Appendices

Appendix A: Summer and winter photos

Summer Photos *White dots indicate approximate coring locations (where appropriate).*

.

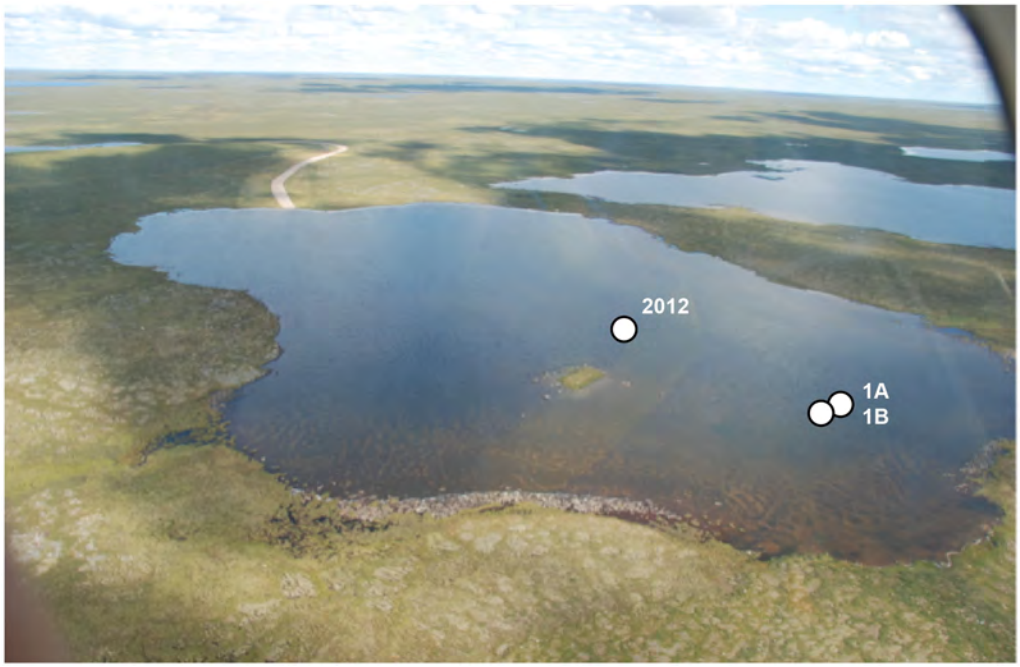
Tibbitt Lake (P0): The lake is about 2.5 km long (NNE/SSW direction) and between 500 m and a kilometer wide. *August 2011.*

Waite Lake (P14): The lake is about 3.5 km long (NNE/SSW direction) and 500-1500 m wide. The trees in the photo are 8-10 ft high. *August 2011.*

Danny's Lake (P34): The vegetation is still recovering from the from a forest fire in 2000. The trees are 6-8 ft high. *August 2011.*

Danny's Lake (P34): The lake is about 600 meters at its widest and 800 meters long. The trace of the ice road can be seen in the distance, connecting Danny's Lake with another lake. *August 2011.*

P39: The lake is about a kilometer long and 400 meters wide. Sparce, stunted spruce trees can be seen on the far side of the lake and a few in the foreground. *August 2011.*



Carleton Lake (P49): The lake is 400-500 m across and 750 m long. Polygonal permafrost features can be seen in foreground. *August 2011.*

Horseshoe Lake (P52): The photo is showing the sub-basin (bottom right) and main basin (upper left). *August 2011.*

Horseshoe Lake (P52): The sub-basin is about 825 m long and 375 m at it's widest. The core was extracted from the sub-basin. *August 2011.*

Lac de Gras (P55): This photo shows where the TCWR enters Lac de Gras to the southeast, which is also where the core was extracted. *August 2011.*

Winter Photos – Coring

Back-loaded auger coring a hole through the winter road. *Winter 2010*

Freeze coring tripod with freeze core inserted through hole in ice. *Winter 2010.*

