Appendix K
Economic Analysis

The Fiscal Impact of Beaches in California

A Report Commissioned by The California Department of Boating and Waterways

by Philip King, Ph.D

Public Research Institute
San Francisco State University
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Executive Summary

- In 1998, California's beaches generated $14 billion dollars of direct revenue. When the indirect and induced benefits of this spending are added, California's beaches total contribution to the national economy is $73 billion.
- The federal tax revenues generated by this beach activity are substantial. The direct federal tax revenues generated are $2.6 billion; however, the total federal tax revenues generated are much higher: $14 billion.
- California's beaches generated 883,000 jobs across the U.S.
- California receives less than one tenth as much in federal appropriations as New York and New Jersey, which have much smaller coastlines and fewer miles of beaches.
- California ranks eighth in terms of federal appropriations for shoreline protection, just ahead of Delaware. It receives just under $12,000 per mile of coastline, compared with well over $800,000 per mile for New York and New Jersey.
- While California receives twice as much in federal shoreline protection appropriations as Delaware (the ninth largest recipient of federal funds) its beaches generate twenty times more economic activity for the national economy and roughly twenty times more tax revenues than Delaware's beaches. In other words, California generates ten times more federal tax dollars, per dollar of shoreline appropriation, than Delaware.
- Our study of Huntington Beach indicates that much of the federal and state tax revenues generated by local beach communities do not go back to local communities. In our survey in Huntington Beach, one-half of all spending on beach activities occurred outside the city. Furthermore, many of the tax dollars generated within the city go to state and federal authorities. Overall, Huntington Beach's beaches generated $135 million in federal tax revenues and $25 million in state sales tax revenues compared to only $4.8 million in local revenues from sales taxes and parking fees.

Introduction

Beaches are an important destination for tourists in California. They generate very large revenues for local, state and federal governments. The purpose of this report is to estimate these revenues. In particular, this study will provide data on the total economic impact that beach visits have on the national economy and the total federal revenues that are generated by this activity. The study also seeks to compare the amount of economic activity generated in California relative to another state which ranks just behind California in overall federal spending for shoreline preservation: Delaware.

The study also seeks to examine the economic impact at the local level by studying one particular beach city: Huntington Beach. One often-made claim is that local beach communities benefit substantially from beach tourism, so that little assistance from state or federal authorities is required. The case study examines federal tax revenues as well as state sales tax revenues generated in Huntington Beach. We find in fact that the revenues generated from these tax sources are substantial.

This study was commissioned by the California Department of Boating and Waterways (DBW) to examine the economic and tax impact of California's beaches. The study is an outgrowth of a previous study performed for DBW in 1995. This study is divided into three sections: **Chapter 1** updates the data from the 1995 study. **Chapter 2** compares the fiscal impact of California's beaches to another state: Delaware. Finally, **Chapter 3** provides a case study of a one-beach community, Huntington Beach, and examines the fiscal impact of the state and city beaches.

1. The Economic Impact of California's Beaches: 1998

During the fall of 1995, the Public Research Institute (PRI) at San Francisco State University conducted a telephone survey under a contract with the California Department of Boating and Waterways. Over 600 residents throughout the state were randomly selected and asked a series of questions regarding their beach-going activities during the previous year. The results of this survey were published and they have been widely disseminated throughout the state and on the World Wide Web. Results from the survey were used to calculate the total economic impact of California's beaches on the state and national economies.[1]

Although the study is still relatively recent, the tremendous growth in California's economy in the late nineties coupled with a substantial increase in the growth of population of the state and moderate inflation mean that the 1995 statistics now significantly underestimate the economic impact of California's beaches. In addition, the figures provided in this study develop the analysis of the impact California's beaches have on federal tax revenues. As in the 1995 study, the impact has been analyzed using IMPLAN software; we have used the latest available data to ensure the accuracy of the results. IMPLAN uses data provided by federal, state and local governments and uses the same methodology (input-output matrices) used by the U.S. Bureau of Economic Analysis. IMPLAN's software has become the standard methodology for conducting this type of analysis. It is used by academics and applied economists all over the United States.[2]

Since conducting an entirely new survey would be prohibitively expensive and it is very unlikely that peoples' basic preferences for beaches has changed significantly, the data here has been updated from the 1995 data. The 1995 survey determined average household spending for one-day trips and for overnight trips by state residents. Tables 1.1 to 1.4 update the old study in several ways. First while inflation has been low, it has not been nonexistent and three years of inflation compounded has a significant effect on the overall impact. Using monthly Consumer Price Index (CPI) data for Western consumers from the Bureau of Labor Statistics (BLS), the total cumulative change in prices is 9.4%.

In addition, California's population has grown significantly. The number of households in California has increased from 10.8 million to an (estimated) 11.45 million (data from California Statistical Abstract). In the previous report, all spending was computed at the household level and then multiplied by the number of households. Since the number of households has now increased, the corresponding state numbers should increase proportionately. As in the previous report, spending was broken down into day-trip spending by Californians, overnight spending by Californians, and spending by tourists from out of state including foreign visitors. Except for the changes mentioned above, the methodology employed is the same as in the 1995 study.

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[1] King, Philip and Michael Potepan, *The Economic Value of California's Beaches*, Public Reseach Institute Report Commision by the California Department of Boating and Waterways, May 1997.
[2] For more information on IMPLAN software see www.implan.com.

Table 1.1 Average Number of and Average Expenditure on Beach Trips by California Households: A Summary of Survey Responses

Based on 9.47% inflation from 1995 to 1998

Total Number of Households Responding to Survey	641 Households

A. Households Taking Day Trips

Total Number of Households Taking Day Trips	409 Households (63.8%)
Mean Number of Day Trips per Year	15.24 Day Trips
Mean Number of Persons on Typical Day Trip	4.0 Persons

Mean Expenditures Per Household on Typical Day Trip	1995 Dollars	1998 Dollars
Gas & Auto	$11.05	$12.10
Parking & Entrance Fees	$3.15	$3.45
Food & Drinks from stores	$15.04	$16.46
Restaurants	$15.78	$17.27
Equipment Rental	$2.53	$2.77
Beach Sporting Goods	$2.35	$2.57
Incidentals	$4.97	$5.44
All Items	$54.87	$60.07

B. Households Taking Overnight Trips

Total Number of Households Taking Overnight Trips	234 Households (36.5%)
Mean Number of Overnight Trips per Year	4.6 Overnight Trips
Mean Number of Days of Typical Overnight Trip	2.65 Days
Mean Number of Persons on Typical Overnight Trip	4.34 Persons

Mean Expenditures Per Household on Typical Overnight Trip	1995 Dollars	1998 Dollars
Gas & Auto	$35.28	$38.62
Beach Related Lodging	$90.47	$99.04
Parking & Entrance Fees	$4.63	$5.07
Food & Drinks from stores	$39.45	$43.19
Restaurants	$53.39	$58.45
Equipment Rental	$9.11	$9.97
Beach Sporting Goods	$2.34	$2.56
Incidentals	$11.11	$12.16
All Items	$246.83	$269.06

Table 1.2 Estimates of Beach Attendance and Spending for California Households on Day Trips to the Beach

	1995		1998	
	Sub-Sample of 409 Taking Day Trips	Full Sample of 641 Total Households Surveyed	Sub-Sample of 409 Taking Day Trips	Full Sample of 641 Total Households Surveyed
A. Attendance Days from Survey				
Mean Number of Day Trips	15.24	10.13		
Mean Number of Persons Per Day Trip	4	2.66		
Mean Annual Person Attendance Days	48.14	32.02		
B. Spending From Survey				
Mean Household Spending Per Trip	$54.87	$36.49	$60.07	$39.95
Mean Per Person Spending Per Trip	$16.45	$10.94	$18.01	$11.98
Mean Annual Household Spending	$518.40	$344.75	$567.51	$377.41
Mean Annual Per Person Spending	$171.57	$114.10	$187.82	$124.91
C. Statewide Attendance Projections				
Mean Annual Person Attendance Days per Household		32.02		32.02
Total California Households (millions)		10.8		11.45
Total Person Attendance Days (millions)		345.78		366.63
D. Total Direct Statewide Spending on Day Trips				
Mean Annual Spending Per Household		344.75		382.84
Total CA Households (millions)		10.8		11.45
Total Statewide Spending (millions)		$3,723.34		$4,383.52

Table 1.3 Estimates of Beach Attendance and Spending for California Households on Overnight Trips to the Beach

	1995		1998	
	Sub-Sample of 409 Taking Day Trips	Full Sample of 641 Total Households Surveyed	Sub-Sample of 409 Taking Day Trips	Full Sample of 641 Total Households Surveyed
A. Attendance Days from Survey				
Mean Number of Overnight Trips	4.6	1.75		
Mean Number of Days per Trip	2.65	1.01		
Mean Number of Persons Per Trip	4.34	1.65		
Mean Annual Person Attendance Days	33.1	12.59		
B. Spending From Survey				
Mean Household Spending Per Trip	$246.83	$93.92	$270.21	$102.82
Mean Per Person Spending Per Trip	$82.09	$31.24	$89.87	$34.20
Mean Annual Household Spending	$907.79	$345.40	$993.79	$378.12
Mean Annual Per Person Spending	$345.24	$131.36	$377.95	$143.80
C. Statewide Attendance Projections				
Mean Annual Person Attendance Days per Household		12.59		12.59
Total California Households (millions)		10.8		11.45
Total Person Attendance Days (millions)		135.97		144.16
D. Total Direct Statewide Spending on Overnight Trips				
Mean Annual Spending Per Household		345.4		383.57
Total CA Households (millions)		10.8		11.45
Total Spending (millions)		$3,730.32		$4,391.88

Table 1.4 Estimates of Beach Attendance and Spending for Out-of-State Tourists Taking Trips to California's Beaches

A. Statewide Attendance Estimates			
Total Attendance Days (Tourists 15% of Total)	566.76		
California Residents' Total Attendance Person Days	481.75		
Out-of-State Tourist Person Attendance Days (millions)	85.01		
B. Converting Attendance Days to Out-of-State Tourist Trips			
Out-of-State Tourist Attendance Days	85.01		
Mean Trip Length for Out-of-State Tourists (days)	2.65		
Out-of-State Tourists Visiting State's Beaches (millions)	32.08		
Total Out-of-State Tourist Trips to the Beach (millions)	12.83		
C. Statewide Spending Projections			
		1995	1998
Household Spending Per Trip (3)		$246.83	$270.21
Out of State Tourist Trips (millions)		12.83	12.83
Total Statewide Spending (millions)		$3,166.87	$3,466.84

Tables 1.5 to 1.8 provide the "Economic Impact" numbers using the data provided in Tables 1.1–1.4. As one can see, total direct statewide spending on California's beaches is just over $12 billion dollars, a significant increase from 1995, when it was just over $10 billion. However, one must also take into account the indirect and induced effects of state spending on beaches since this spending provides jobs and income for California and non-California residents, who in turn spend their added income. Since the numbers provided here are national figures, this indirect and induced effect is much larger than the effects formerly calculated for the state. This is because more of the spillover effect of adding new jobs is captured at the national level. As a result, the employment generated by California's beaches has a substantial impact on the national economy, generating $63 billion in revenue when all effects are taken into account.

The primary purpose of this investigation is to examine the impact of California's beaches on federal tax revenues. Tables 1.6 and 1.7 provide this information. If one just looks at the direct expenditures, California's beaches provide $2.3 billion in tax revenues for the federal government. If one includes indirect and induced effects, the number rises to $12 billion. Finally, Table 1.8 estimates the number of jobs created by California's beaches in 1998. The direct effect is 273,000 jobs; the total effect is 883,000 jobs.

Table 1.5 Total National Economic Impact of Beach Spending in California in 1998: Expenditures Updated for Inflation and Population

A.	Spending by California Households on Day Trips	$4,321,537,219
	Spending by California Households on Overnight Trips	$4,311,359,394
	Spending by Out-of-State Tourists	$3,452,096,522
	Total Direct Statewide Spending	$12,084,993,135
B.	Indirect Spending	$6,582,000,000
	Induced Spending	$44,698,000,000
C.	Combined National Economic Impact of Beach Spending	$63,364,993,135

Table 1.6 Impact of California Beach Direct Expenditure on Federal Tax Receipts, Updated Updated for Inflation and Population

	Ratios of Tax Receipts to GDP are average values from 1995-1997		
	Estimated 1998 California Beach Direct Expenditure: Updated using Inflation	$	12,084,993,135
A.	Ratio of Income Tax Receipts to GDP		0.0861
	Estimated 1998 Federal Income Tax Revenue Generated By Direct California Beach Spending	$	1,041,065,831
B.	Ratio of Corporate Tax Receipts to GDP		0.0222
	Estimated 1998 Federal Corporate Tax Revenue Generated By Direct California Beach Spending	$	268,541,360
C.	Ratio of Excise Tax Receipts to GDP		0.0073
	Estimated 1998 Federal Corporate Tax Revenue Generated By Direct California Beach Spending	$	88,734,893
D.	Ratio of Total Tax Receipts to GDP		0.1906
	Estimated 1998 Federal Tax Revenue Generated By Direct California Beach Spending	**$**	**2,303,116,875**

Table 1.7 Total Impact of California Beach Spending on Federal Tax Receipts: Expenditures Updated for Inflation and Population

Ratios of Tax Receipts to GDP are average values from 1995-1997		
	Estimated 1998 National Economic Impact of California Beach Spending : Updated using Inflation	$ 63,364,993,135
A.	Ratio of Income Tax Receipts to GDP	0.0861
	Estimated 1998 Federal Income Tax Revenue Generated By California Beach Spending	$ 5,458,598,815
B.	Ratio of Corporate Tax Receipts to GDP	0.0222
	Estimated 1998 Federal Corporate Tax Revenue Generated By California Beach Spending	$ 1,408,037,328
C.	Ratio of Excise Tax Receipts to GDP	0.0073
	Estimated 1998 Federal Corporate Tax Revenue Generated By California Beach Spending	$ 465,261,821
D.	Ratio of Tax Receipts from Other Sources* to GDP	0.0749
	Estimated 1998 Federal Tax Revenue From Other Sources Generated by California Beach Spending	$ 4,743,986,842
E.	Ratio of Total Tax Receipts to GDP	0.1906
	Estimated 1998 Federal Tax Revenue Generated By California Beach Spending	$ 12,075,884,806

*Comprised primarily of social insurance and retirement receipts.

Table 1.8 Total National Employment Impact of 1998 California Beach Spending: Expenditures Updated for Inflation and Population

A.	Total Direct National Employment	278,180
B.	Indirect and Induced National Employment	
	Indirect Employment	68,296
	Induced Employment	537,067
	Total Induced and Indirect Spending	605,363
C.	The Combined National Employment Impact	883,543

In addition to changes in the overall price level and population, California has also experienced significant growth in income per capita, particularly given the recent boom in technology spending. *The numbers calculated in tables 1.1 to 1.8 do not take the increase in household income into account*. Further, economists also have found that spending on beaches and other recreational activities is highly sensitive to changes in income. In economic parlance, a 5% increase in income will not necessarily reflect a 5% increase in spending. To correct for the change in income properly, one must use data on the income elasticity of demand.[3] Tables 1.9 to 1.13 are analogous to tables 1.5 to 1.8 except that they take into account the effect of an increase in Californian's income. As one can see, when this effect is taken into account, **total direct spending at California's beaches increases to $14 billion and direct federal tax revenues increase to $2.6 billion. The combined national impact is $73 billion and the total federal tax impact is just over $14 billion.**

Table 1.9 Total 1998 California Beach Spending by Expenditure Category Updated for Income

Category	Estimated 1998 Total CA Day Trip Spending (adjusted for pop growth ($mil)	Estimated 1998 Total CA Overnight Trip Spending (adjusted for pop growth ($mil)	Estimated 1998 Out-of-State Beach Spending ($mil)	Total 1998 CA Direct Beach Spending ($mil)
Gas & Auto	$944.11	$671.36	$655.19	$2,270.66
Beach Related Lodging	$0.00	$1,583.05	$1,558.93	$3,141.97
Parking & Entrance Fees	$253.65	$83.04	$81.55	$418.23
Food & Drinks from Stores	$1,271.61	$742.88	$725.78	$2,740.27
Restaurants	$1,391.15	$1,048.32	$1,019.81	$3,459.28
Equip Rental	$279.71	$224.32	$213.78	$717.81
Beach Sporting Goods	$259.81	$57.62	$54.91	$372.34
Incidentals	$466.58	$232.30	$224.60	$923.48
TOTALS	$4,866.63	$4,642.88	$4,534.54	$14,044.05

[3] The data used here was obtained from Falvey, Rodney and Gemmell, Norman "Are Services Income-Elastic? Some New Evidence", *Review of Income and Wealth*, 42, No 3, 1996.

Table 1.10 Impact of California Beach Direct Expenditure on Federal Tax Receipts, Updated for Income

	Ratios of Tax Receipts to GDP are average values from 1995-1997		
	Estimated 1998 California Beach Direct Expenditure: Updated using Elasticities	$	14,044,049,092
A.	Ratio of Income Tax Receipts to GDP		0.0861
	Estimated 1998 Federal Income Tax Revenue Generated By Direct California Beach Spending	$	1,209,829,370
B.	Ratio of Corporate Tax Receipts to GDP		0.0222
	Estimated 1998 Federal Corporate Tax Revenue Generated By Direct California Beach Spending	$	312,073,661
C.	Ratio of Excise Tax Receipts to GDP		0.0073
	Estimated 1998 Federal Corporate Tax Revenue Generated By Direct California Beach Spending	$	103,119,396
D.	Ratio of Total Tax Receipts to GDP		0.1906
	Estimated 1998 Federal Tax Revenue Generated By Direct California Beach Spending	**$**	**2,676,467,094**

Table 1.11 Total National Economic Impact of Beach Spending in California in 1998: Updated for Income

A.	Spending by California Households on Day Trips	$	4,866,630,047
	Spending by California Households on Overnight Trips	$	4,642,877,898
	Spending by Out-of-State Tourists	$	4,534,541,147
	Total Direct Statewide Spending	$	14,044,049,092
B.	Indirect Spending	$	7,718,000,000
	Induced Spending	$	51,786,000,000
C.	Combined National Economic Impact of Beach Spending	$	73,548,000,000

Table 1.12 Total Impact of California Beach Spending on Federal Tax Receipts: Updated for Income

	Ratios of Tax Receipts to GDP are average values from 1995-1997		
	Estimated 1998 National Economic Impact of California Beach Spending : Updated using Income Elasticities	$	73,548,000,000
A.	Ratio of Income Tax Receipts to GDP		0.0861
	Estimated 1998 Federal Income Tax Revenue Generated By California Beach Spending	$	6,335,817,394
B.	Ratio of Corporate Tax Receipts to GDP		0.0222
	Estimated 1998 Federal Corporate Tax Revenue Generated By California Beach Spending	$	1,634,314,537
C.	Ratio of Excise Tax Receipts to GDP		0.0073
	Estimated 1998 Federal Corporate Tax Revenue Generated By California Beach Spending	$	540,031,249
D.	Ratio of Tax Receipts From Other Sources* to GDP		0.0749
	Estimated 1998 Federal Tax Revenue From Other Sources Generated By California Beach Spending	$	5,506,364,430
E.	Ratio of Total Tax Receipts to GDP		0.1906
	Estimated 1998 Federal Tax Revenue Generated By California Beach Spending	**$**	**14,016,527,609**

* Comprised primarily of social insurance and retirement receipts.

Table 1.13 Total National Employment Impact of 1998 California Beach Spending; Updated for Income

A.	Total Direct National Employment	321,647 jobs
B.	Indirect and Induced National Employment	
	Indirect Employment	79,793
	Induced Employment	622,264
	Total Induced and Indirect Spending	702,057
C.	The Combined National Employment Impact	1,023,704 jobs

2. How does Delaware compare to California?

As shown in Table 2.1, although California has the longest coastline of the twelve states receiving funds and the second longest shoreline (after Florida), it ranks eight overall in federal appropriations for shoreline protection. In terms of overall spending per mile of shoreline, California again ranks second to last. If one includes only coastline, the comparison is even starker. California receives just under $12,000 per mile of coastline compared to over $800,000 for New York and New Jersey. In other words, New York and New Jersey receive over 75 times more federal dollars per mile of coastline than California.

Given the substantial revenues generated by California's beaches, a useful point of comparison might be another state that receives substantial assistance from the federal government. To make an accurate comparison, we chose a state that has performed a similar study to the one completed in Section 1. The most comprehensive study has been performed by the state of Delaware, prepared by Jack Faucett Associates.[4] Although at first glance Delaware, a small state, might seem to be a strange comparison with California, in terms of federal funding, the two states rank eighth and ninth, as one can see from Table 2.1. The two states also rank tenth and eleventh in terms of federal appropriations per mile of shoreline.

Table 2.1 Federal Appropriations for Shoreline Protection by State

State	Total Federal Appropriations FY 95-99 (millions of $)	Coastline*	Shoreline*	Appropriations per mile of Coastline	Appropriations per mile of Shoreline
New Jersey	111	130	1792	$ 853,846.15	$ 61,941.96
New York	104	127	1850	$ 818,897.64	$ 56,216.22
Florida	90	770	5095	$ 116,883.12	$ 17,664.38
South Carolina	46	187	2876	$ 245,989.30	$ 15,994.44
Virginia	45	112	3315	$ 401,785.71	$ 13,574.66
Illinois	30	0		N.A	N.A.
North Carolina	18	301	3375	$ 59,800.66	$ 5,333.33
California	10	840	3427	$ 11,904.76	$ 2,918.00
Delaware	5	28	381	$ 178,571.43	$ 13,123.36
Pennsylvania	2	0	89	N.A.	$ 22,471.91
Maryland	2	31	3190	$ 64,516.13	$ 626.96

* Source: National oceanographic and Atmospheric Atministration; U.S. Department of Commerce

[4] Jack Faucett Associates, "The Economic Effects of a Five Year Nourishment Program for the Ocean Beaches of Delaware", Final report, March 1998.

The survey data contained in the Delaware study was remarkably similar in scope and methodology to the one conducted through PRI. Consequently, it was relatively straightforward to update the data. As in Section 1, the data was updated for changes in the price level, in incomes and in population. The national impact figures were calculated using IMPLAN software and the same methodology used as in Section 1. In short, the comparison of the economic impacts in the two states should be quite appropriate given that the same methodologies were applied. Tables 2.2 to 2.5 provide information on spending in Delaware comparable to the tables in Section 1. In all cases, we have updated for inflation, for population increases and for increases in income as we did in Section 1. Table 2.6 provides a breakdown of out-of-state spending at Delaware's beaches.

As one can see, the differences are quite dramatic, reflecting the differences in the size of the state. While California receives only twice as much in shoreline protection as Delaware, the total direct spending by beach visitors in Delaware is $652 million, compared to $14 billion in California. If one accounts for indirect and induced effects, Delaware's beaches contribute $3.7 billion to the national economy, but California's total impact is over $73 billion. The revenue impact tells the same story: Delaware's total economic impact from beach tourism contributed $715 million in federal tax revenues, while California contributed $14 billion.

In sum, California's beaches contribute roughly twenty times more to the national economy and to federal tax revenues than Delaware Beaches, while receiving only twice as much from the federal government in shore protection appropriations. Another way of thinking about this difference is: California's beaches generate approximately 10 times the federal tax benefit per dollar spent by the federal government in shore protection.

Table 2.2 Delaware Overnight Trip Beach Expenditures by Category Updated for Income and Population Growth

Category	1996 Expenditure per Overnight Trip by Category	Total 1996 Expenditure on Overnight Trips	Income Elasticities	Estimated 1998 Expenditures on Overnight Trips
Lodging	$179.37	$167,616,555.35	0.7115	$183,805,410.58
Restaurants	$106.20	$99,236,114.47	1.6126	$117,872,448.27
Entertainment	$59.00	$55,131,174.70	2.1498	$68,482,665.62
Food Shopping	$45.30	$42,326,514.77	1.2735	$48,822,448.95
Non Food Shopping	$68.18	$63,712,075.28	3.7162	$89,243,926.39
Transportation	$17.65	$16,494,891.79	1.3572	$19,166,151.16
Totals	$475.69	$444,517,326.36		$527,393,050.98

Table 2.3 Delaware Day Trip Beach Expenditures by Category Updated for Income and Population Growth

Category	1996 Expenditure per Day Trip by Category	Total 1996 Expenditure on Day Trips	Income Elasticities	Estimated 1998 Expenditures on Overnight Trips
Lodging	$0.00	$0.00	0.7115	$0.00
Restaurants	$19.95	$ 36,621,044.43	1.6126	$ 43,498,399.63
Entertainment	$9.28	$ 17,036,634.86	2.1498	$ 21,162,512.40
Food Shopping	$11.74	$ 21,553,144.56	1.2735	$ 24,860,948.40
Non Food Shopping	$22.69	$ 41,652,256.08	3.7162	$ 58,343,898.85
Transportation	$6.44	$ 11,825,277.52	1.3572	$ 13,740,317.88
Totals	**$70.11**	**$128,688,357.45**		**$161,606,077.17**

Table 2.4 National Impact of 1998 Delaware Beach Spending

A. National Spending Impacts	
Direct Spending	$ 652,030,302.00
Indirect Spending	$ 381,424,442.00
Induced Spending	$ 2,722,655,693.00
Total Impact	**$ 3,756,110,438.00**
B. National Employment Impacts	
Direct Employment	17,060
Indirect Employment	4,046
Induced Employment	32,716
Total Employment	**53,821**

Table 2.5 Total Impact of Delaware Beach Spending on Federal Tax Receipts

	Ratios of Tax Receipts to GDP are average values from 1995-1997	
	Estimated 1998 National Economic Impact of Delaware Beach Spending : Updated using Inflation	$3,756,110,438
A.	Ratio of Income Tax Receipts to GDP	0.0861
	Estimated 1998 Federal Income Tax Revenue Generated By Delaware Beach Spending	323,571,407
B.	Ratio of Corporate Tax Receipts to GDP	0.0222
	Estimated 1998 Federal Corporate Tax Revenue Generated By Delaware Beach Spending	83,464,756
C.	Ratio of Excise Tax Receipts to GDP	0.0073
	Estimated 1998 Federal Corporate Tax Revenue Generated By Delaware Beach Spending	27,579,499
D.	Ratio of Total Tax Receipts to GDP	0.1906
	Estimated 1998 Federal Tax Revenue Generated By Delaware Beach Spending	**$715,826,748**

Table 2.6 Estimated 1998 Expenditures on Overnight Trips to Delaware Beaches by State of Residence of Beach Visitors

State of Residence	Percent of All Visitors	Estimated 1998 Number of Overnight Trips by State of Origin		Estimated 1998 Overnight Trip Direct Expenditure by State of Origin
Maryland	22.6	2,930,994	$	119,190,830
Pennsylvania	19.59	2,540,627	$	103,316,299
New Jersey	19.28	2,500,423	$	101,681,380
New York	9.71	1,259,290	$	51,209,865
Virginia	8.3	1,076,427	$	43,773,623
Delaware	8.24	1,068,646	$	43,457,187
Connecticut	1.93	250,302	$	10,178,686
Massachusetts	1.53	198,426	$	8,069,114
Florida	1.05	136,175	$	5,537,627
West Virginia	1.04	134,878	$	5,484,888
Other	6.73	872,814	$	35,493,552
		12,969,000	**$**	**527,393,051**

3. A Case Study of Huntington Beach

In many ways, Huntington Beach is a typical beach community in Southern California. Huntington Beach is a small to medium sized city (population about 190,000) city just 35 miles southeast of Los Angeles. One issue of concern to many policy makers is the extent to which tax revenues generated by local governments benefit the locality itself, as opposed to the state or the federal government. This case study examines the revenues generated by federal taxes, by state sales taxes and by parking revenues (some go to the state and some go to the city). The purpose is to estimate the tax revenue impact of beach spending from one specific community. Although Huntington Beach represents only one community, it is quite likely that spending patterns in other Southern California beach communities will be similar, so that the relative ratios between state, local and federal tax dollars generated will likely be similar.

The data used for this study was obtained from several sources. Information on total beach attendance was obtained from the City of Huntington Beach, which maintains monthly and yearly statistics on beach attendance at its state and city beaches. In addition a survey of beach visitors was undertaken by Kim Sterret and Philip King on July 9, 1999. Care was taken to get a full, representative sample throughout all portions of both the city and state beaches. A Friday was chosen as the most representative day since it on the cusp between a weekday and a weekend day. Respondents were given a brief survey about their spending habits, in particular how much they spent and *where* the money was spent. As one can see in the tables below, a substantial amount of the beach spending occurred in inland communities—not at Huntington Beach. In addition, visitors were asked how far away from Huntington Beach they lived (including out-of-state and foreign visitors). Overall, the spending percentages conformed closely to those in our survey from 1995, and the relative spending percentages from this study were used with one exception; parking was a significantly larger proportion of overall expenses for day-trippers in our July 9th survey than in the 1995 telephone survey. This result is not surprising since Huntington Beach requires visitors to pay for parking and some other beaches do not.

The results of the survey are presented in Table 3.1. The overall breakdown of visitors is also consistent with the percentage breakdown provided by the City of Huntington Beach from their records of people needing medical attention at the beach. For a more detailed breakdown of survey results, the reader may consult the appendix.

Table 3.1 Results of the Huntington Beach Survey

Category	Number of Parties	Number of People	Percent of Total Number of People	Avg. Daily Expenditure per Party	Avg. Daily Expenditure per Person	Avg. Percent of Expenditure in Huntington Beach
Local	18	53	12%	$ 11.93	$ 4.05	68.33%
Less Than 60 Miles	54	274	60%	$ 54.46	$ 10.73	42.43%
In-State, > 60 Miles	10	39	8%	$ 102.30	$ 26.23	48.30%
Out of State	23	86	19%	$ 109.61	$ 29.31	61.39%
Out of Country	4	8	2%	$ 70.75	$ 35.38	62.00%
Totals	109	460	100%	$ 64.06	$ 15.18	49.80%*

*Average, weighted by number of people in each category.

Please note that only about half (49.80%) of all spending that results from trips to Huntington Beach actually occurs in Huntington Beach. Most of the other spending occurs within a 60-mile radius of Huntington Beach. For example, note that by far the largest category of beach attendees come from Orange county and neighboring counties, but do not reside in Huntington Beach. A substantial portion of their spending occurs outside of the city. In addition, many people visiting Southern California (e.g., Disneyland) plan to attend Huntington Beach for a day, but the majority of their expenditures for that day lie outside city limits.

Given the information from Table 3.1, it is possible to estimate the total impact of beach spending generated at Huntington Beach. This is presented in Table 3.2. The total direct yearly expenditure by all visitors is estimated to be $139 million.

Table 3.2 Estimated 1998 Direct Beach Expenditure Generated by Huntington Beach Tourists

Category	Percent	1998 Estimated Attendance	Avg. Daily Expenditure per Person	Total 1998 Direct Exp.
Local	11.5	1,055,109	$4.05	$4,276,176
Less Than 60 Miles	59.6	5,454,713	$10.73	$58,548,578
In-State, > 60 Miles	8.5	776,401	$26.23	$20,365,588
Out of State	18.7	1,712,063	$29.31	$50,187,339
Out of Country	1.7	159,262	$35.38	$5,633,882
Totals	**100**	**9,157,547**		**$139,011,563**

Tables 3.3 and 3.4 estimate the national impact of these expenditures using the same methodology applied in Sections 1 and 2. As before, the indirect and induced effect implies that the total national impact is substantially greater than the direct impact. In this case, the total national impact is $711 million. The total amount of federal taxes generated by this activity is $135 million.

Table 3.3 National Impact of 1998 Huntington Beach Expenditures

Direct Expenditure	$	130,391,325
Indirect Expenditure	$	73,785,749
Induced Expenditure	$	507,158,111
Total	**$**	**711,335,183**

Table 3.4 Impact of 1998 Huntington Beach Direct, Indirect and Induced Expenditure on Federal Tax Receipts

Ratios of Tax Receipts to GDP are average values from 1995-1997

	Estimated 1998 Huntington Beach Total Expenditure	$	711,335,183
A.	Ratio of Income Tax Receipts to GDP		0.0861
	Estimated 1998 Federal Income Tax Revenue Generated By Total Huntington Beach Spending	$	61,278,210
B.	Ratio of Corporate Tax Receipts to GDP		0.0222
	Estimated 1998 Federal Corporate Tax Revenue Generated By Total Huntington Beach Spending	$	15,806,622
C.	Ratio of Excise Tax Receipts to GDP		0.0073
	Estimated 1998 Federal Corporate Tax Revenue Generated By Total Huntington Beach Spending	$	5,223,028
D.	Ratio of Total Tax Receipts to GDP		0.1906
	Estimated 1998 Federal Tax Revenue Generated By Total Huntington Beach Spending	**$**	**135,563,839**

Since the state economy is smaller than the national economy, the total effect of Huntington Beach spending is smaller. Nevertheless, the total impact on California's economy of Huntington Beach tourism is $329 million as shown in Table 3.5.

Table 3.5 Impact of 1998 Beach Expenditures at Huntington Beach on the CA Economy

Direct Expenditure	$	139,939,222
Indirect Expenditure	$	38,956,845
Induced Expenditure	$	160,895,602
Total	**$**	**329,791,669**

Tables 3.6 and 3.7 estimate the total sales tax impact from the direct spending ($10 million) as well as the total sales tax effect ($25.5 million).

Table 3.6 CA Sales Taxes Generated by Total Huntington Beach Spending

Jurisdiction	Rate		Revenue Generated
State (General Fund)	5.00%	$	16,489,583.45
State (Local Revenue Fund)	0.50%	$	1,648,958.35
State (Local Public Safety Fund)	0.50%	$	1,648,958.35
Local (City and County Operations)	1.00%	$	3,297,916.69
Local (County Transportation Funds)	0.25%	$	824,479.17
Orange County (Transportation)	0.50%	$	1,648,958.35
Total	**7.75%**	**$**	**25,558,854.35**

Table 3.7 CA Sales Taxes Generated by Direct Huntington Beach Expenditure

Jurisdiction	Rate		Revenue Generated
State (General Fund)	5.00%	$	6,698,488.58
State (Local Revenue Fund)	0.50%	$	669,848.86
State (Local Public Safety Fund)	0.50%	$	669,848.86
Local (City and County Operations)	1.00%	$	1,339,697.72
Local (County Transportation Funds)	0.25%	$	334,924.43
Orange County (Transportation)	0.50%	$	669,848.86
Total	**7.75%**	**$**	**10,382,657.29**

As one can see in Table 3.7 the total sales tax revenue generated from direct spending is $7.7 million.[5] However, most of the revenue goes to the State of California, not to local authorities. Table 3.8 gives a detailed breakdown of where the money is allocated by the State of California's Board of Equalization (BOE). In fact, according to the BOE, only just over $1 million goes directly to Huntington Beach. Another $1.7 million is distributed to Orange County; some of this is distributed to Huntington Beach. *In all, we estimate that only $1.1 million in sales tax revenues generated from beach activity goes back to the City of Huntington Beach.*

Table 3.8 California Sales Tax Revenue From Direct Expenditure

Jurisdiction	Rate	Revenue Generated*
1. State (General Fund)	5%	$ 5,014,142
2. State (Local Revenue Fund, Disbursed to county)	0.50%	$ 501,414
3. State (Local Public Safety Fund, Disbursed to county)	0.50%	$ 501,414
4. Orange County (Transportation)	0.50%	$ 501,414
5. Local (County Transportation Funds)	0.25%	$ 250,707
6. Local (City and County Operations, Disbursed to incorporated city	1%	$ 1,002,828
Total	**7.75%**	**$ 7,771,921**

*Revenues are calculated by multiplying direct expenditures subject to sale taxes by the various tax rates. Revenue from Items 2 and 3 are earmarked for indigent healthcare and general public safety, and are disbursed at the county level. Item 4 is a special district tax imposed and allocated to Orange County. Items 5 and 6 form the Bradley-Burns Uniform Local Sales and Use Tax. Revenues from Item 6 are distributed to the location of sale if the transaction took place in an incorporated city, or, otherwise, to the county level.

[5] Not all of the direct expenditures are subject to sales tax; for example, some food items are exempt. Our survey results were used to estimate the total expeditures subject to sales tax.

Finally, tables 3.9 and 3.10 show the estimated local tax benefits from Huntington Beach tourism. As one can see, the numbers are quite modest compared to the state and national totals, and parking fees (on valuable property) generate most of the local revenues. This result occurs for two main reasons: (1) half of all spending on beach activities occurs outside of the city, (2) as shown in table 3.9, most of the sales tax revenues go to the state, not to local governments. Including parking fees, the city receives $3.2 million in revenues. If indirect and induced effects are added, the number increases to $4.8 million.

Table 3.9 Local Revenues From Direct Expenditures

Direct Sales Tax Revenue to Orange County	$	1,754,950
Huntington Beach Population as a Percentage of Orange County		x 0.07
Estimated Sales Tax Revenue to Huntington Beach disbursed by the county	$	122,846
Direct Sales Tax Revenue to Huntington Beach	$	1,002,828
Revenue from Parking and Entrance Fees	$	2,076,679
Total Local Revenue from Direct Expenditures	**$**	**3,202,354**

Table 3.10 Local Revenues From Total (Direct and Indirect) Expenditures

Total CA Sales Tax Revenue from Direct and Indirect Expenditures	$	18,702,111
Percent of Sales Tax Revenue to County Level		x 0.226
Total Sales Tax Revenue to Orange County	$	4,223,057
Huntington Beach Population as a Percentage of Orange County		x 0.07
Estimated Sales Tax Revenue to Huntington Beach Disbursed from County Level	$	295,614
Proportion of Sales Tax Revenue Allocated to City		x 0.129
Huntington Beach Sales Tax Revenue	$	2,413,176
Revenue from Parking and Entrance Fees	$	2,076,679
Total Local Revenue from Direct and Indirect Expenditures	**$**	**4,785,469**

4. Conclusion

Our study indicates that the impact that California's beaches has on the state and national economy, which was substantial in 1995, has grown significantly. California's beaches contribute $73 billion to the national economy and generate $14 billion in tax revenues for the federal government. In comparison, California only received $10 million in shore protection appropriations from fiscal year 1995-1999. In terms of overall federal spending for shoreline preservation, California ranks eighth out of eleven states receiving funds. When compared with Delaware, a state ranking just behind California in overall federal funding, California generates twenty times more economic activity per federal dollar appropriated than Delaware. When compared to New York or New Jersey, the largest recipients of federal shoreline funding, California receives roughly 75 times *fewer* dollars per mile of coastline than New York or New Jersey.

Our study of Huntington Beach indicates that much of the federal and state tax revenues generated by local beach communities does not go back to local communities. In our survey in Huntington Beach, one-half of all spending on beach activities occurred outside the city. Further, many of the tax dollars generated within the city go to state and federal authorities. Overall, Huntington Beach's beaches generated $135 million in federal tax revenues and $25 million in sales tax revenues compared to only $4.8 million in local revenues from sales taxes and parking fees.

Appendix 1: Detailed Results from the Huntington Beach Survey

Table A.1 Huntington Beach Pier

Category	Number of Parties	Number of People	Percent of Total	Avg. Daily Expenditure per Party	Avg. Daily Expenditure per Person	Avg. Percent of Expenditure in Huntington Beach
Local	5	10	20%	$5.20	$2.60	80%
Less Than 60 Miles	4	15	31%	$16.25	$4.33	95%
In-State, > 60 Miles	3	9	18%	$36.00	$12.00	77%
Out of State	7	14	29%	$68.29	$34.15	100%
Out of Country	1	1	2%	$18.00	$18.00	80%
Totals	20	49	100%	$34.75	$14.18	89.76%*

Table A.2 City Beach

Category	Number of Parties	Number of People	Percent of Total	Avg. Daily Expenditure per Party	Avg. Daily Expenditure per Person	Avg. Percent of Expenditure in Huntington Beach
Local	5	12	11%	$22.50	$9.38	57.50%
Less Than 60 Miles	12	50	48%	$56.33	$13.52	64.58%
In-State, > 60 Miles	3	12	11%	$198.33	$49.58	68.33%
Out of State	8	27	26%	$103.13	$30.56	48.75%
Out of Country	2	4	4%	$125.00	$62.50	34.00%
Totals	30	105	100%	$81.95	$23.41	58.97%*

Table A.3 North of Pier

Category	Number of Parties	Number of People	Percent of Total	Avg. Daily Expenditure per Party	Avg. Daily Expenditure per Person	Avg. Percent of Expenditure in Huntington Beach
Local	3	6	11%	$10.00	$5.00	33.33%
Less Than 60 Miles	10	30	53%	$15.60	$5.20	34.50%
In-State, > 60 Miles	2	13	23%	$55.00	$8.46	20.00%
Out of State	3	5	9%	$56.67	$34.00	36.00%
Out of Country	1	3	5%	$15.00	$5.00	100.00%
Totals	19	57	100%	$25.32	$8.44	34.65%*

Table A.4 Huntington State Beach

Category	Number of Parties	Number of People	Percent of Total	Avg. Daily Expenditure per Party	Avg. Daily Expenditure per Person	Avg. Percent of Expenditure in Huntington Beach
Local	1	2	1%	$20.00	$10.00	100.00%
Less Than 60 Miles	14	105	73%	$49.00	$6.53	10.43%
In-State, > 60 Miles	2	5	3%	$105.00	$42.00	4.00%
Out of State	3	31	22%	$326.00	$31.55	36.67%
Out of Country	0	0	0%	$ -	$ -	0.00%
Totals	20	143	100%	$94.70	$13.24	17.14%*

Table A.5 City Beach, South End

Category	Number of Parties	Number of People	Percent of Total People	Avg. Daily Expenditure per Party	Avg. Daily Expenditure per Person	Avg. Percent of Expenditure in Huntington Beach
Local	4	23	22%	$12.20	$2.12	100.00%
Less Than 60 Miles	14	74	70%	$35.23	$6.67	46.07%
In-State, > 60 Miles	0	0	0%	$ -	$ -	0.00%
Out of State	2	9	8%	$35.00	$7.78	52.00%
Out of Country	0	0	0%	$ -	$ -	0.00%
Totals	20	106	100%	$30.60	$5.77	58.28%*

Appendix 2 : Distribution of Funds Generated by Sales and Use Taxes in Orange County

The sales tax rate in Orange County is 7.75%, which can be broken down into its components of the standard statewide sales tax rate of 7.25%, and the Orange County special district transactions and use tax of 0.5%.

The standard statewide tax can be further decomposed into the sales and use tax portion (6%), and the Bradley-Burns Uniform Local Sales and Use Tax (1.25%). The destination of the funds generated by these components are given in the table below.

Orange County Sales and Use Tax Revenue Distribution		
Sales and Use Tax	5%	General Fund
	0.5%	Local Revenue Fund
	0.5%	Local Public Safety Fund
Bradley-Burns	1%	County and Incorporated City General Fund
	0.25%	County Transportation Funds
District Transactions and Use Tax	0.5%	Orange County Local Transportation Authority
Total	**7.75%**	
Sources: California State Board of Equalization Annual Report 1998, Appendix Table 2. CA Board of Equalization, California City and County Sales and Use Tax Rates, April 1999.		

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MILLIMAN REPORT

Market Value at Risk from Sea Level Rise in selected California cities

January 11, 2023

Andrew Pai, FCAS, MAAA
Matt Chamberlain, FCAS, CSPA, MAAA

Contents

Background

The California Coastal Commission (CCC) has authority regarding land use in California in the Coastal Zone, a region of California extending inland from the coast up to five miles. The CCC was initially established in 1972 through voter initiative Proposition 20. The California Coastal Act of 1976 (Coastal Act) later made the CCC permanent. Broadly speaking, the CCC assists coastal cities and counties in the planning and regulation of land and water use in the Coastal Zone. The Coastal Zone was also established by the Coastal Act and does not include the San Francisco Bay, where the Bay Conservation and Development Commission regulates development.[1]

In response to concerns about the CCC's recommendations, Smart Coast California (Smart Coast) was established in 2019 as a 501(c)6 to promote and advocate for private property rights in the Coastal Zone. Smart Coast engaged Milliman, Inc. (Milliman) in November 2021 to assist in synthesizing some of the material used and promulgated by the CCC. The scope of this work focused on understanding the information used by the CCC and local planners in the Local Coastal Program amendment process. We reviewed four sea level rise studies that were pertinent to the CCC's work over the past decade and examined seven climate change vulnerability studies performed for various California coastal cities. We also reviewed the CCC's guidance on incorporating sea level rise considerations into Local Coastal Programs.

In July 2022, Smart Coast requested that Milliman perform an analysis evaluating the residential market value potentially affected by sea level rise in selected communities. This report is the result of that analysis.

Executive Summary

This study quantified the residential market value that may be affected by flooding under different sea level rise and storm scenarios. It includes the cities of Carlsbad, Coronado, Santa Barbara, Santa Cruz, and Imperial Beach. As the sea level rises, some coastal properties may be threatened and could be inhabitable or have future increased risk of flood damage . One option to address this risk is managed retreat, which can include purchasing properties from owners or the taking of private property via eminent domain, which requires just compensation. This study estimates this cost by comparing the market value of affected coastal properties under different scenarios and compares them to current city budgets.

The key findings addressed in this report are:

- Sea level rise has different implications for each city reviewed. The cities of Coronado and Imperial Beach are the most affected among the cities included. The cities of Santa Barbara and Santa Cruz are less affected, while residential property in Carlsbad is not affected in the scenarios we considered. For this analysis, a property is affected if more than half of the building footprint intersects the hazard scenario.
- When sea level rise is small, the main cause of flood damage is storms and in particular infrequent storms such as a 100-year storm[2]. However, as sea level rise increases, residential properties may be affected even without a storm.
- In some cities condominiums are less at risk than single family home or multi-family dwellings.
- There is considerable uncertainty in trying to estimate when sea level rise will occur and by what amount. It can be helpful to think about the potential impact from different amounts of sea level rise, instead of forecasting when sea level rise will occur.

Data and Methodology

In order to evaluate the market value that may be affected for coastal properties under different sea level rise and storm scenarios, residential property and hazard model scenario data are required. The following section first details the data vendors used for this study. We then explain how we identify properties at risk under different scenarios.

[1] "Our Mission," California Coastal Commission. Accessed February 14, 2022. https://www.coastal.ca.gov/whoweare.html

[2] A-100 year storm is a storm that has a chance of occurring of 1% each year.

Data Sources

The residential property data were provided by LightBox, a company that provides geographical, spatial, and environmental building data to its customers. For this study, we ordered parcel, building, assessment, and building footprint data for properties located in the counties that contain the cities defined in the scope section. Only residential properties, including single family, condominium, townhouse, duplex, etc., are the subject of the study. Other properties such as commercial and timeshare residential properties are excluded from the analysis. The fair market values of the residential properties are estimated using Automated Valuation Model (AVM) data provided by LightBox[3]. AVMs use information such as property characteristics and sales data to estimate property market values.

The hazard data were provided by the Coastal Storm Modeling System (CoSMoS), developed by the United States Geological Survey (USGS). CoSMoS has been used for local coastal planning efforts in California, including municipalities, major utilities, California state agencies, and the federal government. The model provides predictions of coastal flooding due to various sea level rise and storm scenarios over large geographic areas. Sea level rise scenarios are available from zero to two meters[4] and there is an additional five-meter scenario. We did not include the five-meter scenario in this study since the latest sea level rise projections consider that less likely to occur in the near future. The storm scenarios are available for return periods from zero to 100-years.

Methodology

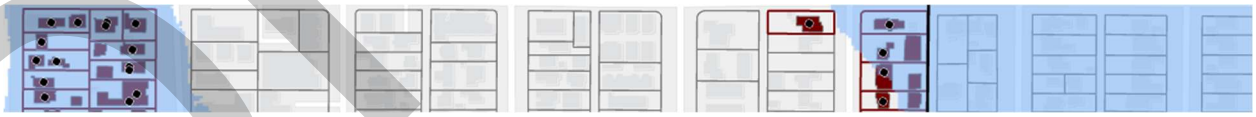
We identified residential properties affected by the combination of each sea level rise and storm scenarios as follows:

- Start with all parcel data from LightBox and filter down to only those parcels within or intersecting city boundaries.

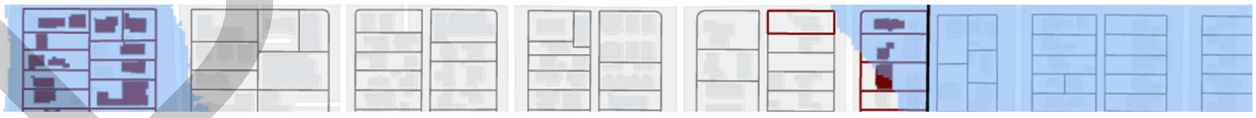
- Choose parcels that intersected with hazard scenario from CoSMoS, shown in blue

- Identify buildings that are within these at-risk, residential parcels.

- Filter buildings down to only those with address points, in order to relate buildings to assessed values.



- Select buildings that have more than half of their area within the hazard polygon. These buildings are considered affected by the hazard scenario.



Note that in some cases, buildings that are not located within the cities in the scope may be included, because part of the parcel is located within the city.

3 Modeled by Black Knight, inc. using their propriety model EZVal. We used model version 6.45.20 released on March 18th, 2022, and currently evaluates 14 different property types.

4 The metric system is used throughout the report. 1 meter is about 3.28 feet.

Market Value affected by Sea Level Rise

The following section reviews the fair market value of residential properties affected under different sea level rise and storm scenarios and compares them to city budgets. It is important to note that this analysis considers a property "affected" if more than half of the building footprint intersects the hazard scenario, but does not evaluate the impact of the hazard scenario on the building, which can vary. For example, we do not assess the flood depth for each scenario and how much damage is produced, which would vary with flood depth. This could be especially important for high rise structures.

City of Coronado

- County: San Diego
- Fiscal year 2022-2023 budget: $107.6 million[5]
- Number of residential properties included in study: 6,935
- Fair market value of residential properties included in study: $16.1 billion
- Distribution of property types included in study
  - Single family home: 52.3%
  - Condominium[6]: 45.6%
  - Townhouse: 0.0%
  - Duplex, triplex, and other multi-family dwellings: 5.1%

Table 1, below, displays the fair market value and number of residential properties affected under each sea level rise and storm scenario.

Table 1. Market Value and Number of Residential Locations Affected- City of Coronado

Sea Level Rise (meter)	0-Year Storm		20-Year Storm		100-Year Storm	
	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations
0.00	$0	0	$0	0	$0	0
0.25	0	0	0	0	55	11
0.50	0	0	27	12	649	181
0.75	10	2	256	102	2,091	641
1.00	867	260	1,018	331	3,164	1,001
1.50	2,782	935	3,031	1,037	3,888	1,256
2.00	4,250	1,444	4,357	1,505	5,445	1,908

As shown in Table 1, no residential properties in the city of Coronado would be affected without sea level rise, even in the event of a 100-year storm. However, once sea level rise reaches 0.25 meters, a 100-year storm would affect residential properties worth more than half of the 2022-2023 city budget of $107.6 million. If sea level rise were to reach 1 meter, 3.7% of all residential properties would be affected, with a value of $867 million, even without a storm. Under the most extreme scenario considered, which is 2 meters in sea level rise and a 100-year storm, 28% of residential properties would be affected, worth over $5.4 billion.

[5] "Fiscal Year 2022-2023 Operating Budget," City of Coronado.

[6] Throughout this study location counts for condominiums are for number of units, not number of buildings. In some cases more than one unit can be in a building.

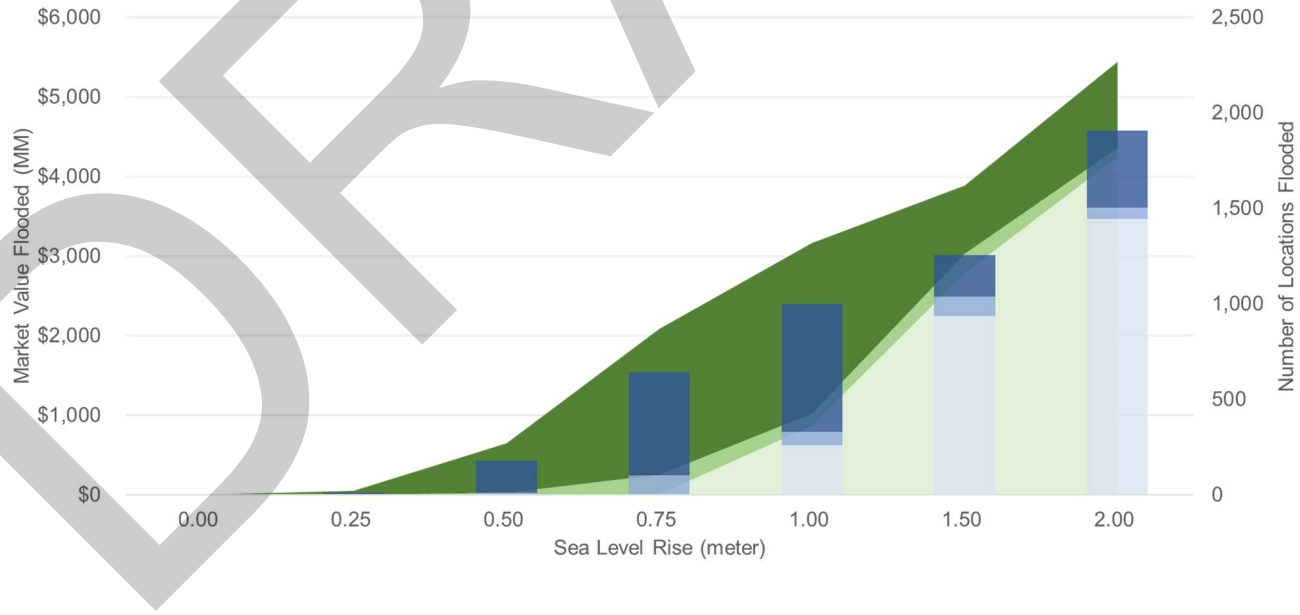
Table 2. Percent of buildings affected by property type – City of Coronado									
	Single Family Home			Condominium			Townhouse, Duplex, and Other		
Sea Level Rise (meter)	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm
0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.25	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.50	0.0%	0.3%	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
0.75	0.1%	2.7%	17.2%	0.0%	0.1%	0.4%	0.0%	0.0%	1.7%
1.00	7.1%	9.0%	25.8%	0.0%	0.2%	1.7%	0.0%	0.0%	3.7%
1.50	22.7%	25.8%	31.8%	3.7%	3.7%	8.0%	1.1%	2.0%	7.7%
2.00	35.3%	36.9%	43.5%	4.4%	4.4%	9.7%	8.8%	9.7%	12.8%

As shown in Table 2, single family homes in Coronado are more affected than other property types.

In Figure 1, below, the line graphs represent the market value of residential properties affected by sea level rise for different storm scenarios. Light green corresponds to no storm, the darker green corresponds to a 20-year storm, and the darkest green corresponds to a 100-year storm. The primary y-axis, on the left, shows the market values.

The bars, in blue, represent number of residential properties affected by sea level rise for different storm scenarios. Light blue corresponds to no storm, the darker blue to a 20-year storm, and the darkest blue to a 100-year storm. The secondary y-axis, on the right, shows the number of locations affected.

Figure 1. Fair market value and number of affected residential properties – City of Coronado



As shown in Figure 1, it can be seen that up to one meter sea level rise, the majority of residential properties are affected as a result of storms. As sea level increases above one meter most affected properties are affected even without a storm. For example, a 1.5-meter sea level rise affects nearly as many residential properties as a 100-year

storm, coupled with one meter of sea level rise. Once sea level rise reaches two meters, the damage exceeds what a 100-year storm causes under other sea level rise scenarios.

City of Imperial Beach

- County: San Diego
- Fiscal year 2022-2023 budget: $39.7 million[7]
- Number of residential properties included in study: 5,365
- Fair market value of residential properties included in study: $4.4 billion
- Distribution of property types included in study
  - Single family home: 51.7%
  - Condominium: 29.7%
  - Townhouse: 0.0%%
  - Duplex, triplex, and other multi-family dwellings: 18.6%

Table 3. Market Value and Number of Residential Buildings Affected - City of Imperial Beach

Sea Level Rise (meter)	0-Year Storm		20-Year Storm		100-Year Storm	
	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations
0.00	$9	10	$50	56	$46	52
0.25	15	17	56	63	77	86
0.50	19	22	68	77	137	151
0.75	44	49	93	104	245	273
1.00	55	62	174	188	314	334
1.50	107	119	317	338	446	477
2.00	334	378	487	521	651	685

As shown in Table 3, residential properties in the city of Imperial Beach are affected by storm scenarios even without sea level rise. A 20-year storm today could affect residential properties worth $50 million, exceeding the 2022-2023 city budget of $39.7 million. Once sea level rise reaches 0.75 meters, it could affect residential properties worth more than the city budget, even without a storm event. Under the most extreme scenario we considered, around 12.7% of residential properties of the city would be affected, worth more than $446 million.

Table 4. Percent of buildings affected by property type – City of Imperial Beach

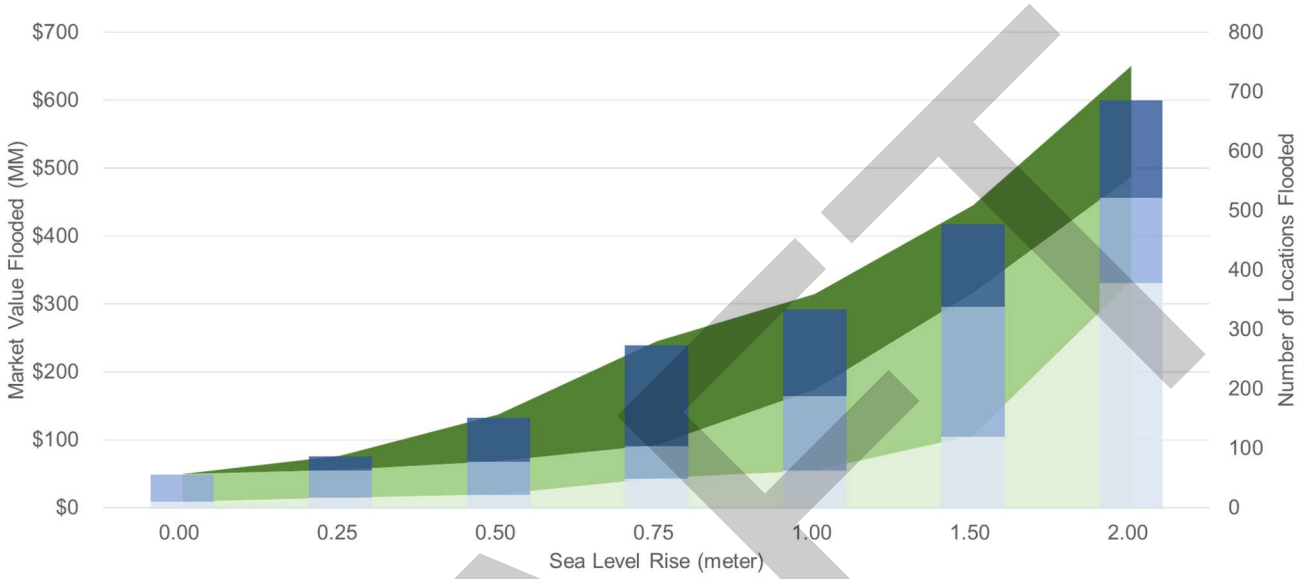
Sea Level Rise (meter)	Single Family Home			Condominium			Townhouse, Duplex, and Other		
	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm
0.00	0.4%	2.0%	1.7%	0.0%	0.1%	0.1%	0.0%	0.0%	0.5%
0.25	0.5%	2.1%	2.4%	0.1%	0.1%	0.2%	0.3%	0.4%	1.6%
0.50	0.5%	2.4%	4.0%	0.1%	0.2%	1.0%	0.6%	0.8%	2.3%
0.75	1.1%	3.0%	6.2%	0.2%	0.3%	3.8%	1.6%	1.8%	4.1%
1.00	1.4%	4.4%	7.5%	0.4%	1.9%	4.1%	1.7%	3.6%	6.2%
2.00	8.4%	11.1%	13.7%	4.2%	6.3%	9.0%	7.9%	11.3%	16.2%

As shown in Table 4, a similar proportion of single-family home, townhouse, duplex, and other occupancies are affected by sea level rise. Just as in Coronado and Imperial Beach, condominiums are affected less than other property types. However, the degree of difference is smaller. Under the two-meter scenario with a 100-year storm in Coronado 43.6%

[7] "2022-2023 Biennial Budget" City of Imperial Beach.

of single-family homes and 9.7% of condominiums are affected, while in Imperial Beach 13.7% of single family homes and 9.0% of condominiums are affected.

Figure 2. Fair market value and number of affected residential properties – City of Imperial Beach



As shown in Figure 2, most properties are affected by storms until sea level rise reaches 2 meters, at which point most affected properties are affected even without a storm.

City of Santa Barbara

- County: Santa Barbara
- Fiscal year 2022-2023 budget: $477.1 million[8]
- Number of residential properties included in study: 20,184
- Fair market value of residential properties included in study: $20.2 billion
- Distribution of property types included in study
  - Single family home: 71.0%
  - Condominium: 17.8%
  - Townhouse: 0.0%%
  - Duplex, triplex, and other multi-family dwellings: 11.2%

Table 5. Market Value and Number of Residential Buildings Affected - City of Santa Barbara

Sea Level Rise (meter)	0-Year Storm		20-Year Storm		100-Year Storm	
	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations
0.00	$0	0	$0	0	$0	0
0.25	0	0	0	0	0	0
0.50	0	0	0	0	0	0
0.75	0	0	0	0	0	0
1.00	0	0	0	0	2	1
1.50	2	1	11	5	26	19
2.00	24	15	47	36	408	477

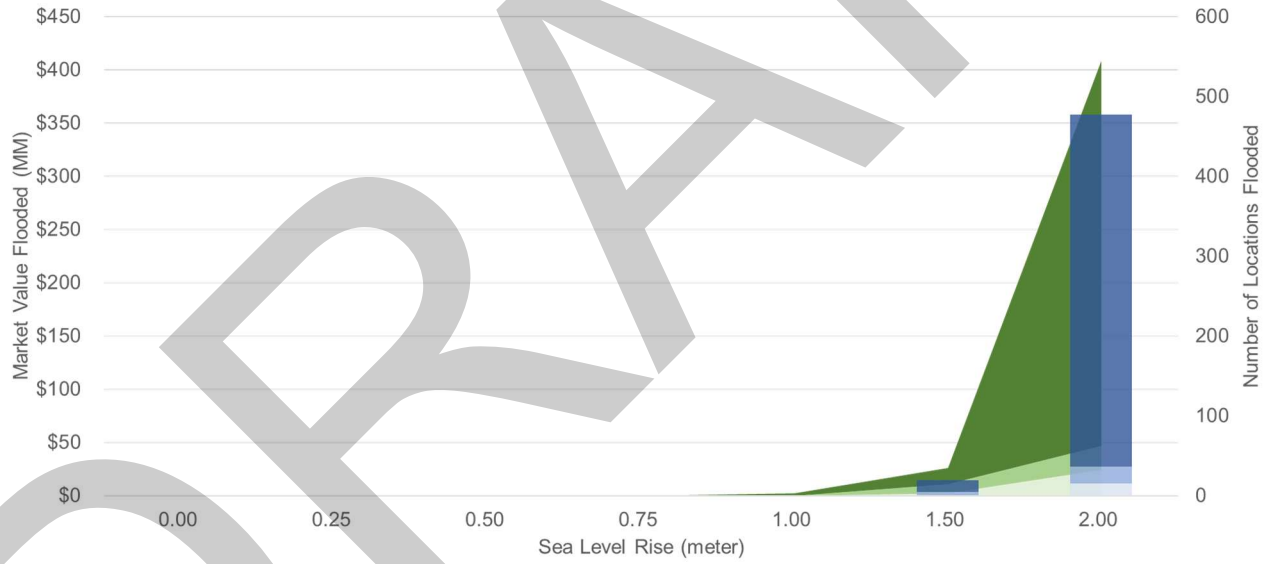
[8] "Summary of Revenues by Fund", https://stories.opengov.com/santabarbara/published/h7l_sMbTl.

In contrast to the cities of Coronado and Imperial Beach, Santa Barbara is less affected by sea level rise. It is not until a 1-meter sea level rise, coupled with a 100-year storm, that any residential properties are affected. Under the most extreme scenario considered, the fair market value of all residential property affected is roughly $408 million, which is less than the city's 2022-2023 fiscal year budget.

Table 6. Percent of buildings affected by property type – City of Santa Barbara

	Single Family Home			Condominium			Townhouse, Duplex, and Other		
Sea Level Rise (meter)	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm
0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.50	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.75	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1.50	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	0.3%
2.00	0.0%	0.0%	0.6%	0.1%	0.5%	9.9%	0.4%	0.5%	1.9%

Figure 3. Fair market value and number of affected residential properties – City of Santa Barbara



As shown in Figure 3, even with up to two meters of sea level rise very few properties affected without a storm. However, sea level rise does enable storm, especially the 100-year storms, to affect many properties that are unaffected in the absence of sea level rise.

City of Santa Cruz

- County: Santa Cruz
- Fiscal year 2022-2023 budget: $421.2 million[9]
- Number of residential properties included in study: 14,449
- Fair market value of residential properties included in study: $18.6 billion

[9] "FY 2023 Annual Budget", City of Santa Cruz.

- Distribution of property types included in study
  - Single family home: 76.4%
  - Condominium: 9.0%
  - Townhouse: 6.6%%
  - Duplex, triplex, and other multi-family dwellings: 8.0%

Table 7. Market Value and Number of Residential Buildings Affected - City of Santa Cruz

Sea Level Rise (meter)	0-Year Storm		20-Year Storm		100-Year Storm	
	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations	Fair Market Value (MM)	Number of Locations
0.00	$0	0	$0	0	$0	0
0.25	0	0	0	0	0	0
0.50	0	0	0	0	0	0
0.75	0	0	0	0	0	0
1.00	0	0	0	0	0	0
1.50	0	0	0	0	0	0
2.00	0	0	0	0	39	45

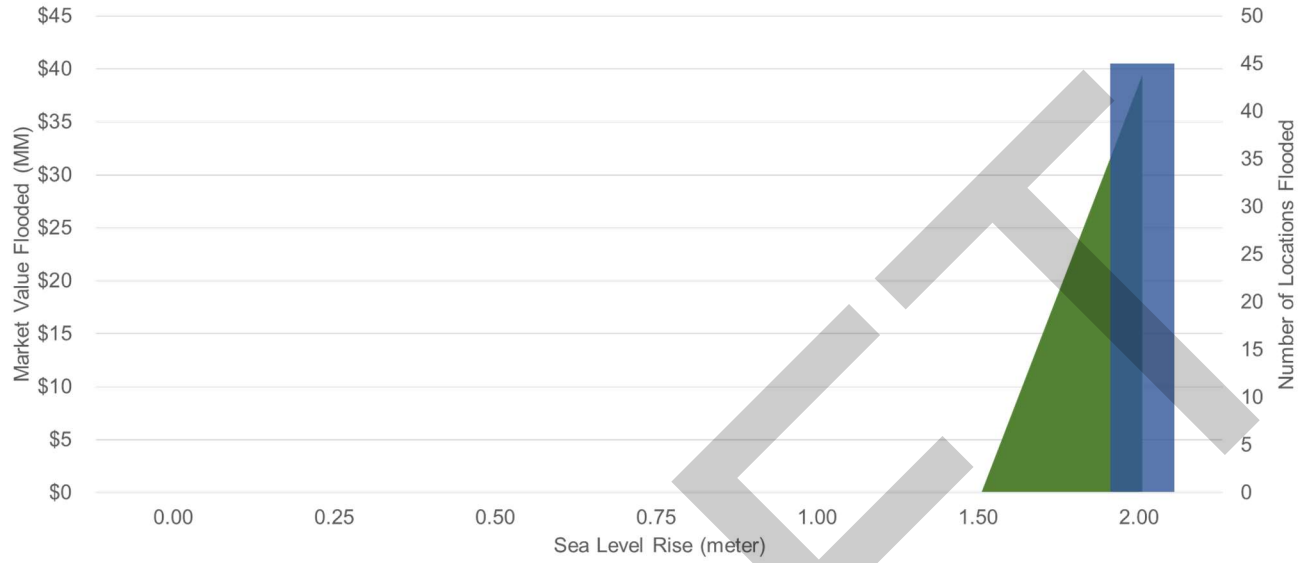
For the city of Santa Cruz, no residential property is affected except in the most extreme scenario considered, two-meters of sea level rise and a 100-year storm. This scenario would affect $39 million worth of residential properties compared to the city's 2022-2023 budget of $421 million.

Table 8. Percent of buildings affected by property type – City of Santa Cruz

Sea Level Rise (meter)	Single Family Home			Condominium			Townhouse, Duplex, and Other		
	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm	0-Year Storm	20-Year Storm	100-Year Storm
0.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.50	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.75	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1.50	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2.00	0.0%	0.0%	0.3%	0.0%	0.0%	0.2%	0.0%	0.0%	0.6%

As shown in Table 8, less than one percent of buildings are affected in any scenario.

Figure 4. Fair market value and number of affected residential properties – City of Santa Cruz



The results for Santa Cruz are similar to Santa Barbara in that sea level rise enables the possibility of properties being affected by 100-year storms that would not be affected in the absence of sea level rise.

City of Carlsbad

- County: San Diego
- Fiscal year 2022-2023 budget: $342.3 million[10]
- Number of residential properties included in study: 36,624
- Fair market value of residential properties included in study: $45.8 billion
- Distribution of property types included in study
  - Single family home: 71.7%
  - Condominium: 26.8%
  - Townhouse: 0.0%%
  - Duplex, triplex, and other multi-family dwellings: 1.5%

The city of Carlsbad is the least affected city we reviewed. No residential property is affected even under the most extreme scenario of 2-meter sea level rise with a 100-year storm. As a result, no tables or figures are included for this city.

Appendices

- Enclosed Appendix A shows the market value and number of residential buildings affected by property type.
- Enclosed Appendices B to F show maps of which residential buildings are affected in all of the scenarios considered.

[10] "Fiscal Year 2022-23 Budget", City of Carlsbad.

Limitations

Use of Report

The data and exhibits in this report are provided to support the conclusions contained herein, limited to the scope of work specified by Smart Coast, and may not be suitable for other purposes. Milliman is available to answer any questions regarding this report or any other aspect of our review.

Data Reliances.

In performing this analysis we relied upon information obtained from Smart Coast, CoSMoS, LightBox and other publicly available information. We have not audited or verified this data and information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. In that event, the analysis may not be suitable for its intended purpose.

Uncertainty.

Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for the analyses. It is certain that actual experience will not conform exactly to the assumptions to be used in these analyses. Actual amounts will differ from projected amounts to the extent that actual experience is better or worse than expected.

Model Reliance.

Our analysis is based on the CoSMoS model. To the extent that the model is biased, the results of our analysis may be biased.

Variability of Results.

Any projection of future insurance costs or asset values involves estimates of future contingencies. While our analysis will be based on sound actuarial principles, it is important to note that variation from the projected result is not only possible, but, in fact, probable. While the degree of such variation cannot be quantified, it could be in either direction from the projections. Such uncertainty is inherent in any set of actuarial projections.

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CONTACT

Andrew Pai
andrew.pai@milliman.com

Matt Chamberlain
matt.chamberlain@milliman.com

Smart Coast California

Fair Market Value of Buildings Flooded
City of Carlsbad

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

Smart Coast California

Number of Buildings Flooded
City of Carlsbad

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

Smart Coast California

Fair Market Value of Buildings Flooded
City of Coronado

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	10	0	0	0	0	0	0	10
1.00	865	2	0	0	0	0	0	867
1.50	2,613	152	2	0	0	0	15	2,782
2.00	3,970	188	8	0	0	0	85	4,250

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	27	0	0	0	0	0	0	27
0.75	250	7	0	0	0	0	0	256
1.00	1,010	8	0	0	0	0	0	1,018
1.50	2,879	134	4	0	0	0	14	3,031
2.00	4,069	188	12	0	0	0	89	4,357

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	55	0	0	0	0	0	0	55
0.50	639	0	0	0	0	0	10	649
0.75	2,043	20	0	0	0	0	28	2,091
1.00	3,040	74	2	0	0	0	47	3,164
1.50	3,694	111	8	0	0	0	75	3,888
2.00	4,796	511	14	0	0	0	124	5,445

Smart Coast California

Number of Buildings Flooded
City of Coronado

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	2	0	0	0	0	0	0	2
1.00	259	1	0	0	0	0	0	260
1.50	823	108	1	0	0	0	3	935
2.00	1,282	131	4	0	0	0	27	1,444

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	12	0	0	0	0	0	0	12
0.75	98	4	0	0	0	0	0	102
1.00	326	5	0	0	0	0	0	331
1.50	938	92	2	0	0	0	5	1,037
2.00	1,340	131	5	0	0	0	29	1,505

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	11	0	0	0	0	0	0	11
0.50	179	0	0	0	0	0	2	181
0.75	623	12	0	0	0	0	6	641
1.00	938	50	1	0	0	0	12	1,001
1.50	1,155	74	4	0	0	0	23	1,256
2.00	1,578	285	6	0	0	0	39	1,908

Smart Coast California

Fair Market Value of Buildings Flooded
City of Imperial Beach

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$9	$0	$0	$0	$0	$0	$0	$9
0.25	12	1	0	0	0	0	3	15
0.50	13	1	1	0	0	0	5	19
0.75	26	2	3	0	0	0	12	44
1.00	34	4	4	0	0	0	12	55
1.50	64	7	5	0	0	0	31	107
2.00	205	46	26	0	0	0	57	334

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$49	$1	$0	$0	$0	$0	$0	$50
0.25	51	1	0	0	0	0	4	56
0.50	59	2	3	0	0	0	5	68
0.75	72	3	3	0	0	0	14	93
1.00	108	27	10	0	0	0	30	174
1.50	192	53	15	0	0	0	56	317
2.00	290	77	37	0	0	0	84	487

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$41	$1	$1	$0	$0	$0	$4	$46
0.25	59	2	3	0	0	0	12	77
0.50	100	12	8	0	0	0	16	137
0.75	154	48	10	0	0	0	33	245
1.00	196	51	16	0	0	0	52	314
1.50	264	74	33	0	0	0	76	446
2.00	357	116	57	0	0	0	122	651

Smart Coast California

Number of Buildings Flooded
City of Imperial Beach

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	10	0	0	0	0	0	0	$10
0.25	13	1	0	0	0	0	3	17
0.50	15	1	1	0	0	0	5	22
0.75	30	3	4	0	0	0	12	49
1.00	39	6	5	0	0	0	12	62
1.50	73	10	6	0	0	0	30	119
2.00	232	67	27	0	0	0	52	378

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	55	1	0	0	0	0	0	$56
0.25	58	1	0	0	0	0	4	63
0.50	66	3	3	0	0	0	5	77
0.75	82	4	4	0	0	0	14	104
1.00	122	30	9	0	0	0	27	188
1.50	204	69	15	0	0	0	50	338
2.00	307	101	39	0	0	0	74	521

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	46	1	1	0	0	0	4	$52
0.25	67	3	4	0	0	0	12	86
0.50	112	16	8	0	0	0	15	151
0.75	171	61	10	0	0	0	31	273
1.00	207	65	16	0	0	0	46	334
1.50	280	97	34	0	0	0	66	477
2.00	381	143	58	0	0	0	103	685

Smart Coast California

Fair Market Value of Buildings Flooded
City of Santa Barbara

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	2	0	0	0	0	0	2
2.00	2	7	15	0	0	0	0	24

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	7	3	0	0	0	0	11
2.00	4	24	19	0	0	0	0	47

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	2	0	0	0	0	0	2
1.50	3	12	11	0	0	0	0	26
2.00	84	278	46	0	0	0	0	408

Smart Coast California

Number of Buildings Flooded
City of Santa Barbara

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	1	0	0	0	0	0	1
2.00	2	4	9	0	0	0	0	15

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	4	1	0	0	0	0	5
2.00	5	19	12	0	0	0	0	36

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	1	0	0	0	0	0	1
1.50	3	9	7	0	0	0	0	19
2.00	81	354	42	0	0	0	0	477

Smart Coast California

Fair Market Value of Buildings Flooded
City of Santa Cruz

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

20-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	$0	$0	$0	$0	$0	$0	$0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	25	1	4	2	4	0	3	39

Smart Coast California

Number of Buildings Flooded
City of Santa Cruz

0-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

20-Year Storm

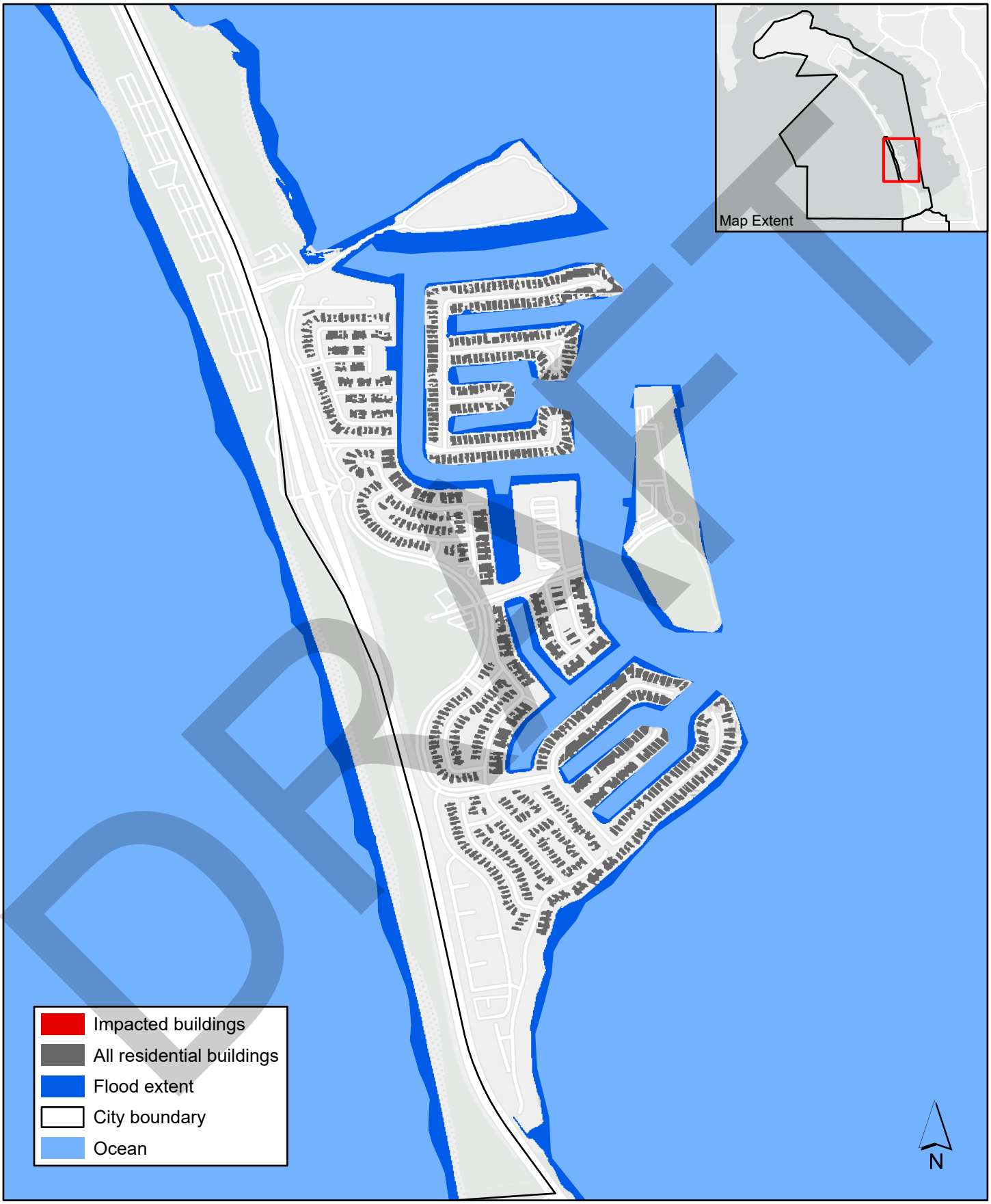
Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	0	0	0	0	0	0	0	0

100-Year Storm

Sea Level Rise (meter)	Single Family Home	Condominiums	Duplex	Triplex	Quadruplex	Townhouse	Multi-Family Dwellings	Total
0.00	0	0	0	0	0	0	0	$0
0.25	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0
2.00	30	2	5	2	4	0	2	45

