The West Side Story of the Spokane Dome of the Priest River Metamorphic Core Complex (PRC) east of Mount Spokane, Washington

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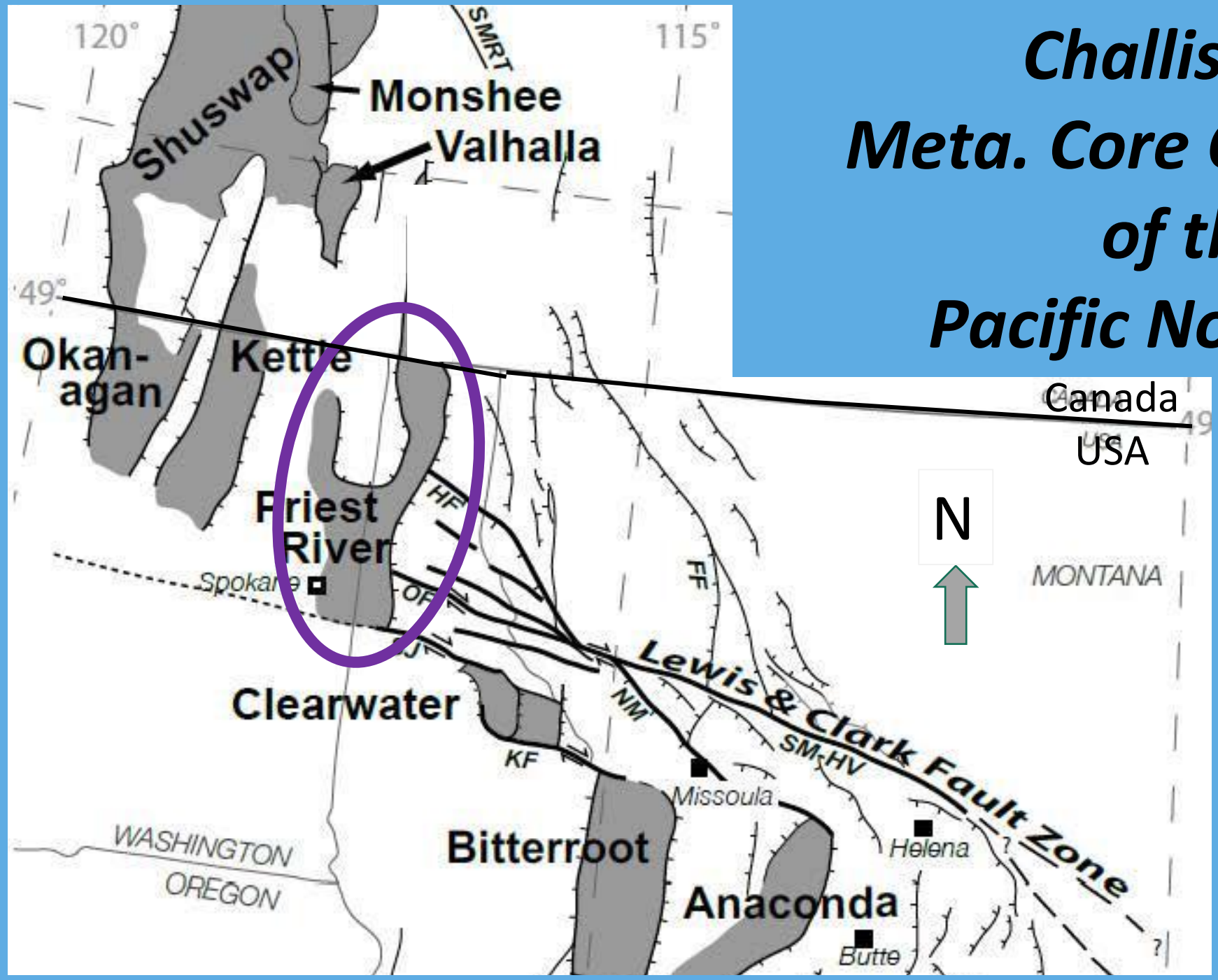
Challis-age Meta. Core Complexes of the Pacific Northwest



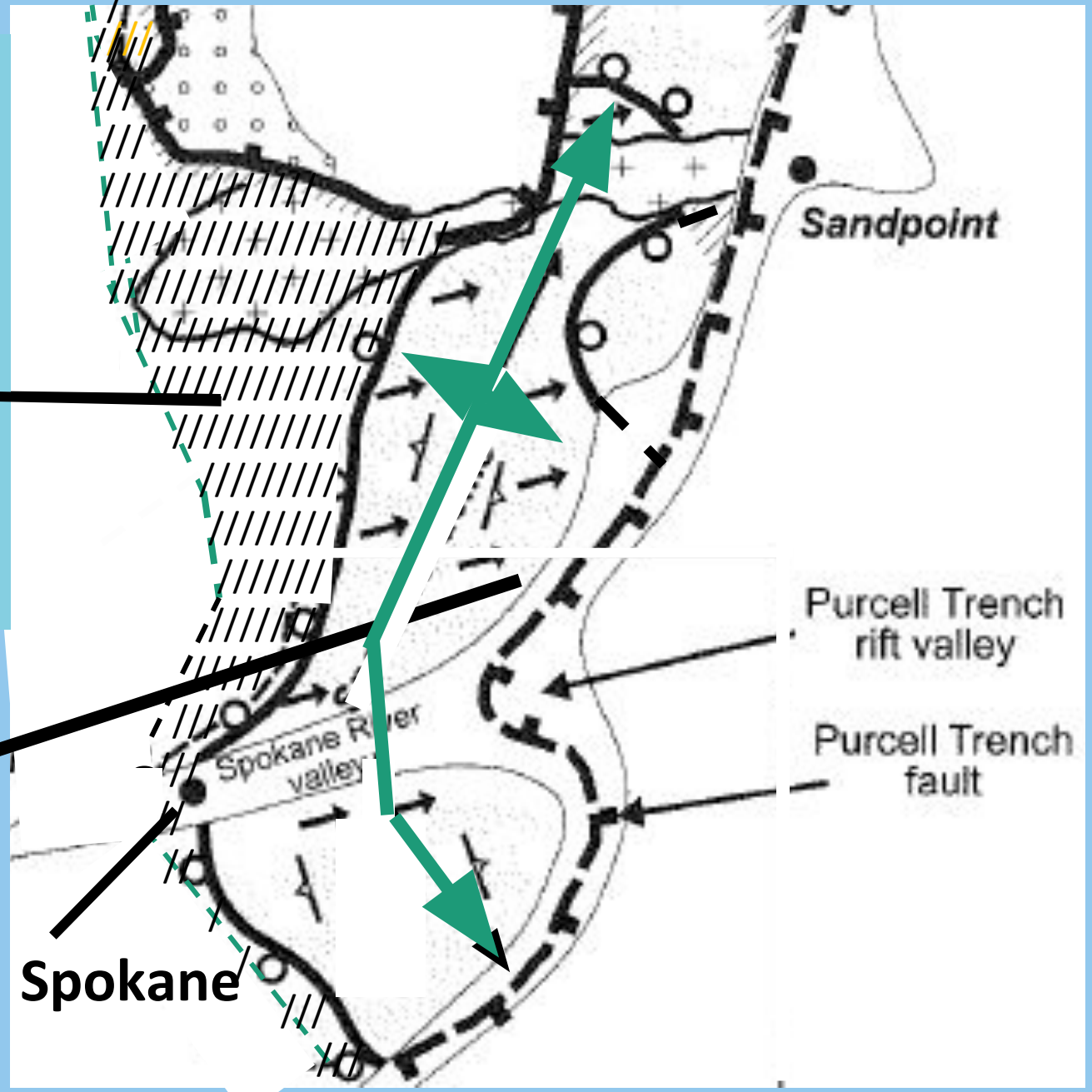
after
Foster et al.,
20o7, GSA
SP 434, f 3

Spokane Dome"
2 parts:

West Side
Transition Zone

Spokane "Dome"
Mylonite Zone

Lineation in mylonie

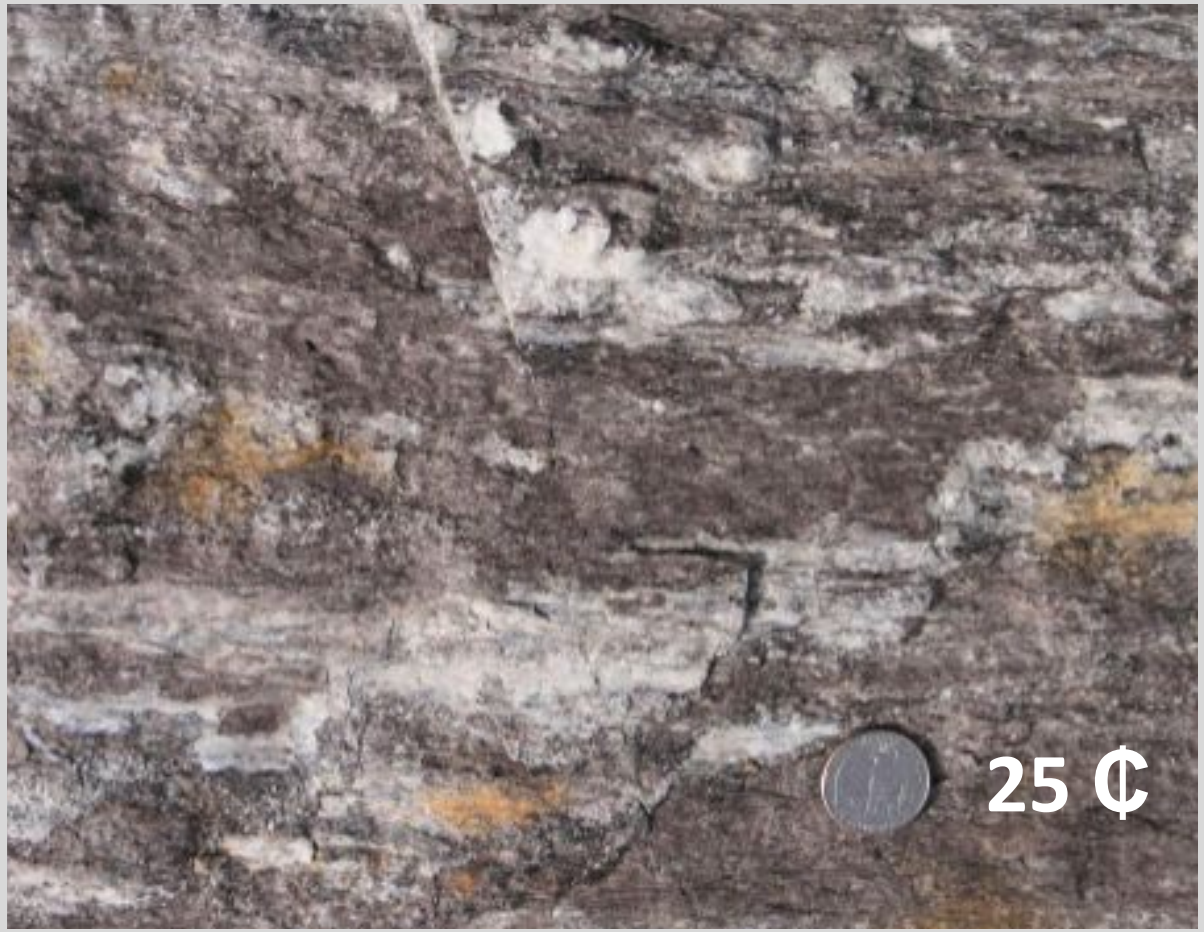


after
Doughty
et al., 2016
UWP, f 6.1

N

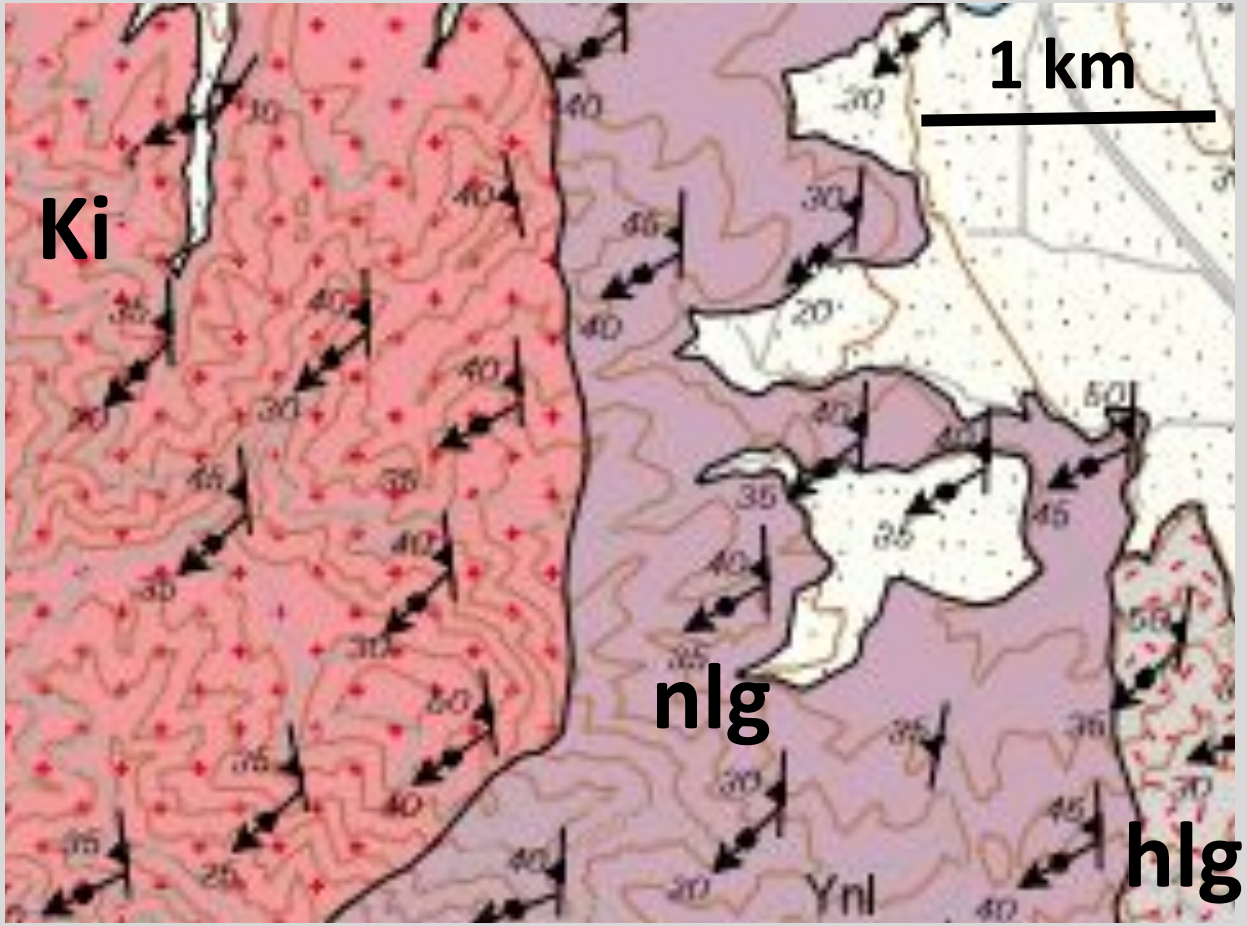
20 km
======

Lineated Rocks of Spokane Dome Mylonite Zone



Sillimanite Lineations, Hauser Lake Gneiss

WA SR 290



Tweedie Area

Miller, 2001, USGS Map MF2354

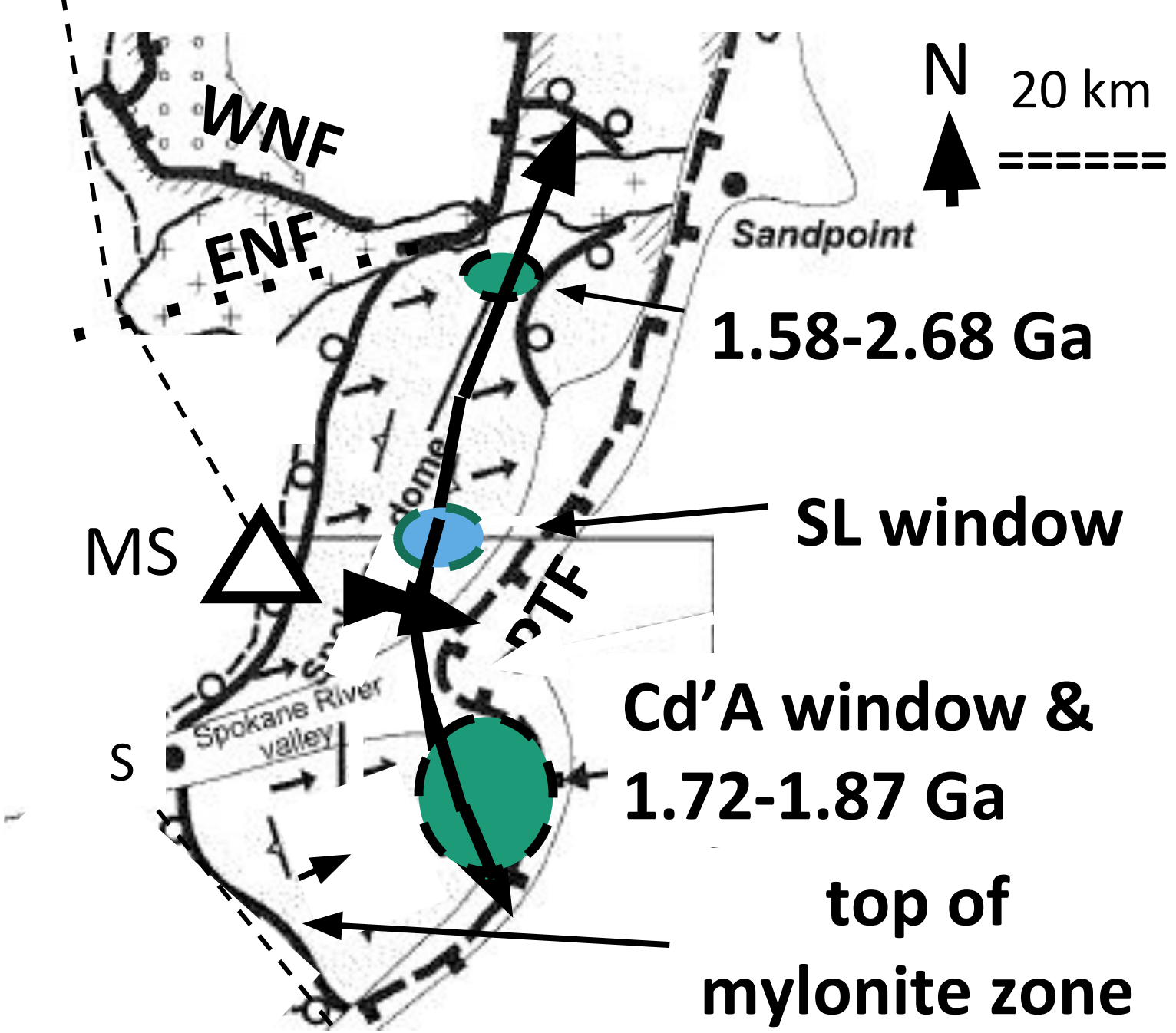
Anatomy of Spokane Dome Mylonite Zone

most rocks < 1.5 Ga

→

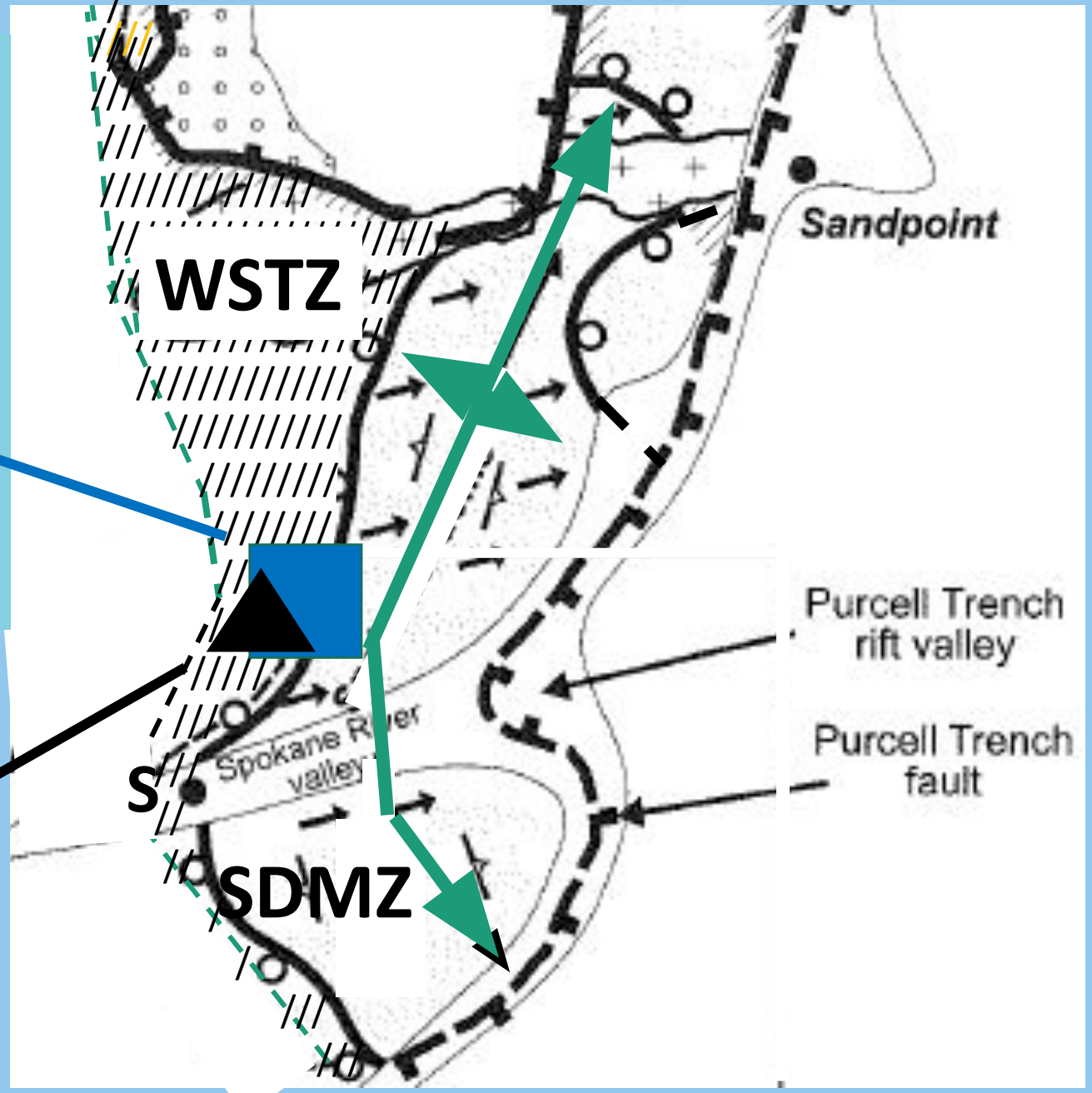
mylonitic lineations

after
Doughty et al., 2016, IWP
Buddington et al., 2016 ,
GSA FG 31



Dates in the Central Part of Spokane Dome

Mylonitization	**< 50 to > 46 Ma**	D&P99, S&O16
