Geoarchaeology in Grand Canyon
Update for 2007 and 2008

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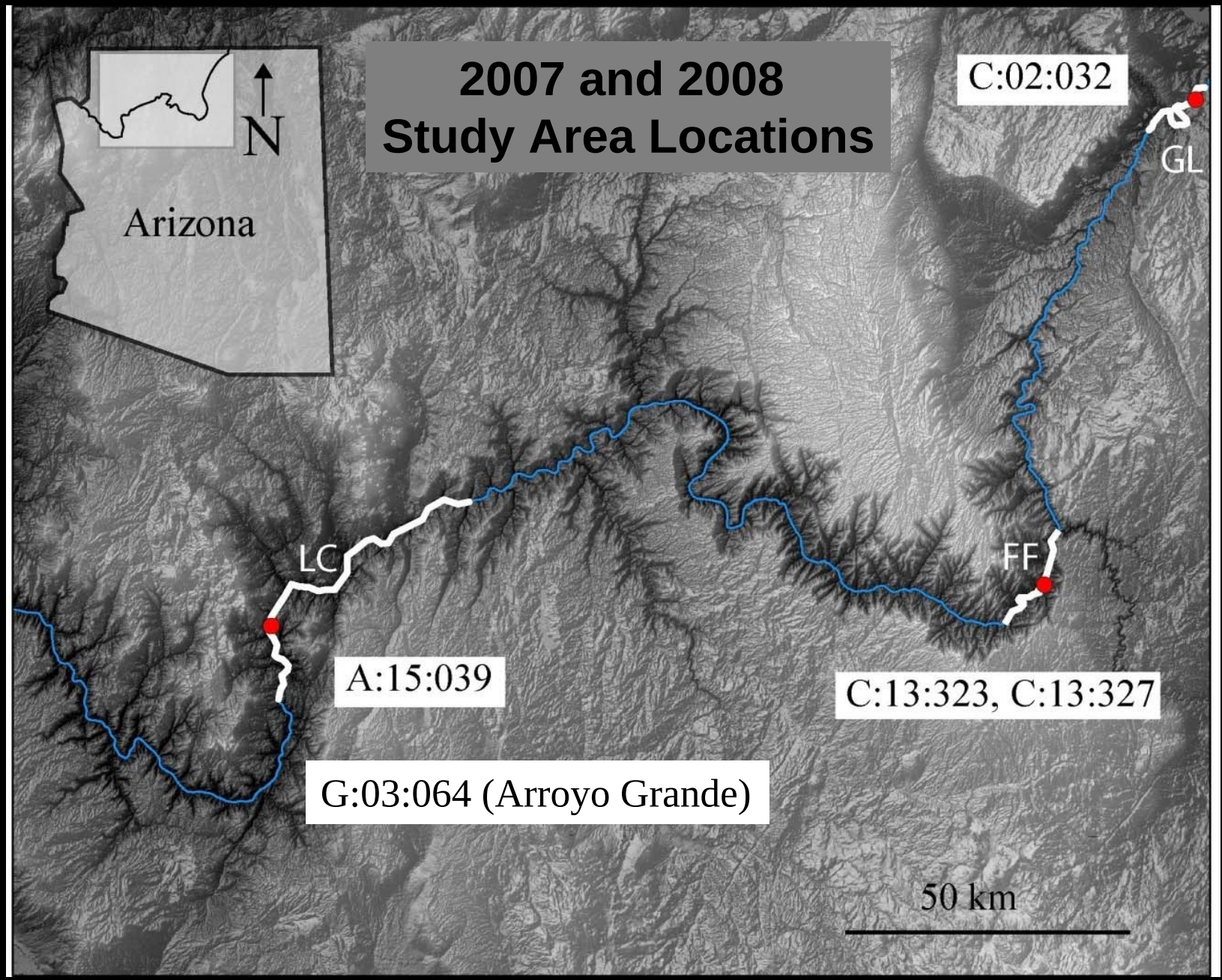
2007 and 2008 Activities


2007 and 2008
Study Area Locations
Arizona
N
C:02:032
GL
LC
FF
A:15:039
C:13:323, C:13:327
G:03:064 (Arroyo Grande)
50 km

Tanner Bar, eastern GC

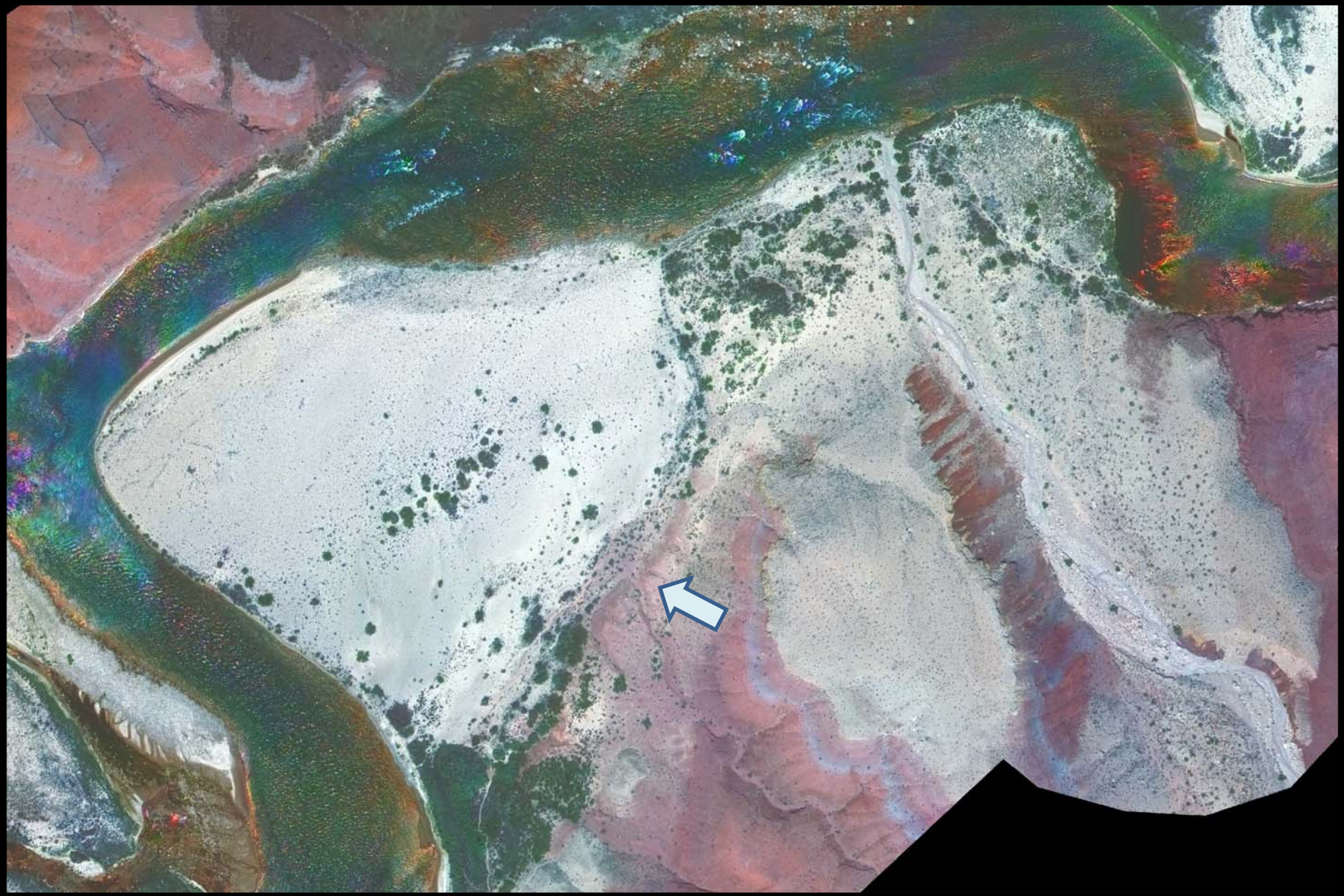
near-surface OSL age:
1.48 ± 0.49 cal kyr

