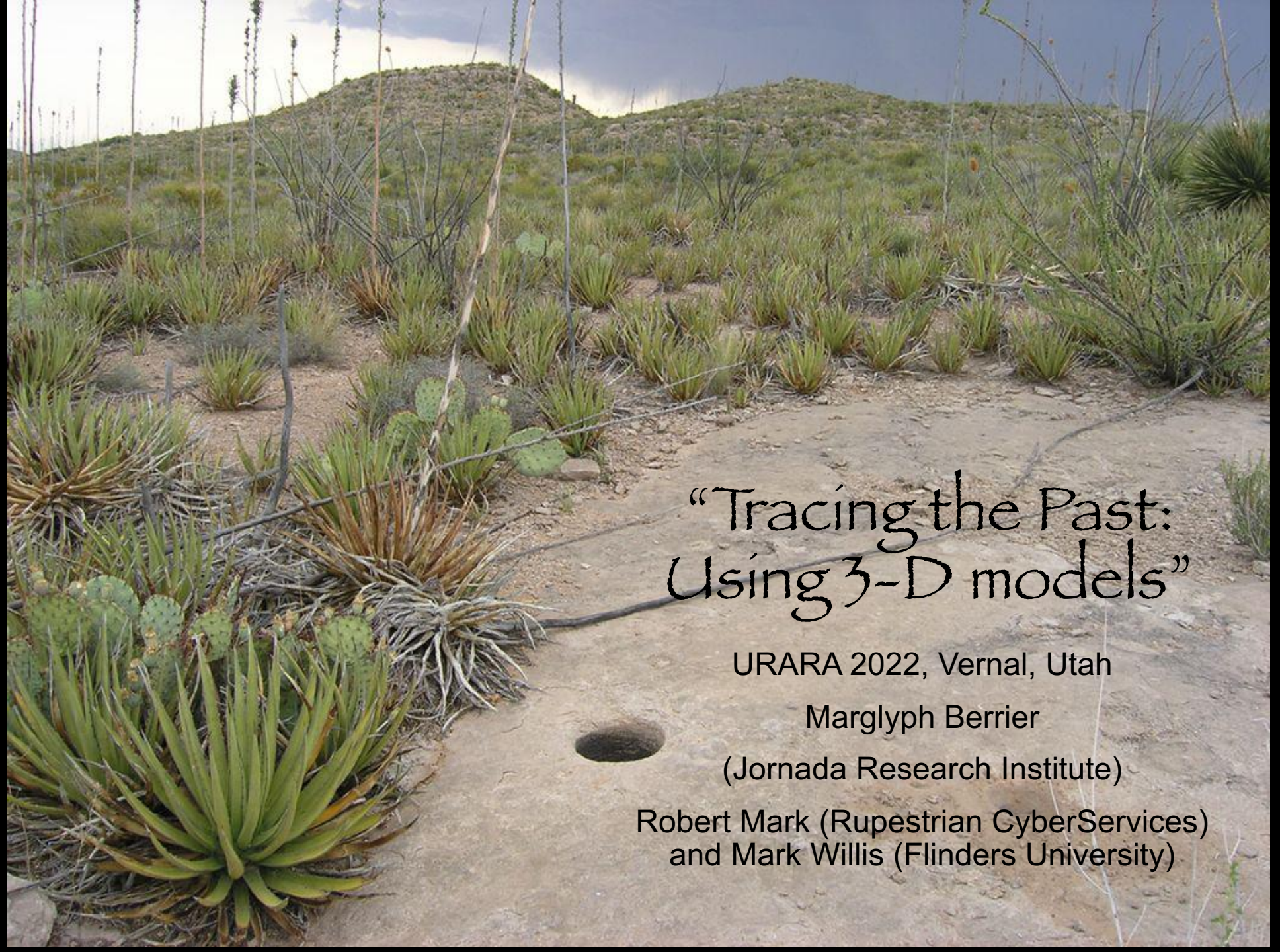


"Tracing the Past: Using 3-D models"

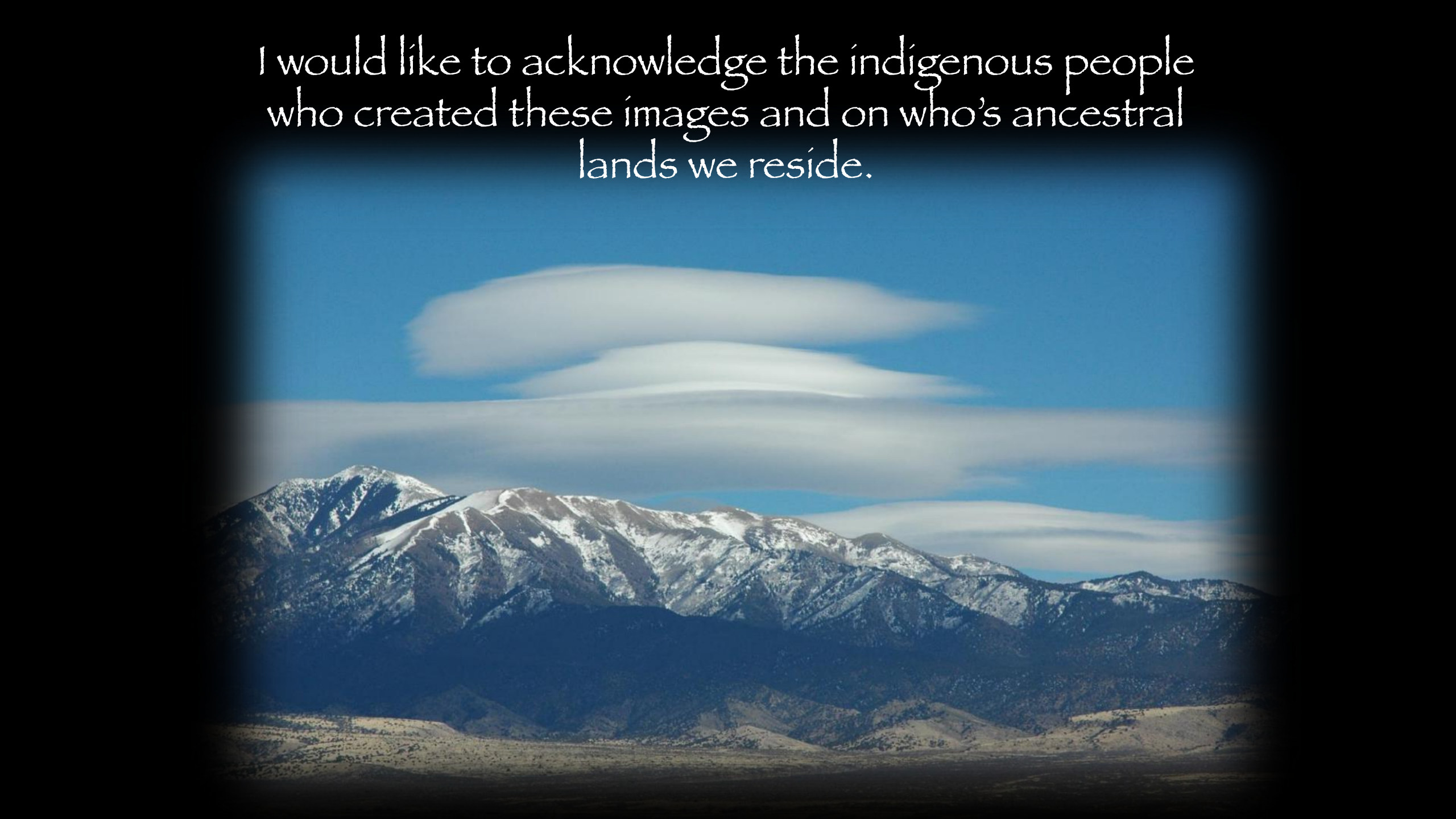
URARA 2022, Vernal, Utah

Marglyph Berrier

(Jornada Research Institute)

Robert Mark (Rupestrian CyberServices)
and Mark Willis (Flinders University)

I would like to acknowledge the indigenous people who created these images and on who's ancestral lands we reside.



