

## **Documenting Channel Deposits in the White Rock Mesa Member, Dakota Sandstone at Red Wash, NM: Using Advanced Equipment and Methods to Produce a High-Resolution, Large-Scale Panoramic Photograph for Field Documentation, Publication, and Presentation**

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Digital photography has made documenting field work and presenting and publishing these images practically effortless and inexpensive. Recently, pocket-sized digital cameras capable of producing a panoramic image in one-shot (requiring the photographer to pan the camera while exposing the sensor) have been made available at the consumer-level. But, if a high-resolution, panoramic photograph of a horizontally and/or vertically high-angle view is needed with little distortion, while also capturing small-scale features within the image, then a professional camera, tripod, and software are needed. Such images make excellent documents of the entire field of view with capabilities of zooming into the image to render finer details.

An excellent outcrop, ideal for panoramic photographic documentation, is located along Red Wash at the US 64 road crossing 13 miles SSE of Four Corners on the Navajo Reservation. Here, well exposed lower coastal plain fluvial channel sandstones, interbedded with coal marker beds and a tonstein layer, and overlain by the X bentonite are well exposed. These lenticular strata are in the White Rock Mesa Member of the Dakota Sandstone (Cenomanian). Reed molds and trace fossils indicate an estuarine environment for the upper beds, which are overlain by an oyster-shell coquina of *Pycnodonte newberryi*.

A Canon EOS-1D Mark III camera, containing a large sensor, with a Canon EF 50mm f/1.2 L USM lens was used to capture the images. Large sensors produce lower-noise images, allowing finer details to be resolved. Also, a fast (large aperture), standard (50mm) lens composed of high-quality glass is necessary to capture images with minimal distortion and maximum clarity, resolution, and contrast.

Also used was a specialty tripod that mounts the camera's sensor over its nodal point (point of camera rotation). This tripod eliminates parallax errors in panoramic photographs, resulting in much-less distorted images. When nodal-centering tripods are not used, small parallax errors can be overcome with computer software but reduce the clarity of the image because of the morphing and blending techniques required to compensate for the errors. Parallax errors also become more pronounced the closer the subject is to the camera.

While photographing the outcrop, adjacent images were overlapped 15-25%. PTGui Professional Edition, off-the-shelf computer software, was used to stitch the images together. Manually stitching images together was possible, but the advanced algorithms used in this software and use of a nodal-centering tripod made this production method unnecessary. Once rendered, Photoshop, with Nik Software plug-in filters installed, was used to produce the final draft of the image.