



**GEOLOGICAL SURVEY OF CANADA**

**OPEN FILE 2236**

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**TILL GEOCHEMISTRY OVER THE  
NORTHERN MIRAMICHI ZONE AND  
VICINITY, NEW BRUNSWICK**

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**M. Lamothe**

**1990**

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Energy, Mines and  
Resources Canada

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Ressources Canada

**Canada**



Natural Resources and Energy  
New Brunswick

Ressources Naturelles et Énergie  
Nouveau-Brunswick



Contribution to Canada-New Brunswick  
Mineral Development Agreement 1984-89, a  
subsidiary agreement under the Economic  
and Regional Development Agreement.

Project funded by the Geological Survey of Canada.

Contribution à l'Entente auxiliaire  
Canada/Nouveau-Brunswick sur l'Exploitation  
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**M. Lamothe**

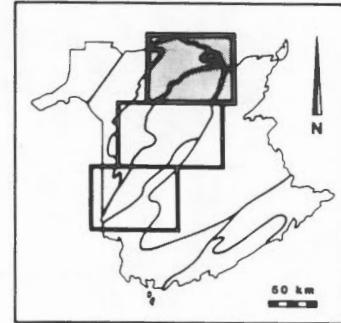
**Département des sciences de la terre  
Université du Québec à Montréal  
C.P. 8888, Succ. "A"  
Montréal, Québec  
H3C 3P8, CANADA**

**1990**

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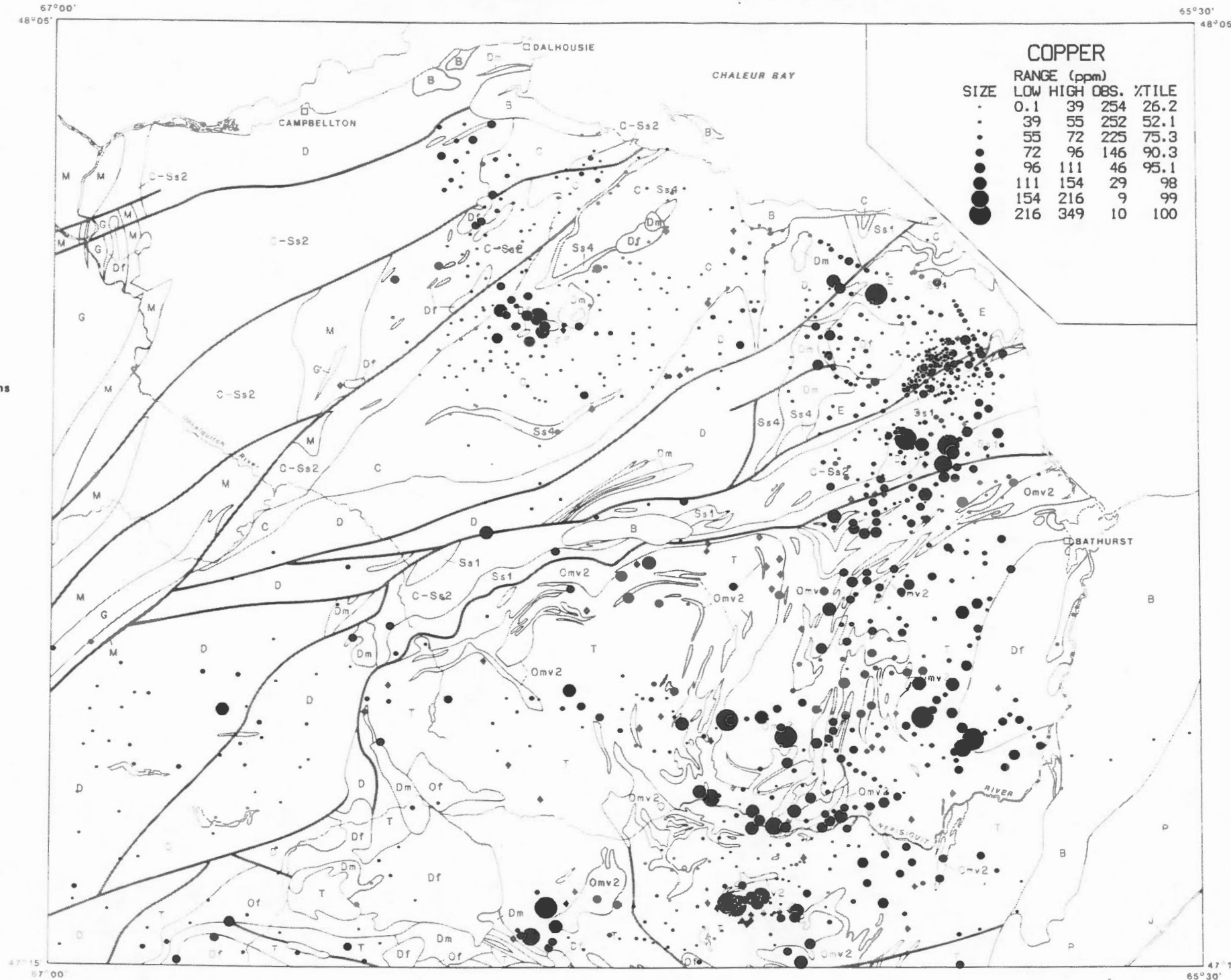
COPPER ABUNDANCE IN CLAY FRACTION OF TILL



- JURASSIC**  
J Caraquet Dyke
- CARBONIFEROUS**  
P Clifton Formation  
B Bonaventure and Bathurst Formations
- DEVONIAN**  
Df Granite and related rocks  
Dm Gabbro and diabase
- LOWER DEVONIAN**  
D Dalhousie Group
- SILURIAN**  
C Chaleur Group undivided  
Ss4 Agglomerate  
Ss2 Calcareous siltstone  
Ss1 Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
M Matapedia Group
- ORDOVICIAN AND OLDER**  
Of Foliated granite  
G Grog Brook Group  
E Elmtree and Fournier Groups  
T Tetagouche Group  
Omv2 Metabasalt: part of T
- Fault  
♦ Mineral occurrence

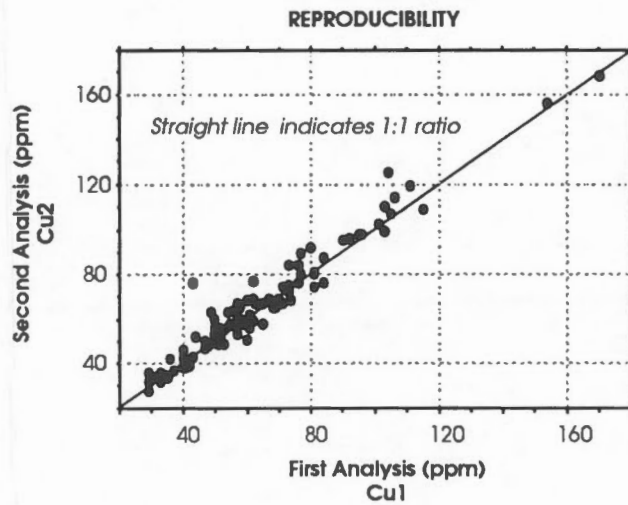
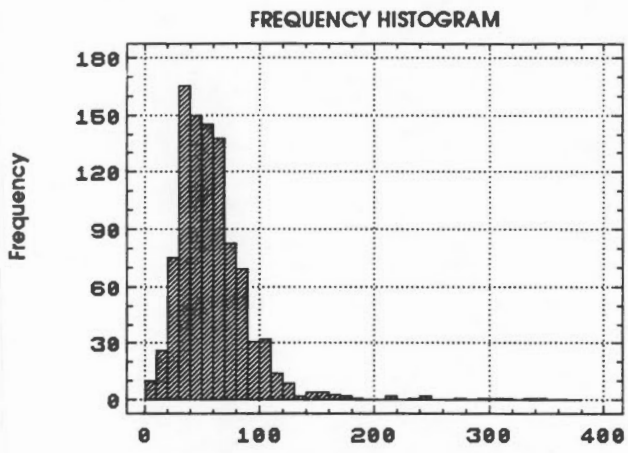
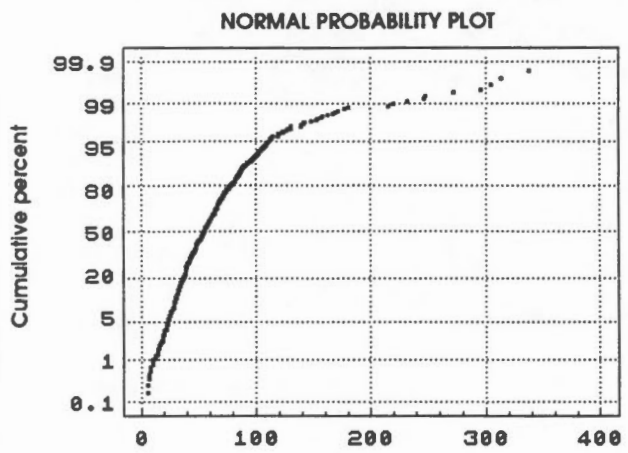
0 5 10 km

Simplified from Davies (1977)



COPPER				
SIZE	RANGE (ppm)		OBS.	%TILE
0.1	39	254	26.2	
39	55	252	52.1	
55	72	225	75.3	
72	96	146	90.3	
96	111	46	95.1	
111	154	29	98	
154	216	9	99	
216	349	10	100	

PLATE 9



Contribution to Canada - New Brunswick  
Mineral Development Agreement 1984-89,  
a subsidiary agreement under the Economic  
and Regional Development Agreement.  
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développement économique et régional. Ce projet a  
été financé par la Commission géologique du Canada.

1:500,000

**TILL GEOCHEMISTRY**

**NORTHERN MIRAMICHI ZONE**

Project leader: MICHEL LAMOTHE

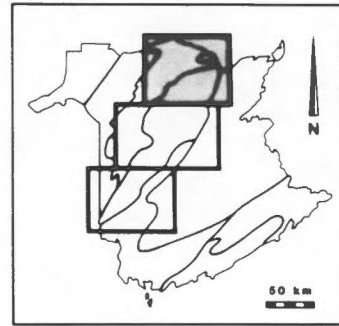
Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
GEOLOGICAL SURVEY OF CANADA  
DIVISION DE LA SCIENCE DES TERRAINS  
COMMISSION GEOLOGIQUE DU CANADA

