

Geology Classification for Protected Area Gap Analysis

Geological Classification

Scale: 1: 250,000 (Yukon-wide)

Source: Bedrock Geology (Gordey & Makepeace, 1999)

Description: Bedrock geology tracts are packages of rocks with similar age and type. In this Protected Area identification process the geology tracts will be organized into a classification according to rock type. The classification will have in the order of 10 classes, such as, in the case of the classification developed for the Selwyn Mountains ecoregion: Quaternary, Selwyn, Jones Lake, Earn, Gull Lake, Hyland, Askin and Backbone. Classification sets in the range of 10 classes appears to reasonably capture the range of geological diversity.

Rationale for use: This is the only Yukon-wide geophysical database at 1:250,000. This coverage and scale make it the best of the abiotic databases for protected area gap analysis. Its use is based on the understanding that common rock type classes will have similar patterns of erosion, [other values—discuss Thursday with geologists: parent material chemistry...] and other similar values—contributing to relatively common ecological conditions.

Case studies & examples:

- Selwyn Mountains Ecoregion

Questions for Thursday, May 25:

1. Rationale: elaborate on ways in which a geological classification may have a landscape determining or ecological expression.
2. Ideas respecting methodology—is there a better way to make use of the GSC compilation in PA gap analysis?
3. Critique of the Selwyn application.
4. Number of major geological regions in Yukon for which distinct classifications of geology would be required.
5. Preferred option for interpreting results for decision making process. (see draft matrix, next pg)

Representation matrix

Map Scale of Data	Theme	Candidate A	Candidate B	Candidate C
1: 1,000,000	Soil Development			
	Parent Materials			
	Glacial Limits			
	Land Cover (from AVHRR)			
	Green up (from AVHRR)			
1: 250,000	Geological Classification			
	DEM Classifications			
	Forestry Inventory			
	Hydrology			
	Key Habitat			
	Rare Vascular Plants			
	Unique Features			
Overall Representation Rating				

Viability Matrix

Viability Theme		Candidate A	Candidate B	Candidate C
Size	MRA <i>min reserve area</i>			
	MDA <i>dynamic</i>			
	MCA <i>critical</i>			
Boundaries	Watersheds			
	Shape			
	Key Habitats			
Connections	Functional Connectivity			
	Intervening matrix			
Naturalness/ <i>Disturbance</i>	Linear Disturbance			
	Exotics			
	Mineral Occurrences			
Overall Viability Rating	e.g.	moderate	high	low

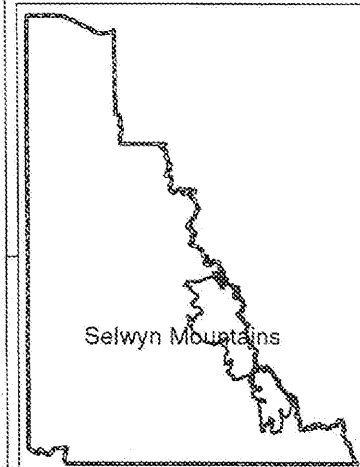
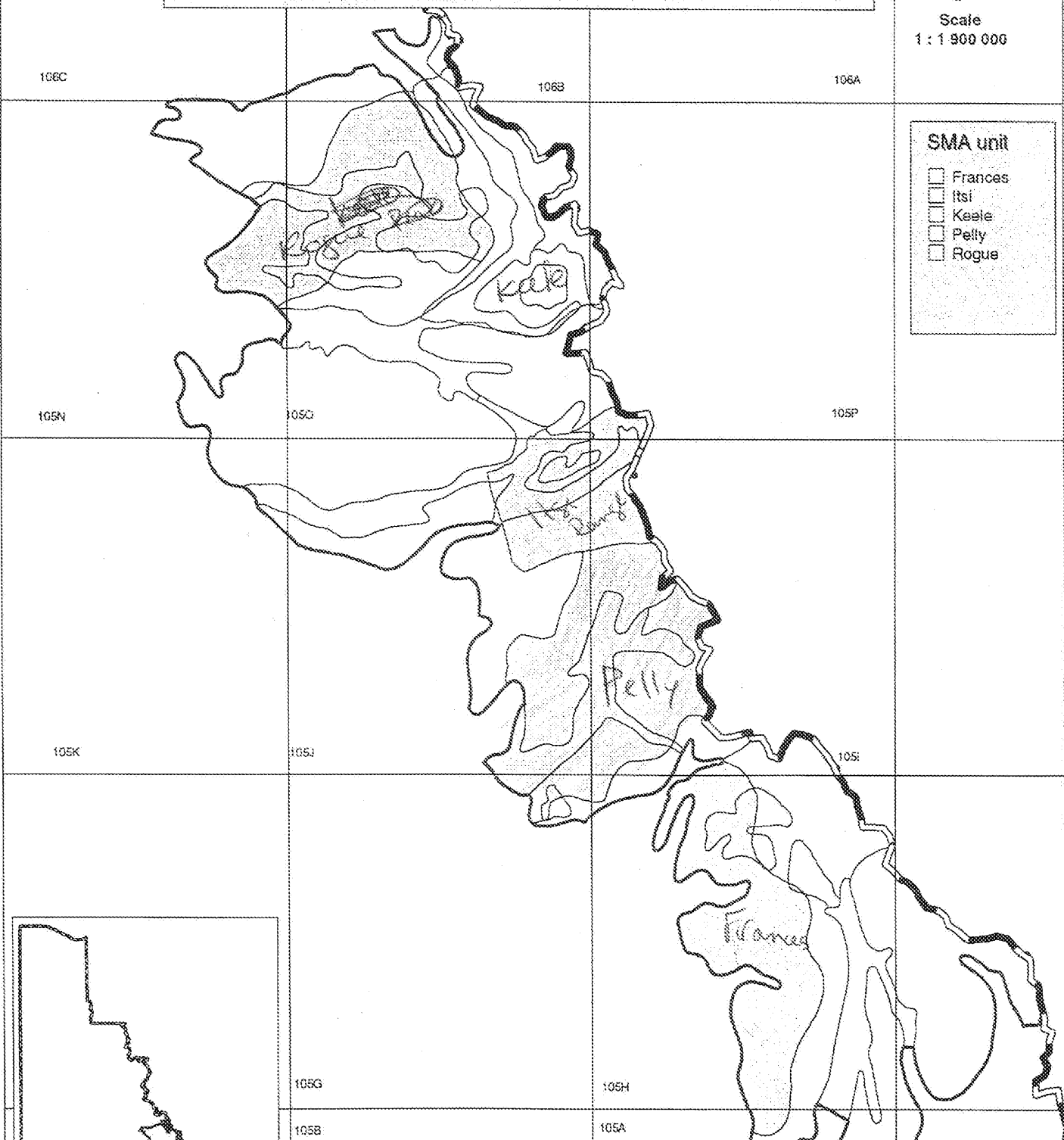
Selwyn Mountains Ecoregion Study Area Delineated Soil Landscape Units and SMA Study Units



