

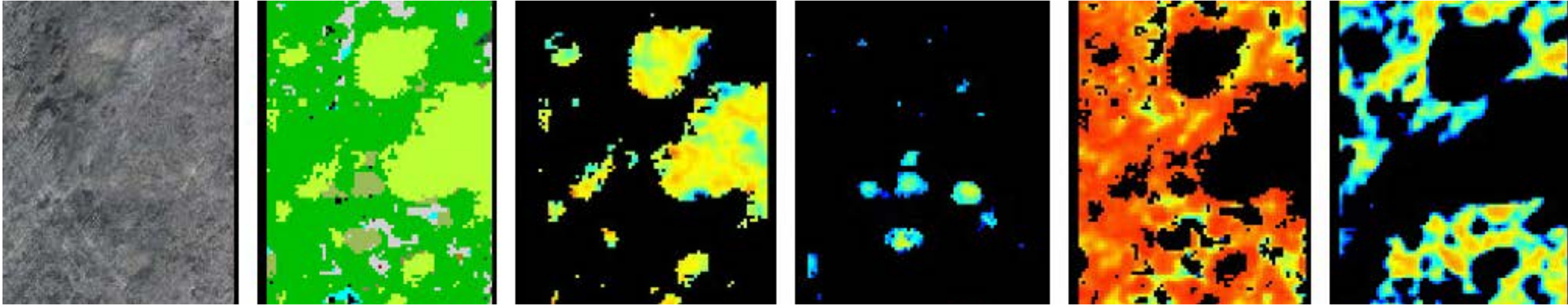
Minnesota DNR Corescan Project

mndnr.gov/corescan

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





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



Source: Google Earth



DNR Corescan Project

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

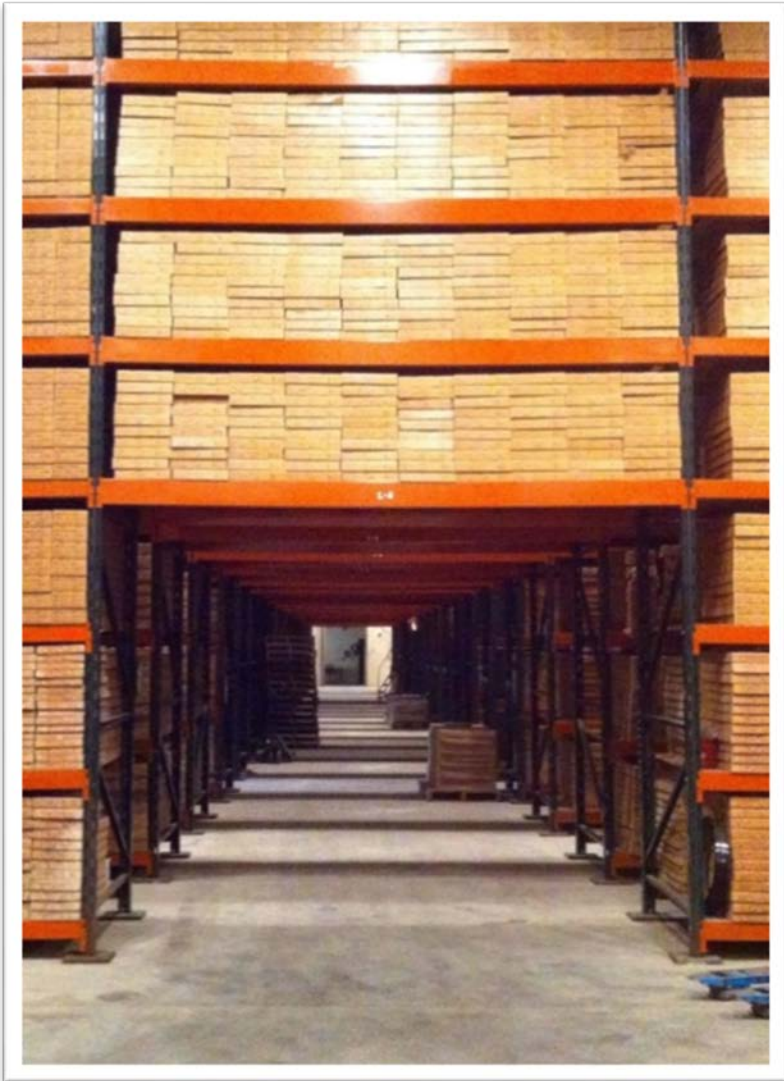


Source: Google Earth

DNR Corescan Project

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





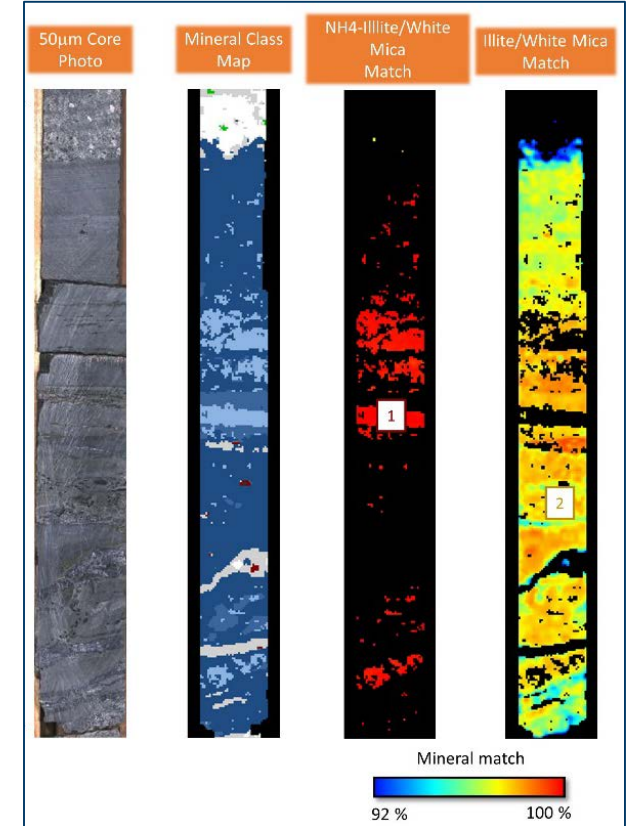
Core Selection



Core Selection



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



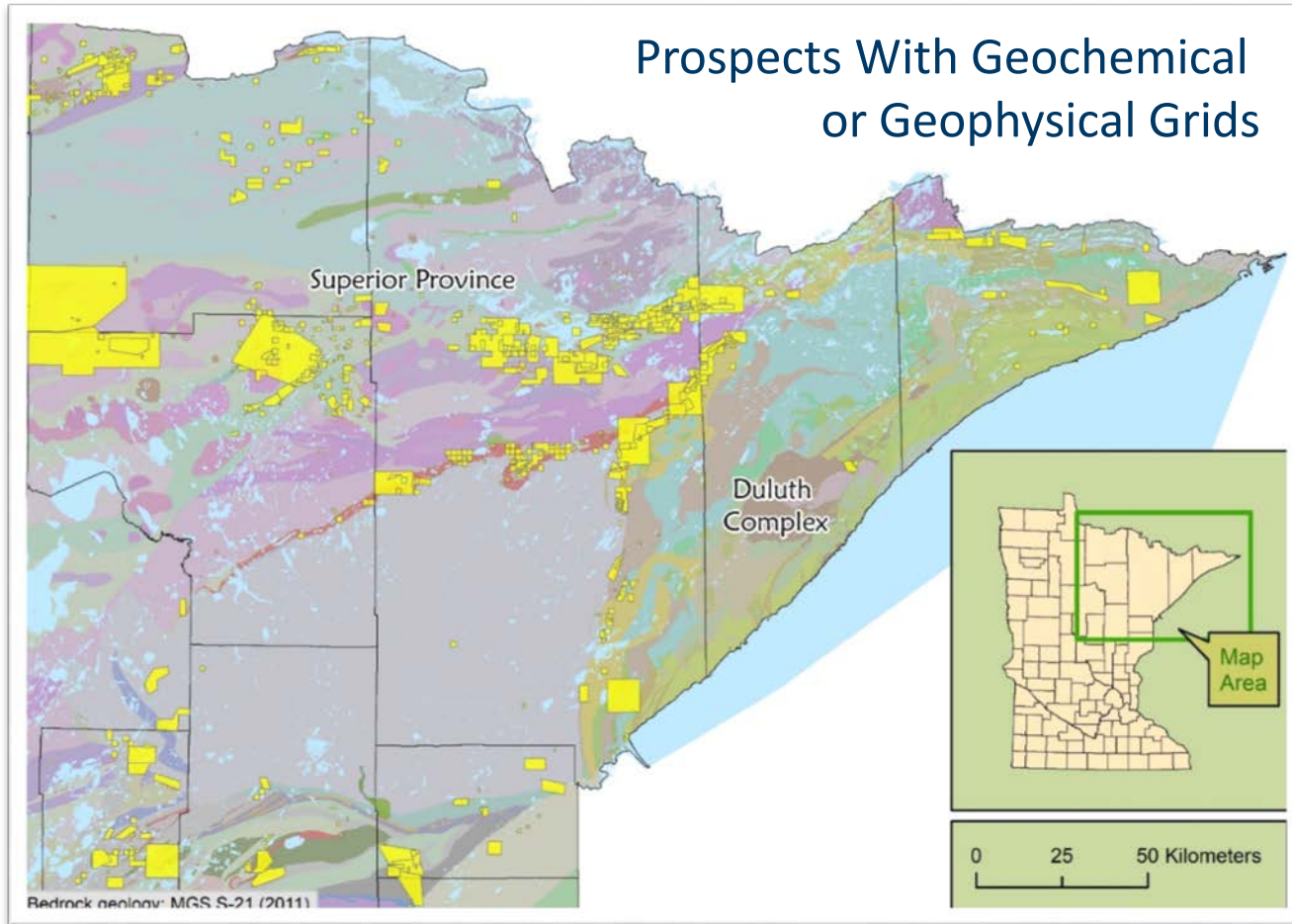


Core Selection Strategies



- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies



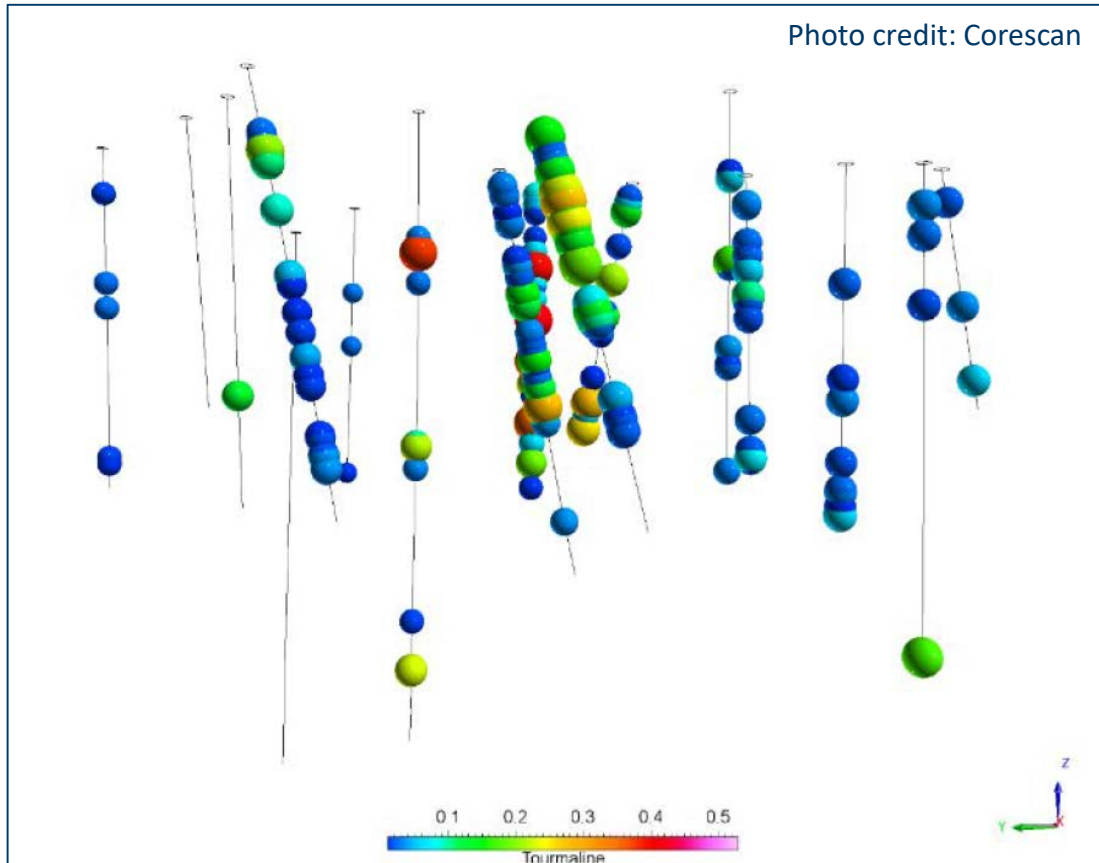
- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies



- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies

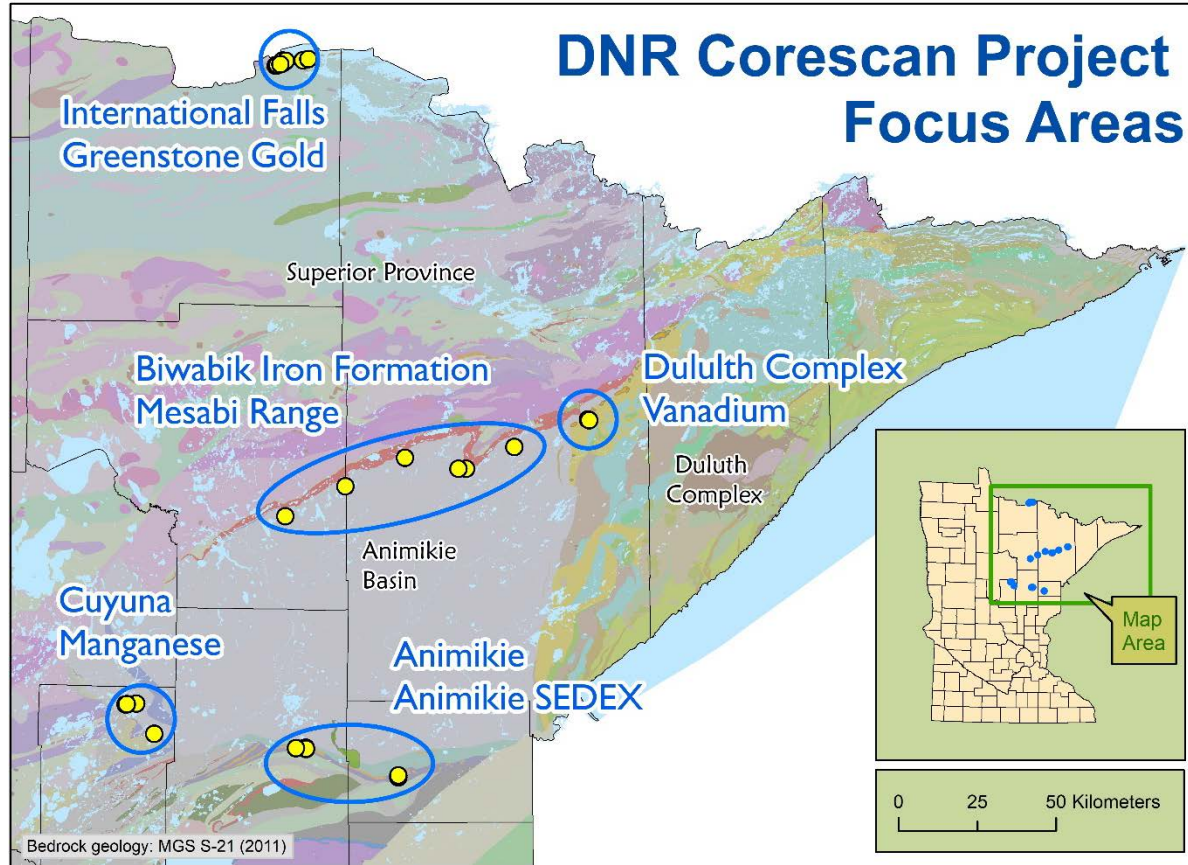


- 31 flavors
- 31 scoops
- Neapolitan

Core Selection Strategies



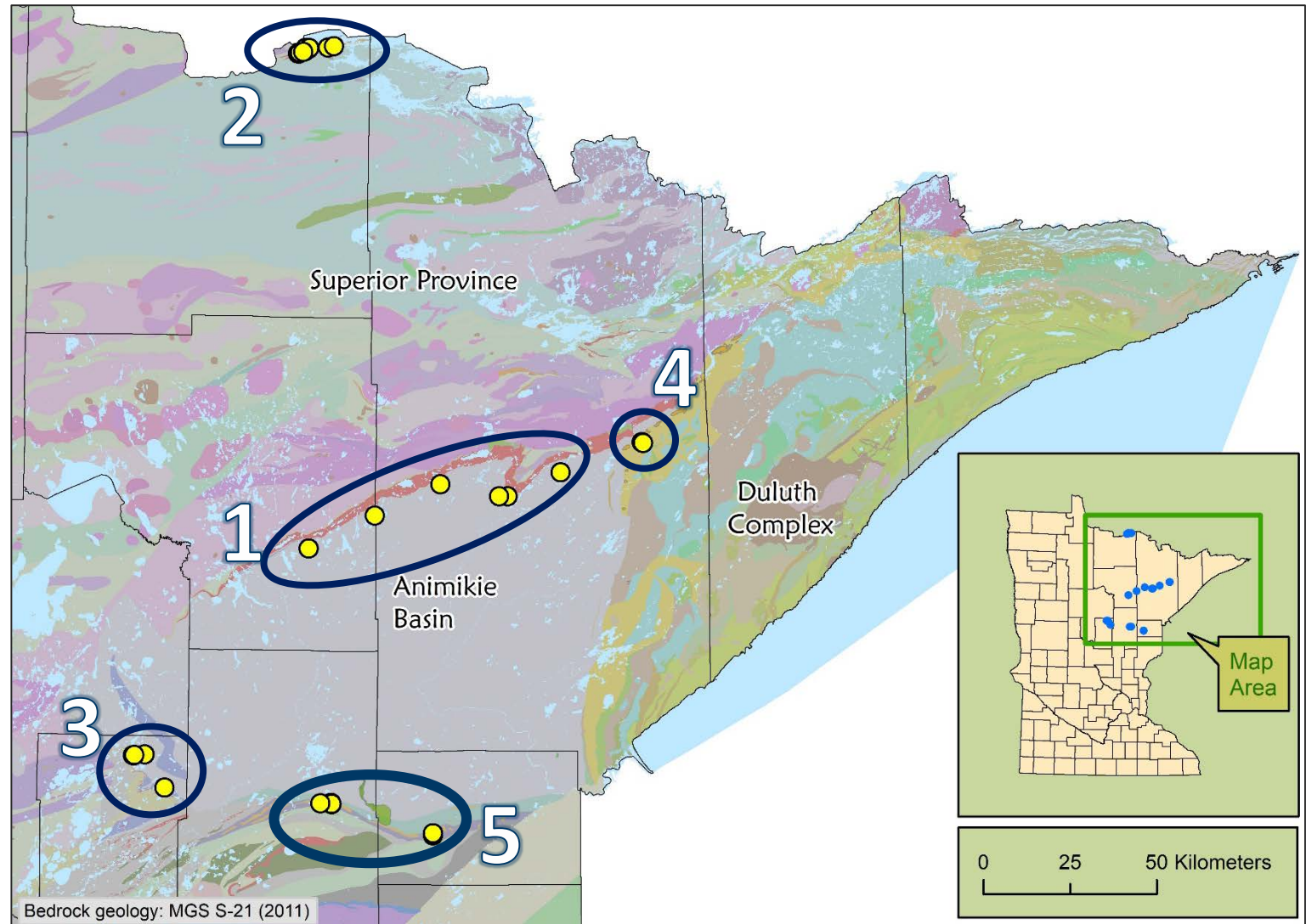
- 31 flavors
- 31 scoops
- Neapolitan



- 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



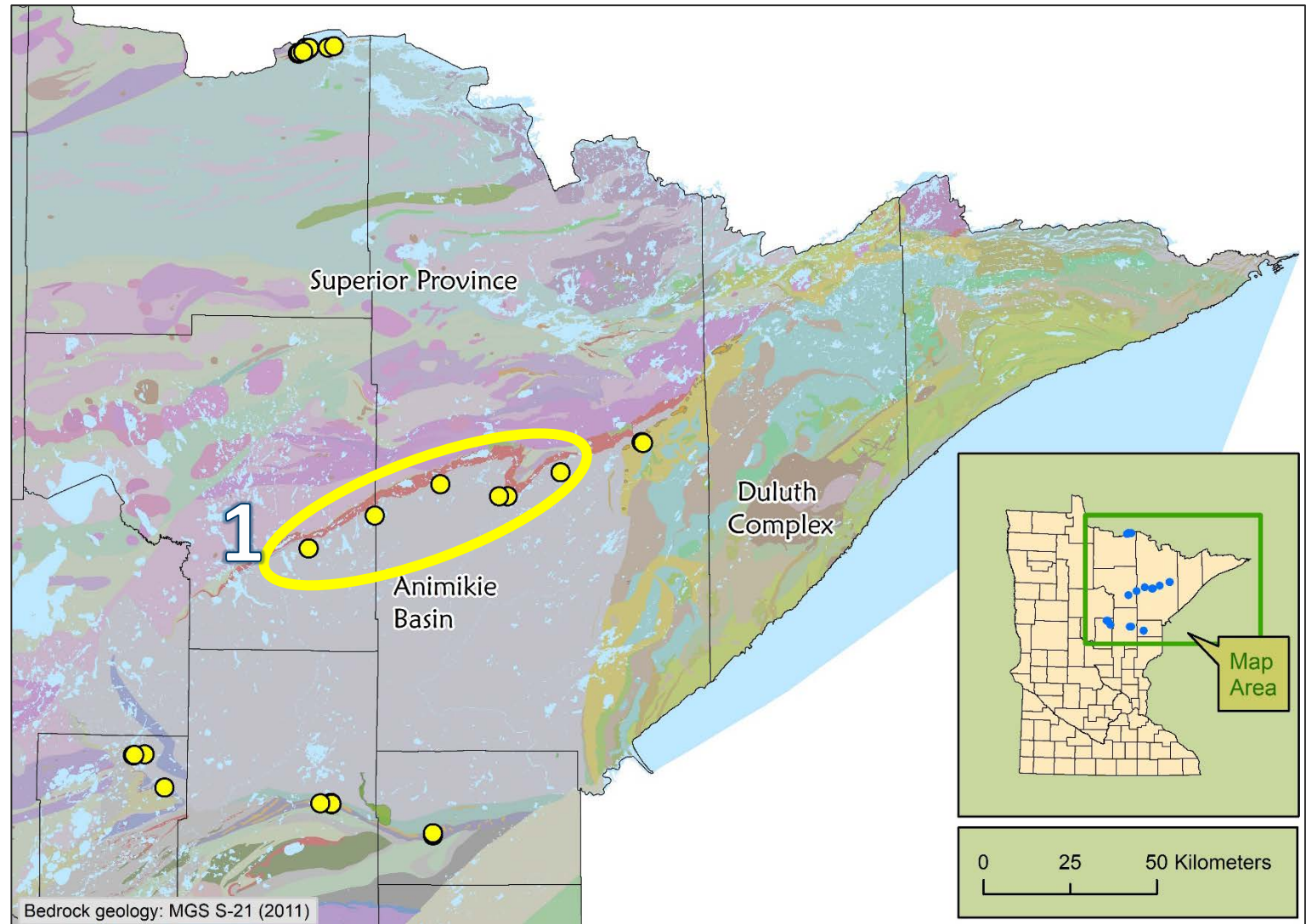
1. Biwabik Iron Formation Mesabi Range

2. International Falls
Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie &
Animikie SEDEX



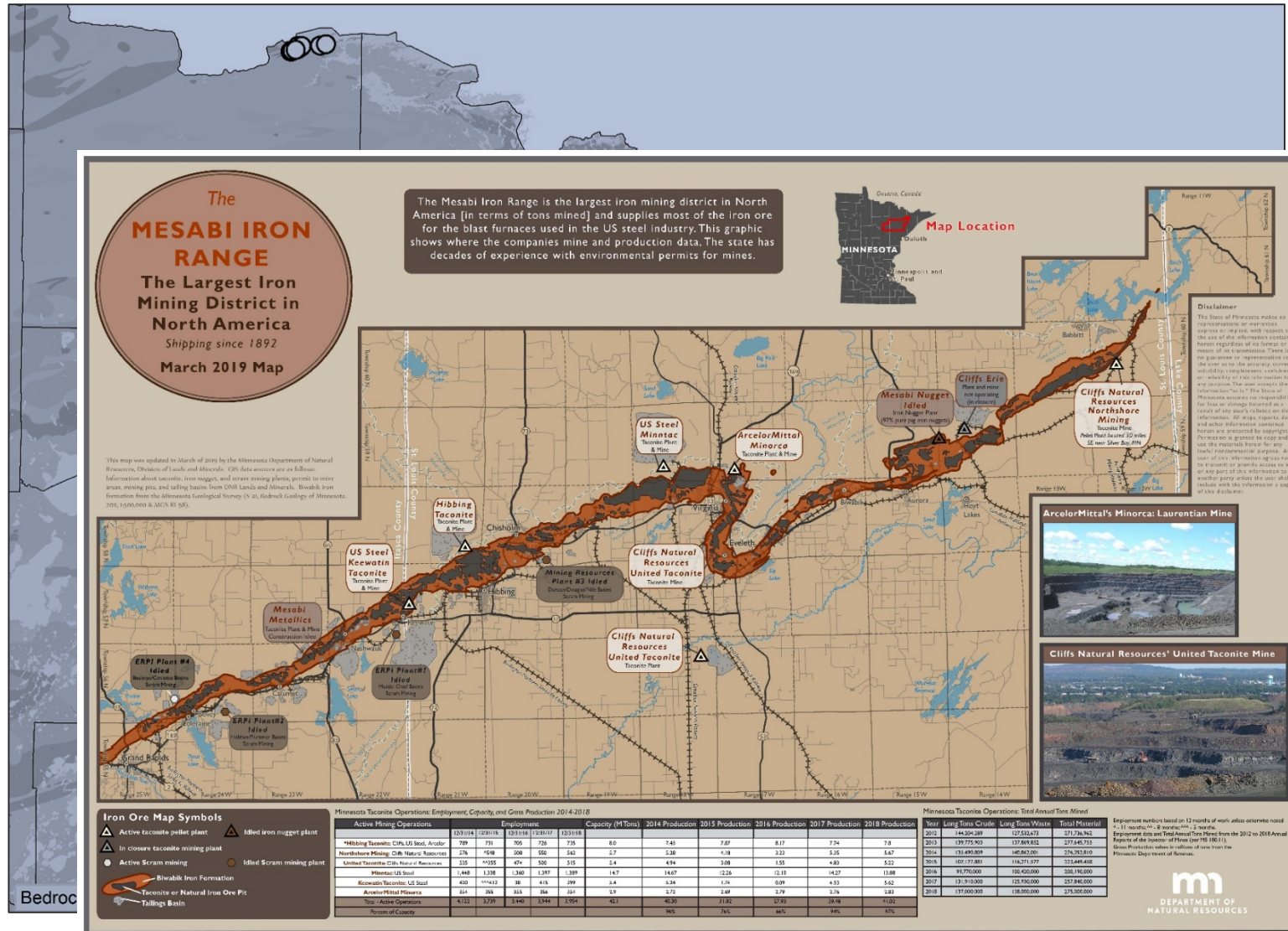
1. Biwabik Iron Formation Mesabi Range

2. International Falls Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie & Animikie SEDEX



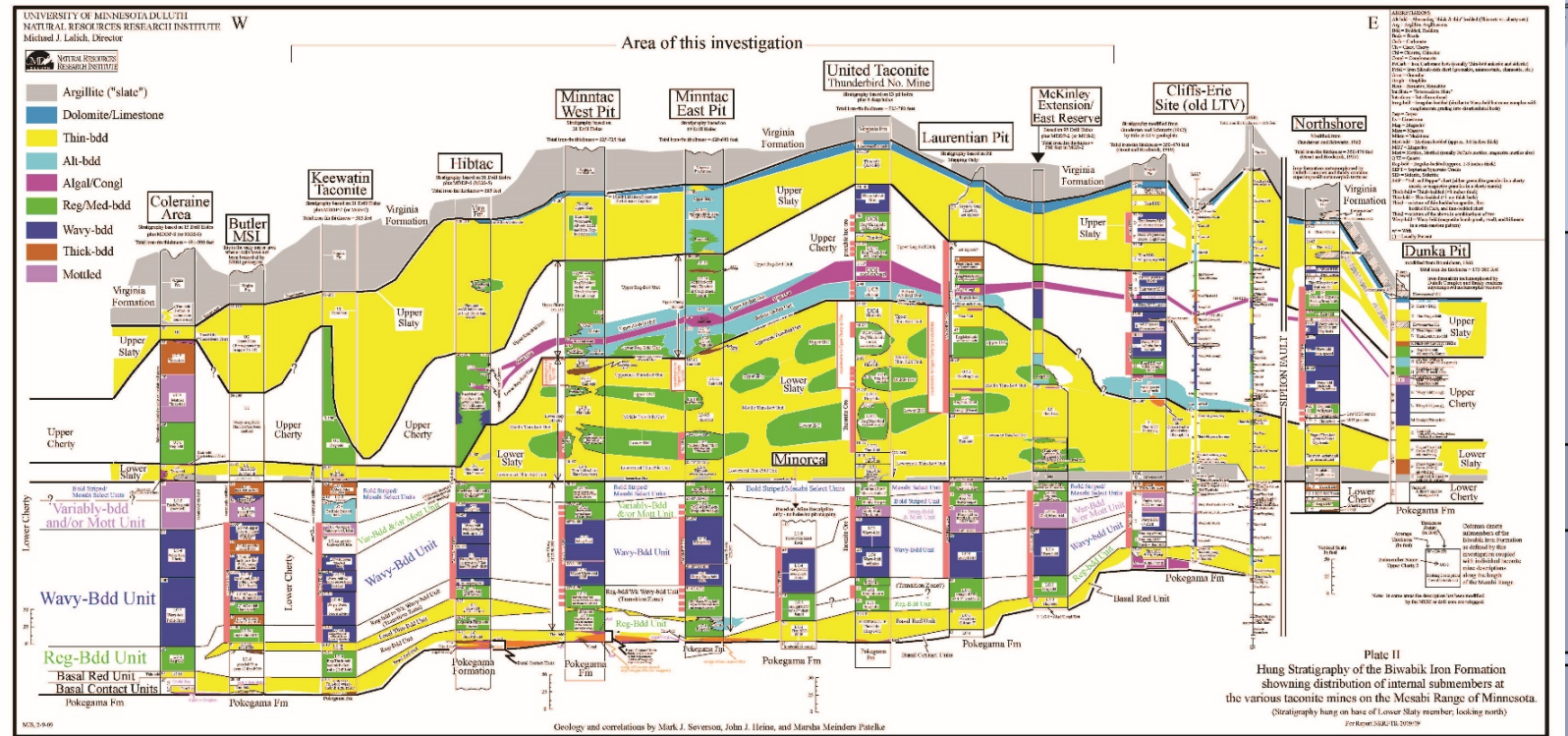
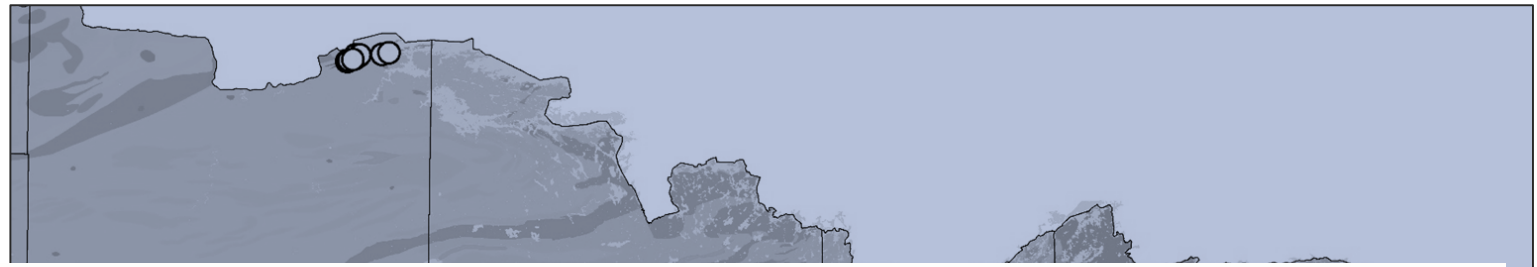
1. Biwabik Iron Formation Mesabi Range

2. International Falls Greenstone Gold

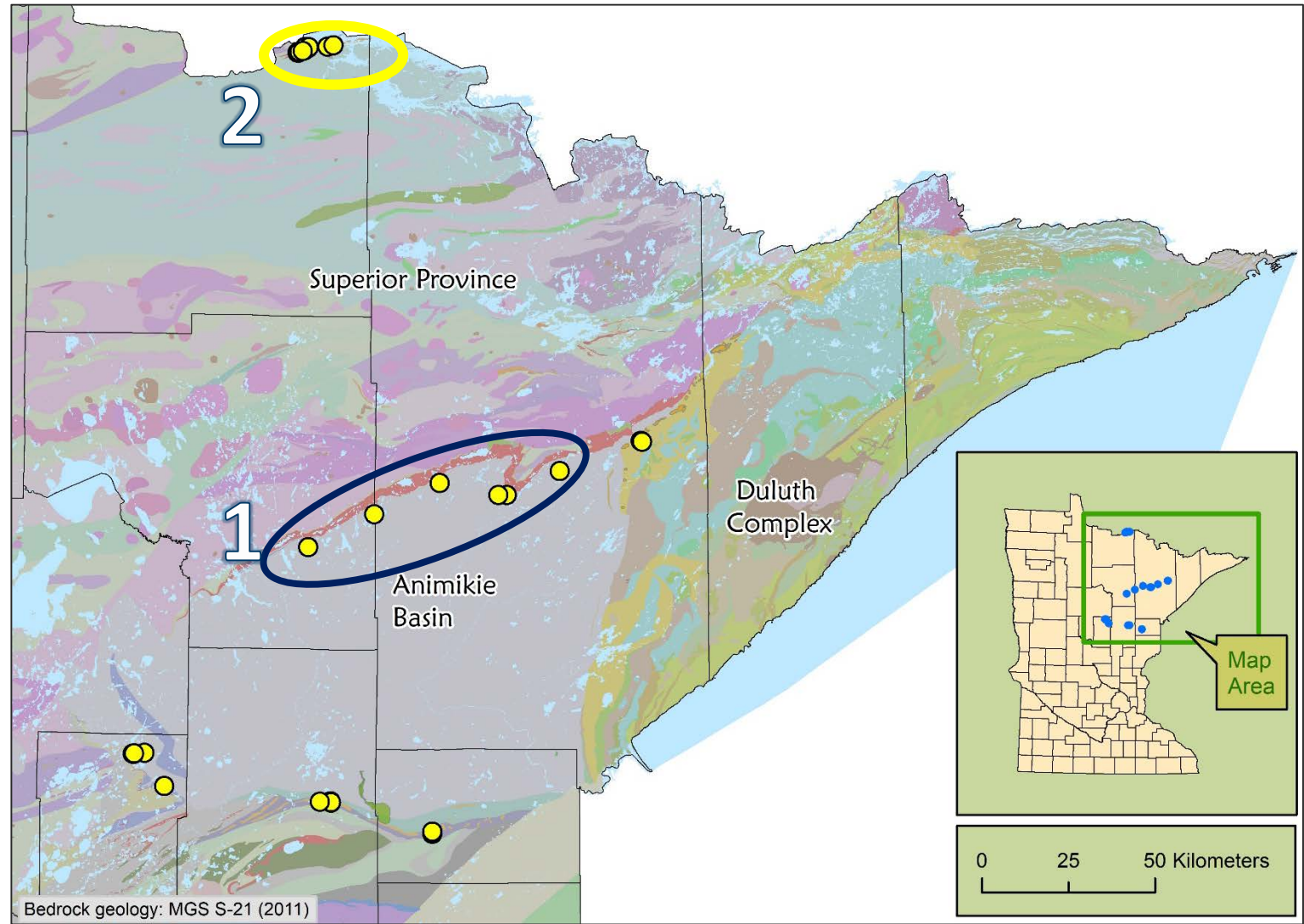
3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie & Animikie SEDEX