Eocene dikes and plutons	**50 - 46 Ma**	S&O16,W&L16
Peak Metamorphism	**72, 68 - 64 Ma**	D&P99, S&O16
Cret. muscovitic granites	**MS = 76.5 Ma**	S&O16
Newman Lake orthogneiss	**65.4 ± 0.9 Ma**	**this paper**
Biotitic banded orthogneiss	**98.9 ± 1.1 Ma**	**this paper**
Hauser Lake gneiss (meta-Prichard Fm.)	**1.43 - 1.45 Ga**	D&C08



Map Area

Mount Spokane

after
Doughty
et al., 2016
UWP, f 6.1

N

20 km

======

WEST SIDE STORY *(1957, Stephen Sondheim)*

And something great is coming!

Who knows?

Its only just out of reach,

Down the block, on a beach…

Hold my hand and we're halfway there.

Hold my hand and I'll take you there…

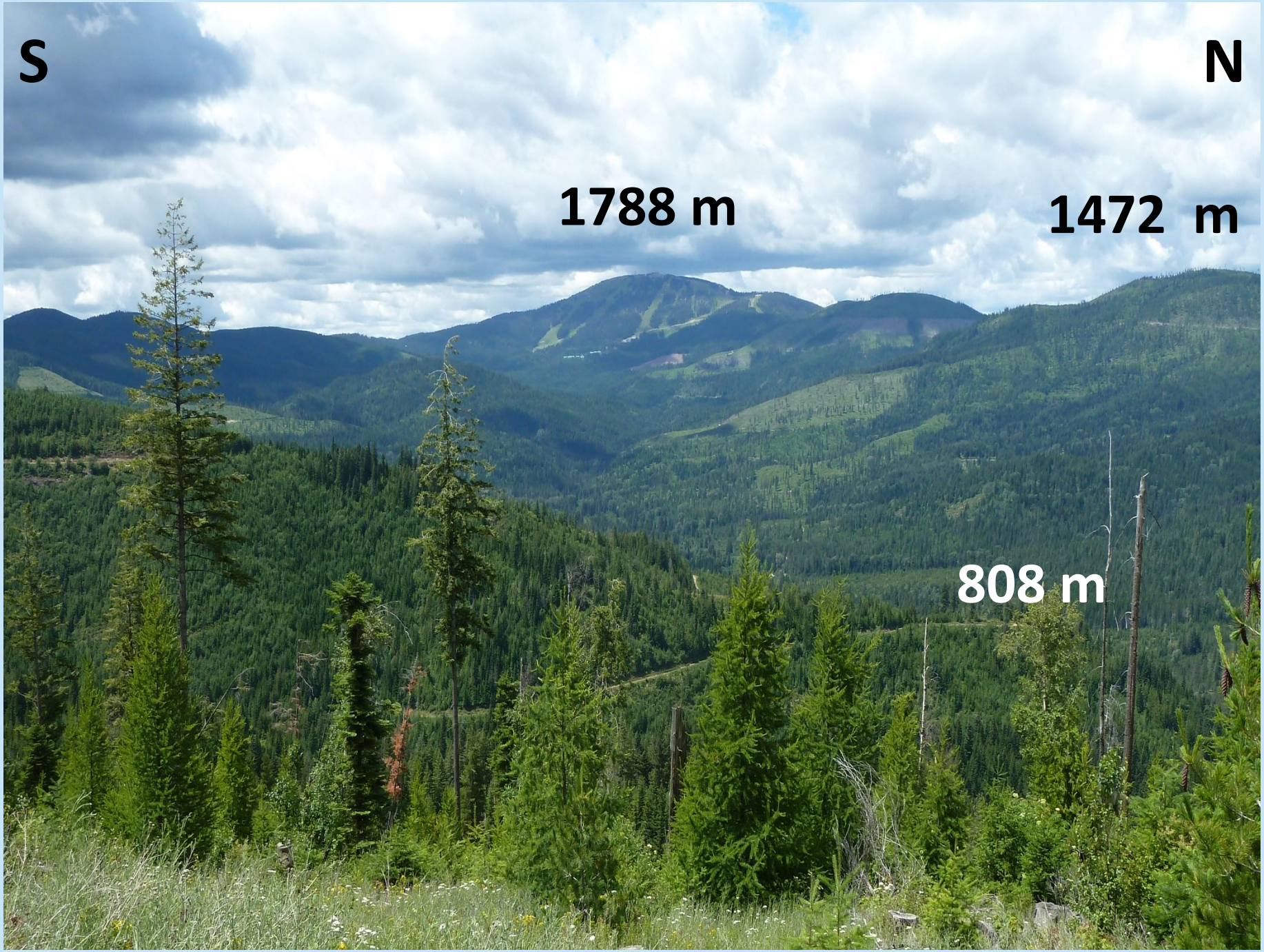
Somewhere!