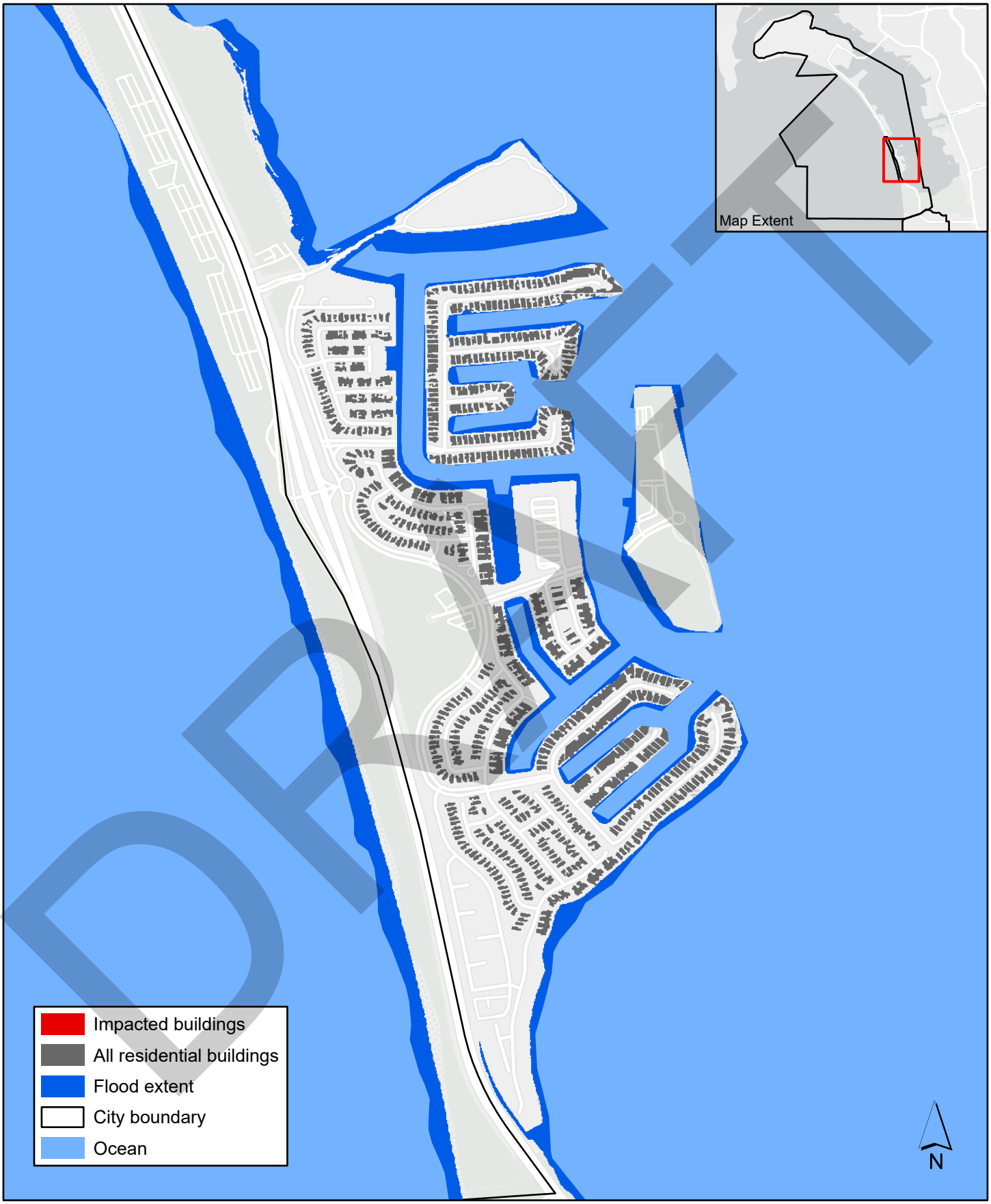
Coronado Area 1

Sea Level Rise 0.0 m - No storm



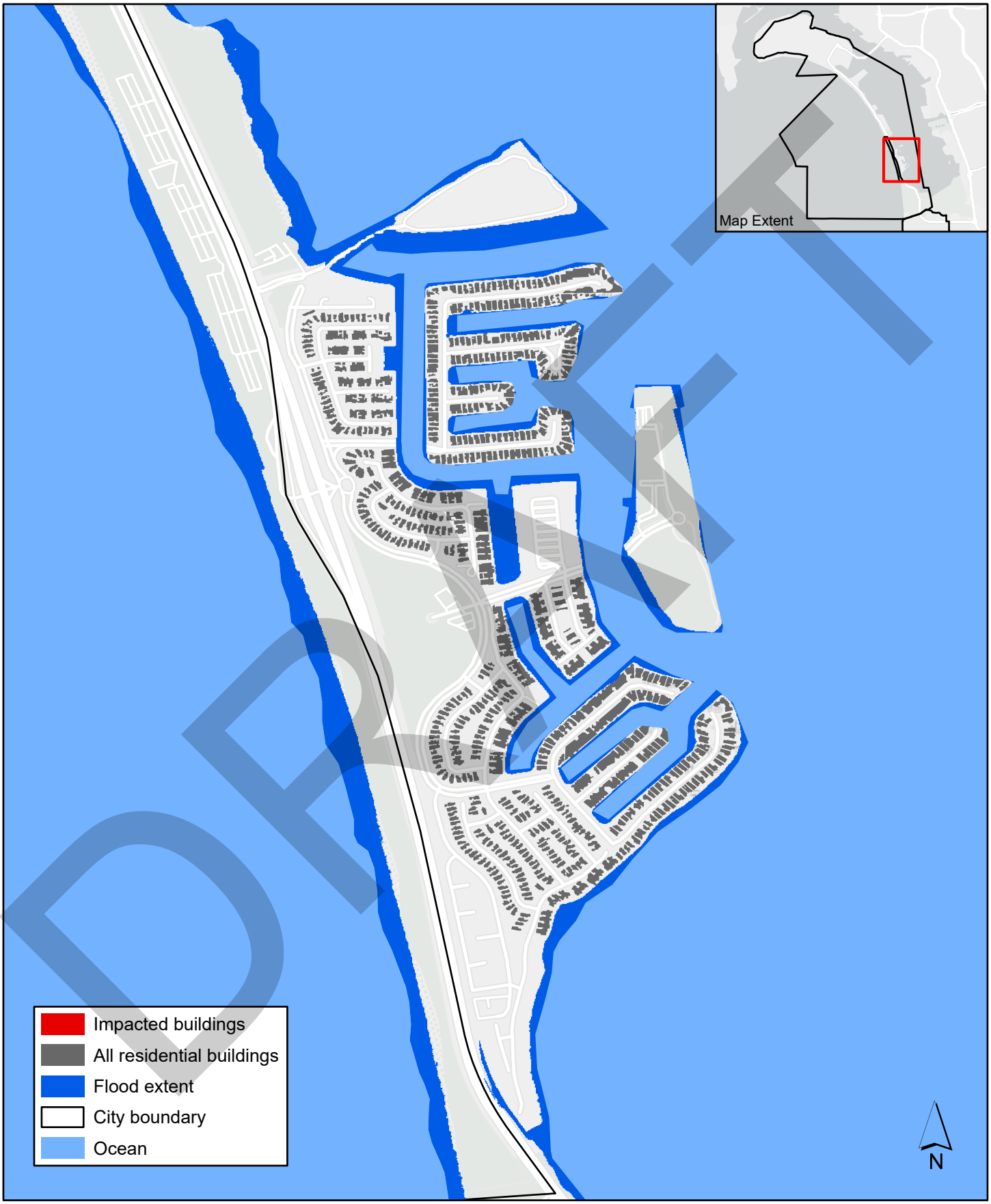
Coronado Area 1

Sea Level Rise 0.0 m - 001 year storm



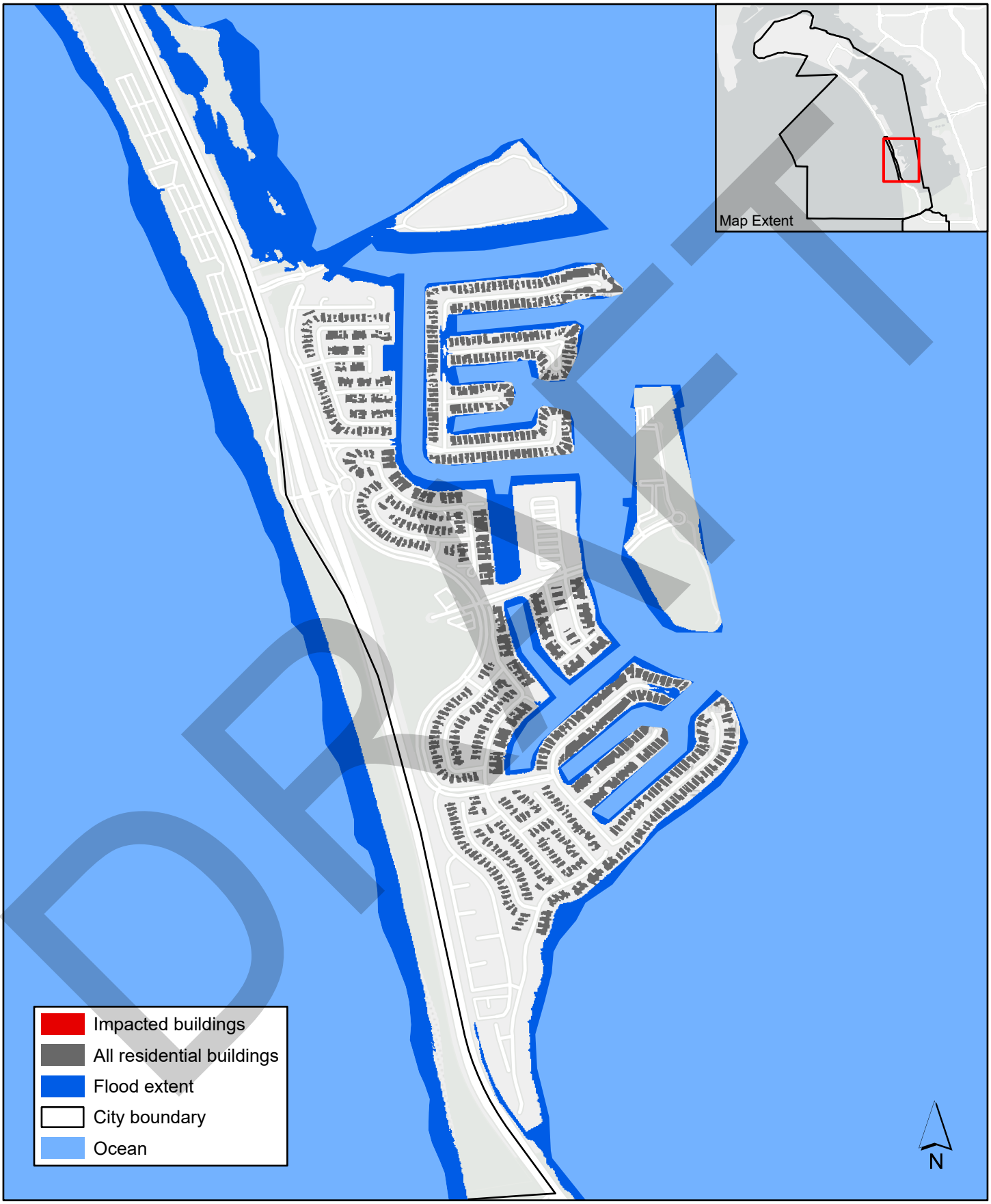
Coronado Area 1

Sea Level Rise 0.0 m - 020 year storm



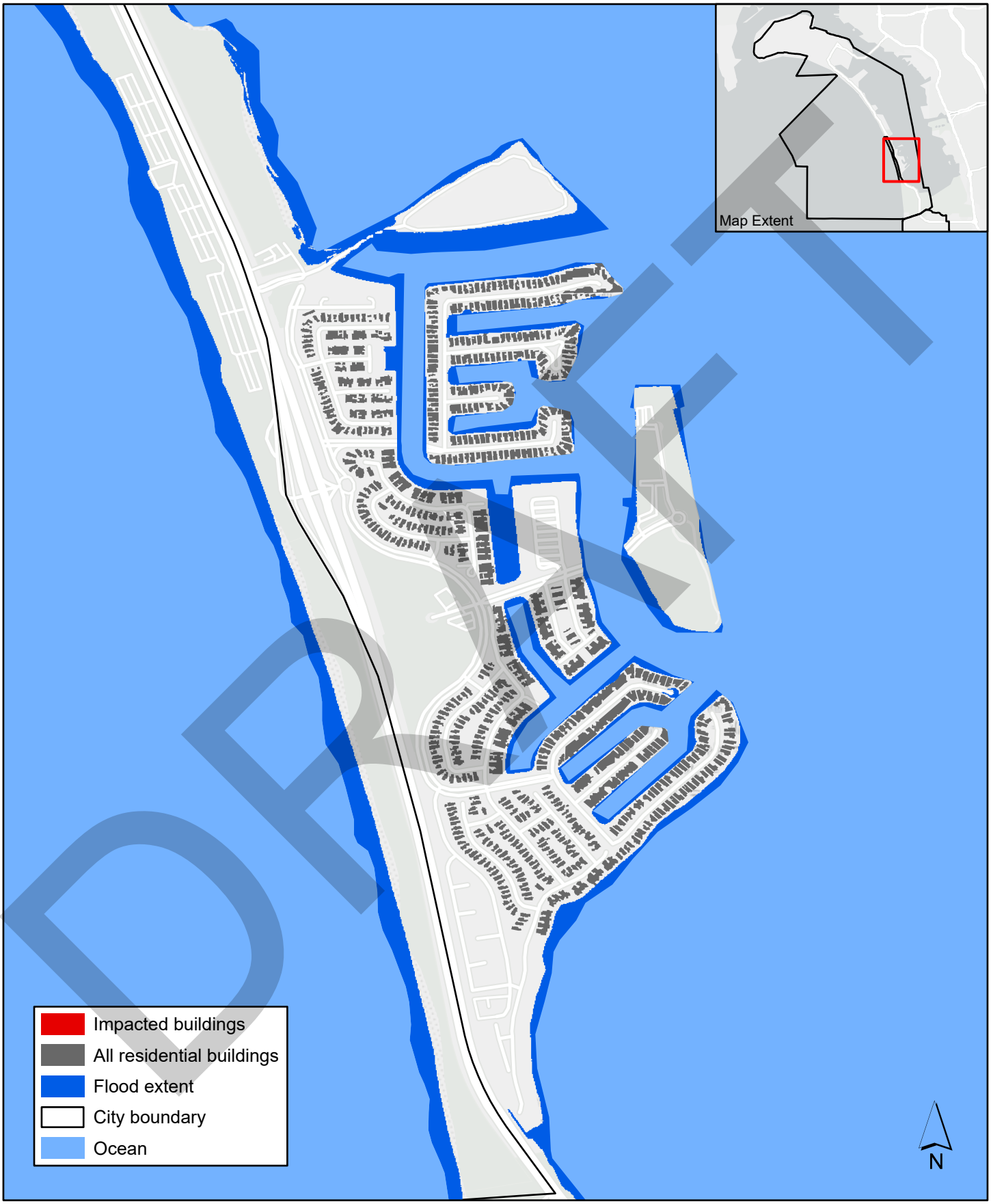
Coronado Area 1

Sea Level Rise 0.0 m - 100 year storm



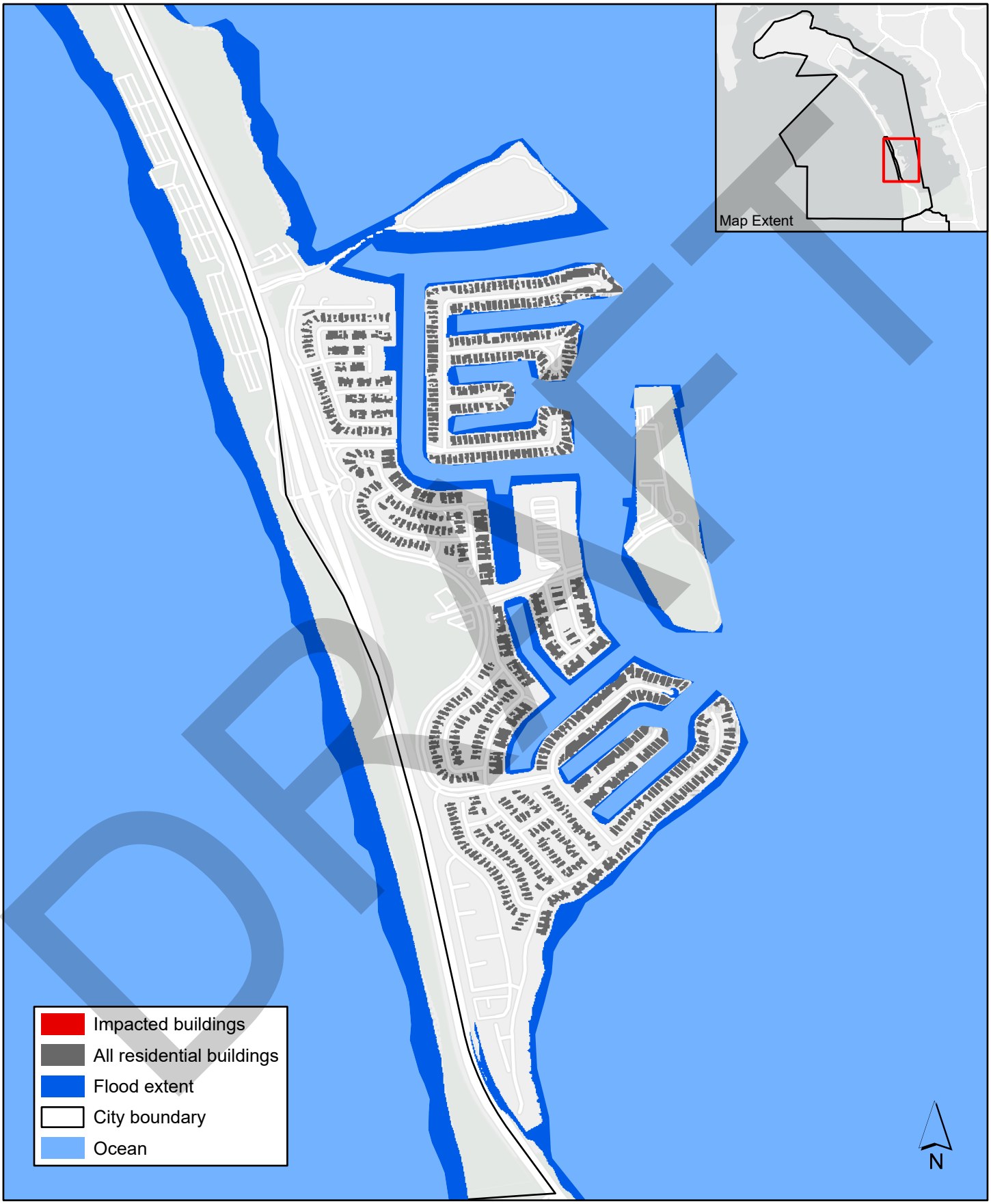
Coronado Area 1

Sea Level Rise 0.25 m - No storm



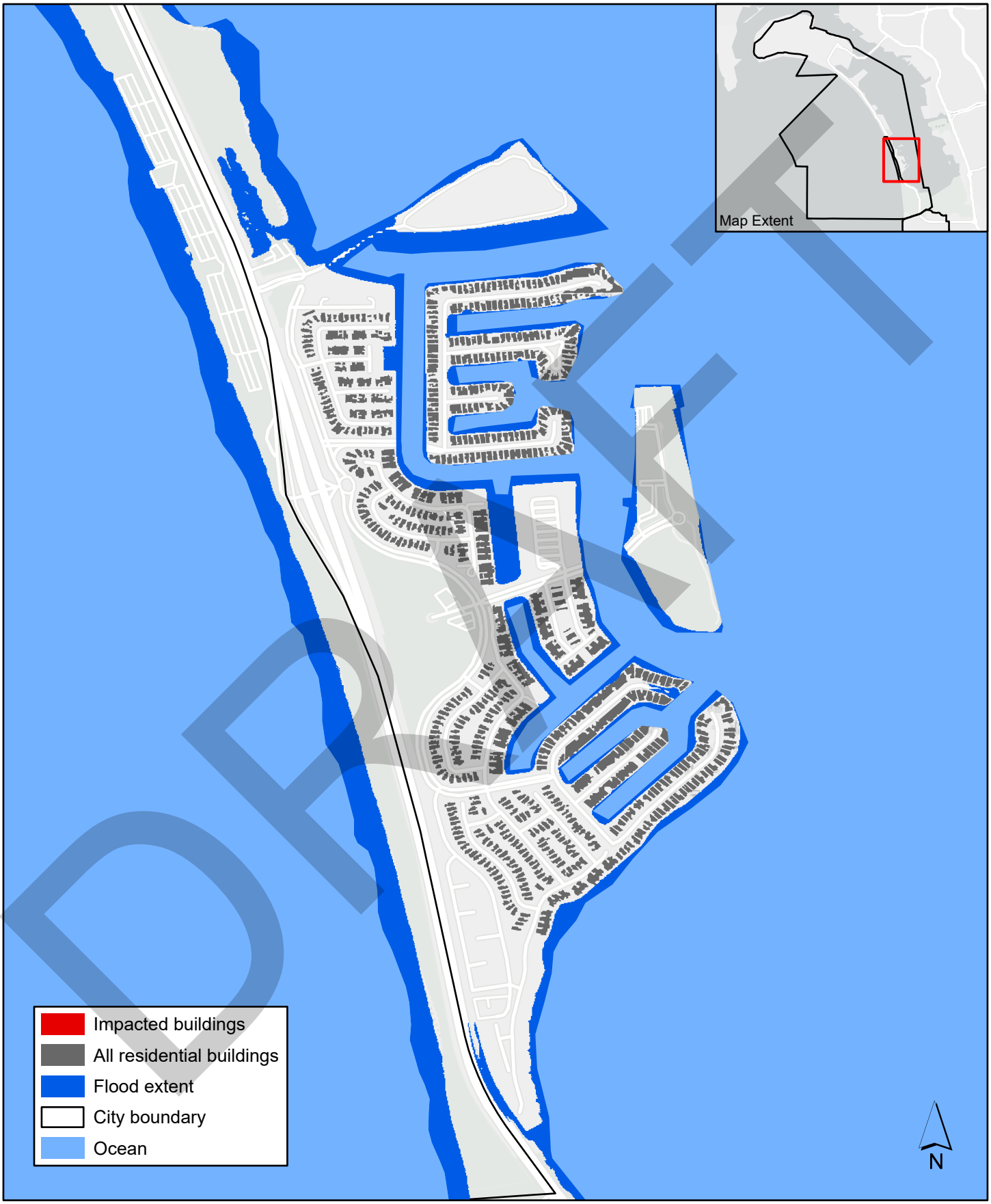
Coronado Area 1

Sea Level Rise 0.25 m - 001 year storm



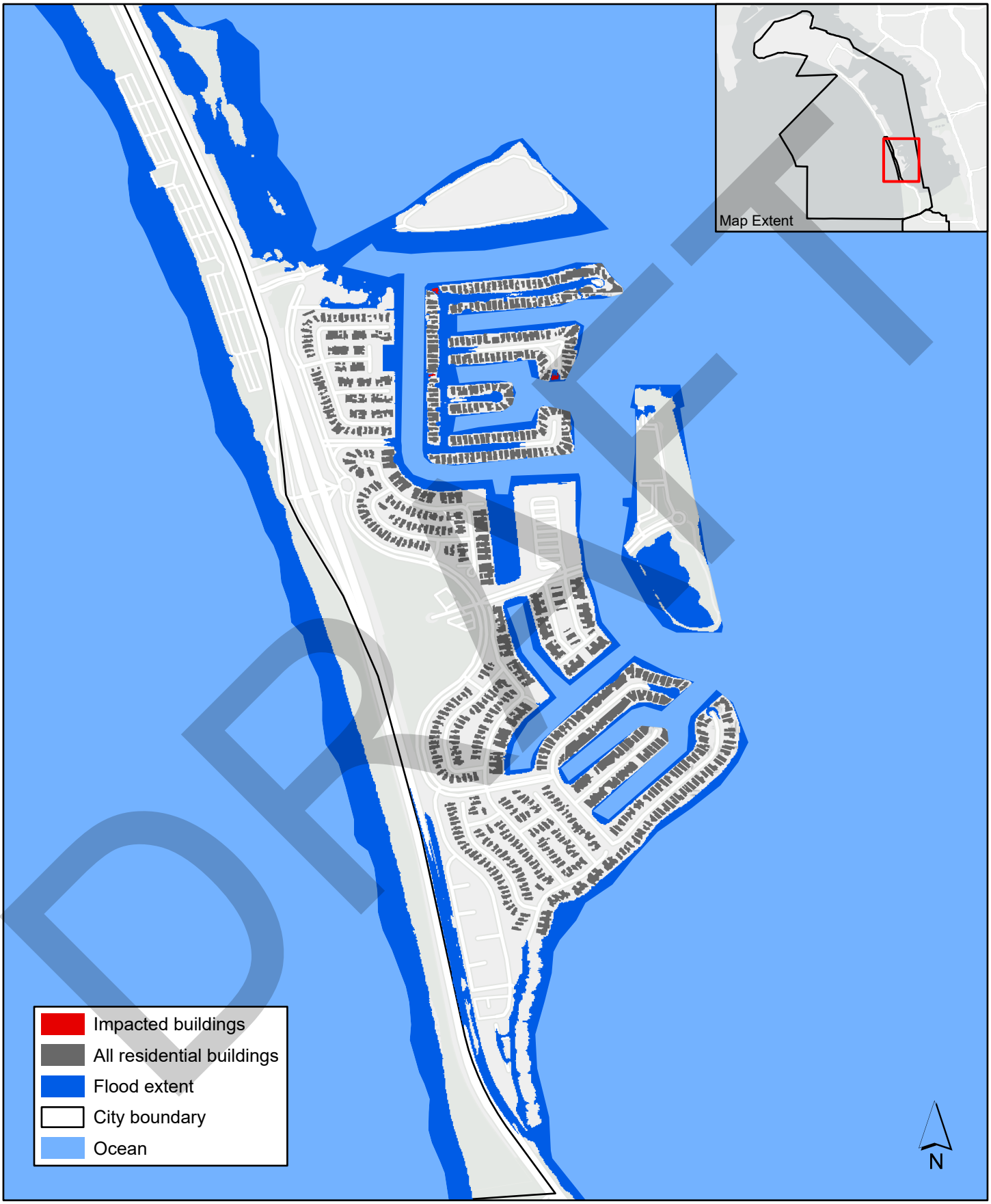
Coronado Area 1

Sea Level Rise 0.25 m - 020 year storm



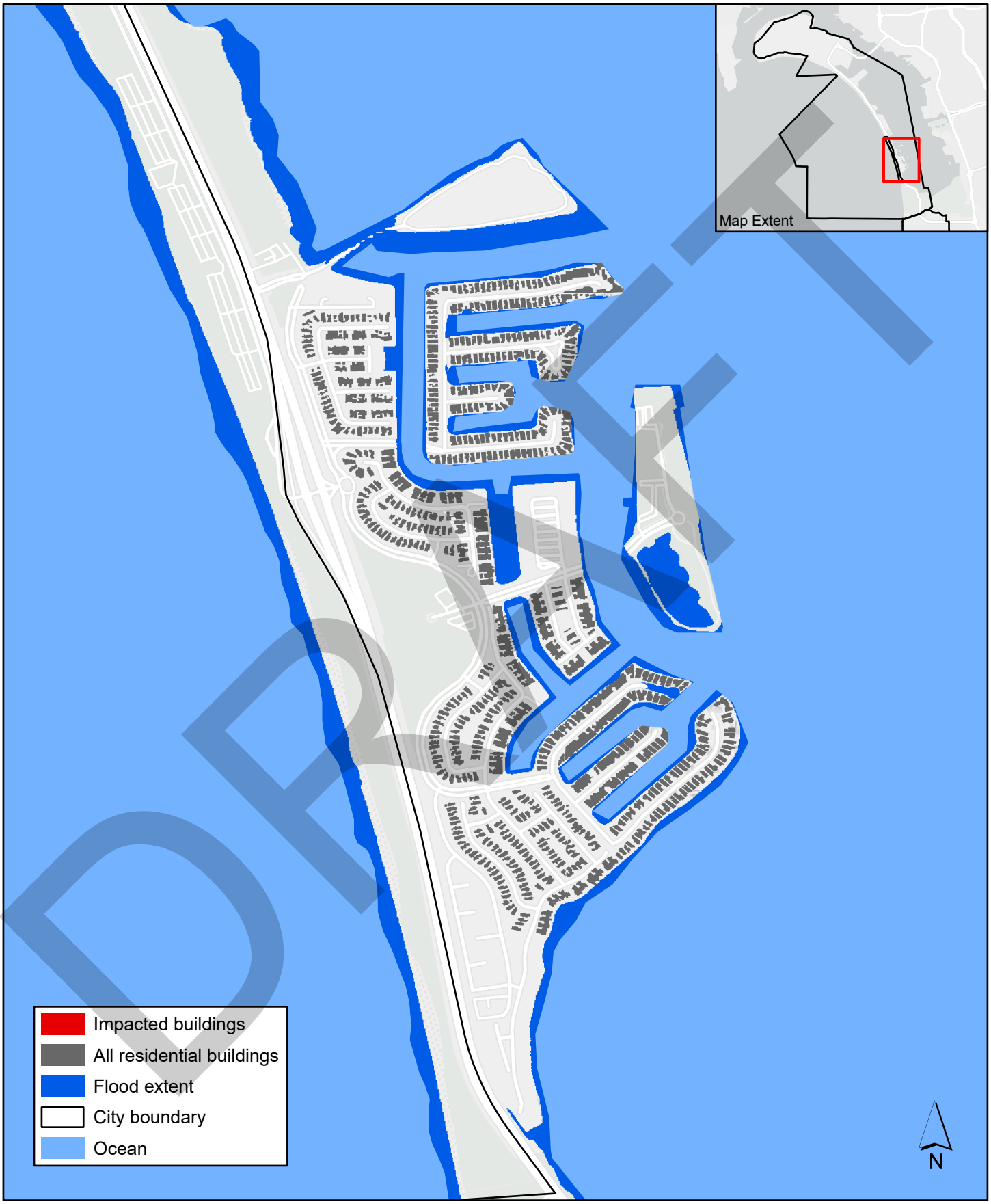
Coronado Area 1

Sea Level Rise 0.25 m - 100 year storm



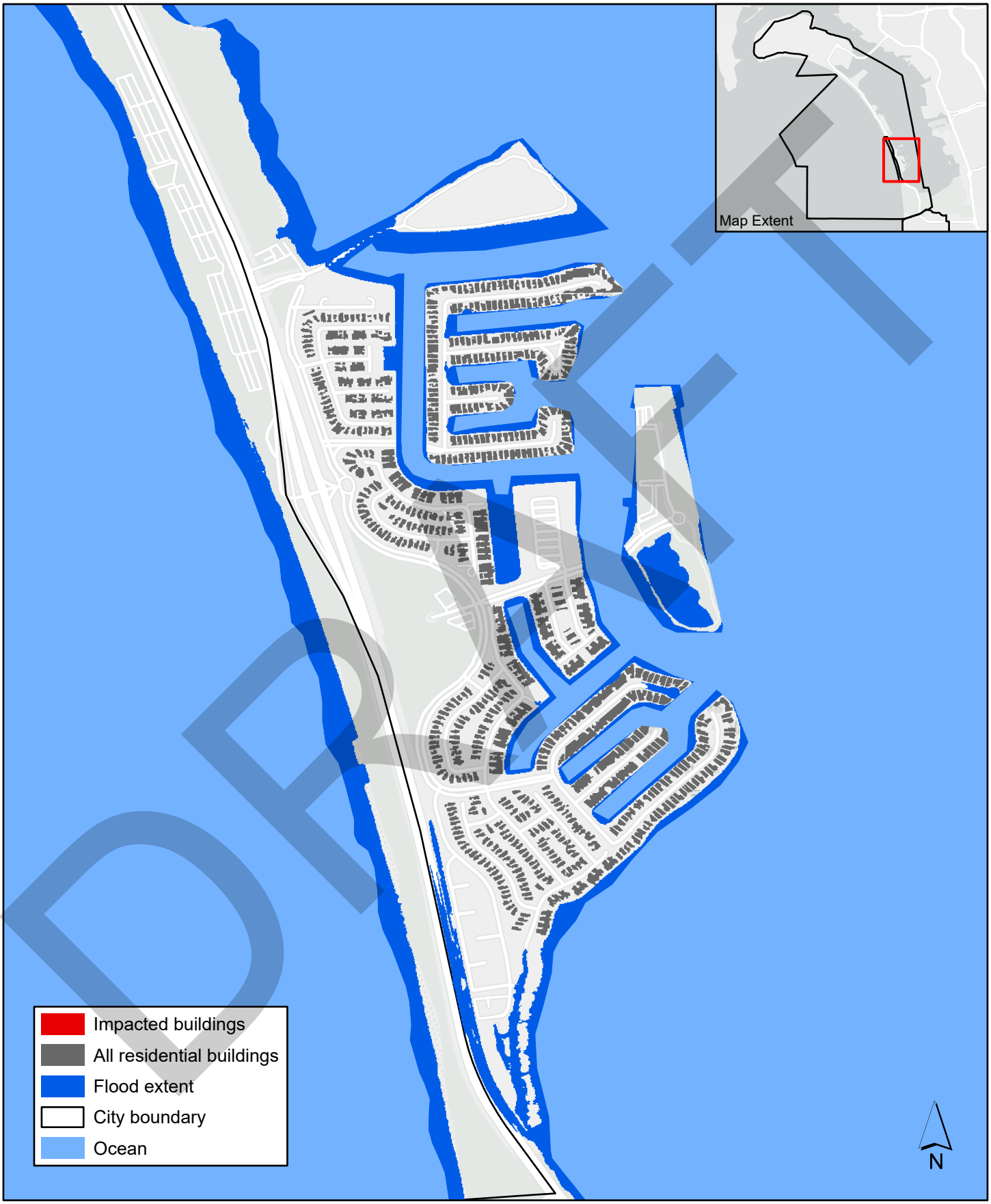
Coronado Area 1

Sea Level Rise 0.5 m - No storm



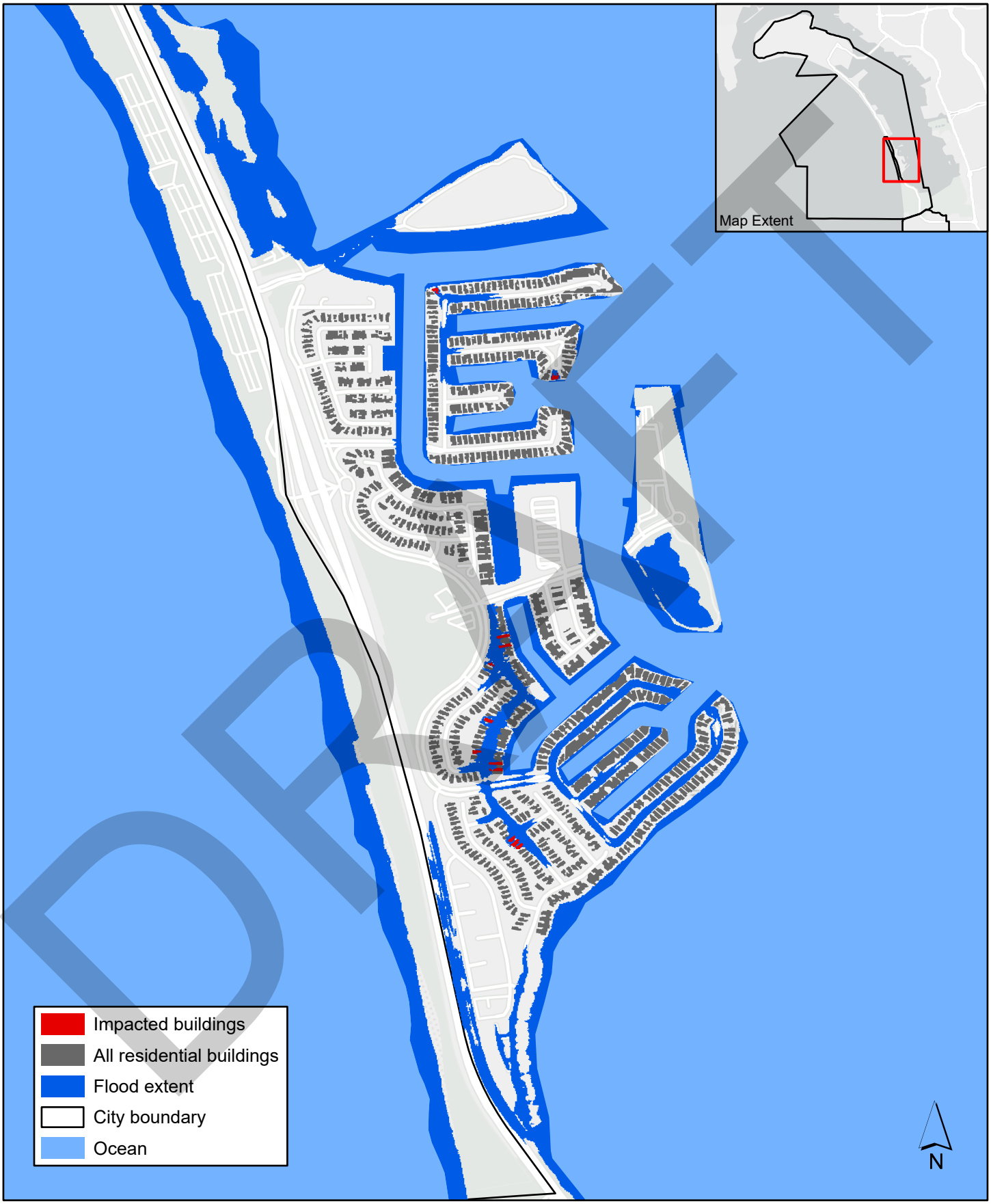
Coronado Area 1

Sea Level Rise 0.5 m - 001 year storm



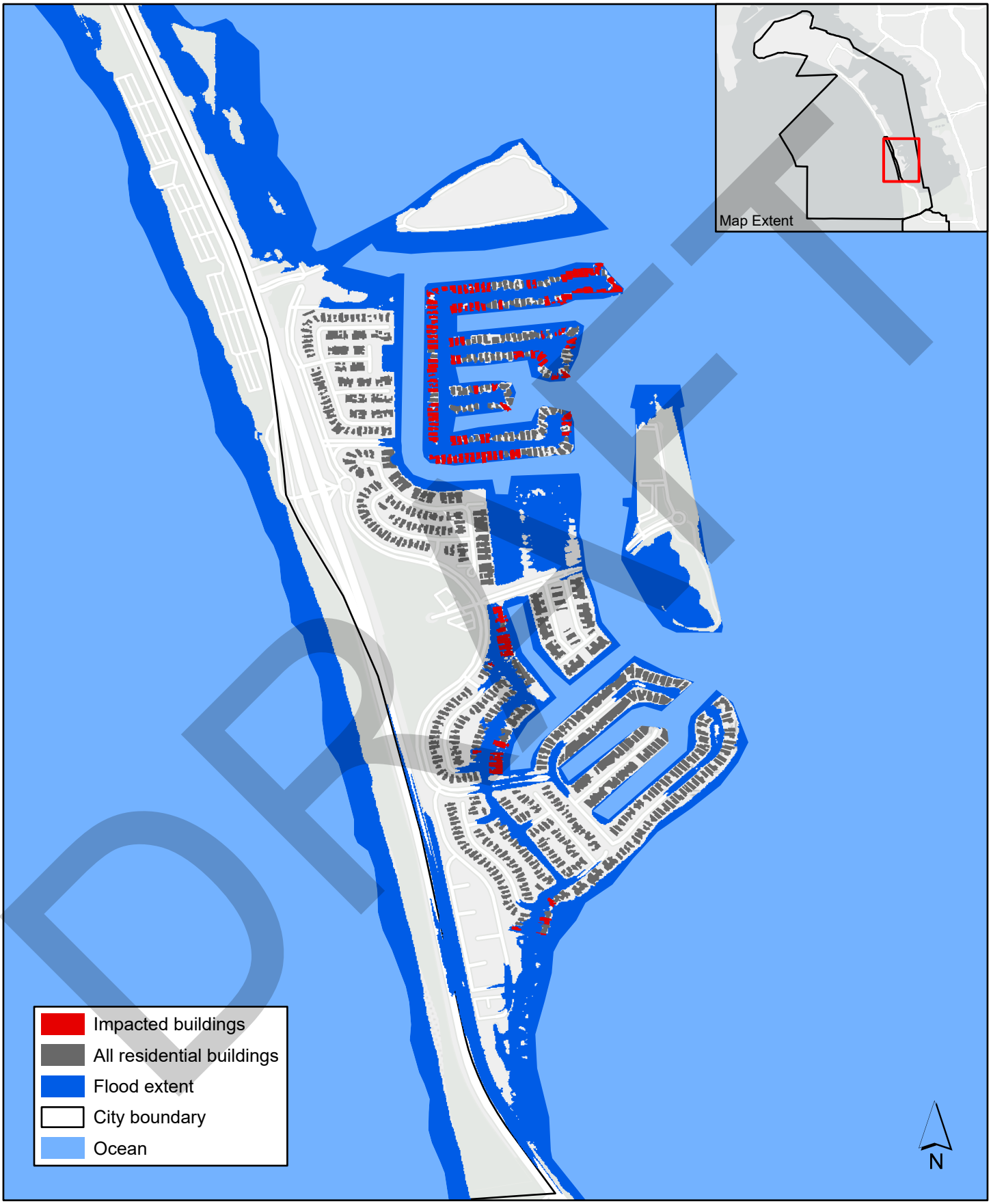
Coronado Area 1

Sea Level Rise 0.5 m - 020 year storm



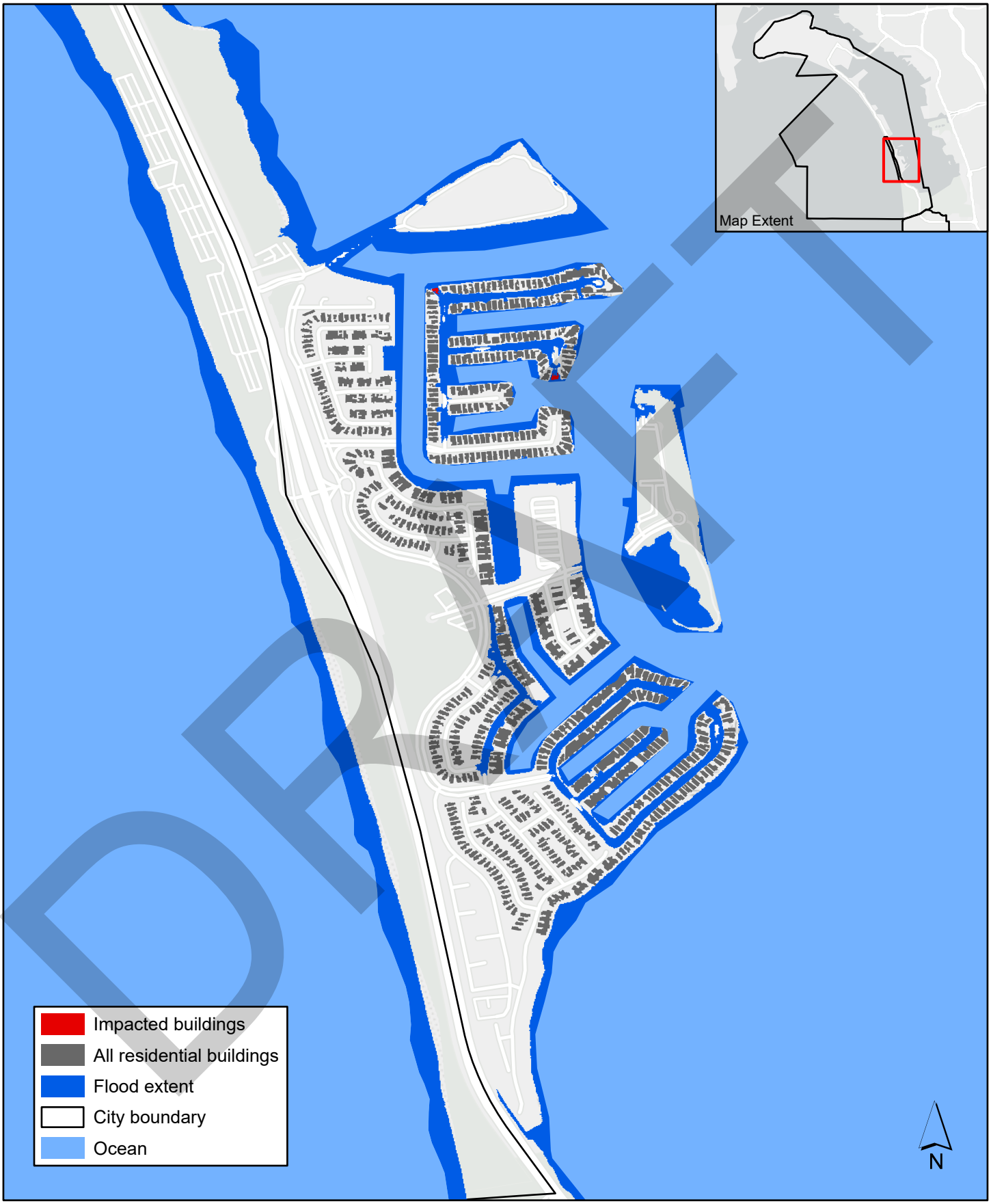
Coronado Area 1

Sea Level Rise 0.5 m - 100 year storm



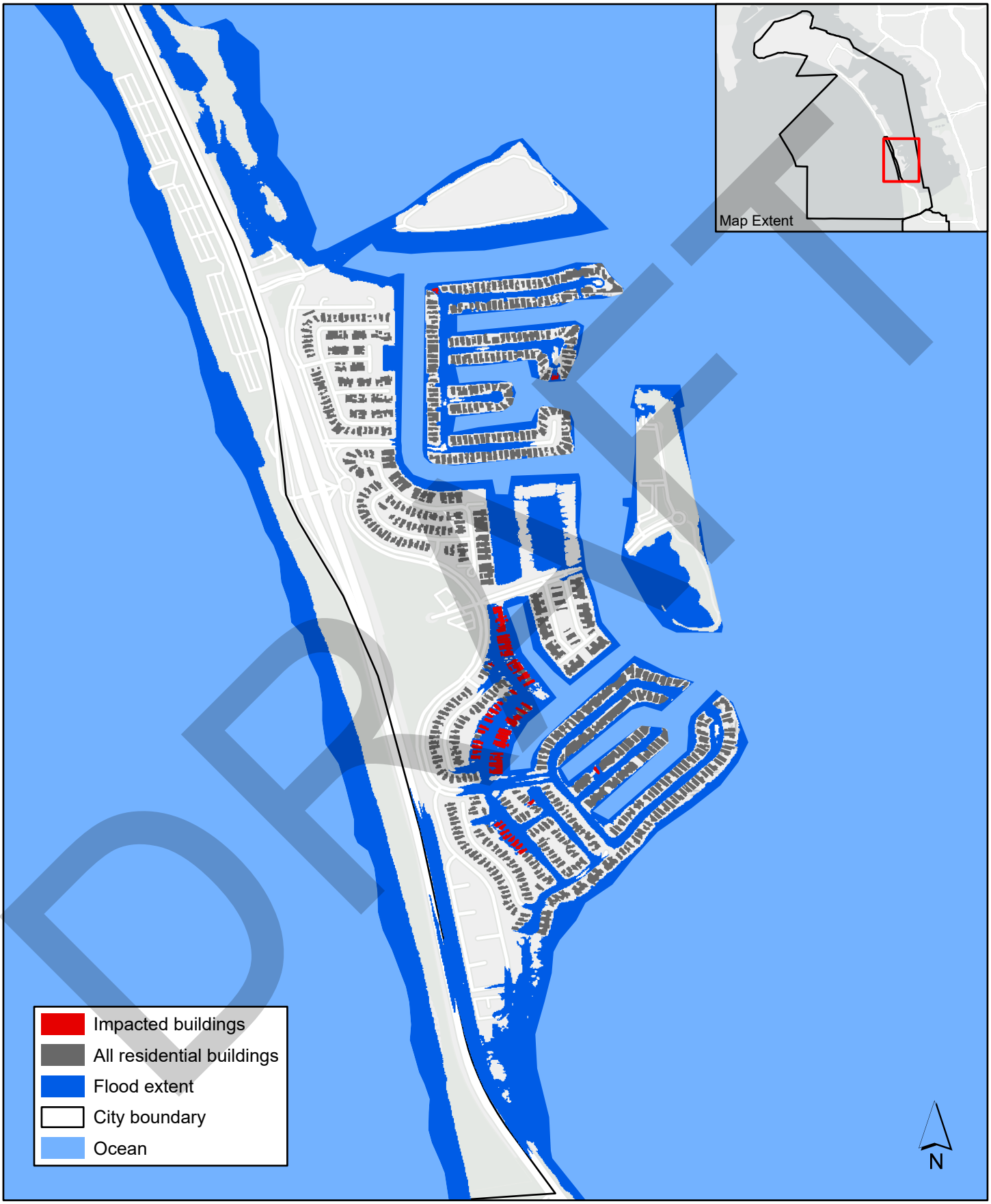
Coronado Area 1

Sea Level Rise 0.75 m - No storm



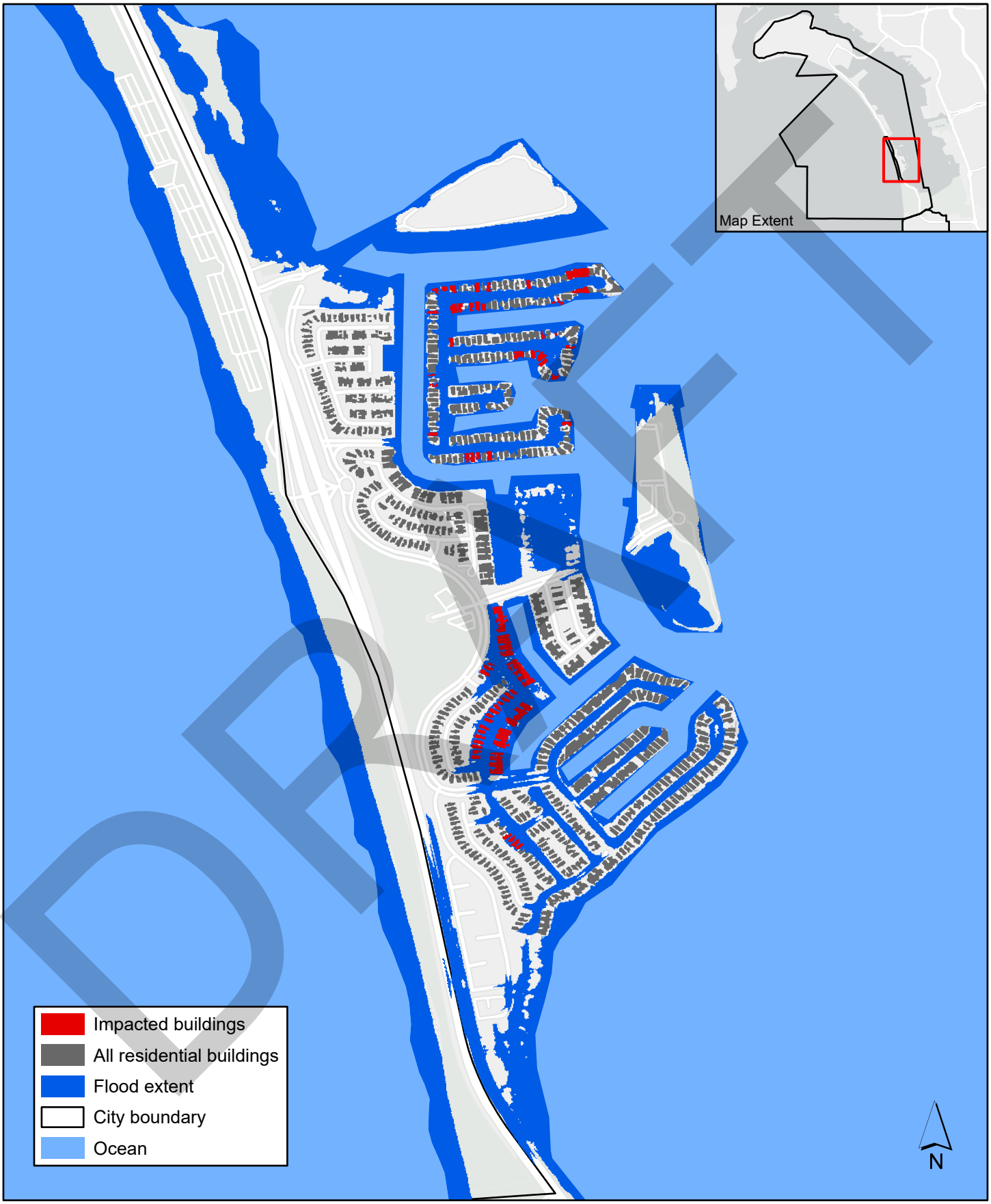
Coronado Area 1

Sea Level Rise 0.75 m - 001 year storm



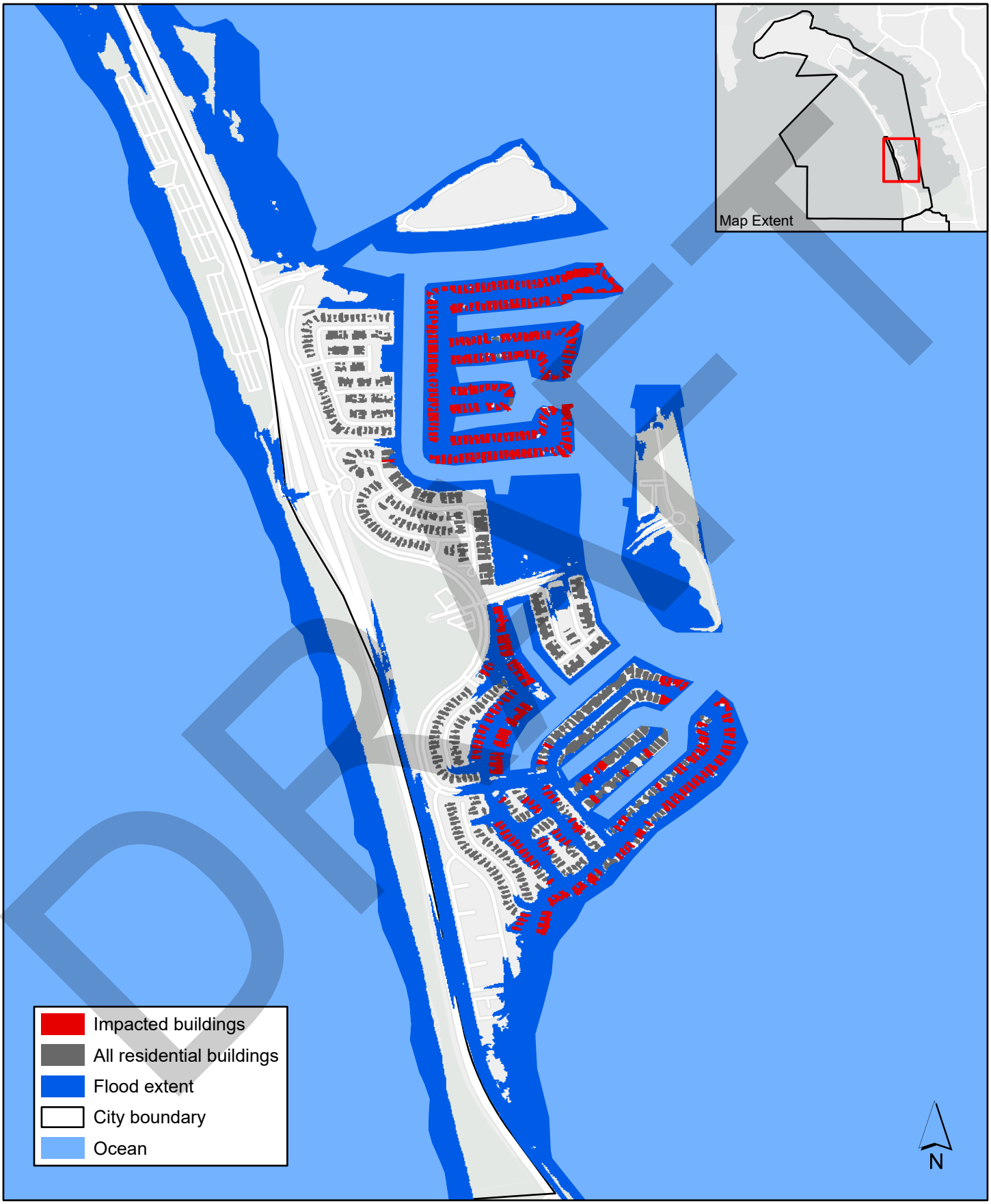
Coronado Area 1

Sea Level Rise 0.75 m - 020 year storm



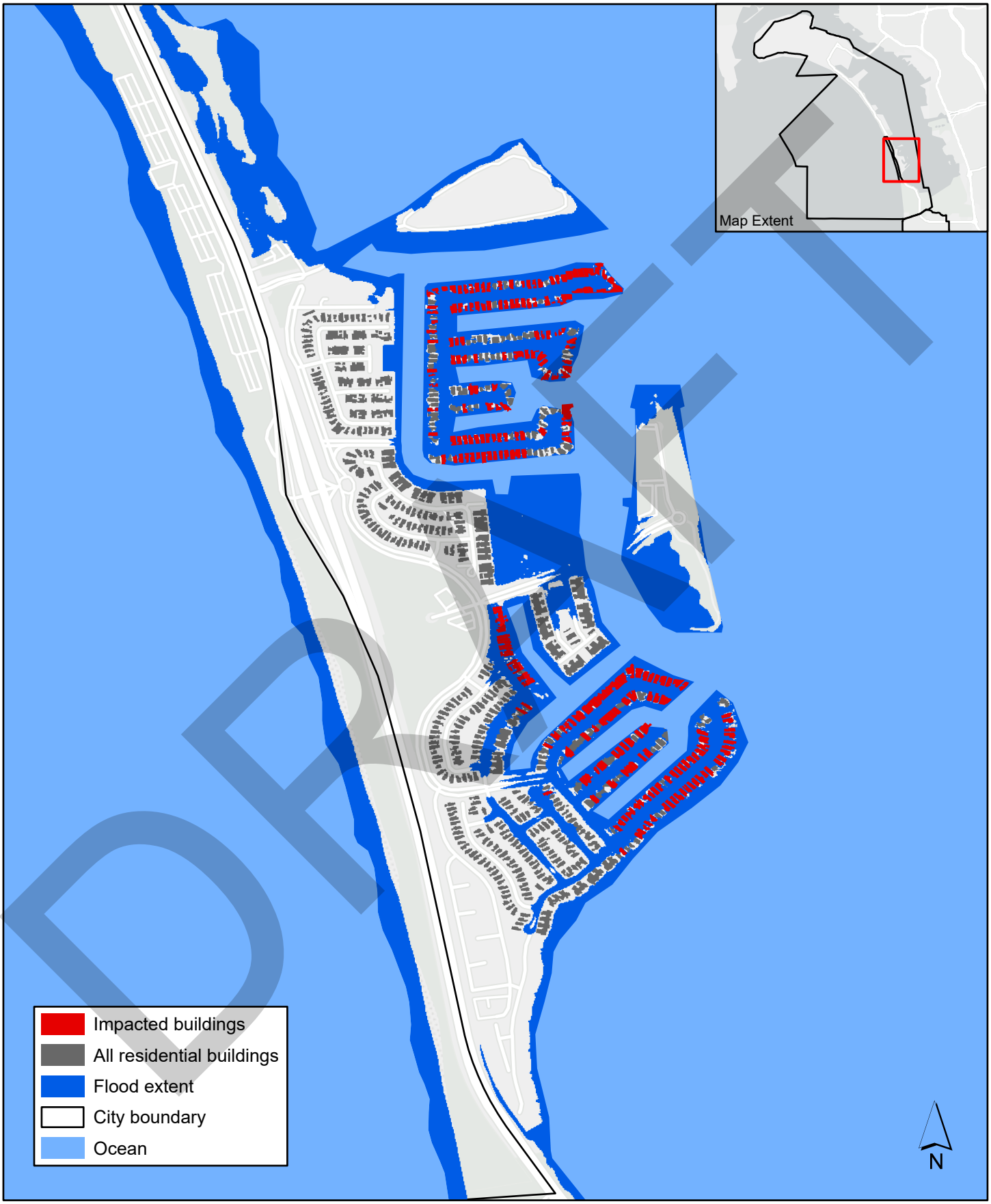
Coronado Area 1

Sea Level Rise 0.75 m - 100 year storm



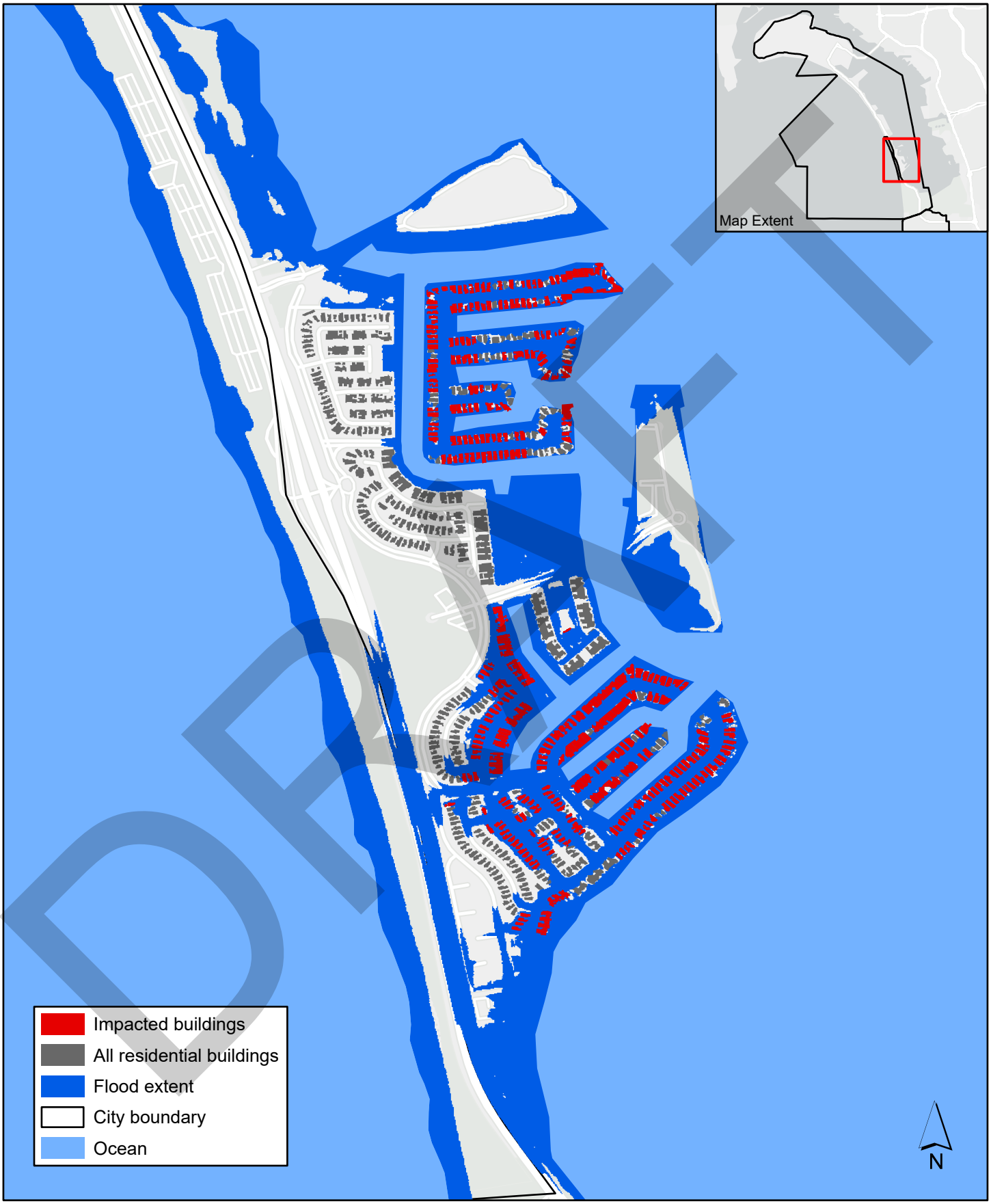
Coronado Area 1

Sea Level Rise 1.0 m - No storm



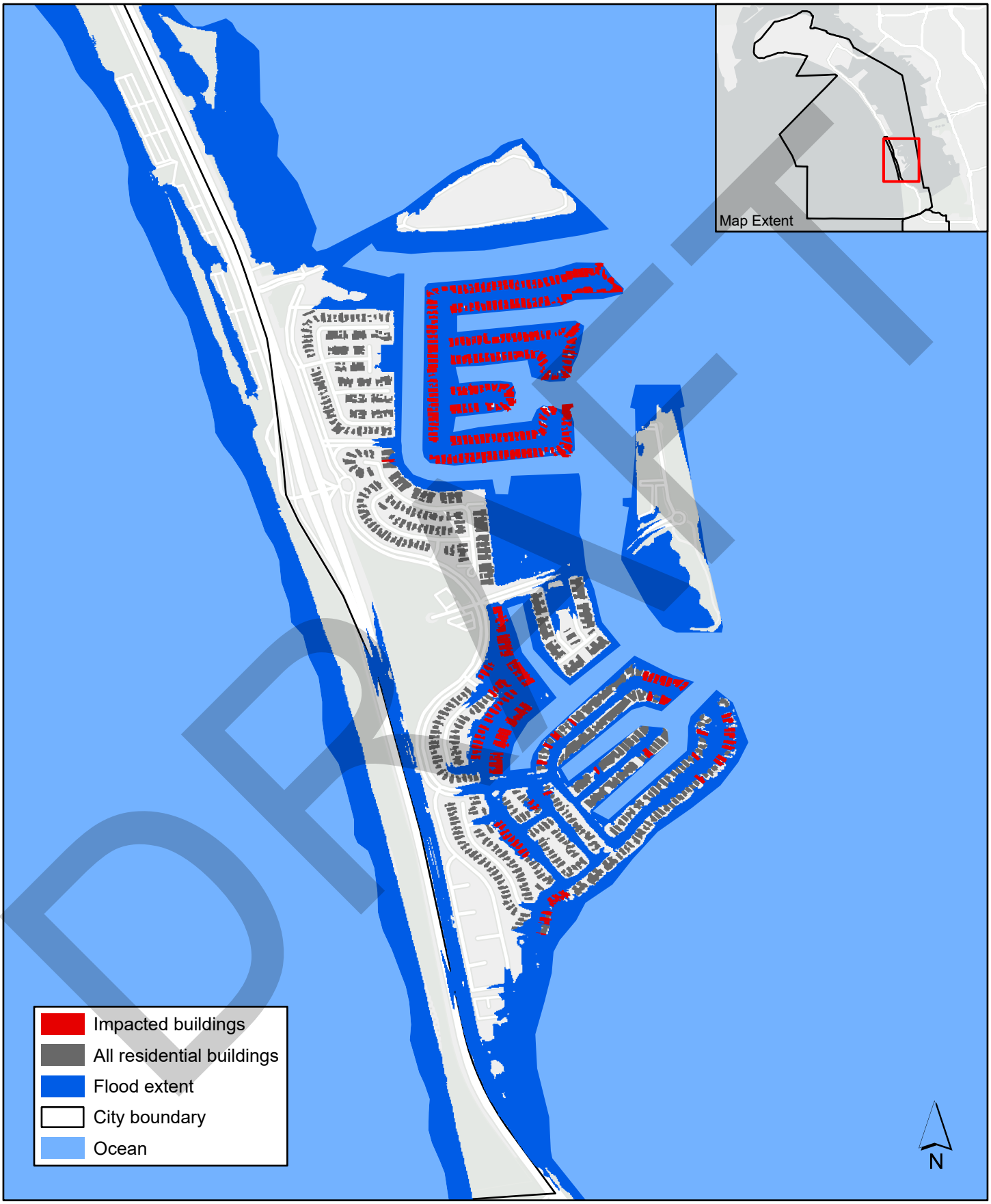
Coronado Area 1

Sea Level Rise 1.0 m - 001 year storm



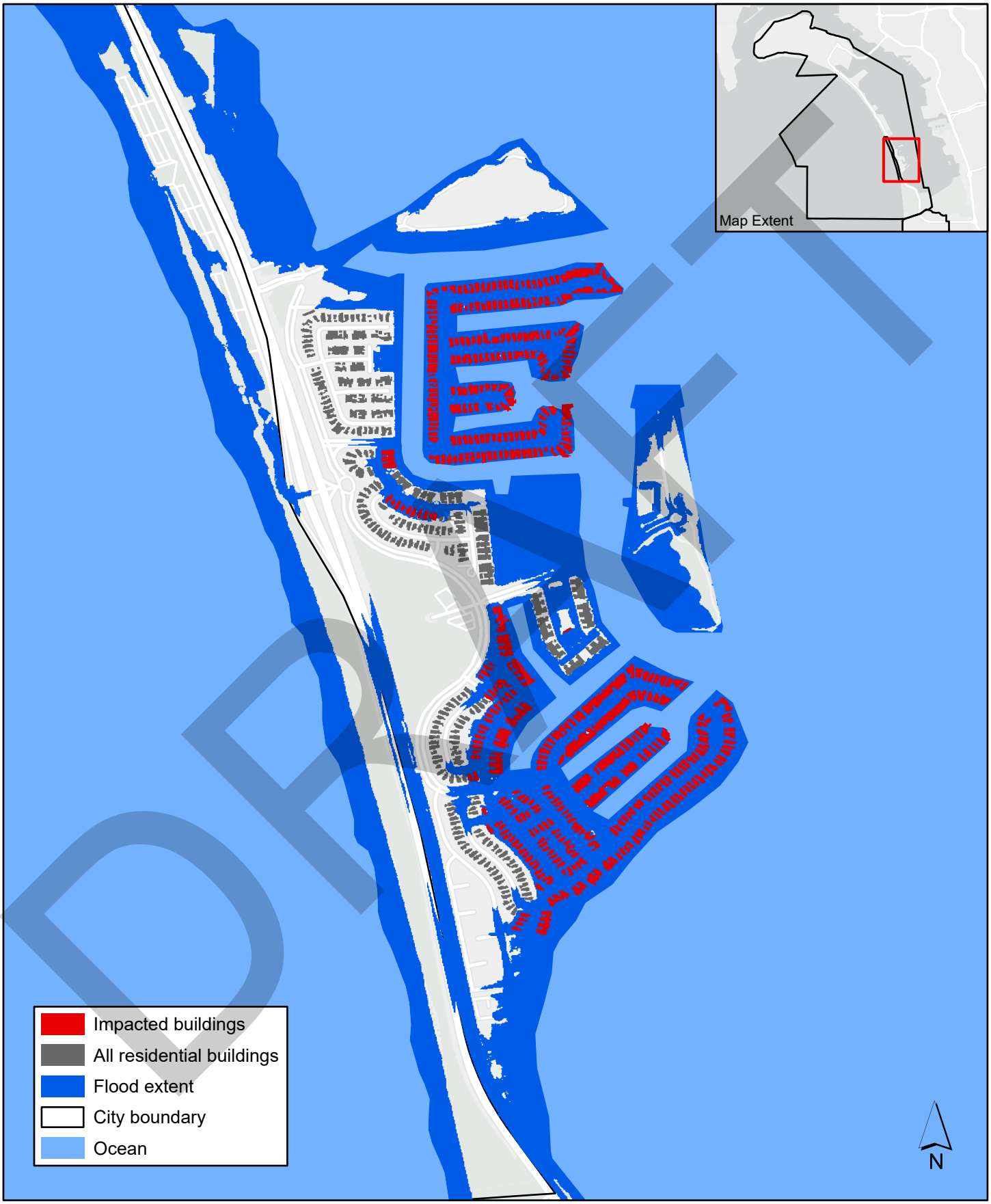
Coronado Area 1

Sea Level Rise 1.0 m - 020 year storm



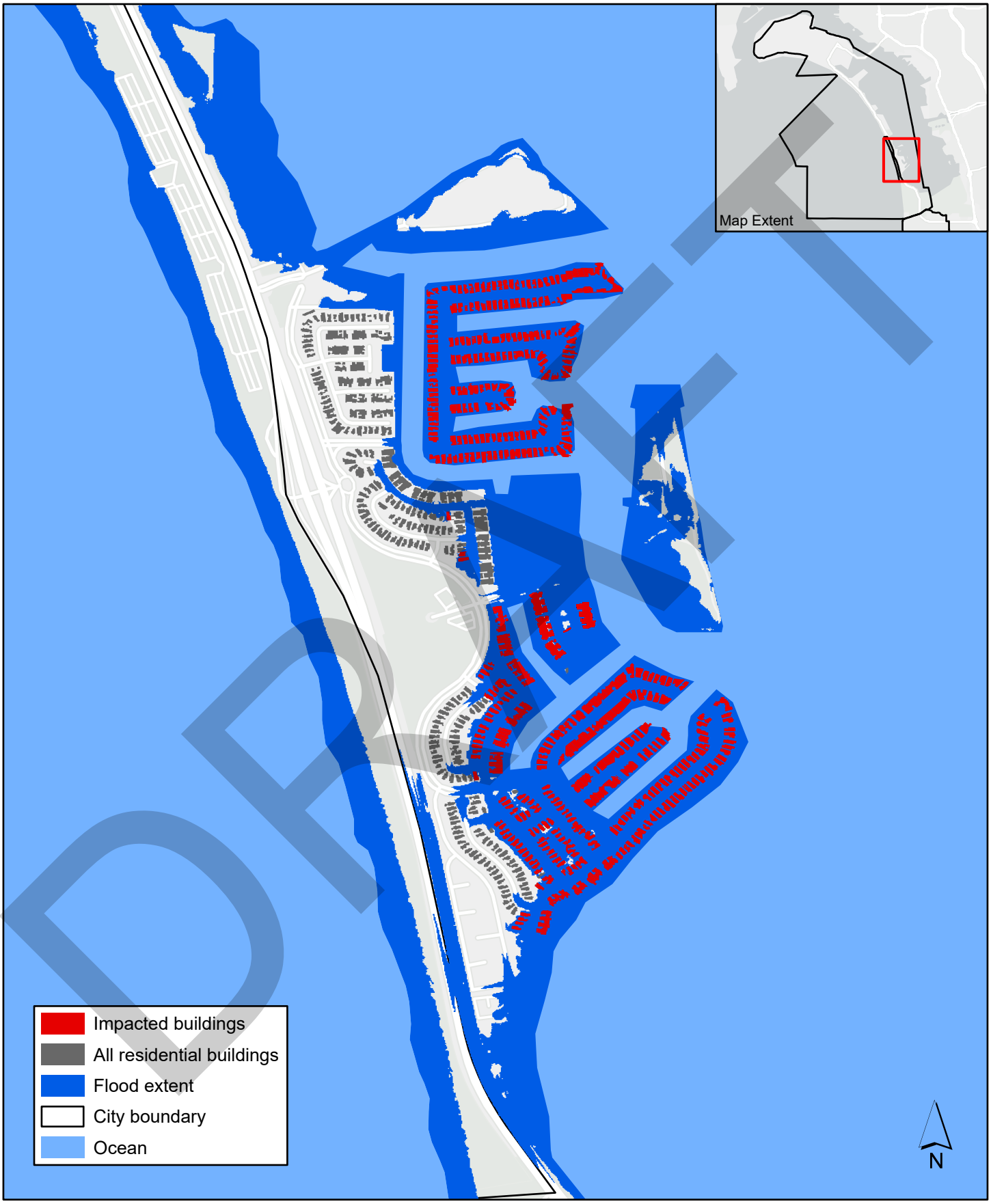
Coronado Area 1

Sea Level Rise 1.0 m - 100 year storm



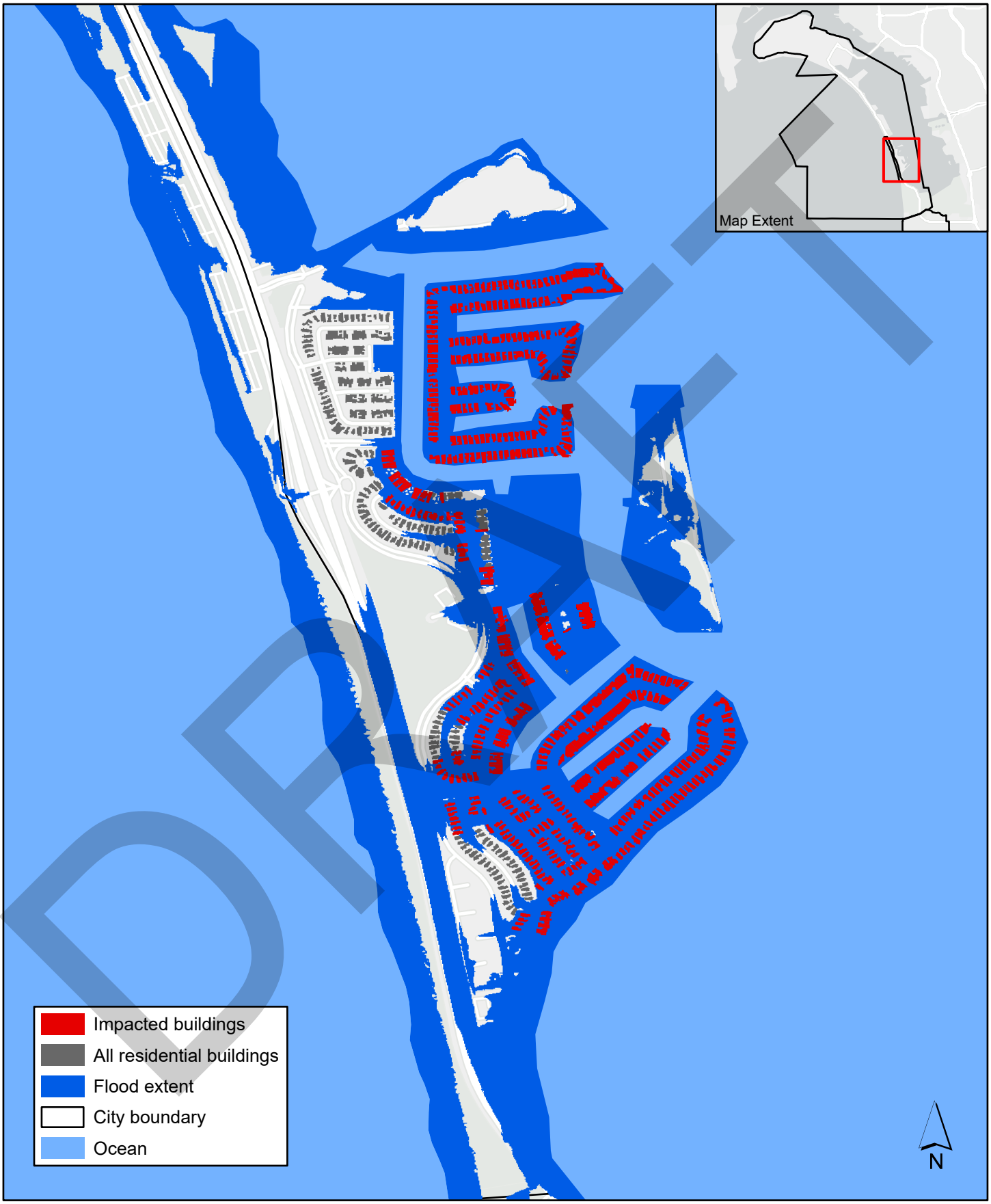
Coronado Area 1

Sea Level Rise 1.5 m - No storm



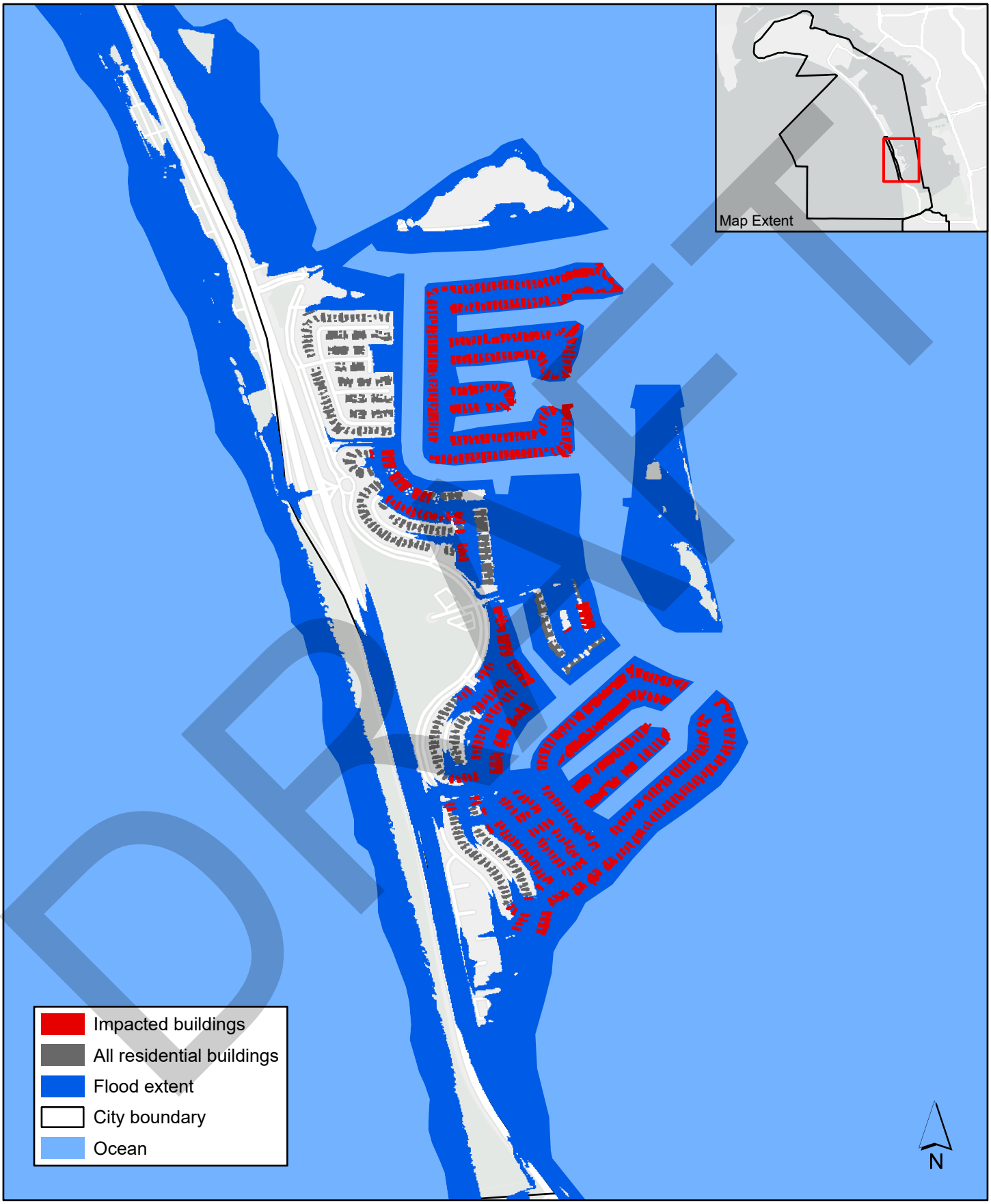
Coronado Area 1

Sea Level Rise 1.5 m - 001 year storm



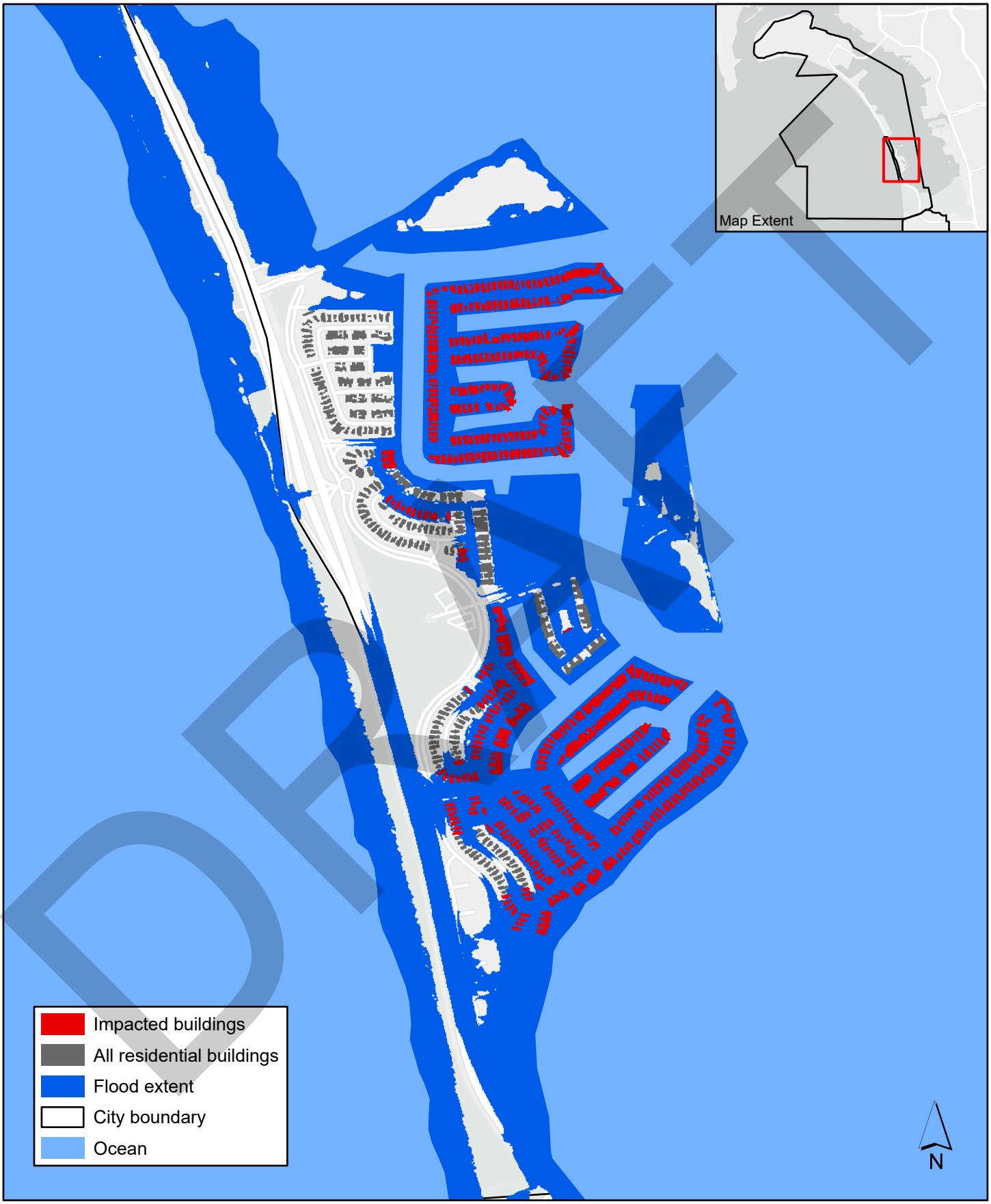
Coronado Area 1

Sea Level Rise 1.5 m - 020 year storm



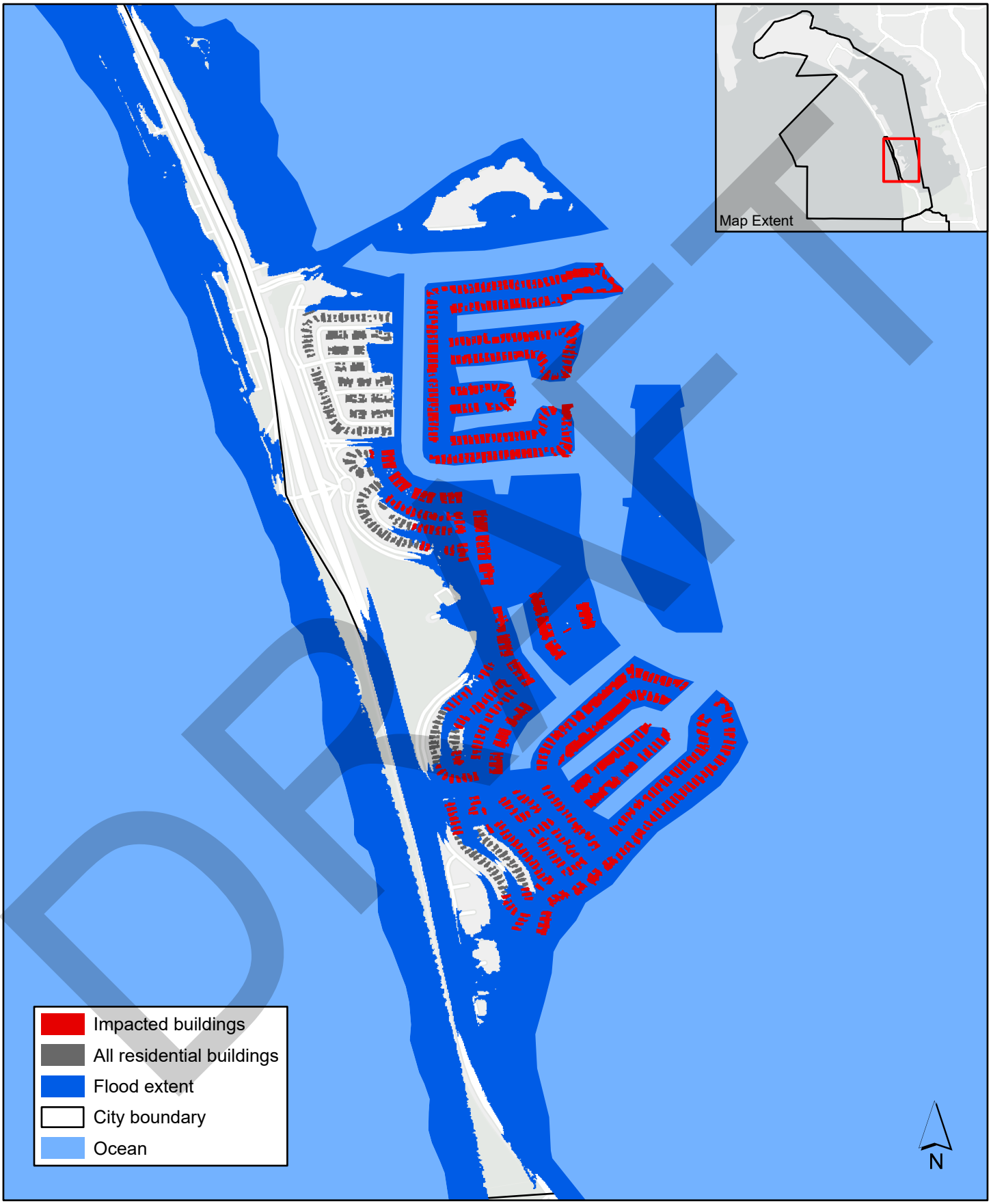
Coronado Area 1

Sea Level Rise 1.5 m - 100 year storm



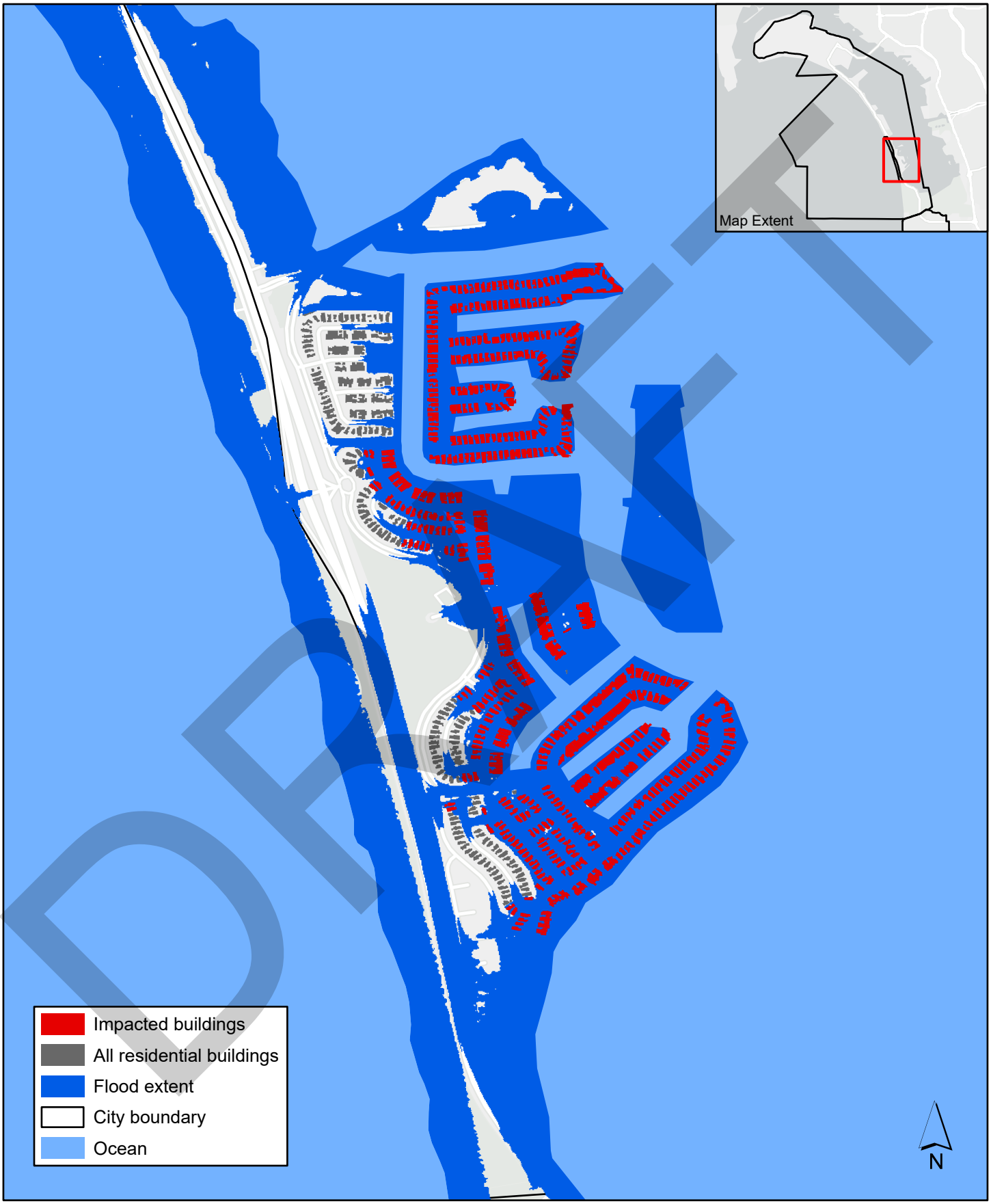
Coronado Area 1

Sea Level Rise 2.0 m - No storm



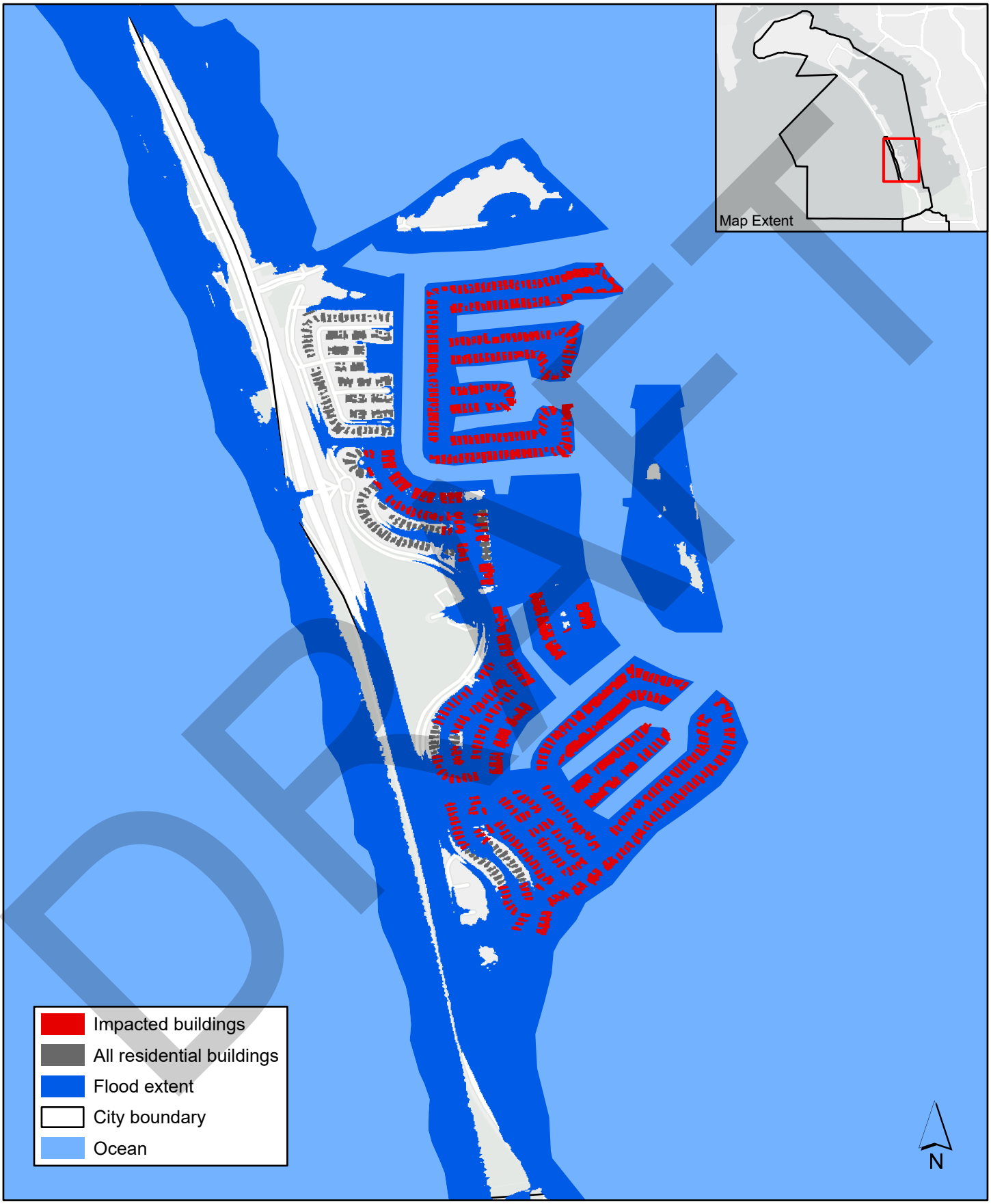
Coronado Area 1

Sea Level Rise 2.0 m - 001 year storm



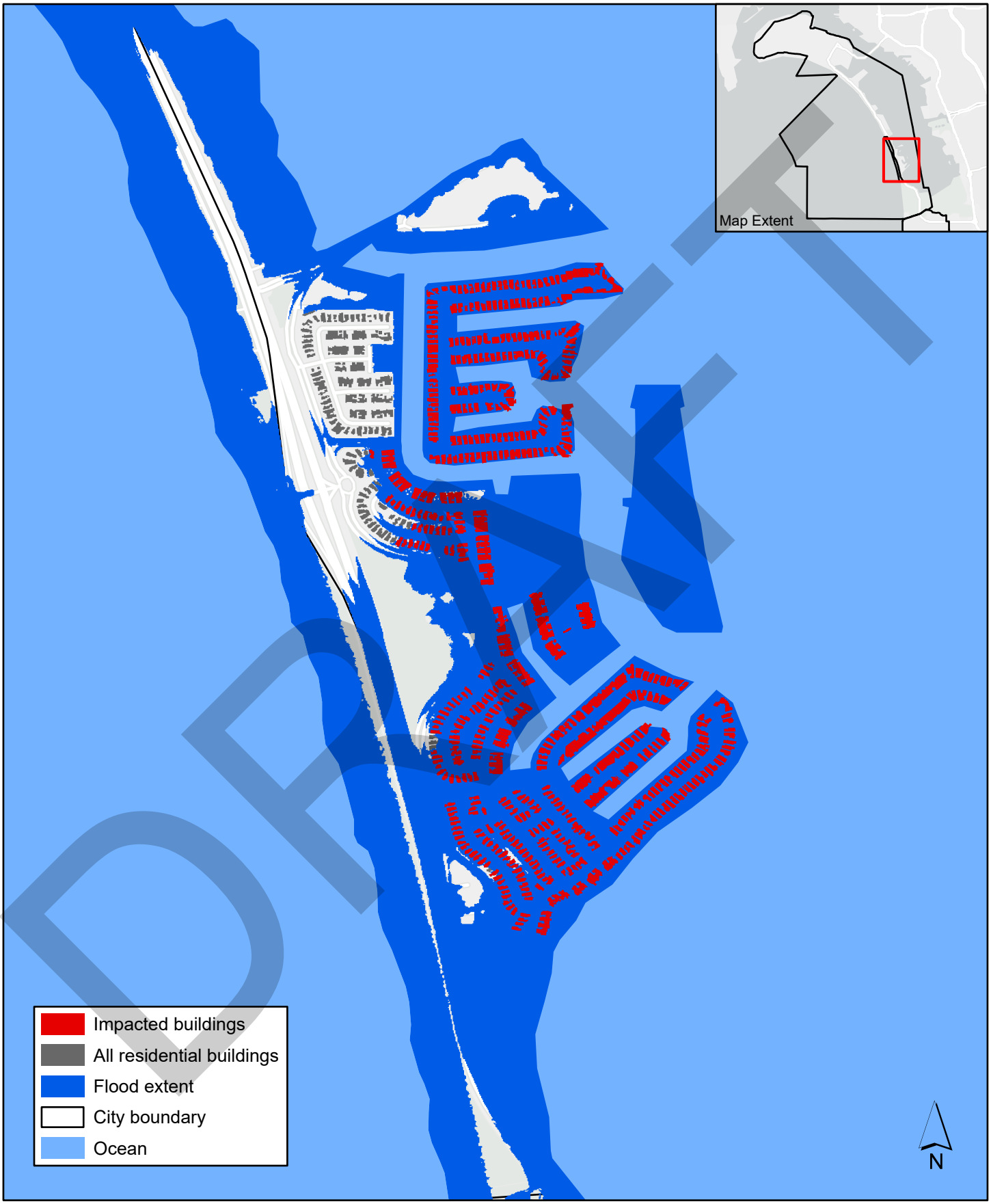
Coronado Area 1

Sea Level Rise 2.0 m - 020 year storm



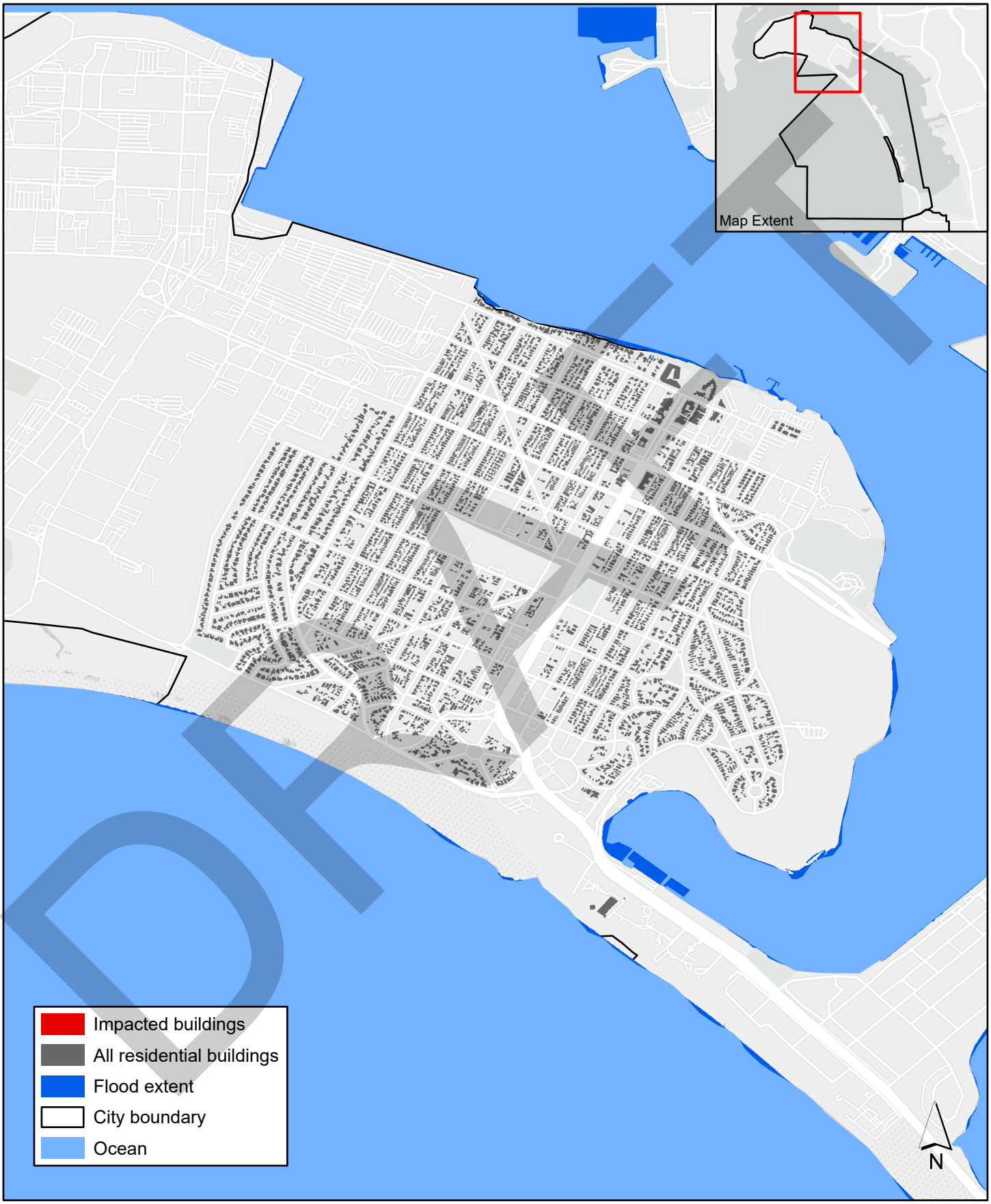
Coronado Area 1

Sea Level Rise 2.0 m - 100 year storm



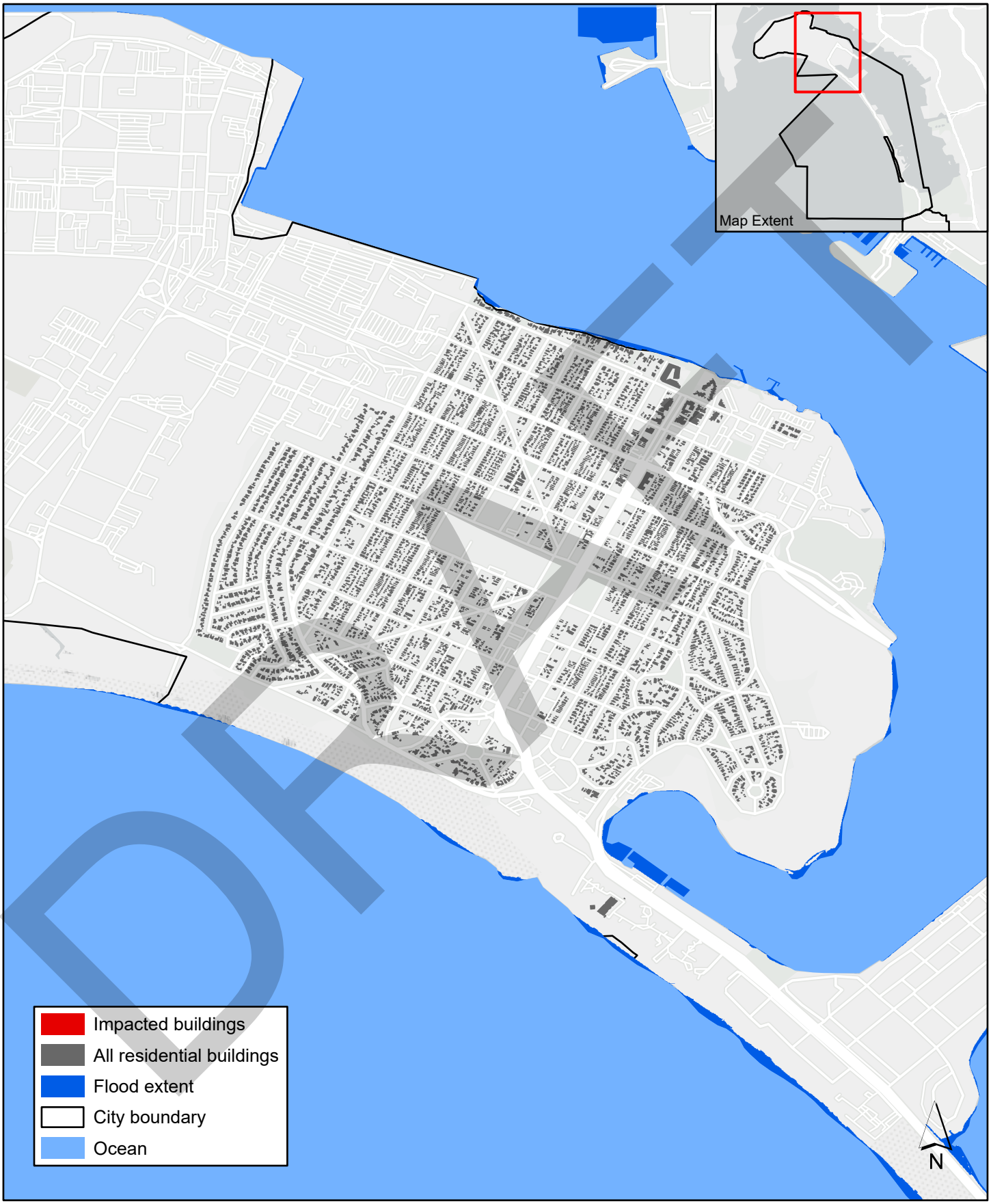
Coronado Area 2

Sea Level Rise 0.0 m - No storm



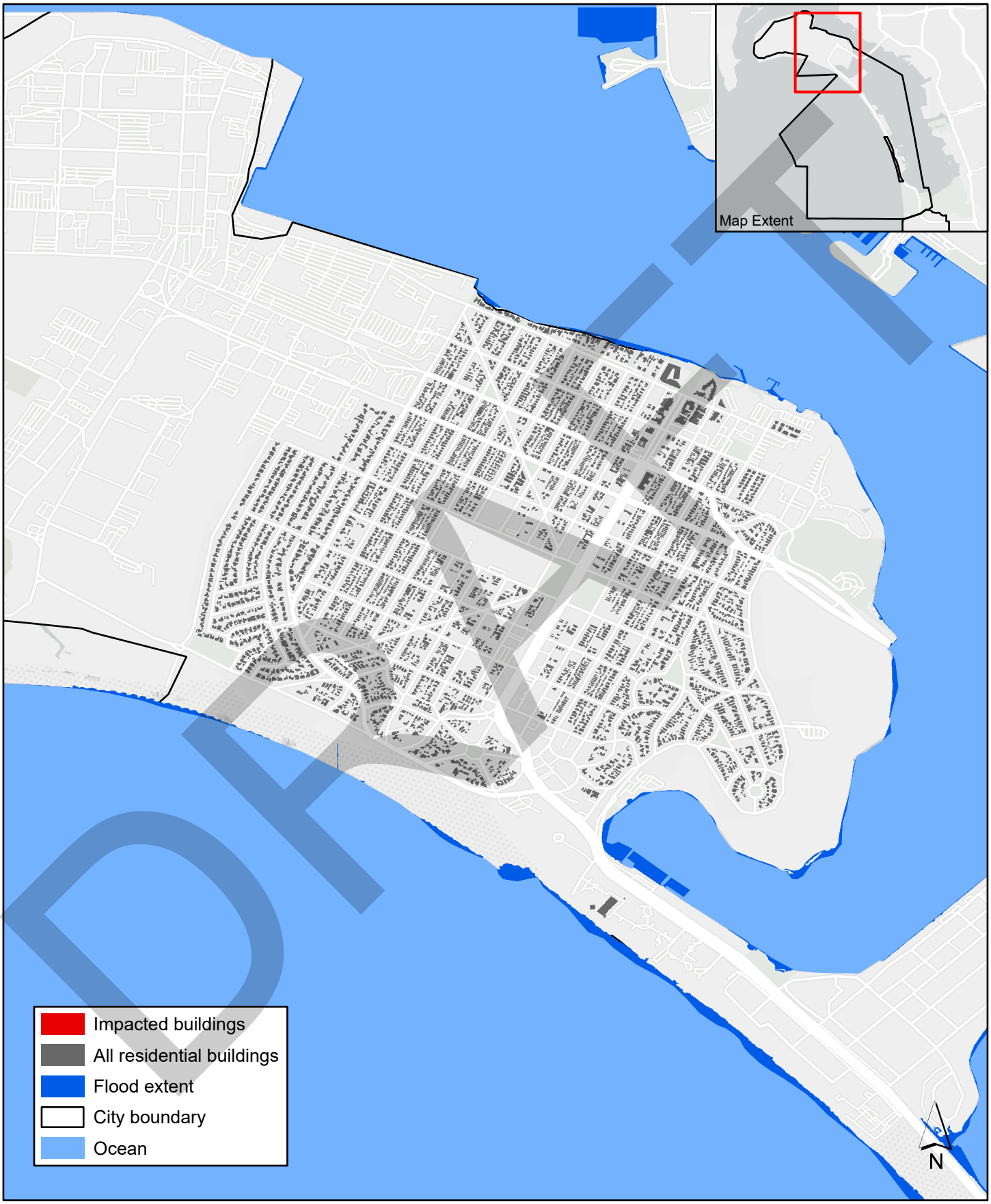
Coronado Area 2

Sea Level Rise 0.0 m - 001 year storm



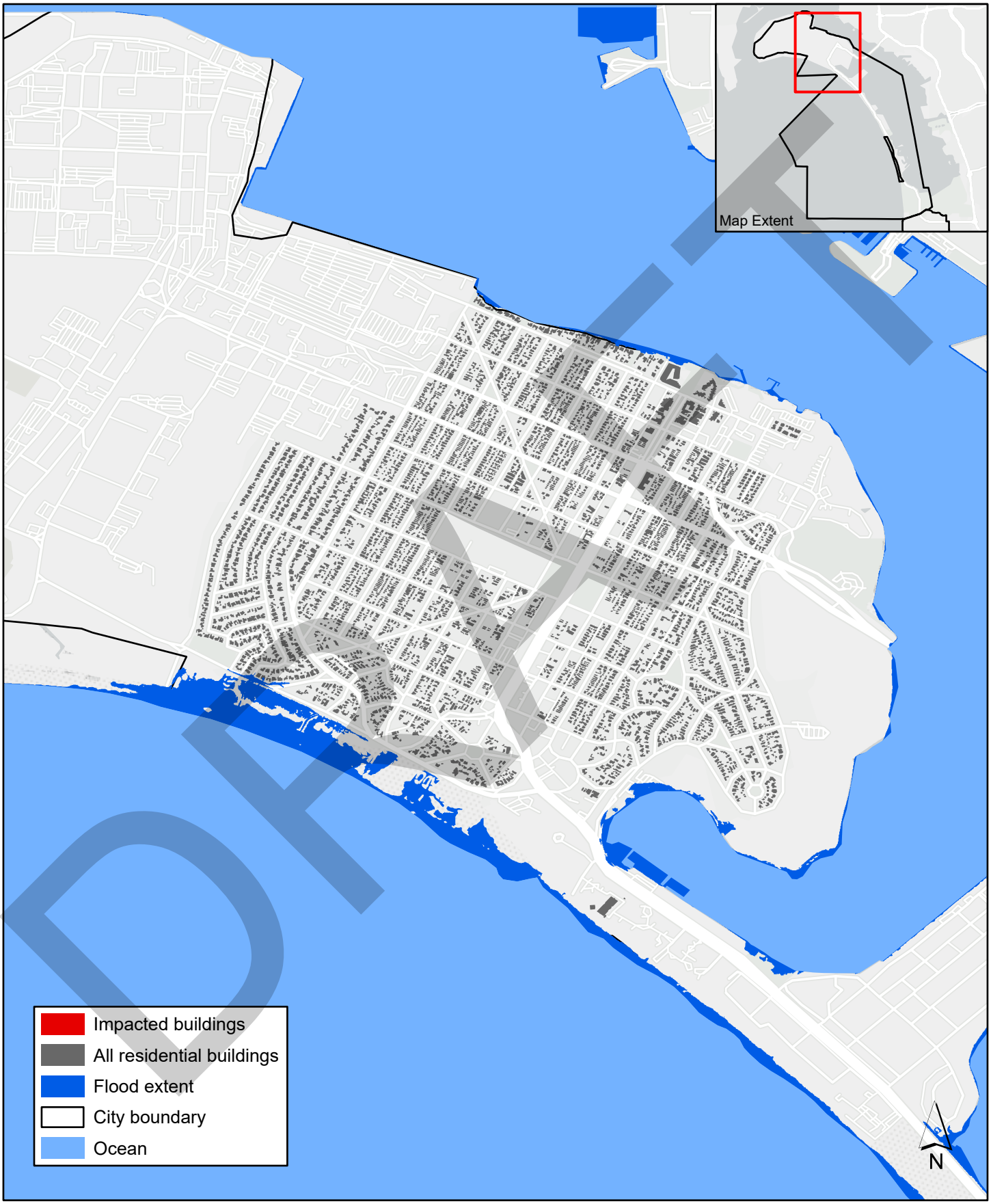
Coronado Area 2

Sea Level Rise 0.0 m - 020 year storm



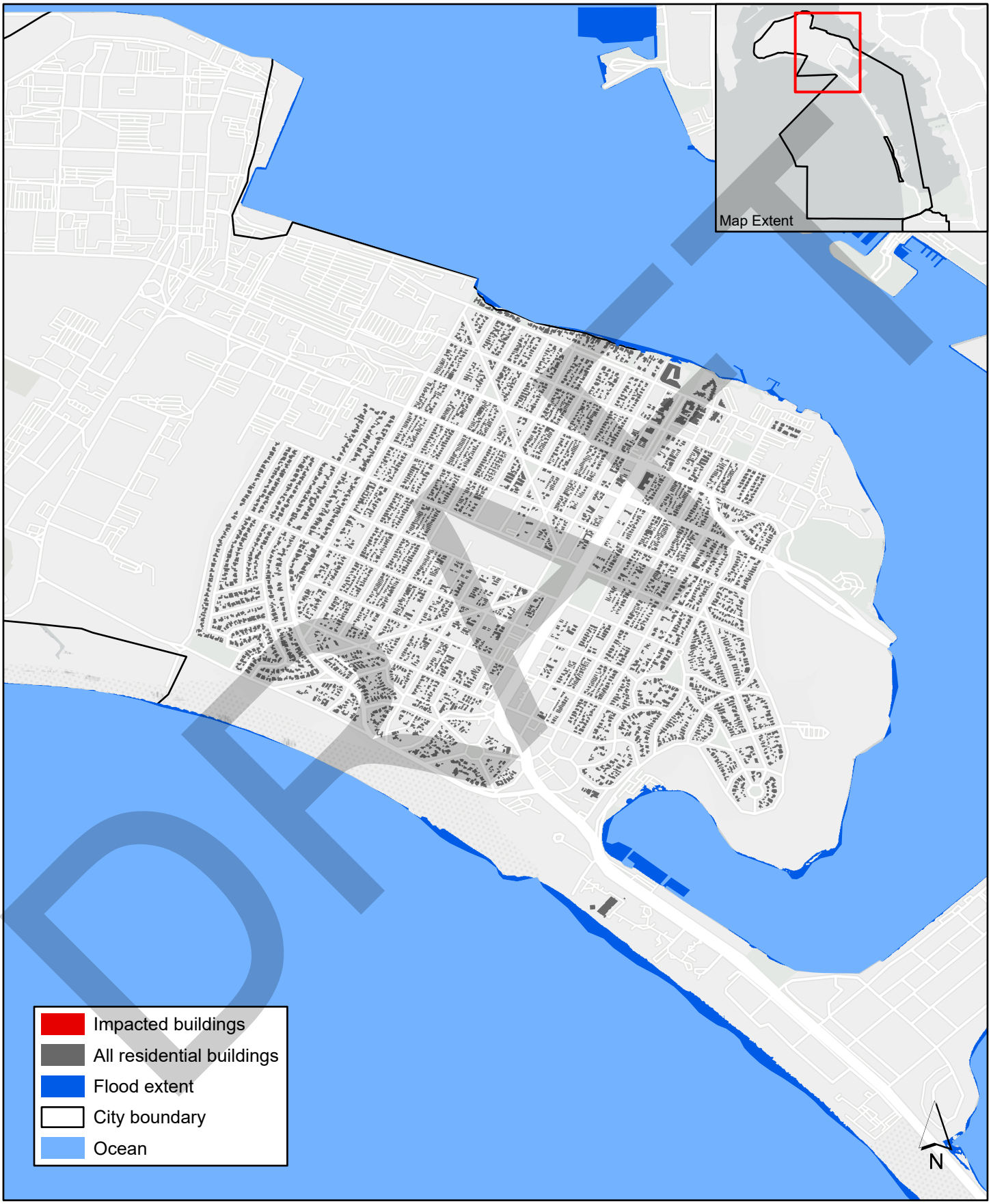
Coronado Area 2

Sea Level Rise 0.0 m - 100 year storm



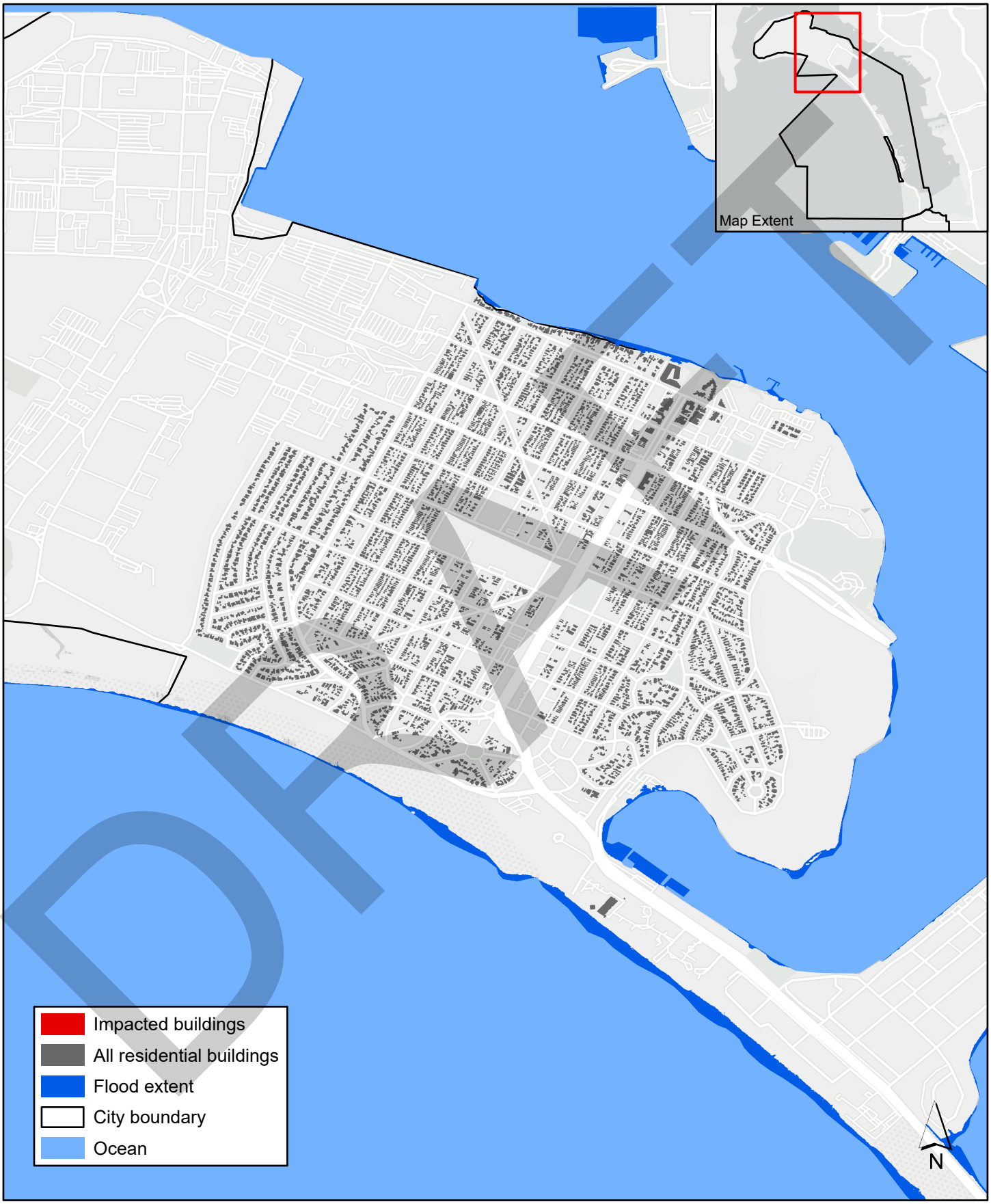
Coronado Area 2

Sea Level Rise 0.25 m - No storm



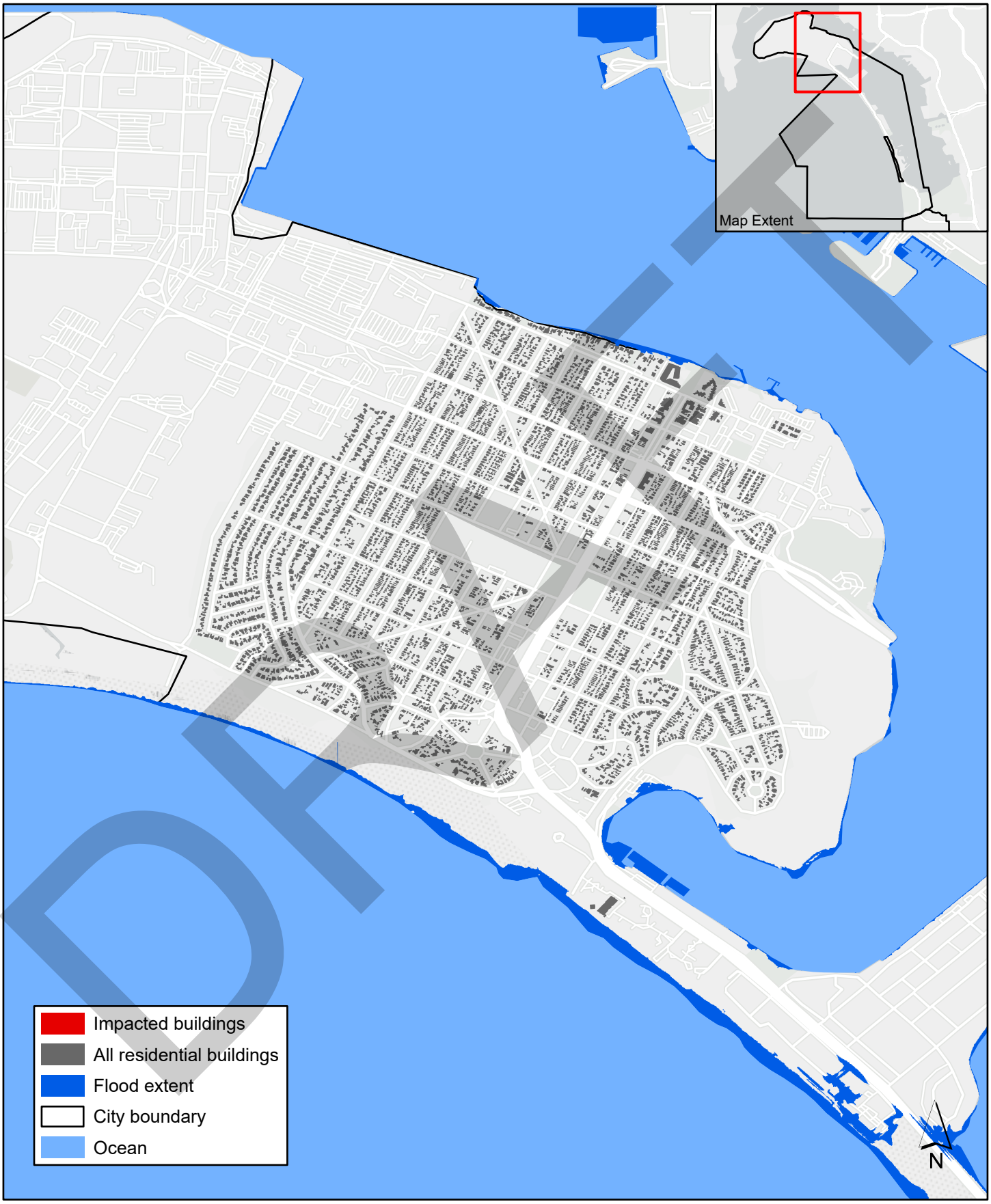
Coronado Area 2

Sea Level Rise 0.25 m - 001 year storm



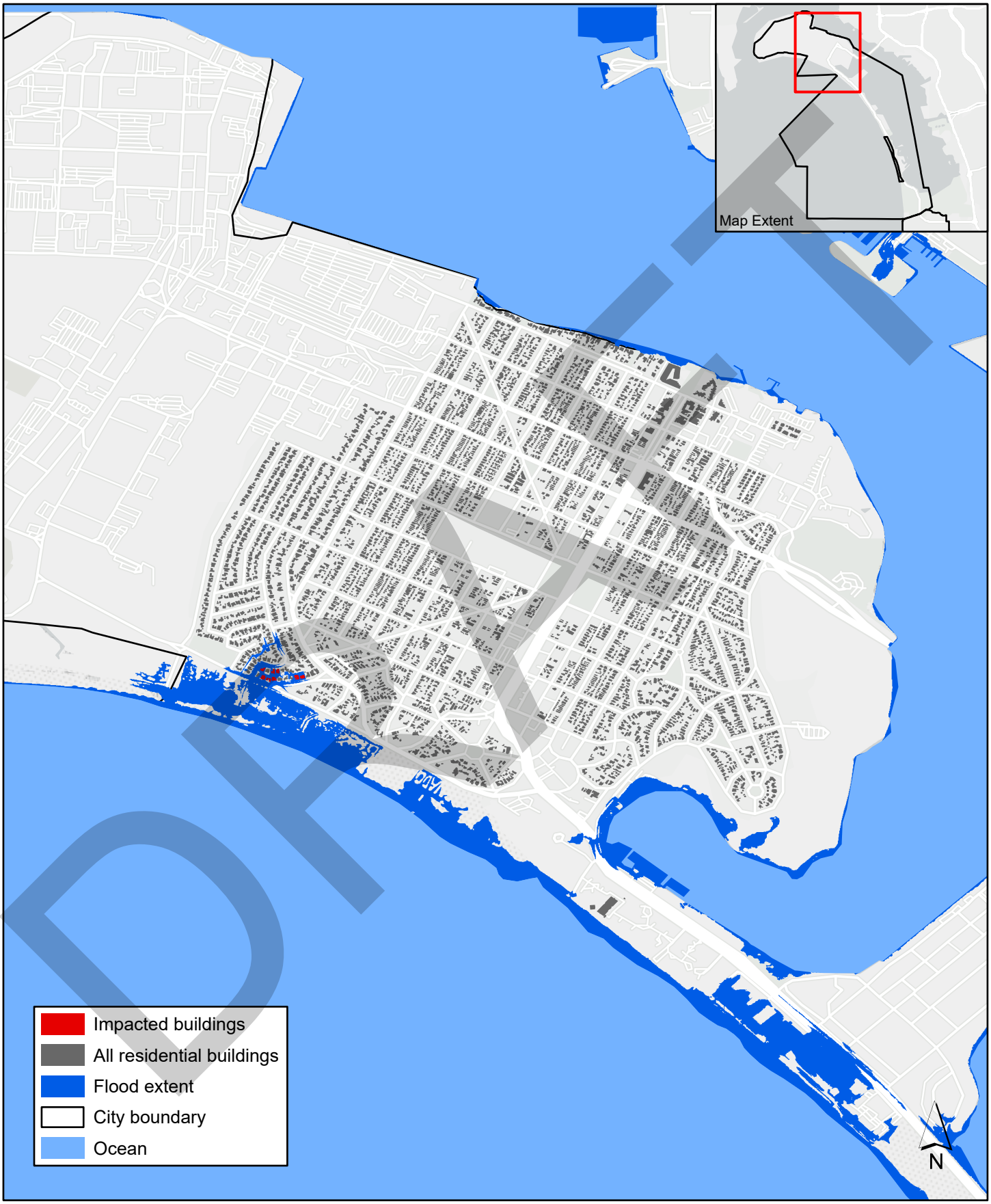
Coronado Area 2