1347 samples/971 sites

# LEAD ABUNDANCE IN CLAY FRACTION OF TILL

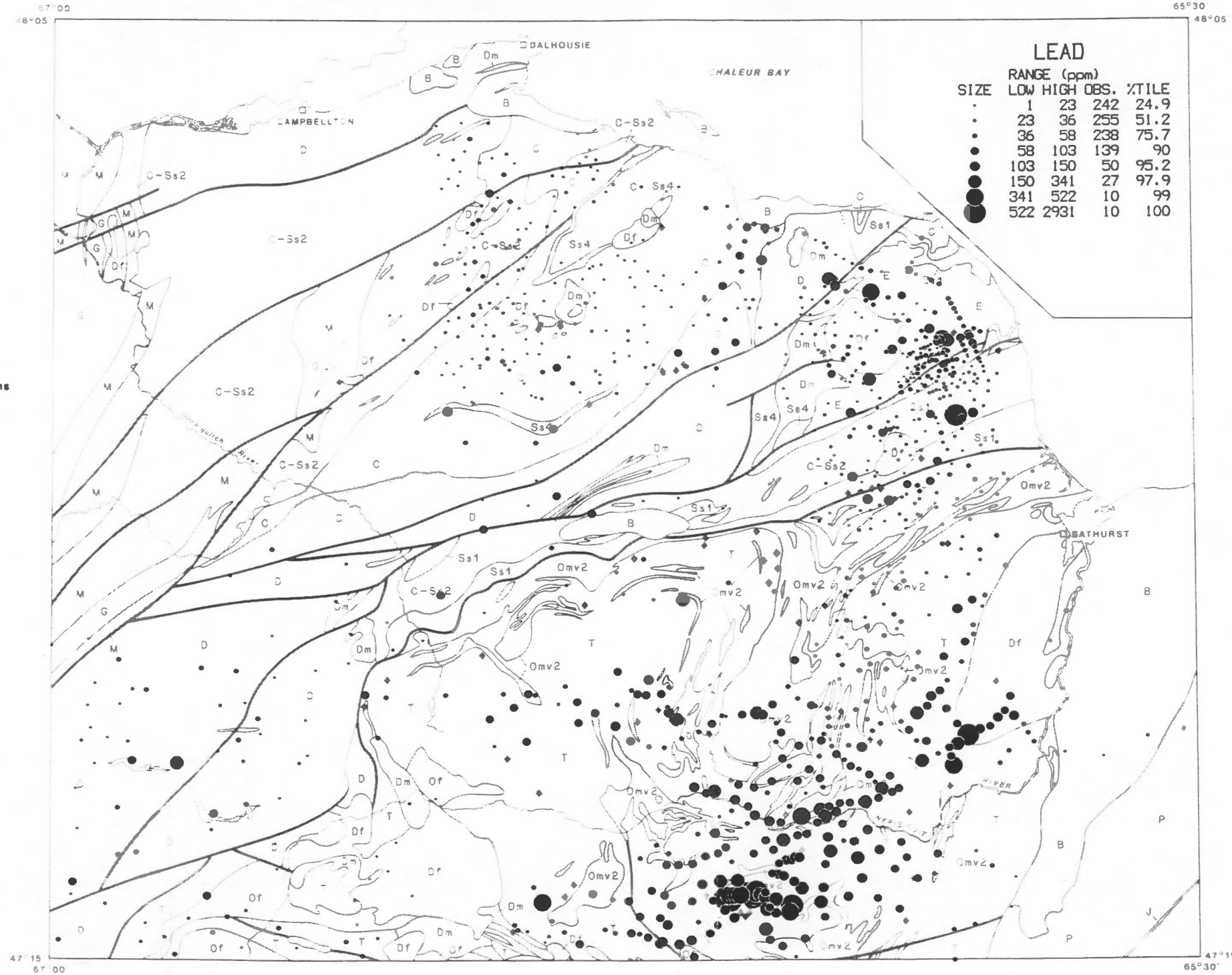
## PLATE 10



- JURASSIC**  
**J** Caraquet Dyke
- CARBONIFEROUS**  
**P** Clifton Formation  
**B** Bonaventure and Bathurst Formations
- DEVONIAN**  
**Df** Granite and related rocks  
**Dm** Gabbro and diabase
- LOWER DEVONIAN**  
**D** Dalhousie Group
- SILURIAN**  
**C** Chaleur Group undivided  
**Ss4** Agglomerate  
**Ss2** Calcareous siltstone  
**Ss1** Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
**M** Metapedia Group
- ORDOVICIAN AND OLDER**  
**Of** Foliated granite  
**G** Greg Brook Group  
**E** Elmtree and Fournier Groups  
**T** Tetagouche Group  
**Omv2** Metabasalt: part of T
- Fault  
 ♦ Mineral occurrence

0 5 10 km

Simplified from Davies (1977)



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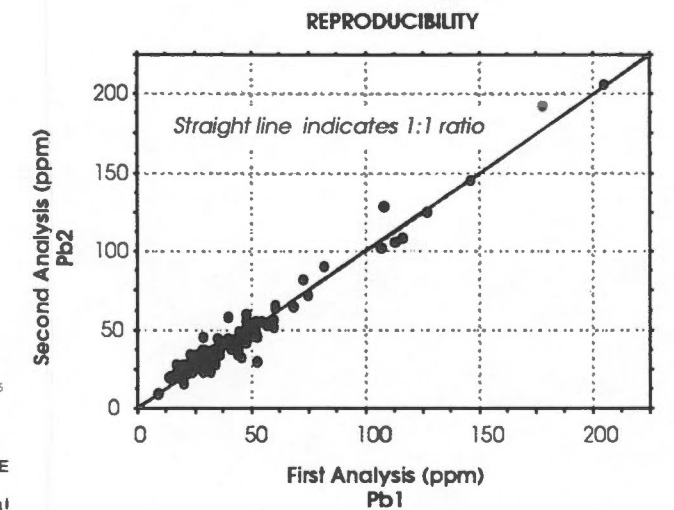
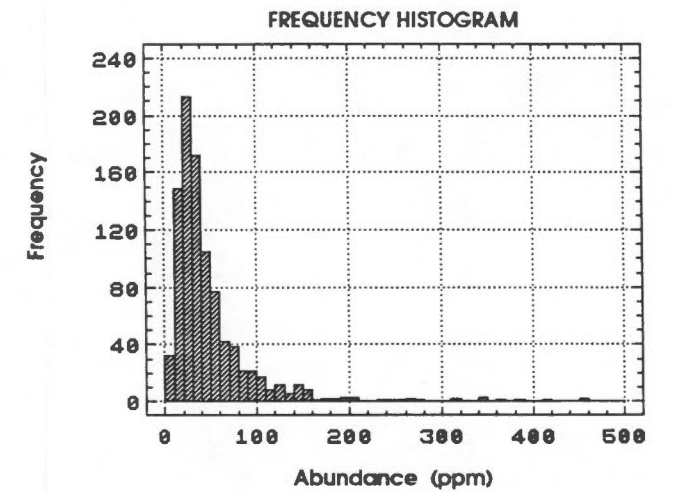
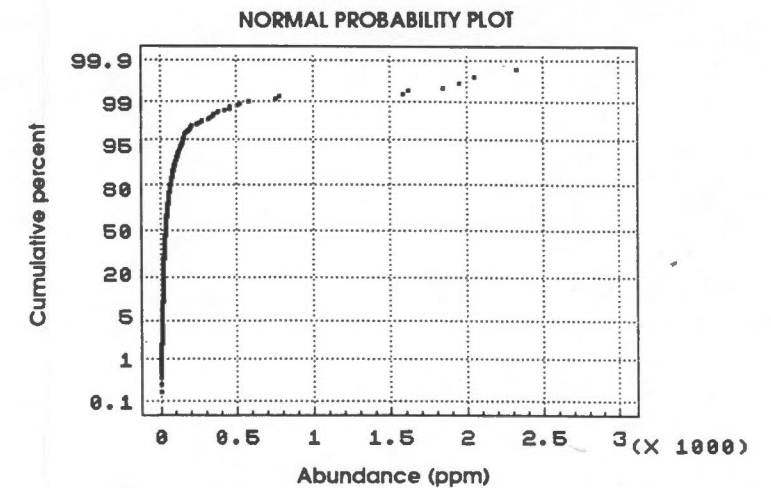
1:500,000

## TILL GEOCHEMISTRY NORTHERN MIRAMICHI ZONE

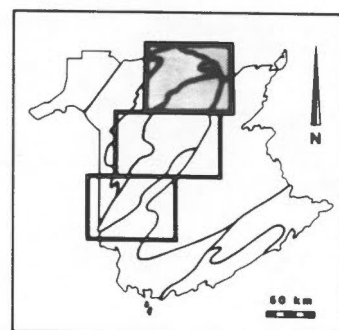
Project leader: MICHEL LAMOTHE  
 Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
 GEOLOGICAL SURVEY OF CANADA  
 DIVISION DE LA SCIENCE DES TERRAINS  
 COMMISSION GEOLOGIQUE DU CANADA

LEAD				
SIZE	RANGE (ppm)		OBS.	%TILE
1	23	242	24.9	
23	36	255	51.2	
36	58	238	75.7	
58	103	139	90	
103	150	50	95.2	
150	341	27	97.9	
341	522	10	99	
522	2931	10	100	



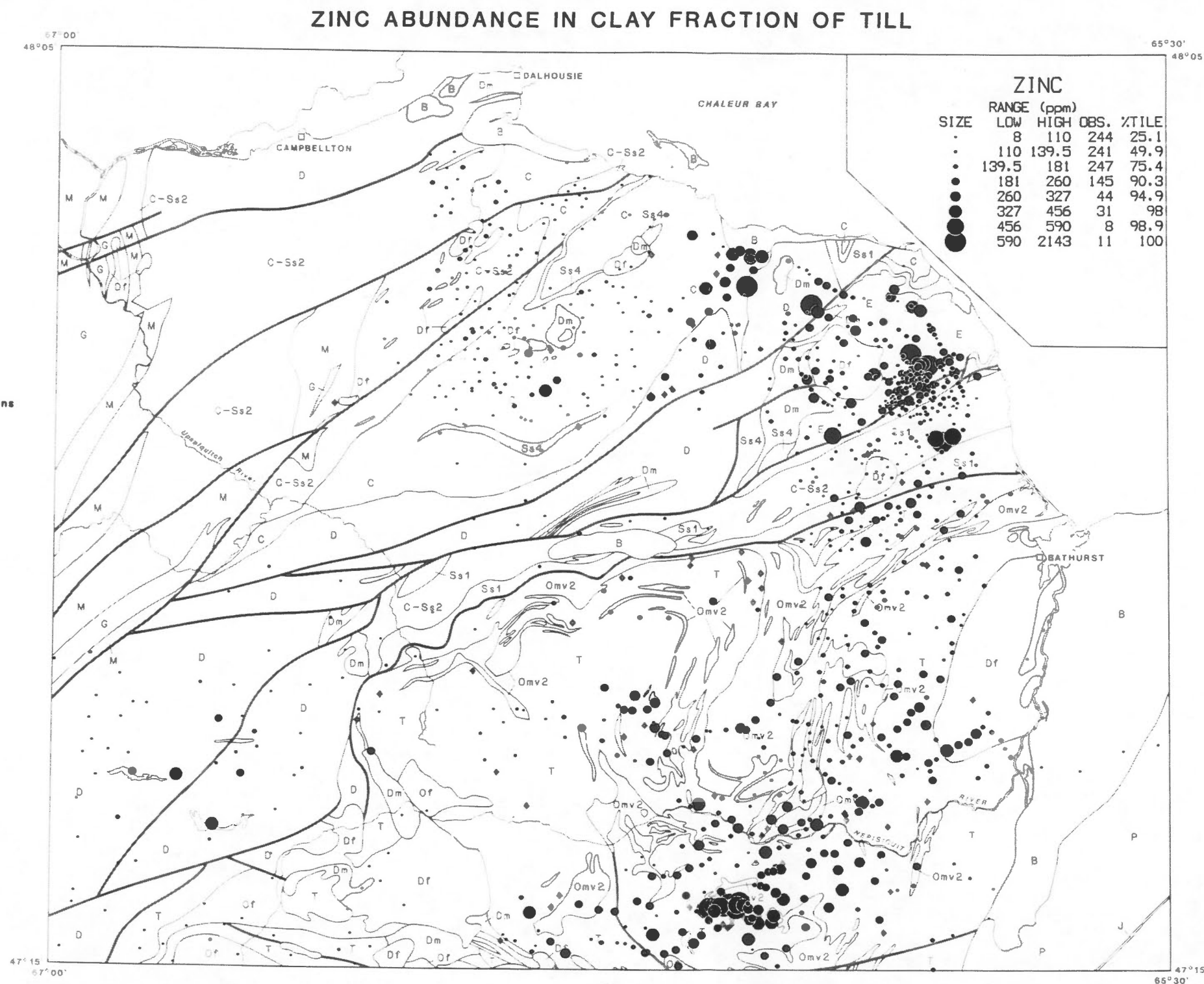
1368 samples/971 sites



- JURASSIC**  
**J** Caraquet Dyke
- CARBONIFEROUS**  
**P** Clifton Formation  
**B** Bonaventure and Bathurst Formations
- DEVONIAN**  
**Df** Granite and related rocks  
**Dm** Gabbro and diabase
- LOWER DEVONIAN**  
**D** Dalhousie Group
- SILURIAN**  
**C** Chaleur Group undivided  
**Ss4** Agglomerate  
**Ss2** Calcareous siltstone  
**Ss1** Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
**M** Matapedia Group
- ORDOVICIAN AND OLDER**  
**Of** Foliated granite  
**G** Grog Brook Group  
**E** Elmtree and Fournier Groups  
**T** Tetagouche Group  
**Omv2** Metabasalt: part of T
- Fault  
 ♦ Mineral occurrence



Simplified from Davies (1977)



