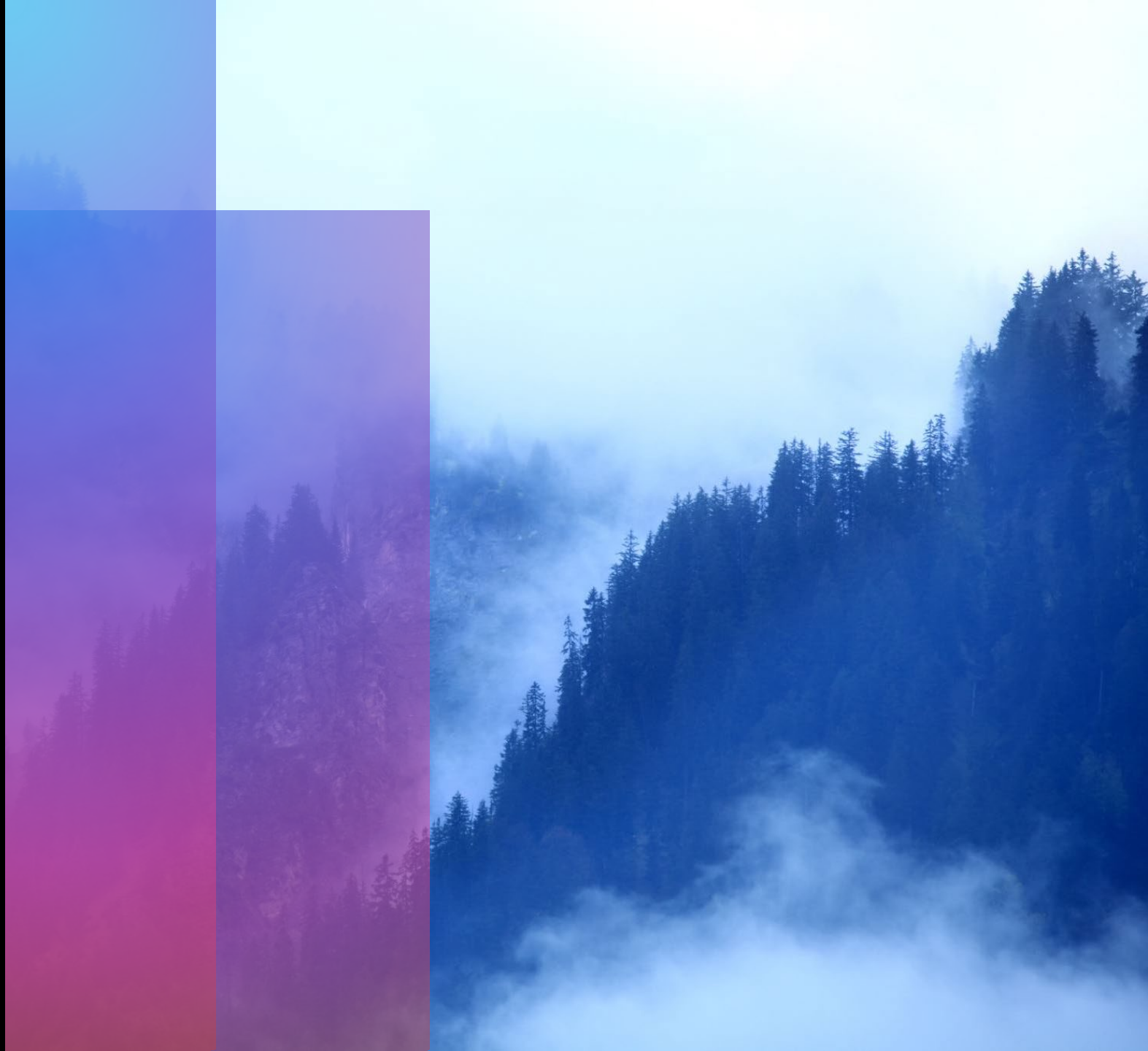


Idaho Batholith

Tyler Erickson

NDSU Geology 422- Petrology

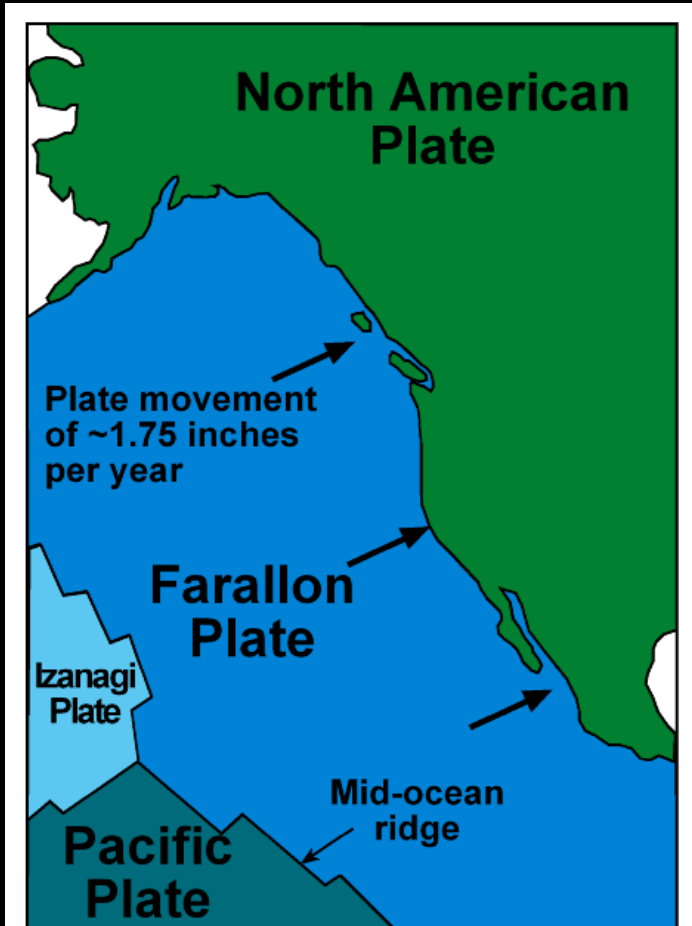
April 29, 2022



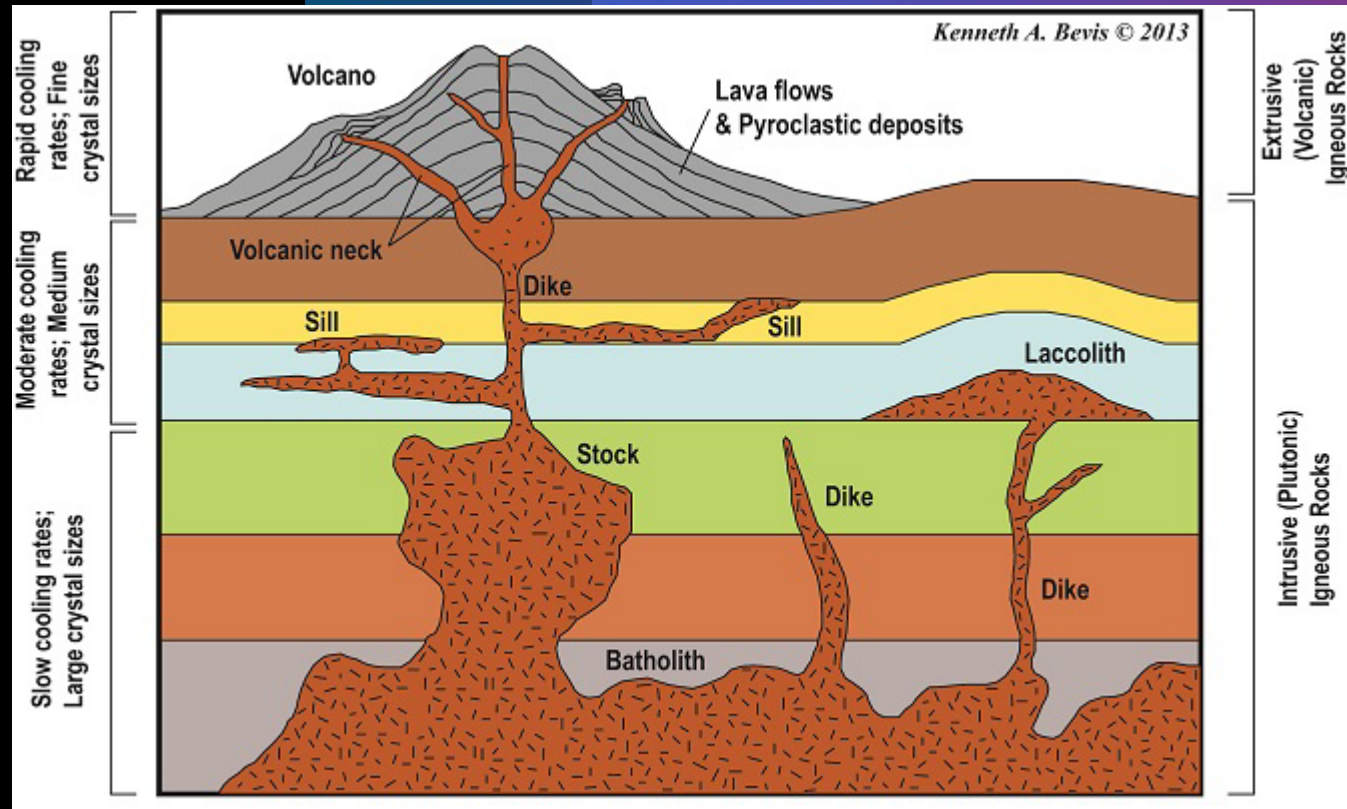
