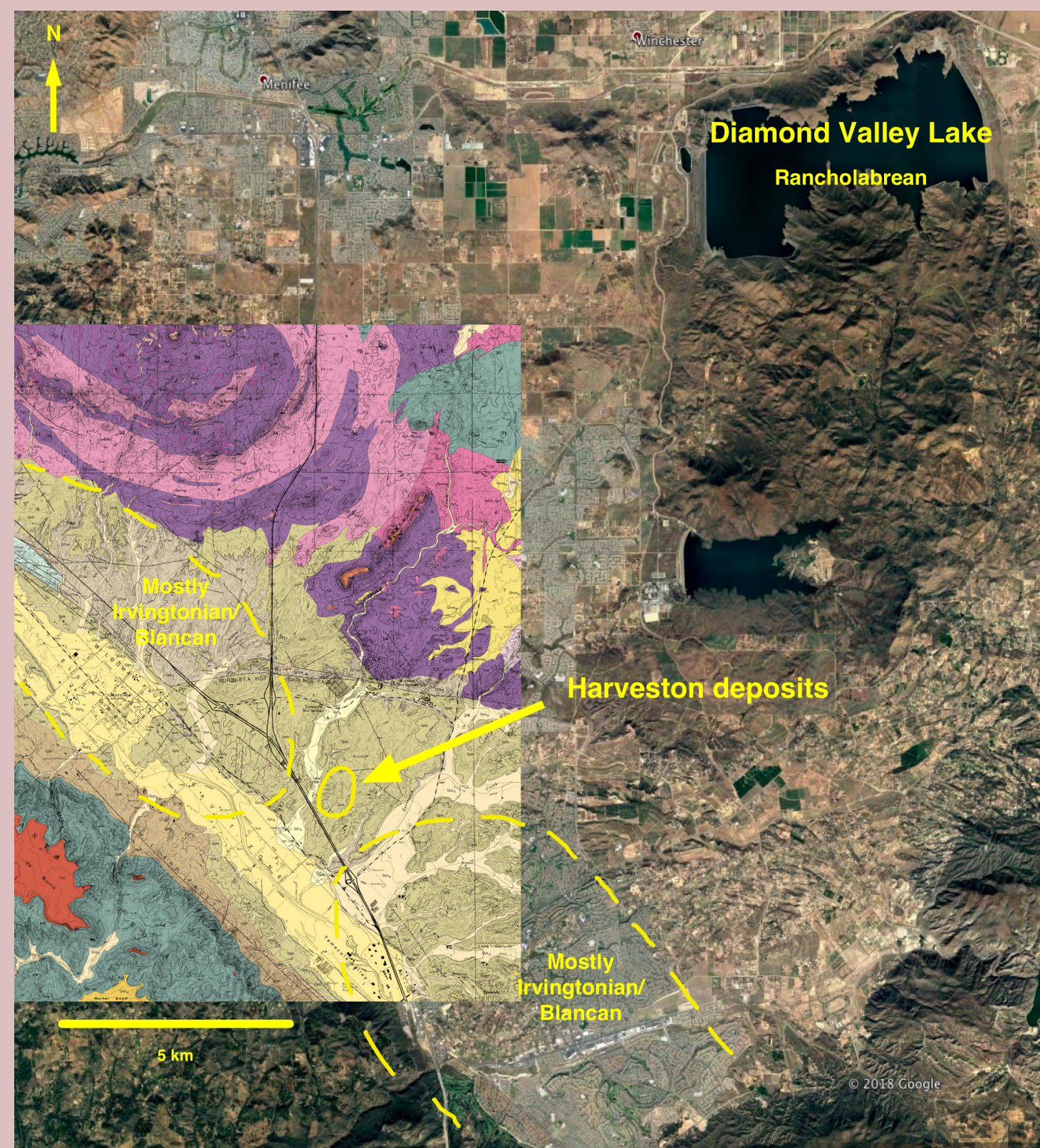


Shifting faunas and changing climate: new remains of middle to late Pleistocene *Equus* from southwestern Riverside County, California

CHARLOTTE J. H. HOHMAN, ERIC SCOTT, and ALTON C. DOOLEY, JR.

