

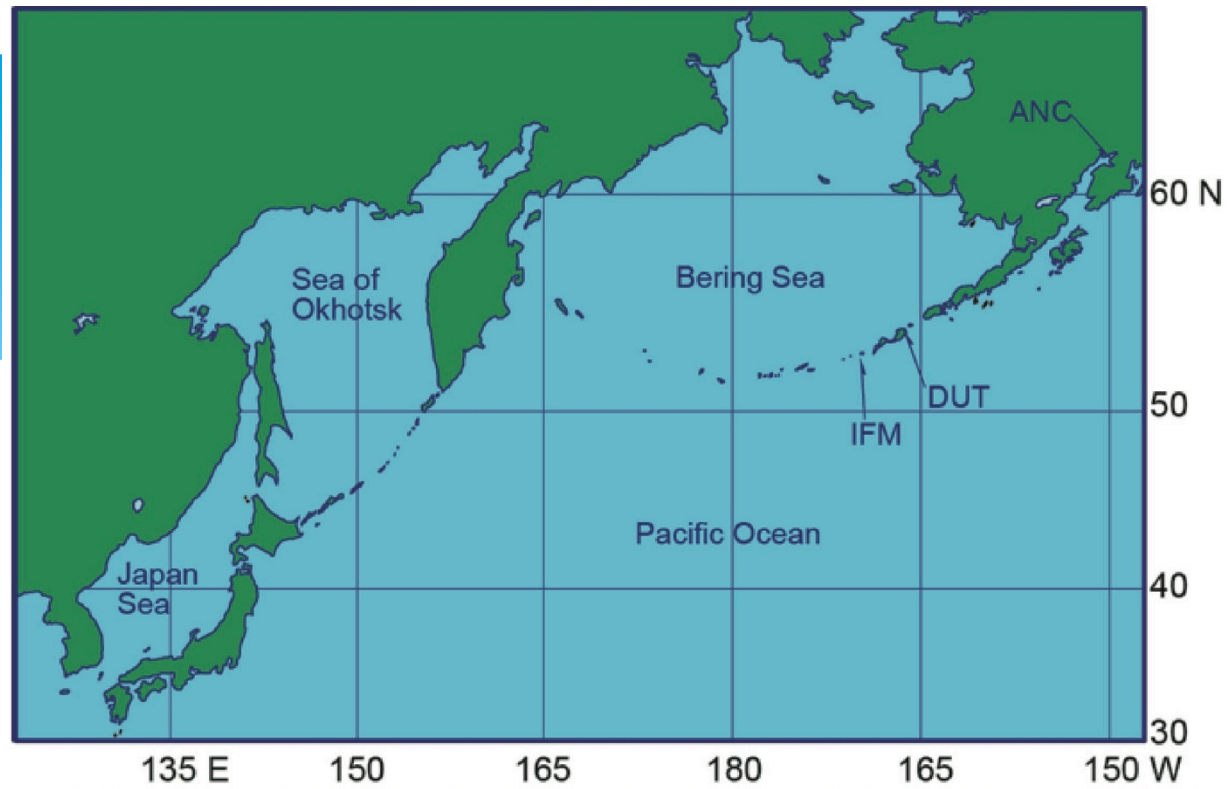
# The Effect of Holocene Eruptions on Prehistoric Habitations in The Islands of Four Mountains, Alaska

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2014.07.28 17:56

# Contents

- \* To determine the effect of volcanic eruptions, we have to construct detailed chronology.
- \* Useful tephras in Holocene tephra stratigraphy
- \* Detailed age determination for two tephras using radiocarbon dates of peat
- \* The CR-02 tephra intercalated with cultural layers
- \* Distribution and possible source of the CR-02 tephra



Locality of the Islands of Four Mountains



# Cleveland volcano

Aleut Archaeological site CR-02  
(AMK-0003) on SE coast of Carlisle

2014/08/10





The CR-02 tephra in cultural layers in CR-02 Unit 3,  
SE Carlisle Island.

It is not disturbed in the section.