Formation



postregister.com

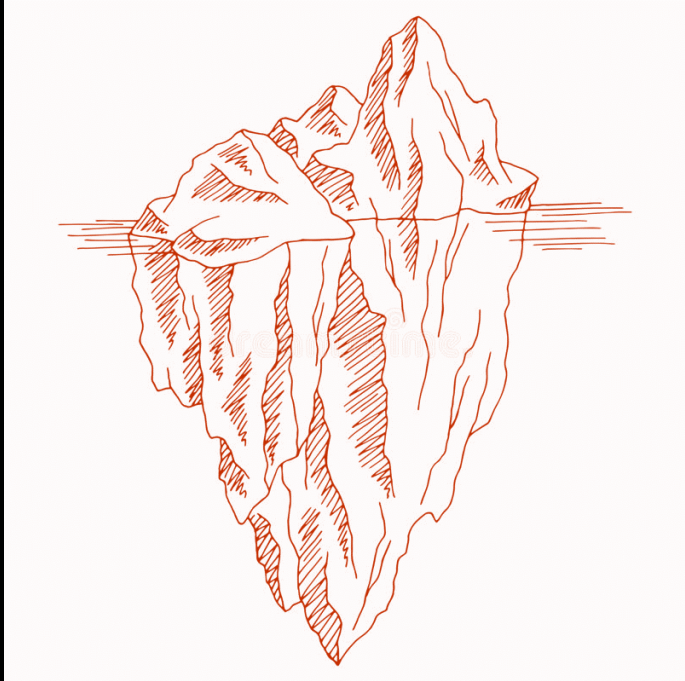


100 Ma (Middle Cretaceous) Plate tectonic configuration. Redrawn from Orr and Orr (2002).



[AlexStrekeisen](#)

