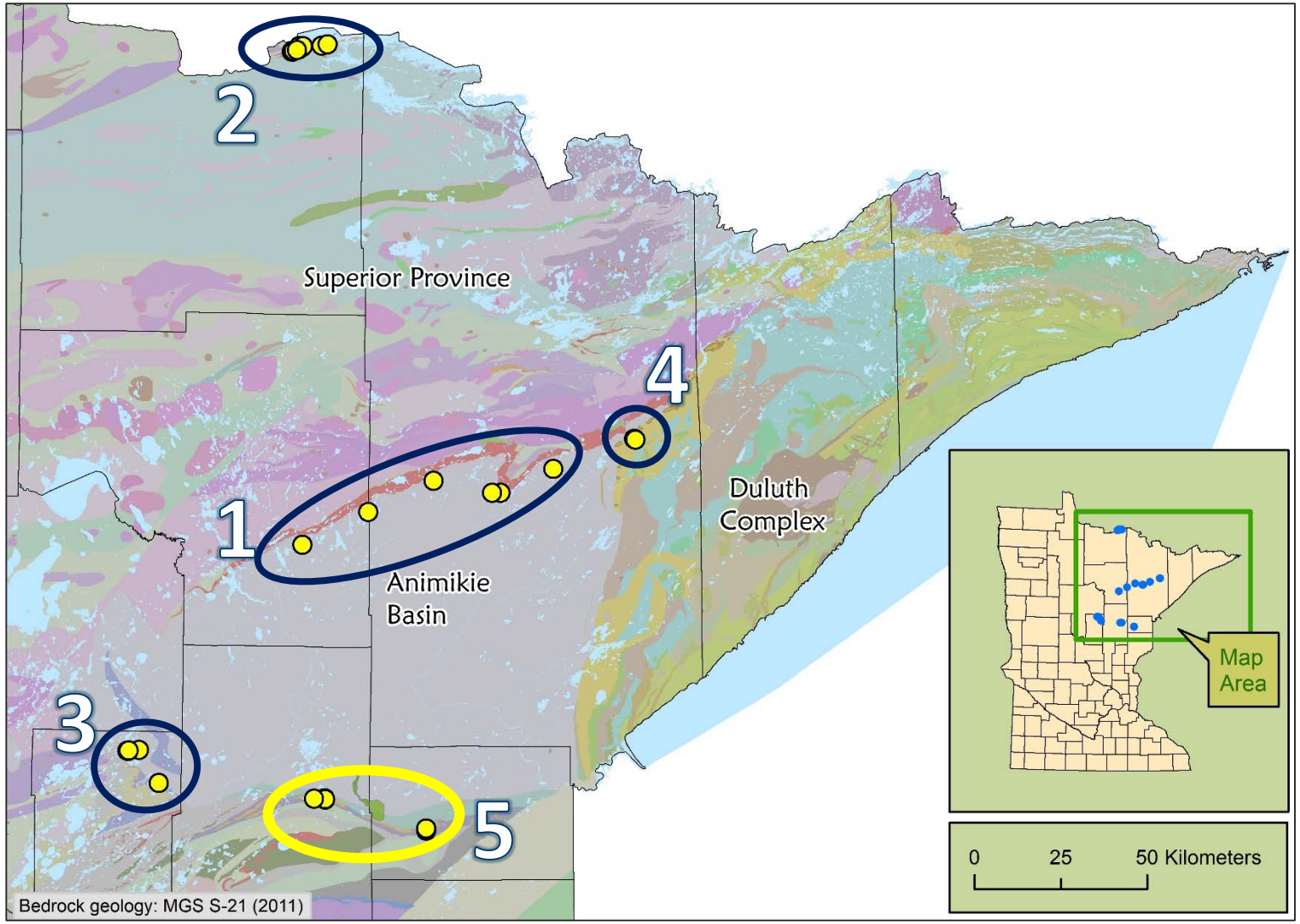




DEPARTMENT OF NATURAL RESOURCES

Focus Areas

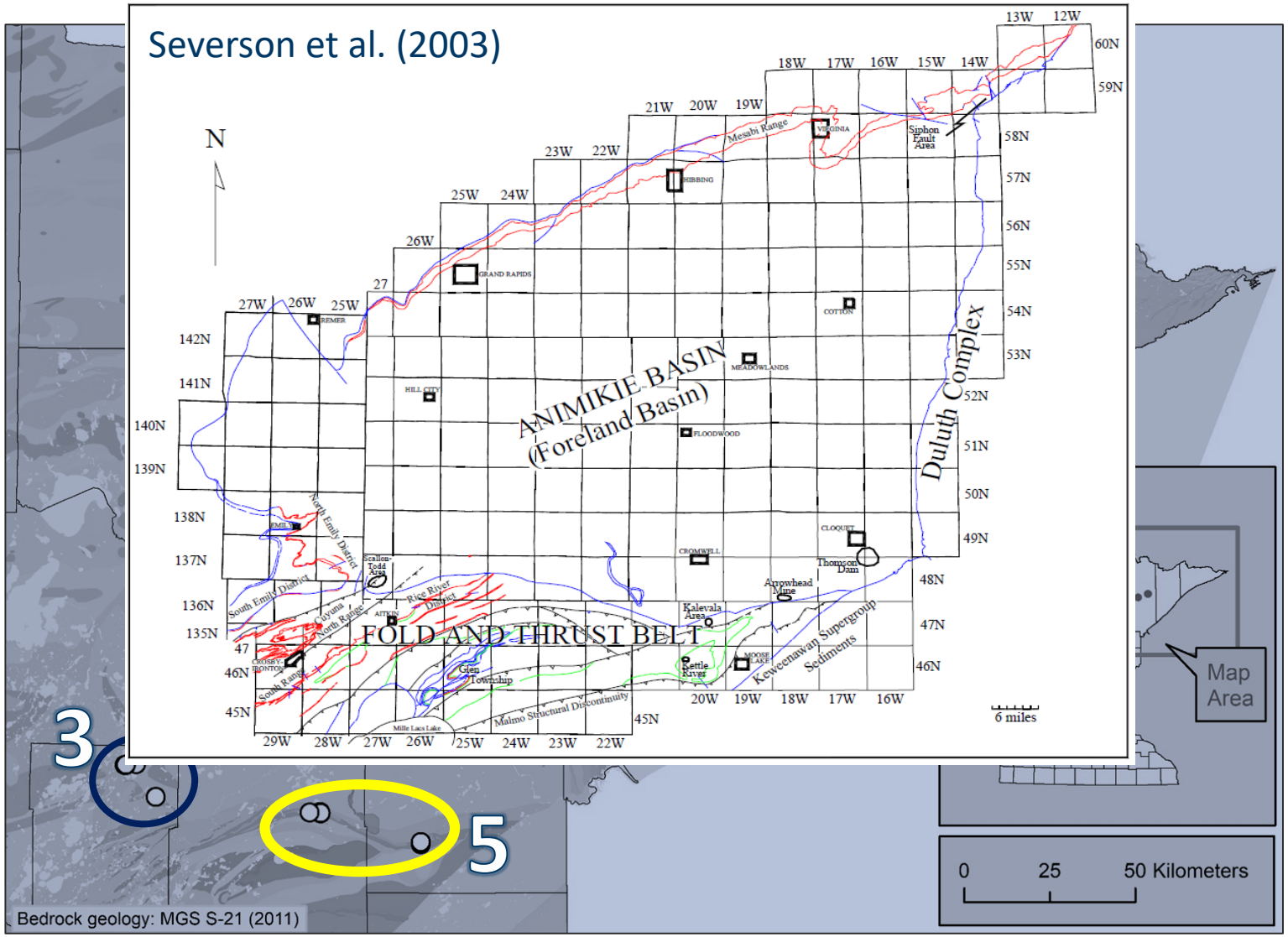
1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. Duluth Complex Vanadium
5. **Animikie &**
