



Just How Screwed Is LA's Coast When Sea Levels Rise Two Feet?

Tuesday, January 7, 2014, by Bianca Barragan



SANTA MONICA & VENICE

SOUTH BAY/SAN PEDRO

CLIMATE CHANGE

EXTREME WEATHER

FLOODING

SEA LEVELS

SEAGRANT

THE CLIMATE

THE FUTURE

TOP

USC

WILMINGTON

Climate change and rising sea levels are probably never going to [submerge LA](http://la.curbed.com/archives/2013/11/imagining_the_underwater_la_of_an_improbably_dystopian_future.php) under 80 feet of water (at least not in the next few hundred years), but how prepared are LA's beach communities (Pacific Palisades from Malibu to Santa Monica, Venice/Playa Del Rey, San Pedro, Wilmington, and the Port of LA) to deal with a rise of say, **two feet**? The city tasked USC's SeaGrant program with finding out how ready the coast is to handle higher sea levels (estimated at anywhere from 0.3 to two feet from 2000 to 2050), particularly coupled with extreme weather (like 2010's El Niño storm), hoping to identify gaps in storm/flood/rising sea level preparedness. Good news: The [final report](http://www.usc.edu/org/seagrant/research/SeaLevelRise_docs/hires_pdfs/City%20of%20LA%20SLR%20Vulnerability%20Study%20FINAL%20Summary%20Report%20Online%20Hyperlinks.pdf) says that the Port of LA and energy facilities along the coast aren't considered in danger. (The Port is one of the agencies named in the report as having been at work since 2011 to get ready for rising sea levels.) Bad news: Roads, water utilities, and some beach neighborhoods are at risk. **Pacific Coast Highway** was called "the the most vulnerable part of the entire City shoreline." **Venice, San Pedro, and Wilmington** were cited in the report as having a "reduced capacity to adapt to the impacts of sea level rise" compared to neighboring areas, because all three have a high percentage of renters in older housing structures, posing challenges for first-responders.