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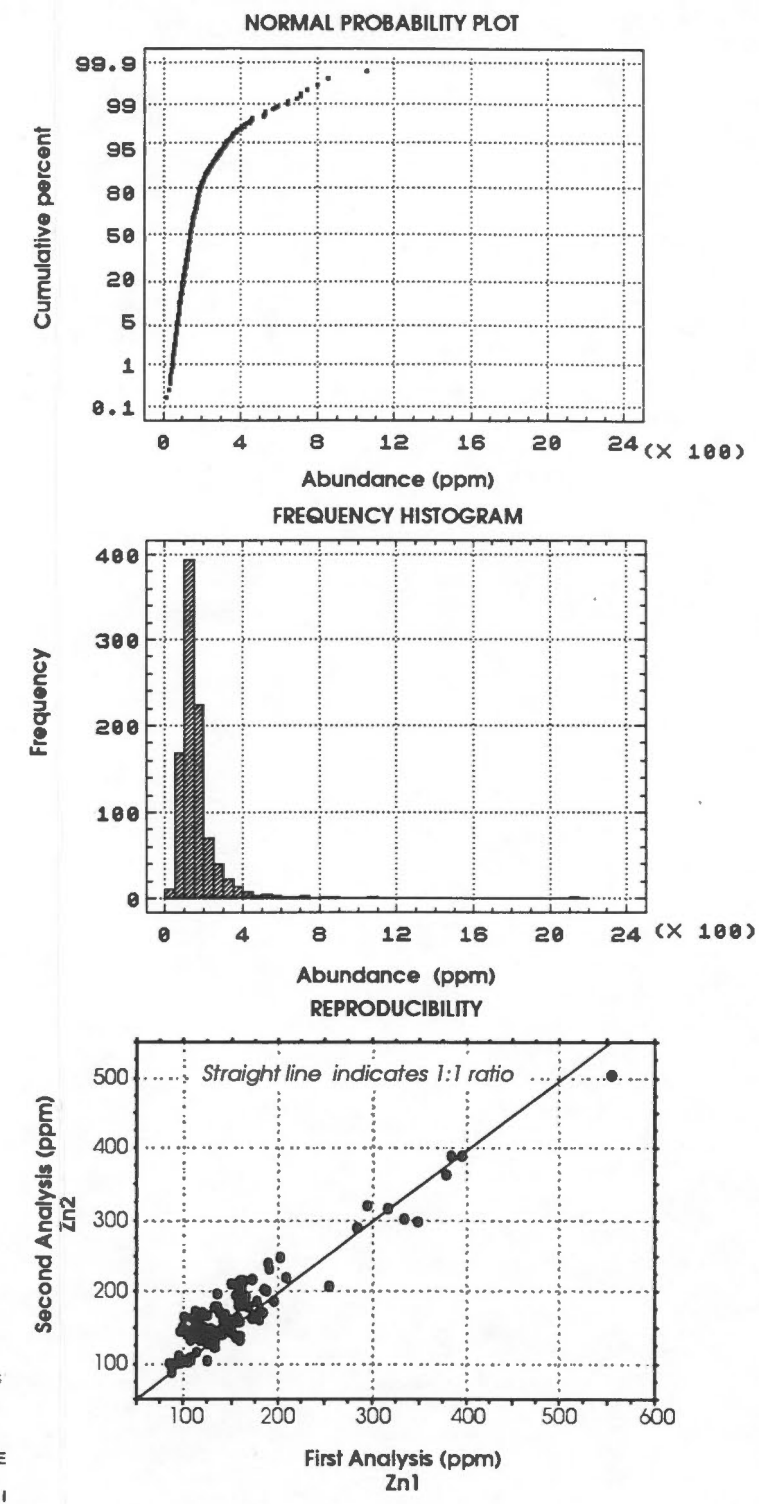
Contribution à l'Entente auxiliaire Canada / Nouveau-Brunswick sur l'Exploitation minière 1984-89 faisant partie de l'entente de développement économique et régional. Ce projet a été financé par la Commission géologique du Canada.

**1:500,000**  
**TILL GEOCHEMISTRY**  
**NORTHERN MIRAMICHI ZONE**

Project leader: MICHEL LAMOTHE  
 Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
 GEOLOGICAL SURVEY OF CANADA  
 DIVISION DE LA SCIENCE DES TERRAINS  
 COMMISSION GEOLOGIQUE DU CANADA

**PLATE 11**

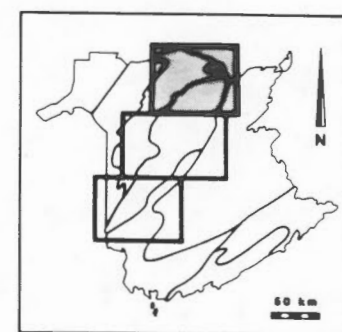


1368 samples/971 sites



# PLATE 12

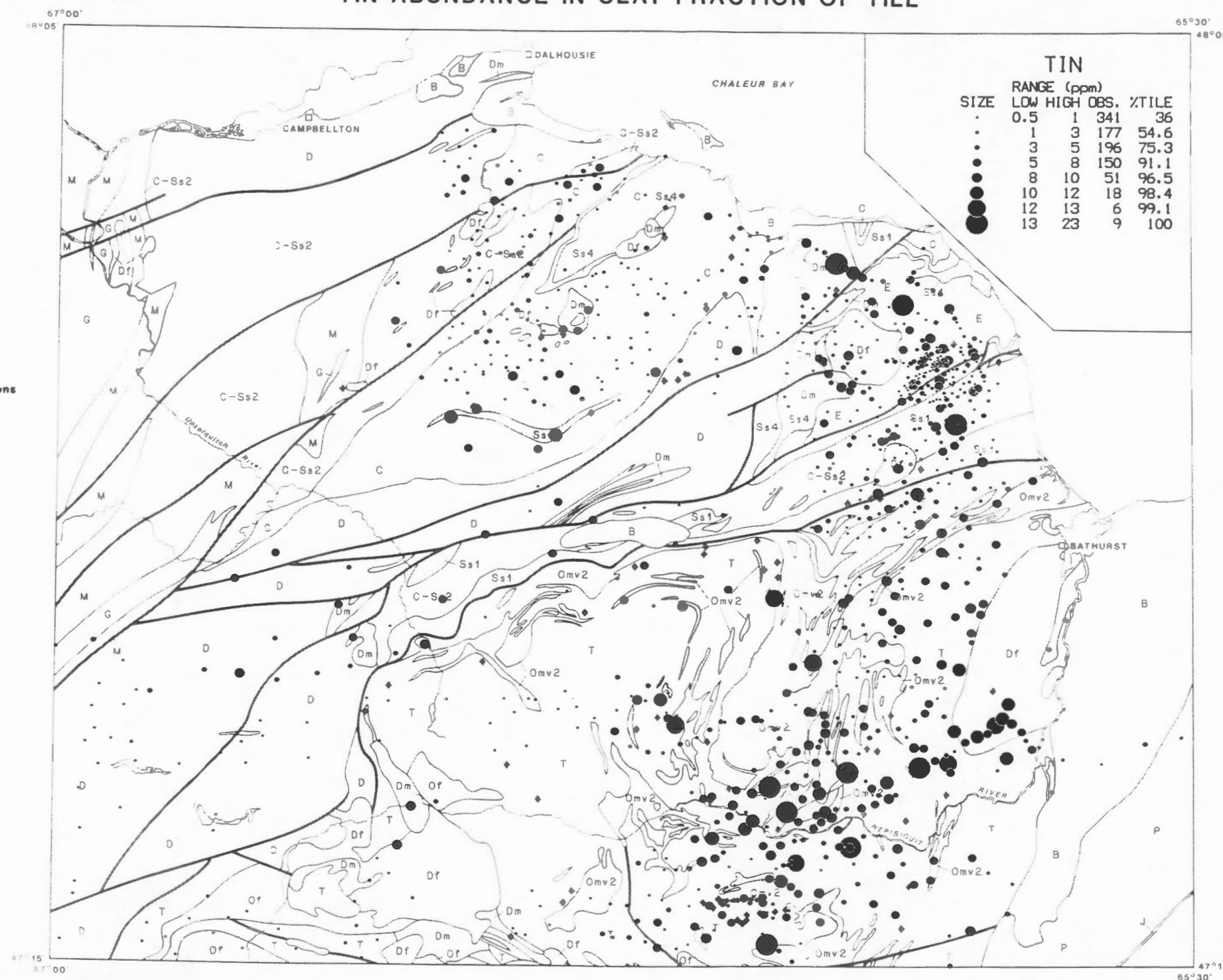
## TIN ABUNDANCE IN CLAY FRACTION OF TILL



- JURASSIC**  
**J** Caraquet Dyke
- CARBONIFEROUS**  
**P** Clifton Formation  
**B** Bonaventure and Bathurst Formations
- DEVONIAN**  
**Df** Granite and related rocks  
**Dm** Gabbro and diabase
- LOWER DEVONIAN**  
**D** Dalhousie Group
- SILURIAN**  
**C** Chaleur Group undivided  
**Ss4** Agglomerate  
**Ss2** Calcareous siltstone  
**Ss1** Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
**M** Matapedia Group
- ORDOVICIAN AND OLDER**  
**Of** Foliated granite  
**G** Grog Brook Group  
**E** Elmtree and Fournier Groups  
**T** Tetagouche Group  
**Omv2** Metabasalt: part of T
- Fault  
 ♦ Mineral occurrence

0 5 10 km

Simplified from Davies (1977)



Contribution to Canada - New Brunswick  
 Mineral Development Agreement 1984-89,  
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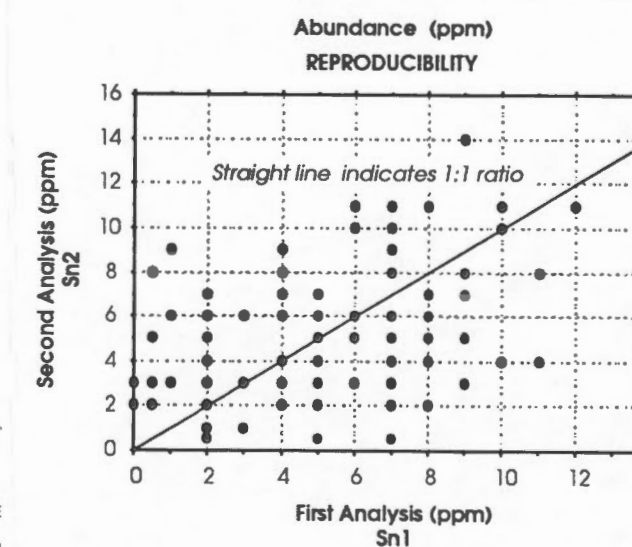
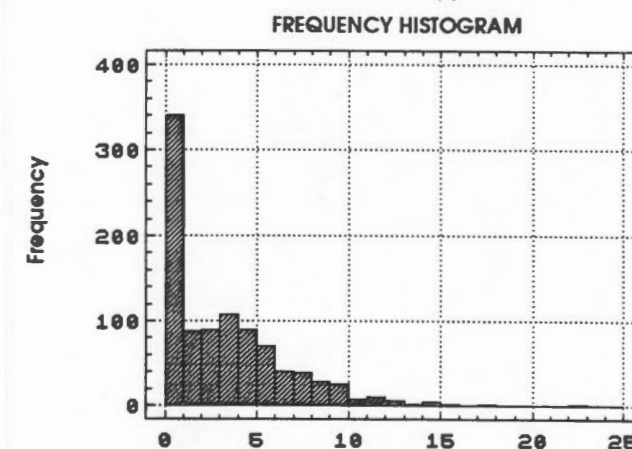
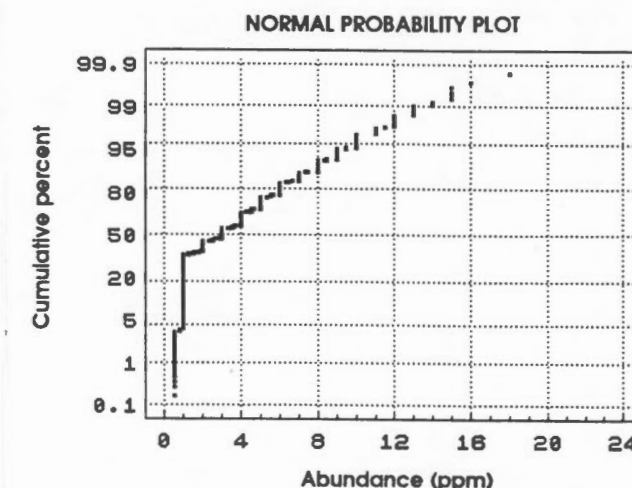
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1:500,000