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

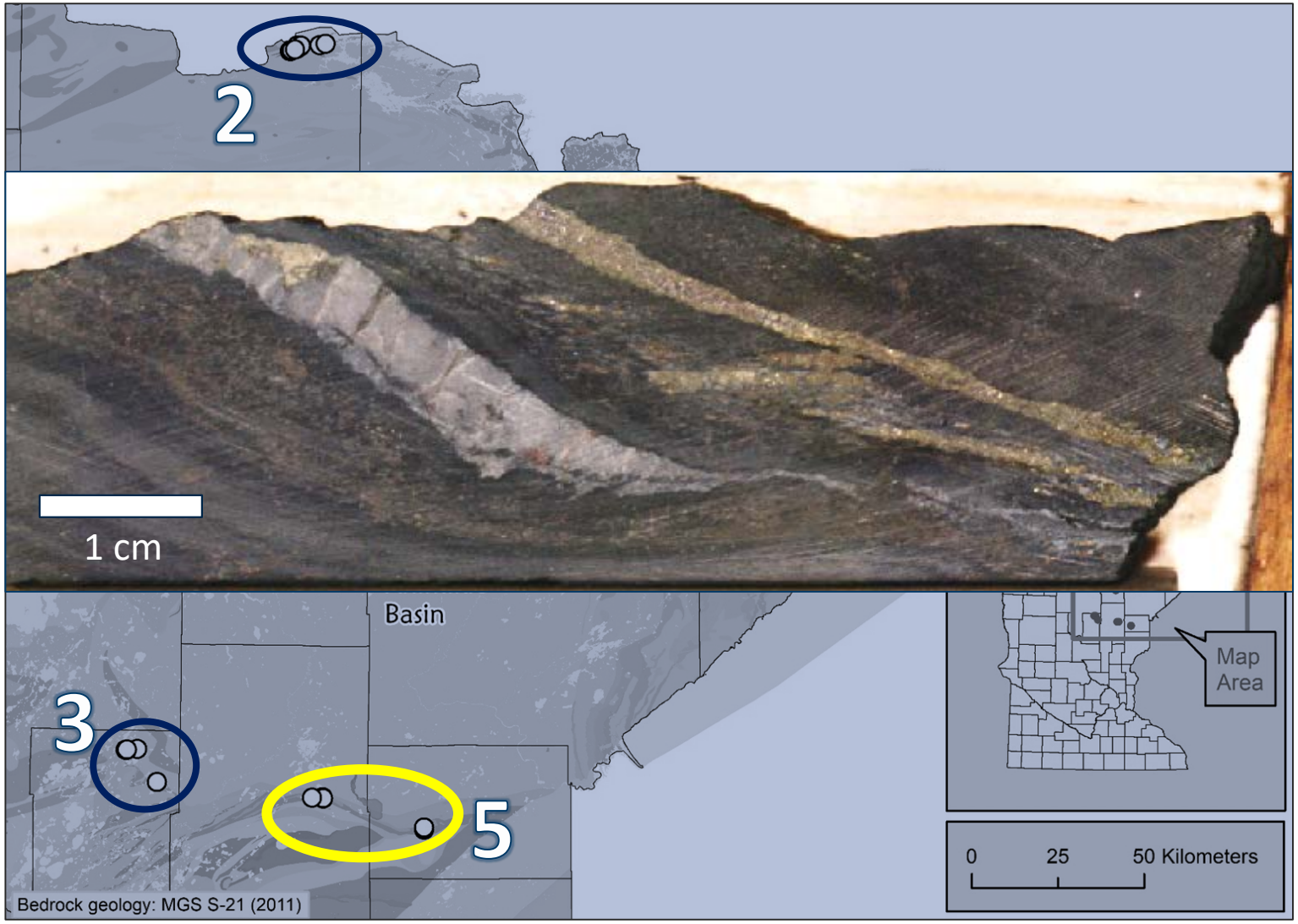
1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. Duluth Complex Vanadium
5. **Animikie &**
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