2014/ 8/13



Depositional structure of "c" member of CR-02 (micro-bedding) implies that the lapilli layer deposited with rainy condition. Charcoal horizons between each members imply time intervals.

d

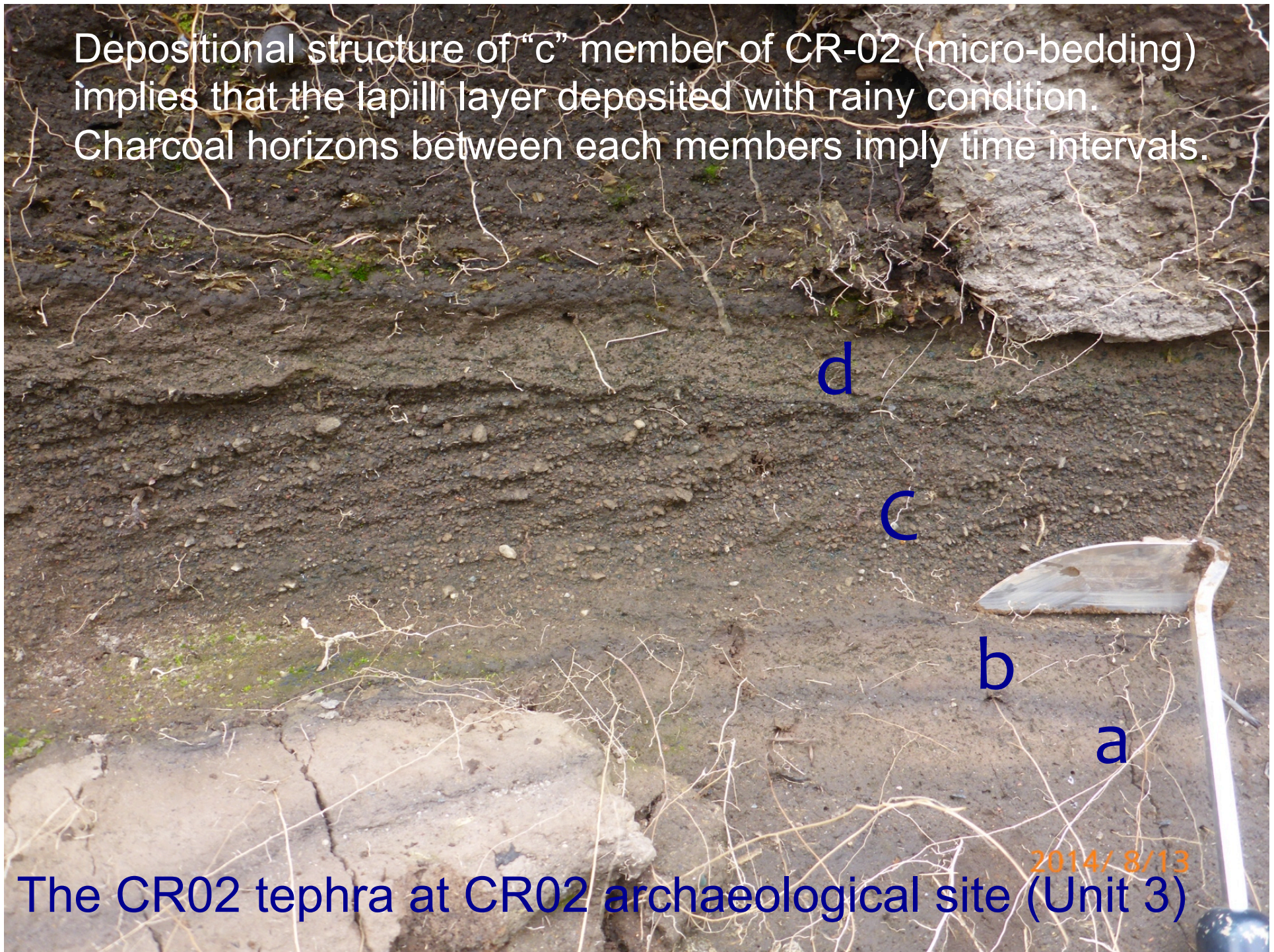