## TILL GEOCHEMISTRY NORTHERN MIRAMICHI ZONE

Project leader: MICHEL LAMOTHE  
 Université du Québec à Montréal

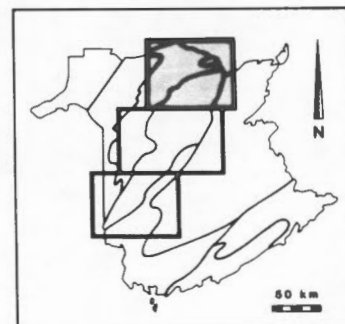
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 GEOLOGICAL SURVEY OF CANADA  
 DIVISION DE LA SCIENCE DES TERRAINS  
 COMMISSION GÉOLOGIQUE DU CANADA



1241 samples/948 sites



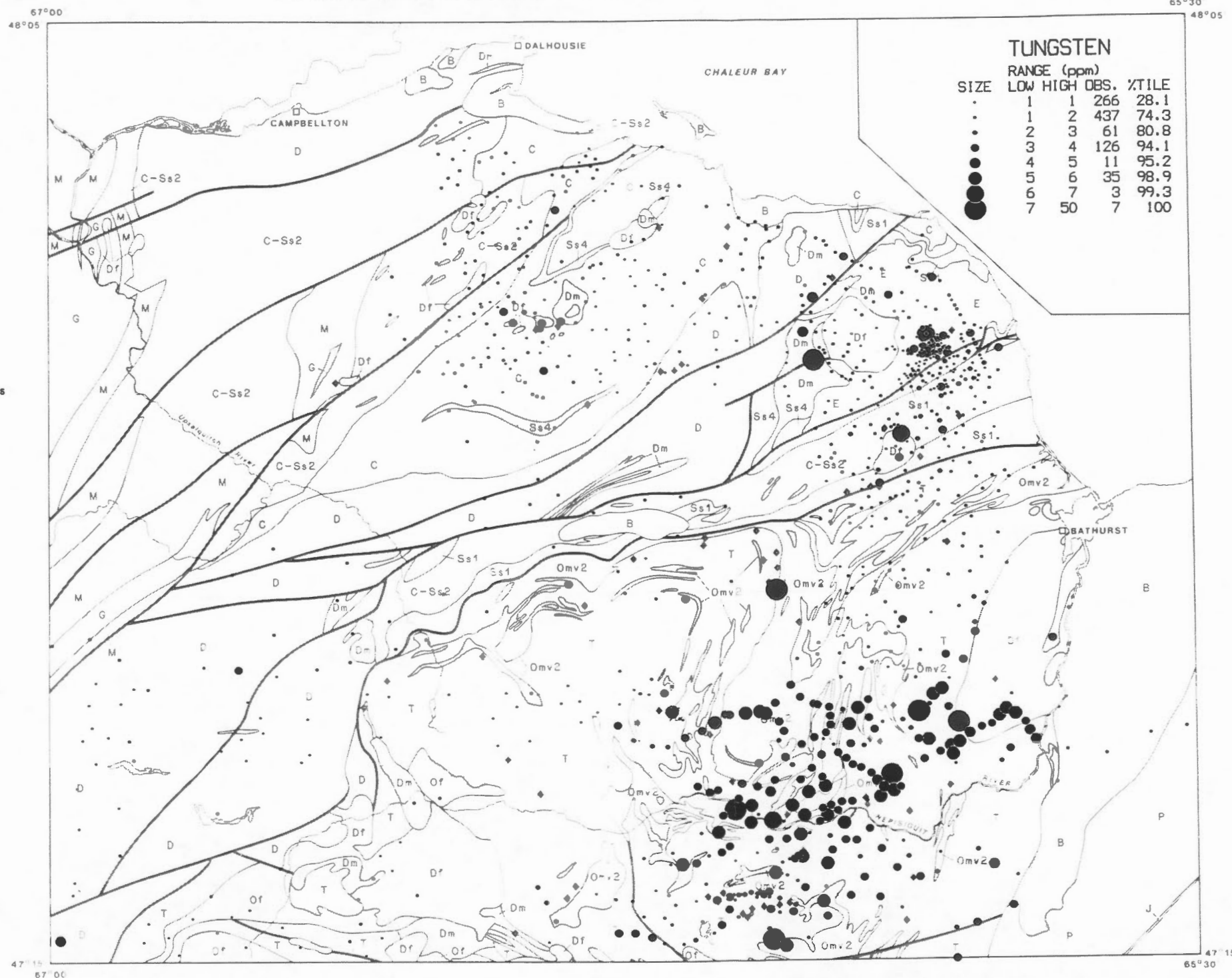
## TUNGSTEN ABUNDANCE IN CLAY FRACTION OF TILL



- JURASSIC**  
J Caraquet Dyke
- CARBONIFEROUS**  
P Clifton Formation  
B Bonaventure and Bathurst Formations
- DEVONIAN**  
Df Granite and related rocks  
Dm Gabbro and diabase
- LOWER DEVONIAN**  
D Dalhousie Group
- SILURIAN**  
C Chaleur Group undivided  
Ss4 Agglomerate  
Ss2 Calcareous siltstone  
Ss1 Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
M Matapedia Group
- ORDOVICIAN AND OLDER**  
Of Foliated granite  
G Grog Brook Group  
E Elmtree and Fournier Groups  
T Tetagouche Group  
Omv2 Metabasalt: part of T
- Fault  
♦ Mineral occurrence

0 5 10 km

Simplified from Davies (1977)



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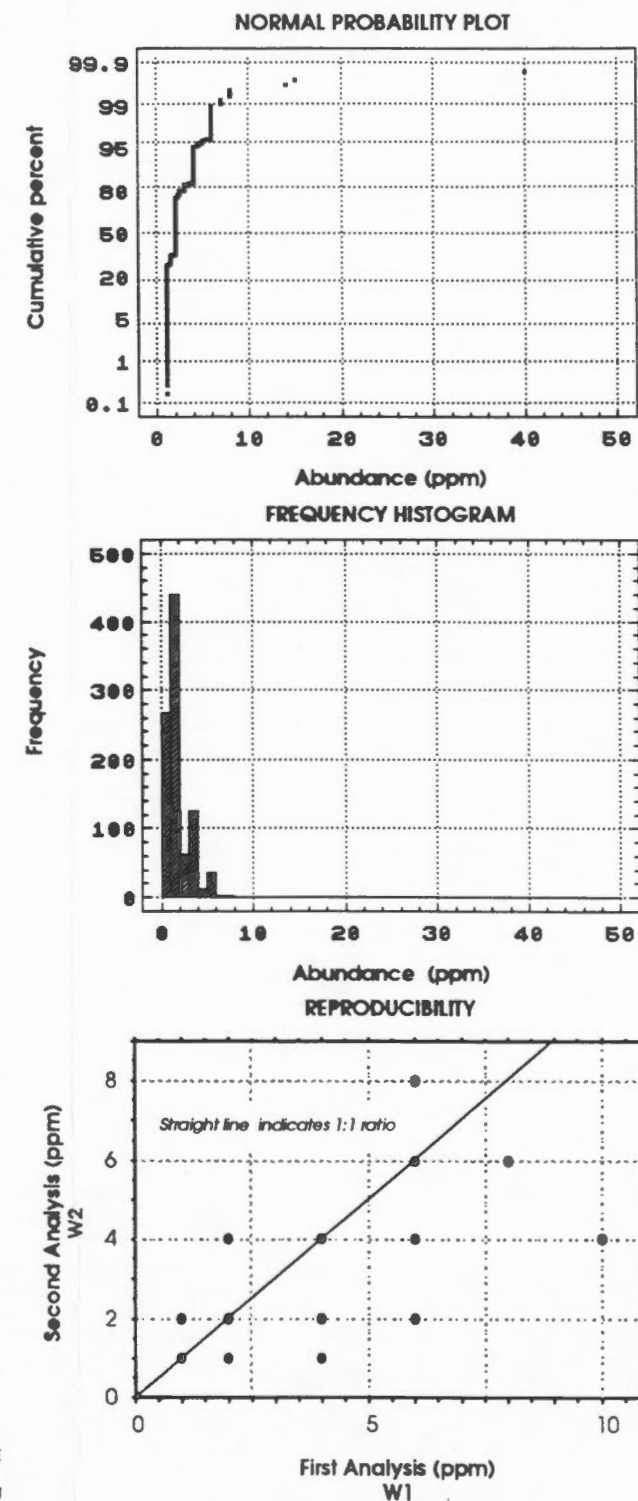
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## TILL GEOCHEMISTRY NORTHERN MIRAMICHI ZONE

Project leader: MICHEL LAMOTHE  
Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
GEOLOGICAL SURVEY OF CANADA  
DIVISION DE LA SCIENCE DES TERRAINS  
COMMISSION GÉOLOGIQUE DU CANADA

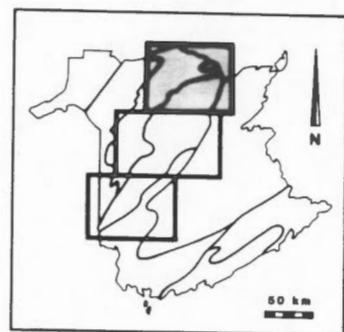
## PLATE 13



1251 samples/946 sites



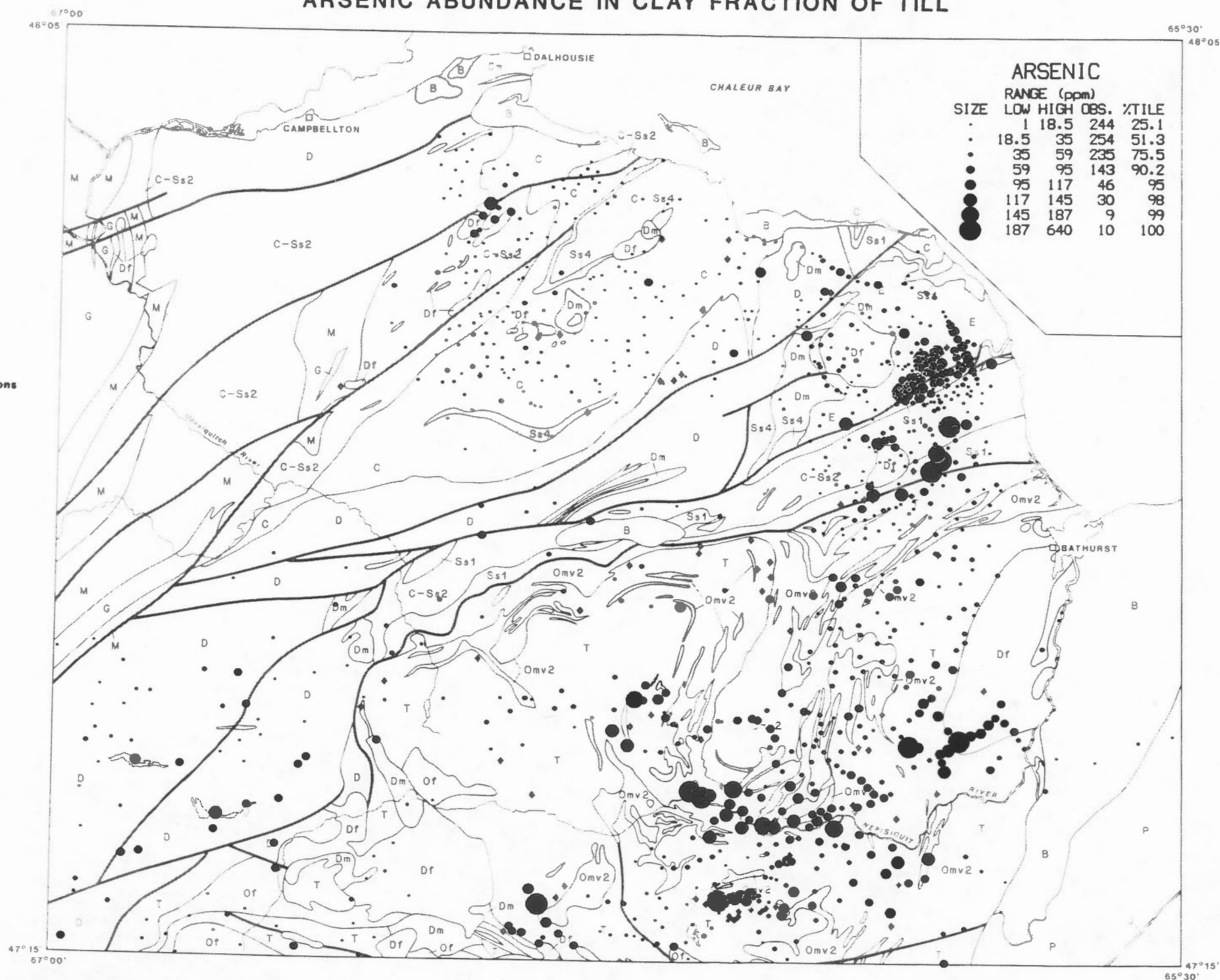
# ARSENIC ABUNDANCE IN CLAY FRACTION OF TILL



- JURASSIC**  
**J** Caraquet Dyke
- CARBONIFEROUS**  
**P** Clifton Formation  
**B** Bonaventure and Bathurst Formations
- DEVONIAN**  
**Df** Granite and related rocks  
**Dm** Gabbro and diabase
- LOWER DEVONIAN**  
**D** Dalhousie Group
- SILURIAN**  
**C** Chaleur Group undivided  
**Ss4** Agglomerate  
**Ss2** Calcareous siltstone  
**Ss1** Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
**M** Matapedia Group
- ORDOVICIAN AND OLDER**  
**Of** Foliated granite  
**G** Grog Brook Group  
**E** Elmtree and Fournier Groups  
**T** Tetagouche Group  
**Omv2** Metabasalt: part of T
- Fault  
 ♦ Mineral occurrence