Patina Privilege

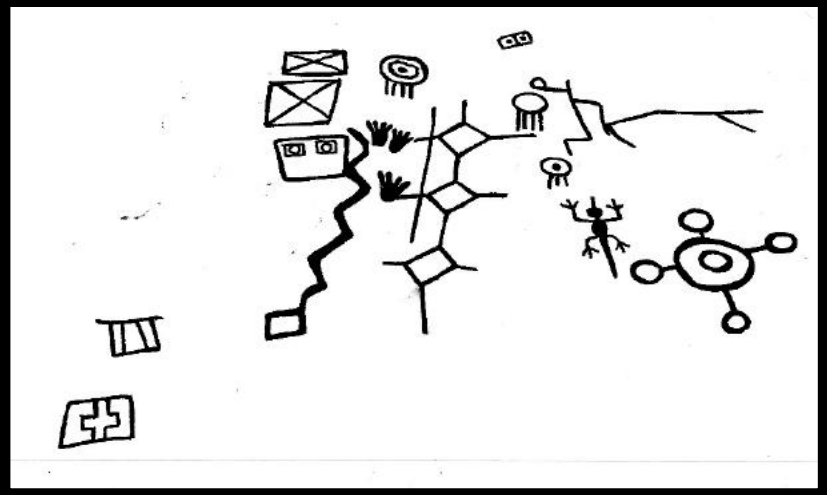
“Photography is the most useful tool for documenting petroglyphs and pictographs”
Myles Miller

Photo by Ken Steiner

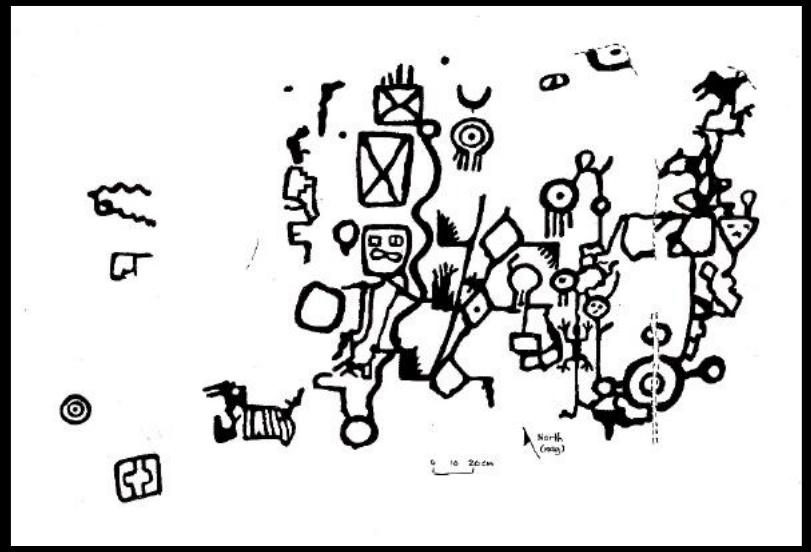
- Early rock art research only reported a few “horizontal bed rock” sites in Southern New Mexico and far West Texas.
- These sites are often difficult to see and are easily missed in survey work.
- Even photos taken in slanting light don’t reveal all the detail

Fort Stanton Boulder, New Mexico

Some early reports used the tracing methods on polyethylene sheeting (which may affect future dating possibilities)

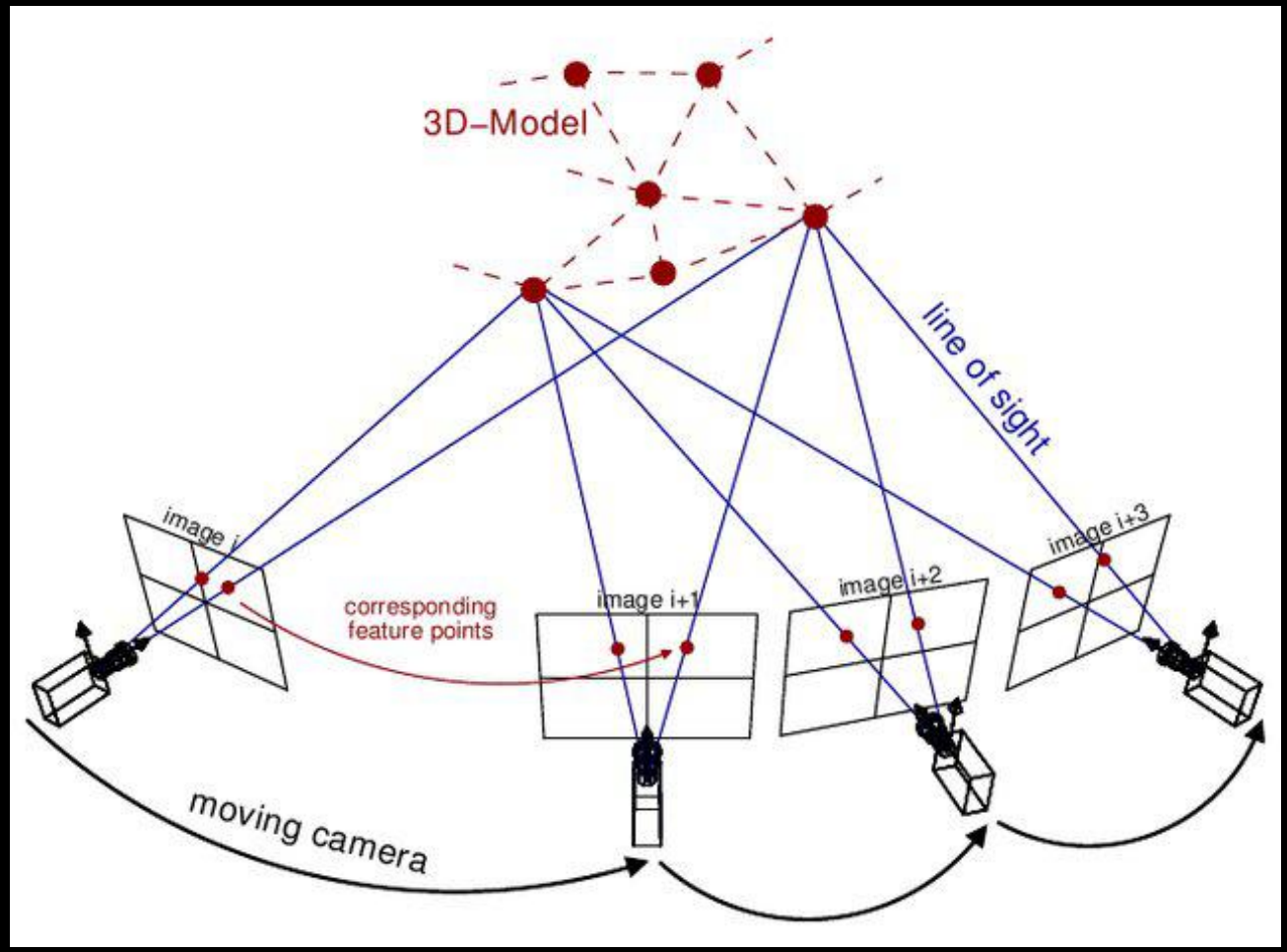


Redraw from Slifer's illustration in
Signs of Life: Rock Art along the Rio Grande



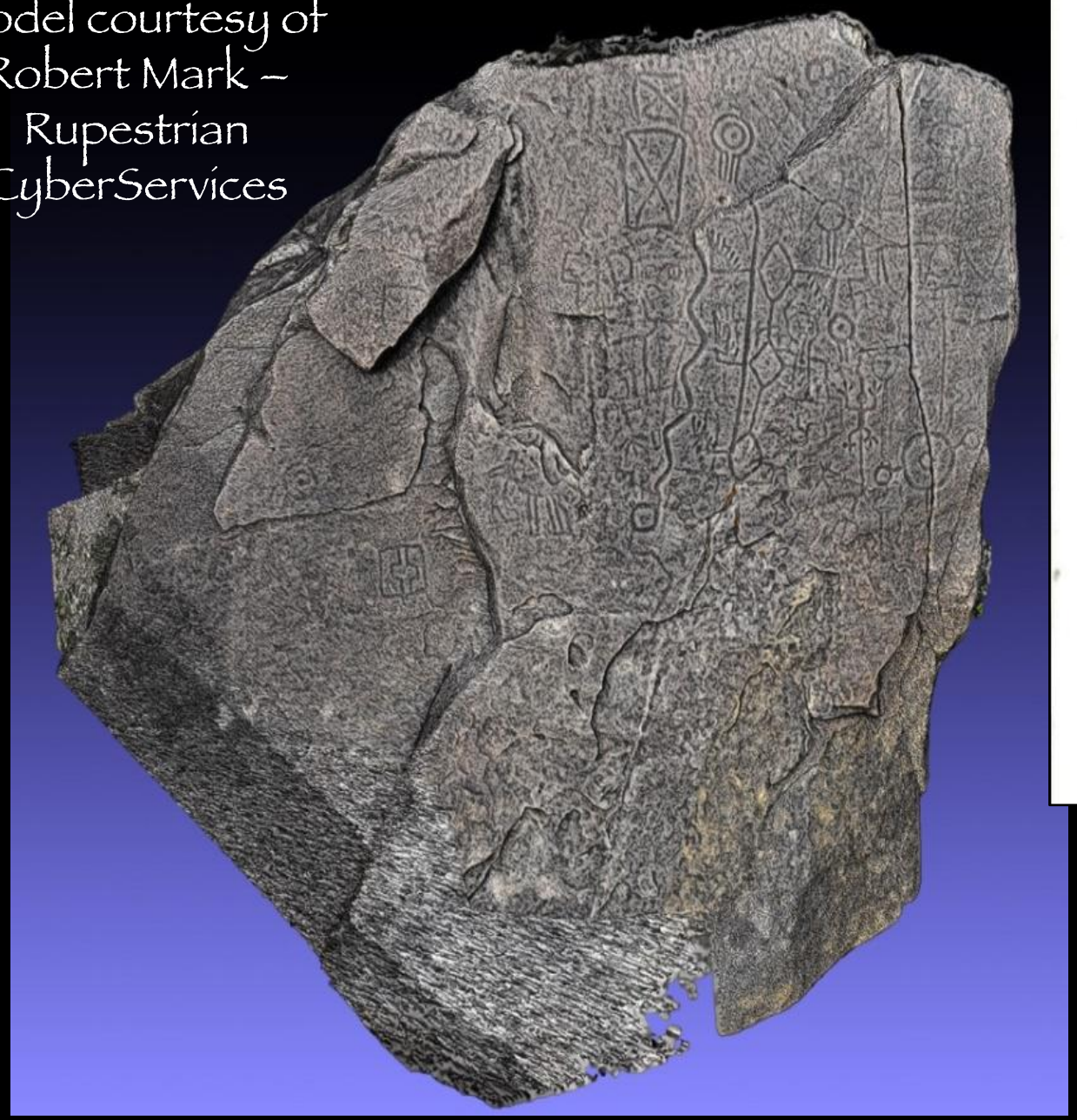
Redraw from tracing done on
polyethylene sheeting