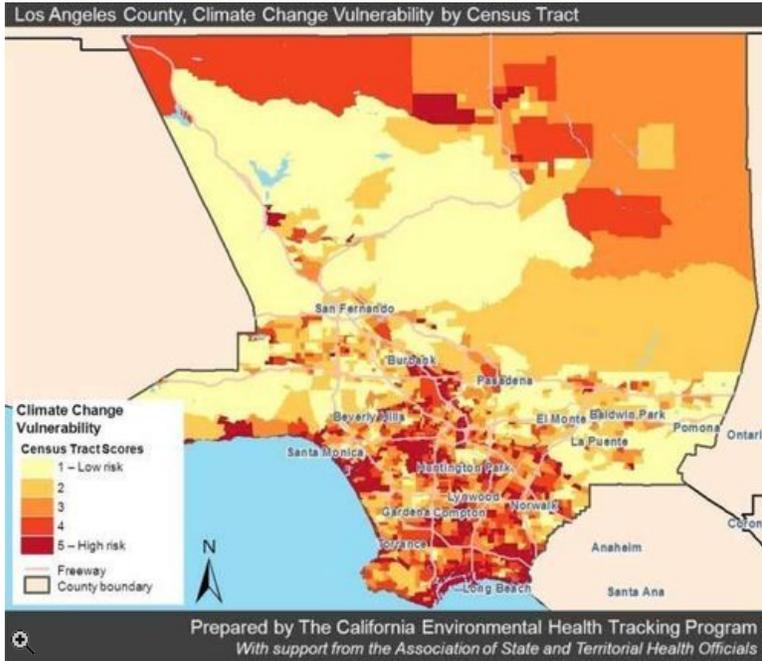


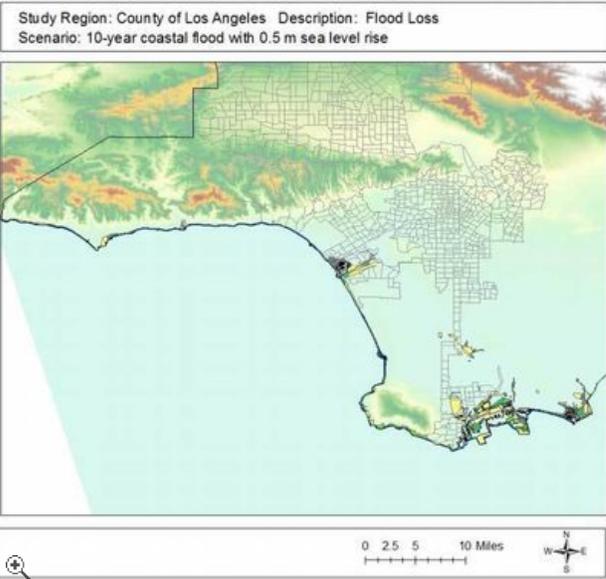


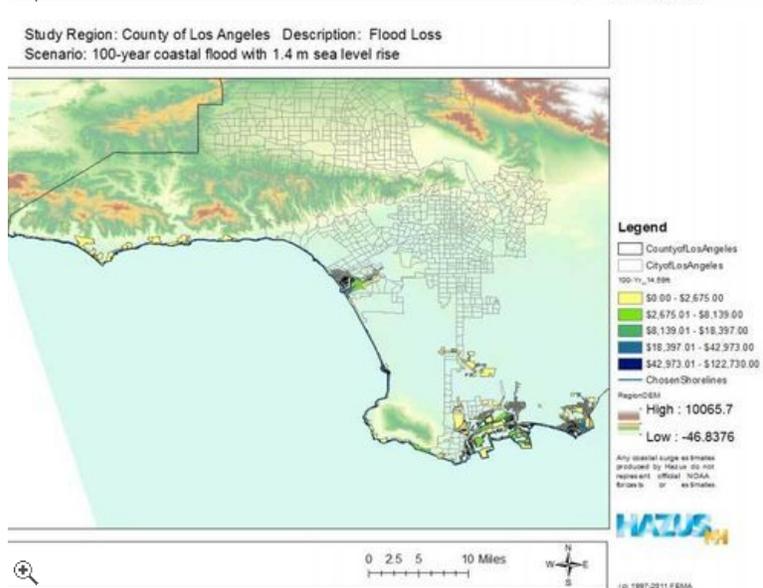
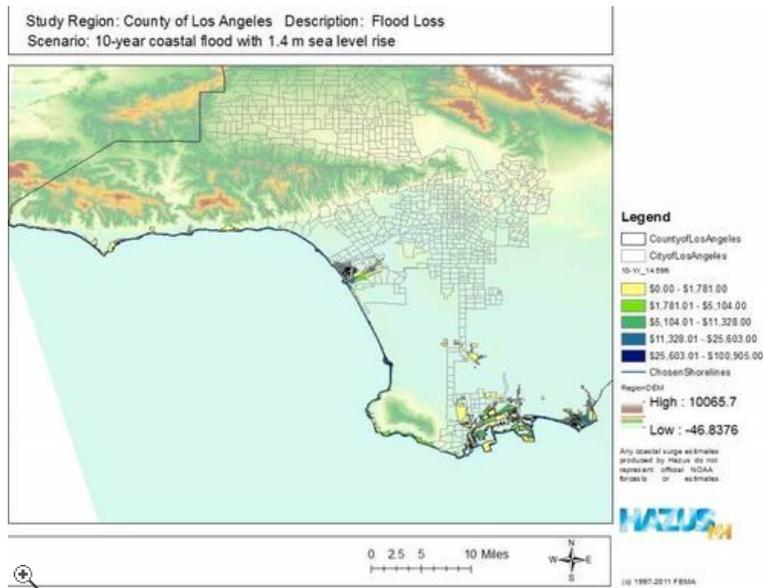
FIGURE 7. EXTENT OF FLOODING ALONG THE SHORELINE OF PACIFIC PALISADES IN A 10-YEAR FLOOD WITH SEA-LEVEL RISE OF 16 INCHES (ORANGE) AND 55 INCHES (RED). SOURCE: BARNARD USGS 2012.





