

**From:** Ben Reineman [<mailto:breineman@gmail.com>]

**Sent:** Sunday, May 10, 2020 9:34 PM

**Subject:** historical photos of 411 Sea Ridge

Attached are some photos mainly from the California Coastal Records Project. There are clear pictures for 2002, 2004, 2006, 2008, 2010, and 2013. There are lower-resolution pictures from 1972 and some from the 80s that I did not include. You can clearly see that significant cliff volume was lost between 1979 and 2002, and then incremental loss between every picture pair after that, including the recent aftermath of a landslide in the 2004 image which undercuts the original patio of 411. A large slide seen in the 2006 photograph begins to undercut the 417 property.

Based on some rudimentary pixel counting, I estimate that the crest of the bluff near the pool has receded by about 9 meters between 1979 and today, so that's over 7 ft/decade. The rate at the base of the bluff is likely higher, as the whole bluff is getting steeper (and therefore more unstable). In some nearby places the erosion looks to be faster, and in others it is slower.

There is no reason to think the rate of cliff destruction will be any less in the future than it was over the course of these photographs, given sea level rise is leading to enhanced destabilization of bluffs as higher tides and larger waves wash away at the base. Dan could probably provide good references on this. Groups at Scripps doing lidar work have also documented this in several places.

The main page of the organization is here:

<https://www.californiacoastline.org/>

An arrangement of pictures of this area can be found here (I just cropped and organized)

<https://www.californiacoastline.org/cgi-bin/timecompare.cgi?image=7955099&flags=1&year=1979&latdeg=32.805965&longdeg=117.270167>

If these go in an official report, you may want to read the fine print on their license, here:

<https://www.californiacoastline.org/license.html>, which says that you need to contact them for government agency use, and legislative proceedings, and that they generally grant permission.

links to the full resolution pictures are here:

1979: <https://largeimages.californiacoastline.org/images/1979/large/9/7955099.JPG>

2002: <https://largeimages.californiacoastline.org/images/2002/large/9/9599.JPG>

2004: <https://largeimages.californiacoastline.org/images/2004/large/5/200407865.JPG>

2006: <https://largeimages.californiacoastline.org/images/2006/large/2/200604592.JPG>

2008: <https://largeimages.californiacoastline.org/images/2008/large/7/200804777.JPG>

2010: <https://largeimages.californiacoastline.org/images/2010/large/8/201004068.JPG>

2013: <https://largeimages.californiacoastline.org/images/2013/large/5/201312515.JPG>

I've also put screenshots from Google Earth historical imagery and Google Maps. here's a link to the maps screenshot:

<https://www.google.com/maps/@32.8070589,-117.2659397,153a,35y,39.49t/data=!3m1!1e3>

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