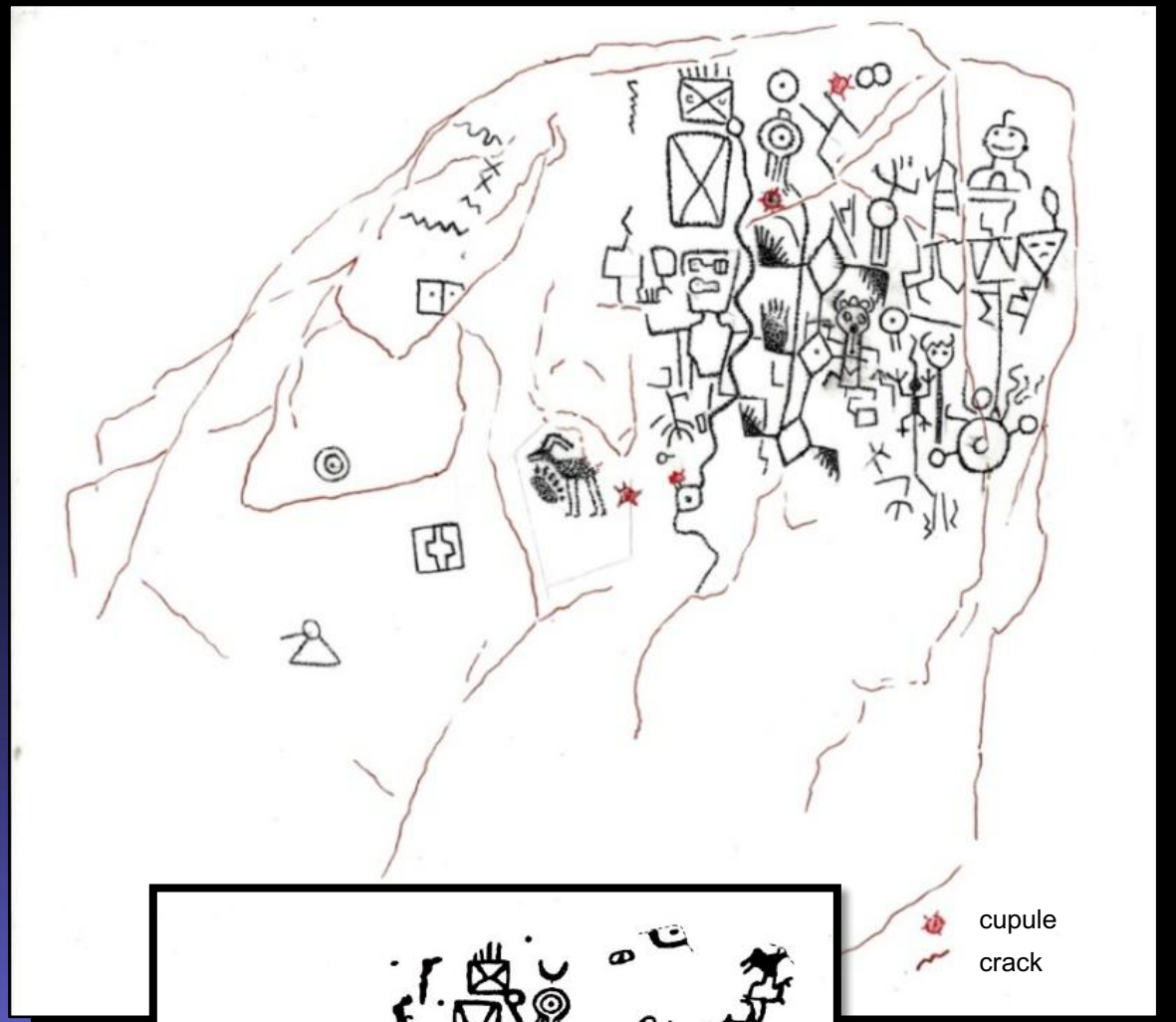
Structure from Motion or SfM is a photogrammetric method for creating three-dimensional models of a feature or topography from overlapping two-dimensional photographs taken from many locations and orientations to reconstruct the photographed scene.

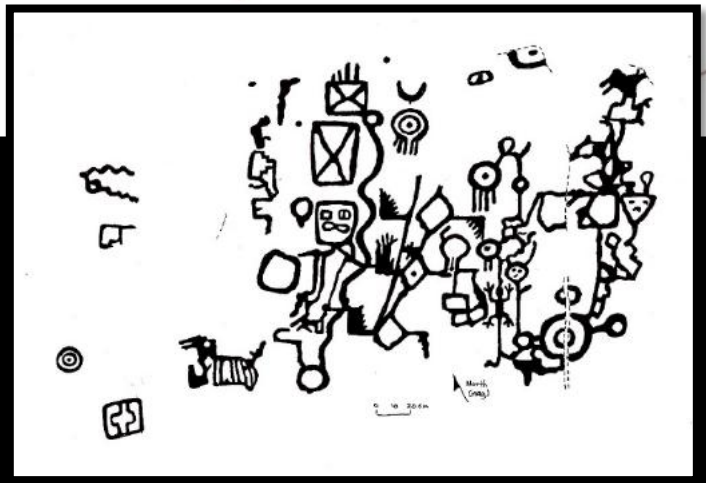


More info here:
https://r.search.yahoo.com/_ylt=Awr4xJR4Ih9gsVIAEUBXNyoA;_ylu=Y29sbwNncTEEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1612681976/RO=10/RU=https%3a%2f%2fshumla.org%2fhigh-res-rock-art-documentation-digital-preservation%2f/RK=2/RS=1ad8xyPSU.jtFyhQfG77T9VBXfY-