Sea Level Rise 0.25 m - 020 year storm



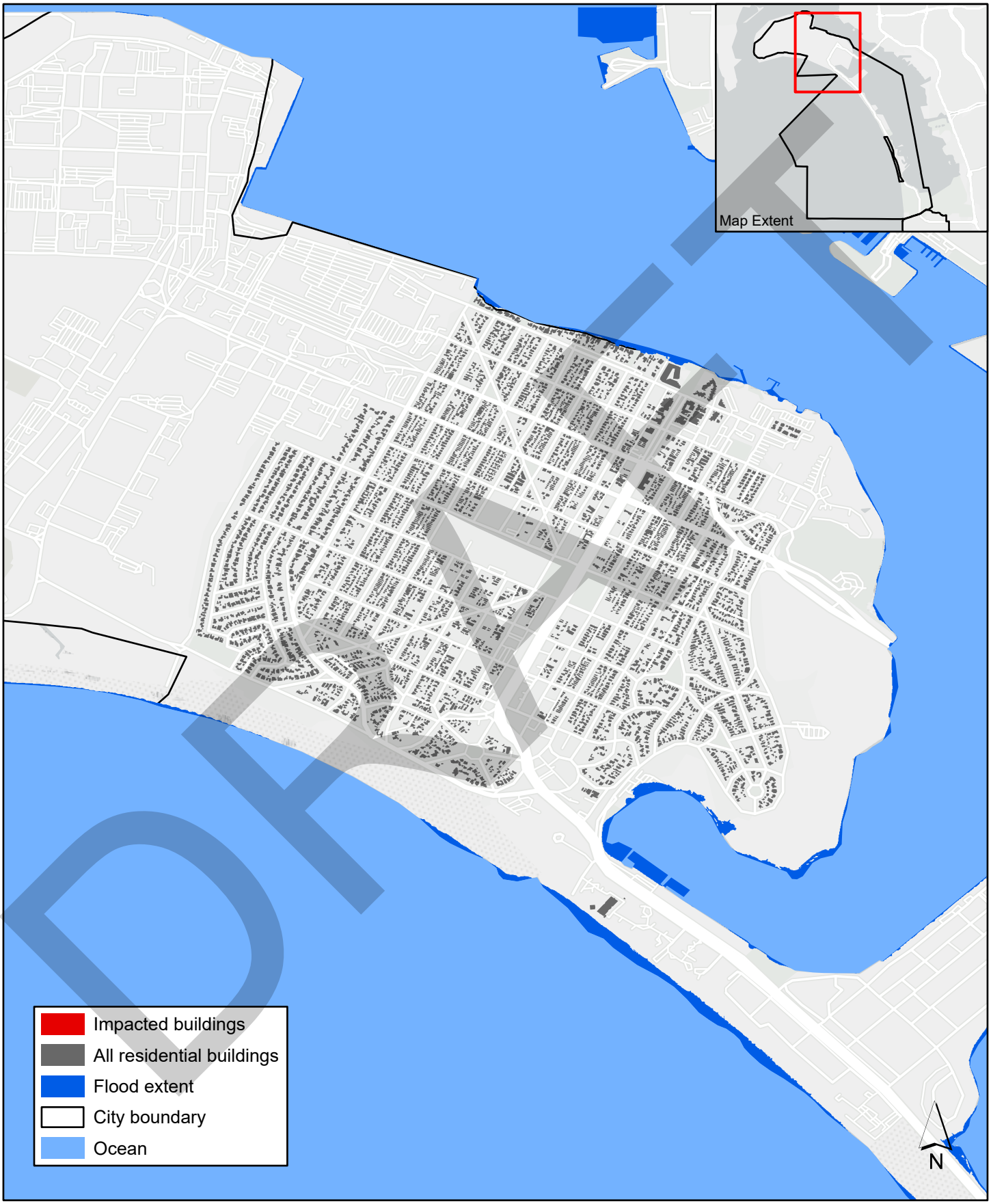
Coronado Area 2

Sea Level Rise 0.25 m - 100 year storm



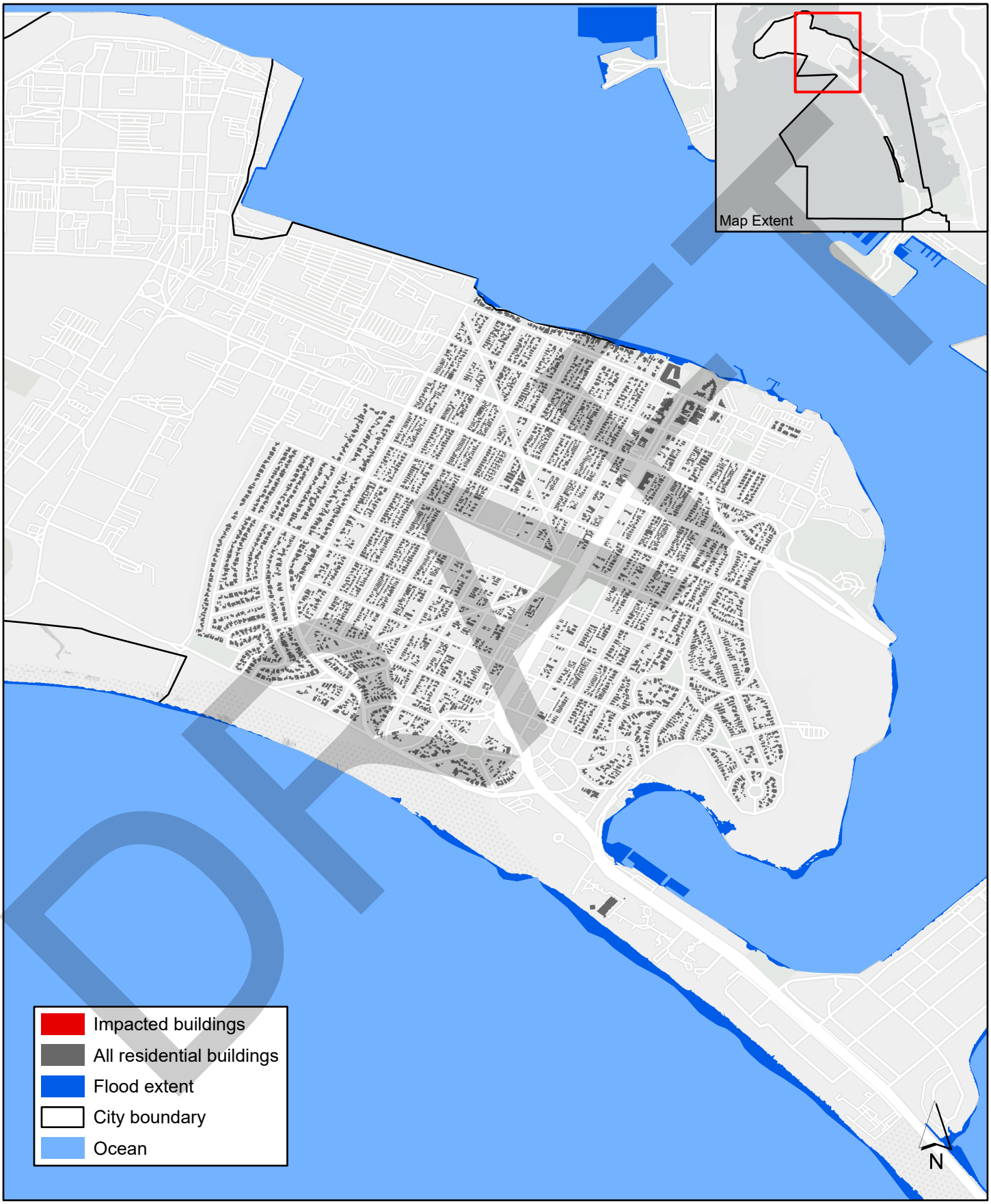
Coronado Area 2

Sea Level Rise 0.5 m - No storm



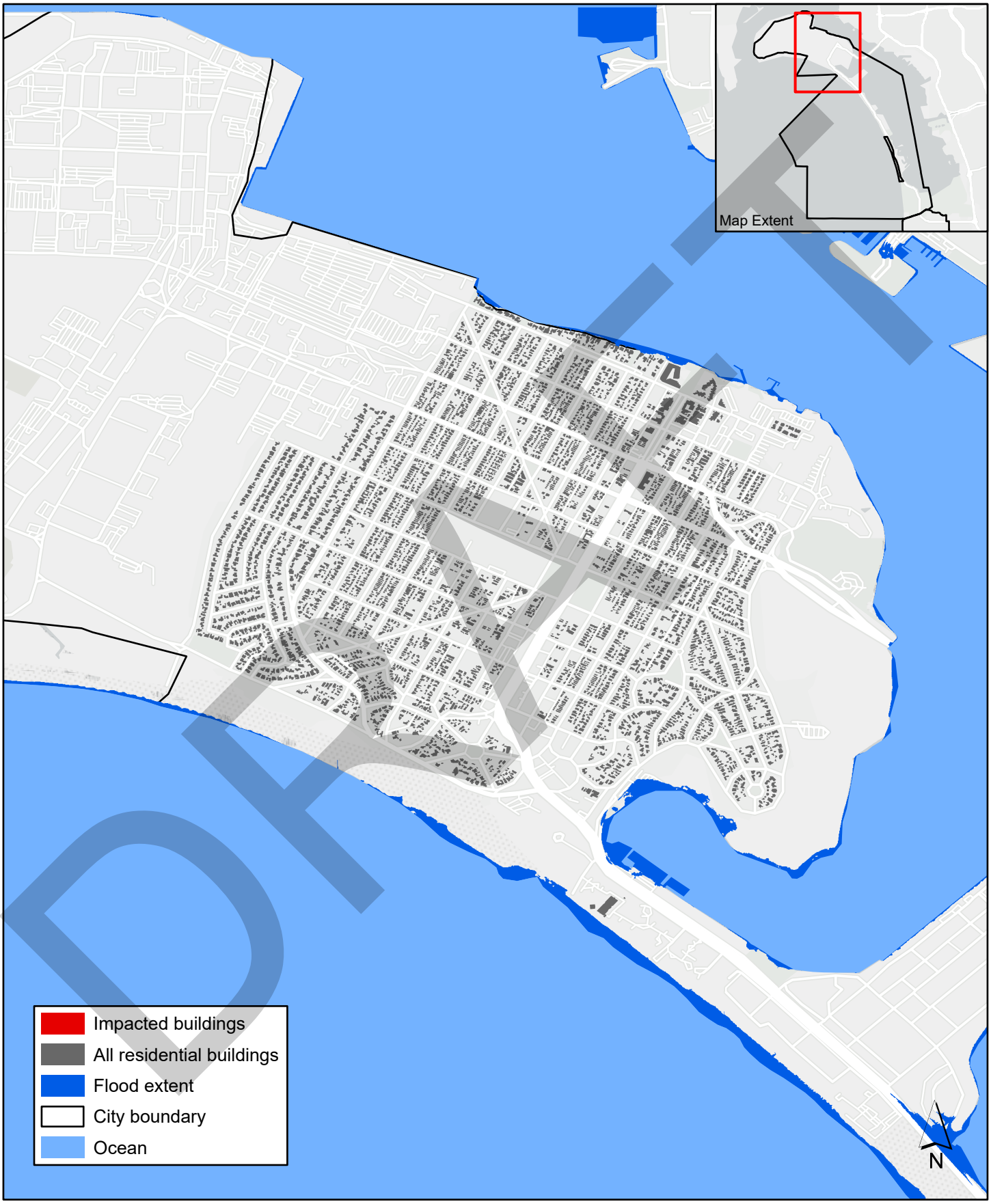
Coronado Area 2

Sea Level Rise 0.5 m - 001 year storm



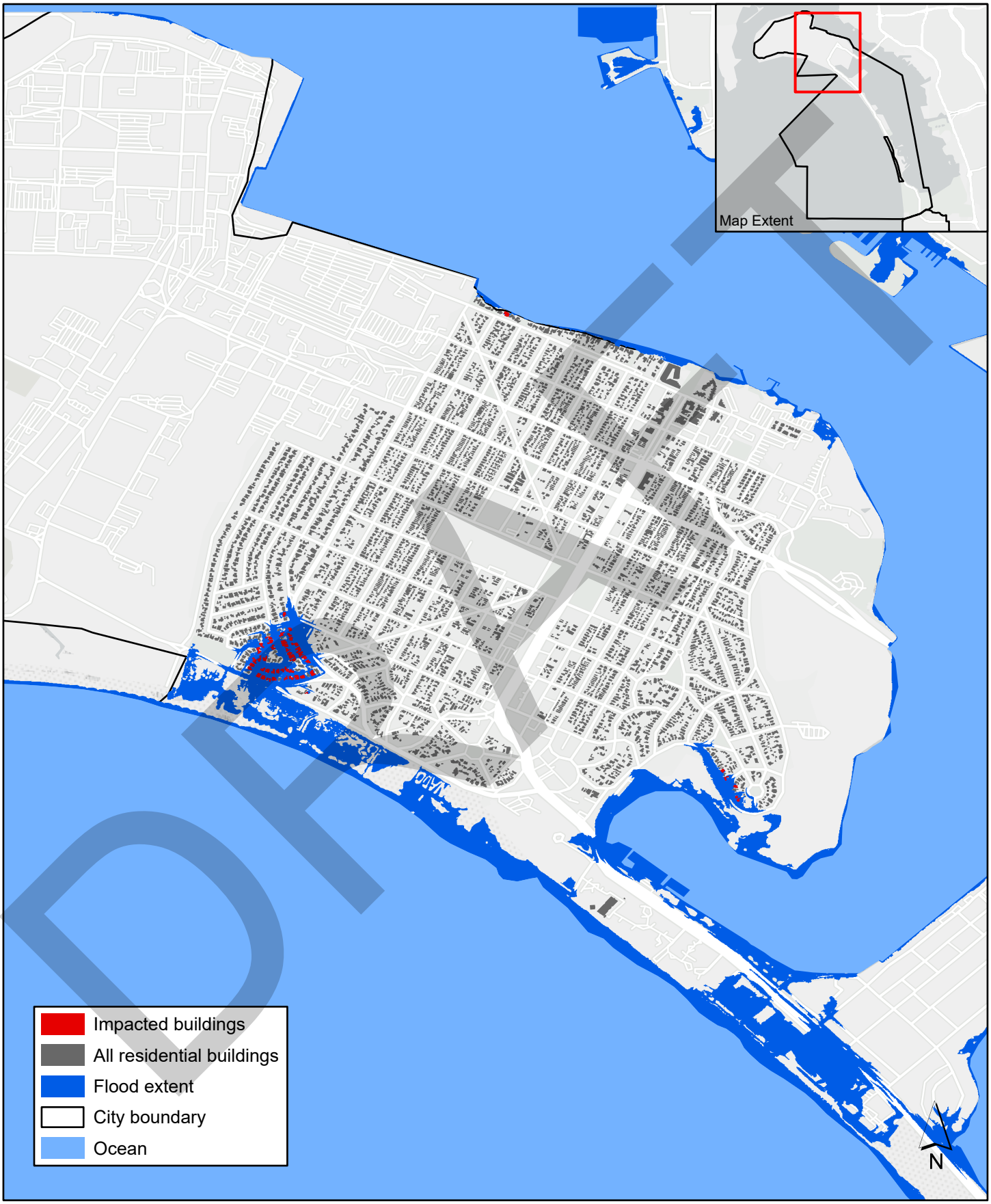
Coronado Area 2

Sea Level Rise 0.5 m - 020 year storm



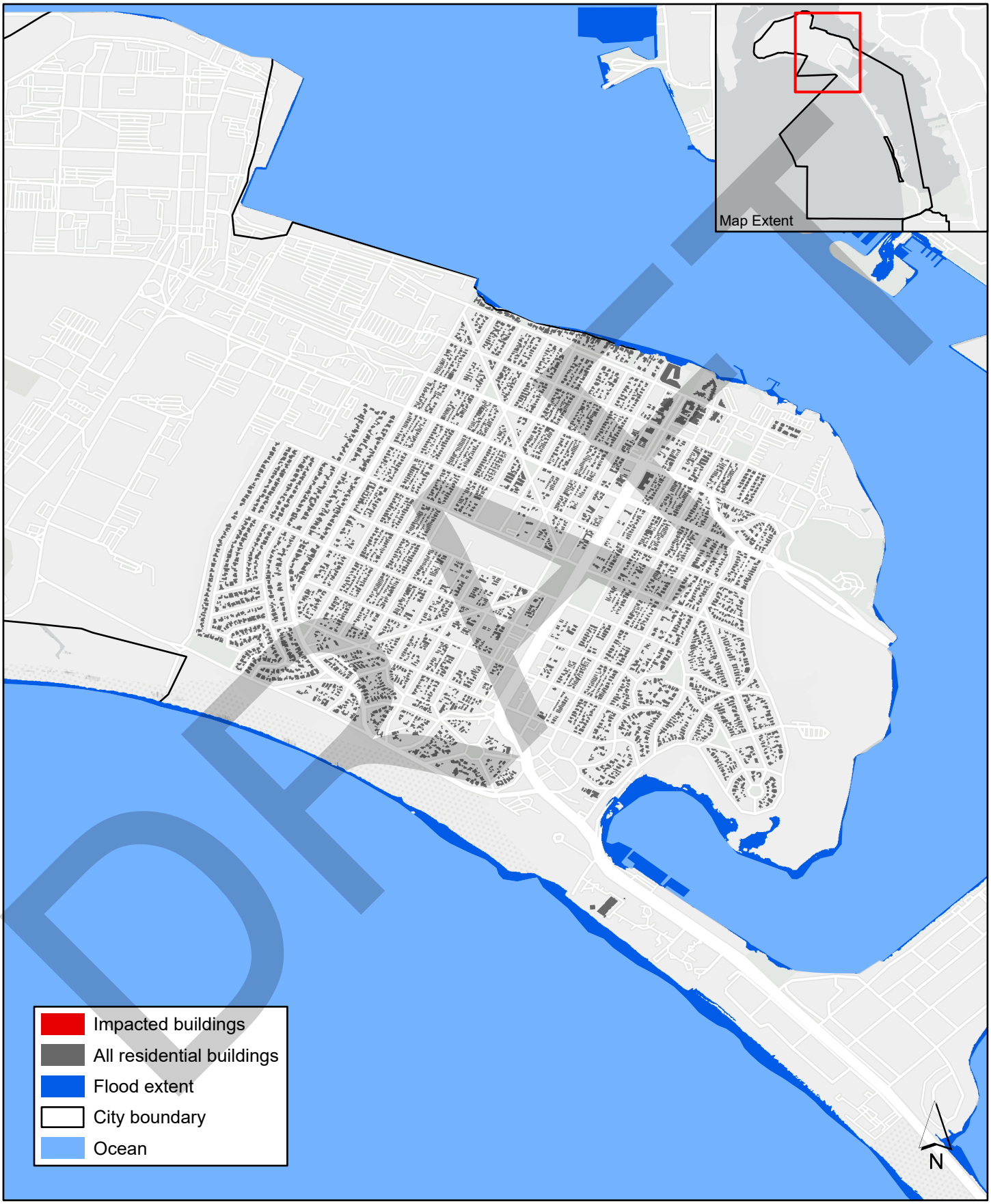
Coronado Area 2

Sea Level Rise 0.5 m - 100 year storm



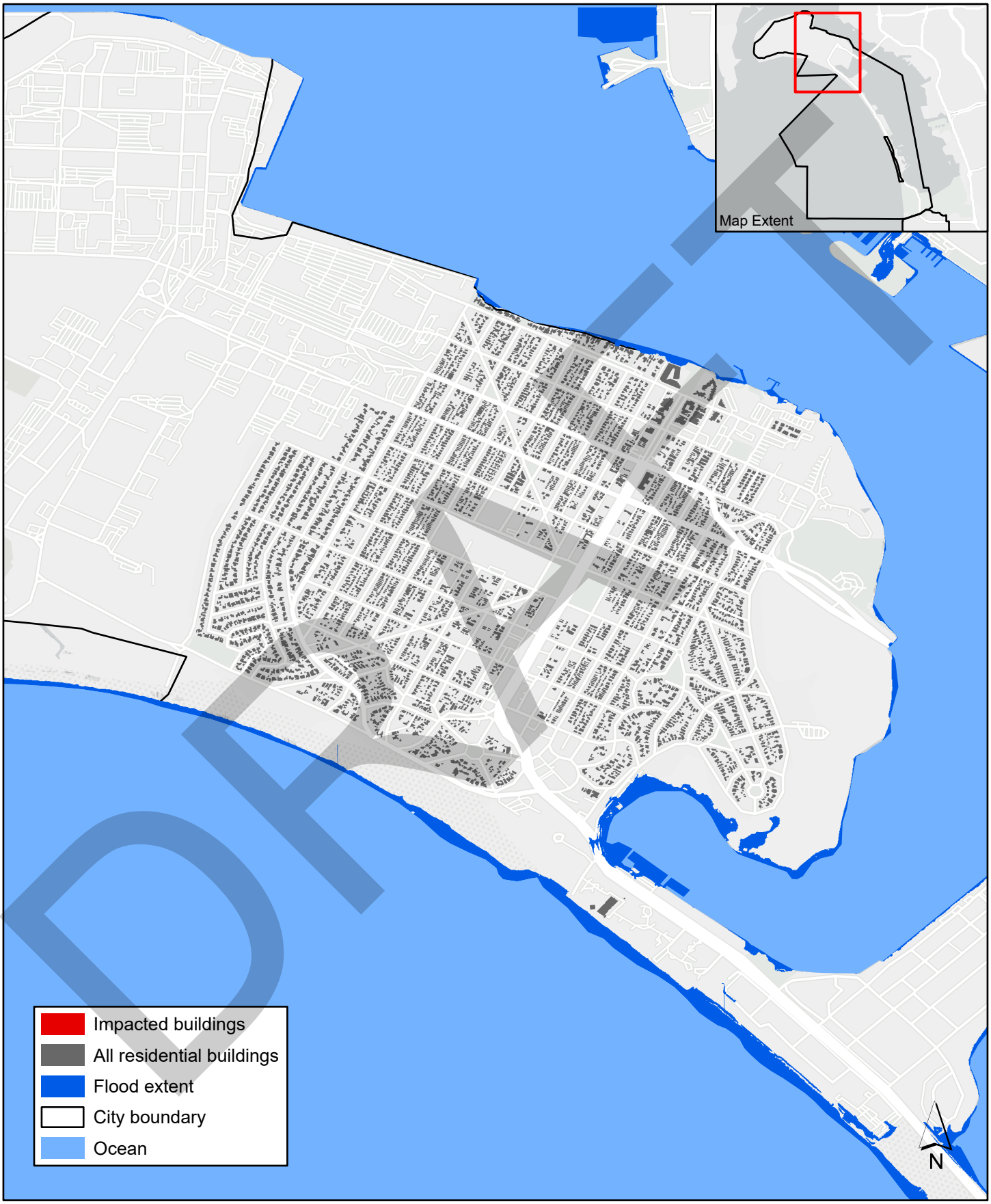
Coronado Area 2

Sea Level Rise 0.75 m - No storm



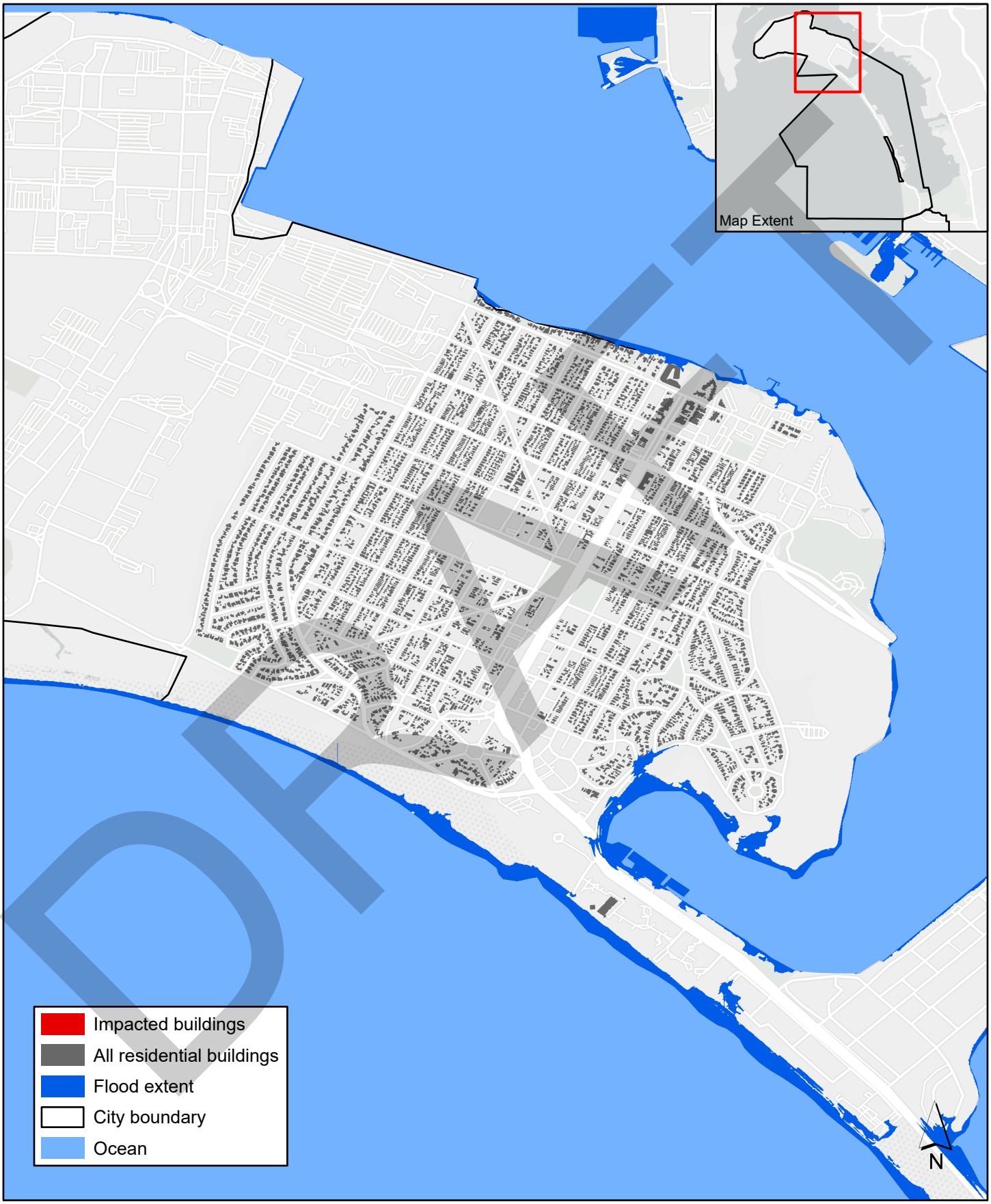
Coronado Area 2

Sea Level Rise 0.75 m - 001 year storm



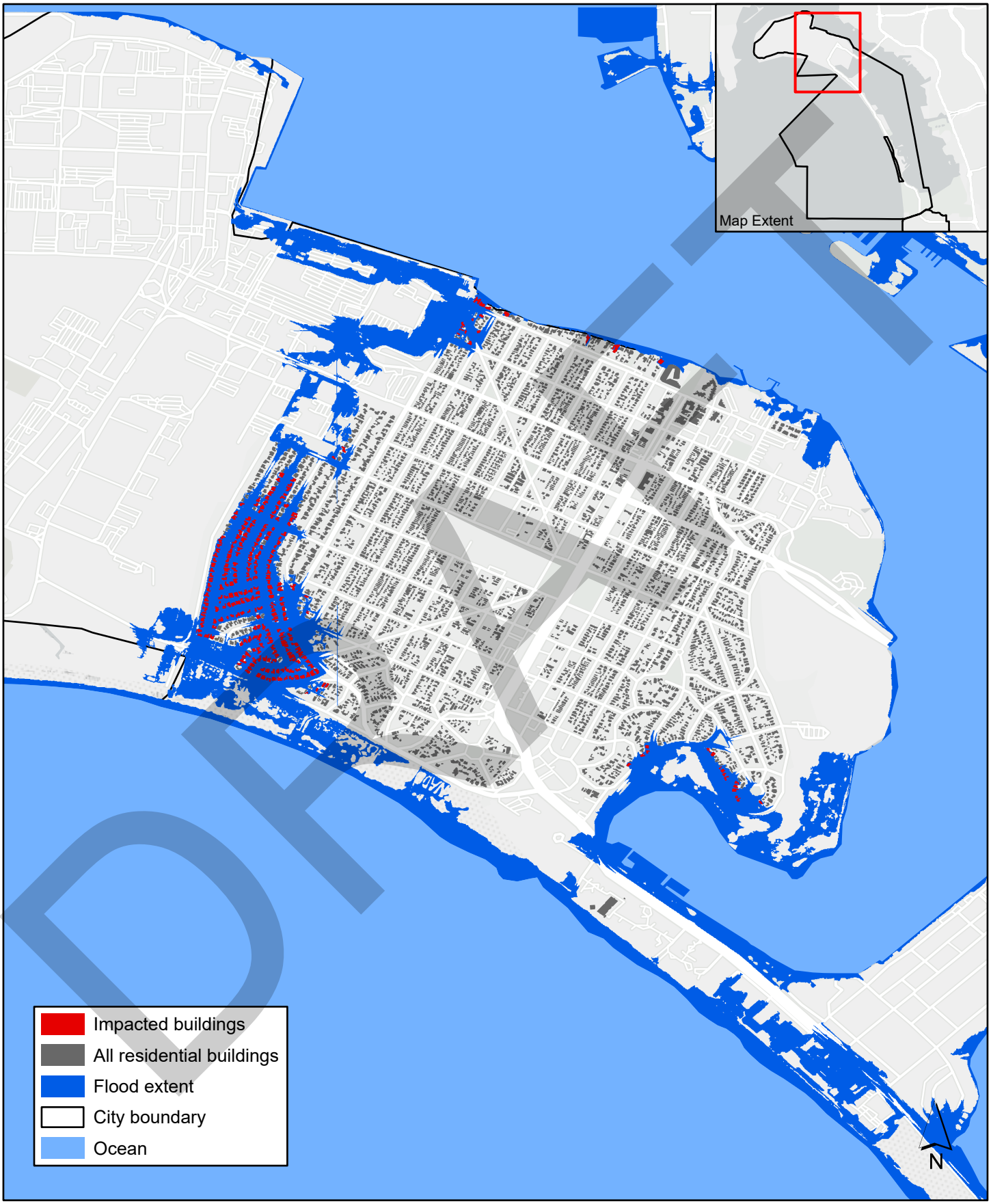
Coronado Area 2

Sea Level Rise 0.75 m - 020 year storm



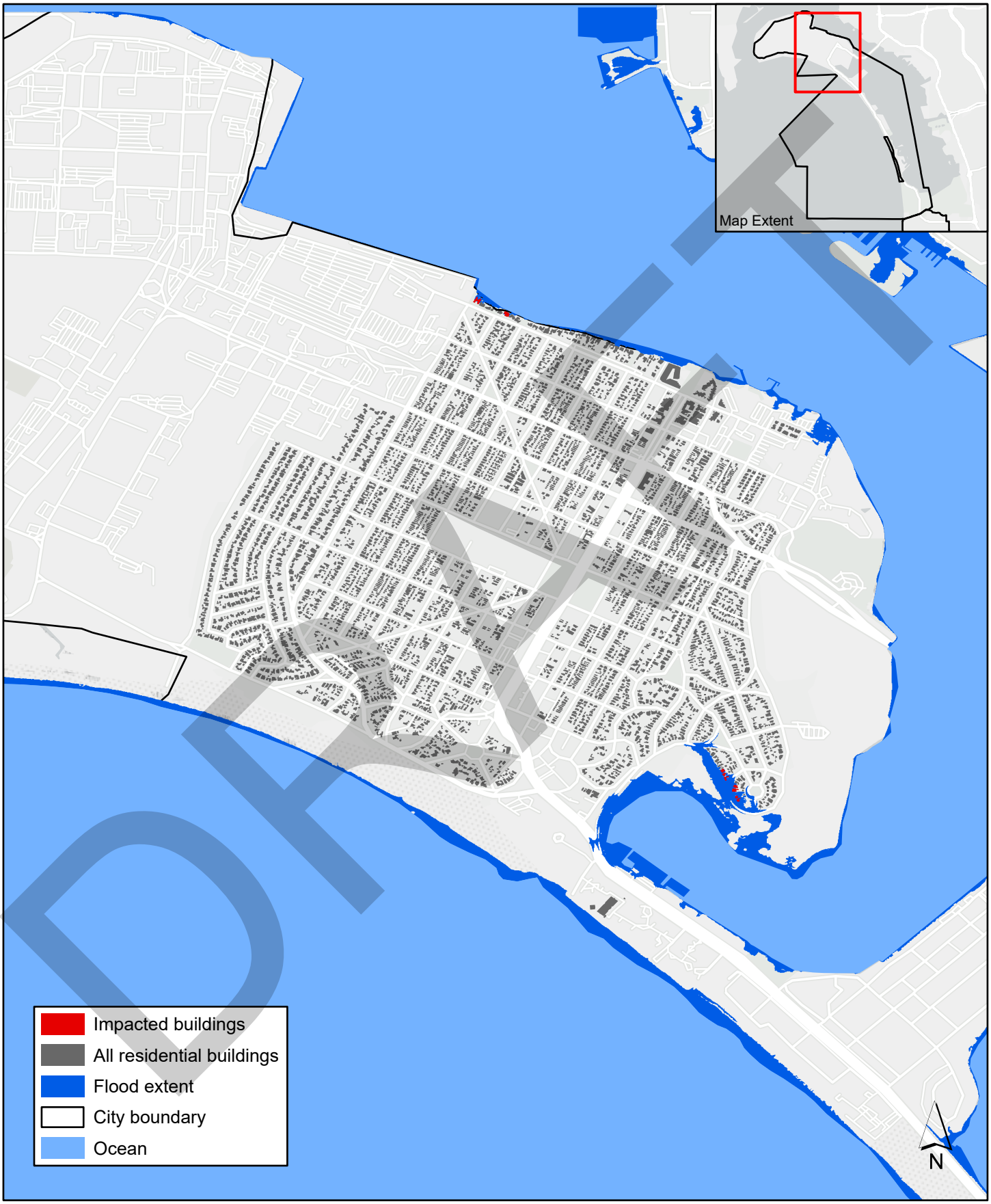
Coronado Area 2

Sea Level Rise 0.75 m - 100 year storm



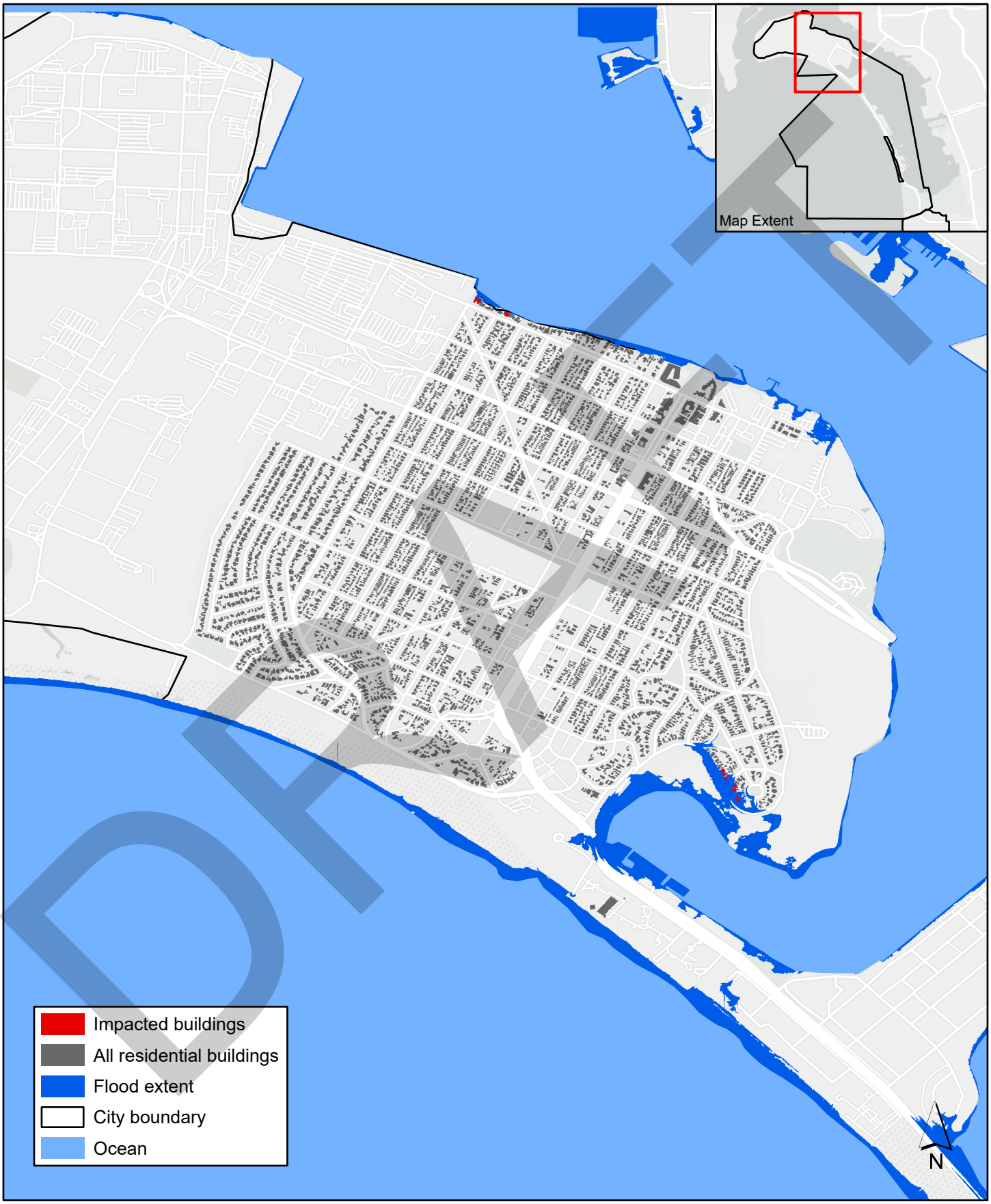
Coronado Area 2

Sea Level Rise 1.0 m - No storm



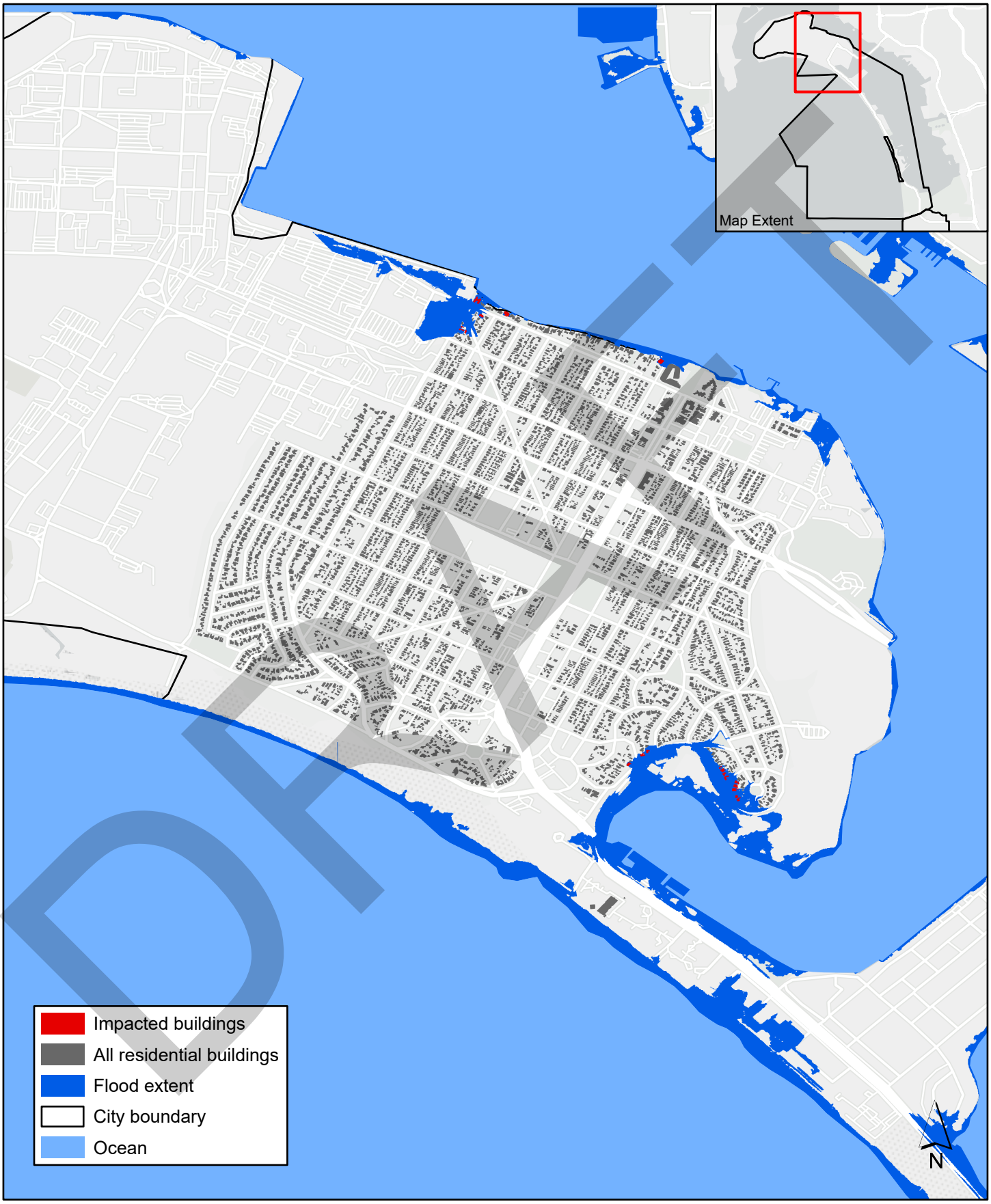
Coronado Area 2

Sea Level Rise 1.0 m - 001 year storm



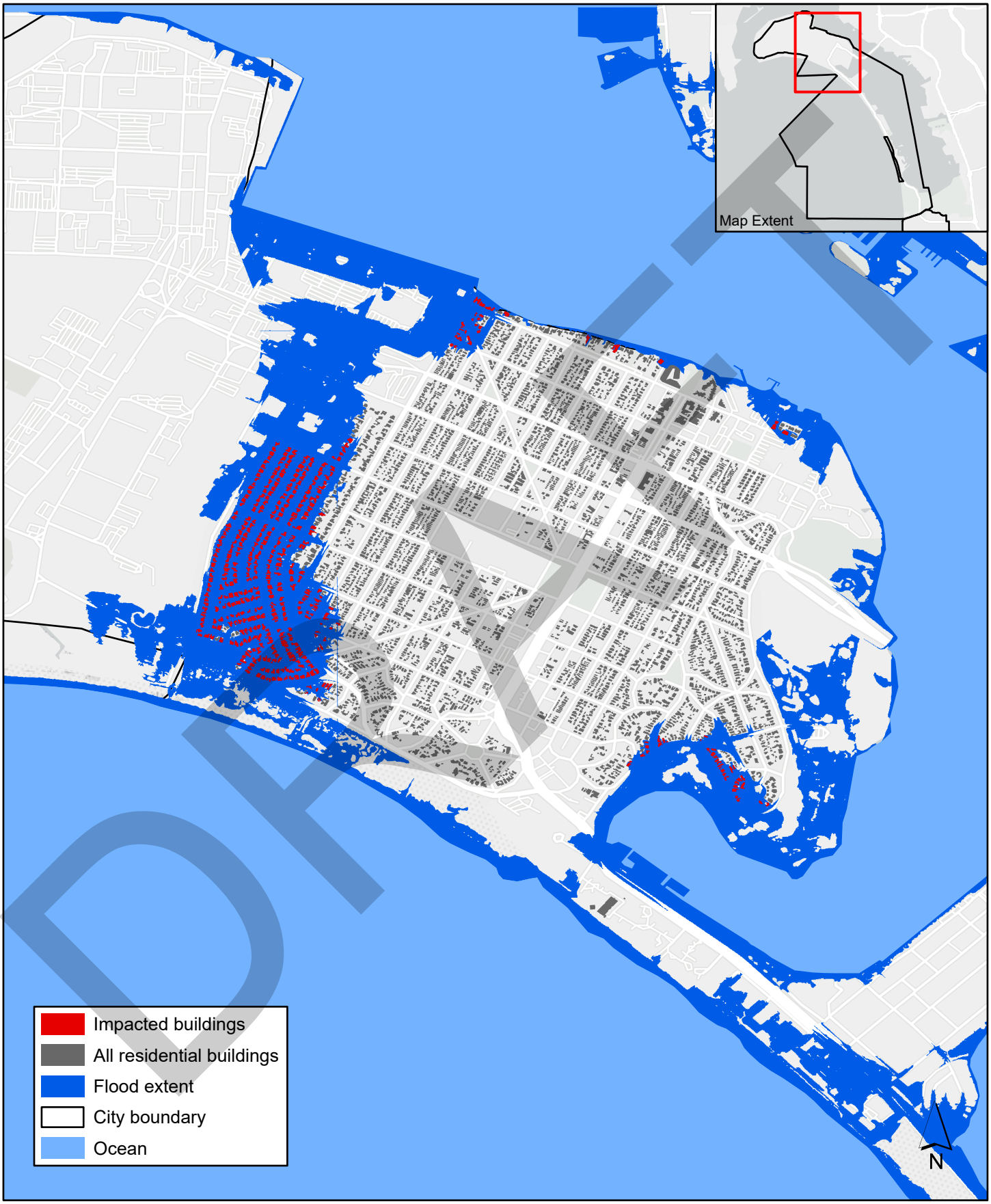
Coronado Area 2

Sea Level Rise 1.0 m - 020 year storm



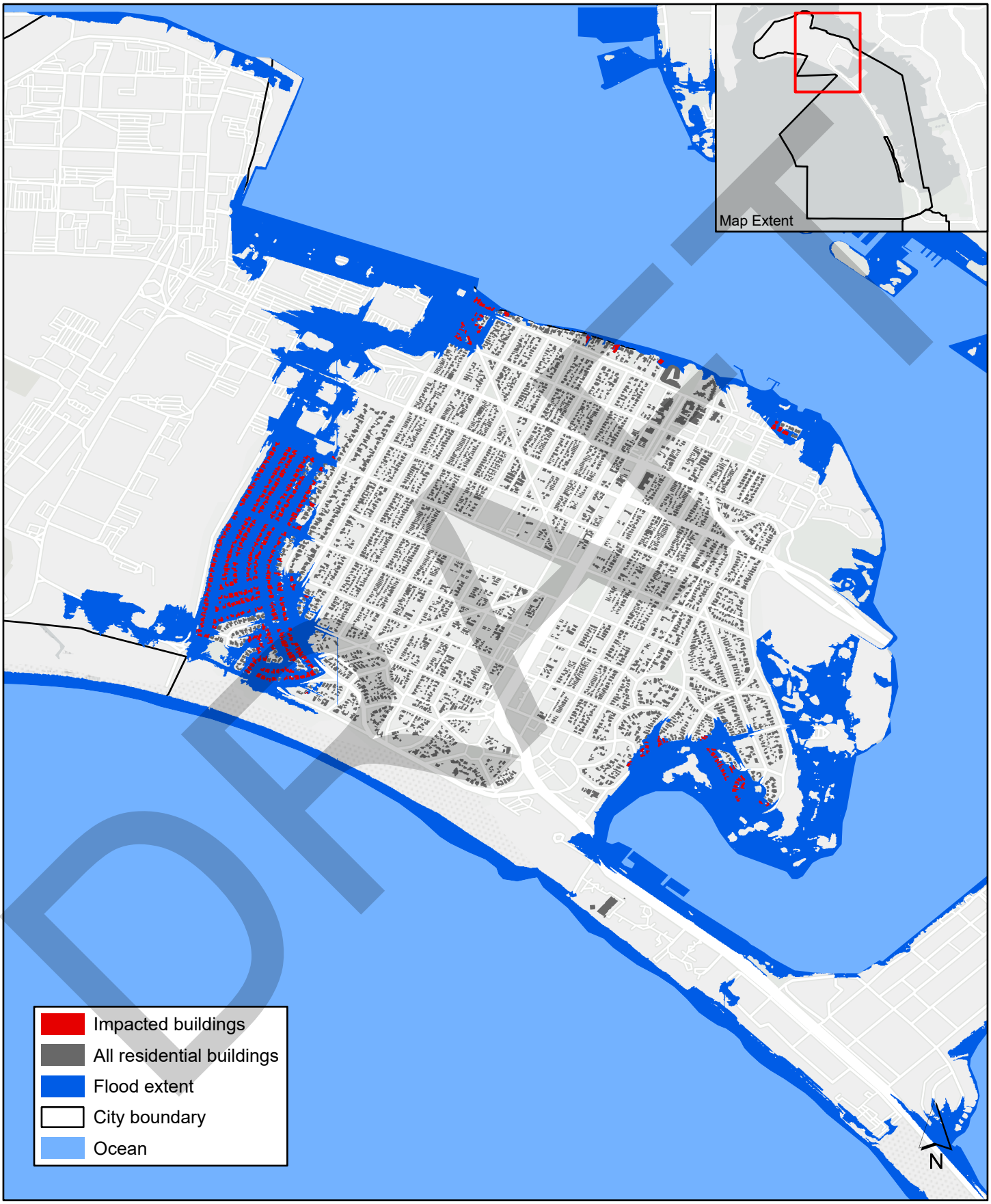
Coronado Area 2

Sea Level Rise 1.0 m - 100 year storm



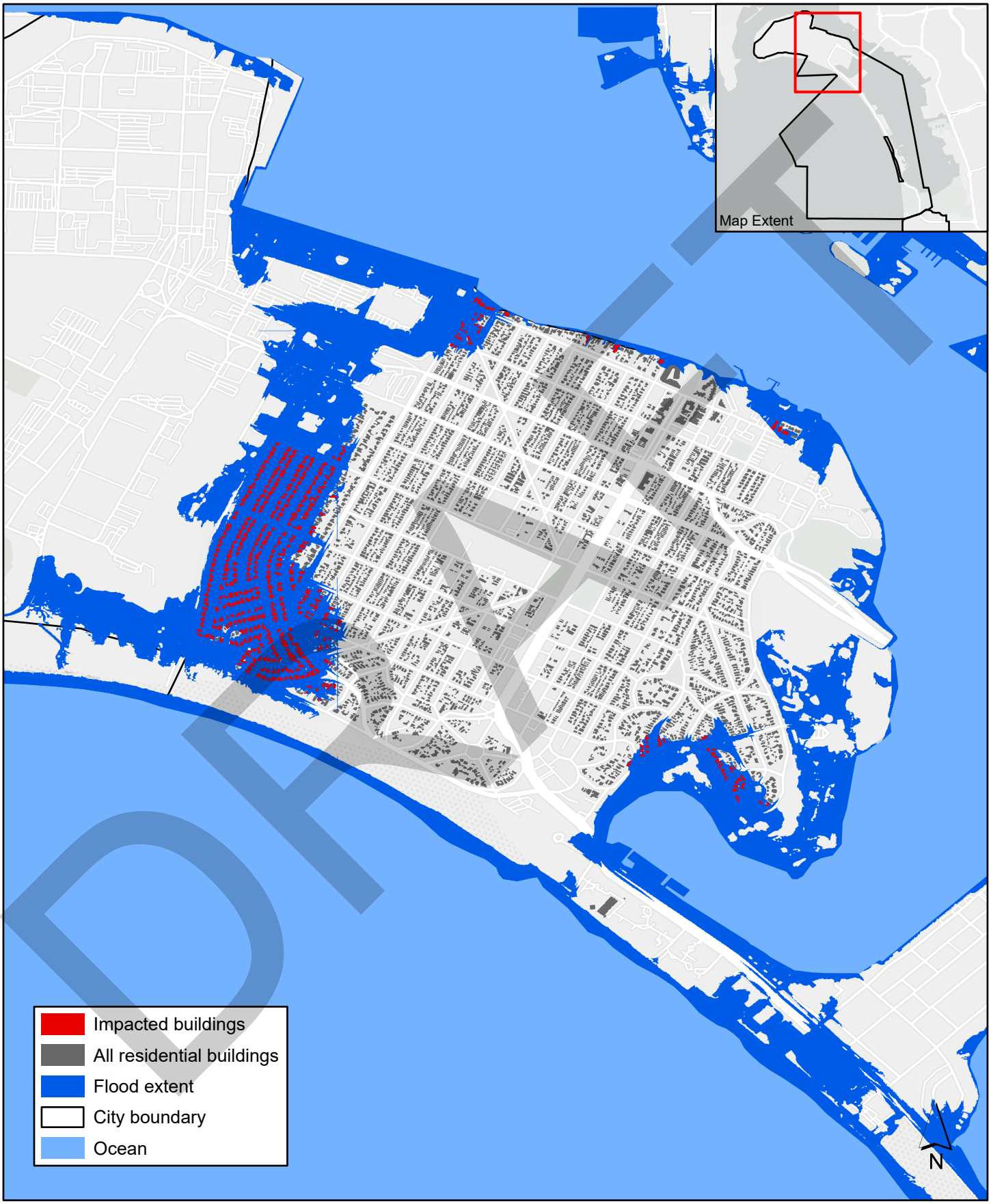
Coronado Area 2

Sea Level Rise 1.5 m - No storm



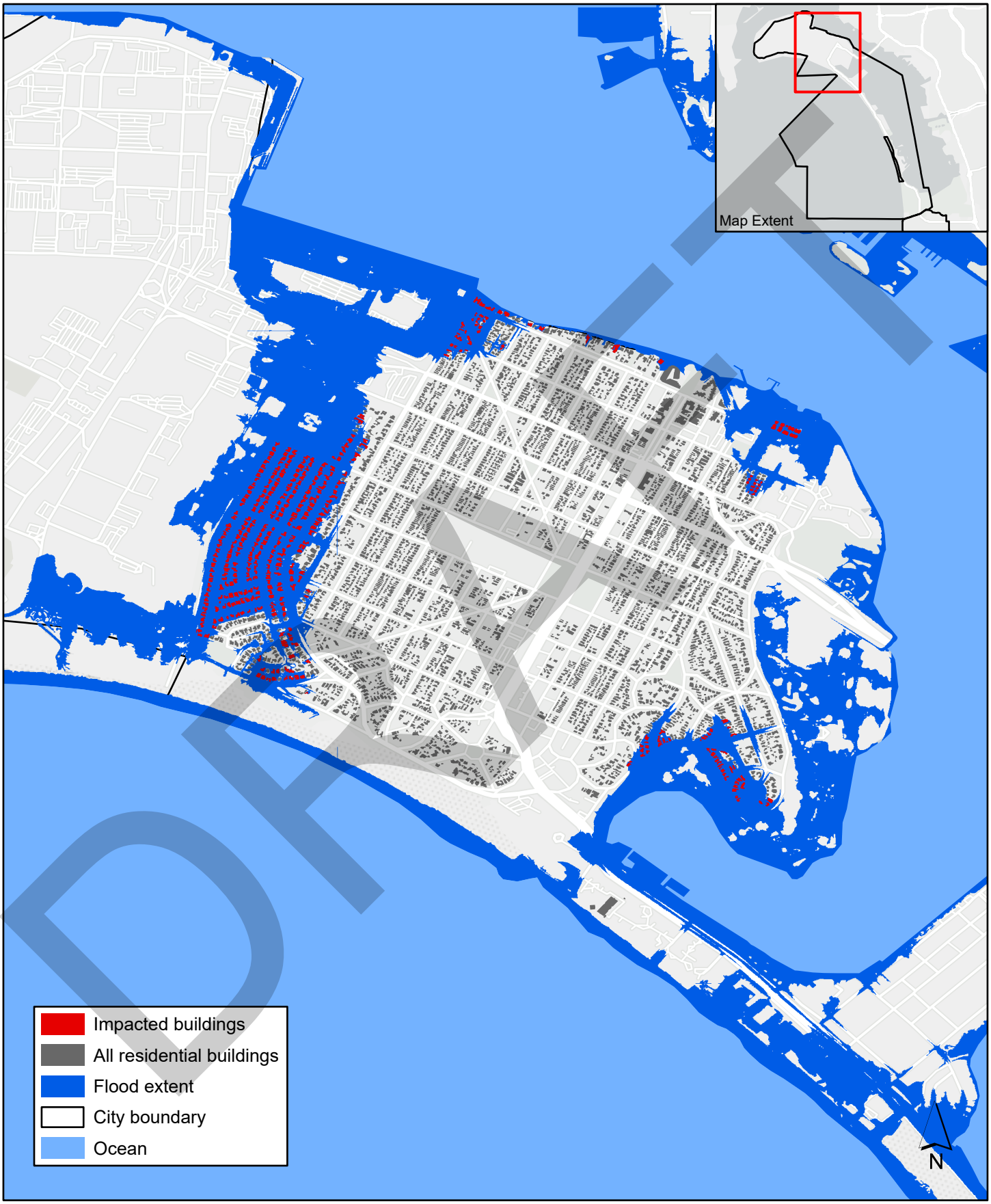
Coronado Area 2

Sea Level Rise 1.5 m - 001 year storm



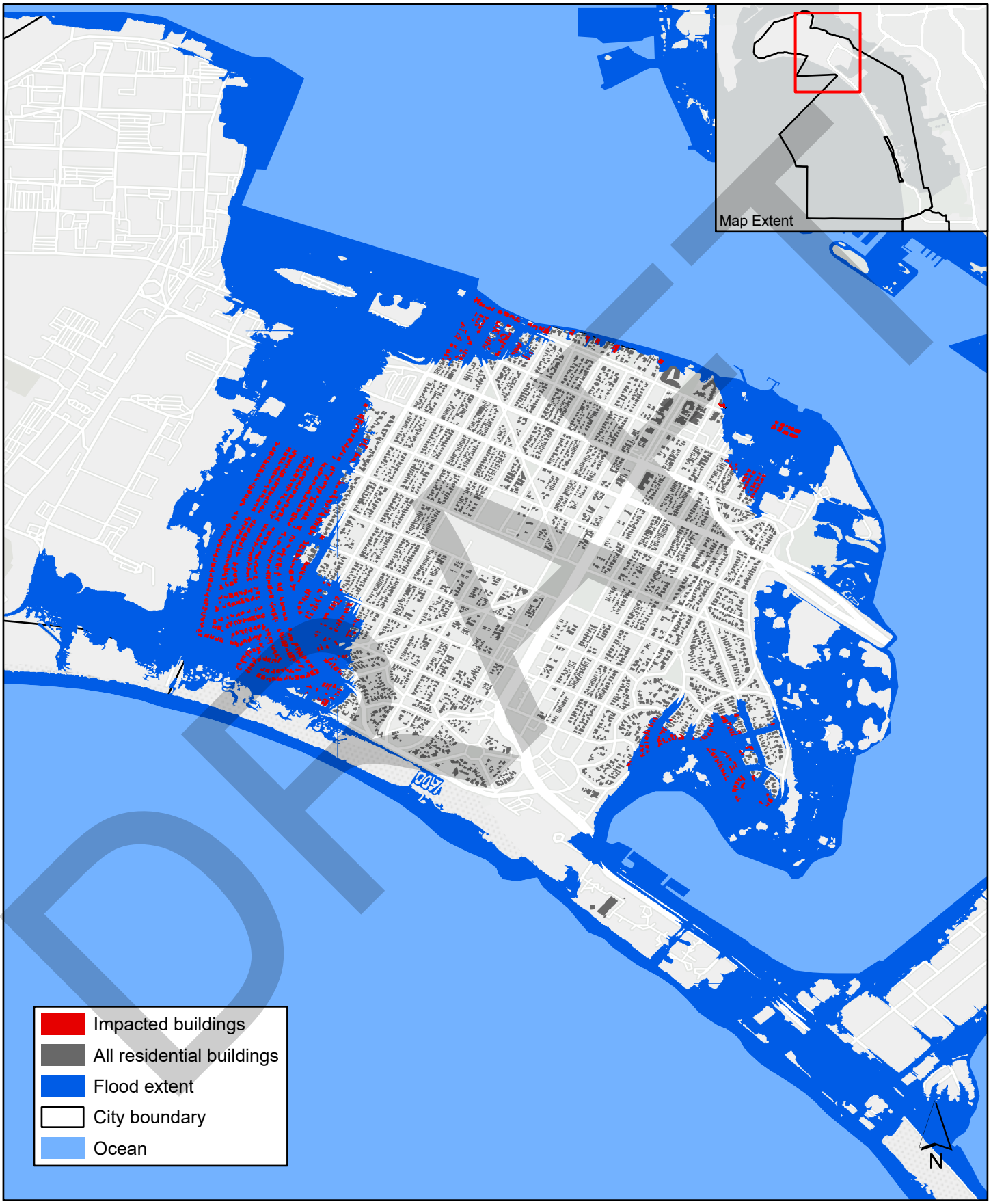
Coronado Area 2

Sea Level Rise 1.5 m - 020 year storm



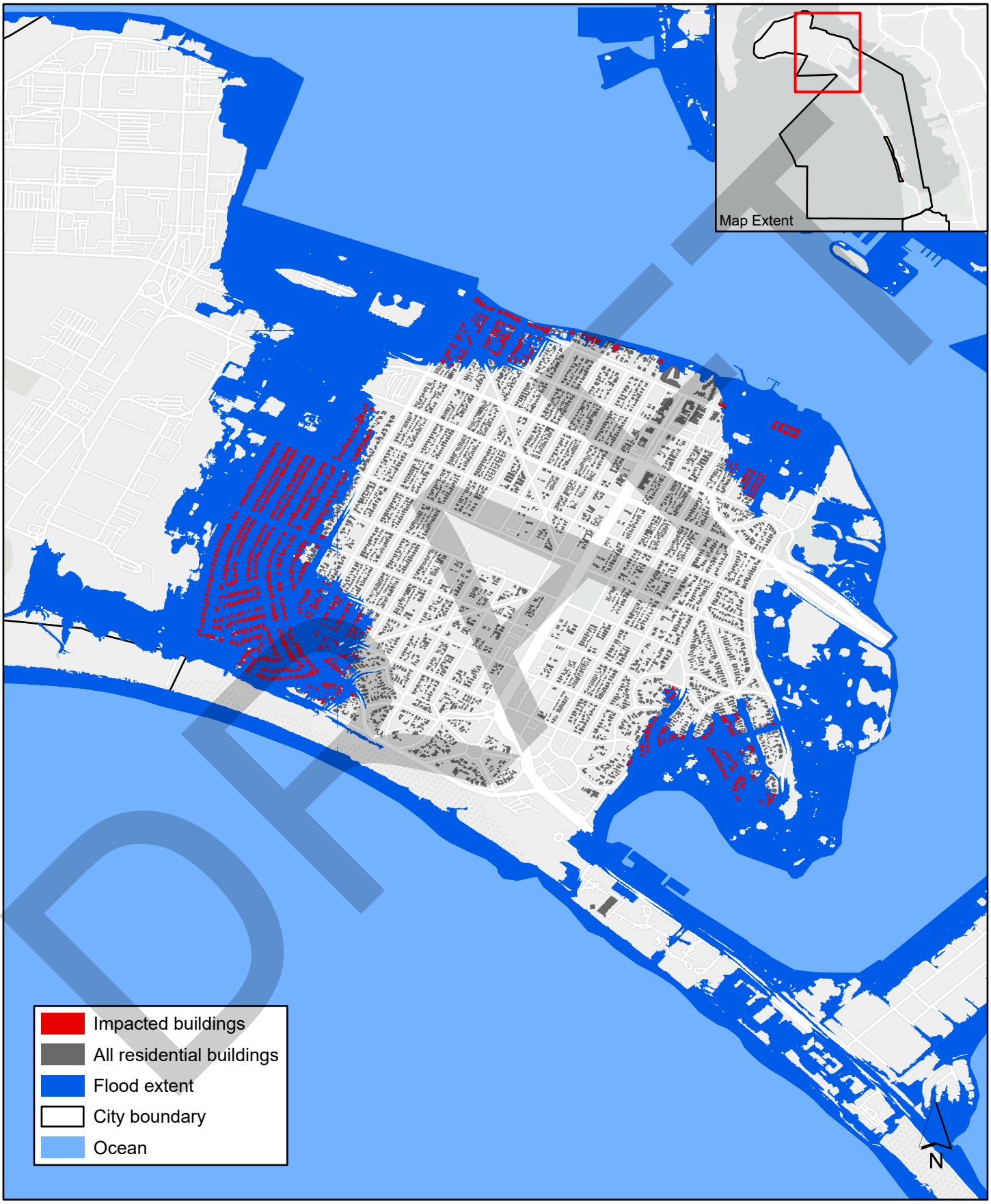
Coronado Area 2

Sea Level Rise 1.5 m - 100 year storm



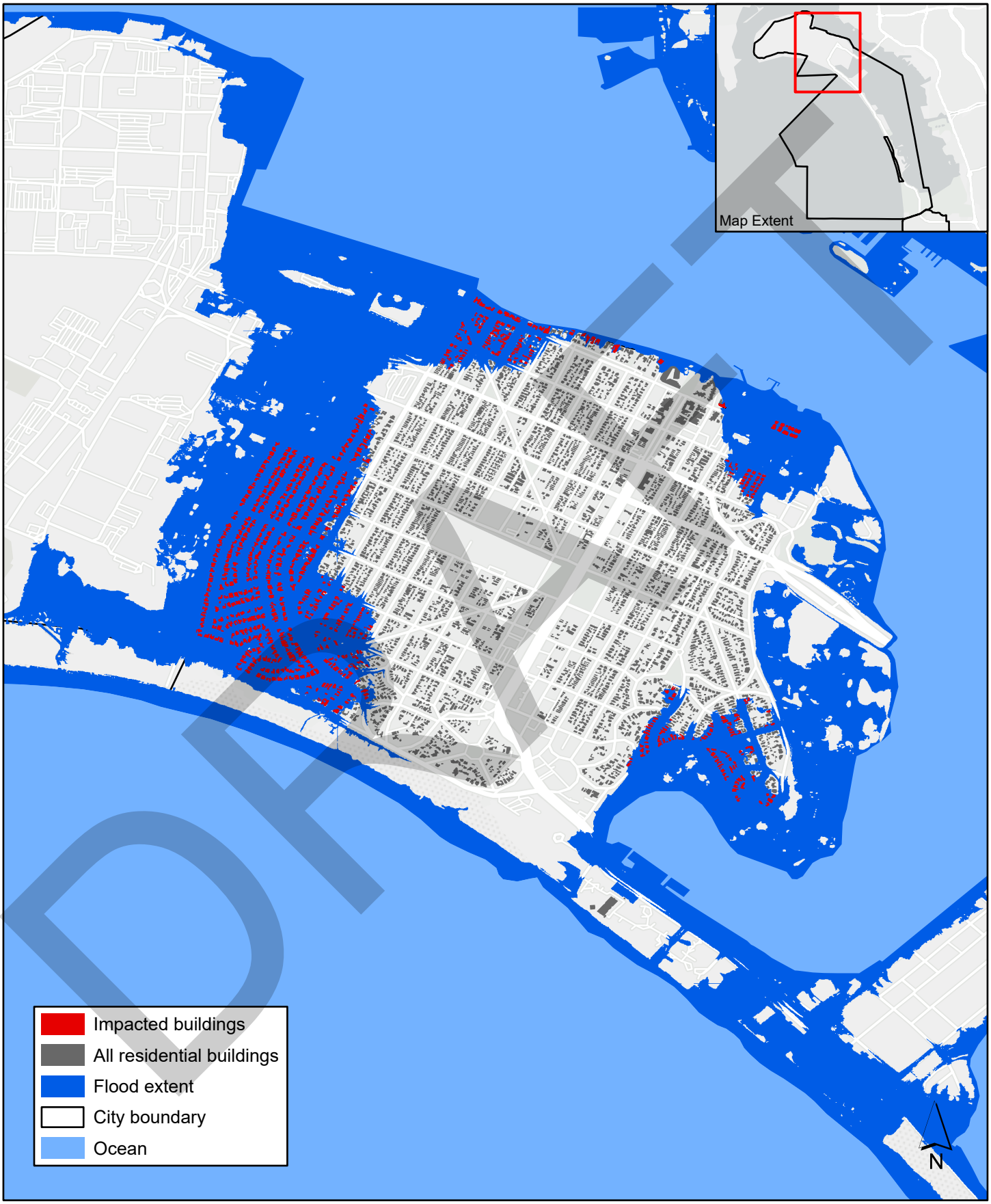
Coronado Area 2

Sea Level Rise 2.0 m - No storm



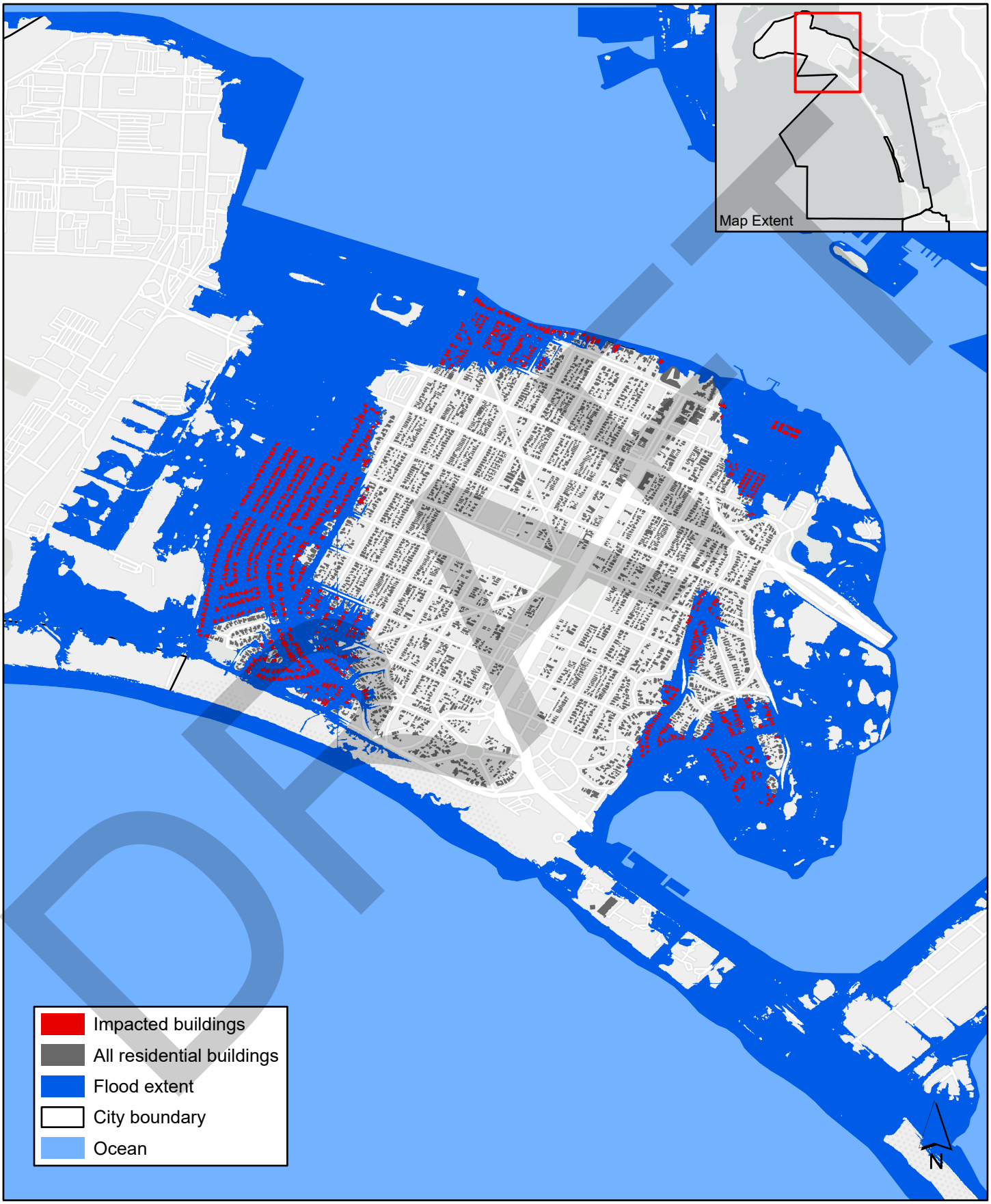
Coronado Area 2

Sea Level Rise 2.0 m - 001 year storm



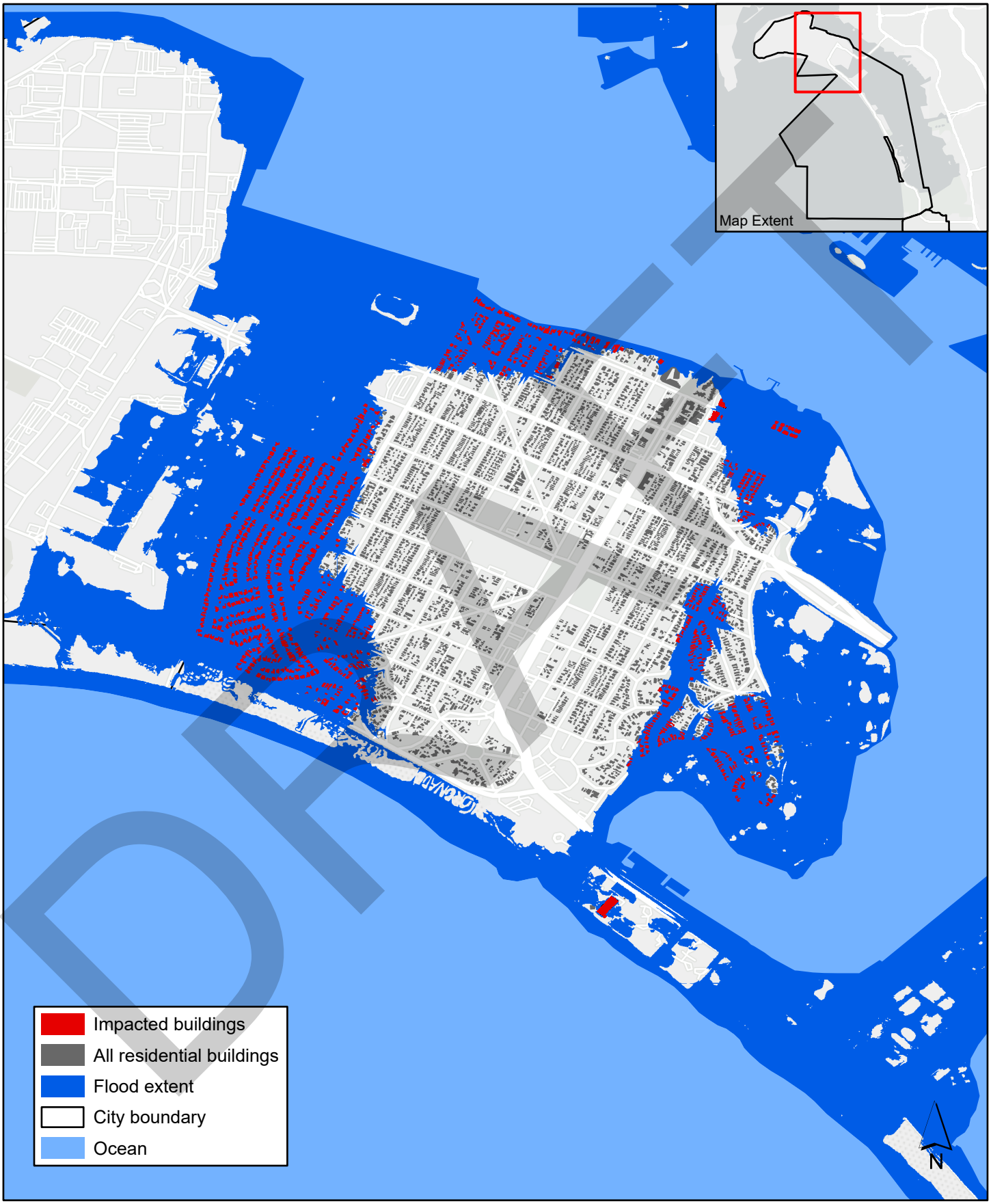
Coronado Area 2

Sea Level Rise 2.0 m - 020 year storm



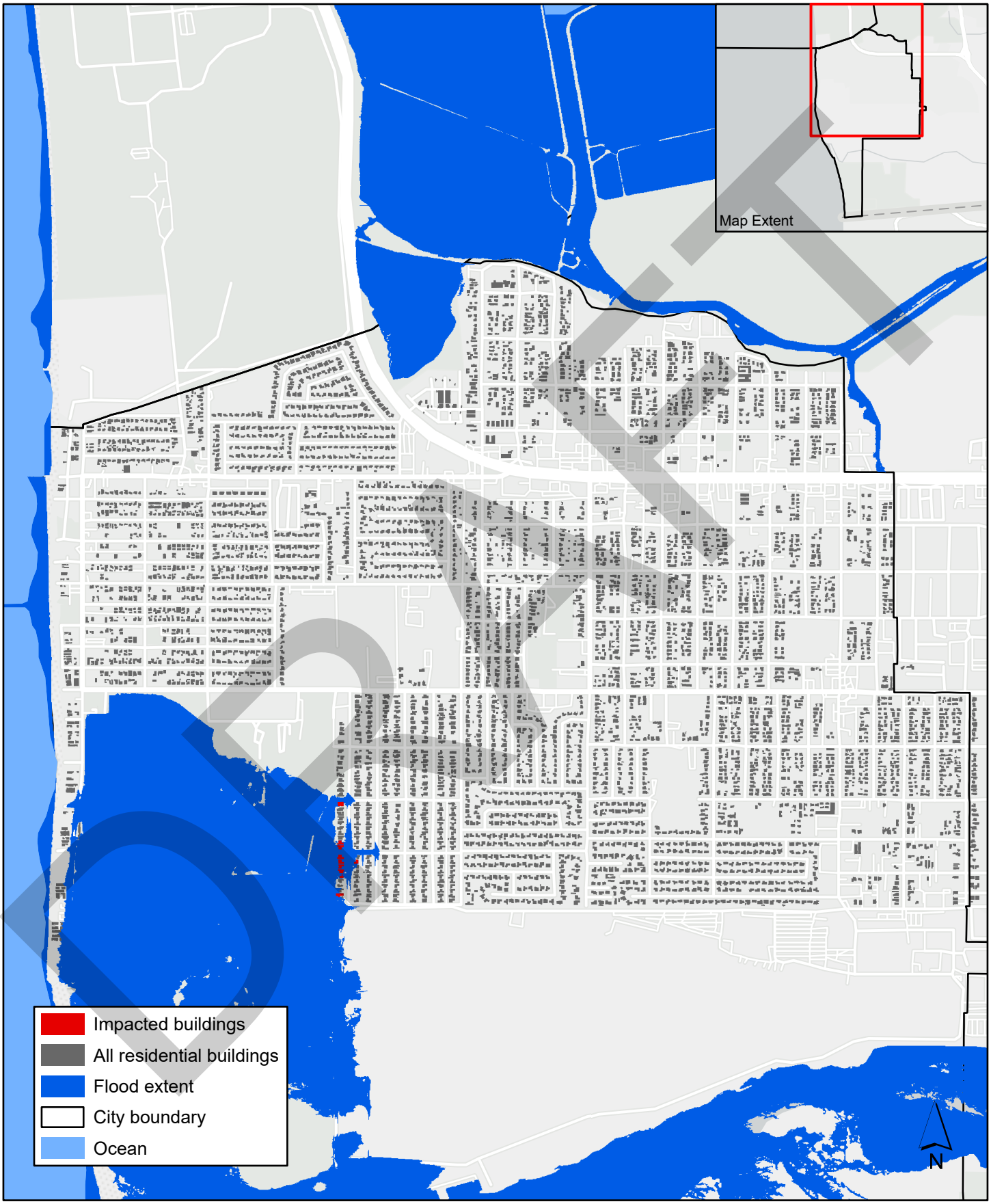
Coronado Area 2

Sea Level Rise 2.0 m - 100 year storm



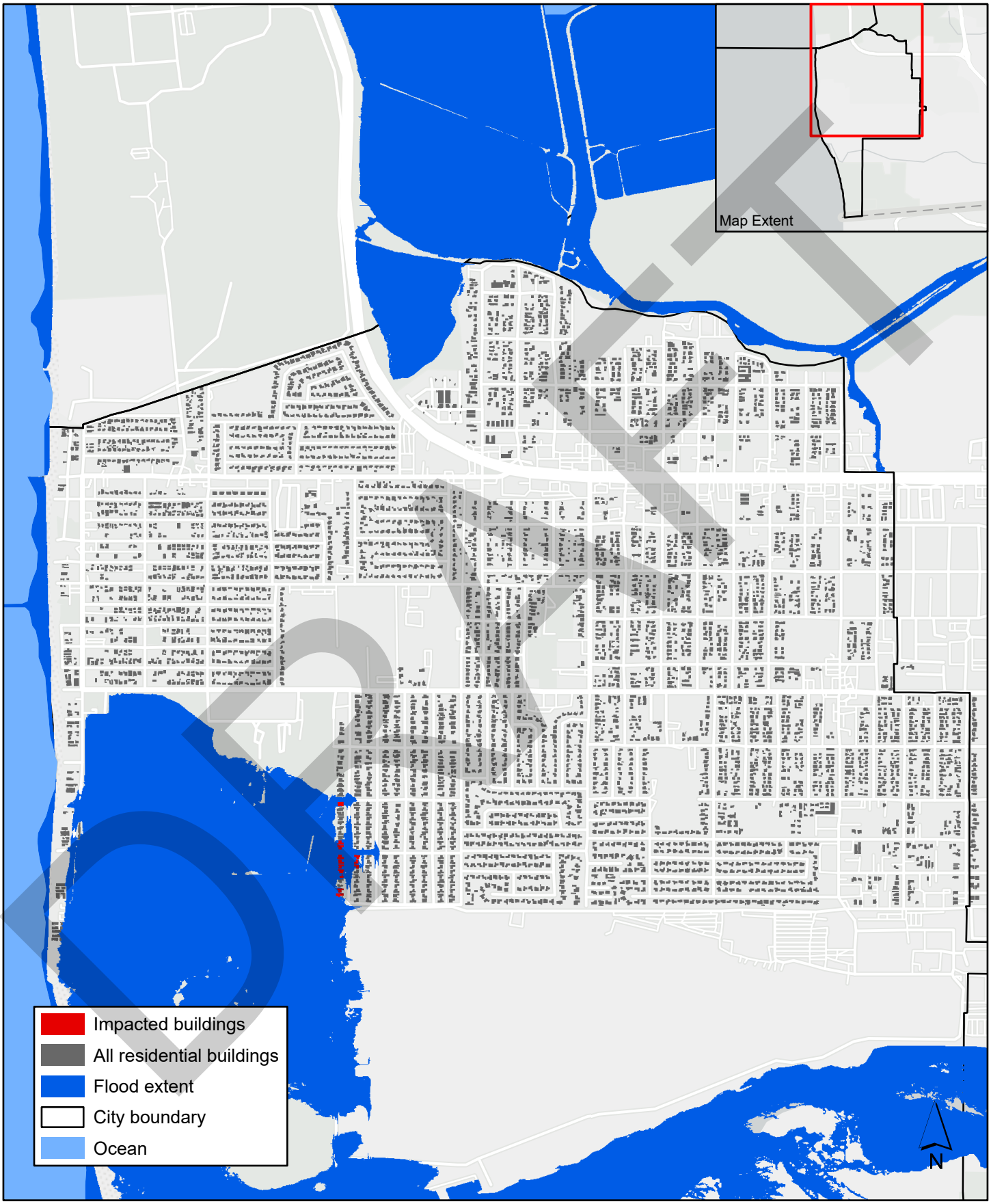
Imperial Beach Area 1

Sea Level Rise 0.0 m - No storm



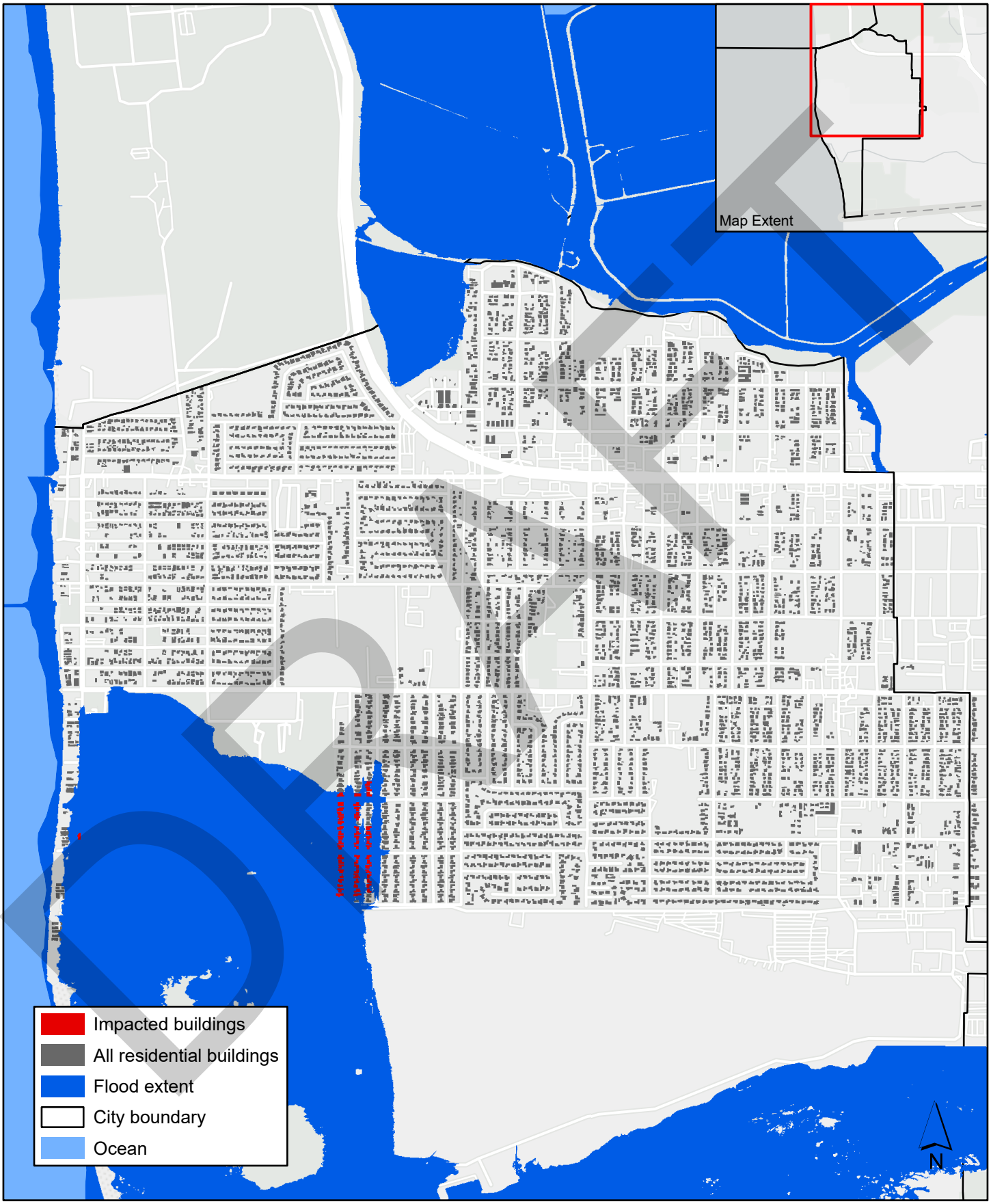
Imperial Beach Area 1

Sea Level Rise 0.0 m - 001 year storm



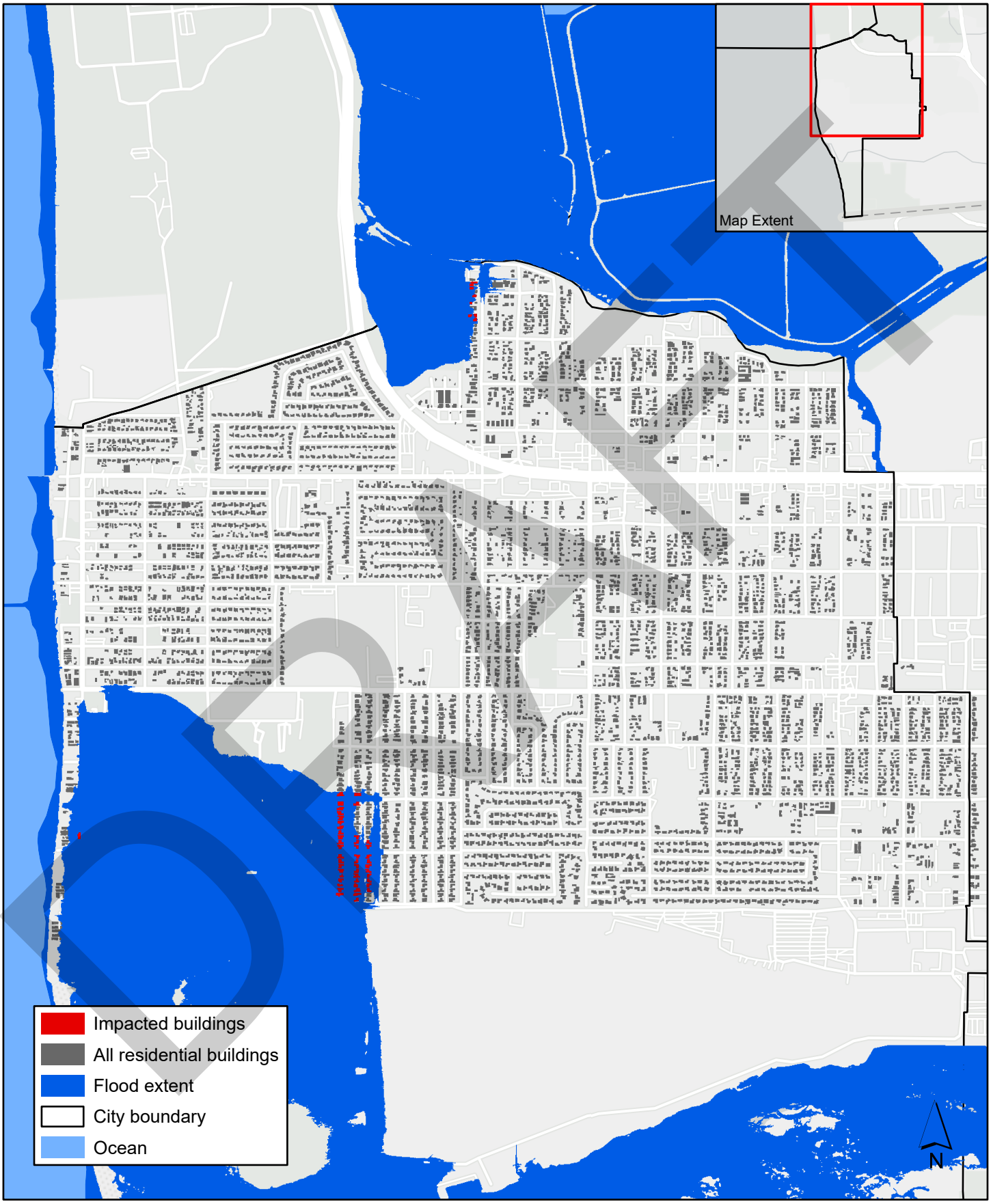
Imperial Beach Area 1

Sea Level Rise 0.0 m - 020 year storm



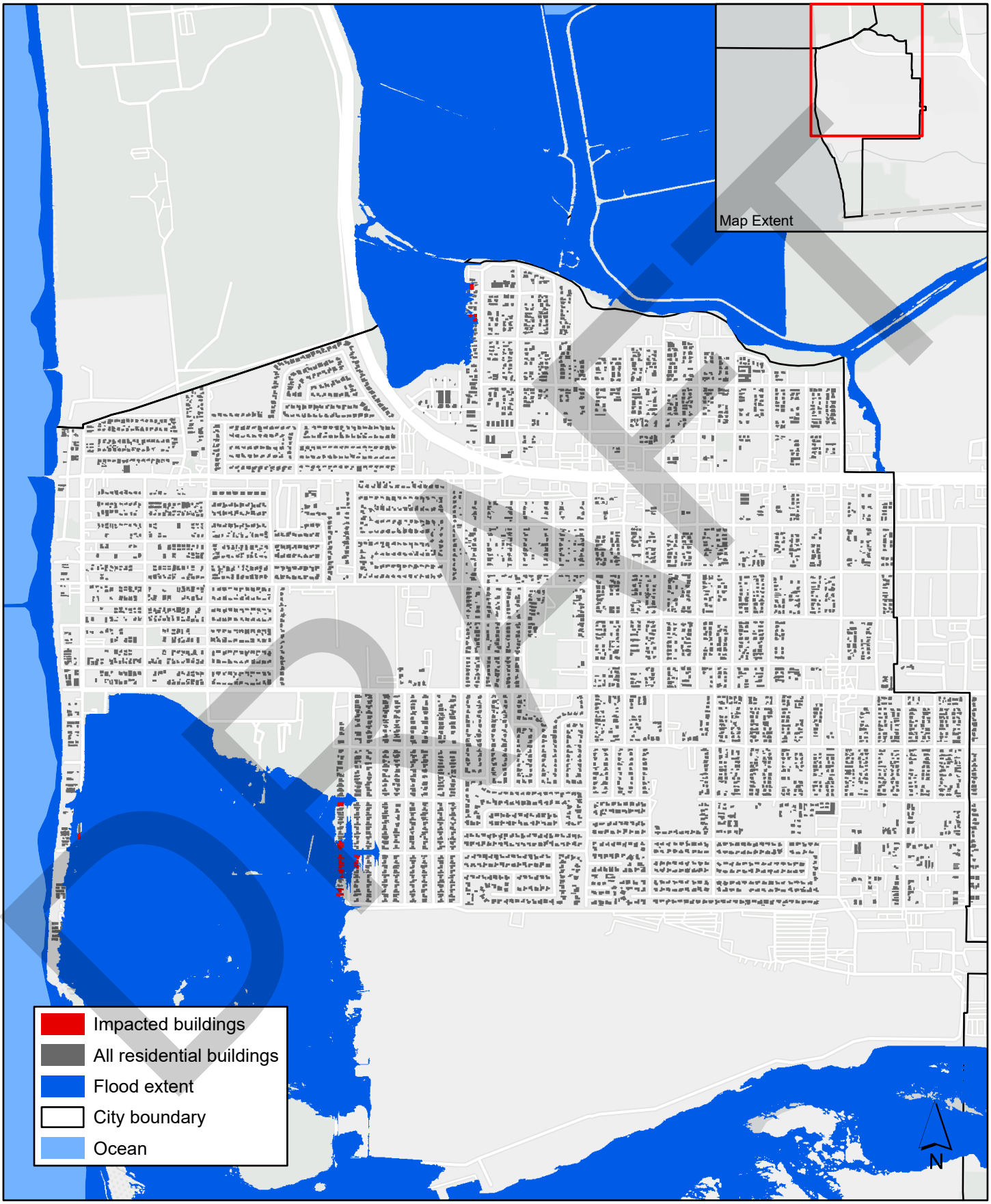
Imperial Beach Area 1

Sea Level Rise 0.0 m - 100 year storm



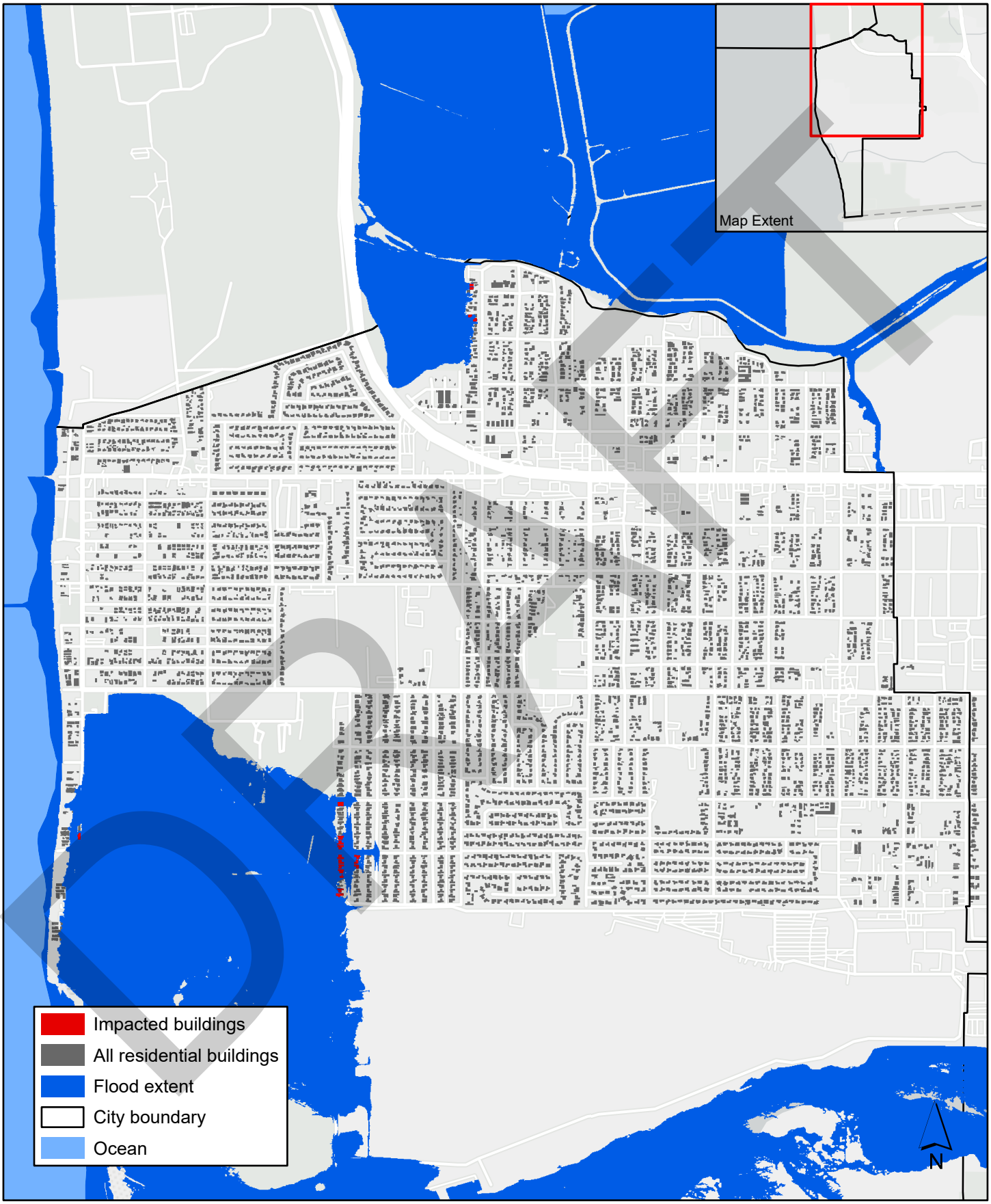
Imperial Beach Area 1

Sea Level Rise 0.25 m - No storm



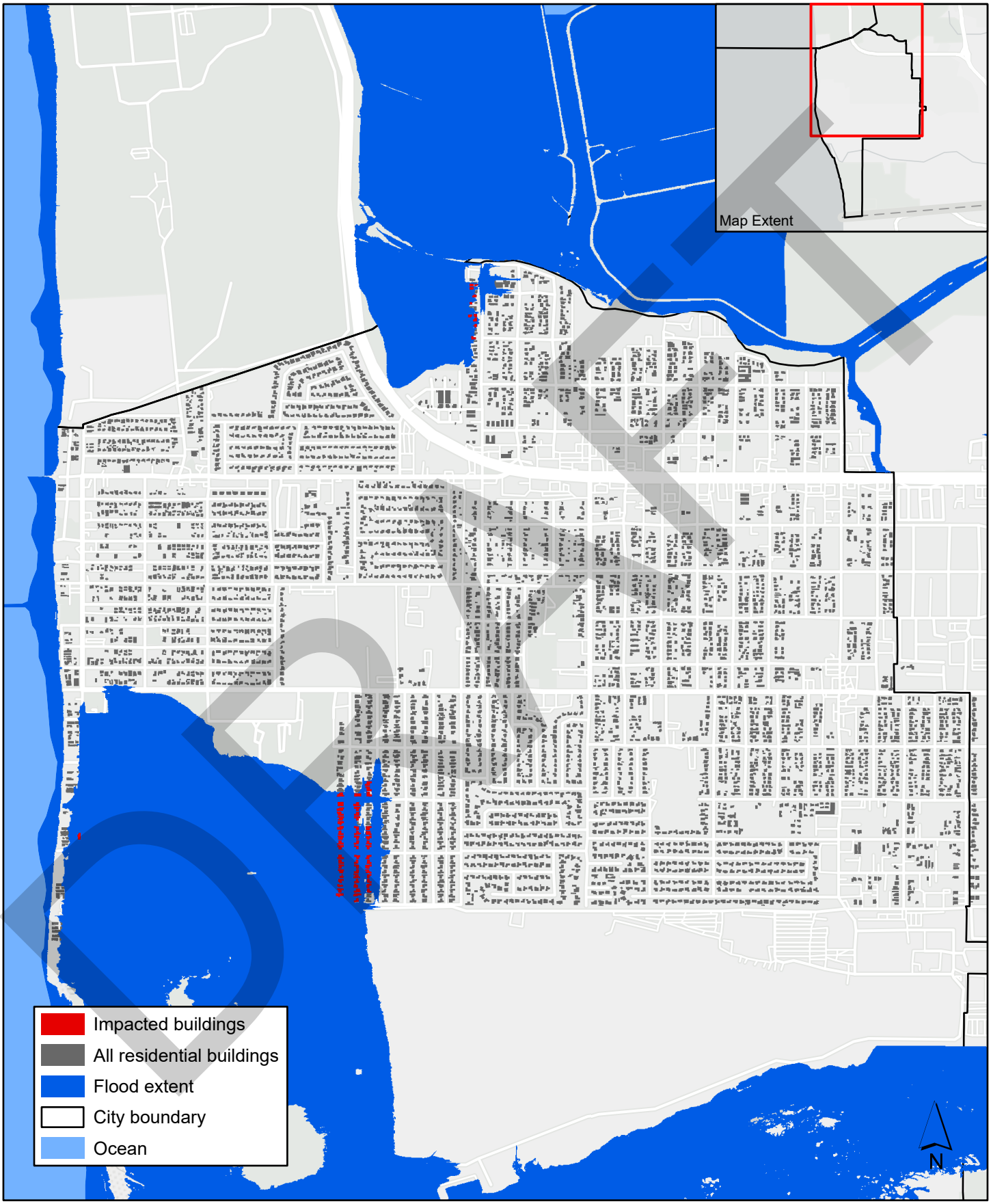
Imperial Beach Area 1

Sea Level Rise 0.25 m - 001 year storm



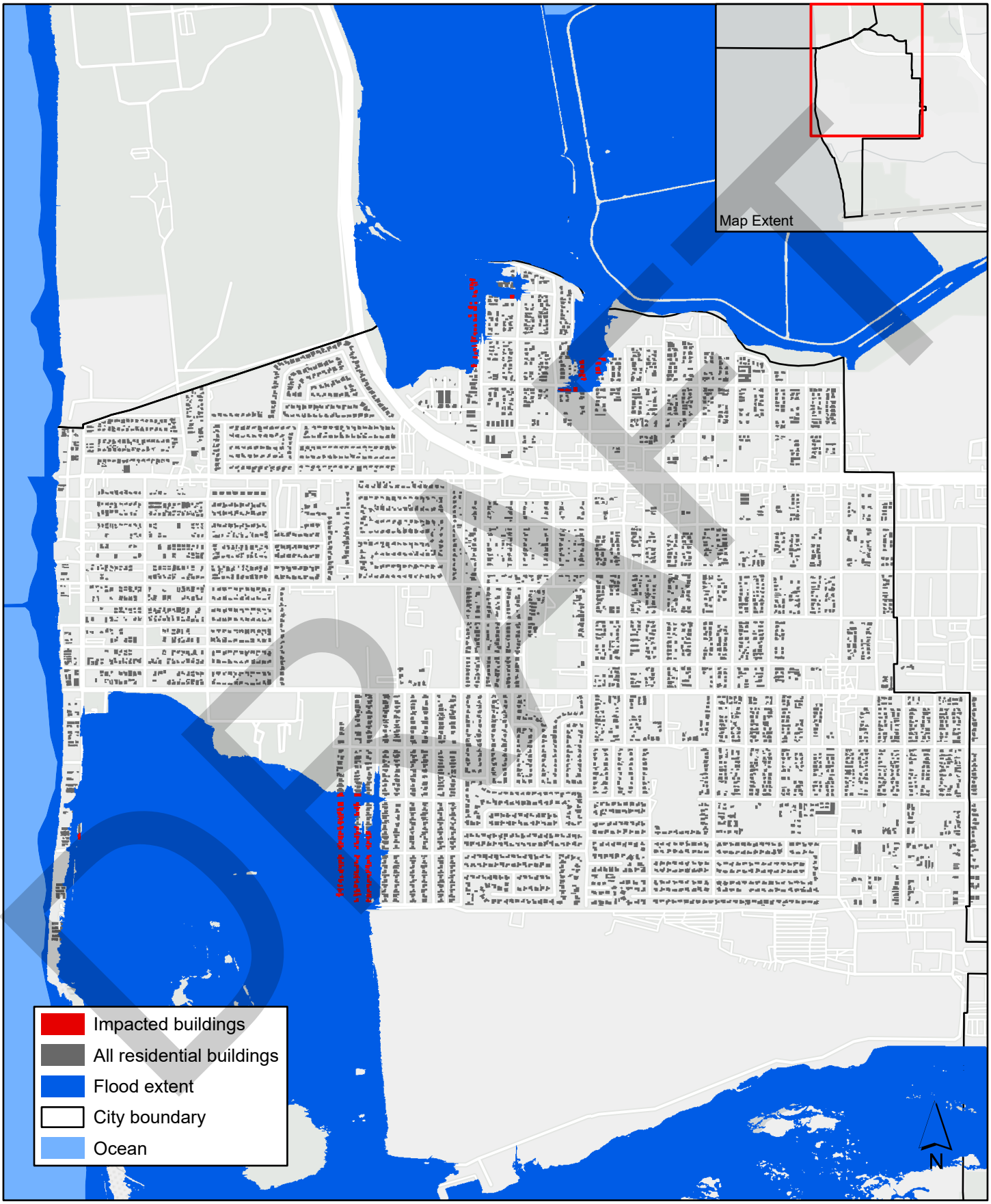
Imperial Beach Area 1

Sea Level Rise 0.25 m - 020 year storm



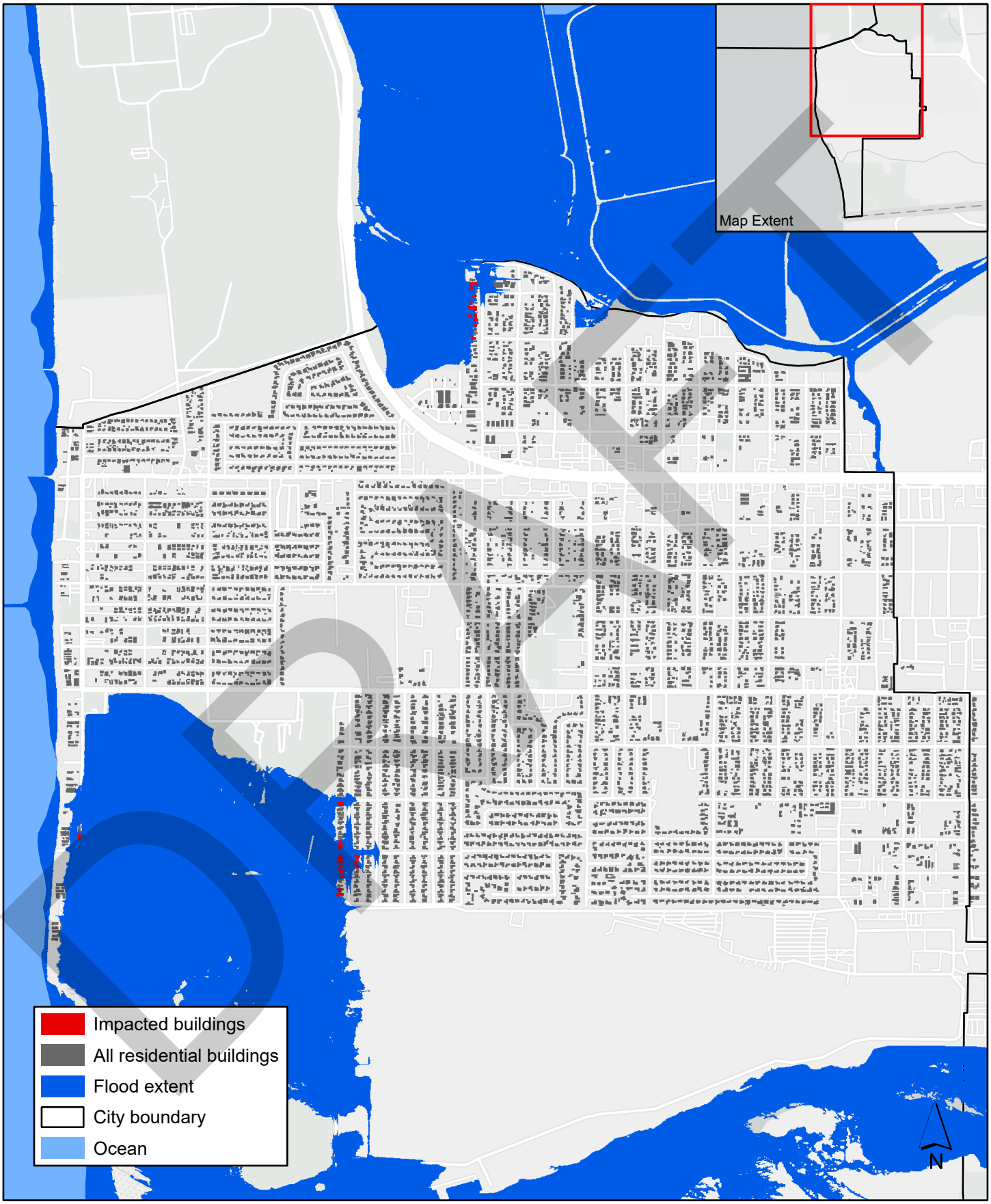
Imperial Beach Area 1

Sea Level Rise 0.25 m - 100 year storm



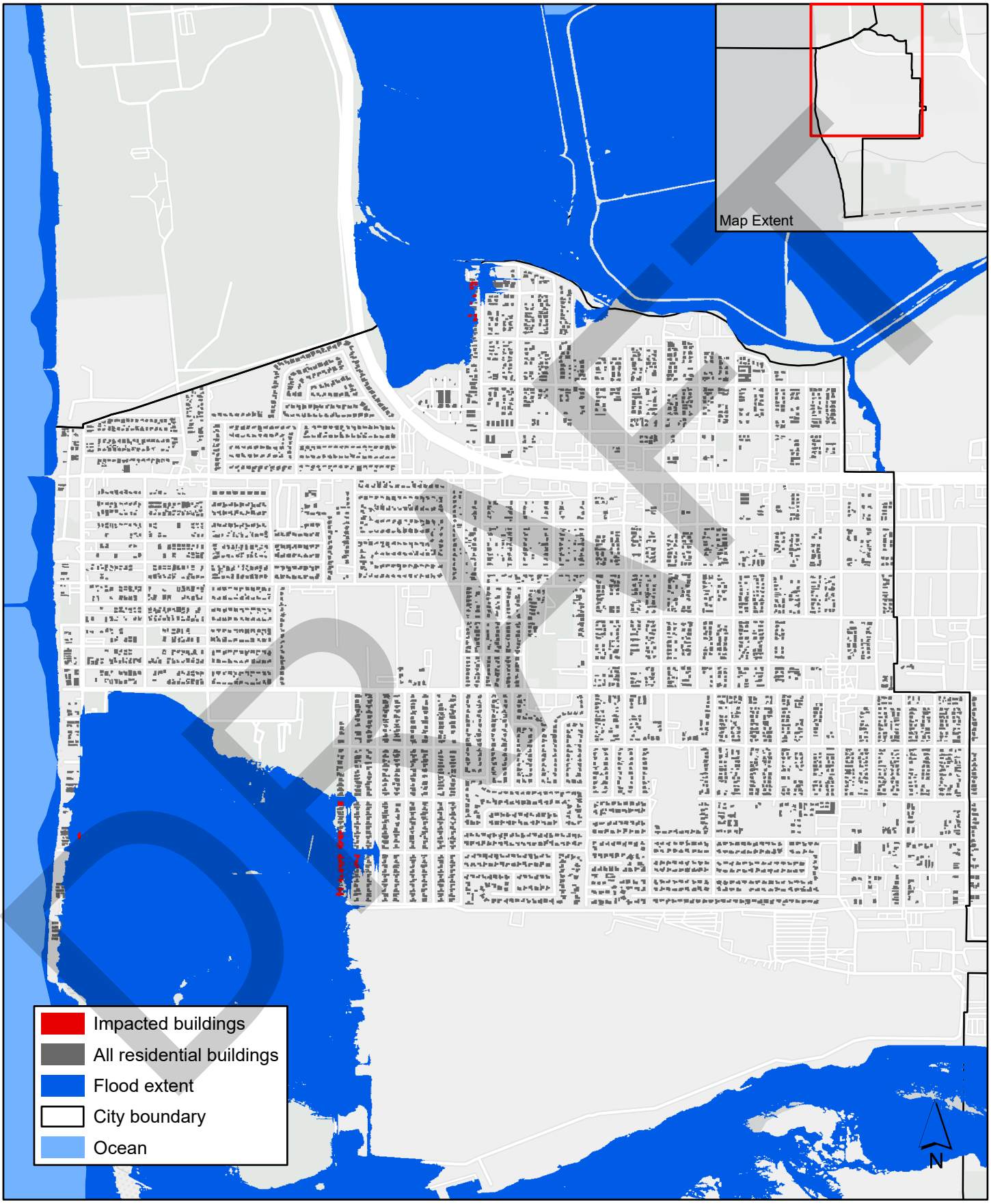
Imperial Beach Area 1

Sea Level Rise 0.5 m - No storm



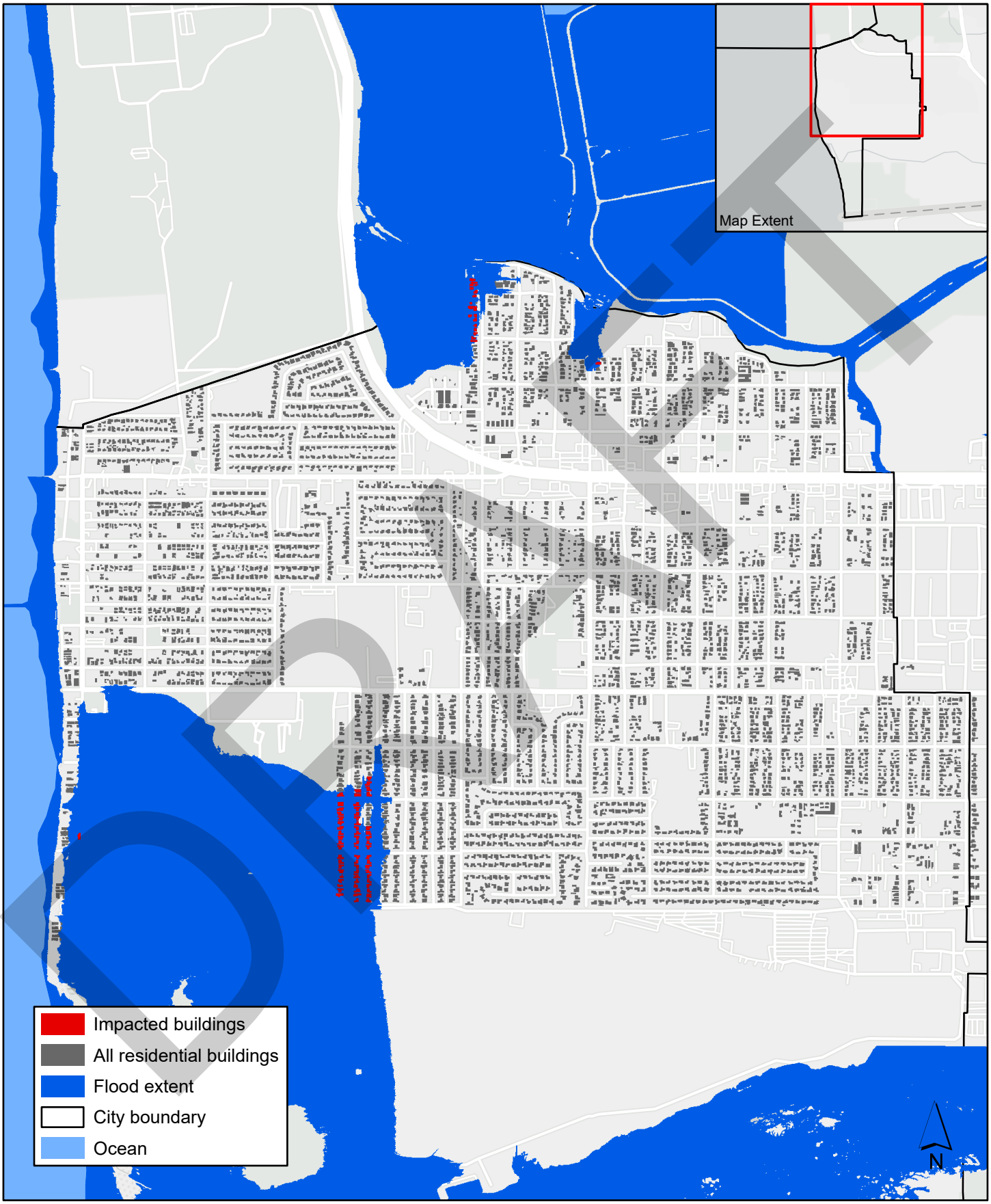
Imperial Beach Area 1

Sea Level Rise 0.5 m - 001 year storm



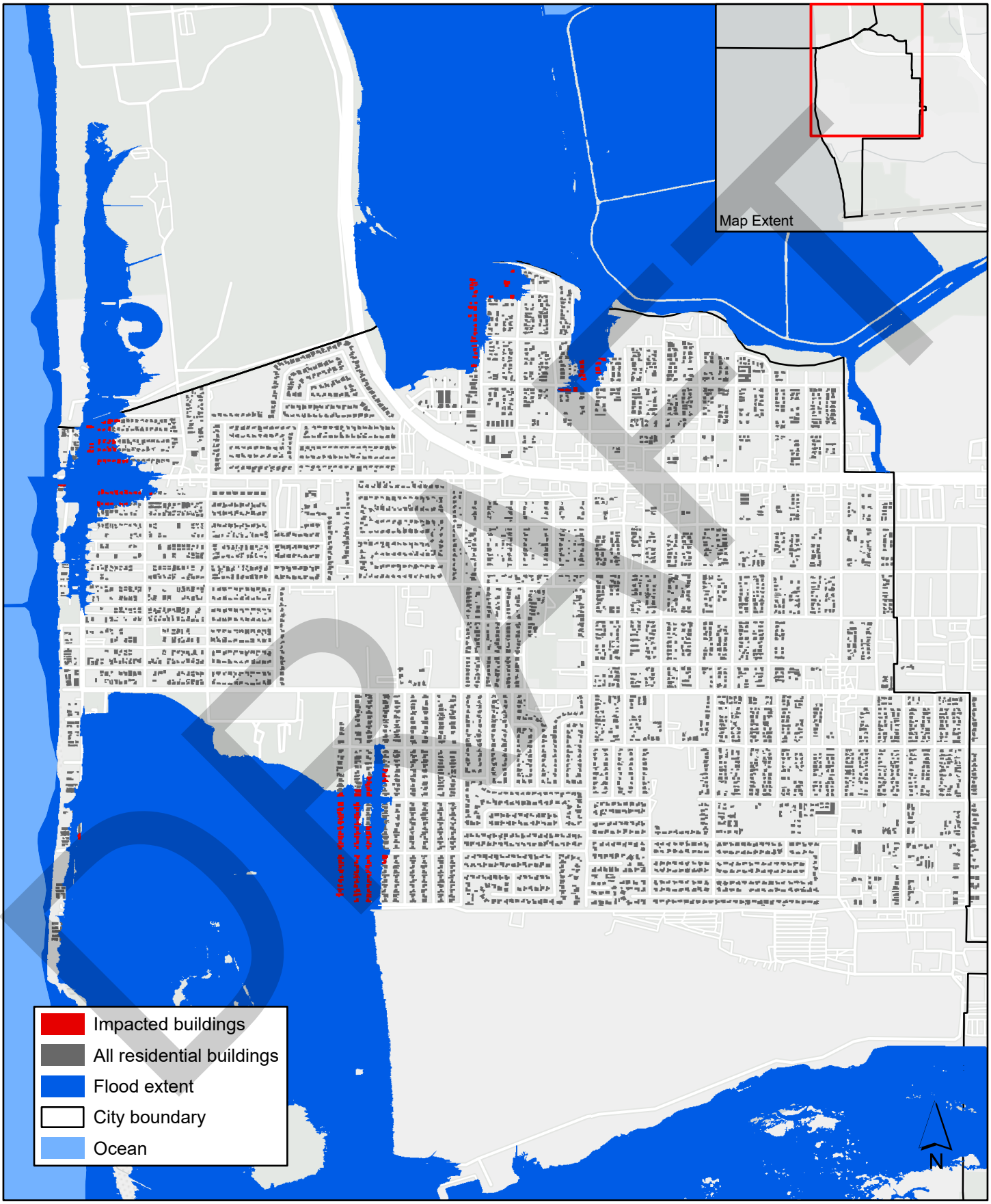
Imperial Beach Area 1

Sea Level Rise 0.5 m - 020 year storm



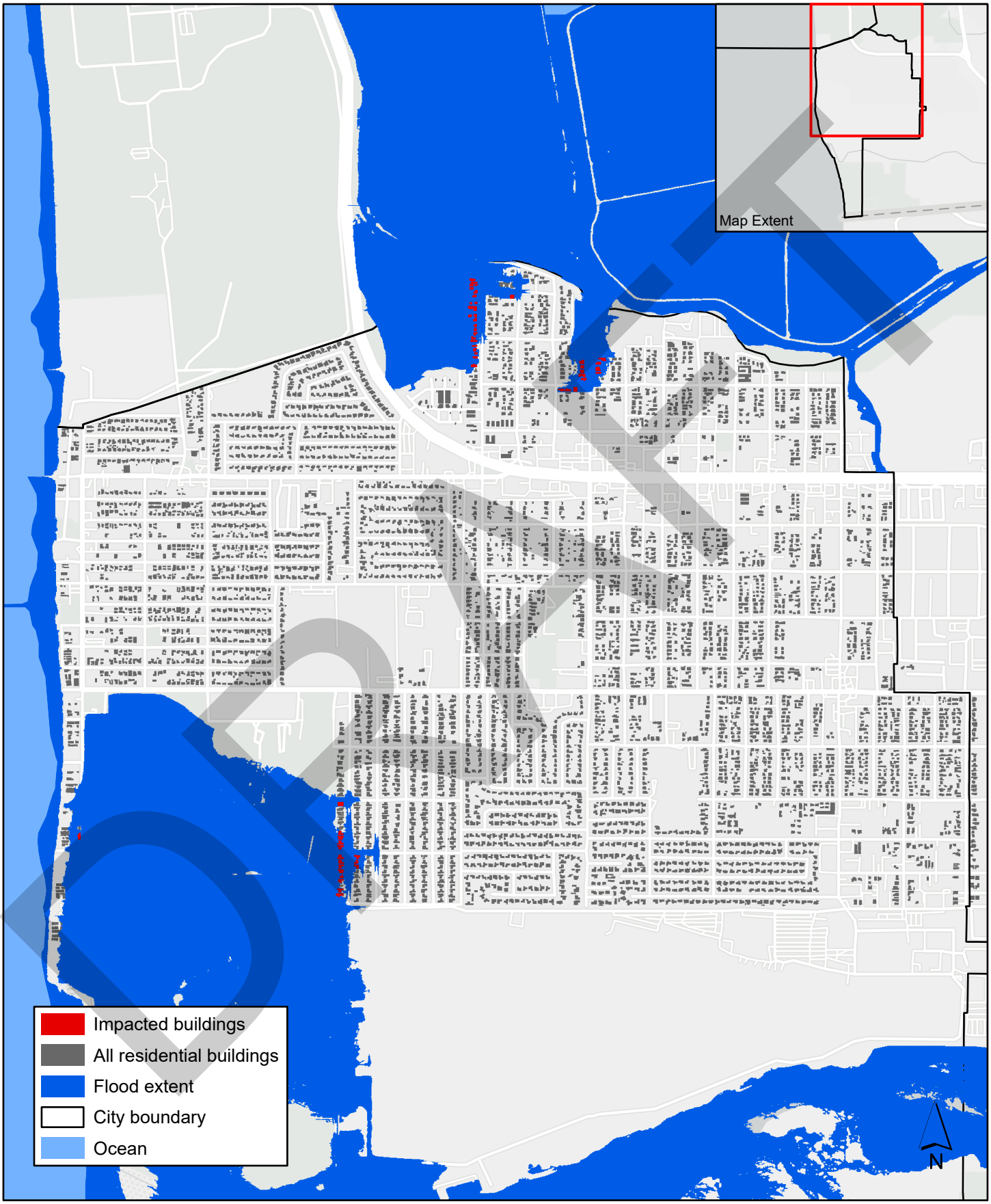
Imperial Beach Area 1

Sea Level Rise 0.5 m - 100 year storm



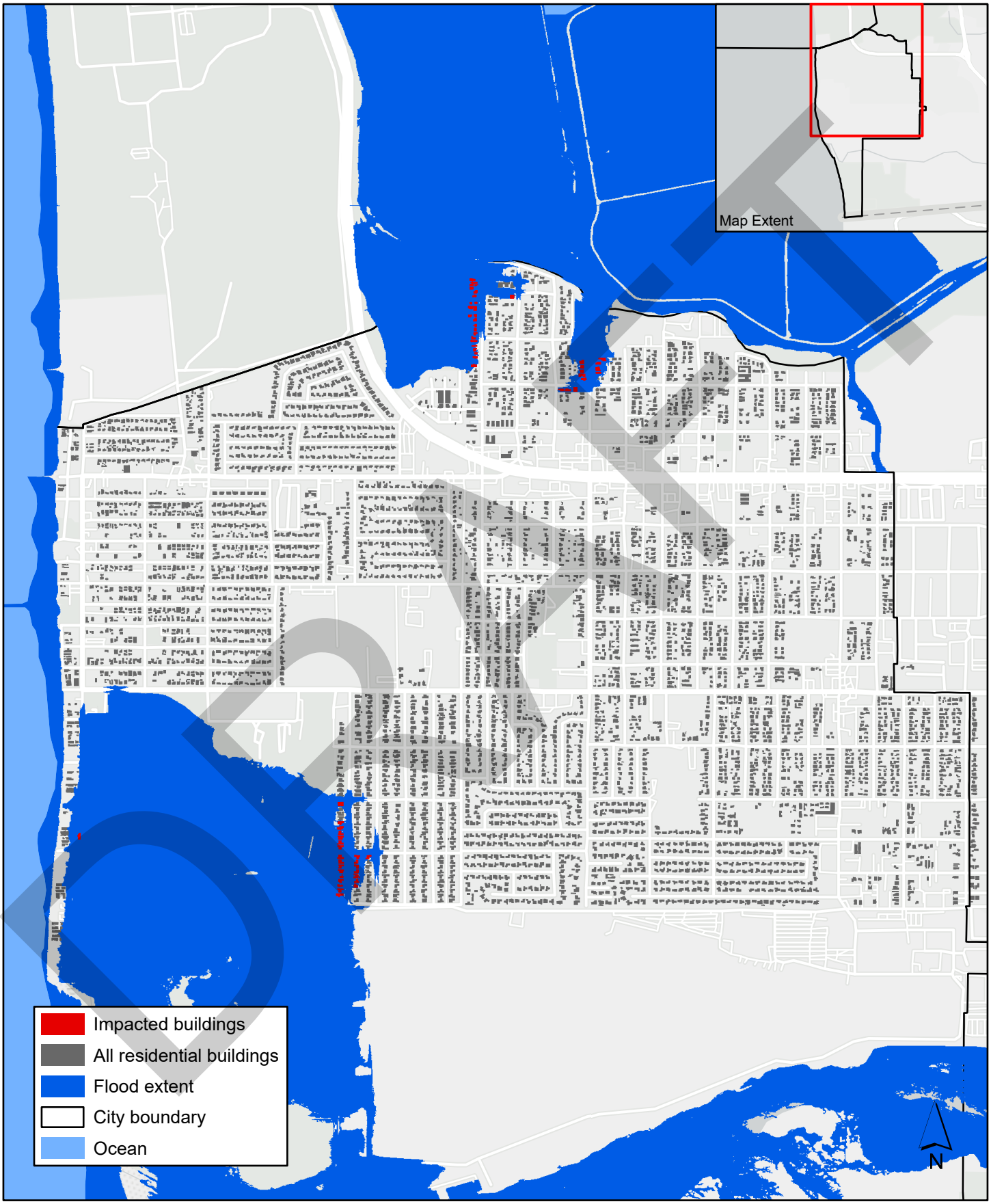
