



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada



GlobalSoilMap.net

Canada

Data, Issues and Results



Purpose

- To develop raster products following GlobalSoilMap.net specifications
 - Weighted mean
 - Spline
- Raster product from Soil Landscapes of Canada ver. 3.22 components
- Evaluate the ver. 0.1 products and data for future versions
- Raster product from Provincial Detail Soil components
- Evaluate the ver. 0.5 products and data for future versions
- Utilize the NSDB Soil Layer and Soil Names tables

Process

- Create raster in ArcGIS from the SLC and available Provincial coverages
 - The data is not continuous, still controlled by soil components and grouped by polygons
- Utilize the value field of the raster table as link to created raster datasets
- Create XBase algorithm
- Process data through routine
 - Weighted Mean
 - Spline (SLC)
- Create maps and graphics

Data Manipulation

- Populate GSM attribute table by fixed depths
 - 0-5
 - 5-15
 - 15-30
 - 30-60
 - 60-100
 - 100-200
- Remove surface LFH layers for calculation
- Layer table data in the NSDB for the most part goes to a depth of 100 cm.
 - Records exist that exceed this depth
- Created a new horizon that duplicates the last horizon to a depth of 200 cm.
- Develop routine to convert spline data to data table

Data Manipulation

- Attributes
 - Organic Carbon
 - pH
 - Clay
 - Sand
 - Silt
 - Coarse Fragments
 - Electrical Conductivity
 - Bulk Density
 - Available Water Holding Capacity

Data Issues

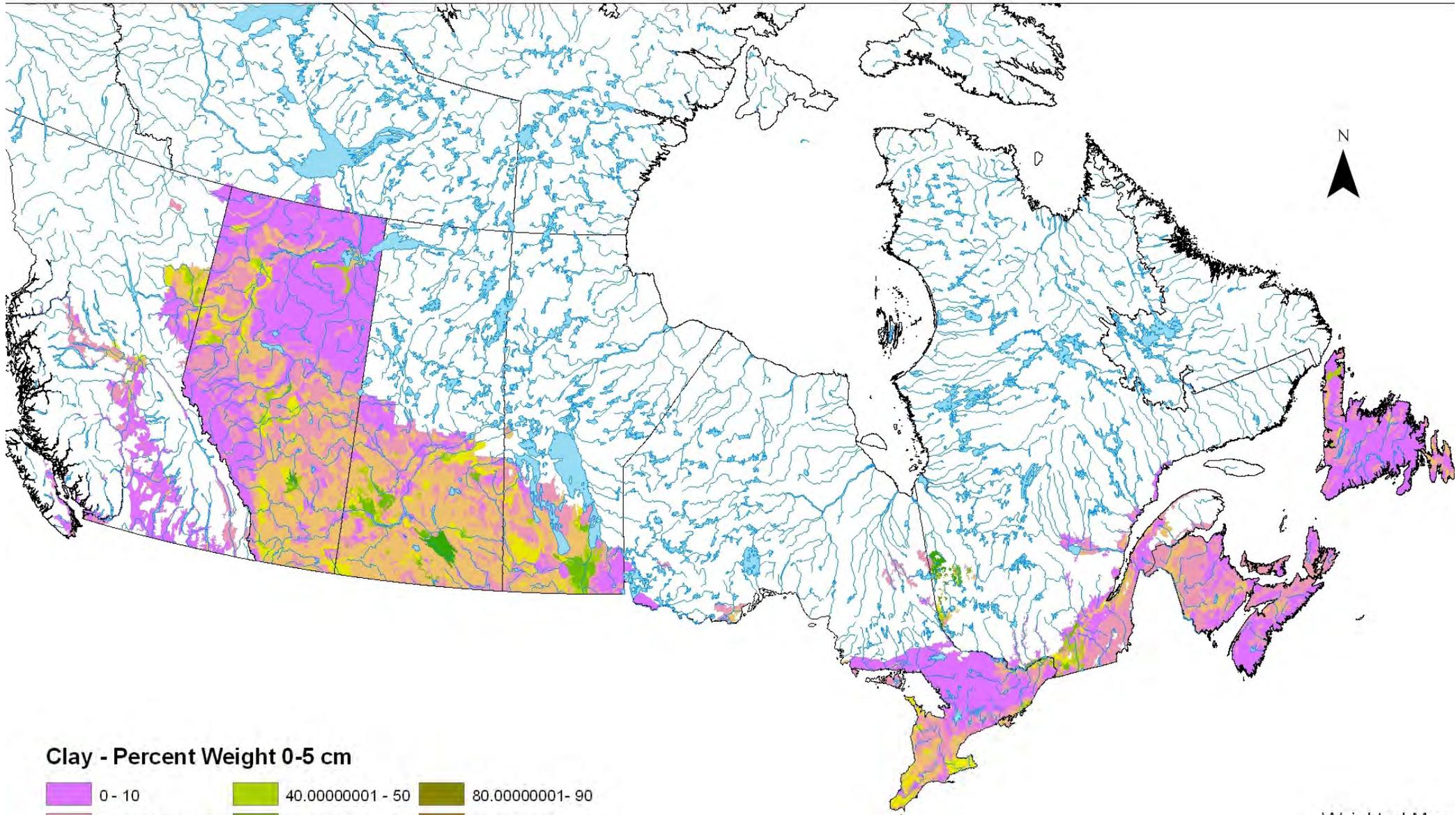
- GSM Specifications changed during processing
 - Units for Clay, Sand, Silt changed from g/Kg to % weight
 - Units for Coarse fragments changed from g/Kg to % volume
- Rock layers in components skewing weighted average
 - New set of SLC products showing percent rock occupying polygon
- Spline routine changed to new version
- Spline data contains negative values

Results

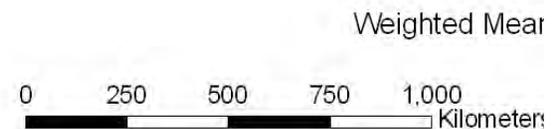
- ArcGIS map products
 - SLC → 108 mxd files
 - Rock modification → 54 mxd files
 - Detail data
 - 7 provinces at 54 mxd files per province
- Graphics
 - SLC → 108 jpg files
 - Rock Modification → 54 jpg files
 - Detail data
 - 378 jpg files