Appendix B: Age-depth modeling code

OxCal Outlier Analysis (Danny's Lake)

```
Plot()
 {
 Outlier_Model("General",T(5),U(0,4),"t");
 Sequence()
 {
  Boundary("");
  Sequence("")
  {
   R_Date("UBA-16440",7450,30){Outlier(0.05);};
   R_Date("UBA-17932",7623,38){Outlier(0.10);};
   R_Date("UBA-16439",8112,32){Outlier(0.10);};
   R_Date("UBA-17931",6231,34){Outlier(0.05);};
   R_Date("UBA-16548",5834,29){Outlier(0.05);};
   R_Date("UBA-16547",5039,51){Outlier(0.05);};
   R_Date("UBA-16546",3604,25){Outlier(0.05);};
   R_Date("UBA-16545",2912,24){Outlier(0.05);};
   R_Date("UBA-20372",4863,29){Outlier(0.05);};
   R_Date("UBA-20371",2554,28){Outlier(0.05);};
   R_Date("UBA-17930",2549,26){Outlier(0.05);};
   R_Date("UBA-20373",2448,33){Outlier(0.05);};
   R_Date("UBA-20374",2392,25){Outlier(0.05);};
   R_Date("UBA-17432",2659,32){Outlier(0.05);};
   R_Date("UBA-20375",2248,25){Outlier(0.05);};
   R_Date("UBA-20376",2073,28){Outlier(0.05);};
   R_Date("UBA-17929",2257,26){Outlier(0.05);};
   R_Date("UBA-20378",2159,24){Outlier(0.05);};
   R_Date("UBA-20377",2071,24){Outlier(0.05);};
   R_Date("UBA-16544",1916,25){Outlier(0.05);};
   R_Date("UBA-17431",1659,21){Outlier(0.05);};
   R_Date("UBA-17361",1617,25){Outlier(0.05);};
   R_Date("UBA-16543",1329,23){Outlier(0.05);};
   R_Date("UBA-17360",855,23){Outlier(0.05);};
   R_Date("UBA-17359",693,21){Outlier(0.05);};
  };
  Boundary();};};
```

Table of results for Danny's Lake outlier analysis. Highlighted samples were identified as outliers.

Element	Prior	Posterior	Model	Type
UBA-16440	5	35	General	t
UBA-17932	10	67	General	t
UBA-16439	10	100	General	t
UBA-17931	5	4	General	t
UBA-16548	5	4	General	t
UBA-16547	5	4	General	t
UBA-16546	5	5	General	t
UBA-16545	5	5	General	t
UBA-20372	5	100	General	t
UBA-20371	5	3	General	t
UBA-17930	5	2	General	t
UBA-20373	5	2	General	t
UBA-20374	5	2	General	t
UBA-17432	5	100	General	t
UBA-20375	5	2	General	t
UBA-20376	5	84	General	t
UBA-17929	5	6	General	t
UBA-20378	5	2	General	t
UBA-20377	5	2	General	t
UBA-16544	5	3	General	t
UBA-17431	5	2	General	t
UBA-17361	5	2	General	t
UBA-16543	5	3	General	t
UBA-17360	5	3	General	t
UBA-17359	5	2	General	t

Extraction of Accumulation Rate at 100 yr intervals (Clam)

Below is the code to be used in R. Italicized text must be substituted with the appropriate file path or site name. The user is intended to press 'enter' after each line of code.

```
> setwd("/Applications/Clam")
> source("clam.R")
> clam(Example,4,0.3)
> acc <- read.table("Cores/Example/Example_smooth_spline_ages.txt", header=T)
> ages <- acc[,4] # the 'best' point estimates
> accs <- acc[,5]
> ageseq <- seq(0, max(ages), by=100)
> accseq <- approx(ages, accs, ageseq)$y
> plot(ageseq, accseq, type="l")
> x <- data.frame(a = ageseq, b = accseq)
> write.table(x,file="AccAge.csv",sep=",",col.names=NA)
```

Requesting the age of the sediment-water interface from Danny's Lake (P34)

```
> clam("P34",4,0.7, outliers=c(1,11,13,18,24,25), ageofdepth=0)
```