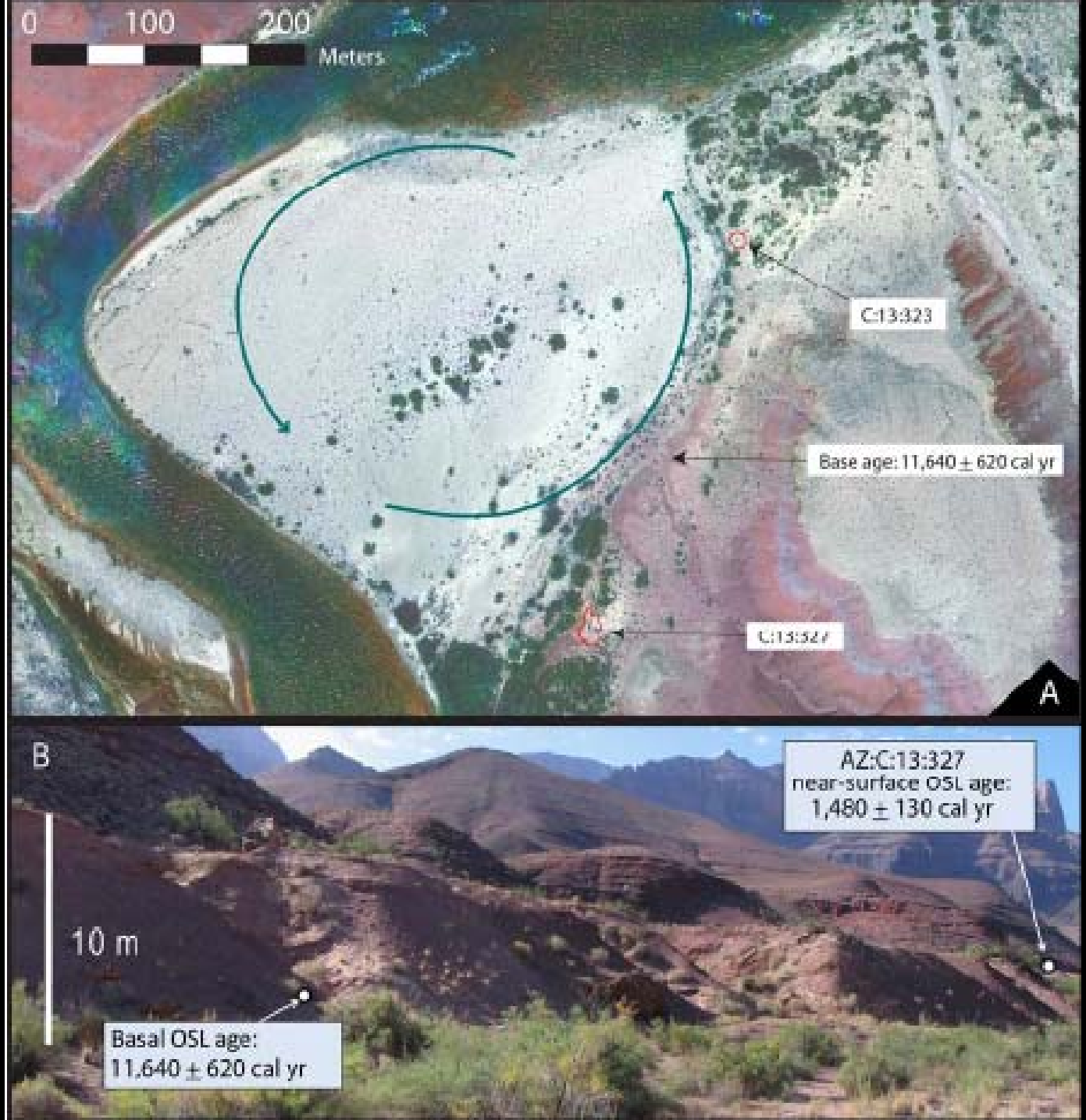
10 m

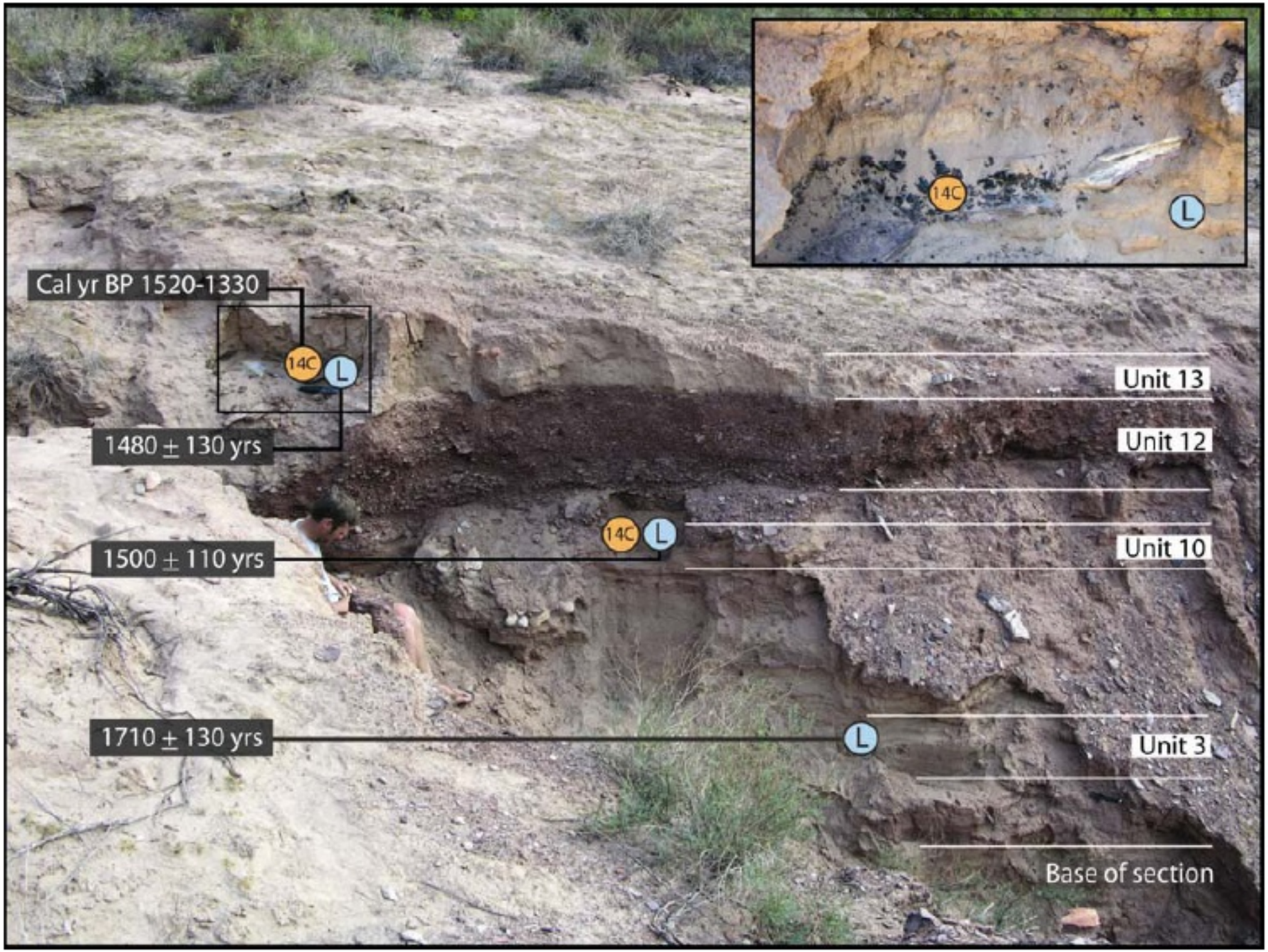
10 m

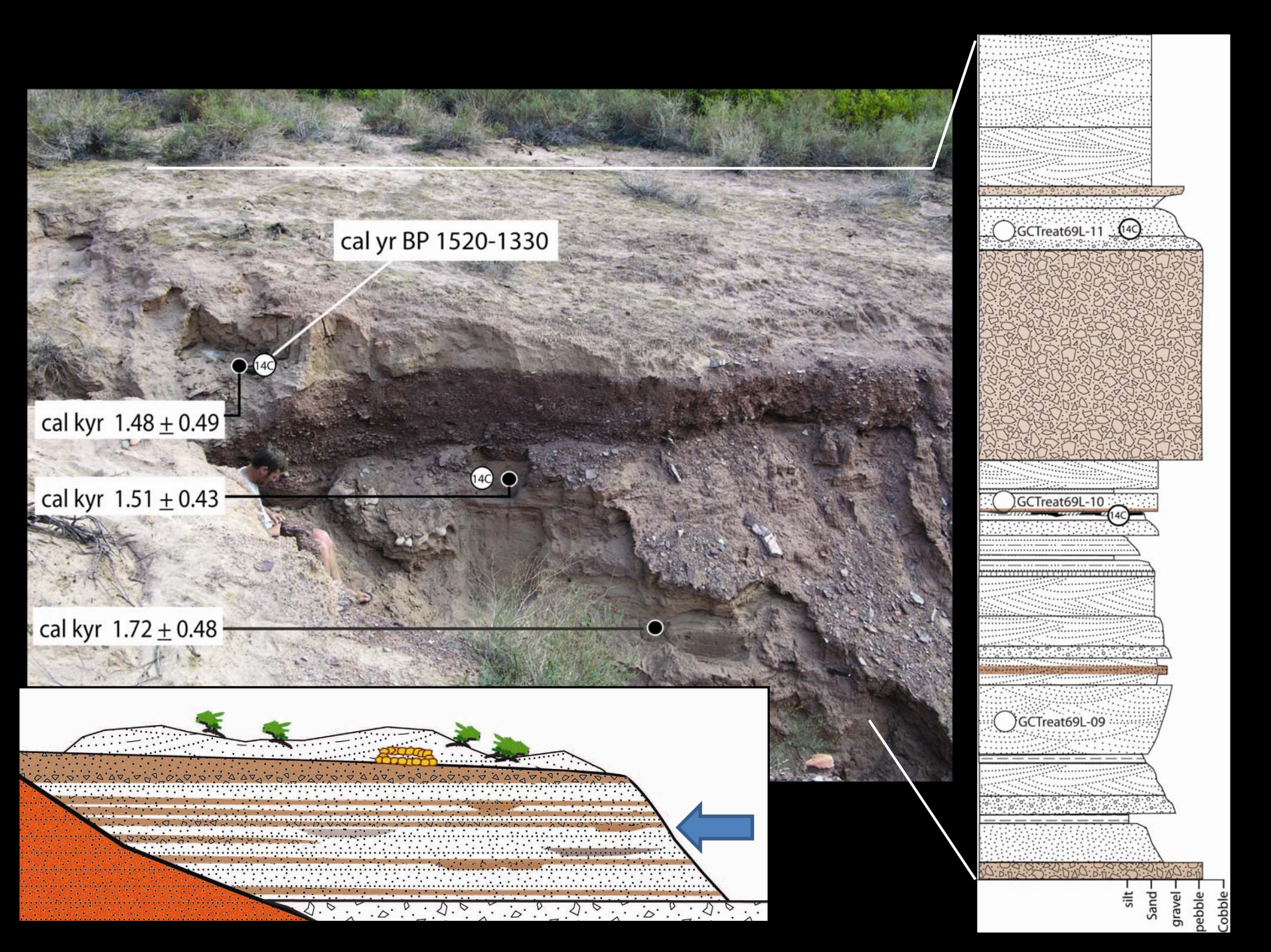
Basal OSL age:
12.27 ± 1.59 cal kyr

Tanner Bar, eastern GC



