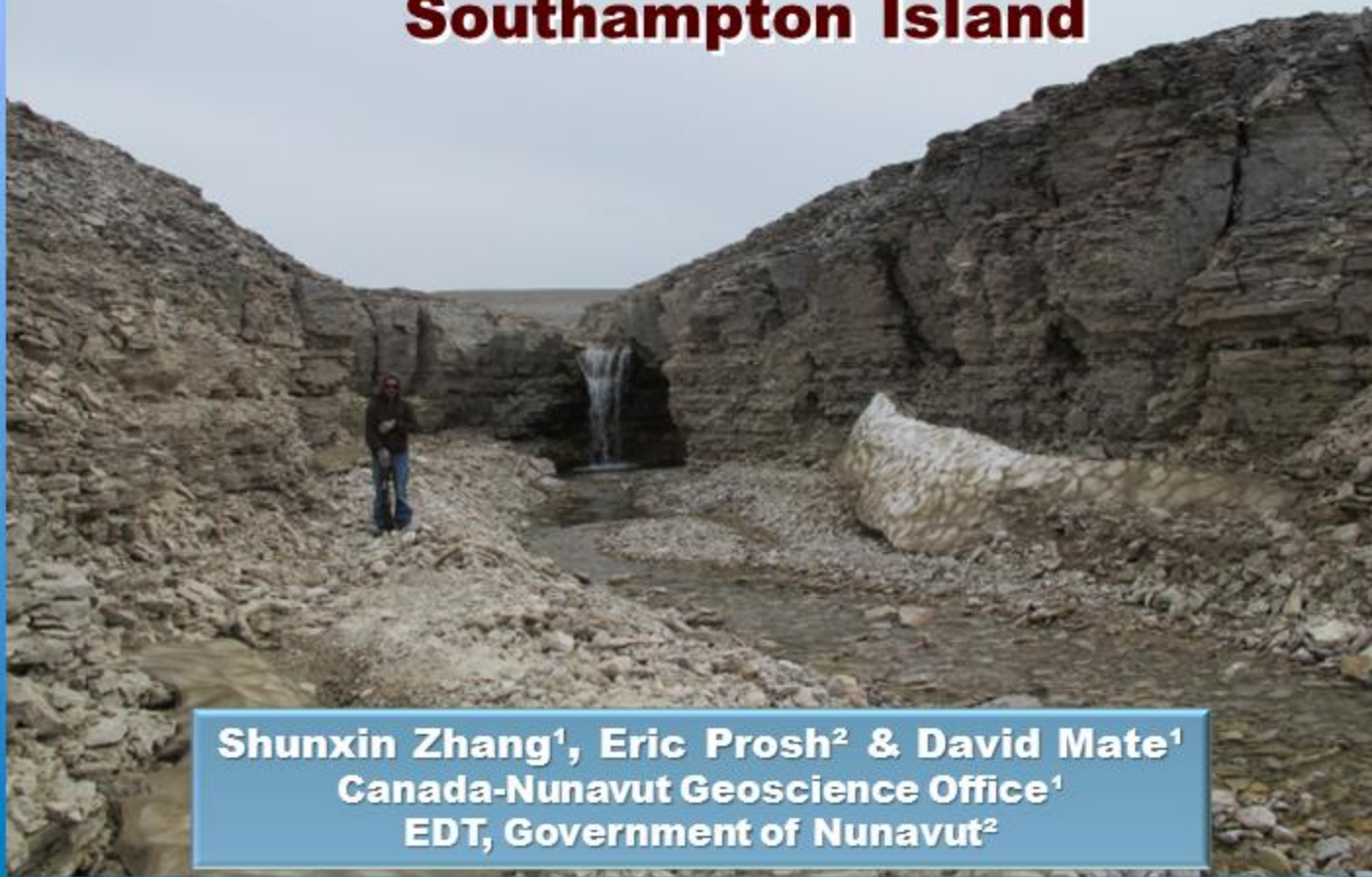




Industrial Limestone Resources, Southampton Island



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EDT, Government of Nunavut²



Natural Resources Canada
Ressources naturelles Canada



Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

Canada



NORTH AMERICA

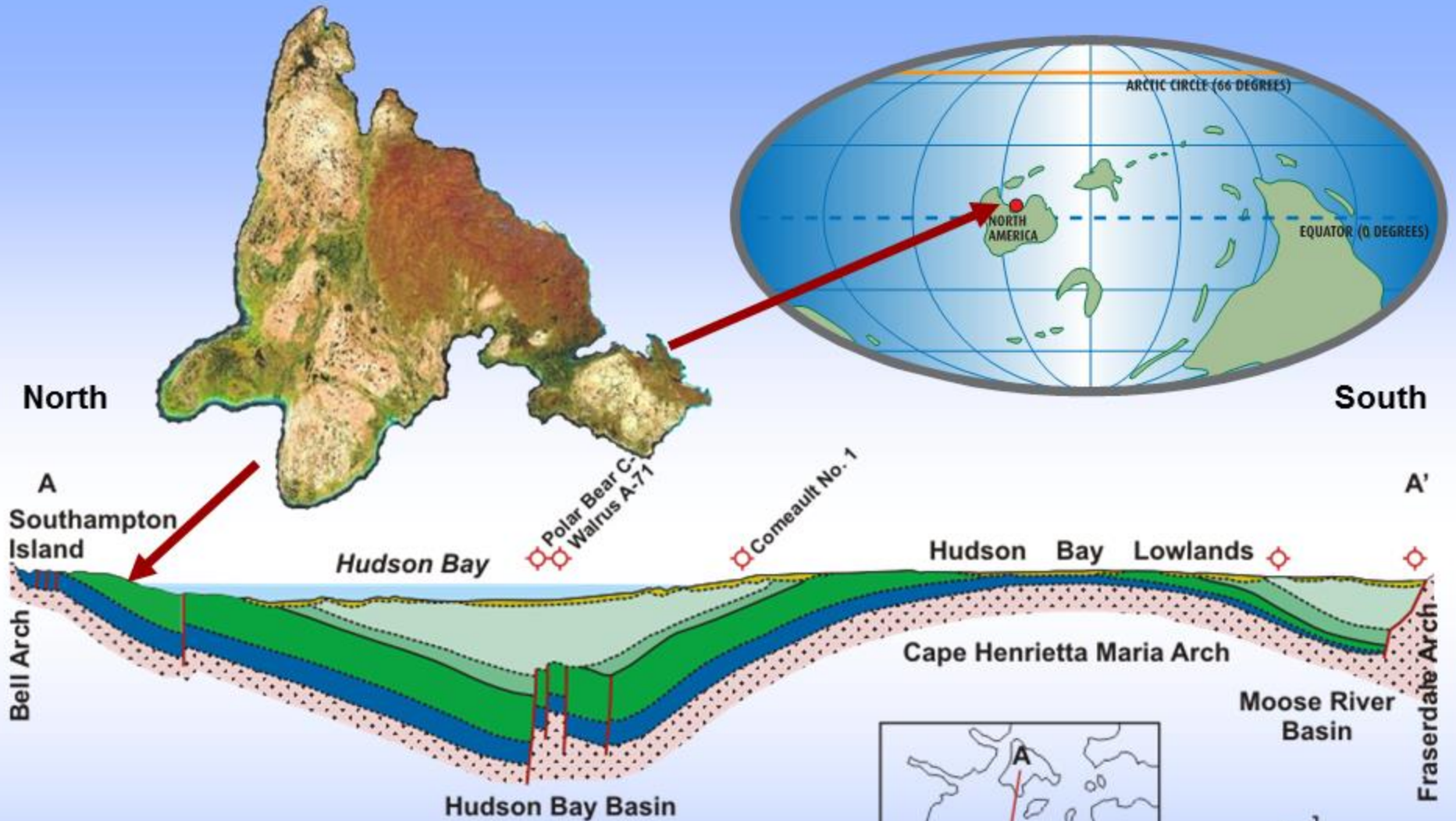
ARCTIC CIRCLE (66 DEGREES)