Mount Spokane

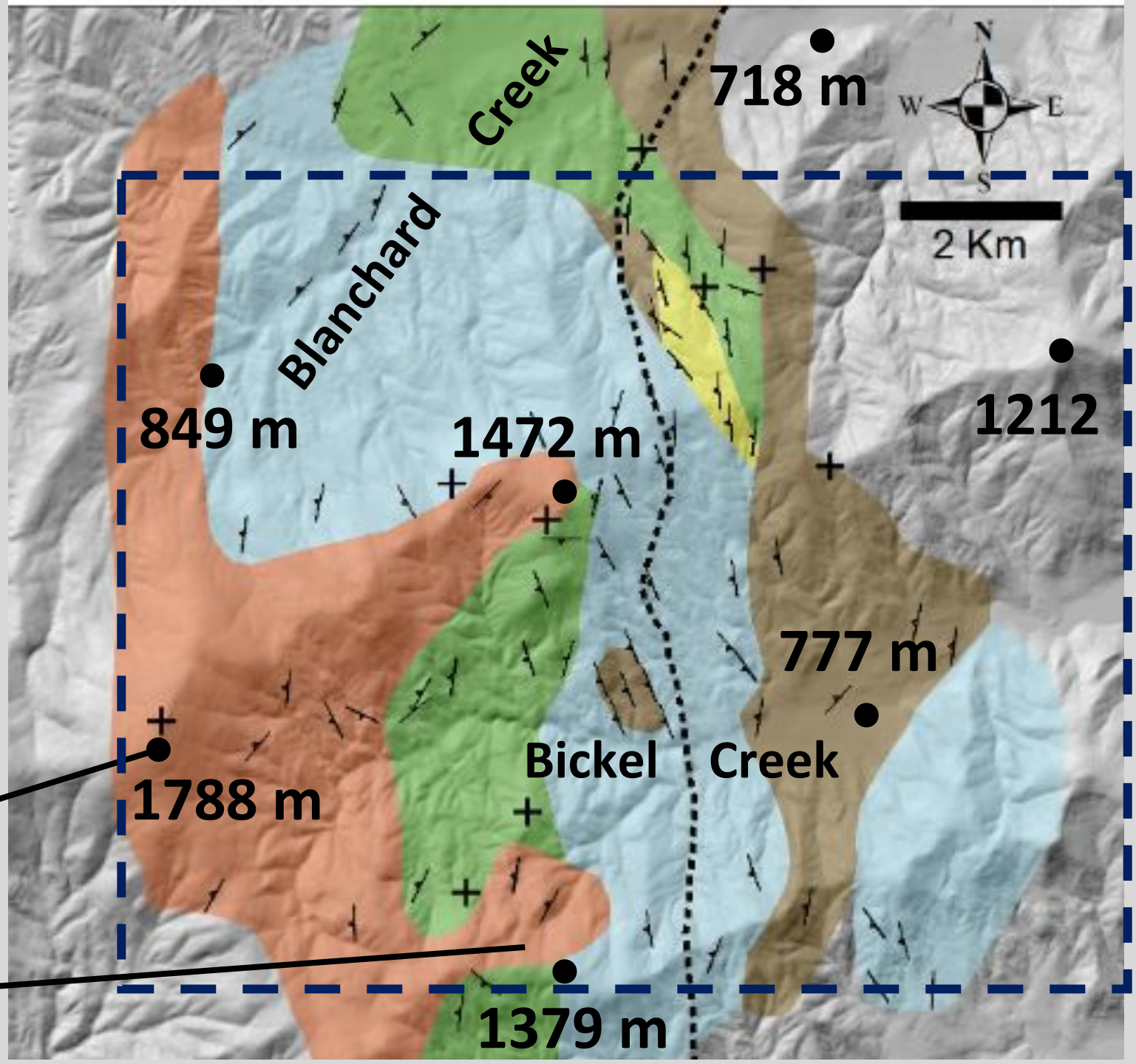
Highest Peak
in
Spokane Dome

Looking E up
Brickel Creek

Photo by
A.M. Buddington 7/18



Topography & Simplified Geology Of Mount Spokane Quadrangle



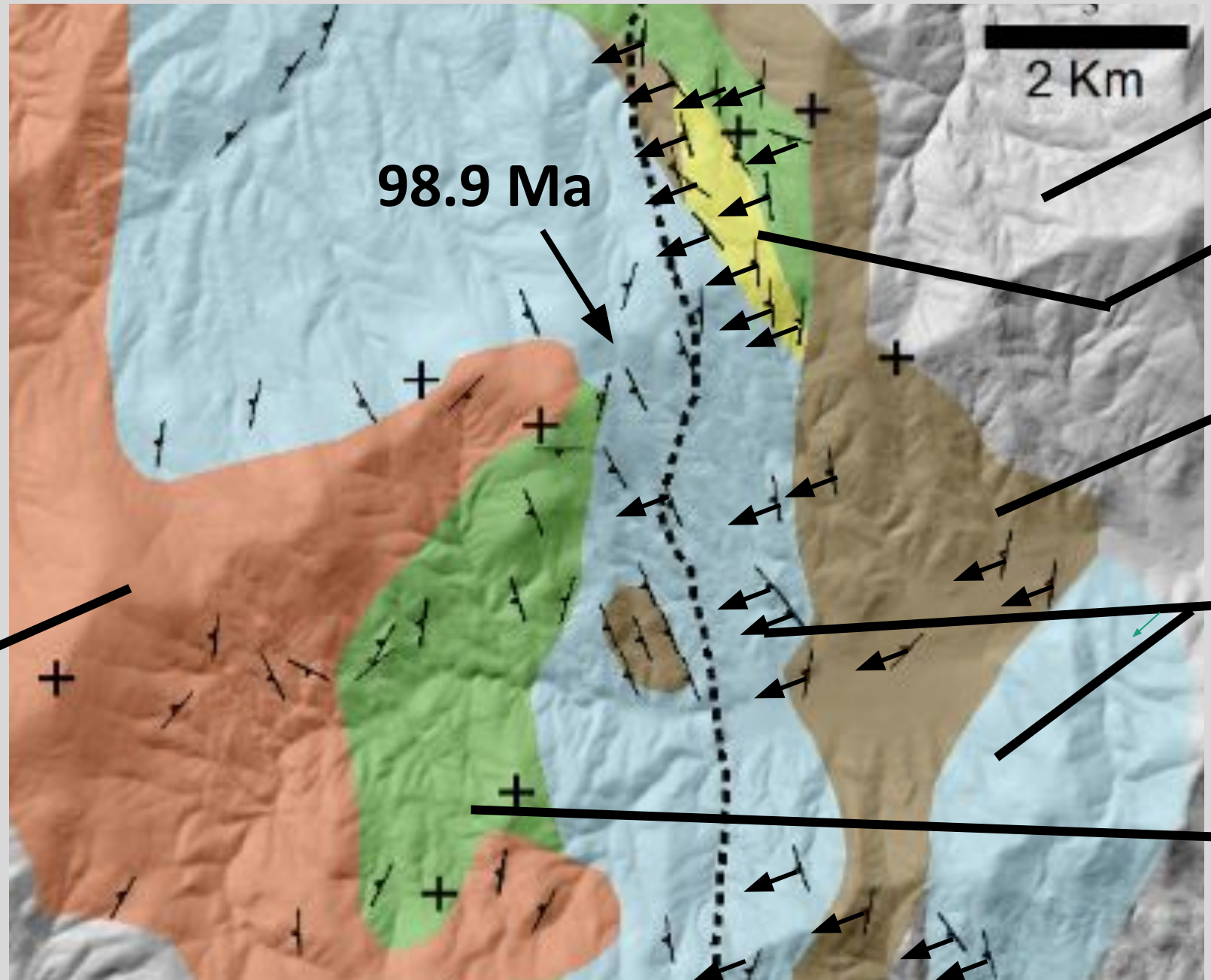
Next Map

Mt. Spokane & NE ridge

East ridge

map crafted by HM Green-berg, 0219

WSTZ | SDMZ



Rock Units; MS Quad.

Unmapped

HLG quartzite

Hauser Lake Gneiss (HLG)