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



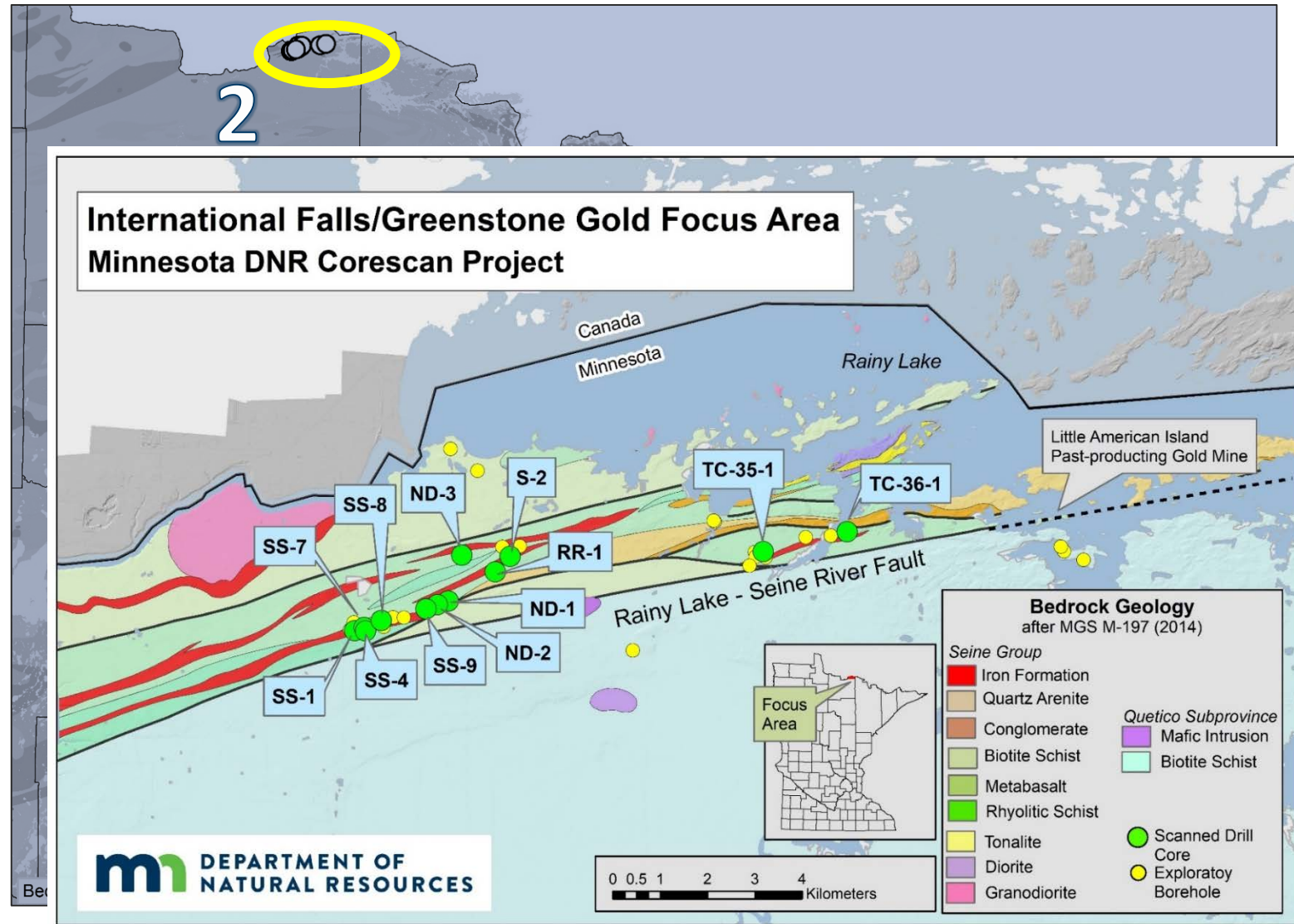
1. Biwabik Iron Formation
Mesabi Range

2. International Falls
Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie &
Animikie SEDEX



Focus Areas

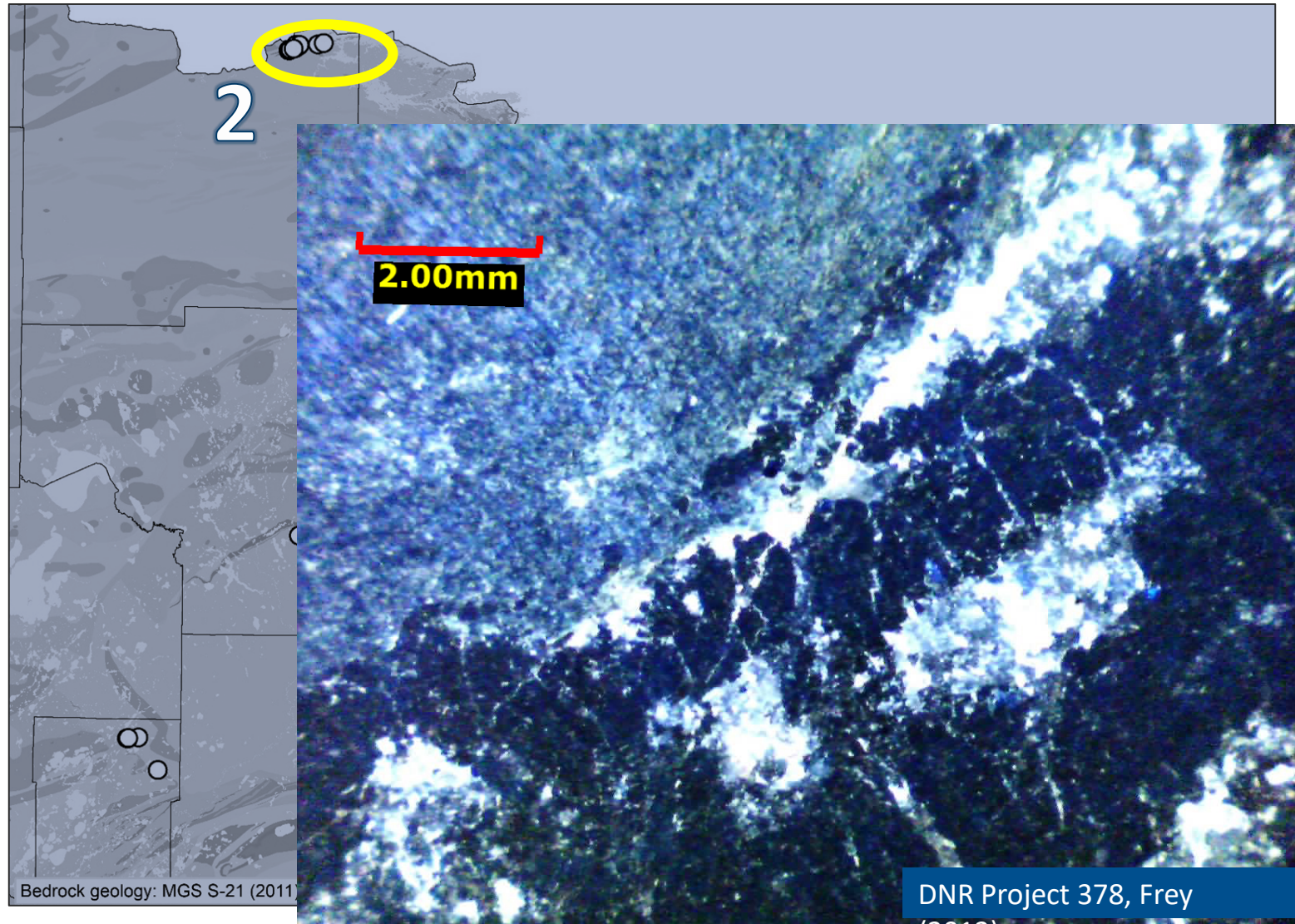
1. Biwabik Iron Formation
Mesabi Range

**2. International Falls
Greenstone Gold**

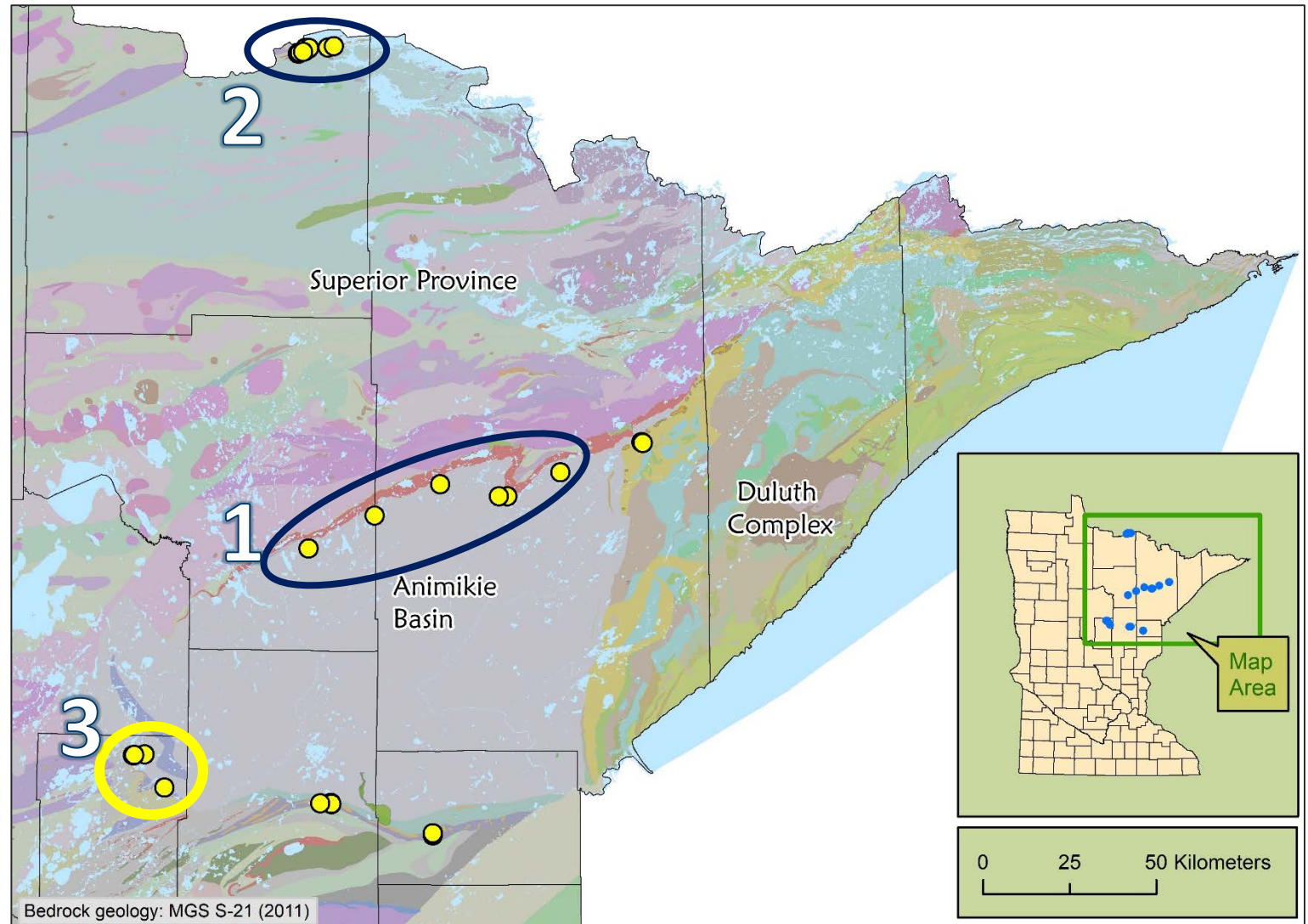
3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie &
Animikie SEDEX