GEOGRAPHIC AND STRATIGRAPHIC BACKGROUND

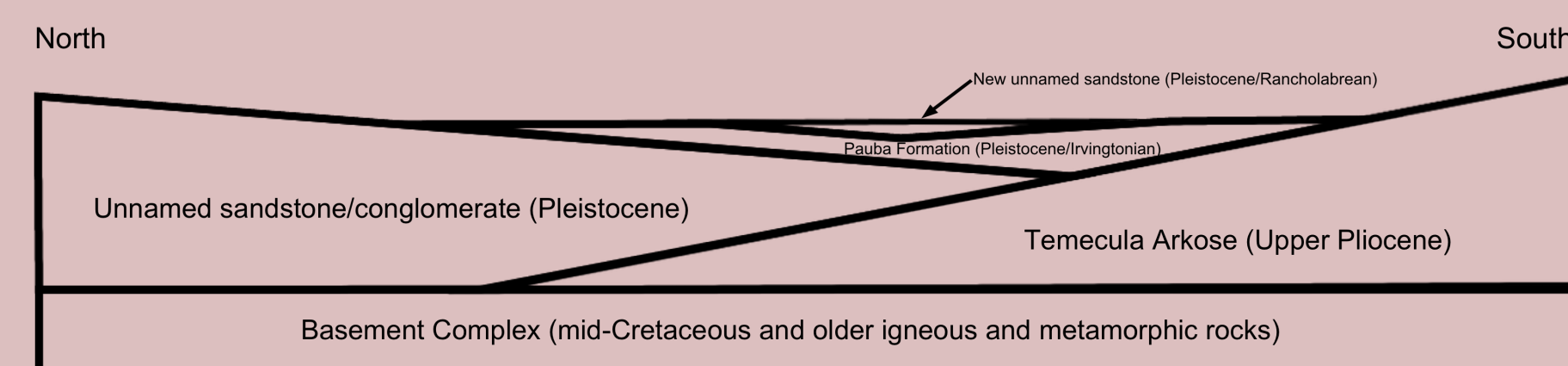
Harveston is a housing development in the City of Temecula, on the border between Temecula and Murrieta in southwestern Riverside County, California. During grading and construction from 2002-2004, a number of fossil sites were discovered and excavated.



Geological map from Kennedy, M. P. and D. M. Morton, Preliminary Geological Map of the Murrieta 7.5' Quadrangle, Riverside County, California. Version 1.0. U. S. Geological Survey Open-File Report 03-189. Base map from Google Earth.

To the north in Murrieta, fossils date to the late Blancan and Irvingtonian North American Land Mammal Ages, and derive from the Pauba Formation and an underlying unnamed sandstone and conglomerate formation. To the south, ages are less well constrained but appear to also be primarily Irvingtonian and Blancan. Diamond Valley Lake, northeast of Harveston, yielded almost exclusively Rancholabrean assemblages, with the youngest fossils (c. 14,000 ybp) at the western end of the valley.

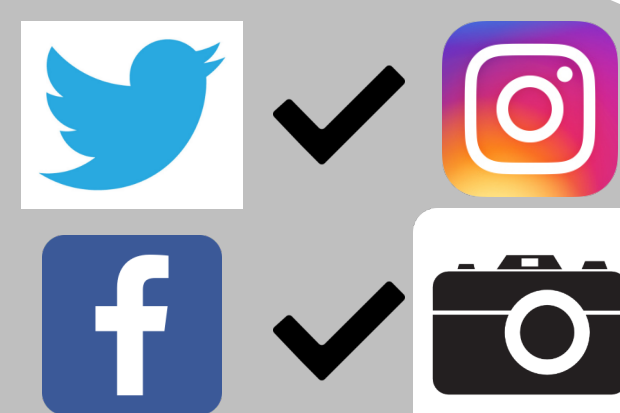
Construction of the Harveston subdivision exposed Irvingtonian Pauba Formation overlain by a newly-recognized unnamed late Pleistocene sandstone. Both units produced both large and small vertebrate remains. The Pauba Formation yielded only a few large mammal remains including *Paramylodon*, *Equus*, *Odocoileus*, and *Hemiauchenia*. The majority of the remains were recovered from the unnamed sandstone overlying the Pauba. This unit yielded numerous horses, *Mammuthus*, and, most significantly, *Bison antiquus*, establishing this unit as Rancholabrean. Specimens are curated at the Western Science Center, Hemet, California.