c

b

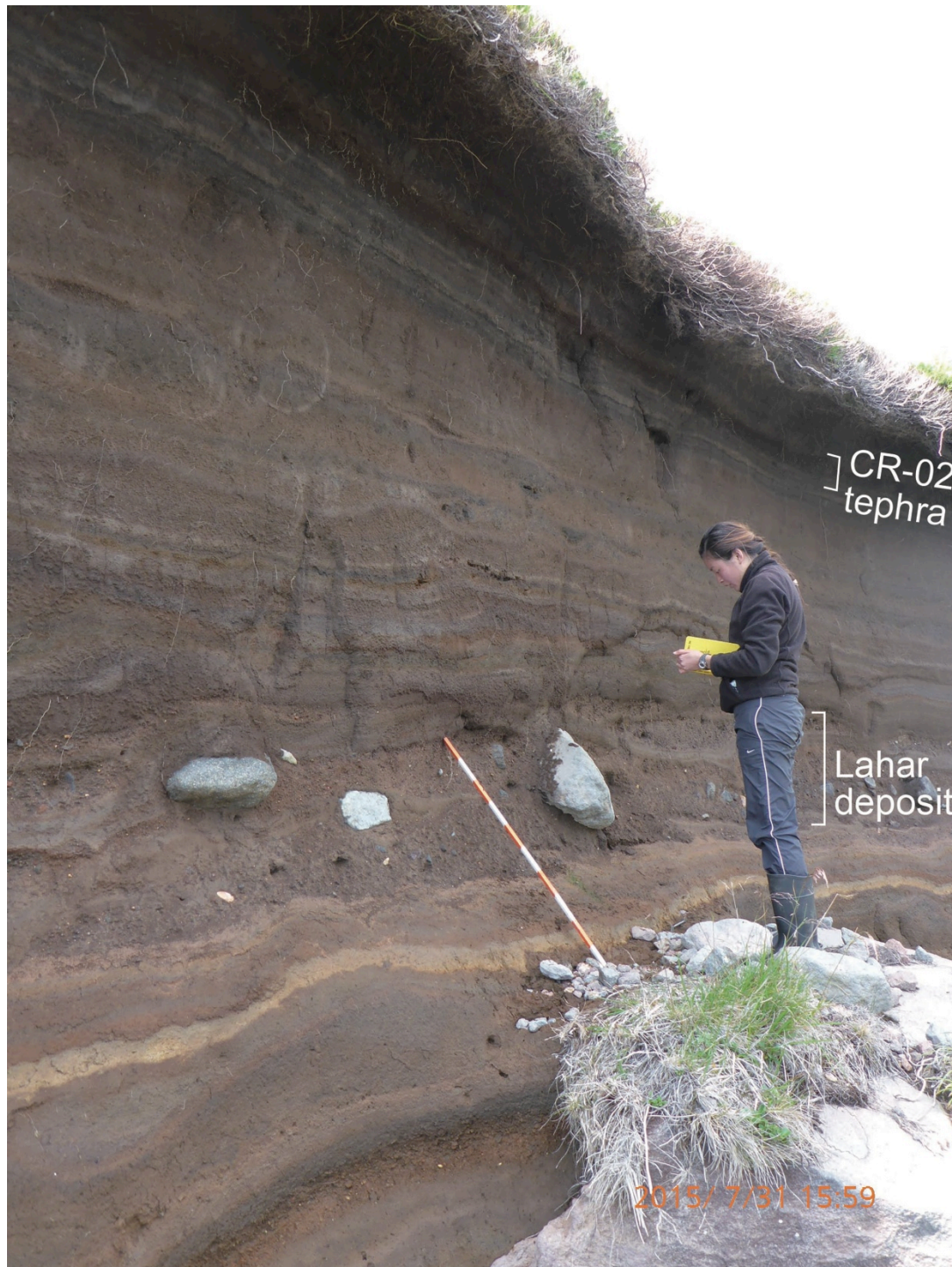
a

2014/ 8/13

The CR02 tephra at CR02 archaeological site (Unit 3)







Soil and tephra complexes during the Holocene Period near the CR-02 (AMK-0003) site, southeastern foot of Carlisle volcano.