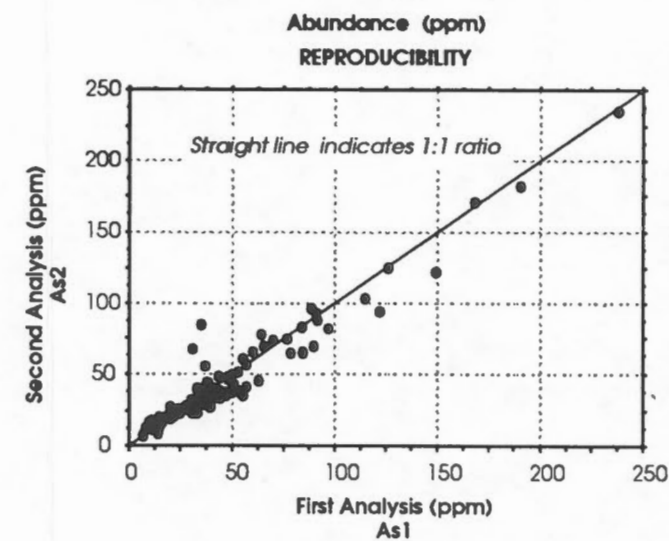
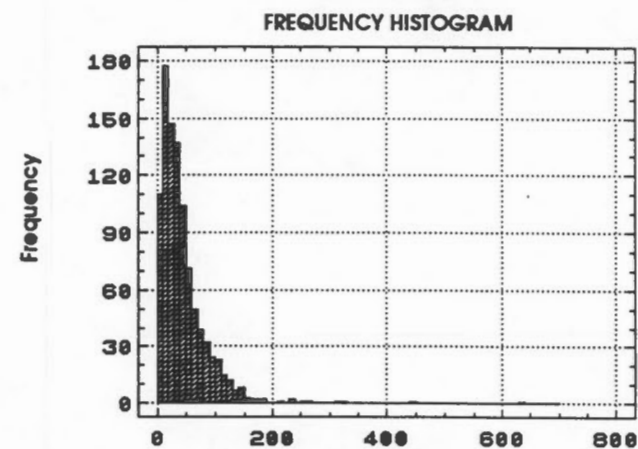
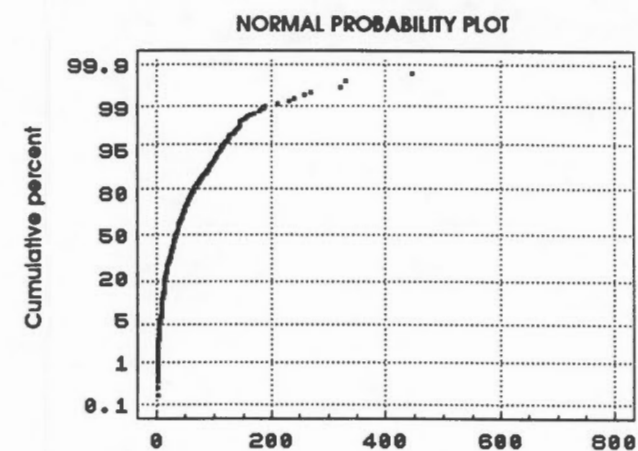
0 5 10 km

Simplified from Davies (1977)



ARSENIC				
SIZE	RANGE (ppm)		OBS.	%TILE
1	18.5	244	25.1	
18.5	35	254	51.3	
35	59	235	75.5	
59	95	143	90.2	
95	117	46	95	
117	145	30	98	
145	187	9	99	
187	640	10	100	

## PLATE 14



1277 samples/971 sites

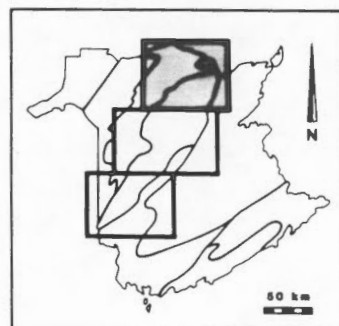
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1:500,000  
**TILL GEOCHEMISTRY**  
**NORTHERN MIRAMICHI ZONE**

Project leader: MICHEL LAMOTHE  
 Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
 GEOLOGICAL SURVEY OF CANADA  
 DIVISION DE LA SCIENCE DES TERRAINS  
 COMMISSION GEOLOGIQUE DU CANADA

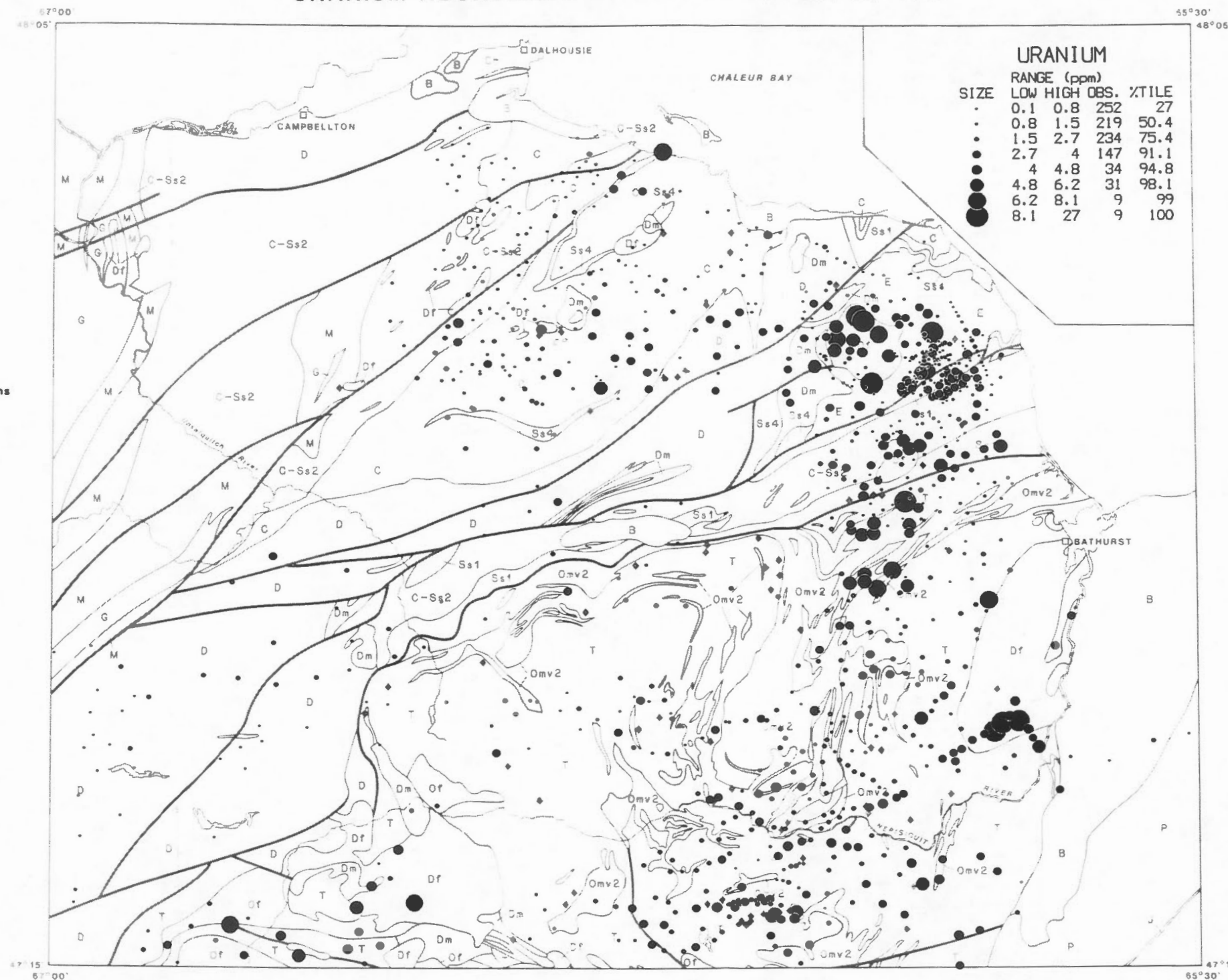


# URANIUM ABUNDANCE IN CLAY FRACTION OF TILL

- JURASSIC**
- J Caraque Dyke
- CARBONIFEROUS**
- P Clifton Formation
  - B Bonaventure and Bathurst Formations
- DEVONIAN**
- Df Granite and related rocks
  - Dm Gabbro and diabase
- LOWER DEVONIAN**
- D Dalhousie Group
- SILURIAN**
- C Chaleur Group undivided
  - Ss4 Agglomerate
  - Ss2 Calcareous siltstone
  - Ss1 Greywacke
- ORDOVICIAN AND/OR SILURIAN**
- M Matapedia Group
- ORDOVICIAN AND OLDER**
- Of Foliated granite
  - G Grog Brook Group
  - E Elmtree and Fournier Groups
  - T Tetagouche Group
  - Omv2 Metabasalt: part of T
- Fault
- ◆ Mineral occurrence

0 5 10 km

Simplified from Davies (1977)



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1:500,000

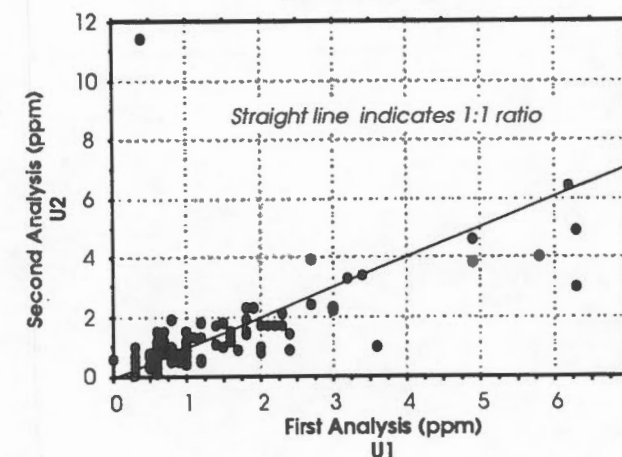
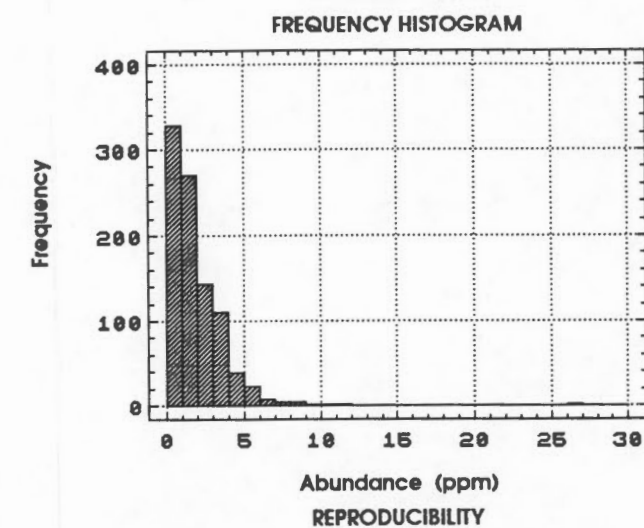
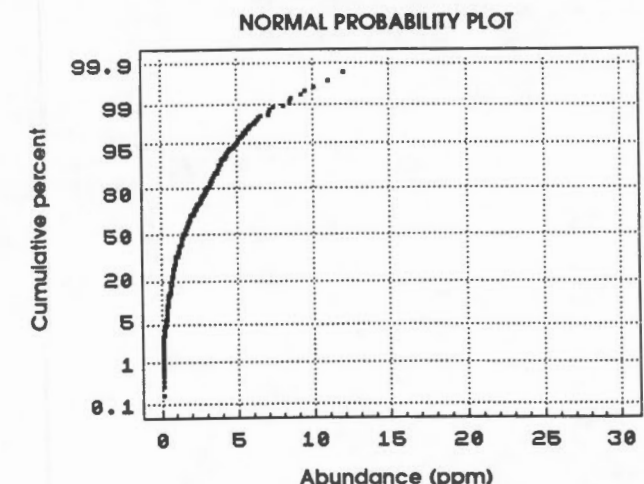
## TILL GEOCHEMISTRY NORTHERN MIRAMICHI ZONE