EQUATOR (0 DEGREES)

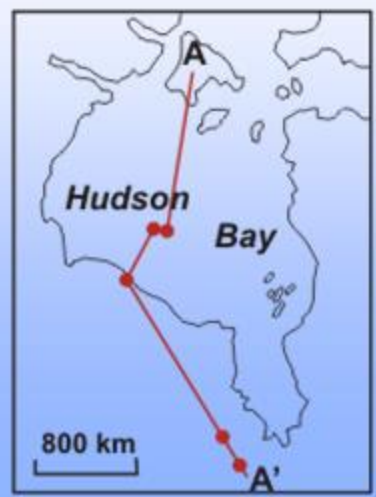
Southampton Island

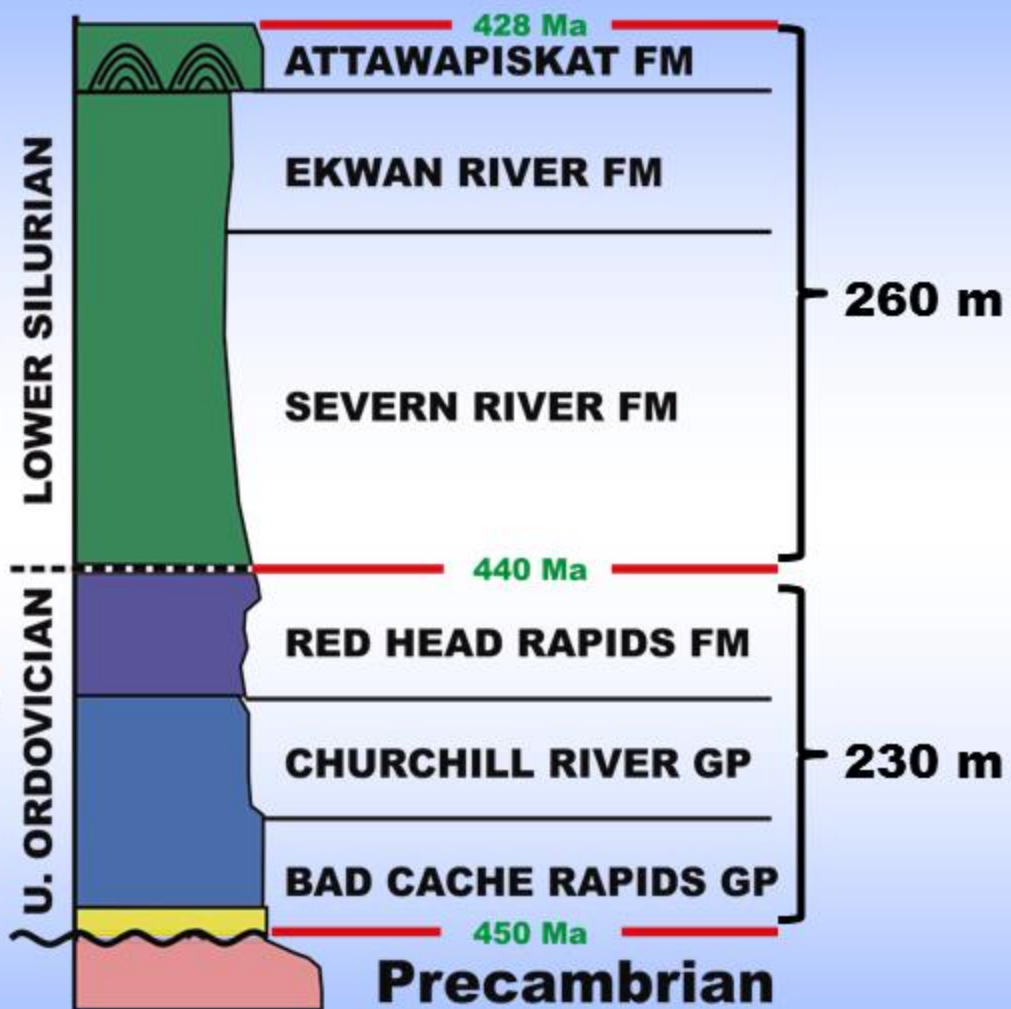
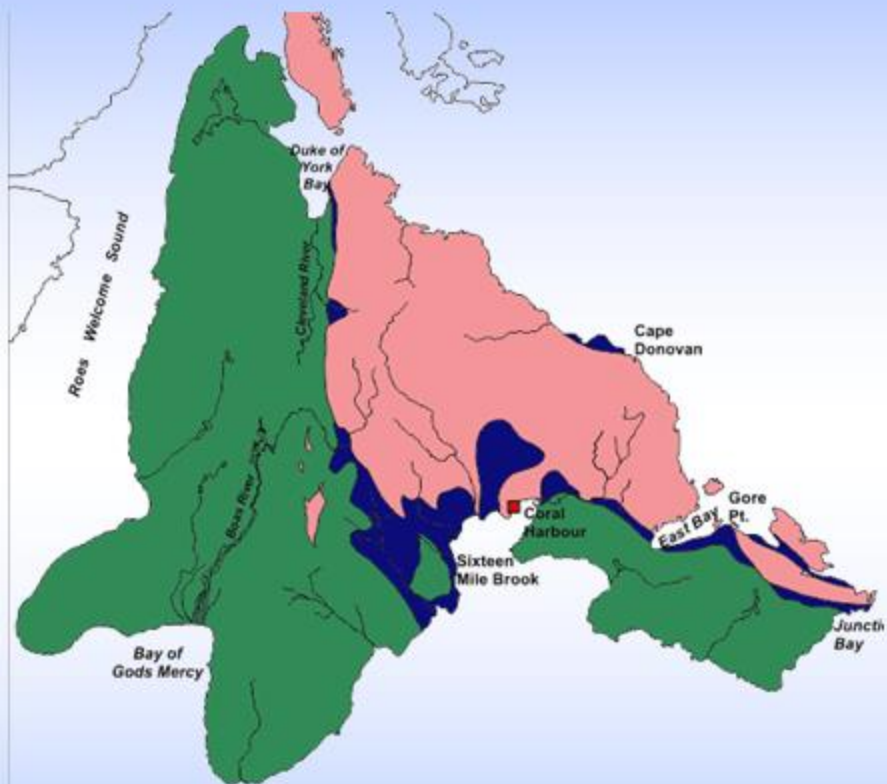
Hudson Bay

