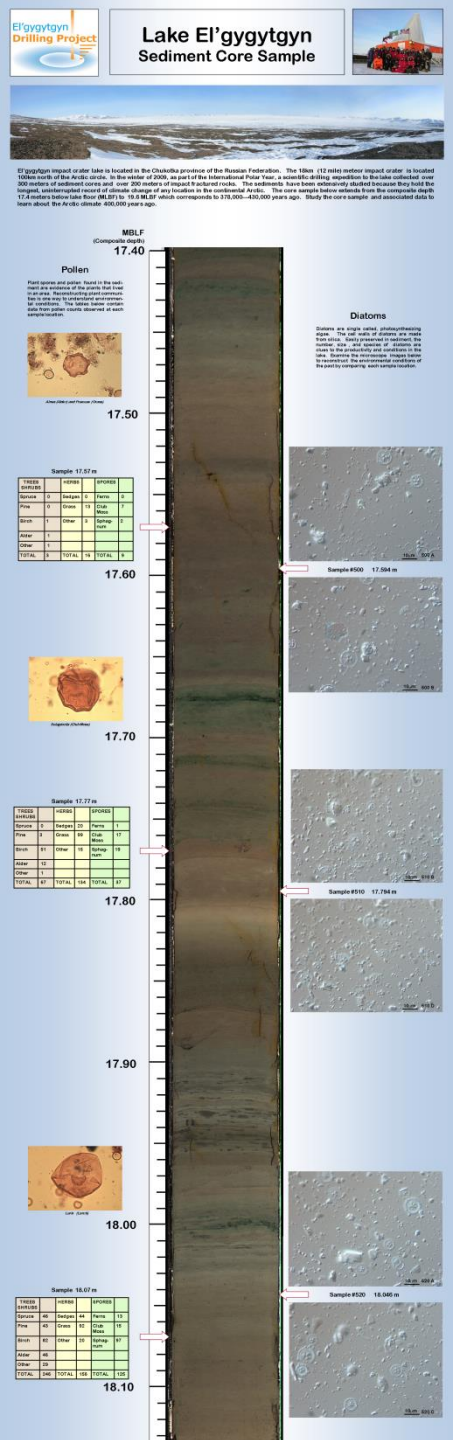


El'gygytgyn Drilling Project

Pollen Data Analysis
Lake El'gygytgyn Core 5011

Samples 17.57 – 19.33

Depths 17.594 – 19.446 MBLF

Ages 385 – 429 k.a.

This data set is to be used in conjunction with Lake El'gygytgyn sediment core poster.

Samples prepared by Dr. A. Lozhkin , North Eastern Interdisciplinary Science Research Institute, Russian Academy of Science, Dr. P. Anderson University of Washington.

Paleoclimatology activity by T. Martin.

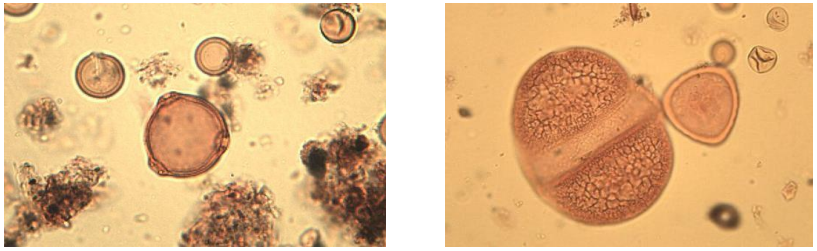
El'gygytgyn Drilling Project

Pollen Analysis

Pollen is a microscopic structure that is produced in flowers which contains genetic material for plant reproduction (spores are similar structures for non-flowering plants.) Both spores and pollen are very resilient and easily preserved in lake sediment. The pollen found in sediment is a reliable environmental record of the plants that grew in the area when the sediment was deposited. To extract pollen grains from a sediment sample a variety of acids and other chemicals are used to dissolve mineral and other organic material in the sediment.

Examine the data tables in the following slides to reconstruct the environmental conditions of the past by comparing each sample.

Note: Due to inconsistencies in sample size and extraction procedure, relative abundance of pollen type is studied rather than simple numeric counts. For pollen analysis of these samples, compare the type of pollen to the total pollen count (percentage.)



Light microscope images of pollen samples from Lake El'gygytgyn. Left- Birch (Betula) and Grass pollen, Right - Pine (Pinus) pollen and Moss spores (Sphagnum)

Suggested Investigations

- For each sample calculate and graph relative percentages of tree/shrub pollen, herb pollen and spores
- Calculate and graph relative percentages of individual species
  - Suggested: Pine, Alder, Grass
- Construct hypothesis to explain observed changes.