Mount Spokane 2-mica granite

Banded Gneiss

Newman Lake Gneiss

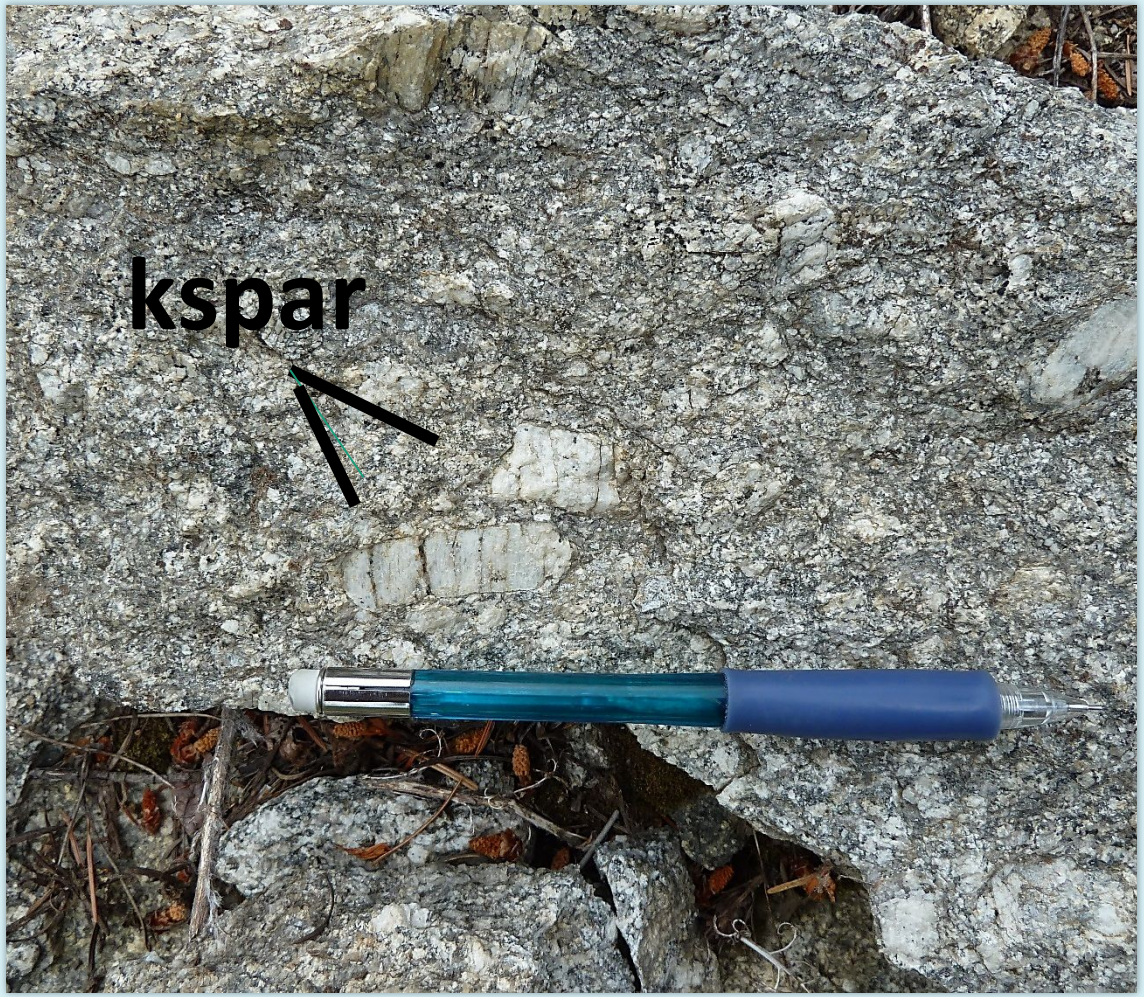
S – C Fabric top-to- E

Newman Lake Gneiss

quartzite

Hauser Lake pelitic gneiss

Orthogneisses in West Side Transition Zone



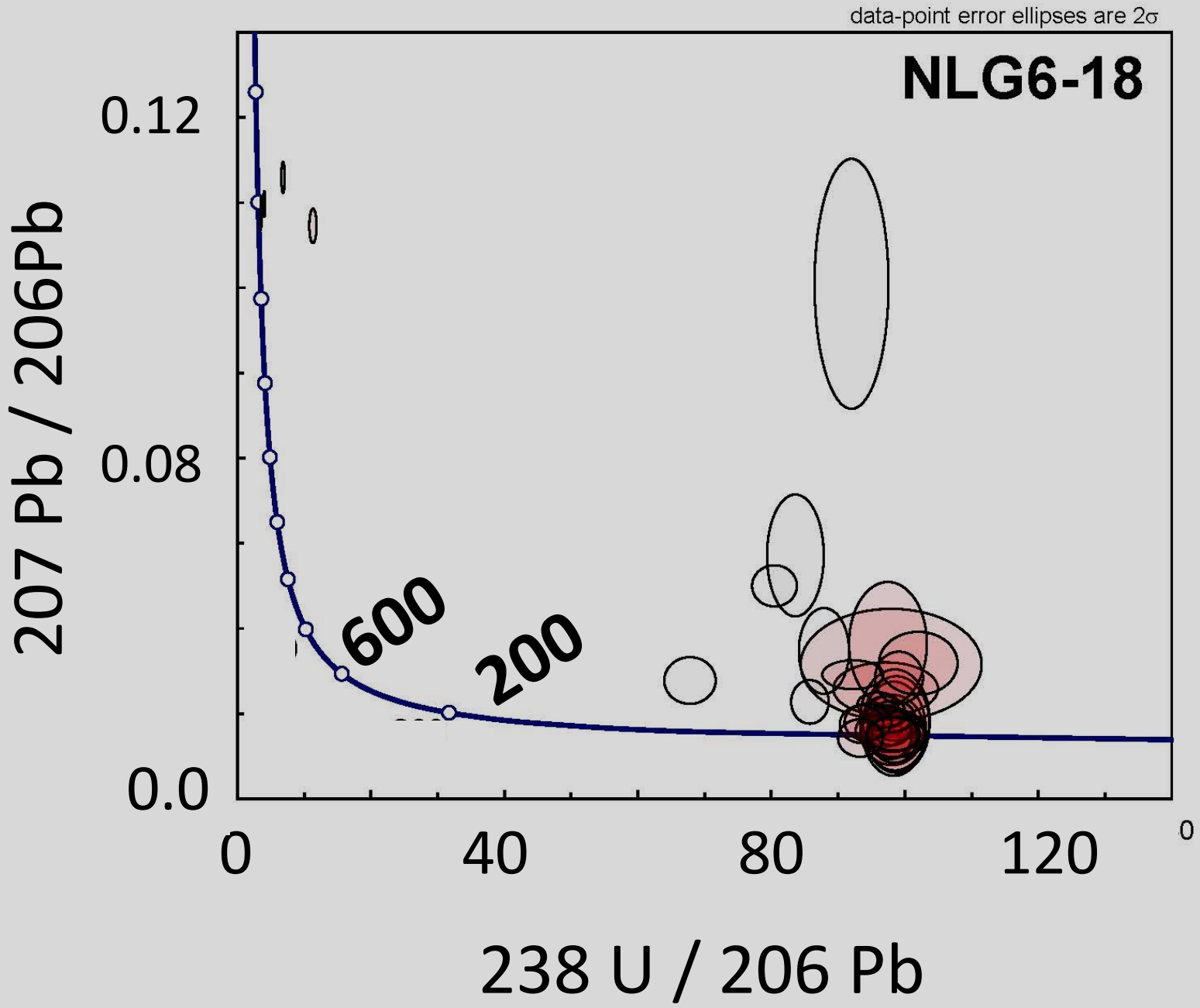
Newman Lake Gneiss, 65.4 Ma
indicates WSTZ still active

Biotitic Banded Gneiss, 98.9 Ma
protolith older than WS metamorphism

Newman Lake Gneiss
65.4 ± 0.9 Ma

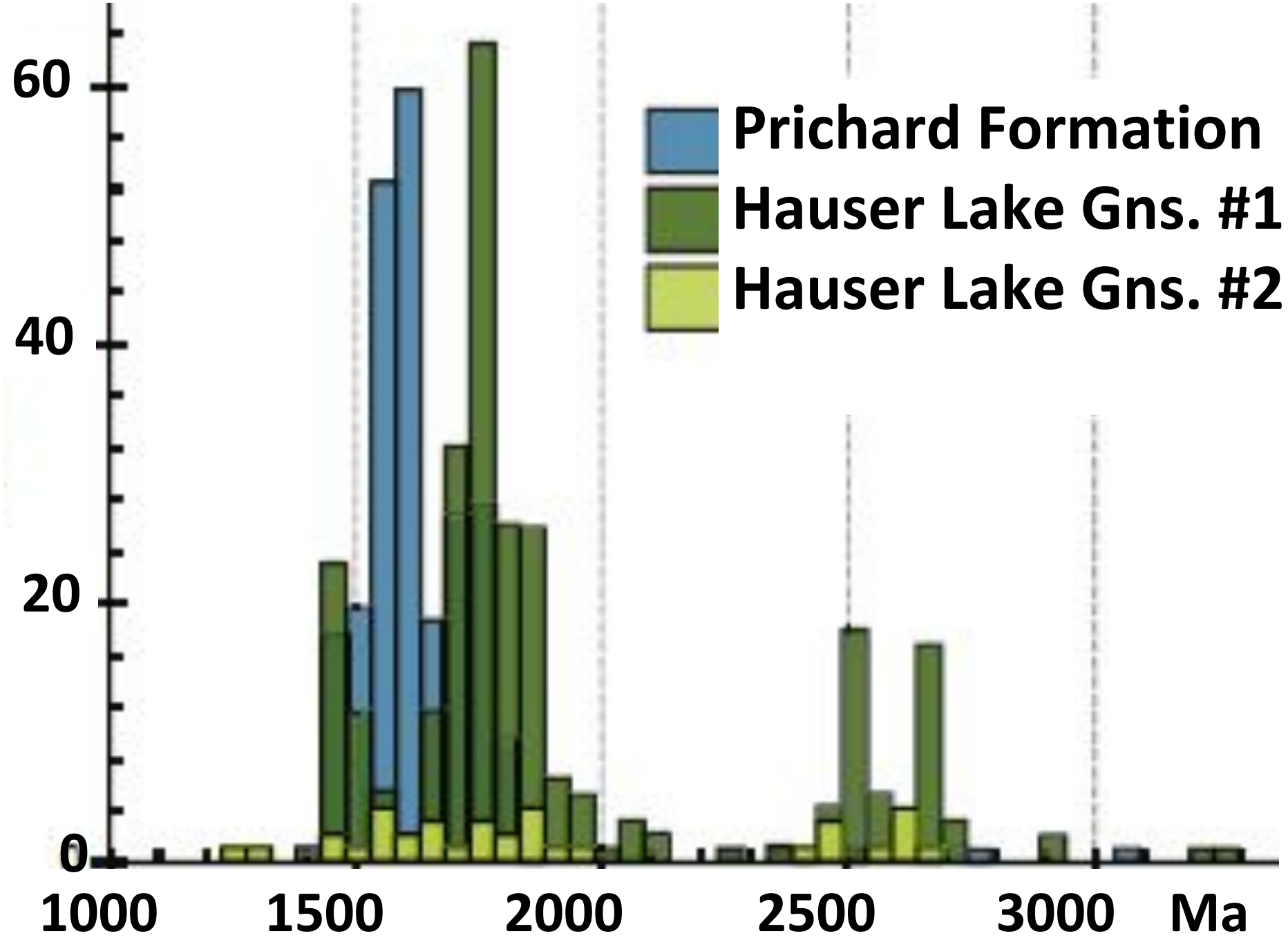
Ellipses are 2σ

Redrafted from Wash. State Univ.