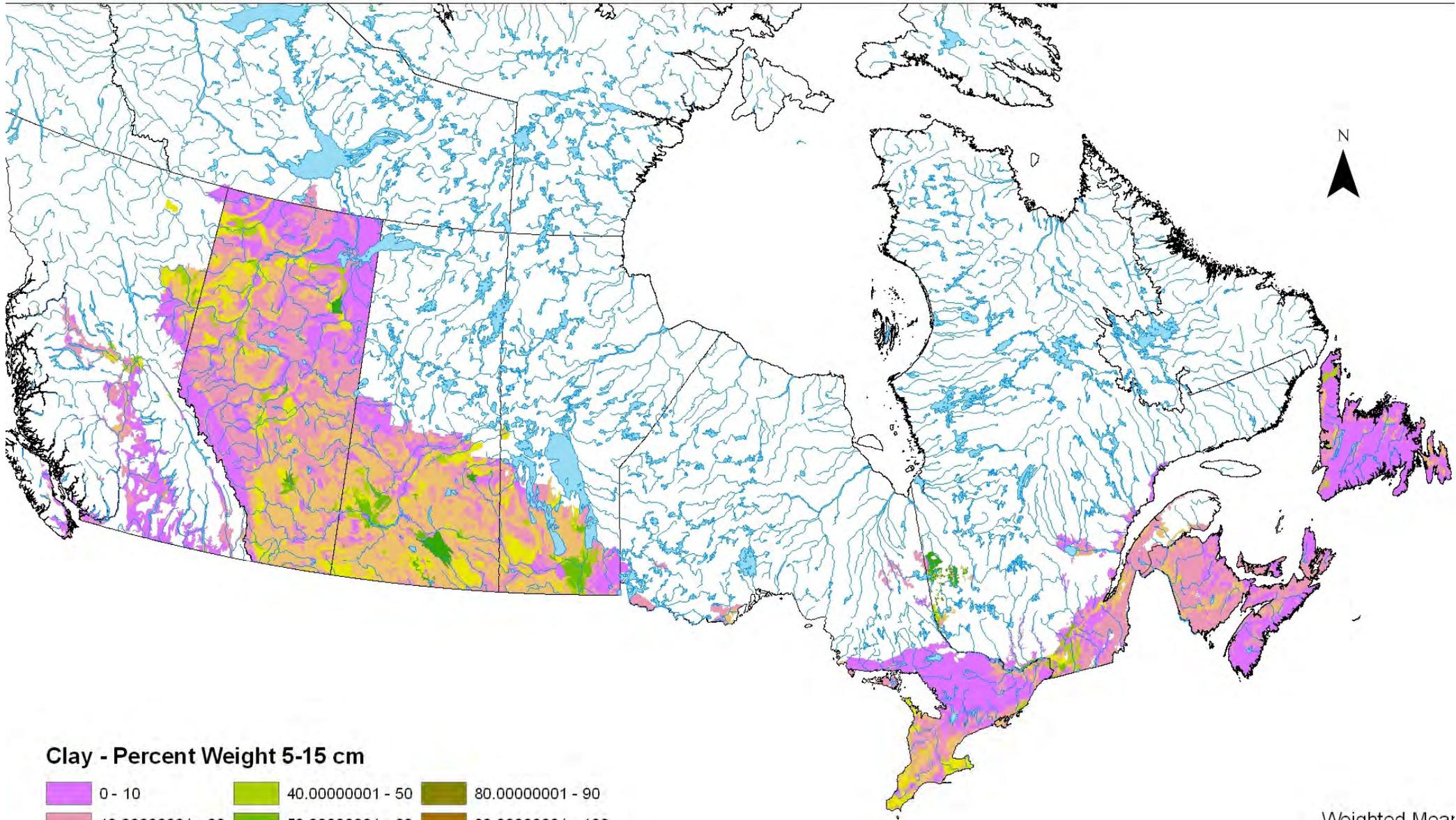
Soil Landscapes of Canada

Weighted Mean data example



Clay - Percent Weight 0-5 cm



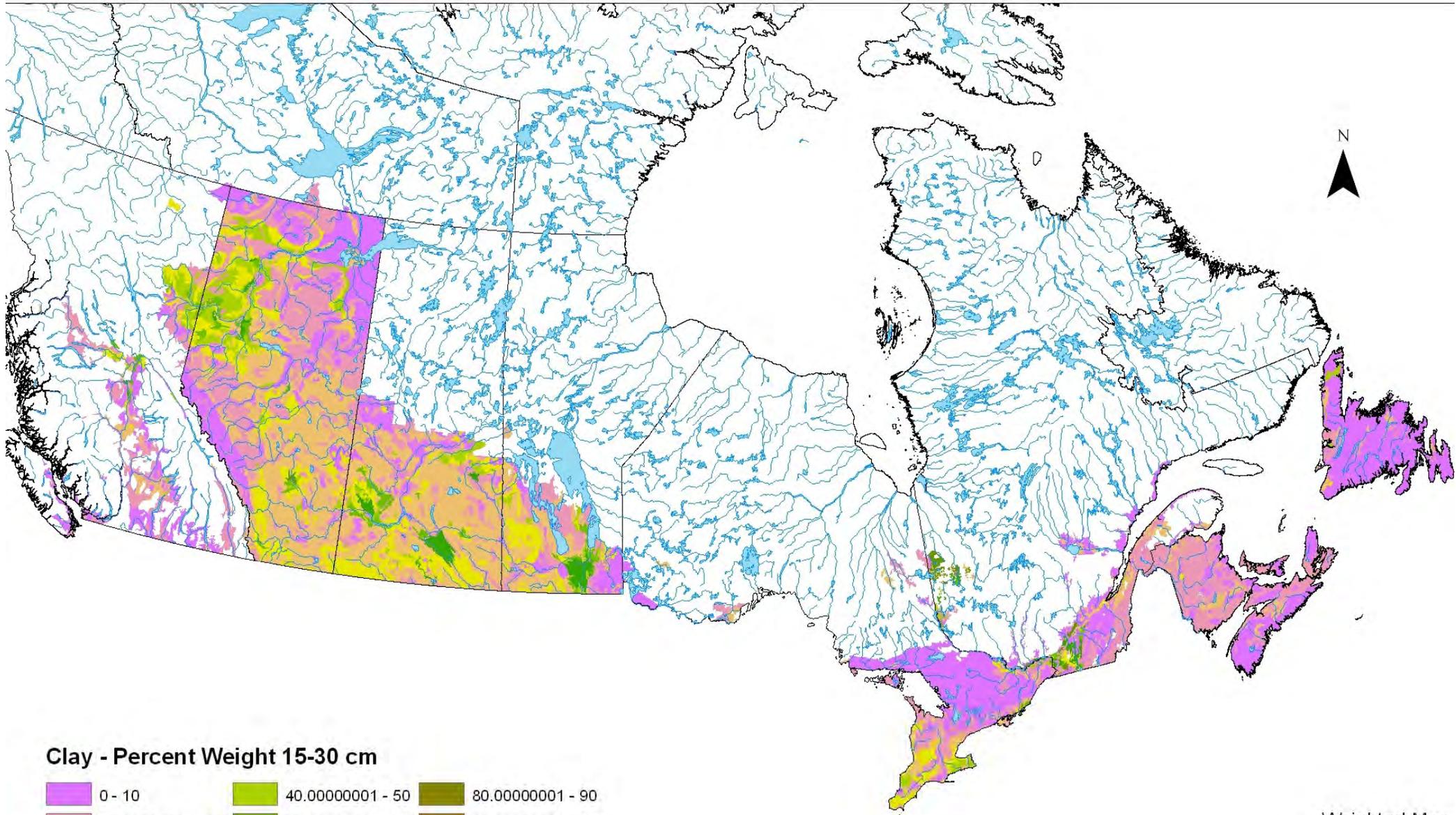


Clay - Percent Weight 5-15 cm

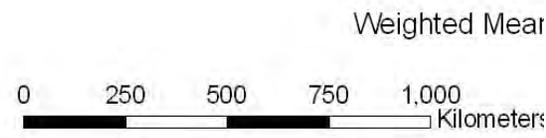


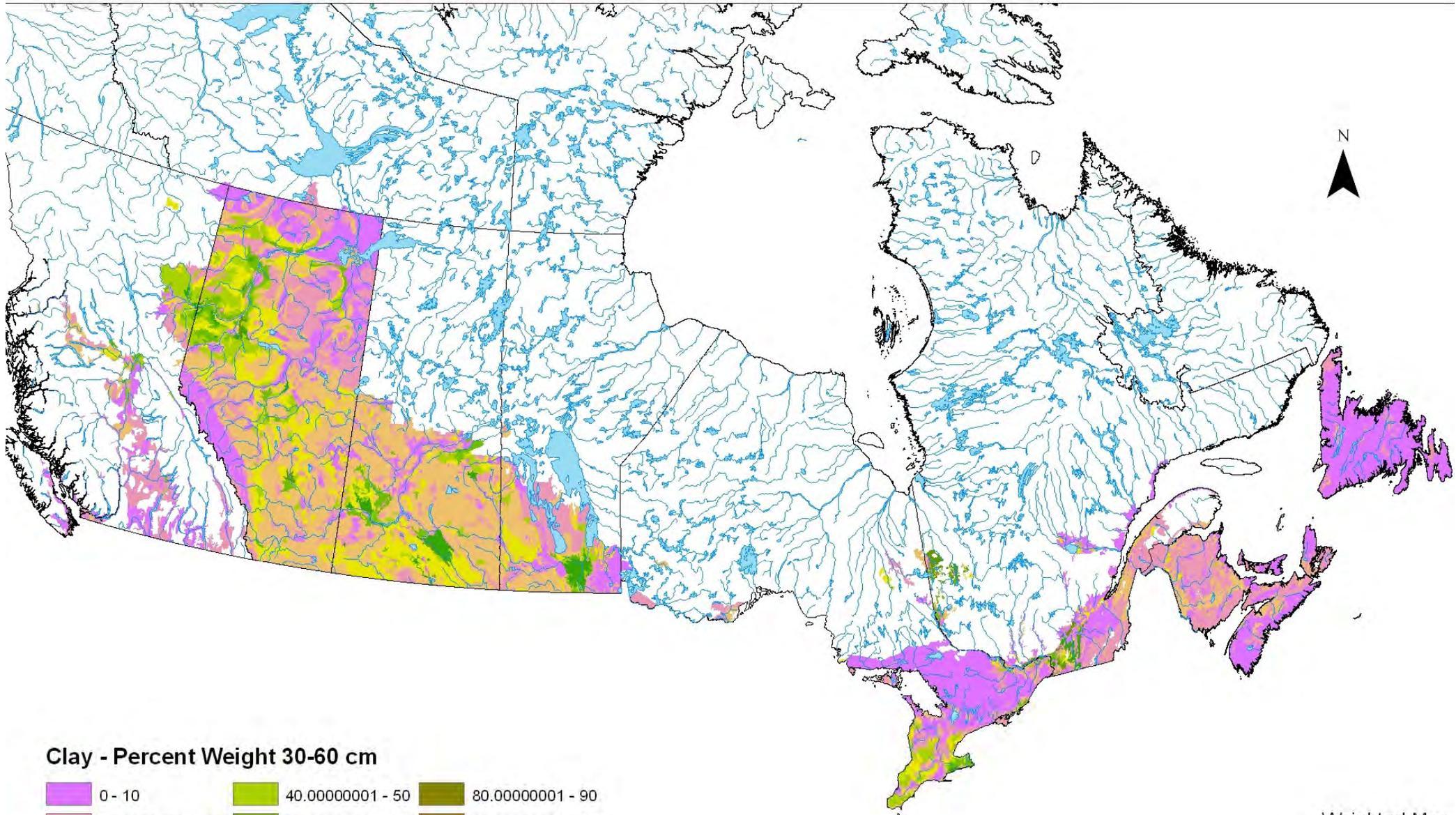
Weighted Mean



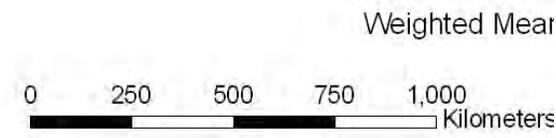


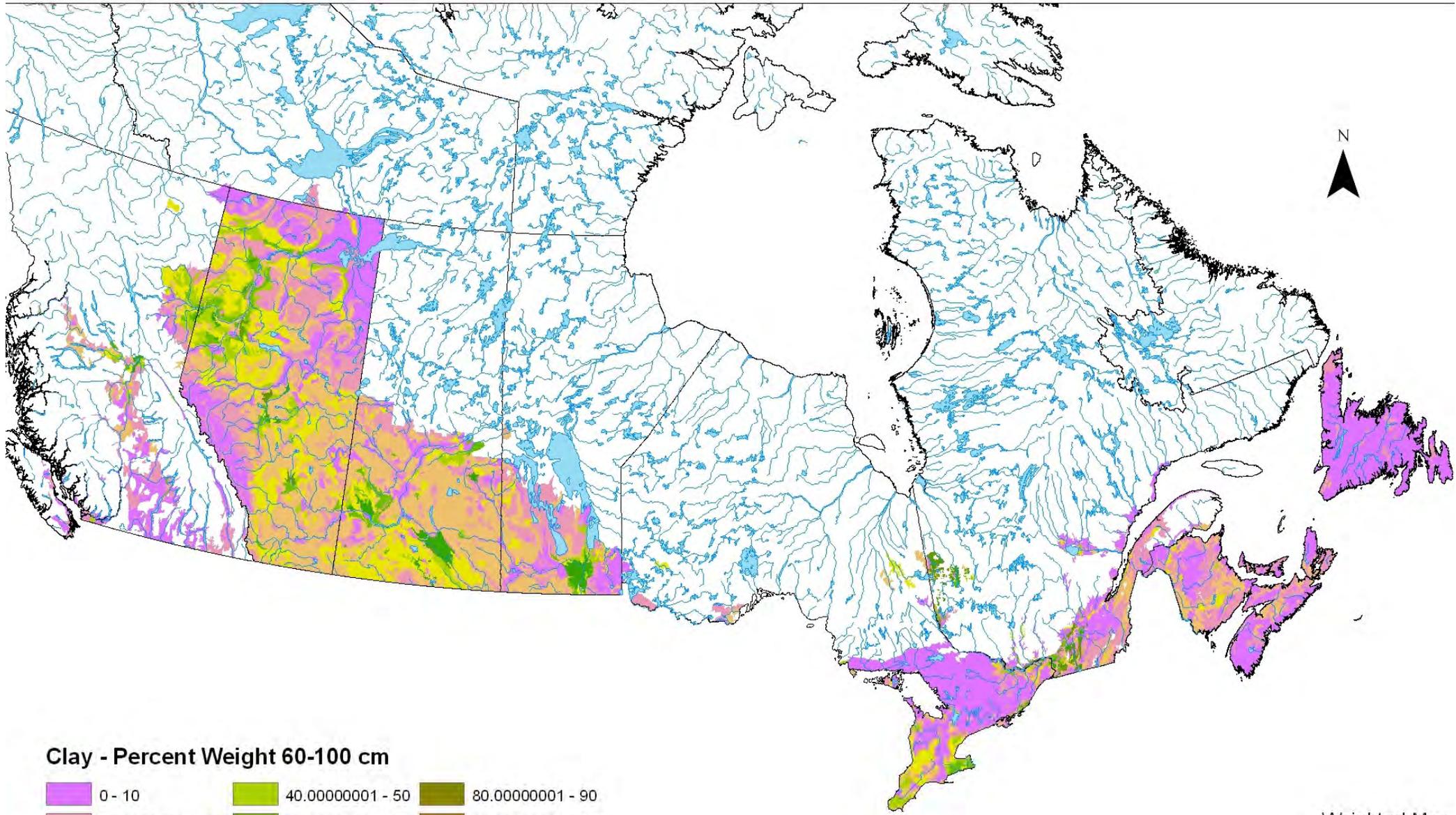
Clay - Percent Weight 15-30 cm





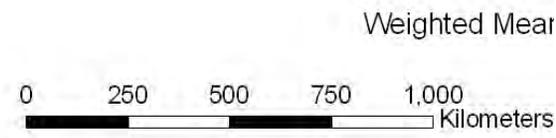
Clay - Percent Weight 30-60 cm

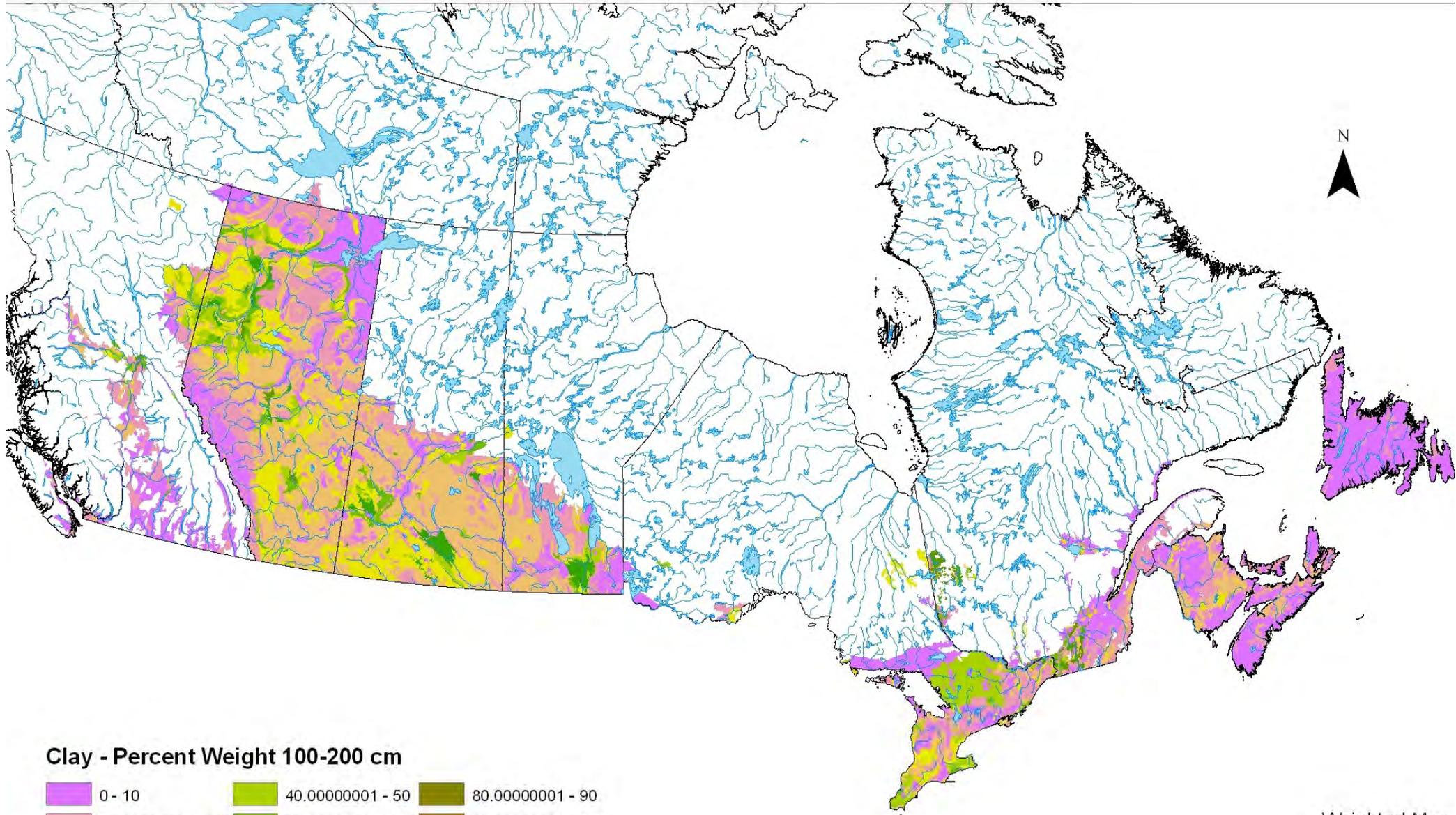




Clay - Percent Weight 60-100 cm

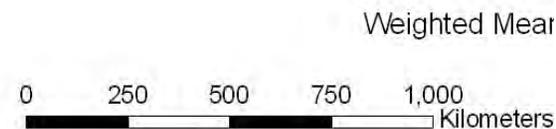
0 - 10	40.00000001 - 50	80.00000001 - 90
10.00000001 - 20	50.00000001 - 60	90.00000001 - 100
20.00000001 - 30	60.00000001 - 70	
30.00000001 - 40	70.00000001 - 80	