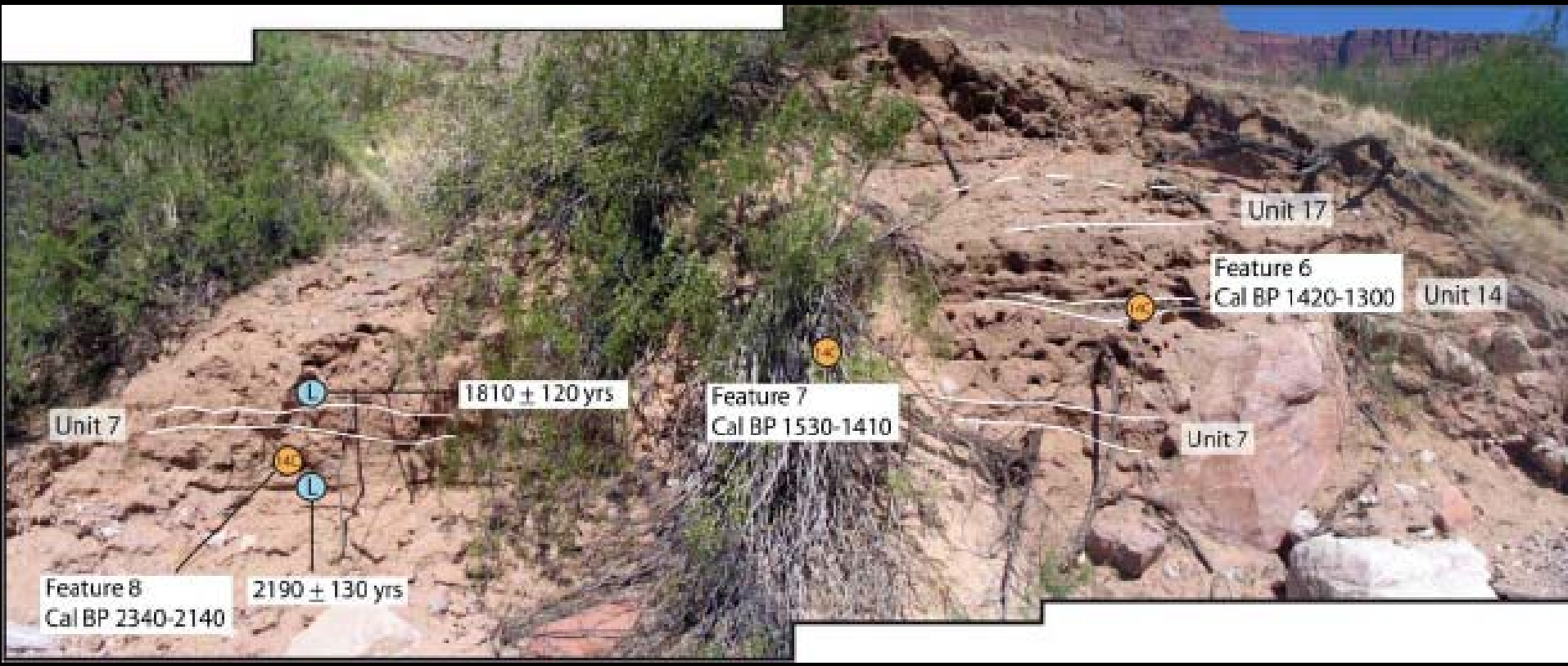

0
100
200
Meters
C:13:323
Base age: 11,640 ± 620 cal yr
C:13:327
A
B
10 m
AZ:C:13:327
near-surface OSL age:
1,480 ± 130 cal yr
Basal OSL age:
11,640 ± 620 cal yr