Beltian Detrital Zircons
$^{207}Pb/^{206}Pb$

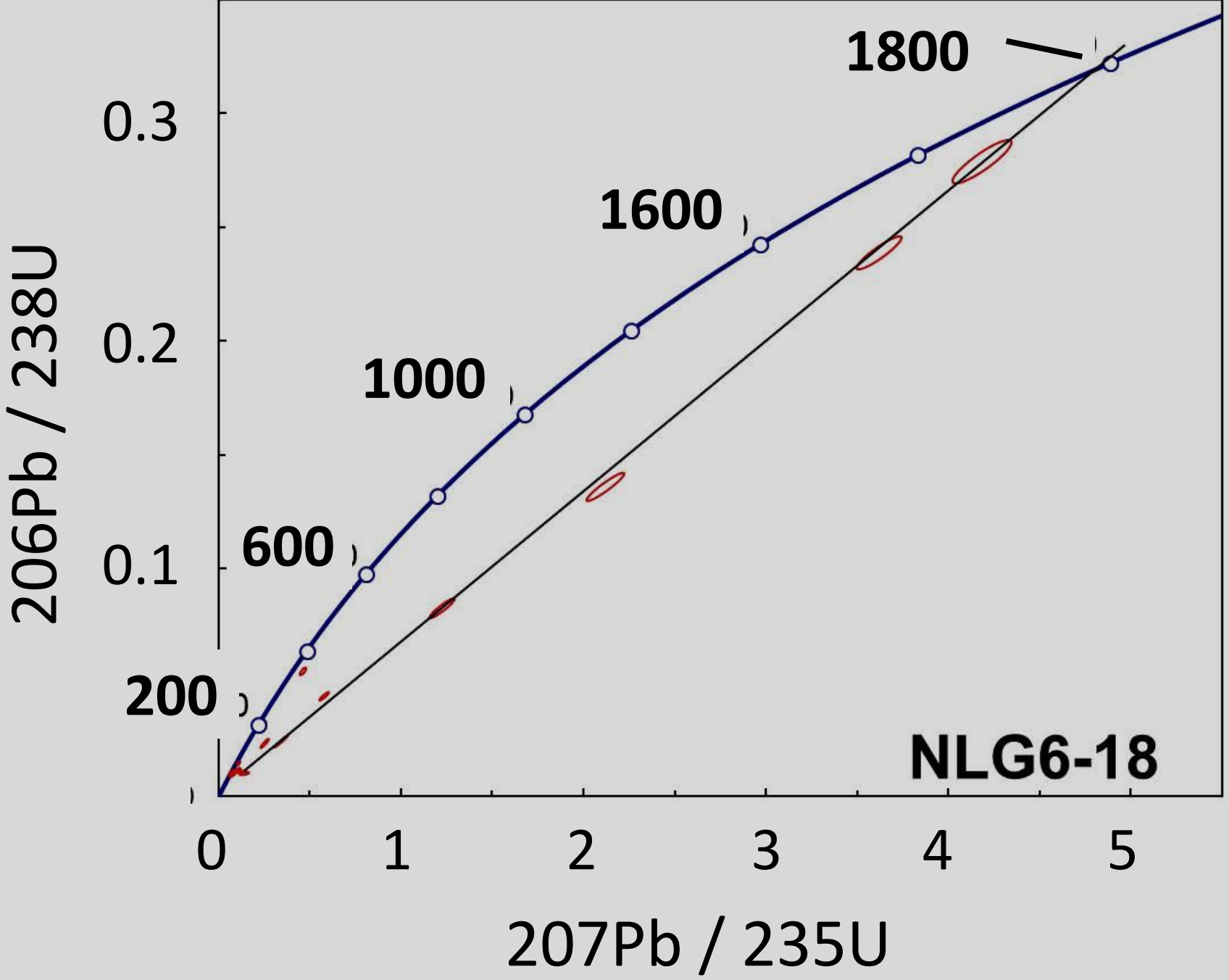
from
Stevens et al.,
2016, f 4c



Xenocrysts, Newman Lake Gneiss

Ellipses are 2σ

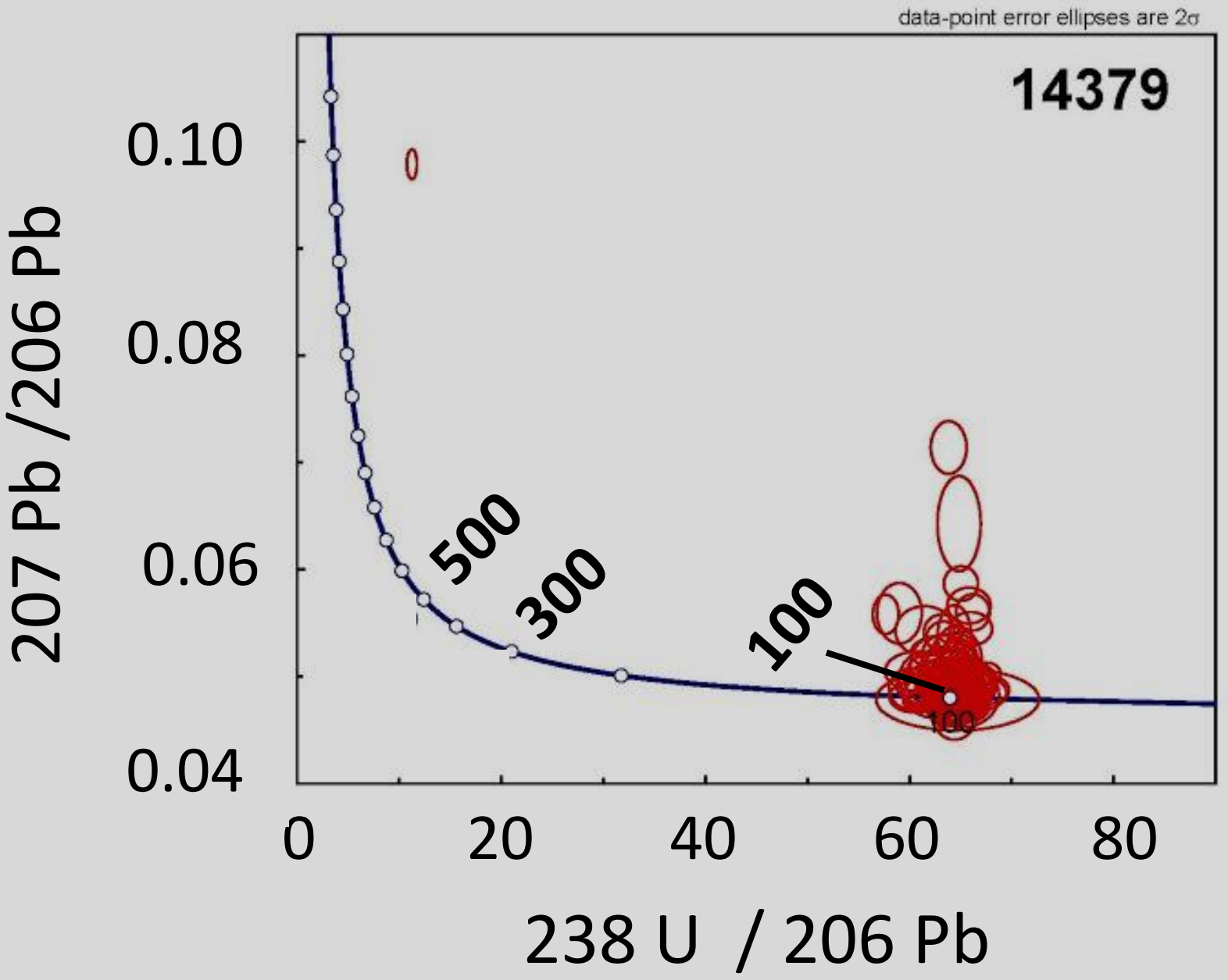
redrafted from Wash. State Univ.



Biotitic Banded Orthogneiss 98.9 ± 1.2 Ma

Ellipses are 2σ

redrafted from Wash. State Univ.



More Info on these Igneous Rocks

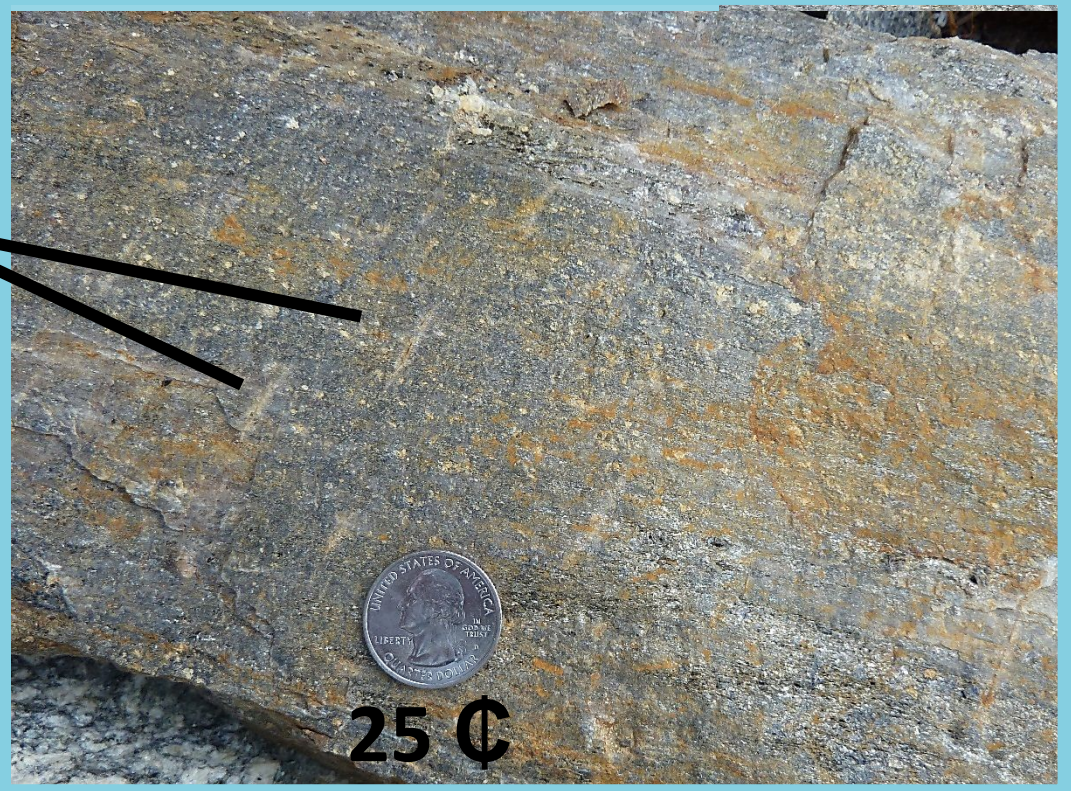
Buddington et al., Poster # 25-5, Thursday AM

Cretaceous and Eocene magmatism in the southern Priest River core complex (PRC) of northeastern Washington and northern Idaho