Exposure

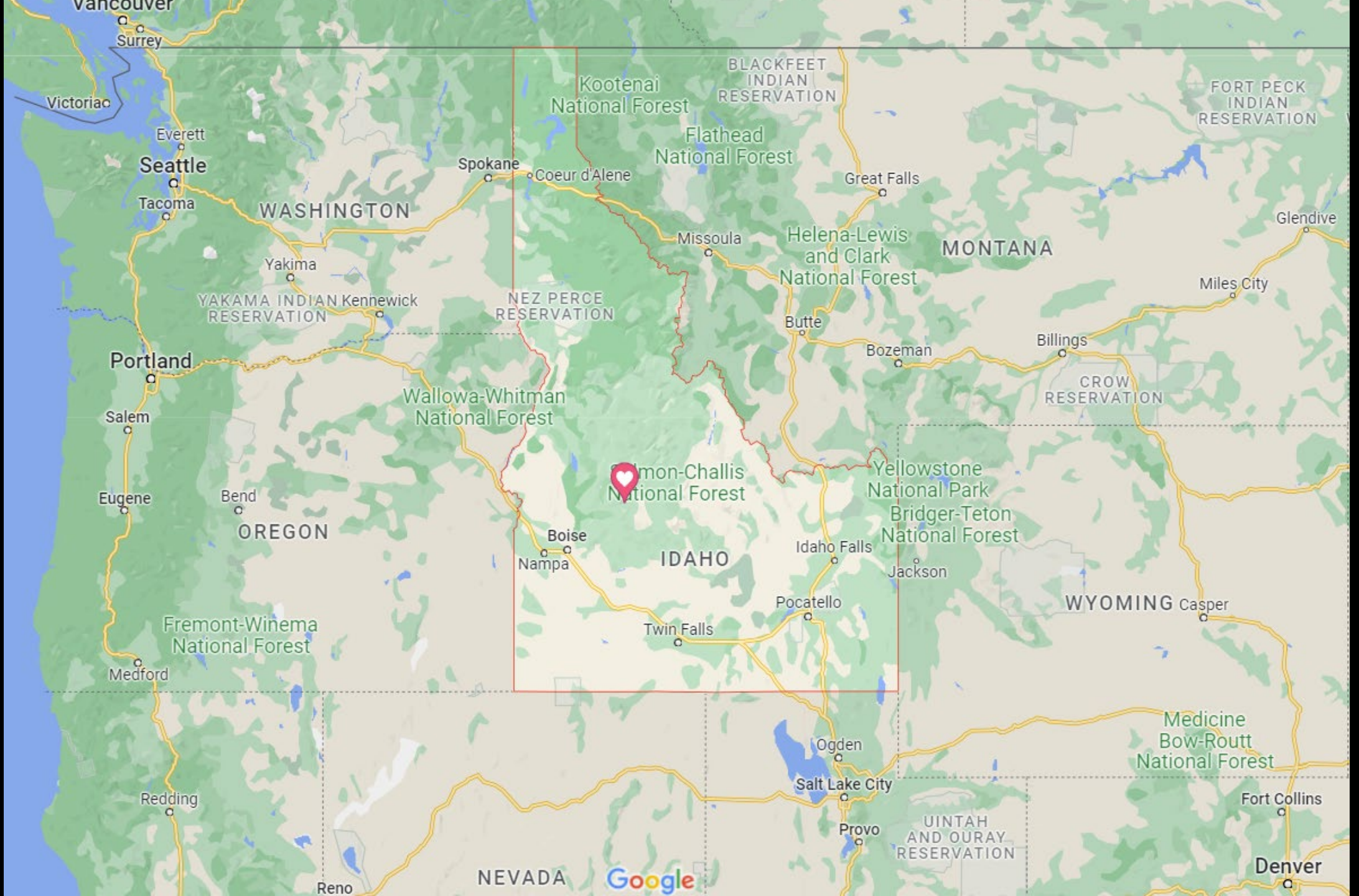


[Dreamstime](#)



Castle Peak, 38 Mi E of Collected Samples

[AlexStrekeisen](#)



Salmon-Challis National Forest

Google



Ponderosa Pine Scenic Route

524

Payette River

Bonneville Campground



Bonneville Campground

21

Boise 50 mi SW



[IdahoHotSprings](#)