Where is Southampton Island today ?



Where was Southampton Island during the early Paleozoic?
 (cross section modified from Norris 1993)





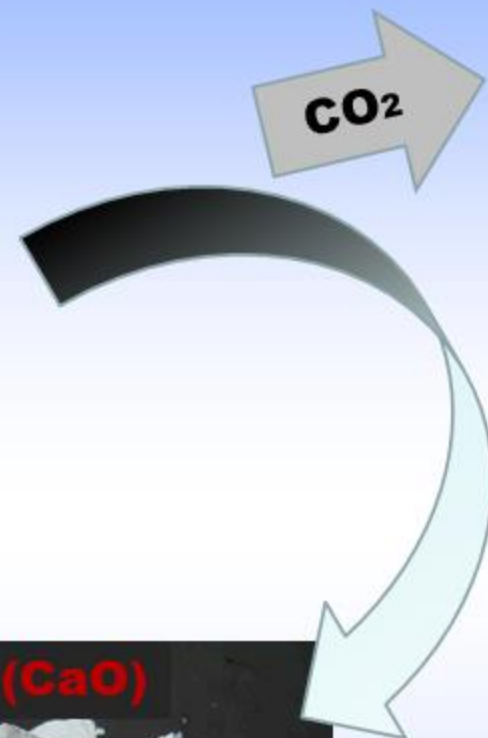
**Why have CNGO & GN done
a study of the limestones
on Southampton Island?**

Common chemical reagents produced from high purity limestone

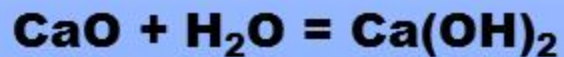
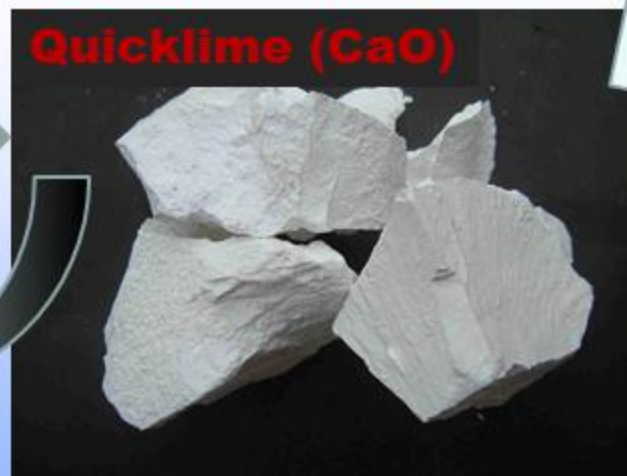
Limestone (CaCO_3) resource on the island



CO_2



H_2O



Motivation for this study

Quicklime would be required annually:

- Kiggavik (Uranium): 4,700 tons
- Meadowbank (Gold): 4,000 tons
- Meliadine (Gold): 4,000–10,000 tons
- Σ : > 13,000 tons