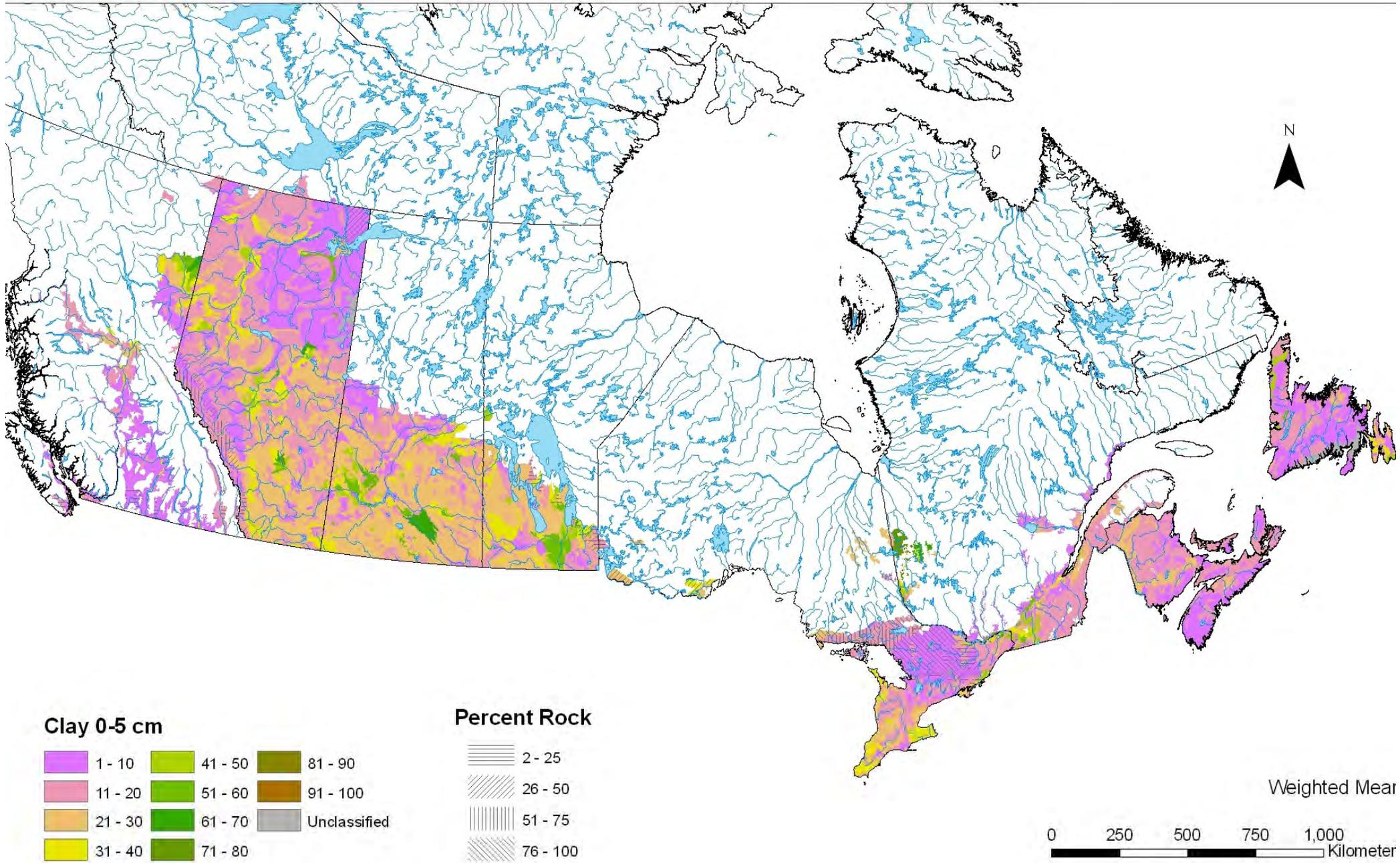
Clay - Percent Weight 100-200 cm

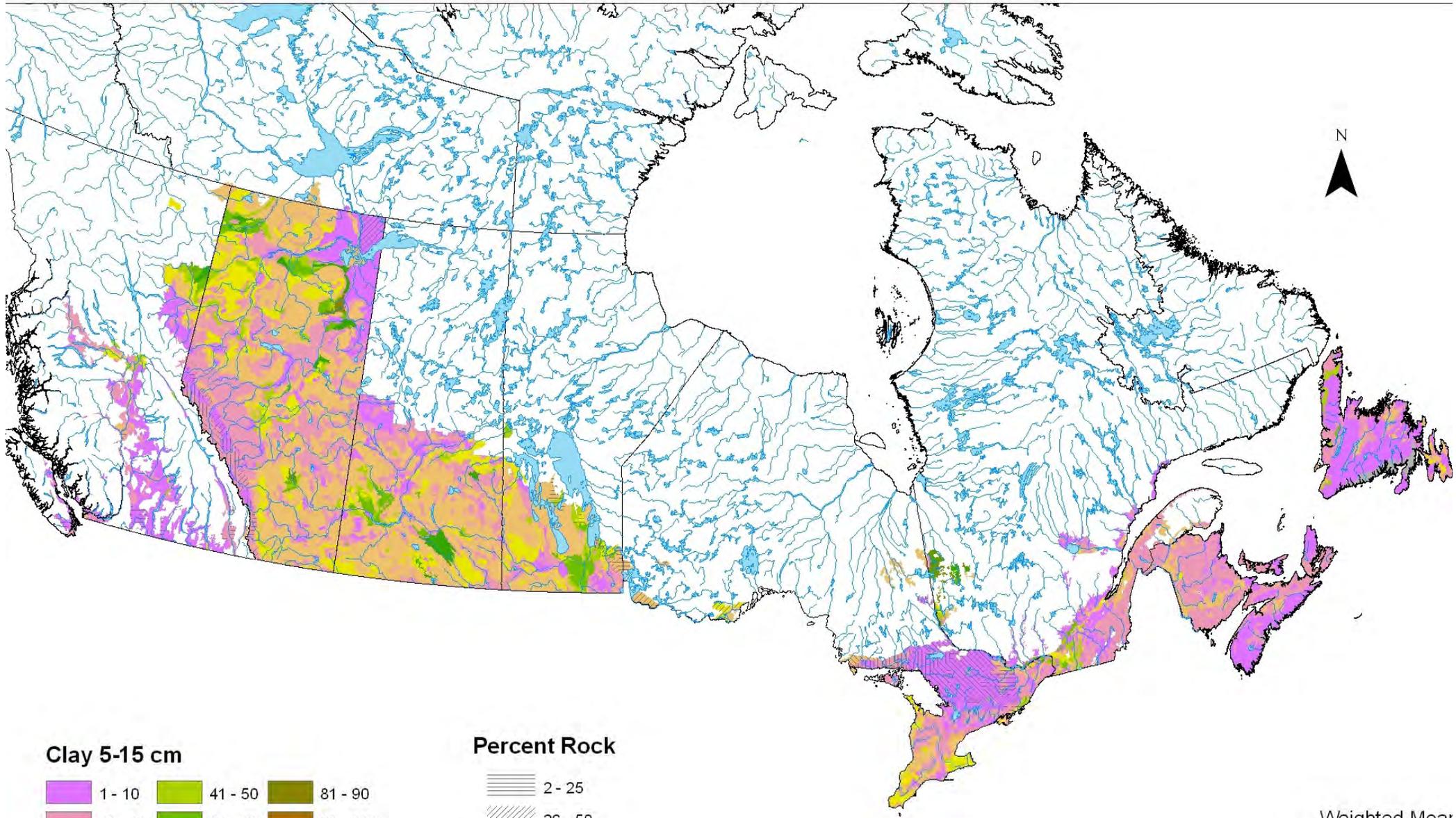
0 - 10	40.00000001 - 50	80.00000001 - 90
10.00000001 - 20	50.00000001 - 60	90.00000001 - 100
20.00000001 - 30	60.00000001 - 70	
30.00000001 - 40	70.00000001 - 80	



Soil Landscapes of Canada

Weighted Mean Rock component example



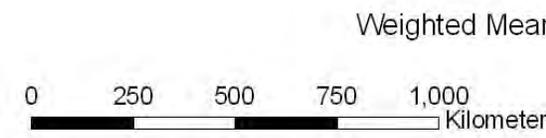


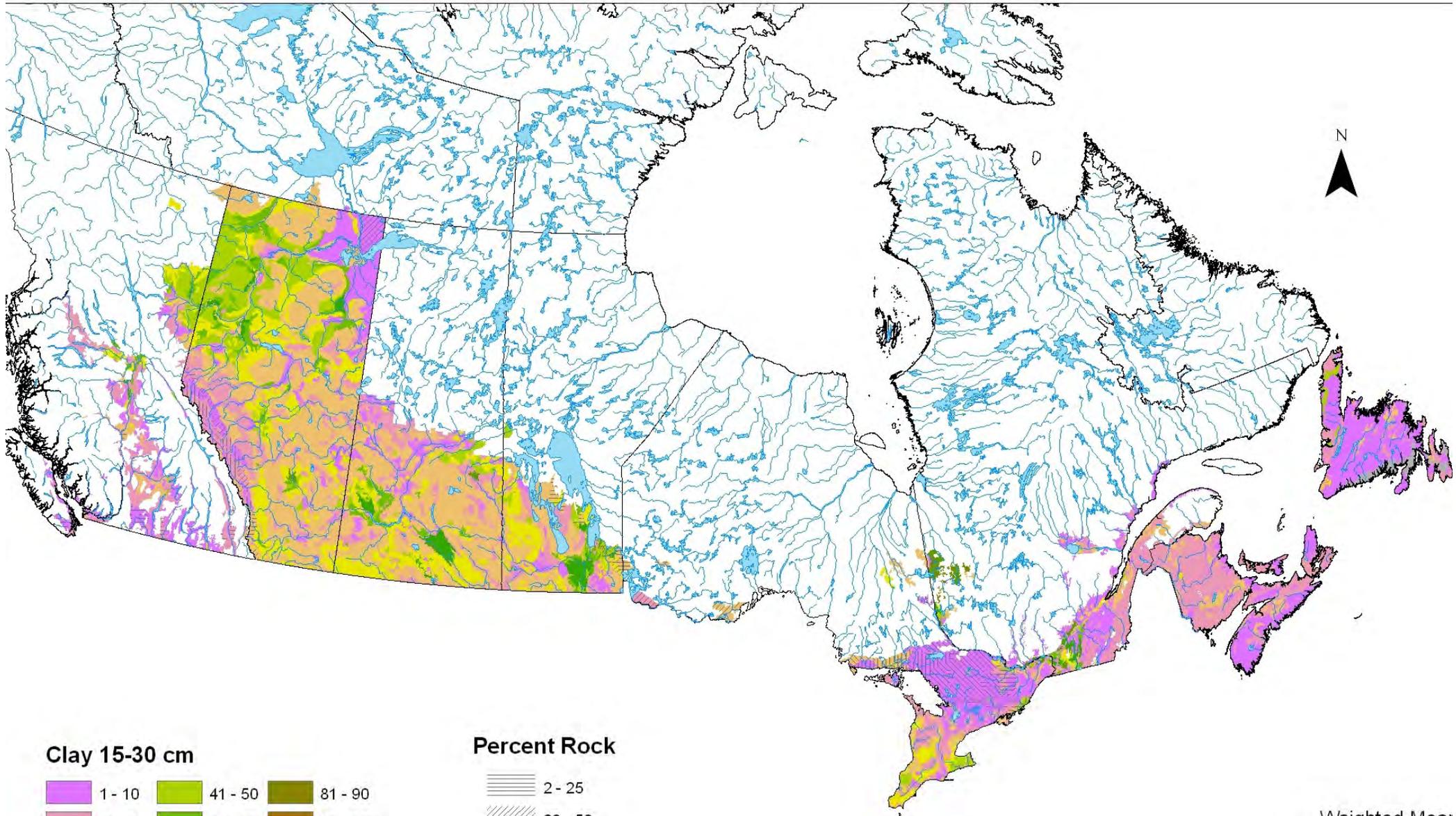
Clay 5-15 cm

	1 - 10		41 - 50		81 - 90
	11 - 20		51 - 60		91 - 100
	21 - 30		61 - 70		Unclassified
	31 - 40		71 - 80		