Imperial Beach Area 1

Sea Level Rise 0.75 m - No storm



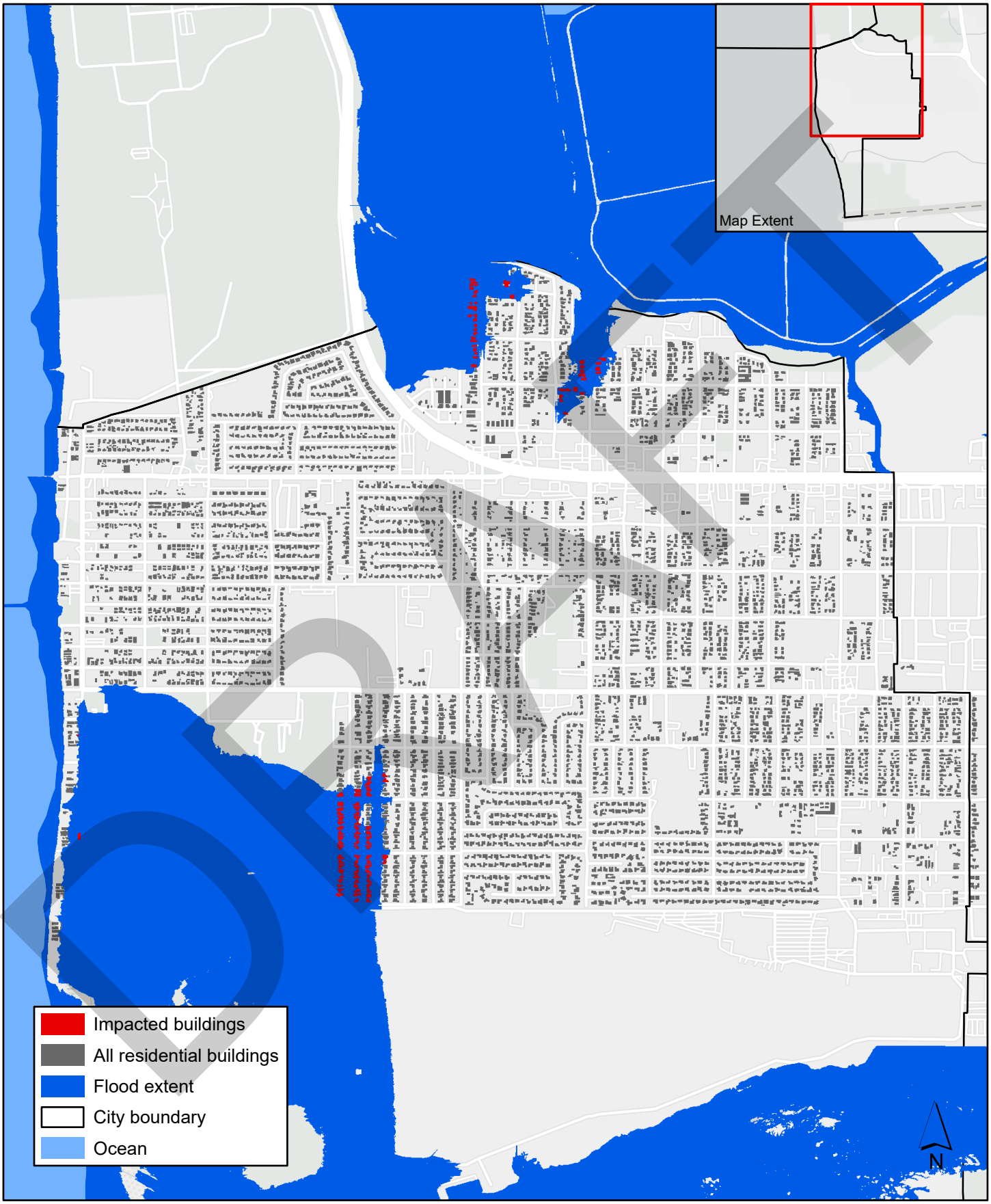
Imperial Beach Area 1

Sea Level Rise 0.75 m - 001 year storm



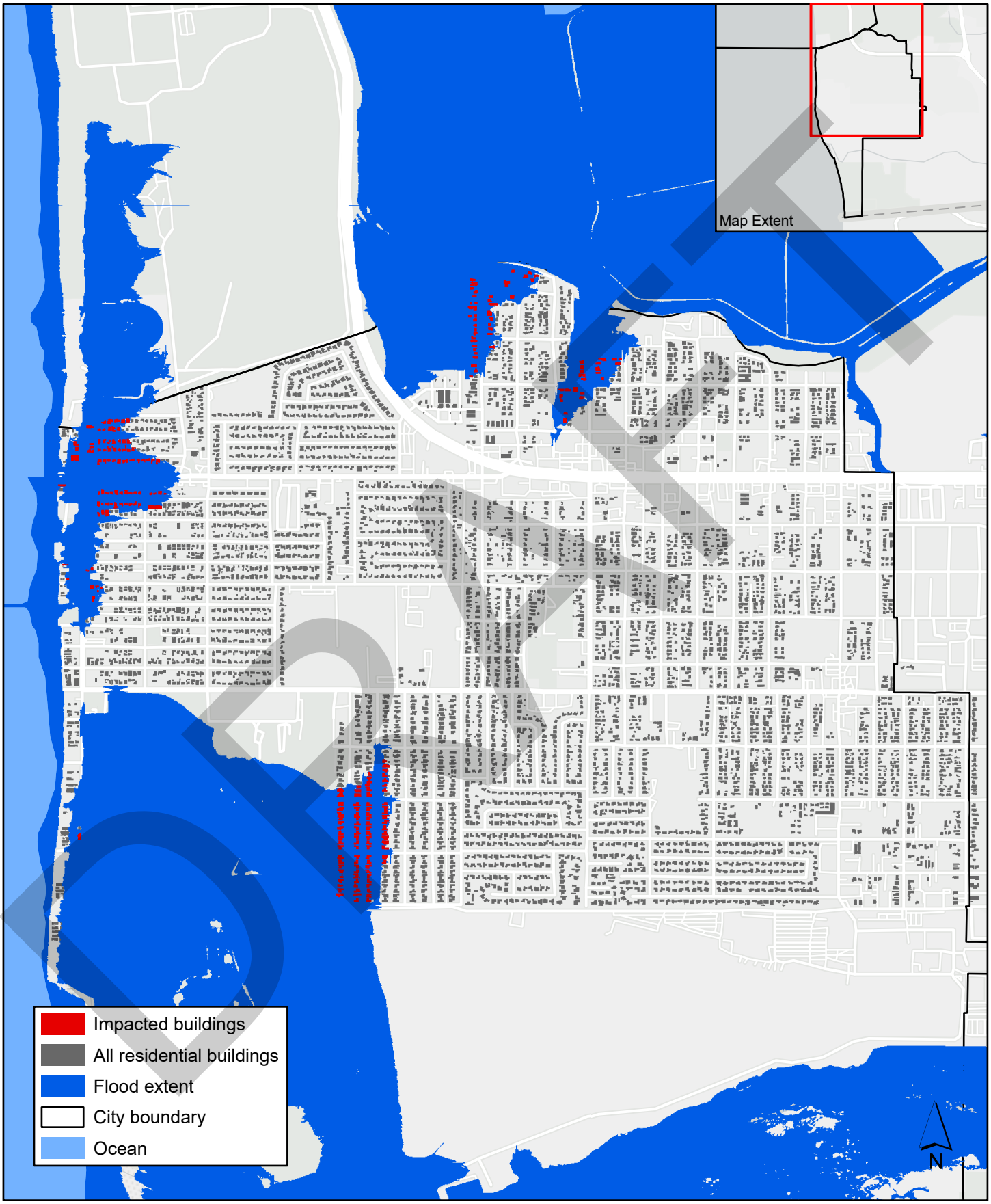
Imperial Beach Area 1

Sea Level Rise 0.75 m - 020 year storm



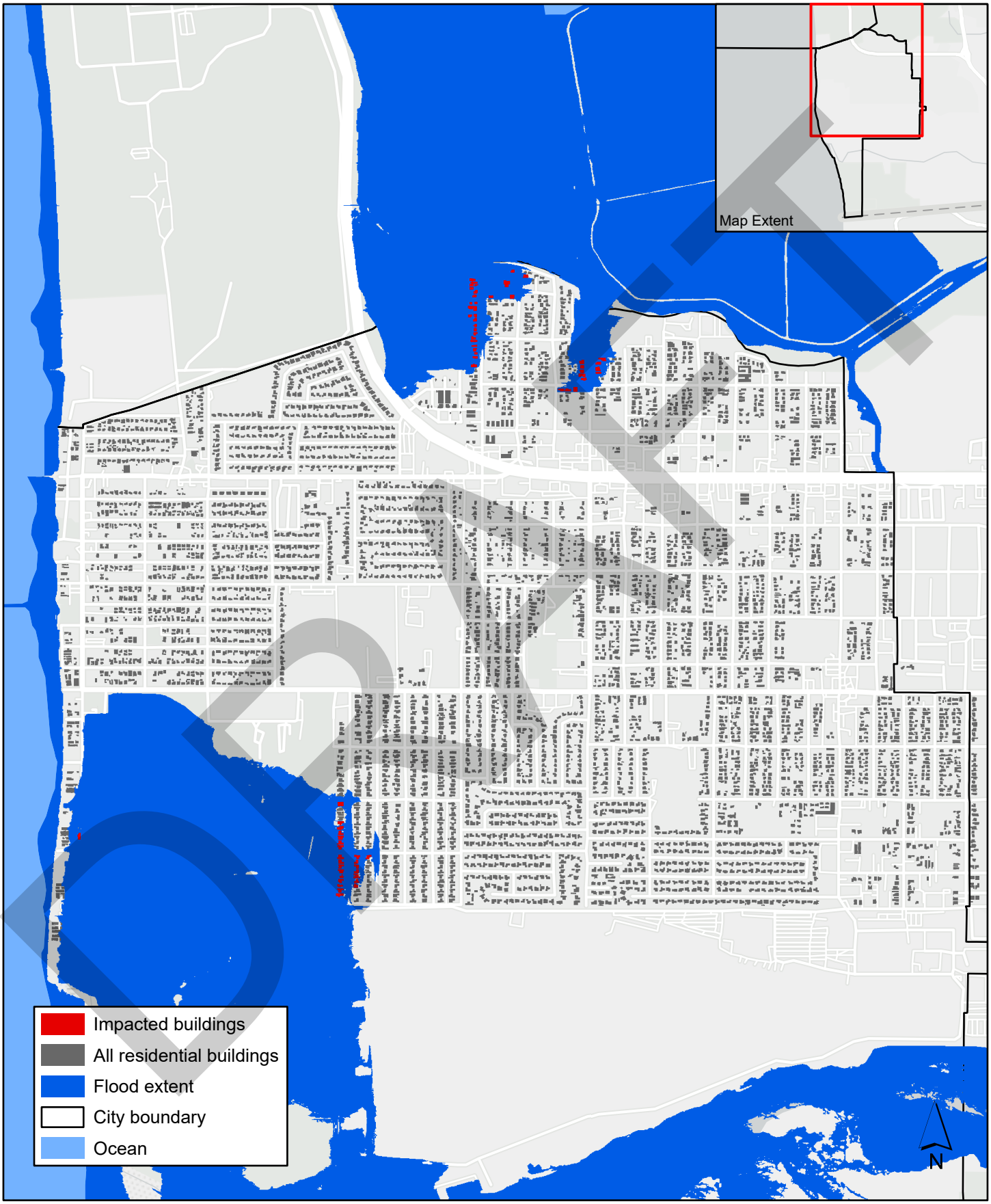
Imperial Beach Area 1

Sea Level Rise 0.75 m - 100 year storm



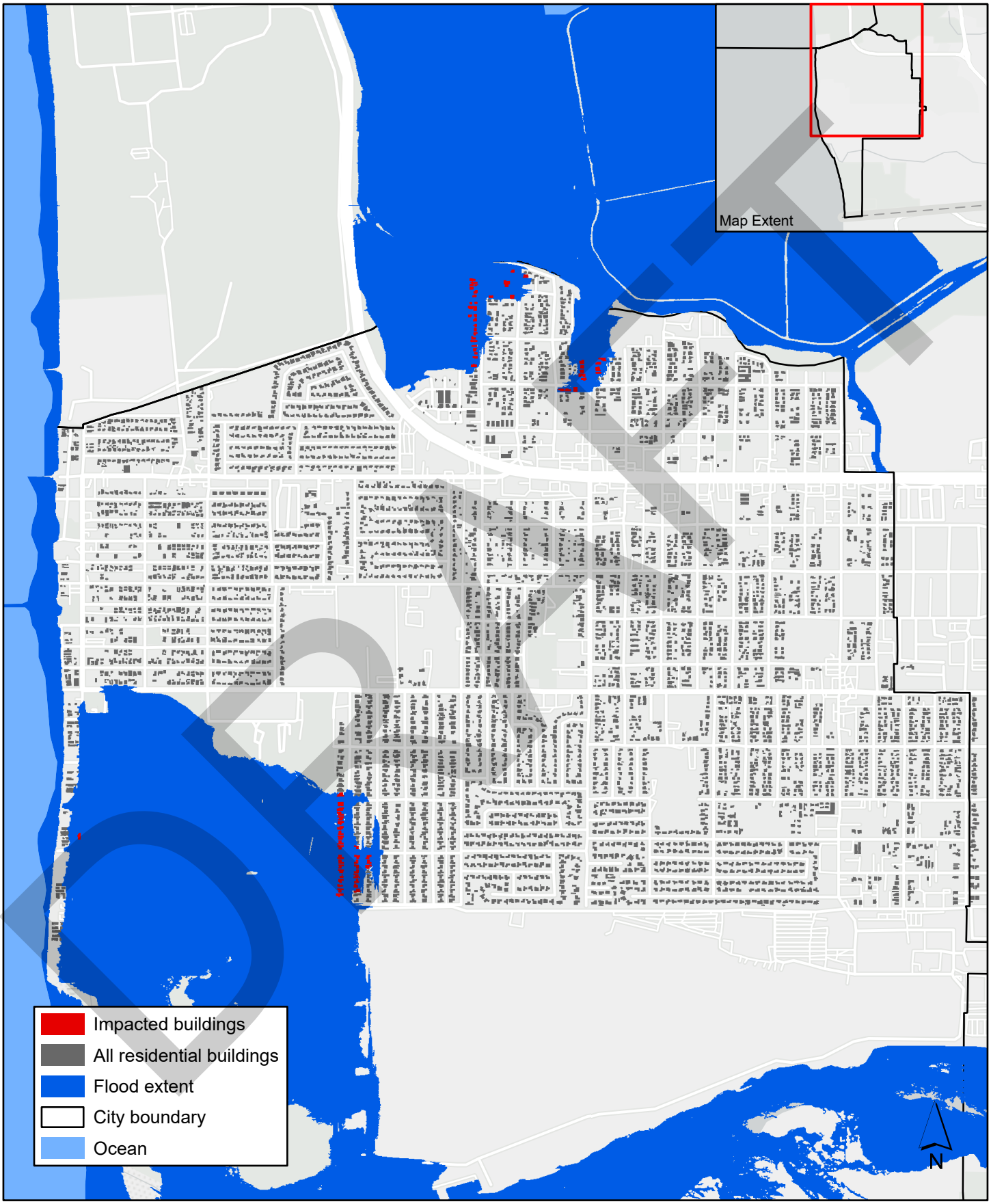
Imperial Beach Area 1

Sea Level Rise 1.0 m - No storm



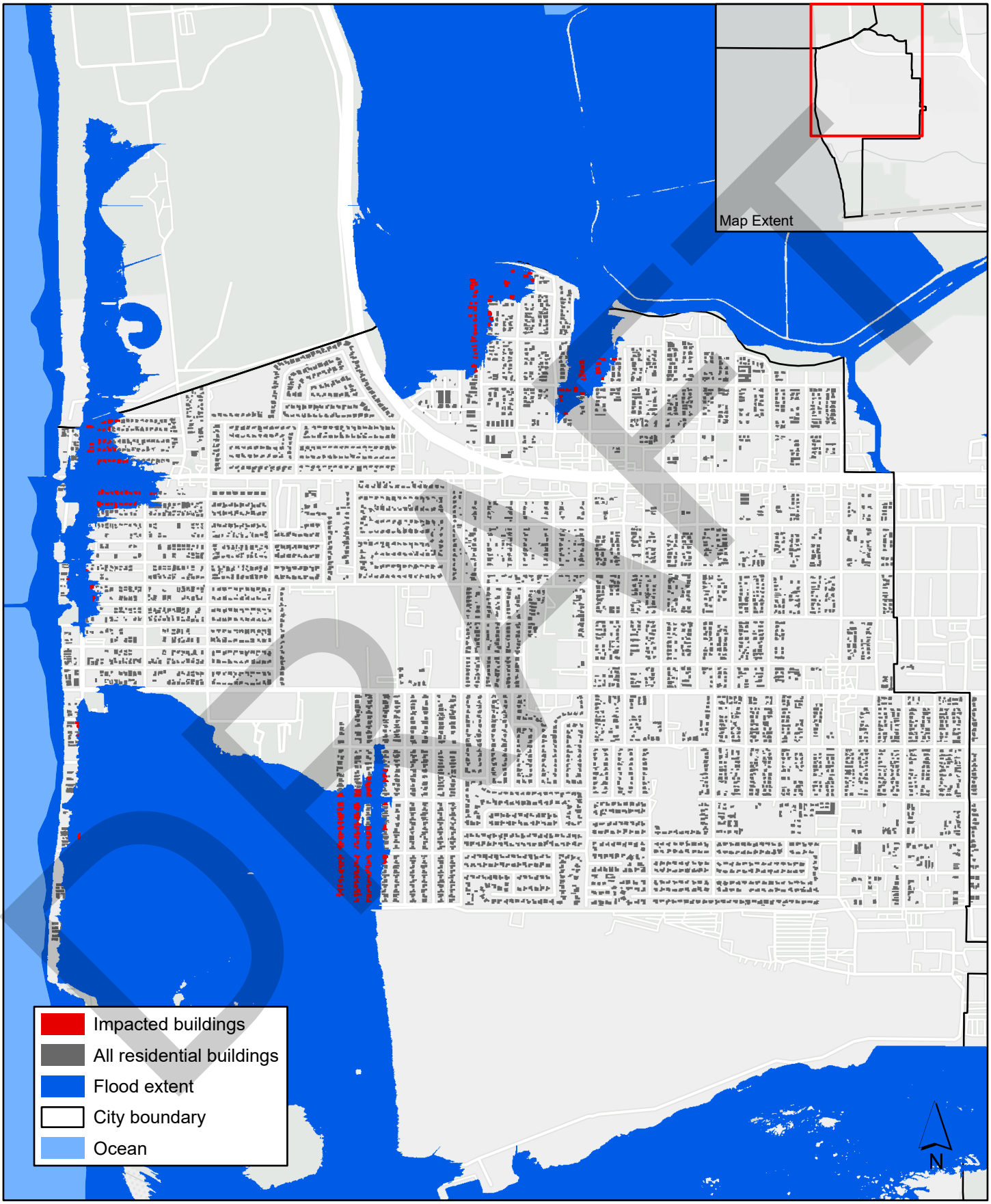
Imperial Beach Area 1

Sea Level Rise 1.0 m - 001 year storm



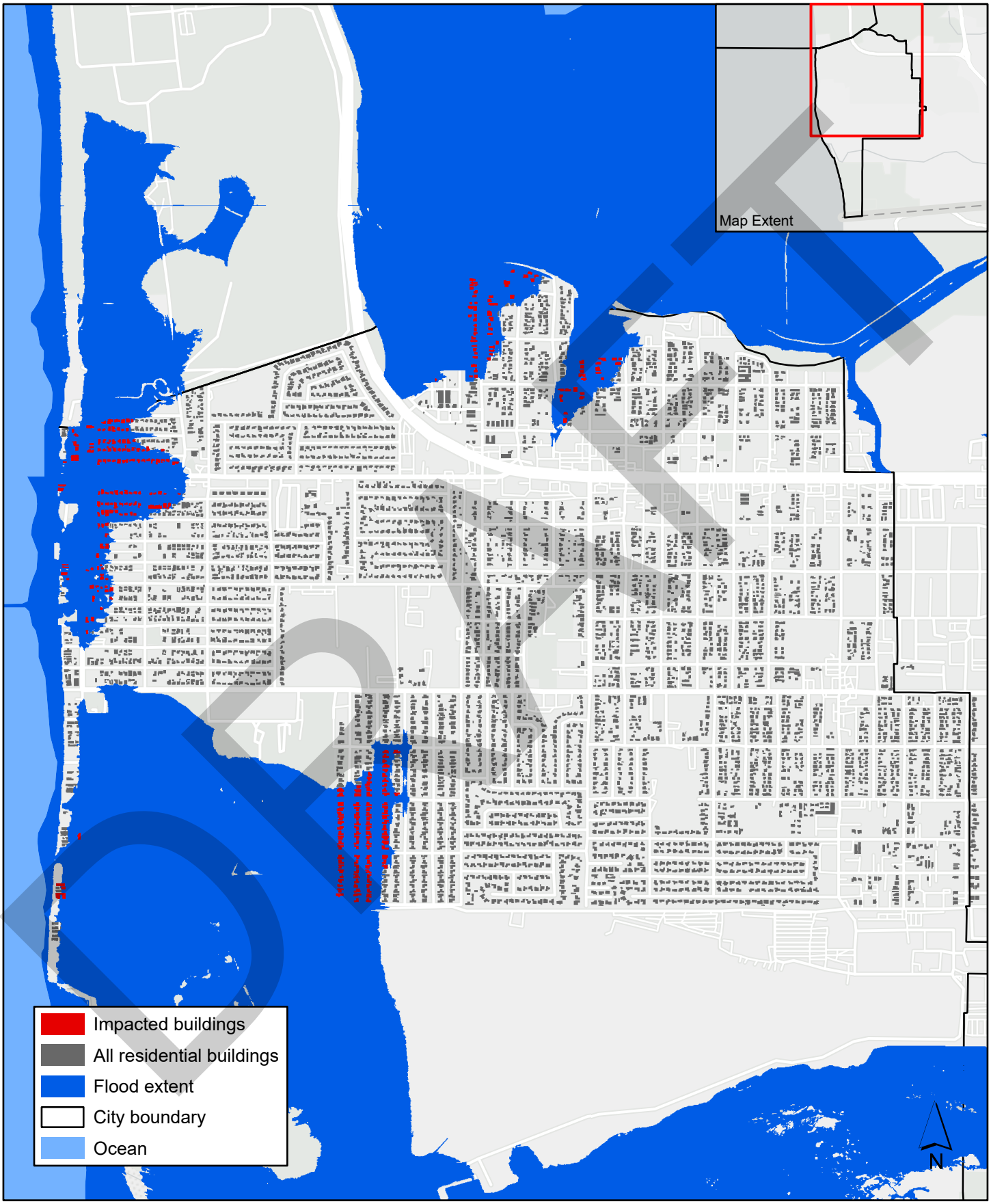
Imperial Beach Area 1

Sea Level Rise 1.0 m - 020 year storm



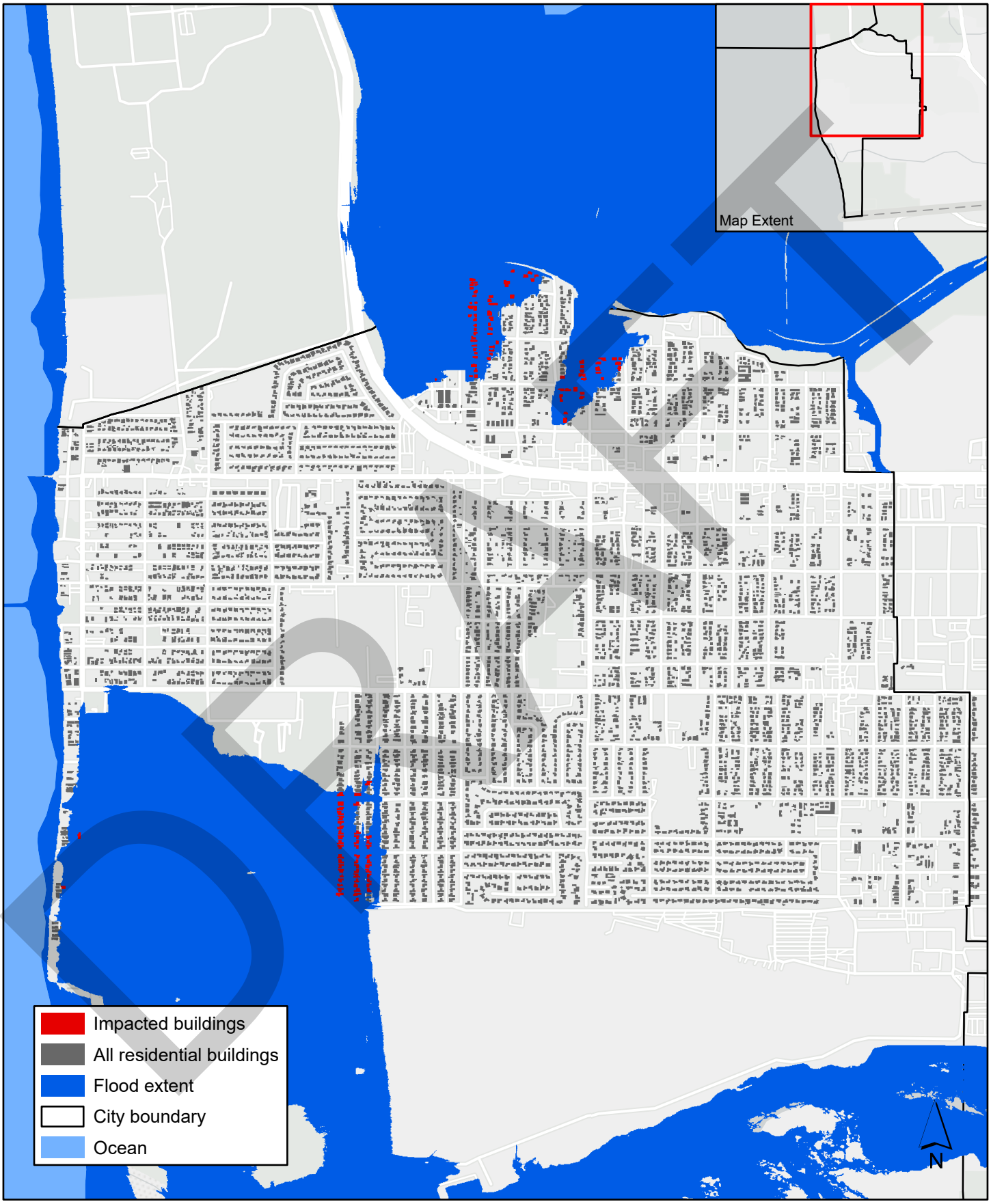
Imperial Beach Area 1

Sea Level Rise 1.0 m - 100 year storm



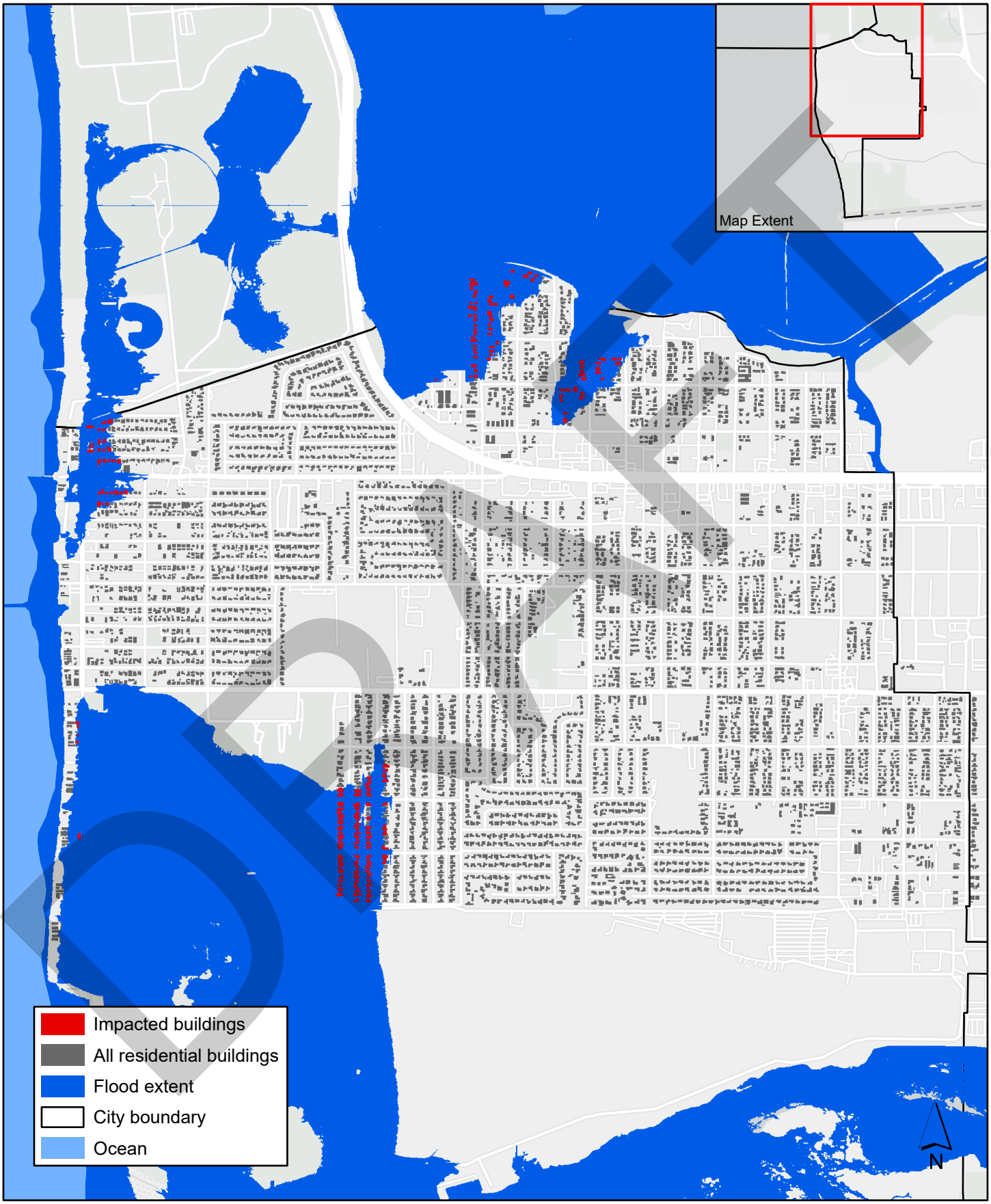
Imperial Beach Area 1

Sea Level Rise 1.5 m - No storm



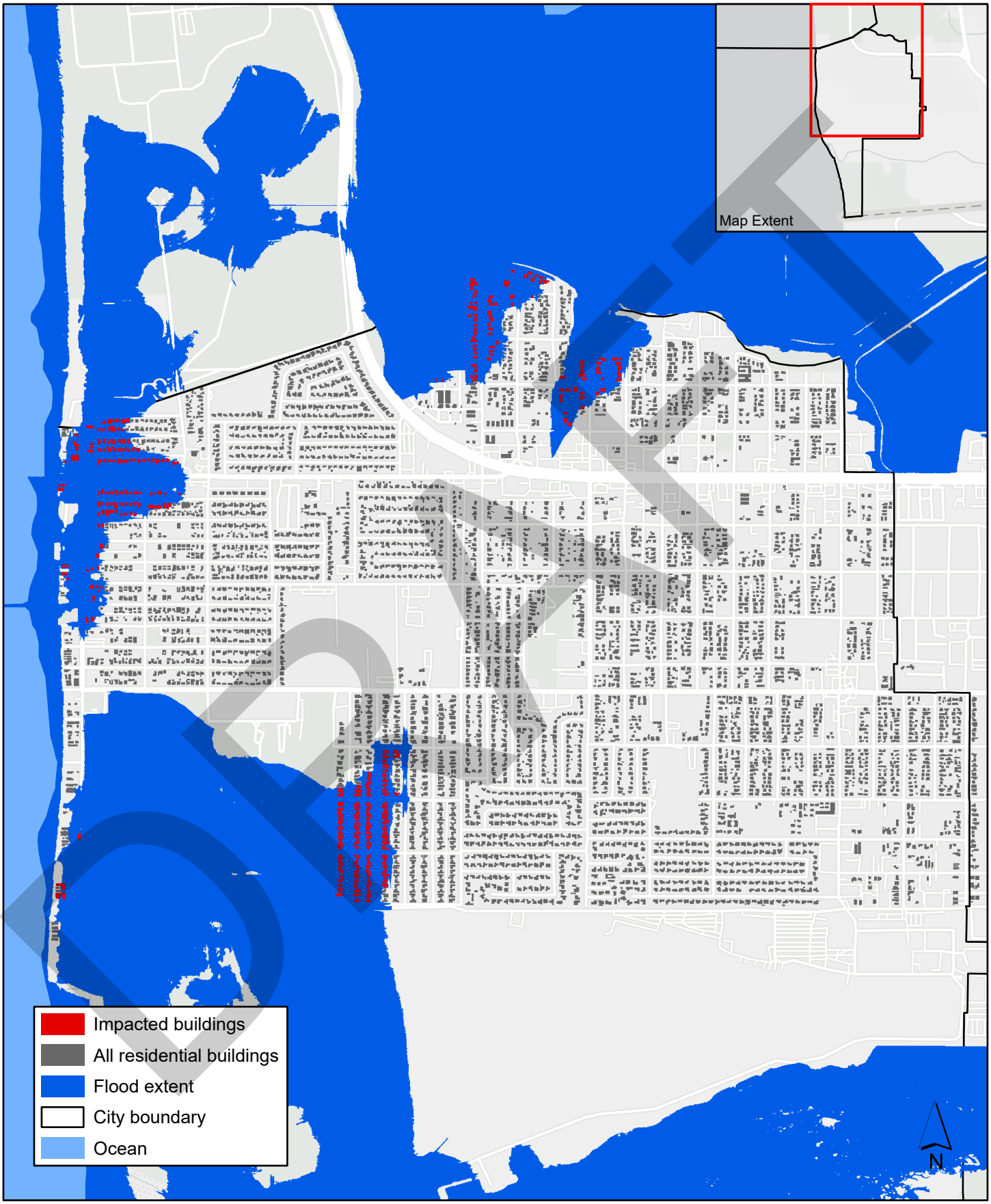
Imperial Beach Area 1

Sea Level Rise 1.5 m - 001 year storm



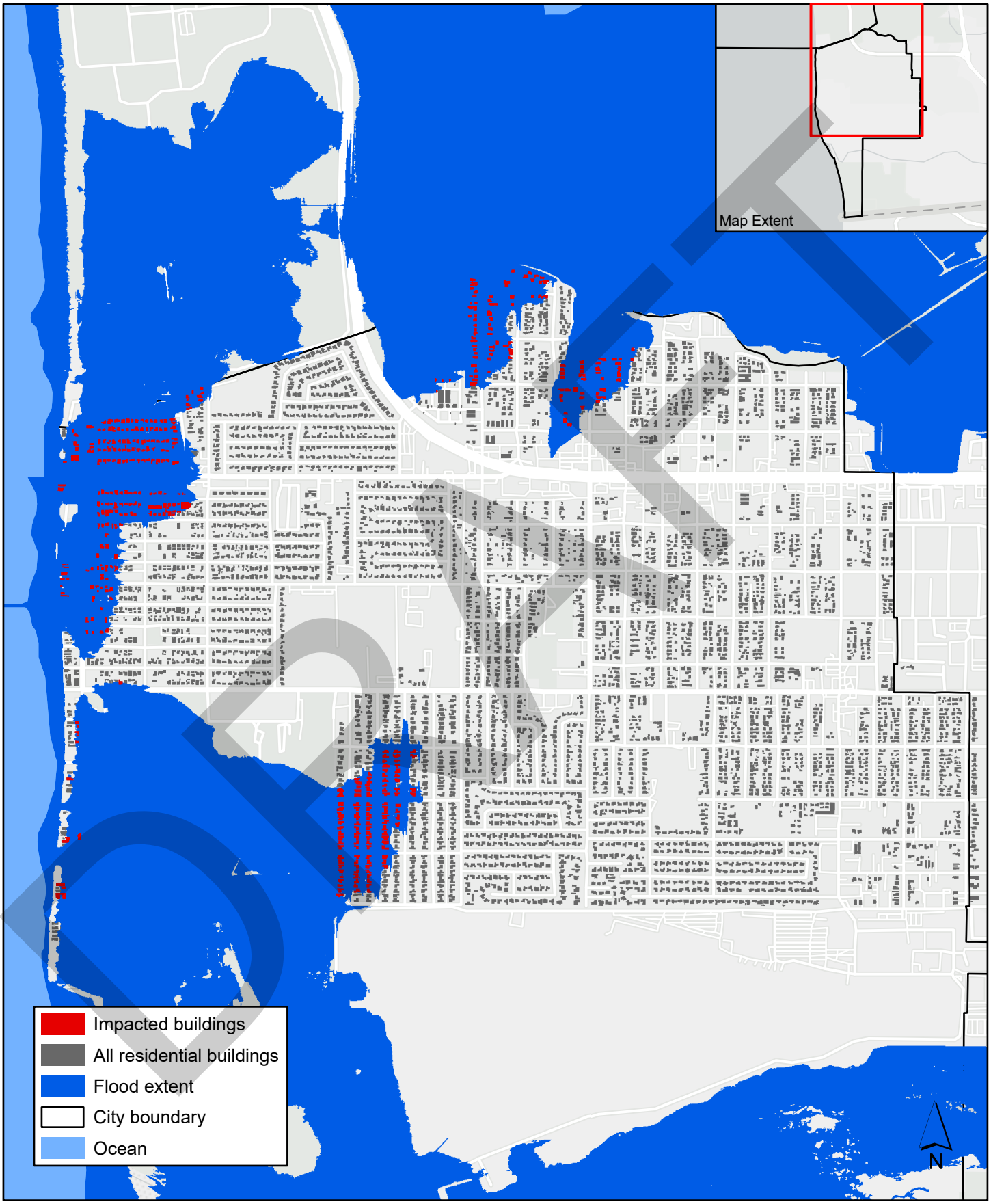
Imperial Beach Area 1

Sea Level Rise 1.5 m - 020 year storm



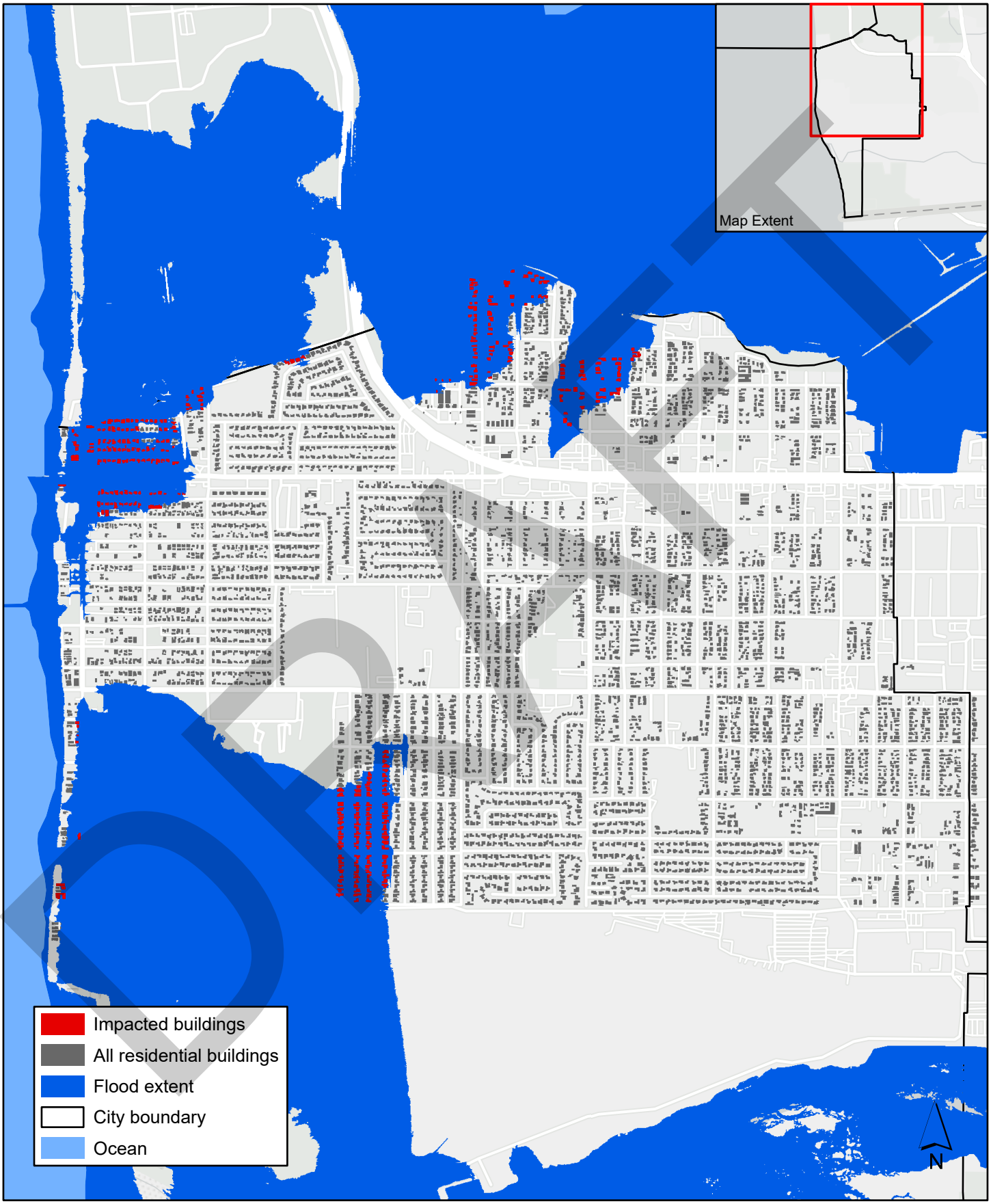
Imperial Beach Area 1

Sea Level Rise 1.5 m - 100 year storm



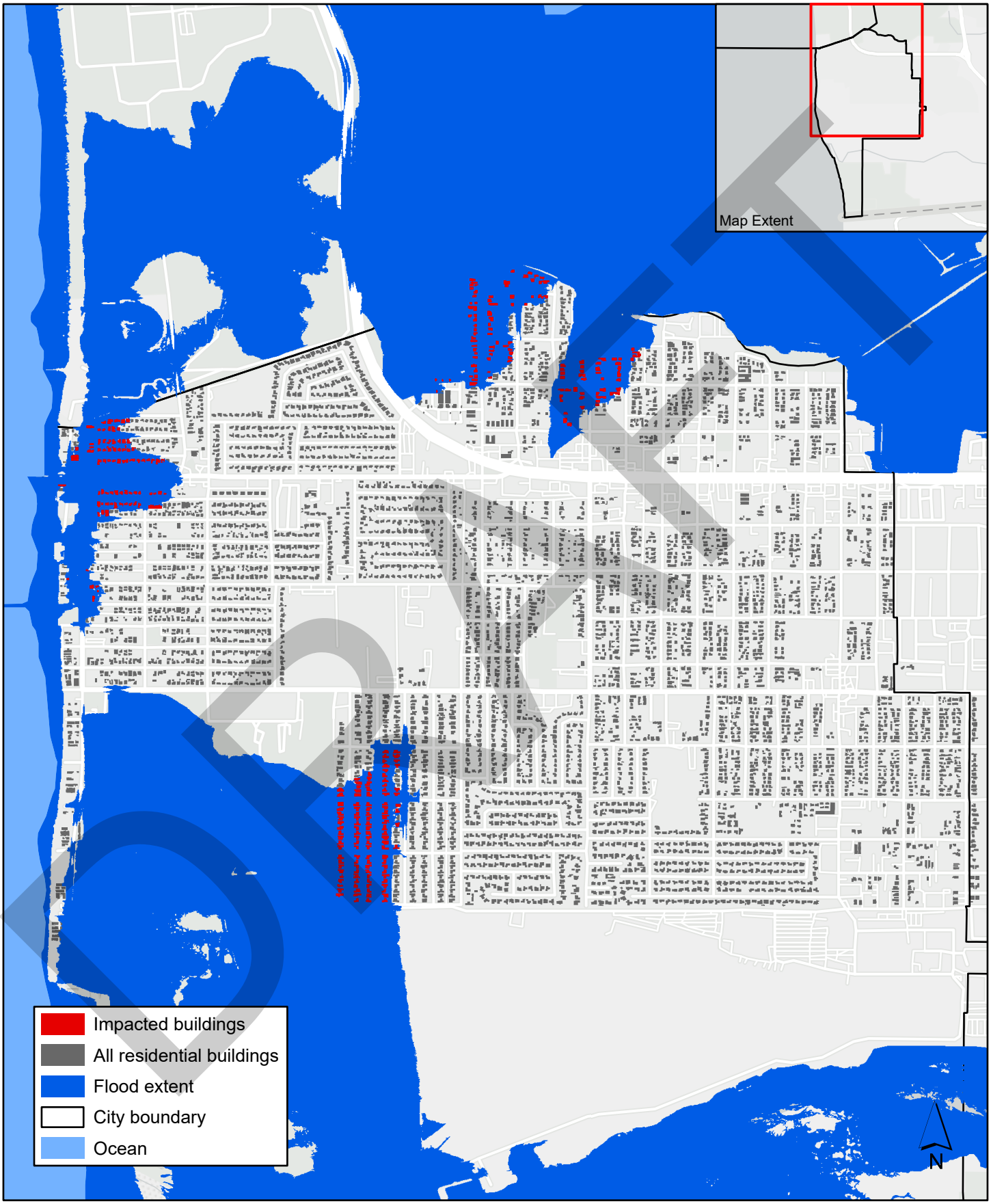
Imperial Beach Area 1

Sea Level Rise 2.0 m - No storm



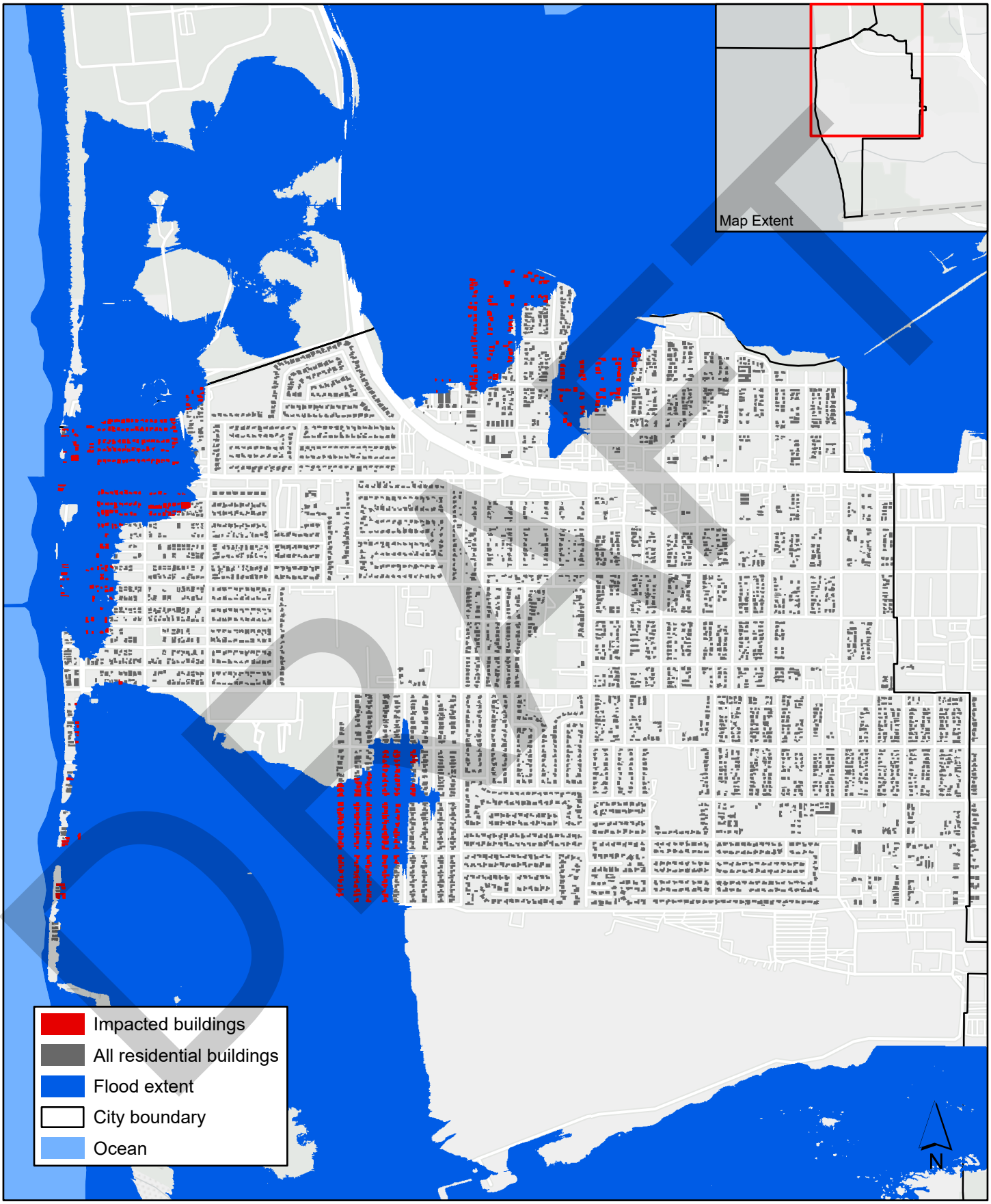
Imperial Beach Area 1

Sea Level Rise 2.0 m - 001 year storm



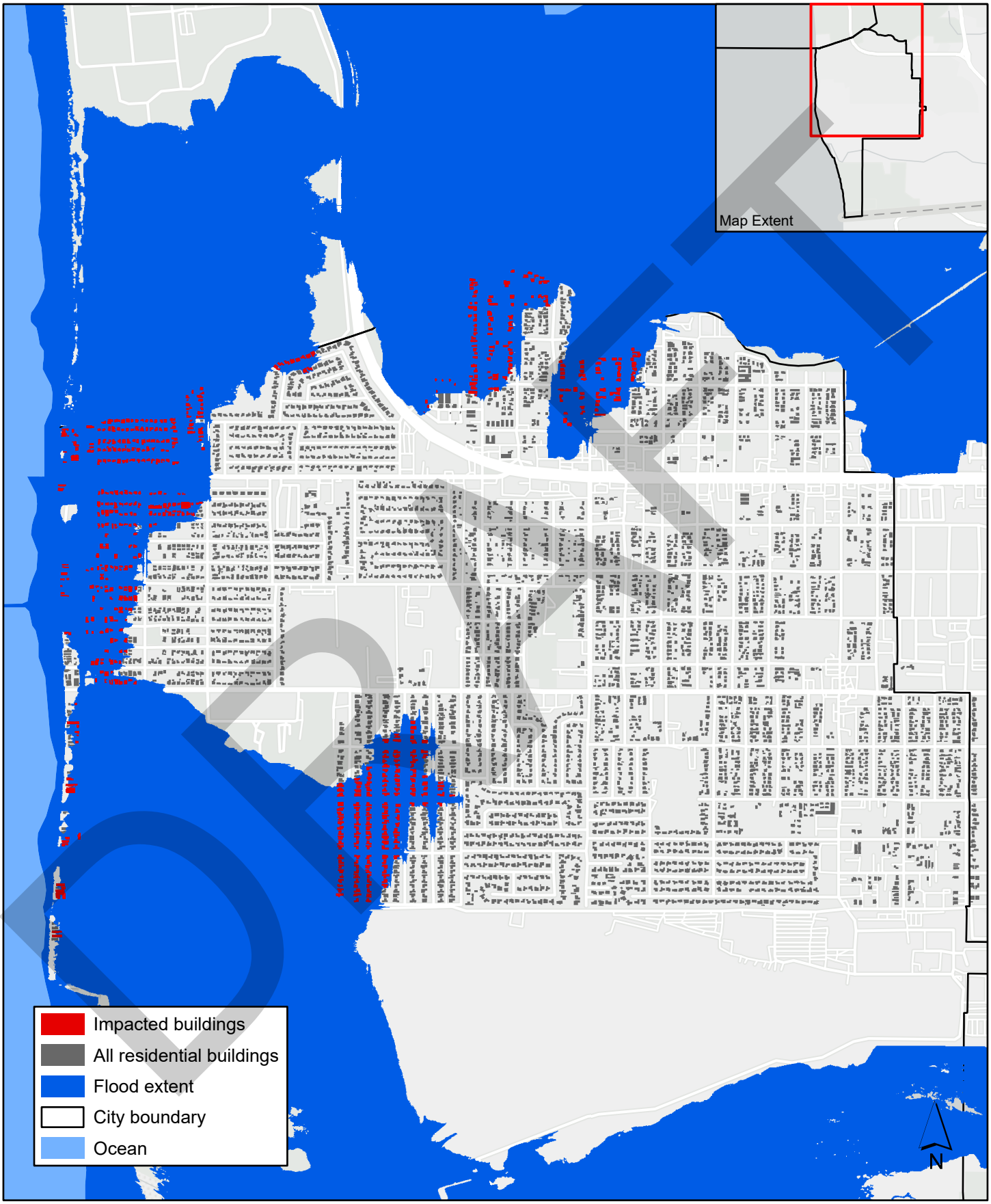
Imperial Beach Area 1

Sea Level Rise 2.0 m - 020 year storm



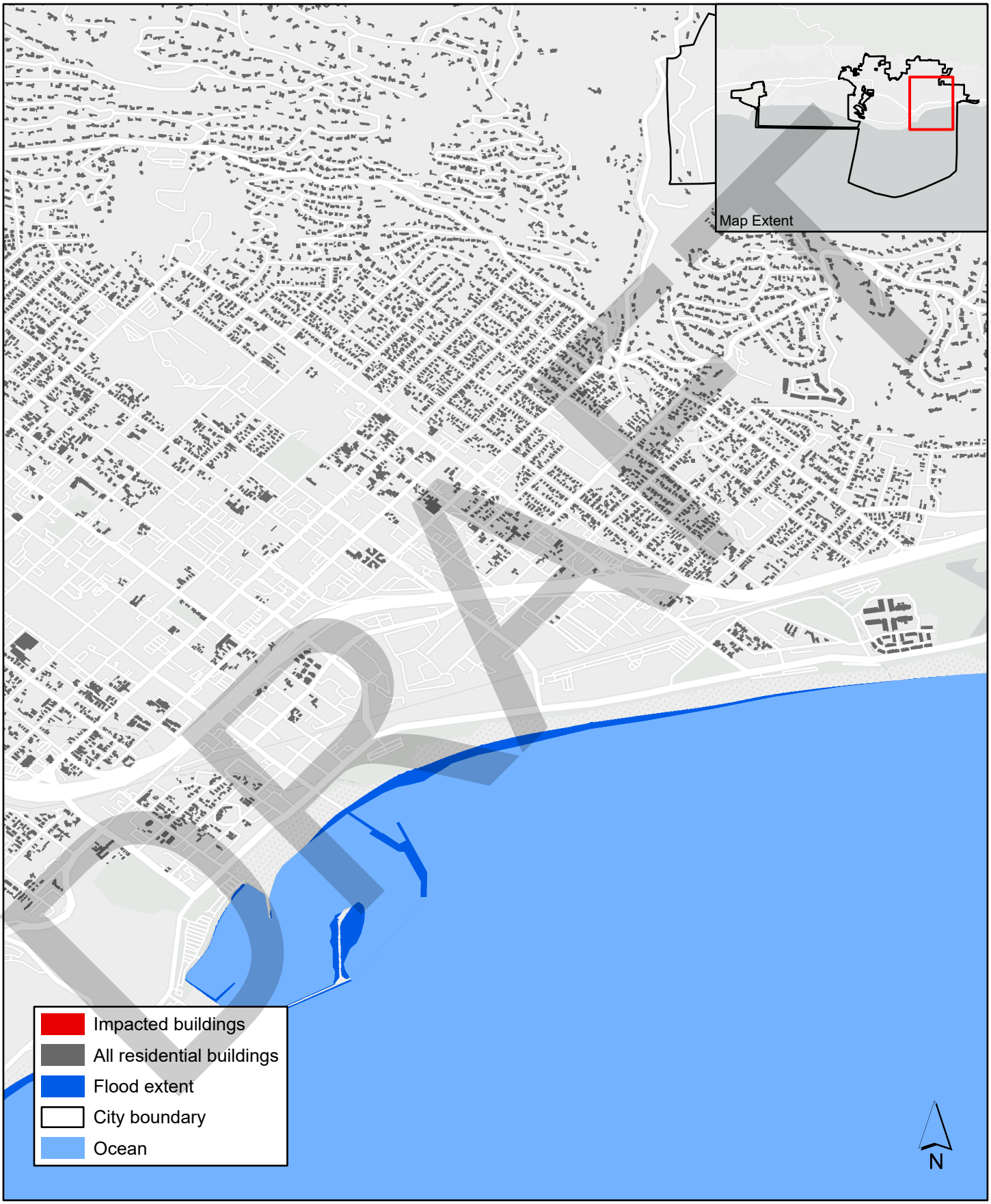
Imperial Beach Area 1

Sea Level Rise 2.0 m - 100 year storm



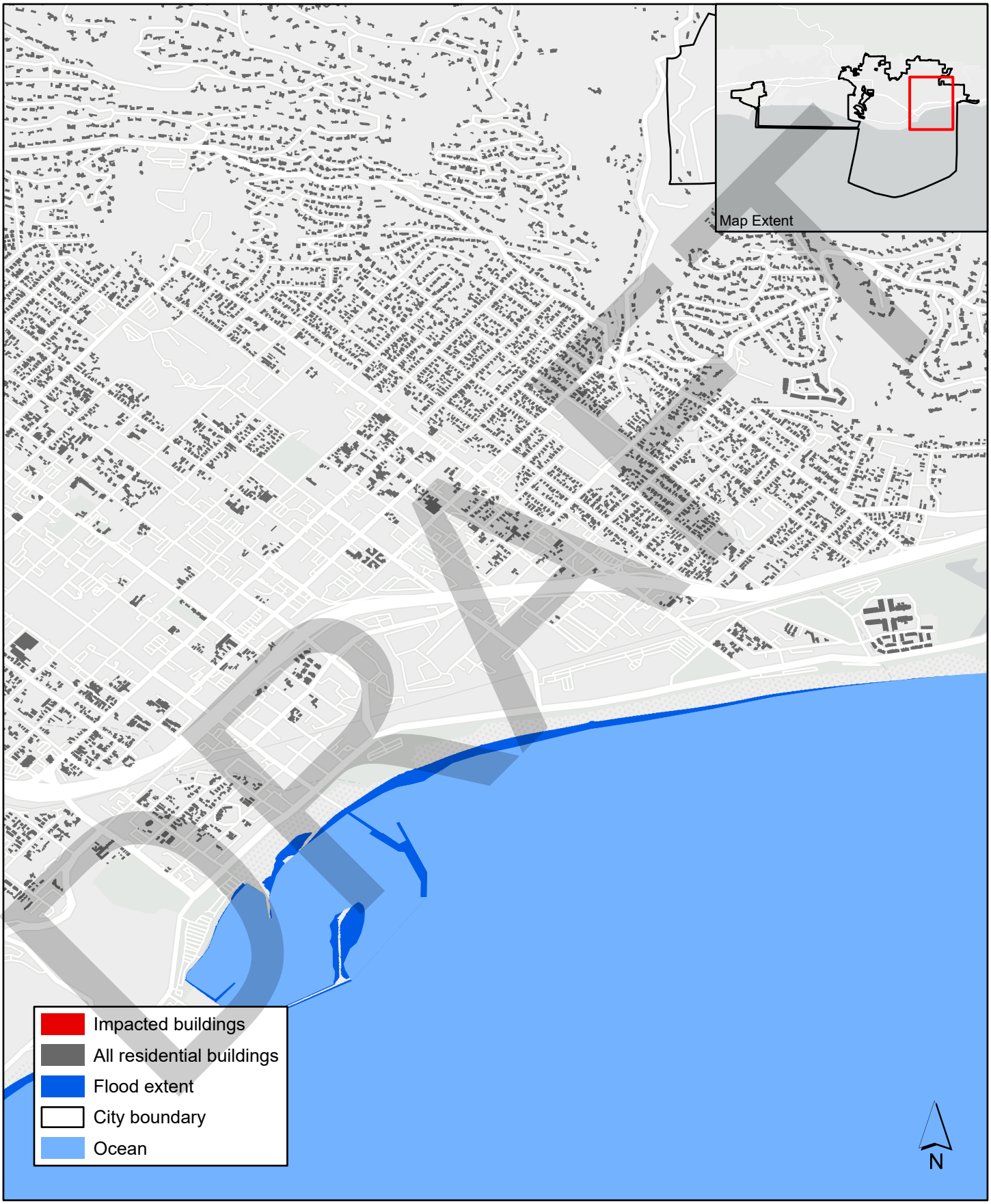
Santa Barbara Area 1

Sea Level Rise 0.0 m - No storm



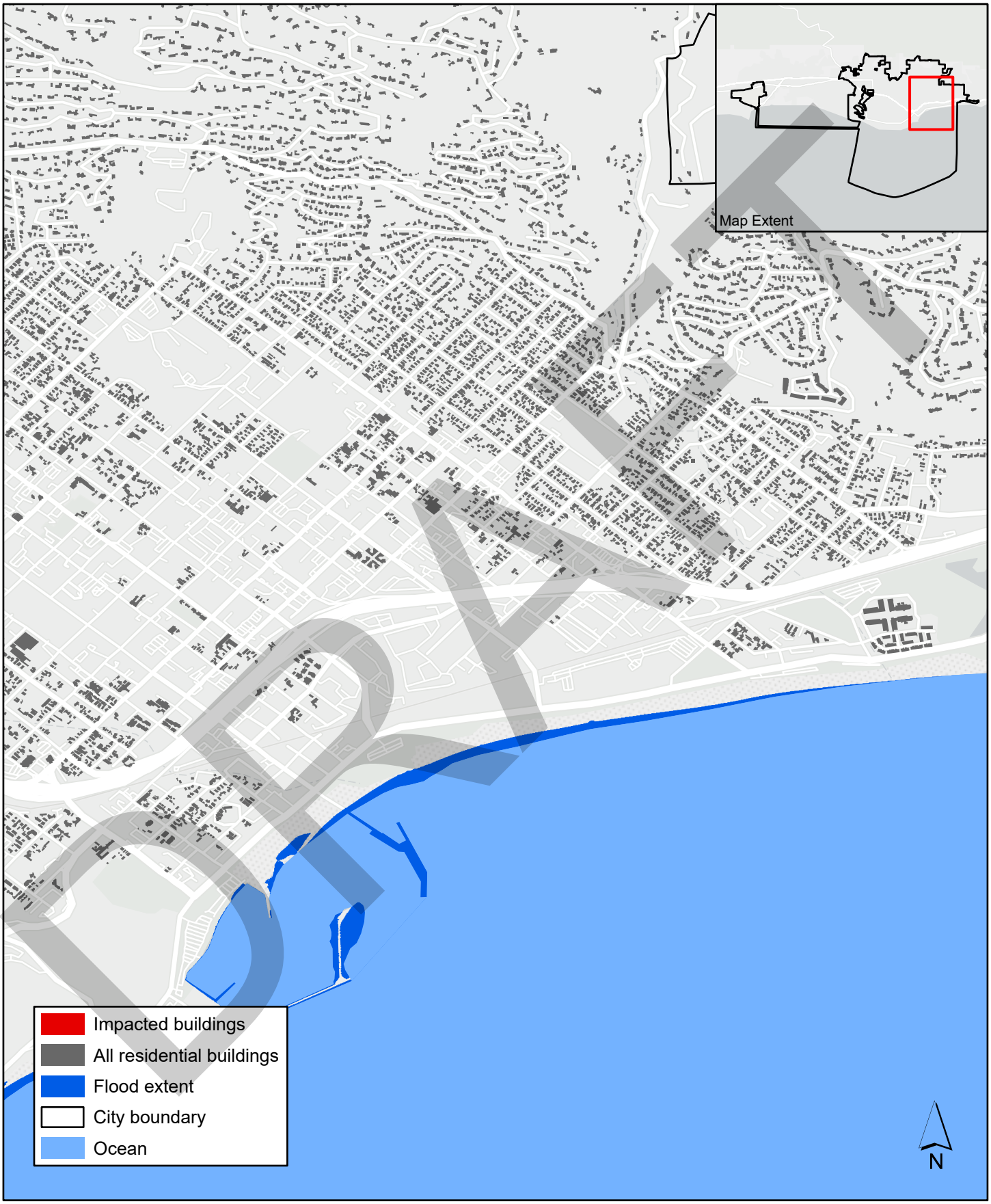
Santa Barbara Area 1

Sea Level Rise 0.0 m - 001 year storm



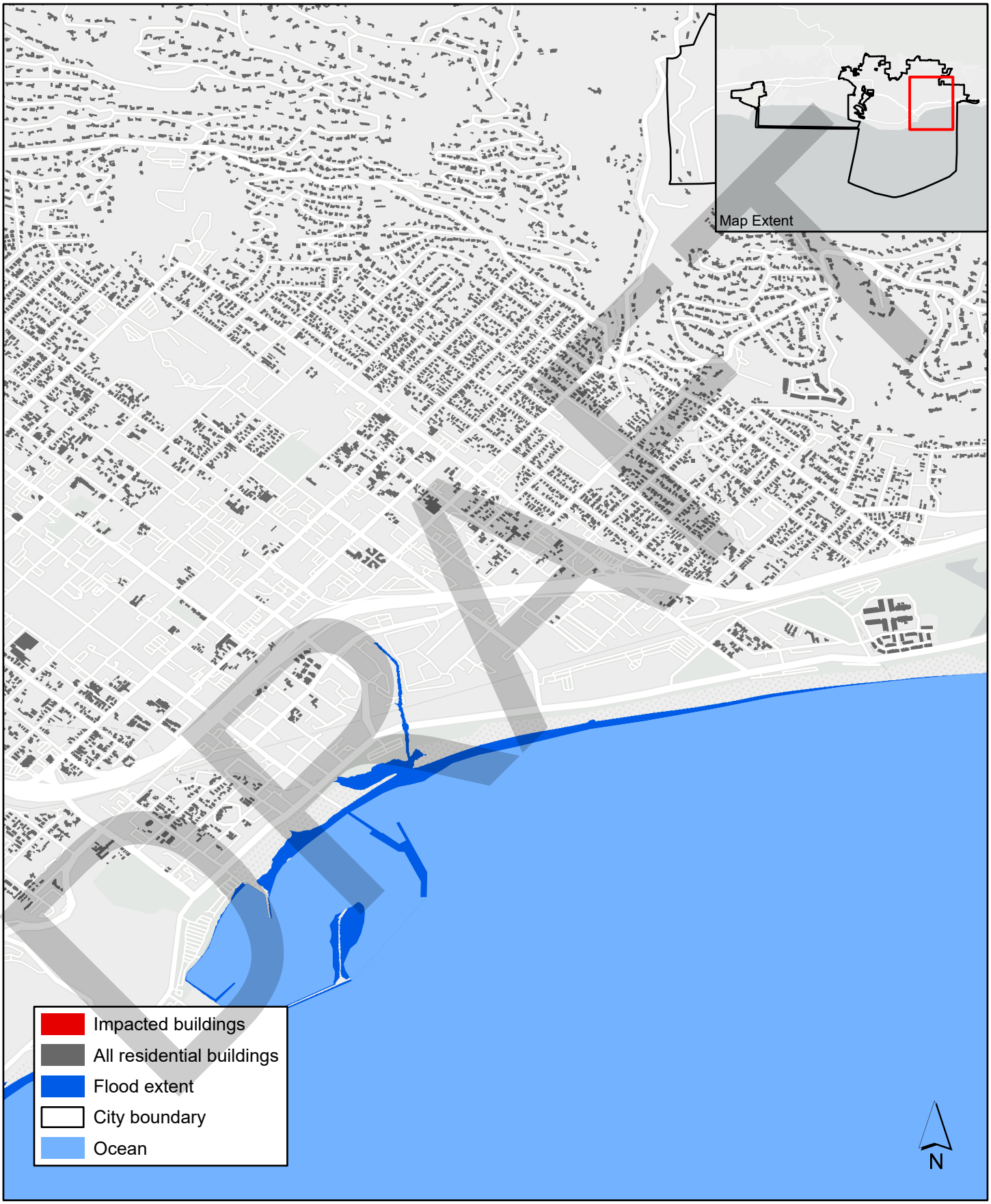
Santa Barbara Area 1

Sea Level Rise 0.0 m - 020 year storm



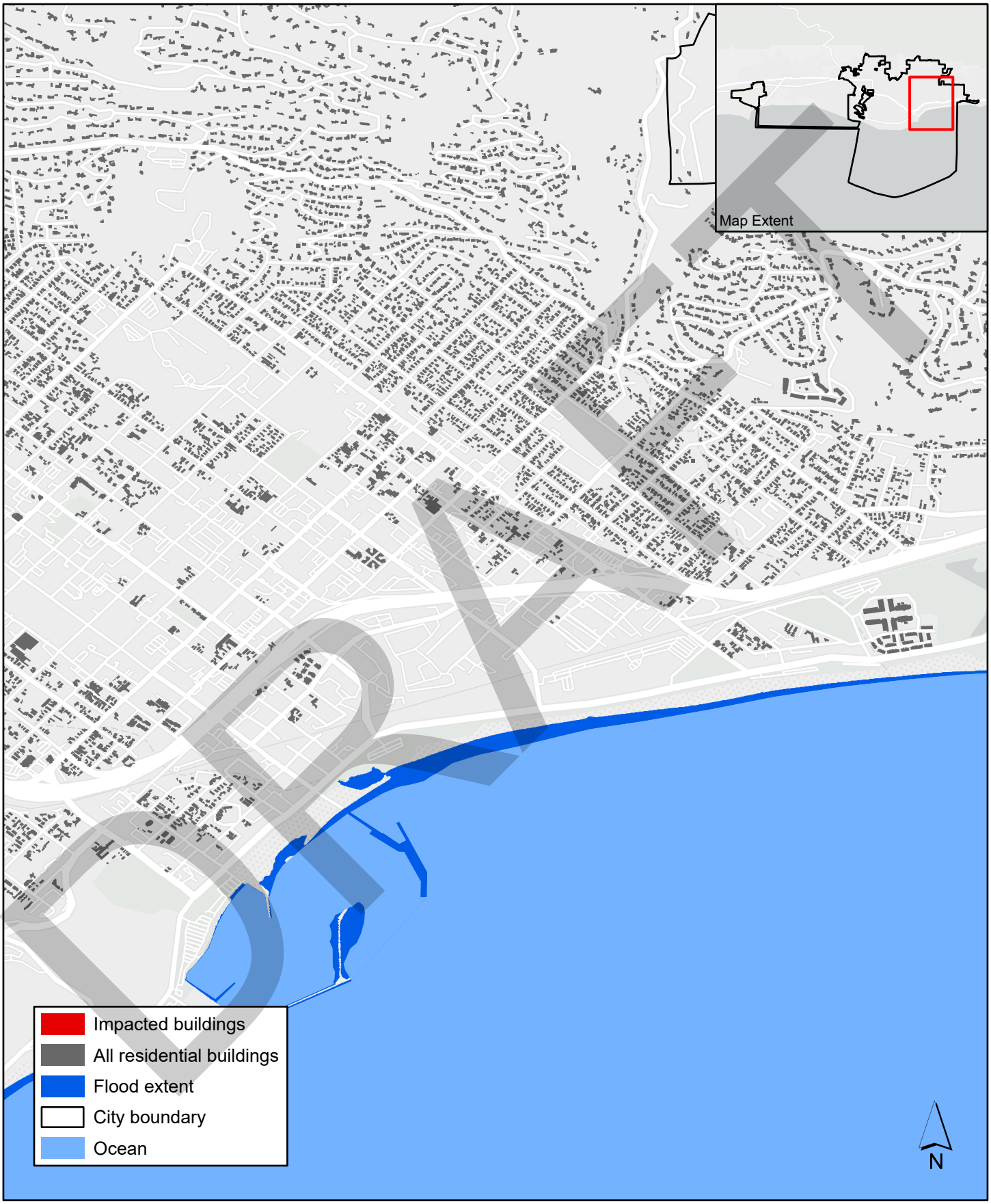
Santa Barbara Area 1

Sea Level Rise 0.0 m - 100 year storm



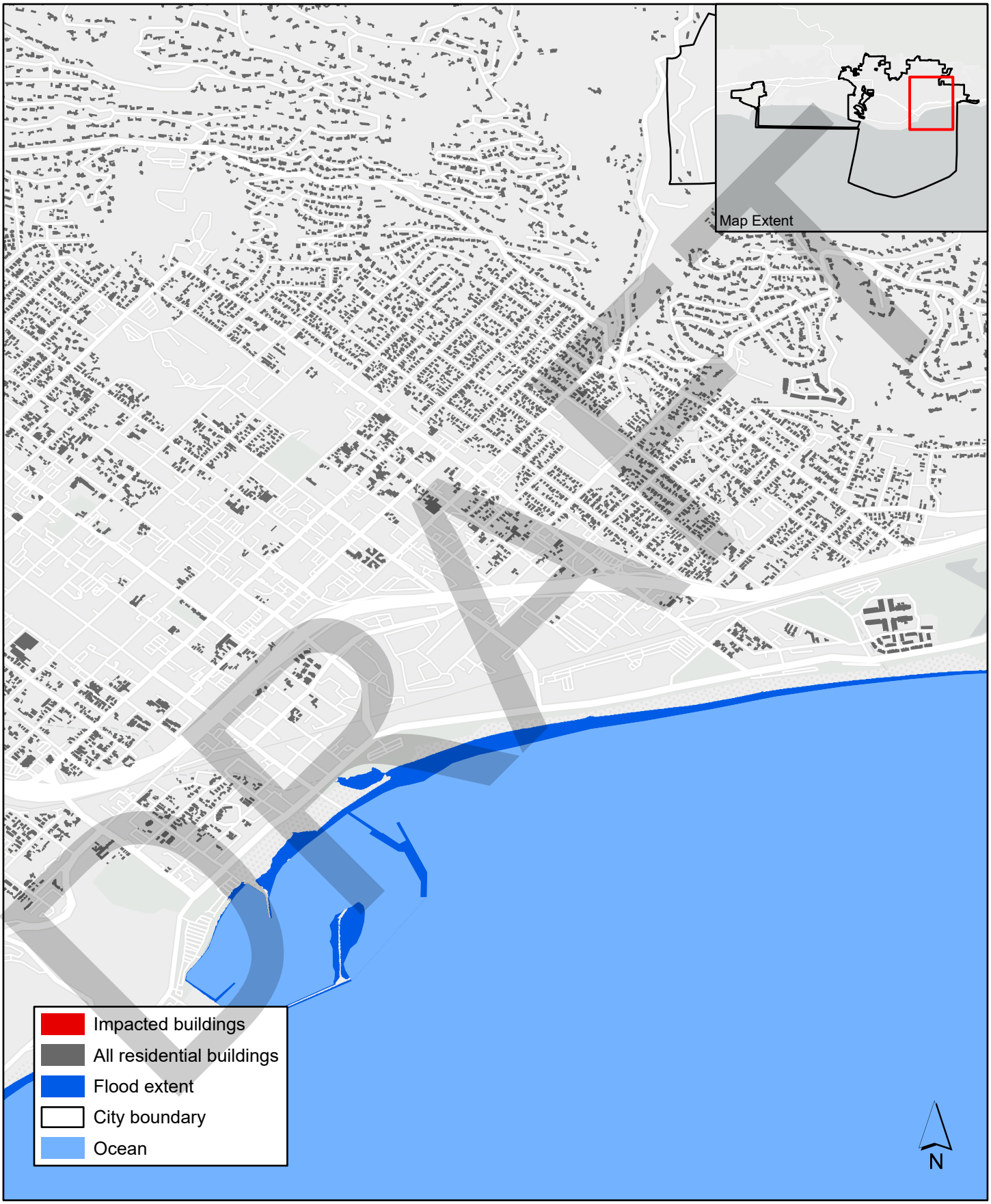
Santa Barbara Area 1

Sea Level Rise 0.25 m - No storm



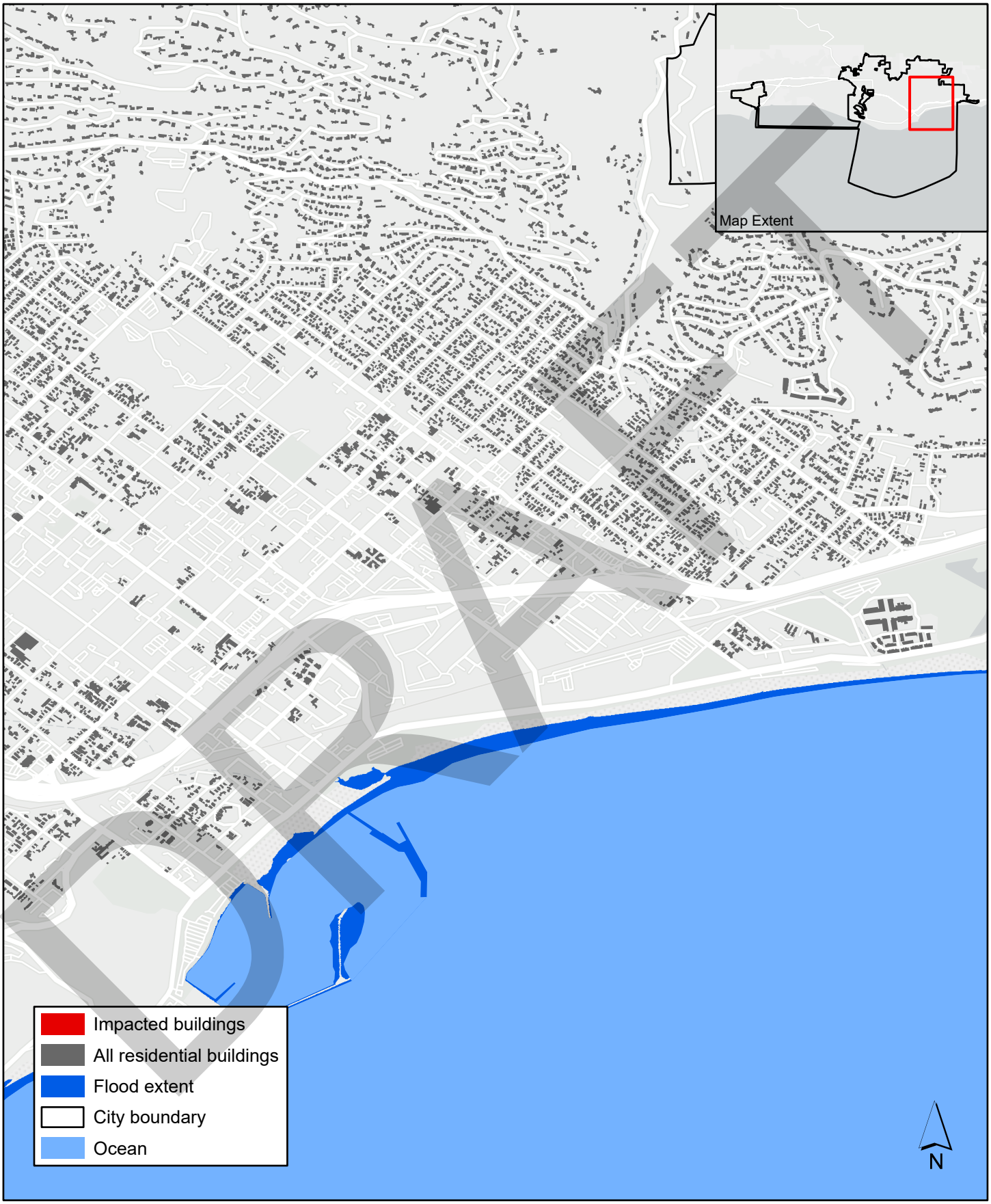
Santa Barbara Area 1

Sea Level Rise 0.25 m - 001 year storm



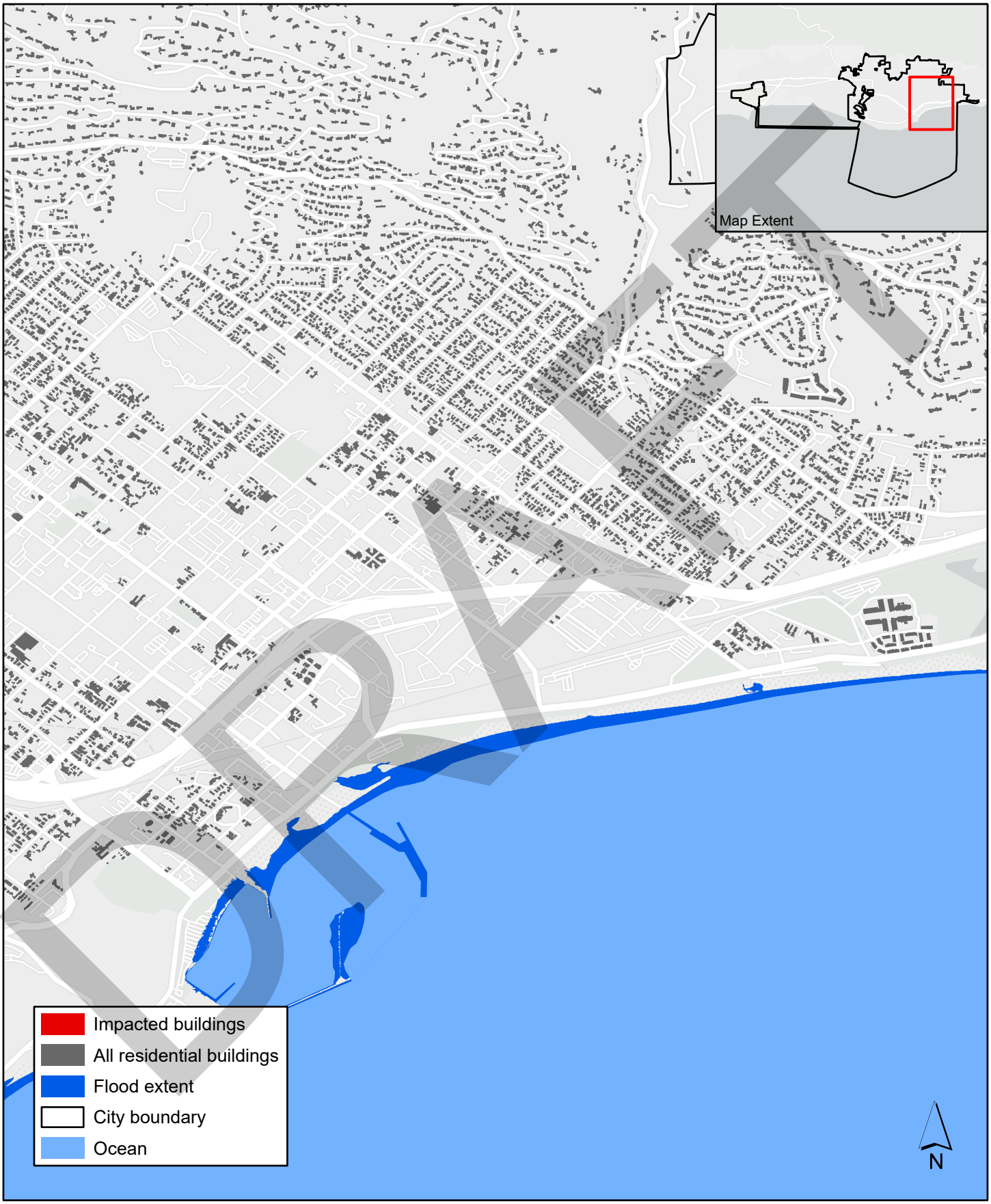
Santa Barbara Area 1

Sea Level Rise 0.25 m - 020 year storm



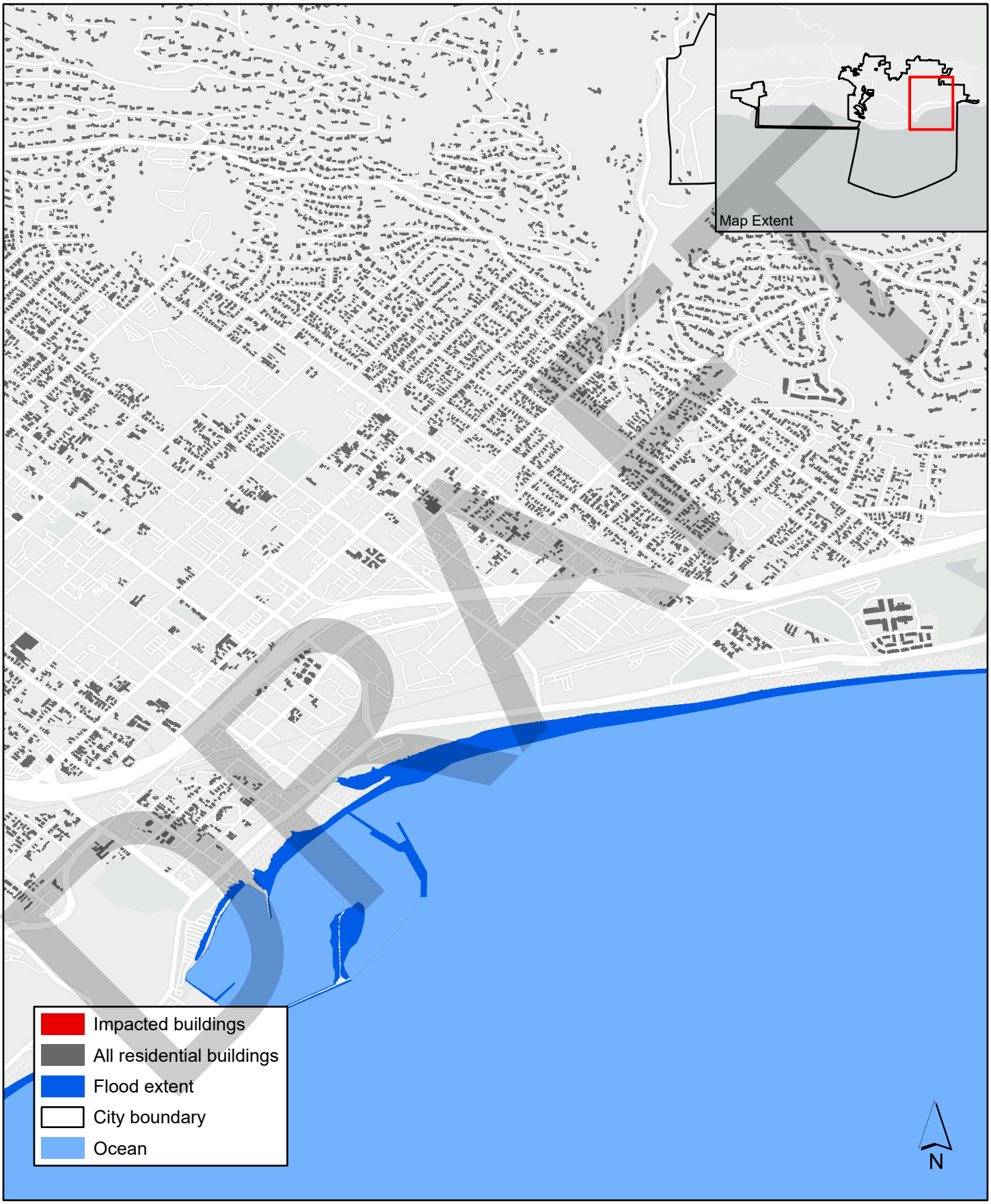
Santa Barbara Area 1

Sea Level Rise 0.25 m - 100 year storm



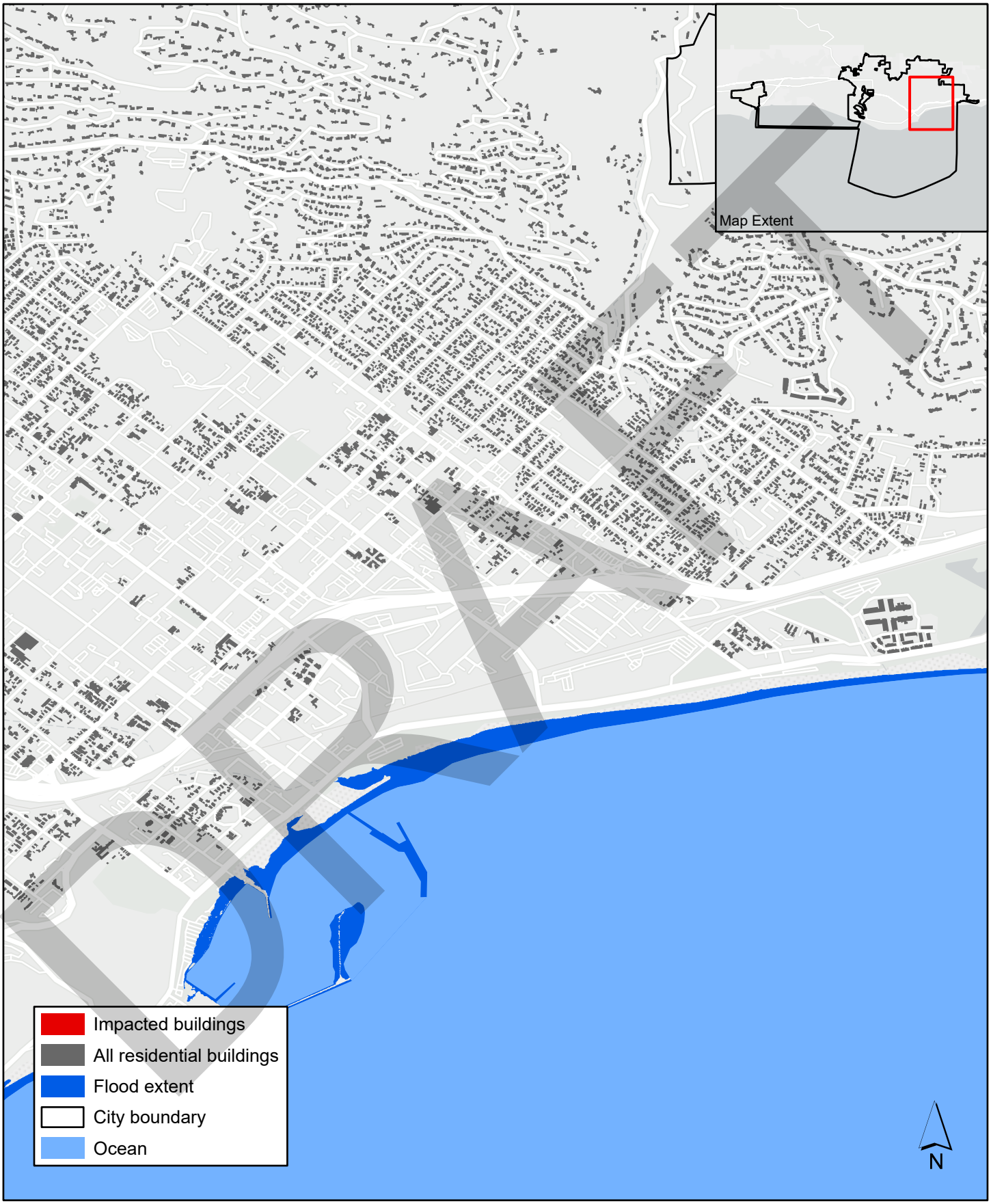
Santa Barbara Area 1

Sea Level Rise 0.5 m - No storm



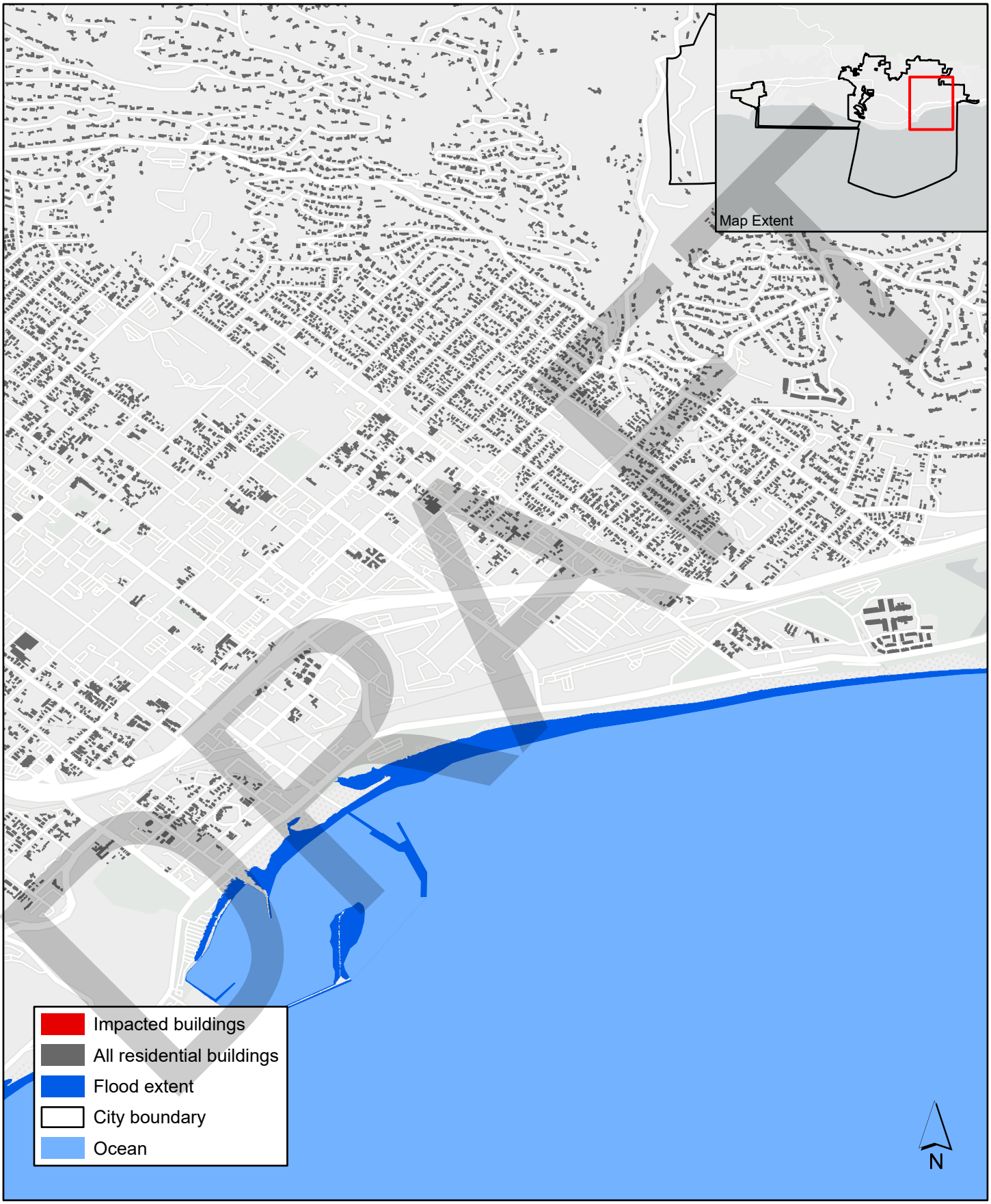
Santa Barbara Area 1

Sea Level Rise 0.5 m - 001 year storm



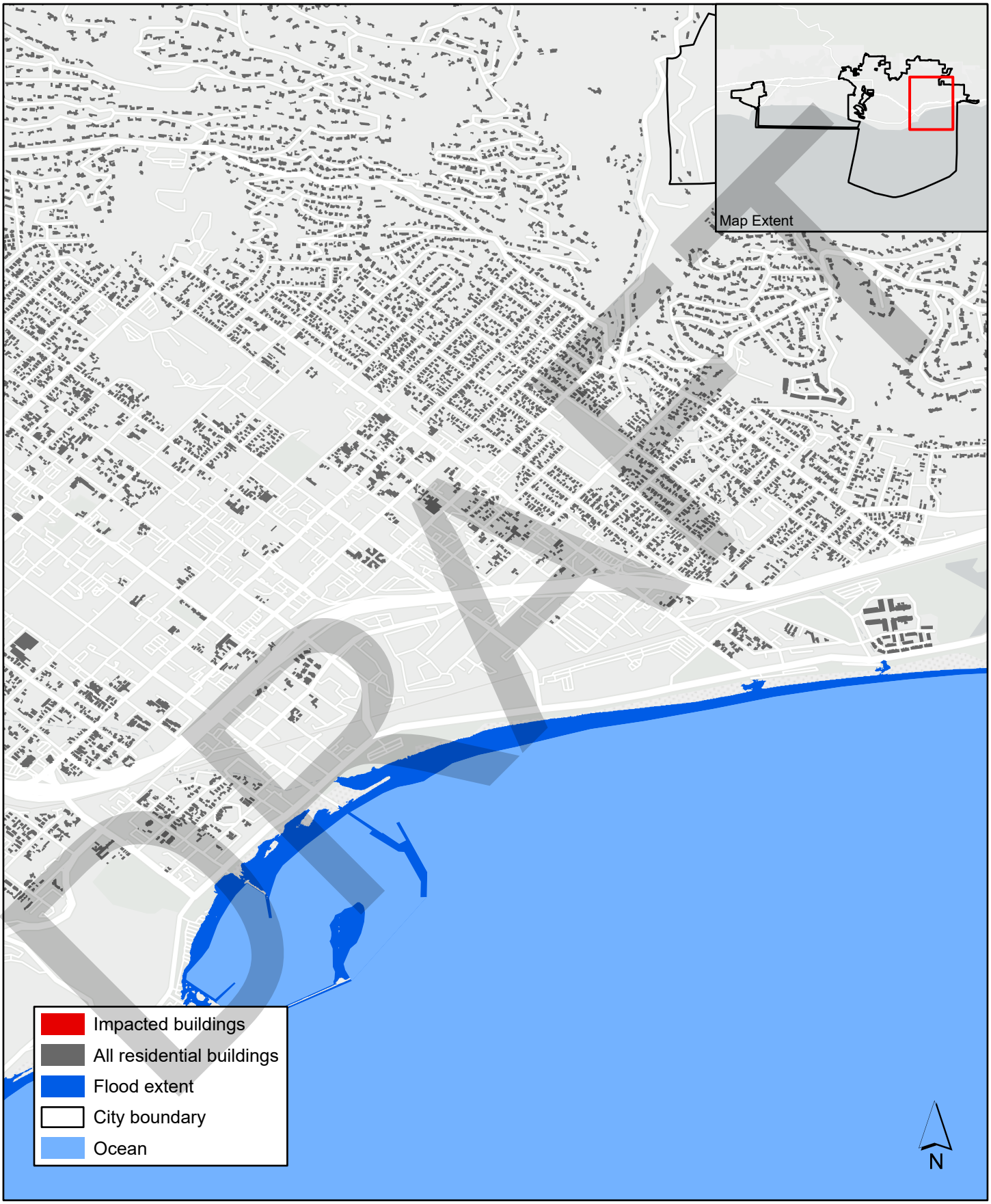
Santa Barbara Area 1

Sea Level Rise 0.5 m - 020 year storm



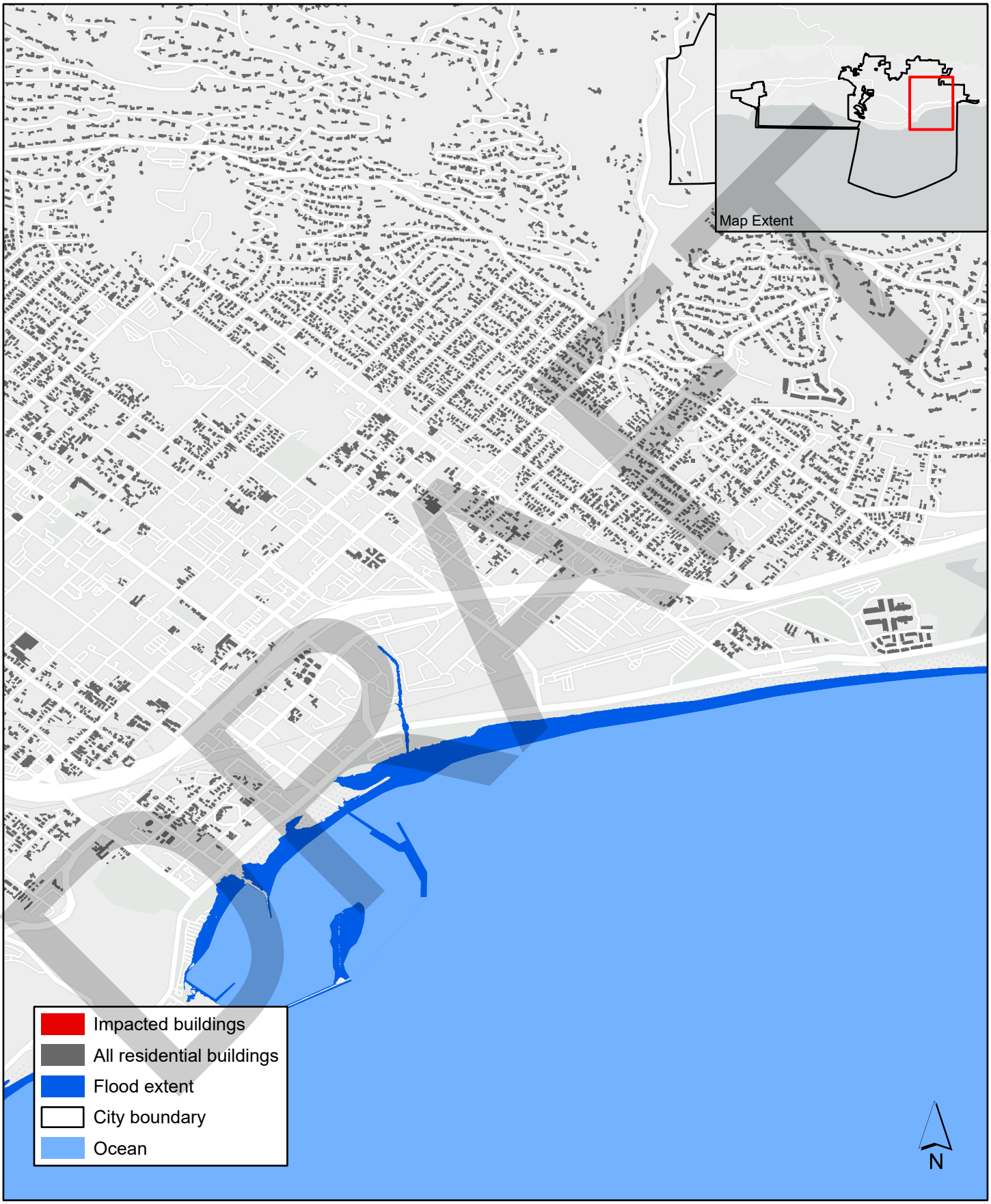
Santa Barbara Area 1

Sea Level Rise 0.5 m - 100 year storm



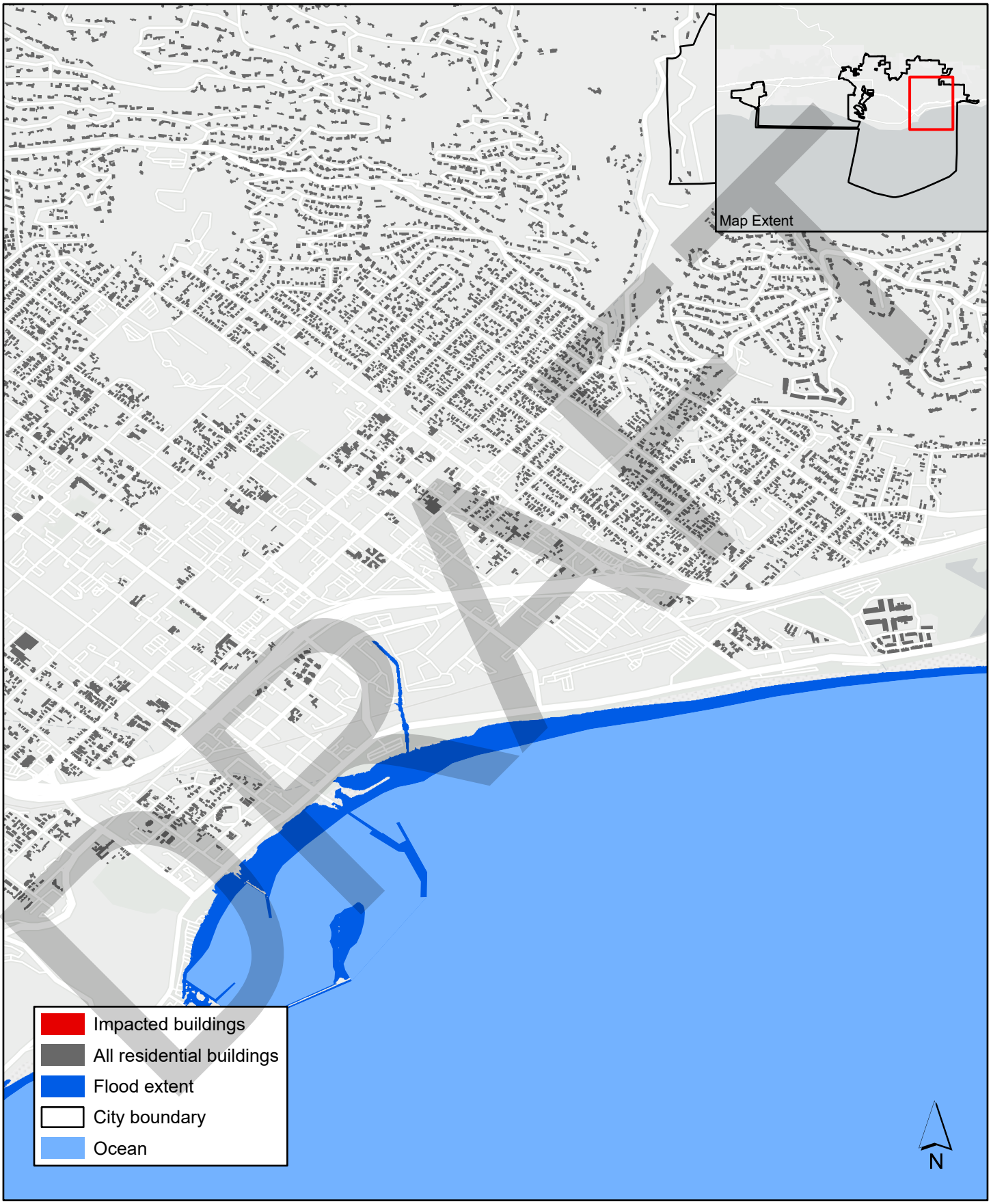
Santa Barbara Area 1

Sea Level Rise 0.75 m - No storm



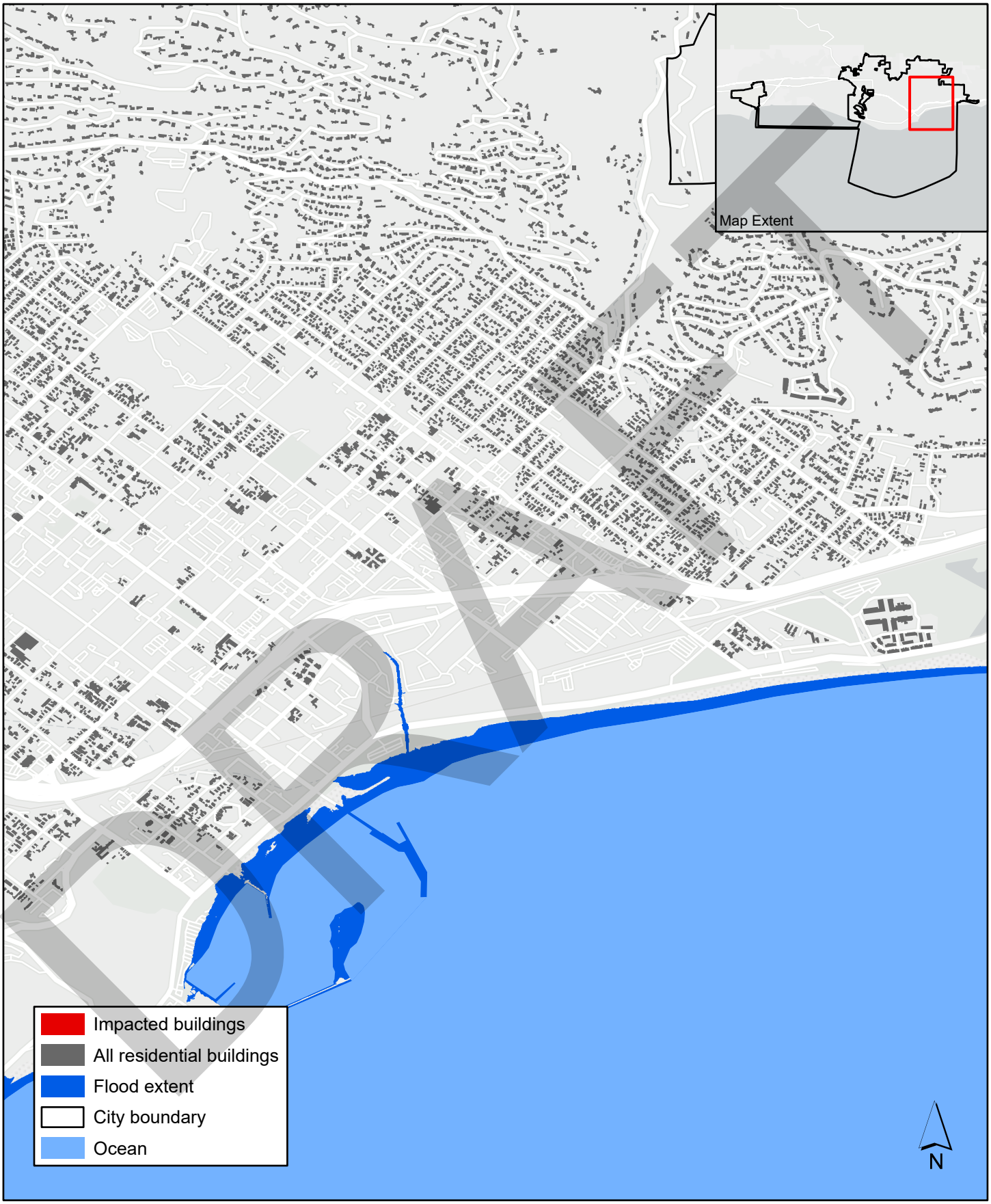
Santa Barbara Area 1

Sea Level Rise 0.75 m - 001 year storm



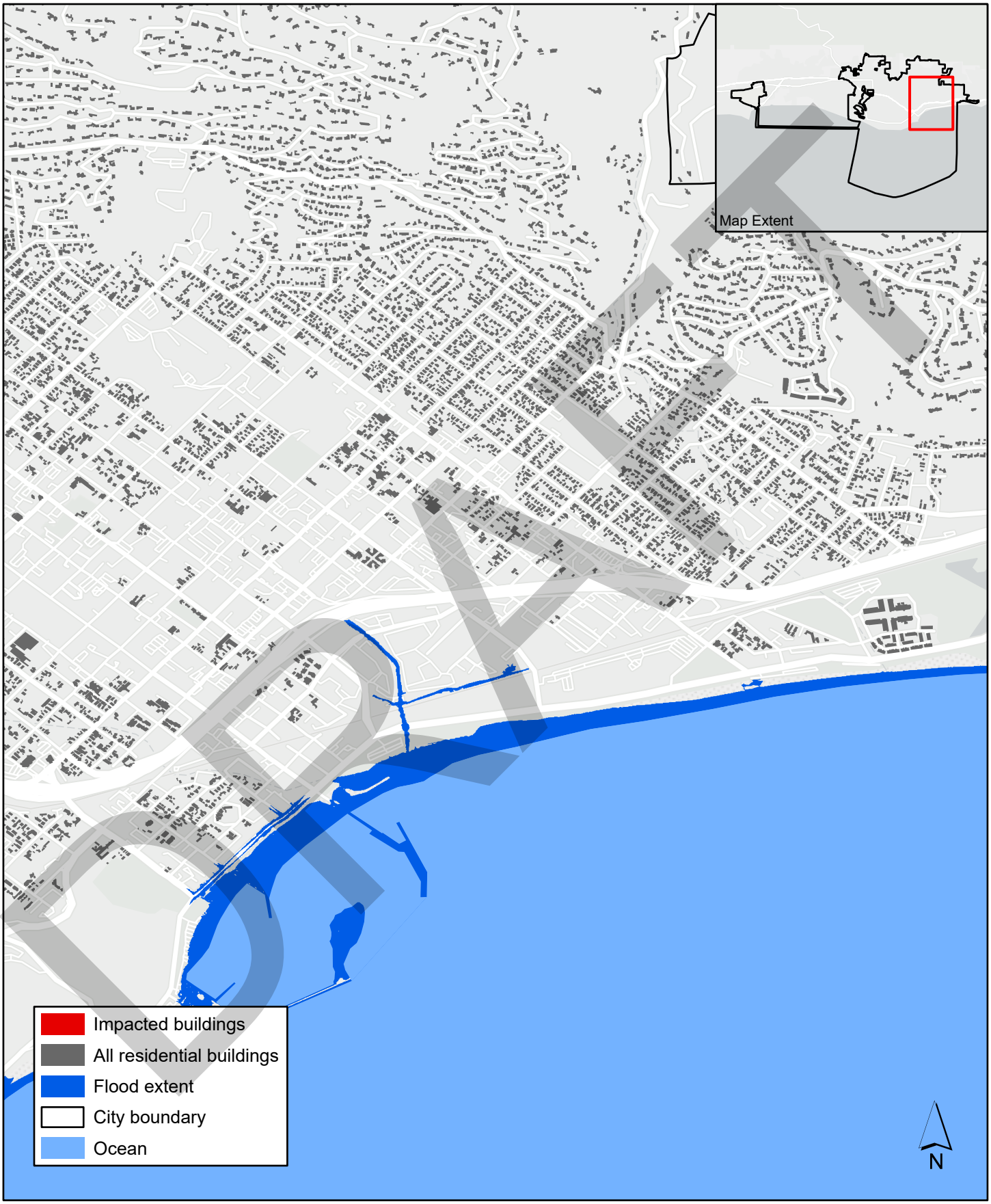
Santa Barbara Area 1

Sea Level Rise 0.75 m - 020 year storm



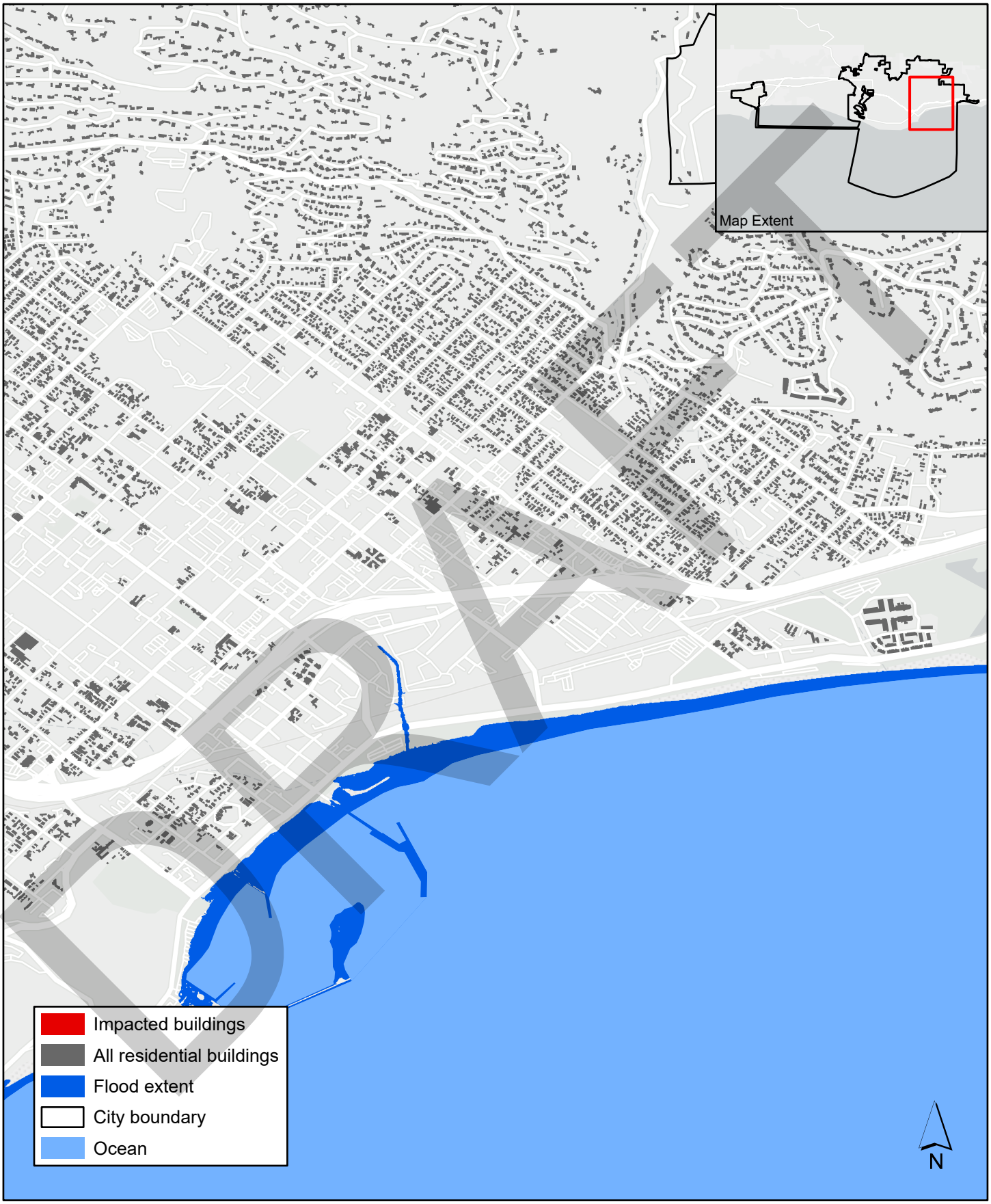
Santa Barbara Area 1

Sea Level Rise 0.75 m - 100 year storm



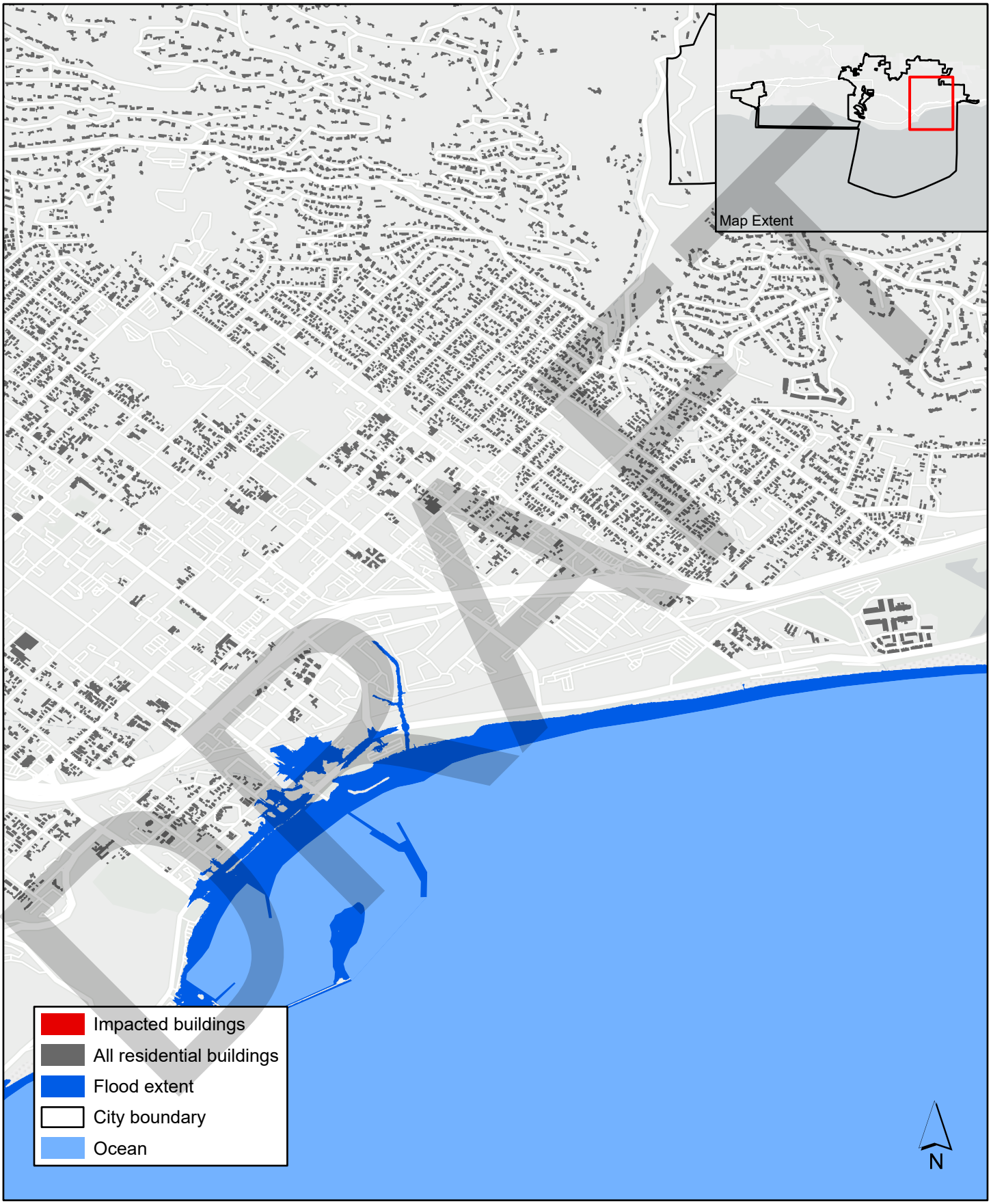
Santa Barbara Area 1

Sea Level Rise 1.0 m - No storm