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



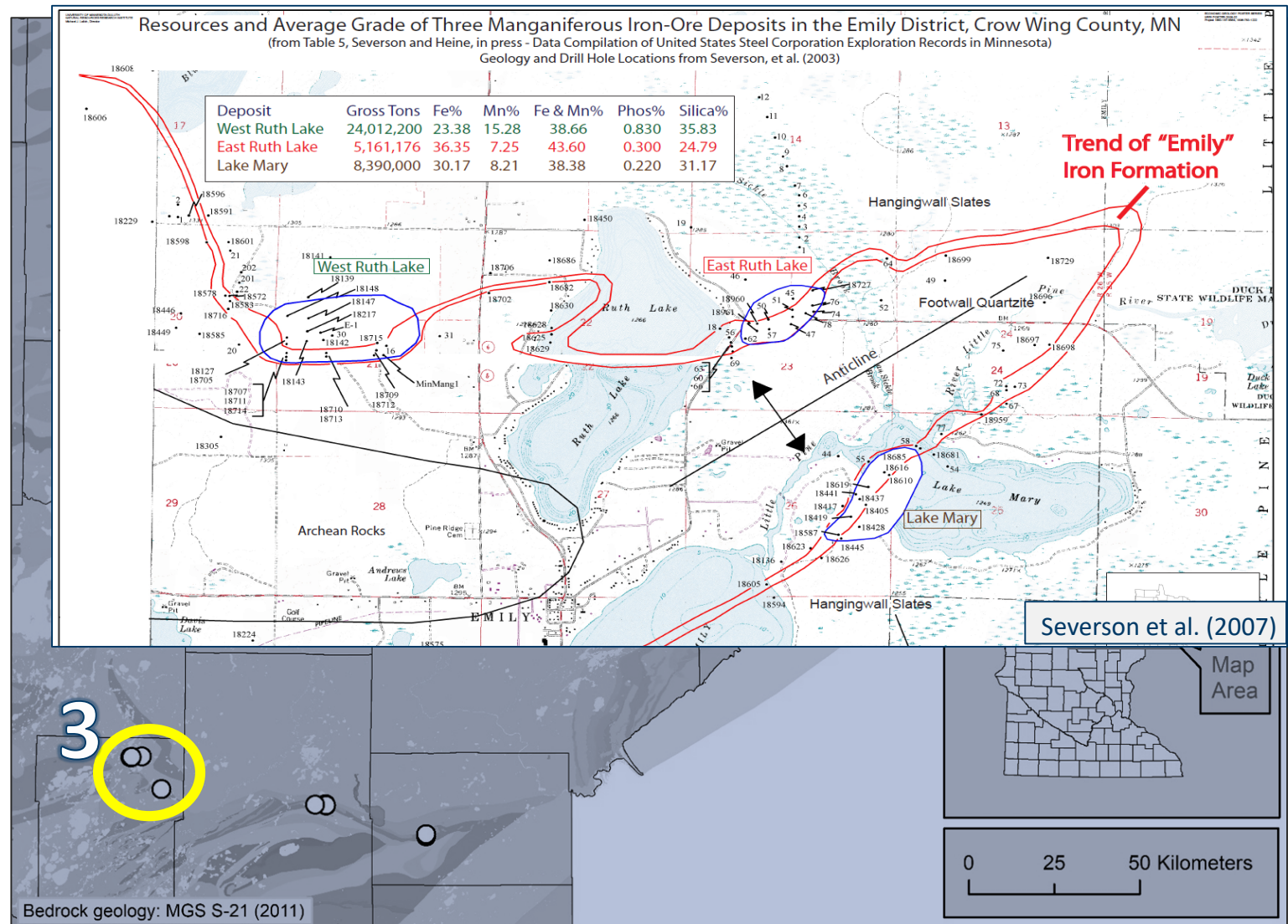
1. Biwabik Iron Formation Mesabi Range

2. International Falls Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie & Animikie SEDEX



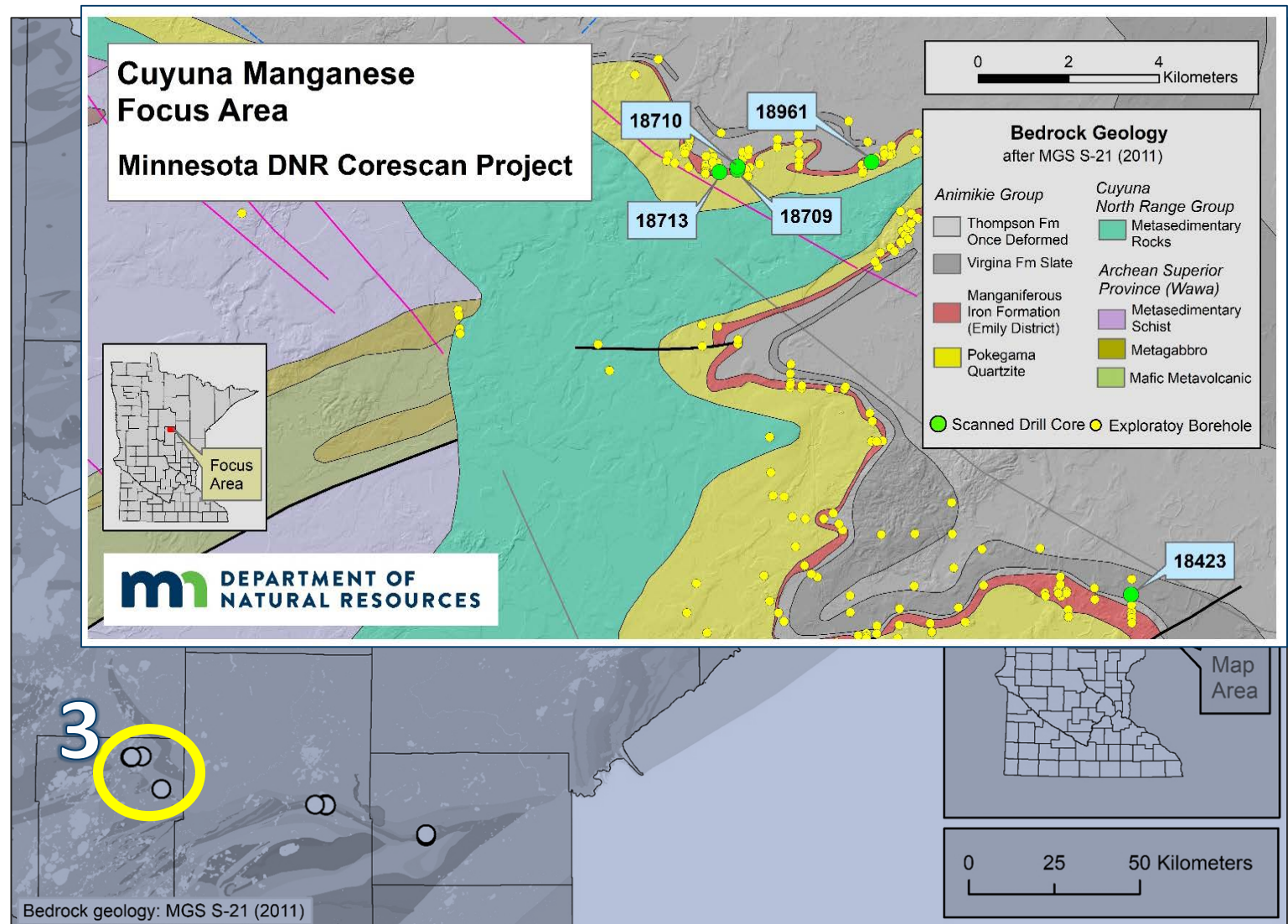
1. Biwabik Iron Formation
Mesabi Range

2. International Falls
Greenstone Gold

3. Cuyuna Manganese

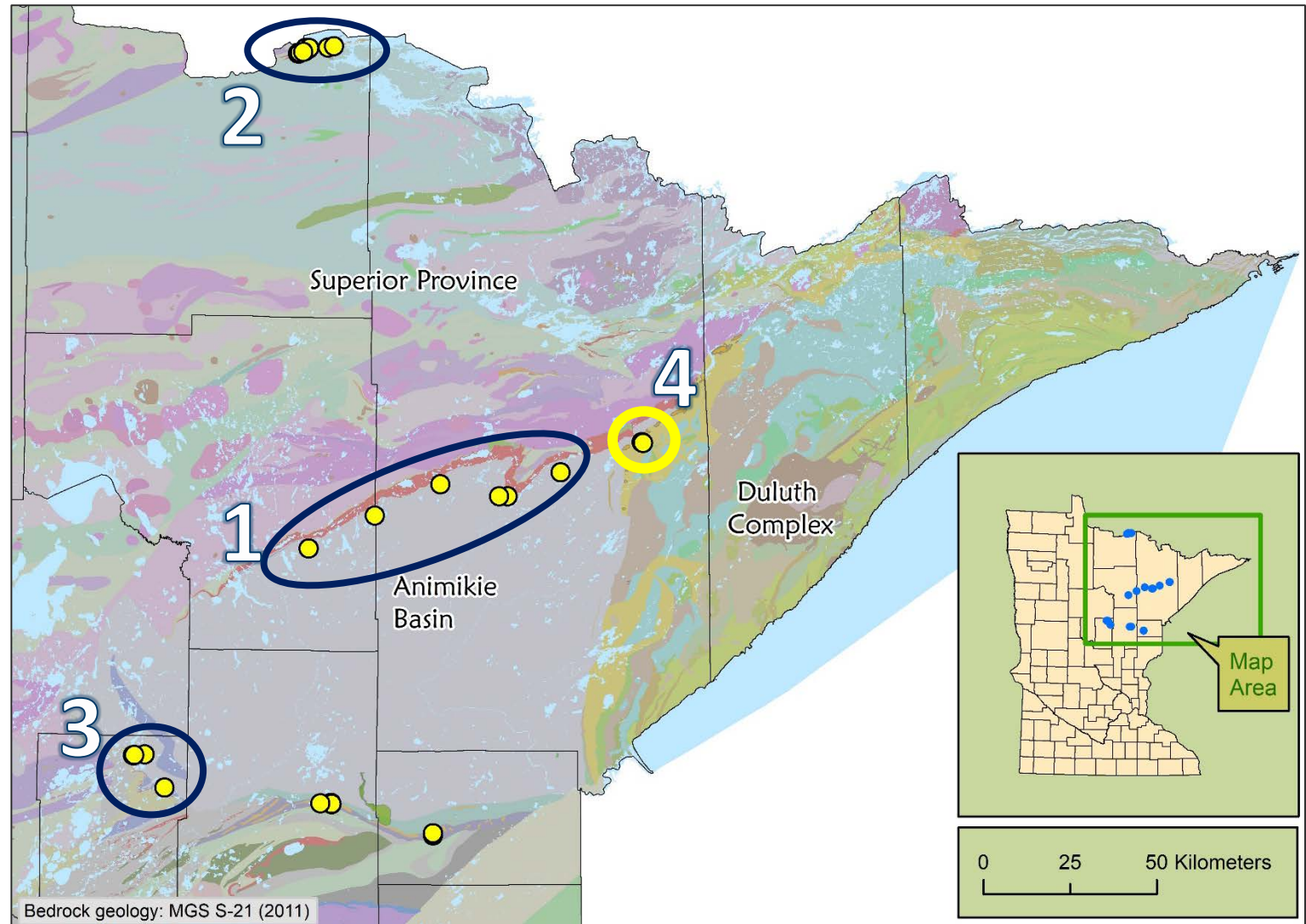
4. Duluth Complex Vanadium

5. Animikie &
Animikie SEDEX



Focus Areas

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



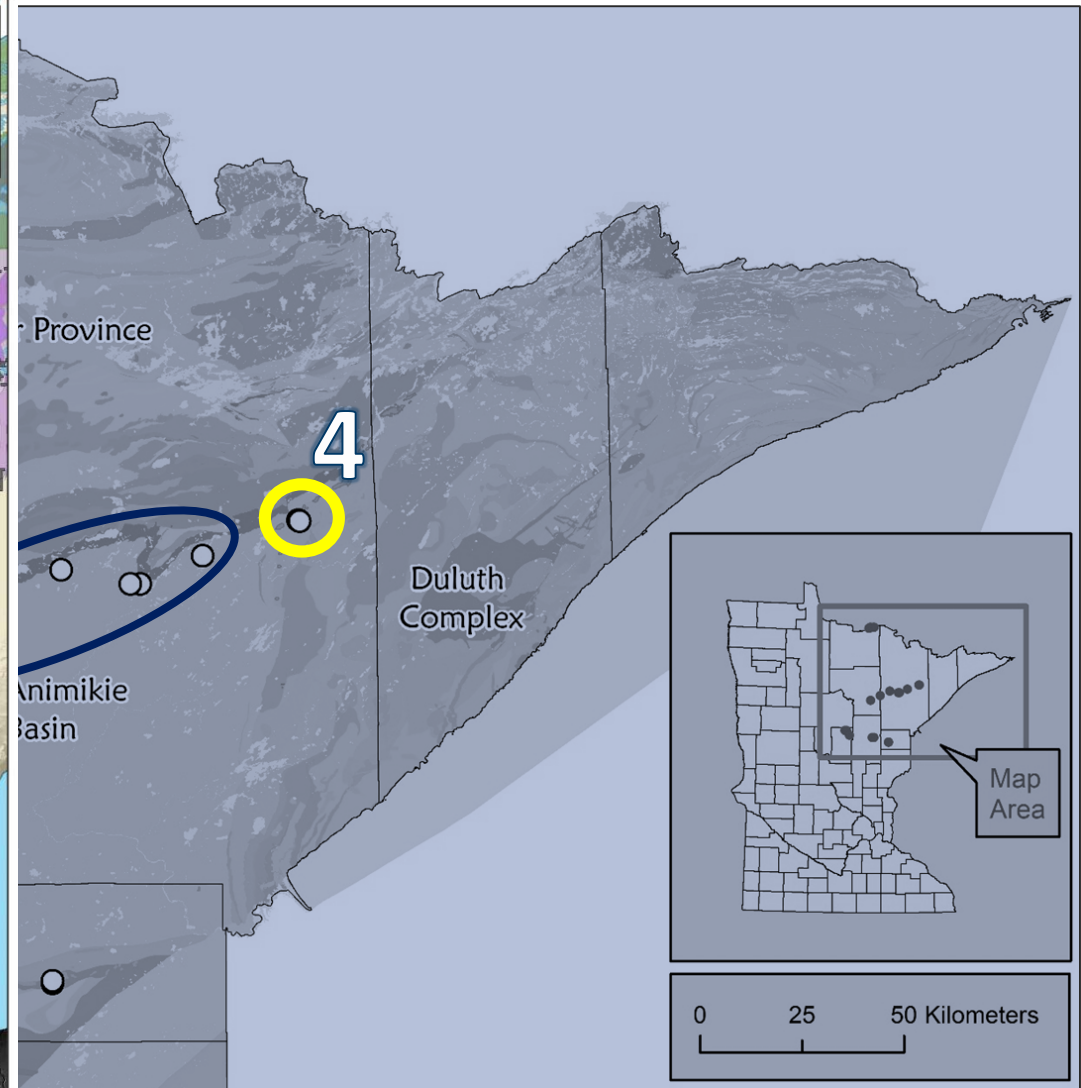
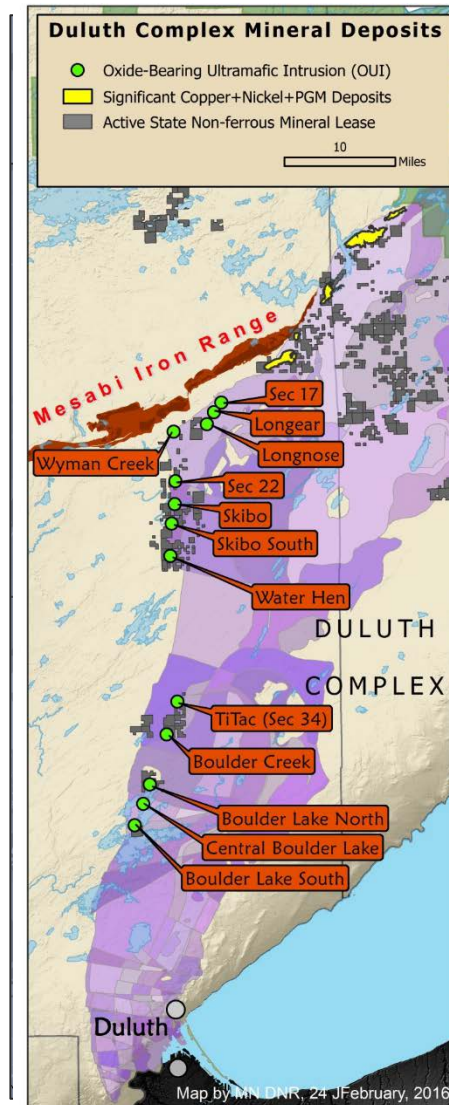
1. Biwabik Iron Formation
Mesabi Range