This site is located on edge of volcanic fan of SE Carlisle.



# Correlation between natural and archaeological sites

(natural outcrop)



(archaeological site)



d  
c  
b  
a

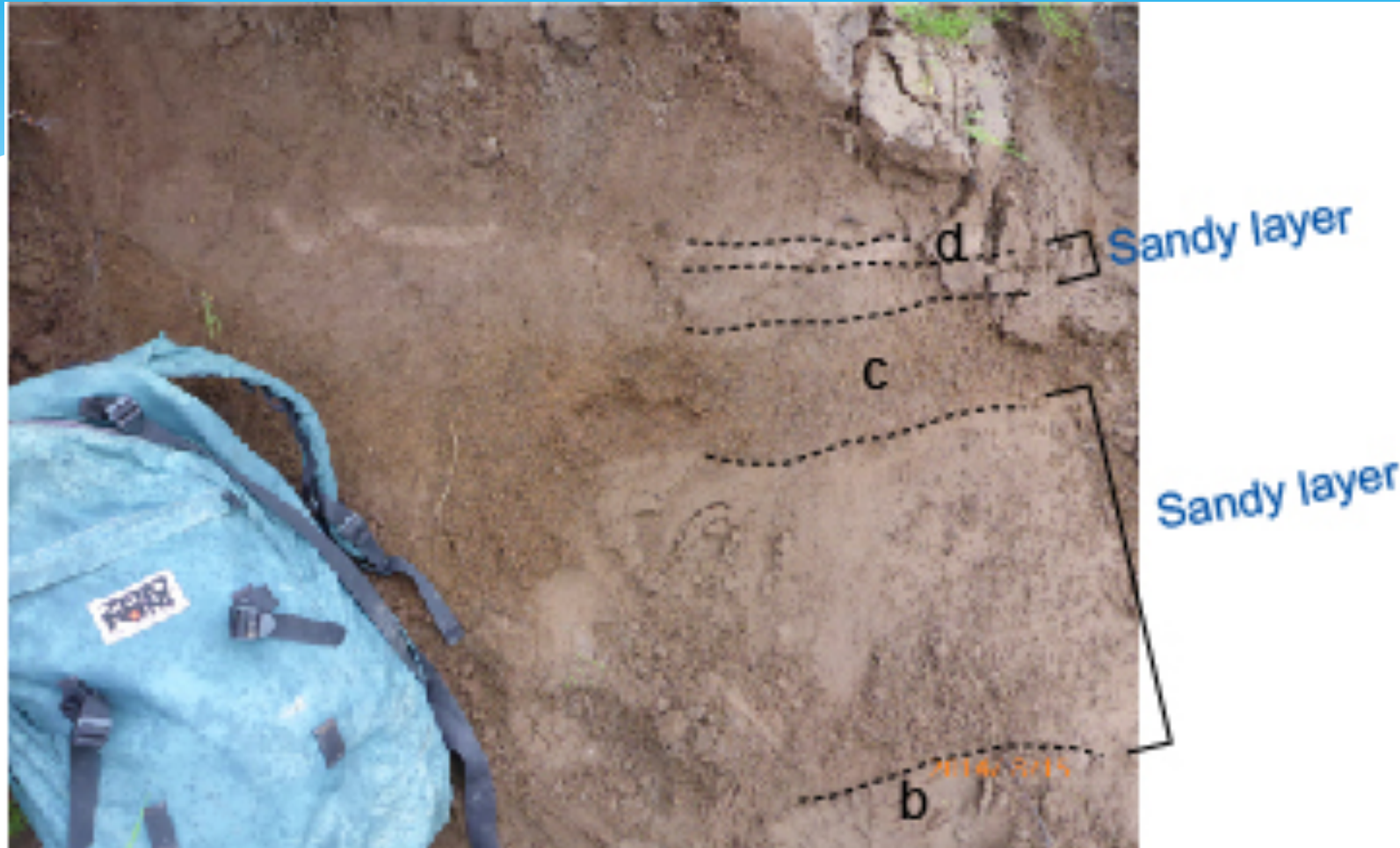
Cultural layer2

CR02

Cultural layer1