Percent Rock

	2 - 25
	26 - 50
	51 - 75
	76 - 100



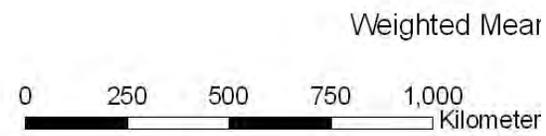


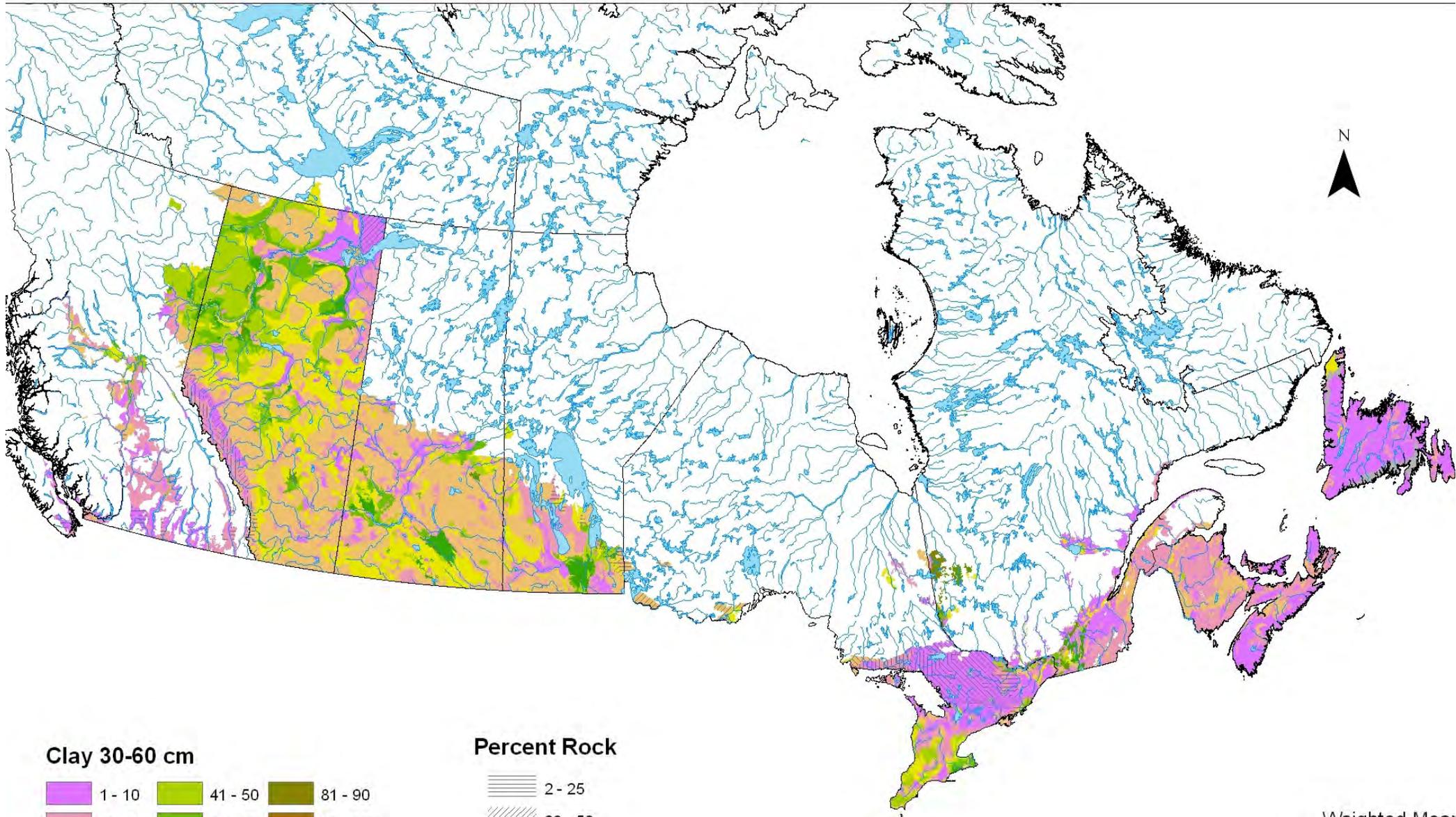
Clay 15-30 cm

1 - 10	41 - 50	81 - 90
11 - 20	51 - 60	91 - 100
21 - 30	61 - 70	Unclassified
31 - 40	71 - 80	

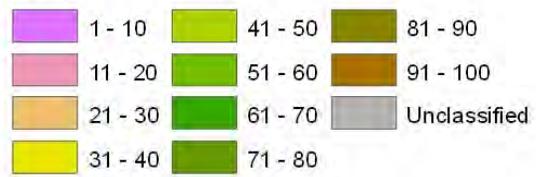
Percent Rock

2 - 25
26 - 50
51 - 75
76 - 100

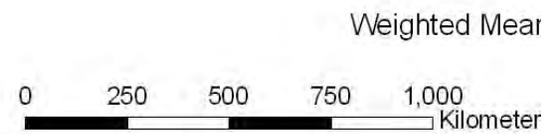
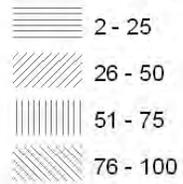


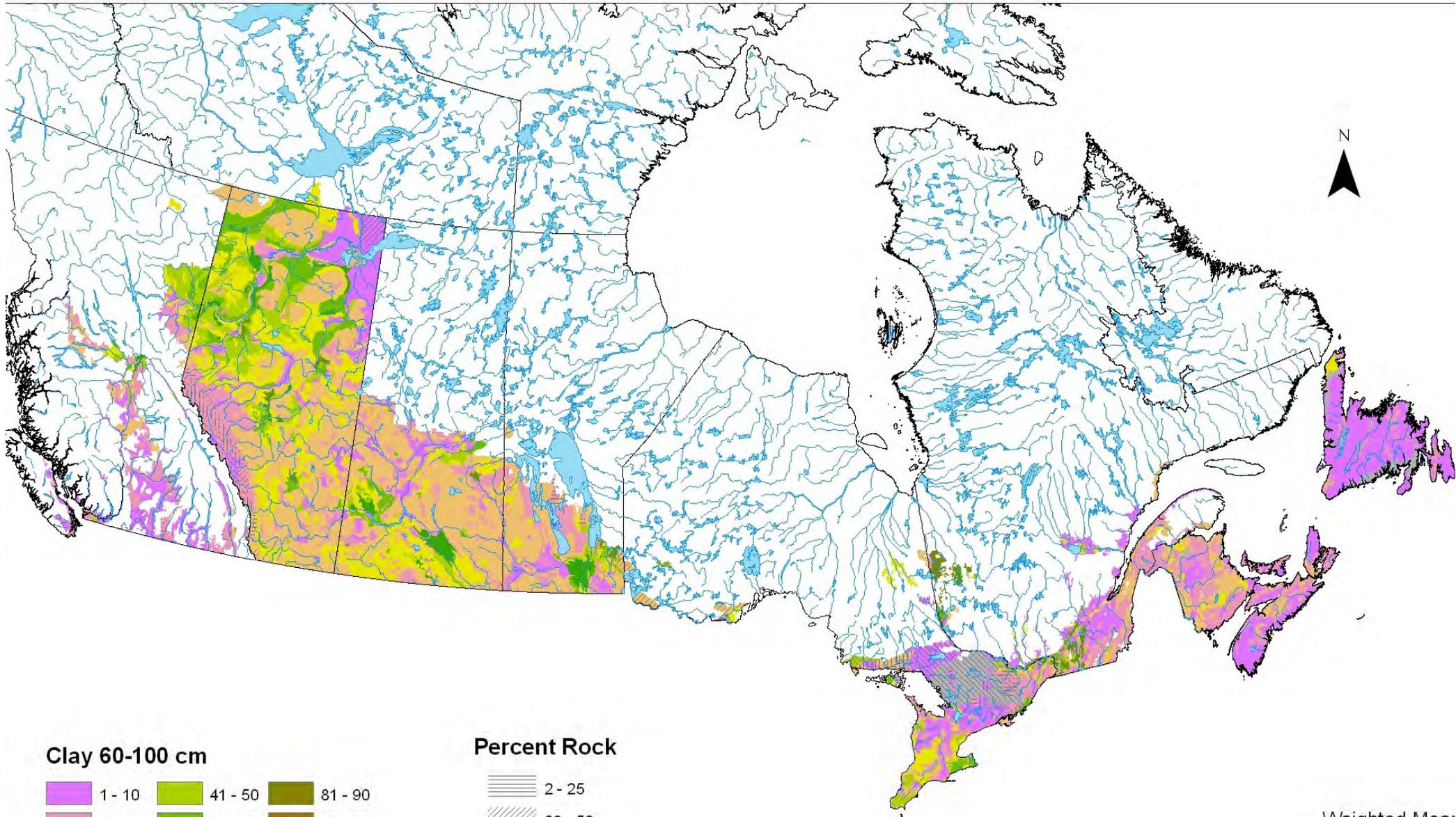


Clay 30-60 cm



Percent Rock





Clay 60-100 cm

1 - 10	41 - 50	81 - 90
11 - 20	51 - 60	91 - 100
21 - 30	61 - 70	Unclassified
31 - 40	71 - 80	