Project leader: MICHEL LAMOTHE

Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
GEOLOGICAL SURVEY OF CANADA  
DIVISION DE LA SCIENCE DES TERRAINS  
COMMISSION GEOLOGIQUE DU CANADA

## PLATE 15

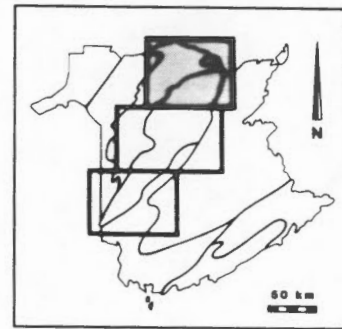


1229 samples/935 sites





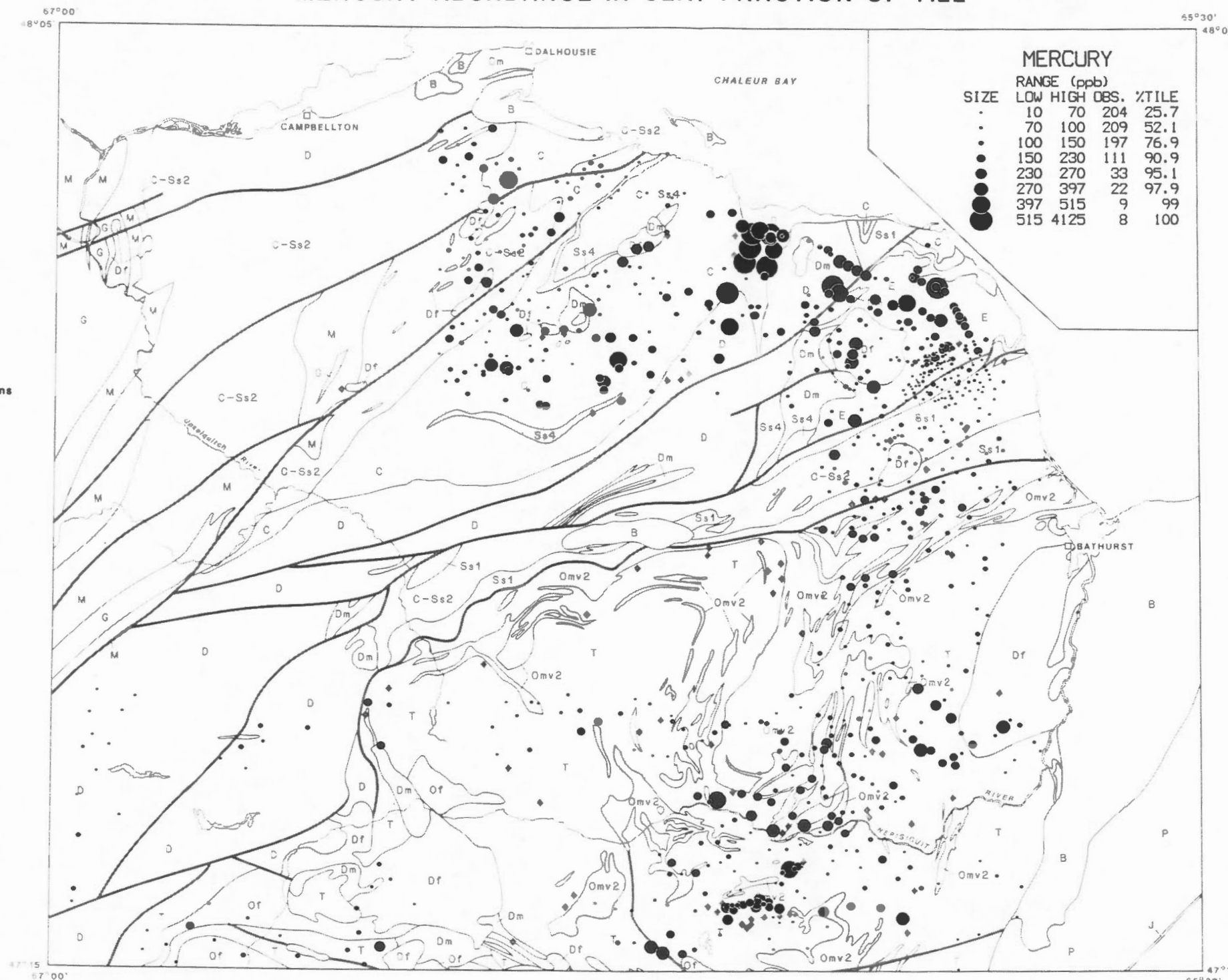
# MERCURY ABUNDANCE IN CLAY FRACTION OF TILL



- JURASSIC**  
J Caraquet Dyke
- CARBONIFEROUS**  
P Clifton Formation  
B Bonaventure and Bathurst Formations
- DEVONIAN**  
Df Granite and related rocks  
Dm Gabbro and diabase
- LOWER DEVONIAN**  
D Dalhousie Group
- SILURIAN**  
C Chaleur Group undivided  
Ss4 Agglomerate  
Ss2 Calcareous siltstone  
Ss1 Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
M Matapedia Group
- ORDOVICIAN AND OLDER**  
Of Foliated granite  
G Grog Brook Group  
E Elmtree and Fournier Groups  
T Tetagouche Group  
Omv2 Metabasalt: part of T
- Fault  
♦ Mineral occurrence

0 5 10 km

Simplified from Davies (1977)



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1:500,000

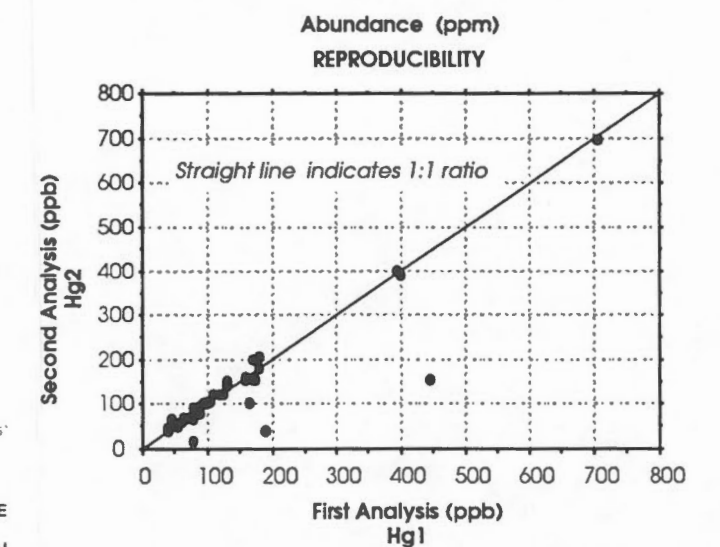
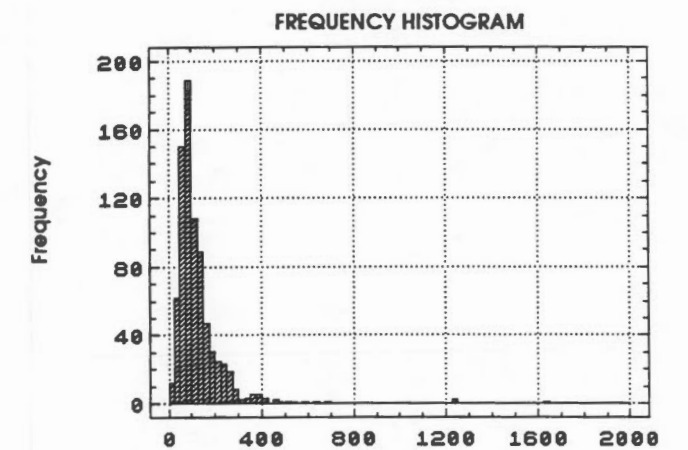
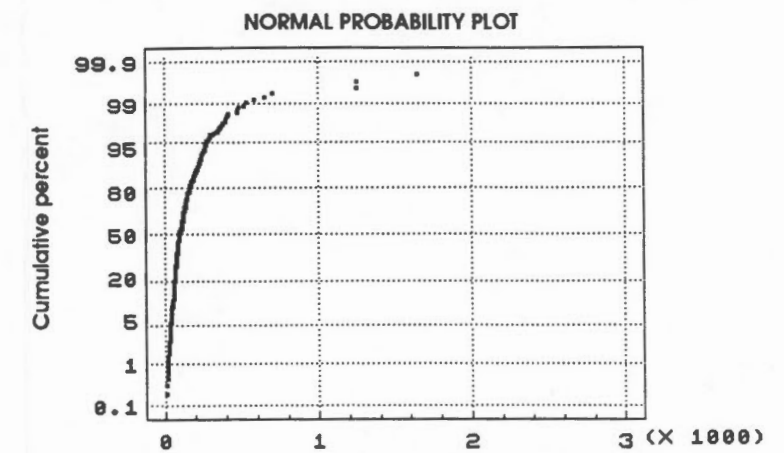
## TILL GEOCHEMISTRY NORTHERN MIRAMICHI ZONE

Project leader: MICHEL LAMOTHE

Université du Québec à Montréal

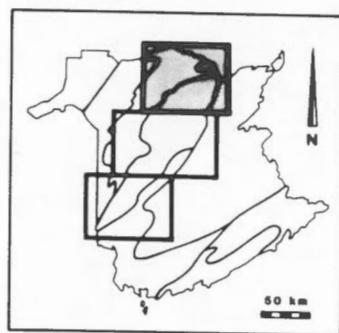
COMPILED FOR: TERRAIN SCIENCES  
GEOLOGICAL SURVEY OF CANADA  
DIVISION DE LA SCIENCE DES TERRAINS  
COMMISSION GEOLOGIQUE DU CANADA