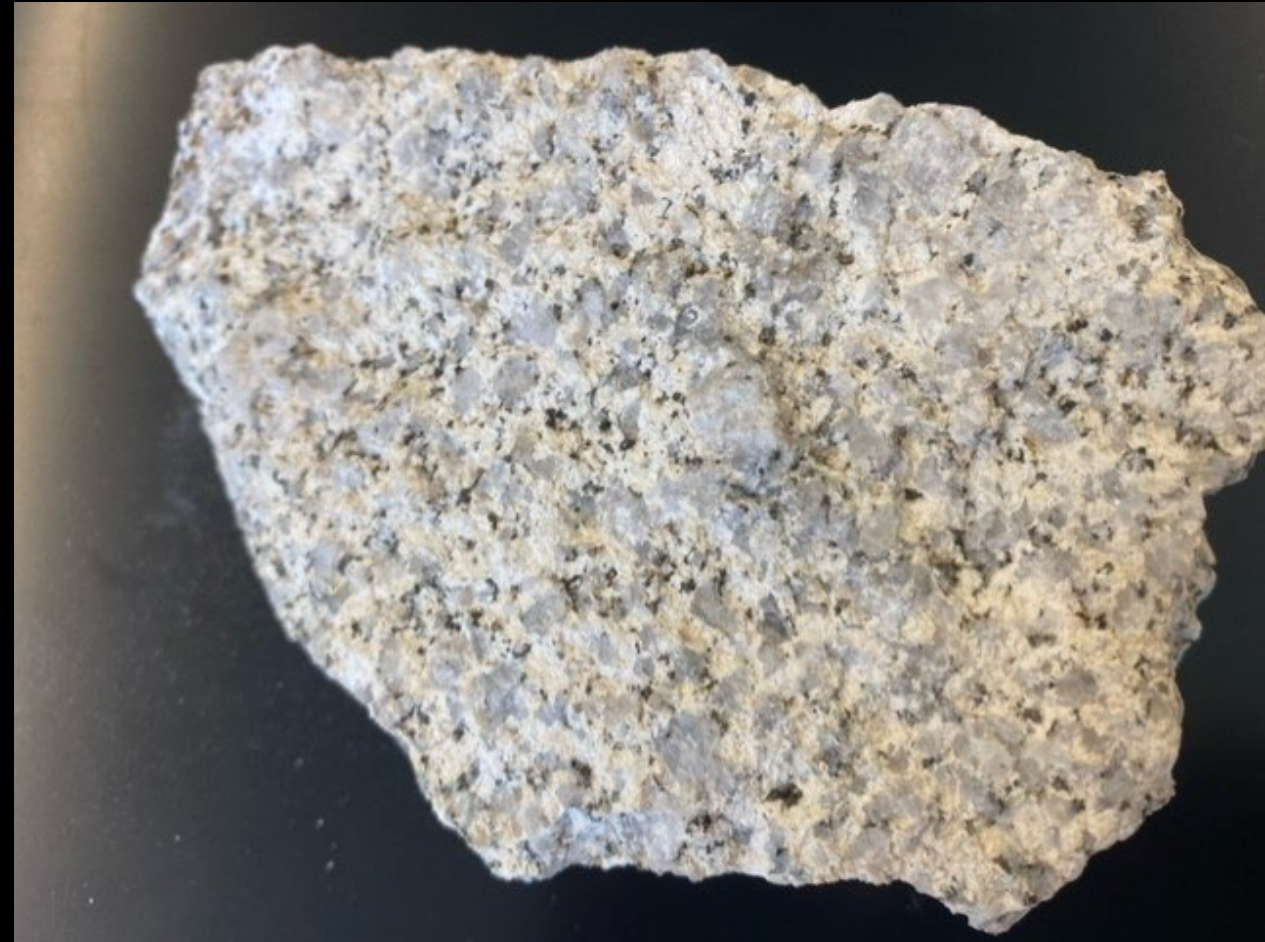
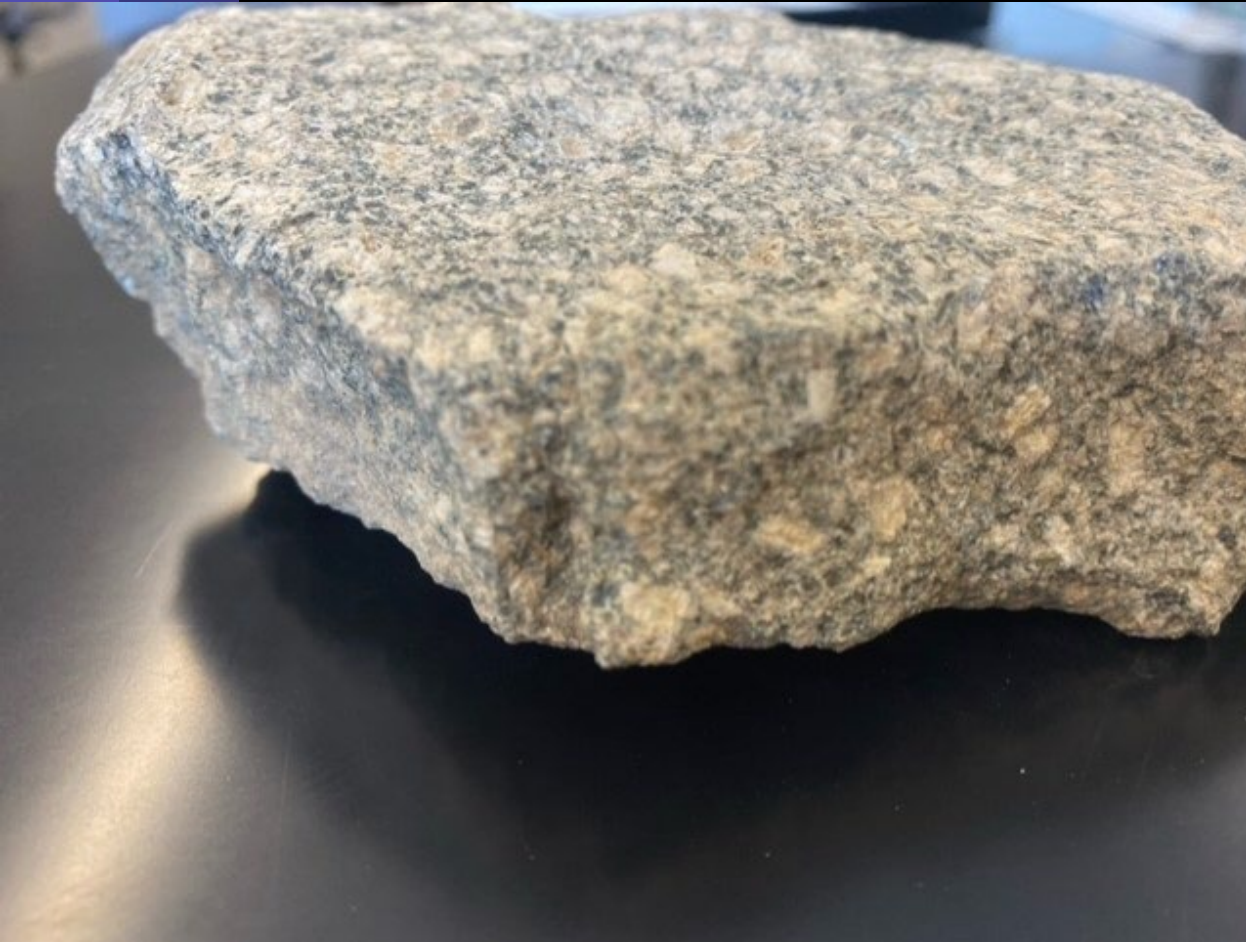
Google Maps Street View

Sample Location (Ground Visual)



Idaho batholith
South Fork Payette River
44° 09' N, 115° 17' W
Idaho

Idaho-1 - Idaho-2



Idaho
South Fork Payette Riv
44° 09' N, 115° 17' W
Idaho
AC Ashworth, 2004

1



2



Cross Section

Idaho-1



Megascopic Analysis

- Very Faint Foliation
- Porphyritic
- Feldspar
- Quartz
- Kaolinite

Idaho-2



- Equigranular
- Quartz
- Feldspar
- Biotite

Idaho-1



- “Somewhat Gneissic”
- Hornblendic
- Highly Visible Titanite Grains
- West Side of Batholith
- Granodiorite