Scale
1 : 1 900 000

SMA unit

- Frances
- Itsi
- Keele
- Pelly
- Rogue



Source Information
Soil Landscapes of Canada
Version 2.2
Date: 1996.11.27
Scale 1 : 1 000 000
National Soil Database
Agriculture and Agri-Food Canada

Compiled By: Nadele Flynn
Applied Ecosystem Management
Compiled On: October 15, 1998
Revision: 1a

Selwyn Mtns. Geology

ERA	PERIOD/EPOCH	ASSEMBLAGE
Cenozoic	Quaternary	Quaternary
	Tertiary (Eocene)	Ross
Mesozoic	Cretaceous	Selwyn Suite
	Triassic	Jones Lake
Upper Paleozoic	Permian to Carboniferous	Mount Christie
		Tsichu
	Carboniferous (Mississippian)	Tay
		Keno Hill
	Carboniferous (Mississippian) to upper Devonian	Earn
	Middle Devonian	Natla
	Devonian	Grizzly Bear (#282)
	Middle Devonian to middle Silurian	Askin (#2759)
Lower Paleozoic	Silurian	McEvoy
	Lower Silurian to Ordovician	Road River
		Road River - Selwyn
	Ordovician to upper Cambrian	Rabbitkettle
		Marmot
	Middle Cambrian	Hess River
	Lower Cambrian	Sekwi
Gull Lake		
Precambrian	Lower Cambrian to upper Proterozoic	Backbone
		Vampire

1) Quaternary

2) Selwyn Suite
(Try a 1km buffer as hornfeld)

3) Jones Lake ✓
Mount Christie ✓
TsiChu ✓
Tay ✓
Keno Hill ✓

4) Earn ✓

5) Natla ✓
Grizzly Bear (#282) ✓
Askin (#2759) ✓
McEvoy ✓

6) Road River ✓
Road River - Selwyn ✓
Rabbitkettle ✓
Marmot CSM ✓
Hess River ✓
Gull Lake ✓

7) Vampire
Hyland

8) Sekwi
Backbone

Delete:

Ross

	Ecoregion	Rogue	Keele	Itsi	Pelly	Frances	Keele/Itsi	
Quaternary	5.3	4.6	4.2	18.1	8.1	3.3	0.3	14
Selwyn	13.3	12.87	3.3	3.1	8.8	1.1	49.2	5.5
Jones Lk	3.3	0.46	2.1	0.2	8.6	1.2	0	3.7
Earn	12.7	12.74	2.9	6.5	21.1	15.7	9	12.5
Gull Lk	33.9	5.62	32	36.8	52.2	51.4	0	43.2
Hyland	29	30.39	33.5	19.6	0	26.5	33.9	11.5
Askin <small>McEwen</small>	0.95	0.70	0	2	0	0.7	4.5	1.2
Backbone	1	0.57	0	6.4	0	0	0	3.8
	99.45		78	92.7	98.8	99.9	96.9	95.4

	Ecoregion	Keele/Itsi
Quaternary	5.3	14
Selwyn	13.3	5.5
Jones Lk	3.3	3.7
Earn	12.7	12.5
Gull Lk	33.9	43.2
Hyland	29	11.5
Askin	0.95	1.2
Backbone	1	3.8
	99.45	95.4

	Ecoregion	Rogue
Quaternary	5.3	4.2
Selwyn	13.3	3.3
Jones Lk	3.3	2.1
Earn	12.7	2.9
Gull Lk	33.9	32
Hyland	29	33.5
Askin	0.95	0
Backbone	1	0
	99.45	78

	Ecoregion	Keele
Quaternary	5.3	18.1
Selwyn	13.3	3.1
Jones Lk	3.3	0.2
Earn	12.7	6.5
Gull Lk	33.9	36.8
Hyland	29	19.6
Askin	0.95	2
Backbone	1	6.4
	99.45	92.7