## The CR02 tephra near CR-03 , NE Carlisle



Sandy layers are intercalated with member of the CR-02 tephra. The facts may indicate time interval between each member. And this is consistent with an existence of charcoal fragments between members.

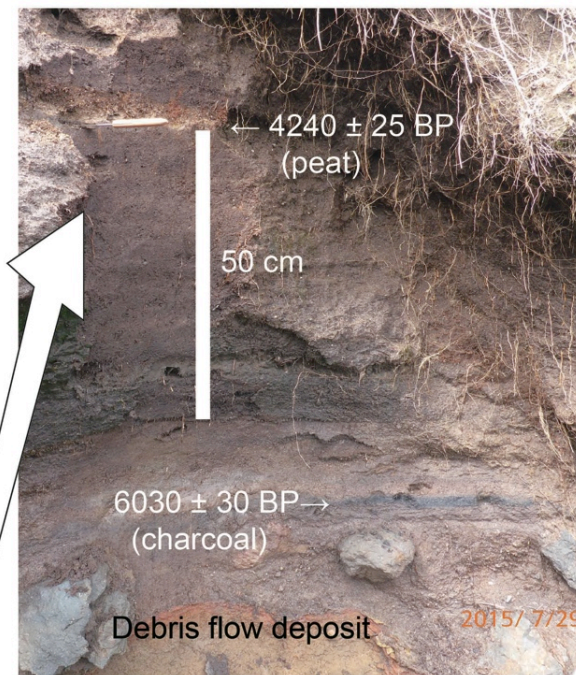
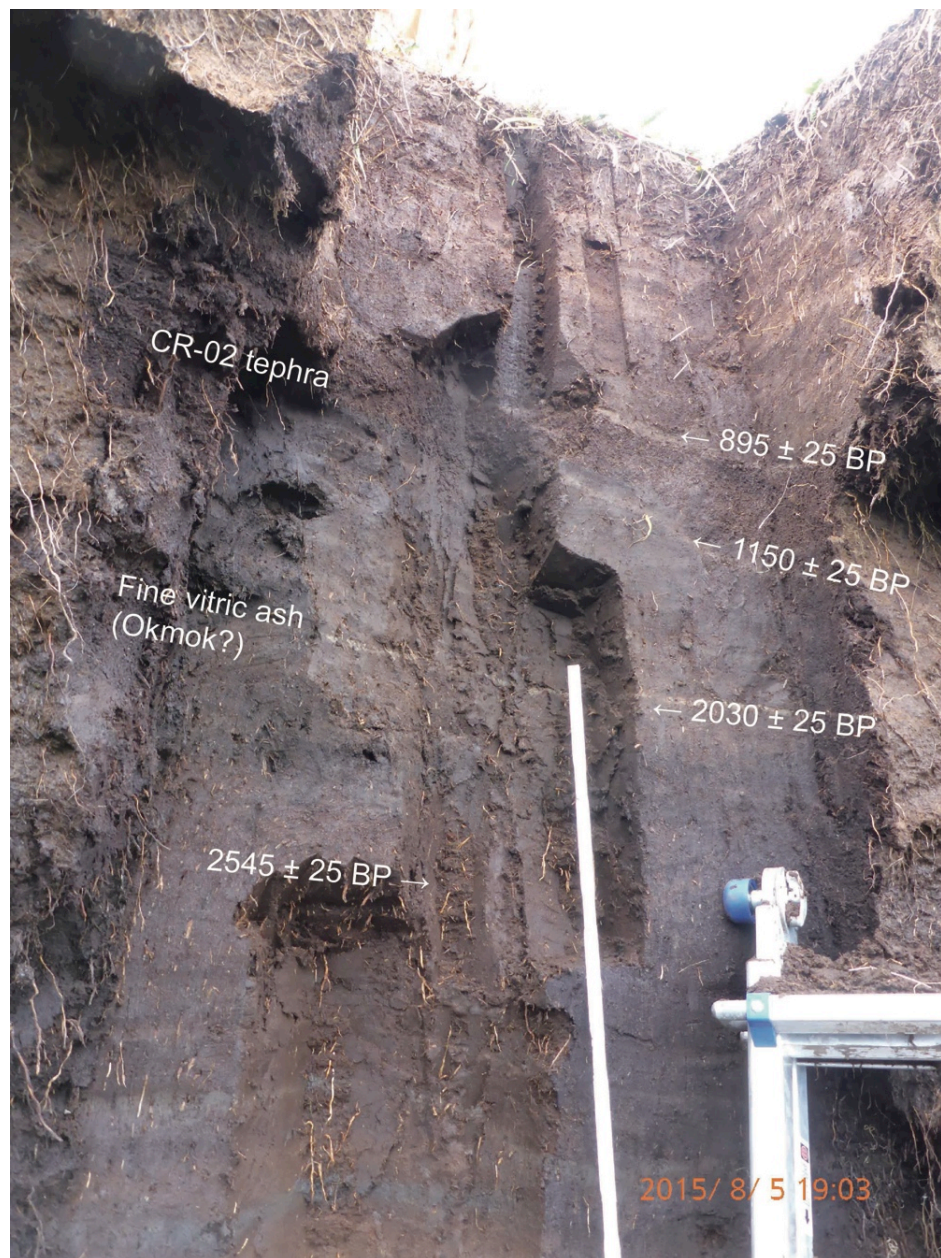