- Same Minerals Listed in Megascopic Analysis Apply

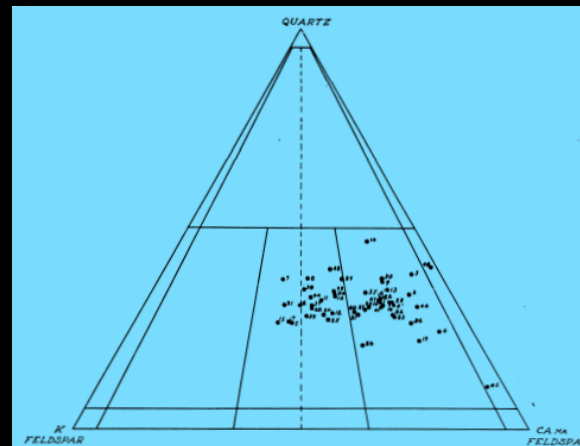
Idaho-2



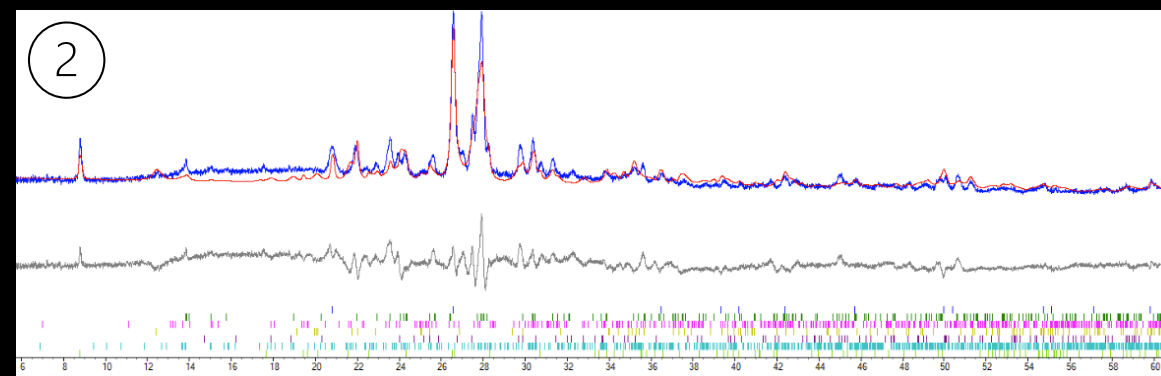
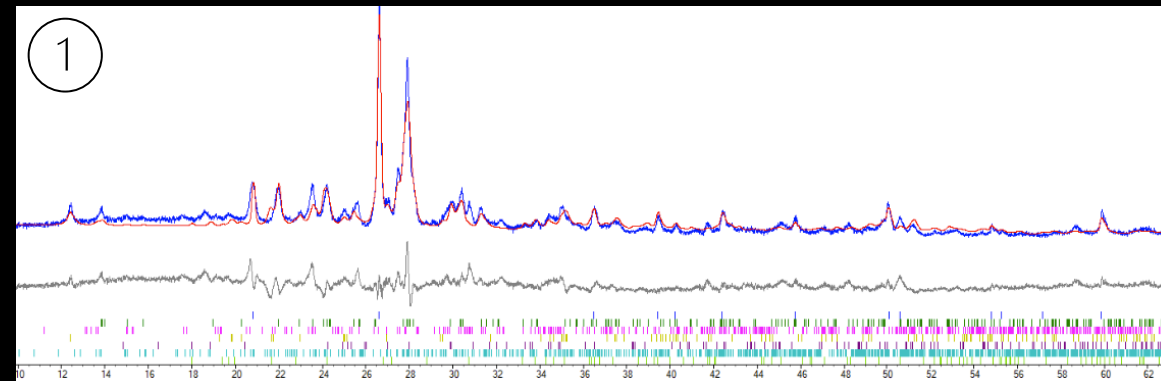
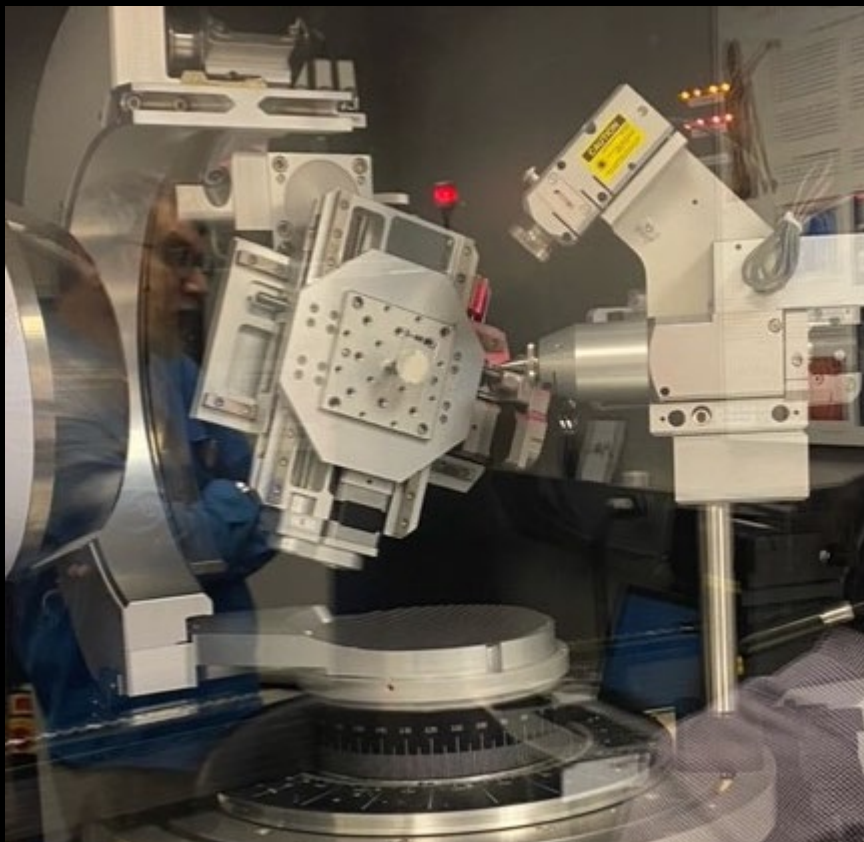
- Main Mass of Batholith
- Granodiorite