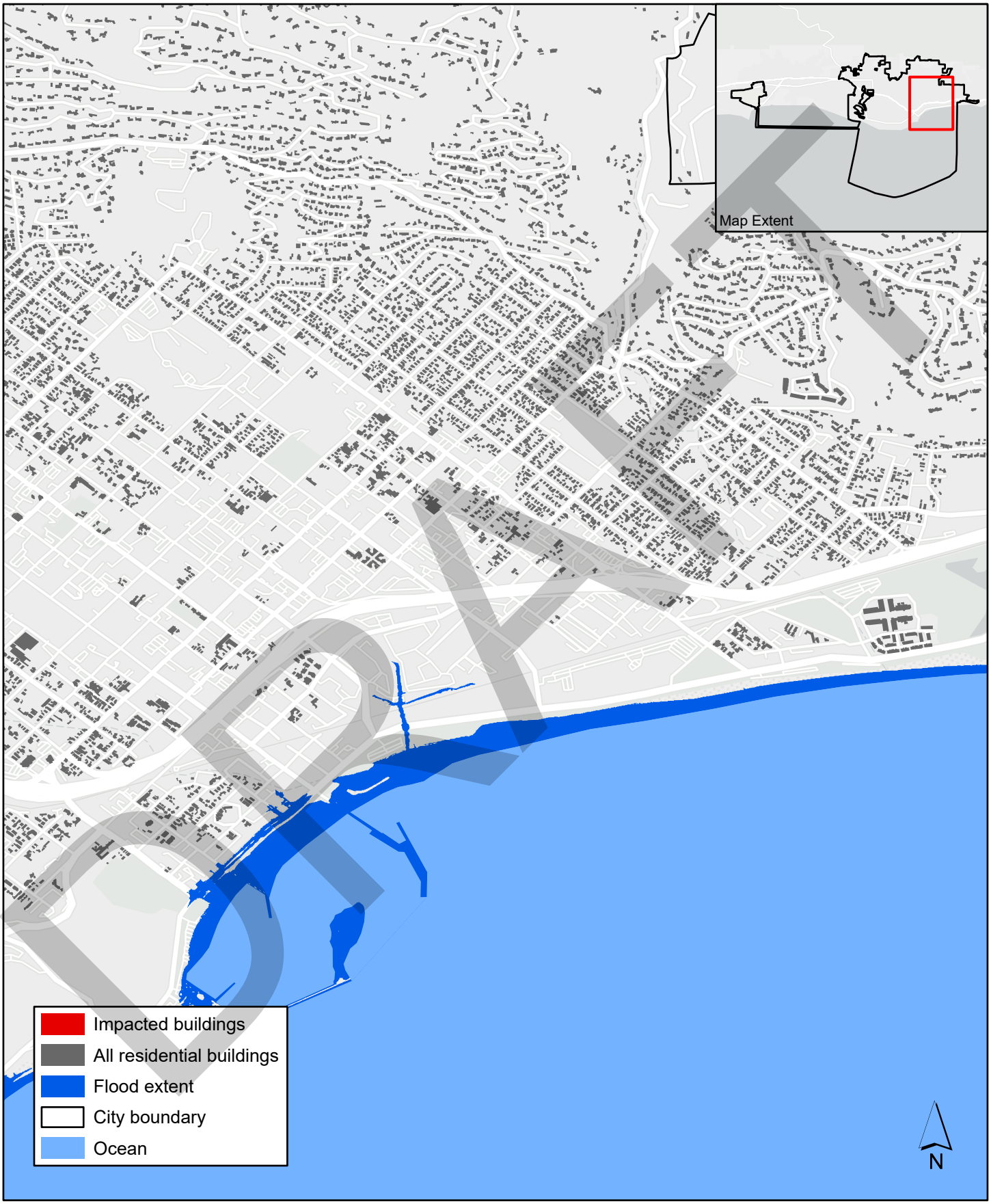
Santa Barbara Area 1

Sea Level Rise 1.0 m - 001 year storm



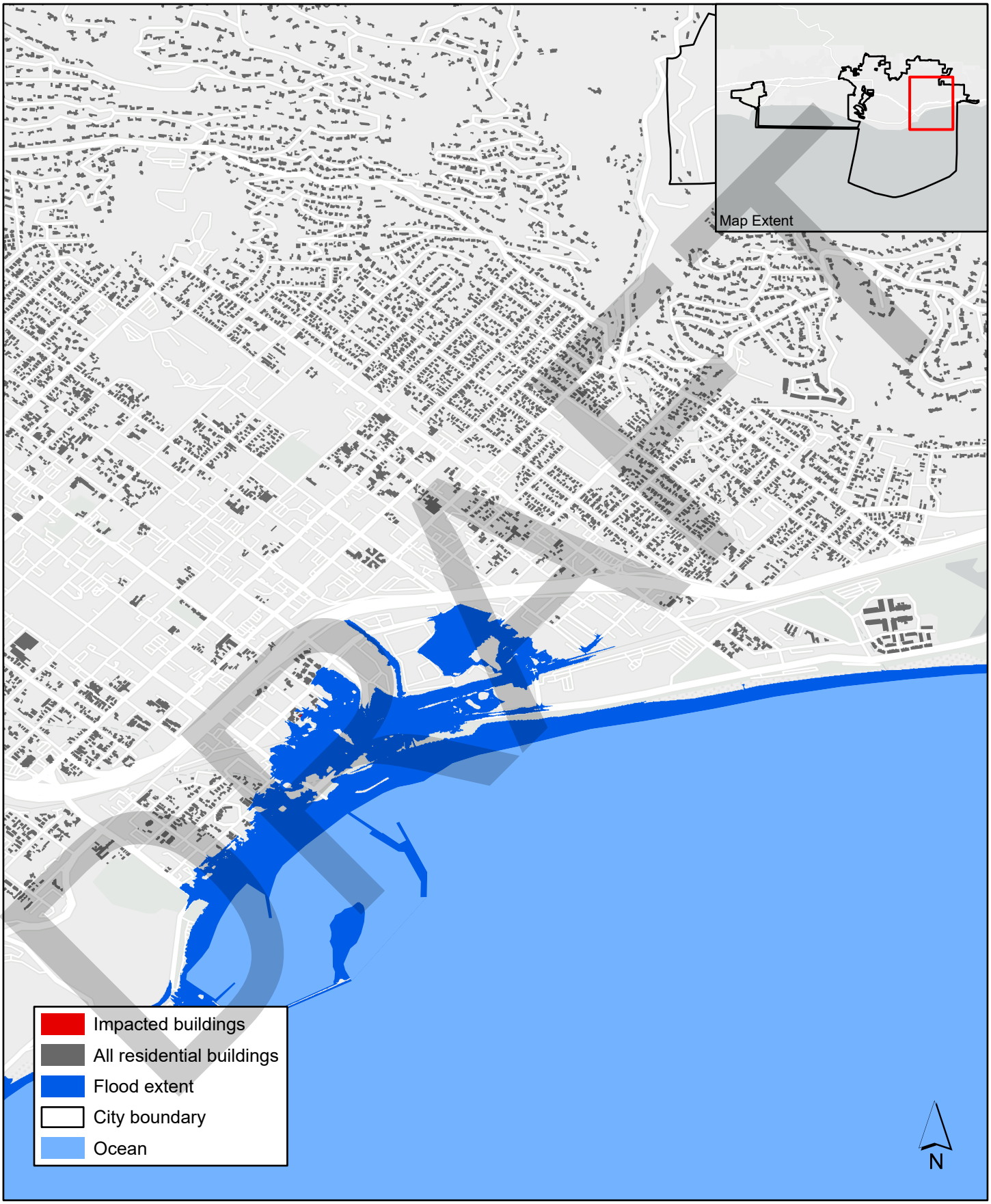
Santa Barbara Area 1

Sea Level Rise 1.0 m - 020 year storm



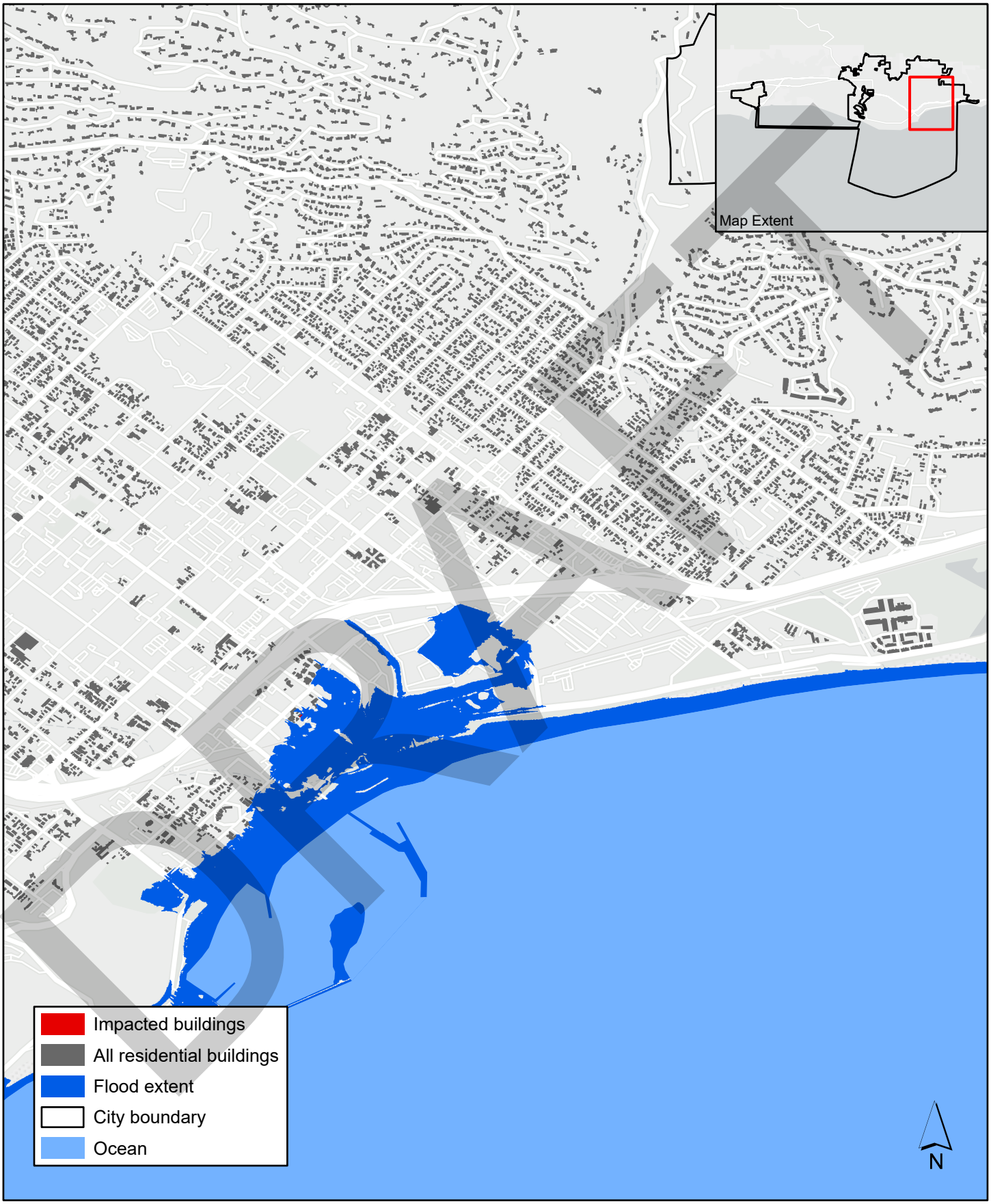
Santa Barbara Area 1

Sea Level Rise 1.0 m - 100 year storm



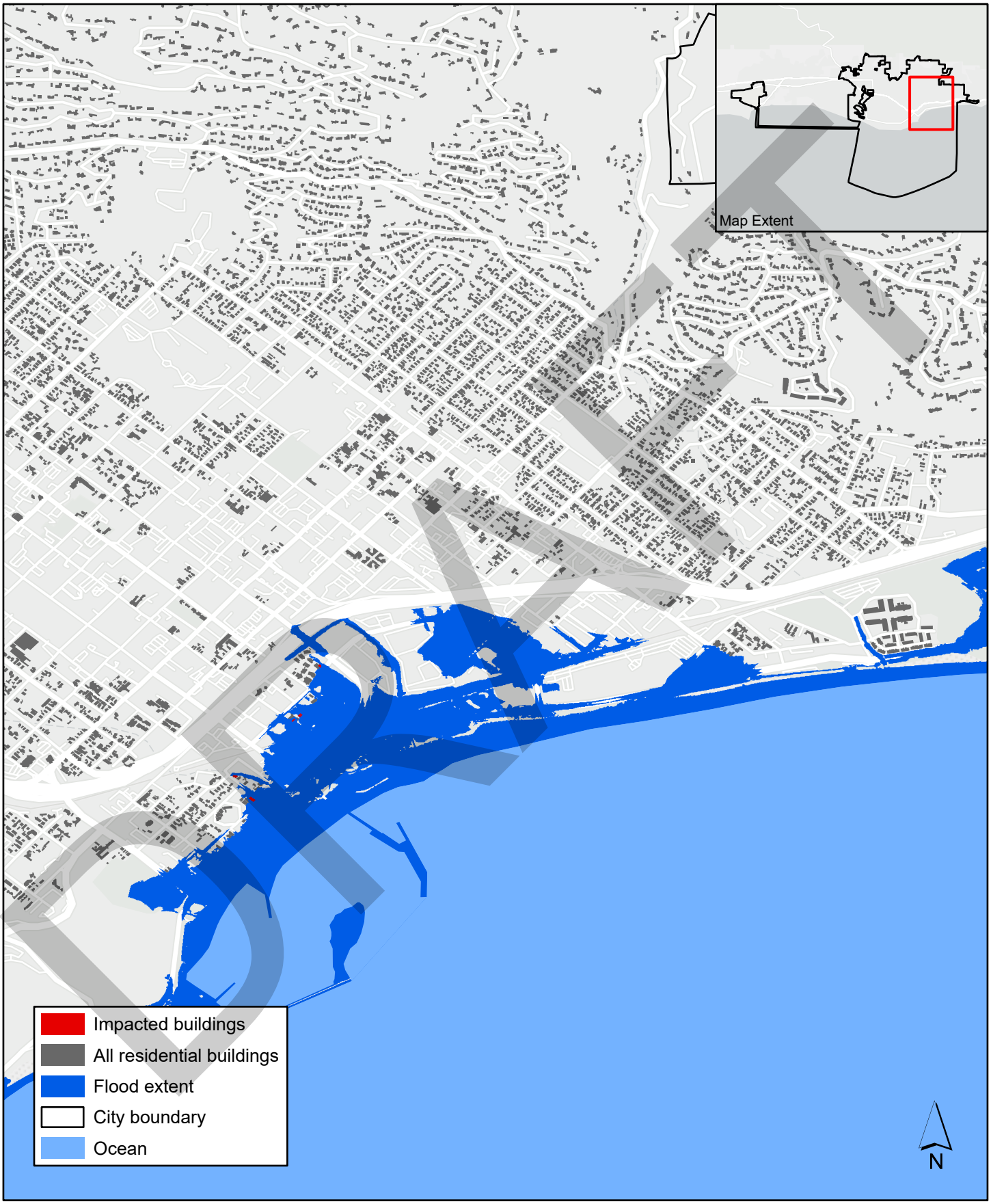
Santa Barbara Area 1

Sea Level Rise 1.5 m - No storm



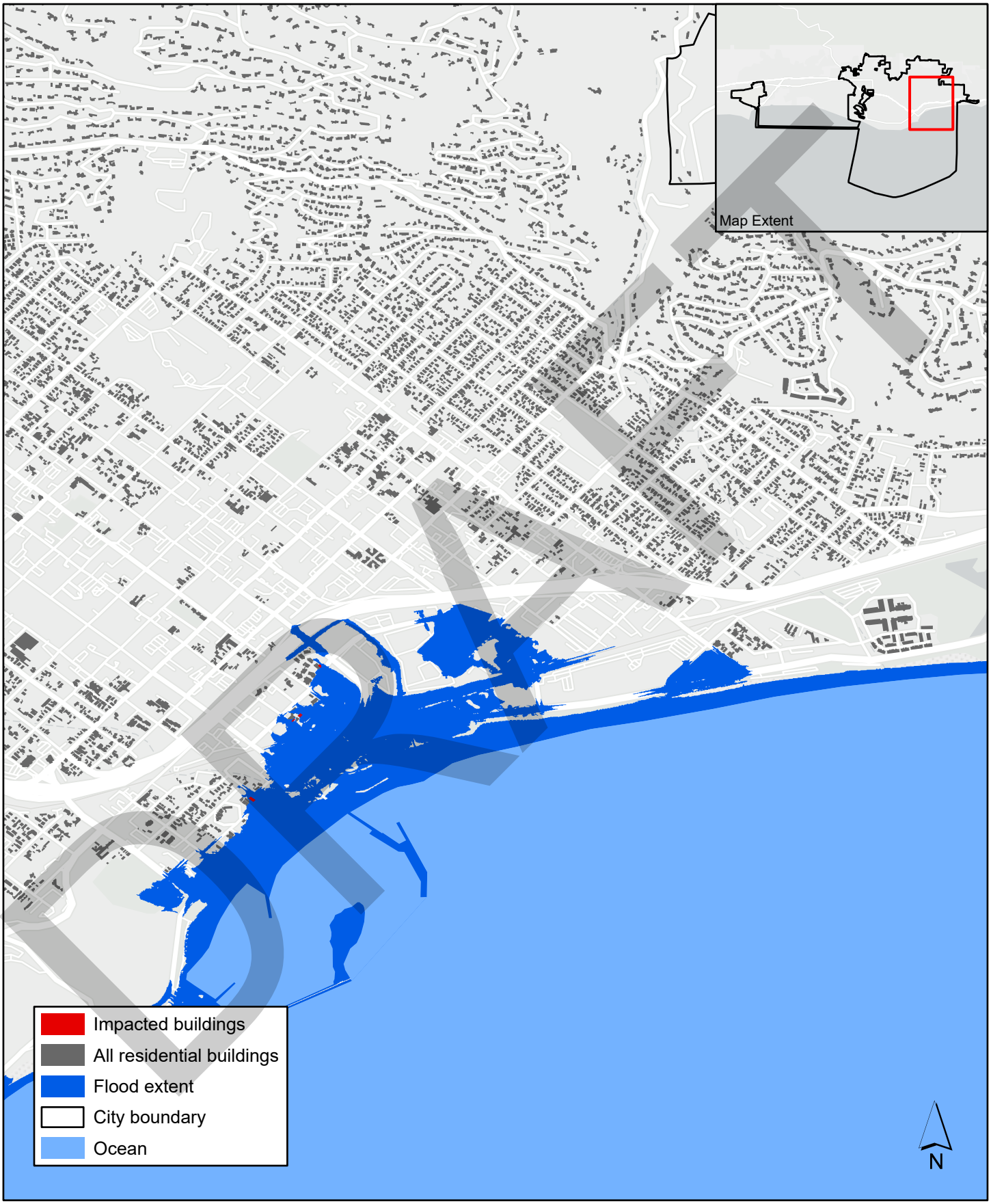
Santa Barbara Area 1

Sea Level Rise 1.5 m - 001 year storm



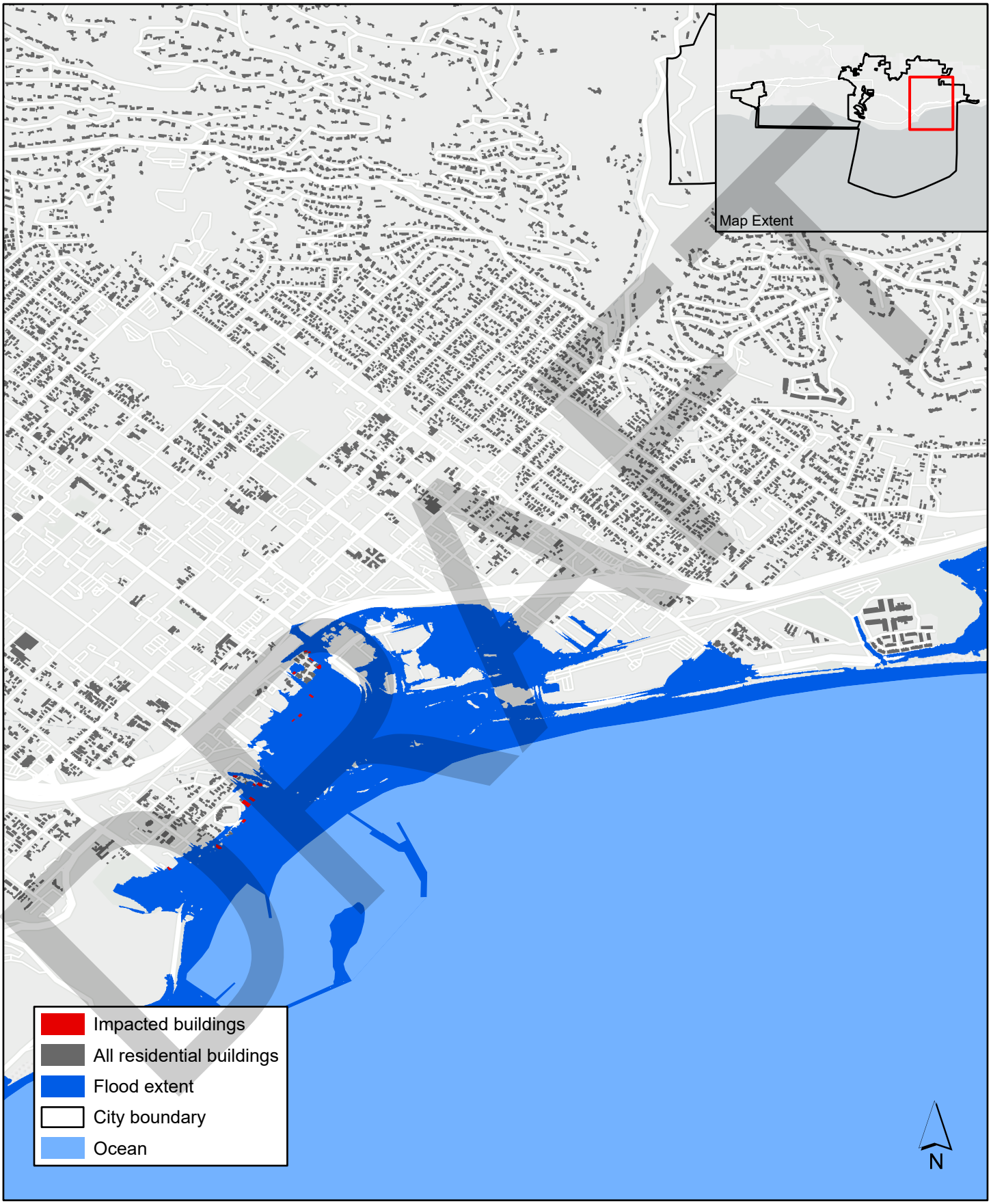
Santa Barbara Area 1

Sea Level Rise 1.5 m - 020 year storm



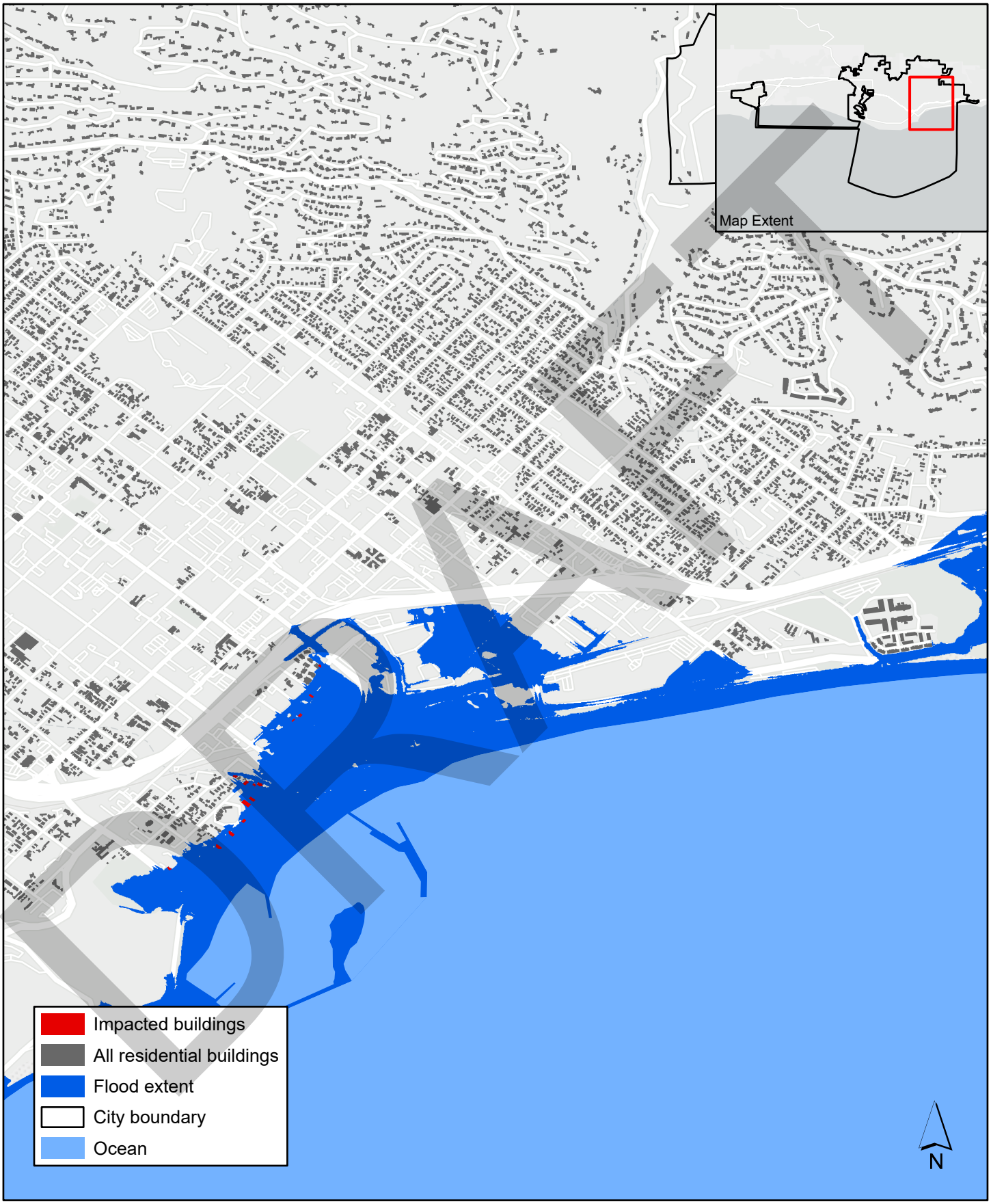
Santa Barbara Area 1

Sea Level Rise 1.5 m - 100 year storm



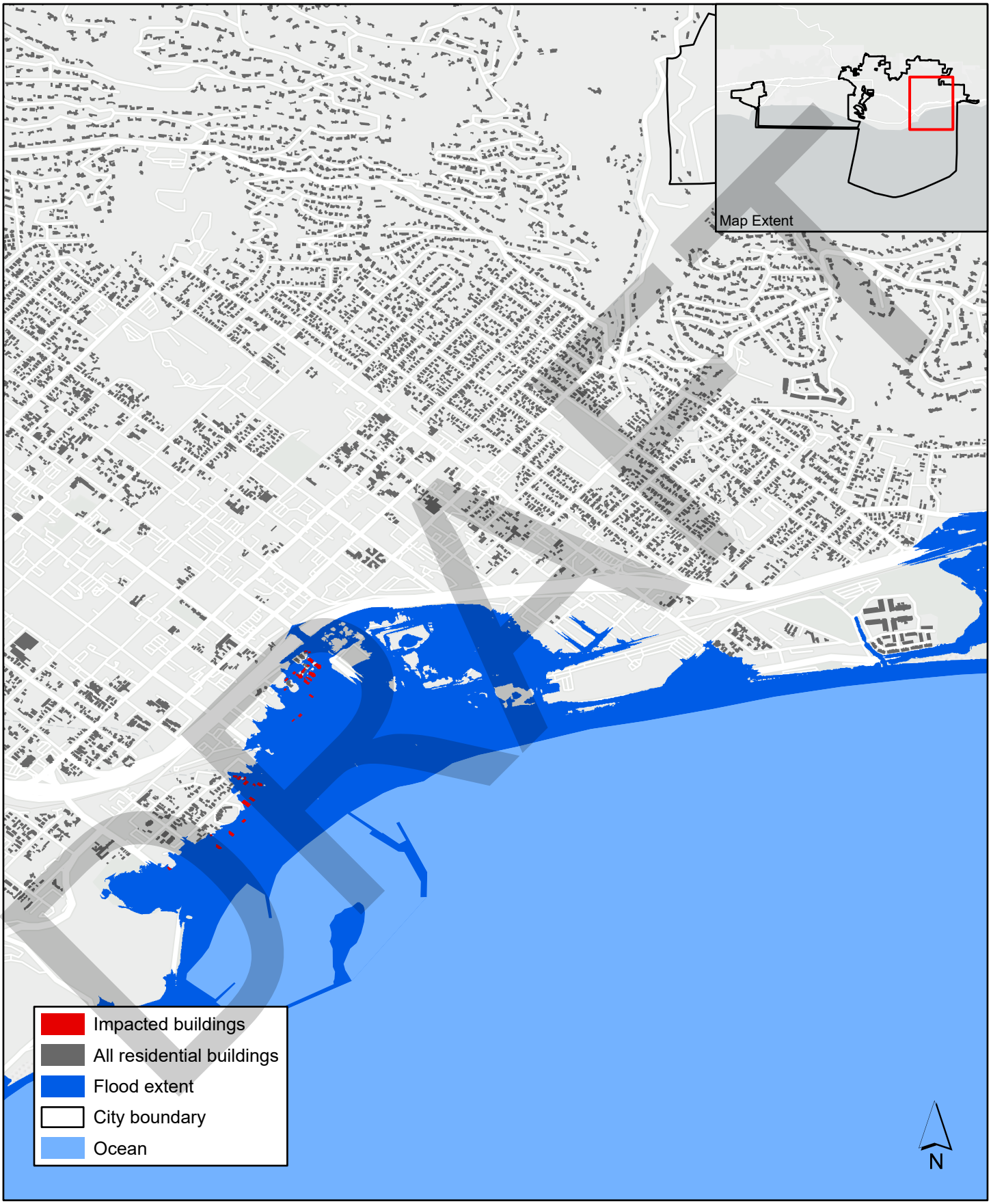
Santa Barbara Area 1

Sea Level Rise 2.0 m - No storm



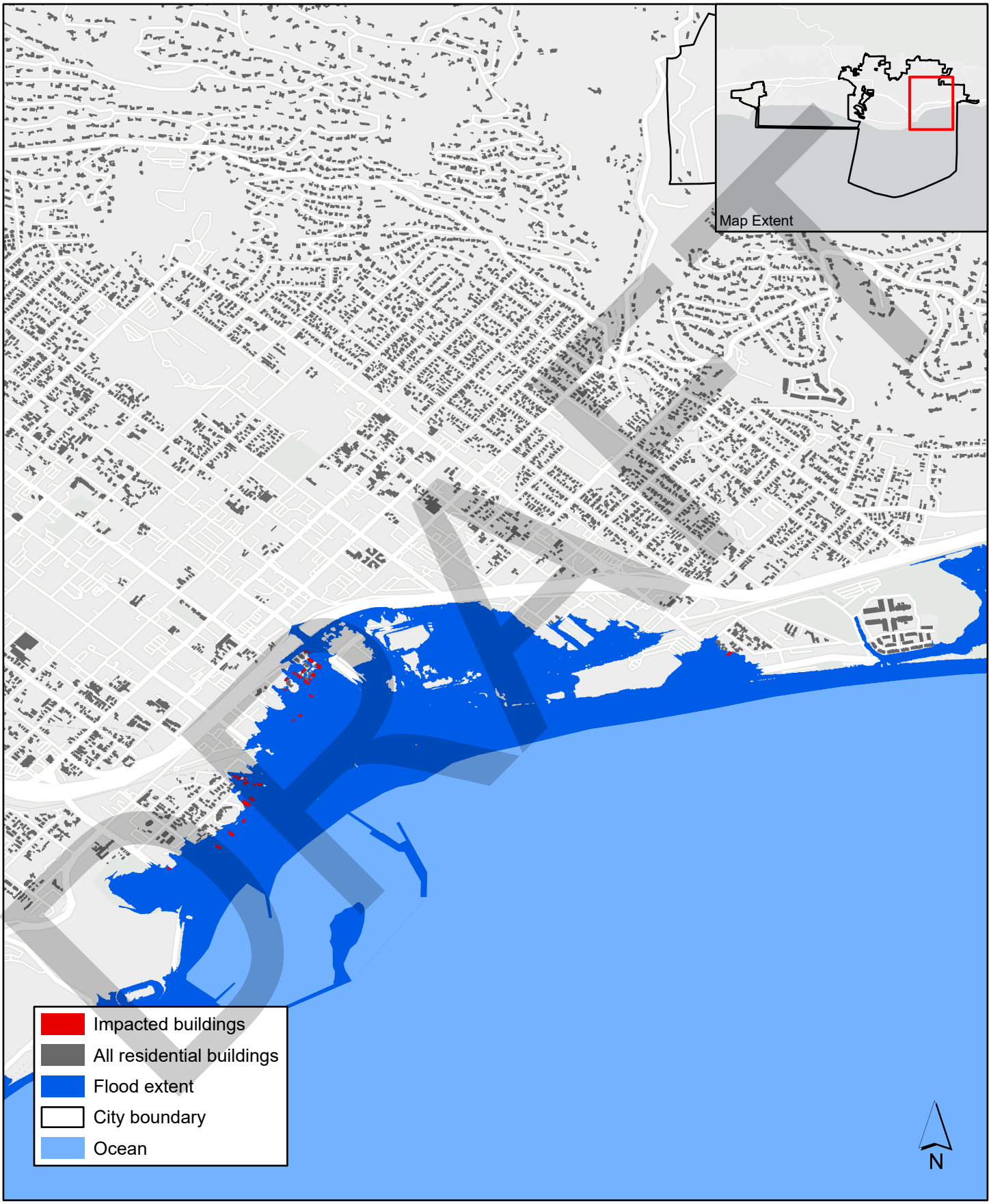
Santa Barbara Area 1

Sea Level Rise 2.0 m - 001 year storm



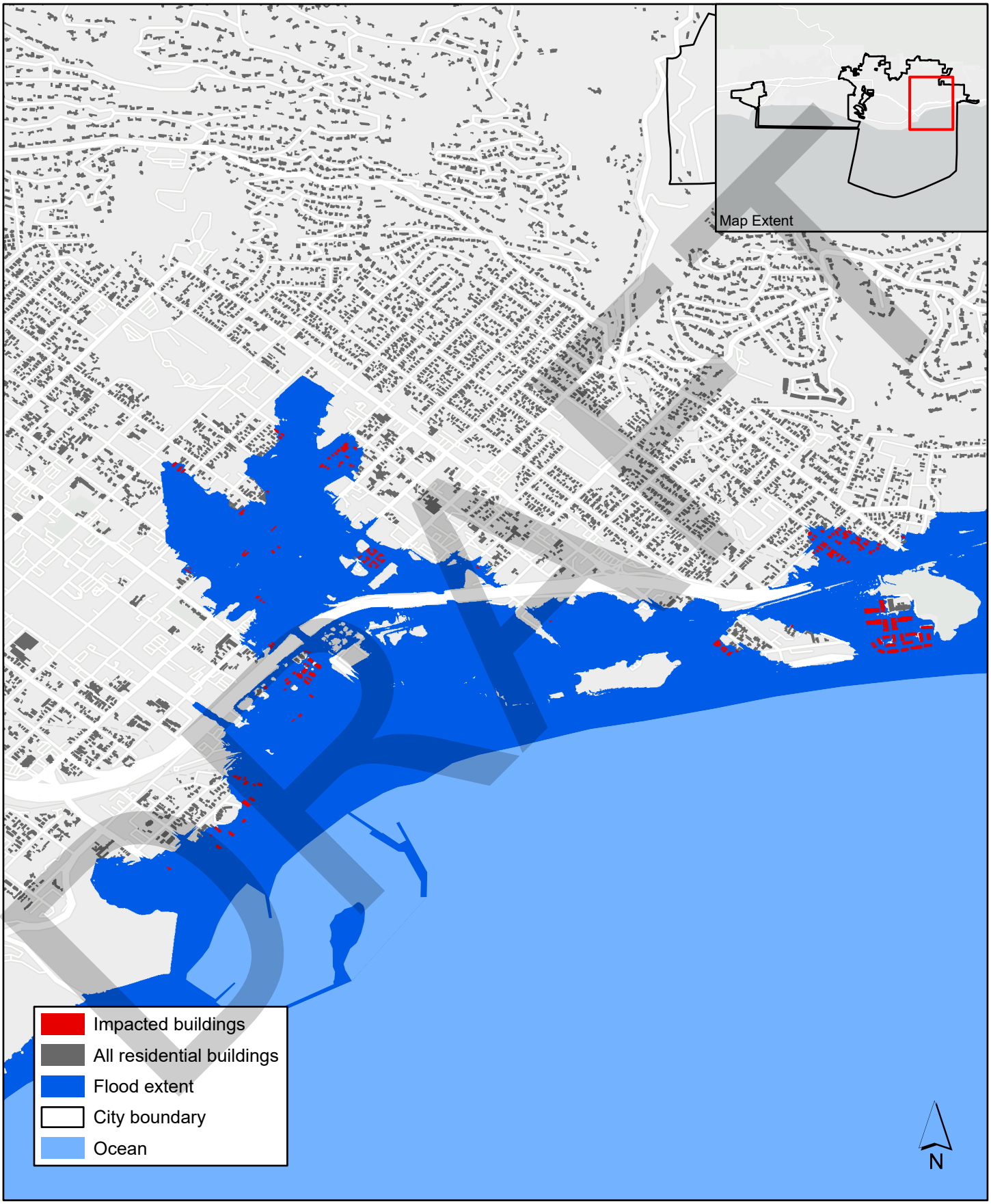
Santa Barbara Area 1

Sea Level Rise 2.0 m - 020 year storm



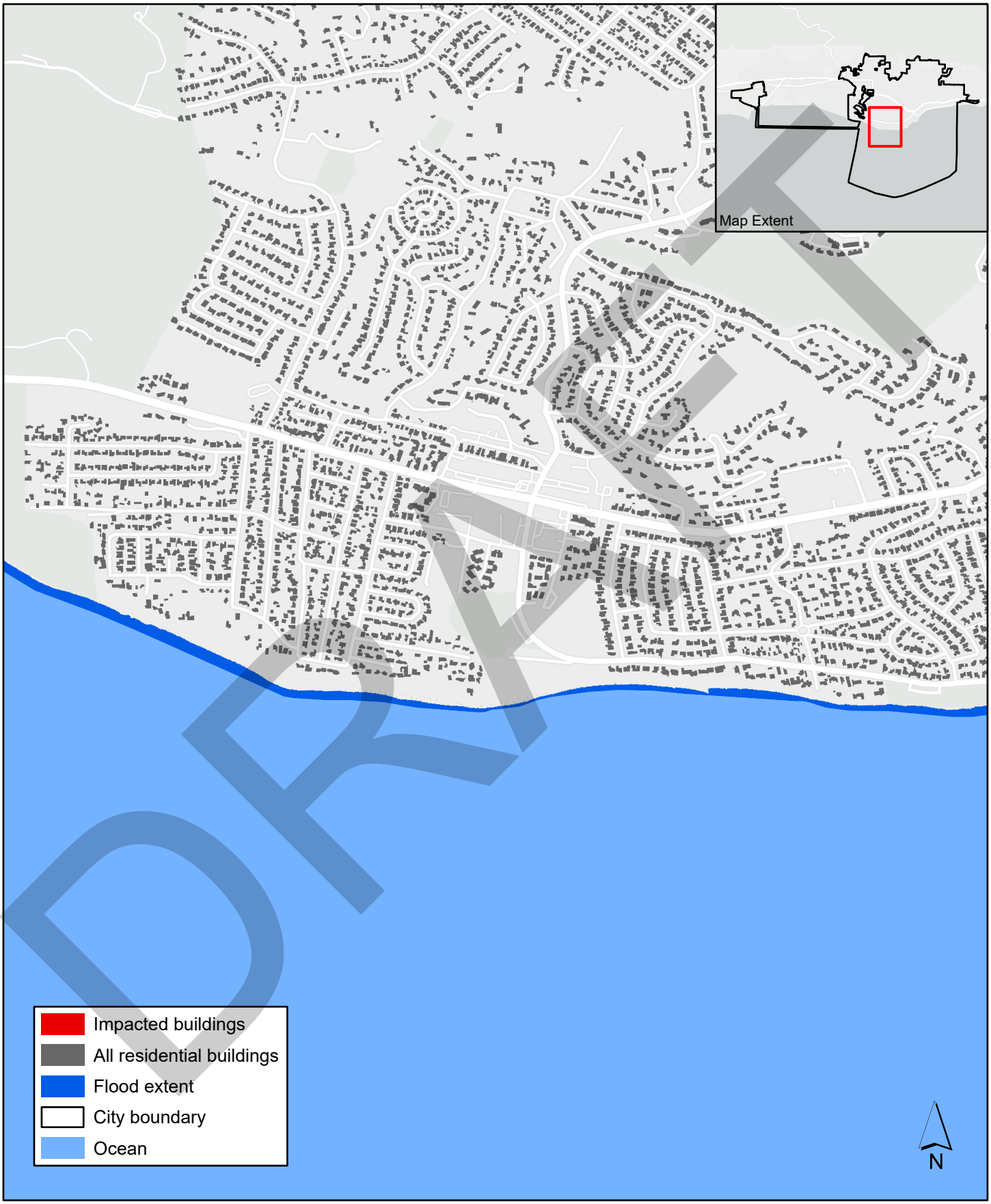
Santa Barbara Area 1

Sea Level Rise 2.0 m - 100 year storm



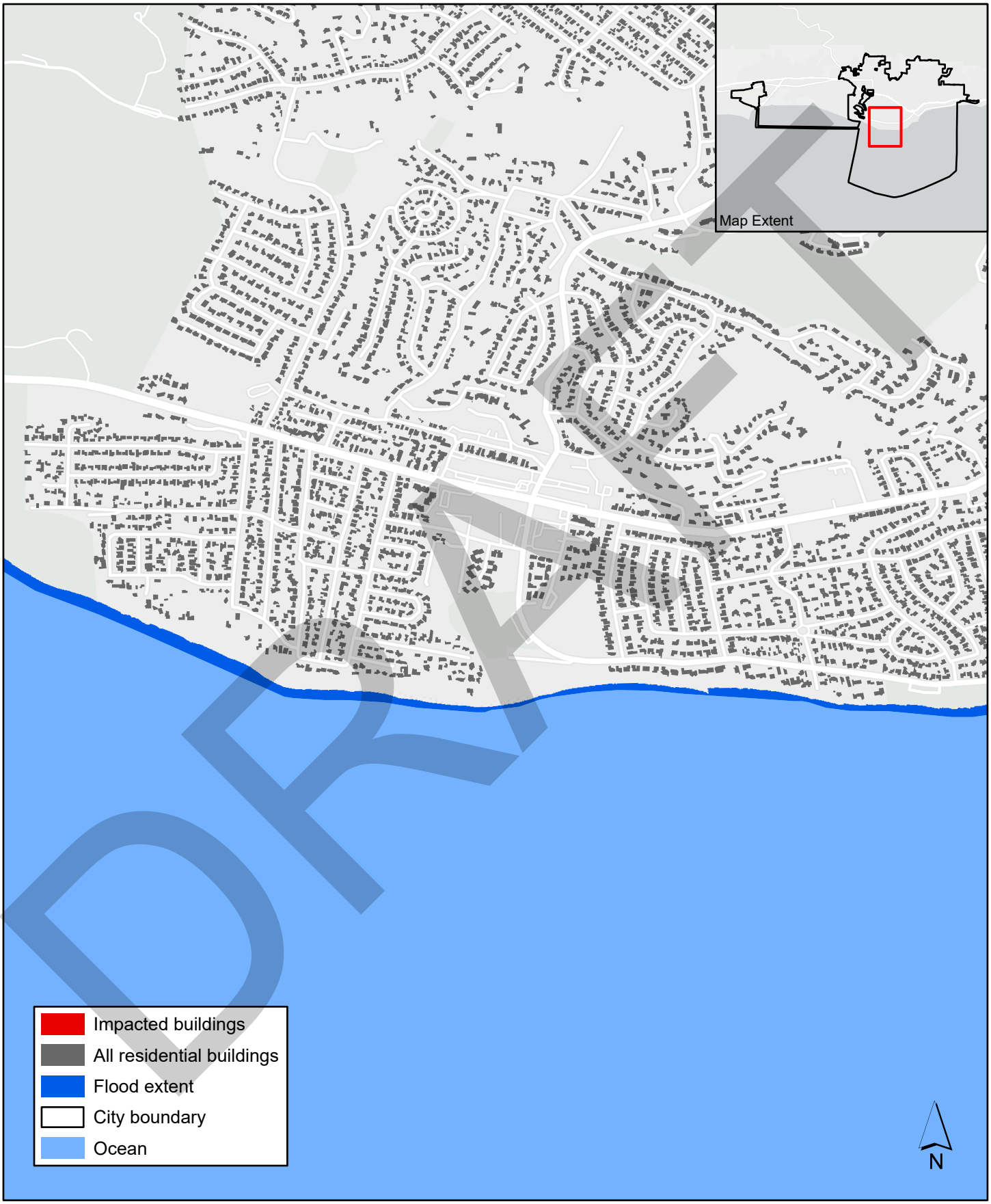
Santa Barbara Area 2

Sea Level Rise 0.0 m - No storm



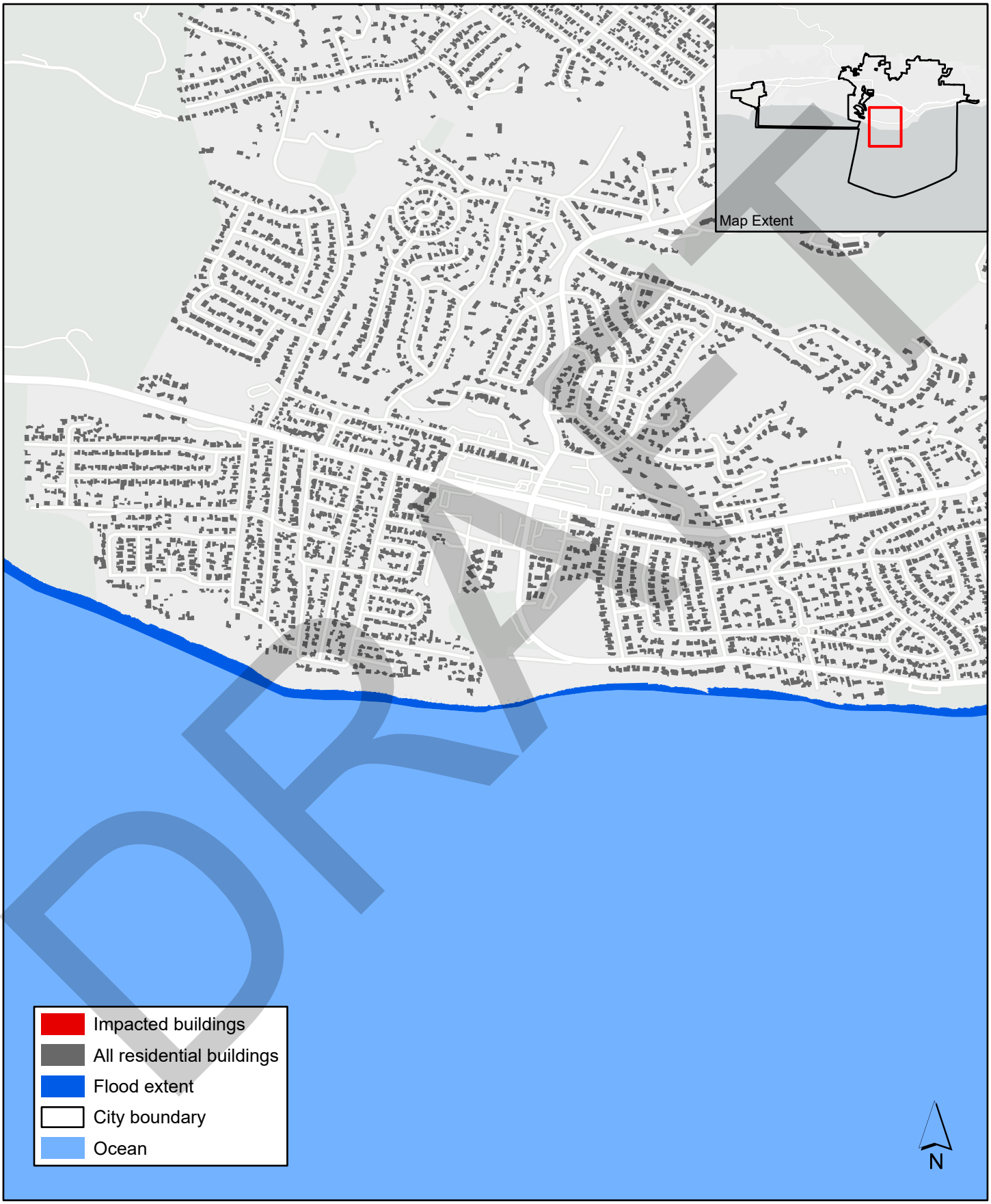
Santa Barbara Area 2

Sea Level Rise 0.0 m - 001 year storm



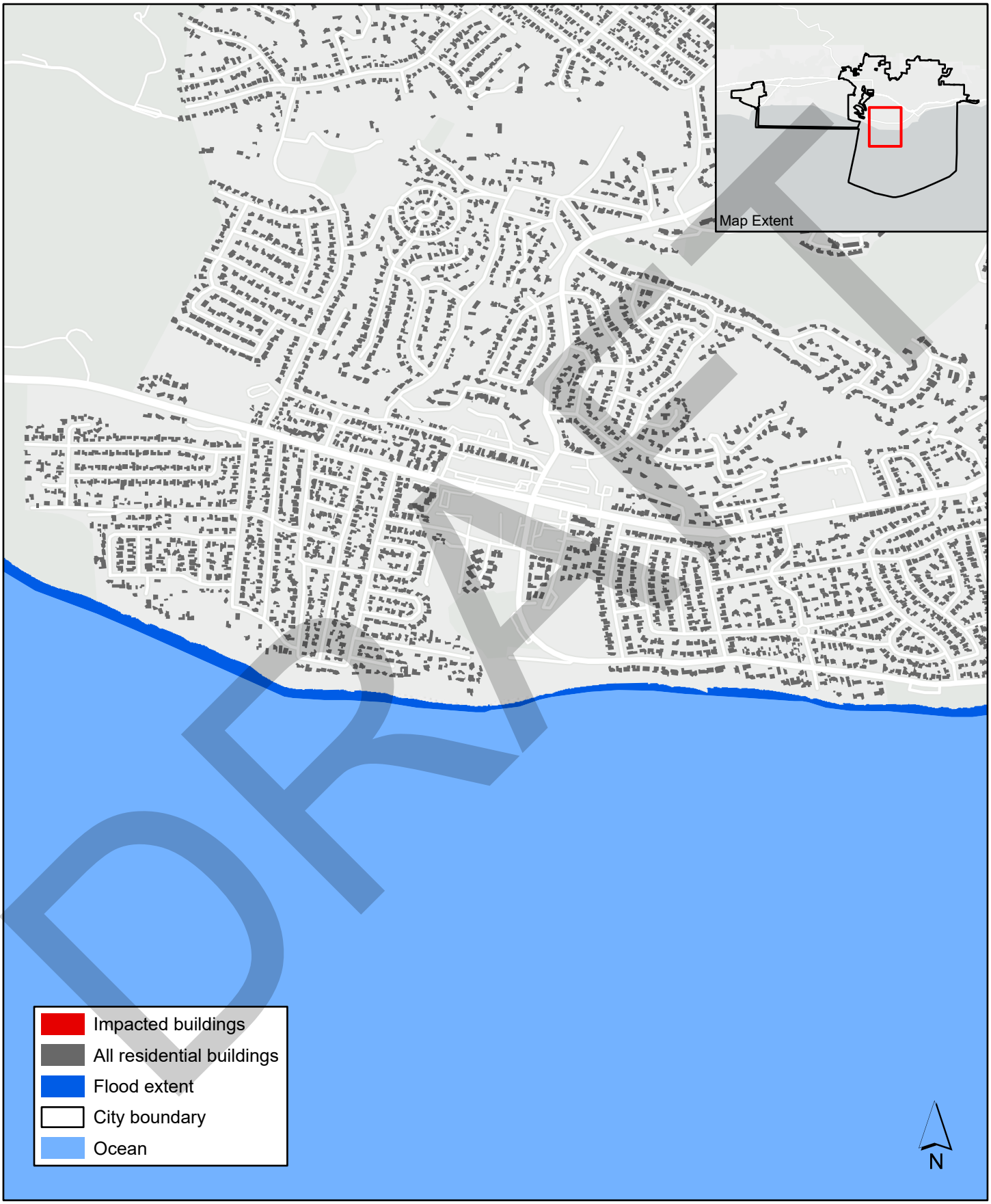
Santa Barbara Area 2

Sea Level Rise 0.0 m - 020 year storm



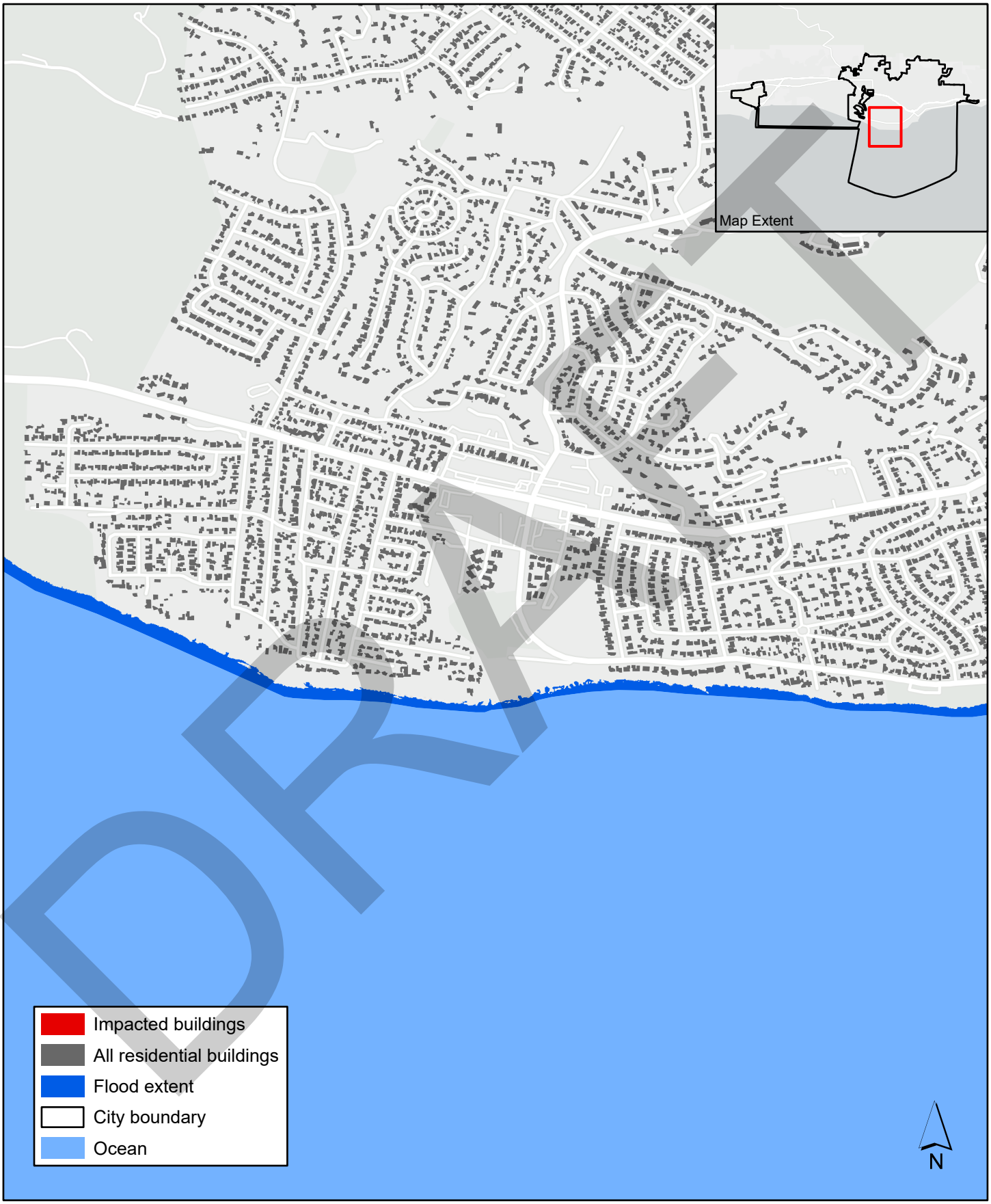
Santa Barbara Area 2

Sea Level Rise 0.0 m - 100 year storm



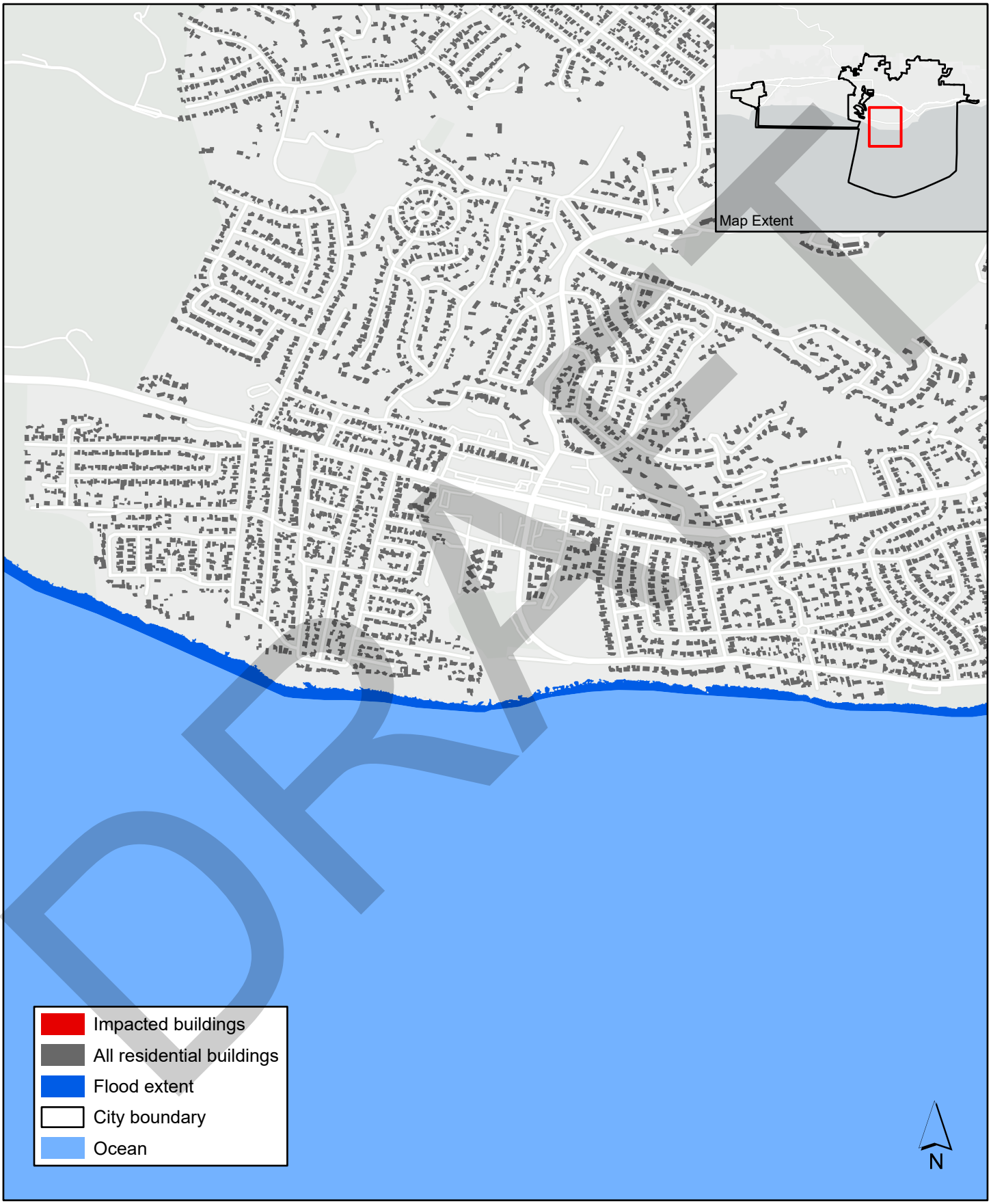
Santa Barbara Area 2

Sea Level Rise 0.25 m - No storm



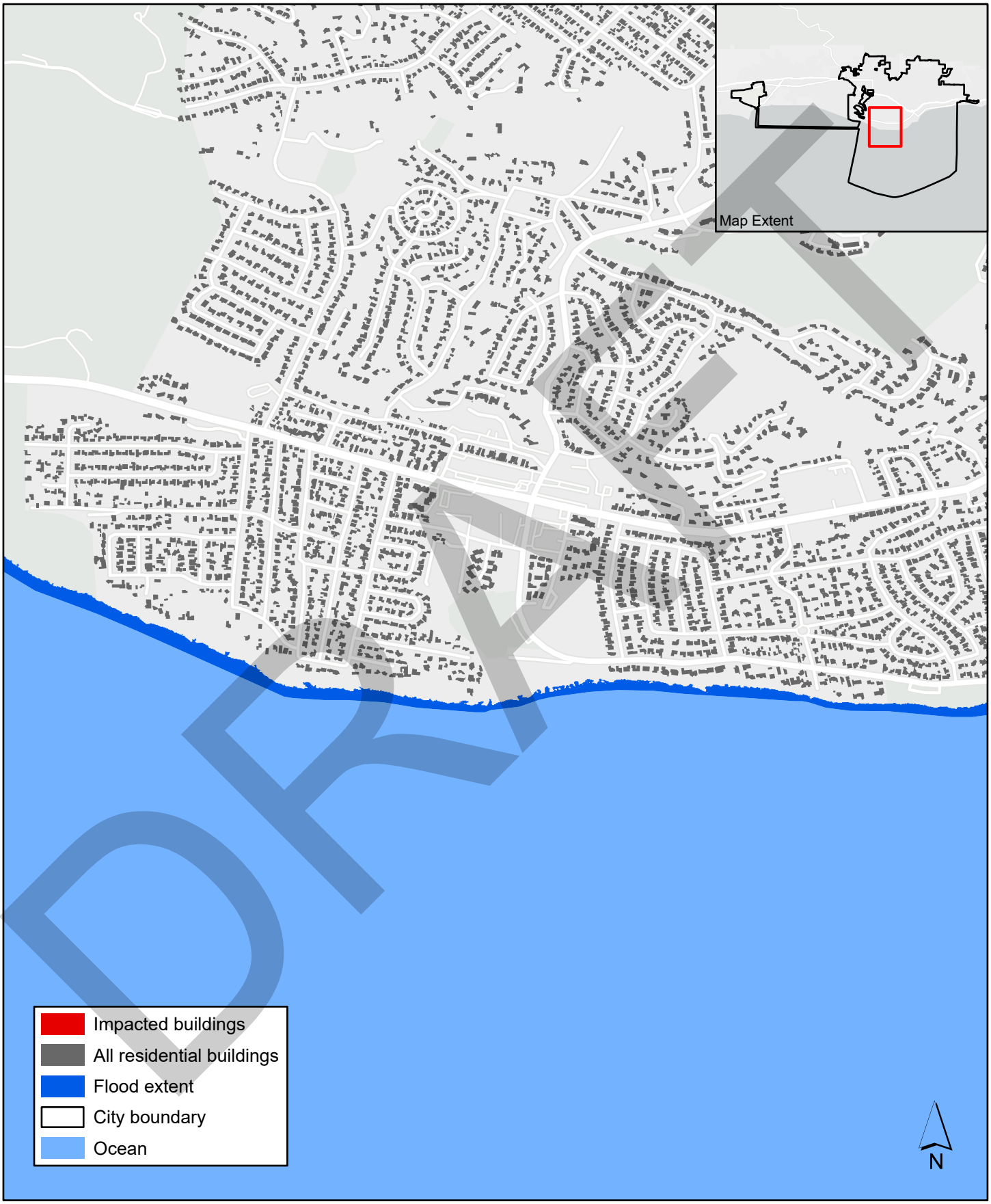
Santa Barbara Area 2

Sea Level Rise 0.25 m - 001 year storm



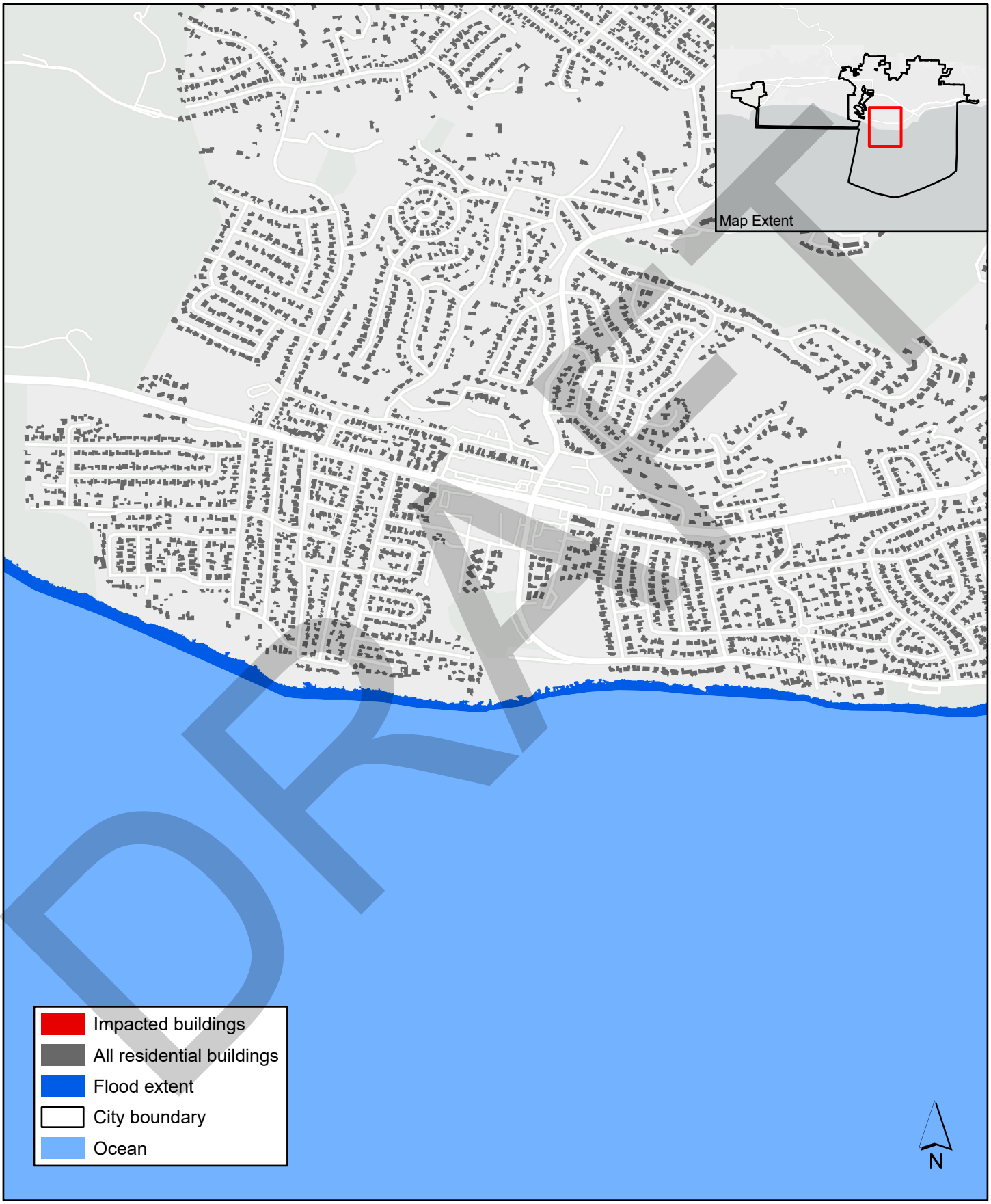
Santa Barbara Area 2

Sea Level Rise 0.25 m - 020 year storm



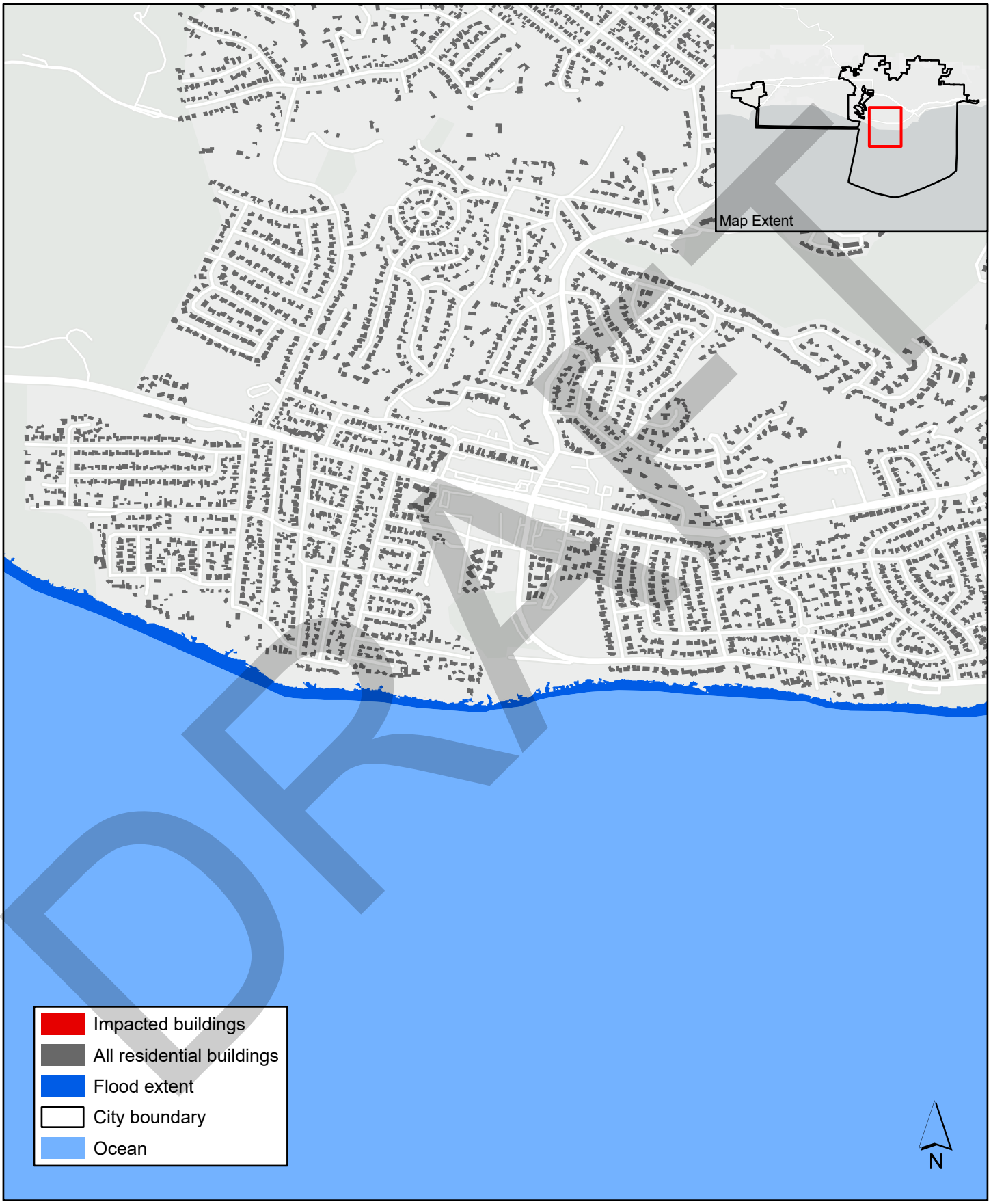
Santa Barbara Area 2

Sea Level Rise 0.25 m - 100 year storm



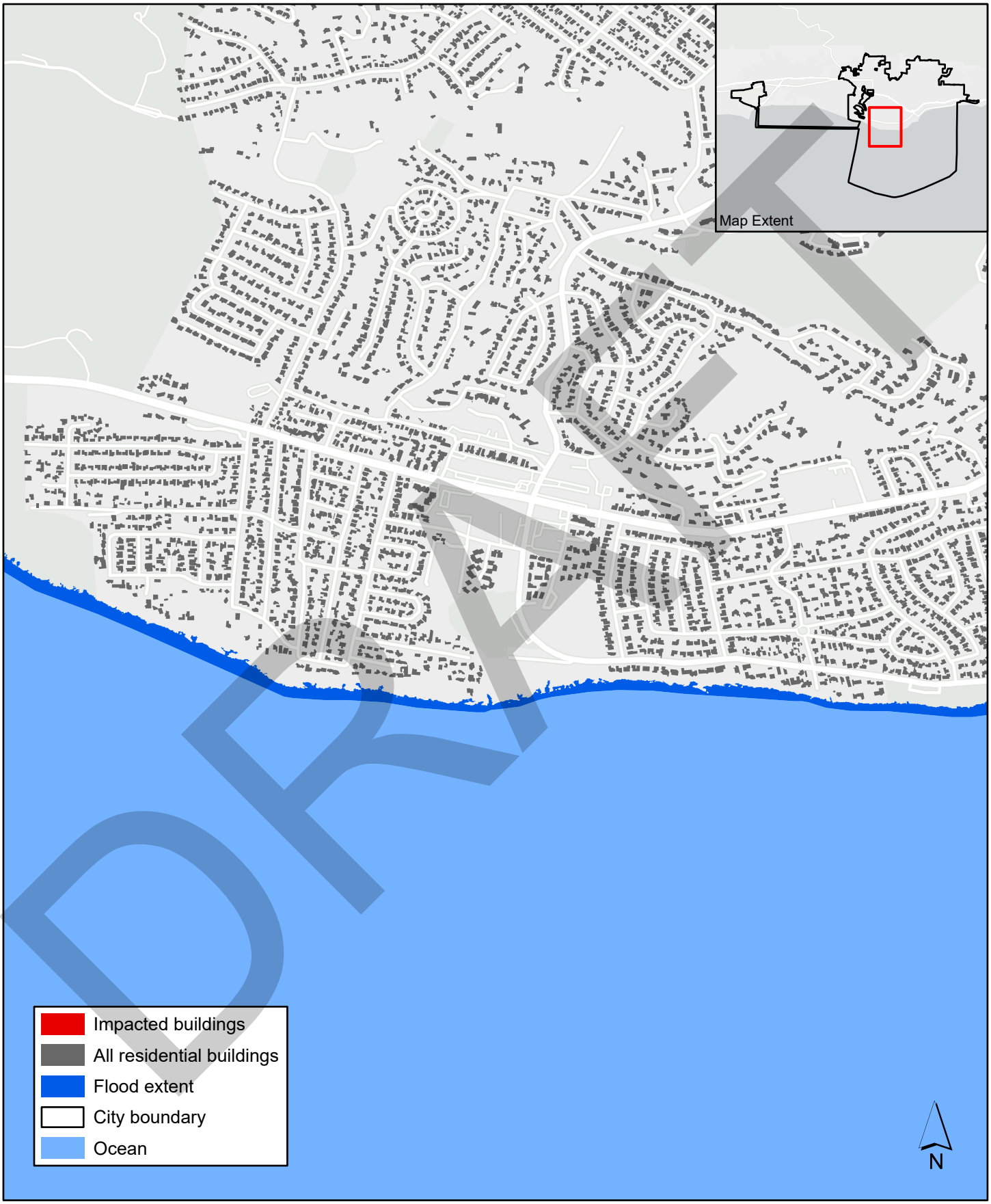
Santa Barbara Area 2

Sea Level Rise 0.5 m - No storm



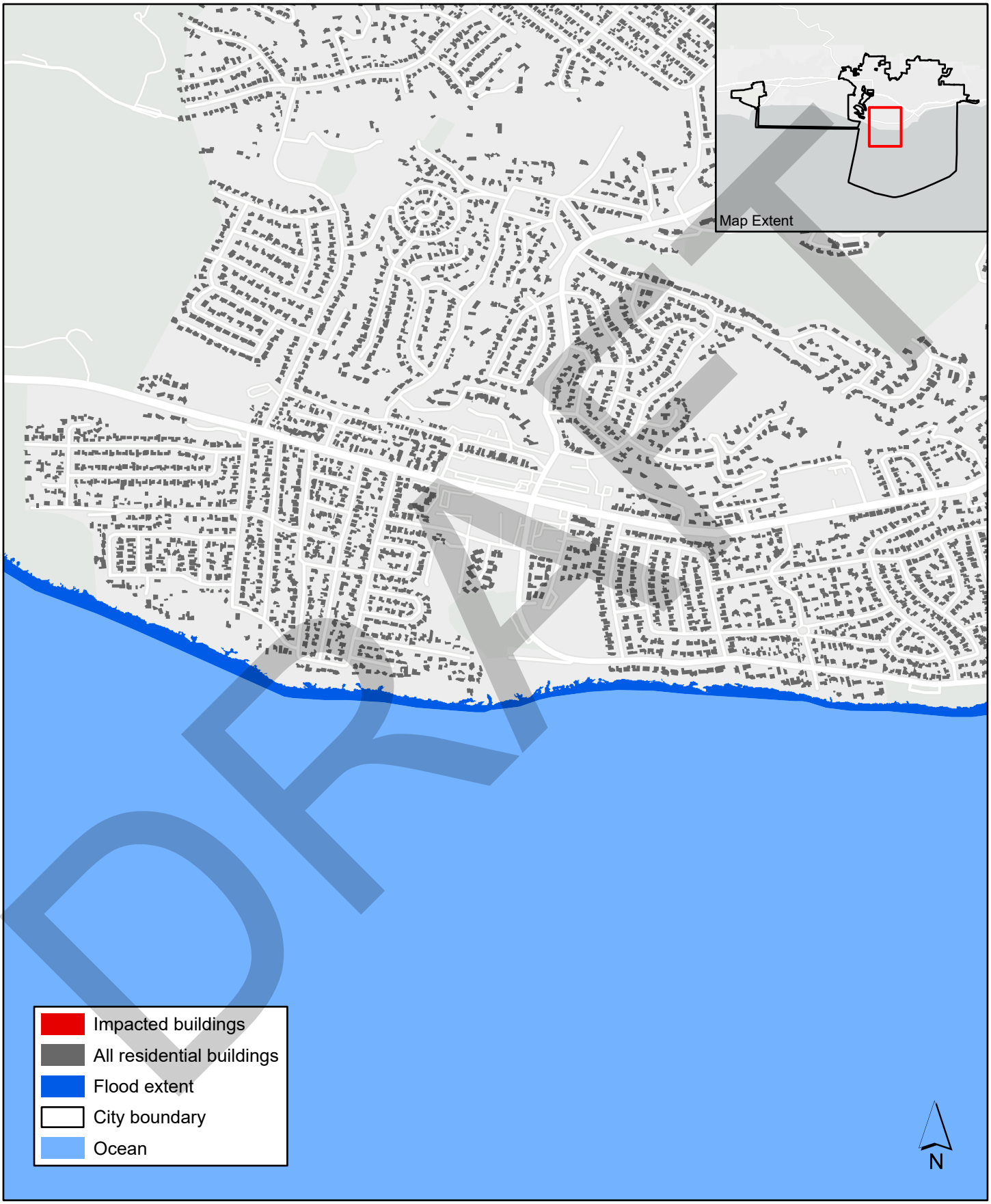
Santa Barbara Area 2

Sea Level Rise 0.5 m - 001 year storm



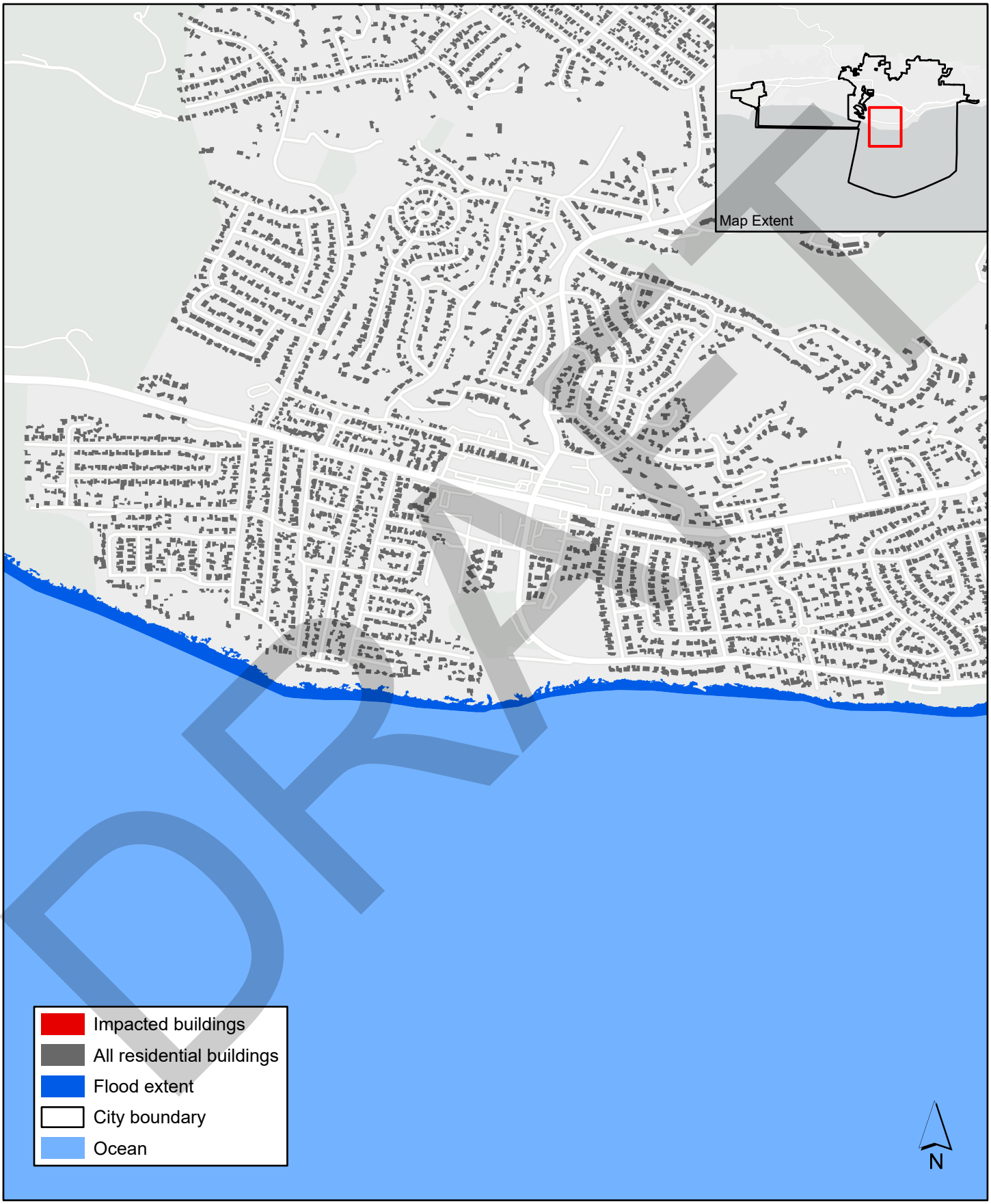
Santa Barbara Area 2

Sea Level Rise 0.5 m - 020 year storm



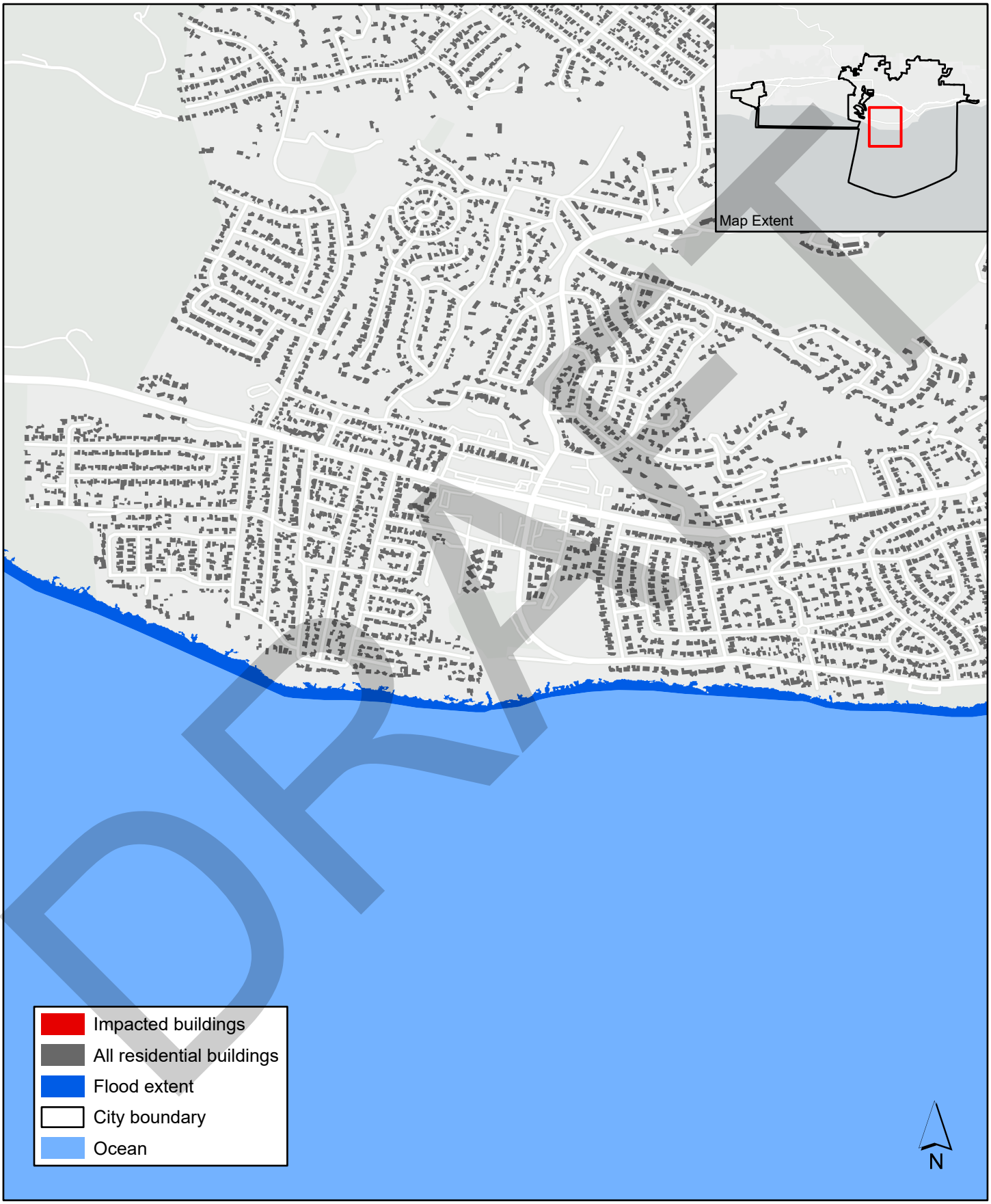
Santa Barbara Area 2

Sea Level Rise 0.5 m - 100 year storm



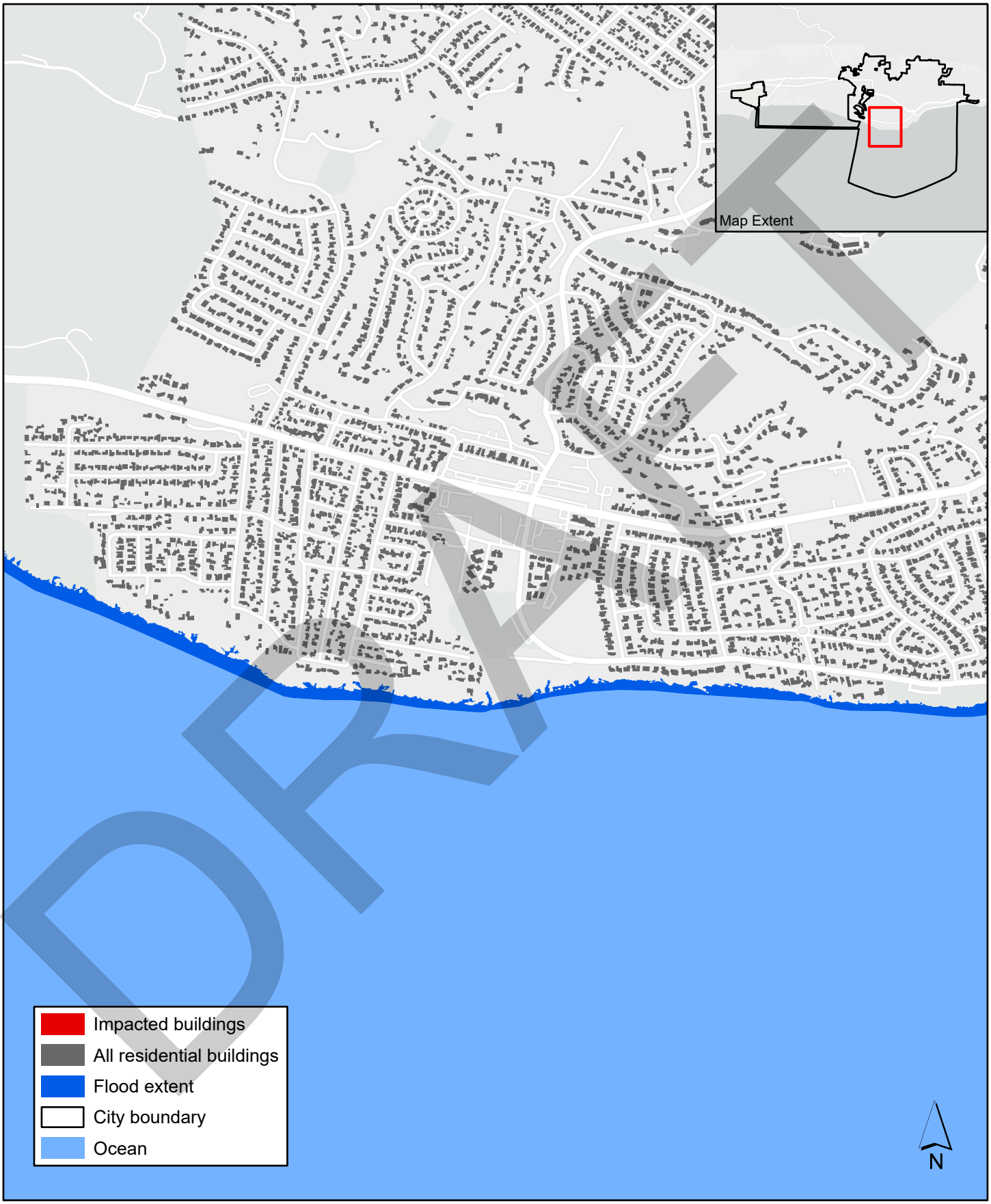
Santa Barbara Area 2

Sea Level Rise 0.75 m - No storm



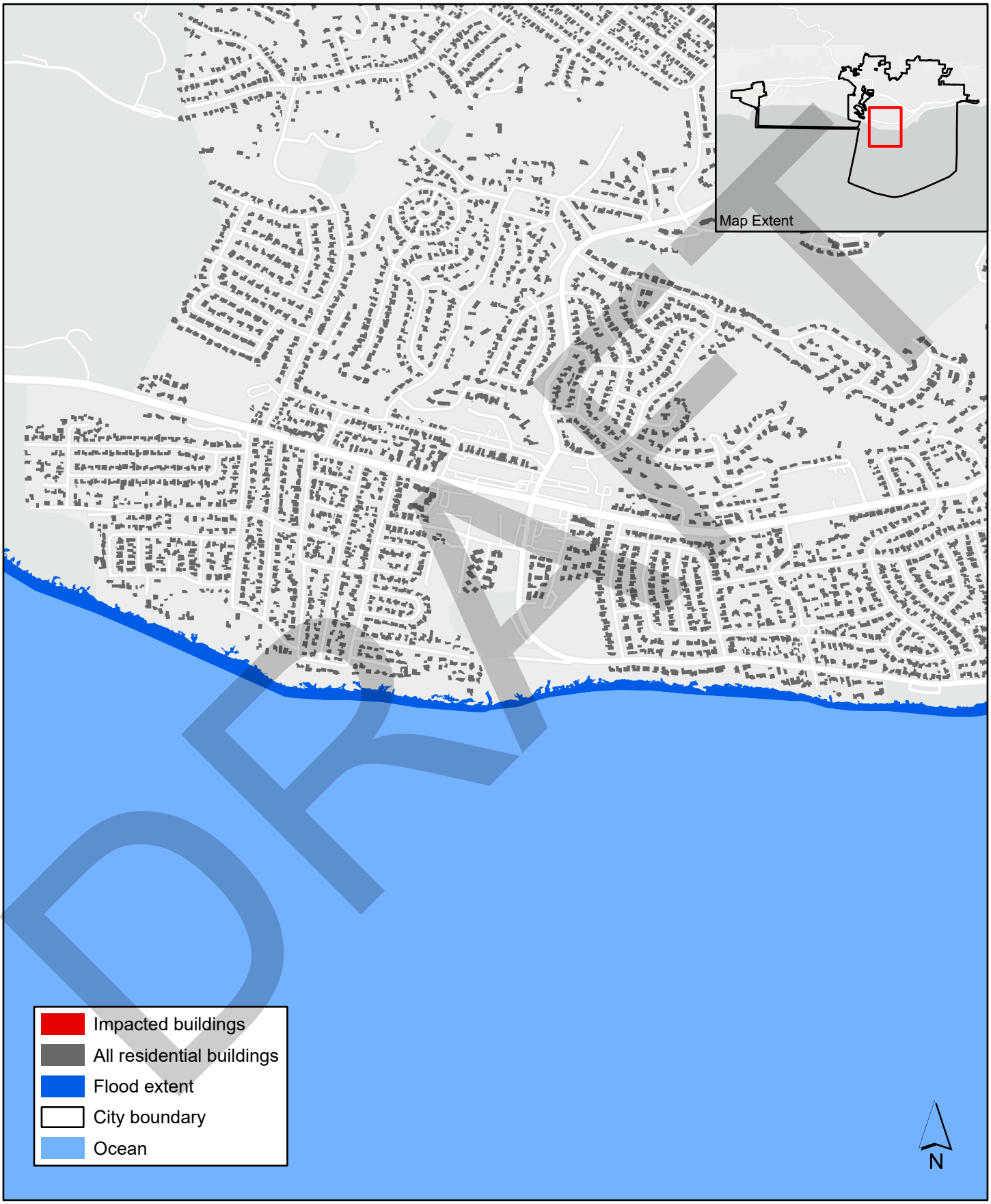
Santa Barbara Area 2

Sea Level Rise 0.75 m - 001 year storm



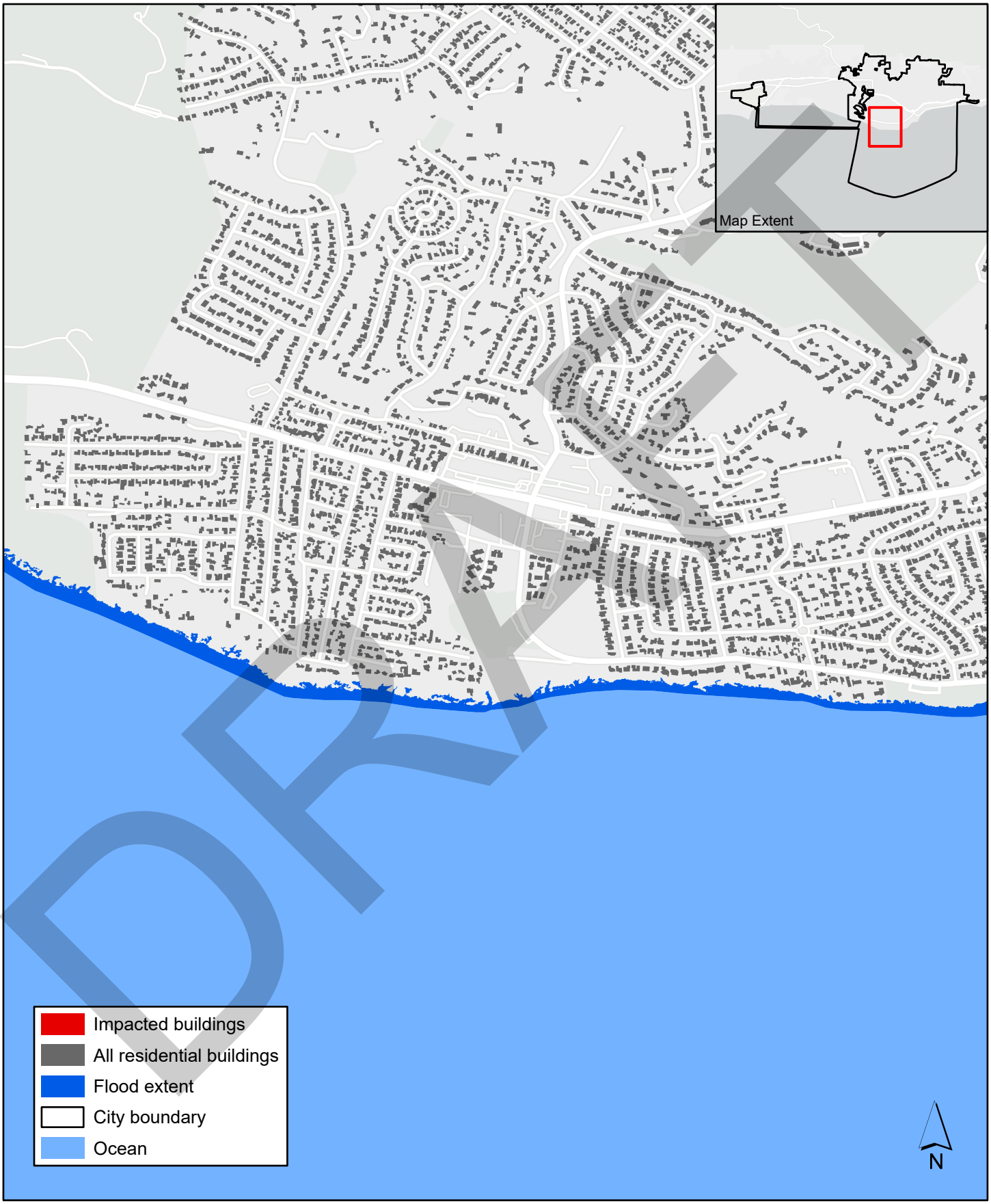
Santa Barbara Area 2

Sea Level Rise 0.75 m - 020 year storm



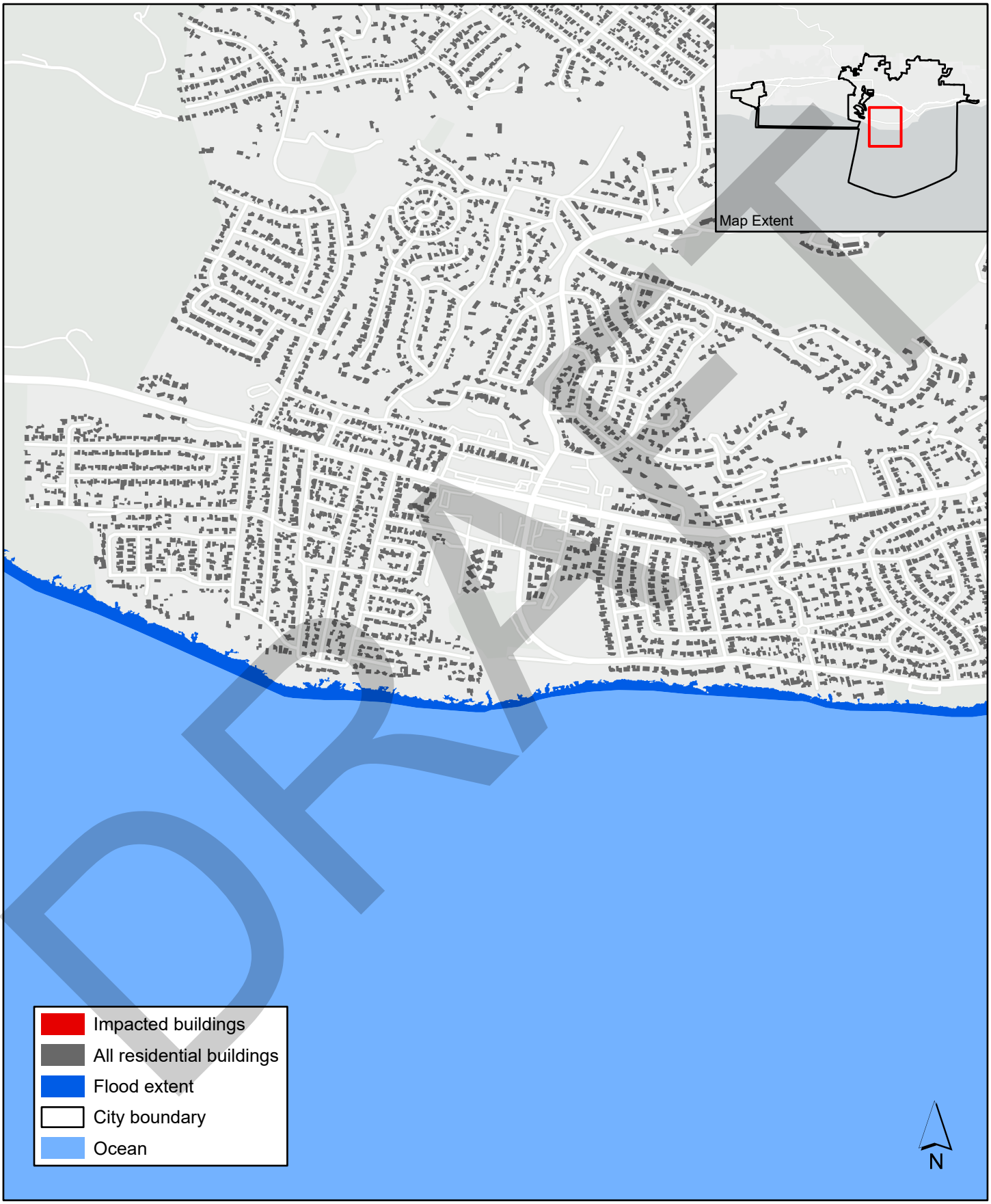
Santa Barbara Area 2

Sea Level Rise 0.75 m - 100 year storm



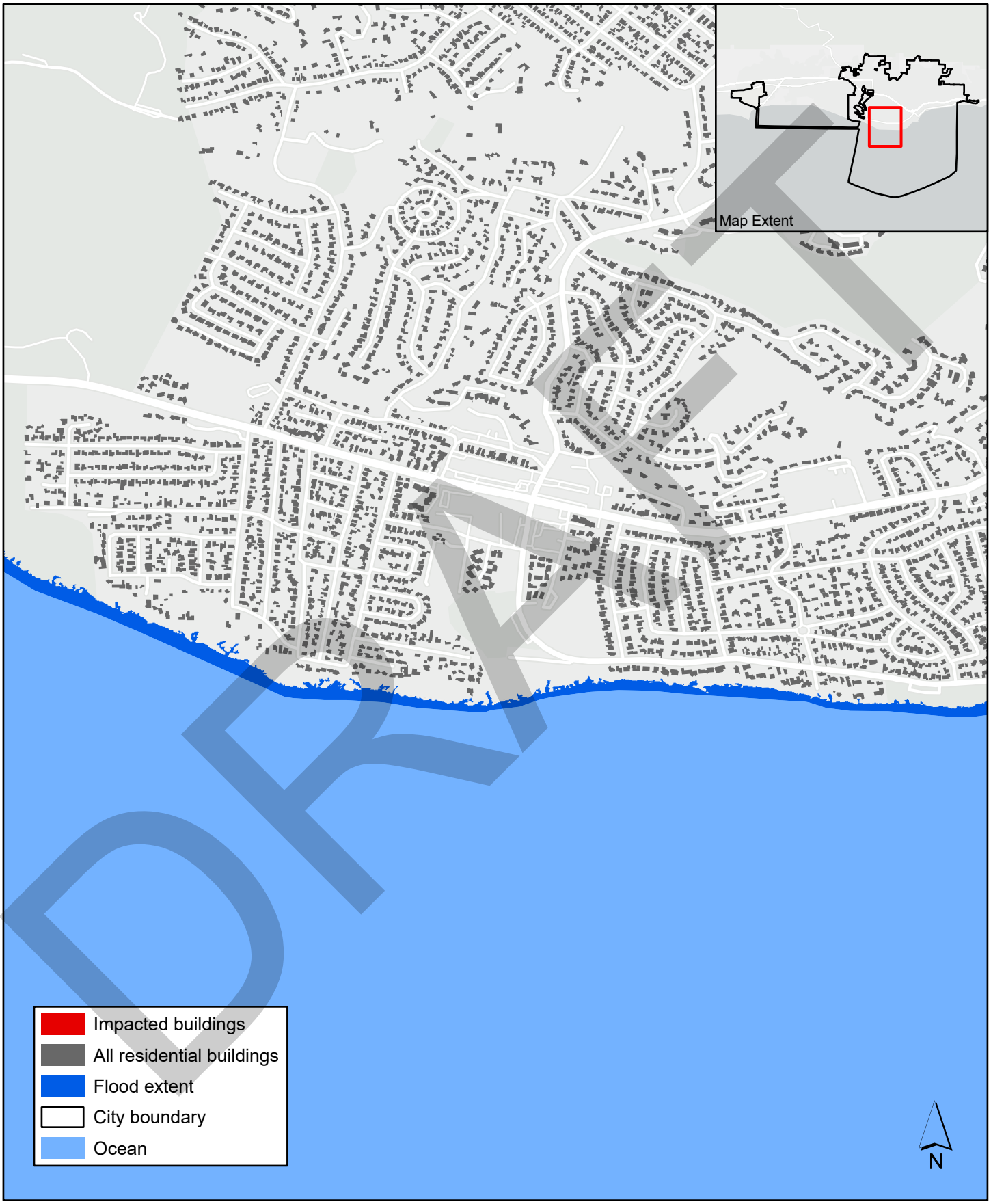
Santa Barbara Area 2

Sea Level Rise 1.0 m - No storm



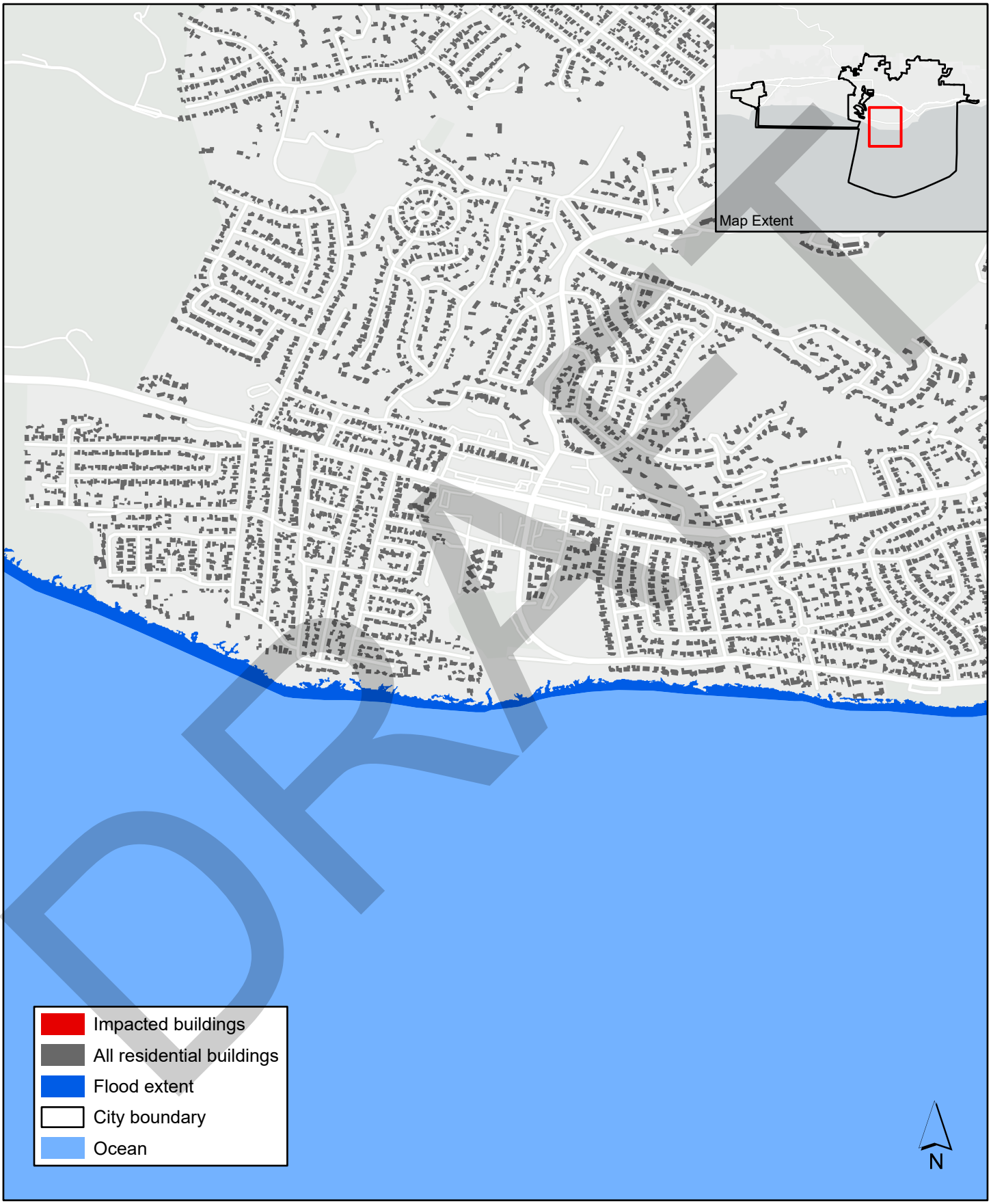
Santa Barbara Area 2

Sea Level Rise 1.0 m - 001 year storm



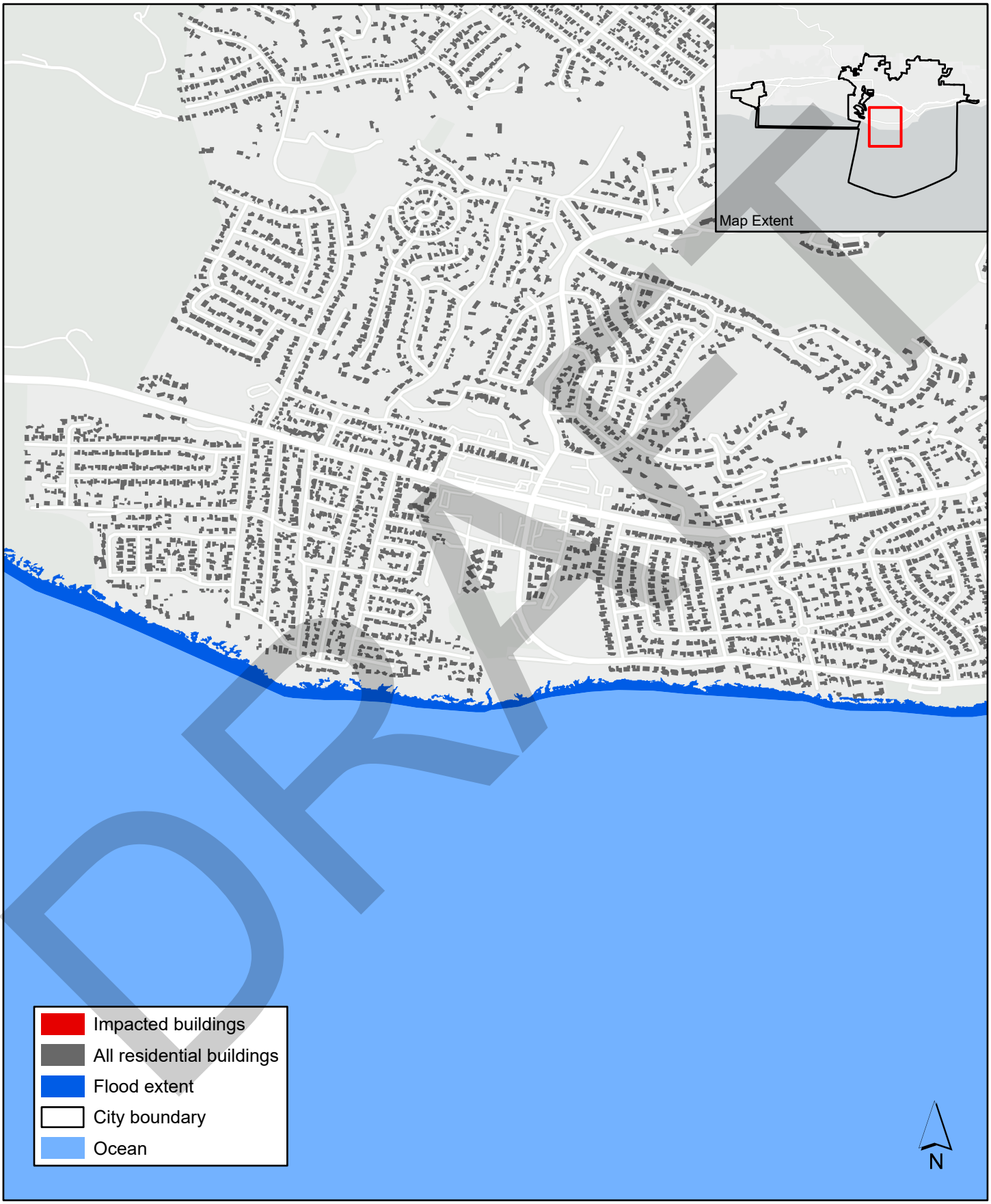
Santa Barbara Area 2

Sea Level Rise 1.0 m - 020 year storm



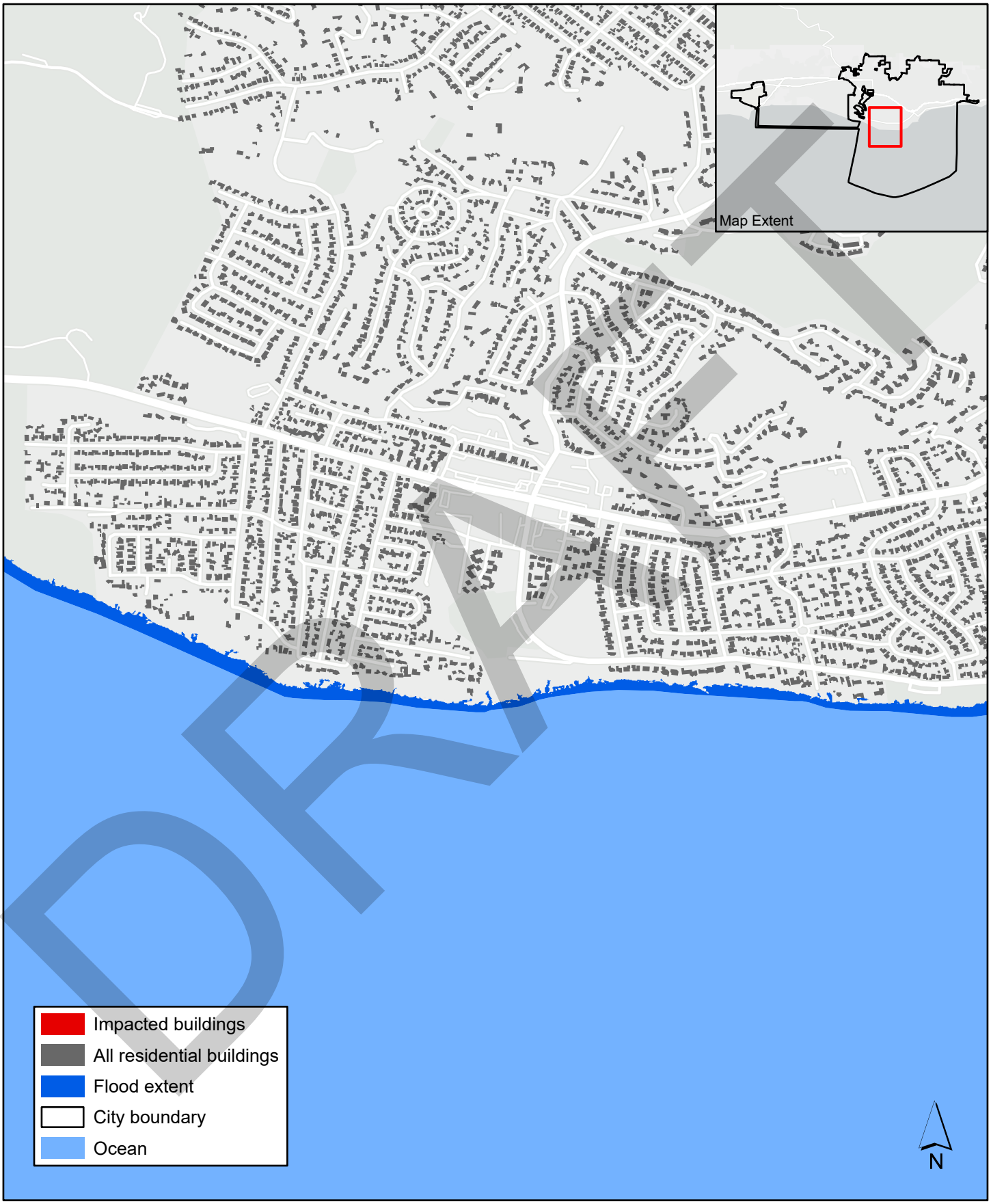
Santa Barbara Area 2

Sea Level Rise 1.0 m - 100 year storm



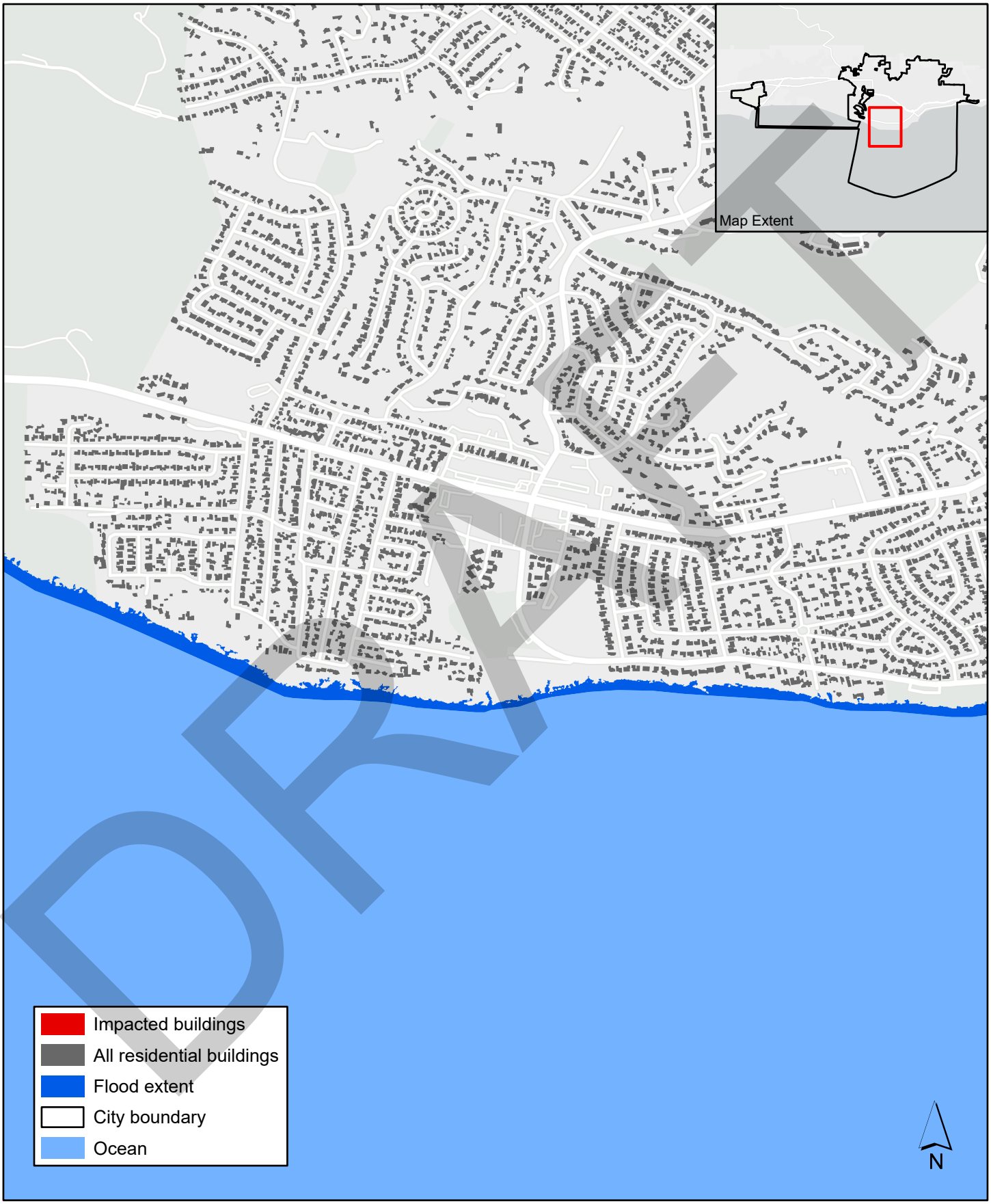
Santa Barbara Area 2

Sea Level Rise 1.5 m - No storm



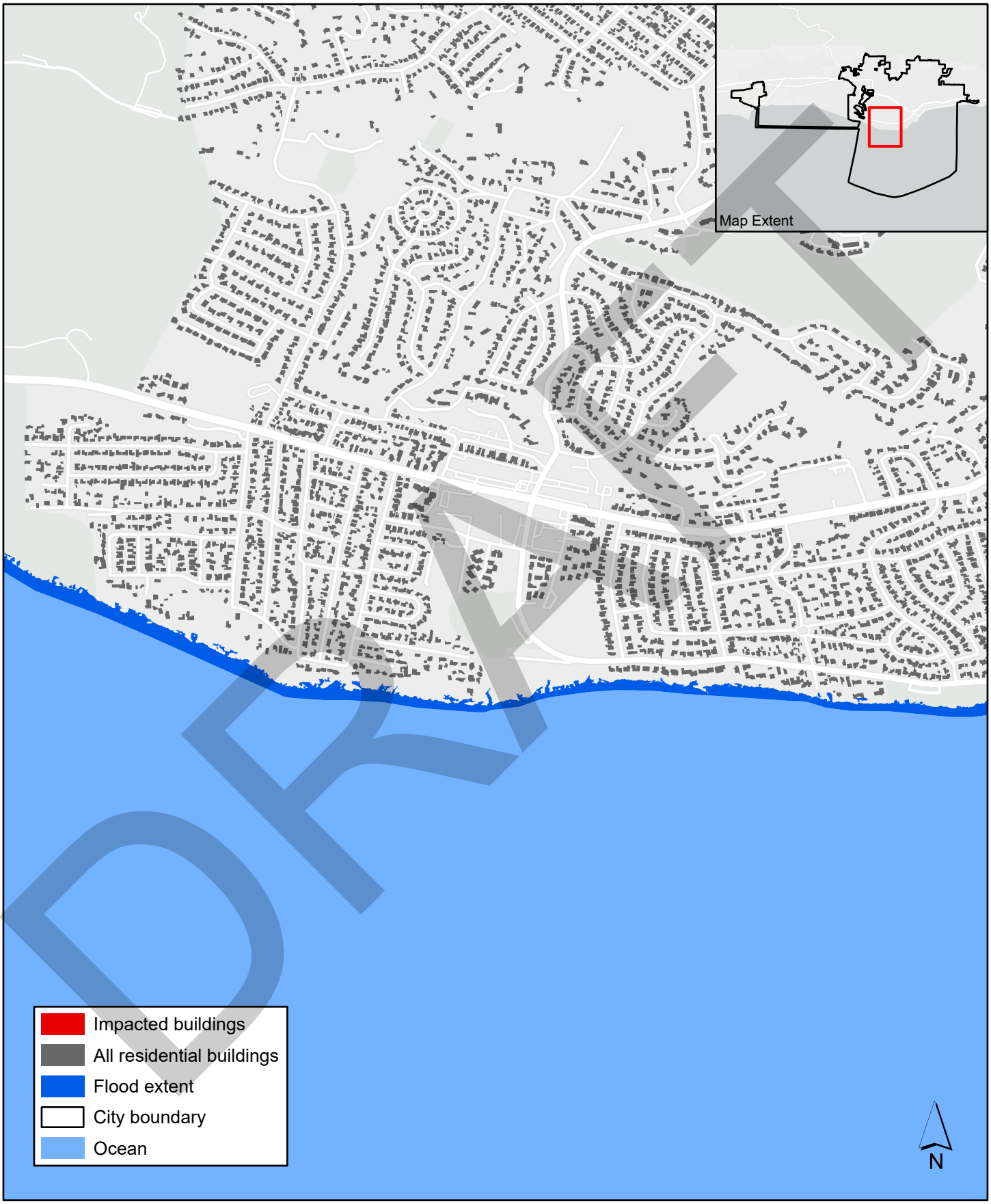
Santa Barbara Area 2