Peat and debris-flows on lava flow near CR-03  
=> This place is isolated from slope of Carlisle.



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(Basal part of this site)

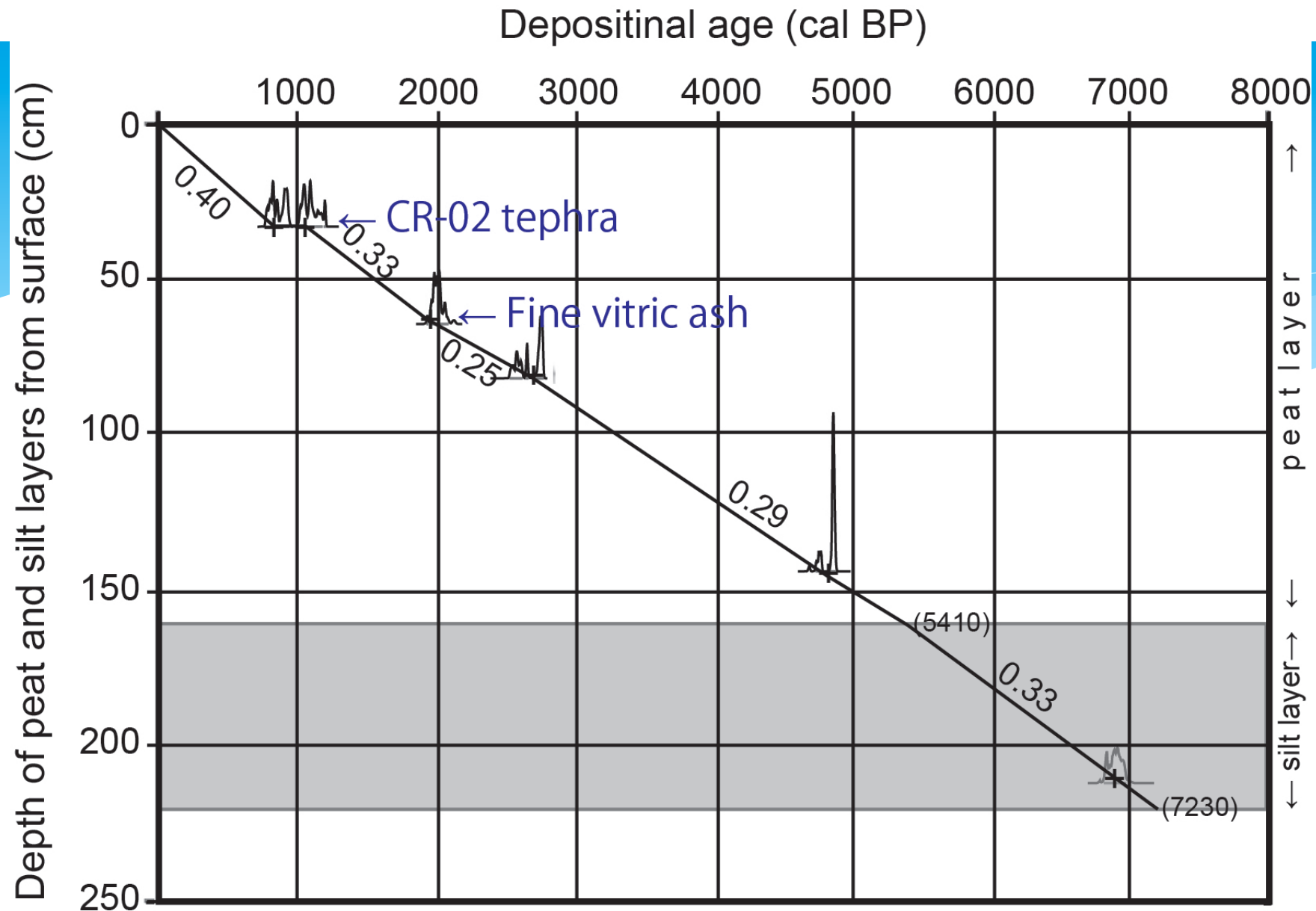
Peat section near CR-03 site.  
Peat provides reliable age for tephra.