FIGURE 25: FLOOD LOSS THROUGHOUT THE CITY – REPETITIVE LOSS PROPERTIES AND FEMA PAID CLAIMS (SOURCE: CITY OF FLOODPLAIN MANAGEMENT PLAN, APRIL 2010)





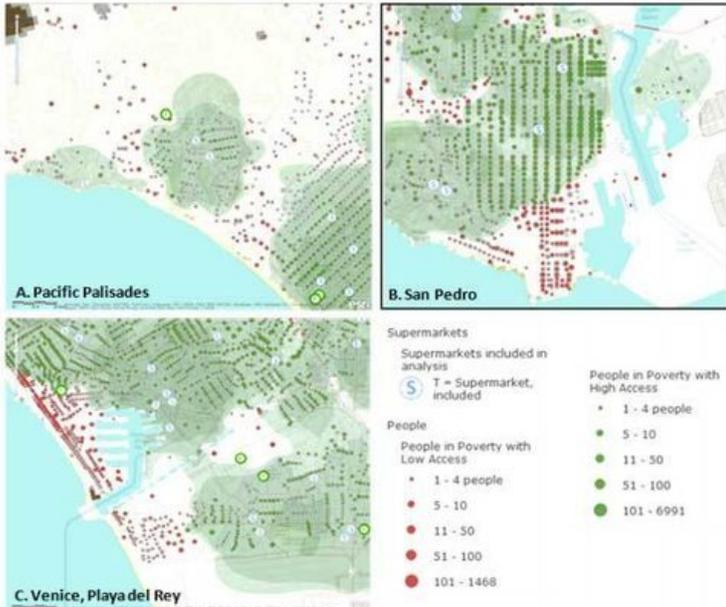


FIGURE 29: SUPERMARKET ACCESS FOR LOW-INCOME POPULATIONS IN SAN PEDRO AND HARBOR (TOP RIGHT MAP), PACIFIC PALISADES (TOP LEFT) AND VENICE AND PLAYA DEL REY (BOTTOM LEFT). GREEN AND RED DOTS INDICATE COASTAL POPULATIONS IN FUTURE FLOOD RISK ZONES THAT HAVE LOW OR HIGH ACCESS, RESPECTIVELY, TO CRITICAL GOODS, SUCH AS FOOD, BOTTLED WATER, PRESCRIPTION MEDICINES, AND OTHER EMERGENCY SUPPLIES (SOURCE: ARCGIS.COM)³¹