- Same Minerals Listed in Megascopic Analysis Apply

Comparison (Anderson and Rasor)



X-Ray Diffraction (Bruker D8)



TOPAS Spotlight 2016

- Quantitative Analysis
- Estimated Proportions of Minerals

1

Quartz, low	17.95 %
Albite, calcian	44.28 %
Microcline	0.08 %
Kaolinite 2M	9.47 %
Titanite	3.98 %
Anorthite	22.97 %
Biotite	1.26 %

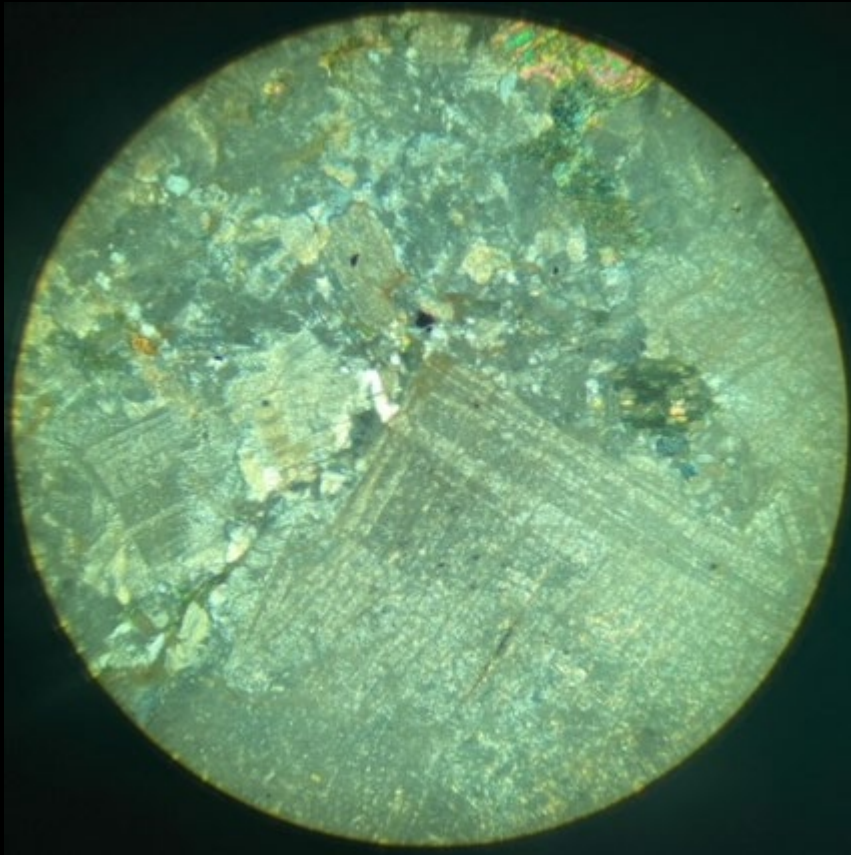


2

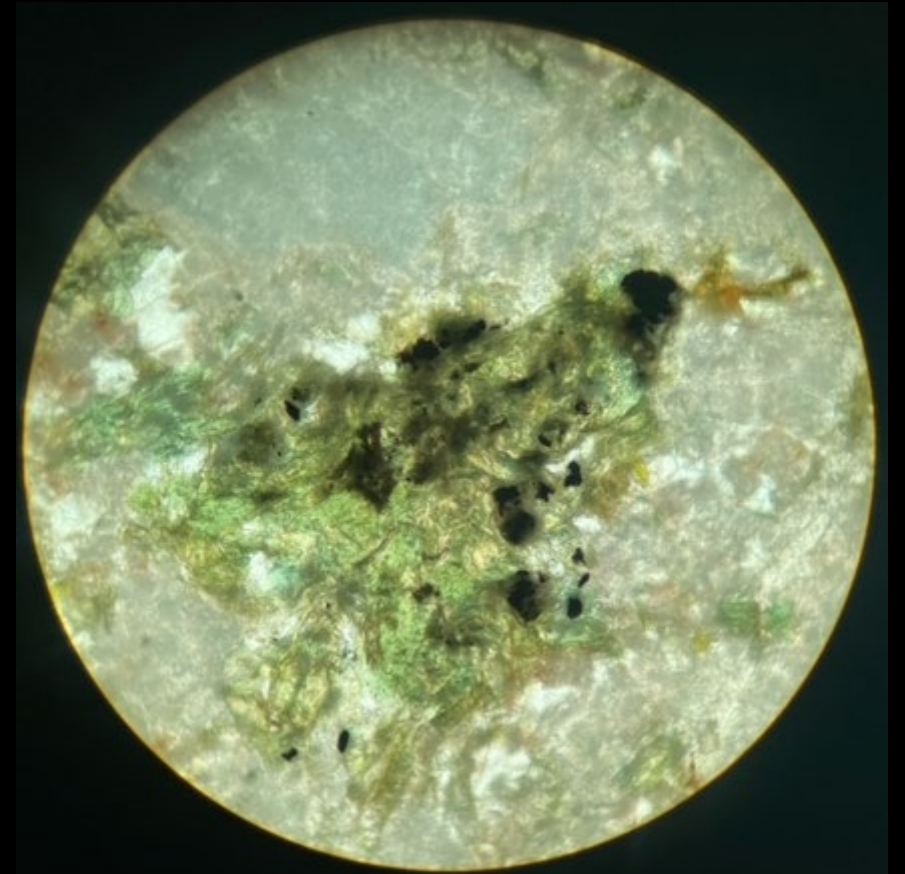
Quartz, low	11.40 %
Albite, calcian	23.24 %
Microcline	0.00 %
Kaolinite 2M	8.52 %
Titanite	9.34 %
Anorthite	42.27 %
Biotite	5.23 %