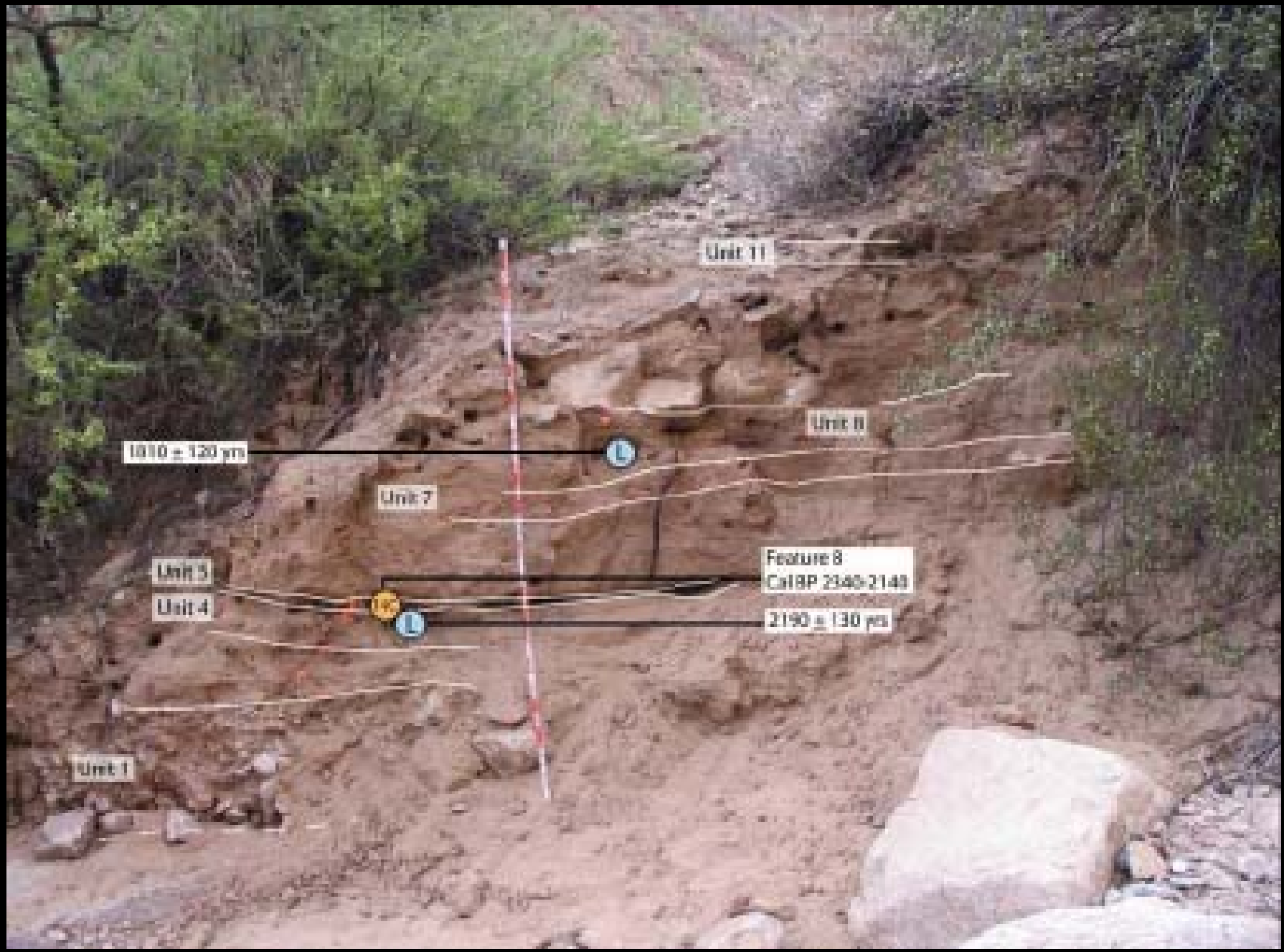

14C
L
Cal yr BP 1520-1330
14C
L
1480 ± 130 yrs
14C
L
1500 ± 110 yrs
1710 ± 130 yrs
L
Unit 13
Unit 12
Unit 10
Unit 3
Base of section

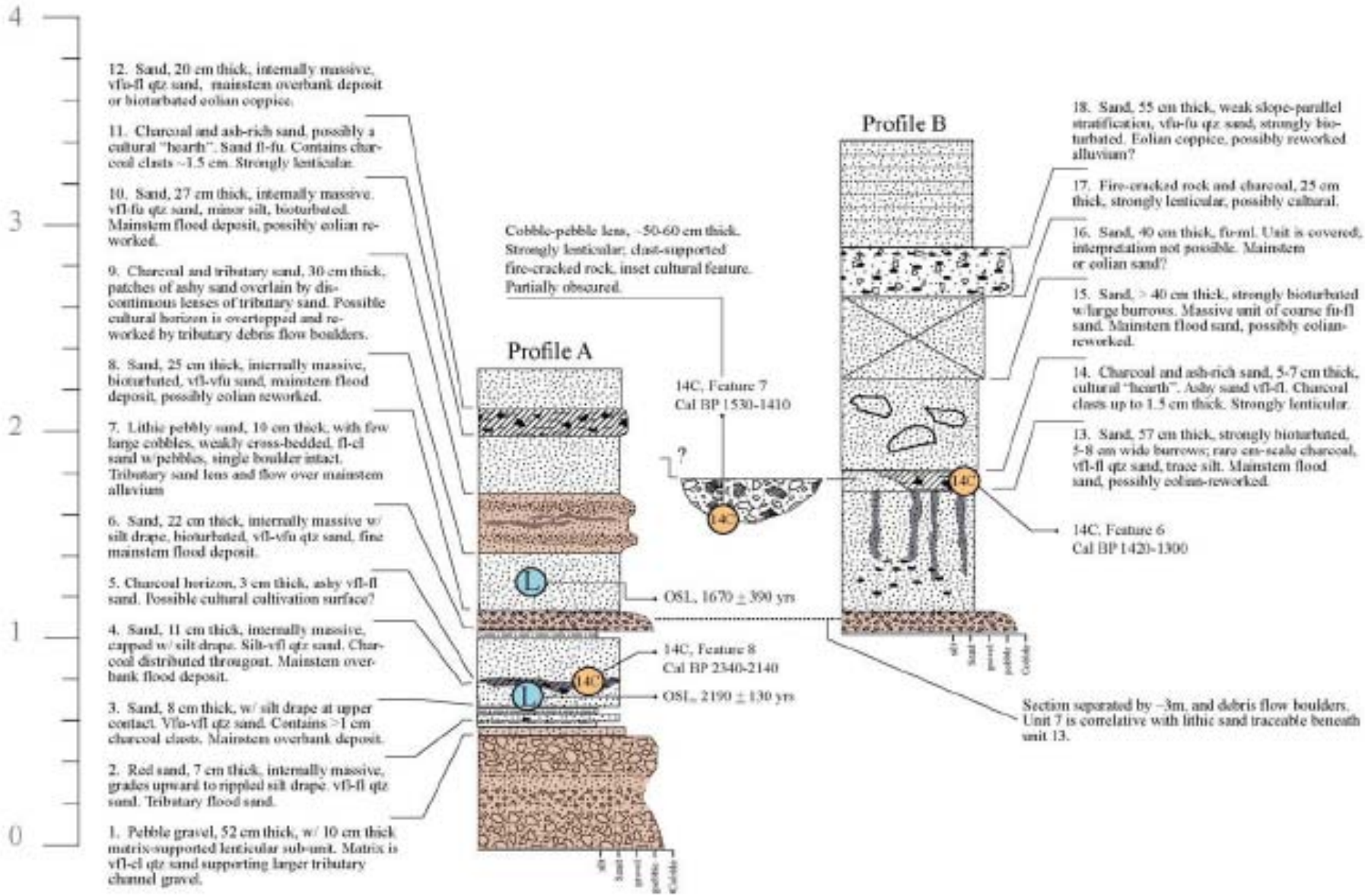

cal yr BP 1520-1330
14C
cal kyr 1.48 ± 0.49
14C
cal kyr 1.51 ± 0.43
cal kyr 1.72 ± 0.48
GCTreat69L-11
14C
GCTreat69L-10
14C
GCTreat69L-09
silt
Sand
gravel
pebble
Cobble