Ecoregion Itsi

Quaternary	5.3	8.1
Selwyn	13.3	8.8
Jones Lk	3.3	8.6
Earn	12.7	21.1
Gull Lk	33.9	52.2
Hyland	29	0
Askin	0.95	0
Backbone	1	0
	99.45	98.8

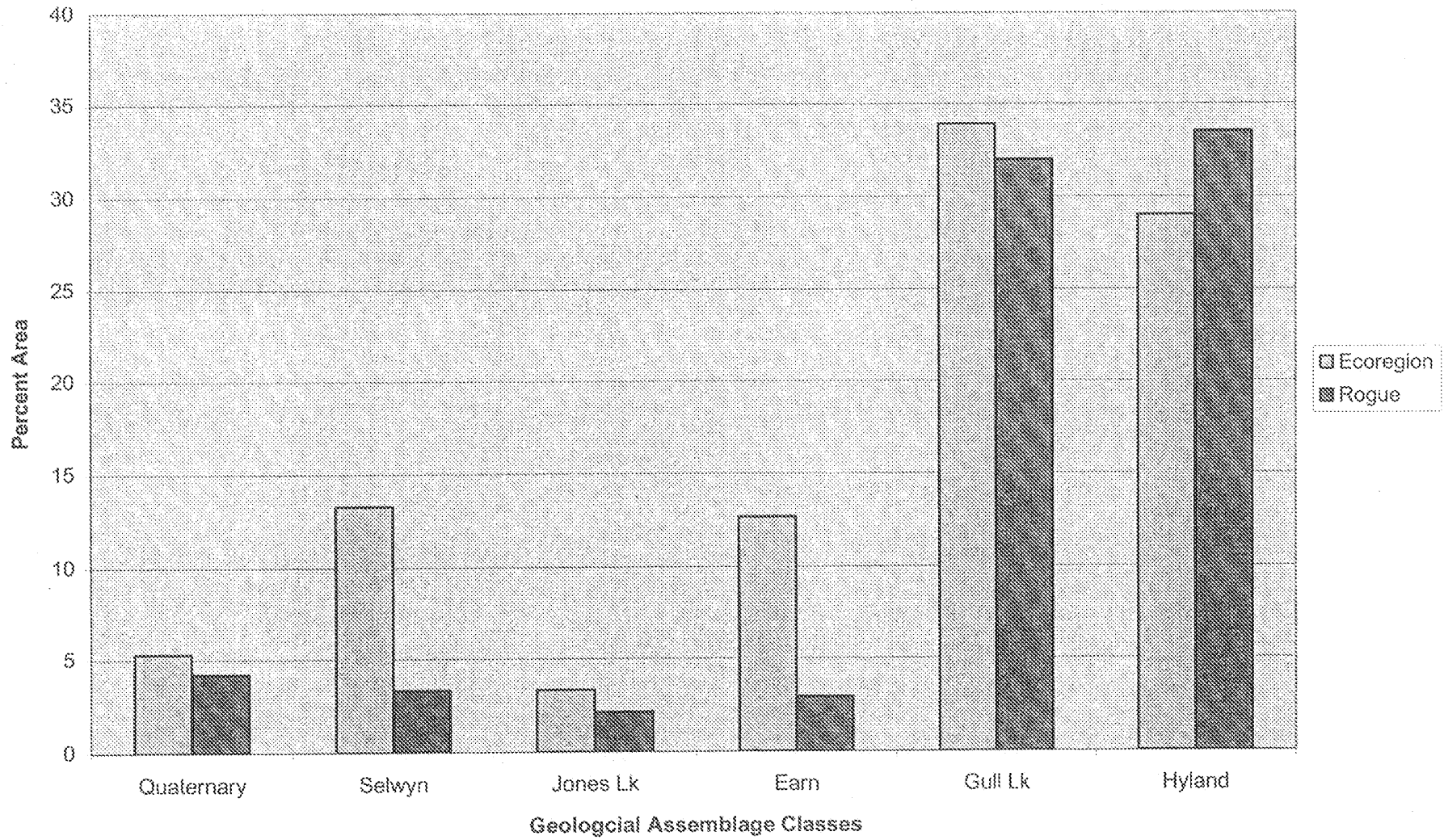
Ecoregion Pelly

Quaternary	5.3	3.3
Selwyn	13.3	1.1
Jones Lk	3.3	1.2
Earn	12.7	15.7
Gull Lk	33.9	51.4
Hyland	29	26.5
Askin	0.95	0.7
Backbone	1	0
	99.45	99.9