1. Biwabik Iron Formation
   Mesabi Range
2. International Falls
   Greenstone Gold
3. Cuyuna Manganese
4. Duluth Complex Vanadium
5. **Animikie &**
   Animikie SEDEX



DEPARTMENT OF NATURAL RESOURCES

Focus Areas

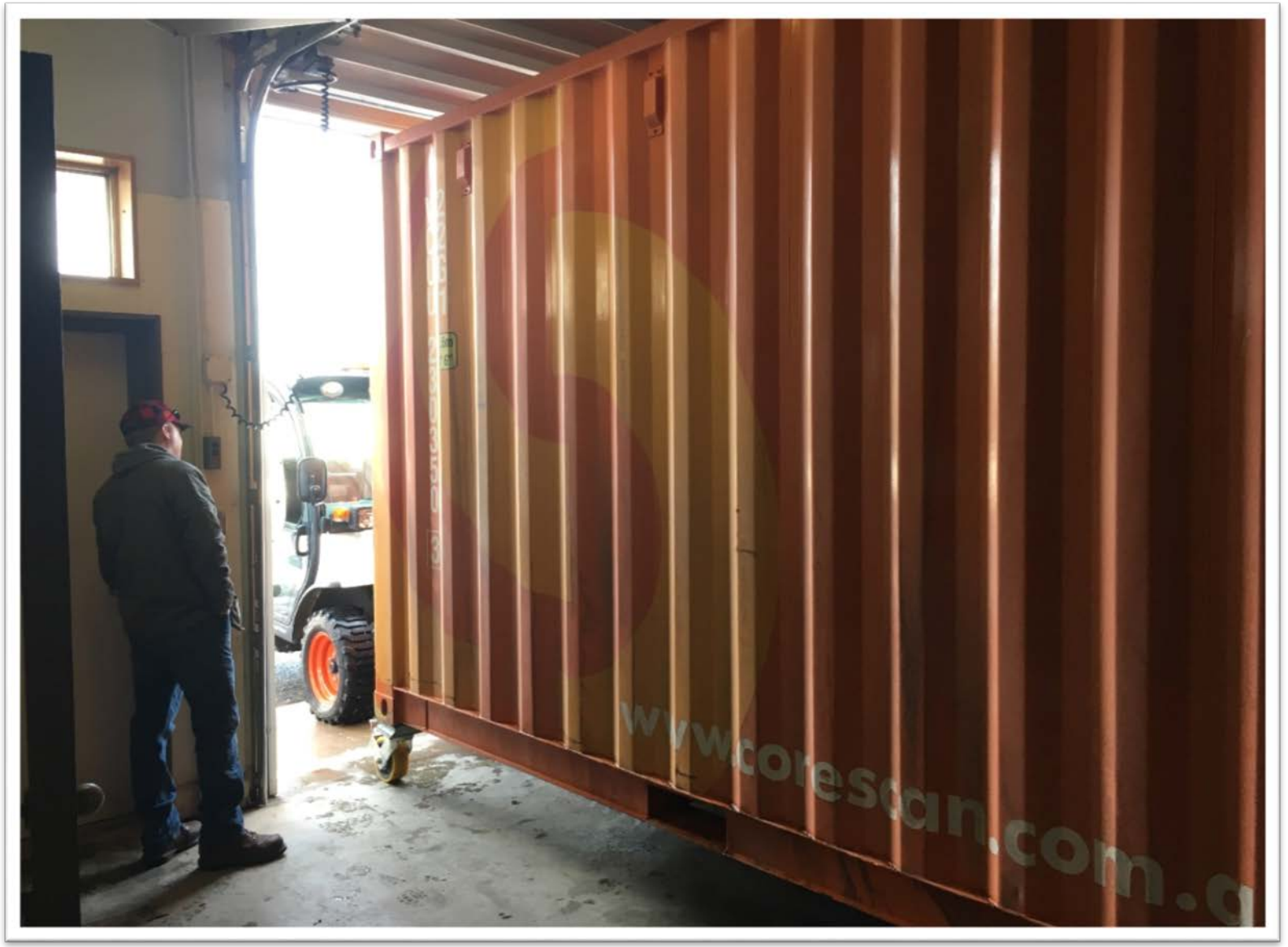
DEPARTMENT OF NATURAL RESOURCES

DNR Corescan Project

DEPARTMENT OF NATURAL RESOURCES

DNR Corescan Project

DEPARTMENT OF NATURAL RESOURCES



DNR Corescan Project

DEPARTMENT OF NATURAL RESOURCES

Focus Area	Target	Number of cores	Total length (meters)
Mesabi Range (Biwabik Iron Formation)	Iron	6	1,495
International Falls Greenstone	Gold	12	2,097
Cuyuna Range	Manganese	5	345
Duluth Complex	Vanadium	3	640
Animikie Basin	SEDEX	6	413