Meadowbank



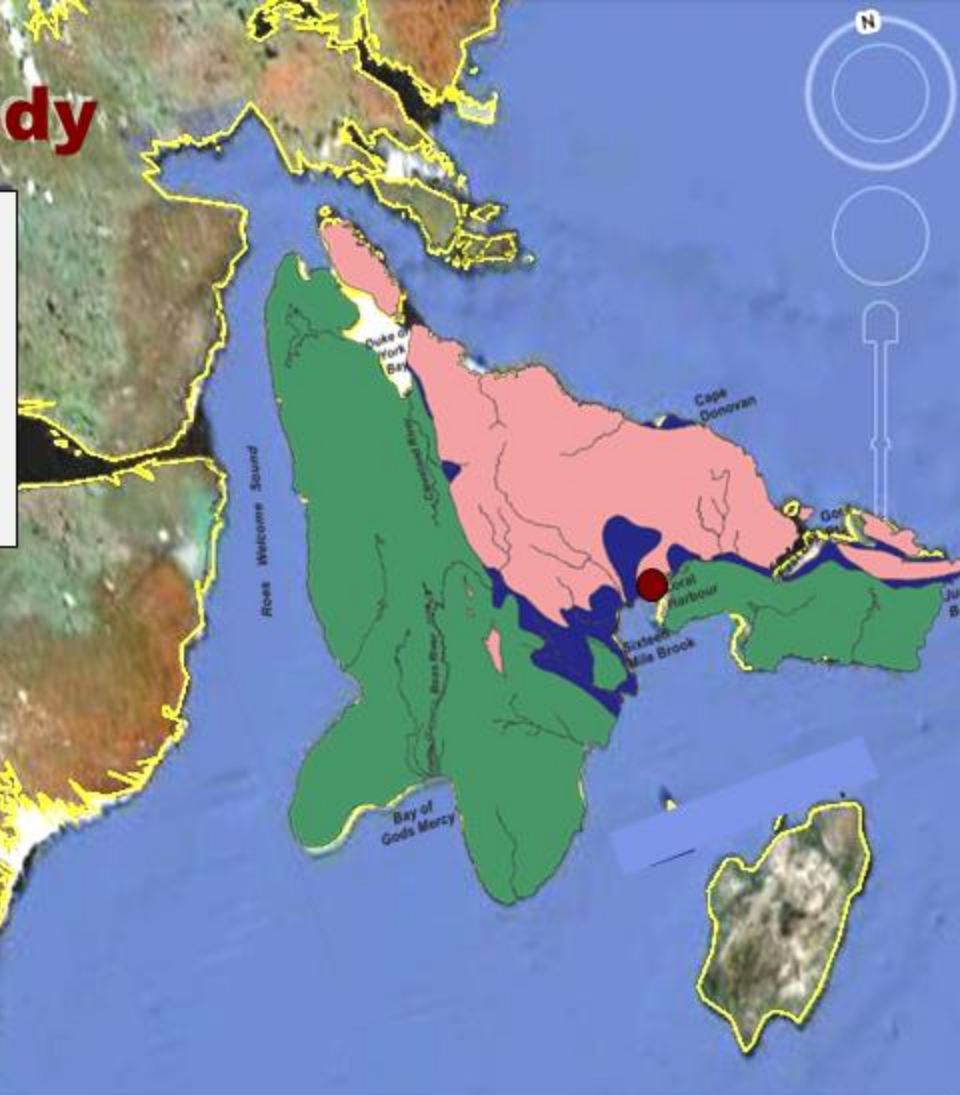
Kiggavik

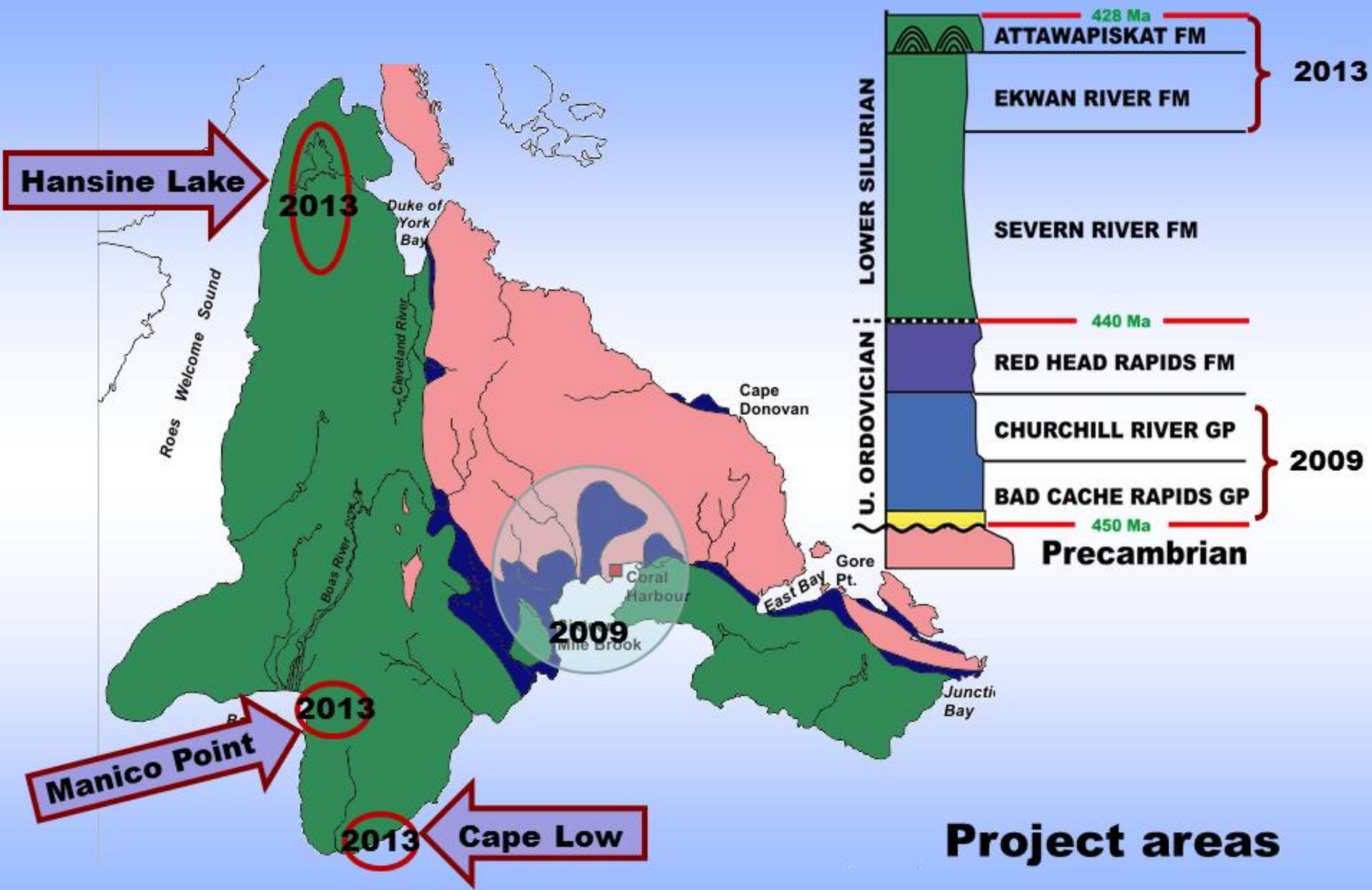


Meliadine



- C.H. strategically located within barging distance of mining projects in Kivalliq
- Potential limestone resource near tidewater
- No work on geochemical suitability of these rocks has ever been done