Sea Level Rise 1.5 m - 001 year storm



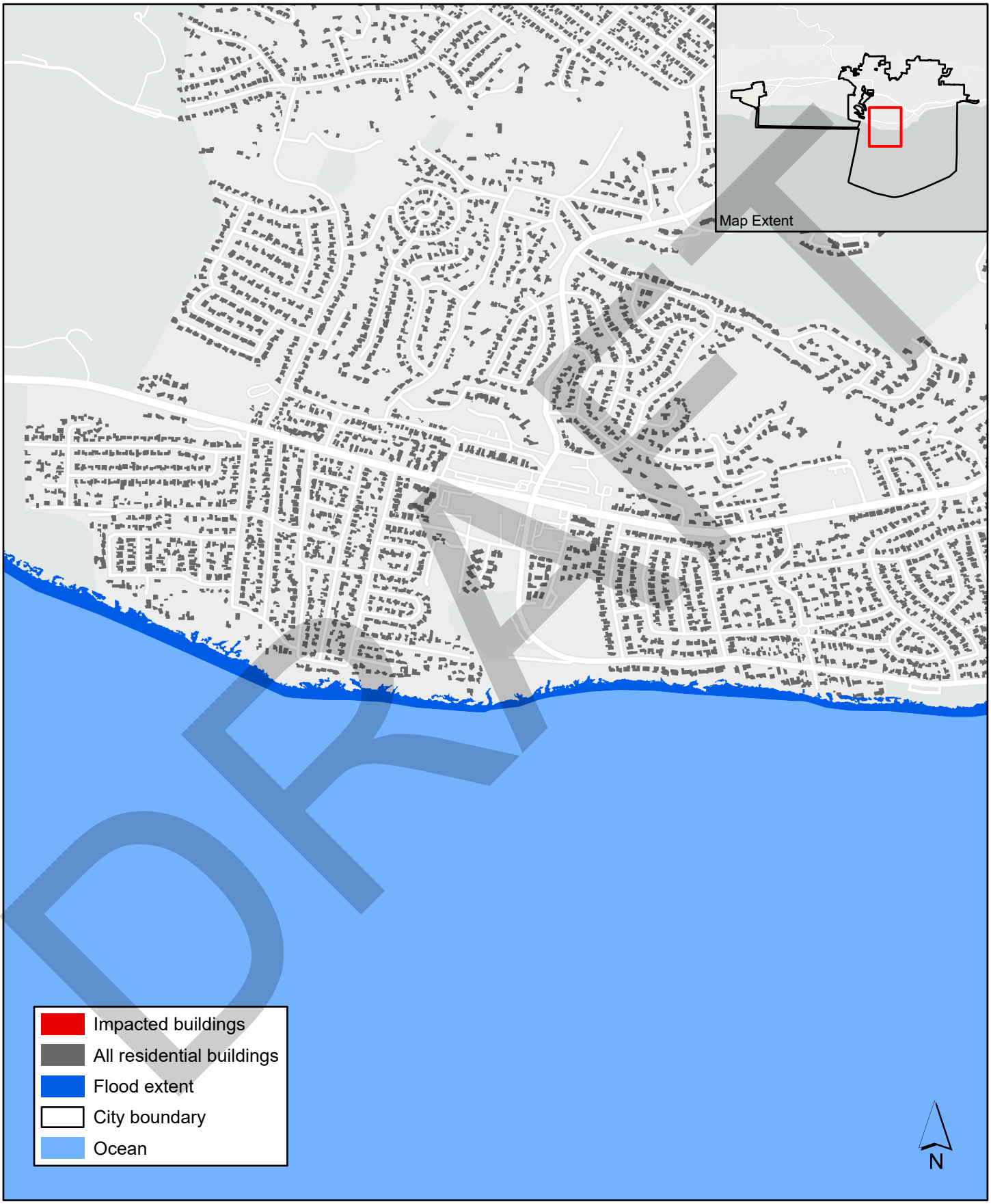
Santa Barbara Area 2

Sea Level Rise 1.5 m - 020 year storm



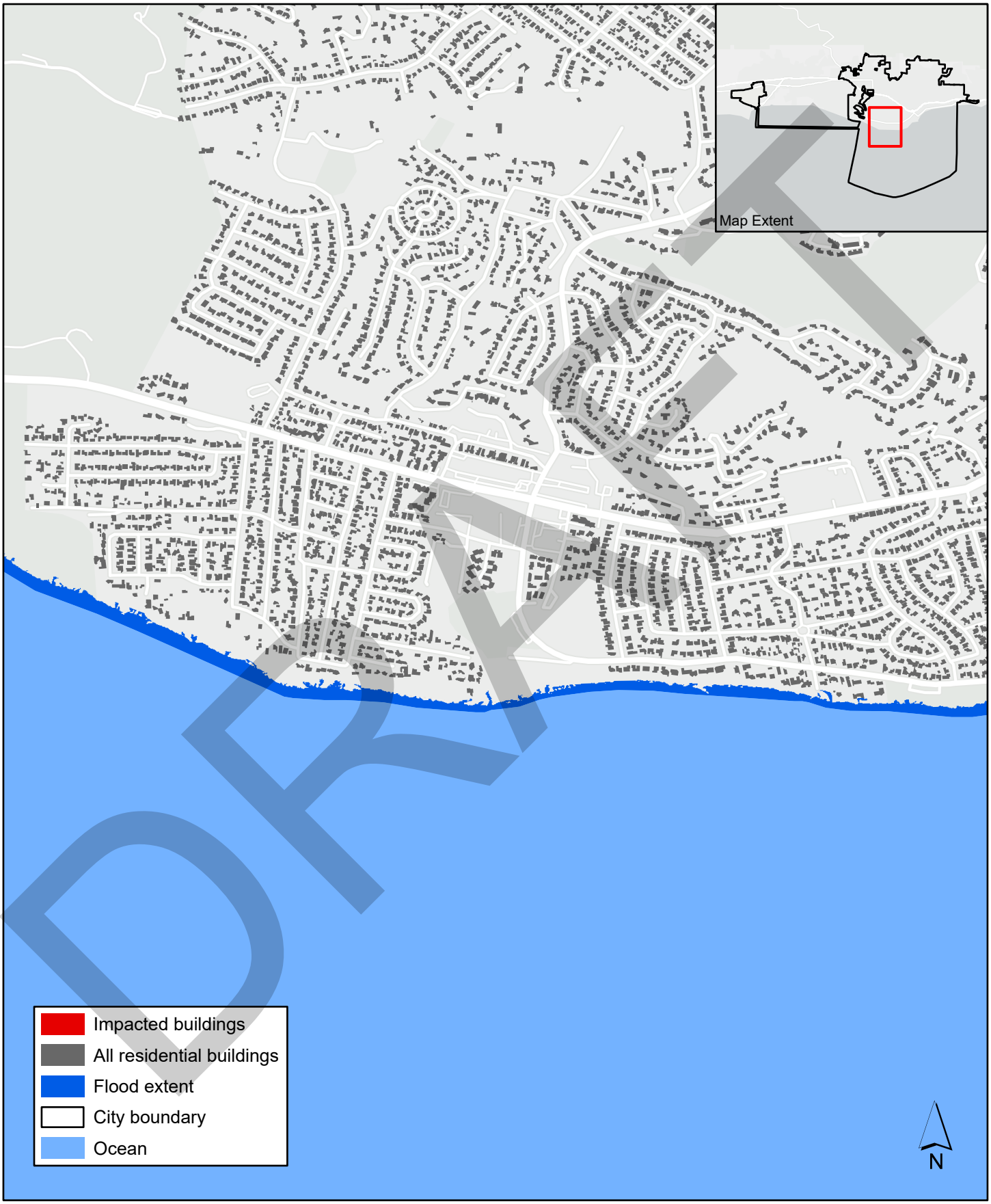
Santa Barbara Area 2

Sea Level Rise 1.5 m - 100 year storm



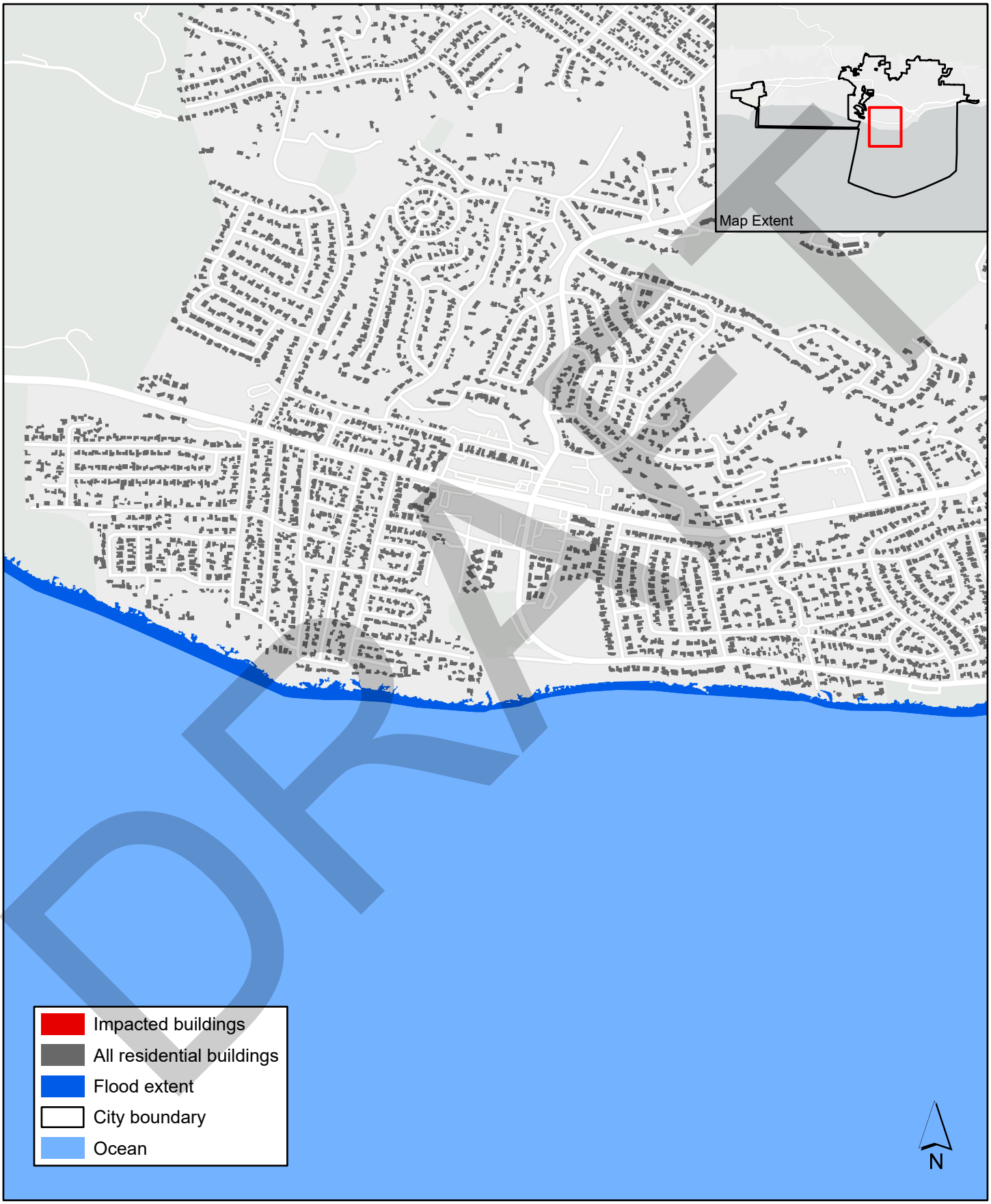
Santa Barbara Area 2

Sea Level Rise 2.0 m - No storm



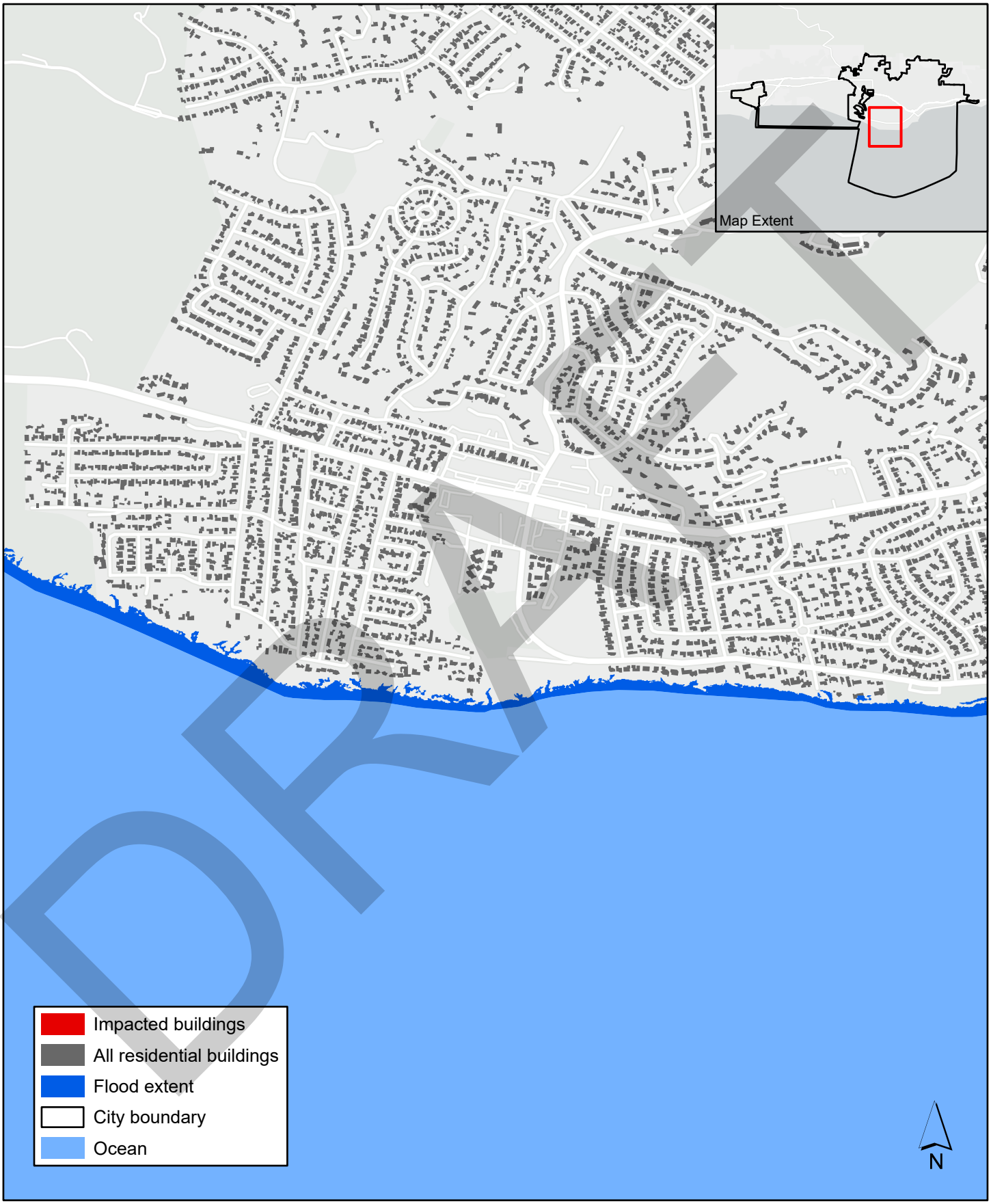
Santa Barbara Area 2

Sea Level Rise 2.0 m - 001 year storm



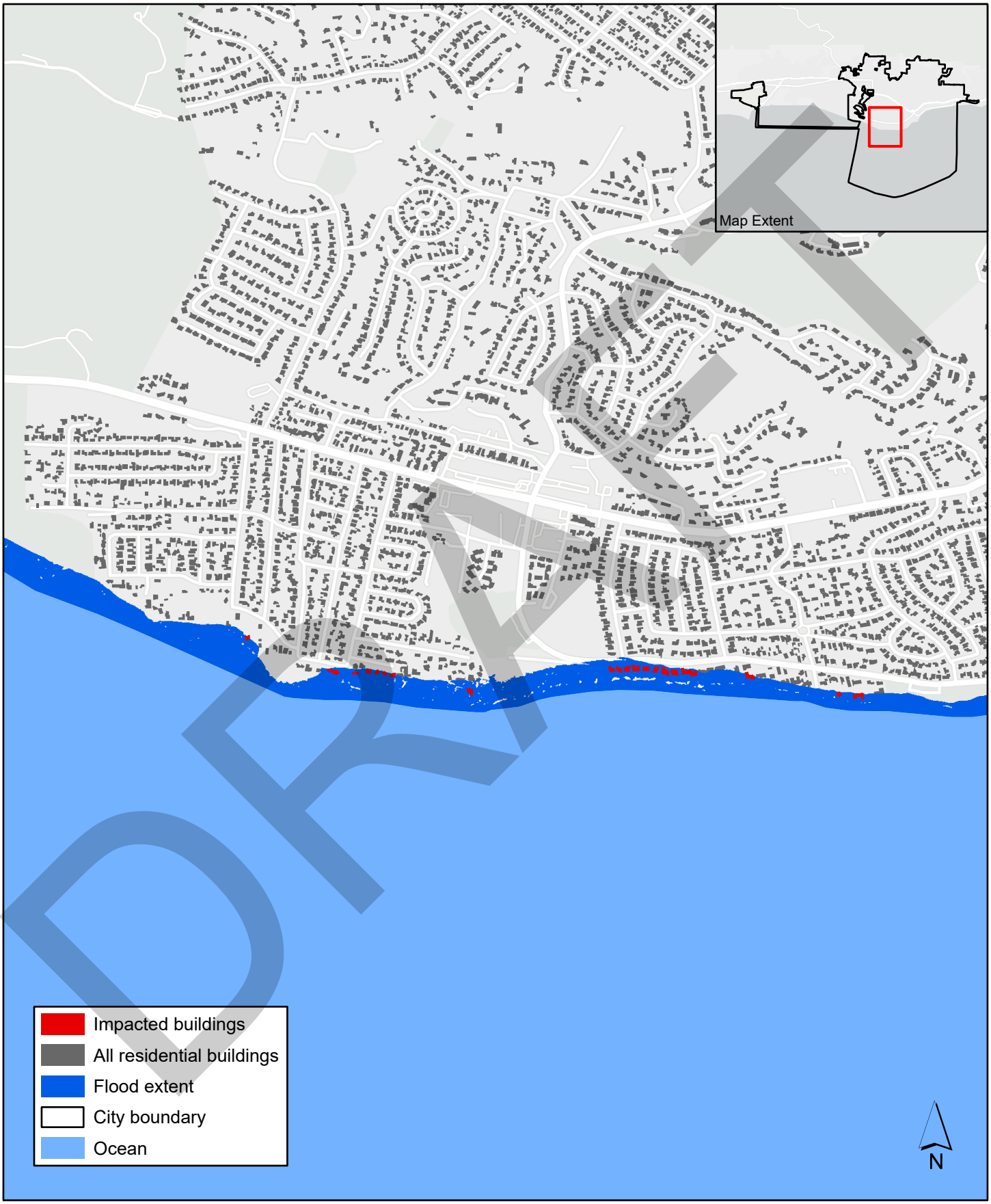
Santa Barbara Area 2

Sea Level Rise 2.0 m - 020 year storm



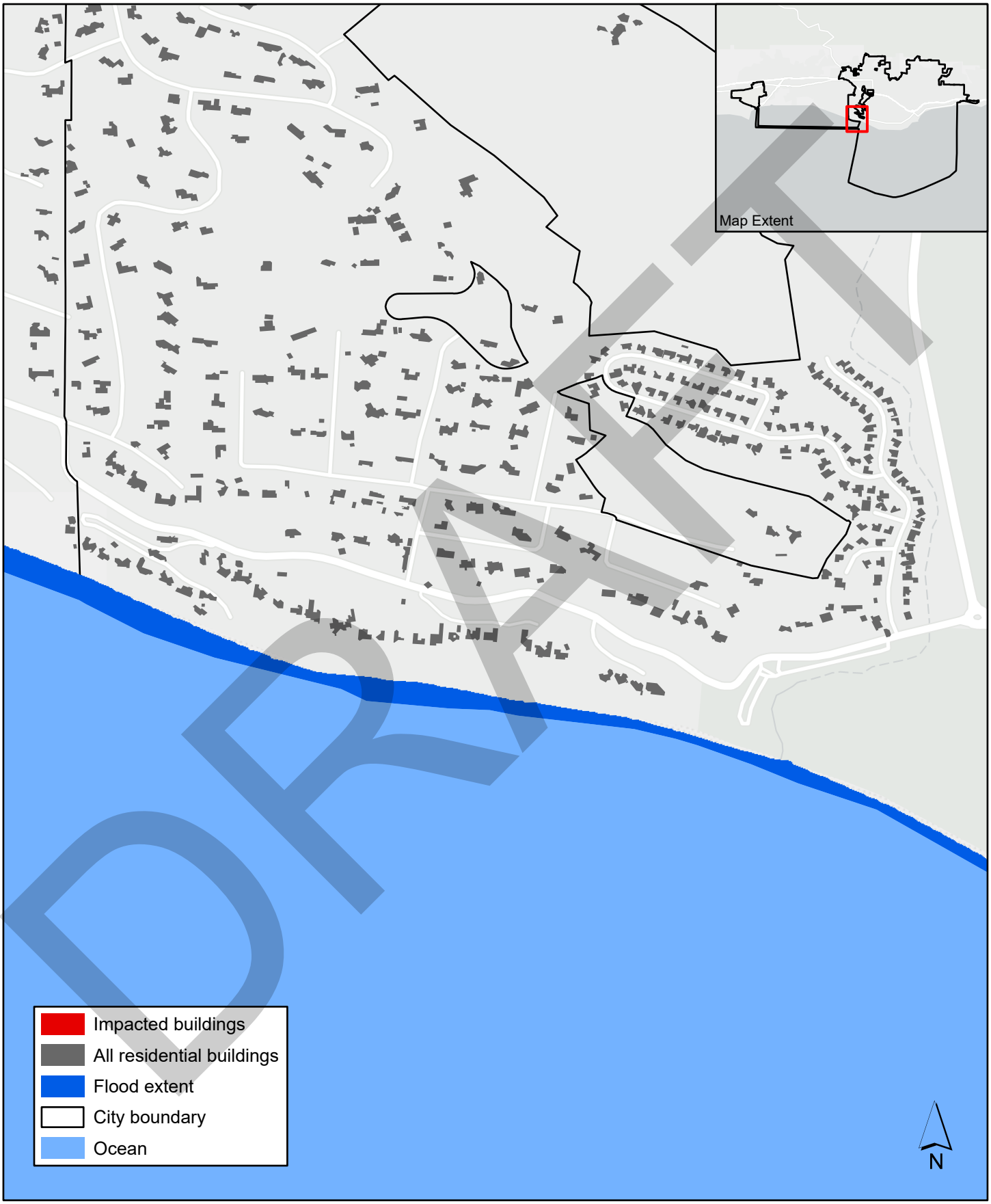
Santa Barbara Area 2

Sea Level Rise 2.0 m - 100 year storm



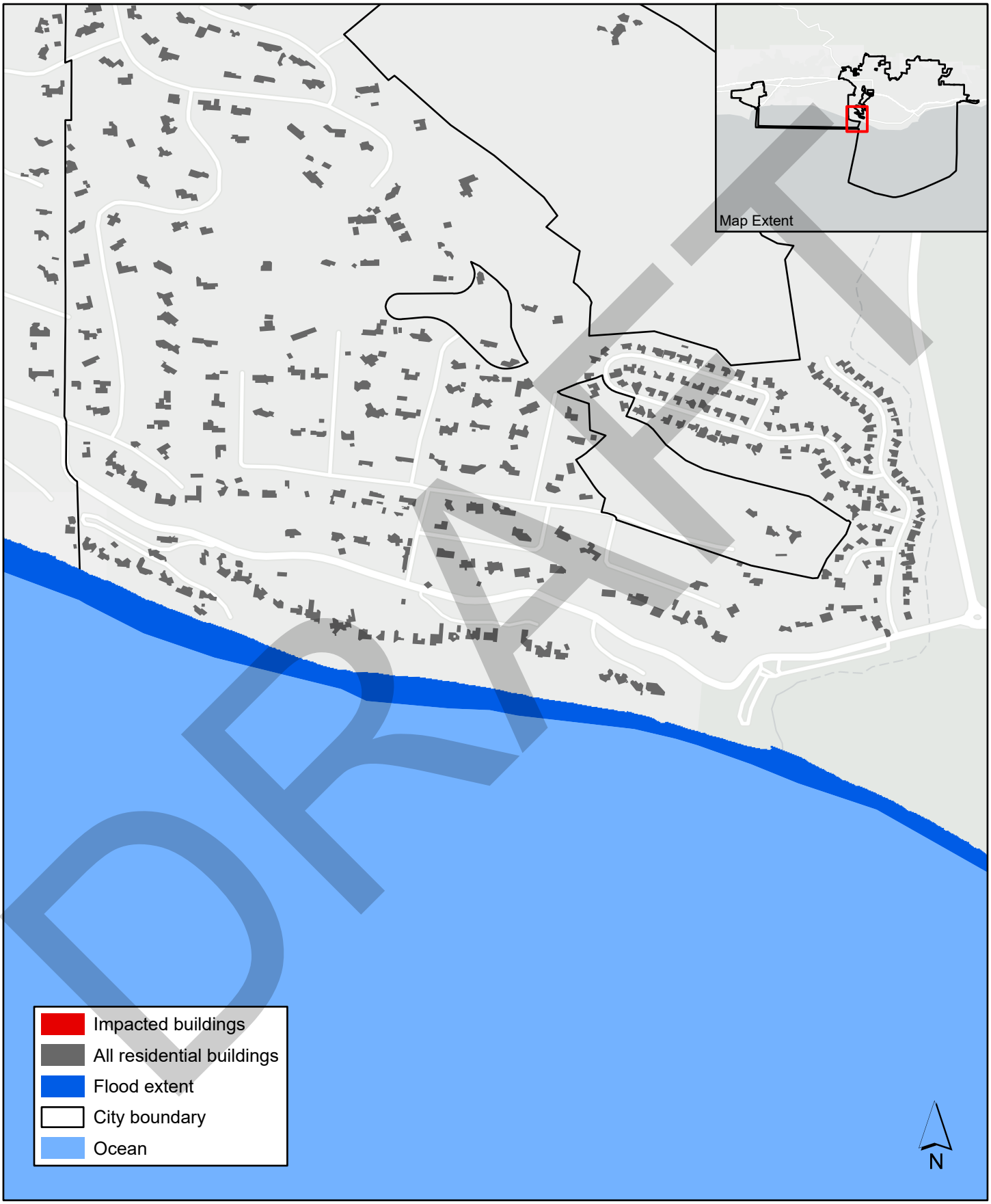
Santa Barbara Area 3

Sea Level Rise 0.0 m - No storm



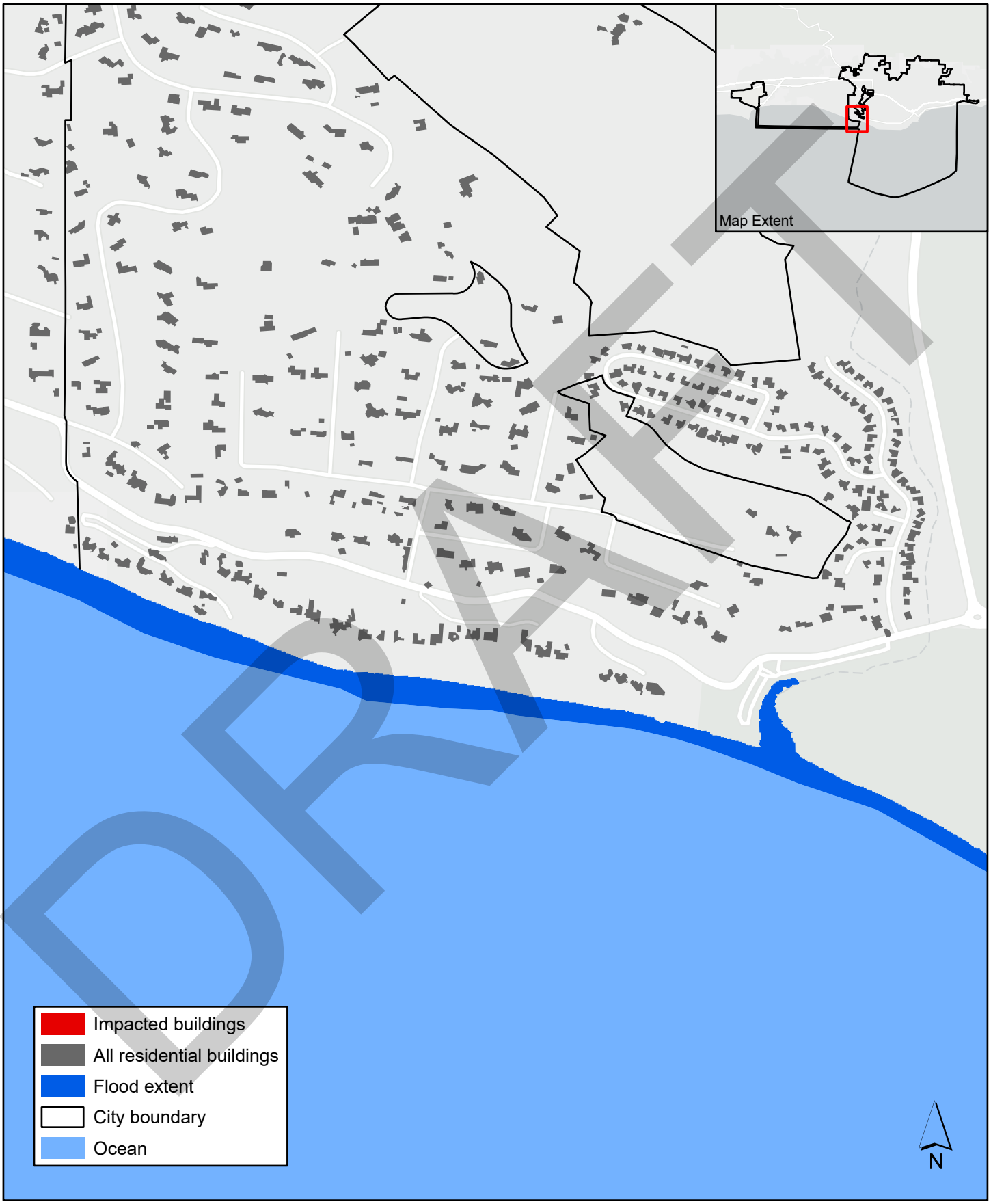
Santa Barbara Area 3

Sea Level Rise 0.0 m - 001 year storm



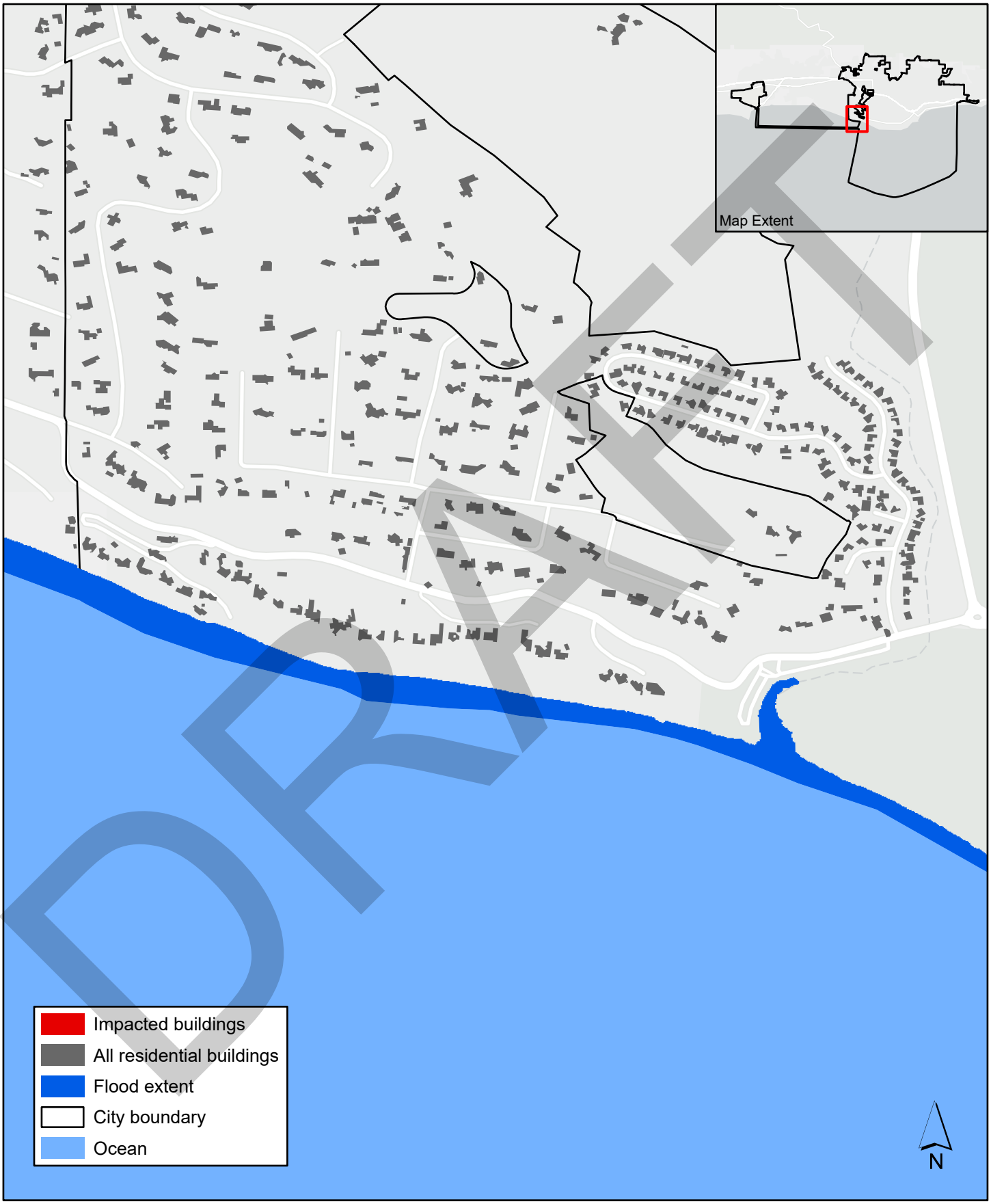
Santa Barbara Area 3

Sea Level Rise 0.0 m - 020 year storm



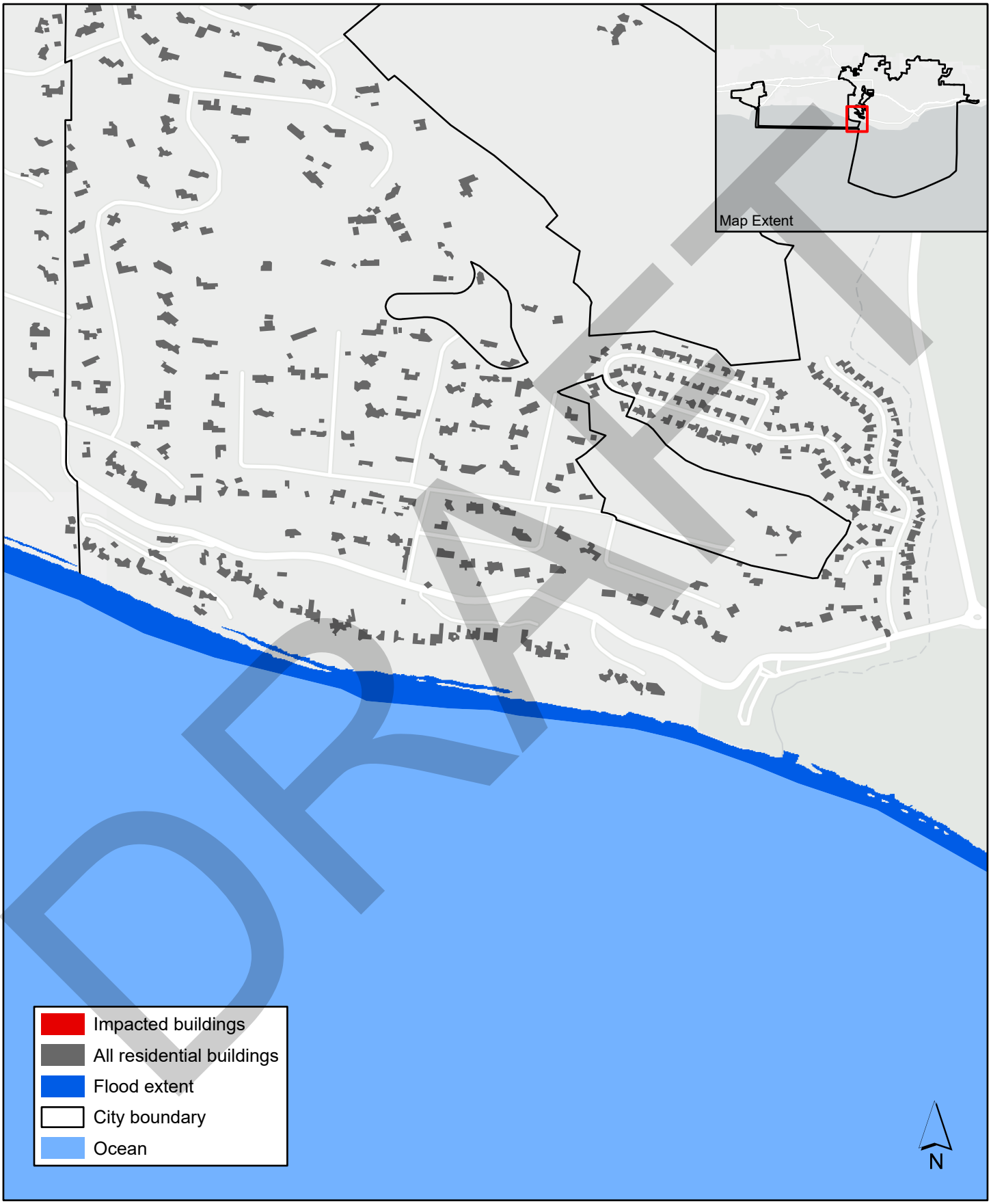
Santa Barbara Area 3

Sea Level Rise 0.0 m - 100 year storm



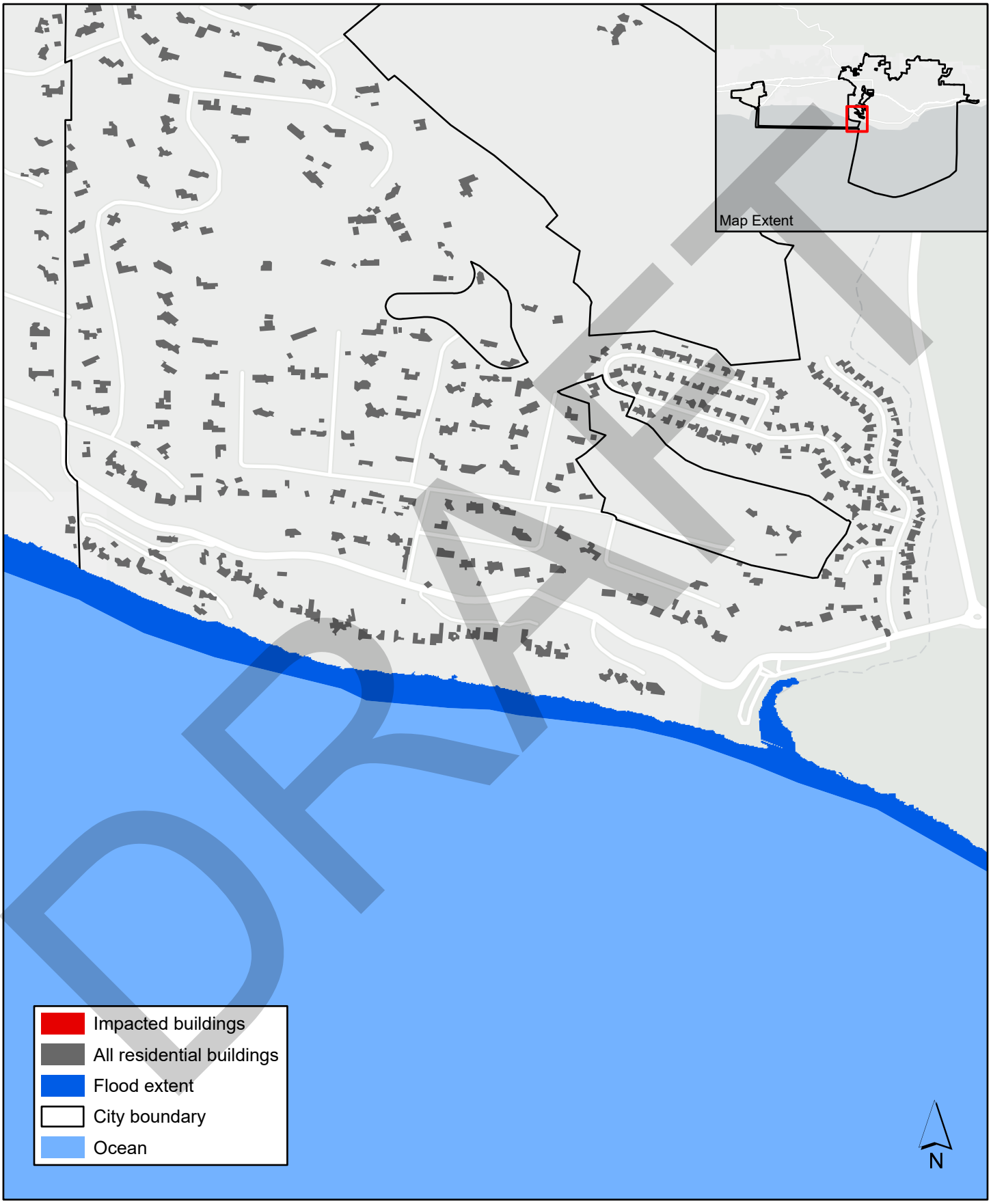
Santa Barbara Area 3

Sea Level Rise 0.25 m - No storm



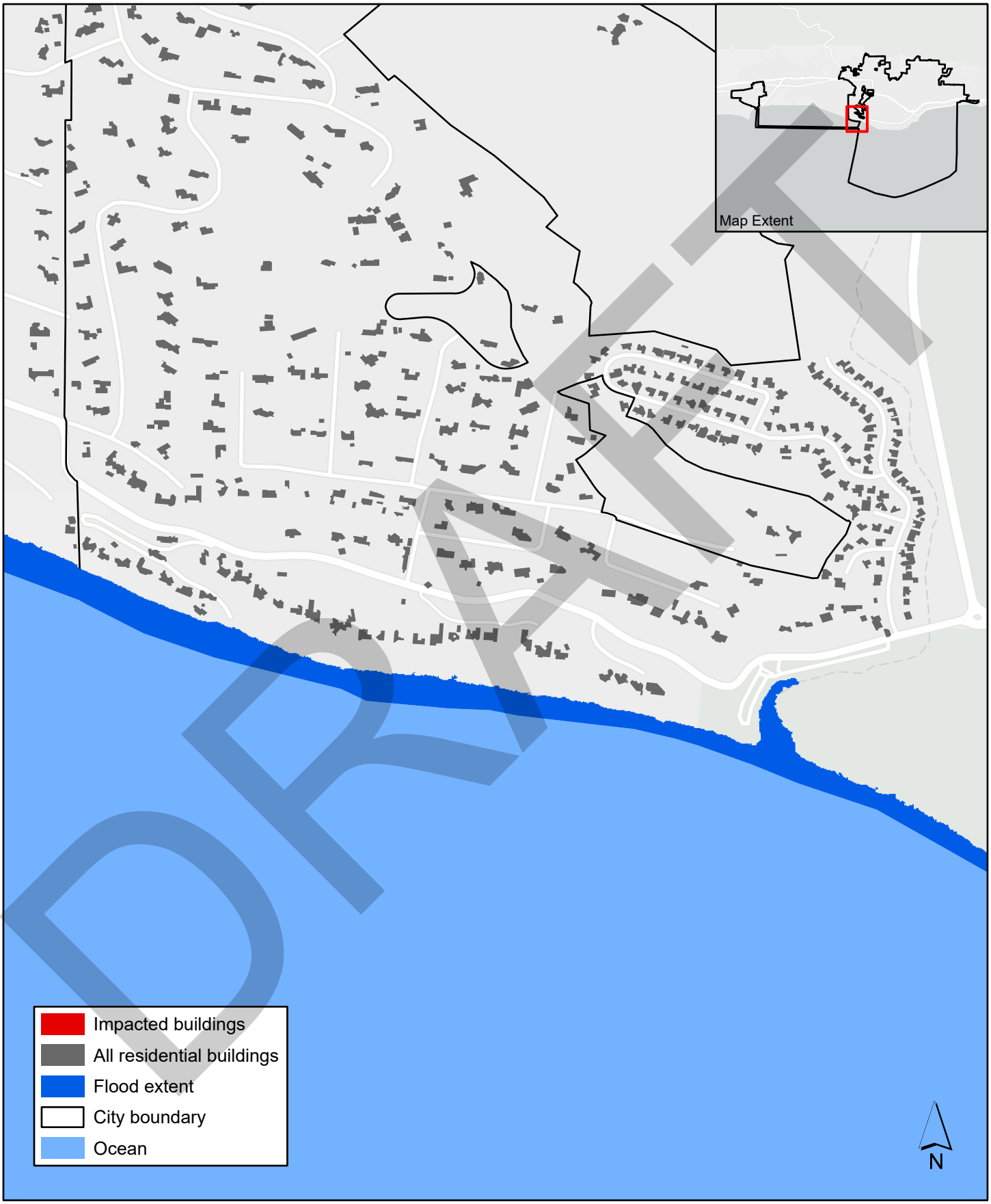
Santa Barbara Area 3

Sea Level Rise 0.25 m - 001 year storm



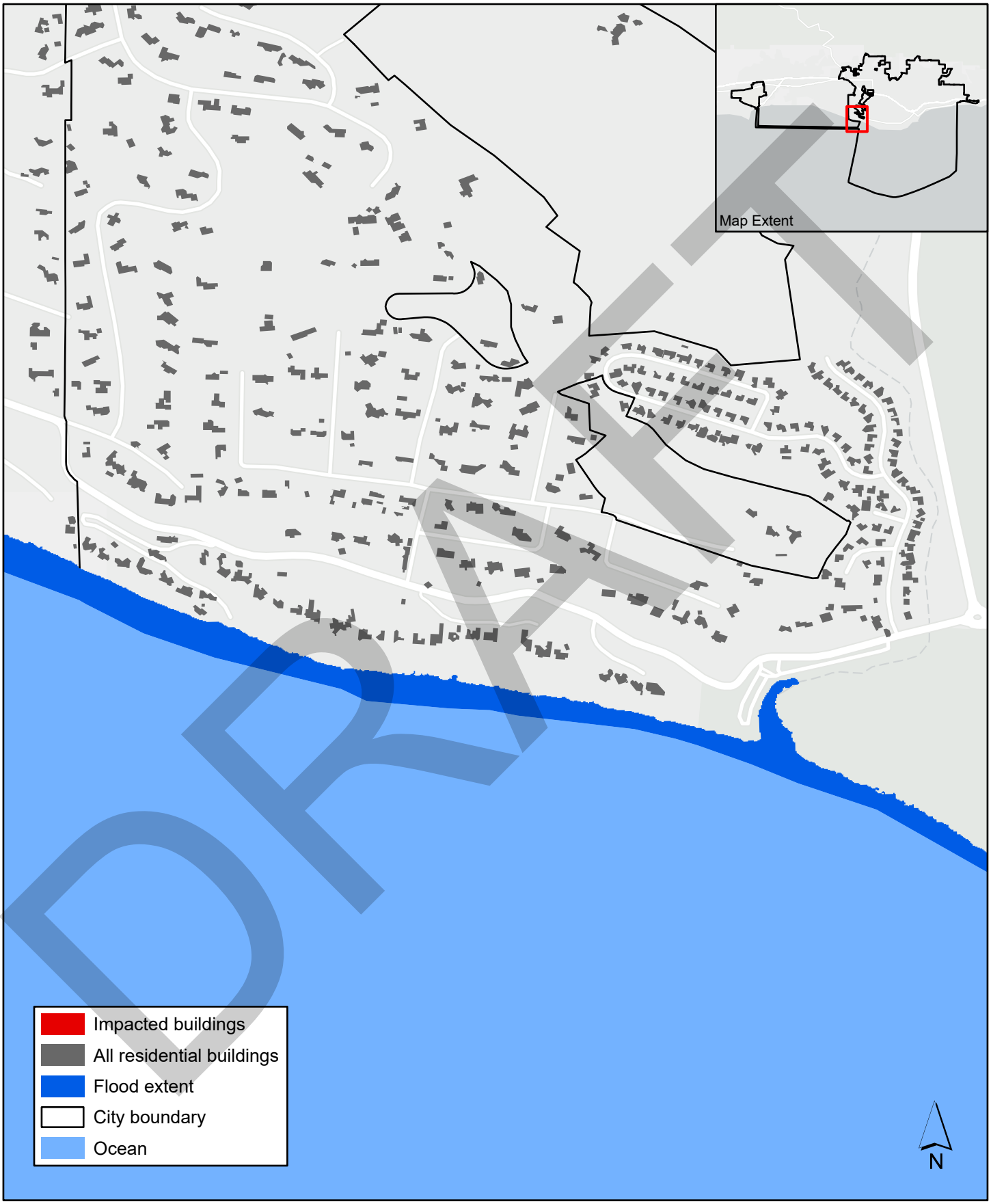
Santa Barbara Area 3

Sea Level Rise 0.25 m - 020 year storm



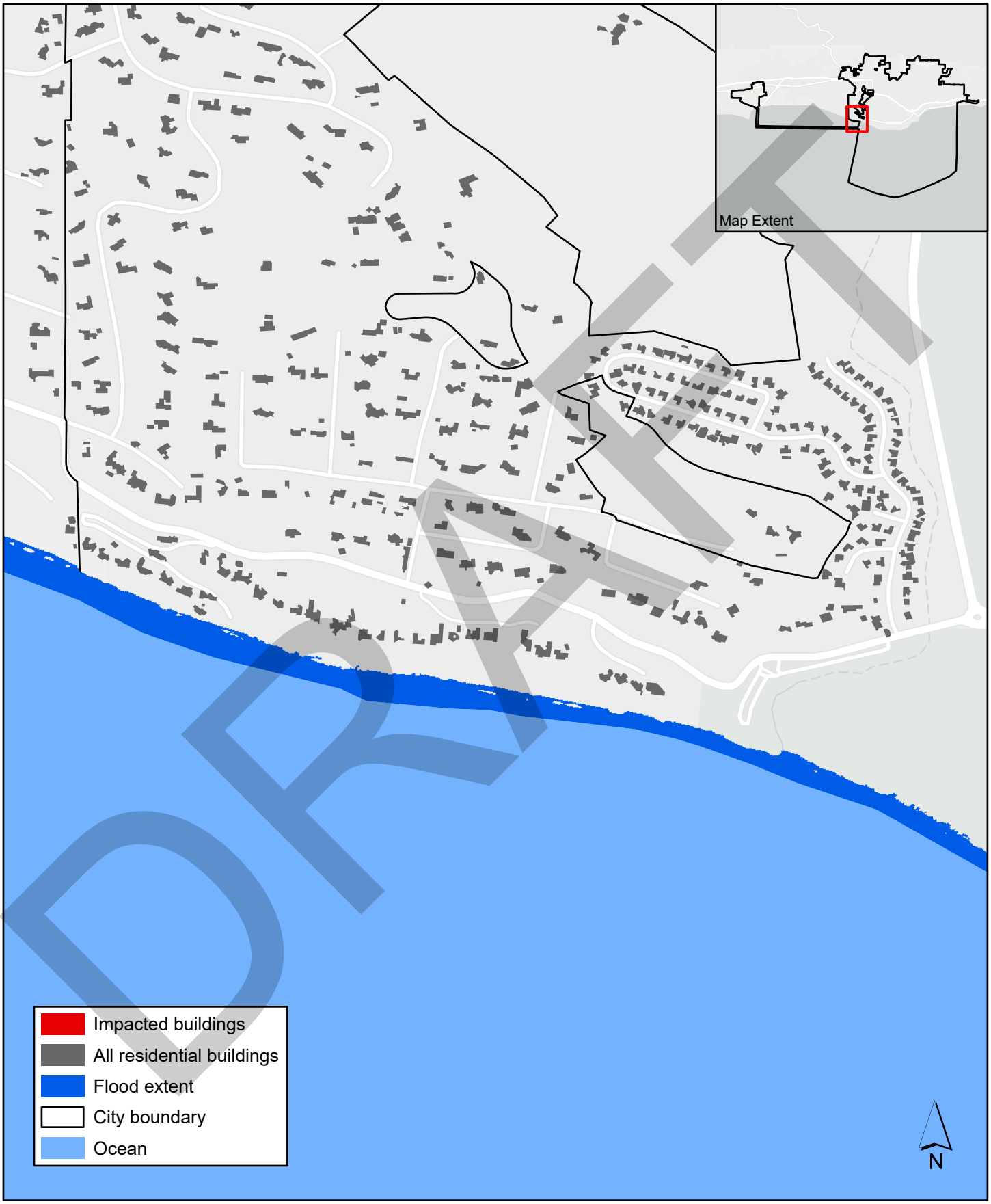
Santa Barbara Area 3

Sea Level Rise 0.25 m - 100 year storm



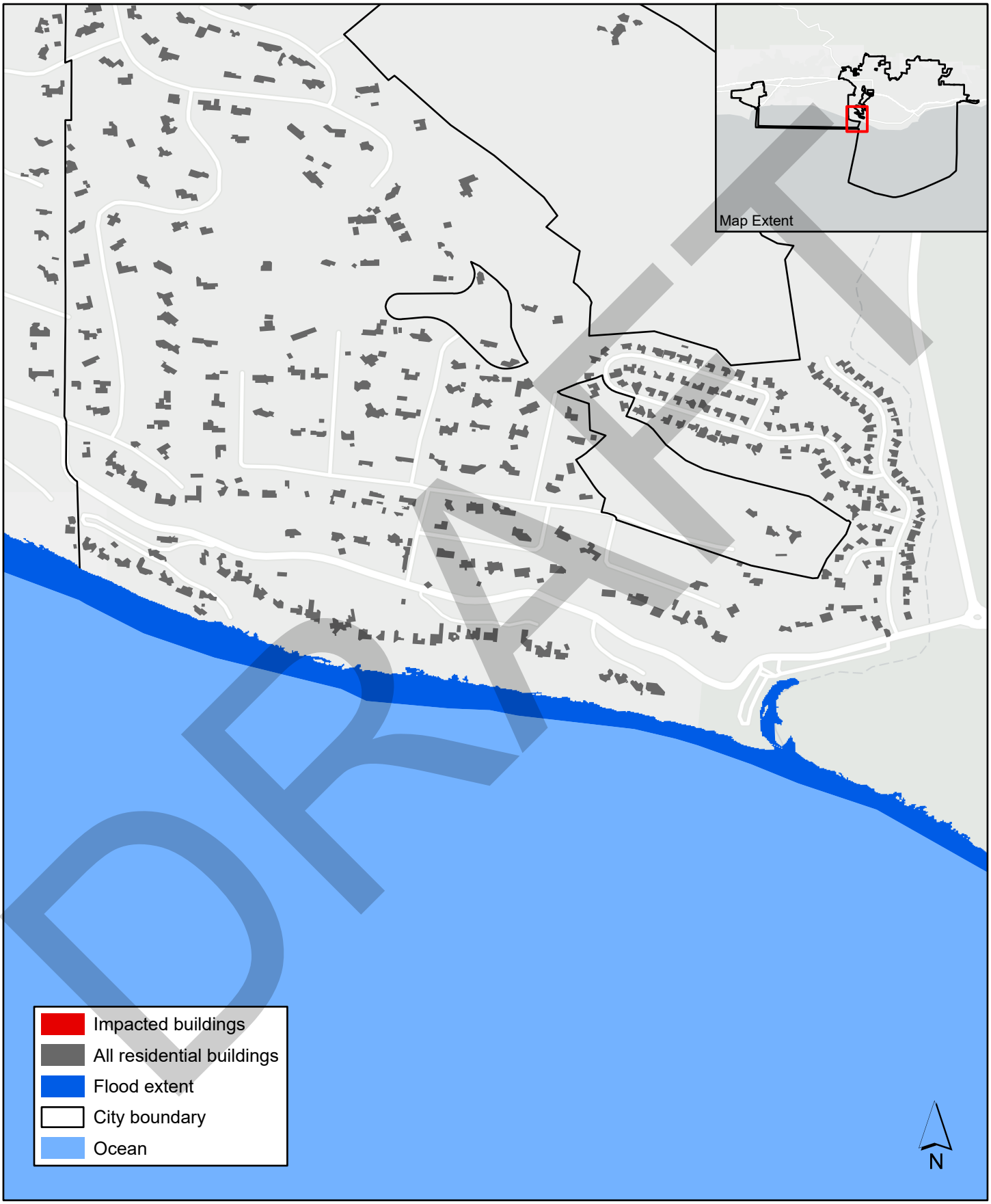
Santa Barbara Area 3

Sea Level Rise 0.5 m - No storm



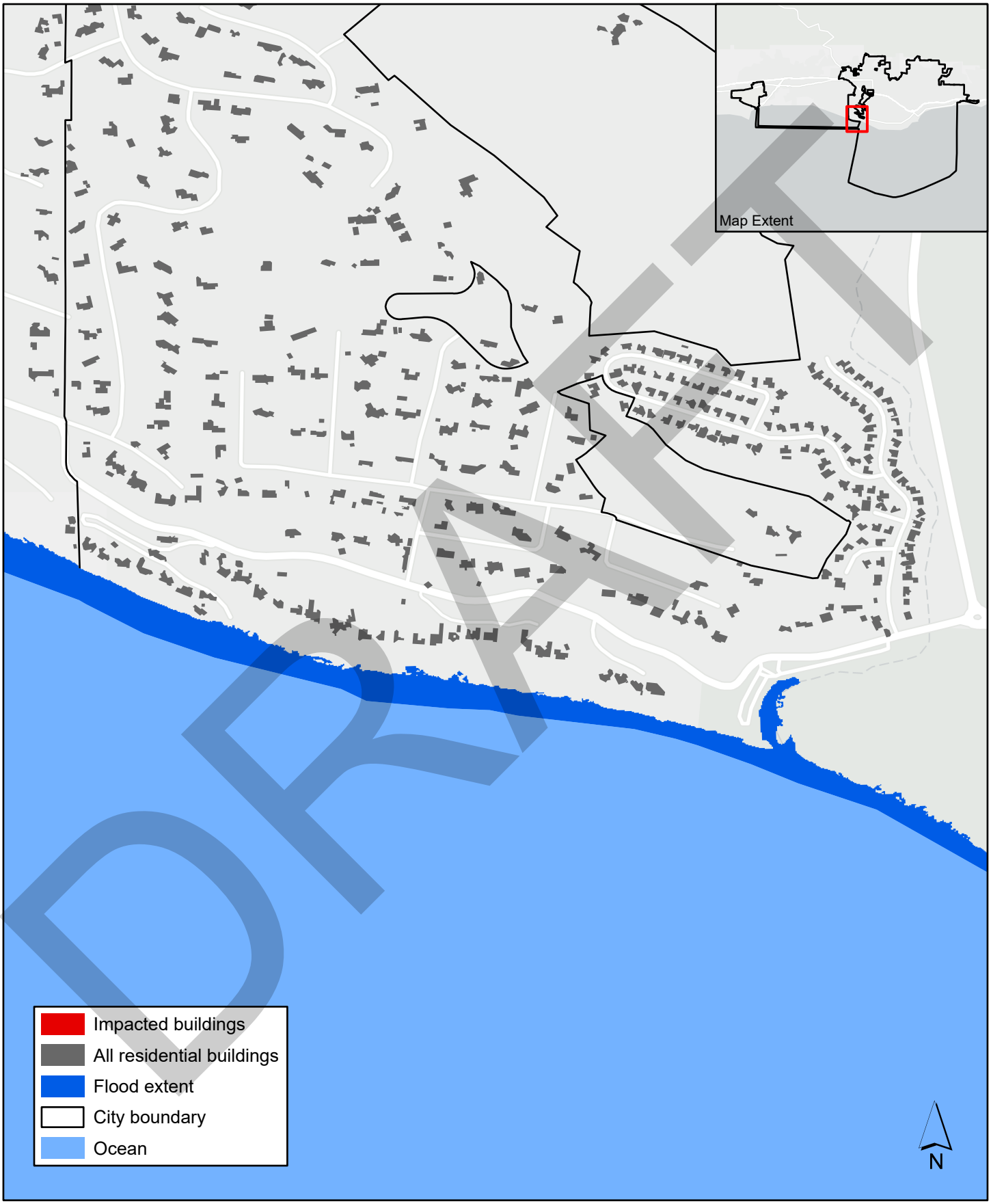
Santa Barbara Area 3

Sea Level Rise 0.5 m - 001 year storm



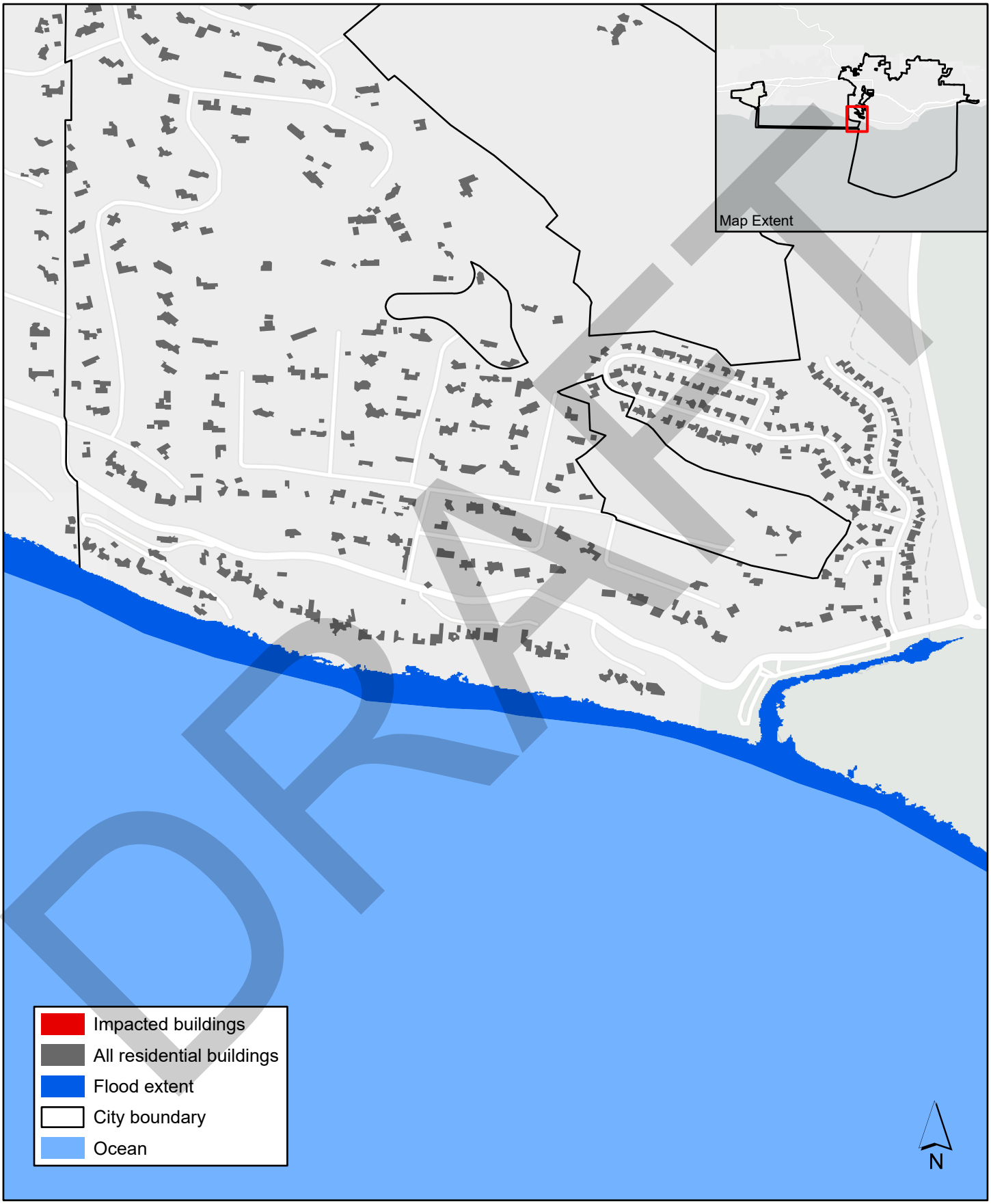
Santa Barbara Area 3

Sea Level Rise 0.5 m - 020 year storm



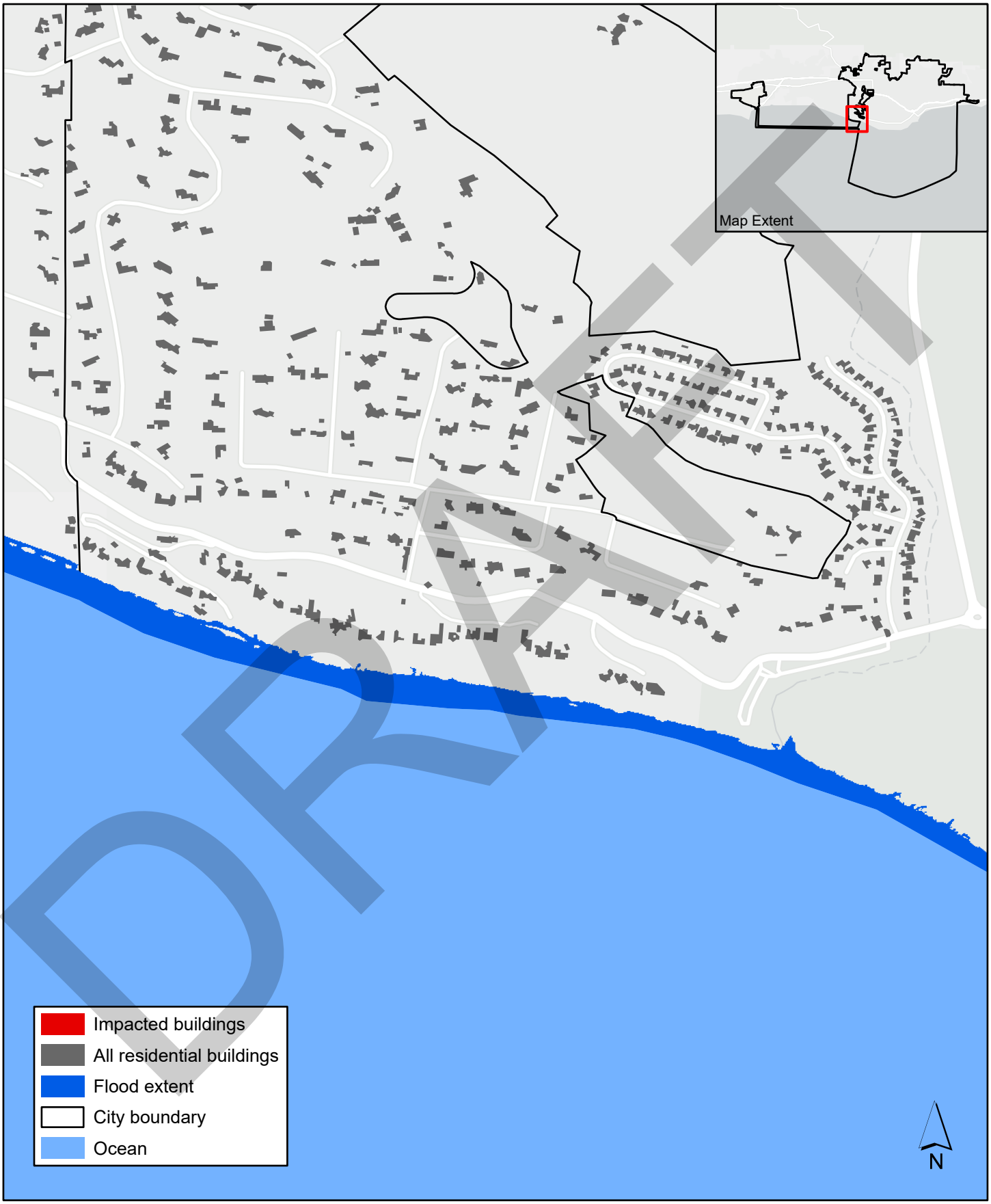
Santa Barbara Area 3

Sea Level Rise 0.5 m - 100 year storm



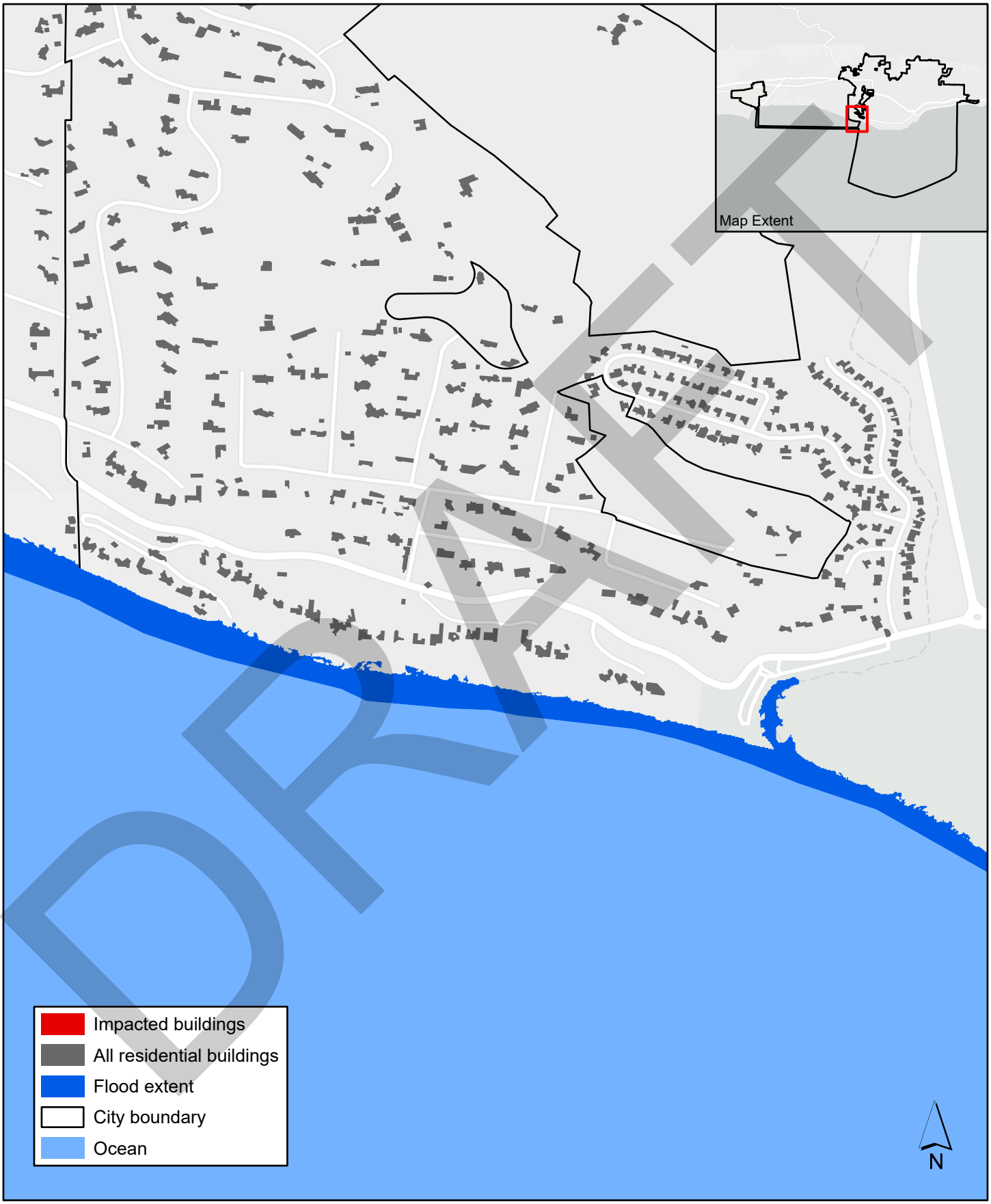
Santa Barbara Area 3

Sea Level Rise 0.75 m - No storm



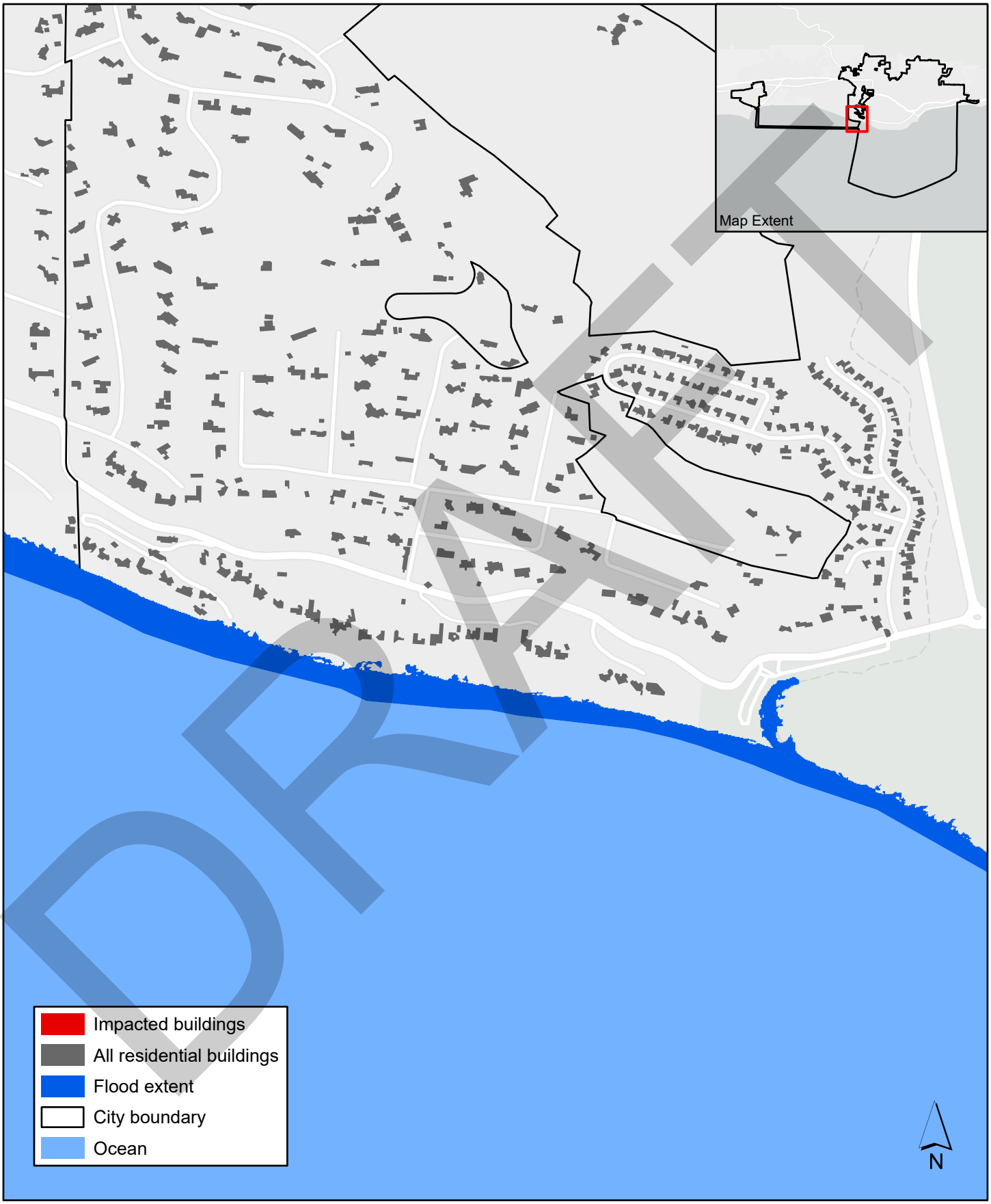
Santa Barbara Area 3

Sea Level Rise 0.75 m - 001 year storm



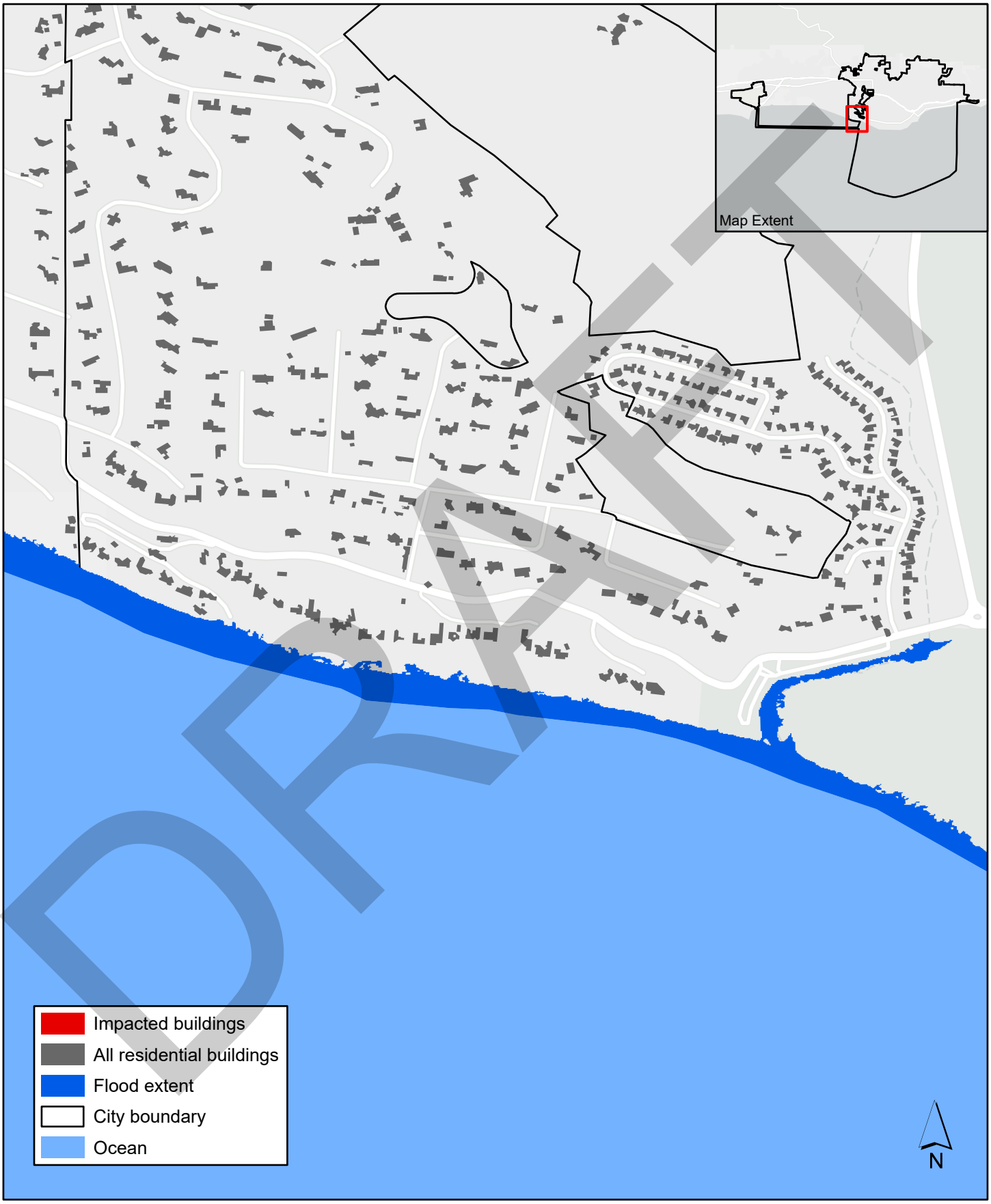
Santa Barbara Area 3

Sea Level Rise 0.75 m - 020 year storm



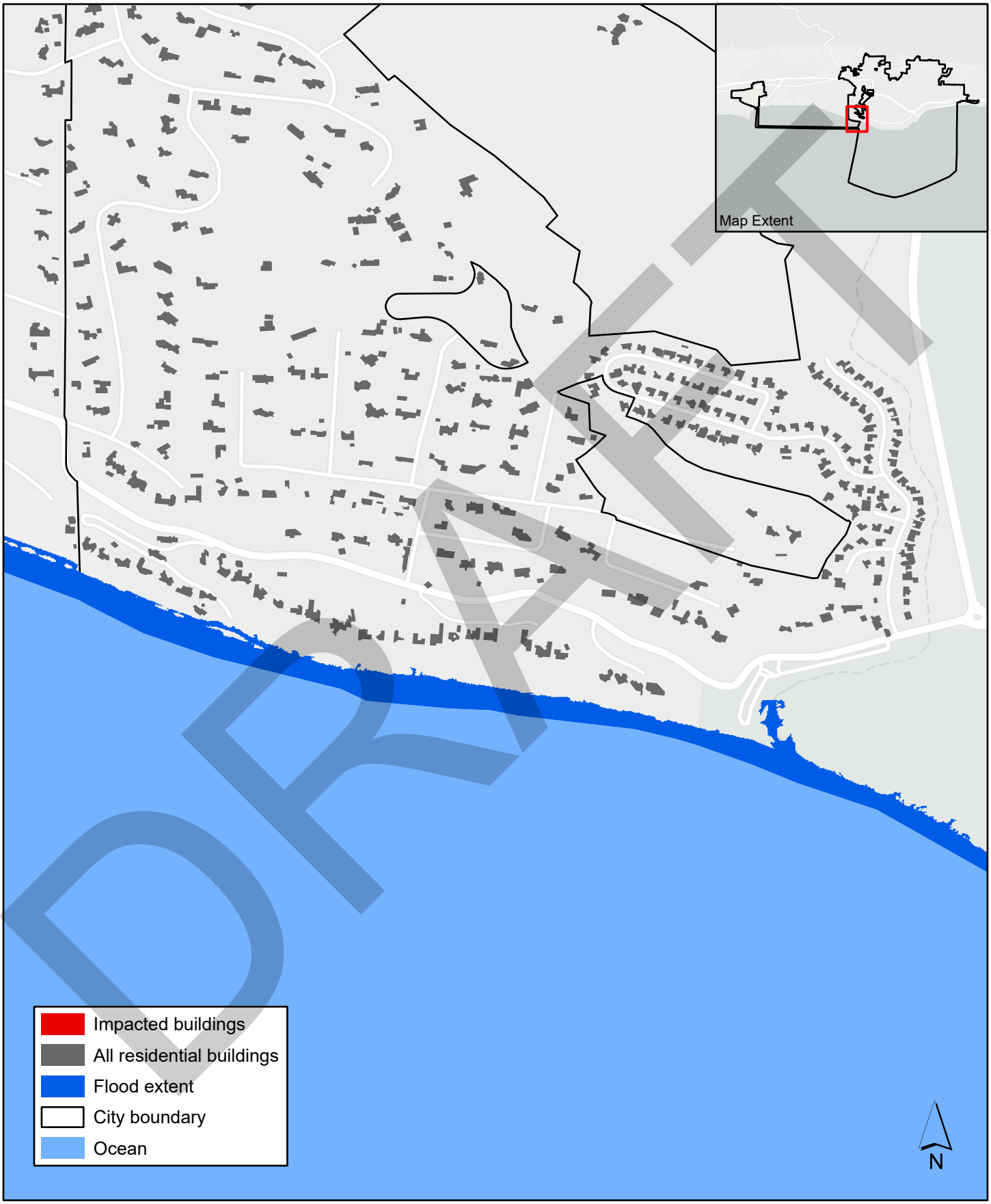
Santa Barbara Area 3

Sea Level Rise 0.75 m - 100 year storm



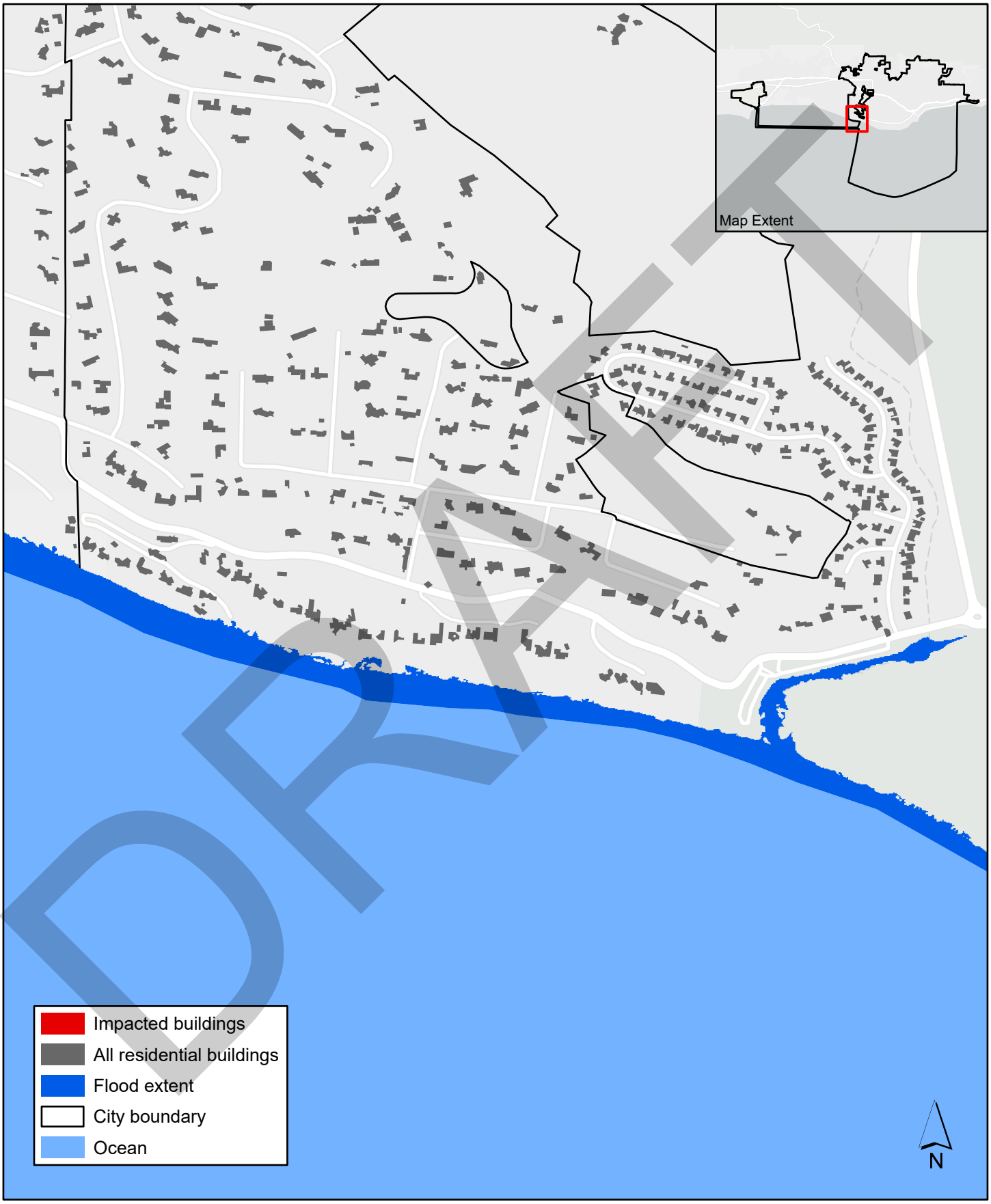
Santa Barbara Area 3

Sea Level Rise 1.0 m - No storm



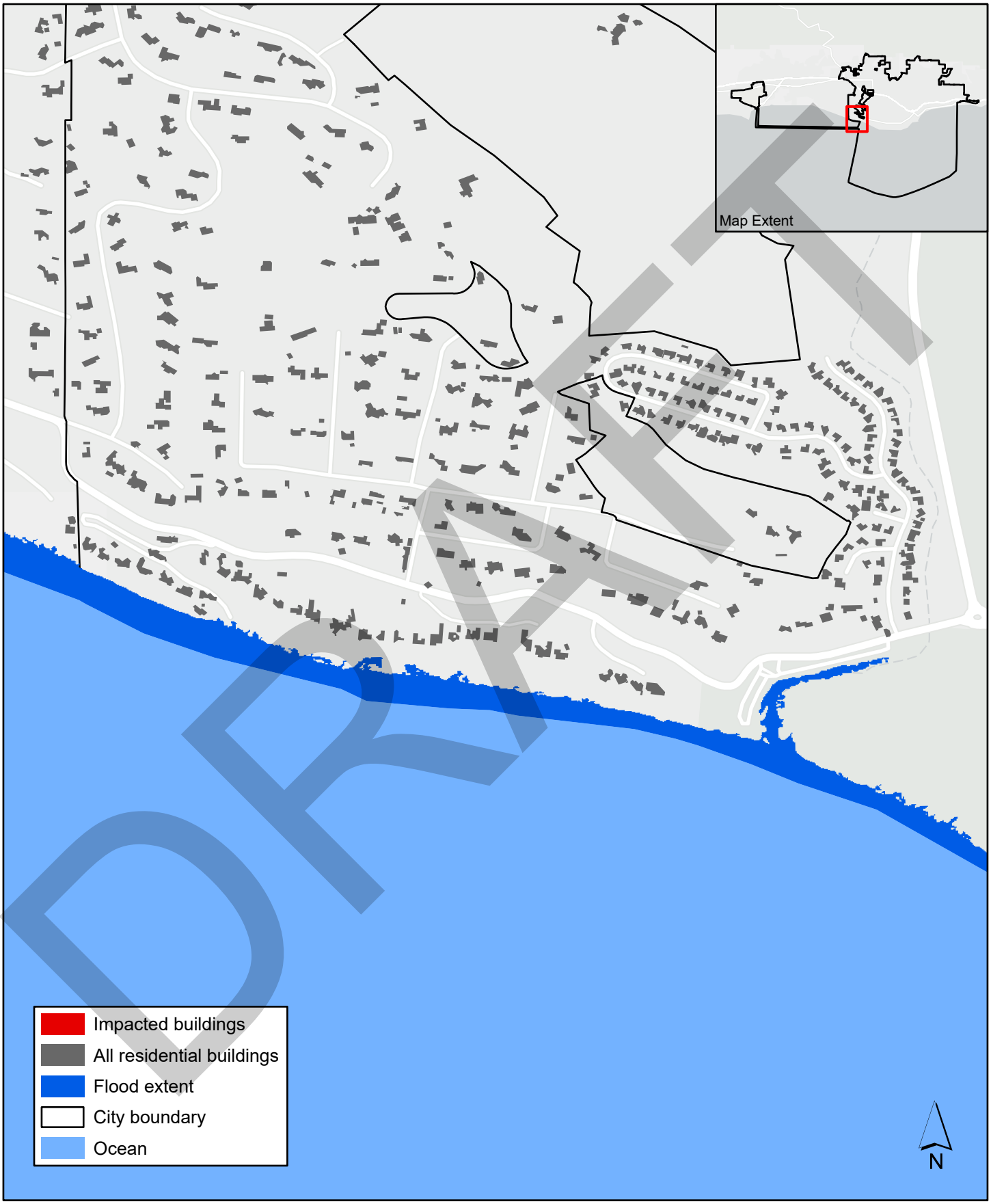
Santa Barbara Area 3

Sea Level Rise 1.0 m - 001 year storm



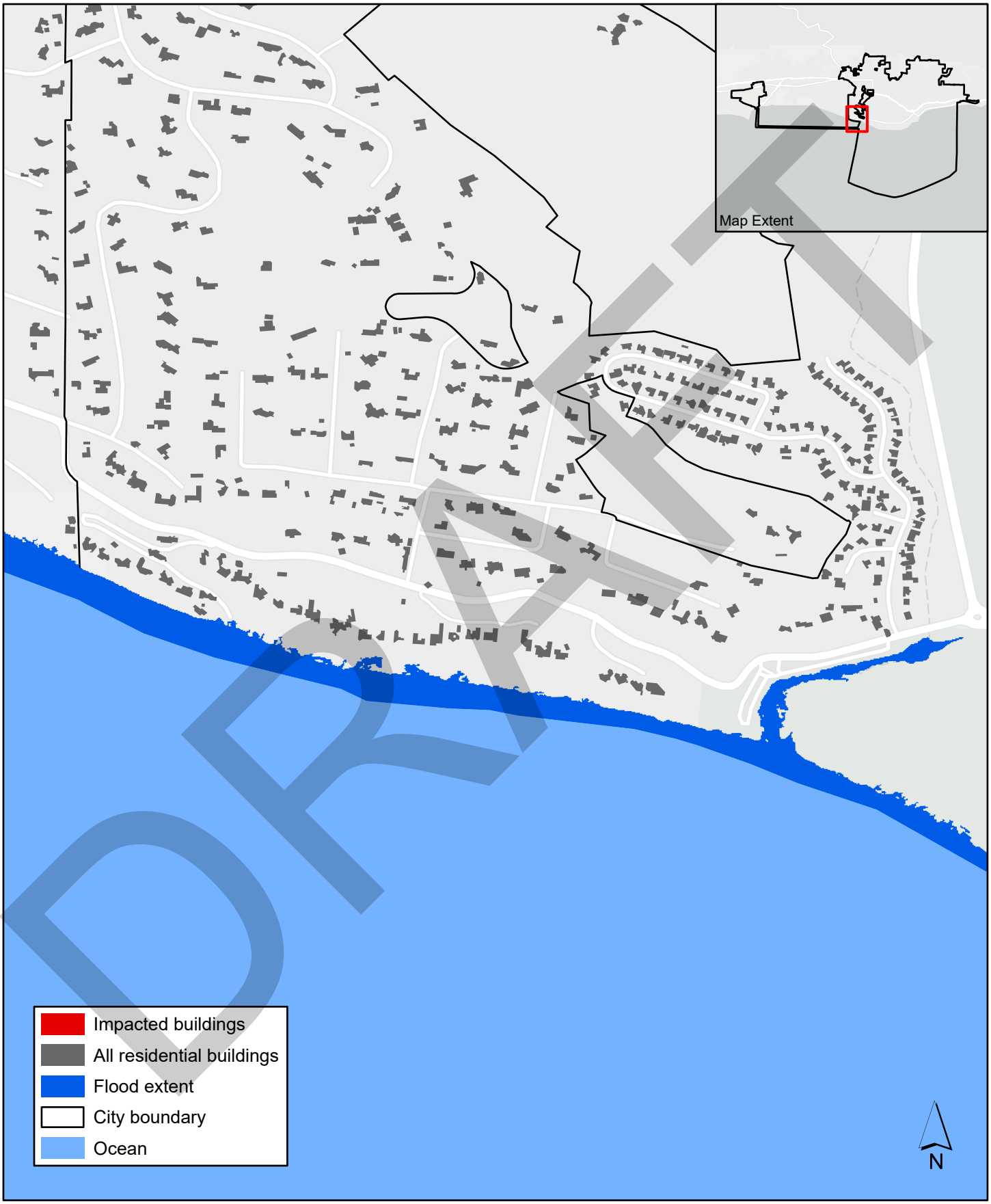
Santa Barbara Area 3

Sea Level Rise 1.0 m - 020 year storm



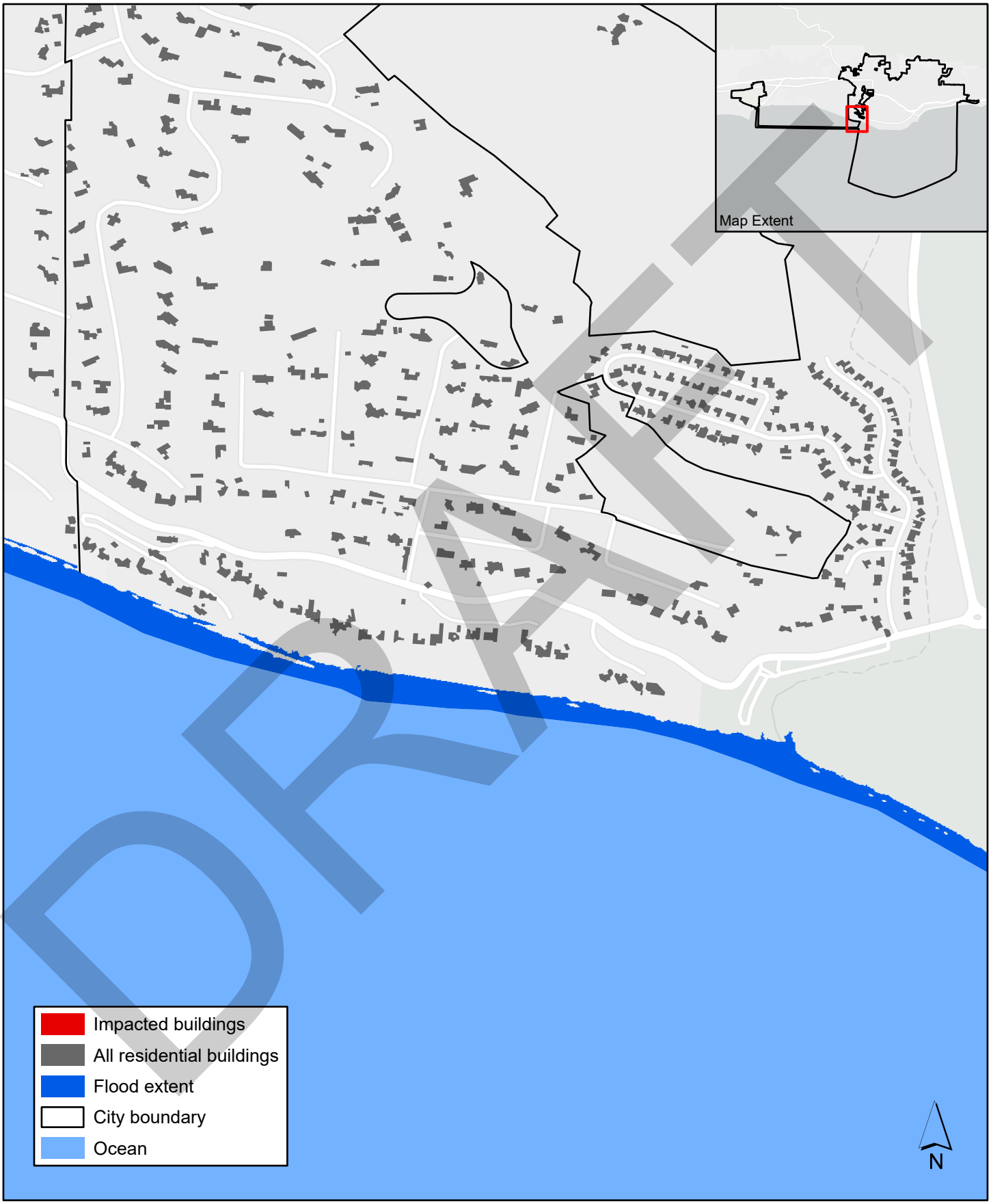
Santa Barbara Area 3

Sea Level Rise 1.0 m - 100 year storm



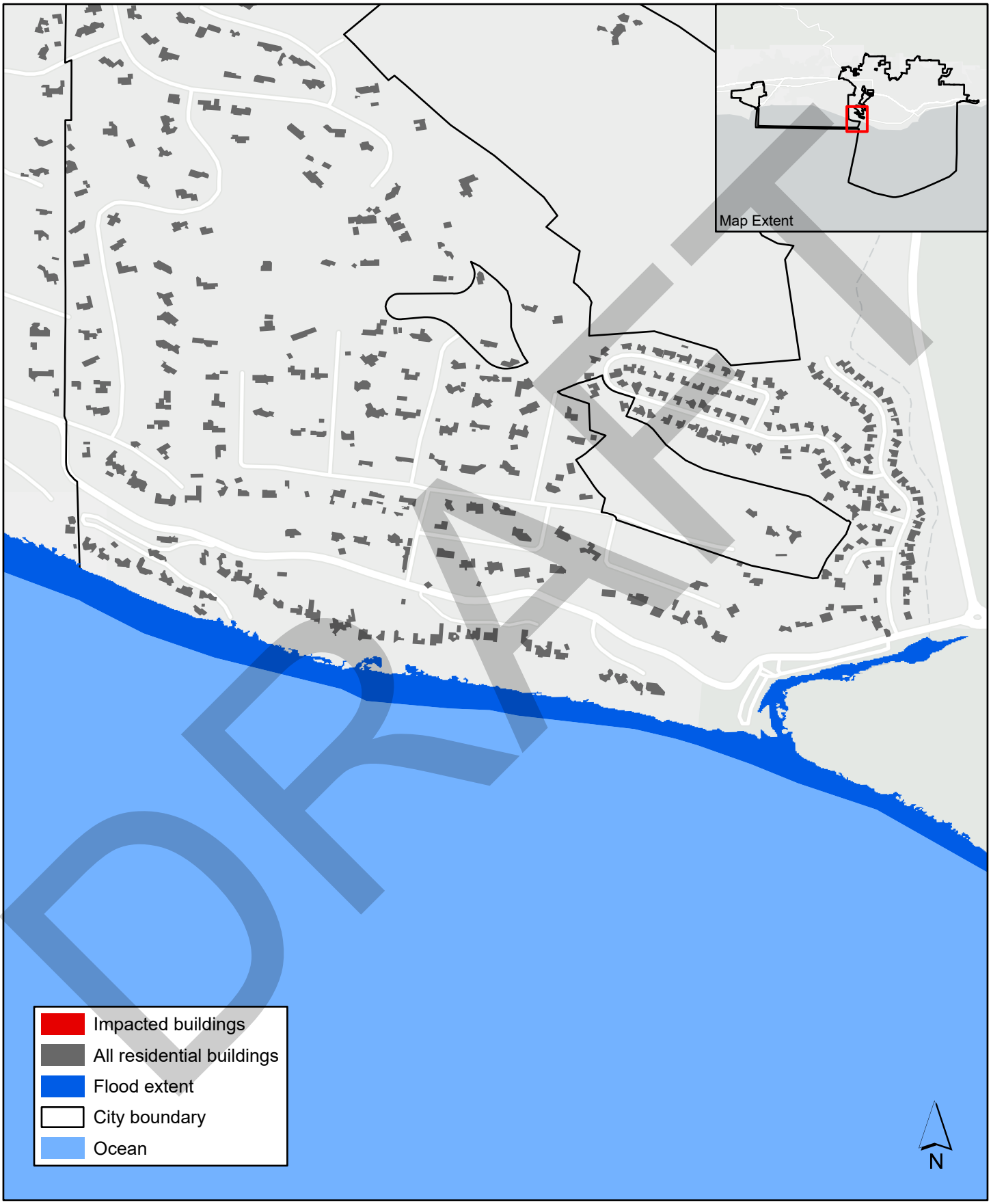
Santa Barbara Area 3

Sea Level Rise 1.5 m - No storm



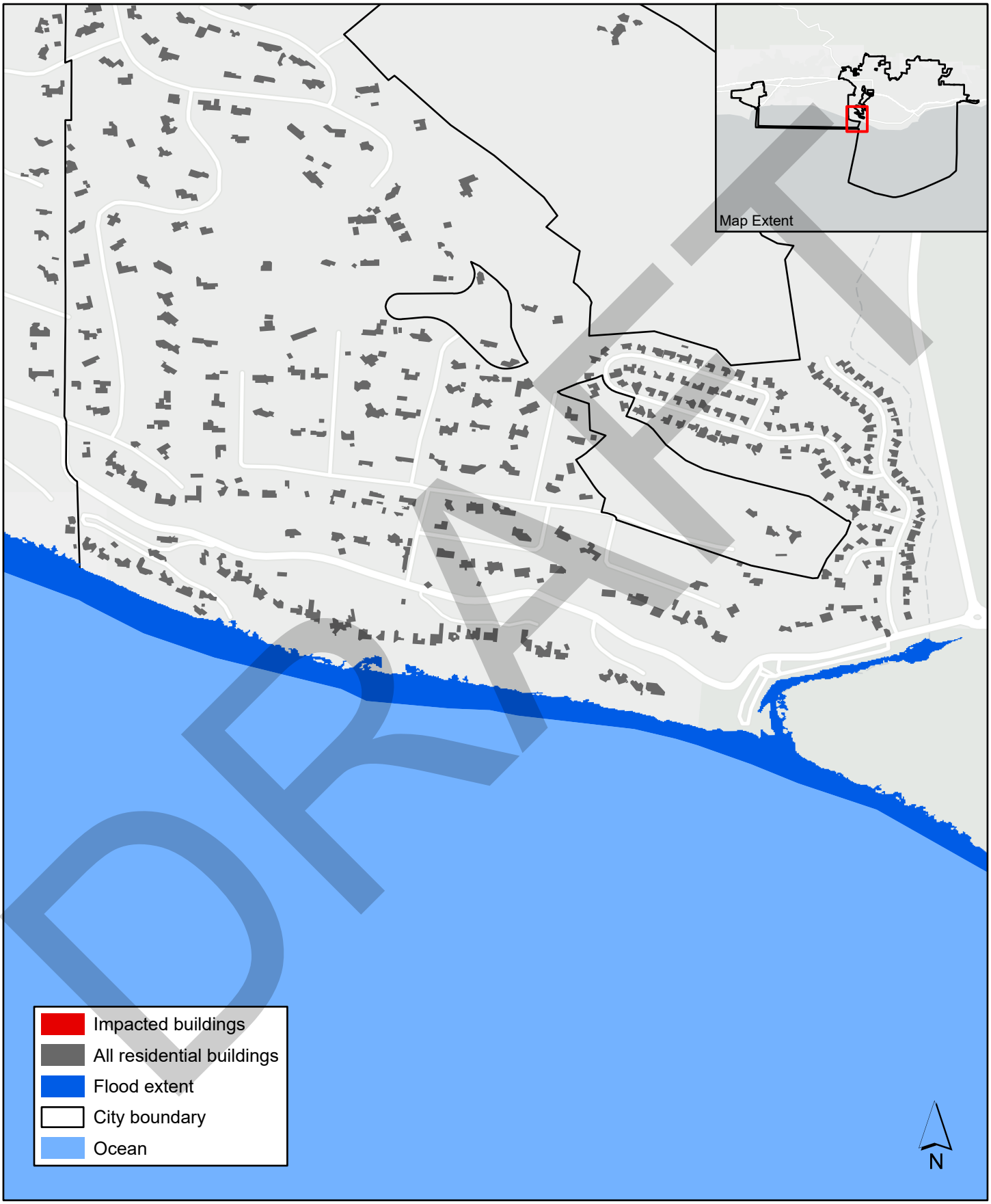
Santa Barbara Area 3

Sea Level Rise 1.5 m - 001 year storm



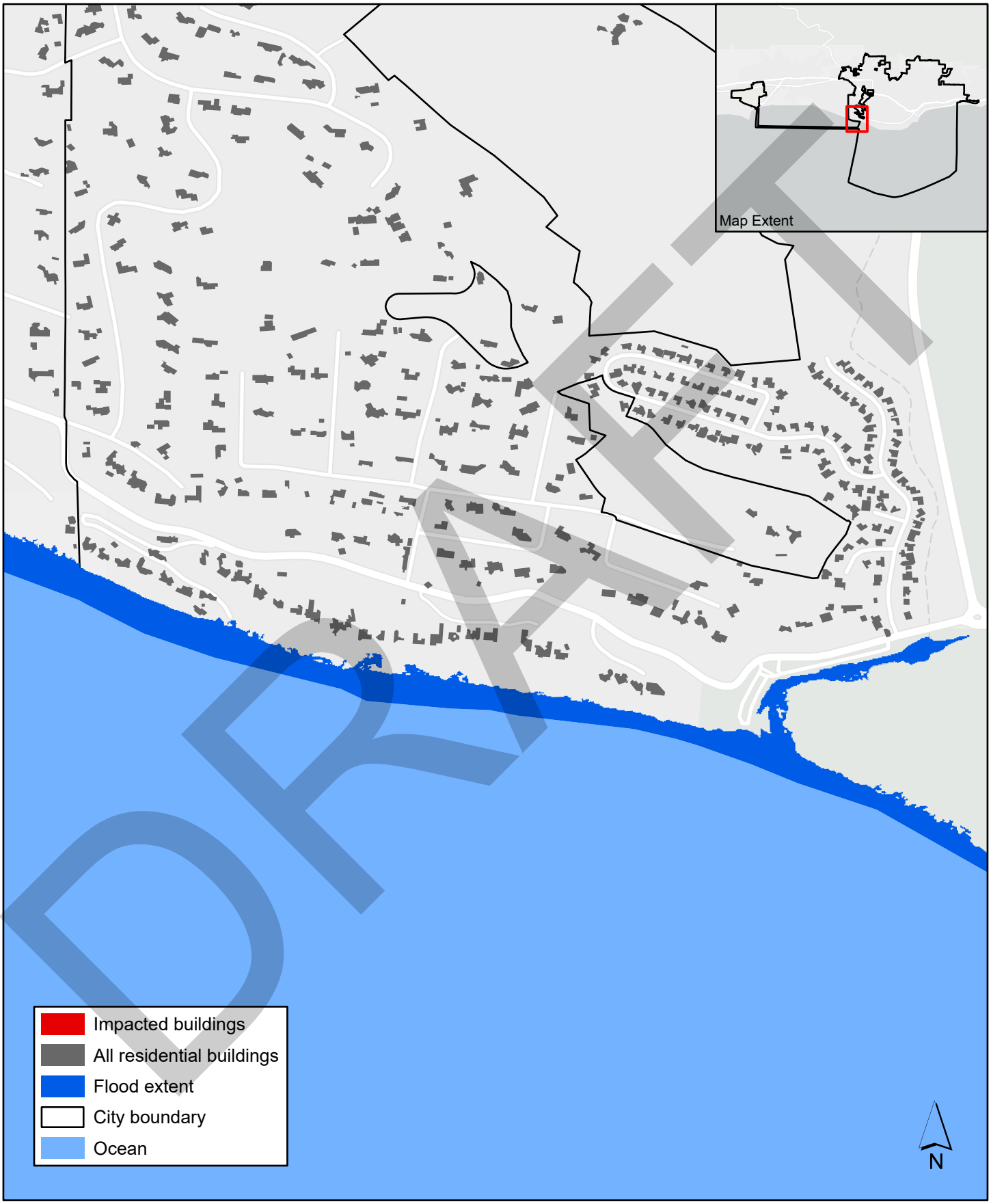
Santa Barbara Area 3

Sea Level Rise 1.5 m - 020 year storm



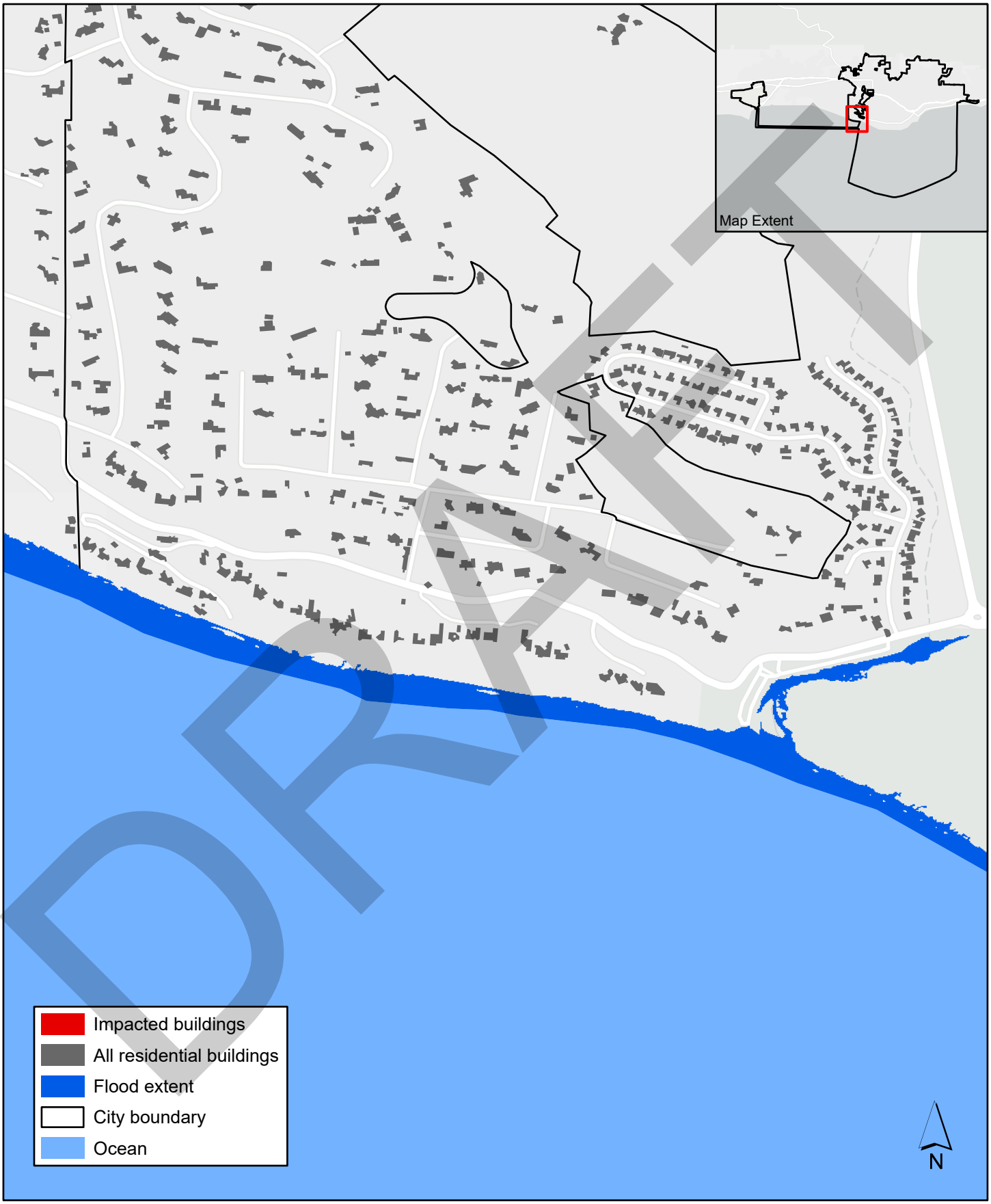
Santa Barbara Area 3

Sea Level Rise 1.5 m - 100 year storm



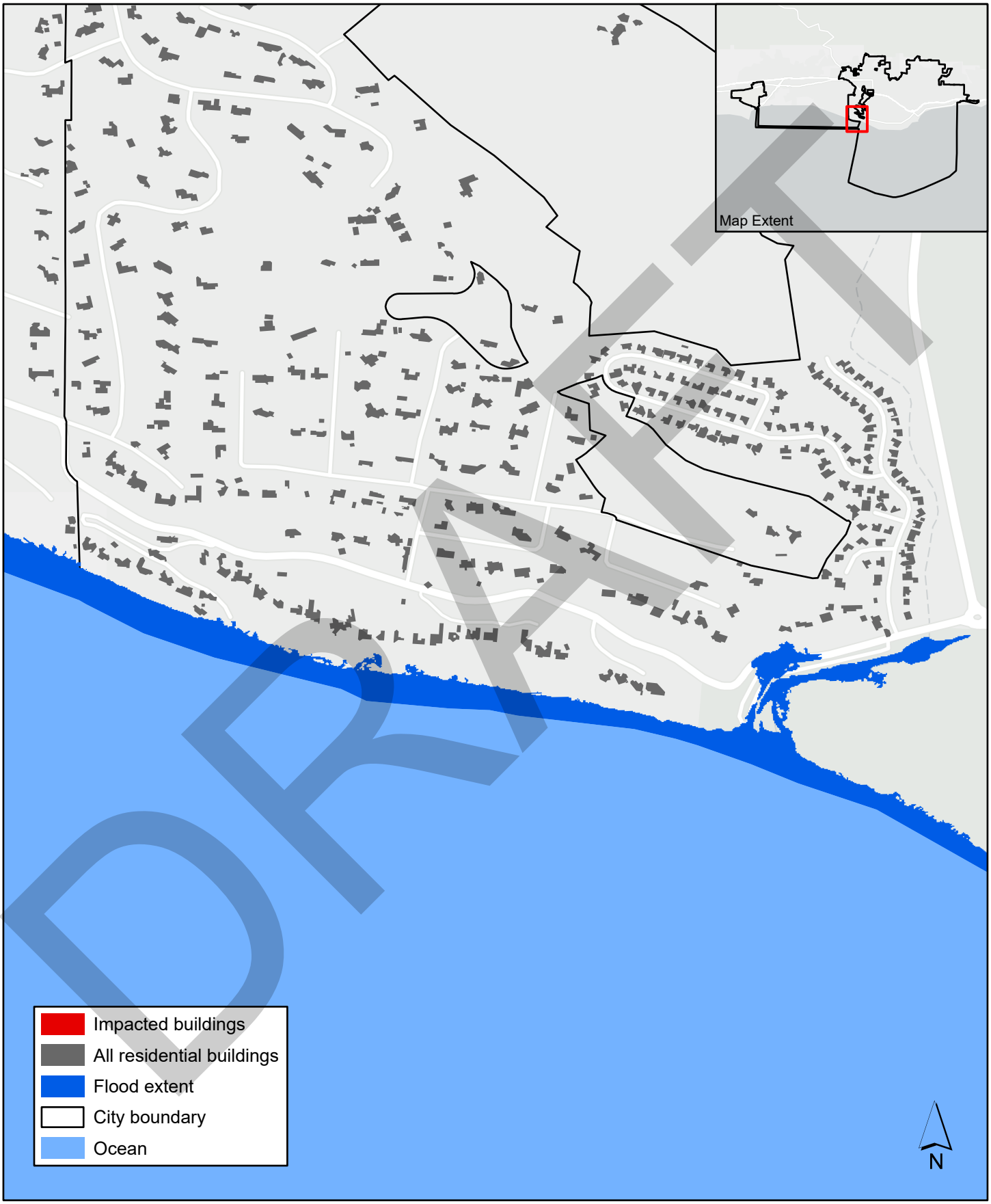
Santa Barbara Area 3

Sea Level Rise 2.0 m - No storm



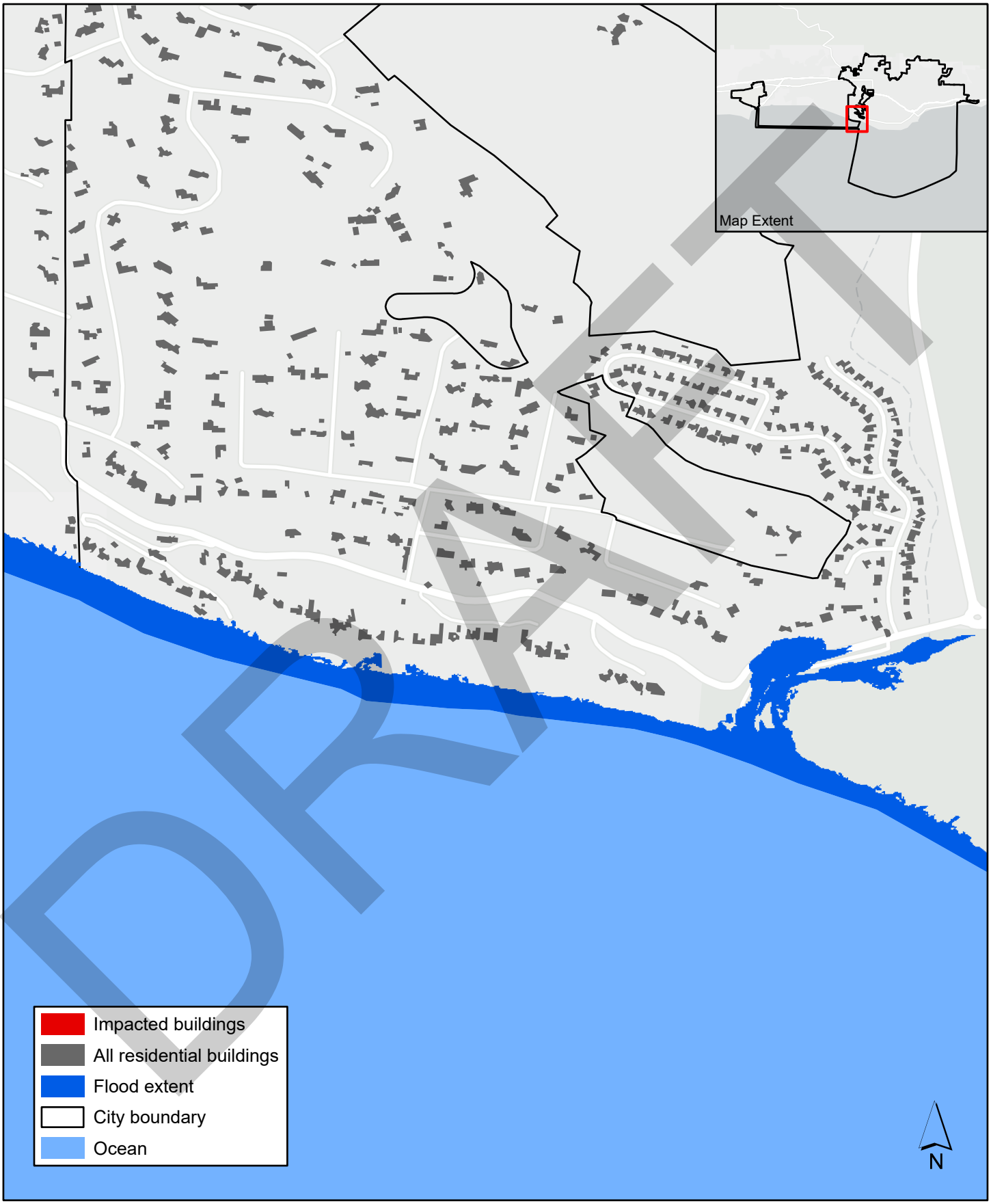
Santa Barbara Area 3

Sea Level Rise 2.0 m - 001 year storm



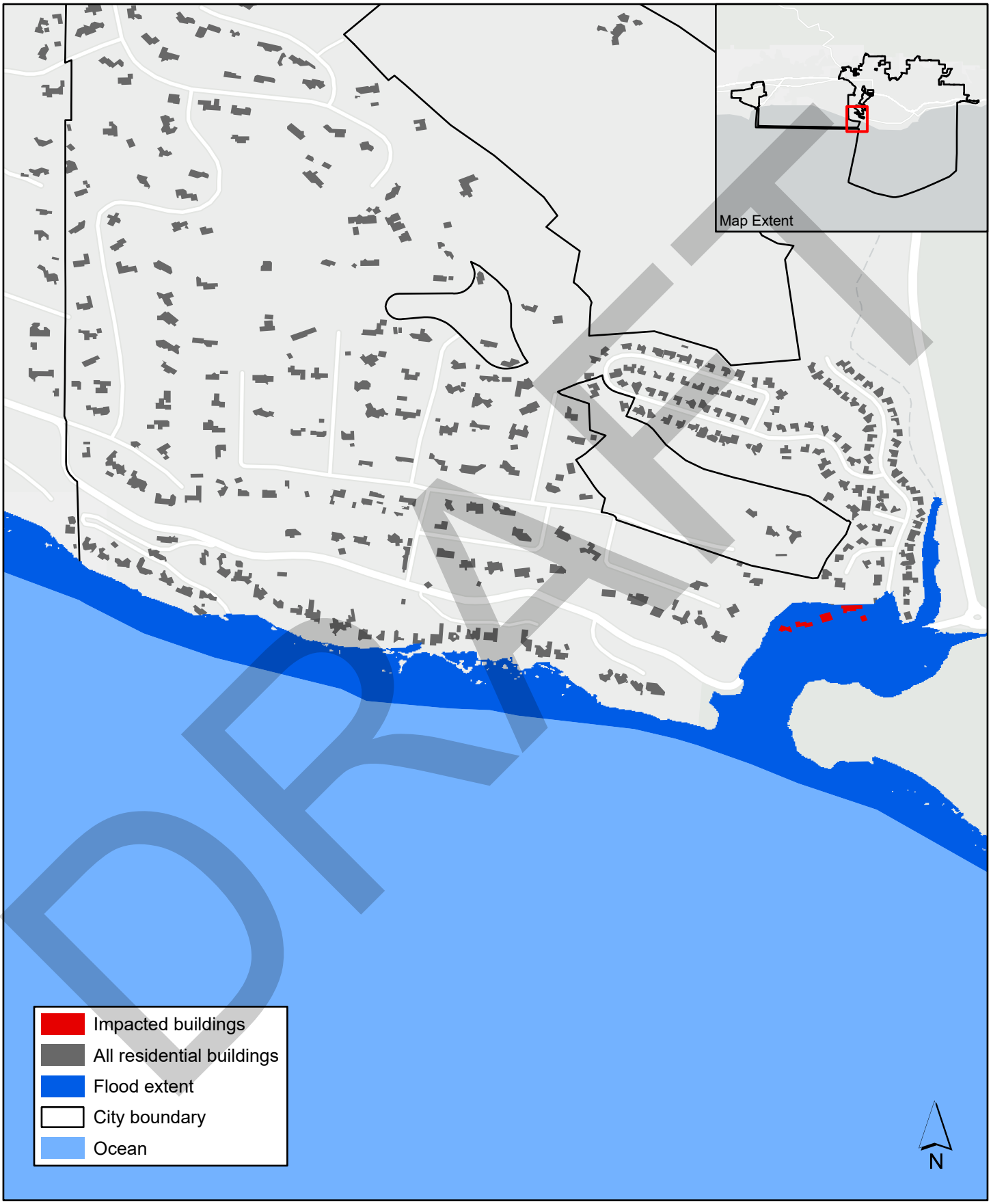
Santa Barbara Area 3