DNR Corescan Project Results

DEPARTMENT OF NATURAL RESOURCES

DNR Corescan Project Results

DEPARTMENT OF NATURAL RESOURCES

- Mineral Exploration
- Mineral Development
- Active Curation

DNR Corescan Project Results

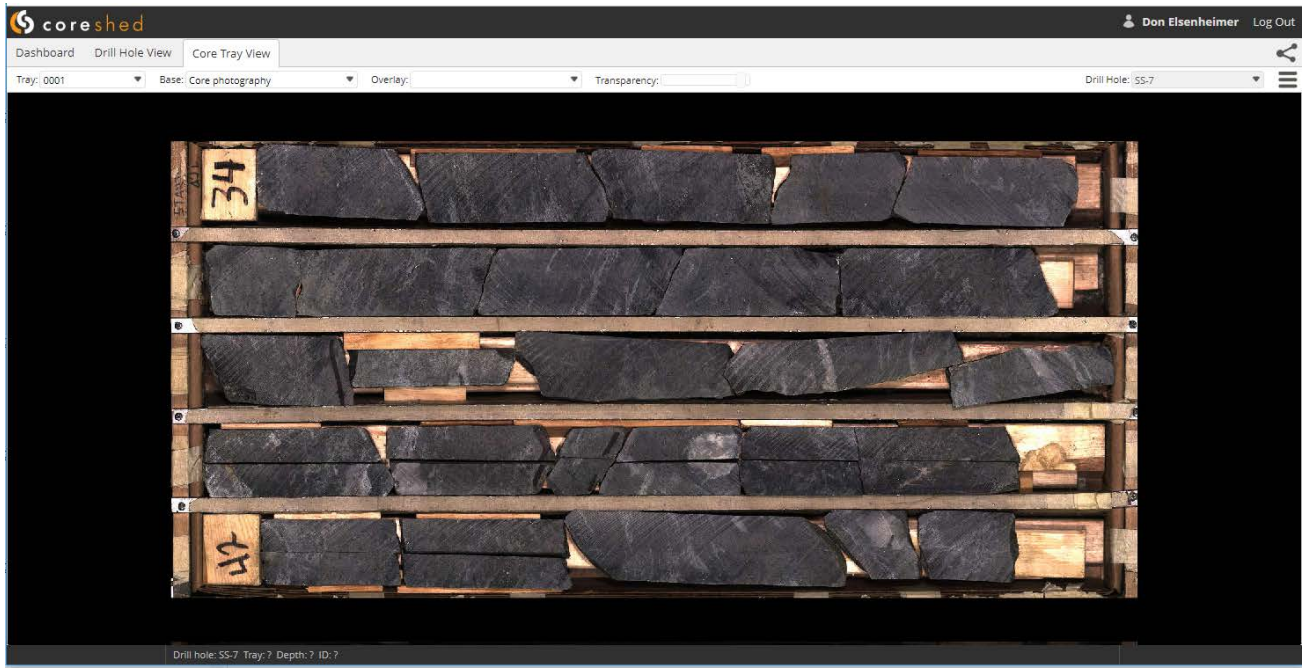
DEPARTMENT OF NATURAL RESOURCES

- Catalog and Care
- Public Access