Hearth
0
6
12
Meters
AZ:C:13:323

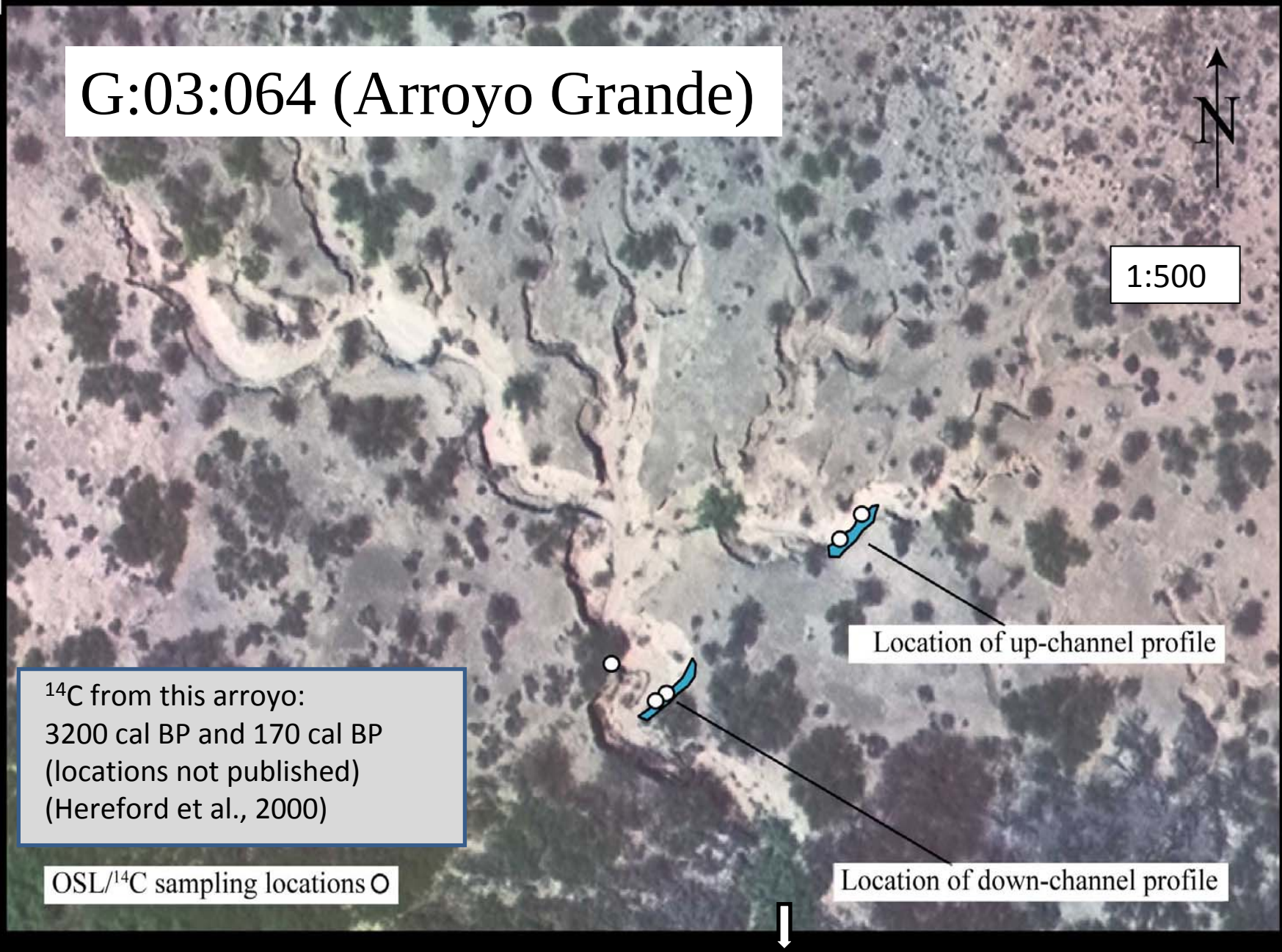

Site A:15:039
N
1
2
3
4
5
6
7
8
Location of Figure 11
0 Meters 50


Unit 17
Feature 6
Cal BP 1420-1300
Unit 14
1810 ± 120 yrs
Feature 7
Cal BP 1530-1410
Unit 7
Unit 7
Feature 8
Cal BP 2340-2140
2190 ± 130 yrs

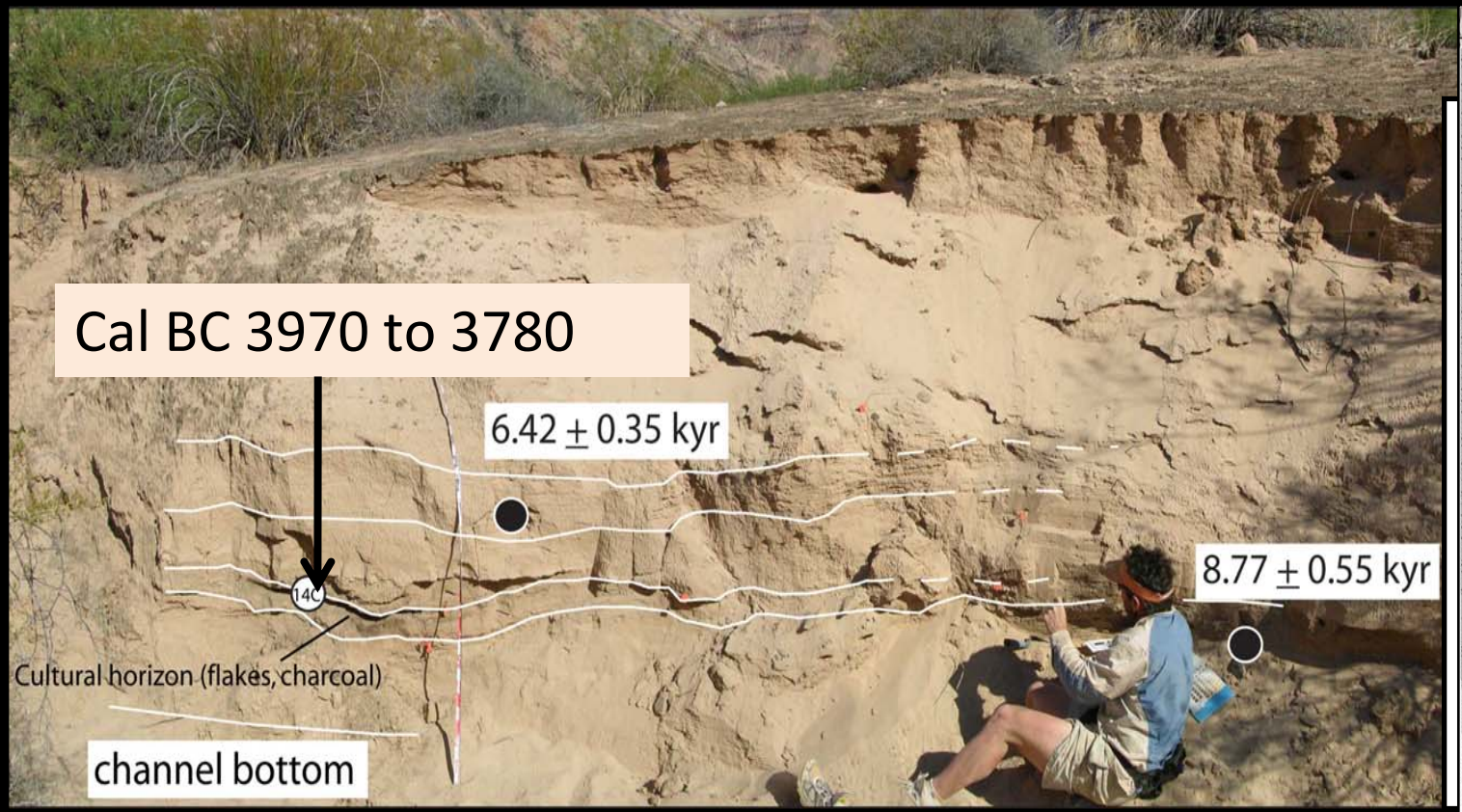

Unit 11
Unit 8
1810 ± 120 yrs
Unit 7
Feature 8
Cal BP 2340-2148
Unit 5
Unit 4
2190 ± 130 yrs
Unit 1