Stylized cross-section showing sedimentary units in Temecula Valley. The lateral extent of the newly-recognized unnamed sandstone underlying the Pauba Formation is not known, as thus far it has only been reported from Harveston. Adapted from Kennedy, M. P., 1977. Recency and Character of Faulting Along the Elsinore Fault Zone in Southern Riverside County, California. California Division of Mines and Geology Special Report 131, 12 p.

ACKNOWLEDGMENTS

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Please give attribution!

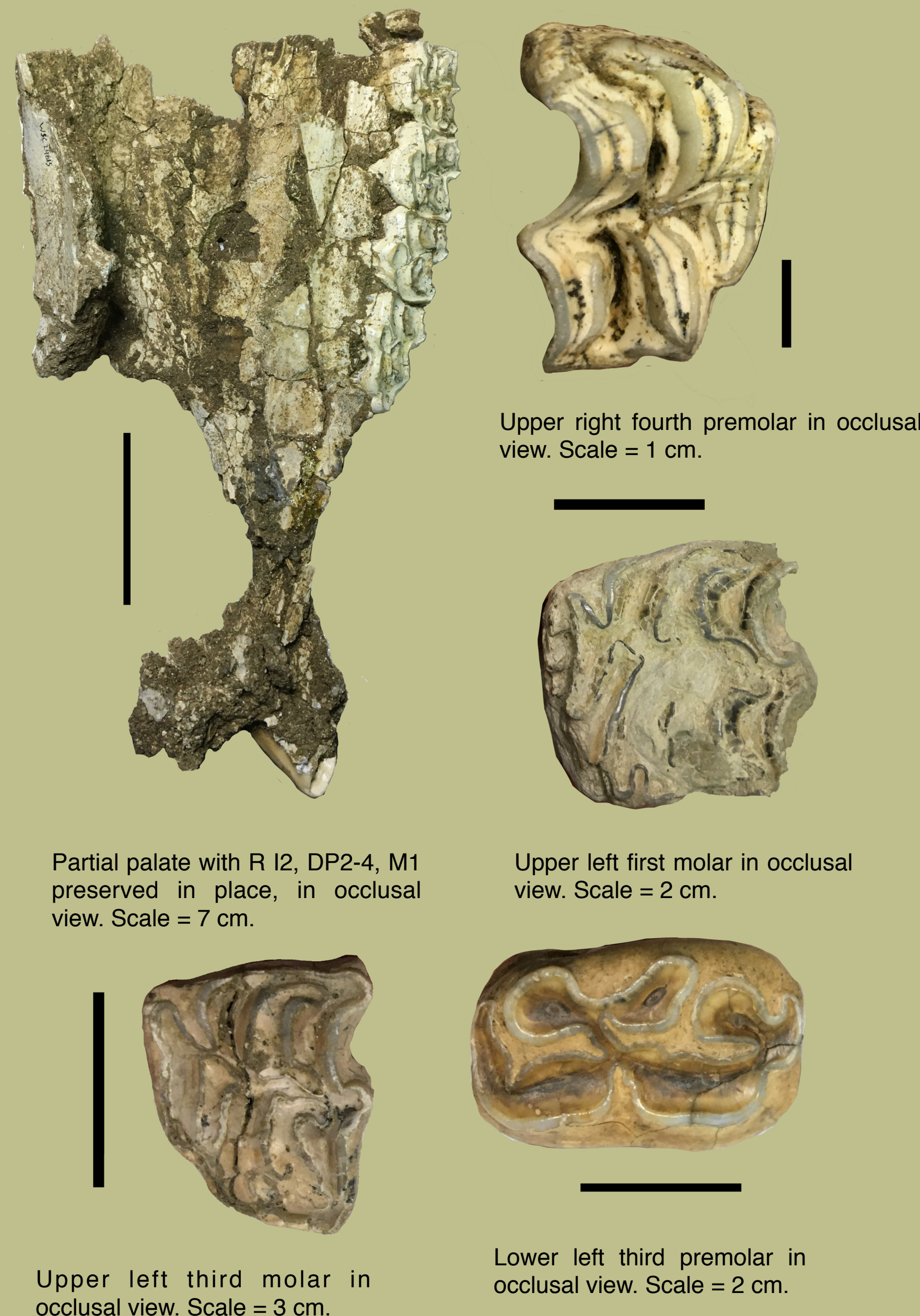
IF YOU ONLY TAKE THREE THINGS FROM THIS POSTER (tl;dr):

