

Mullet Island has become a peninsula

David K. Lynch (USGS)

Paul M. Adams and David M. Tratt (The Aerospace Corporation)

Abstract:

Sometime between 28 Aug and 24 Sept 2013, a land bridge formed between Mullet Island and the adjacent mainland. This occurred when the Salton Sea level dropped to an elevation of -232.4 ft, the lowest since the 1950's. As expected, predators reached the island, presumably coyotes. They have raided the cormorant nesting sites, leaving the now-peninsula essentially barren of bird life.

1. The Land Bridge

With the legally mandated lowering of the Salton Sea (Quantification Settlement Agreement 2003), formation of a land bridge was inevitable. In a previous paper (Lynch 2011), we predicted that the bridge would form when the sea level reached -232.4 ft (USGS Westmoreland Gauge). This event took place sometime during a 27-day period between 28 Aug 2013 and 24 Sept 2013 (Figures 1, 2 & 3).

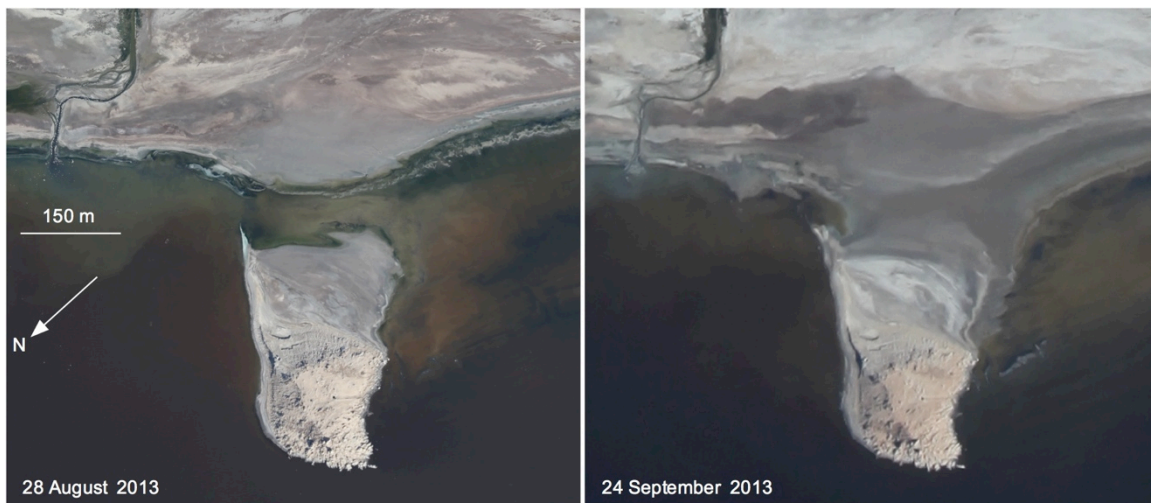


Figure 1. Aerial photographs showing the emergence of the land bridge. Left: 28 August 2013, altitude 6000 ft. AGL. Right: 24 Sept 2013, altitude 12,000 ft. AGL.

The land bridge is a broad, flat sand bar that was formerly the Salton Sea level bottom. It is composed primarily of quartz, gypsum, and various amounts of alkali sulfate evaporites, and halite.



Figure 2. Panoramic view of the land bridge from Mullet Island looking southeast, 12 Oct 2013. The authors walked to the island on firm but moist mud across the land bridge.