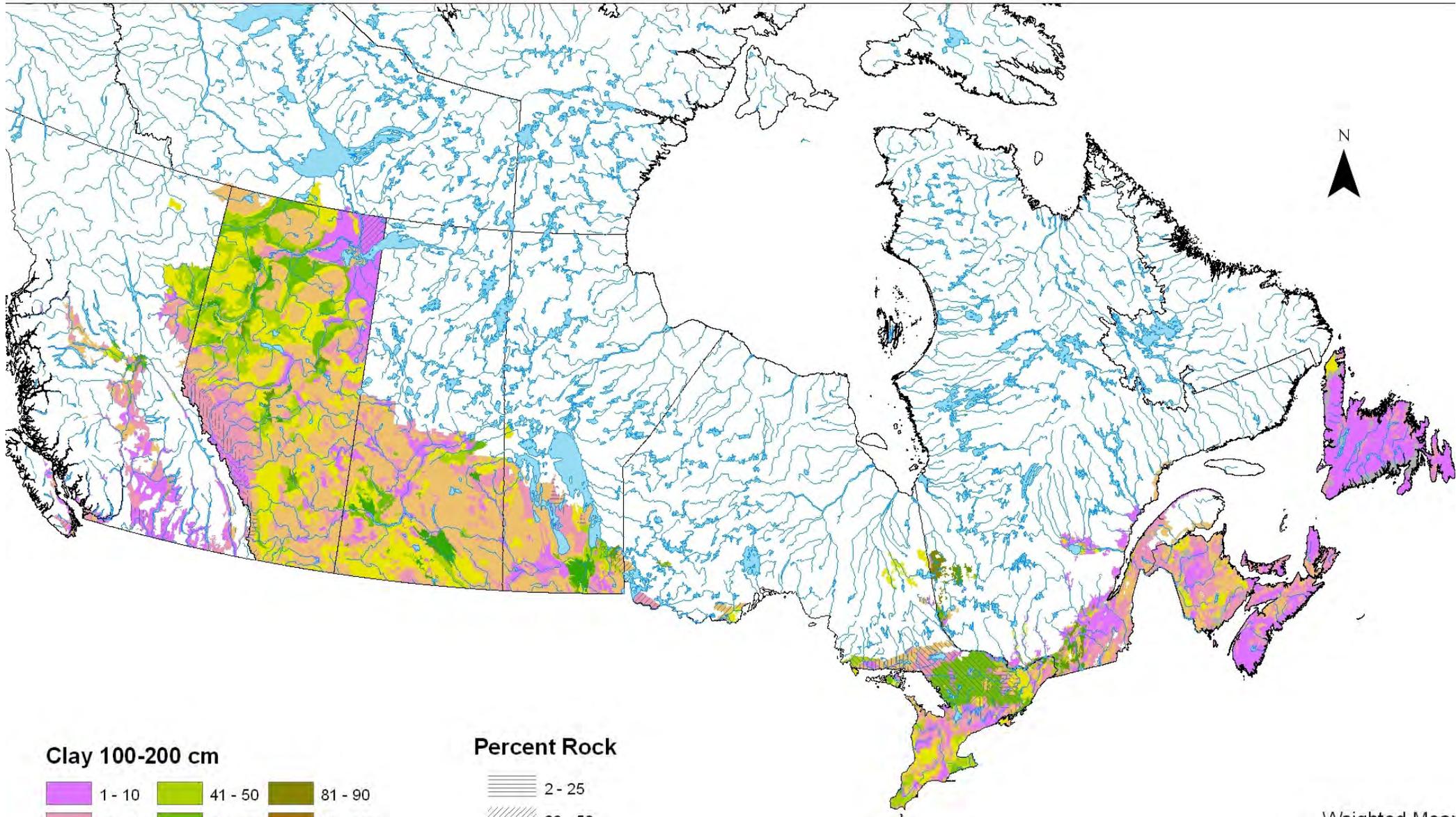
Percent Rock

2 - 25
26 - 50
51 - 75
76 - 100

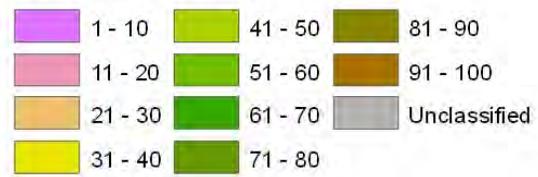


0 250 500 750 1,000
Kilometer

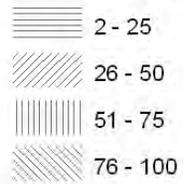
Weighted Mean



Clay 100-200 cm



Percent Rock

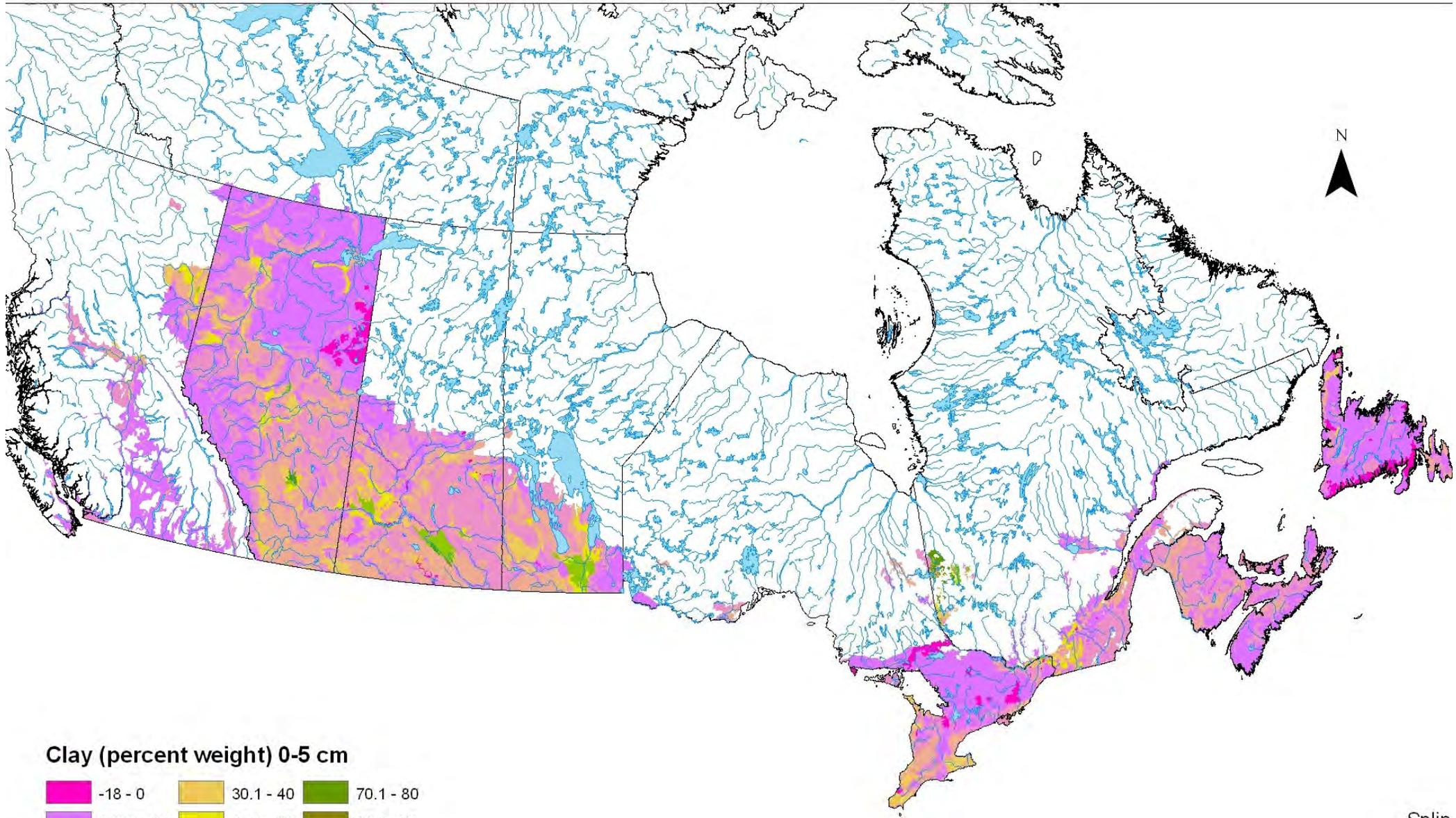


Weighted Mean

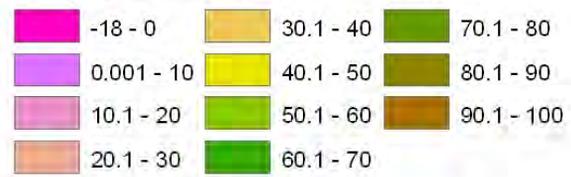


Soil Landscapes of Canada

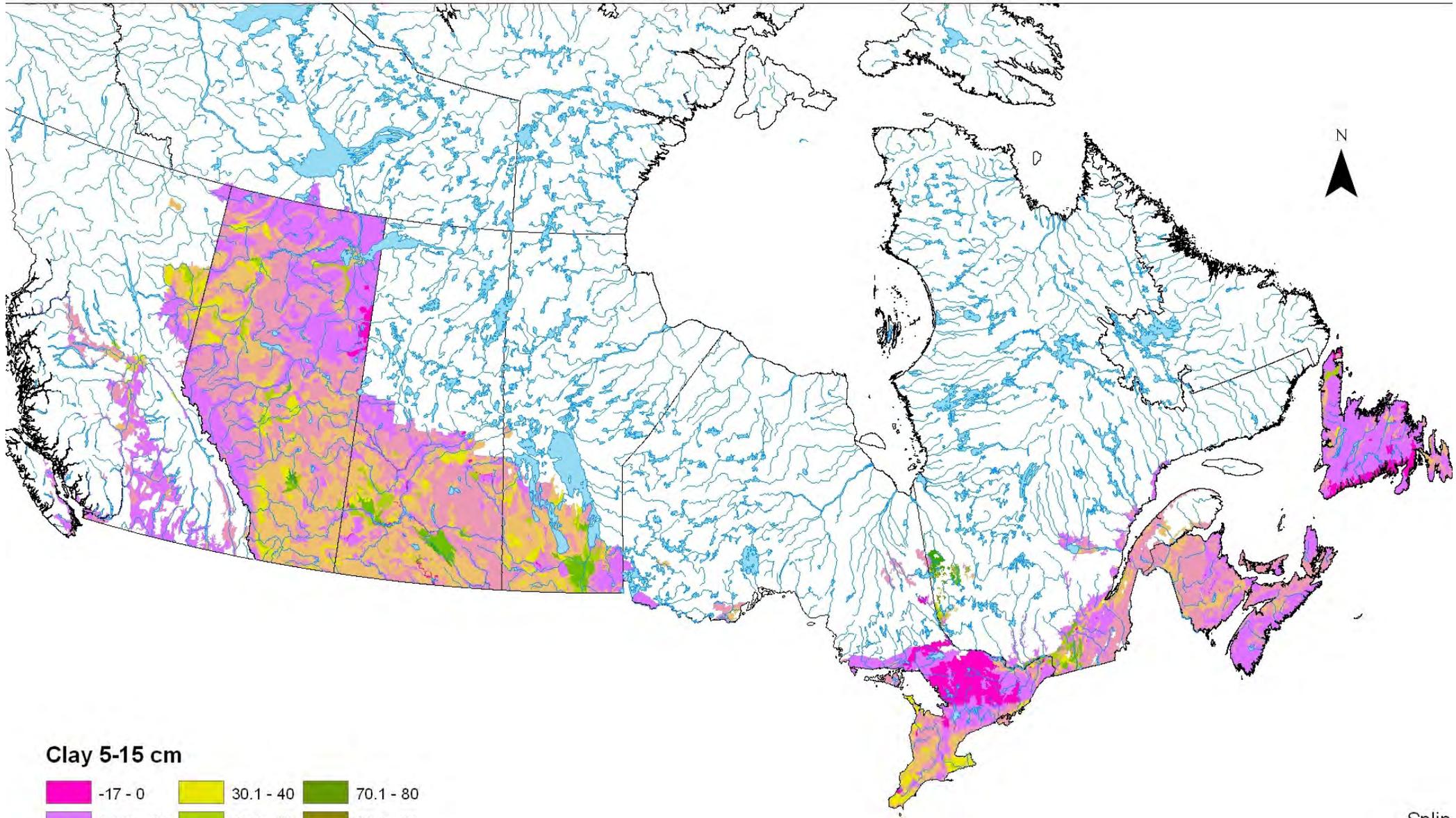
Spline data example



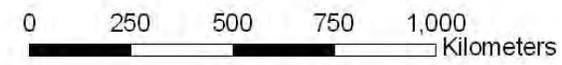
Clay (percent weight) 0-5 cm



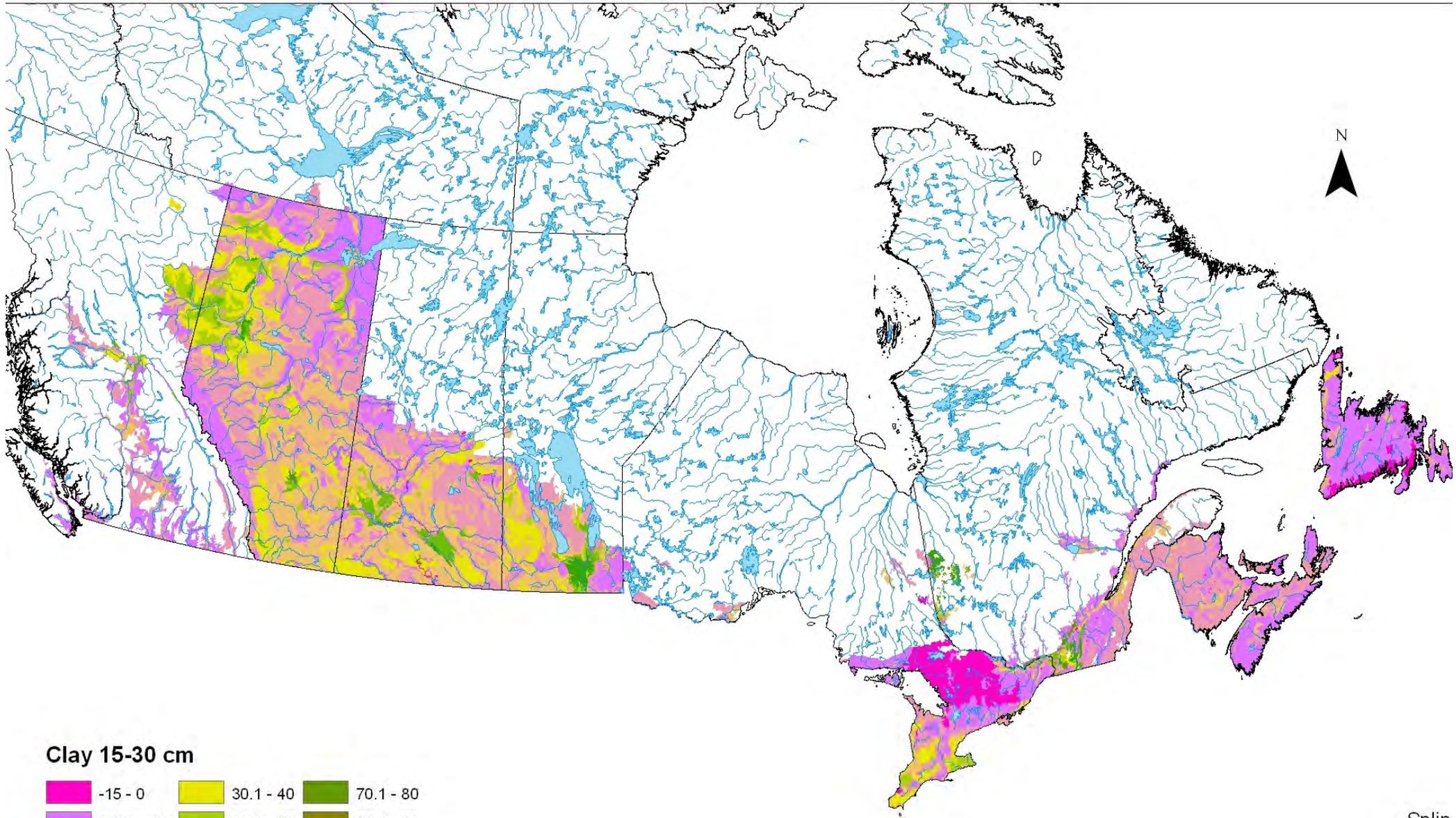
Splin



Clay 5-15 cm



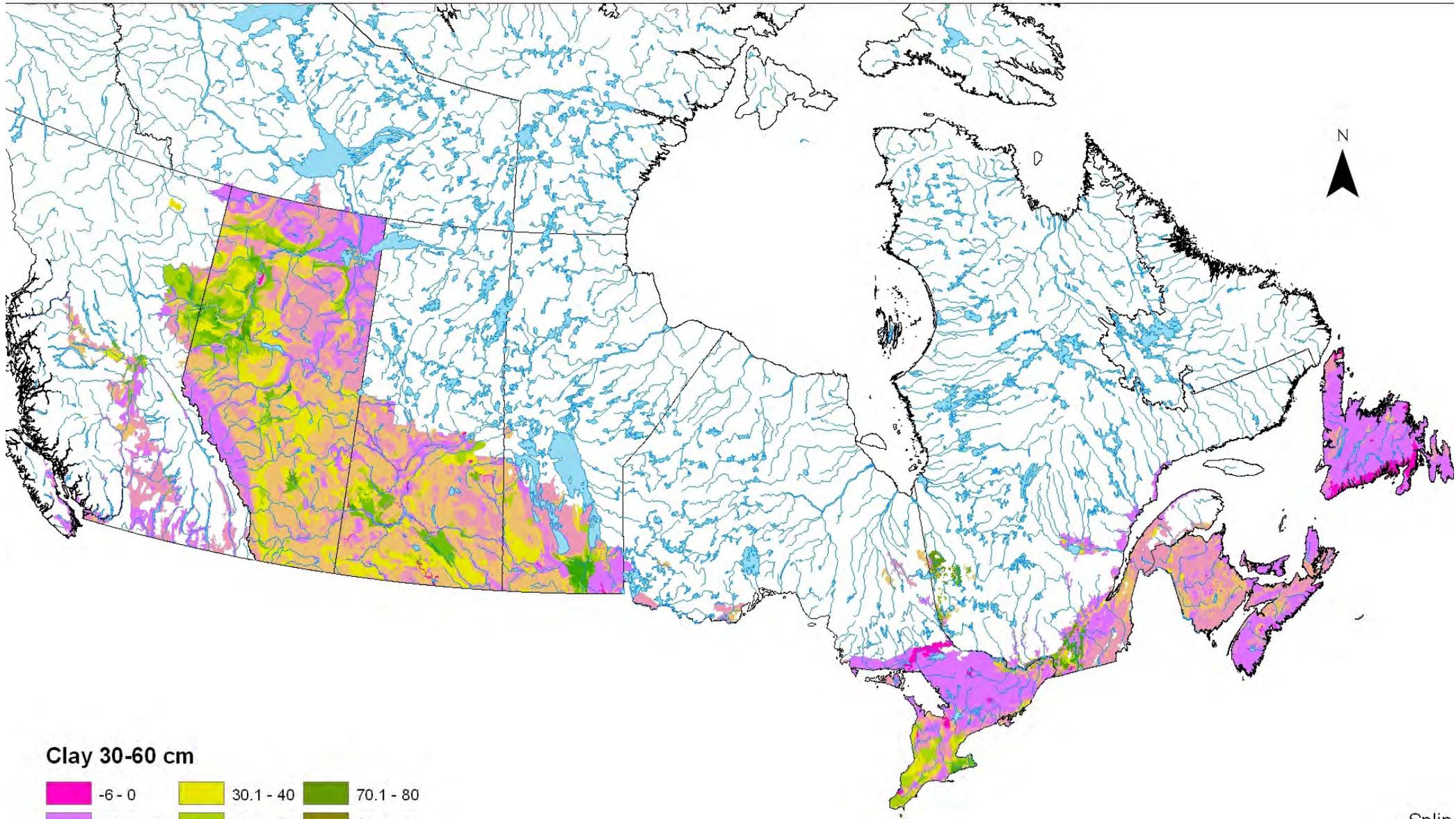