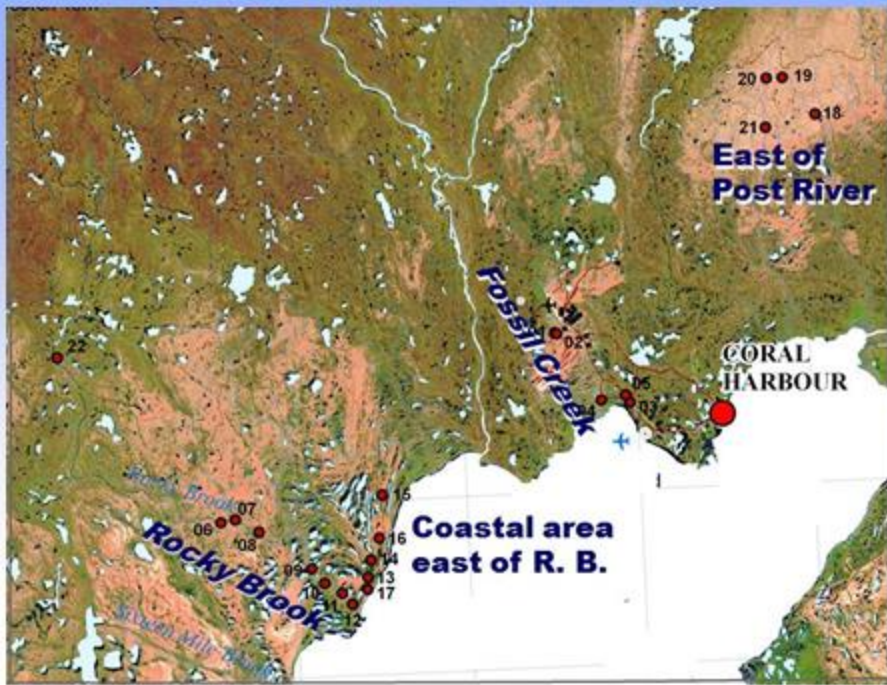


Project areas

Industrial standard in evaluating limestones

British Geological Survey Scheme for the Classification of Limestone by purity
(after Harrison, 1992)

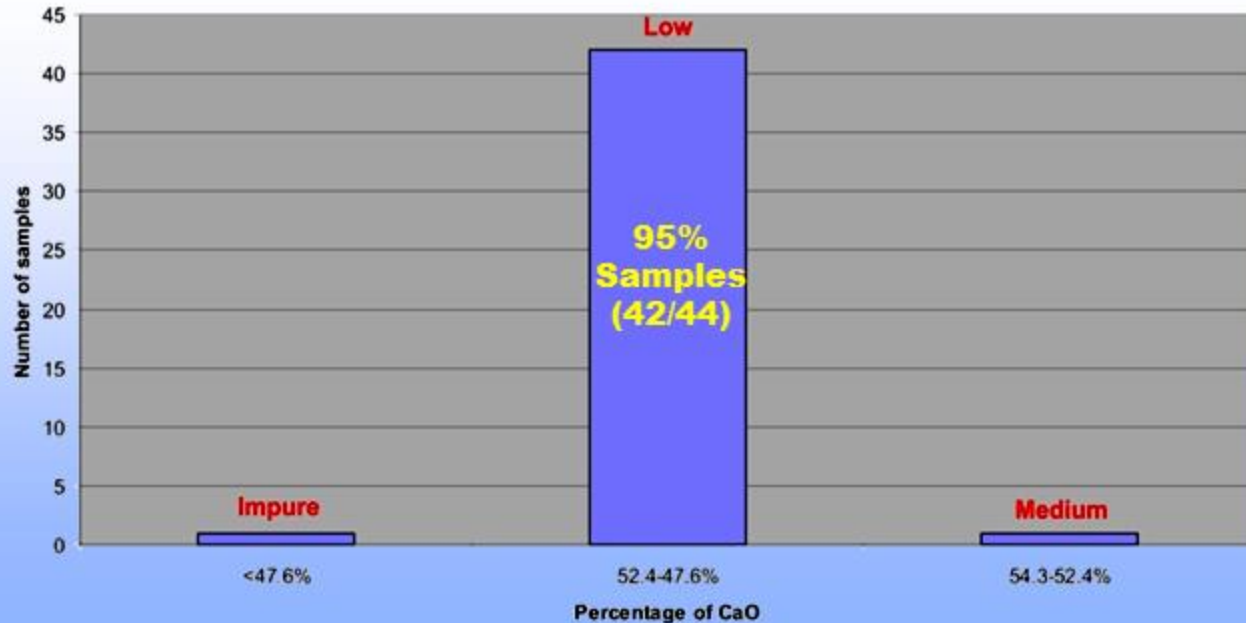
No	Percentage of		Category
	CaCO ₃ (XRD)	CaO (XRF)	
1	> 98.5	> 55.2	Very high purity
2	98.5 - 97.0	55.2 - 54.3	High purity
3	97.0 - 93.5	54.3 - 52.4	Medium purity
4	93.5 - 85.0	52.4 - 47.6	Low purity
5	< 85.0	< 47.6	Impure



ALL 44 samples collected from Upper Ordovician Bad Cache Rapids and Churchill River limestones at 4 localities near Coral Harbour contains **<54.3% CaO**

Results of 2009-2010

(Zhang et al., 2011)



Are there any other potential for pure limestone on Southampton Island?

We need to look at other units on the island with the potential to host & preserve limestone with higher purity.