- 1) *Equus* is present in both the Irvingtonian Pauba Formation and the overlying Rancholabrean unnamed sandstone.
- 2) Two different size classes of horse are present in the newly-recognized Rancholabrean unnamed sandstone.
- 3) The smaller size class is less common and may have affinities with horses from San Josecito Cave, Nuevo León, Mexico

Pauba Formation (Irvingtonian)

Equus sp.

Horse fossils are less common in the Pauba Formation than in the sandstone that overlays it. There are no postcranial remains. One class size is present.



Partial palate with R I2, DP2-4, M1 preserved in place, in occlusal view. Scale = 7 cm.

Upper left first molar in occlusal view. Scale = 2 cm.

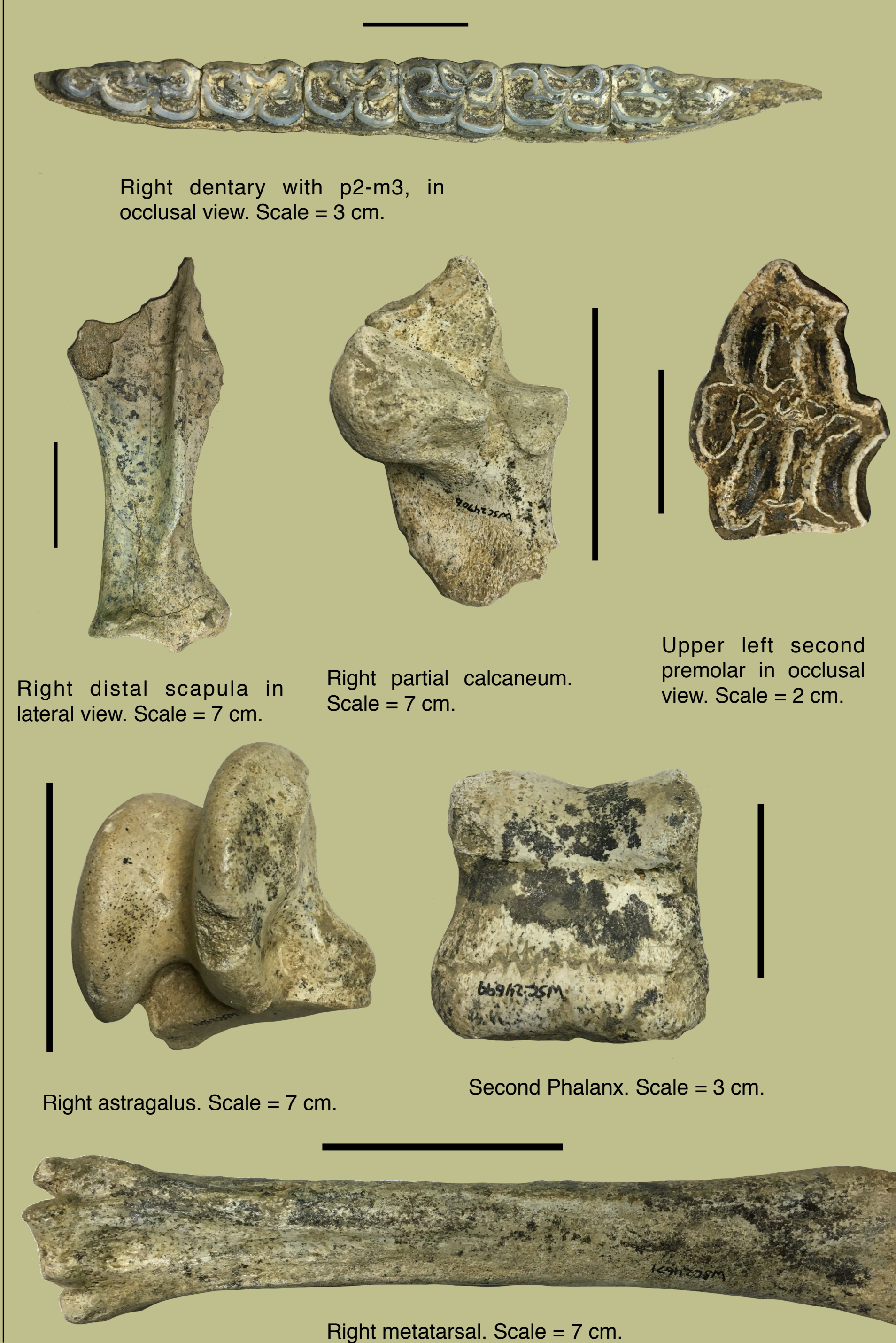
Upper left third molar in occlusal view. Scale = 3 cm.