Radiance Scaling Model courtesy of Robert Mark – Rupestrian CyberServices







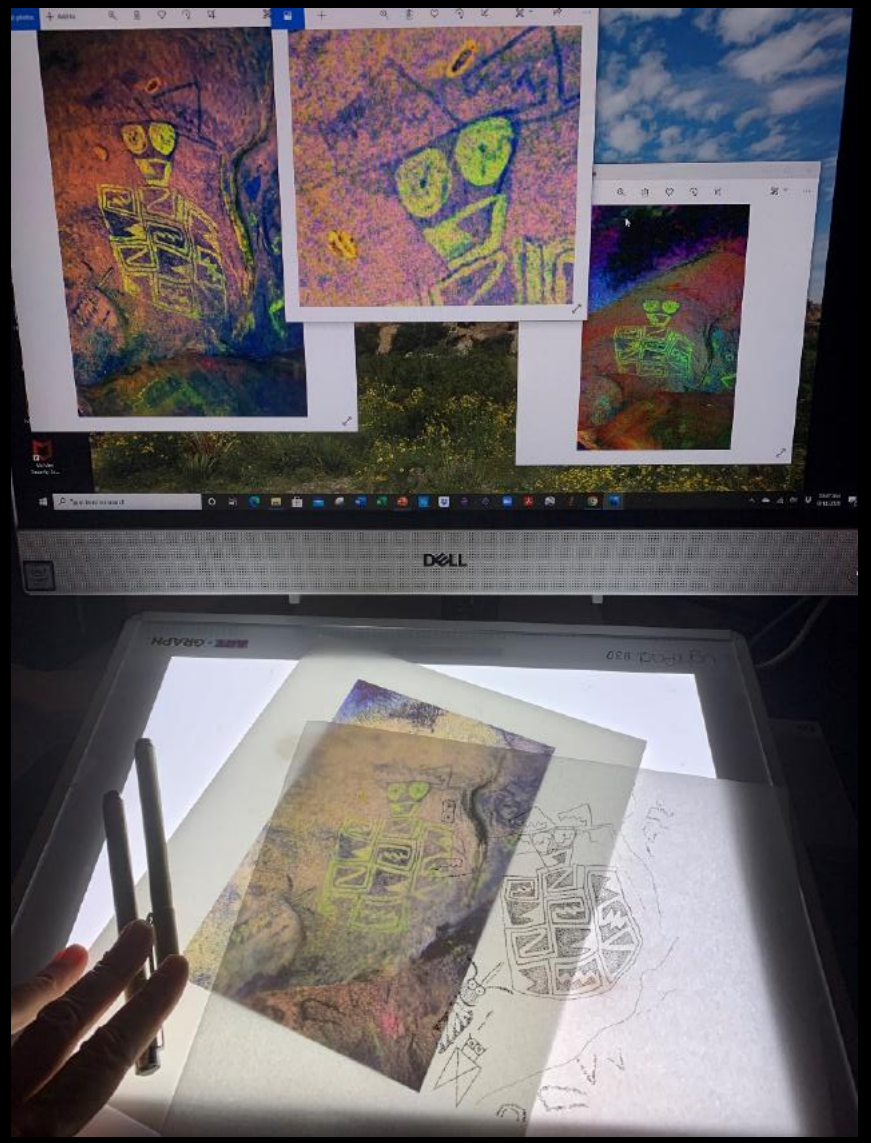
Computer wizard speak

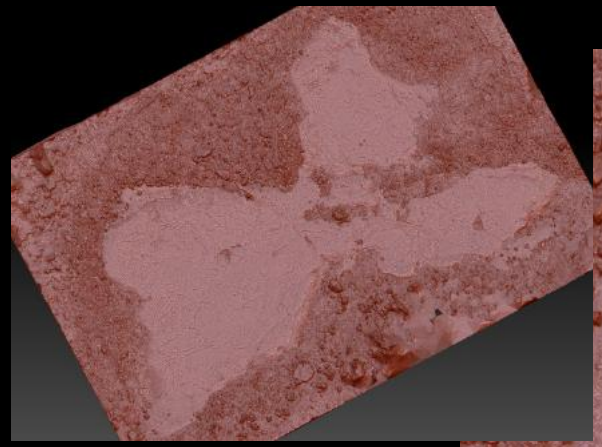
- High quality Structure from Motion (SfM) 3D models enhance the visibility of petroglyphs that are otherwise almost or completely invisible.
- Model must accurately capture the geometry of the rock surface.
- A colored curvature map is generated from the model's mesh using Meshlab Render Radiance Scaling
- Manipulation in Photoshop produces surprising results.
- Photoshop is used to blend (overlay, soft light, or hard light) the red or blue channel from the color curvature map with the original image or a shaded one that can also be generated in Radiance Scaling

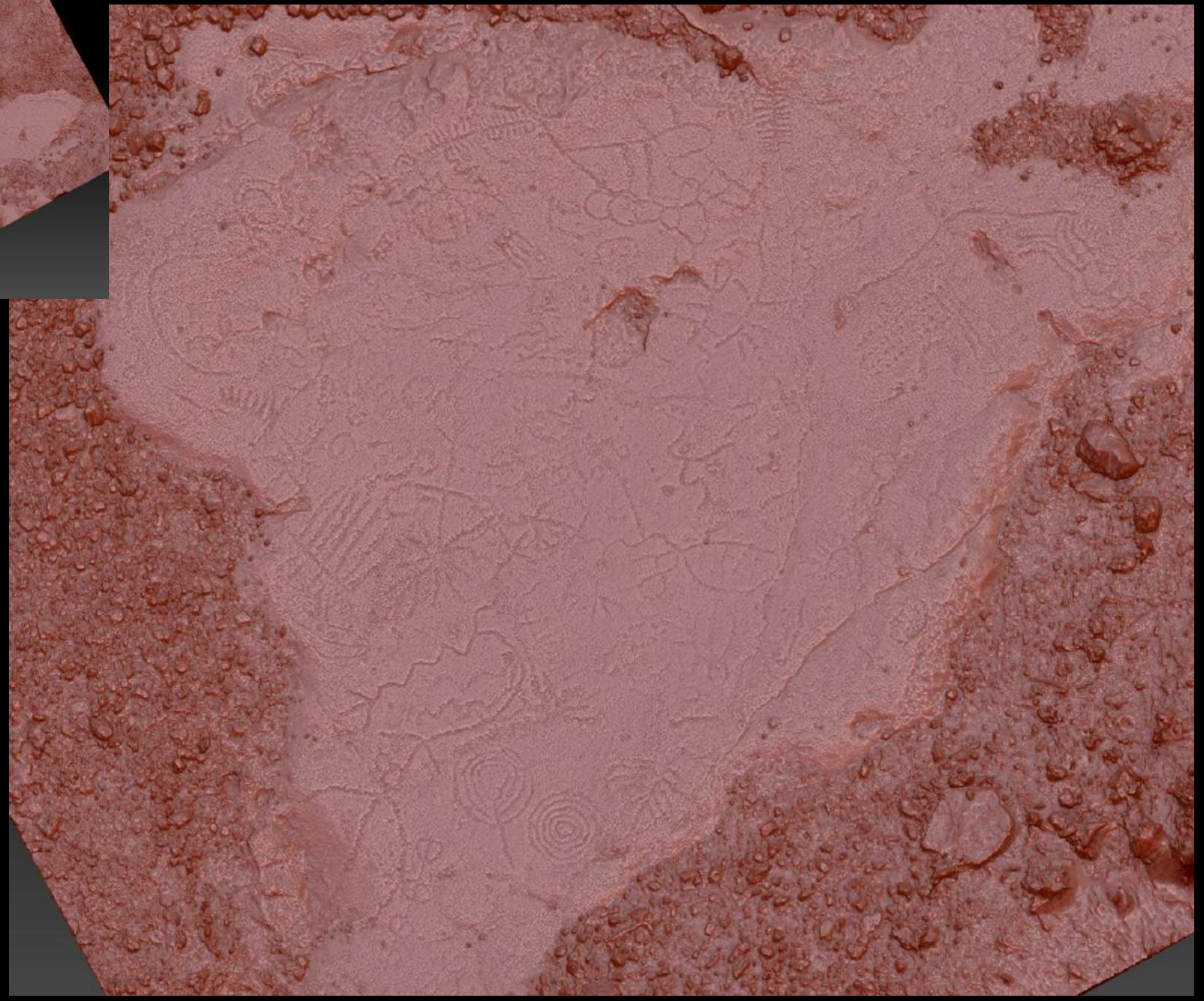
Methods

- Print a copy of the photo/model and put it on a light table (or project)
- Trace on vellum using pencil.
- Using the computer relook at the model - zooming in and out to check for mistakes or missed lines/elements.
- Use other detailed photos and any older ones from collections
- FIELD CHECK!
- Complete using permanent markers.
- Scan finished product for publication and/or landowners.