Sea Level Rise 2.0 m - 020 year storm



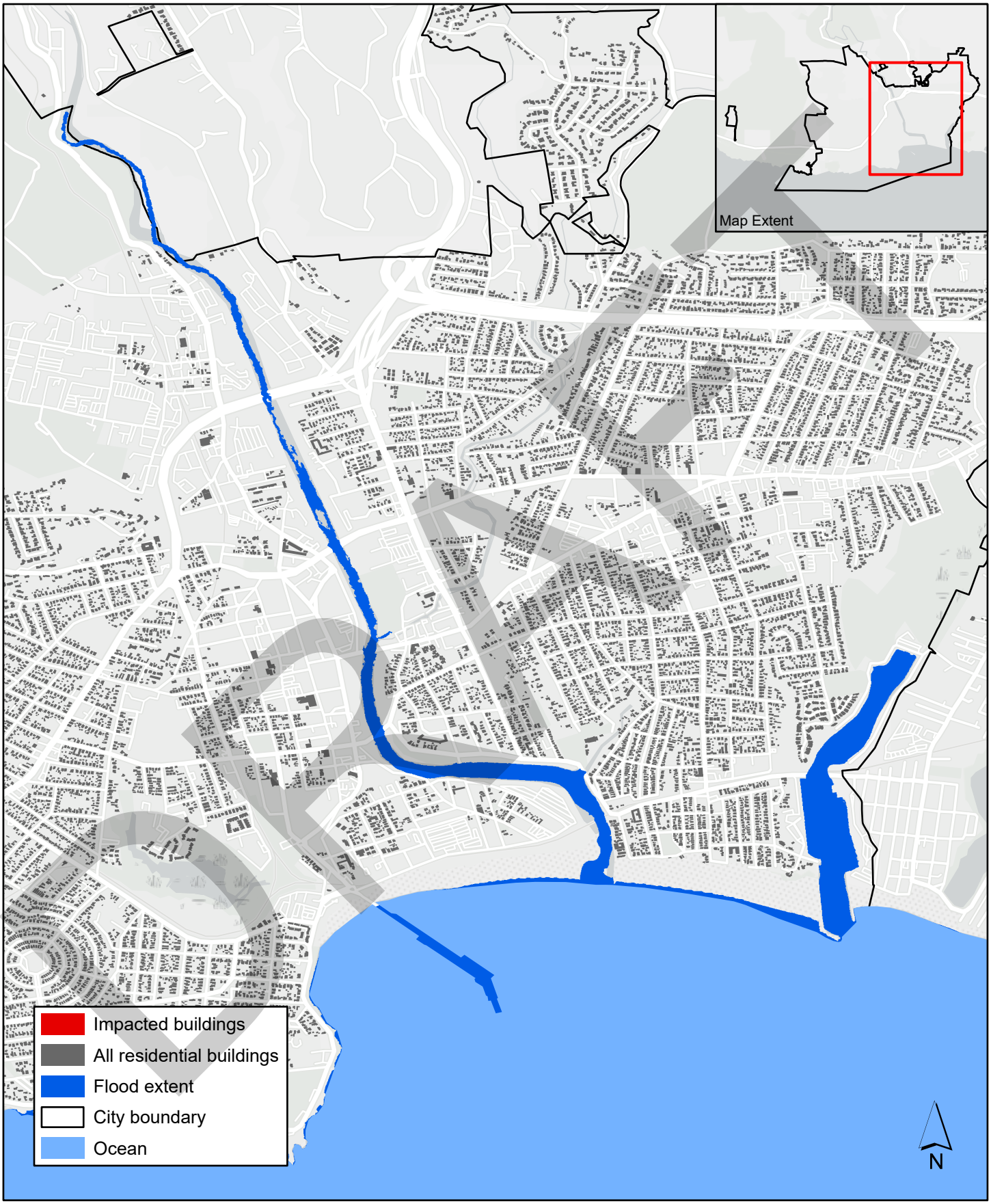
Santa Barbara Area 3

Sea Level Rise 2.0 m - 100 year storm



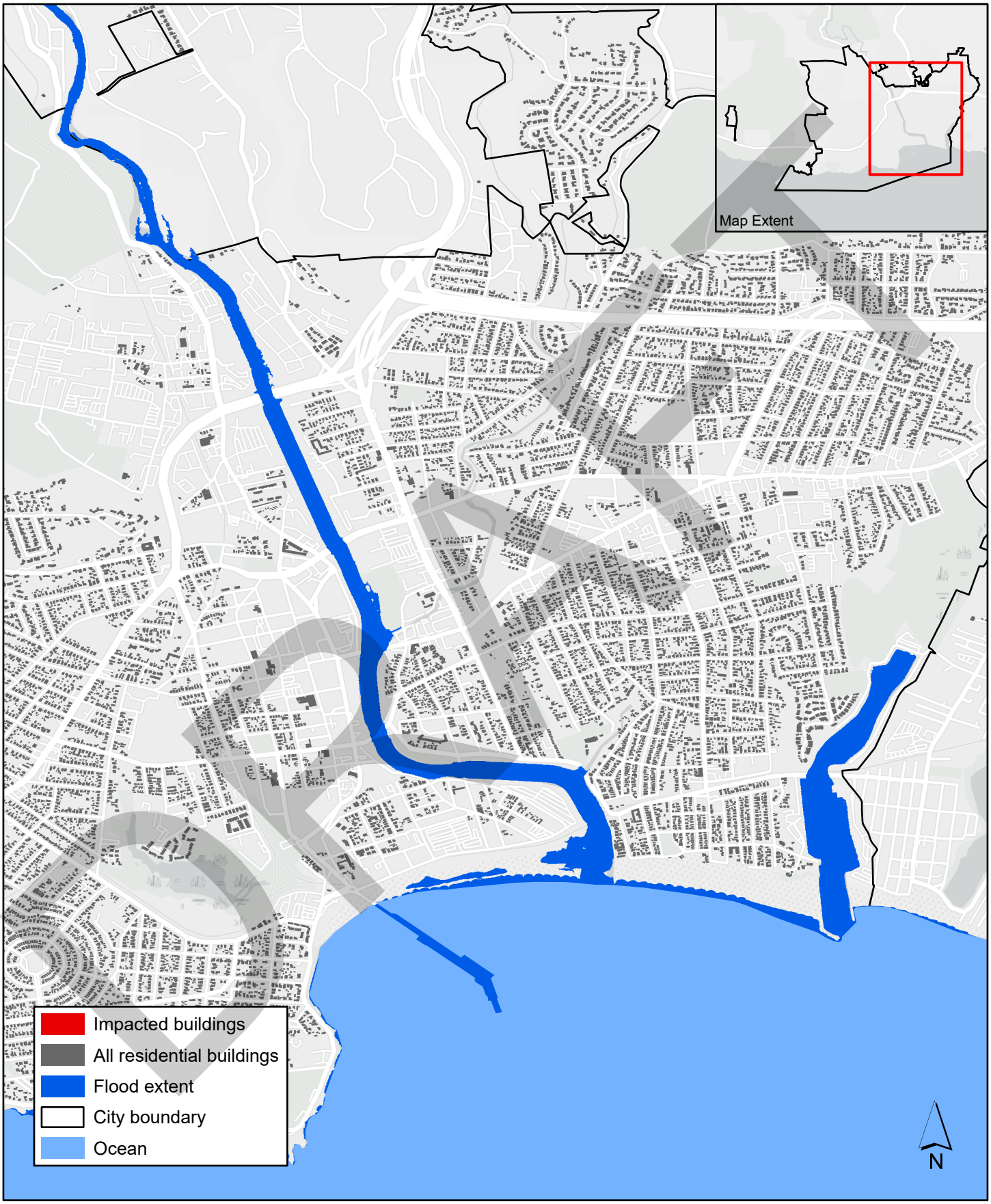
Santa Cruz Area 1

Sea Level Rise 0.0 m - No storm



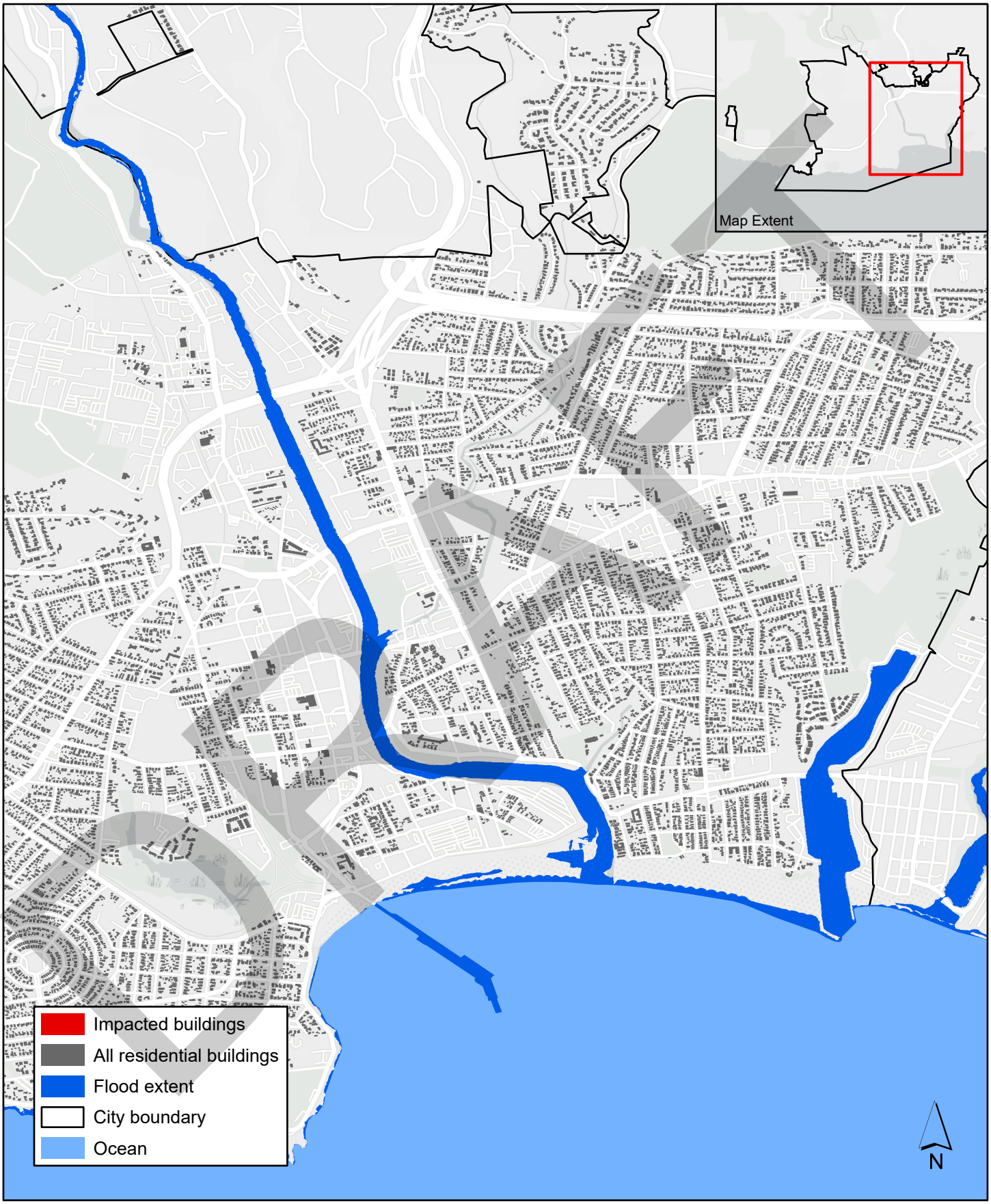
Santa Cruz Area 1

Sea Level Rise 0.0 m - 001 year storm



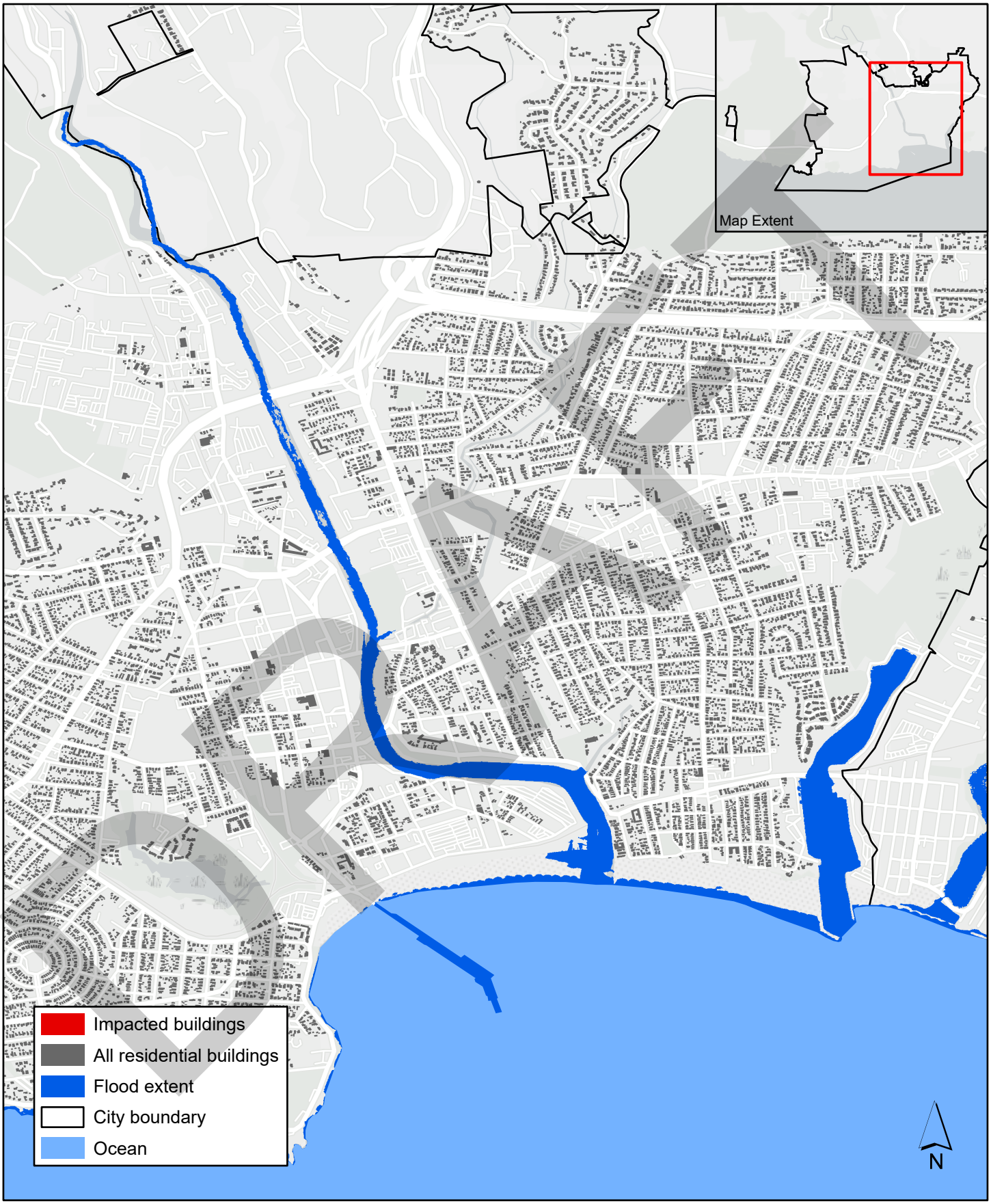
Santa Cruz Area 1

Sea Level Rise 0.0 m - 020 year storm



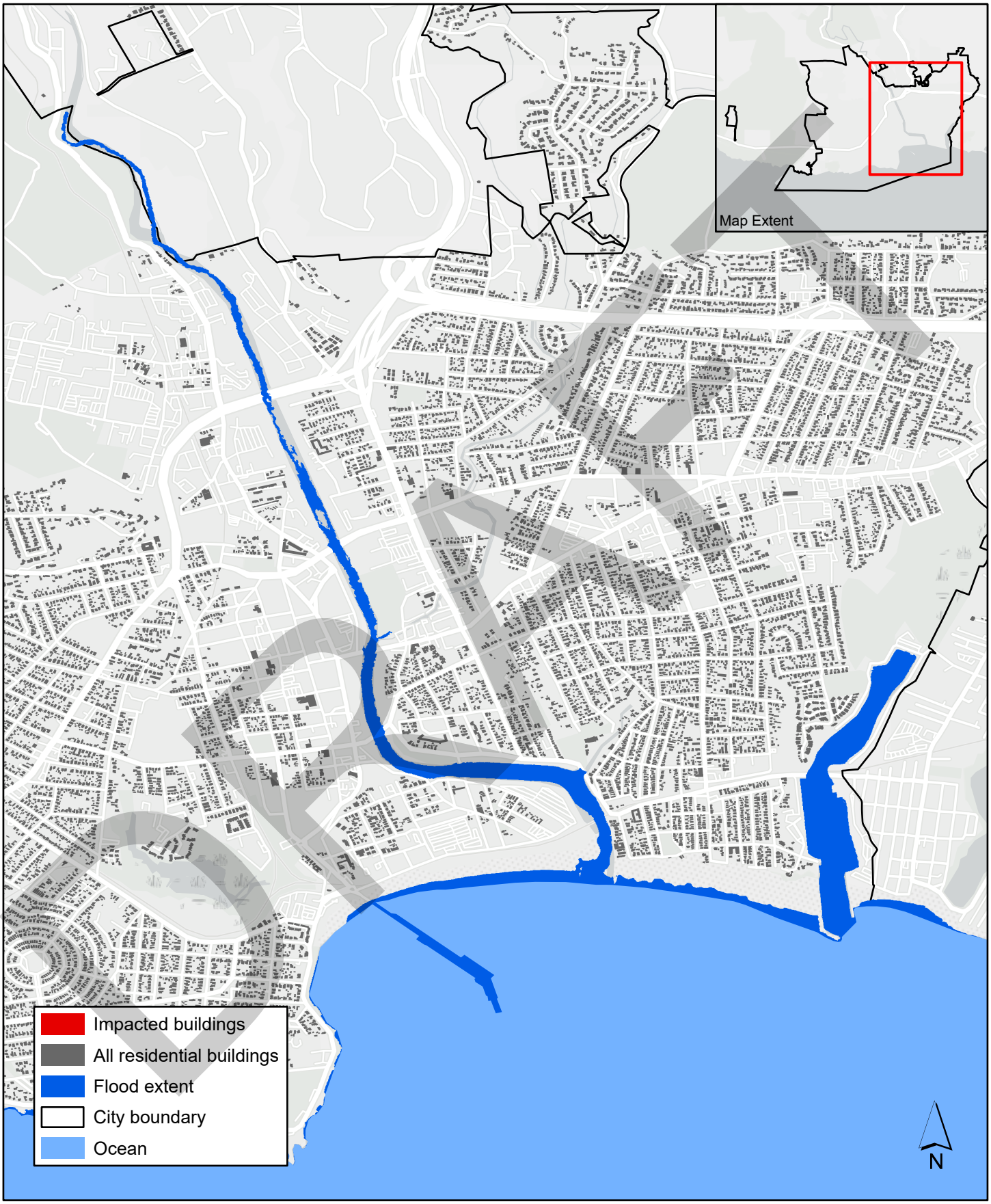
Santa Cruz Area 1

Sea Level Rise 0.0 m - 100 year storm



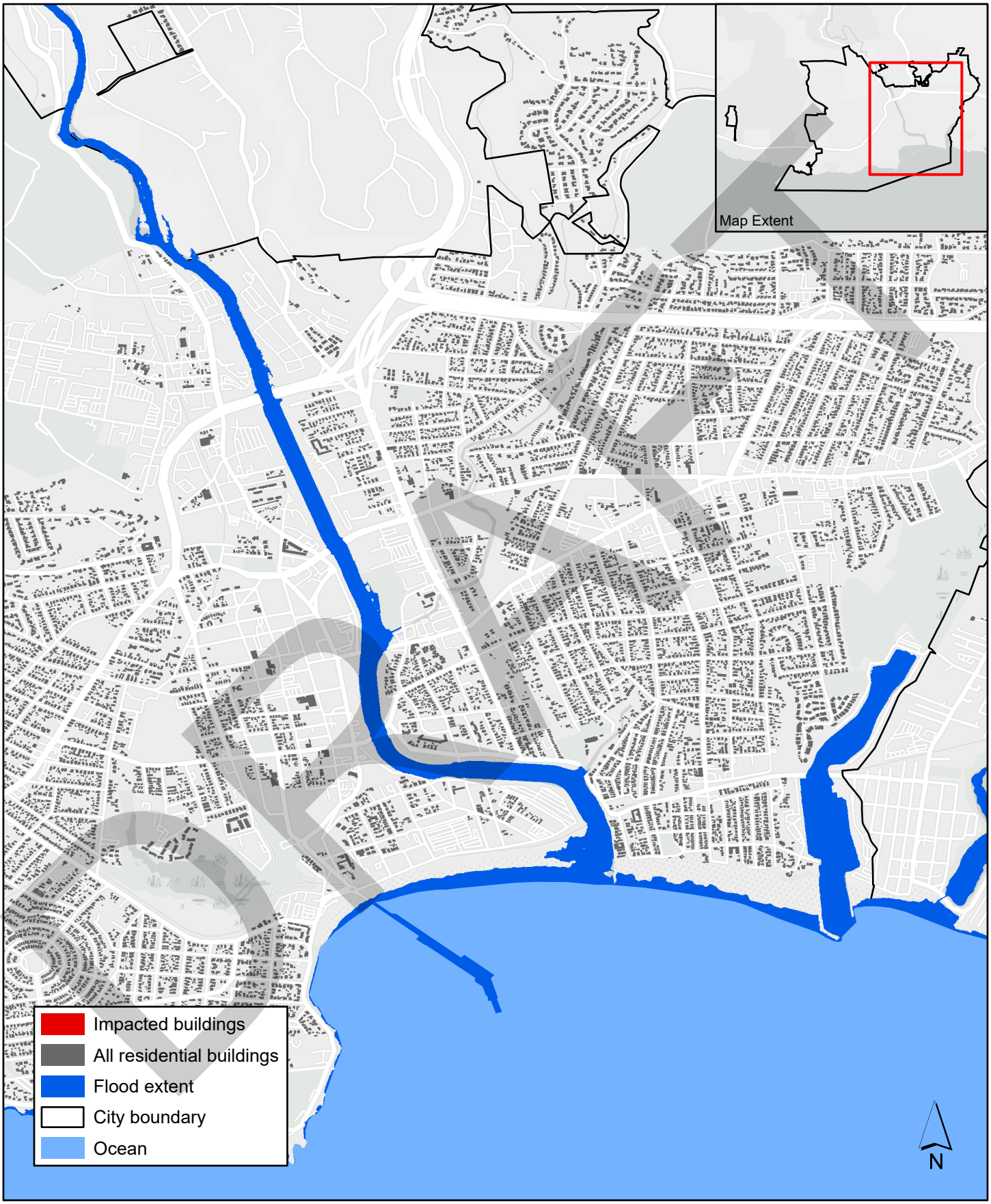
Santa Cruz Area 1

Sea Level Rise 0.25 m - No storm



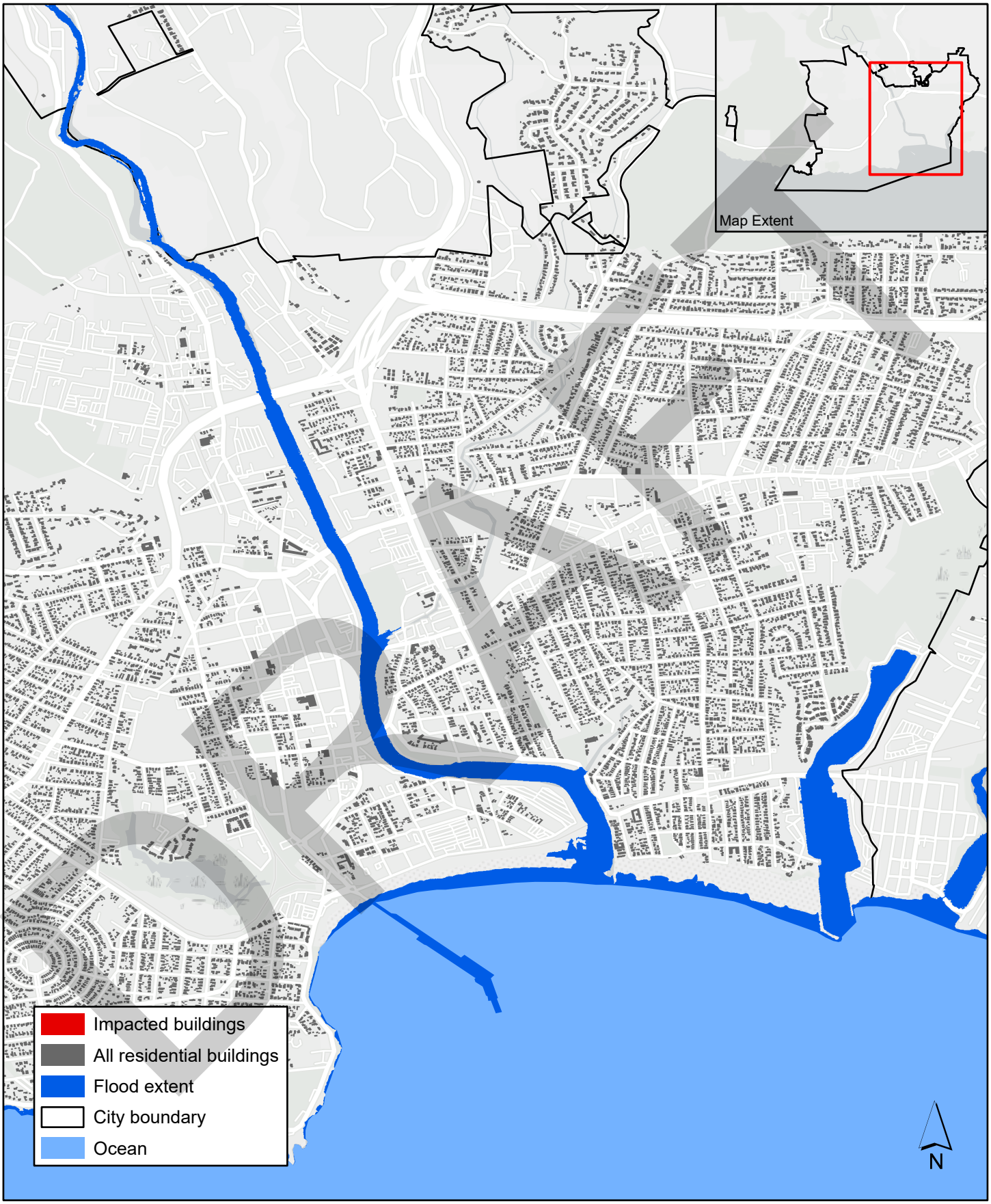
Santa Cruz Area 1

Sea Level Rise 0.25 m - 001 year storm



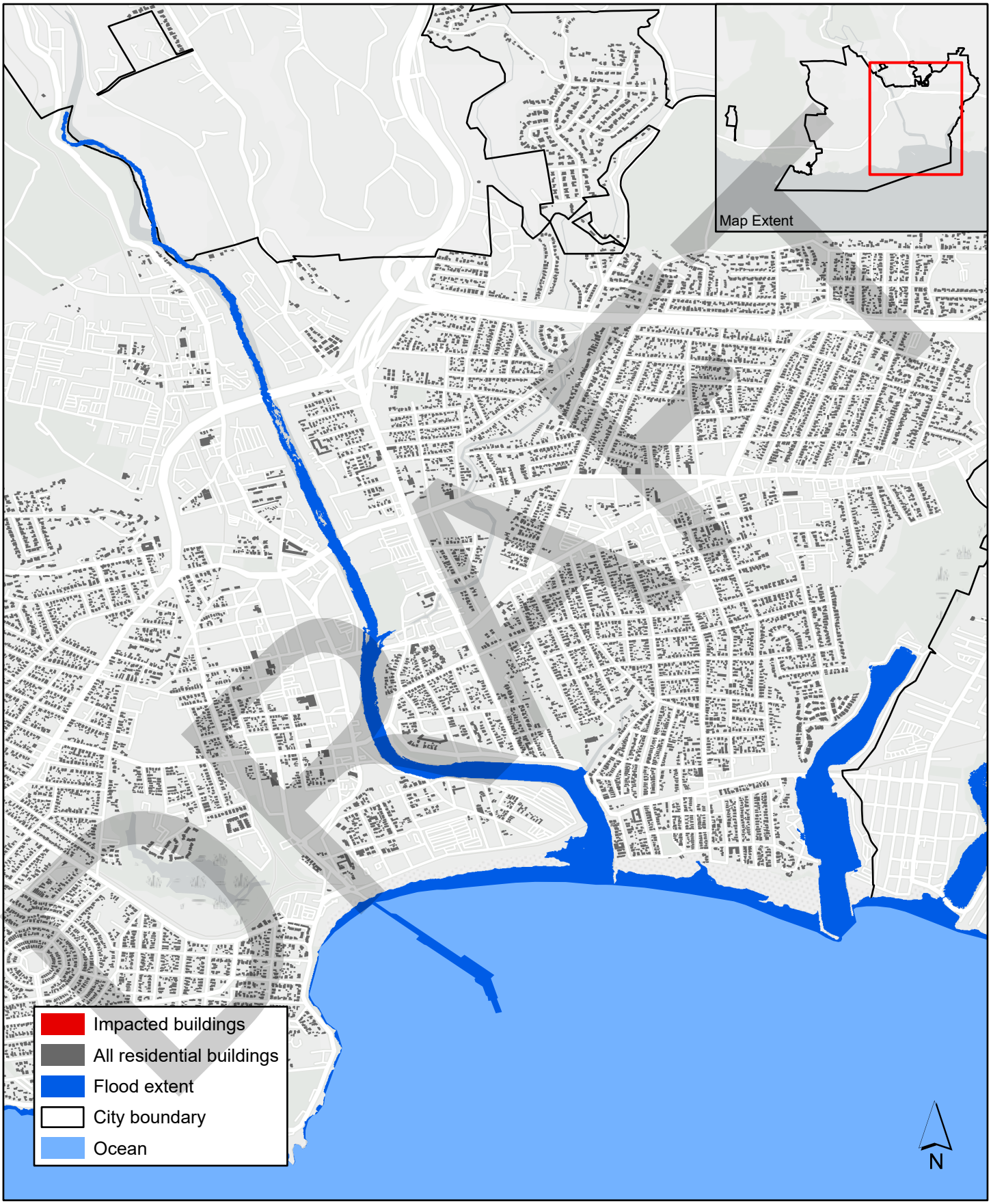
Santa Cruz Area 1

Sea Level Rise 0.25 m - 020 year storm



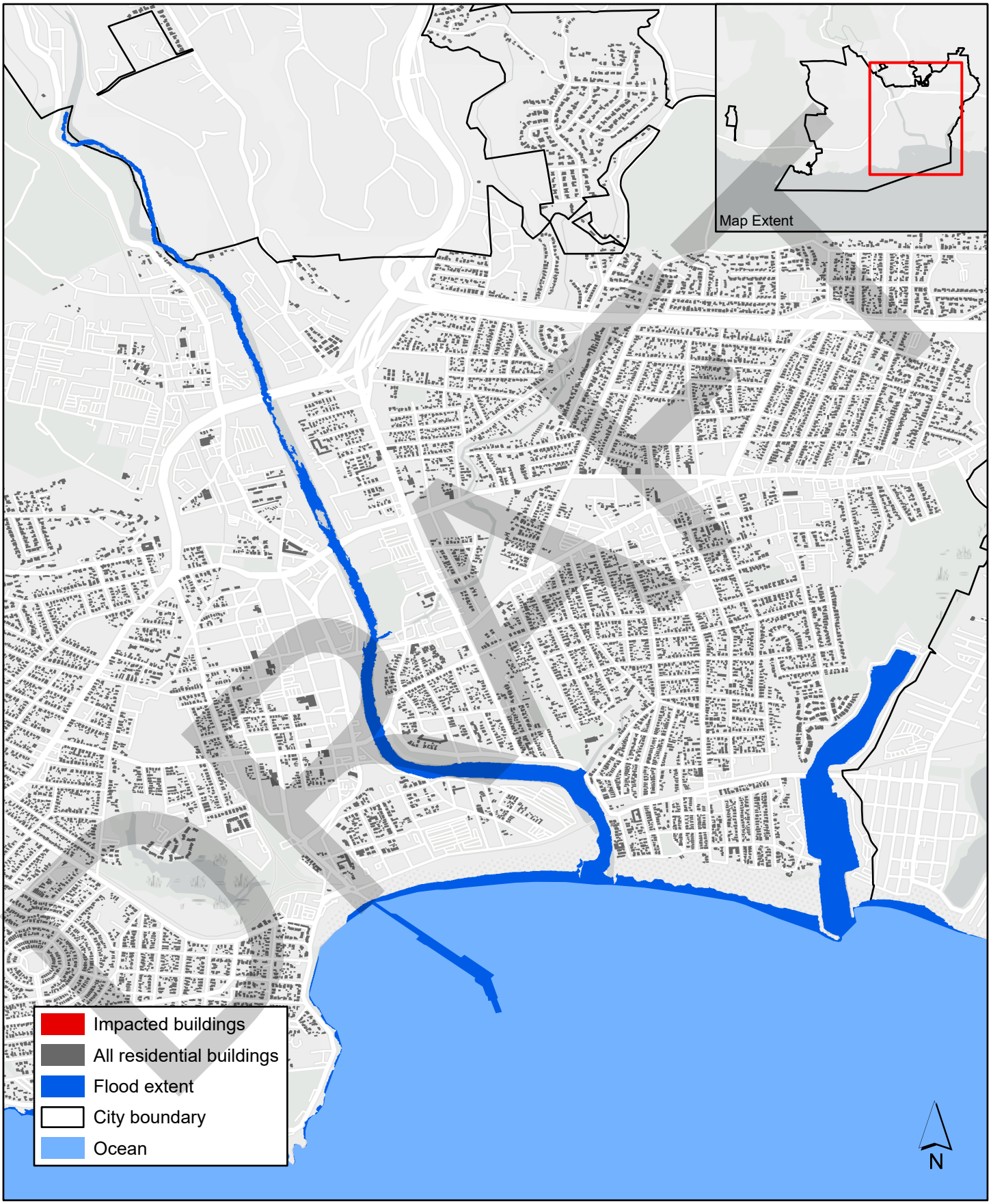
Santa Cruz Area 1

Sea Level Rise 0.25 m - 100 year storm



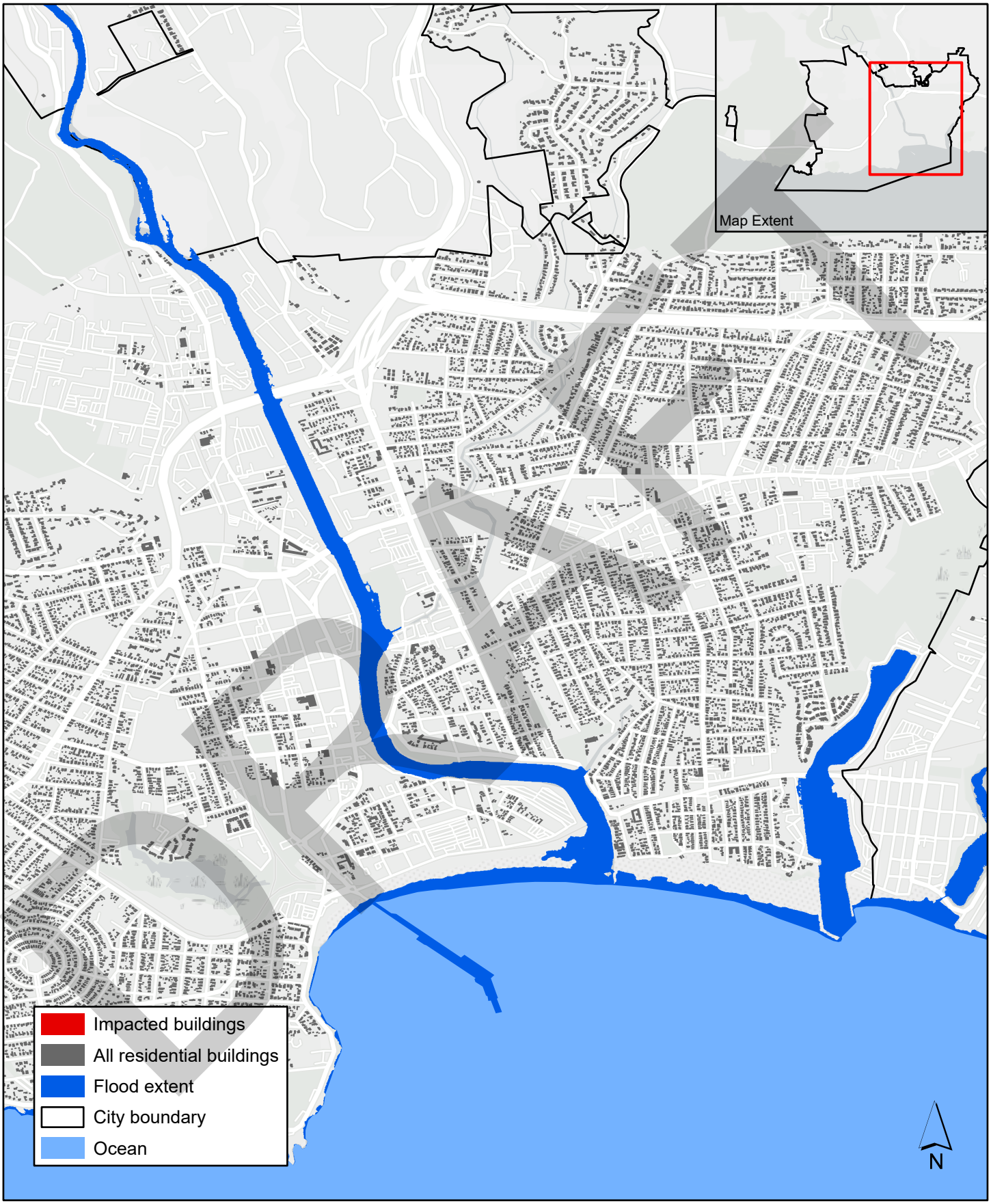
Santa Cruz Area 1

Sea Level Rise 0.5 m - No storm



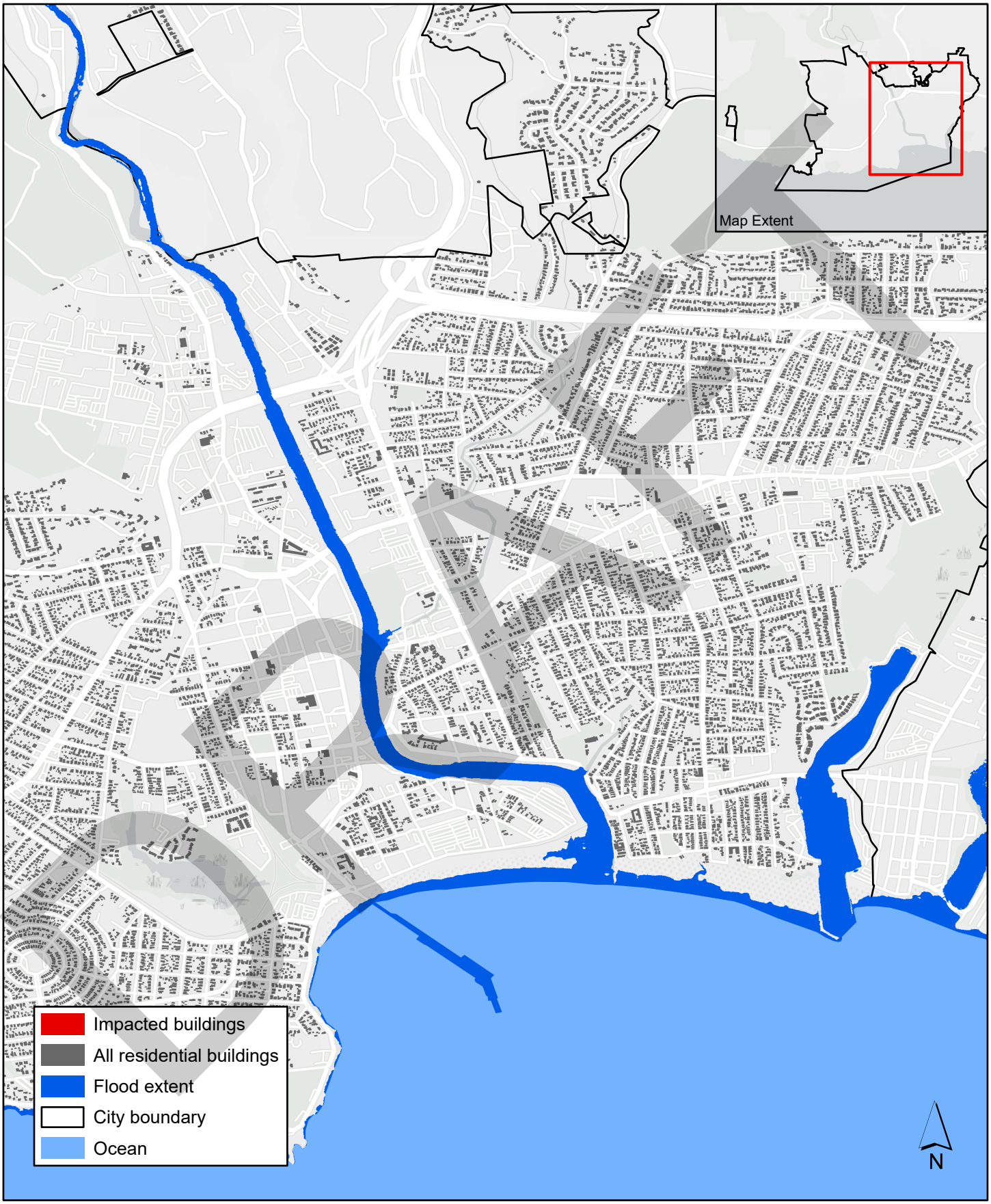
Santa Cruz Area 1

Sea Level Rise 0.5 m - 001 year storm



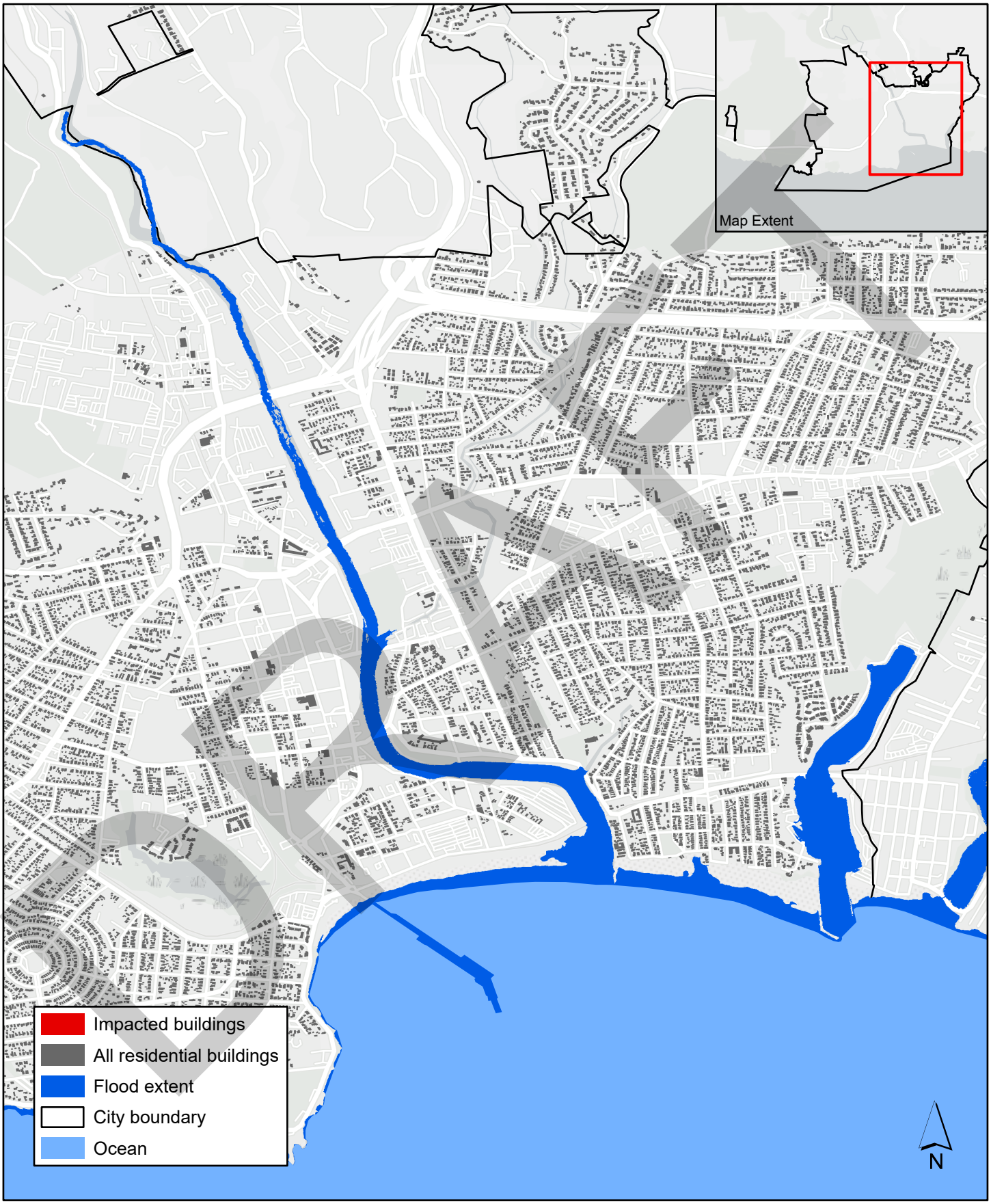
Santa Cruz Area 1

Sea Level Rise 0.5 m - 020 year storm



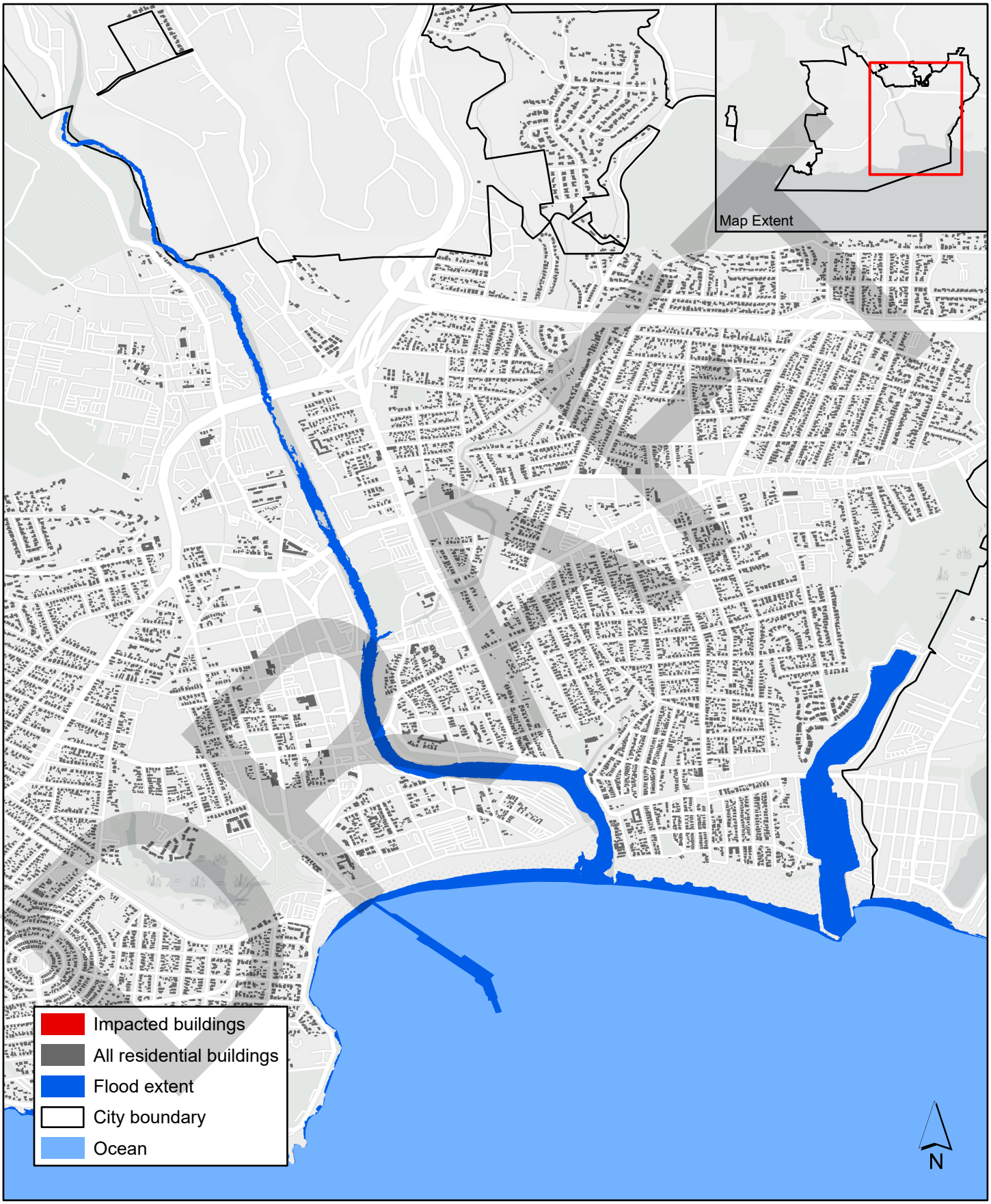
Santa Cruz Area 1

Sea Level Rise 0.5 m - 100 year storm



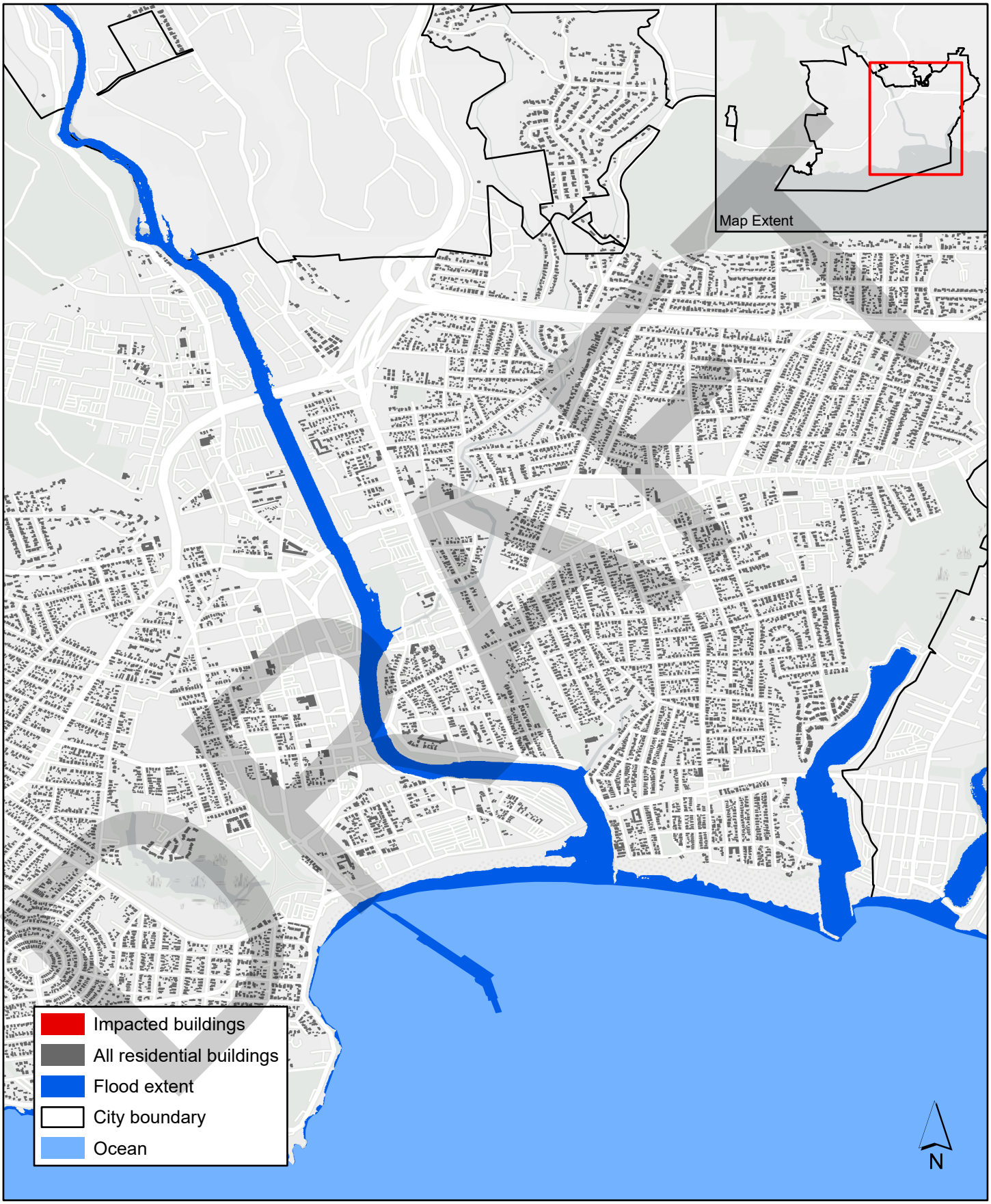
Santa Cruz Area 1

Sea Level Rise 0.75 m - No storm



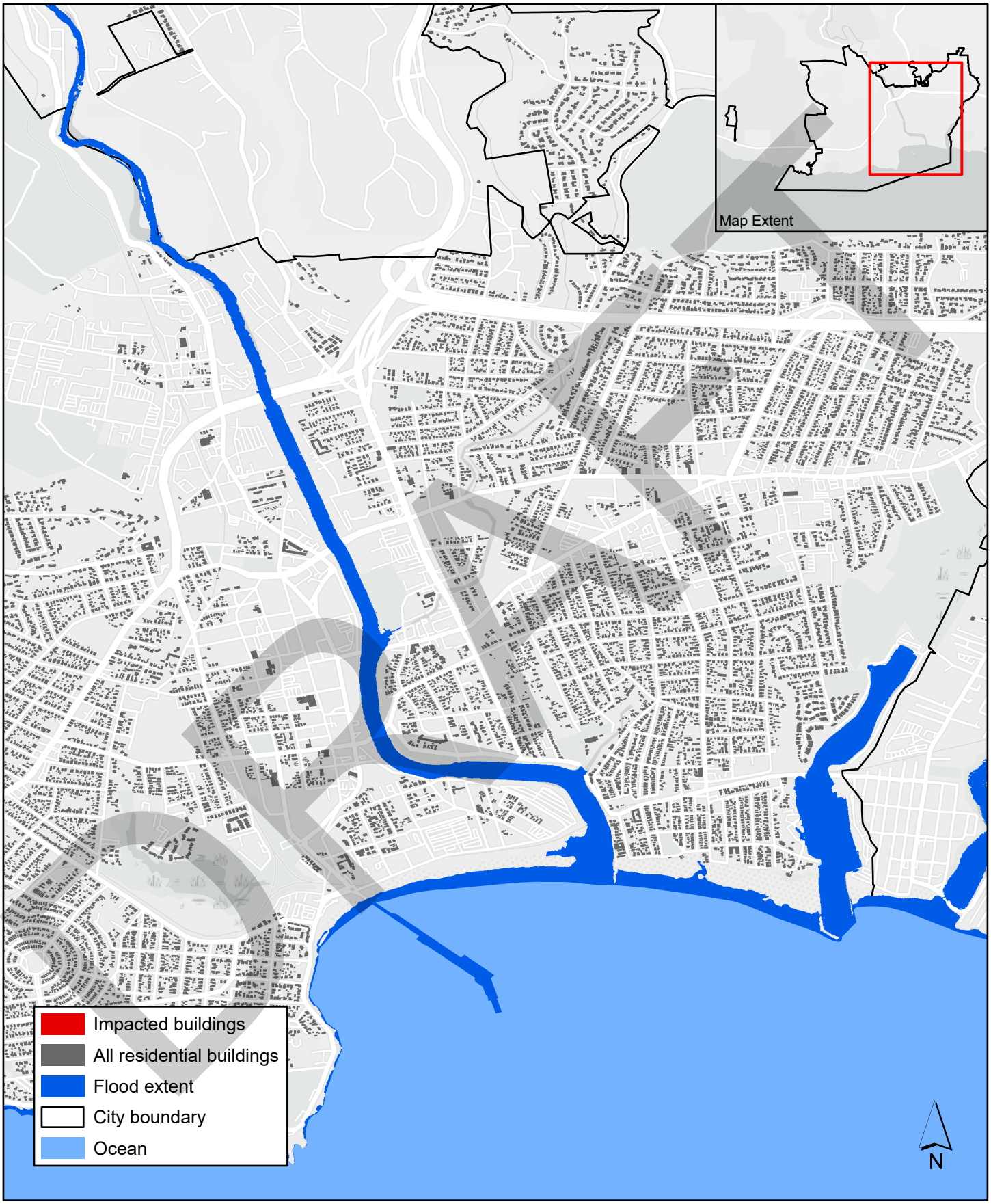
Santa Cruz Area 1

Sea Level Rise 0.75 m - 001 year storm



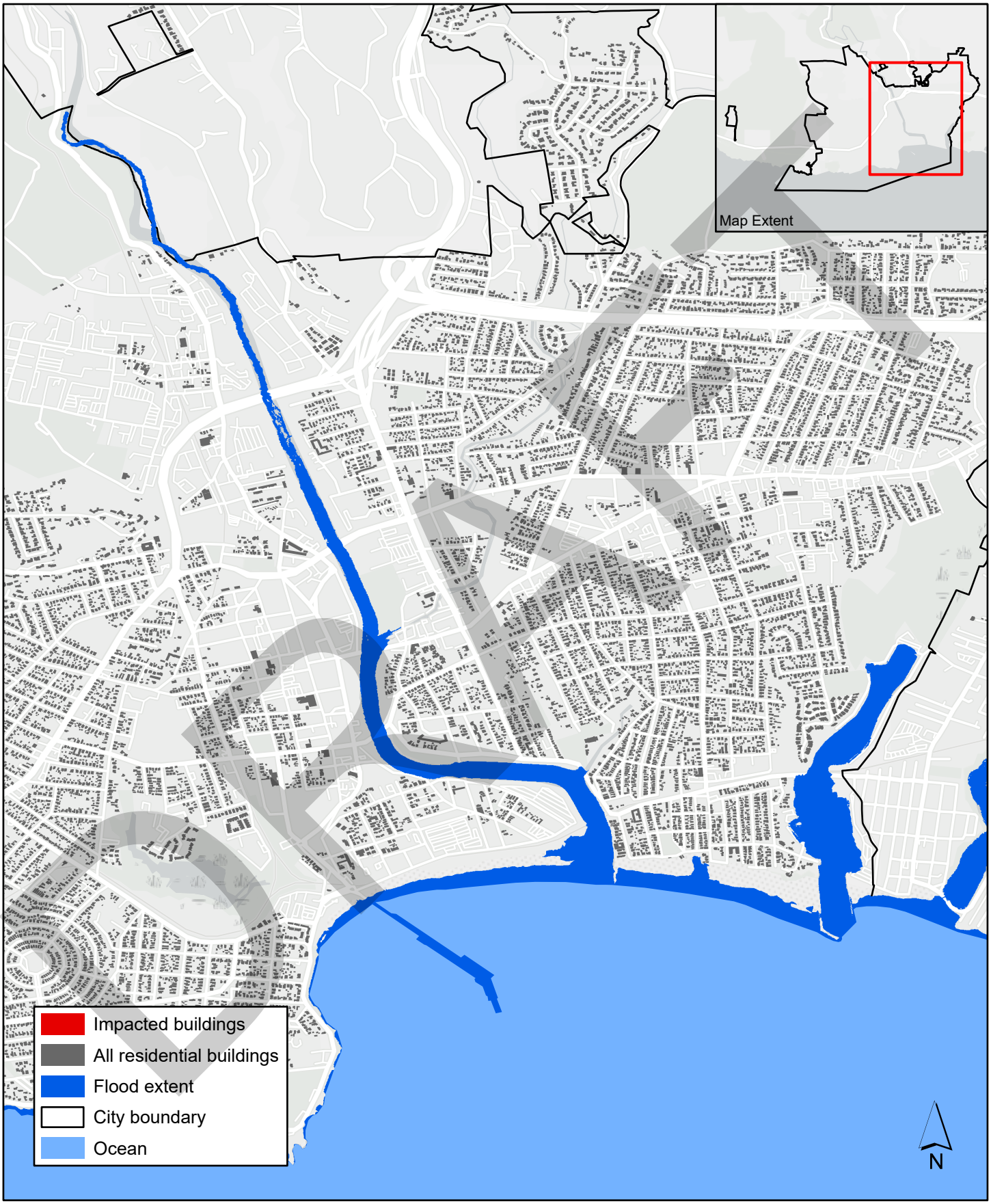
Santa Cruz Area 1

Sea Level Rise 0.75 m - 020 year storm



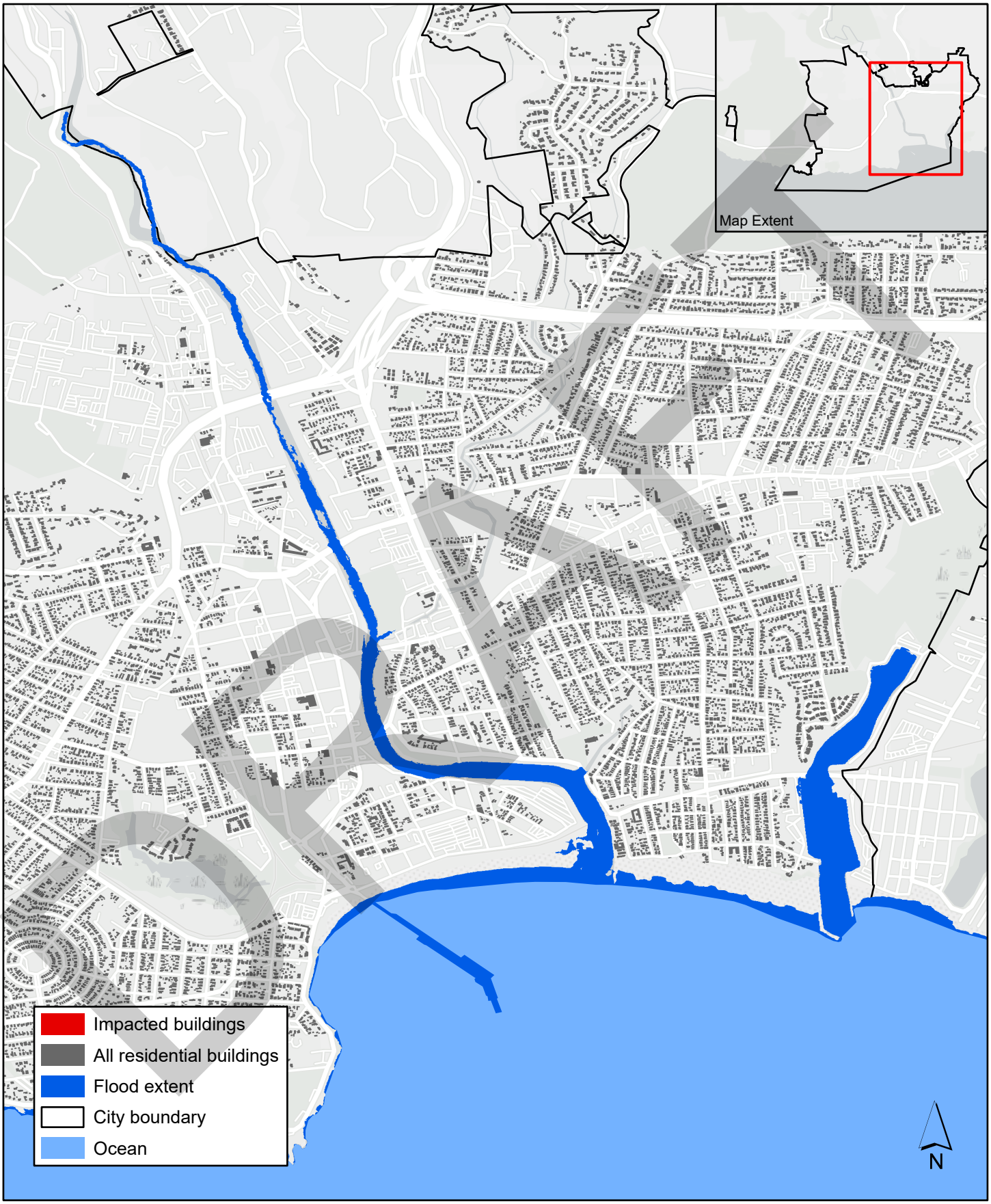
Santa Cruz Area 1

Sea Level Rise 0.75 m - 100 year storm



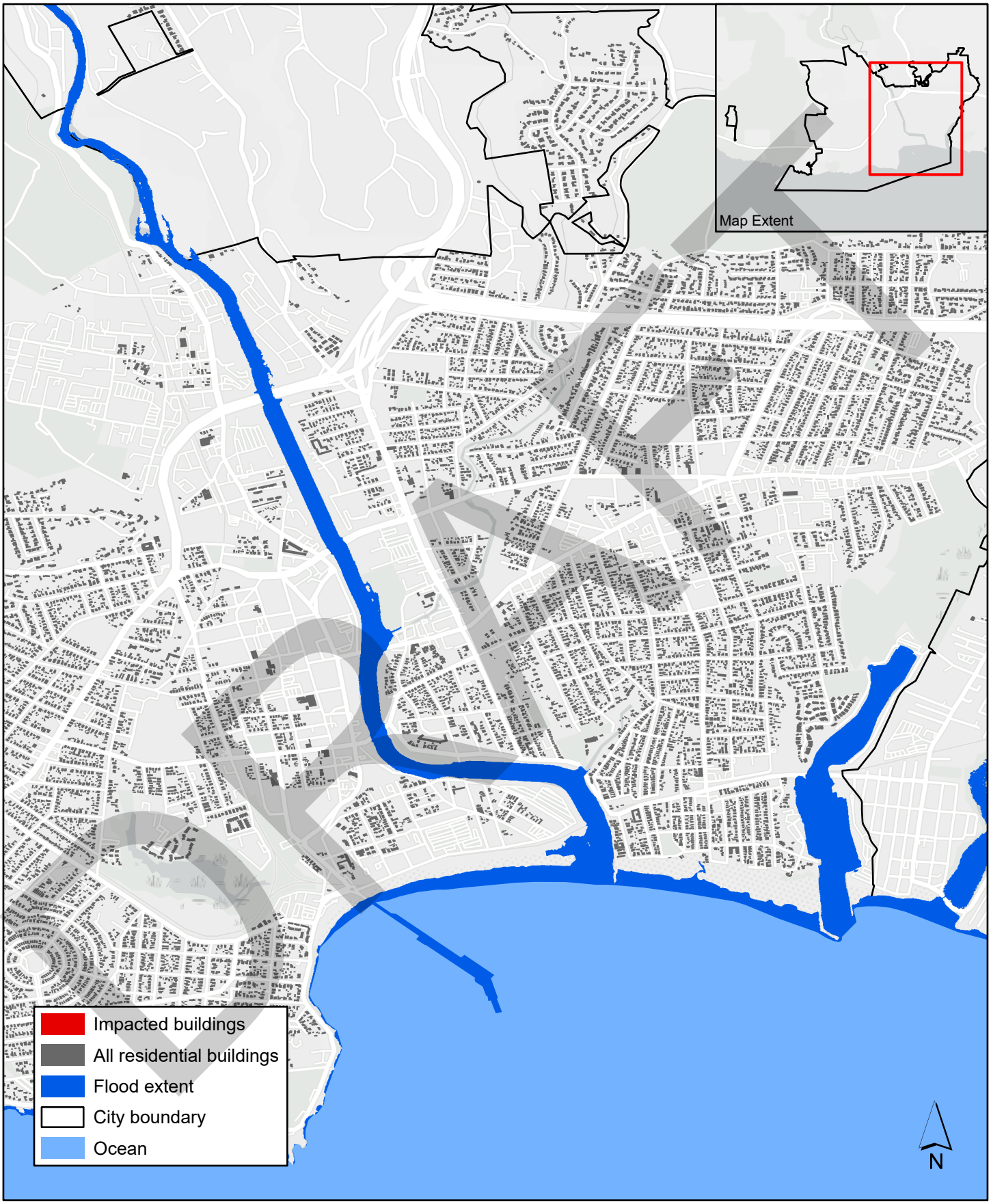
Santa Cruz Area 1

Sea Level Rise 1.0 m - No storm



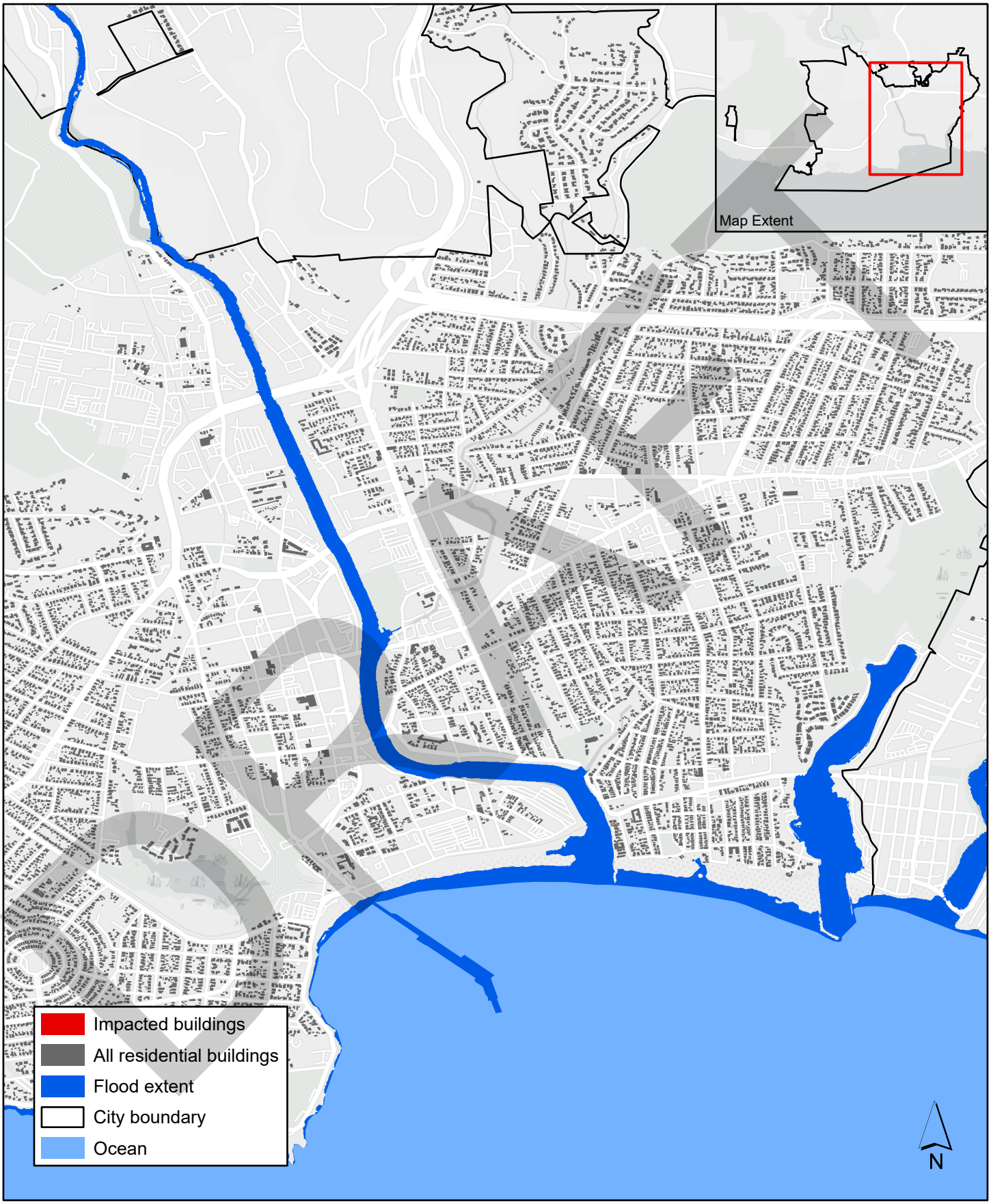
Santa Cruz Area 1

Sea Level Rise 1.0 m - 001 year storm



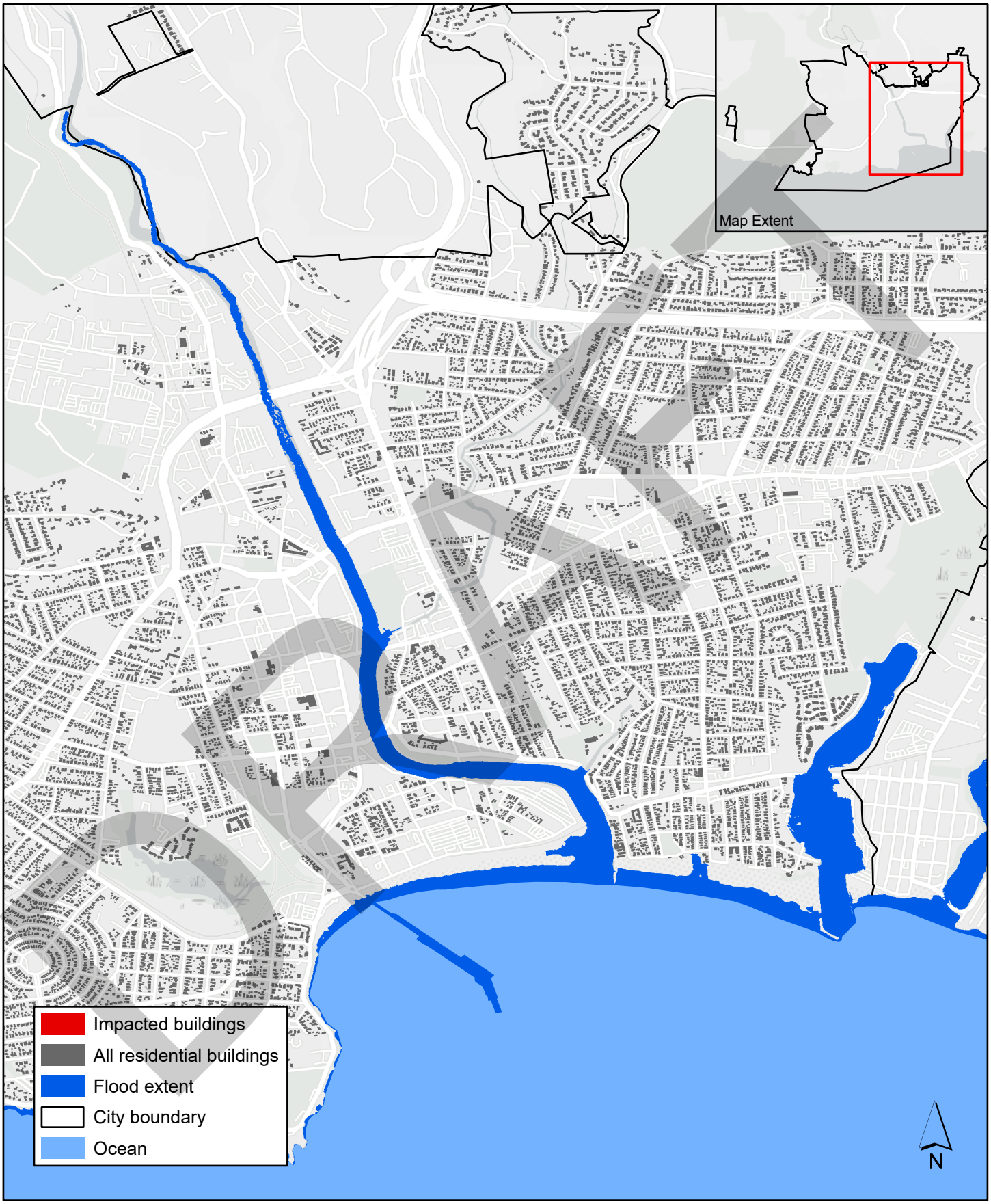
Santa Cruz Area 1

Sea Level Rise 1.0 m - 020 year storm



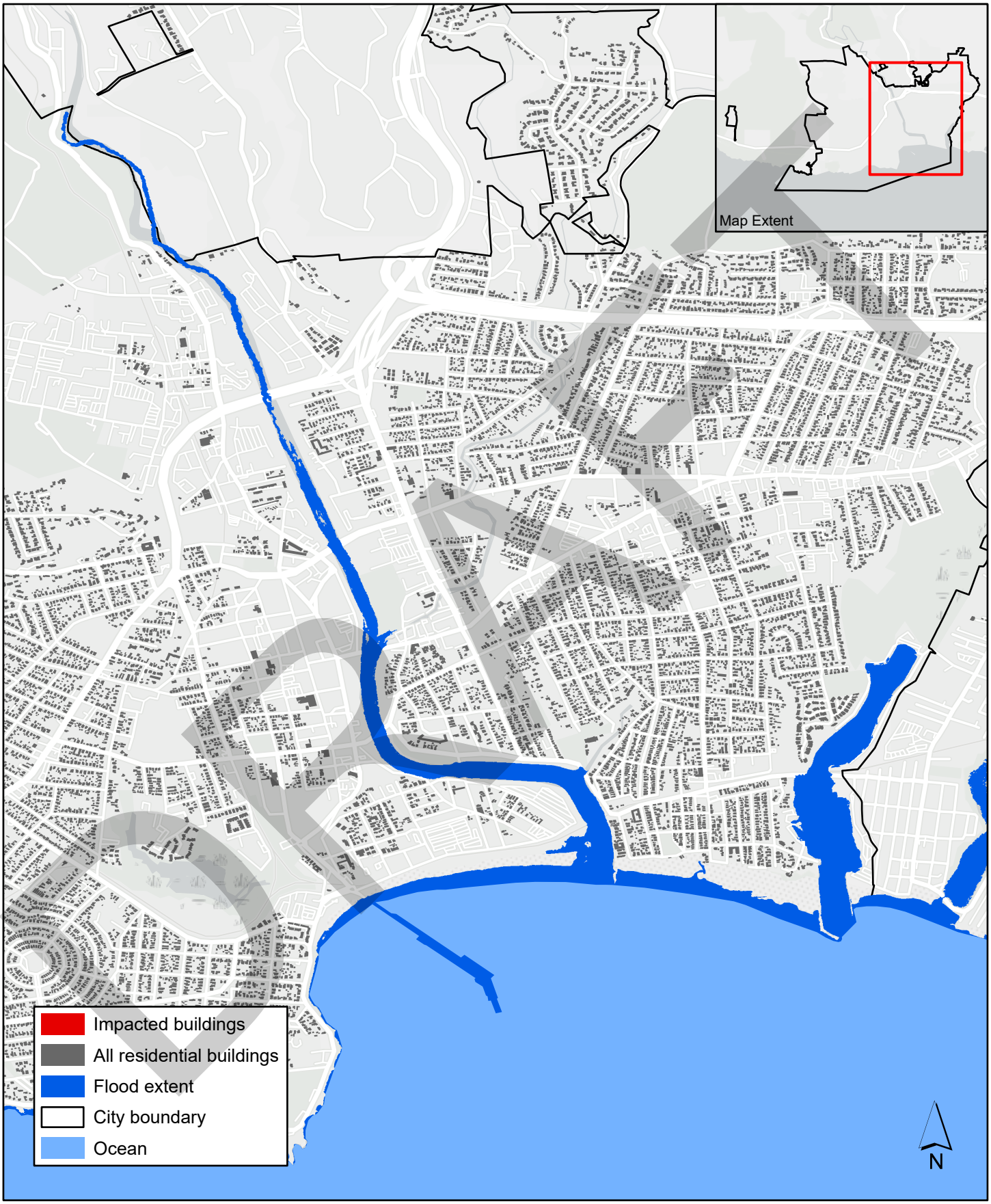
Santa Cruz Area 1

Sea Level Rise 1.0 m - 100 year storm



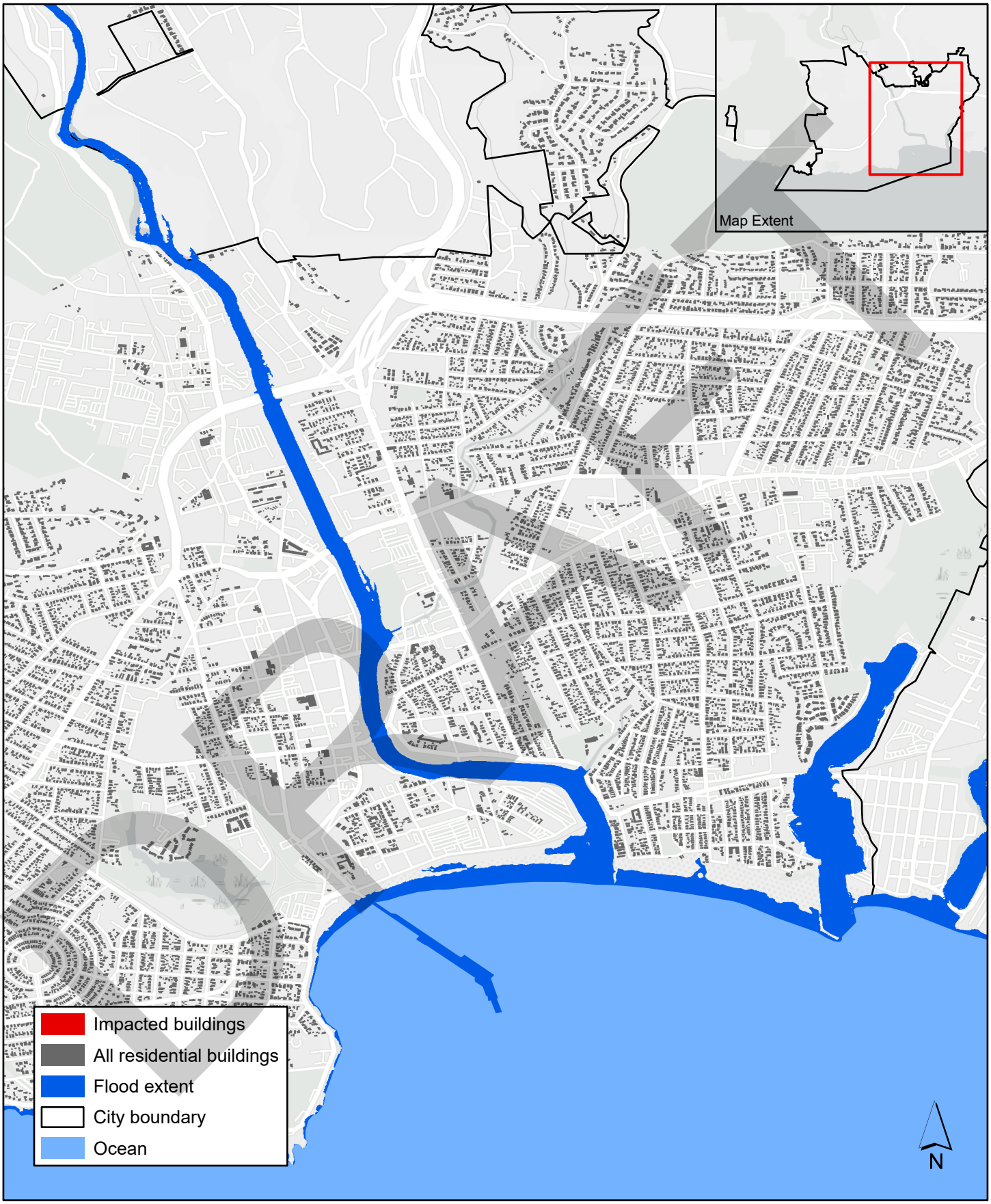
Santa Cruz Area 1

Sea Level Rise 1.5 m - No storm



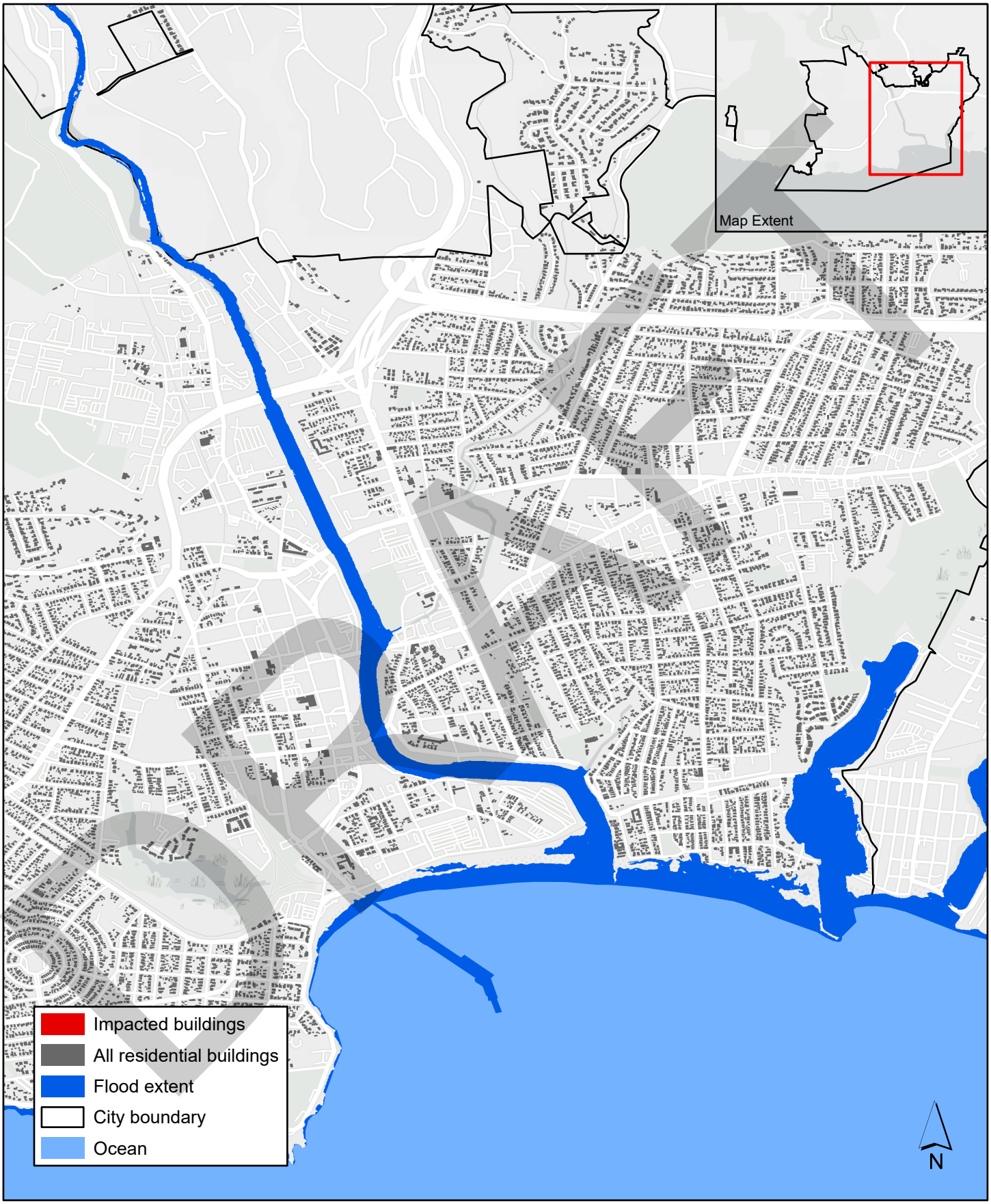
Santa Cruz Area 1

Sea Level Rise 1.5 m - 001 year storm



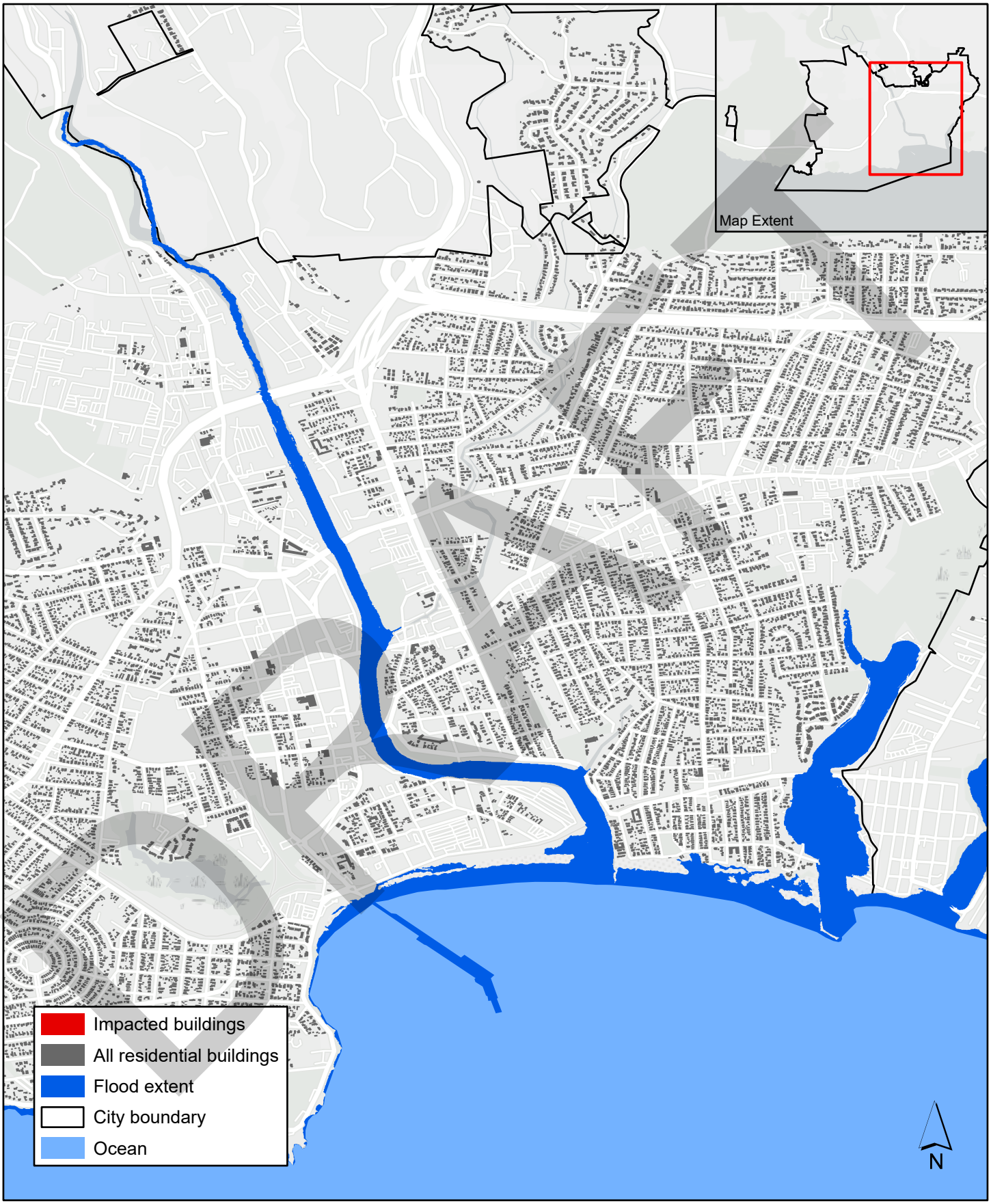
Santa Cruz Area 1

Sea Level Rise 1.5 m - 020 year storm



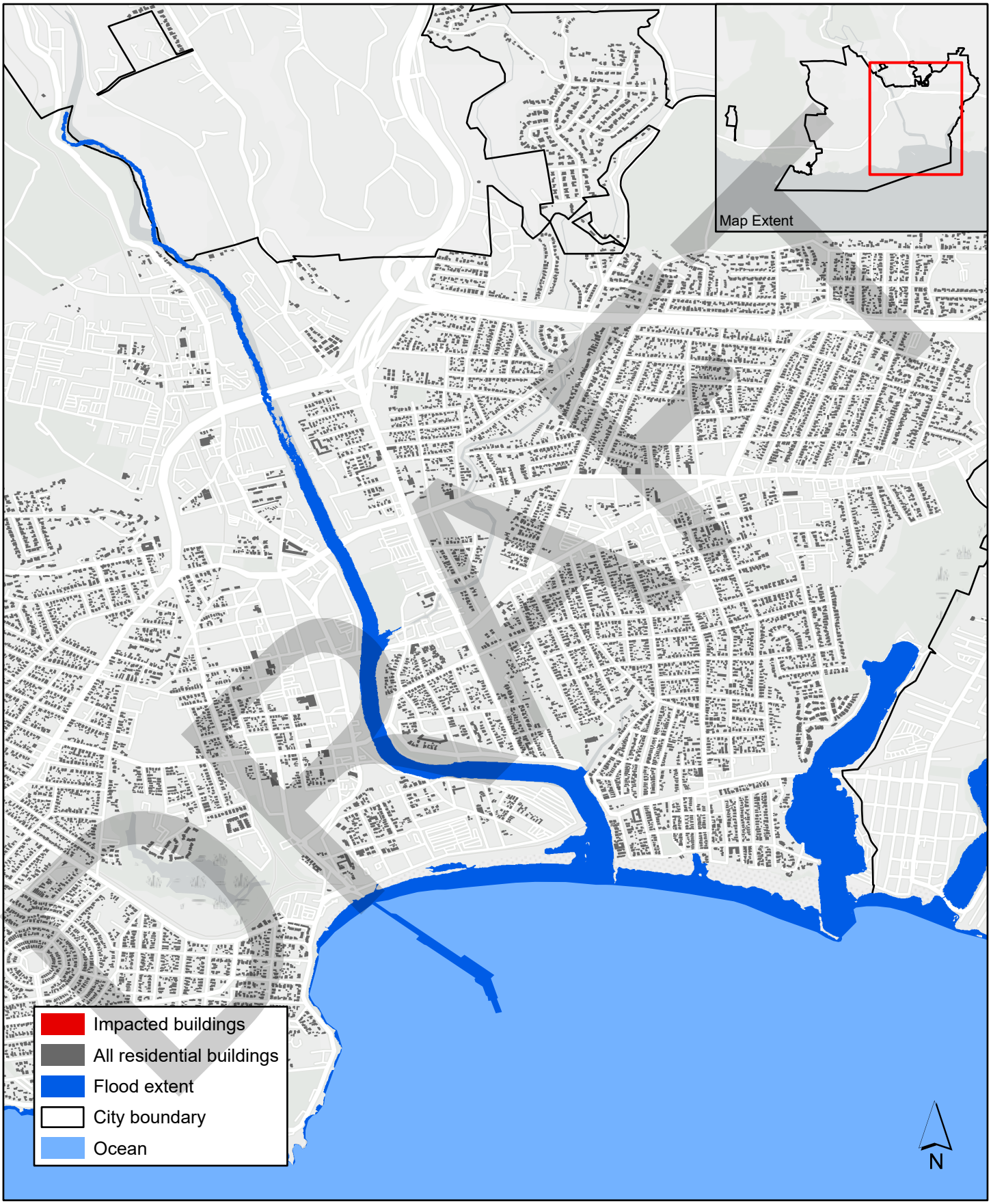
Santa Cruz Area 1

Sea Level Rise 1.5 m - 100 year storm



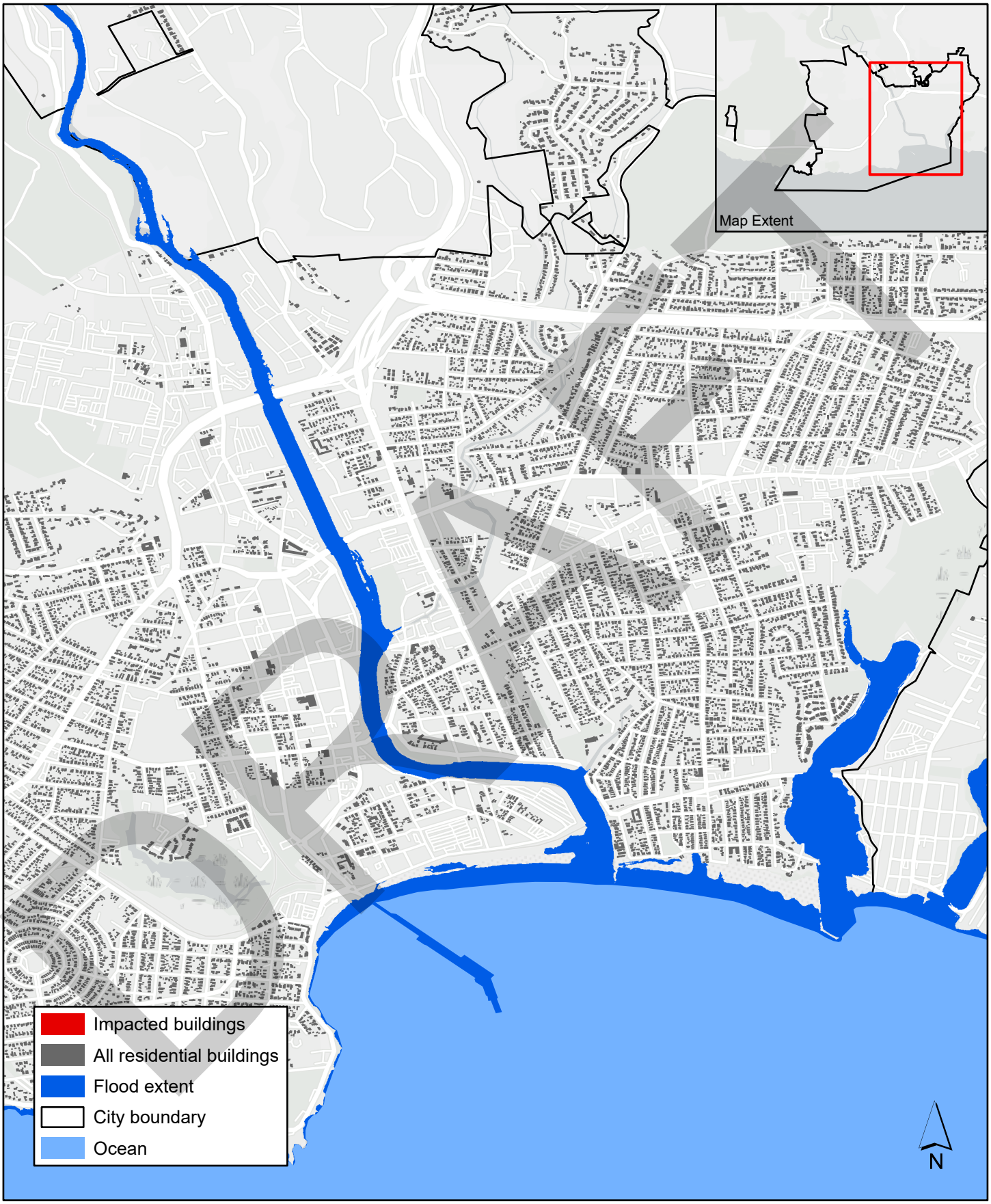
Santa Cruz Area 1

Sea Level Rise 2.0 m - No storm



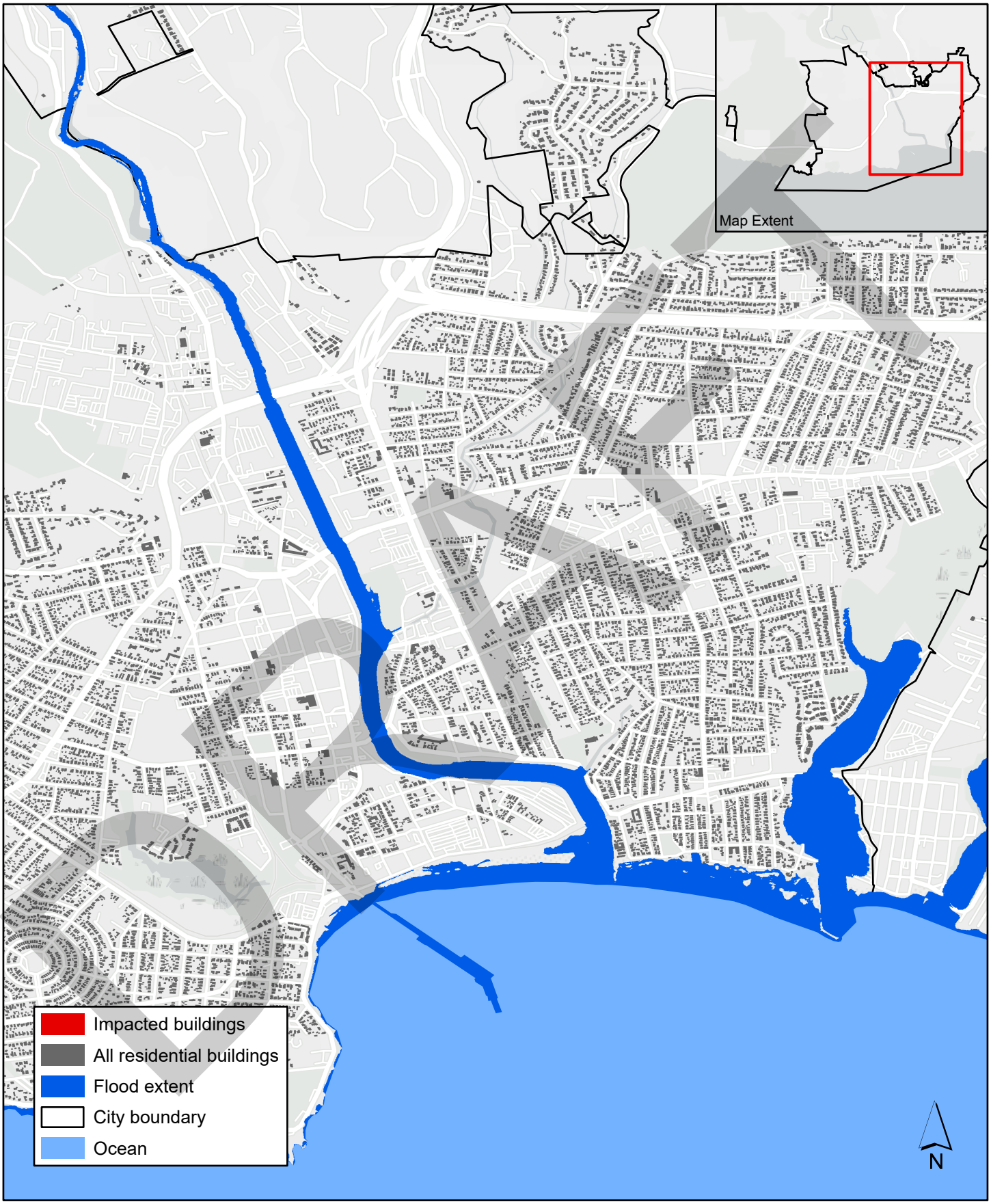
Santa Cruz Area 1

Sea Level Rise 2.0 m - 001 year storm



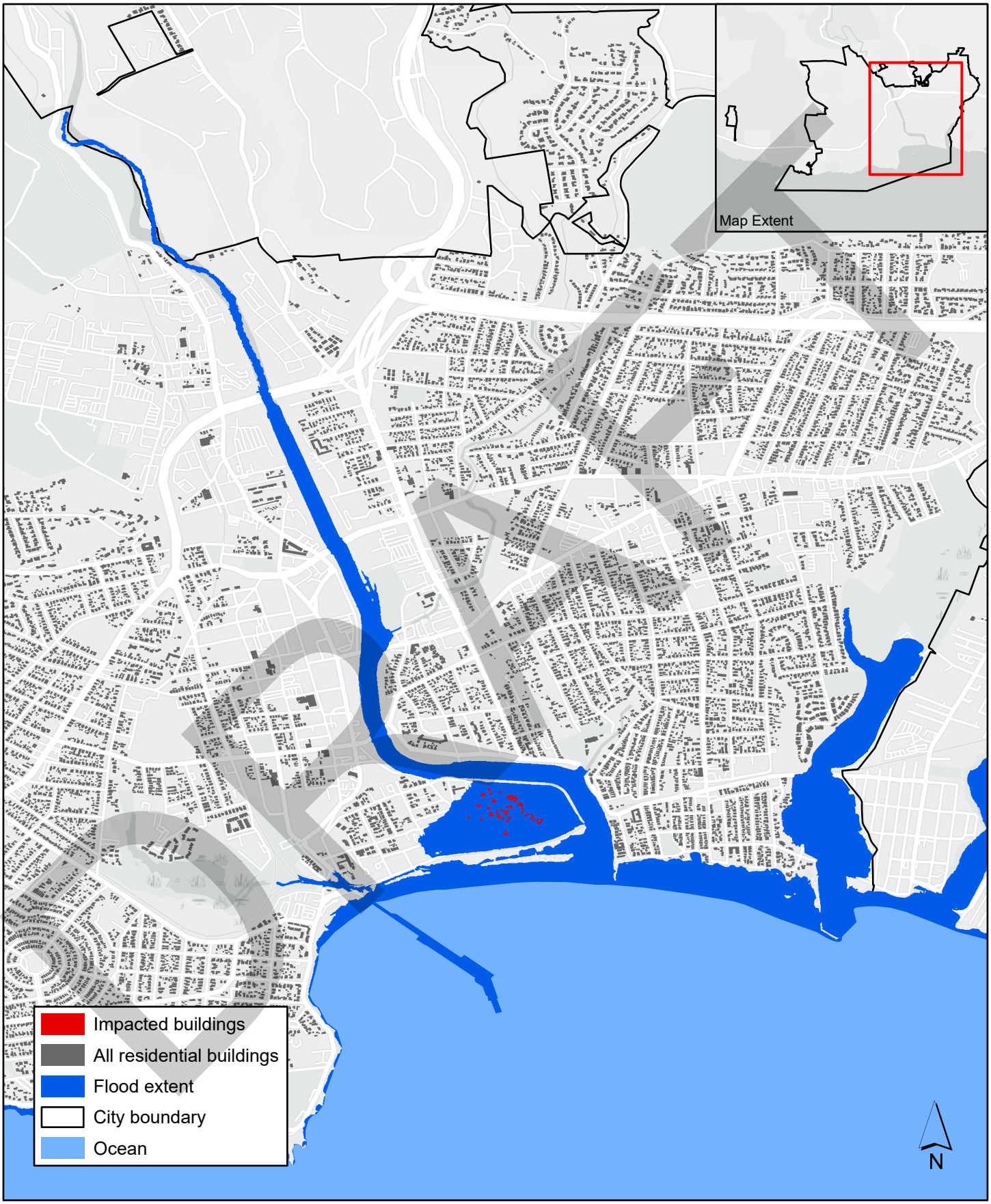
Santa Cruz Area 1

Sea Level Rise 2.0 m - 020 year storm



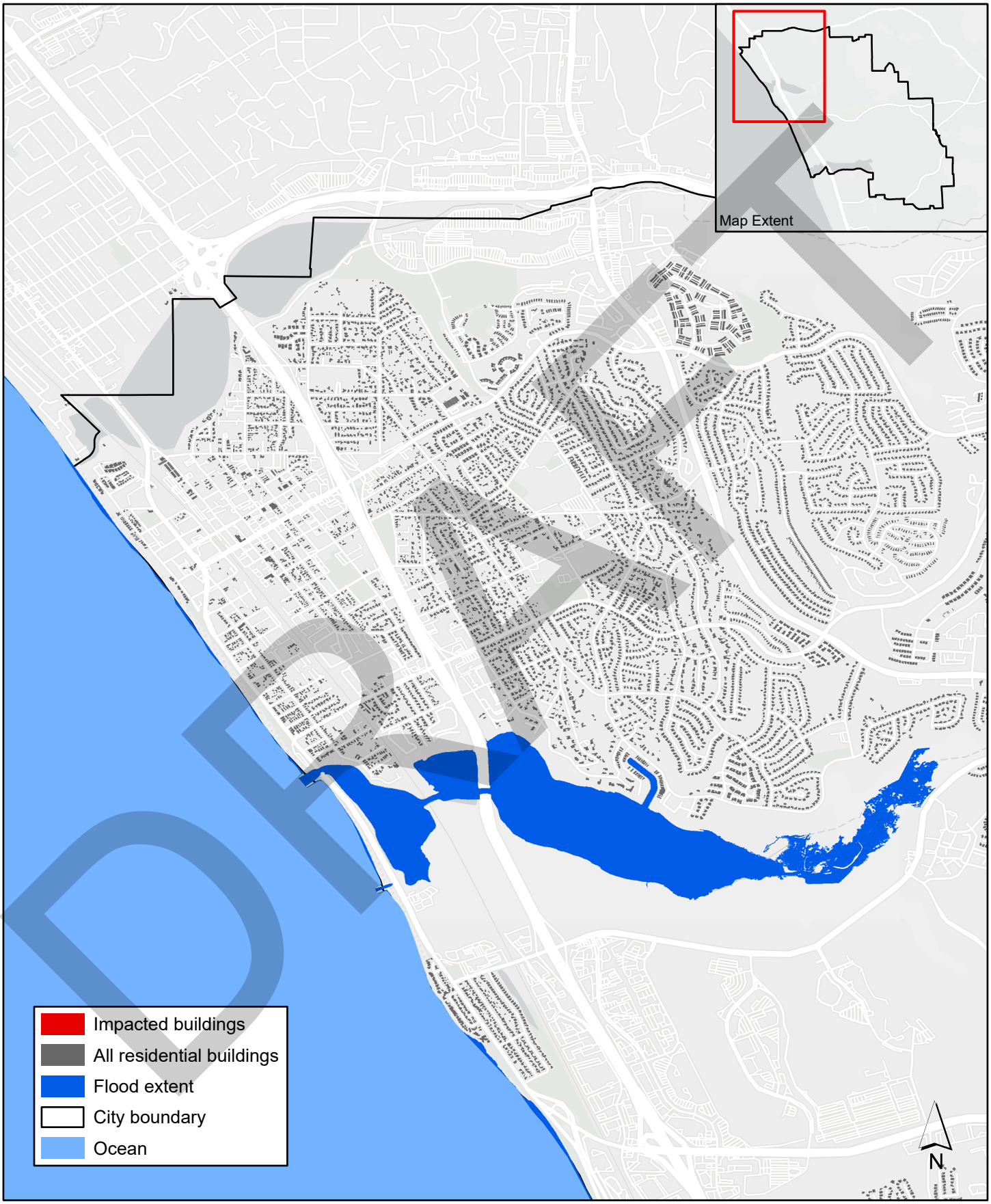
Santa Cruz Area 1

Sea Level Rise 2.0 m - 100 year storm



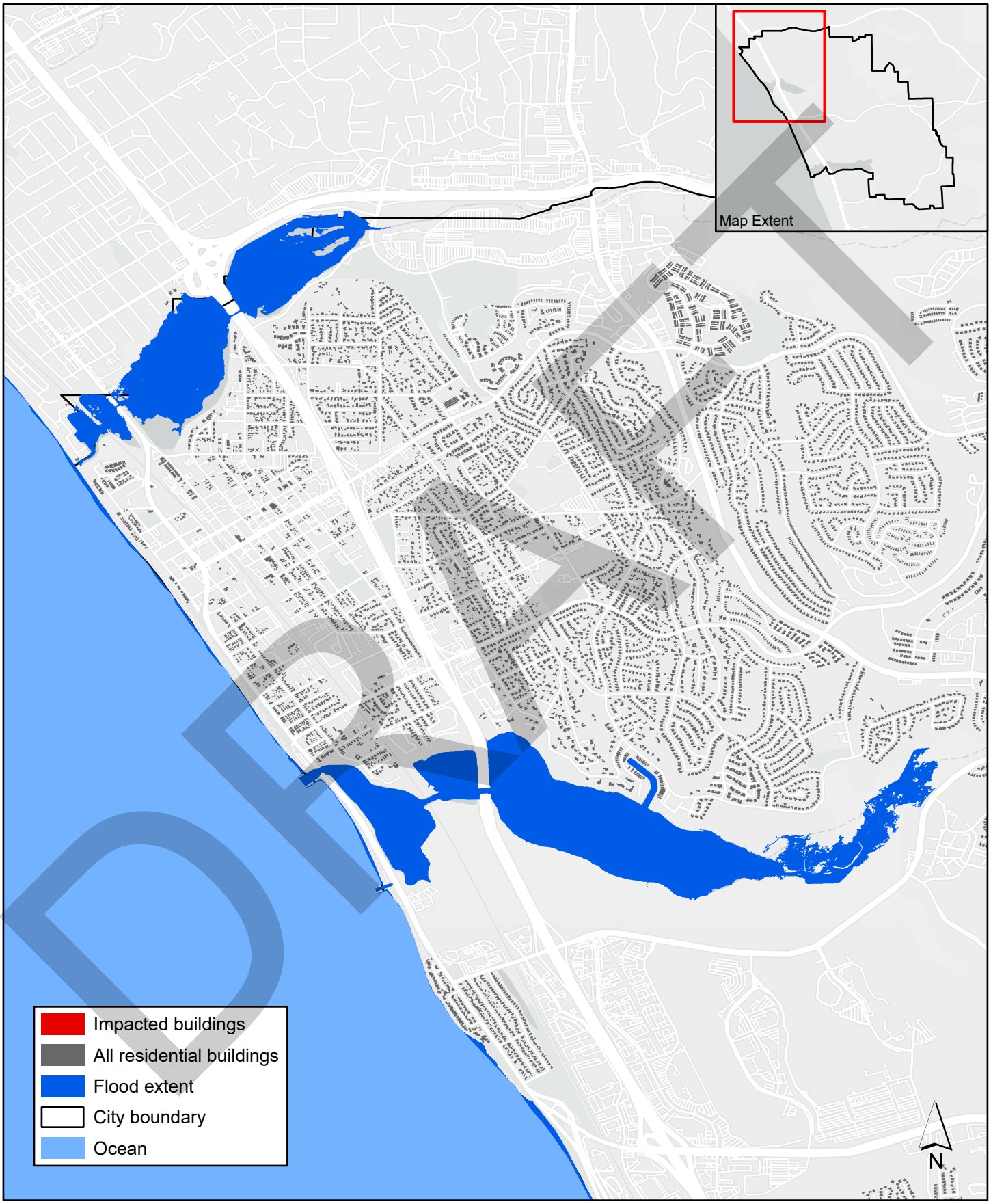
Carlsbad Area 1

Sea Level Rise 0.0 m - No storm



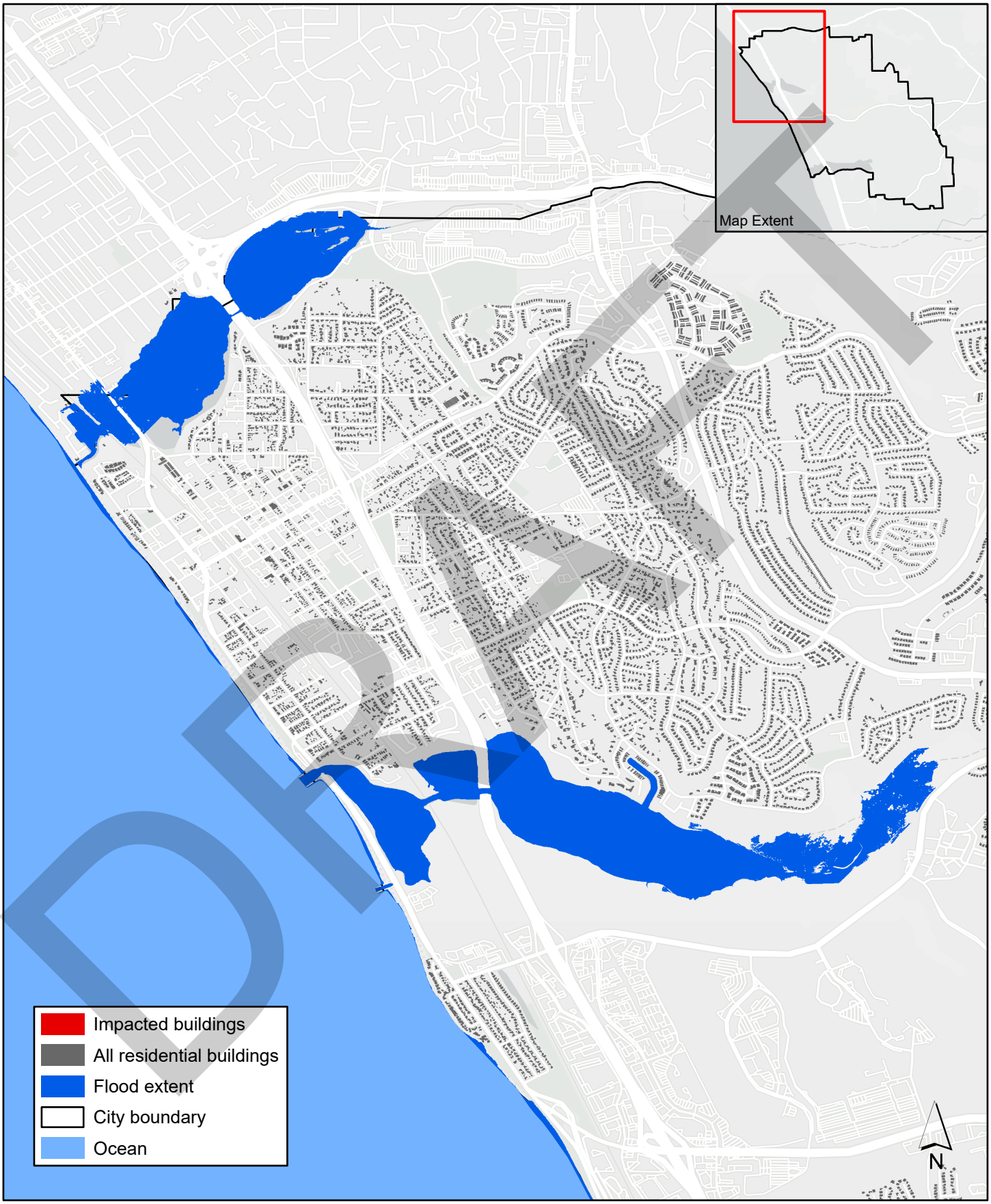
Carlsbad Area 1

Sea Level Rise 0.0 m - 001 year storm



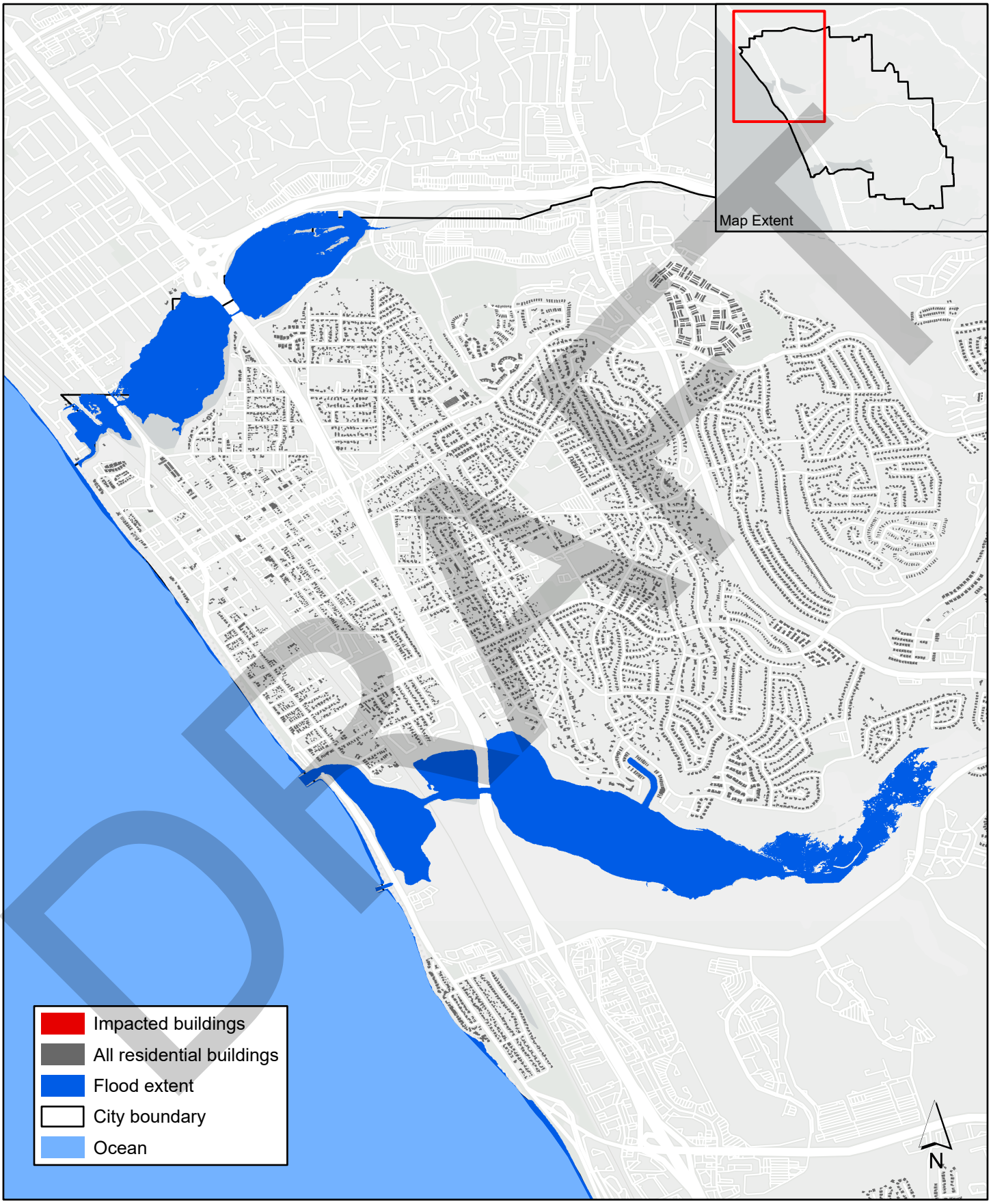
Carlsbad Area 1

Sea Level Rise 0.0 m - 020 year storm



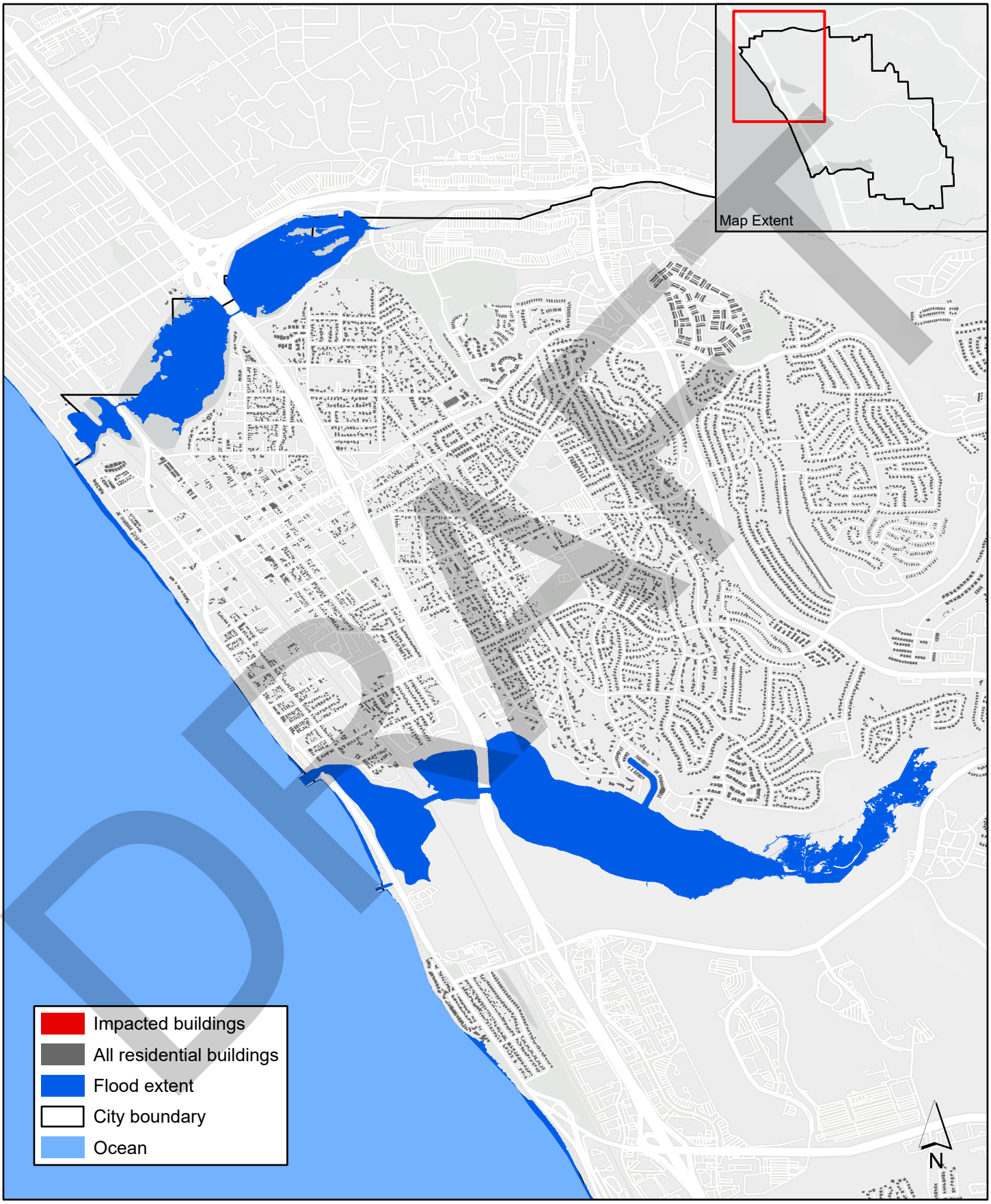
Carlsbad Area 1

Sea Level Rise 0.0 m - 100 year storm



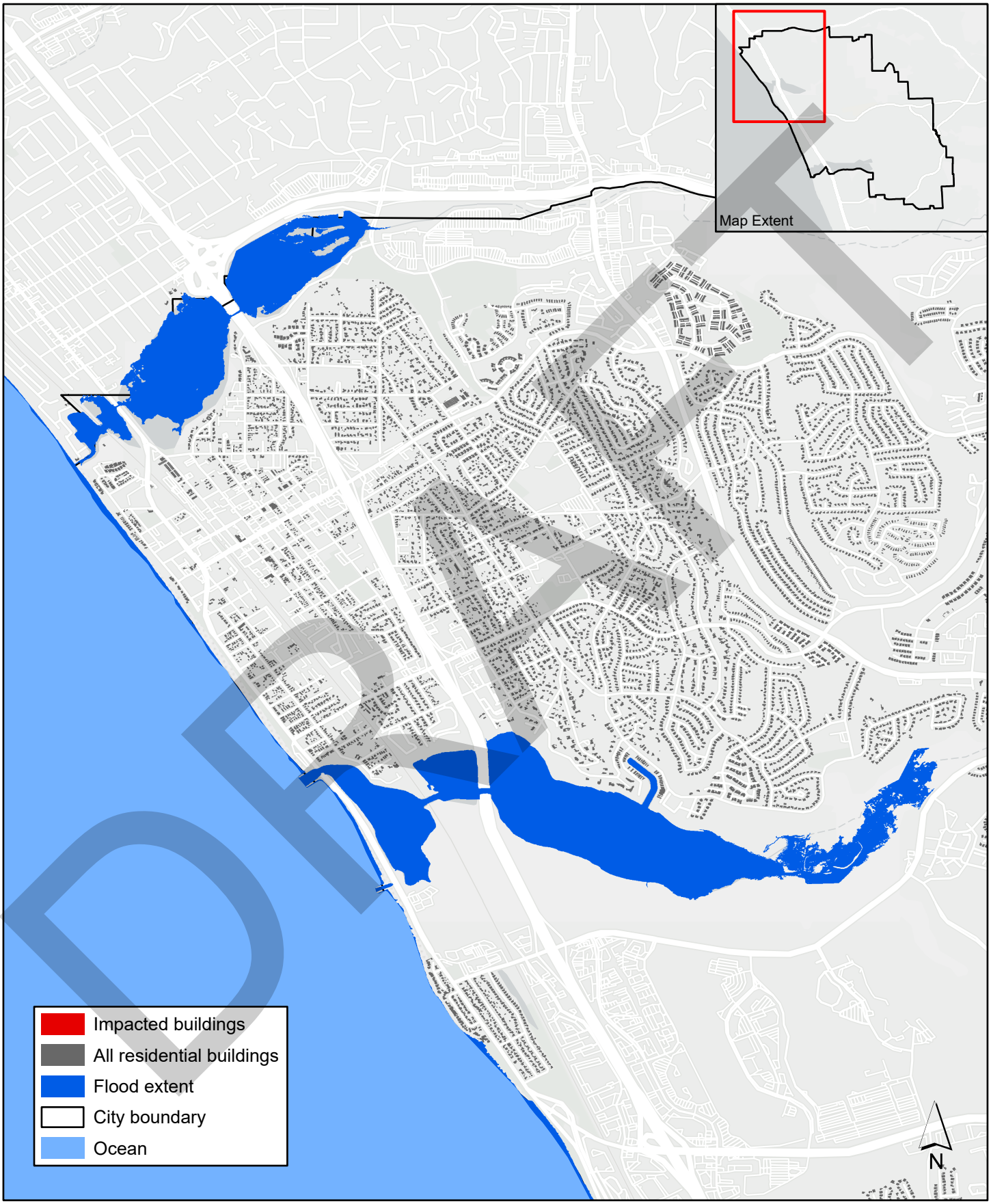