Lower left third premolar in occlusal view. Scale = 2 cm.

Unnamed Sandstone (Rancholabrean)

Equus sp.

Horse fossils are more common in the unnamed sandstone than in the underlying Pauba Formation. Both cranial and postcranial remains were uncovered. Two class sizes are present.



Right dentary with p2-m3, in occlusal view. Scale = 3 cm.

Right distal scapula in lateral view. Scale = 7 cm.

Right partial calcaneum. Scale = 7 cm.

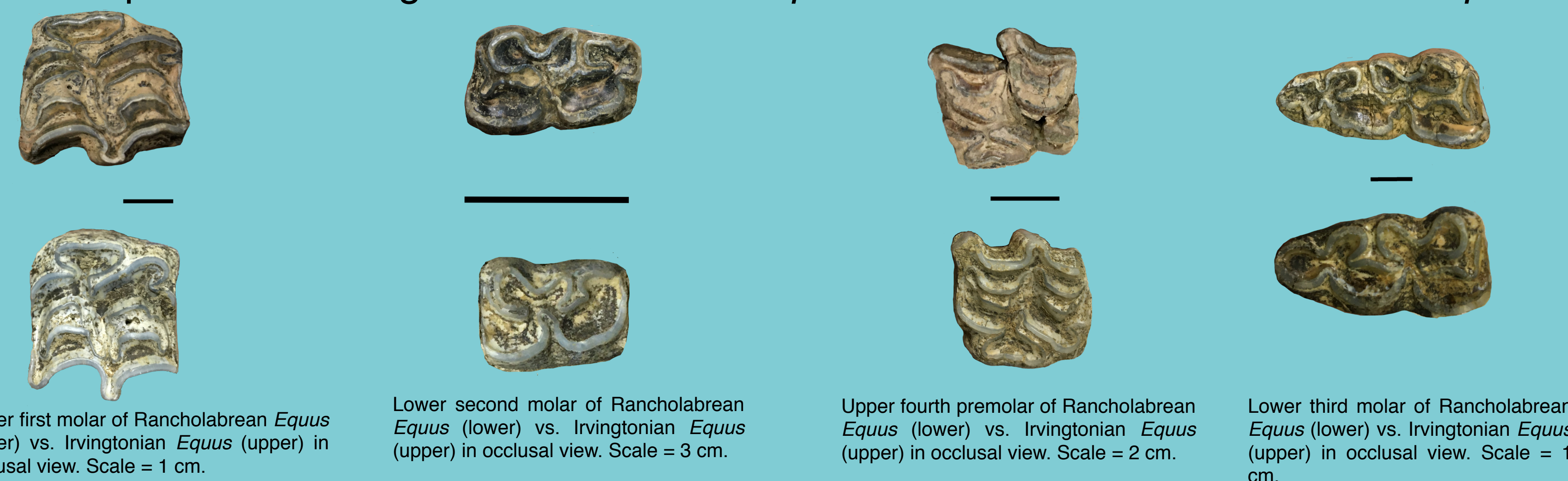
Upper left second premolar in occlusal view. Scale = 2 cm.