Splin



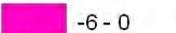
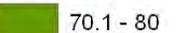
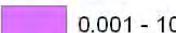
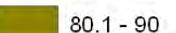
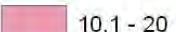
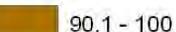
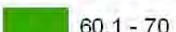
Clay 15-30 cm

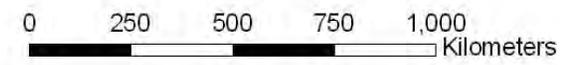


Splin

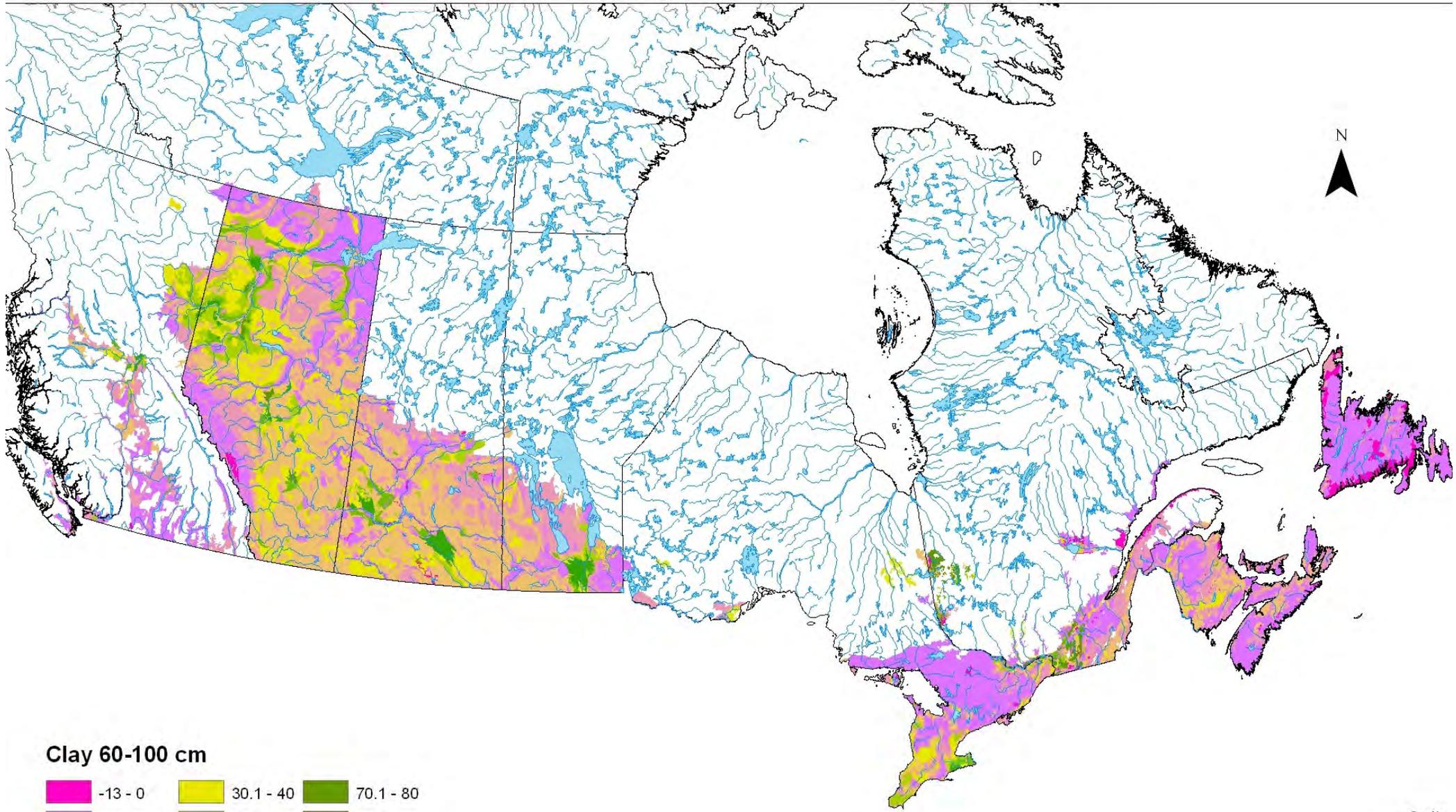


Clay 30-60 cm

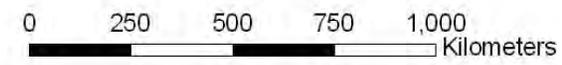
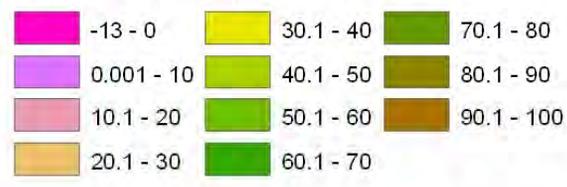
 -6 - 0	 30.1 - 40	 70.1 - 80
 0.001 - 10	 40.1 - 50	 80.1 - 90
 10.1 - 20	 50.1 - 60	 90.1 - 100
 20.1 - 30	 60.1 - 70	