Tracing







Site 41-
EP-32

Model courtesy
of Mark Willis

Using older photos

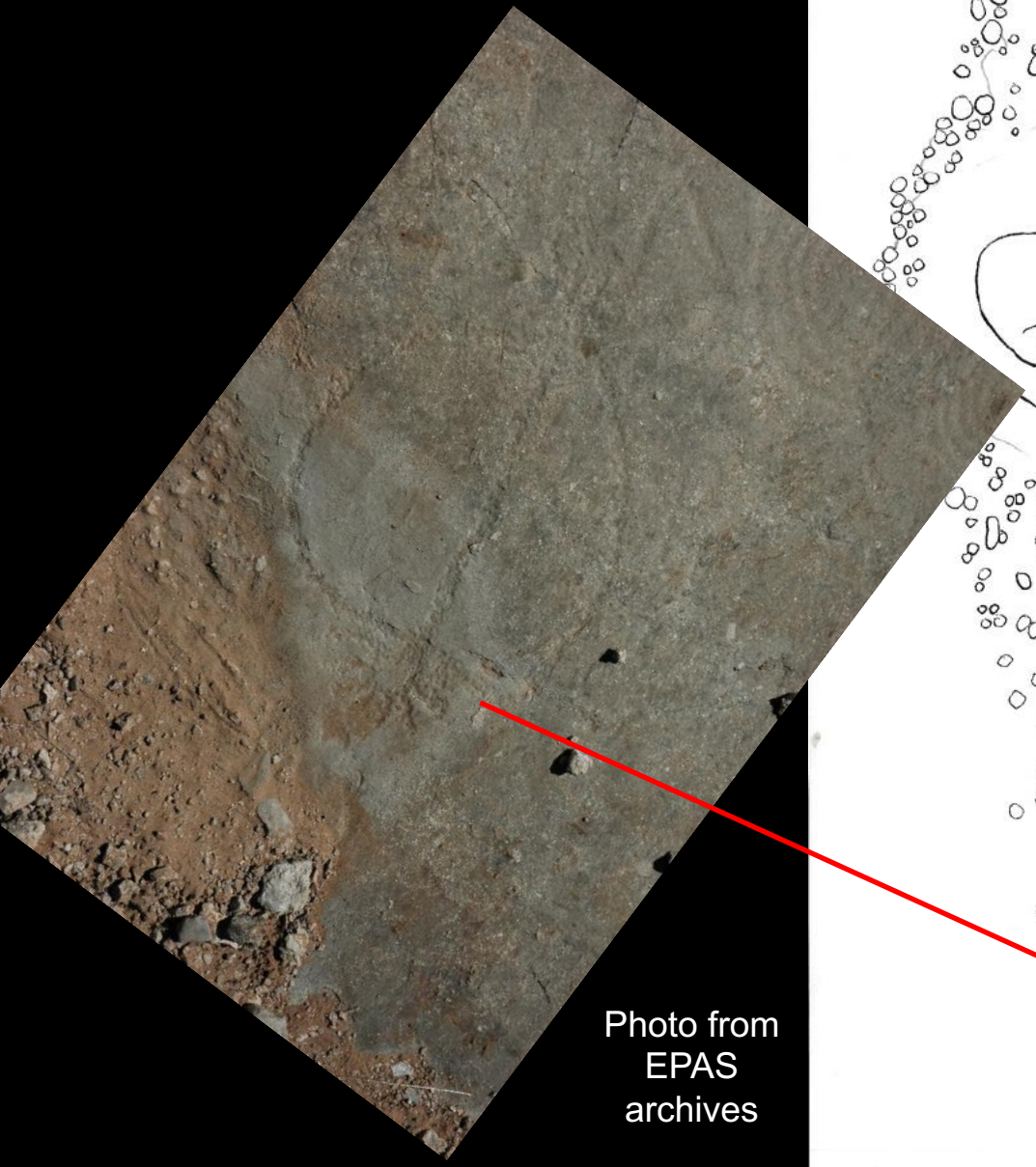
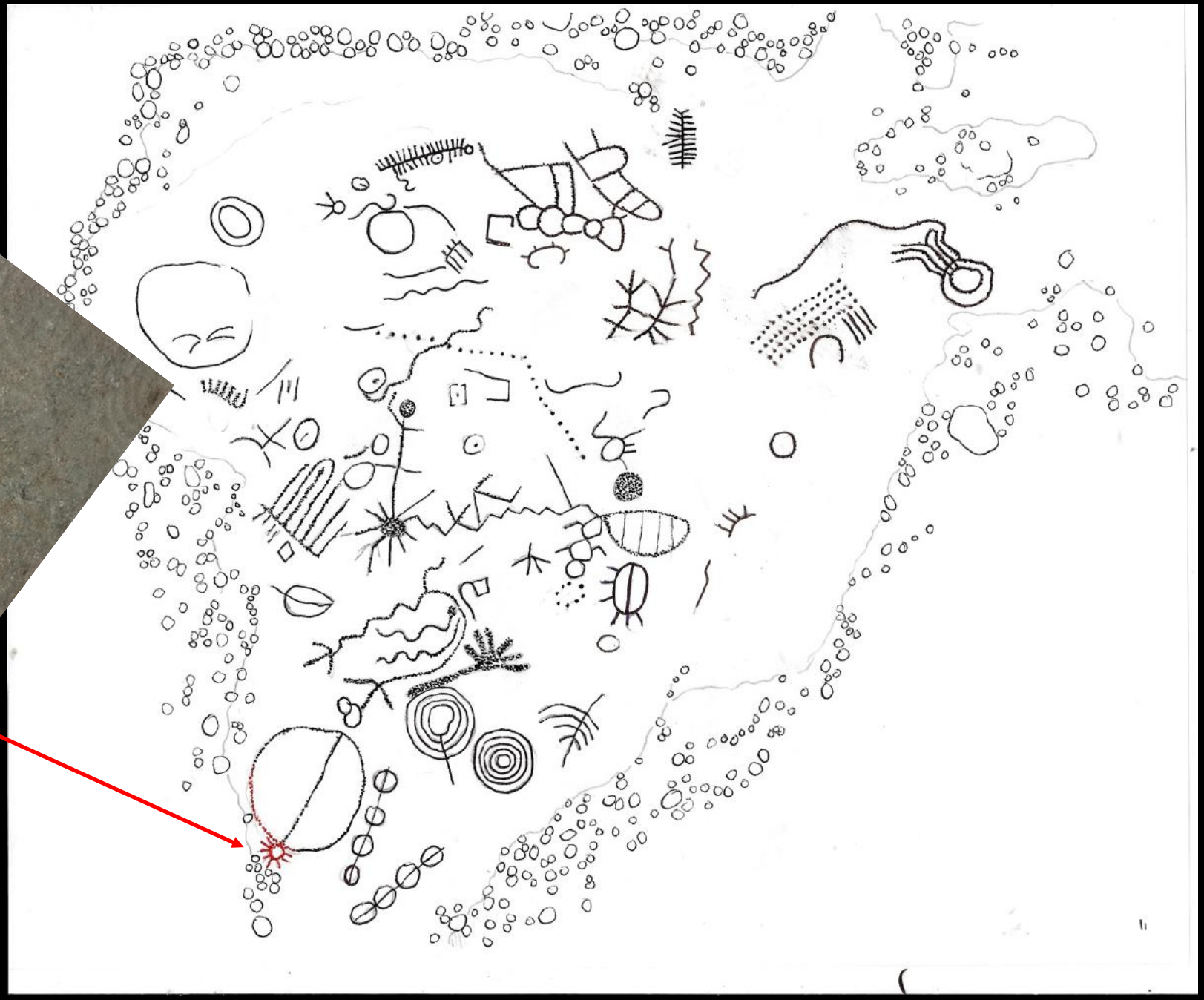
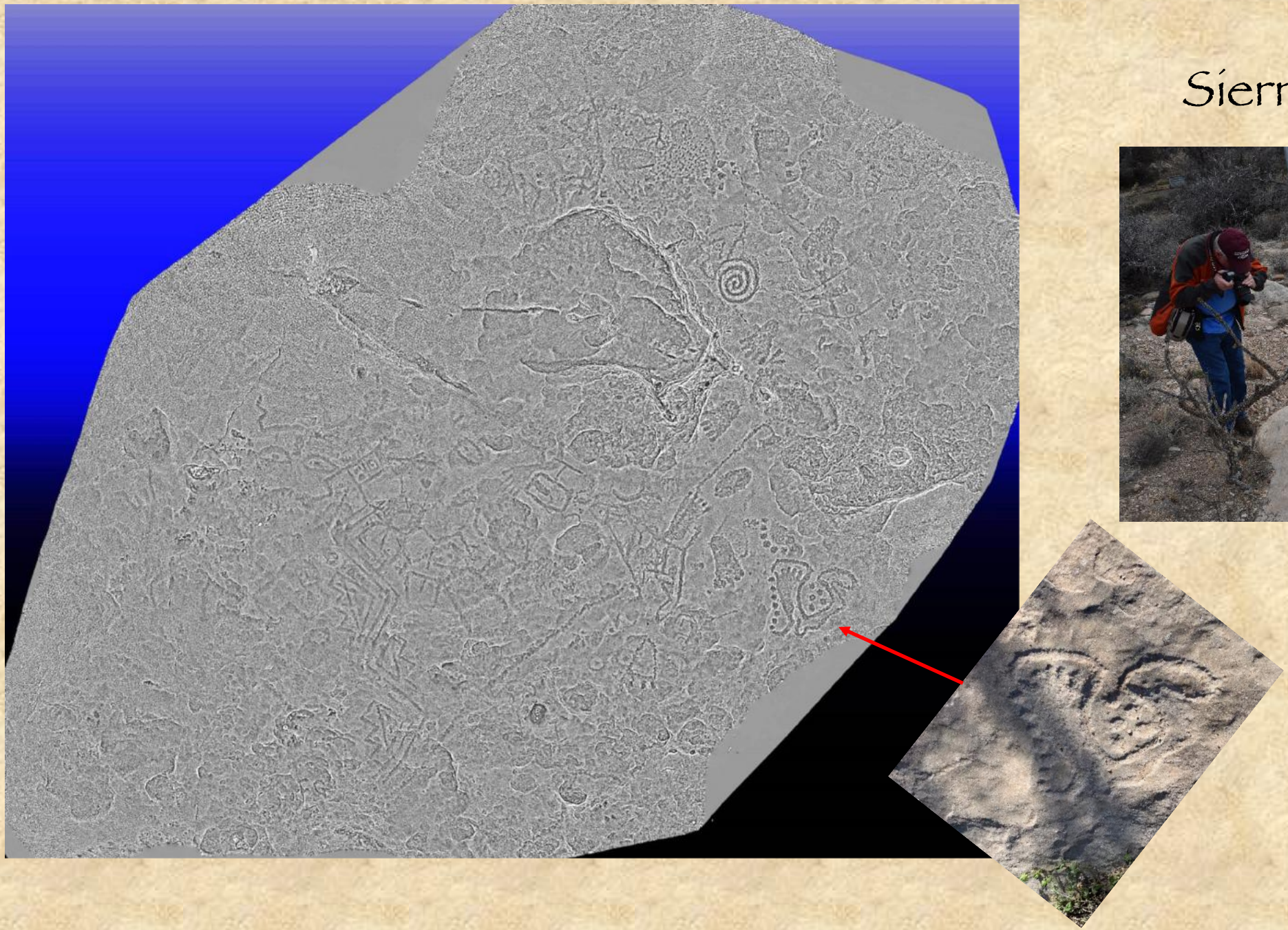