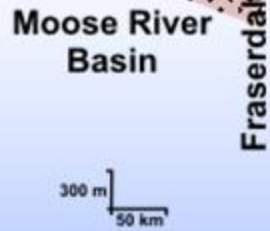
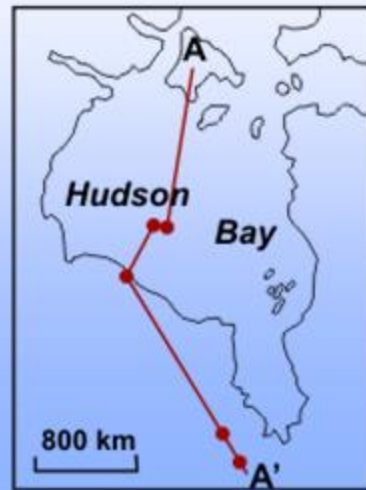
Two main prospective types of deposit from other areas:

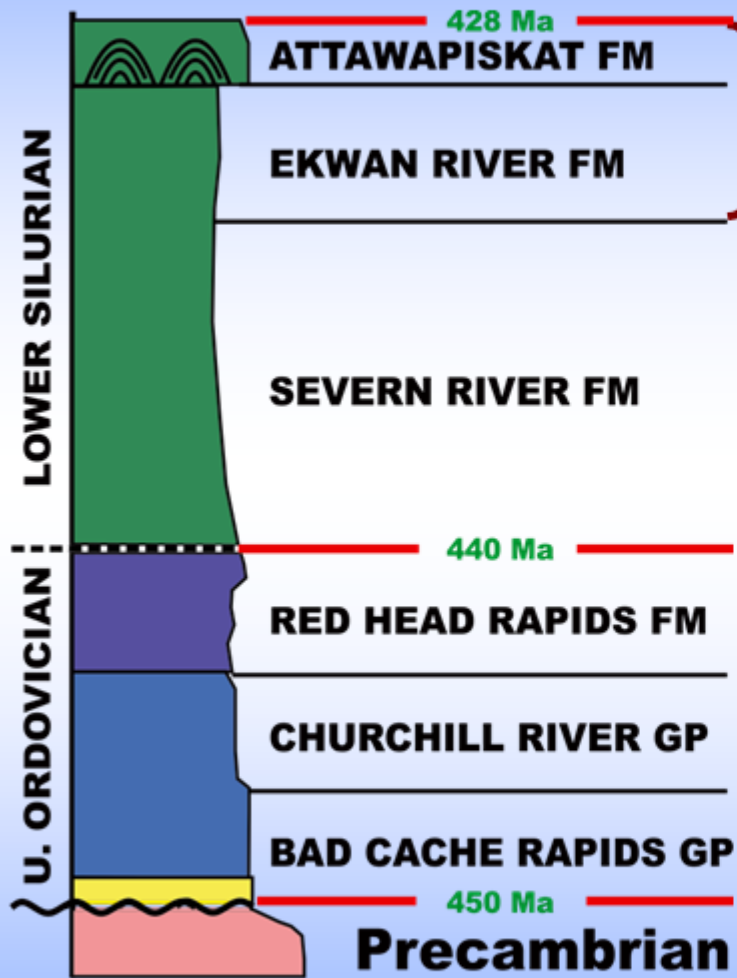
- Fossil reefs (L. Silurian Attawapiskat Fm)**
- high-calcium limestone (L. Silurian Ekwan River Fm)**

Reasonable potential in the region



Moose River Basin, potential for high-calcium limestone with 54.3% CaO in Ekwan River Fm & 55-56% CaO in Attawapiskat Fm.