## PLATE 16



899 samples/793 sites



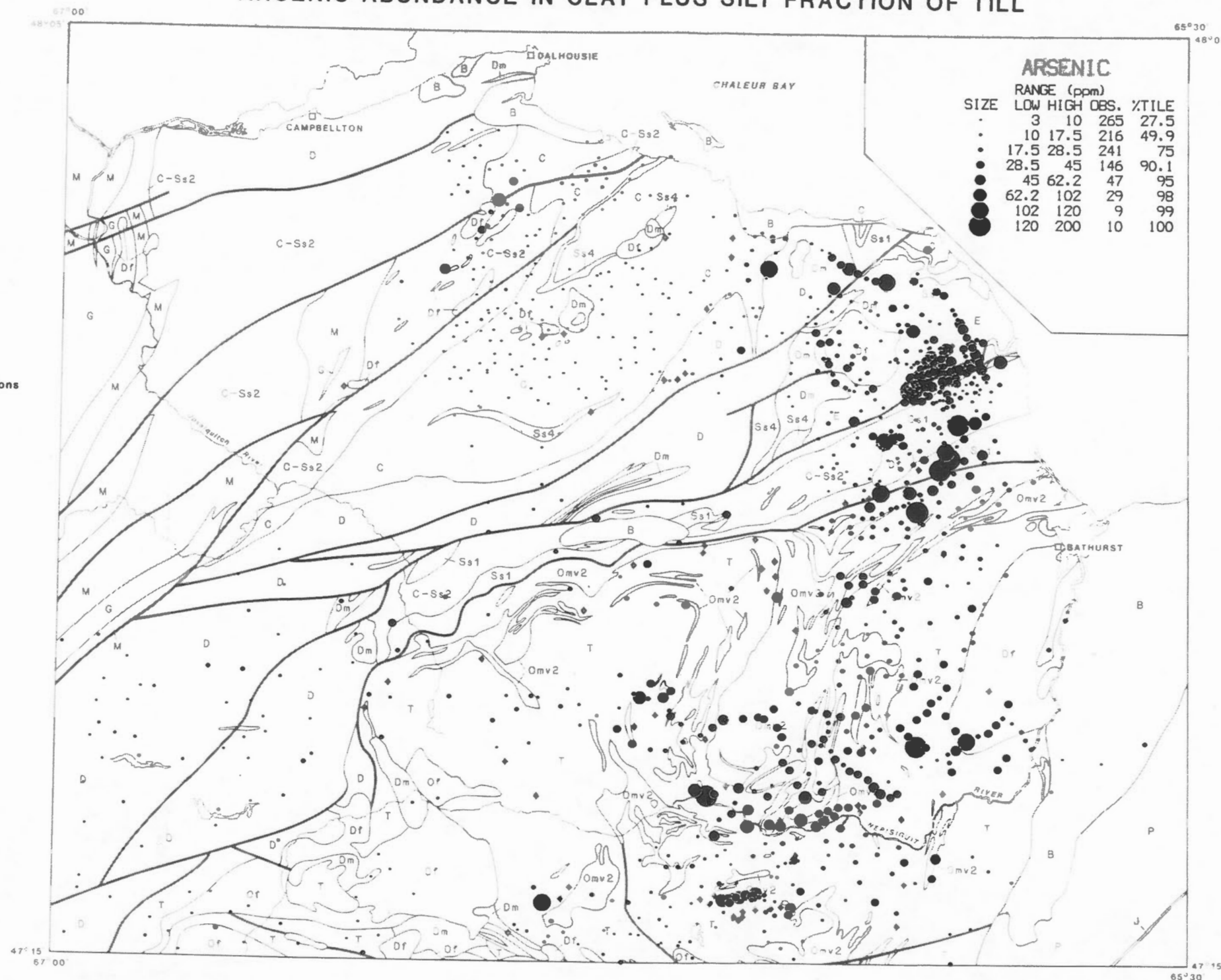


# ARSENIC ABUNDANCE IN CLAY PLUS SILT FRACTION OF TILL

- JURASSIC**  
**J** Caraquet Dyke
- CARBONIFEROUS**  
**P** Clifton Formation  
**B** Bonaventure and Bathurst Formations
- DEVONIAN**  
**Df** Granite and related rocks  
**Dm** Gabbro and diabase
- LOWER DEVONIAN**  
**D** Dalhousie Group
- SILURIAN**  
**C** Chaleur Group undivided  
**Ss4** Agglomerate  
**Ss2** Calcareous siltstone  
**Ss1** Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
**M** Metapedia Group
- ORDOVICIAN AND OLDER**  
**Of** Foliated granite  
**G** Grog Brook Group  
**E** Elmtree and Fournier Groups  
**T** Tetagouche Group  
**Omv2** Metabasalt: part of T
- Fault  
 ♦ Mineral occurrence

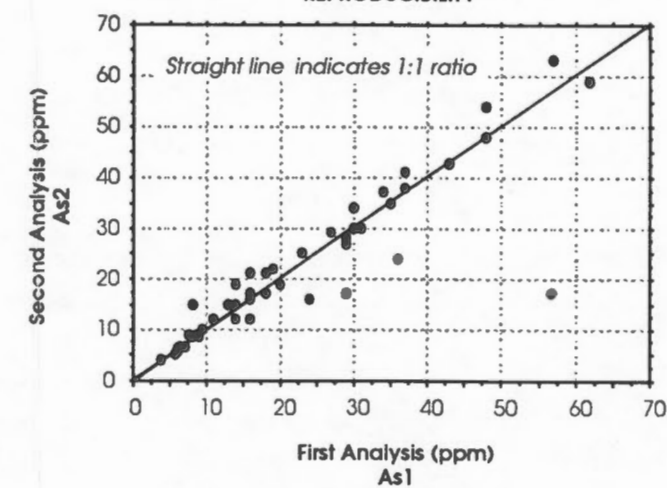
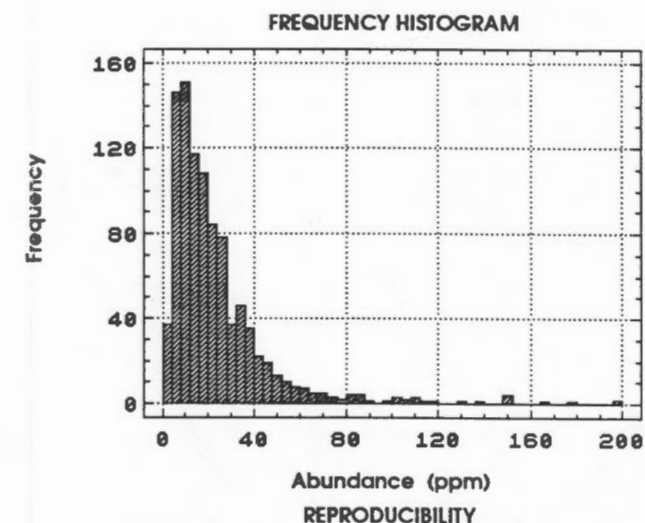
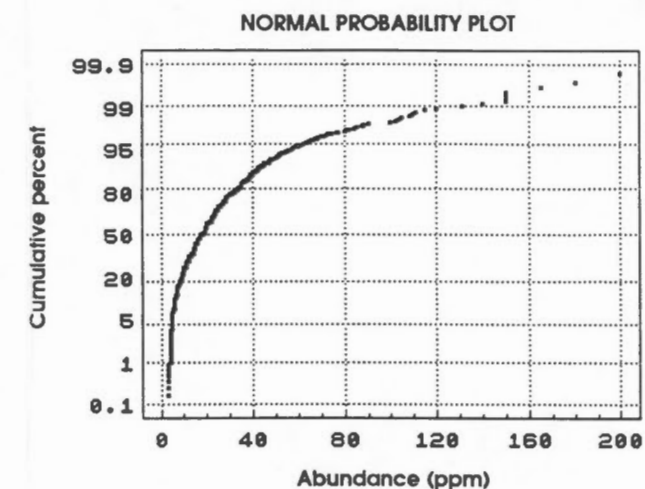
0 5 10 km

Simplified from Davies (1977)



ARSENIC				
SIZE	RANGE (ppm)		OBS.	XTILE
	LOW	HIGH		
•	3	10	265	27.5
•	10	17.5	216	49.9
•	17.5	28.5	241	75
•	28.5	45	146	90.1
•	45	62.2	47	95
•	62.2	102	29	98
•	102	120	9	99
•	120	200	10	100

## PLATE 17



1105 samples/963 sites

Contribution to Canada-New Brunswick  
 Mineral Development Agreement 1984-89,  
 a subsidiary agreement under the Economic  
 and Regional Development Agreement.  
 Project funded by the Geological Survey of Canada.

Contribution à l'Entente auxiliaire  
 Canada / Nouveau-Brunswick sur l'Exploitation  
 minière 1984-89 faisant partie de l'entente de  
 développement économique et régional. Ce projet a  
 été financé par la Commission géologique du Canada.

1:500,000

## TILL GEOCHEMISTRY NORTHERN MIRAMICHI ZONE

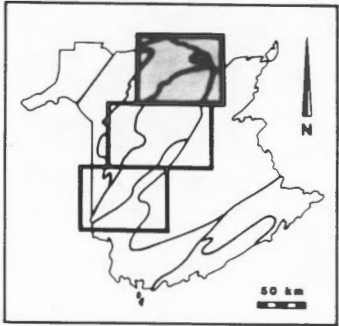
Project leader: MICHEL LAMOTHE

Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
 GEOLOGICAL SURVEY OF CANADA  
 DIVISION DE LA SCIENCE DES TERRAINS  
 COMMISSION GEOLOGIQUE DU CANADA

ANTIMONY ABUNDANCE IN CLAY PLUS SILT FRACTION OF TILL

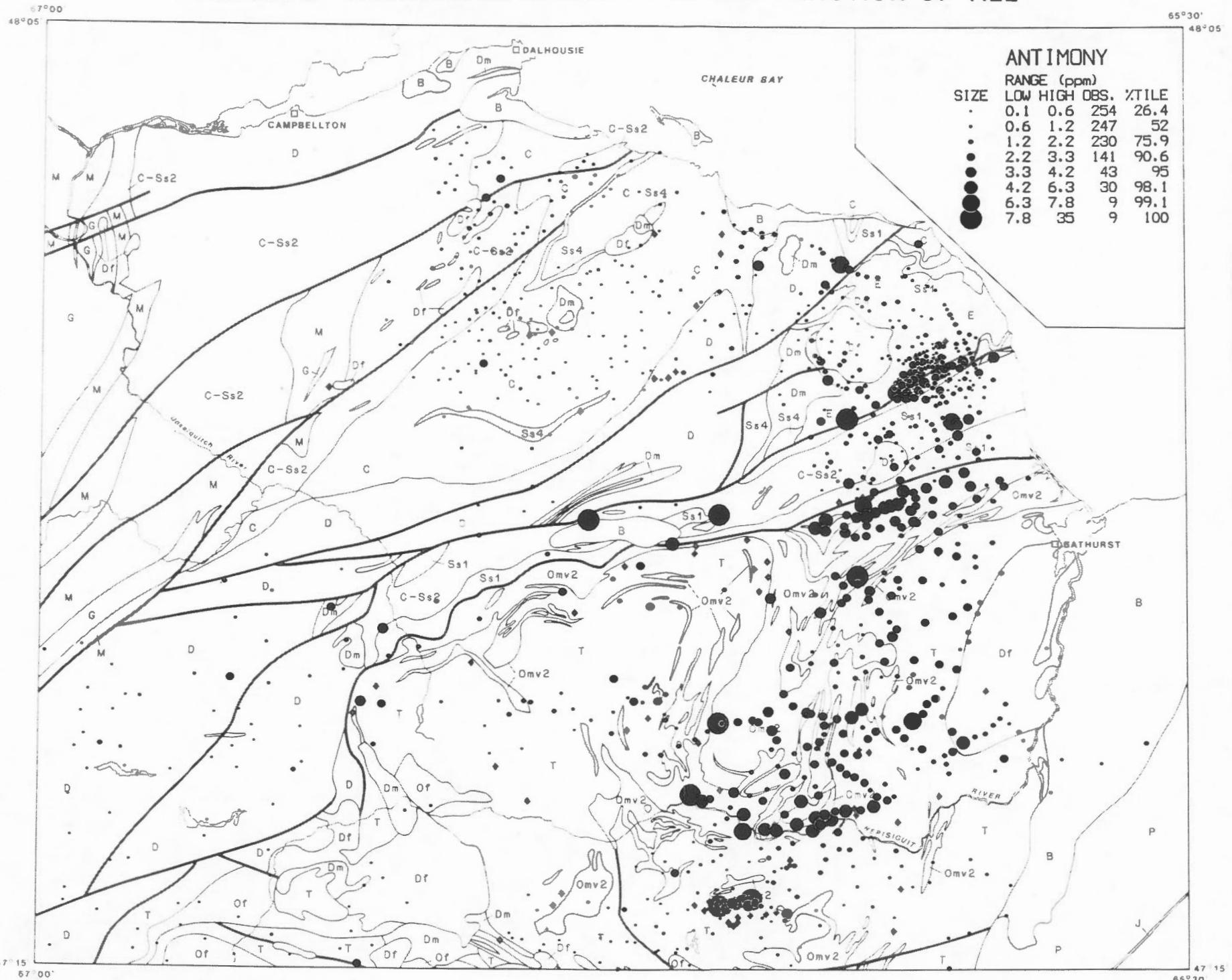
PLATE 18



- JURASSIC**  
J Caraquet Dyke
- CARBONIFEROUS**  
P Clifton Formation  
B Bonaventure and Bathurst Formations
- DEVONIAN**  
Df Granite and related rocks  
Dm Gabbro and diabase
- LOWER DEVONIAN**  
D Dalhousie Group
- SILURIAN**  
C Chaleur Group undivided  
Ss4 Agglomerate  
Ss2 Calcareous siltstone  
Ss1 Greywacke
- ORDOVICIAN AND/OR SILURIAN**  
M Matapedia Group
- ORDOVICIAN AND OLDER**  
Of Foliated granite  
G Grog Brook Group  
E Elnetree and Fournier Groups  
T Tetagouche Group  
Omv2 Metabasalt: part of T
- Fault  
♦ Mineral occurrence