Photo from EPAS archives



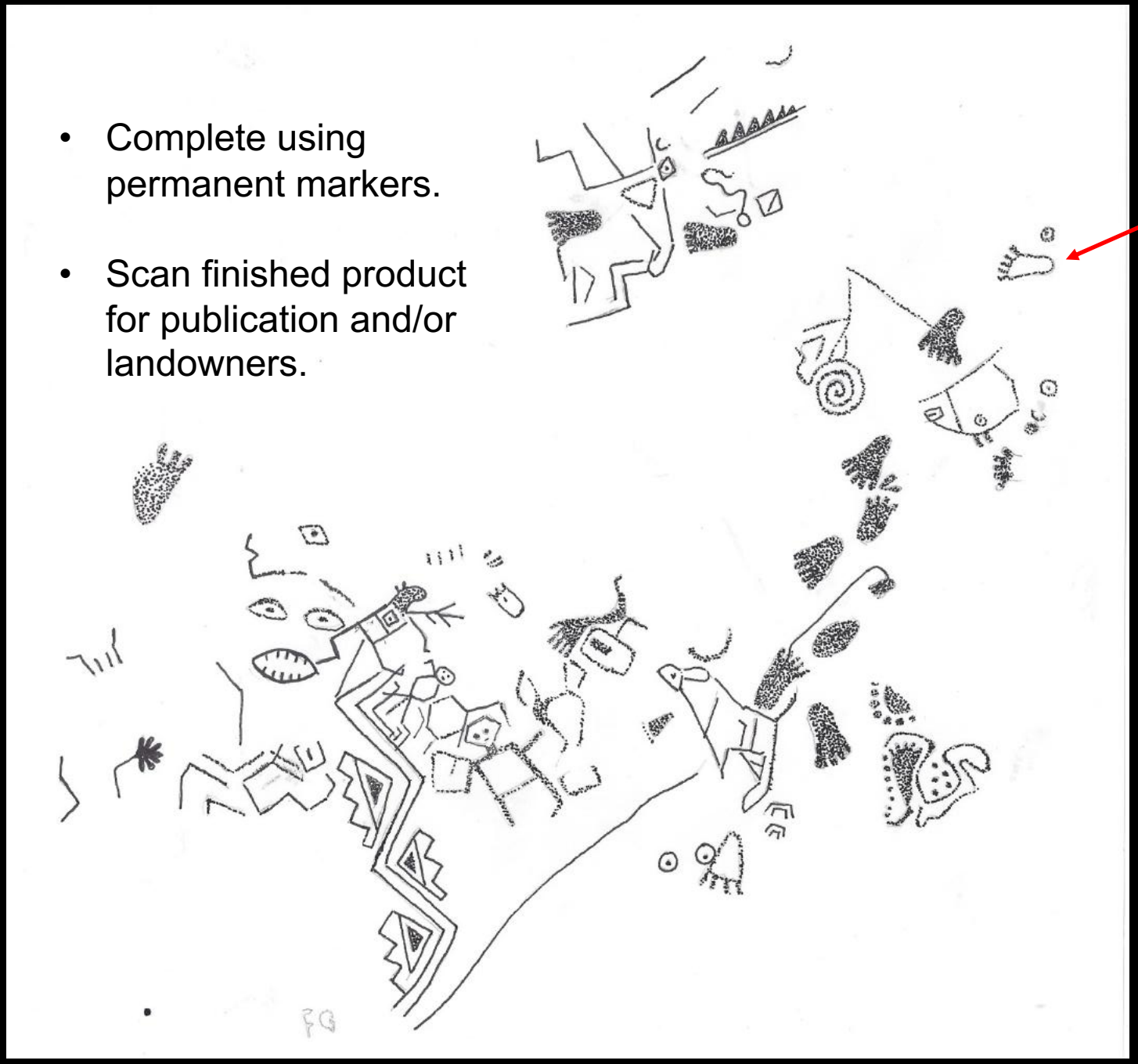
Windmill, Sierra County, NM

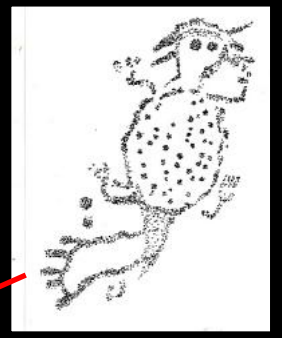


Model courtesy of Mark Willis

Field Check

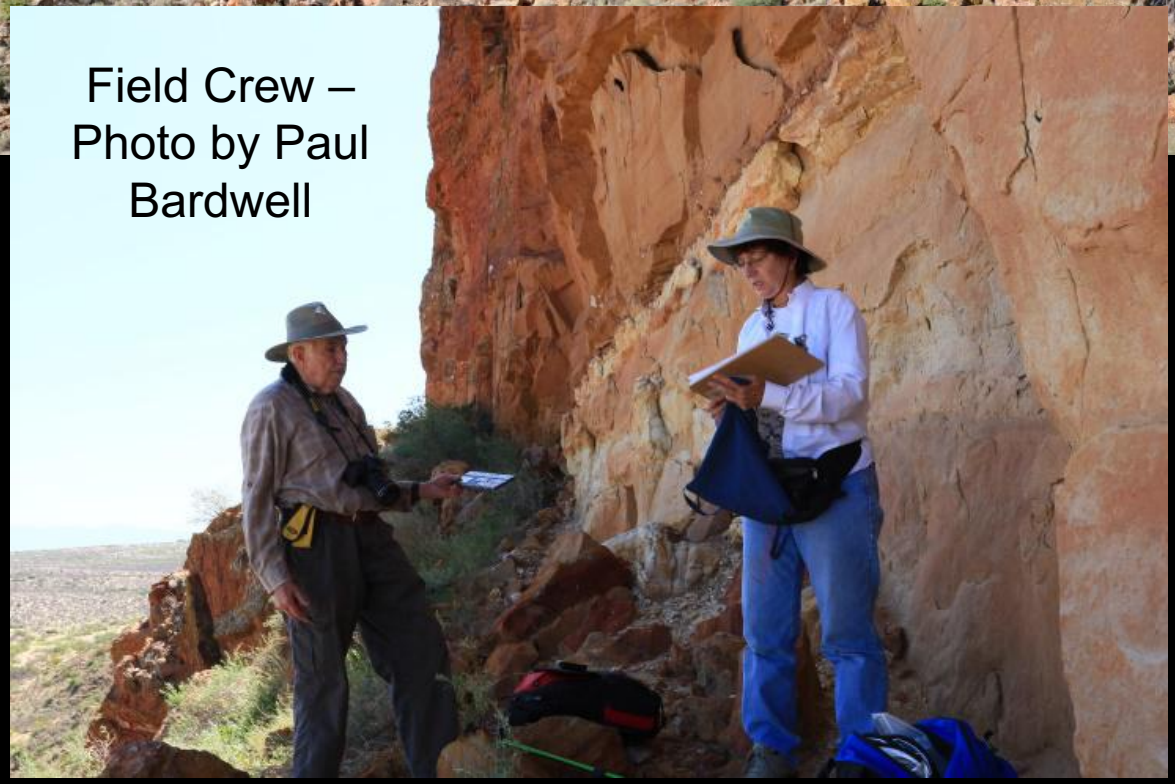
- Complete using permanent markers.
- Scan finished product for publication and/or landowners.