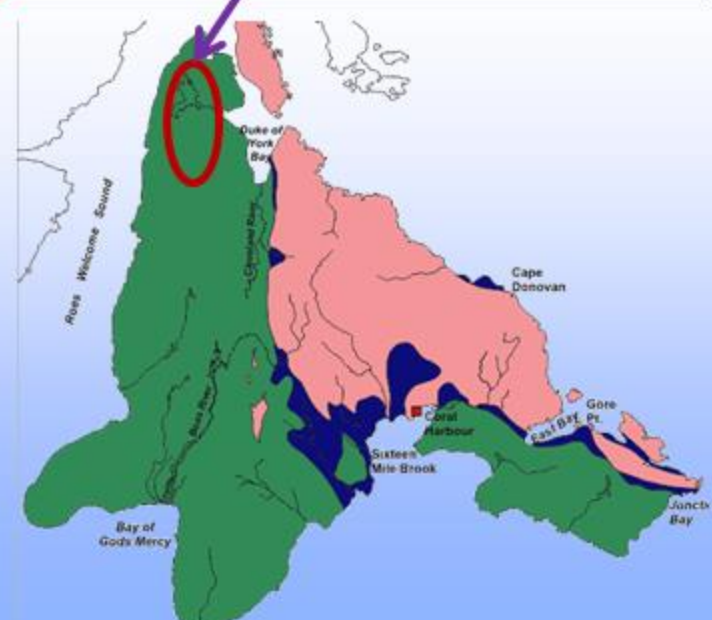
Hansine Lake

**2013
project
areas**

Manico Point

Cape Low

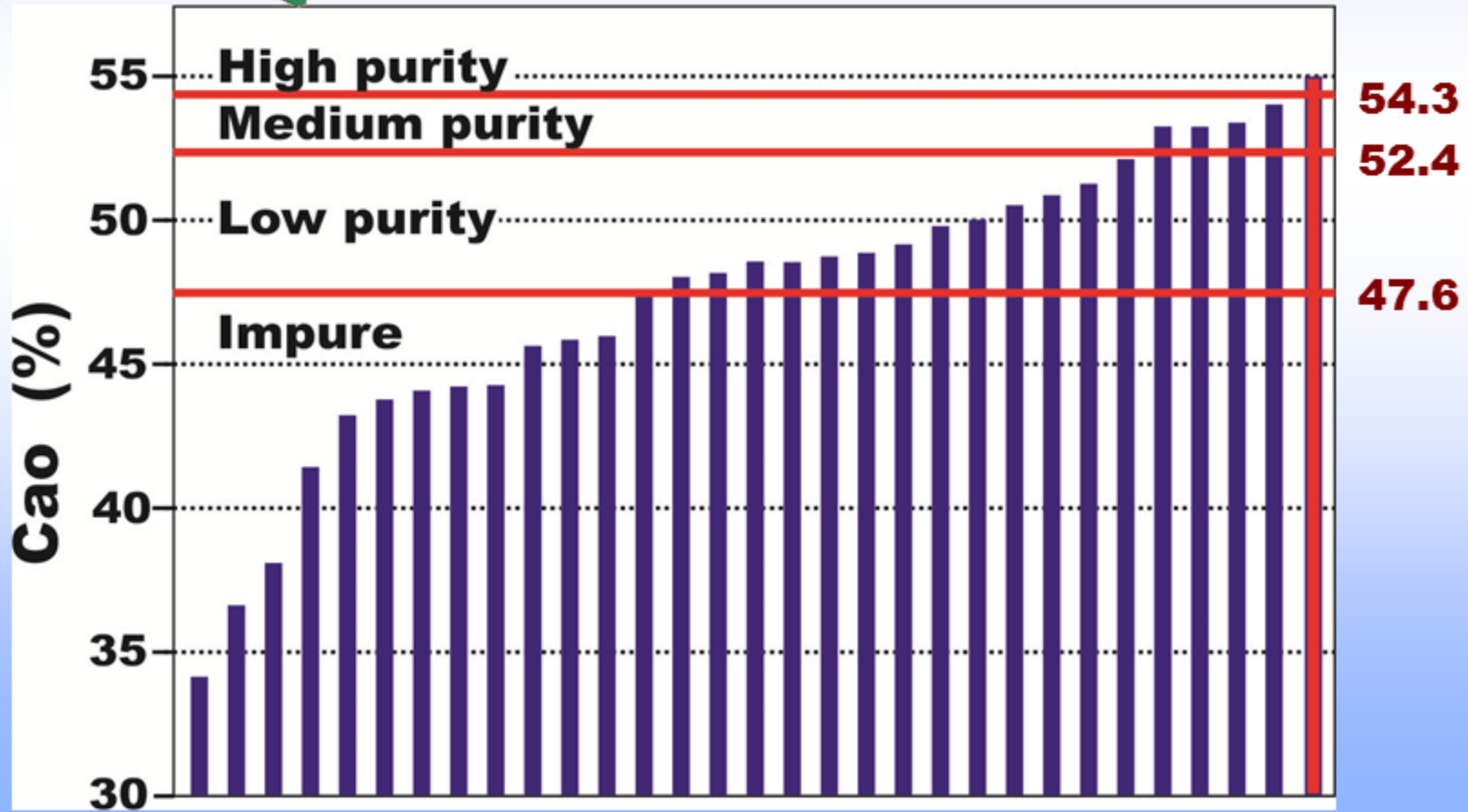
**Stratigraphically moving up to
test limestone of Lower
Silurian Ekwon River Fm &
Attawapiskat Fm on the island**

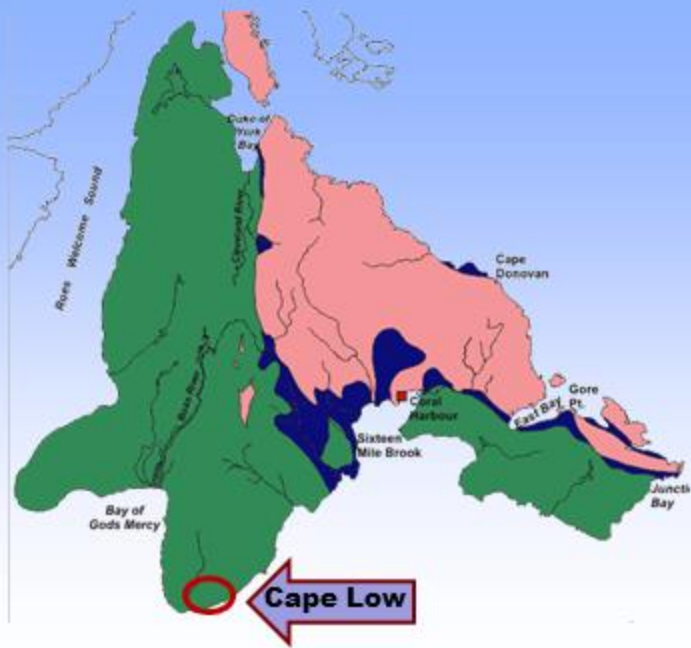


**Localities close to Hansine Lake,
where no outcrops were found**



30 samples collected from Hansine Lake for geochemical analysis (XRF); only one (3%) is classified as high purity





Small reefs interbedded with layered dolostone

Small reefs exposed on the surface

These reefs are heavily dolomitized, which can be tested by 10% hydro-chlorite (HCl) in the field.