Features of West Side Transition Zone

1) sparse lineations
2) ultra-mylonite
3) tension gashes
4) folds
5) relict igneous texture

banded gneiss



foliation plane of HLG gneiss

Features of West Side Transition Zone

bio. banded orthogneiss

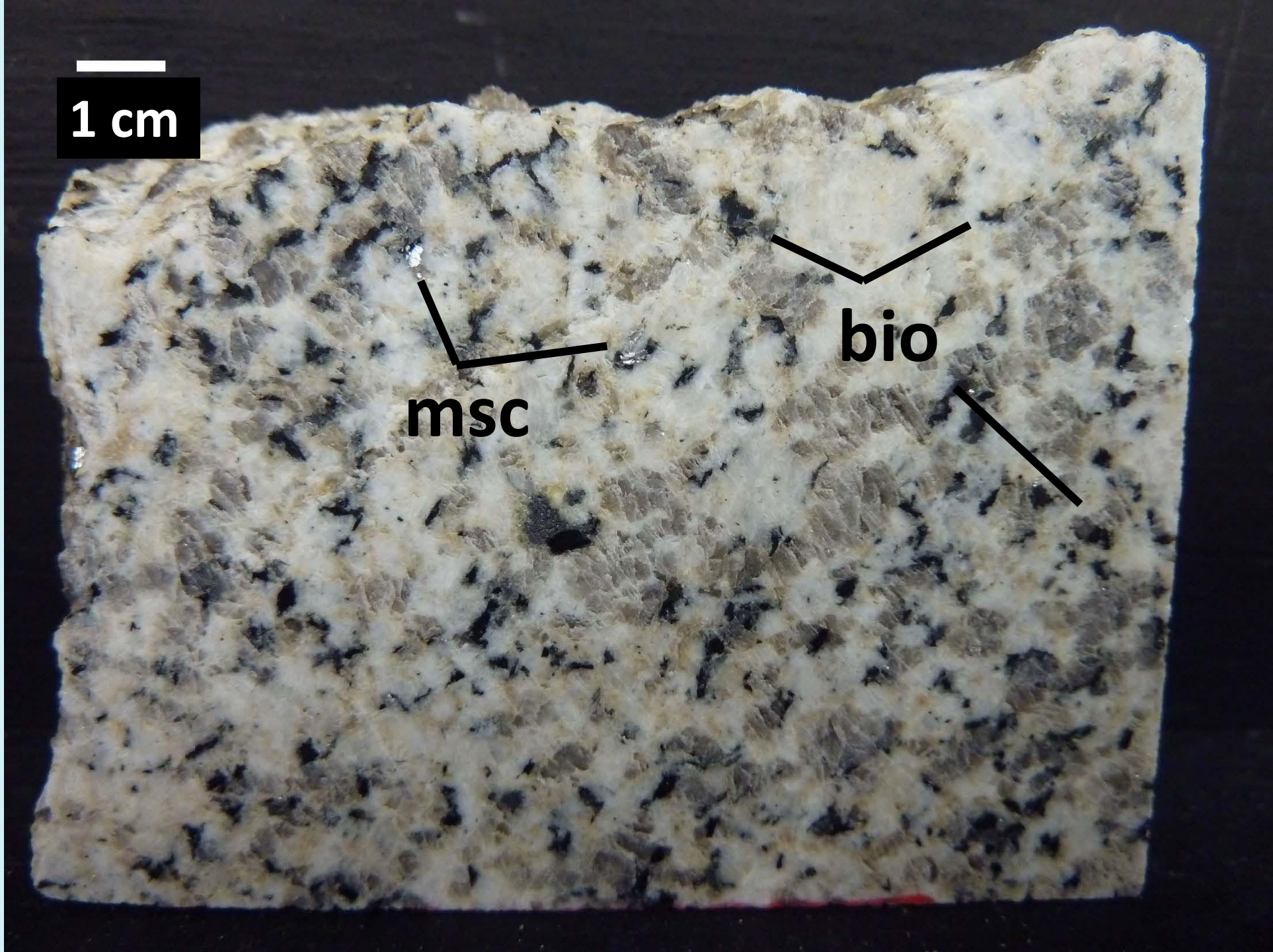
1) sparse lineations
2) ultra-mylonite
3) tension gashes
4) folds
5) relict igneous texture

Hauser Lake Gneiss

Mount Spokane two-mica granite

76.5 Ma

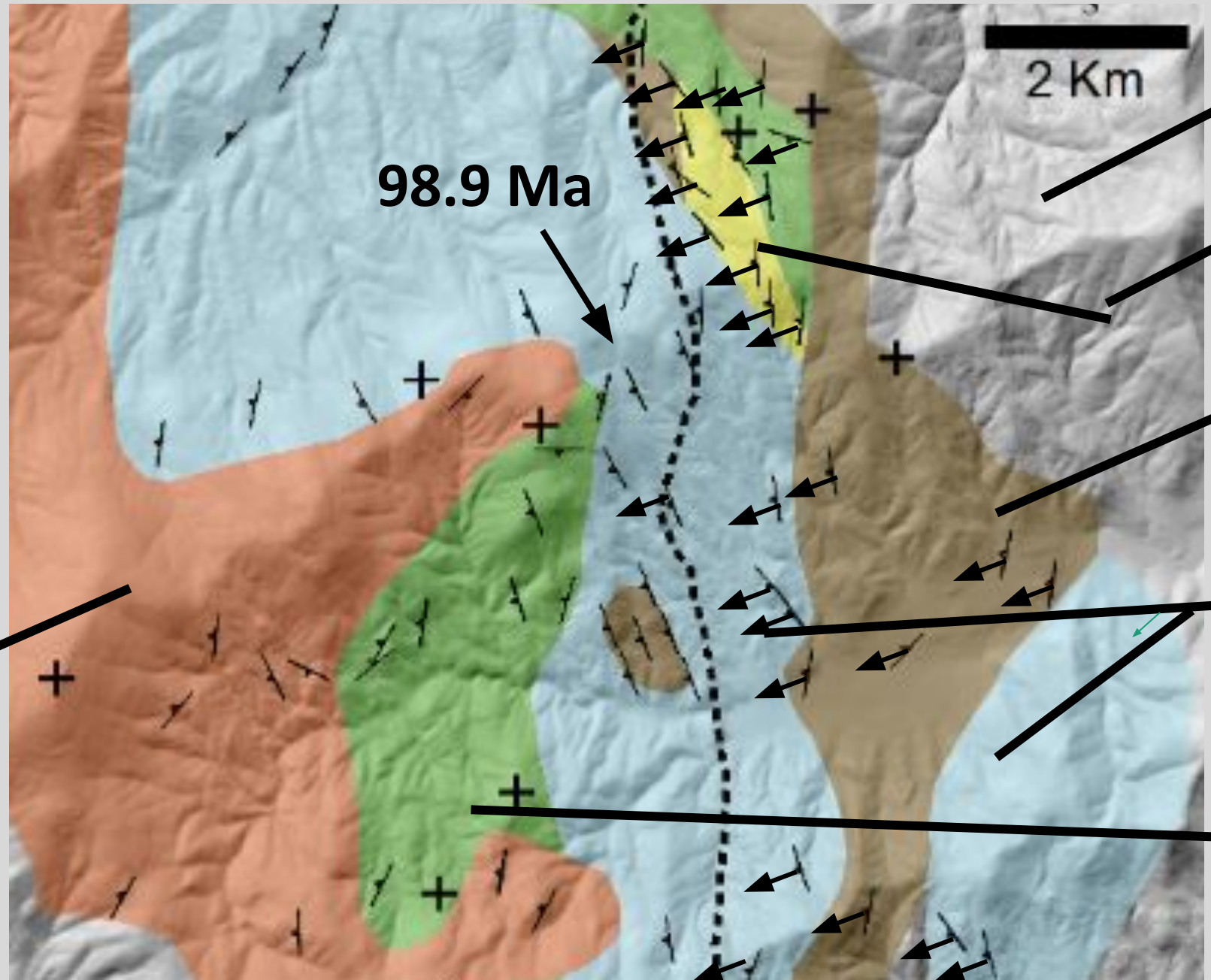
WA SR 206, 10.4 km SW of summit



WSTZ | SDMZ

MS Quad.

no chlorite breccia



Mount Spokane 2-mica granite

Unmapped

HLG quartzite

Hauser Lake Gneiss (HLG)