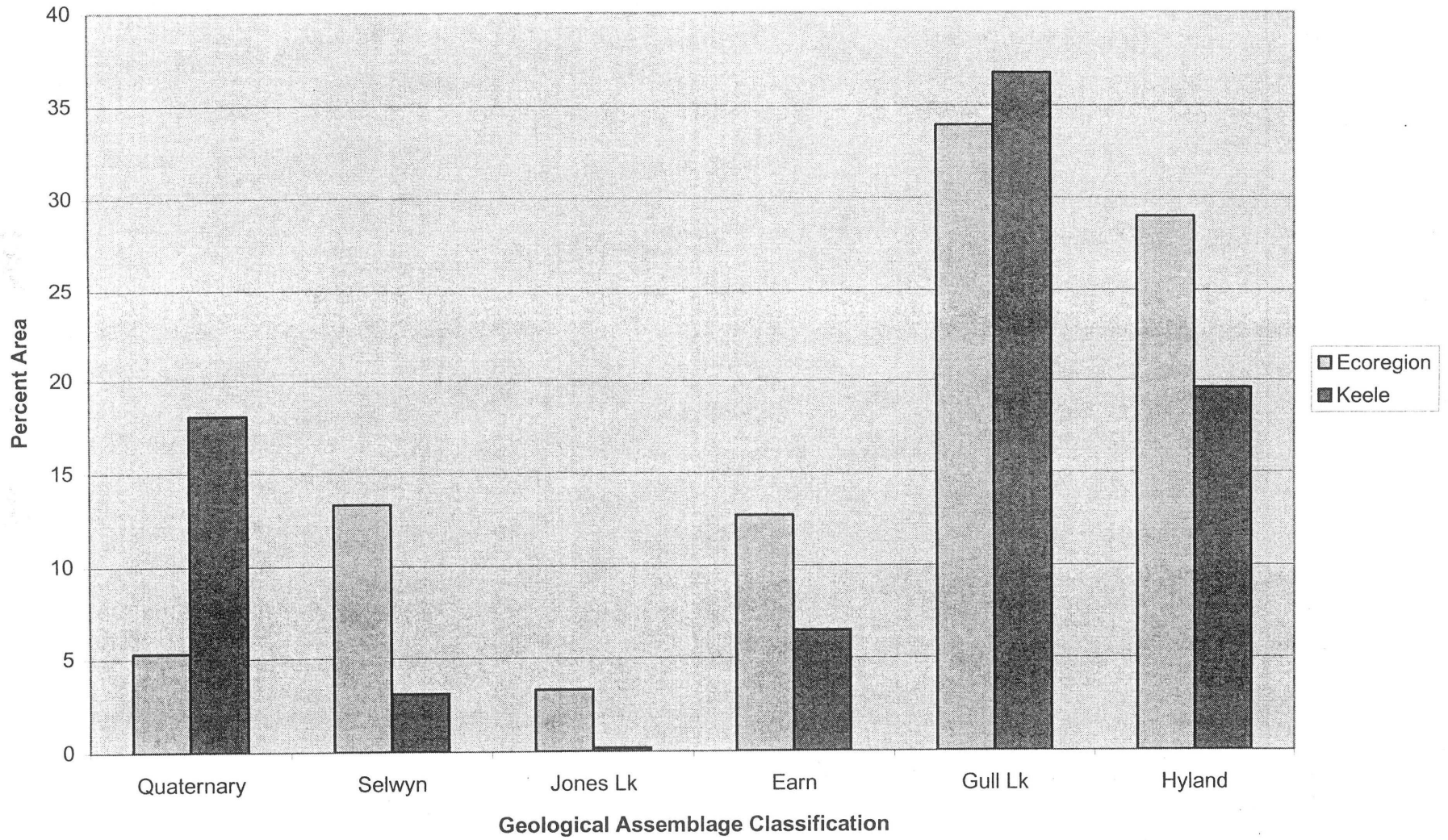
Ecoregion Frances

Quaternary	5.3	0.3
Selwyn	13.3	49.2
Jones Lk	3.3	0
Earn	12.7	9
Gull Lk	33.9	0
Hyland	29	33.9
Askin	0.95	4.5
Backbone	1	0
	99.45	96.9

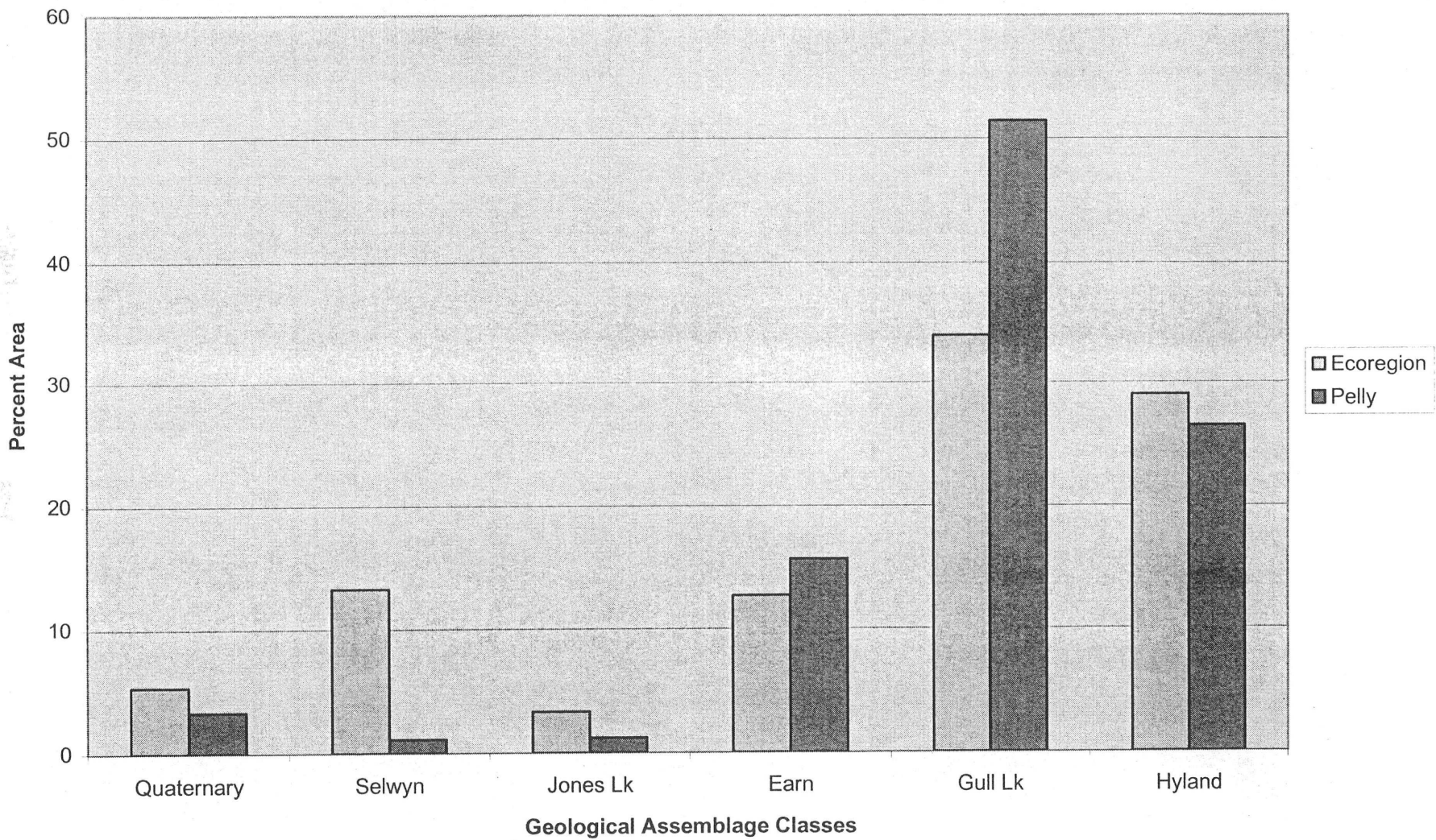
Selwyn Mountains Ecoregion and Rogue Option