Fine vitric ash and CR-02 tephra are ca. 2 and 1 cal kBP, respectively.

# Result of AMS radiocarbon dating

Depth (cm)	Material	<sup>14</sup> C date (BP)	δ <sup>13</sup> C (‰)	Calibrated age range (cal BP)	Lab. No. (IAAA-)
33-34	Peat	895 ± 25	-25.9	738 - 833 (58) 845 - 908 (42)	160136
34-35	Peat	1150 ± 25	-26.4	979 - 1097 (76.8) 1101 - 1148 (15.6) 1158 - 1173 (7.6)	160137
62-63	Peat	2030 ± 25	-27.8	1899 - 1914 (3.1) 1918 - 2056 (96.9)	160138
81-82	Peat	2540 ± 25	-26.0	2499 - 2593 (35.1) 2614 - 2635 (11.1) 2692 - 2747 (53.8)	160139
143-44	Peat	4240 ± 25	-25.6	4661 - 4666 (0.9) 4708 - 4755 (19.6) 4812 - 4858 (79.5)	160140
210-11	Charcoal	6030 ± 30	-24.8	6787 - 6954 (100)	160141





Probability distribution of calibrated years ranges. Values indicate sedimentation rate in mm/yr. It is noted that “depth” does not include thickness of tephra layers.



They are slightly older than dates from the CR-03.

← 1045 ± 20 BP  
(UCIAMS-153681)

CR-02  
tephra

Cultural  
Layer (1)

← 1925 ± 20 BP  
(UCIAMS-153681)