4
3
2
1
0
12. Sand, 20 cm thick, internally massive, vfu-fl qtz sand, mainstem overbank deposit or bioturbated eolian coppice.
11. Charcoal and ash-rich sand, possibly a cultural "hearth". Sand fl-fu. Contains charcoal clasts ~1.5 cm. Strongly lenticular.
10. Sand, 27 cm thick, internally massive. vfl-fu qtz sand, minor silt, bioturbated. Mainstem flood deposit, possibly eolian reworked.
9. Charcoal and tributary sand, 30 cm thick, patches of ashy sand overlain by discontinuous lenses of tributary sand. Possible cultural horizon is overstepped and reworked by tributary debris flow boulders.
8. Sand, 25 cm thick, internally massive, bioturbated, vfl-vfu sand, mainstem flood deposit, possibly eolian reworked.
7. Lithic pebbly sand, 10 cm thick, with few large cobbles, weakly cross-bedded. fl-cl sand w/pebbles, single boulder intact. Tributary sand lens and flow over mainstem alluvium
6. Sand, 22 cm thick, internally massive w/ silt drape, bioturbated, vfl-vfu qtz sand, fine mainstem flood deposit.
5. Charcoal horizon, 3 cm thick, ashy vfl-fl sand. Possible cultural cultivation surface?
4. Sand, 11 cm thick, internally massive, capped w/ silt drape. Silt-vfl qtz sand. Charcoal distributed througout. Mainstem overbank flood deposit.
3. Sand, 8 cm thick, w/ silt drape at upper contact. Vfu-vfl qtz sand. Contains >1 cm charcoal clasts. Mainstem overbank deposit.
2. Red sand, 7 cm thick, internally massive, grades upward to rippled silt drape. vfl-fl qtz sand. Tributary flood sand.
1. Pebble gravel, 52 cm thick, w/ 10 cm thick matrix-supported lenticular sub-unit. Matrix is vfl-cl qtz sand supporting larger tributary channel gravel.
Profile A
Cobble-pebble lens, ~50-60 cm thick. Strongly lenticular; clast-supported fire-cracked rock, inset cultural feature. Partially obscured.
14C, Feature 7
Cal BP 1530-1410
?
14C
OSL, 1670 ± 390 yrs
14C, Feature 8
Cal BP 2340-2140
14C
OSL, 2190 ± 130 yrs
Profile B
18. Sand, 55 cm thick, weak slope-parallel stratification, vfu-fu qtz sand, strongly bioturbated. Eolian coppice, possibly reworked alluvium?
17. Fire-cracked rock and charcoal, 25 cm thick, strongly lenticular, possibly cultural.
16. Sand, 40 cm thick, fu-ml. Unit is covered, interpretation not possible. Mainstem or eolian sand?
15. Sand, > 40 cm thick, strongly bioturbated w/large burrows. Massive unit of coarse fu-fl sand. Mainstem flood sand, possibly eolian-reworked.
14. Charcoal and ash-rich sand, 5-7 cm thick, cultural "hearth". Ashy sand vfl-fl. Charcoal clasts up to 1.5 cm thick. Strongly lenticular.
13. Sand, 57 cm thick, strongly bioturbated, 5-8 cm wide burrows; rare cm-scale charcoal, vfl-fl qtz sand, trace silt. Mainstem flood sand, possibly eolian-reworked.
14C
14C, Feature 6
Cal BP 1420-1300
Section separated by ~3m, and debris flow boulders. Unit 7 is correlative with lithic sand traceable beneath unit 13.

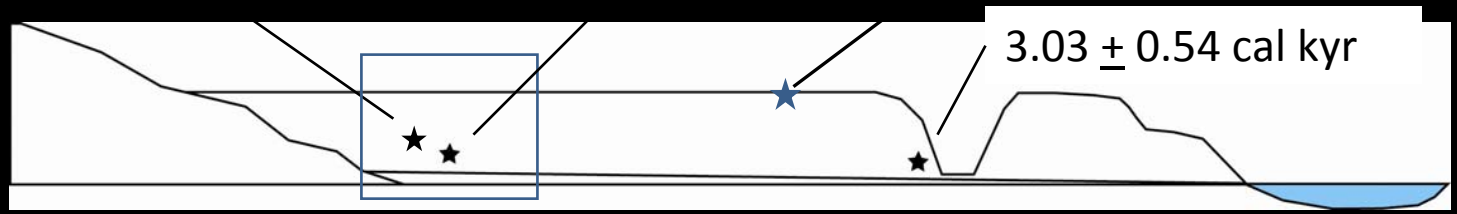
Arroyo Grande, western Grand Canyon

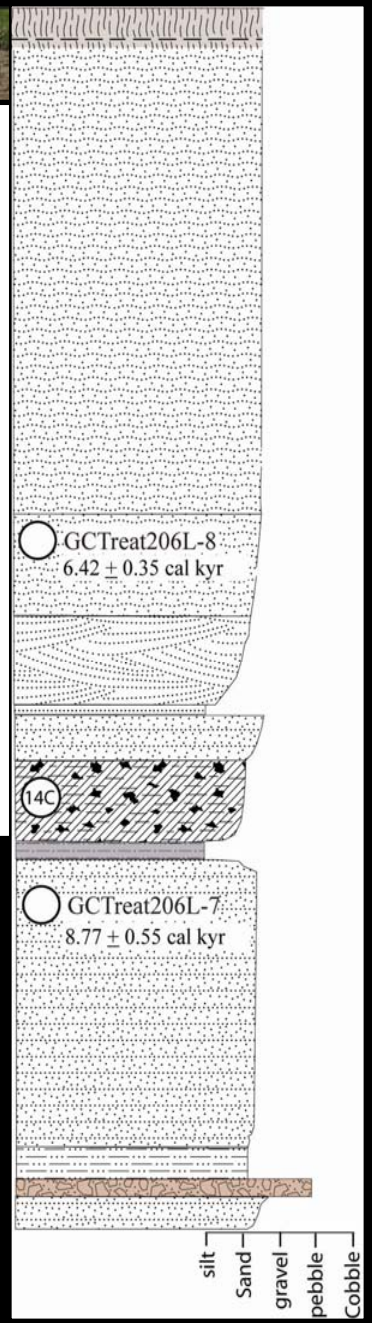


^{14}C from this arroyo:
3200 cal BP and 170 cal BP
(locations not published)
(Hereford et al., 2000)