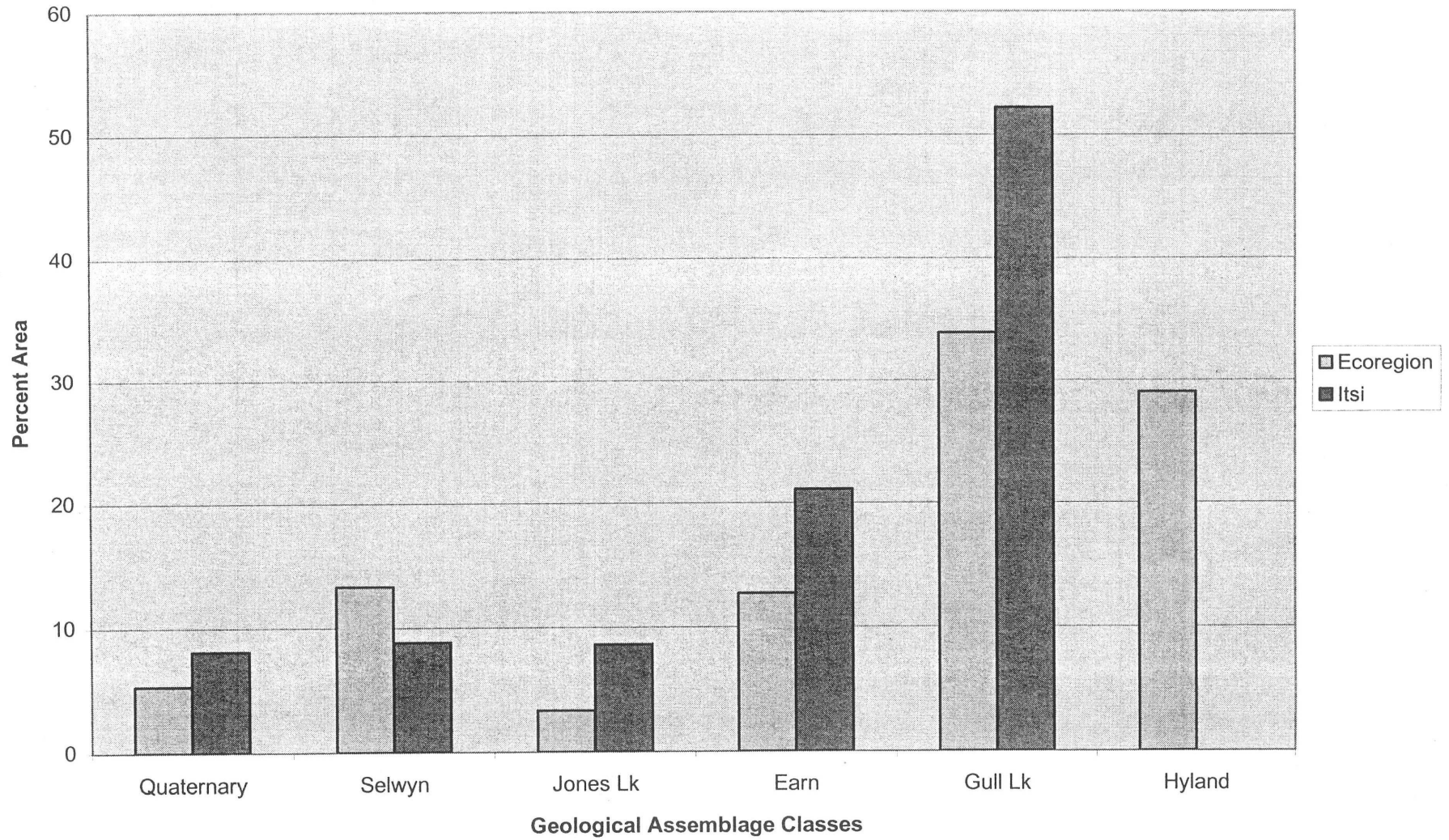
Selwyn Mountains Ecoregion Geology and Keele Option