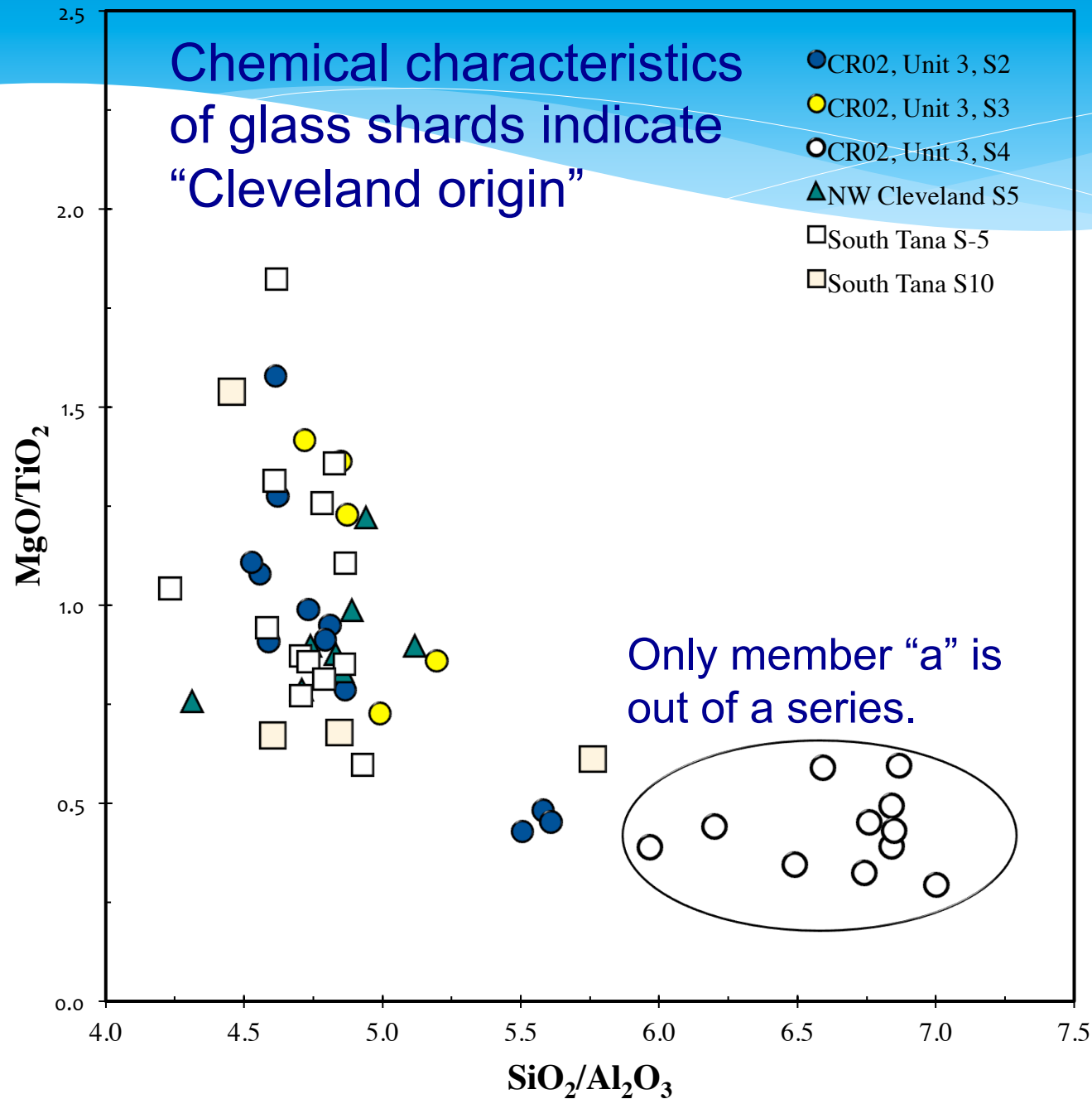
← 2990 ± 20 BP  
(UCIAMS-153681)

For reconstruction of archaeological chronology around this area, we have to pay attention not only to the marine reservoir effect.





# Chemical characteristics of glass shards indicate “Cleveland origin”





# Conclusion

- \* The CR-02 tephra (ca. 1 cal kBP) and ca. 2 cal kBP fine vitric ash are useful tools for determining the effect of volcanic eruptions on prehistoric habitations.
- \* Distribution of the CR-02 tephra indicates prehistoric village CR-02 might be affected by this eruption.
- \* However, people might continue activity around there. We have to check time lag more carefully.