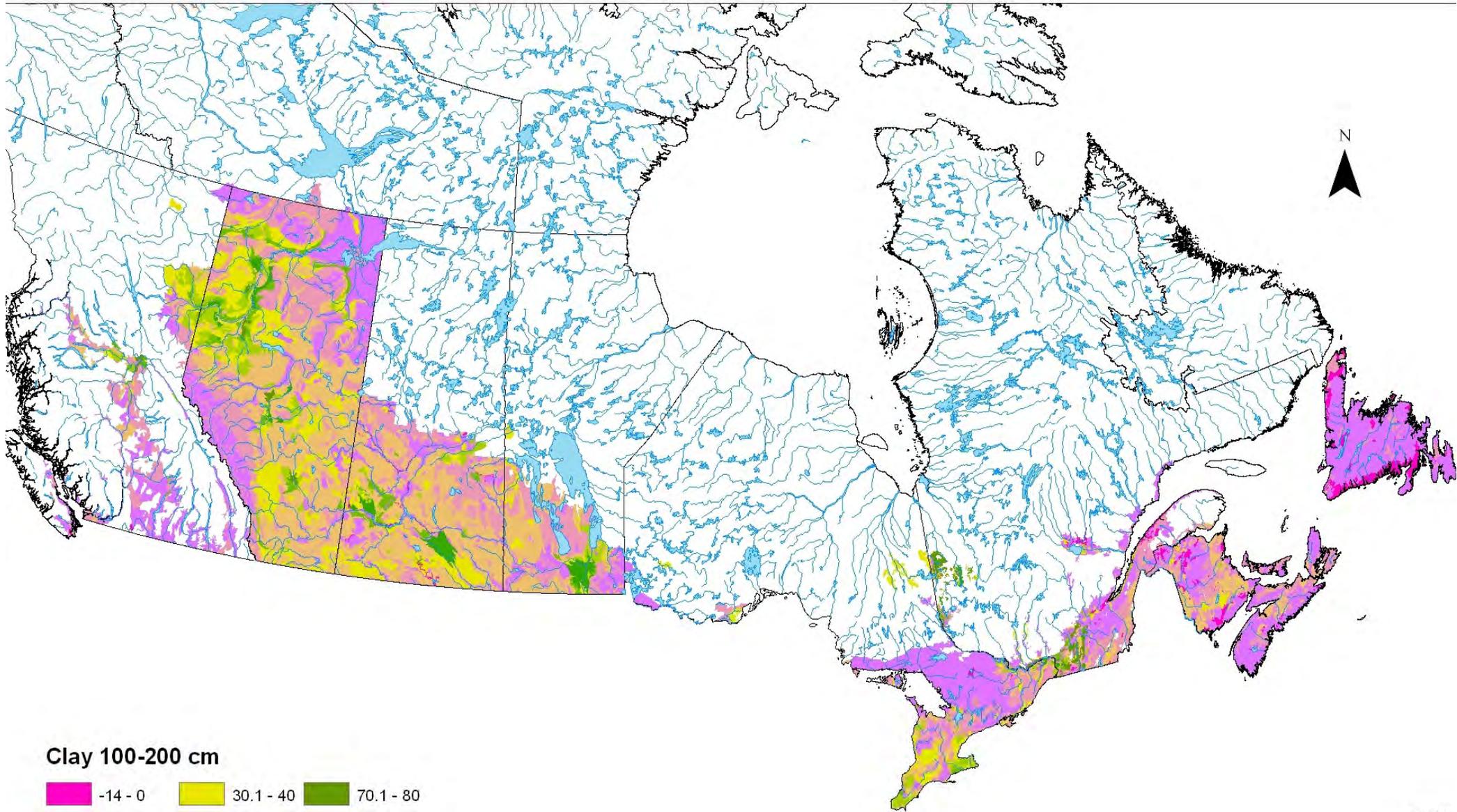
Splin



Clay 60-100 cm



Splin



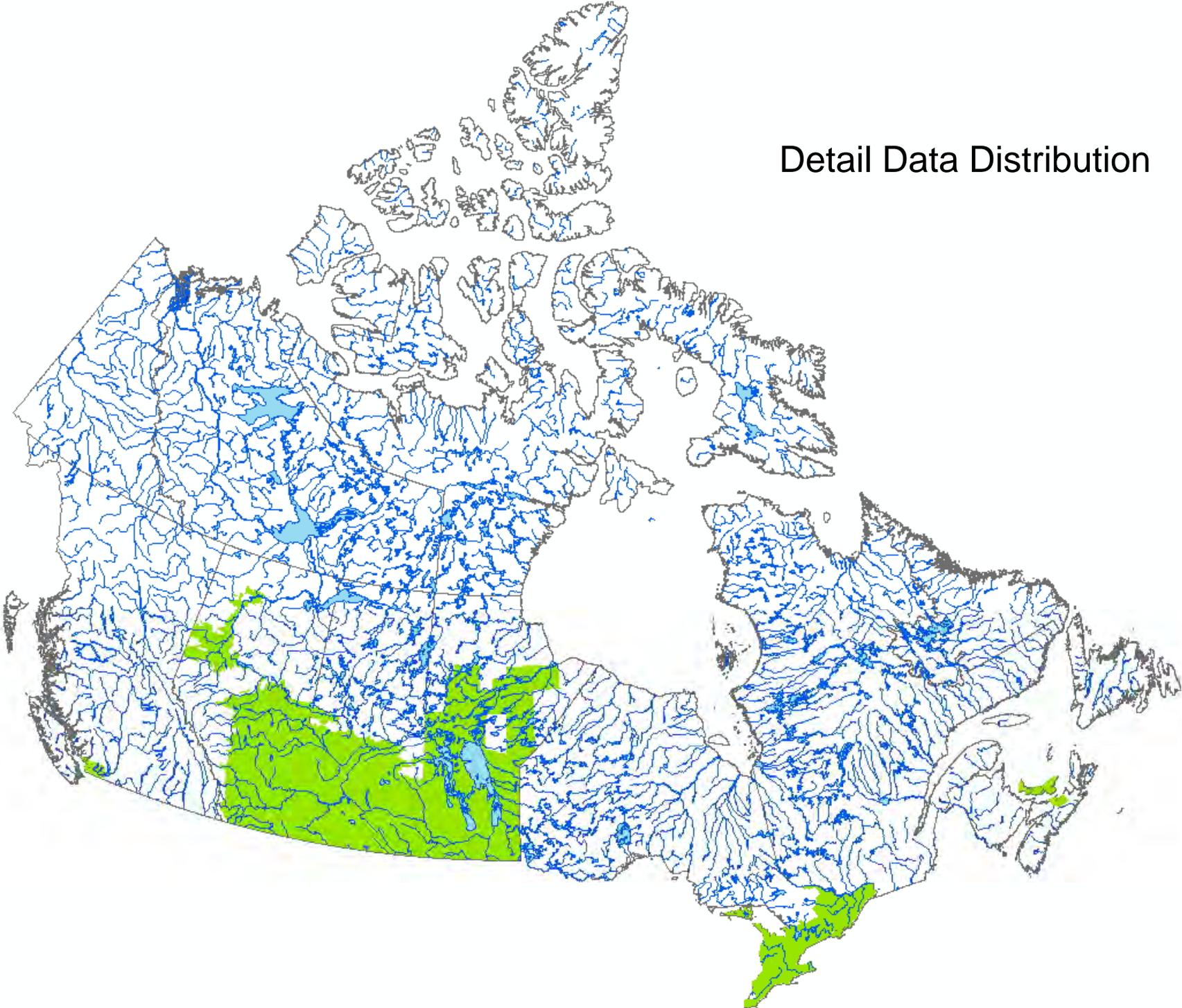
Clay 100-200 cm



0 250 500 750 1,000 Kilometers

Splin

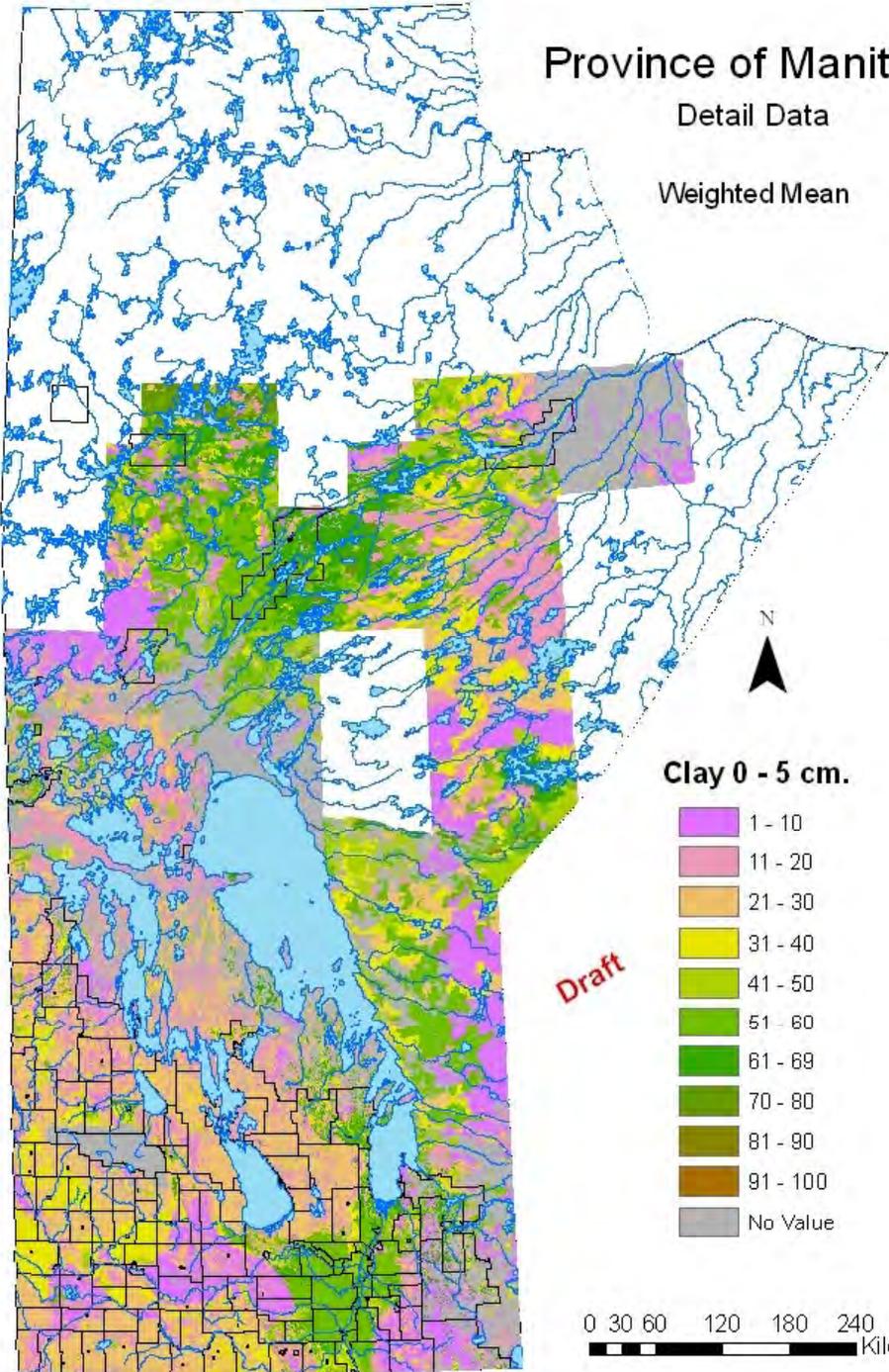
Detail Data Distribution



Province of Manitoba

Detail Data

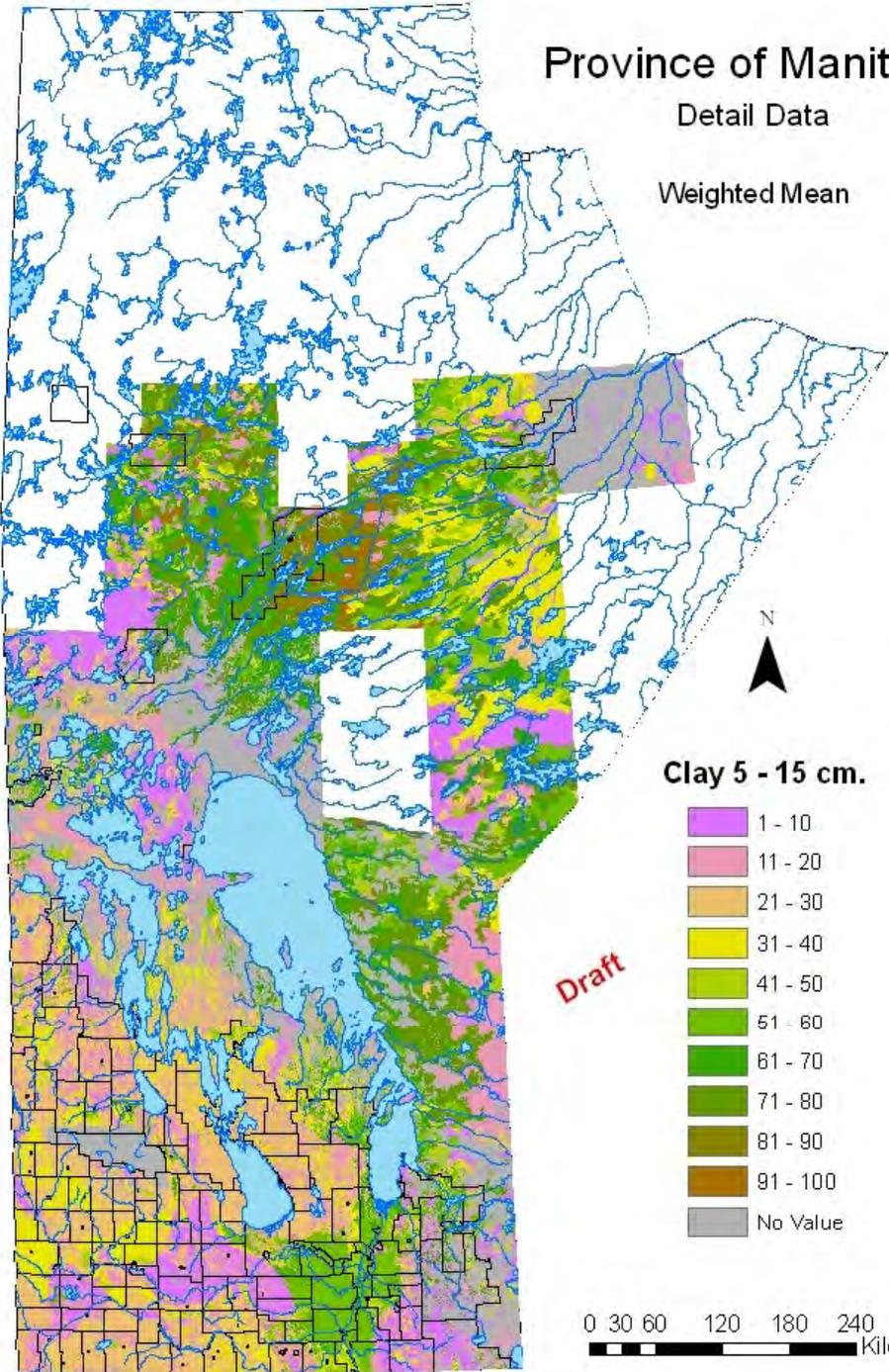
Weighted Mean



Province of Manitoba

Detail Data