Idaho-1 Microscopy

PPL



Meiji 2mm



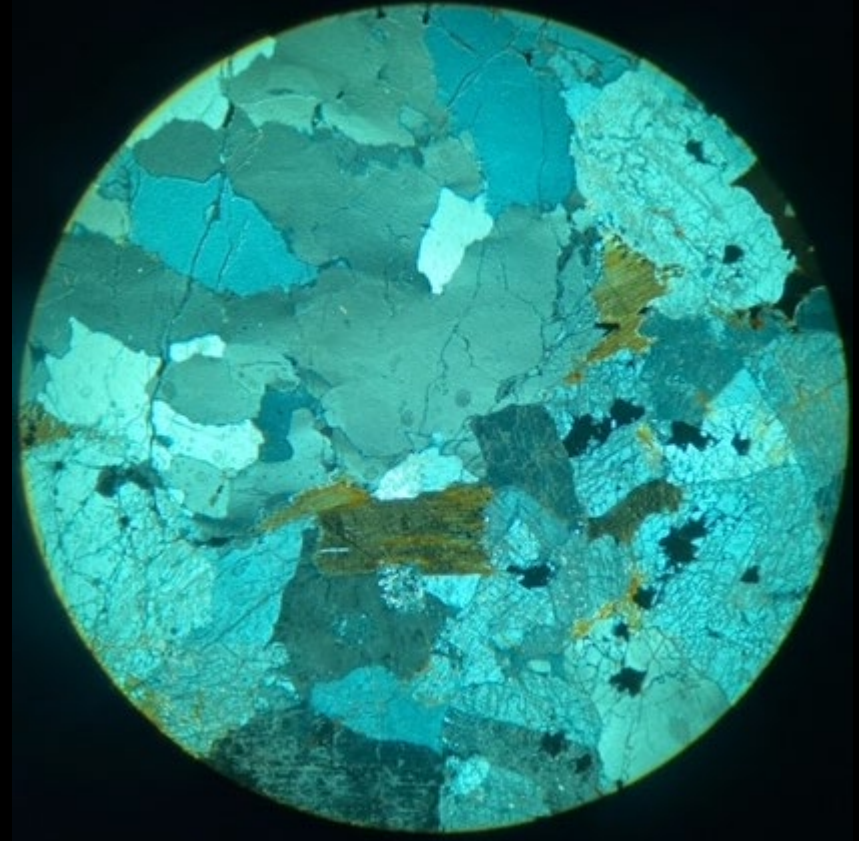
PPL

Idaho-2 Microscopy

PPL

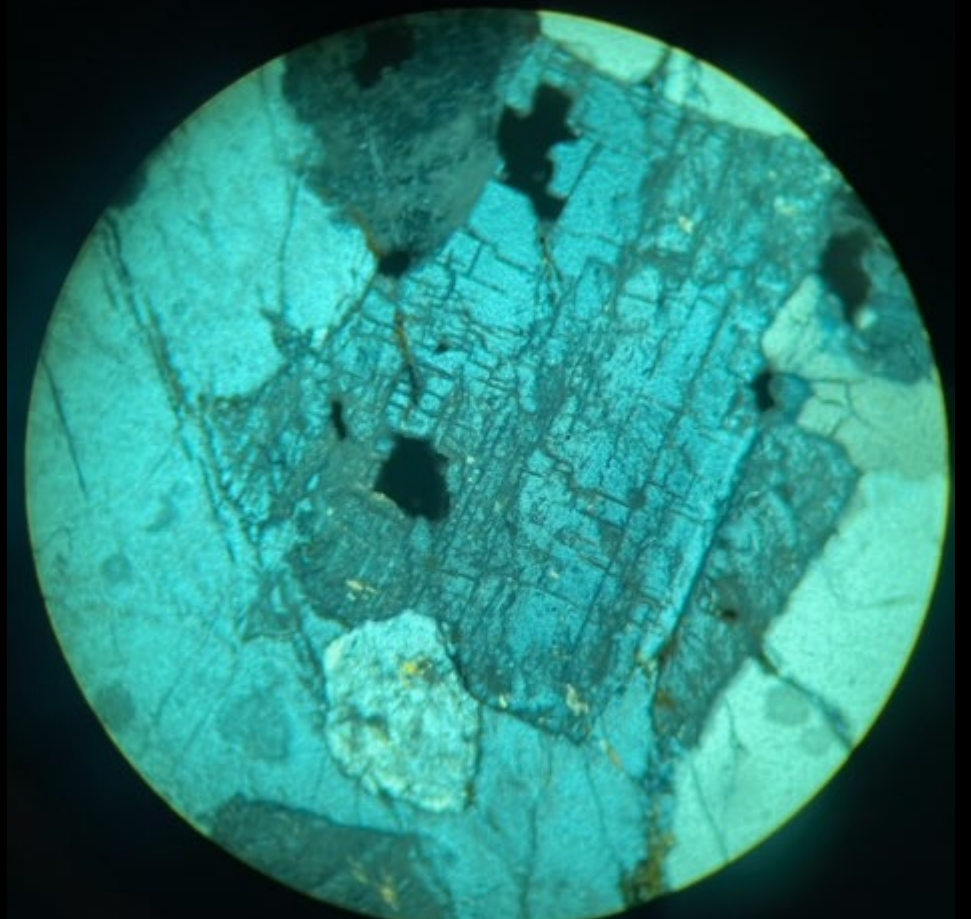
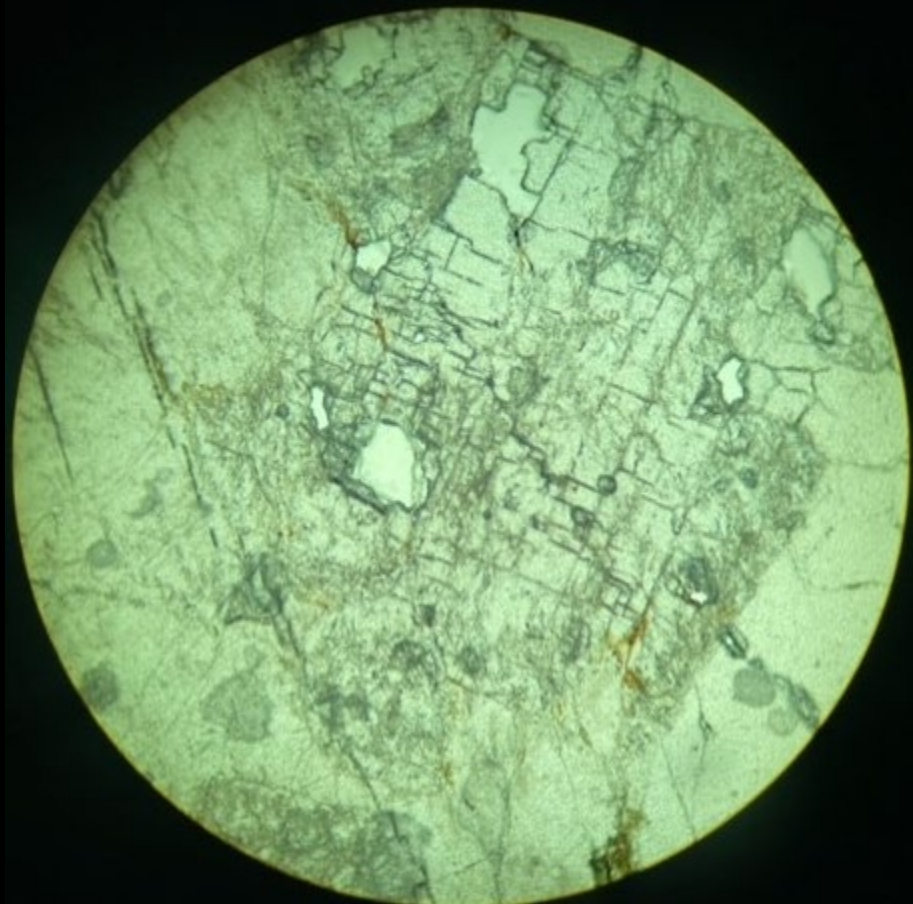