Impervious Surface Coverage

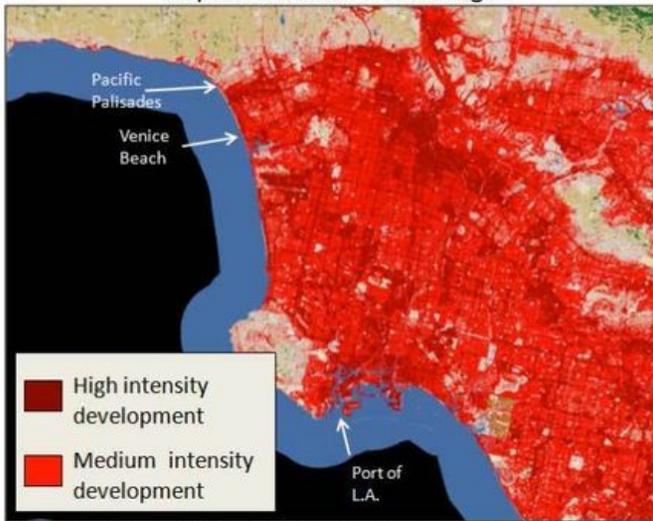


FIGURE 24: IMPERVIOUS SURFACE COVERAGE IN LOS ANGELES REGION. MUCH OF LOS ANGELES COUNTY IS COVERED BY IMPERVIOUS SURFACES, WHICH PREVENT EXCESS WATER (RAIN OR STORM SURGE) FROM INFILTRATING INTO THE GROUNDWATER AND, THUS, INCREASING FLOODING RISK. HIGH INTENSITY DEVELOPMENT IMPERVIOUS SURFACES (DARK RED) ACCOUNT FOR 80% TO 100% OF THE TOTAL COVER. MEDIUM INTENSITY DEVELOPMENT (LIGHTER RED) IMPERVIOUS SURFACES ACCOUNT FOR 50% TO 79% OF THE TOTAL COVER (SOURCE: NATIONAL LAND COVER DATABASE 2006³²).

Category	Baseline Conditions		0.5 m Sea Level Rise		1.4 m Sea Level Rise	
	10-yr Flood	100-yr Flood	10-yr Flood	100-yr Flood	10-yr Flood	100-yr Flood
Building Losses	\$103.3	\$260.9	\$179.4	\$364.4	\$315.0	\$649.9
Content Losses	\$132.6	\$312.1	\$219.6	\$435.5	\$380.2	\$759.9
Inventory Losses	\$6.8	\$15.5	\$11.3	\$20.3	\$19.7	\$31.5
Total Building Losses	\$242.7	\$588.6	\$410.3	\$820.2	\$714.9	\$1,441.3

Table 1. This table presents the summary results of general building losses in millions of 2010 \$US. (Table from Wei & Chatterjee Economic Vulnerability Assessment, Appendix 4).

Category	Baseline Conditions		0.5 m Sea Level Rise		1.4 m Sea Level Rise	
	10-yr Flood	100-yr Flood	10-yr Flood	100-yr Flood	10-yr Flood	100-yr Flood
Output Losses	\$3.4	\$7.4	\$5.8	\$10.5	\$9.1	\$21.9
Income Losses	\$2.3	\$4.9	\$3.8	\$6.6	\$5.9	\$13.6
Employment Losses	24	52	41	74	64	158

Table 2. This table presents the summary of business interruption losses in millions of 2010 \$US (output/income losses) and number of jobs (employment losses). (Table from Wei & Chatterjee Economic Vulnerability Assessment, Appendix 4).

Venice

100-Year Coastal Flood Impacts

(millions of 2010 dollars)

Scenario	Baseline	1.0 m Sea-Level Rise		1.4 m Sea-Level Rise		2.0 m Sea-Level Rise	
	2000	2050	2100	2050	2100	2050	2100
Residential Structures	3.0	5.6	14.6	6.5	24.1	8.7	43.8
Residential Contents	1.3	2.5	6.4	2.9	10.5	3.8	19.0
Total Residential Damages	4.3	8.1	21.0	9.4	34.6	12.5	62.8
Commercial Structures	0.8	1.3	3.3	1.7	5.1	2.0	9.1
Commercial Contents	1.9	3.1	7.1	3.9	11.4	4.8	23.2
Total Commercial Damages	2.7	4.4	10.4	5.6	16.5	6.8	32.3
Institutional Structures	0.0	0.0	0.1	0.0	0.2	0.0	0.5
Institutional Contents	0.0	0.1	0.1	0.1	0.3	0.1	0.6
Total Institutional Damages	0.0	0.1	0.2	0.1	0.5	0.1	1.1
Total Flood Damages	7.0	12.6	31.6	15.1	51.6	19.4	96.2
Sea Level Rise Impact							
Damages Beyond Baseline	—	5.6	24.6	8.1	44.6	12.4	89.2
% Increase From Baseline	—	80%	351%	116%	637%	177%	1,274%