- Focused Research

Active Curation

DEPARTMENT OF NATURAL RESOURCES

- Catalog and Care
- Public Access
- Focused Research



Cloud-based Catalog

DEPARTMENT OF NATURAL RESOURCES

- Catalog and Care
- Public Access
- Focused Research

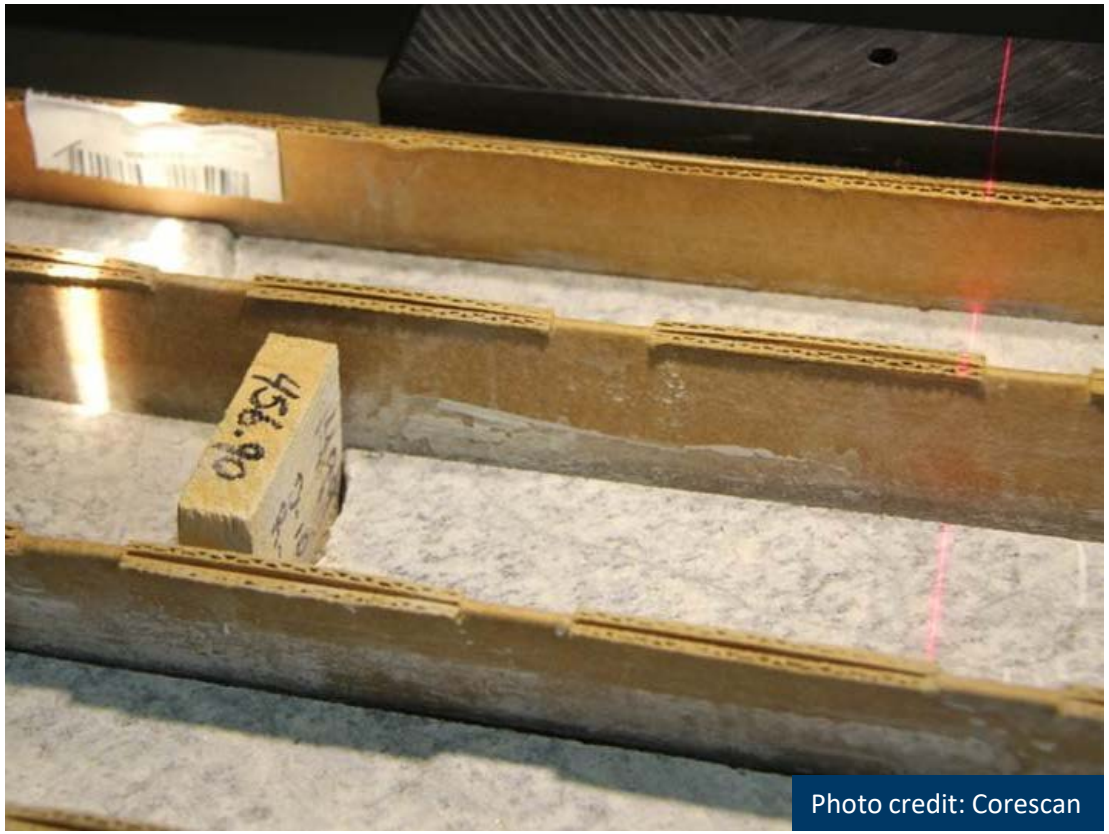
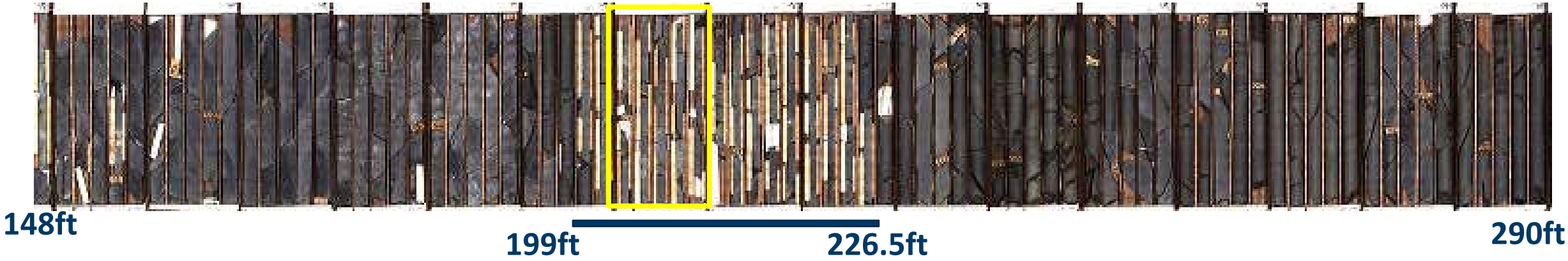