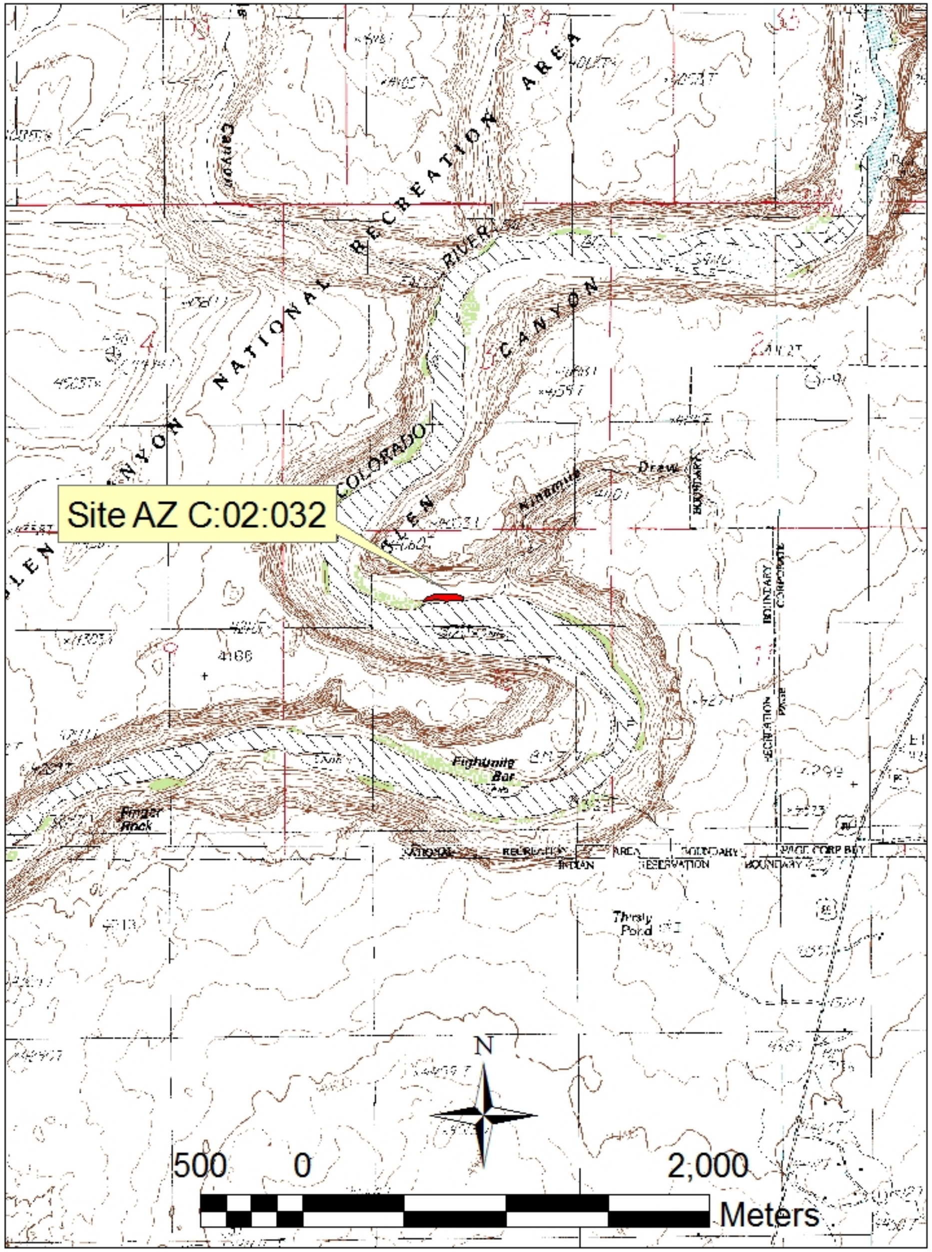


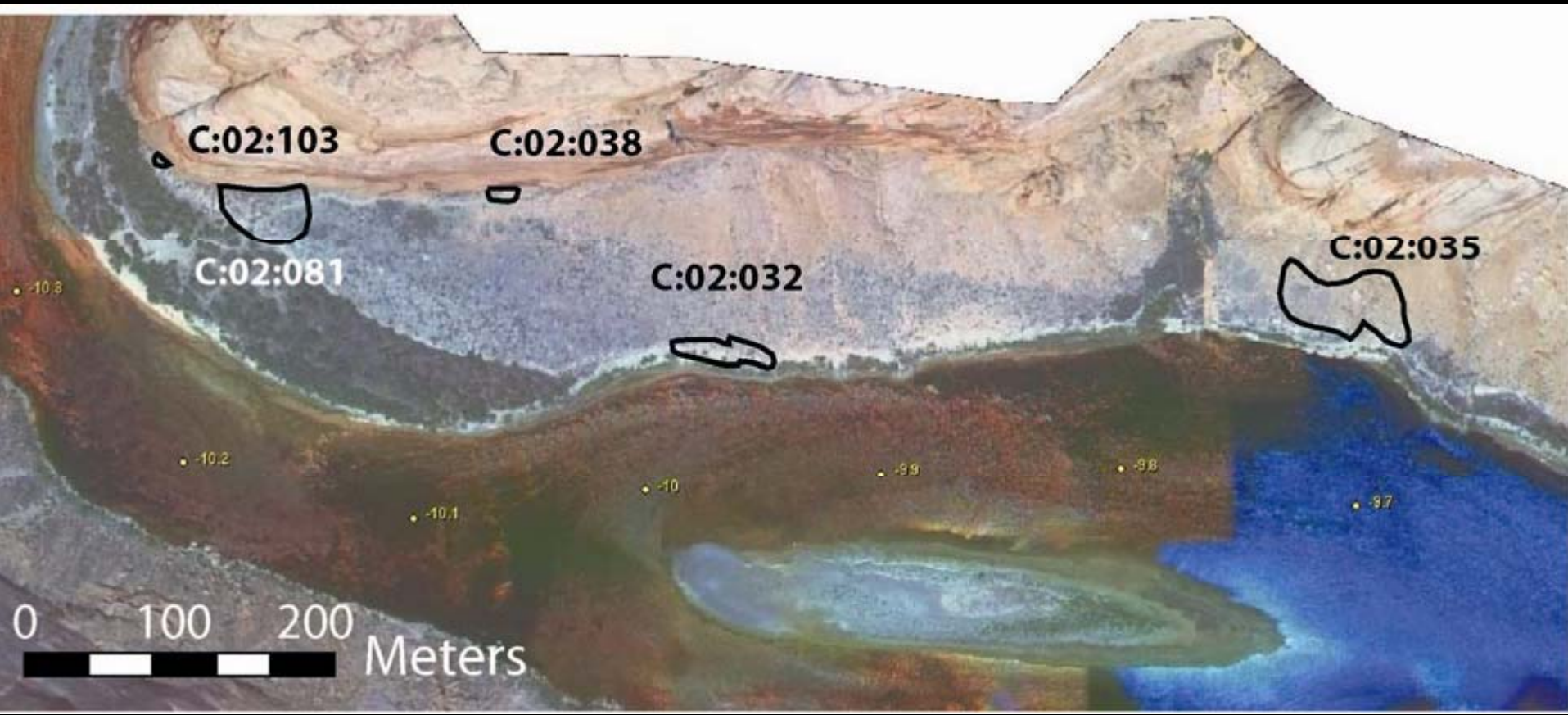
~170 ^{14}C Cal yr BP



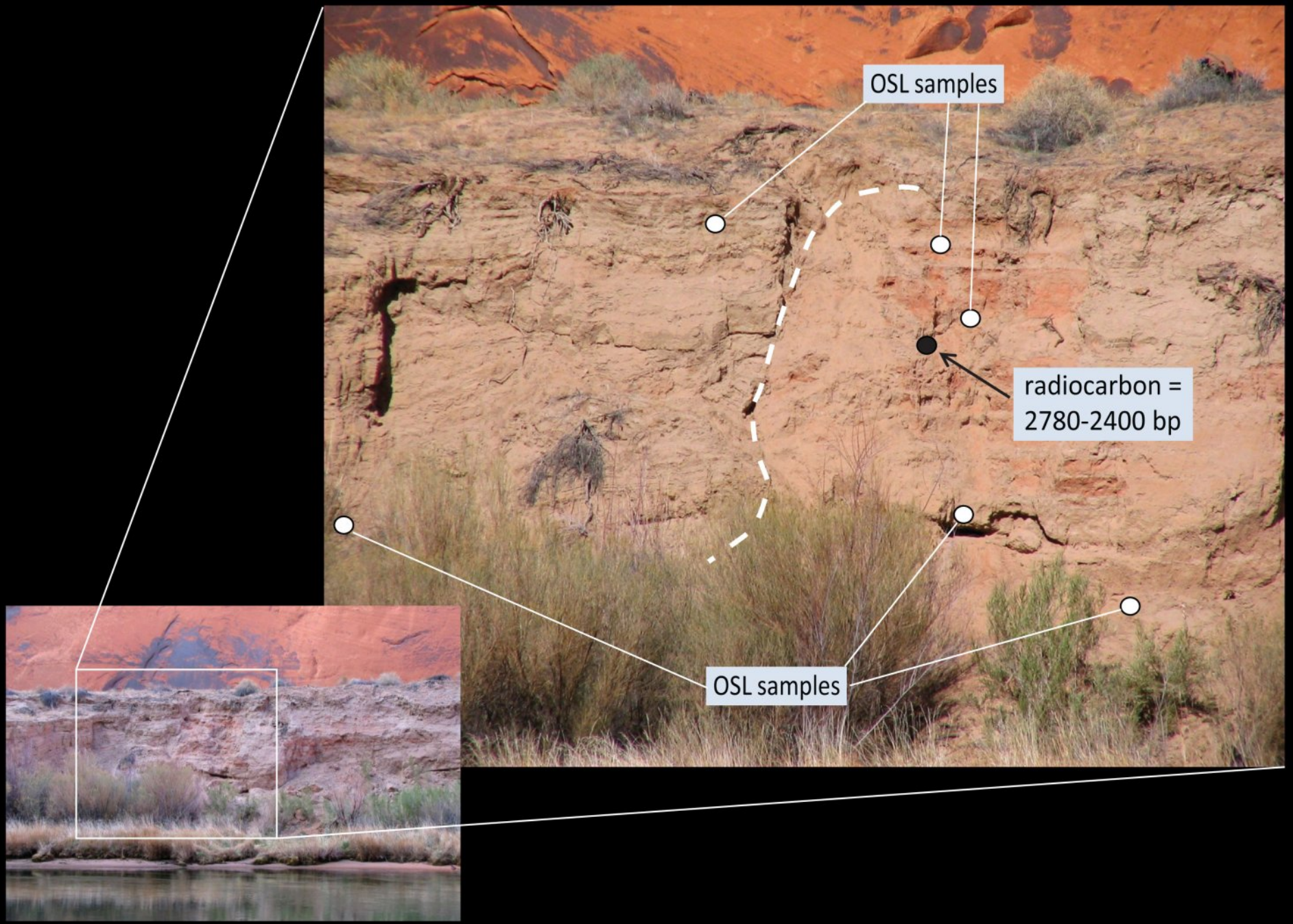


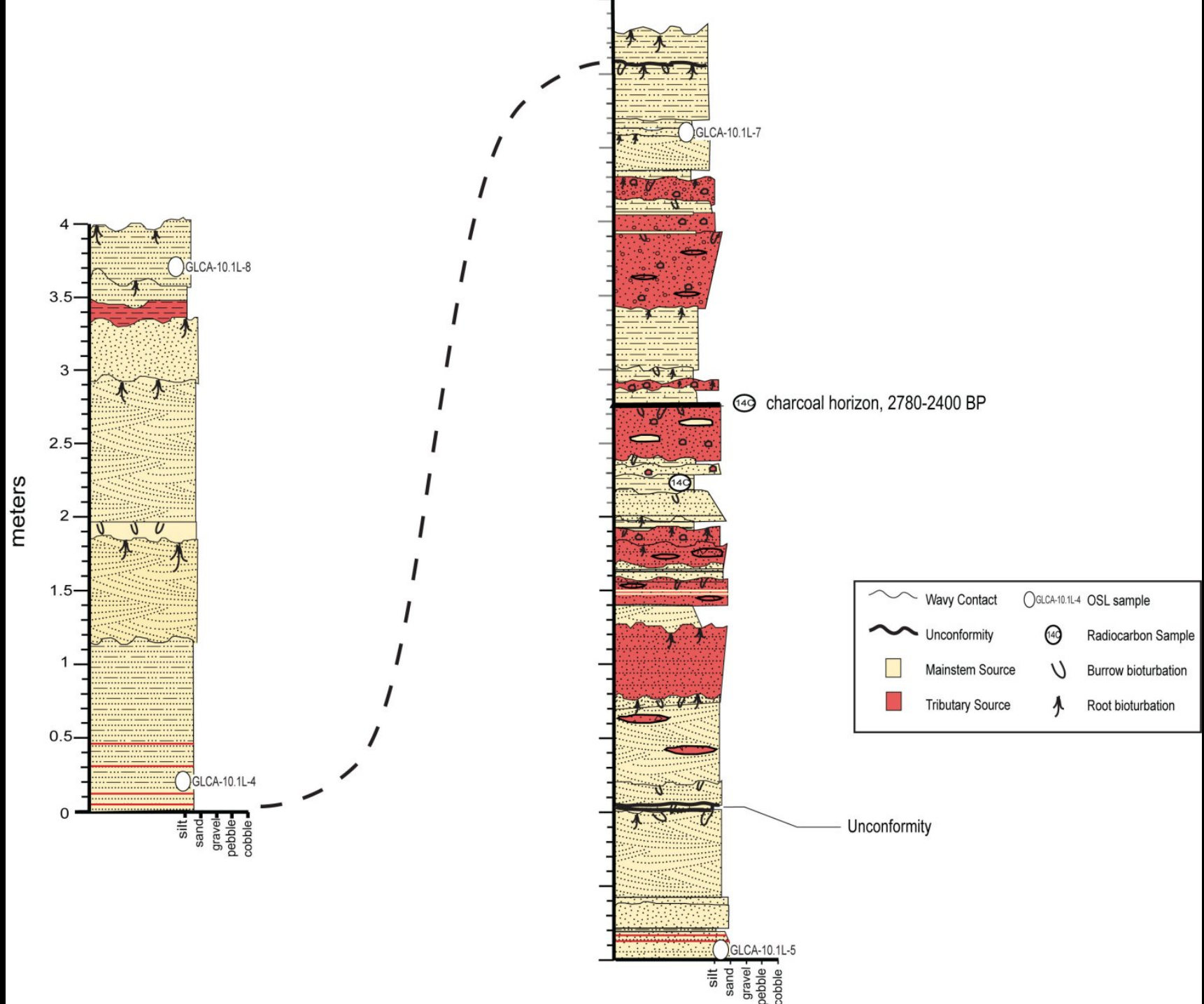
HFE Related Geoarchaeological Activities

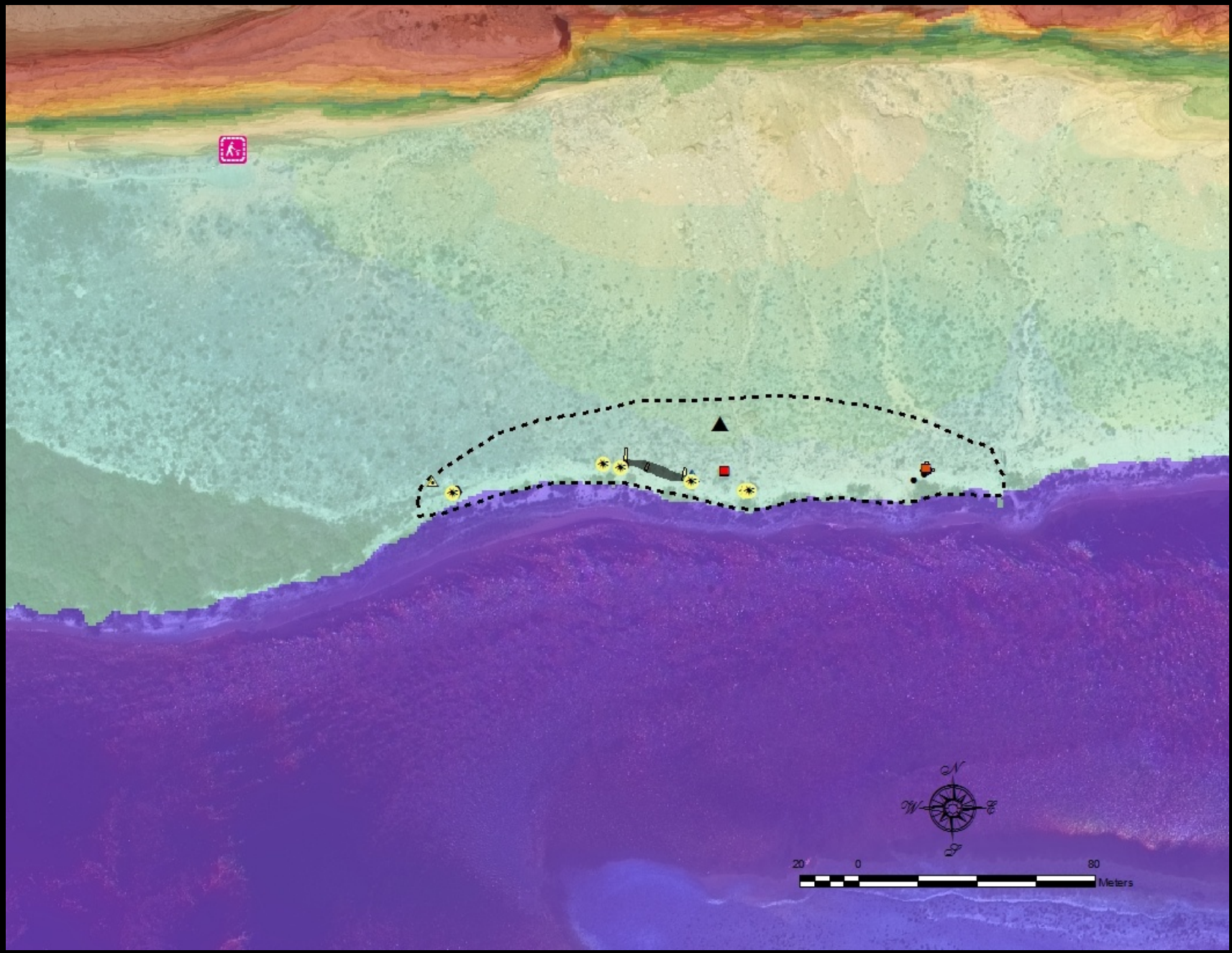

Site AZ C:02:032
GLEN CANYON NATIONAL RECREATION AREA
COLORADO RIVER
GLEN CANYON
Ninemile Draw
Eightmile Bar
Finger Rock
Thirsty Pond
NATIONAL RECREATION AREA BOUNDARY
INDIAN RESERVATION BOUNDARY
PAGE CORP BDY
N
500
0
2,000
Meters


C:02:103
C:02:038
C:02:081
C:02:032
C:02:035
-10.3
-10.2
-10.1
-10
-9.9
-9.8
-9.7
0
100
200
Meters


carbonate lens
OSL sample


OSL samples
radiocarbon =
2780-2400 bp
OSL samples


meters
4
3.5
3
2.5
2
1.5
1
0.5
0
GLCA-10.1L-8
GLCA-10.1L-4
silt
sand
gravel
pebble
cobble
GLCA-10.1L-7
14C
charcoal horizon, 2780-2400 BP
Unconformity
GLCA-10.1L-5
Wavy Contact
GLCA-10.1L-4 OSL sample
Unconformity
14C Radiocarbon Sample
Mainstem Source
Burrow bioturbation
Tributary Source
Root bioturbation


N
W
E
S
20
0
80
Meters