Right astragalus. Scale = 7 cm.

Second Phalanx. Scale = 3 cm.

Right metatarsal. Scale = 7 cm.

Comparison of Irvingtonian Harveston *Equus* to Rancholabrean Harveston *Equus*



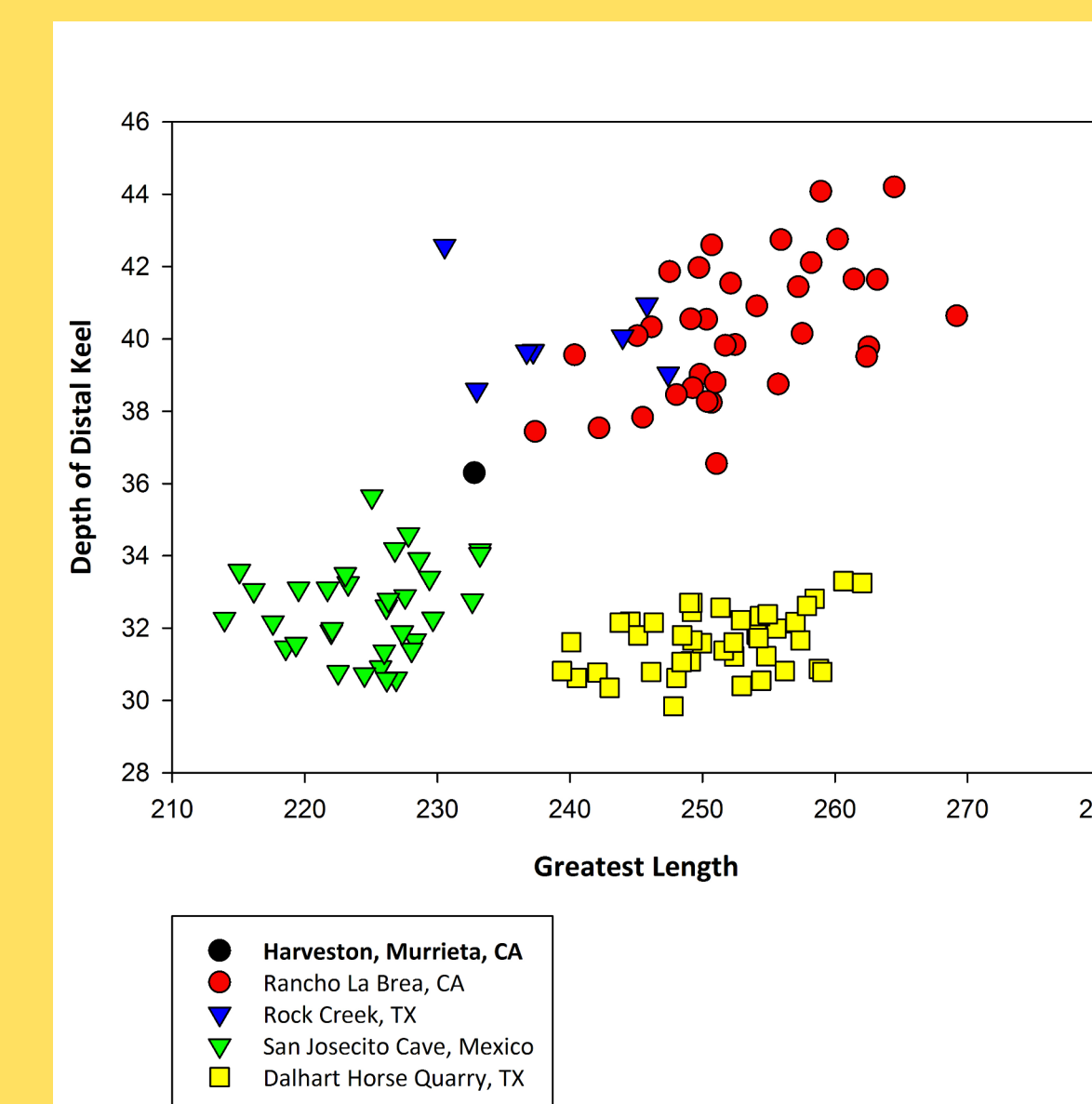
Upper first molar of Rancholabrean *Equus* (lower) vs. Irvingtonian *Equus* (upper) in occlusal view. Scale = 1 cm.