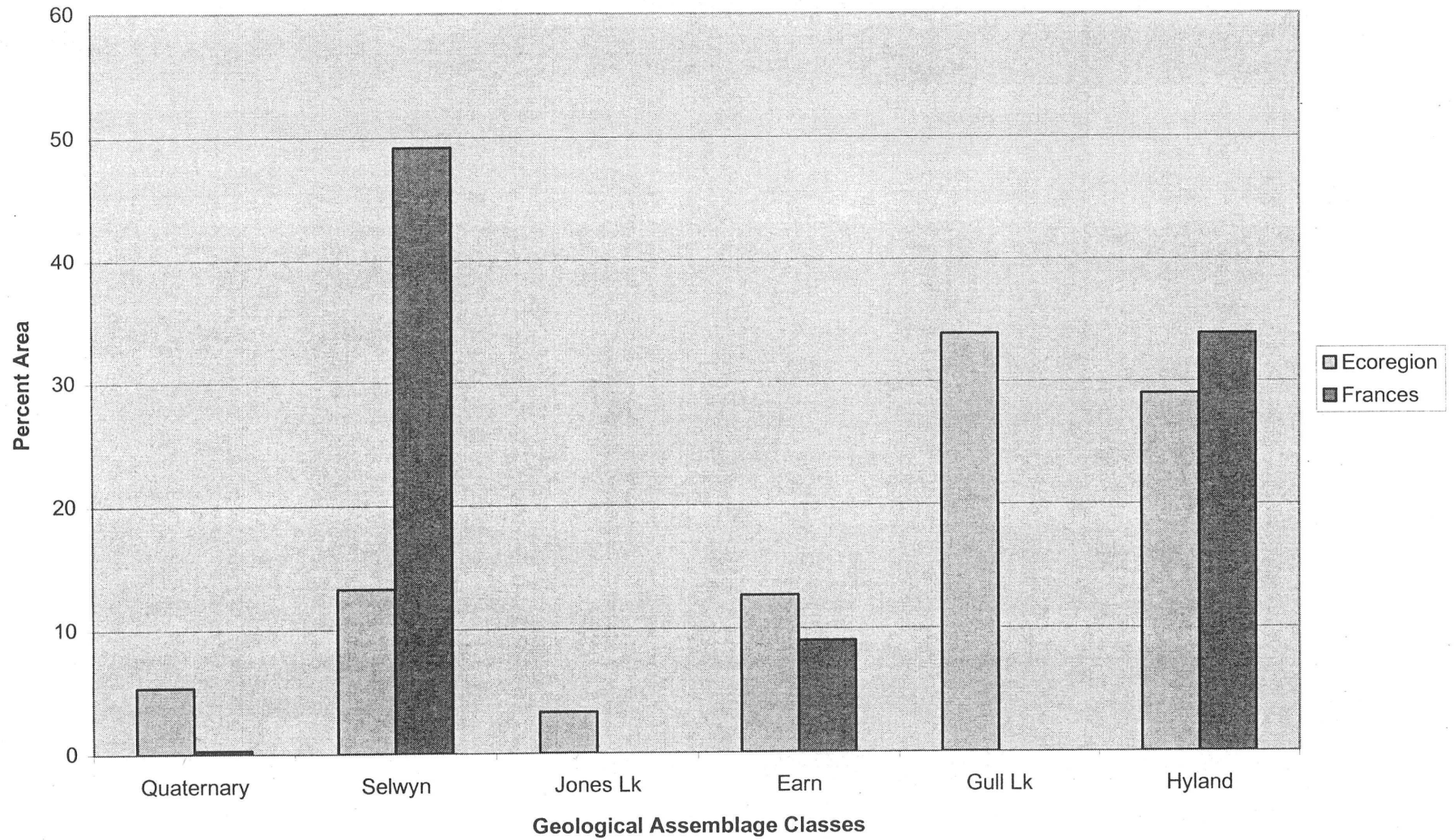
Geological Representivity: Selwyn Mountains Ecoregion and Pelly Option