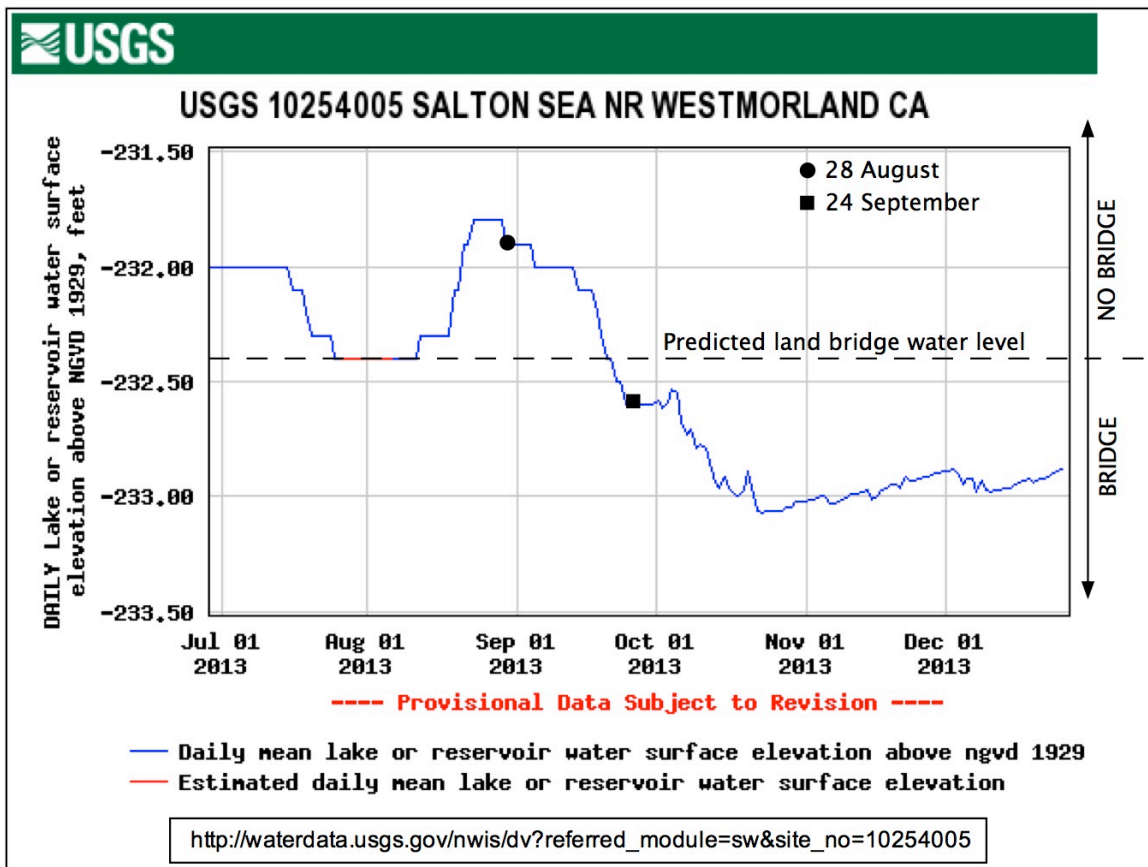


Figure 3. Water level of the Salton Sea showing the predicted land bridge formation water level (Lynch 2011) and the times of the aerial images shown in Figure 1. The bridge could have formed as early as late July 2013.



Figure 4. View of cormorants and nests on 25 Jan 2011.



Figure 5. Same view as shown in Figure 4, but taken on 12 Oct 2013.

2. Impact on Cormorant Nesting

Double Crested Cormorants have been nesting on the island since the 1960's, although their general abundance was recognized as far back as the 1920's when it was known as Cormorant Island (Rogers 1926, Weight 1948). Owing to the island's isolation and inaccessibility, the nests were densely located on the ground (Figure 4, 25 Jan 2011). Figure 5 shows a photograph of the same scene on 12 Oct 2013. The differences were dramatic, as not a single cormorant was found and there was no evidence of bird occupancy at all. A few empty nests remained intact. While we did not witness predation by coyotes, we presume that they were the principal cause of the elimination or dispersal of the cormorant population. Indeed we saw many *canid* tracks leading from the mainland brush directly to the island (Figure 6).



Figure 6. Fresh *canid* tracks on the land bridge (12 Oct 2013).

A close examination of Figure 1 (Aug 28 2013) reveals no cormorants. Although individual birds would be too small to be seen, the flock of black cormorants was easily seen in previous years from great distances as a dark mass against the white island (e.g., Riesz 2011). Therefore, it seems that the predators reached the island before the land bridge formed, perhaps by wading through shallow water.

During a visit to the site on Dec 21, 2013, it was clear that the land bridge had been flooded since our October visit. While the water had receded somewhat and it was still possible to walk to the island, fluctuations in the water level evidently produced transient land bridges that the *canids* may have used. During this time we observed a flock of cormorants on the far western part of the island, though we do not know if they were nesting. This seems unlikely because we also observed tire tracks

crossing the land bridge and up to the summit of the island, indications of human visits that were not present in October 2013 (Figure 7).



Figure 7. Top: Tire tracks leading across the land bridge to Mullet Island. Bottom: Tire tracks leading to the summit.

3. Discussion

Like all animals, cormorants adapt to their environment. In finding a safe new place to roost, the birds settled on Mullet Island in the 1960's. But it wasn't always an island. In 1937 it was in the middle of agricultural fields, the Salton Sea shore lying 3 km away (Figure 8). Before that, transient Lake Cahuilla episodically submerged and exposed the small volcanic neck in response to shifting sediments of the Colorado River delta. The sediments altered the river's course, causing it to alternately flow into the Salton Trough and the Sea of Cortez.

With fewer and fewer southern California wetlands, the Salton Sea is one of the only remaining places on the Pacific Flyway for migrating birds to find respite (and nonmigrating birds such as the cormorants). Over 400 bird species have been recorded in and around the Salton Sea.



Figure 8. Aerial photo of the Mullet Island area from 1937. Mullet Island is outlined.

Much of the area east of Mullet Island is under the control of the California Dept. of Fish and Game. F&G is caught in a perverse political dichotomy. They seasonally flood levee-bounded fields so that migrating ducks have places to rest, and so that hunters can shoot them. Birders and hunters have legitimate and long-standing recreational interests in the area.

Acknowledgements

The authors would like to thank Christian Schoneman of the US Fish and Wildlife Service for logistic support on numerous occasions. This research was partially supported by The Aerospace Corporation's Independent Research and Development program. Mullet Island is owned by the Imperial Irrigation District.

References

- Lynch, David K., 2011. The Coming Land Bridge to Mullet Island, in Proceedings of the 2011 Desert Symposium, The Incredible Shrinking Pliocene, R. Reynolds (ed), 96-100
- Quantification Settlement Agreement, 2003
<http://www.sdcwa.org/quantification-settlement-agreement>
- Riesz, Karen, 2011. Double-crested Cormorants on Mullet Island [image], *Flickr*.
<http://www.flickr.com/photos/californiadfg/7421150680>
- Rogers, Austin F., 1926. Geology of Cormorant Island, Salton Sea, Imperial County, California [abstract], *Bulletin of the Geological Society of America*, 37(1), p.219.
- USGS Westmoreland Gauge.
http://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=10254005
- Weight, Harold O., 1948. Nature's Freaks on Salton Shore, *The Desert Magazine*, 11(6), 5-8.