2. International Falls
Greenstone Gold

3. Cuyuna Manganese

4. Duluth Complex Vanadium

5. Animikie &
Animikie SEDEX



Focus Areas

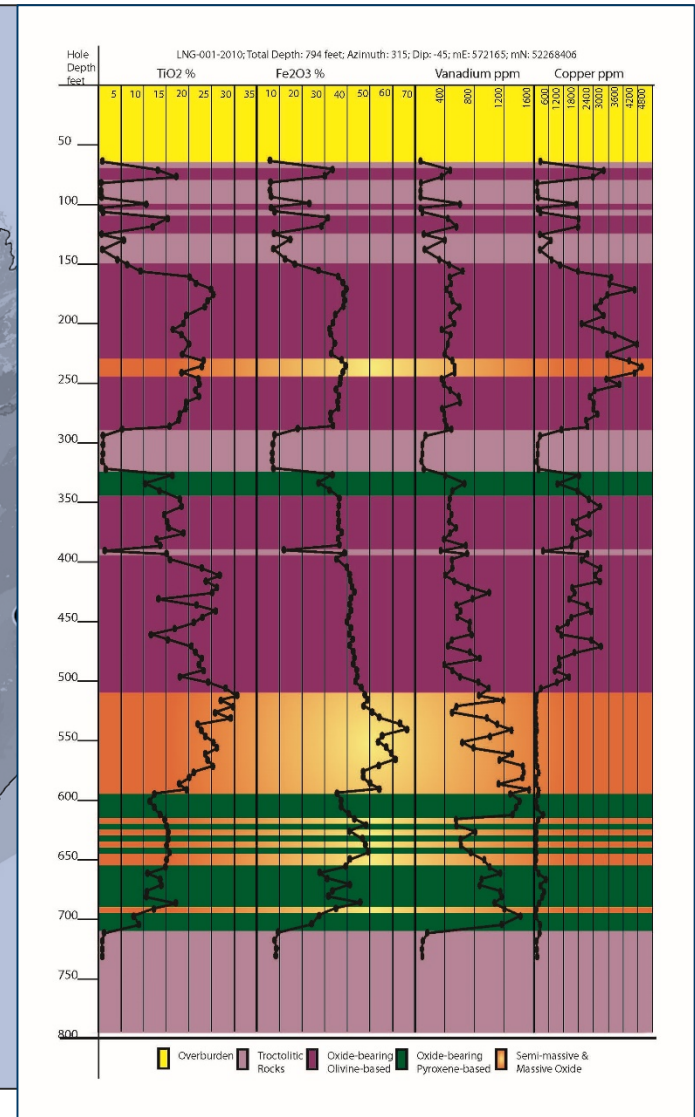
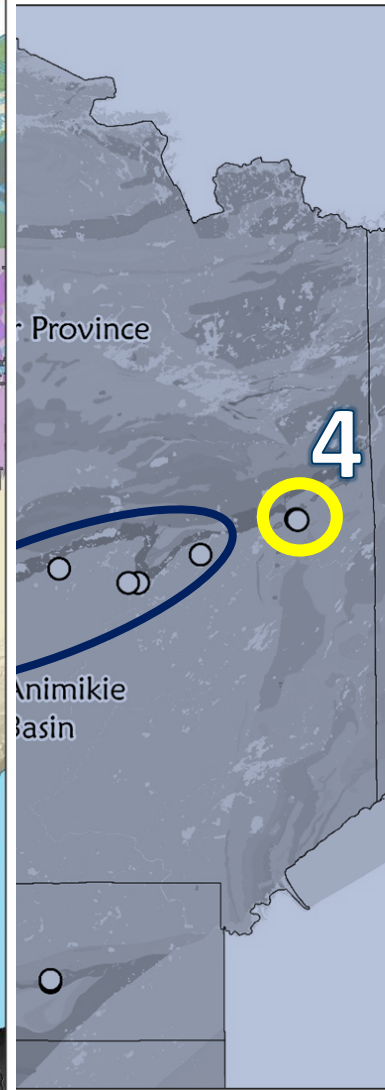
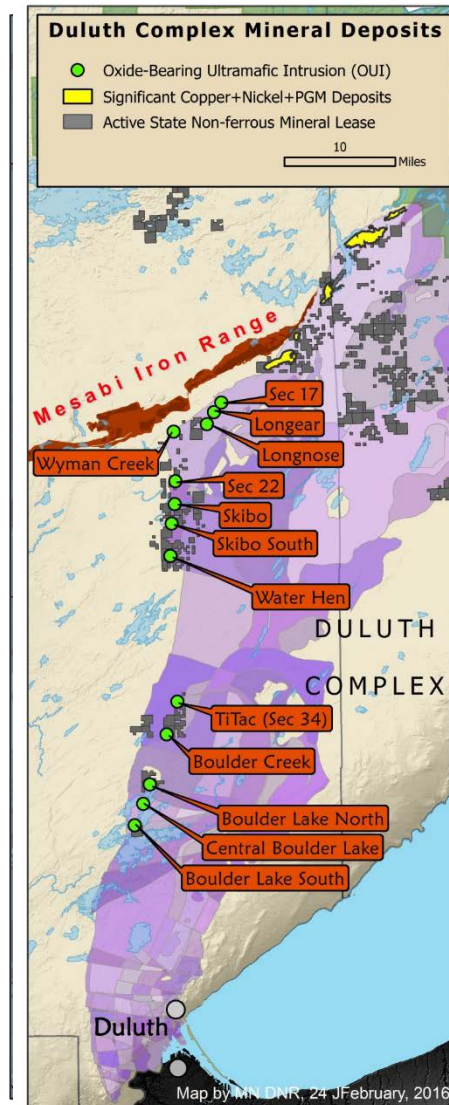
1. Biwabik Iron Formation Mesabi Range