0 5 10 km

Simplified from Davies (1977)



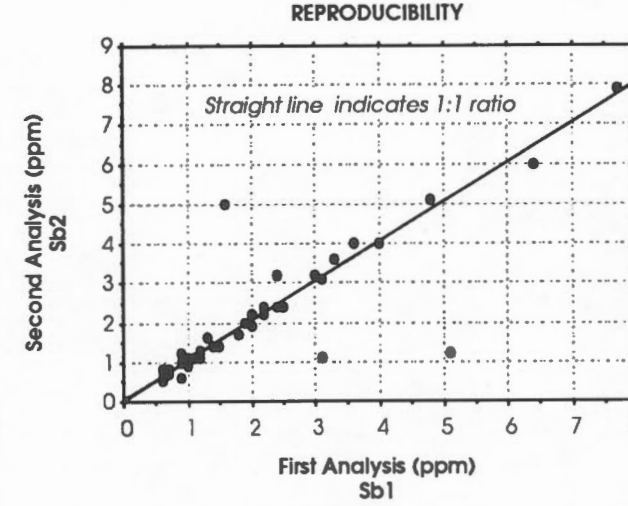
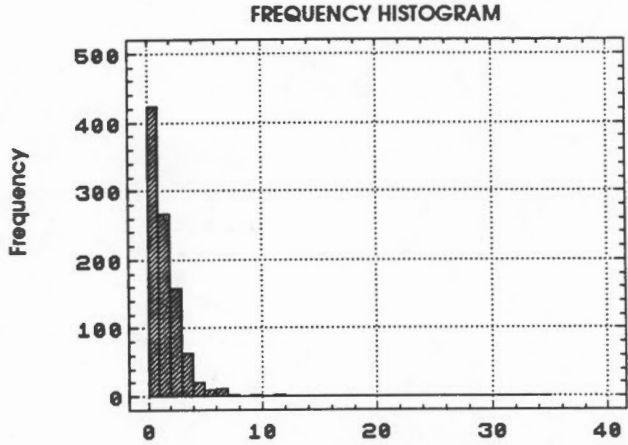
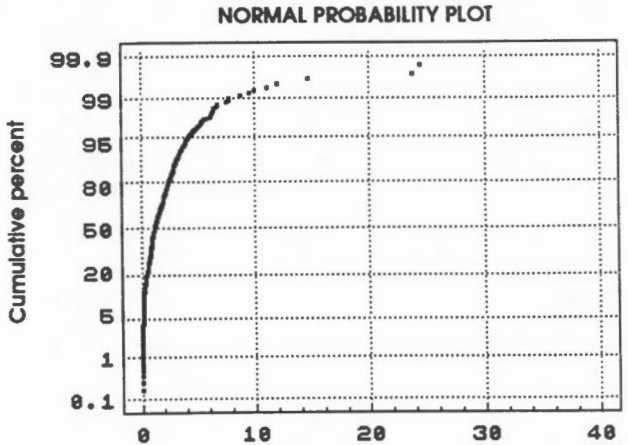
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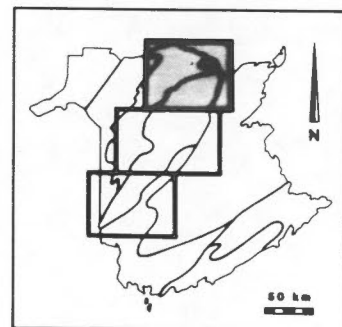
1:500,000  
TILL GEOCHEMISTRY  
NORTHERN MIRAMICHI ZONE

Project leader: MICHEL LAMOTHE  
Université du Québec à Montréal

COMPILED FOR: TERRAIN SCIENCES  
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DIVISION DE LA SCIENCE DES TERRAINS  
COMMISSION GEOLOGIQUE DU CANADA



1105 samples/963 sites

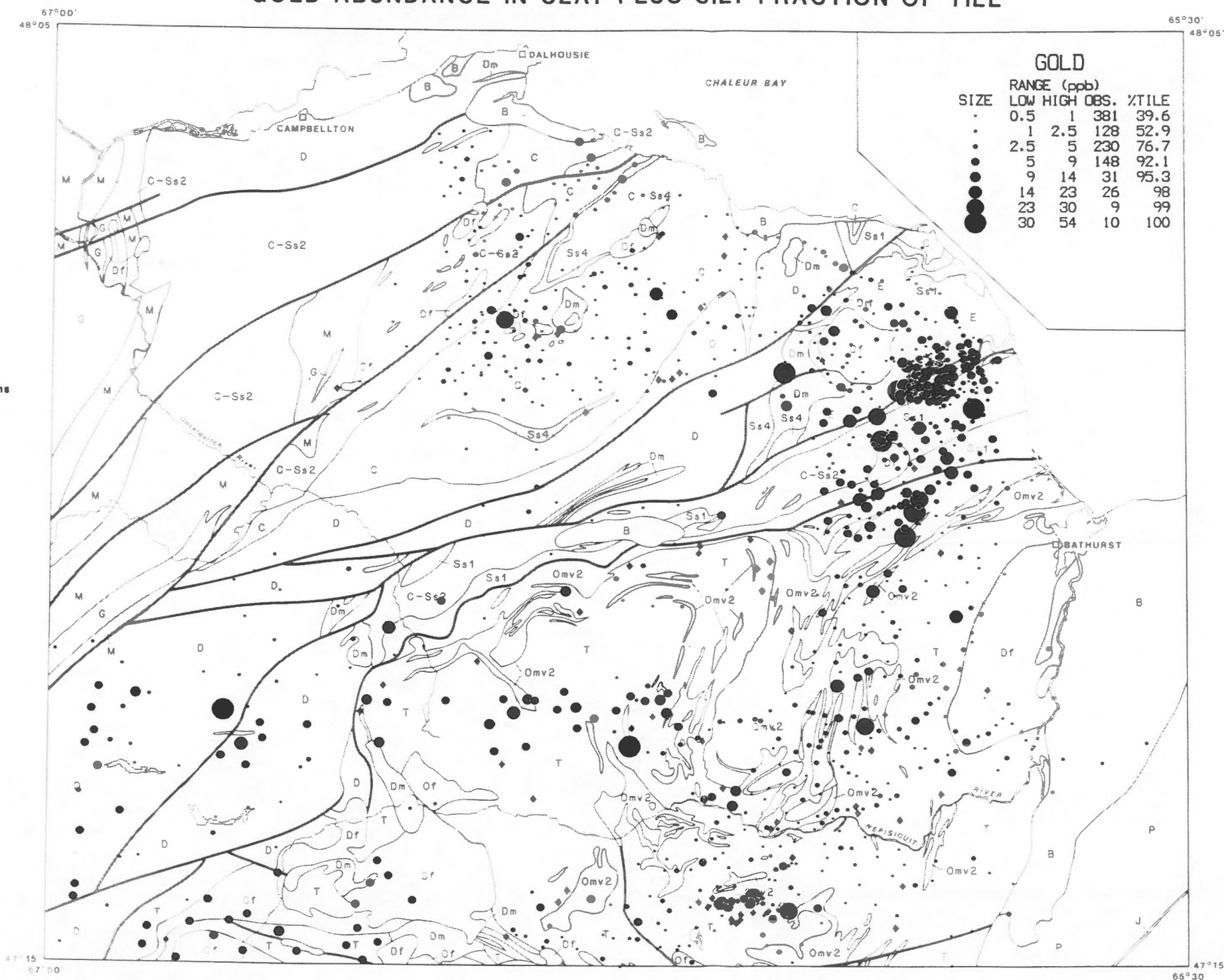


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E Elmtree and Fournier Groups  
T Tetagouche Group  
Omv2 Metabasalt: part of T
- Fault  
♦ Mineral occurrence

0 5 10 km

Simplified from Davies (1977)

## GOLD ABUNDANCE IN CLAY PLUS SILT FRACTION OF TILL



Contribution to Canada-New Brunswick  
Mineral Development Agreement 1984-89,  
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Contribution à l'Entente auxiliaire  
Canada / Nouveau-Brunswick sur l'Exploitation  
minérale 1984-89, faisant partie de l'entente de  
développement économique et régional. Ce projet a  
été financé par la Commission géologique du Canada.

1:500,000

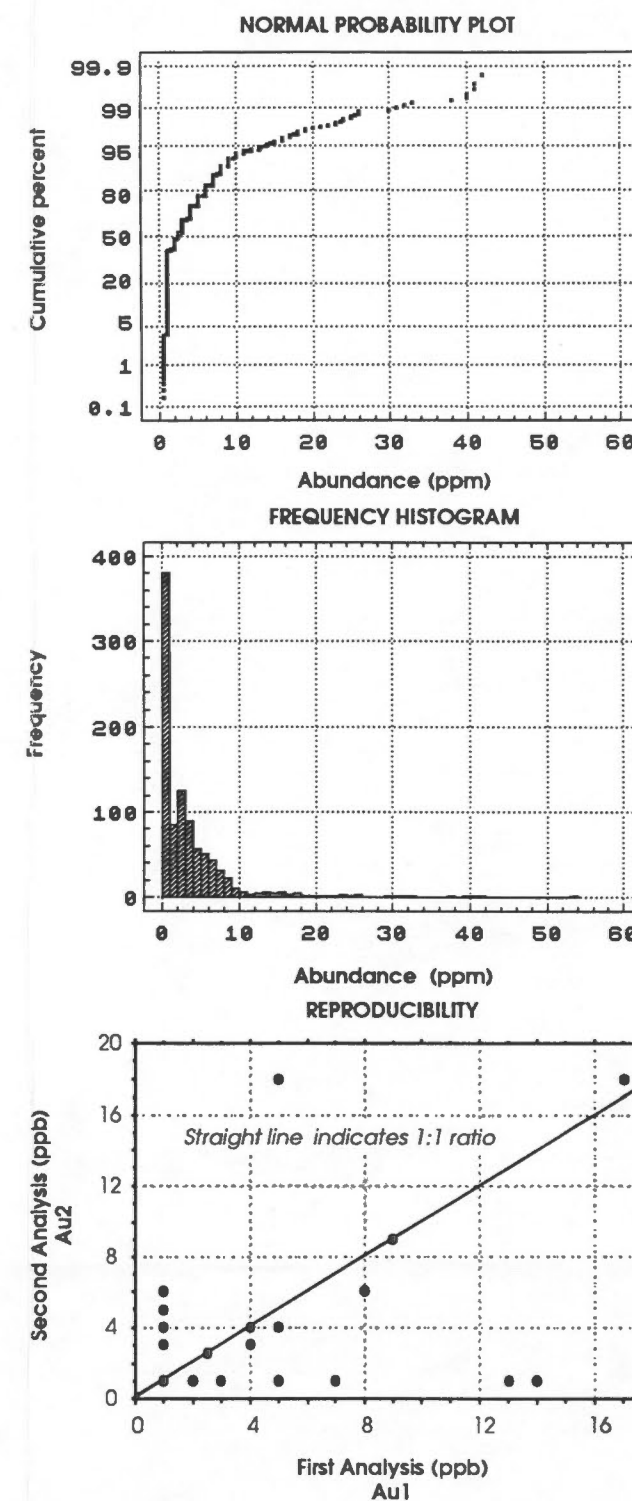
## TILL GEOCHEMISTRY NORTHERN MIRAMICHI ZONE

Project leader: MICHEL LAMOTHE

Université du Québec à Montréal

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GEOLOGICAL SURVEY OF CANADA  
DIVISION DE LA SCIENCE DES TERRAINS  
COMMISSION GEOLOGIQUE DU CANADA

## PLATE 19



1105 samples/963 sites