Meiji 2mm



XPL

Idaho-2 Microscopy (cont.)



Metamorphism/Mineral Alteration

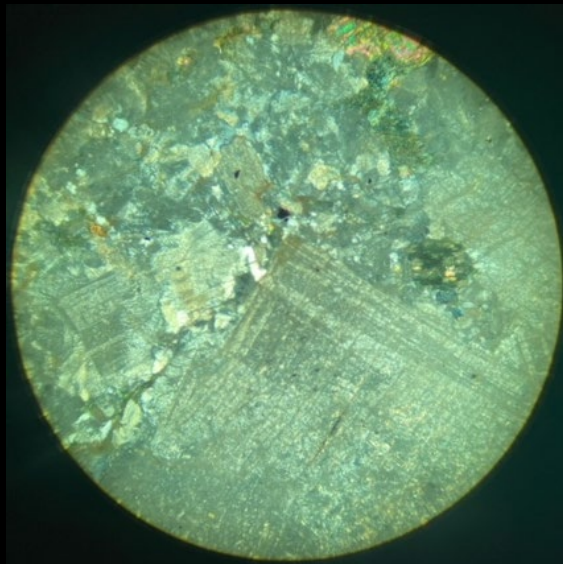
Kaolinization

- Hydrothermal acidic conditions
- Alkali Feldspar → Kaolinite

Chloritization

- Pyroxene/Amphibole(Biotite) → Chlorite

Idaho-1, PPL, 2mm



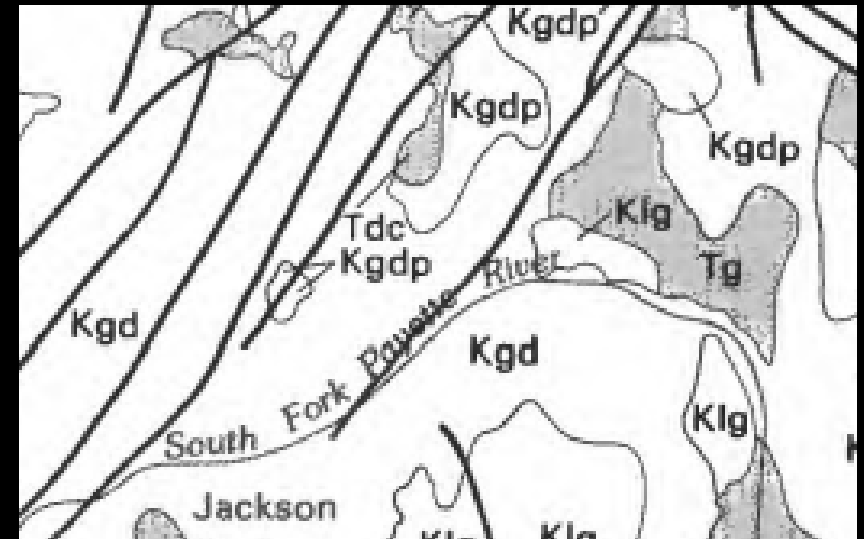
Idaho-2, PPL 2mm



Metamorphism/Mineral Alteration (cont.)

Trans-Challis fault system

- Collection of semi-parallel faults
- Promotes Hydrothermal Alteration
- Hot Springs



Conclusions

Comparisons to granodiorite; qtz monzonite accurate with Anderson and Rasor

However:

- Lack of Hornblende
- No mention of Kaolinization
- Lack of Microcline



References

- Anderson, A.L., and Rasor, A.C. Composition of a Part of the Idaho Batholith in Boise County, Idaho:
- Clarke, Christopher Brian (1990). The geochemistry of the Atlanta Lobe of the Idaho Batholith in the western United States, Cordillera. PhD thesis. The Open University.
- McIntyre, D.H., 1985, Plutonic rocks of Cretaceous age and faults in the Atlanta Lobe of the Idaho Batholith, Challis Quadrangle, p. 29–42.