Lower second molar of Rancholabrean *Equus* (lower) vs. Irvingtonian *Equus* (upper) in occlusal view. Scale = 3 cm.

Upper fourth premolar of Rancholabrean *Equus* (lower) vs. Irvingtonian *Equus* (upper) in occlusal view. Scale = 2 cm.

Lower third molar of Rancholabrean *Equus* (lower) vs. Irvingtonian *Equus* (upper) in occlusal view. Scale = 1 cm.

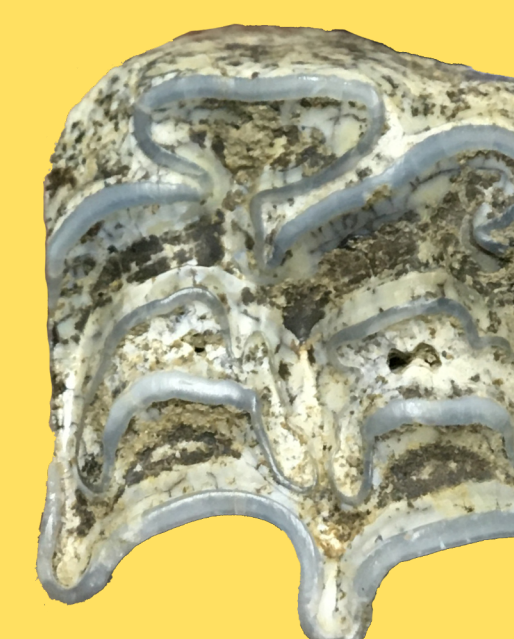
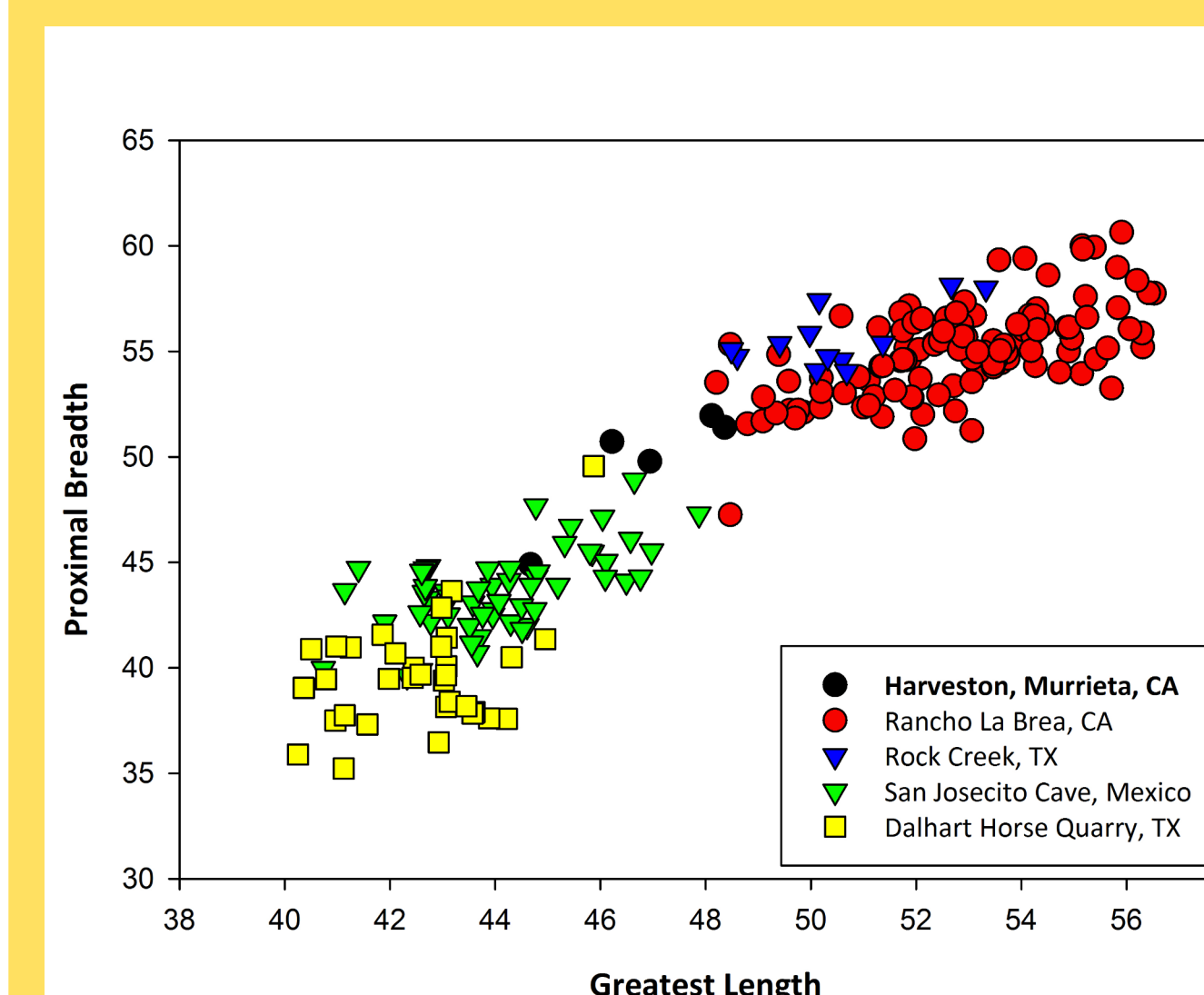
Size Comparisons and Classes of Harveston Horses (Rancholabrean)