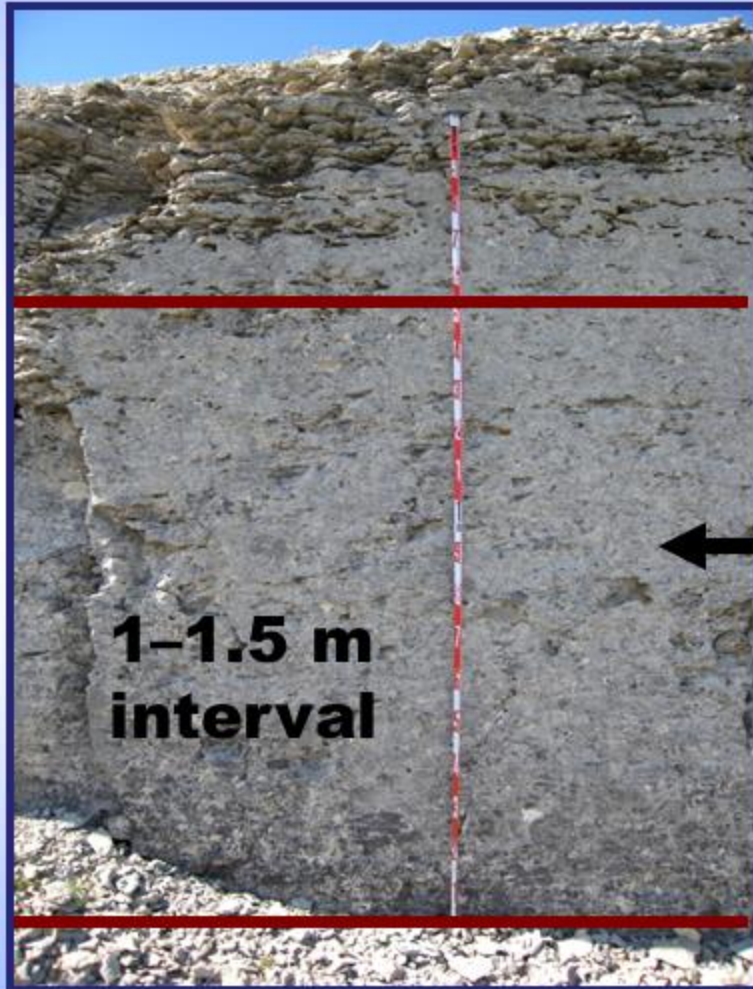


Manico Point

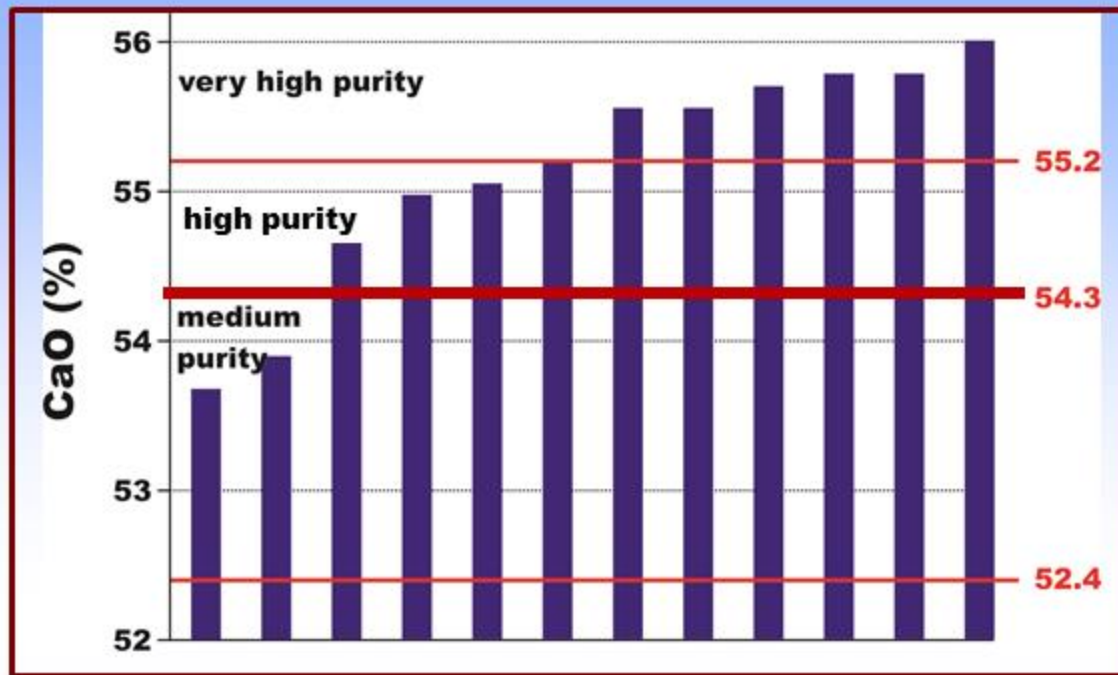
Ekwan River limestone well exposed along a creek near Manico Point



How to collect samples from outcrop for XRF analysis?



**3 kg chip sample covering
1-1.5 m interval for XRF
analysis**



- **12 samples collected from two localities along a creek near Manico Point for XRF analysis; 10 of 12 (83%) are classified as HIGH PURITY and VERY HIGH PURITY.**
- **These limestones meet the standards for most industrial uses.**



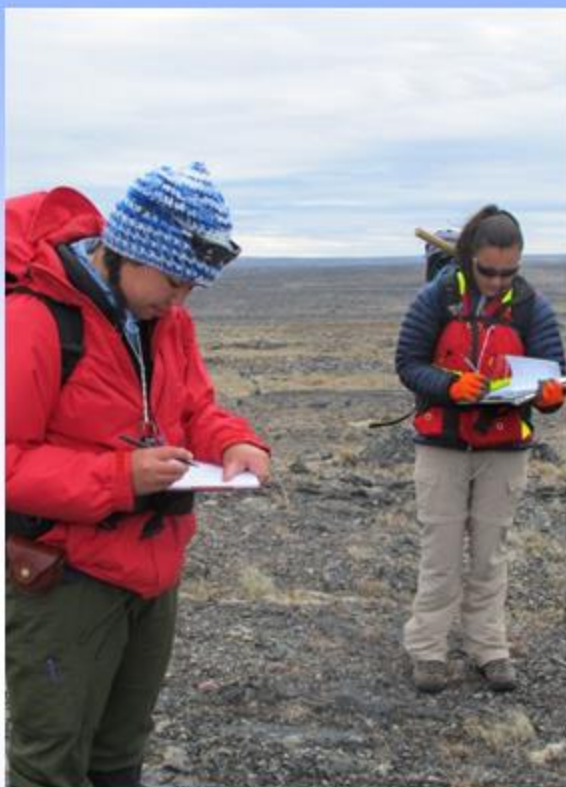
Reasonable potentials in the region

Paleozoic strata on Southampton Island are distributed horizontally; therefore, rocks from Manico Point to Nalugalaarvik Point along west coast belong to same unit – Lower Silurian Ekwan River Fm.

Future works

- Detailed sampling between Station 23 and 24
- Sampling along all the creeks south of Manico Point
- More geochemical analysis
- Identify minable intervals
- Identify quarry locations





Summary
of Activities
2013

**Resource potential for
industrial limestone on
Southampton Island, Nunavut:
summary of fieldwork and
geochemical data**

By S. Zhang, E.C. Prosh and D.J. Mate

Free download from

<http://cngo.ca/summary-of-activities/2013-2/>



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GEOSCIENCE TITIGAKVIIT



Dr. Eric Prosh will always be remembered.



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- **Field assistant Peter Adams**
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