Photo credit: Corescan

Non-destructive Care

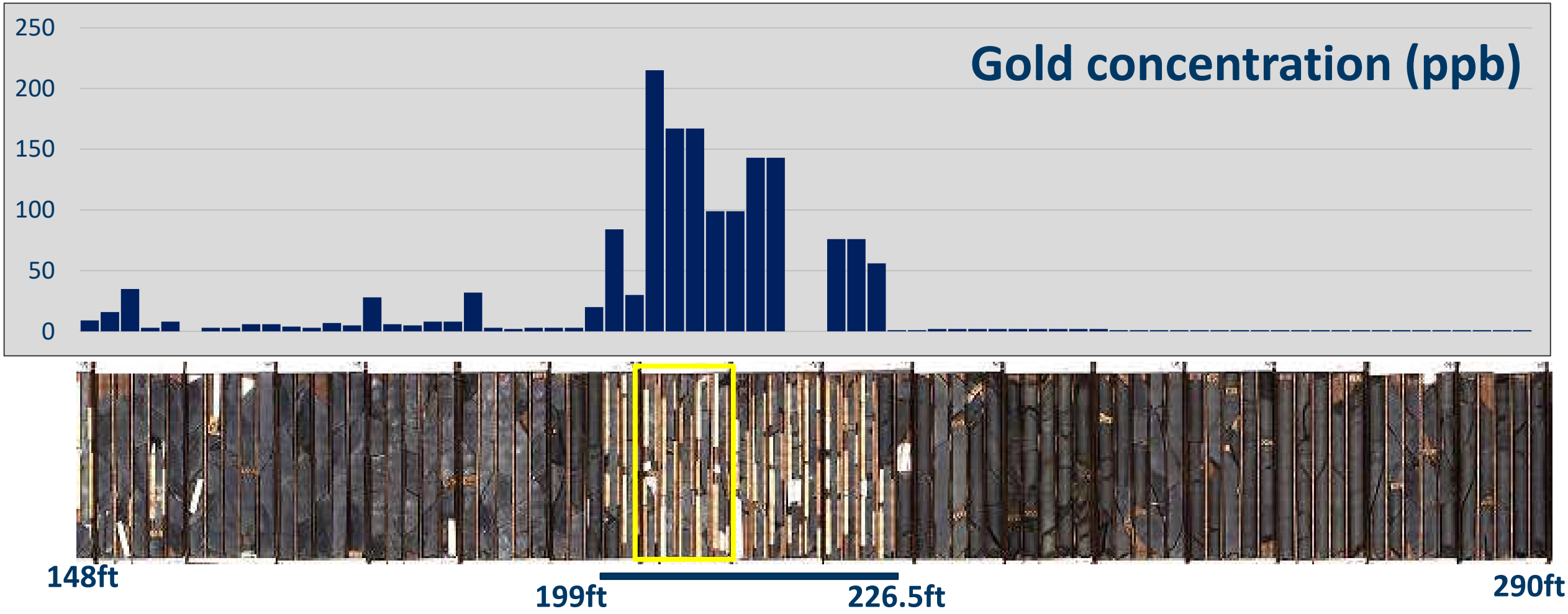
DEPARTMENT OF NATURAL RESOURCES

Non-destructive Care



DEPARTMENT OF NATURAL RESOURCES

Non-destructive Care



DEPARTMENT OF NATURAL RESOURCES

Non-destructive Care