Stitched photo by LeRoy Unglaub

Field Crew – Photo by Paul Bardwell



Screen shot of the middle portion of the 3-D model created by Mark Willis

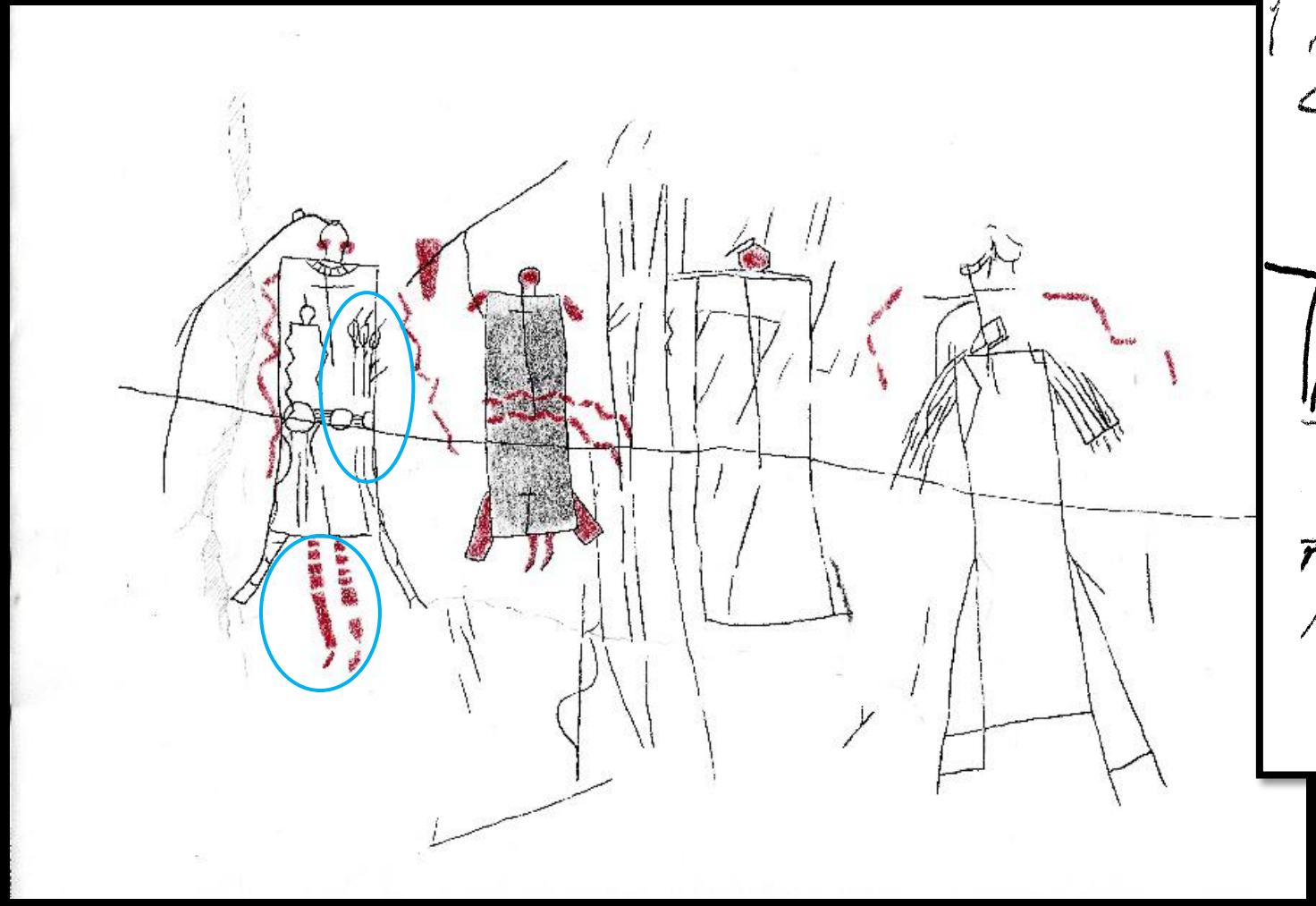
Tracing from 3-D model of Panel 1
Talus Slope, New Mexico

Teamwork at the Garnsey Site – near Roswell New Mexico

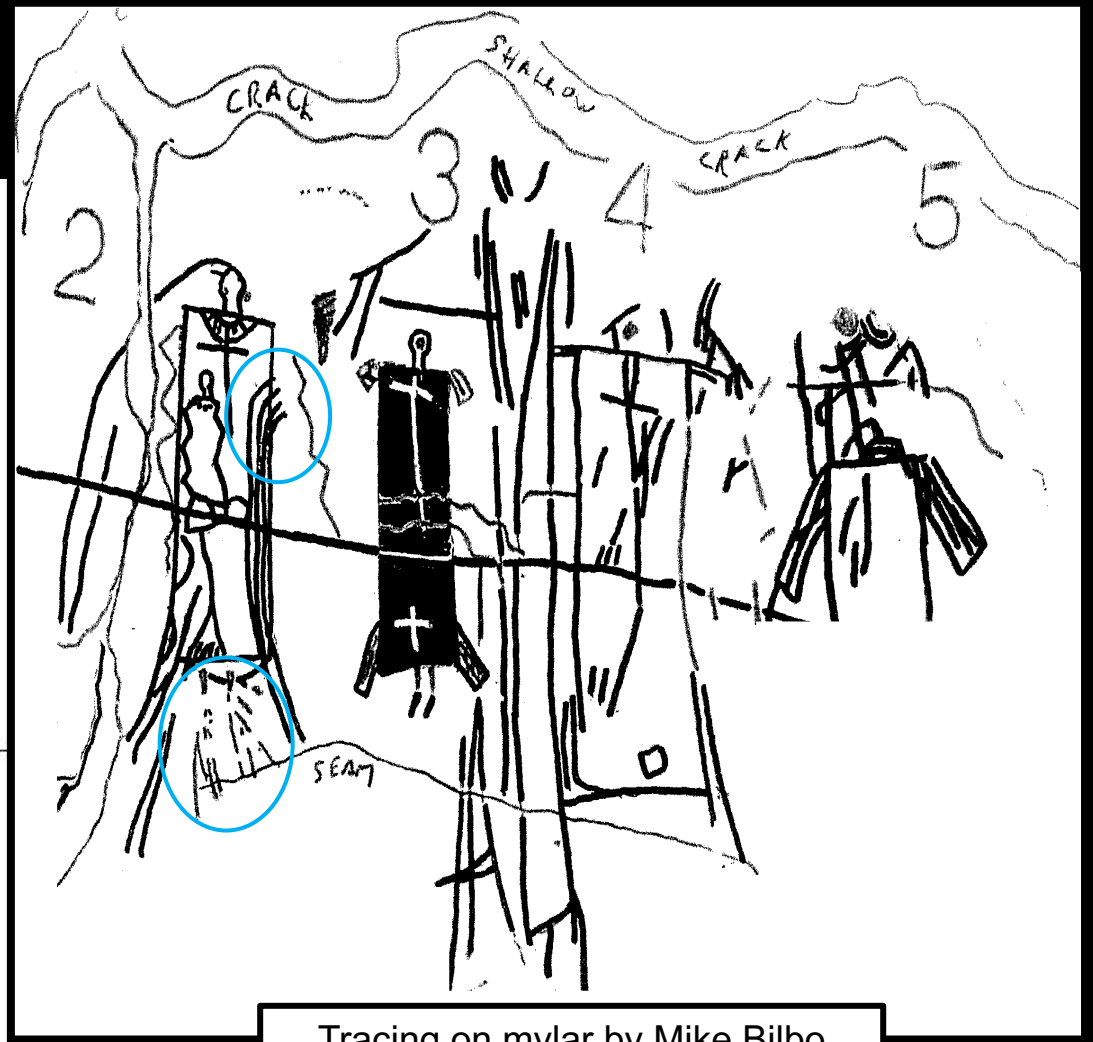
Overview photo by Alec Davis

3-D Model from Mark Willis

Garnsey Site – Preliminary

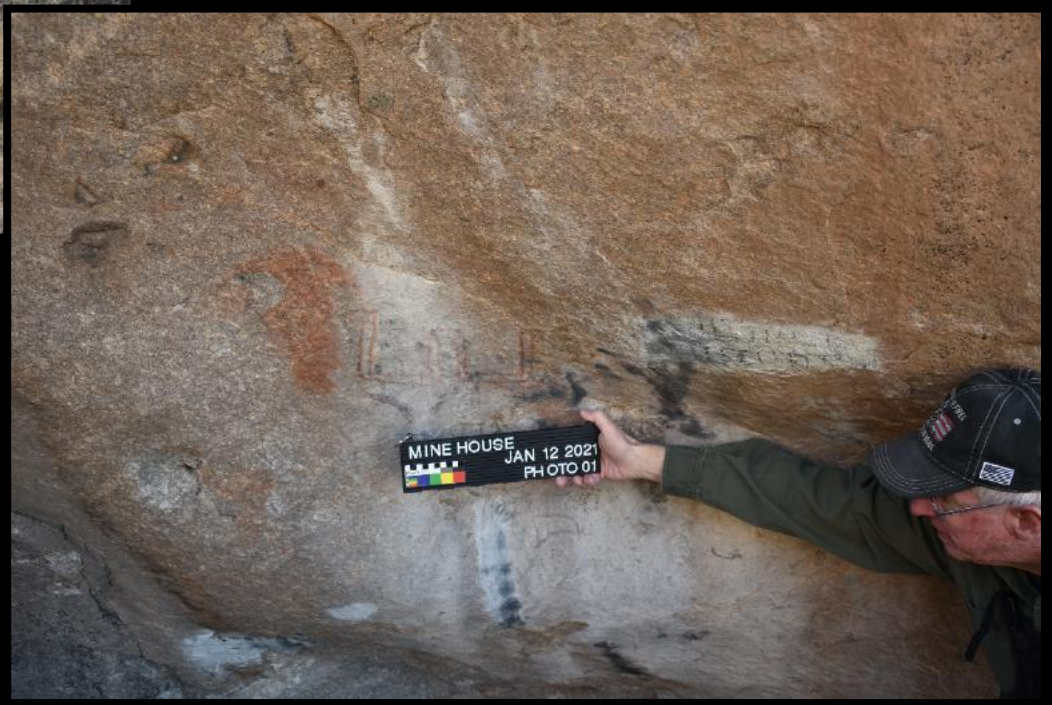


Tracing using the new 3-D model with DStretch
– not yet field checked



Tracing on mylar by Mike Bilbo
using a frame that prevented the
touching of rock art