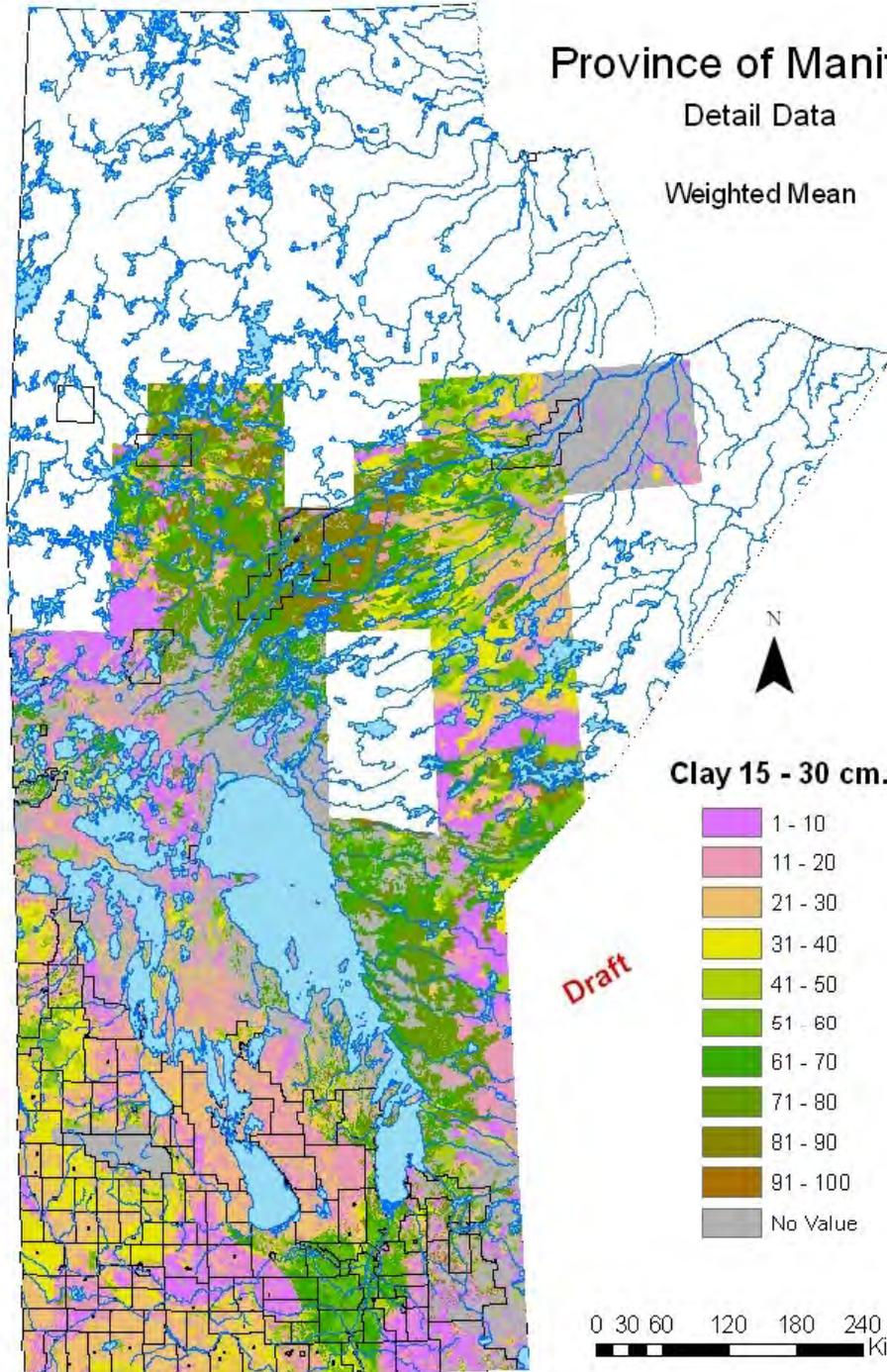
Weighted Mean



Province of Manitoba

Detail Data

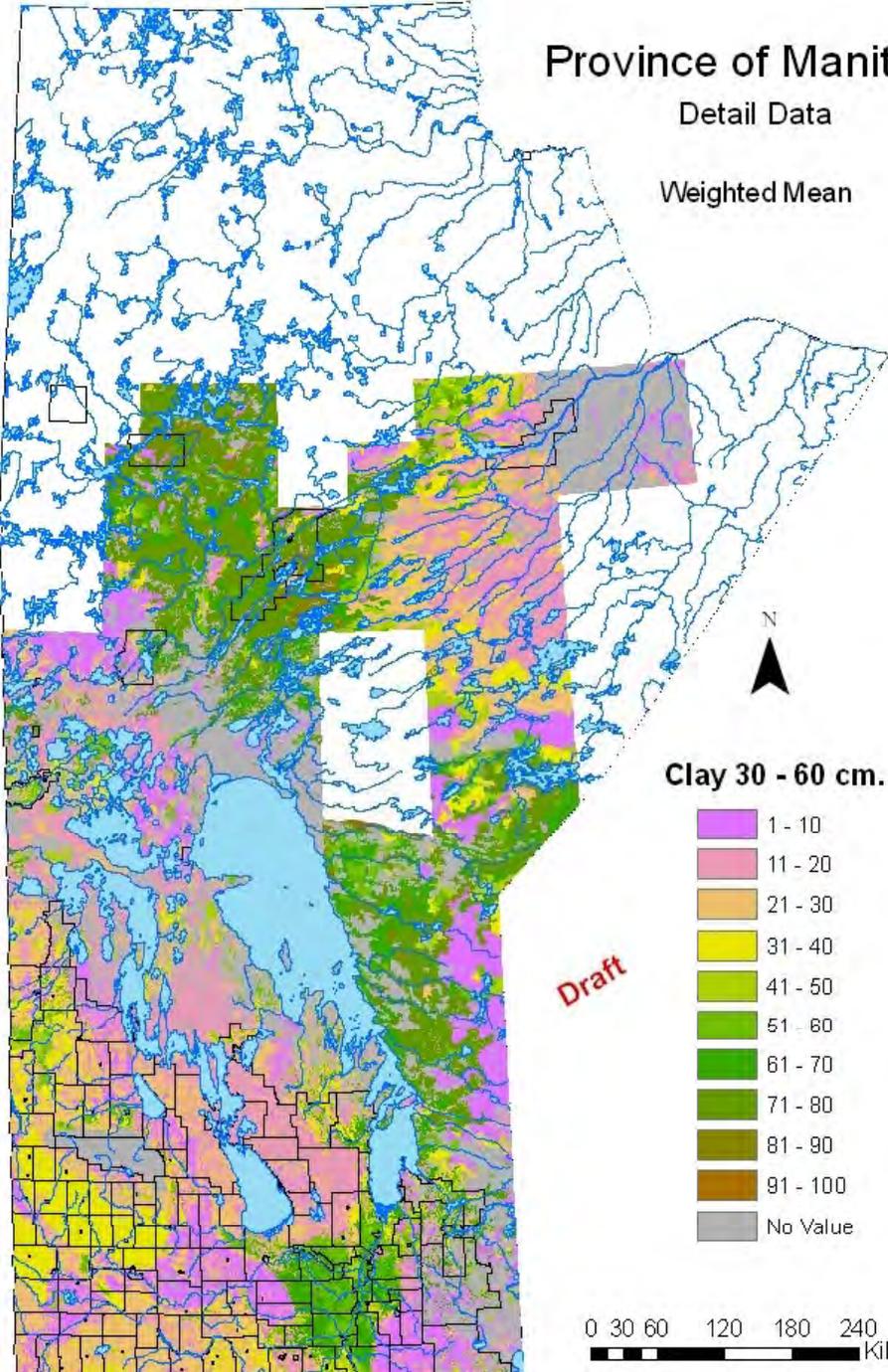
Weighted Mean



Province of Manitoba

Detail Data

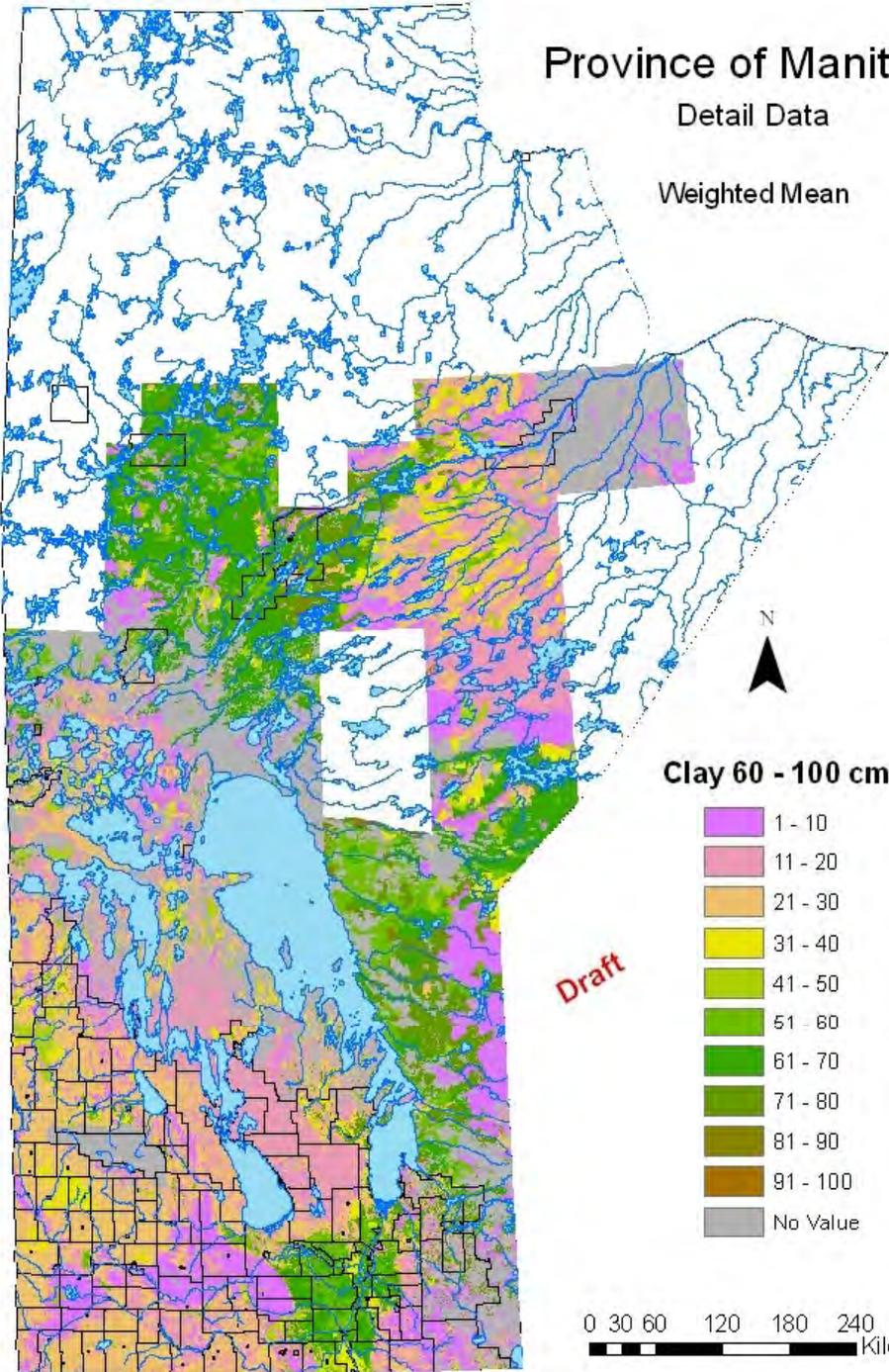
Weighted Mean



Province of Manitoba

Detail Data

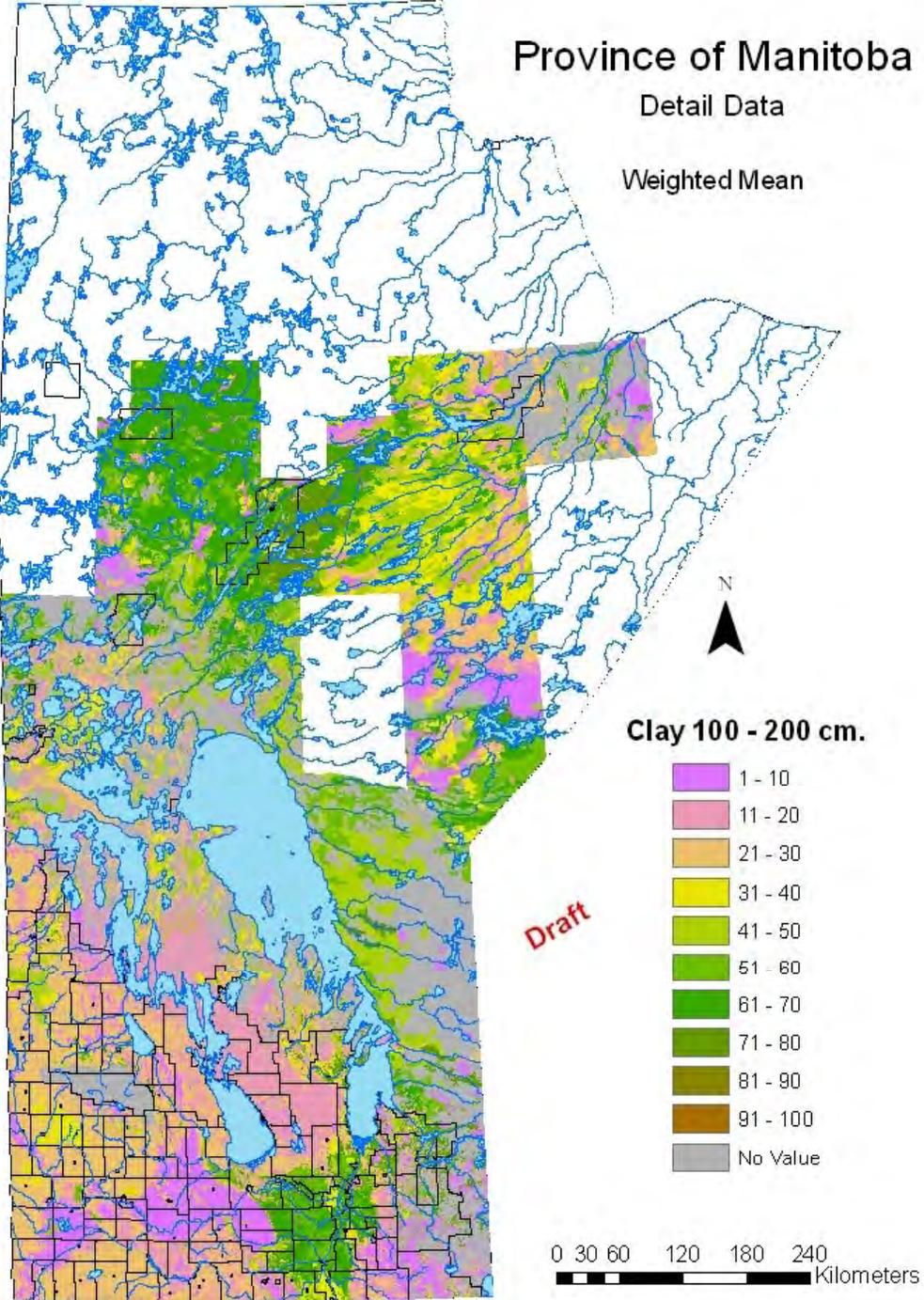
Weighted Mean



Province of Manitoba

Detail Data

Weighted Mean



Questions ?