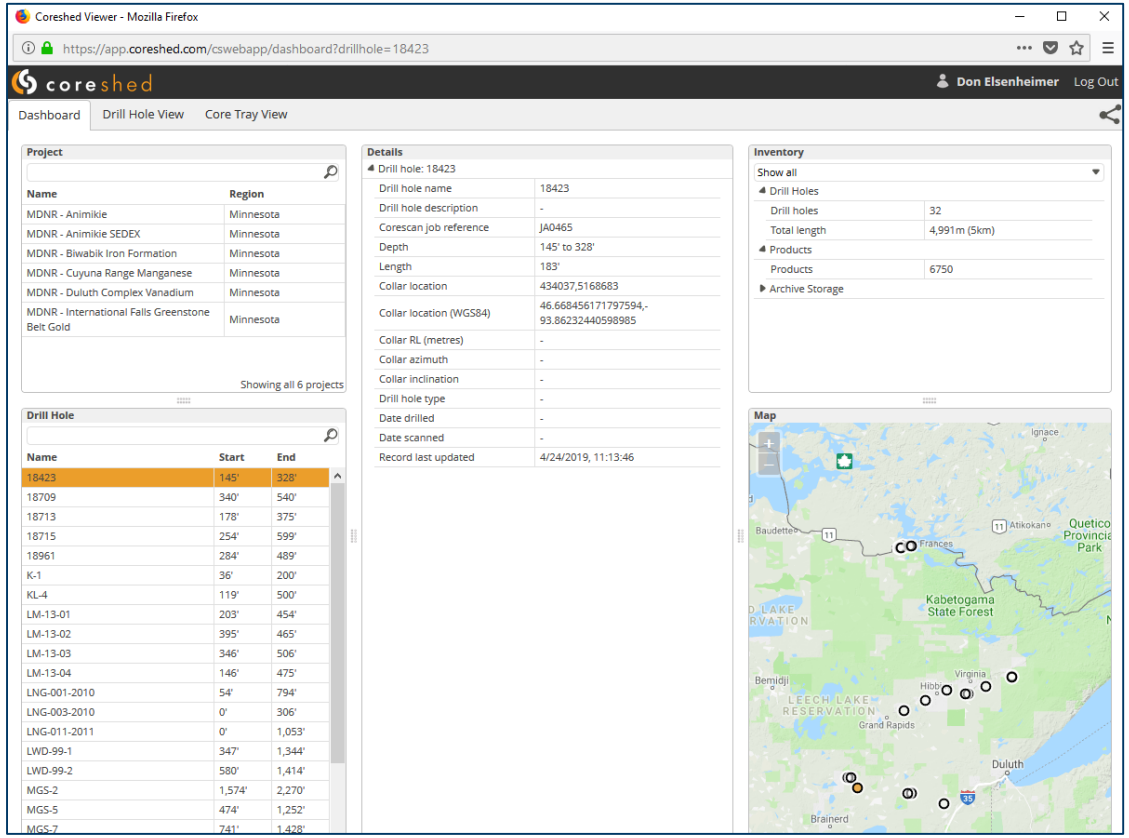
DEPARTMENT OF NATURAL RESOURCES

- Catalog and Care
- Public Access
- Focused Research

Active Curation

DEPARTMENT OF NATURAL RESOURCES

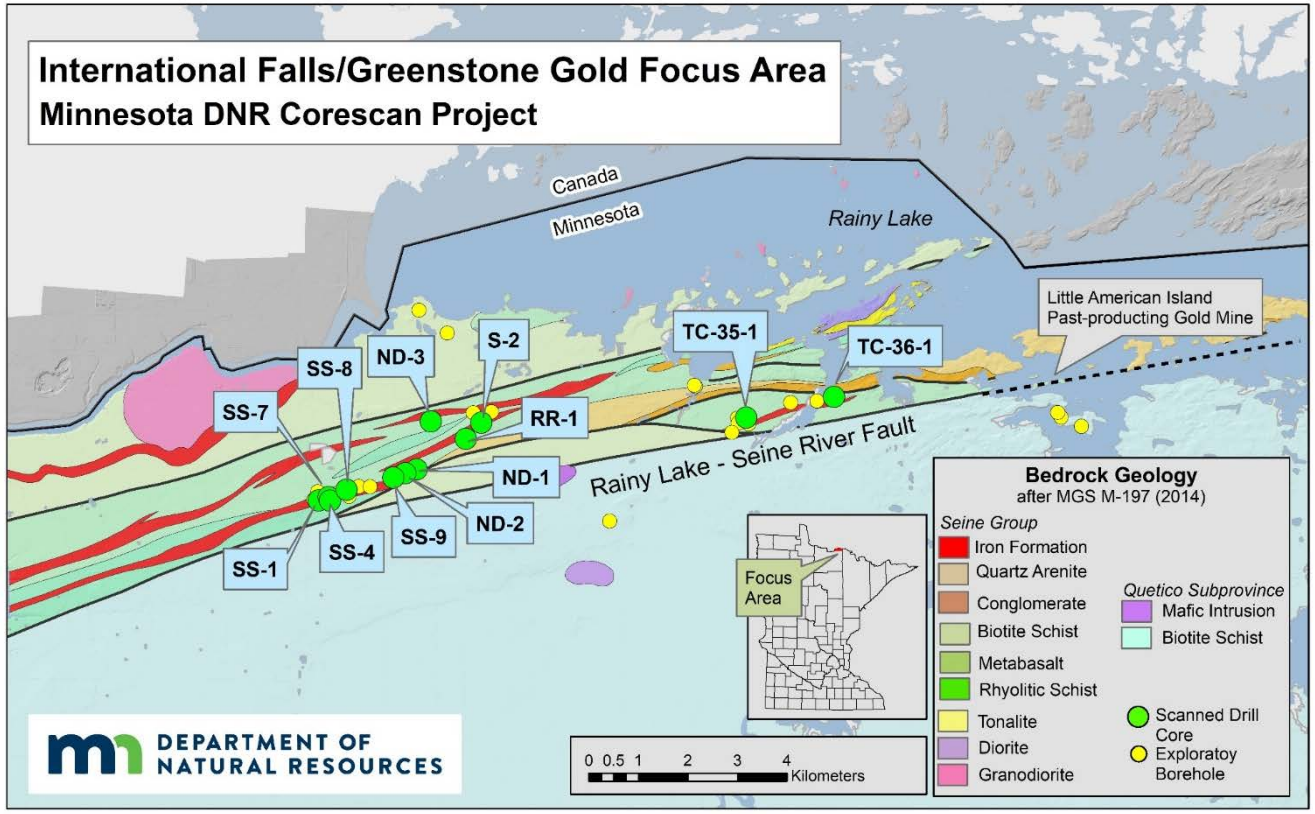
- Catalog and Care
- Public Access
- Focused Research