2. International Falls Greenstone Gold

3. Cuyuna Manganese

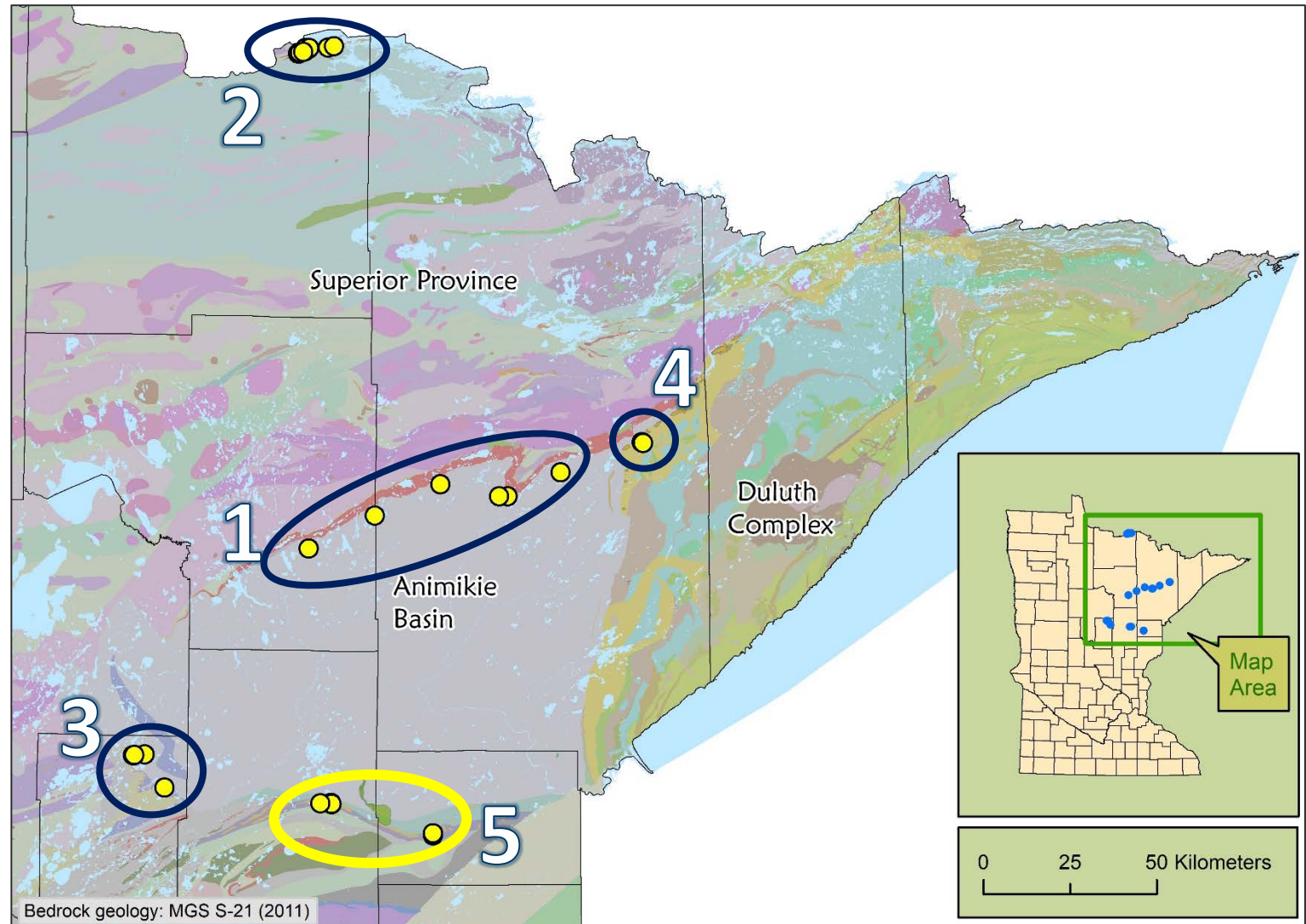
4. Duluth Complex Vanadium

5. Animikie & Animikie SEDEX

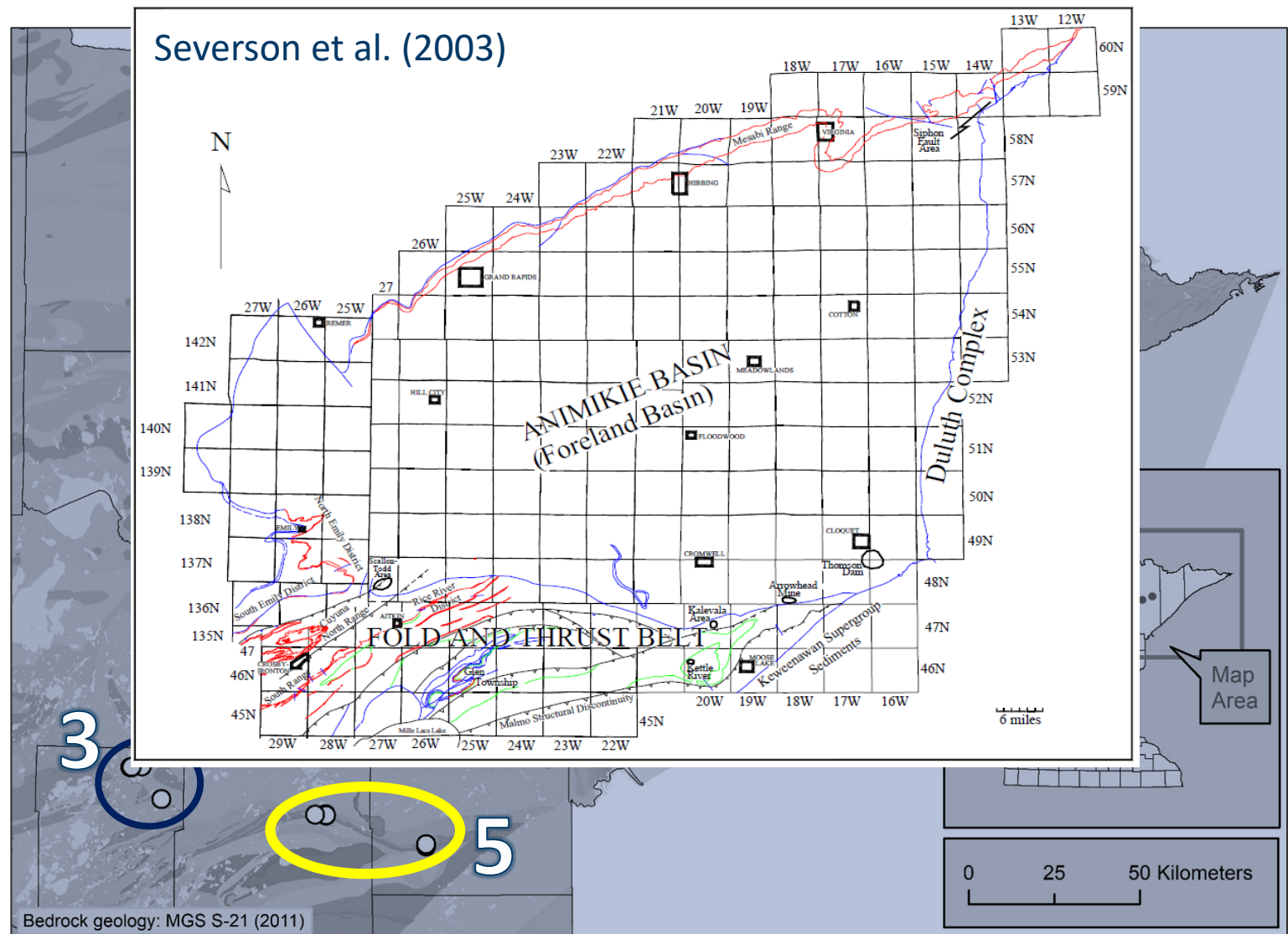


Focus Areas

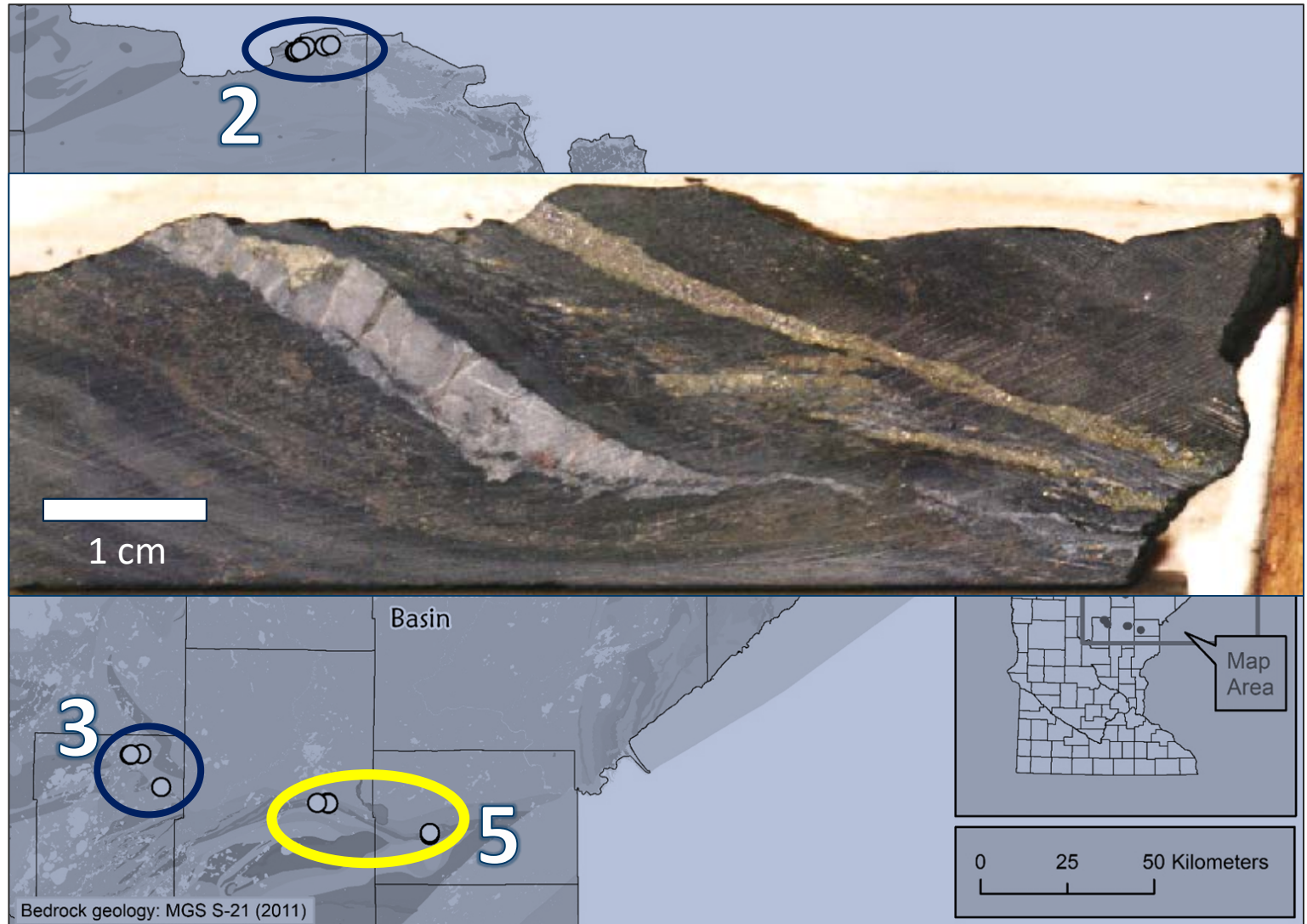
1. Biwabik Iron Formation
Mesabi Range
2. International Falls
Greenstone Gold
3. Cuyuna Manganese
4. Duluth Complex Vanadium
5. Animikie &
Animikie SEDEX