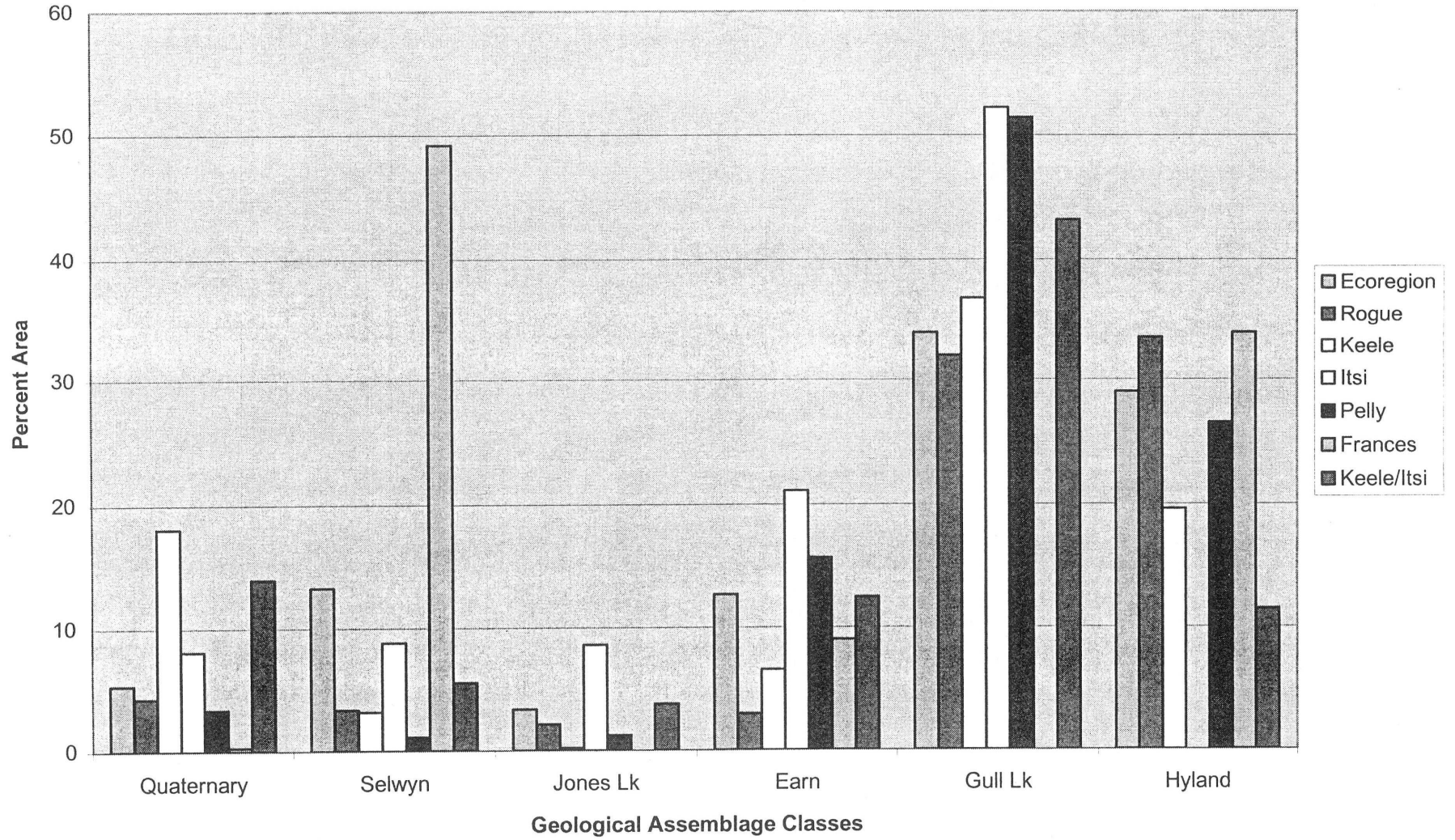
Selwyn Mountains Ecoregion Geology and Itsi Option



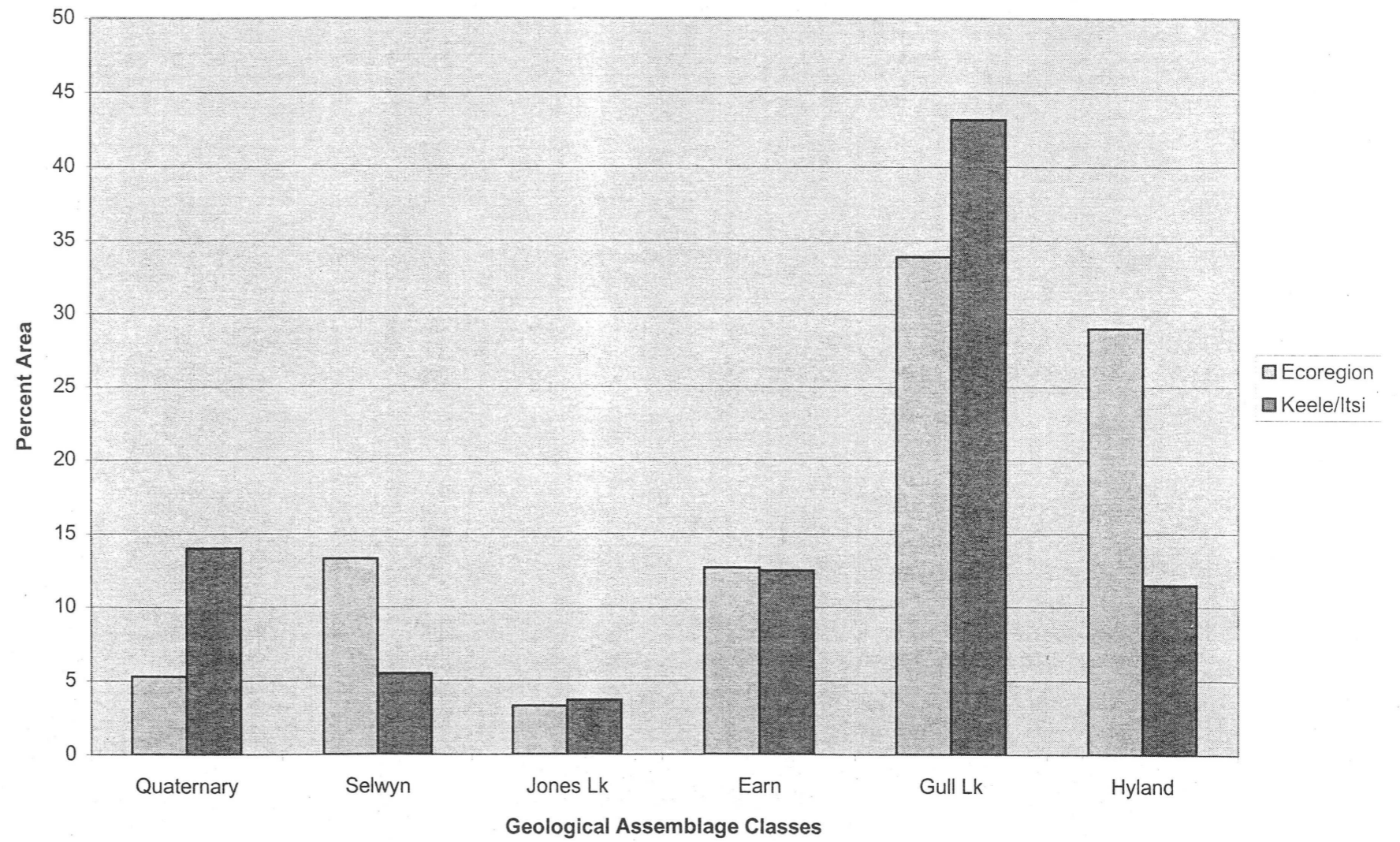
Geological Representivity: Selwyn Mountains Ecoregion and Frances Option