Banded Gneiss

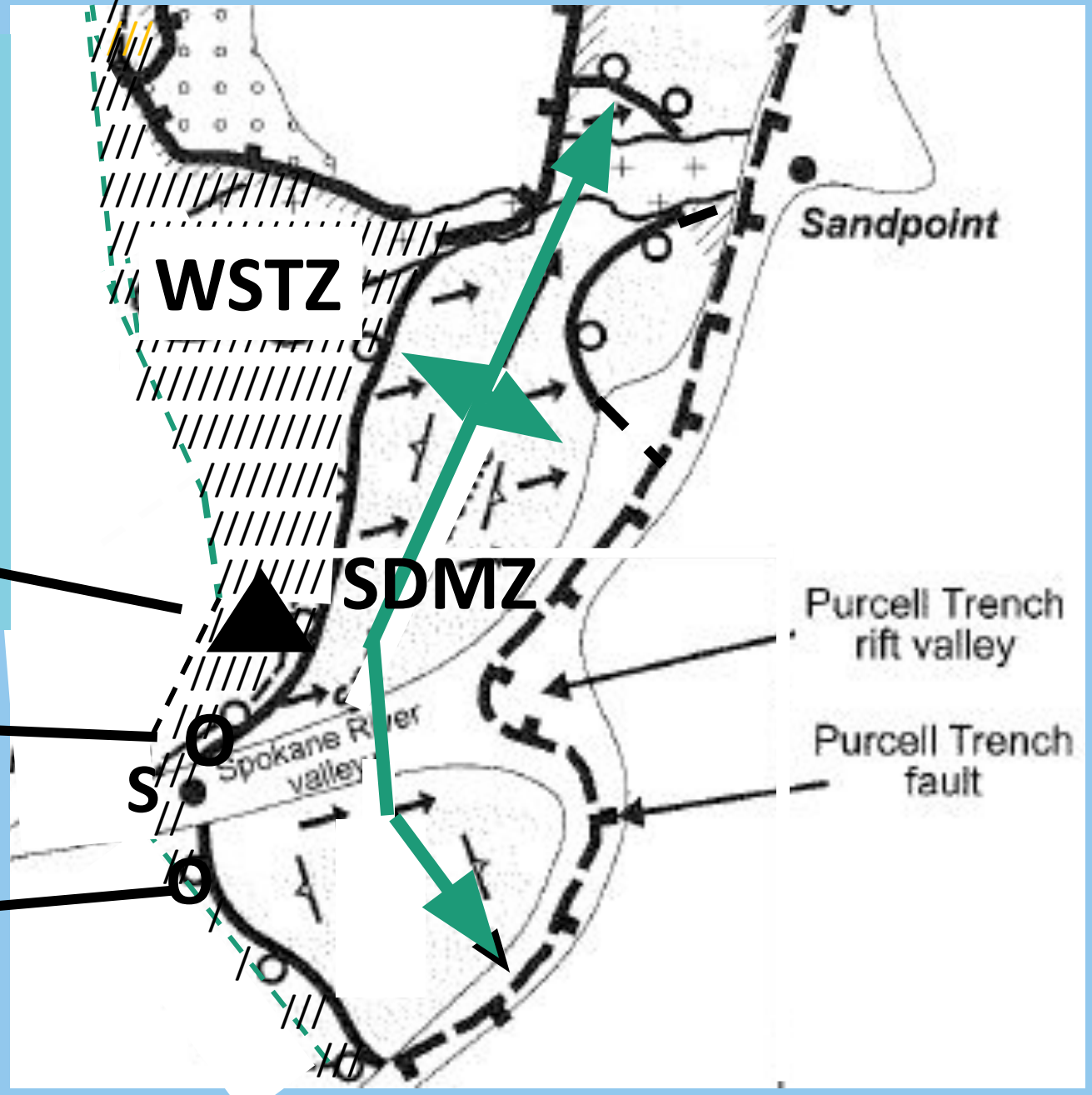
Newman Lake Gneiss

Localities without Chlorite BX

Mount Spokane

Beacon Rock

Chester Creek



after Doughty et al., 2016 UWP, f 6.1

N

20 km

======

Chester Creek: WSTZ = Carapace Above Mylonite

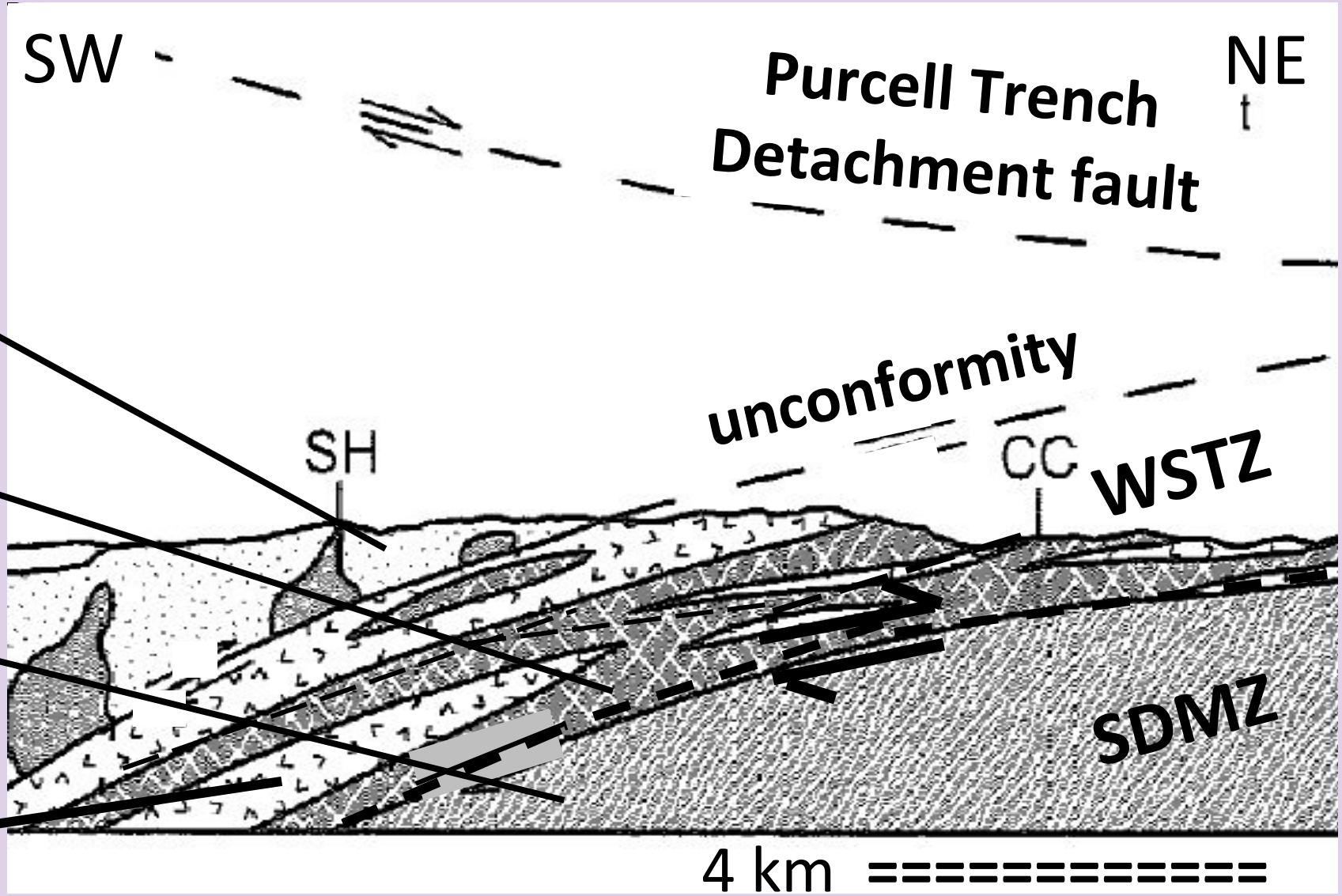
relabeled from Doughty et al., 2016, UWP, f. 8.12

Middle Cambrian Quartzite

Ravalli Group

Prichard Formation

Mount Spokane 2-mica granite

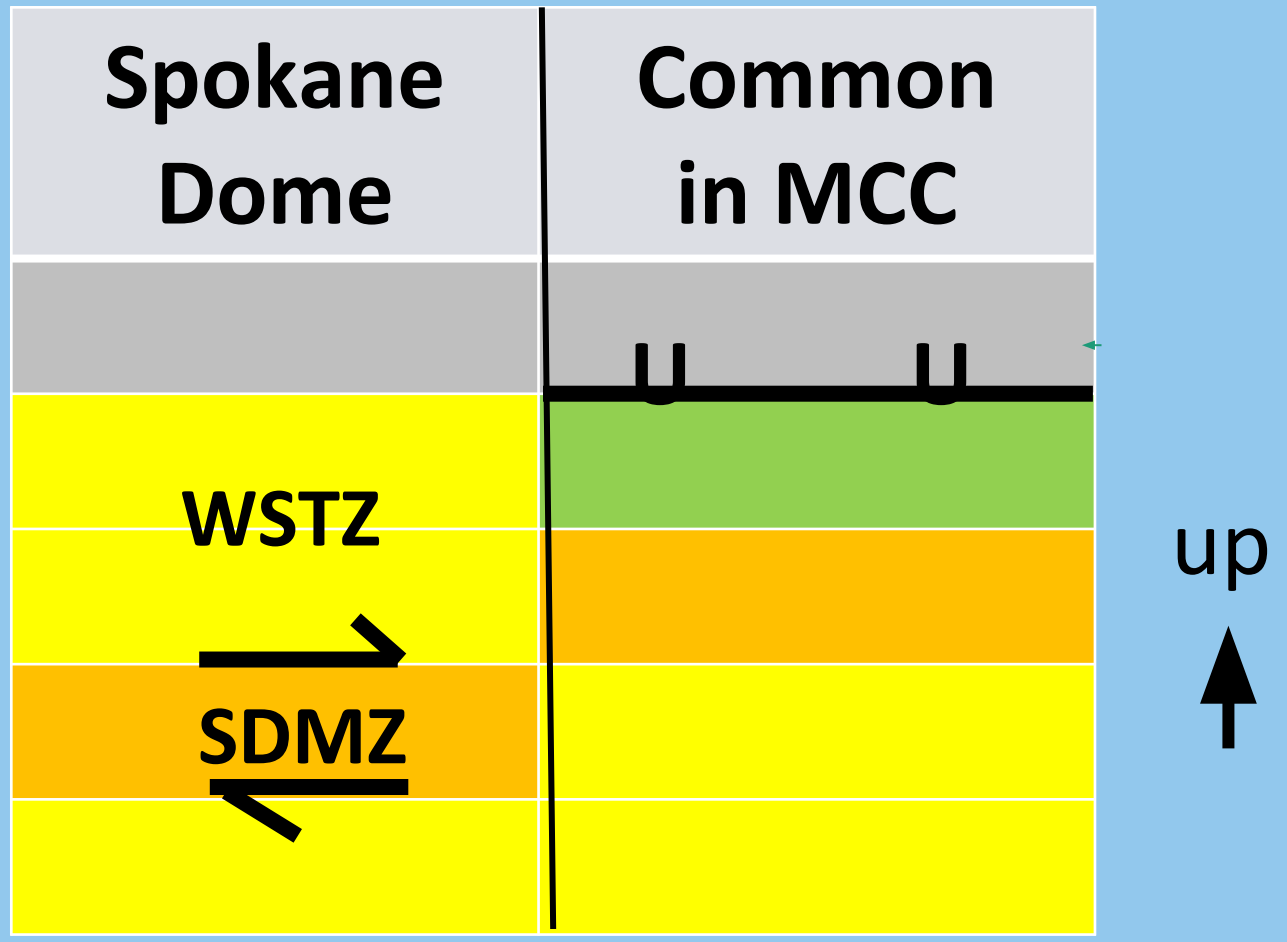


Schematic Comparison of MCCs

(no actual or relative scale)

Explanation

Non-meta. “roof”
Chlorite Breccia
Non-Mylonitic
Mylonite



The West Side Story*: conclusions*

Banded orthogneiss = 98.9 Ma, Newman Lake = 65.4 Ma;
≥ 1.5 Ga gneisses likely restricted to axis of Spokane "Dome"

West Side Transition Zone (WSTZ) is pre- to syn-mylonite; meta. = 98 to 47 Ma: a carapace containing ultramylonites, tension gashes, relict folds in gneiss, relict igneous textures (including Mount Spokane two-mica granite = 76.5 Ma)

No detachment faults bound WSTZ; top is Mount Spokane granite, which intruded the sub-Cambrian unconformity