TABLE 1: ECONOMIC DAMAGES CAUSED BY 100-YEAR FLOOD EVENT WITH SEA-LEVEL RISE IN VENICE SOURCE: KING, MCGREGOR, AND WHITTET (2011)¹⁰

San Pedro and Wilmington are also more at risk because their populations are lower-income, non-native English speaking, and have lower education levels, all of which the report said present challenges to spreading the information about preparing for these kinds of emergencies. The report made recommendations to help residents and the city strengthen their abilities to adapt to rising sea levels, but, as the associate director of SeaGrant told KPCC

<<http://www.scprr.org/blogs/environment/2014/01/07/15542/usc-report-concludes-la-risks-much-from-climate-re/>>, the biggest obstacles to getting beach neighborhoods prepared are man-made: budget cuts (always) and jurisdictional issues (beaches are controlled by the county, but affect the city).

· [Sea Level Rise Vulnerability Study for the City of Los Angeles](#)

<http://www.usc.edu/org/seagrant/research/SeaLevelRise_docs/hires_pdfs/City%20of%20LA%20SLR%20Vulnerability%20Study%20FINAL%20Summary%20Report%20Online%20Hyperlinks.pdf> (pdf) [USC]

· [USC Report Concludes LA Risks Much from Climate-Related Sea Level Rise](#)

<<http://www.scprr.org/blogs/environment/2014/01/07/15542/usc-report-concludes-la-risks-much-from-climate-re/>> [SCPR]



1852

This is horrific news. I think we should all run around screaming with bags over our heads.

#1. 01/07/14 03:39 PM



25

 **FromMarsToEarth** 27 #2. 01/07/14 03:46 PM
 That's it! It's time to buy land near the mtns. of Big Bear....in a couple hundred years my great-great-great-grand children will have a piece of oceanfront property.

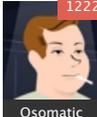
 **Aaron Bateman** 27 #3. 01/07/14 03:51 PM
 I would worry more about Tsunamis mowing the west coast down or nukes going off in the port than sea rise from melting ice.
 I wonder how much \$\$\$ was wasted on this no shit assessment and study?

 **OliverTwisted** 38 #4. 01/07/14 03:58 PM
 If rising tides wipe out Silicon Beach 2.0, global warming will have been worth it.

 **OliverTwisted** 38 #5. 01/07/14 04:02 PM
 On a side note, this link has way too many maps and graphs to deal with at 4 p.m.

 **ocsurfer** 6 #6. 01/07/14 04:13 PM
 Someone's been drinking the global warming kool aid too much, perhaps?
 Aren't we at record cold temps across the U.S. and have the largest ice caps at both North and South Poles?
 Perhaps Curbed should post how the glaciers moving in from the north will affect LA's real estate. More probable, actually...

 **ConnieCassero** 228 #7. 01/07/14 04:19 PM
 Way too much impervious surface. More greenspace, and pervious surfaces needed.

 **Osomatic** 1222 #8. 01/07/14 04:23 PM
 @ocsurfer: Weather isn't the same as climate, and the consensus of the vast majority of climate scientists isn't "kool-aid."

 **OliverTwisted** 38 #9. 01/07/14 04:24 PM
 @ocsurfer: Someone doesn't know the difference between long-term trends and fluctuations. I hope you don't manage your own investments.

 **BrianSorensen** 357 #10. 01/07/14 04:29 PM
 @ocsurfer: You may want to visit the temperature variation maps for the past few weeks. You will see that outside of the US, the rest of the world has pretty much been experiencing above average temperatures.
 But we're Americans, so everything revolves around us, right?
<https://www.google.com/search?q=world+temperature+variation+map+december+2013&tbm=isch&tbo=u&source=univ&sa=X&ei=I5shot-2014-01-03-at-4.32.22-pm.png%3Bhttp%253A%252F%252Fwww.accuweather.com%252Fen%252Fclimate-change%3B590%3B373>

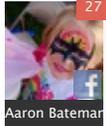
 **Ali_J** 64 #11. 01/07/14 04:46 PM
 I think it's also worth noting that the term "global warming" only appears once in the linked 99-page report. And, even then, it's only appears as the name of a source document.