Upper right first molar of *Equus* sp. (small size class) in occlusal view. Scale = 1 cm.



Harveston Third Metacarpal Plot



Upper right first molar of *Equus* sp. (large size class) in occlusal view. Scale = 1 cm.

Harveston Second Phalanx Plot

In the unnamed Rancholabrean sandstone, a smaller and larger morphotype of horse are present, as indicated by differences in size of weight-bearing elements and teeth. The larger morphotype of horse is more common in the Harveston sample. Preliminary measurements of weight-bearing elements indicate that the smaller morphotype may have affinities with horses from San Josecito Cave, Nuevo León, Mexico. The larger horses are more ambiguous and seem to be intermediate between Mexican horses and horses from Rancho La Brea.

OBSERVATIONS ON THE HARVESTON HORSES

Equus sp. is present in both the Irvingtonian Pauba Formation and the Rancholabrean overlying unnamed sandstone.

More *Equus* specimens were recovered from the unnamed sandstone than the Pauba Formation.

Two different size classes of horse are present in the overlying Rancholabrean unnamed sandstone: a mid-sized horse and a small horse.

The smaller horse is rarer in the Harveston sample than the larger horse. The size of teeth and weight-bearing elements indicate that the smaller horse may have ties to horses found in San Josecito Cave, Nuevo León, Mexico.

The larger horse is the most common large animal in the Rancholabrean unnamed sandstone. The size of weight-bearing elements plot intermediately between the San Josecito Cave horses and horses from Rancho La Brea.