DStretch detail yre-cf



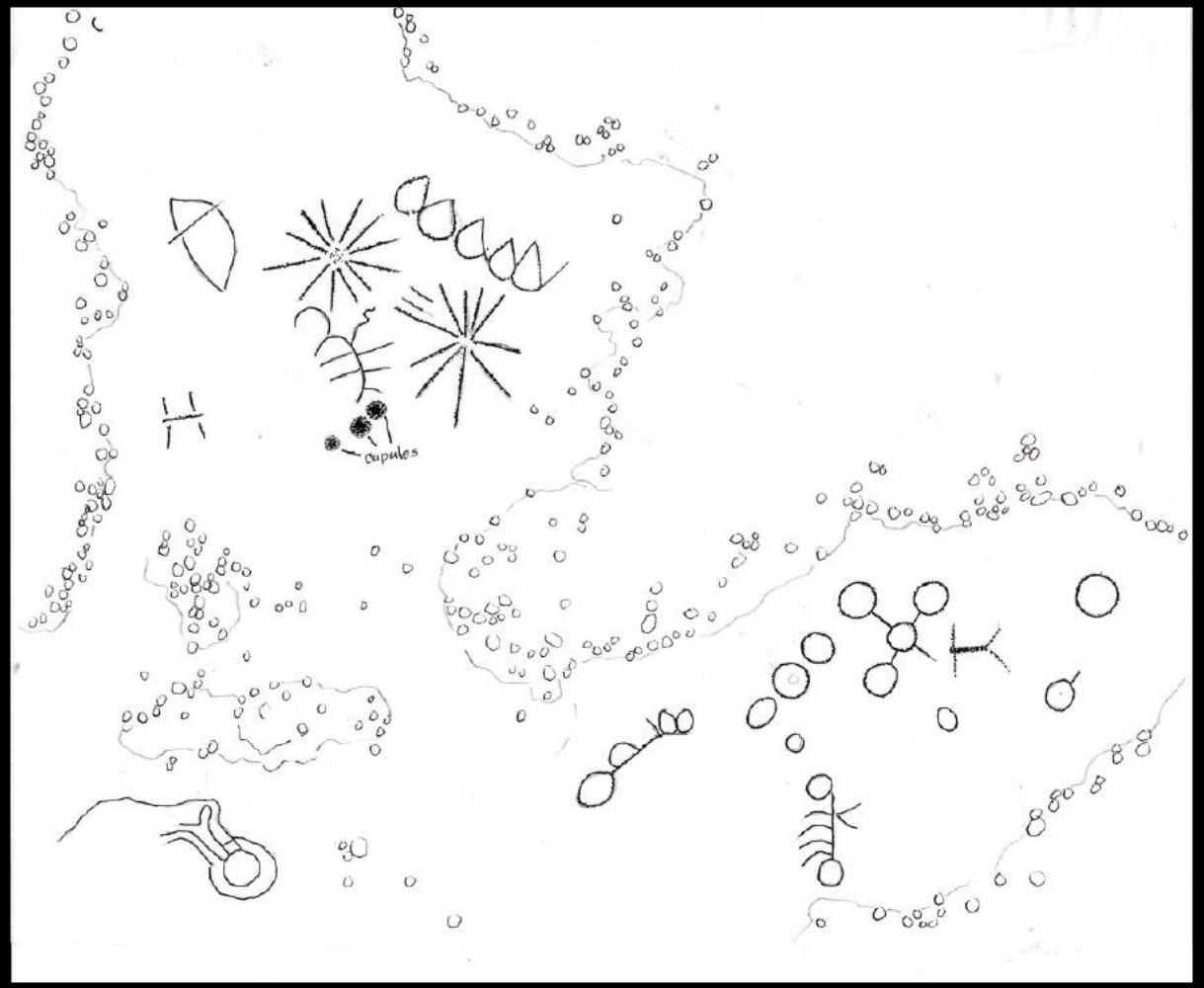
Mine House Site Survey– in my backyard

Mine House
Site
Model by
Robert Mark
using
Marglyph's
photos
DStretch can
be done on
entire model

For more about DStretch
http://www.dstretch.com/

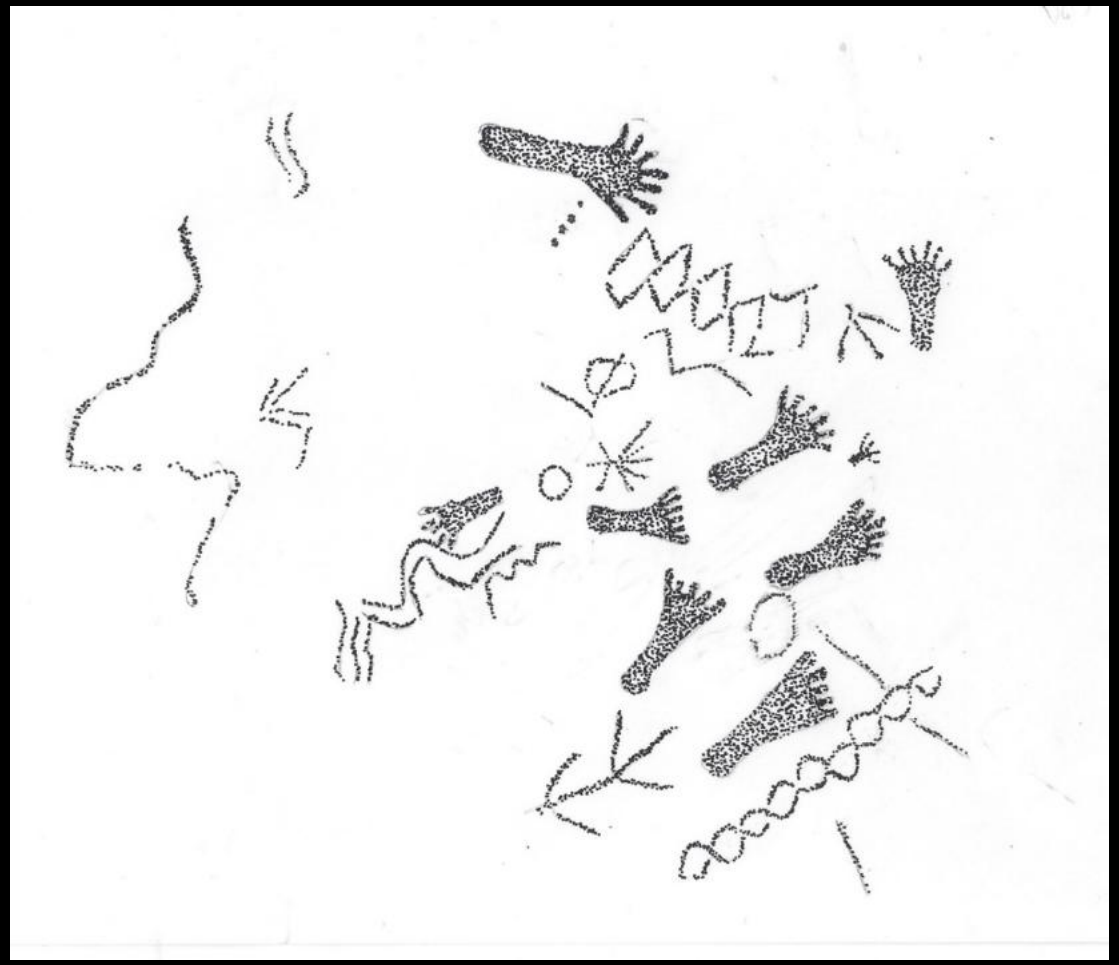
WHY TRACE photos?

- Lowest impact recording
- More accurate than field sketches
- Easier to categorize/compare imagery
- Useful for land managers to relocate imagery
- Can be used for publication(s)
- Tracing/drawing helps the person doing the drawing recognize patterns and remember images better



…drawing promotes better recognition than writing due largely to the high detail and rich context: Participants identified the source of the memory with greater accuracy when it had been drawn, and more regularly recalled contextual features.

Fernandes, M., Wammes, J., & Meade, M. (2018). The surprisingly powerful influence of drawing on memory. *Current Directions in Psychological Science, 27*(5), 302-308. https://doi.org/10.1177/0963721418755385



Tracing from RCS model by Marglyph
Indian Wells, New Mexico
LA 74159

Acknowledgements

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LeRoy Unglaub
Mark Willis
El Paso Archaeology Society