Selwyn Mountain Ecoregion: Geological Representivity



Selwyn Mountains Ecoregion Geology & Keele and Itsi Combined Option



Geology Coverage of Yukon

Polygon-id	NAME	orig_unit	reg_unit	terrain	assemblage	age	includes	description	area
2816	Frances	PY	PCH1	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Yusezyu	thin_to_thic	49459572
2895	Frances	PCN	PCH3	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._Narchilla__Senoah__Arrowhead_Lake	distinctive_	132489.2656
2897	Frances	PCN	PCH3	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._Narchilla__Senoah__Arrowhead_Lake	distinctive_	34657.09766
2903	Frances	PCN	PCH3	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._Narchilla__Senoah__Arrowhead_Lake	distinctive_	396525.5
2904	Frances	PY	PCH1	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Yusezyu	thin_to_thic	896484.5625
2909	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	339636448
2918	Frances	PCN	PCH3	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._Narchilla__Senoah__Arrowhead_Lake	distinctive_	11645.60254
2996	Frances	1a	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	178374.2813
3035	Frances	ice	ice	STp				JB	1678536.125
3038	Frances		15 mKgS	mKp	Selwyn_Suite	mid-Cretaceous	Selwyn_Suite	resistant_b	15053909
3051	Frances		15 mKgS	mKp	Selwyn_Suite	mid-Cretaceous	Selwyn_Suite	resistant_b	1093992.875
3062	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	102009.5625
3063	Frances	ice	ice	STp				JB	426438.75
3077	Frances	ice	ice	ice				JB	310726.6563
3078	Frances		15 mKgS	mKp	Selwyn_Suite	mid-Cretaceous	Selwyn_Suite	resistant_b	14172635
3089	Frances	2_1	PCH4	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._mostly(?)_Yusezyu	quartzose_	90069928
3100	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	237417.625
3102	Frances	1a	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	153210.3125
3118	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	111157.4766
3119	Frances	1a	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	15888.8584
3142	Frances		15 mKgS	mKp	Selwyn_Suite	mid-Cretaceous	Selwyn_Suite	resistant_b	384531264
3170	Frances	1b	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	9786679
3173	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	814191.3125
3195	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	1325864.875
3197	Frances	1b	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	2208103.75
3201	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	5730392.5
3215	Frances	1b	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	11162962
3224	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	17489152
3234	Frances	13_1	DME1	NA	Eam	Upper_Devonian_and_Mississippian	Eam_Gp._Portrait_Lake_and_Prevost	thin_bedde	5991900.5
3238	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	378955.25
3247	Frances	1b	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	1856266
3248	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	1733277.375
3249	Frances	1e	PCH3	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._Narchilla__Senoah__Arrowhead_Lake	distinctive_	56597692
3251	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	1532825.5
3259	Frances	ice	ice	WM				JB	1875097
3260	Frances	1b	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	865438.375
3261	Frances		16 Q	Qs	Quaternary	Quaternary		unconsolid.	5515081
3263	Frances	1?	PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	1011511.188
3264	Frances		16 Q	Qs	Quaternary	Quaternary		unconsolid.	370964.8125
3266	Frances	1b	PCH2	NA	Hyland	Upper_Proterozoic	Hyland_Gp._Algae_Lake__limestone_member_of_Yusezyu	grey_weath	622074.1875
3269	Frances		1 PCH	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp.	consists_uj	50087888
3278	Frances	2_1	PCH4	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._mostly(?)_Yusezyu	quartzose_	7881384.5
3300	Frances	2_1	PCH4	NA	Hyland	Upper_Proterozoic_to_Lower_Cambrian	Hyland_Gp._mostly(?)_Yusezyu	quartzose_	202092.2813