El'gygytgyn Drilling Project

Tree and Shrub species Pollen

Sample Depth	Age	Picea	Pinus	Betula	Alnus	Corylus	Salix	Larix	Ericales	Other	Total TS
MBLF	ka	Spruce	Pine	Birch	Alder	Hazel	Willow	Larch			
17.57	384.20	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	3.0
17.77	390.02	0.0	3.0	51.0	12.0	0.0	1.0	0.0	0.0	1.0	67.0
18.07	395.88	46.0	43.0	82.0	46.0	0.0	6.0	0.0	23.0	29.0	246.0
18.25	399.30	28.0	66.0	57.0	99.0	0.0	5.0	5.0	7.0	17.0	267.0
18.49	404.58	243.0	170.0	173.0	194.0	0.0	5.0	13.0	9.0	27.0	807.0
18.67	412.91	115.0	87.0	134.0	243.0	0.0	4.0	8.0	1.0	13.0	592.0
18.85	419.47	117.0	20.0	180.0	249.0	0.0	11.0	5.0	4.0	20.0	586.0
19.03	423.79	352.0	3.0	386.0	187.0	44.0	15.0	29.0	3.0	91.0	1019.0
19.21	427.00	1.0	0.0	165.0	9.0	0.0	6.0	4.0	9.0	19.0	194.0
19.33	428.20	0.0	0.0	10.0	3.0	0.0	3.0	0.0	0.0	3.0	16.0

Pollen Data Analysis Lake El'gygytgyn Core 5011

El'gygytgyn Drilling Project

Herb species Pollen

Sample Depth	Age	Saxifragaceae	Artemisia	Caryophyllaceae	Cyperaceae		Papaveraceae	Other	Total Herb
MBLF	ka				Sedges	Grass	Poppy		
17.57	384.20	1.0	1.0	1.0	0.0	13.0	0.0	3.0	16.0
17.77	390.02	2.0	2.0	9.0	20.0	99.0	2.0	15.0	134.0
18.07	395.88	2.0	4.0	13.0	44.0	92.0	1.0	20.0	156.0
18.25	399.30	1.0	3.0	7.0	78.0	27.0	3.0	14.0	119.0
18.49	404.58	0.0	0.0	0.0	29.0	10.0	1.0	1.0	40.0
18.67	412.91	0.0	0.0	0.0	14.0	9.0	0.0	0.0	23.0
18.85	419.47	2.0	2.0	0.0	33.0	14.0	1.0	5.0	52.0
19.03	423.79	0.0	2.0	2.0	53.0	69.0	3.0	7.0	129.0
19.21	427.00	2.0	5.0	2.0	29.0	59.0	5.0	14.0	102.0
19.33	428.20	0.0	10.0	5.0	20.0	145.0	22.0	37.0	202.0

Pollen Data Analysis Lake El'gygytgyn Core 5011

El'gygytgyn Drilling Project

Spores (Mosses and Ferns)

Sample Depth	Age	Sphagnum	Selaginella	Polypodiaceae	Total Spores
MBLF	ka	Moss	Club moss	Ferns	
17.57	384.20	2.0	7.0	0.0	9.0
17.77	390.02	19.0	17.0	1.0	37.0
18.07	395.88	97.0	15.0	13.0	125.0
18.25	399.30	101.0	7.0	5.0	113.0
18.49	404.58	67.0	1.0	6.0	74.0
18.67	412.91	72.0	0.0	1.0	73.0
18.85	419.47	75.0	3.0	2.0	80.0
19.03	423.79	143.0	5.0	2.0	150.0
19.21	427.00	84.0	14.0	1.0	99.0
19.33	428.20	4.0	9.0	0.0	13.0

Pollen Data Analysis Lake El'gygytgyn Core 5011

El'gygytgyn Drilling Project

Sub-Totals

Sample Depth (MBLF)	Age (ka)	Total Tree and Shrub	Total Herb	Total Spores	Total count	Percent Tree and Shrub	Percent Herb	Percent Spores
17.57	384.20	3.0	16.0	9.0	28.0	10.7%	57.14%	32.14%
17.77	390.02	67.0	134.0	37.0				
18.07	395.88	246.0	156.0	125.0				
18.25	399.30	267.0	119.0	113.0				
18.49	404.58	807.0	40.0	74.0				
18.67	412.91	592.0	23.0	73.0				
18.85	419.47	586.0	52.0	80.0				
19.03	423.79	1019.0	129.0	150.0				
19.21	427.00	194.0	102.0	99.0				
19.33	428.20	16.0	202.0	13.0				

Pollen Data Analysis Lake El'gygytgyn Core 5011