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



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

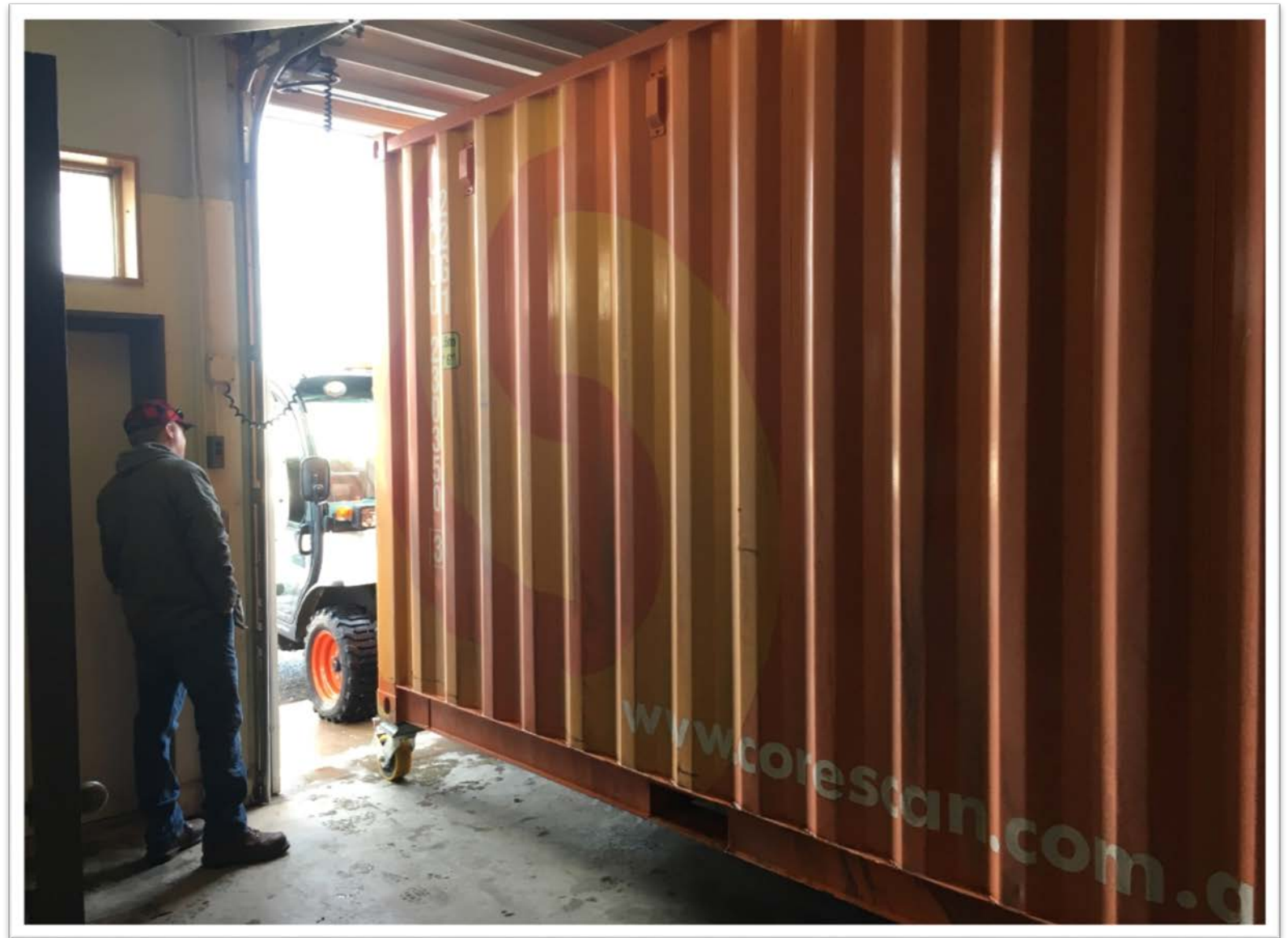




DNR Corescan Project



DNR Corescan Project



DNR Corescan Project



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



DNR Corescan Project Results



- Mineral Exploration
- Mineral Development
- Active Curation

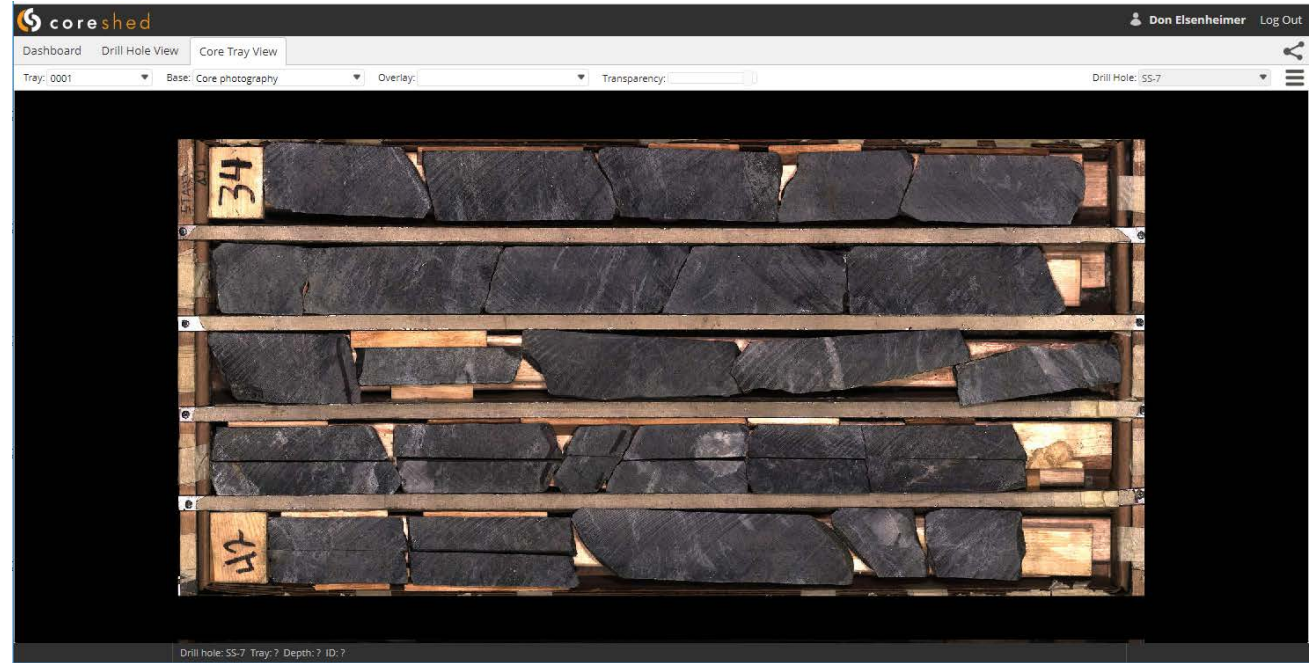
DNR Corescan Project Results

- Catalog and Care
- Public Access
- Focused Research



Active Curation

- Catalog and Care
- Public Access
- Focused Research



Cloud-based Catalog

- Catalog and Care
- Public Access
- Focused Research

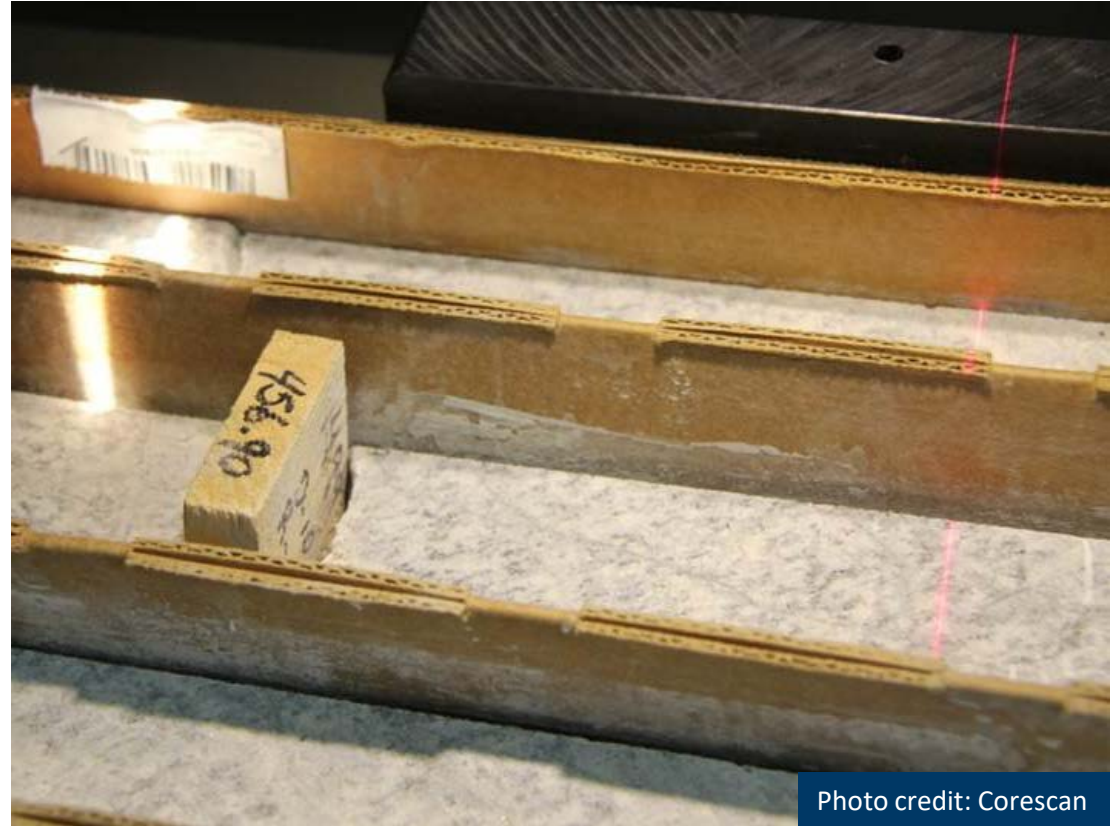


Photo credit: Corescan

Non-destructive Care





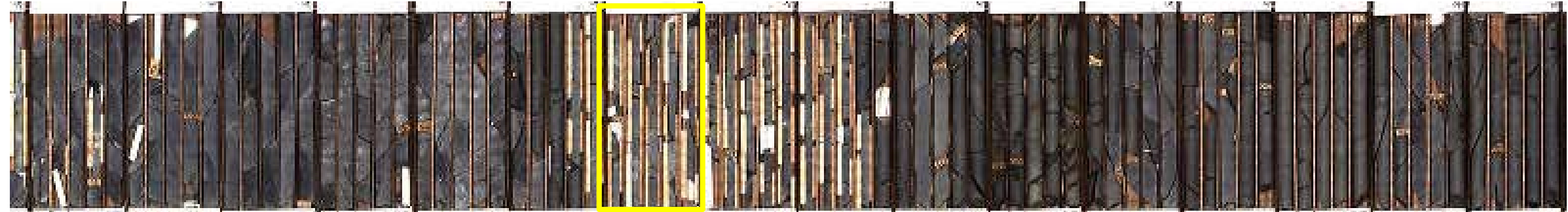
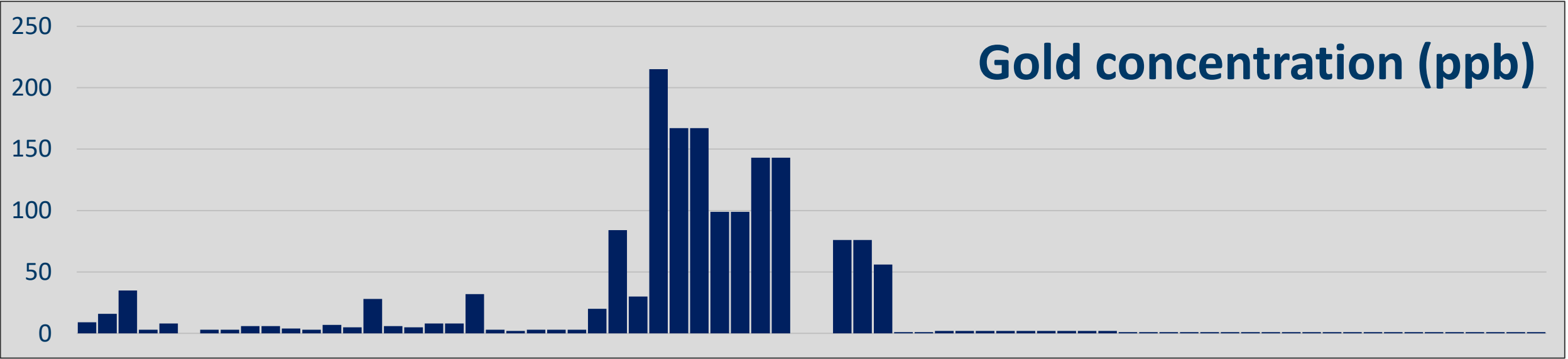
148ft

199ft

226.5ft

290ft

Gold concentration (ppb)



148ft 199ft 226.5ft 290ft

- Catalog and Care
- Public Access
- Focused Research



Active Curation

- Catalog and Care
- Public Access
- Focused Research

Coreshed Viewer - Mozilla Firefox
<https://app.coreshed.com/cswebapp/dashboard?drillhole=18423>

core shed Don Elsenheimer Log Out

Dashboard Drill Hole View Core Tray View

Project

Name	Region
MDNR - Animikie	Minnesota
MDNR - Animikie SEDEX	Minnesota
MDNR - Biwabik Iron Formation	Minnesota
MDNR - Cuyuna Range Manganese	Minnesota
MDNR - Duluth Complex Vanadium	Minnesota
MDNR - International Falls Greenstone Belt Gold	Minnesota

Showing all 6 projects

Details

Drill hole: 18423

Drill hole name	18423
Drill hole description	-
Corescan job reference	JA0465
Depth	145' to 328'
Length	183'
Collar location	434037,5168683
Collar location (WGS84)	46.668456171797594, 93.86232440598985
Collar RL (metres)	-
Collar azimuth	-
Collar inclination	-
Drill hole type	-
Date drilled	-
Date scanned	-
Record last updated	4/24/2019, 11:13:46

Inventory

Show all

Drill holes	32
Total length	4,991m (5km)
Products	6750

Archive Storage

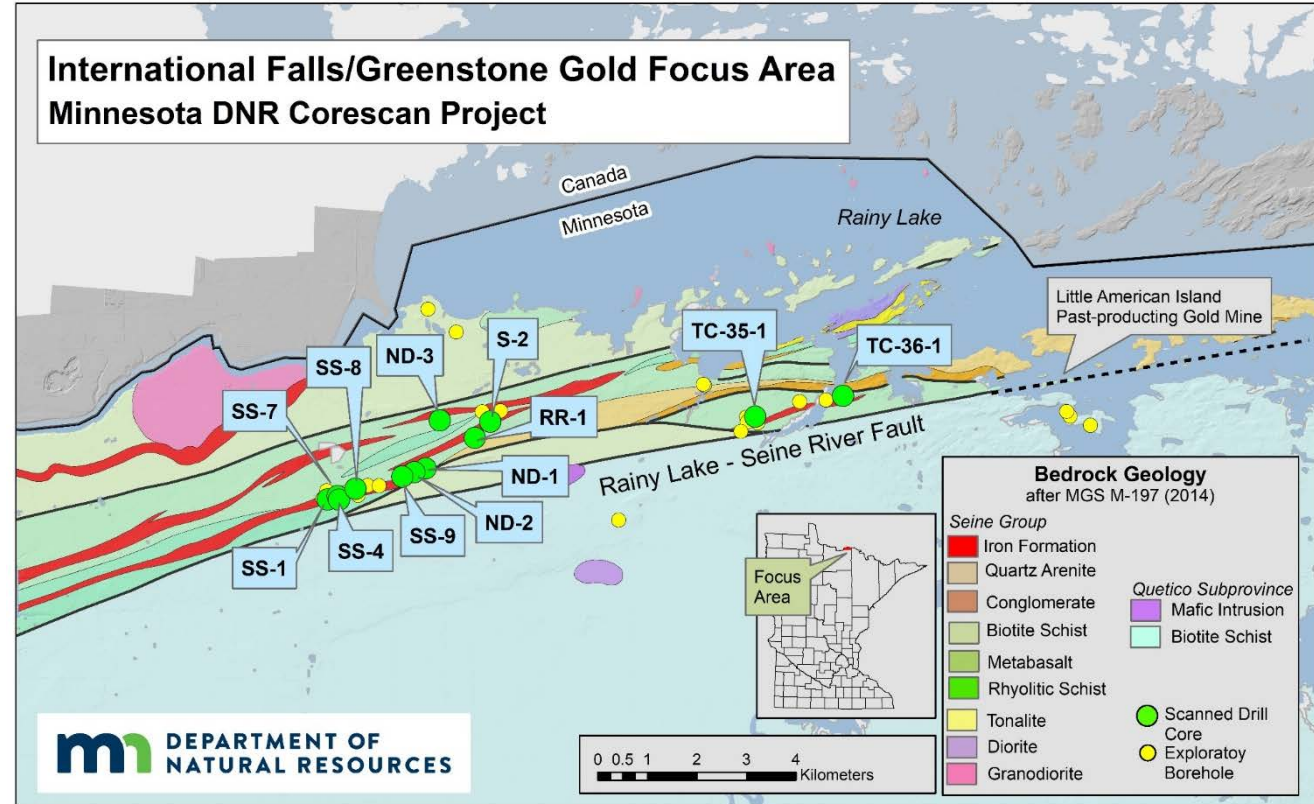
Map

Drill Hole

Name	Start	End
18423	145'	328'
18709	340'	540'
18713	178'	375'
18715	254'	599'
18961	284'	489'
K-1	36'	200'
KL-4	119'	500'
LM-13-01	203'	454'
LM-13-02	395'	465'
LM-13-03	346'	506'
LM-13-04	146'	475'
LNG-001-2010	54'	794'
LNG-003-2010	0'	306'
LNG-011-2011	0'	1,053'
LWD-99-1	347'	1,344'
LWD-99-2	580'	1,414'
MGS-2	1,574'	2,270'
MGS-5	474'	1,252'
MGS-7	741'	1,428'

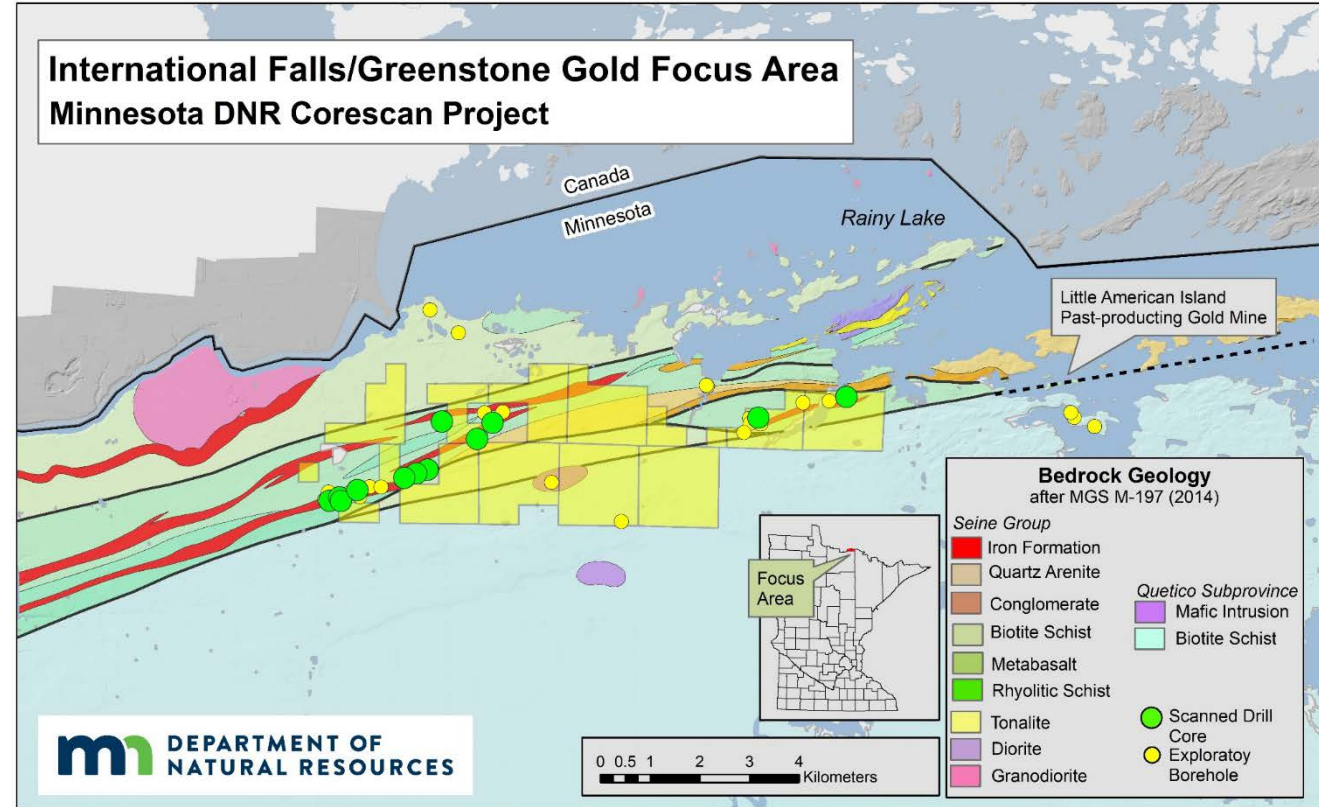
Active Curation

- Catalog and Care
- Public Access
- Focused Research



Active Curation

- Catalog and Care
- Public Access
- Focused Research

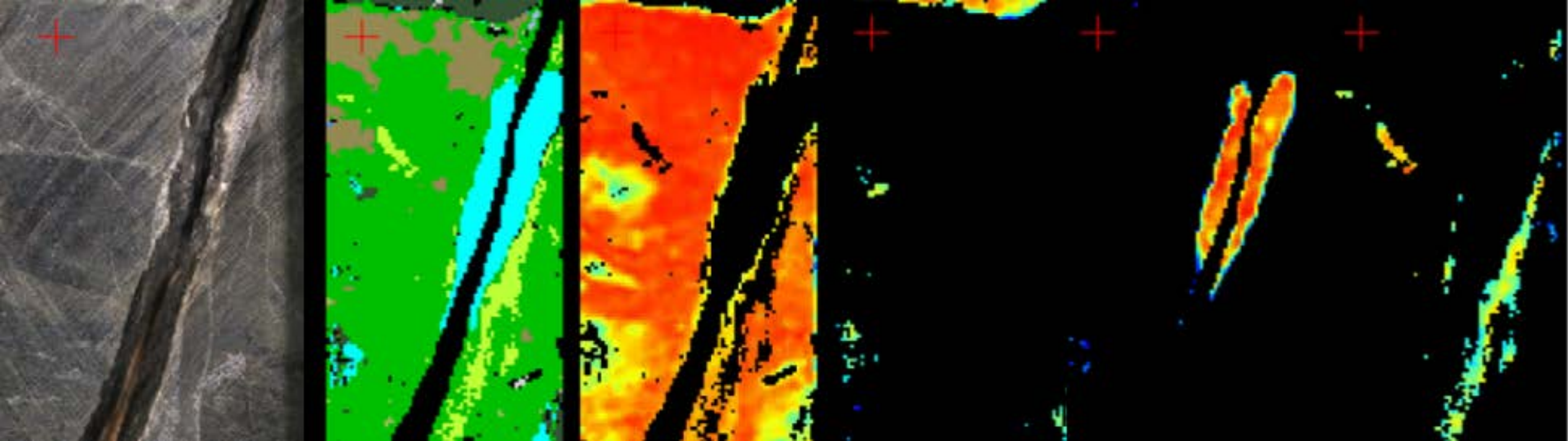


Active Curation

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





For More Information

mndnr.gov/corescan