Active Curation

DEPARTMENT OF NATURAL RESOURCES

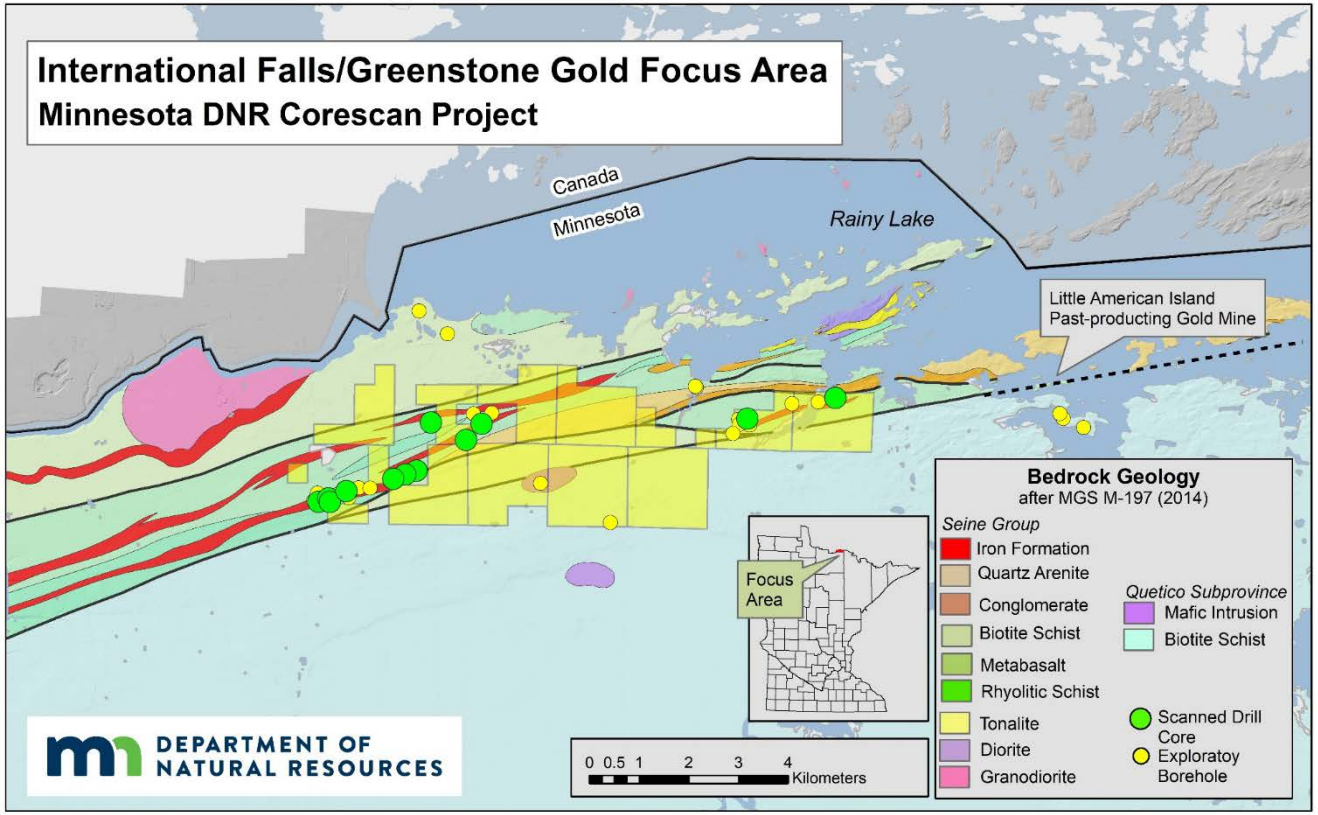
- Catalog and Care
- Public Access
- Focused Research



Active Curation

DEPARTMENT OF NATURAL RESOURCES

- Catalog and Care
- Public Access
- Focused Research

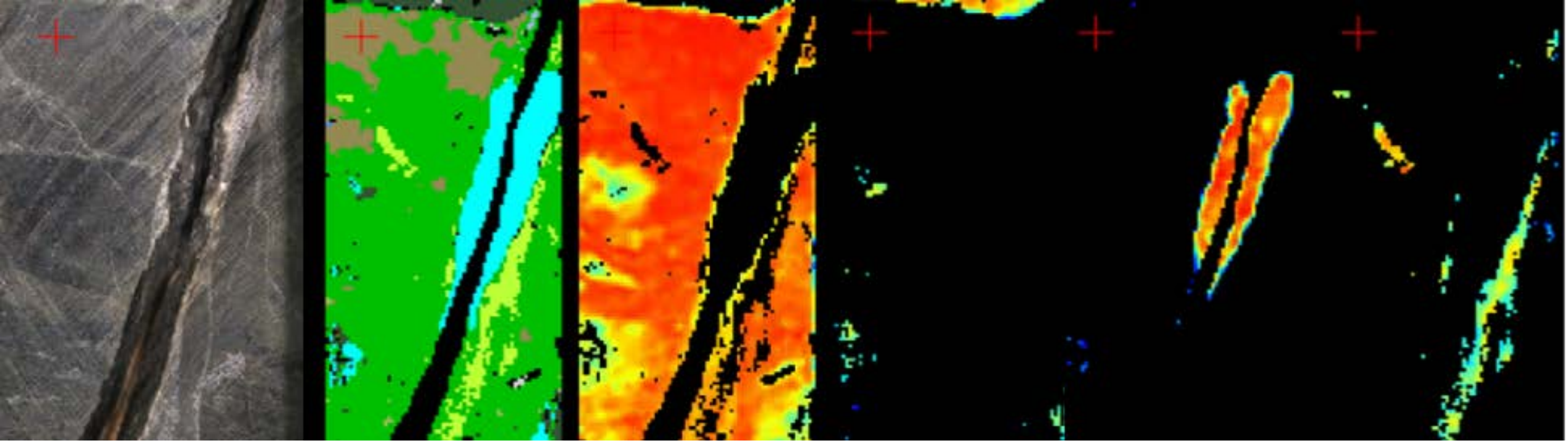


Active Curation

Minnesota DNR Corescan Project Seminar

1. Project Overview
2. Mobile, Automated Hyperspectral Core Logging
3. Hyperspectral Core Imaging for Institutional Core Repositories
4. **Procedure and Deliverables**
5. Results from Five Focus Areas
6. Data Visualization and Interpretation Using the Coreshed Virtual Core Library

DEPARTMENT OF NATURAL RESOURCES



For More Information

mndnr.gov/corescan

DEPARTMENT OF NATURAL RESOURCES