 **goingup** 445
 [Profile picture icon]

The hills of Glendale are lookin' pretty safe on this front, too.

#12. 01/07/14 05:00 PM

@ocsurfer: Are you a troll or really stupid. Global warming not only causes overall warming, it also causes extremes of all sorts of weather, be it hot, cold, wet and dry.



27

Public shaming on the non-hipster unbeliever!!! 2 minutes of hate starts now!

#13. 01/07/14 07:22 PM



183

@Aaron Bateman: You seem to relish your ignorance like the pigs in our farm loved rollicking around in mud.

#14. 01/07/14 08:11 PM



146

@Aaron Bateman: Understanding science is just about as far from being a hipster as you can get, but thanks for playing.

#15. 01/07/14 08:15 PM

That said, I truly do not understand people who are determined to only trust their own personal 'gut' feeling about a worldwide phenomenon over thousands of scientists who have spent their lives studying the data.



745

@Osomatic:
52% is not a vast majority.

#16. 01/07/14 10:28 PM

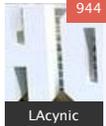


146

@ShadesOfGrayBox: You must be trolling. 97% of climate experts agree humans are causing global warming.

#17. 01/07/14 11:28 PM

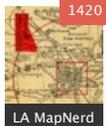
<http://www.skepticalscience.com/global-warming-scientific-consensus.htm>



944

I think the biggest threat to PCH and all the roads in LA is the city budget and lack of attention they are getting. need to get a 4 wheel drive pretty soon since it's like going off roading when driving in some parts of LA

#18. 01/08/14 06:42 AM



1420

@ocsurfer: Aren't we at record cold temps across the U.S. and have the largest ice caps at both North and South Poles?

#19. 01/08/14 08:44 AM

It's simple, really: global weather is a dynamic, oscillating heat-driven system. When you add more heat, the dynamic oscillations get bigger.

It's like pushing a child on a swing - even though you're only pushing forward, the swing goes higher both forward AND back. Because it's oscillating, and adding energy makes the oscillations bigger.

More heat evaporates more water off the oceans, making more and bigger clouds which form more and bigger storms, which gives you more extreme weather. Bigger storms, more rain, more snow, more ice.

So, yeah: global warming can cause colder winters. That's why they call it "Climate Change".

Isn't science cool? :-)



11

Why on earth is a census tract the selected unit of analysis?

#20. 01/08/14 08:54 AM



1420

 LA MapNerd 1420 #21. 01/08/14 09:17 AM

@ShadesOfGrayBox: 52% is not a vast majority.

Yes, but what @Osomatic said was "a consensus" - not "a majority." .

A thin 52% majority is not a consensus - and what we have is a consensus. A very solid consensus.

I won't presume to post dictionary definitions, since you have a net connection and can do that for yourself - but it might be a good idea to do that before you embarrass yourself any further.

 LA MapNerd 1420 #22. 01/08/14 09:21 AM

@Raphael Mazor: Because it made the analysis easier? :-)

Hey, you need *something* precise when you start mapping dimensionless formula-derived nonsense like "vulnerability." :-)

 VoiceOfSanity 175 #23. 01/08/14 09:58 AM

@Raphael Mazor: US government publishes vast data broken down to census tracts. This data makes detail analysis possible. Take a look here of what can be learned from census tracts <http://www.ffiec.gov/geocode/>

 ncrpz2 557 #24. 01/08/14 10:10 AM

I'm looking forward to living in the new California Bay. Single Family Homes on stilts for everyone!