Carlsbad Area 1

Sea Level Rise 0.25 m - No storm



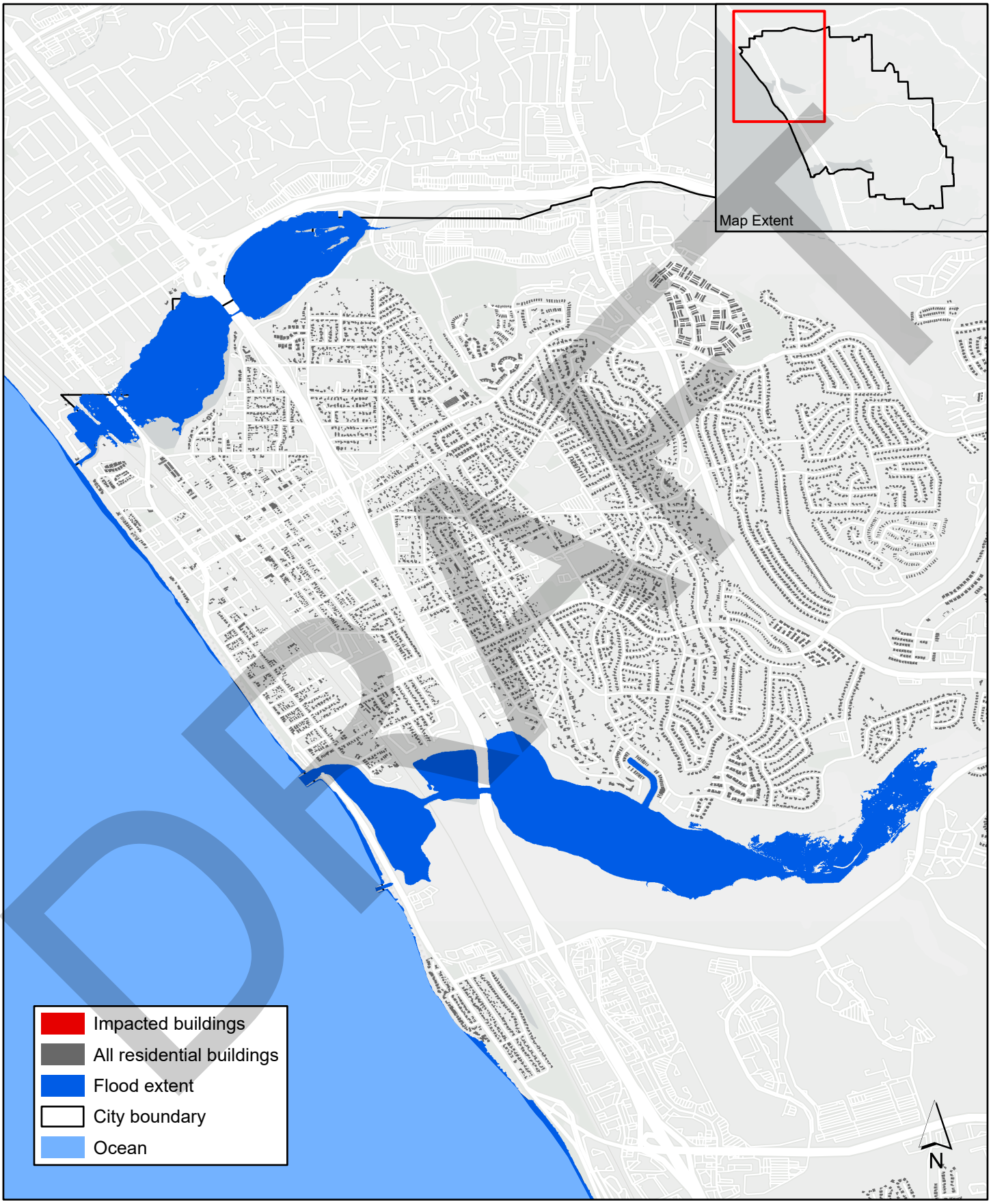
Carlsbad Area 1

Sea Level Rise 0.25 m - 001 year storm



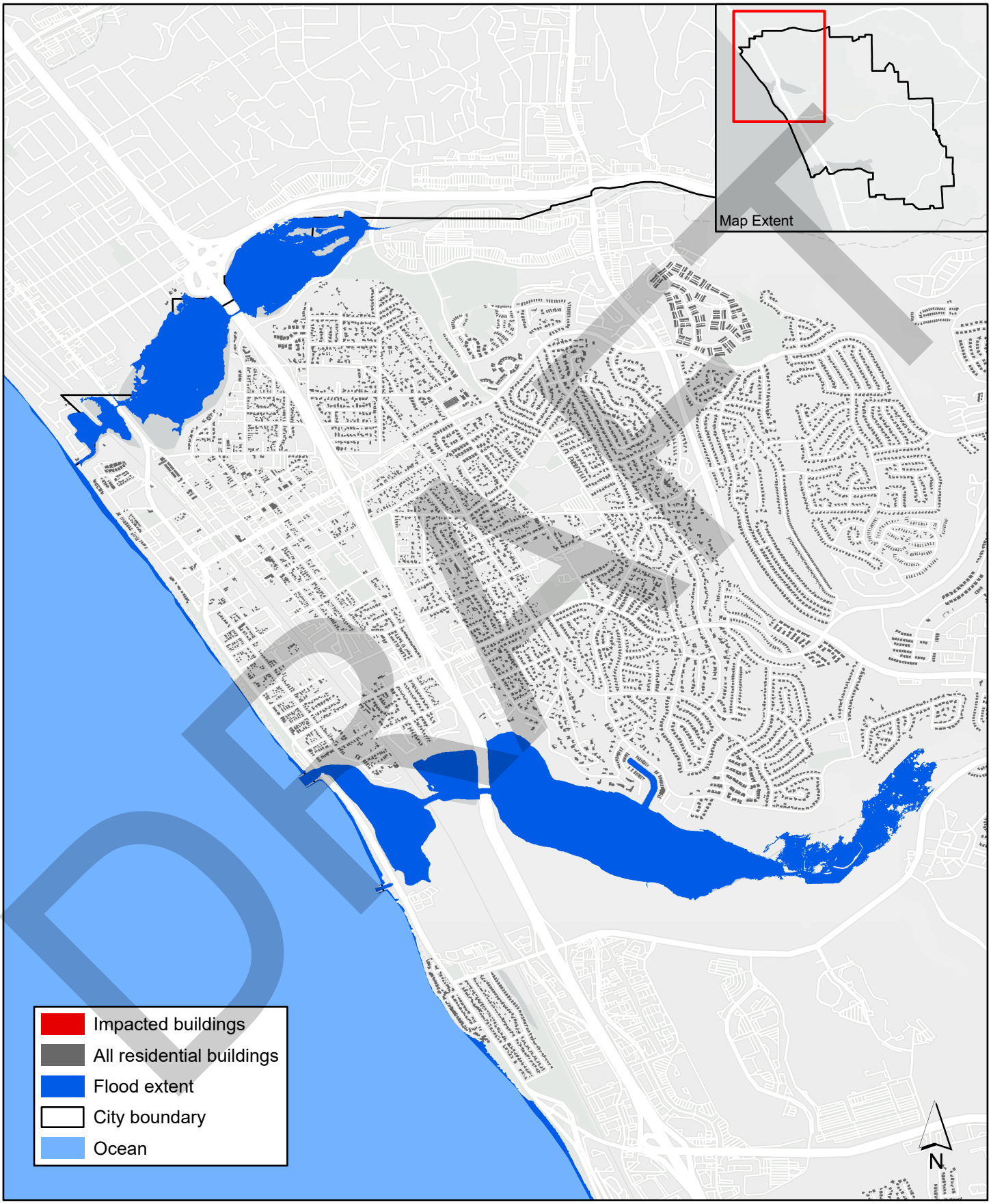
Carlsbad Area 1

Sea Level Rise 0.25 m - 020 year storm



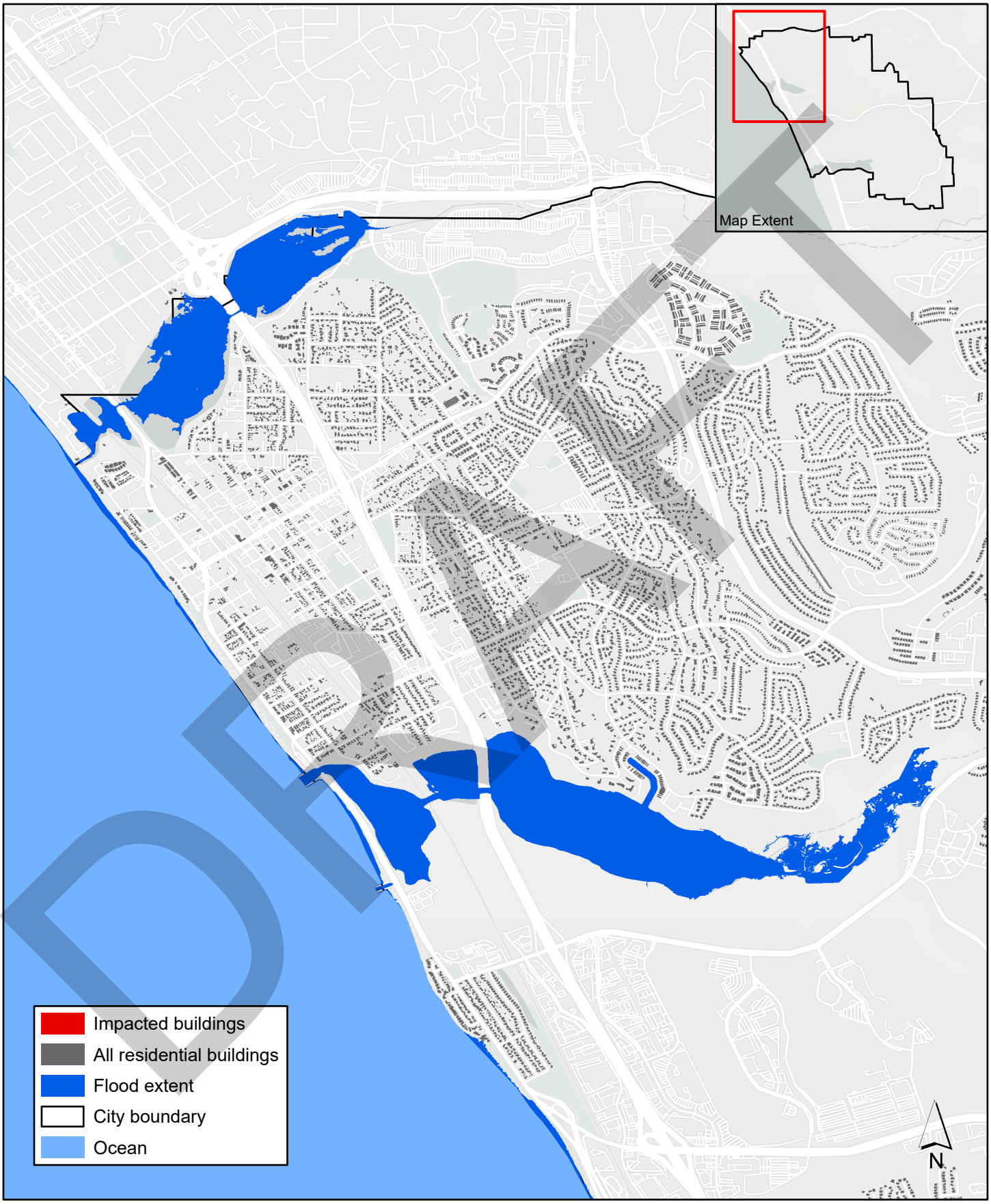
Carlsbad Area 1

Sea Level Rise 0.25 m - 100 year storm



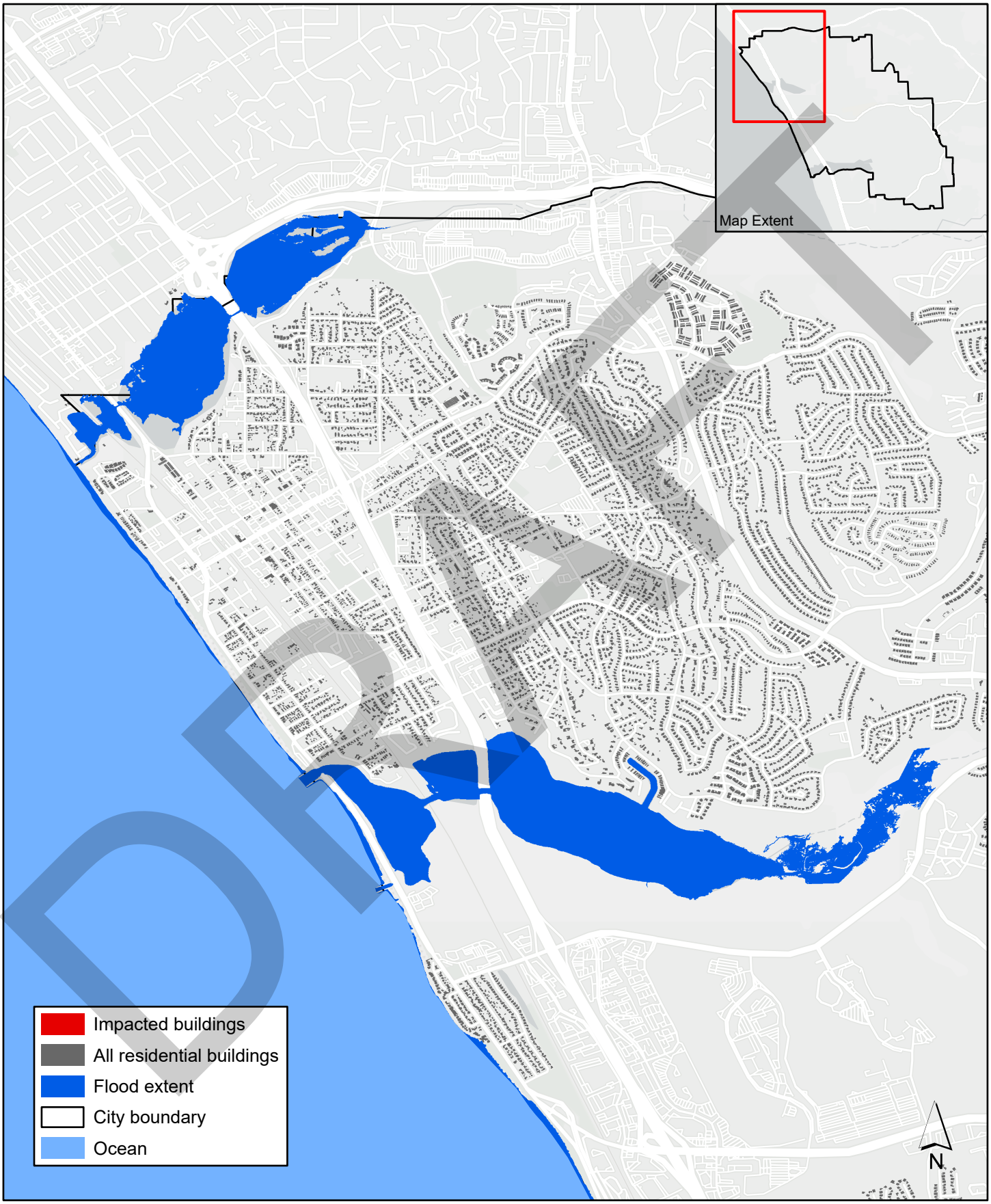
Carlsbad Area 1

Sea Level Rise 0.5 m - No storm



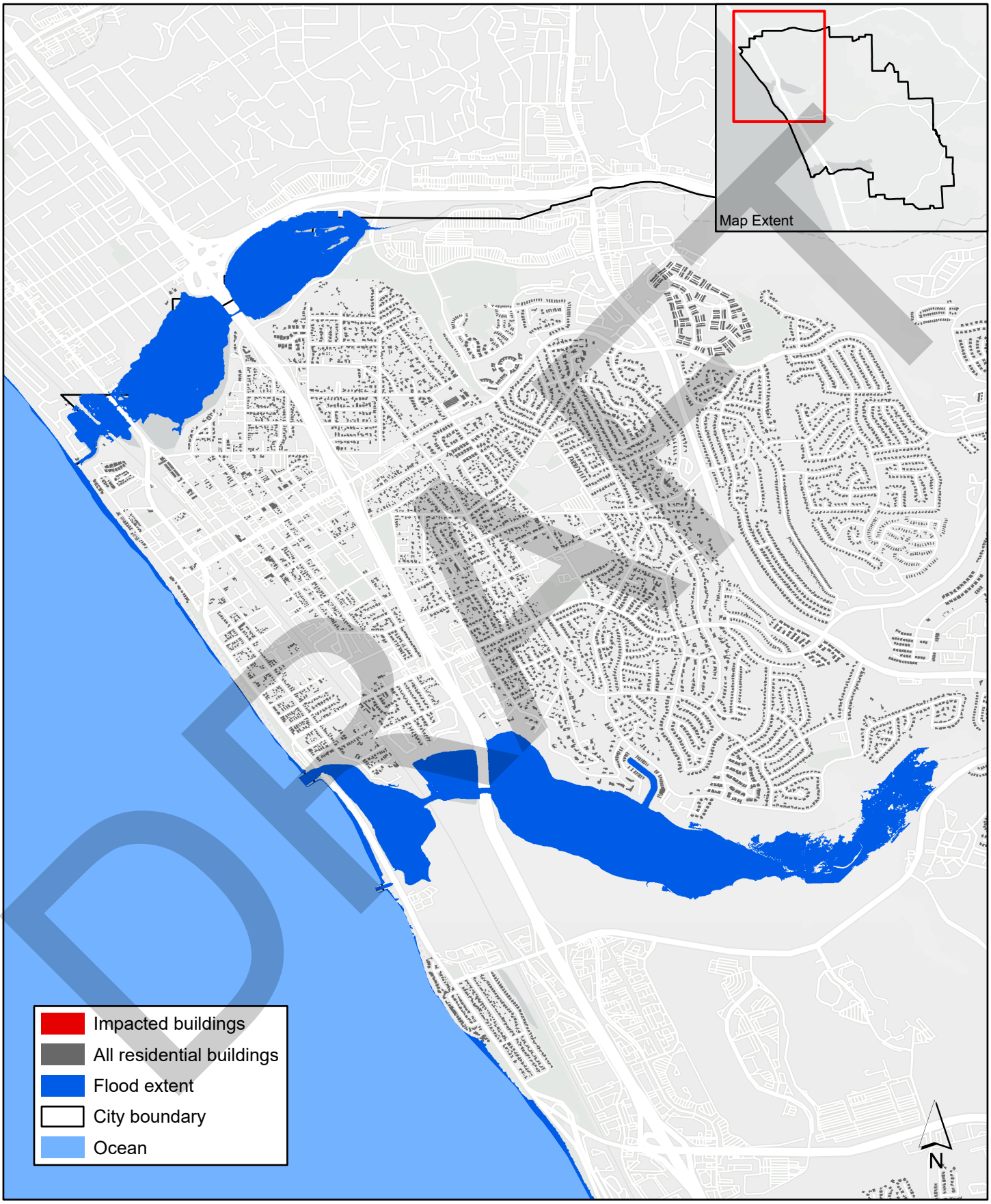
Carlsbad Area 1

Sea Level Rise 0.5 m - 001 year storm



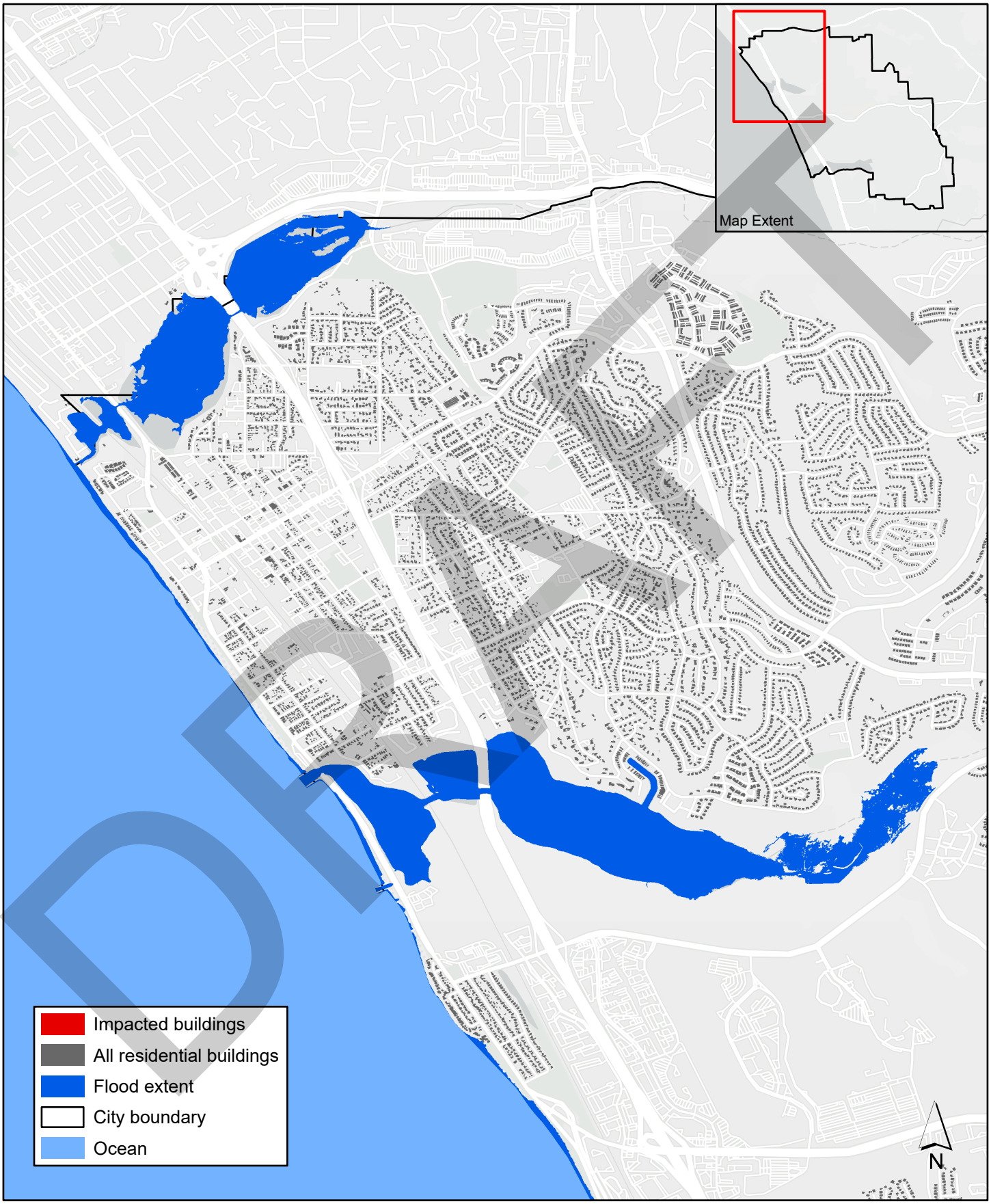
Carlsbad Area 1

Sea Level Rise 0.5 m - 020 year storm



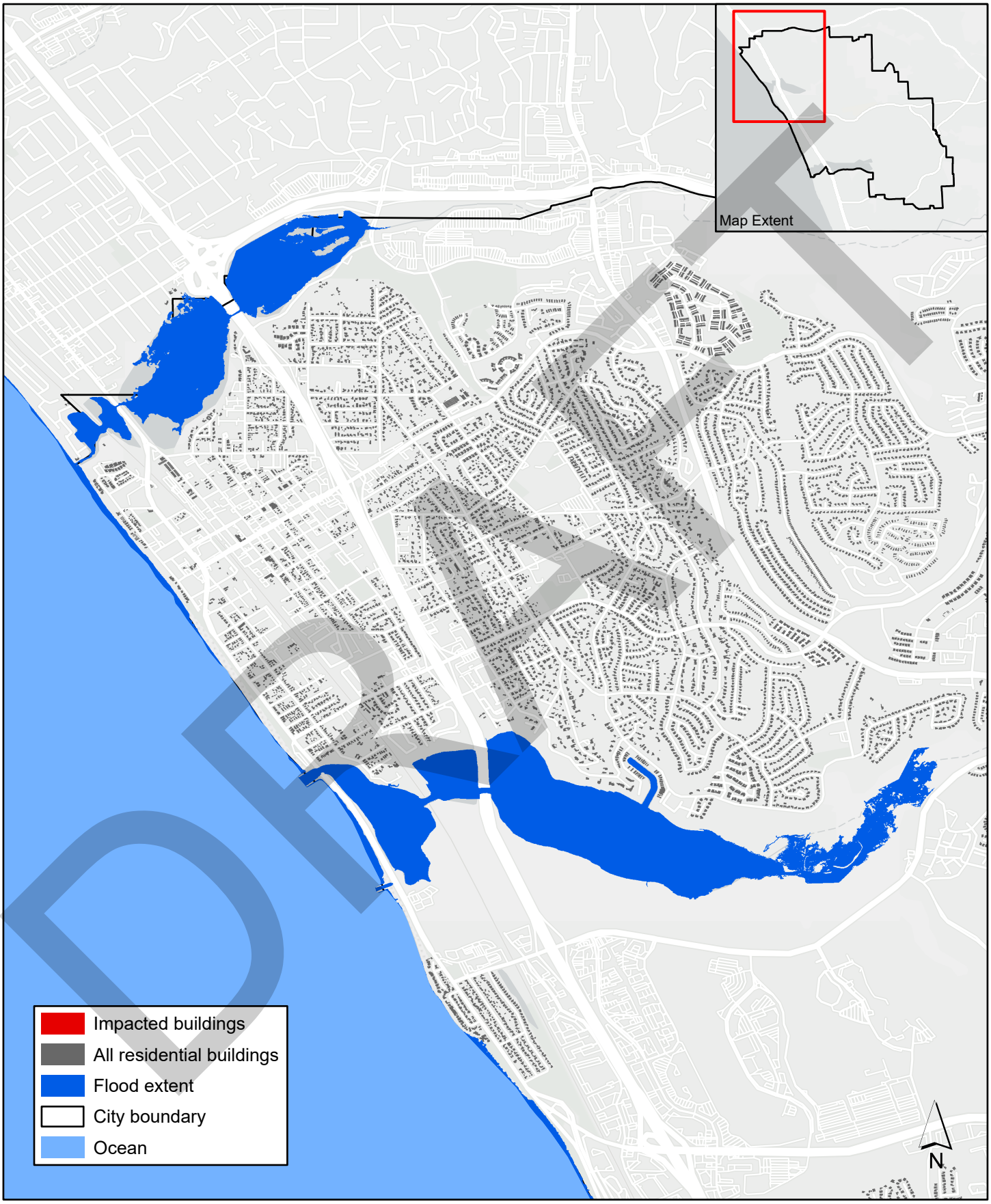
Carlsbad Area 1

Sea Level Rise 0.5 m - 100 year storm



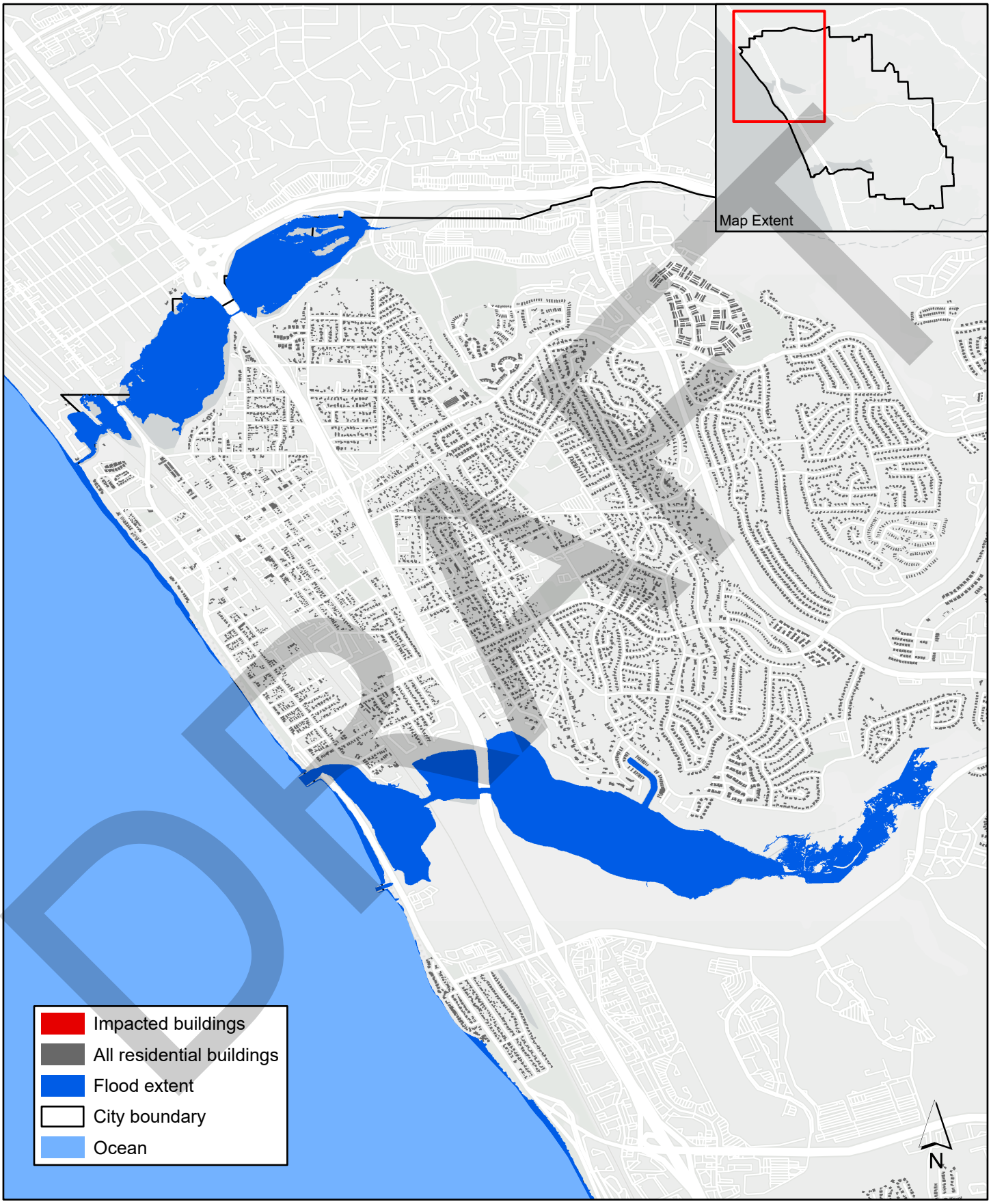
Carlsbad Area 1

Sea Level Rise 0.75 m - No storm



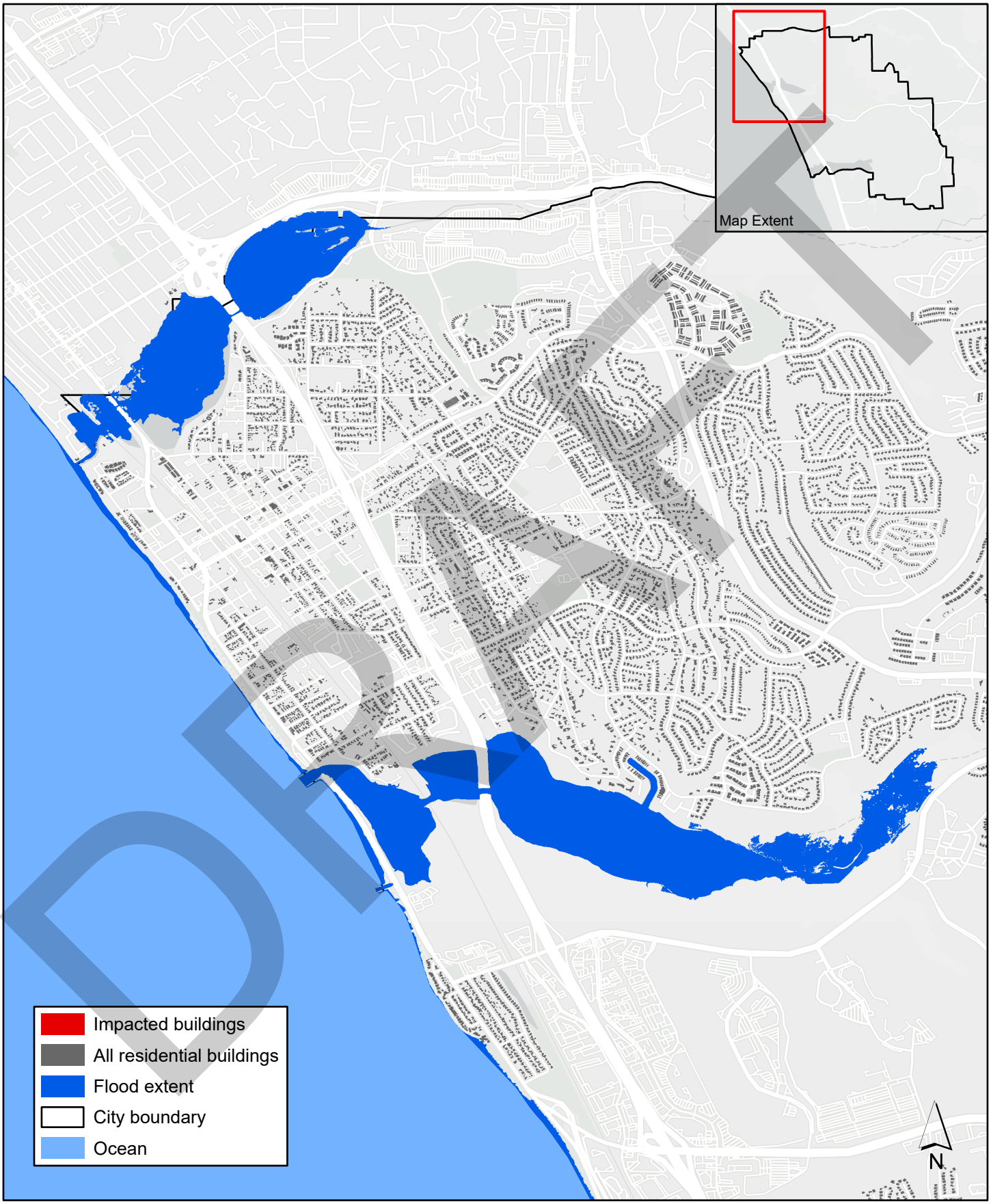
Carlsbad Area 1

Sea Level Rise 0.75 m - 001 year storm



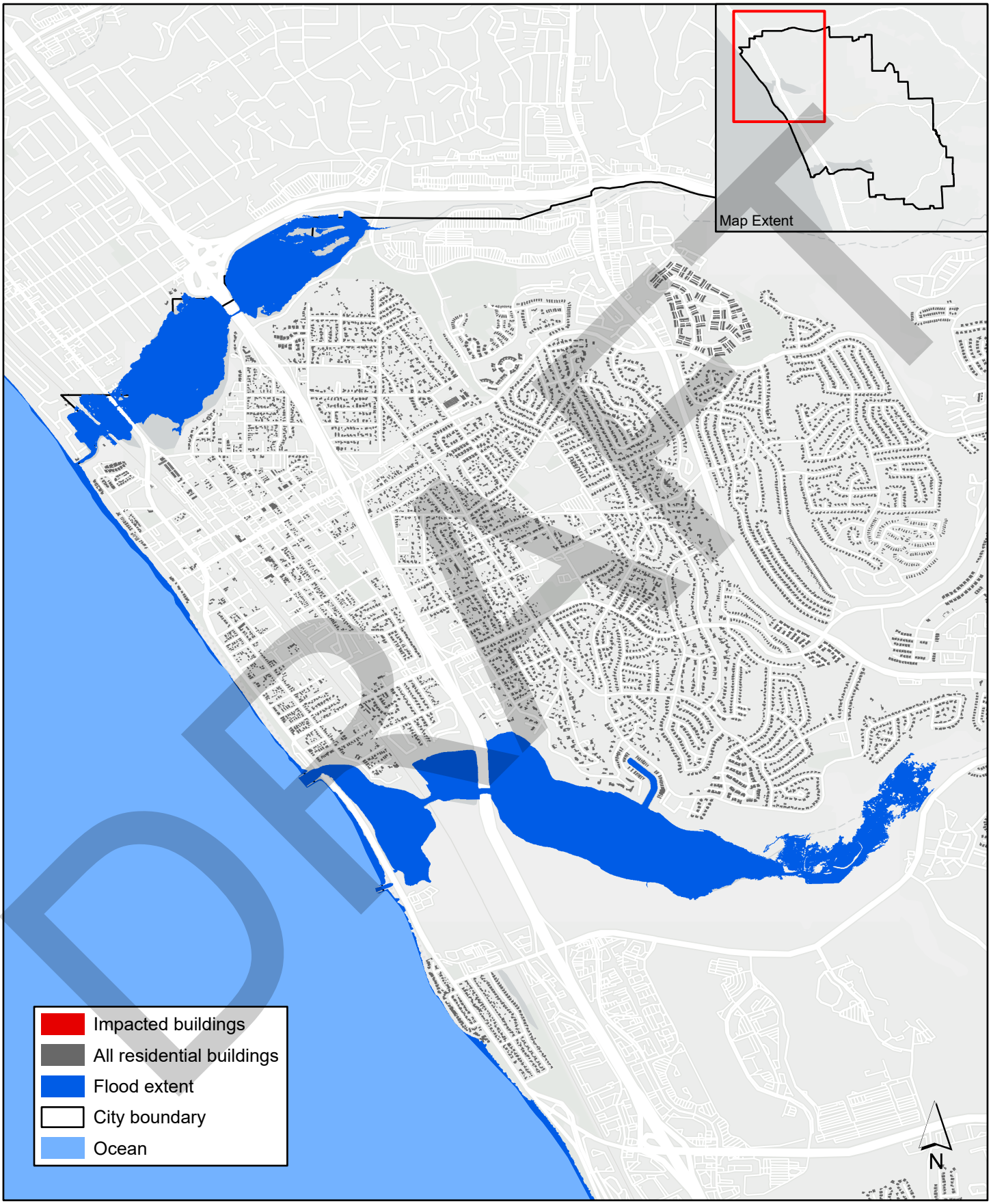
Carlsbad Area 1

Sea Level Rise 0.75 m - 020 year storm



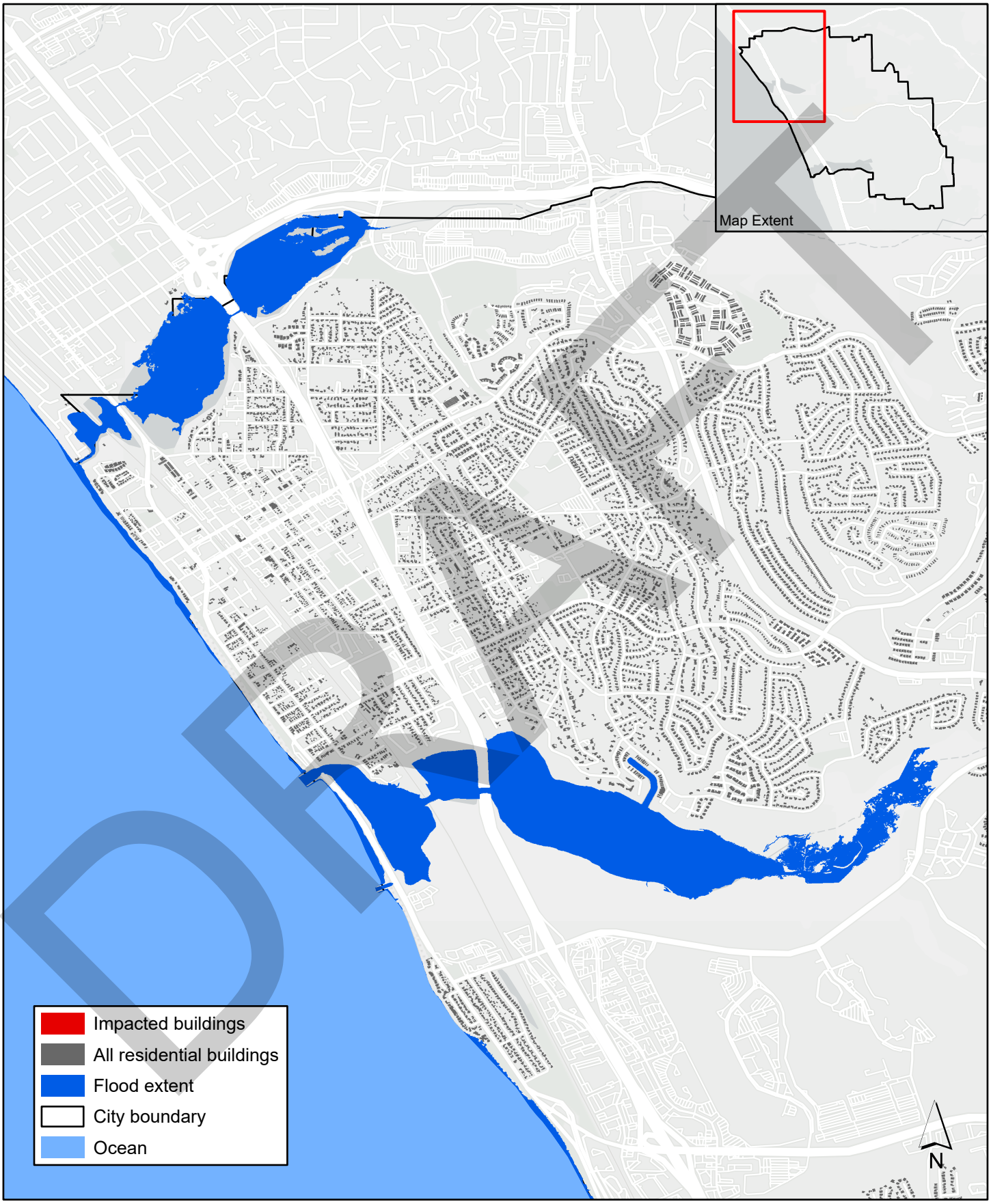
Carlsbad Area 1

Sea Level Rise 0.75 m - 100 year storm



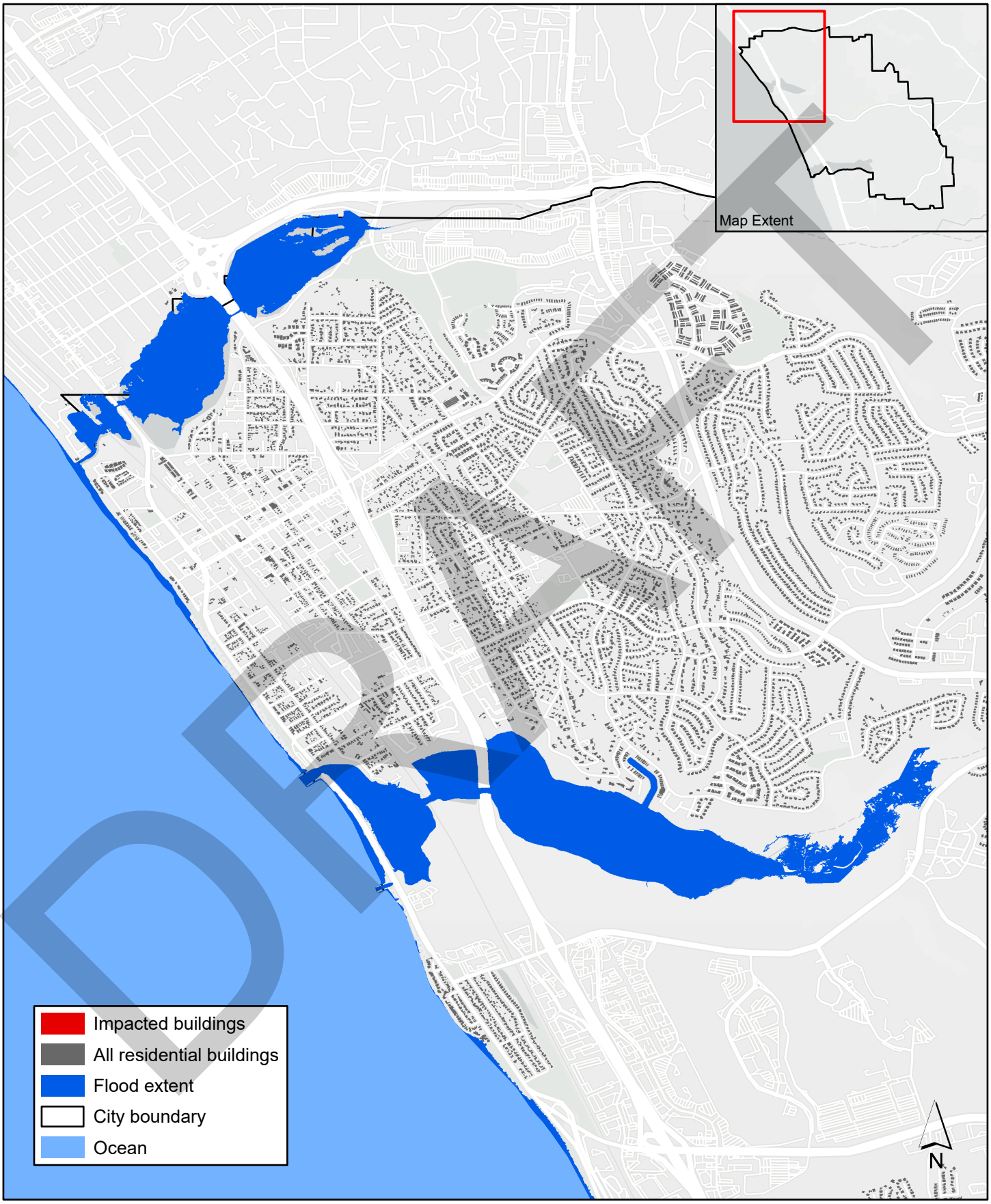
Carlsbad Area 1

Sea Level Rise 1.0 m - No storm



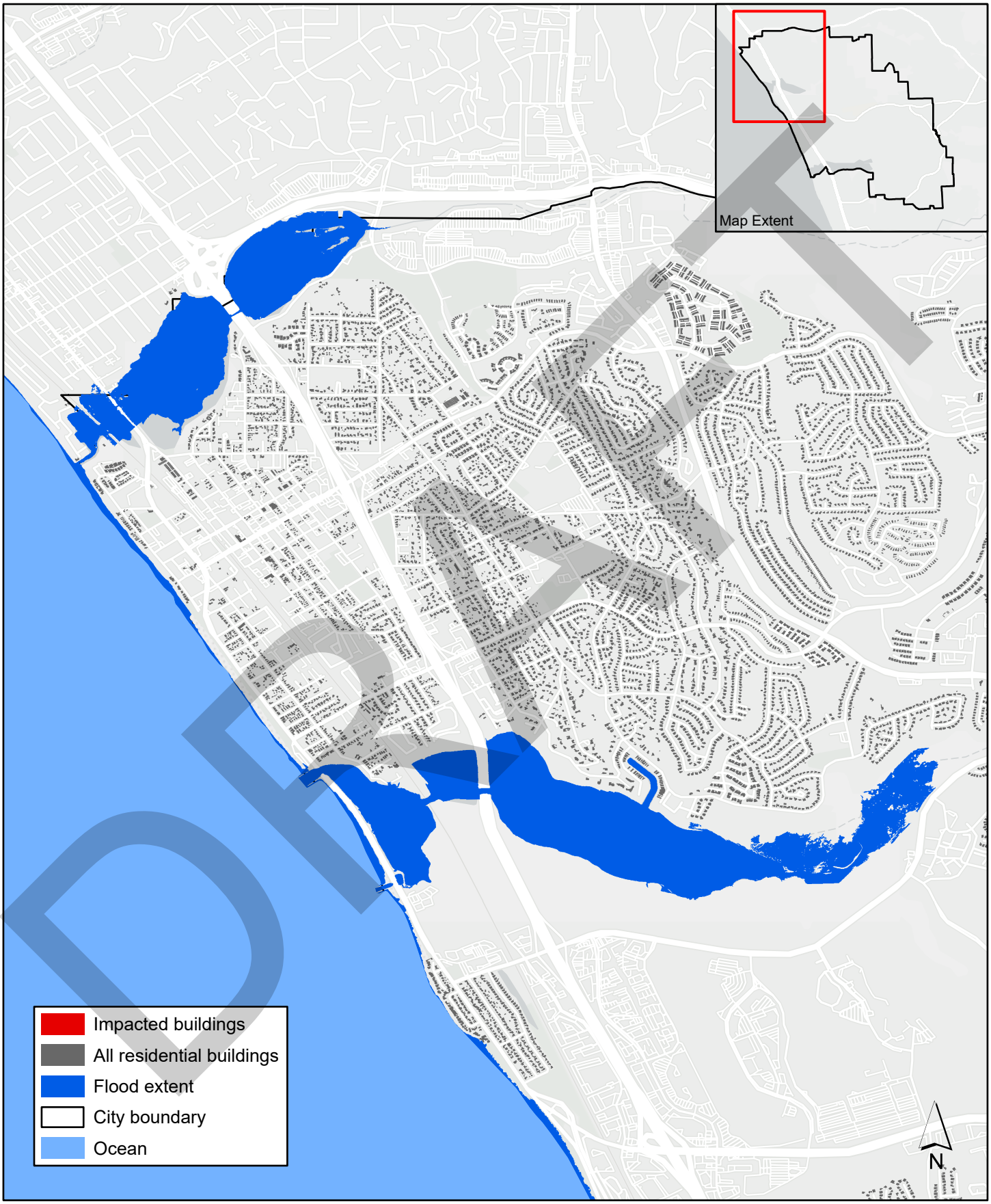
Carlsbad Area 1

Sea Level Rise 1.0 m - 001 year storm



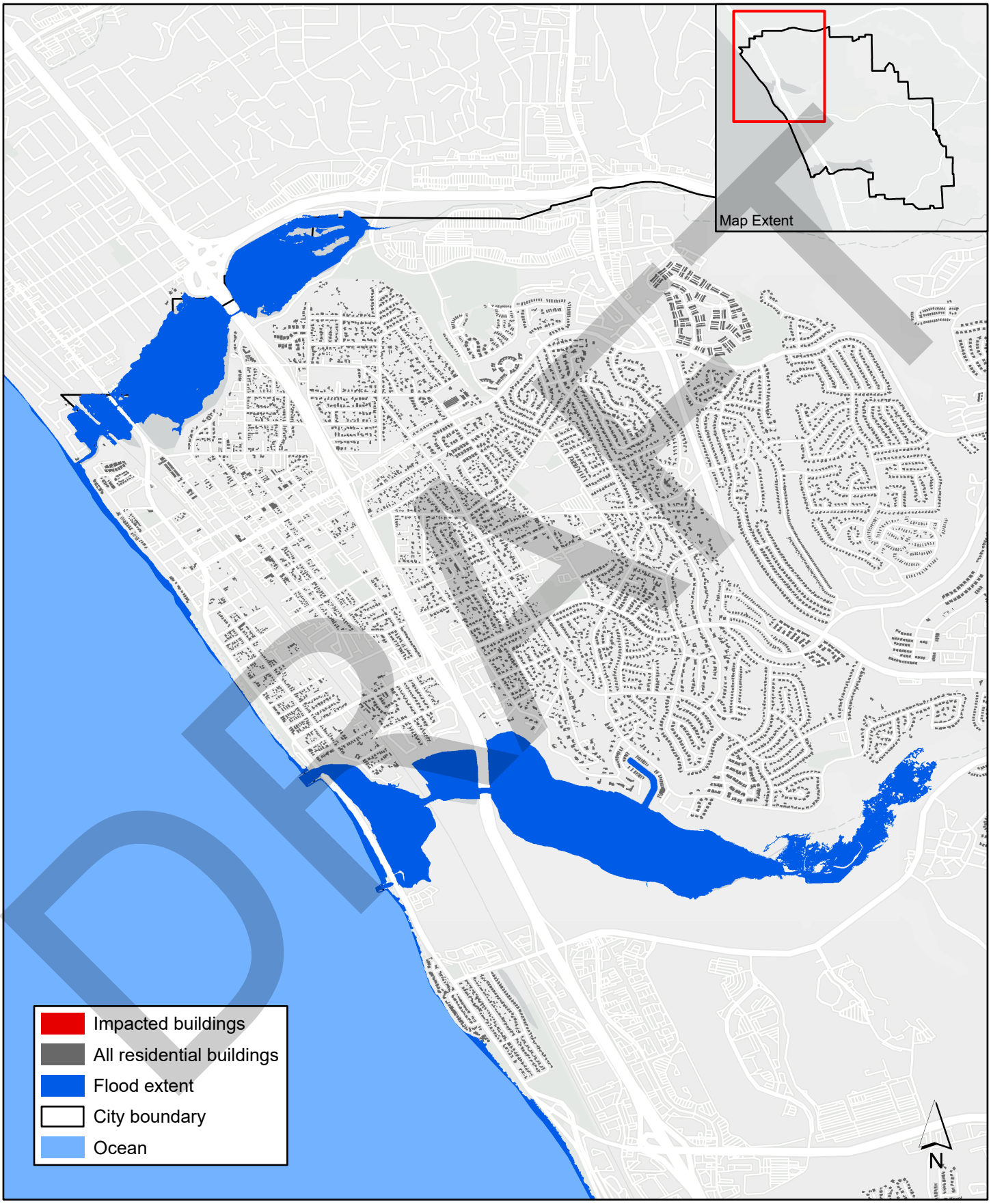
Carlsbad Area 1

Sea Level Rise 1.0 m - 020 year storm



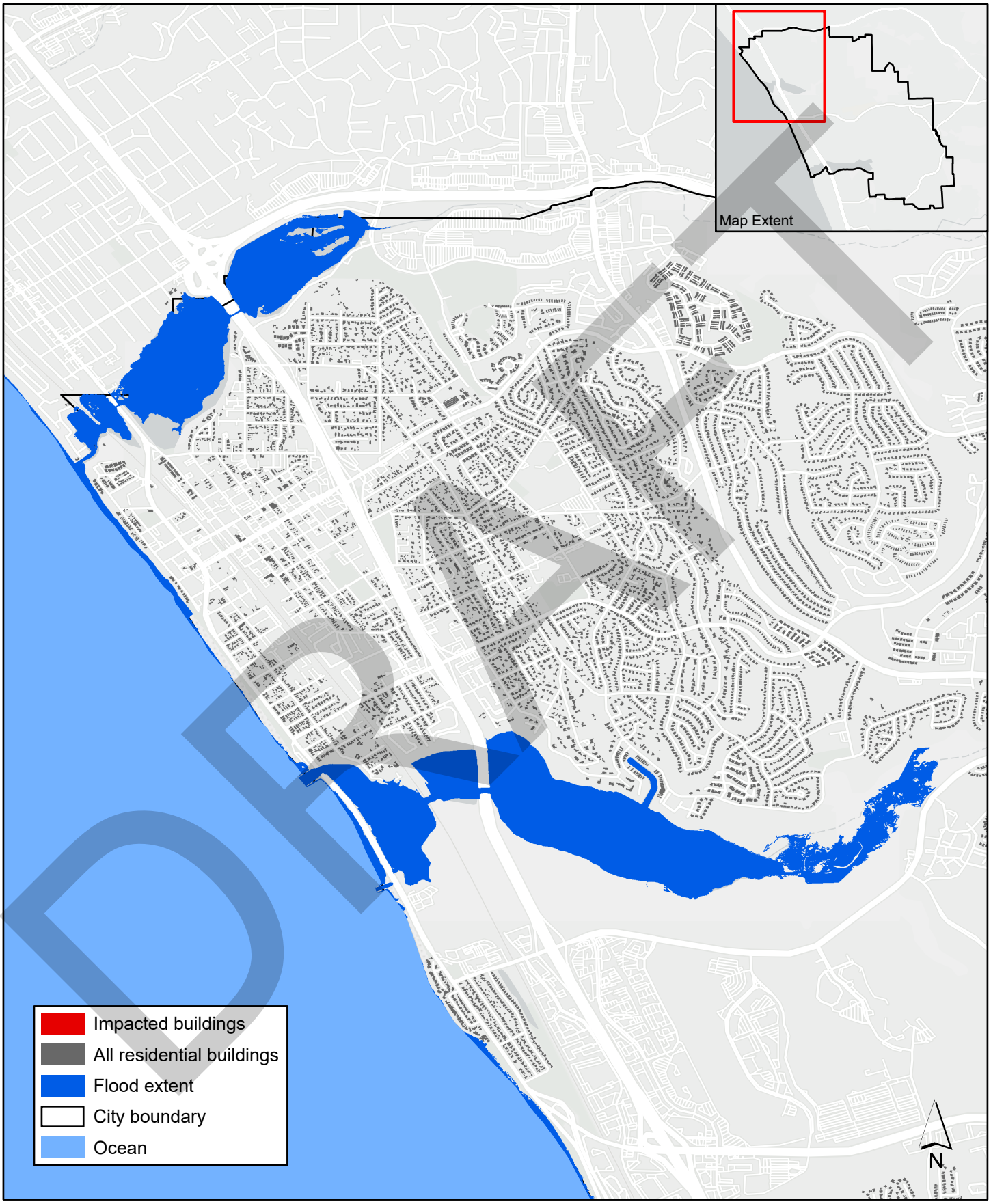
Carlsbad Area 1

Sea Level Rise 1.0 m - 100 year storm



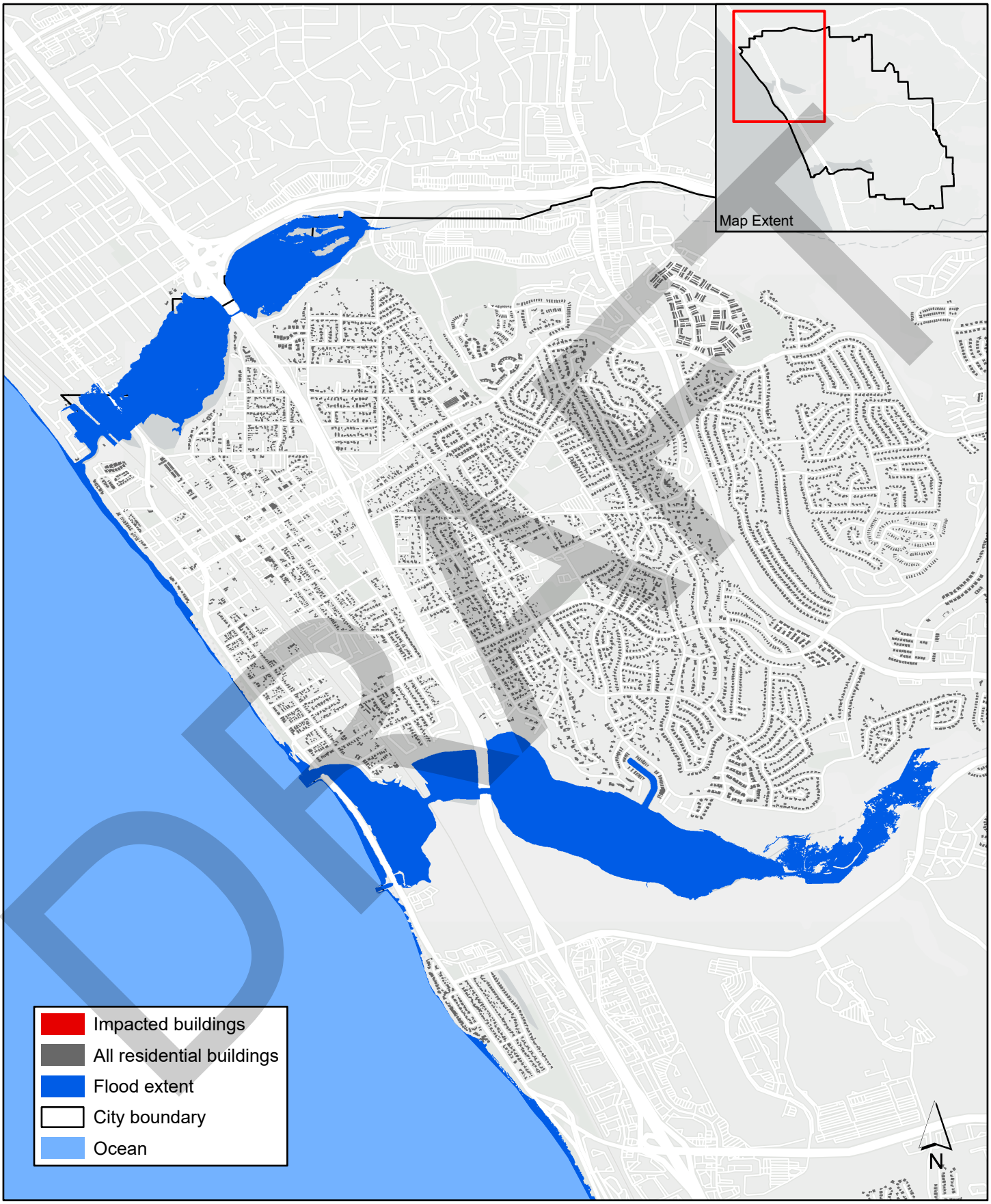
Carlsbad Area 1

Sea Level Rise 1.5 m - No storm



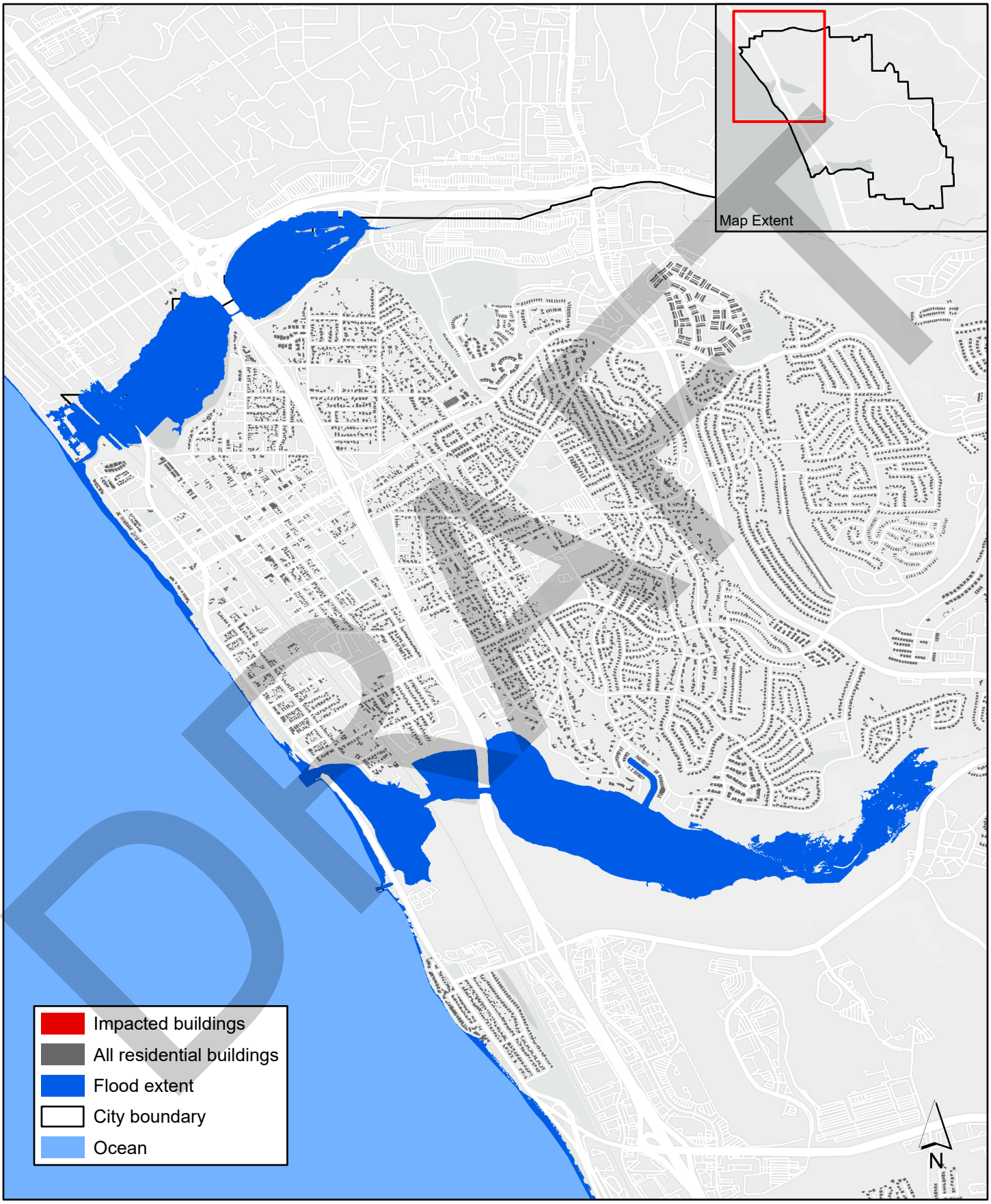
Carlsbad Area 1

Sea Level Rise 1.5 m - 001 year storm



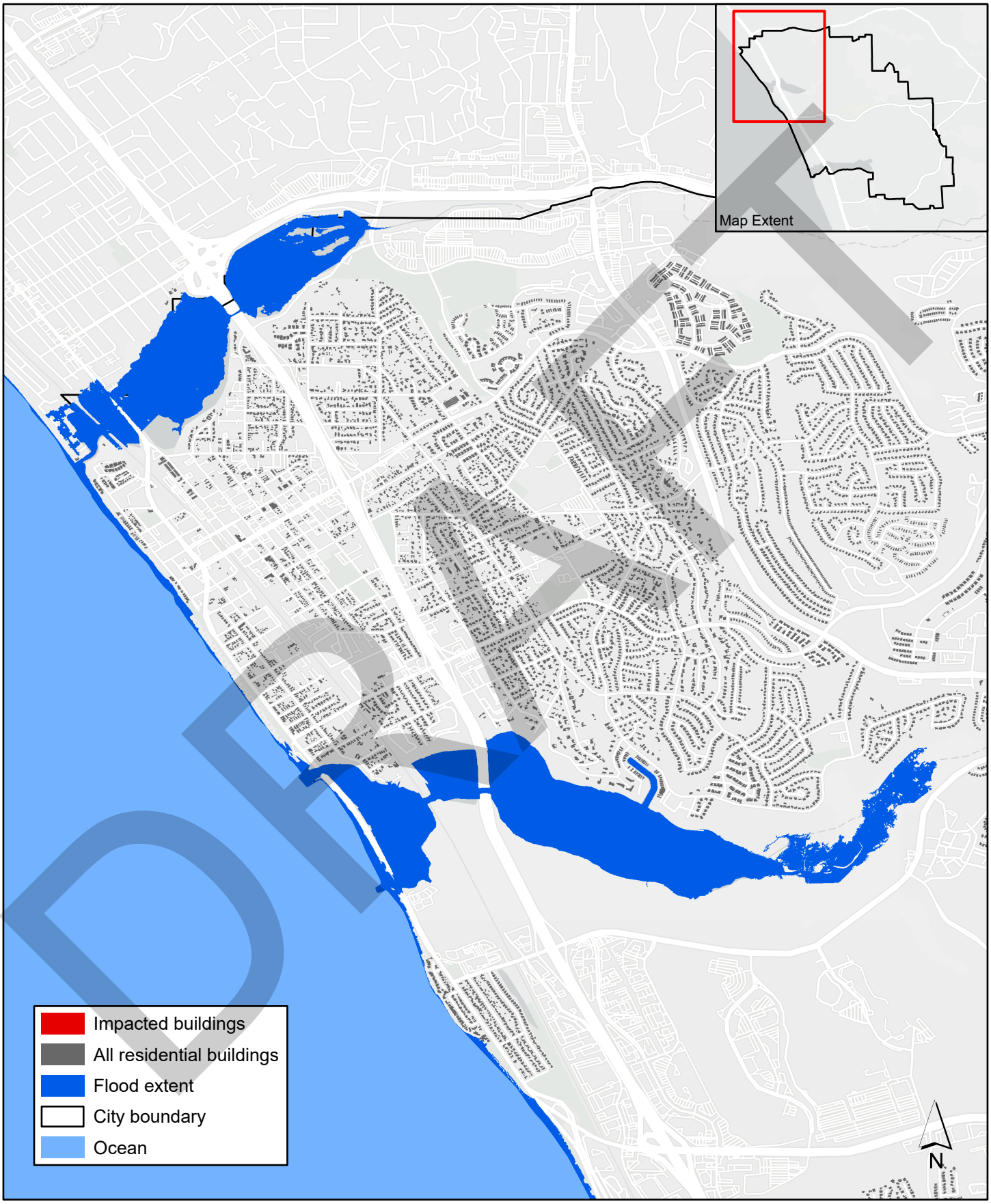
Carlsbad Area 1

Sea Level Rise 1.5 m - 020 year storm



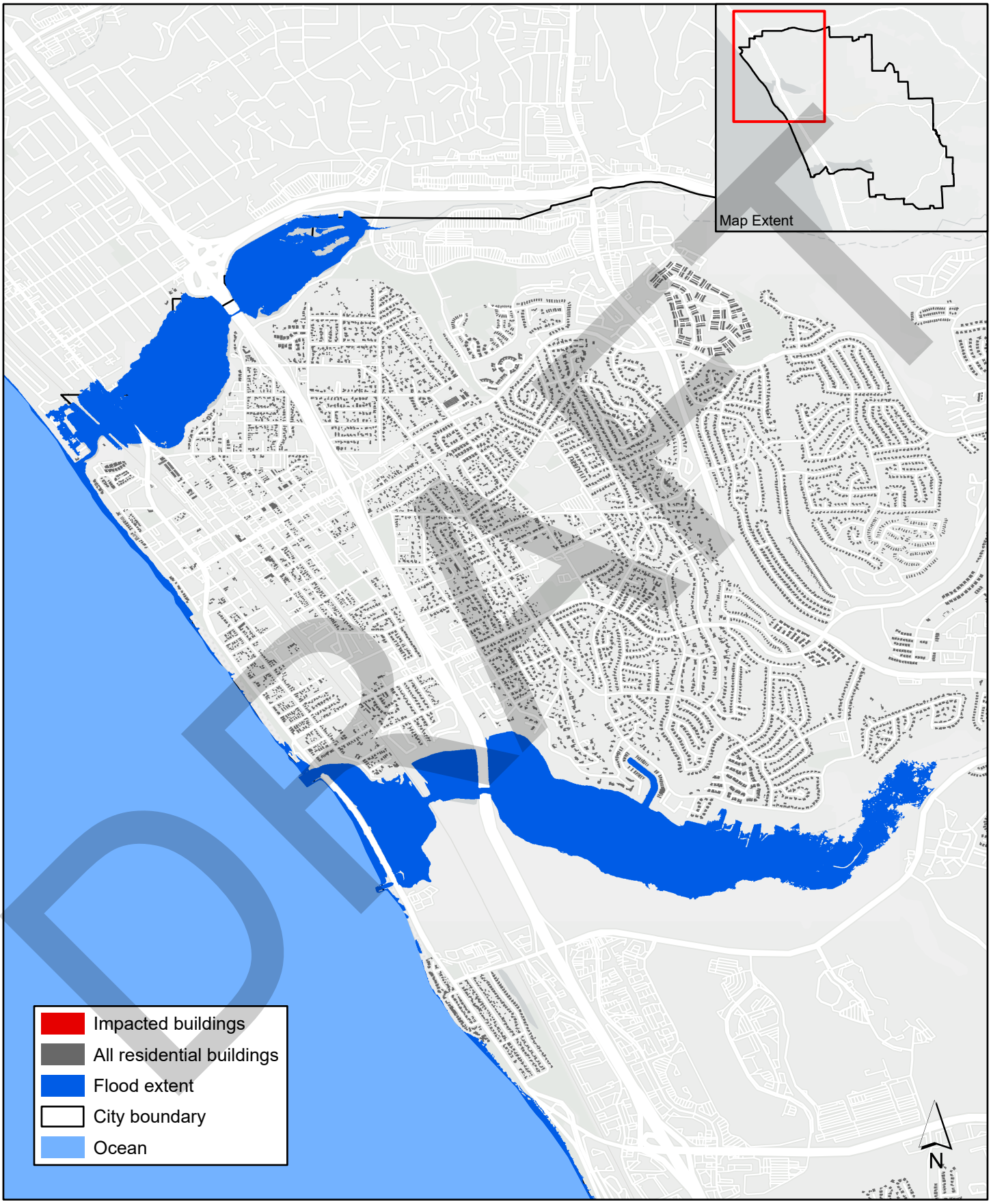
Carlsbad Area 1

Sea Level Rise 1.5 m - 100 year storm



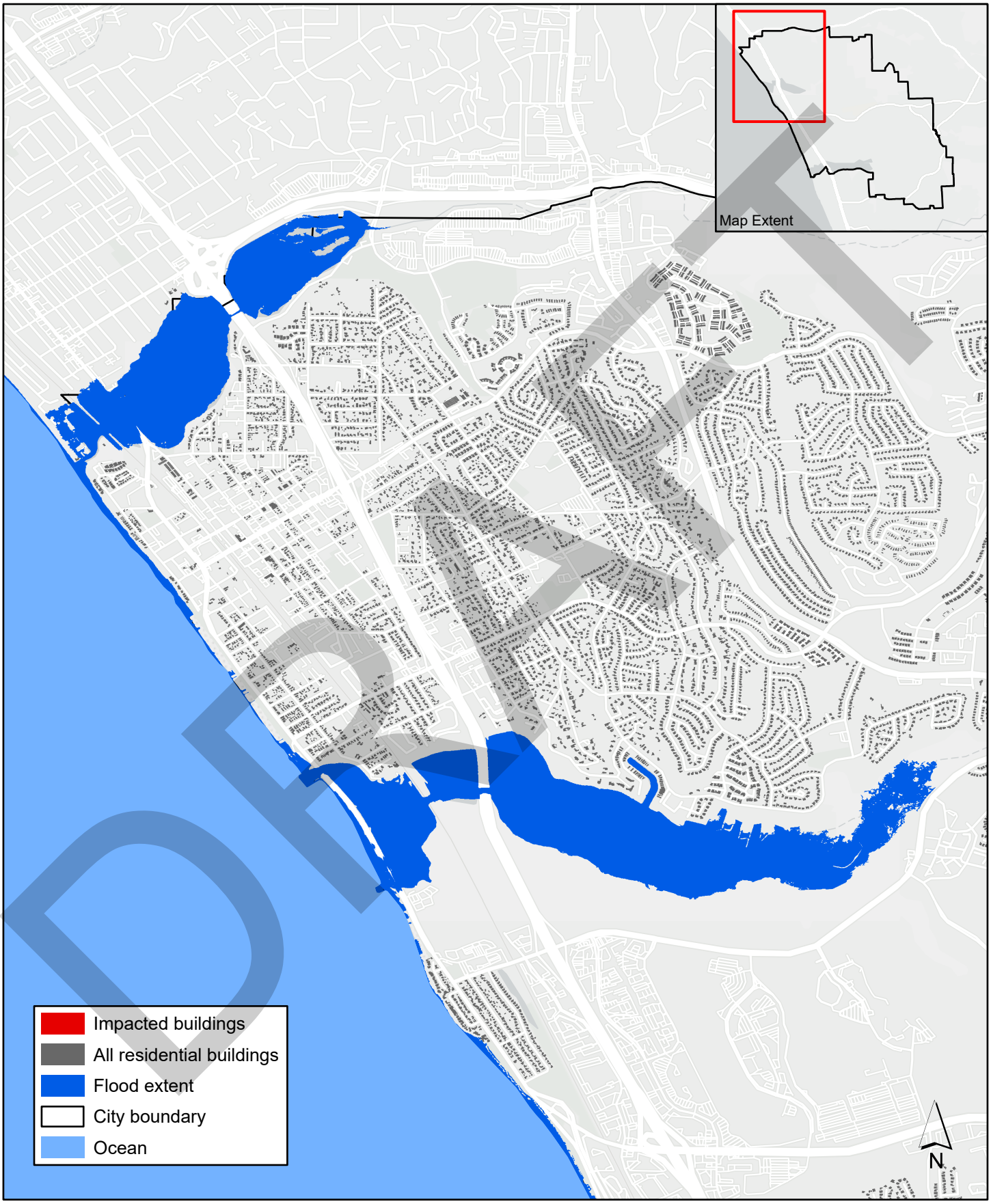
Carlsbad Area 1

Sea Level Rise 2.0 m - No storm



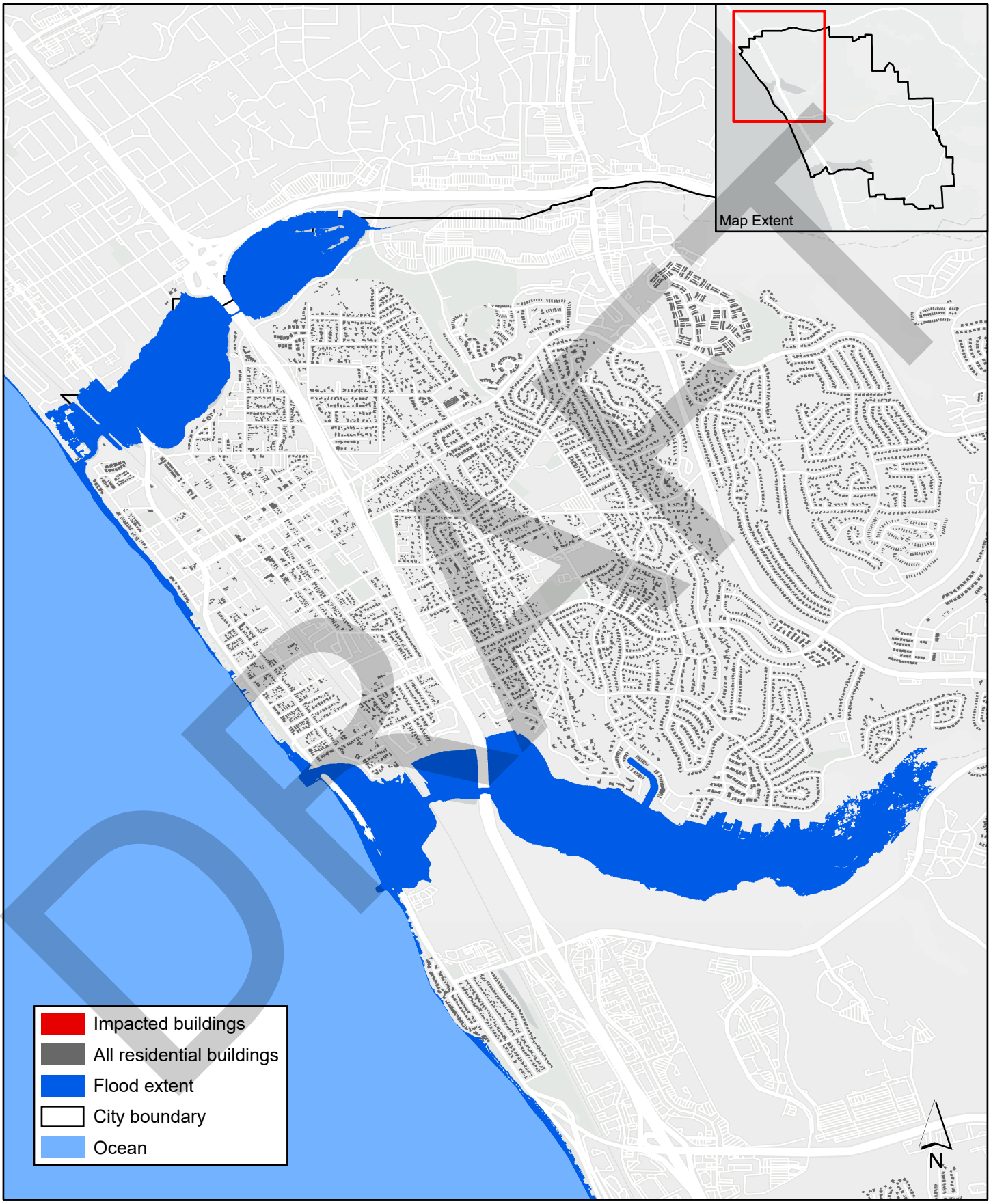
Carlsbad Area 1

Sea Level Rise 2.0 m - 001 year storm



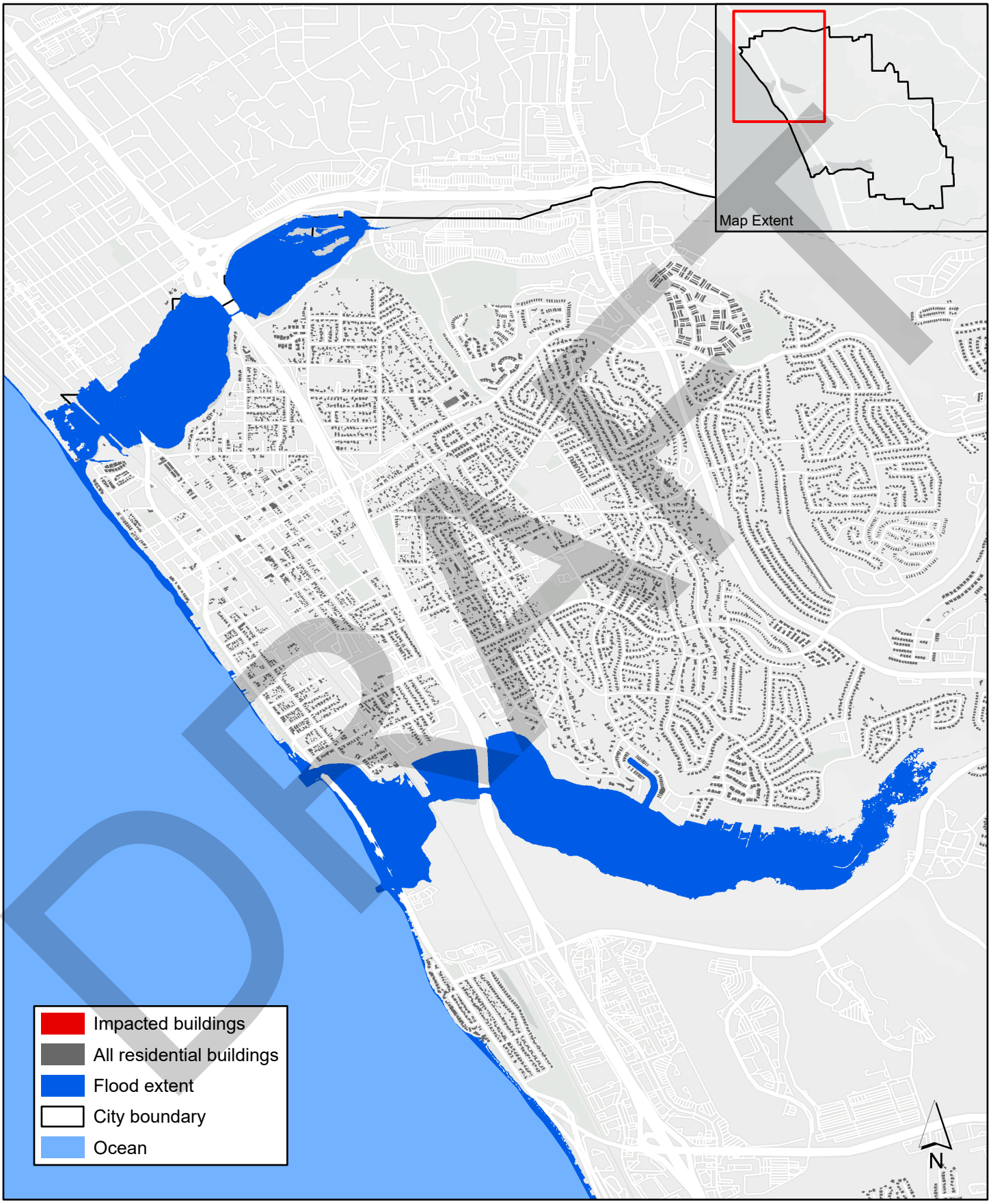
Carlsbad Area 1

Sea Level Rise 2.0 m - 020 year storm



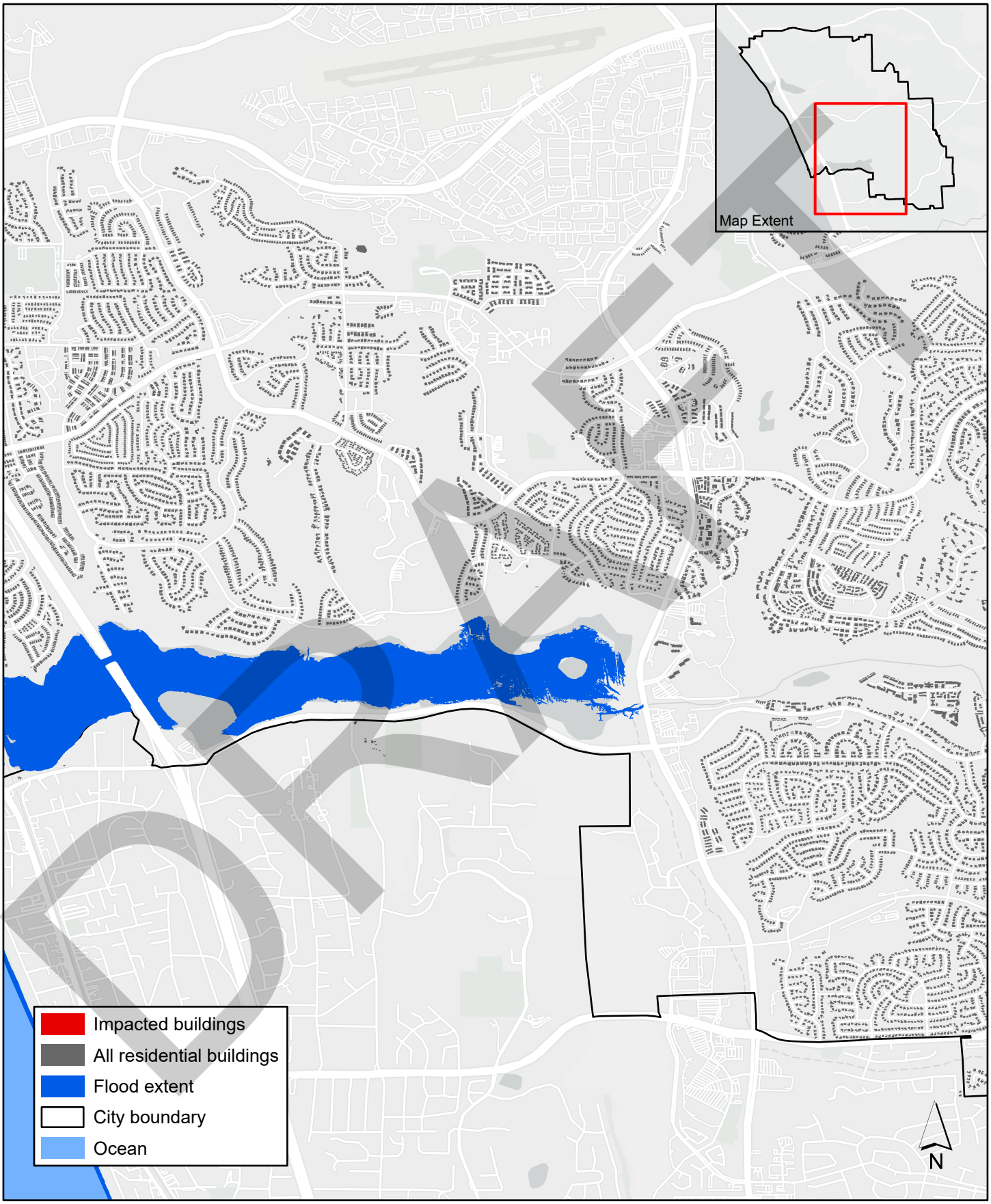
Carlsbad Area 1

Sea Level Rise 2.0 m - 100 year storm



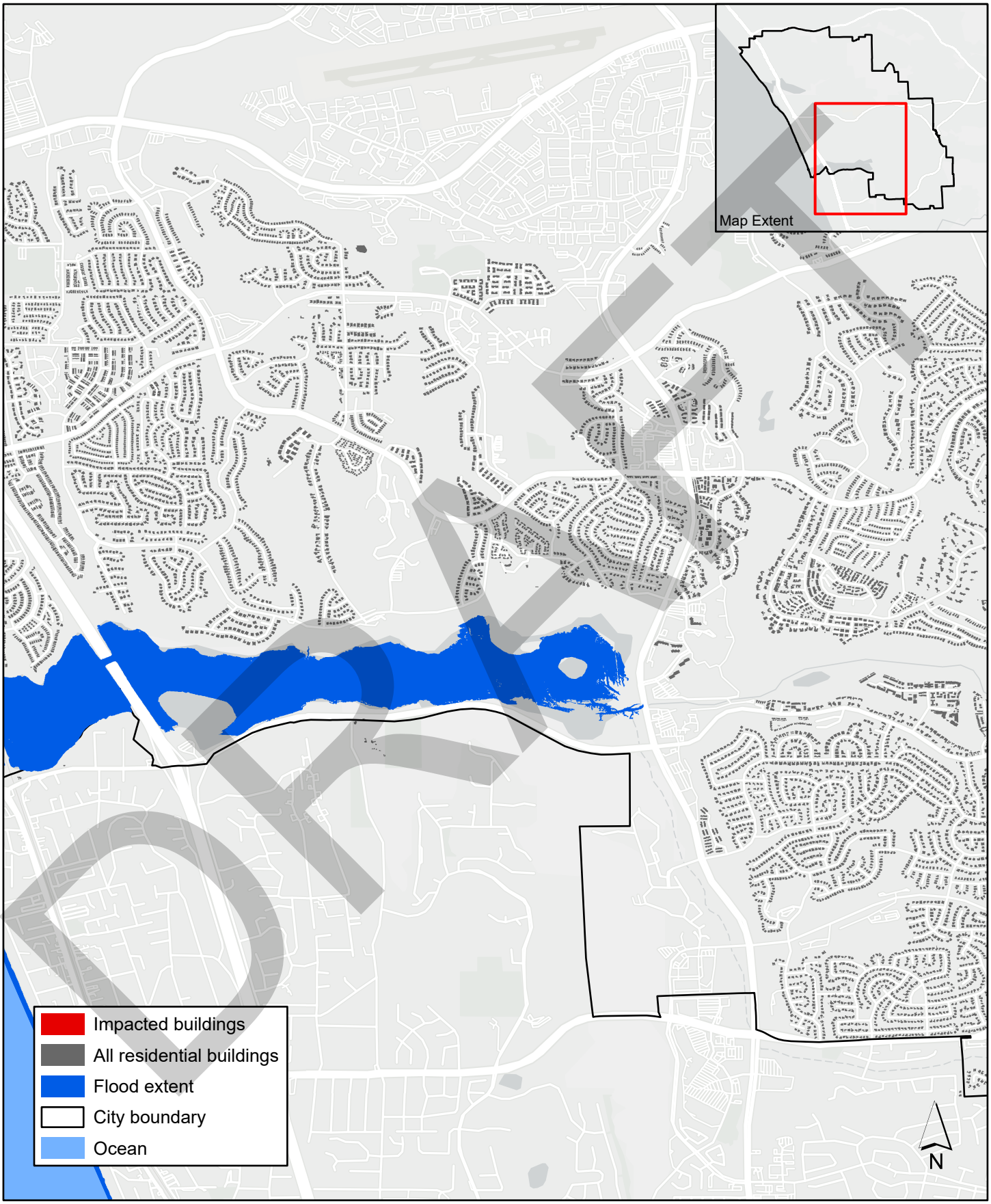
Carlsbad Area 2

Sea Level Rise 0.0 m - No storm



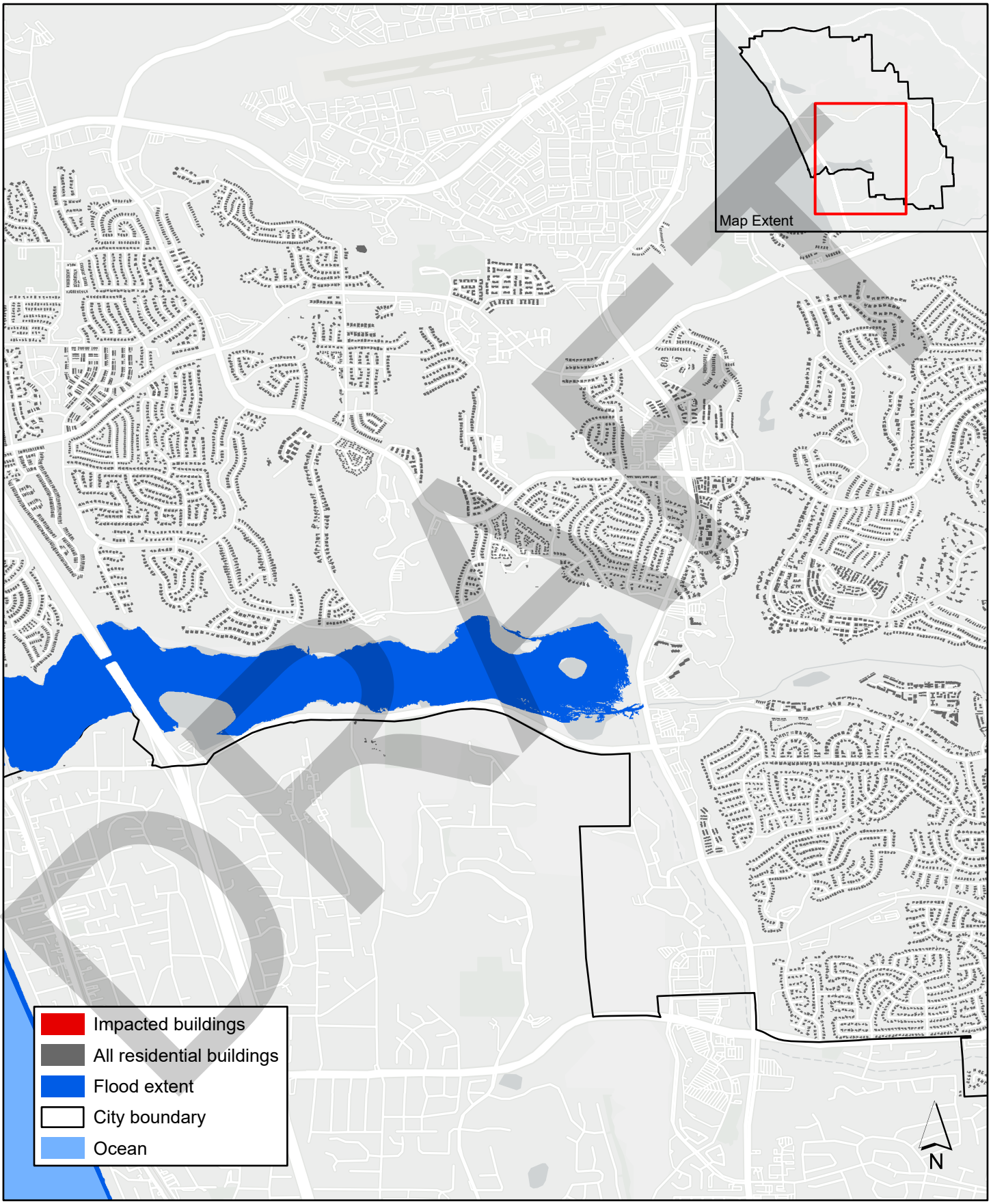
Carlsbad Area 2

Sea Level Rise 0.0 m - 001 year storm



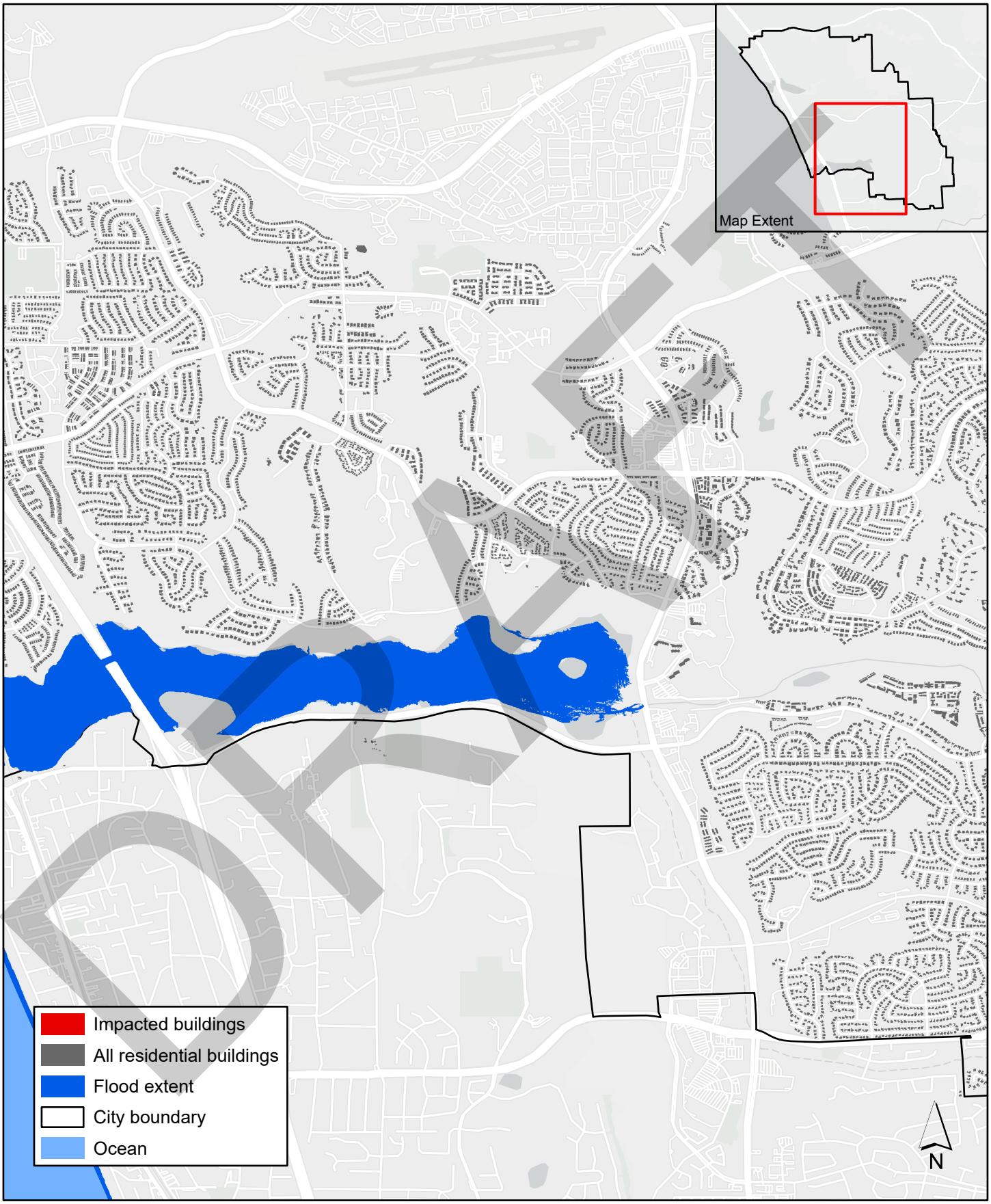
Carlsbad Area 2

Sea Level Rise 0.0 m - 020 year storm



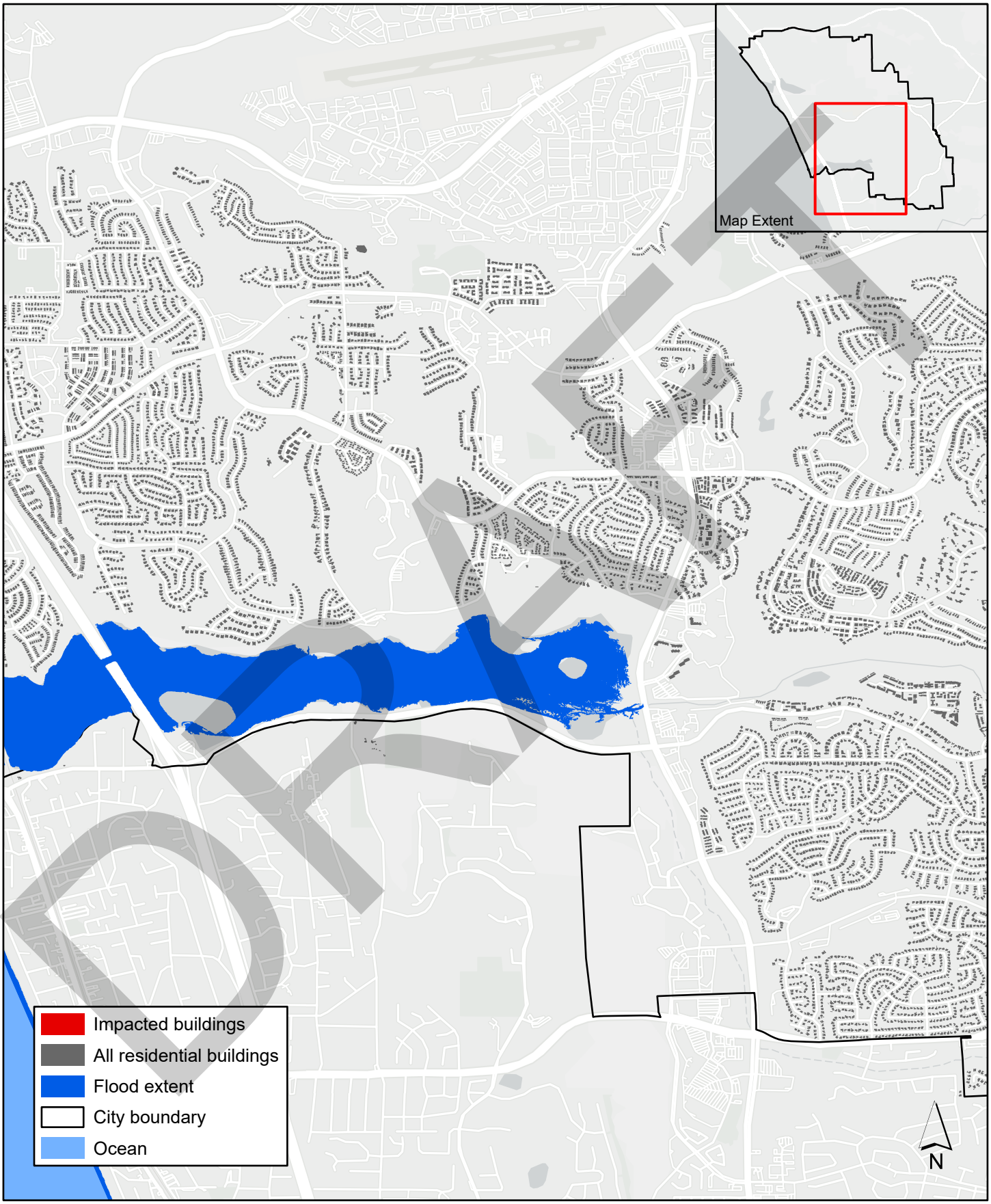
Carlsbad Area 2

Sea Level Rise 0.0 m - 100 year storm



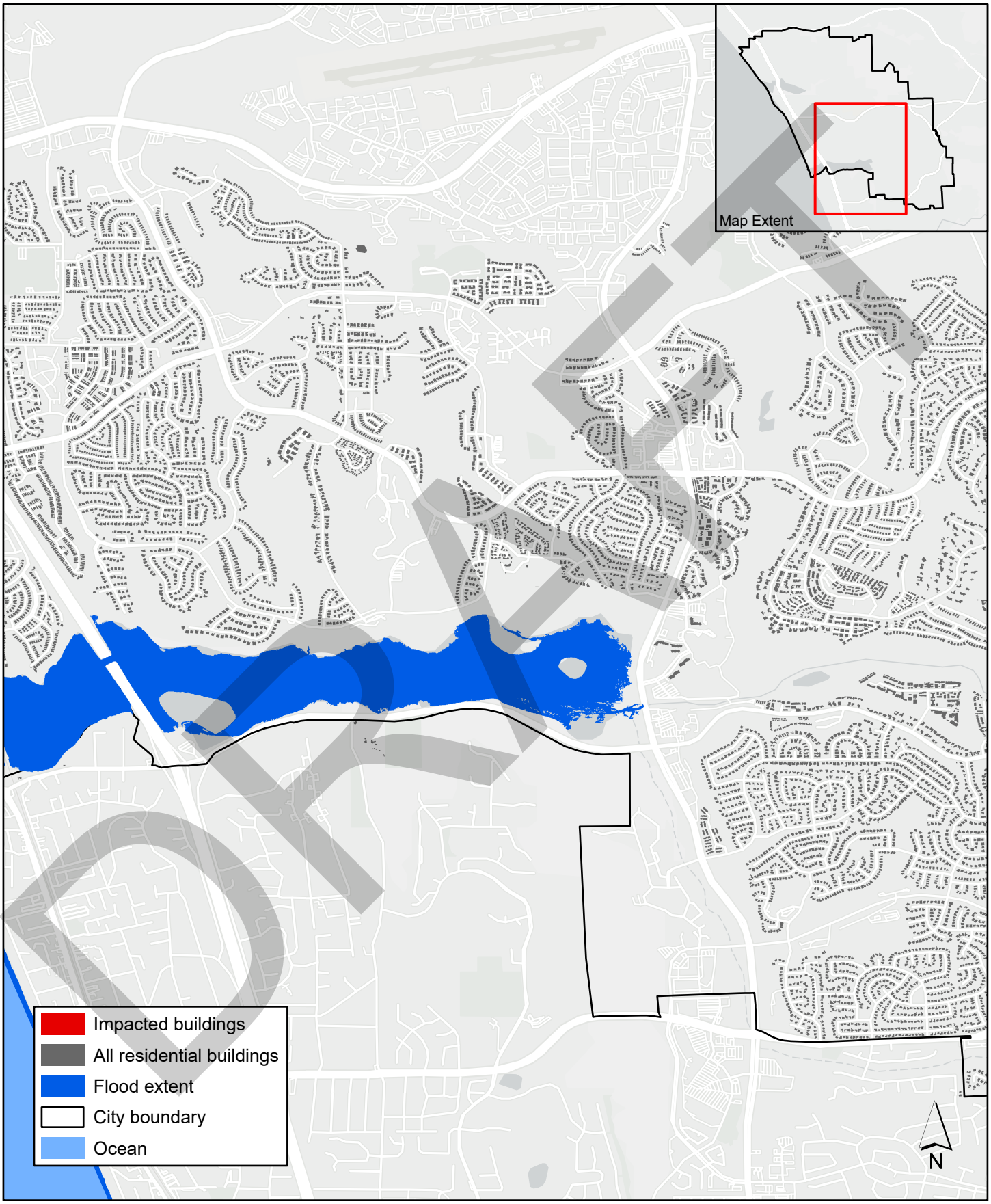
Carlsbad Area 2

Sea Level Rise 0.25 m - No storm



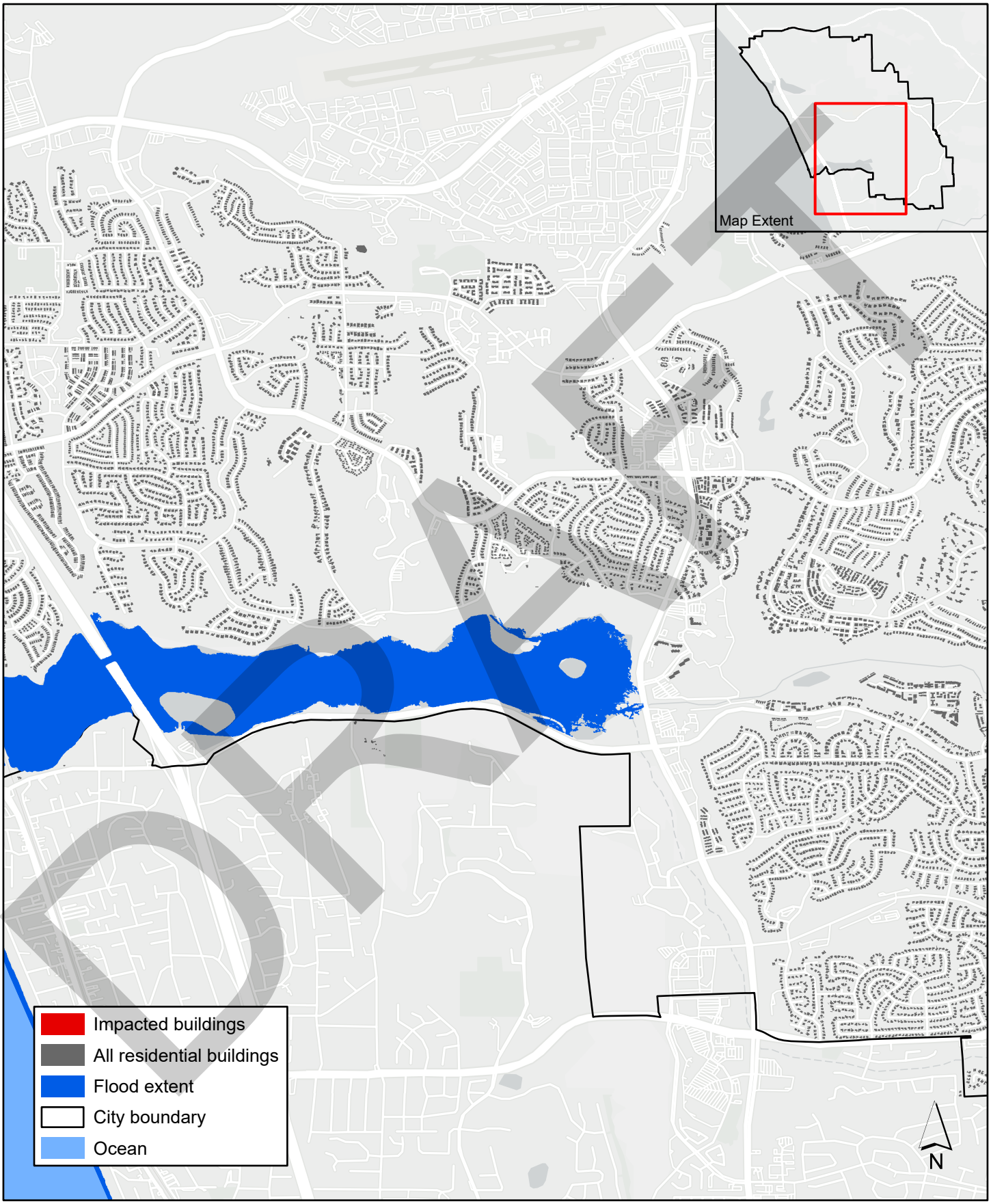
Carlsbad Area 2

Sea Level Rise 0.25 m - 001 year storm



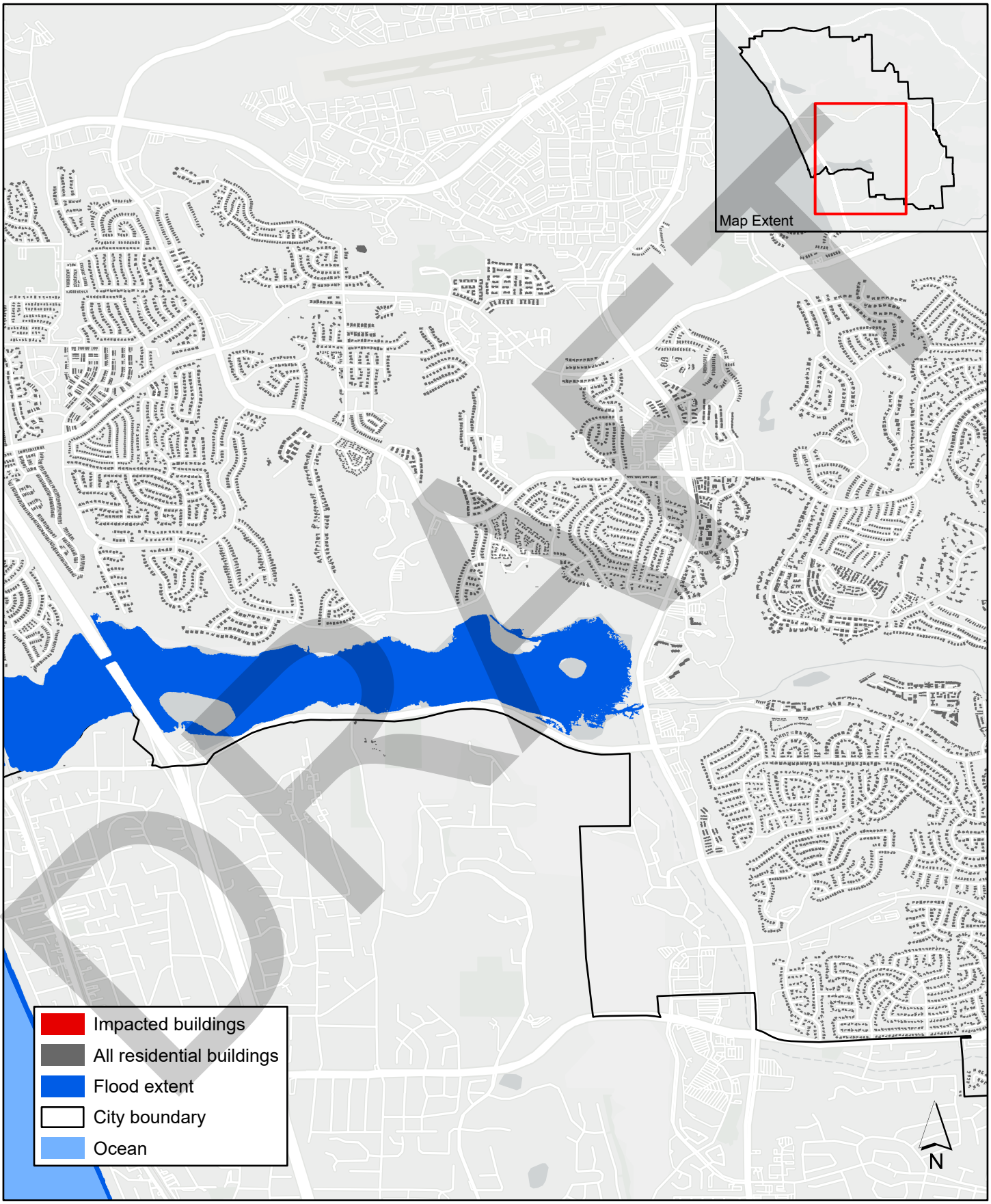
Carlsbad Area 2

Sea Level Rise 0.25 m - 020 year storm



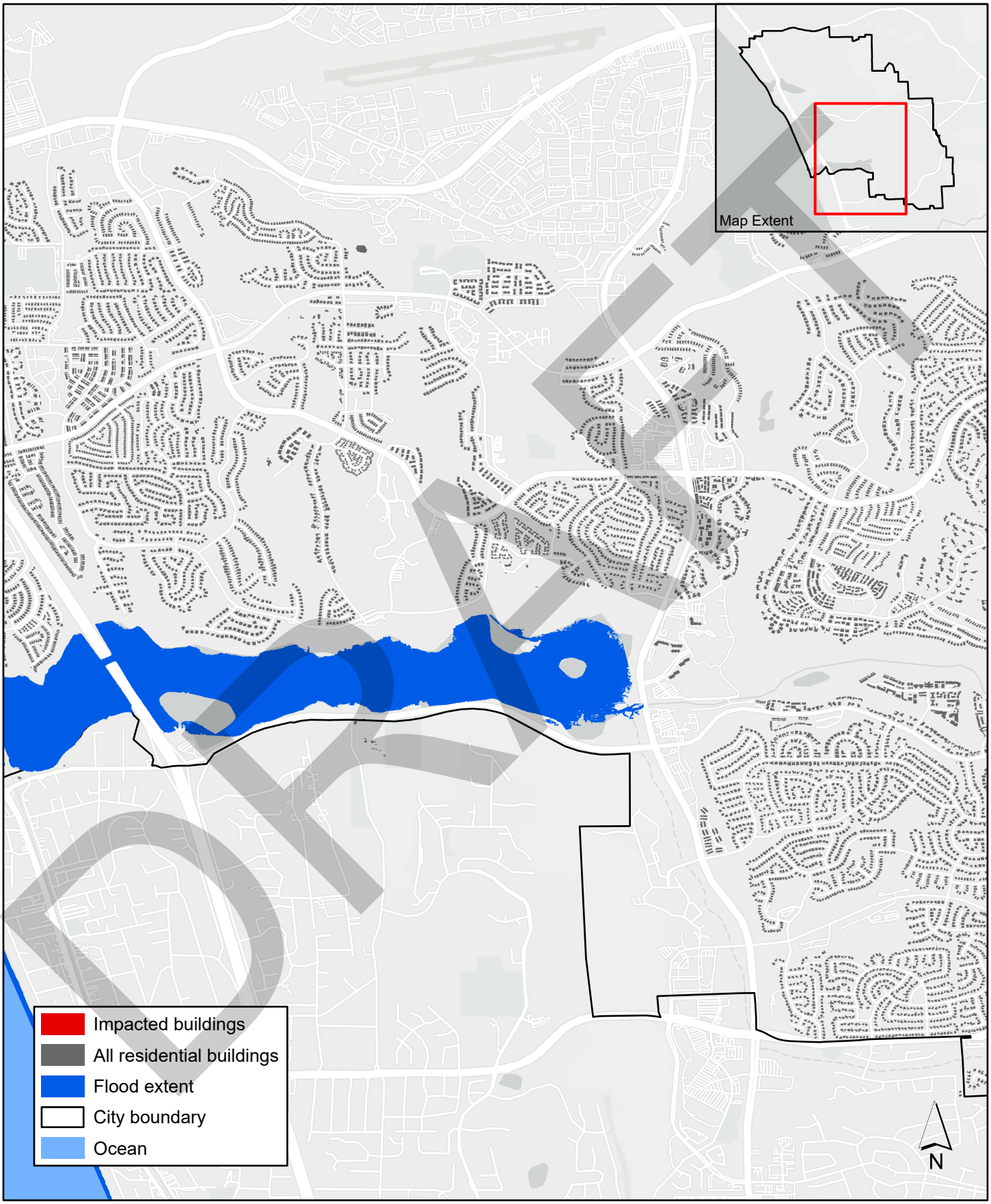
Carlsbad Area 2

Sea Level Rise 0.25 m - 100 year storm



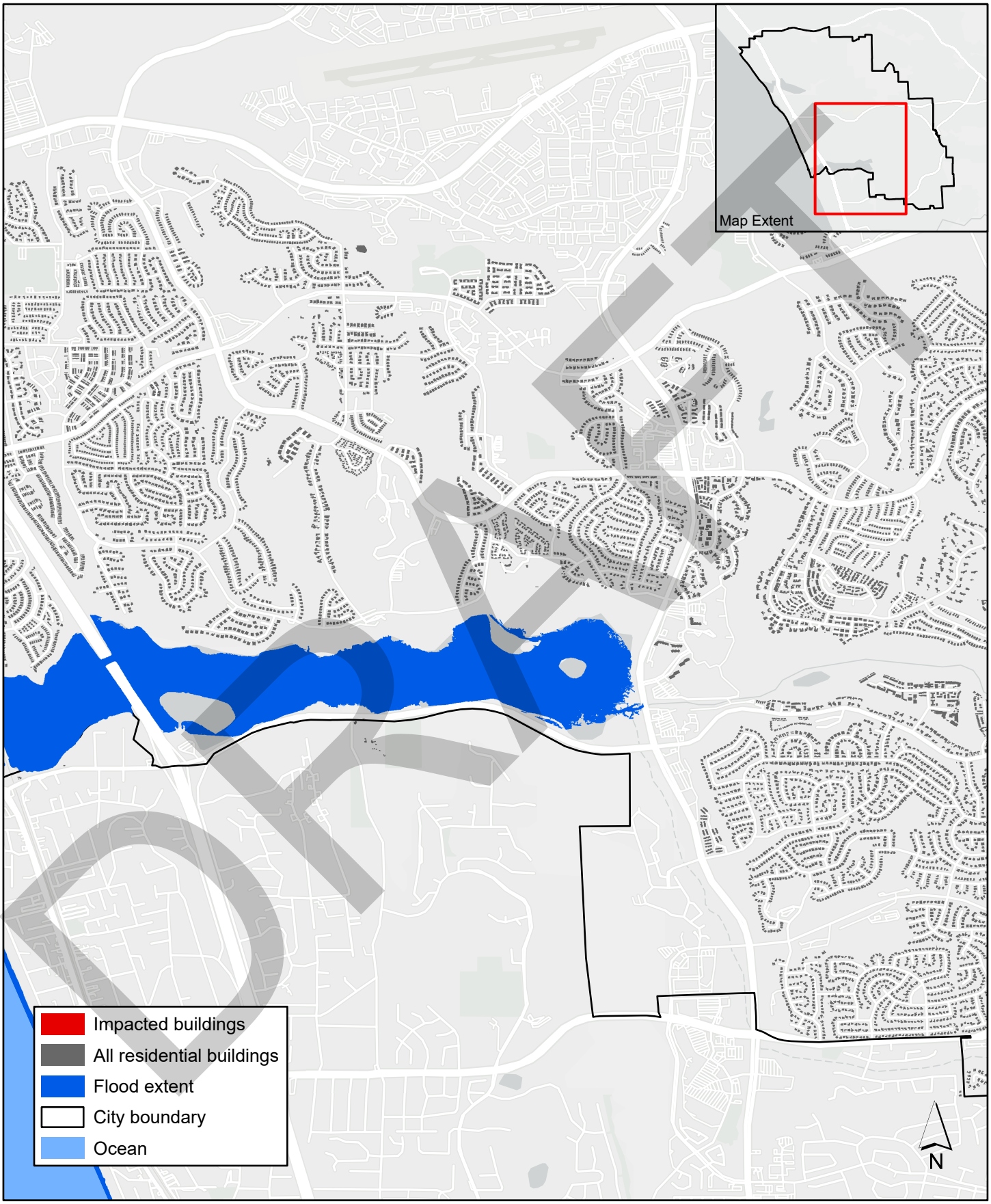
Carlsbad Area 2

Sea Level Rise 0.5 m - No storm



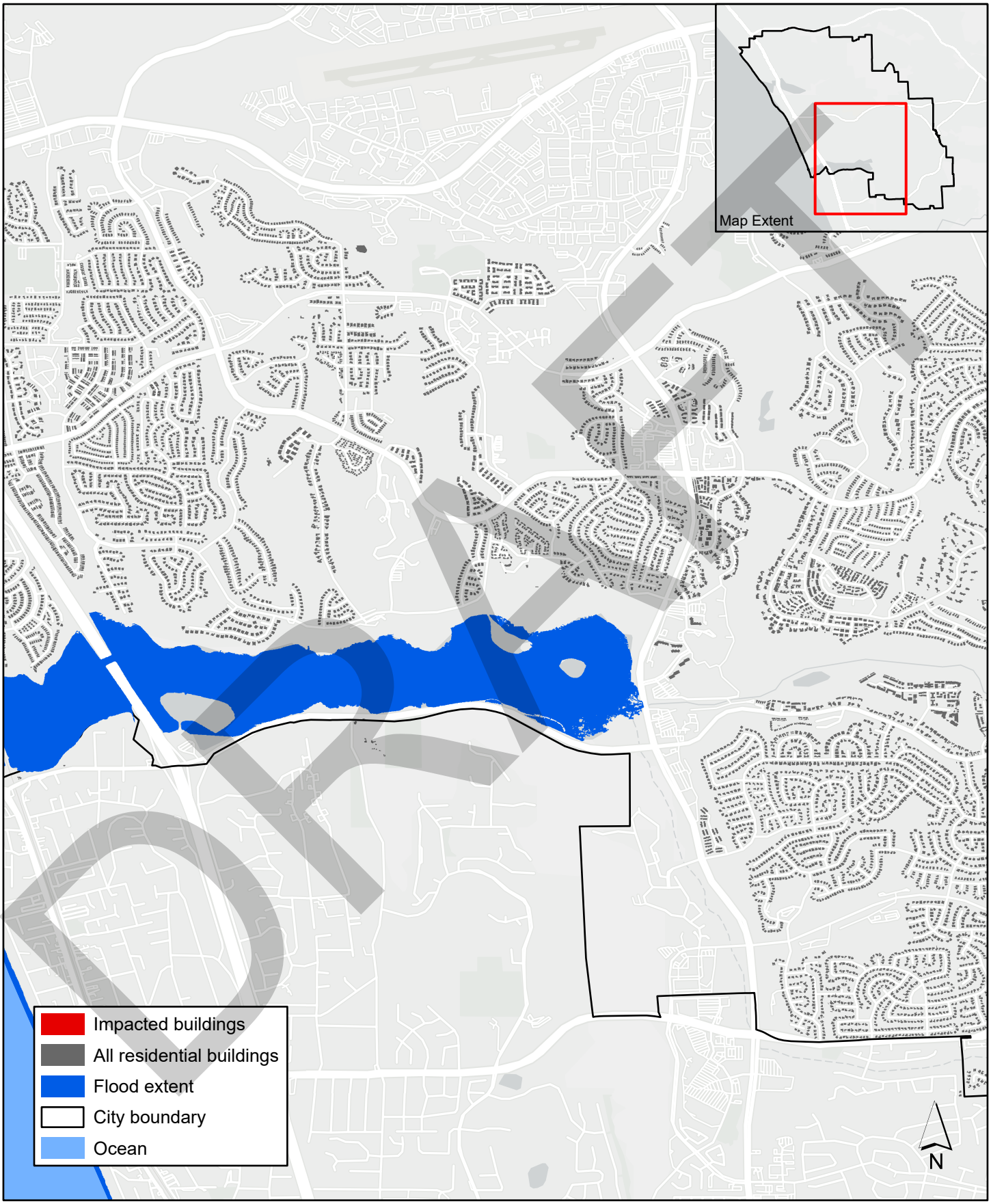
Carlsbad Area 2

Sea Level Rise 0.5 m - 001 year storm



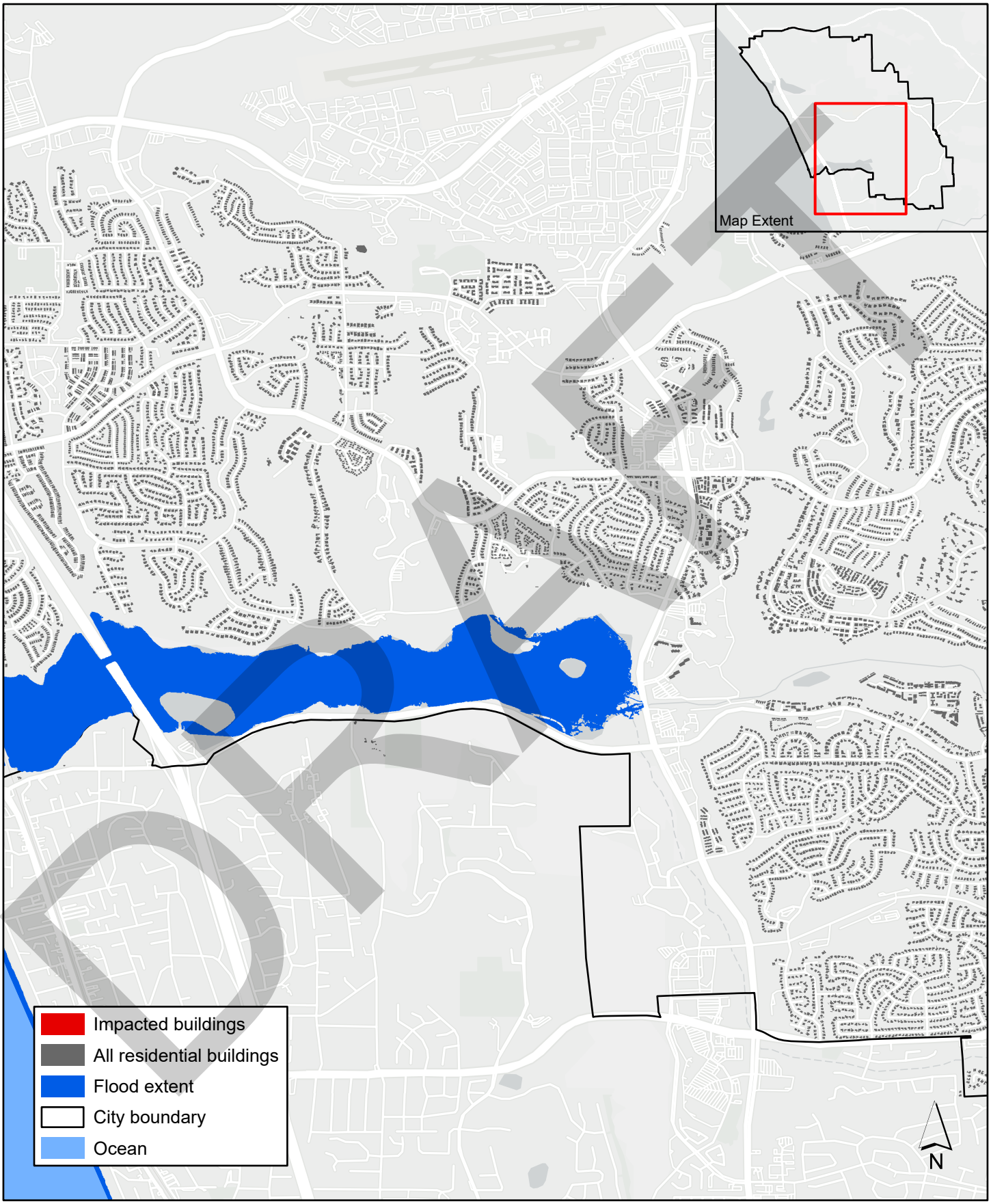
Carlsbad Area 2

Sea Level Rise 0.5 m - 020 year storm



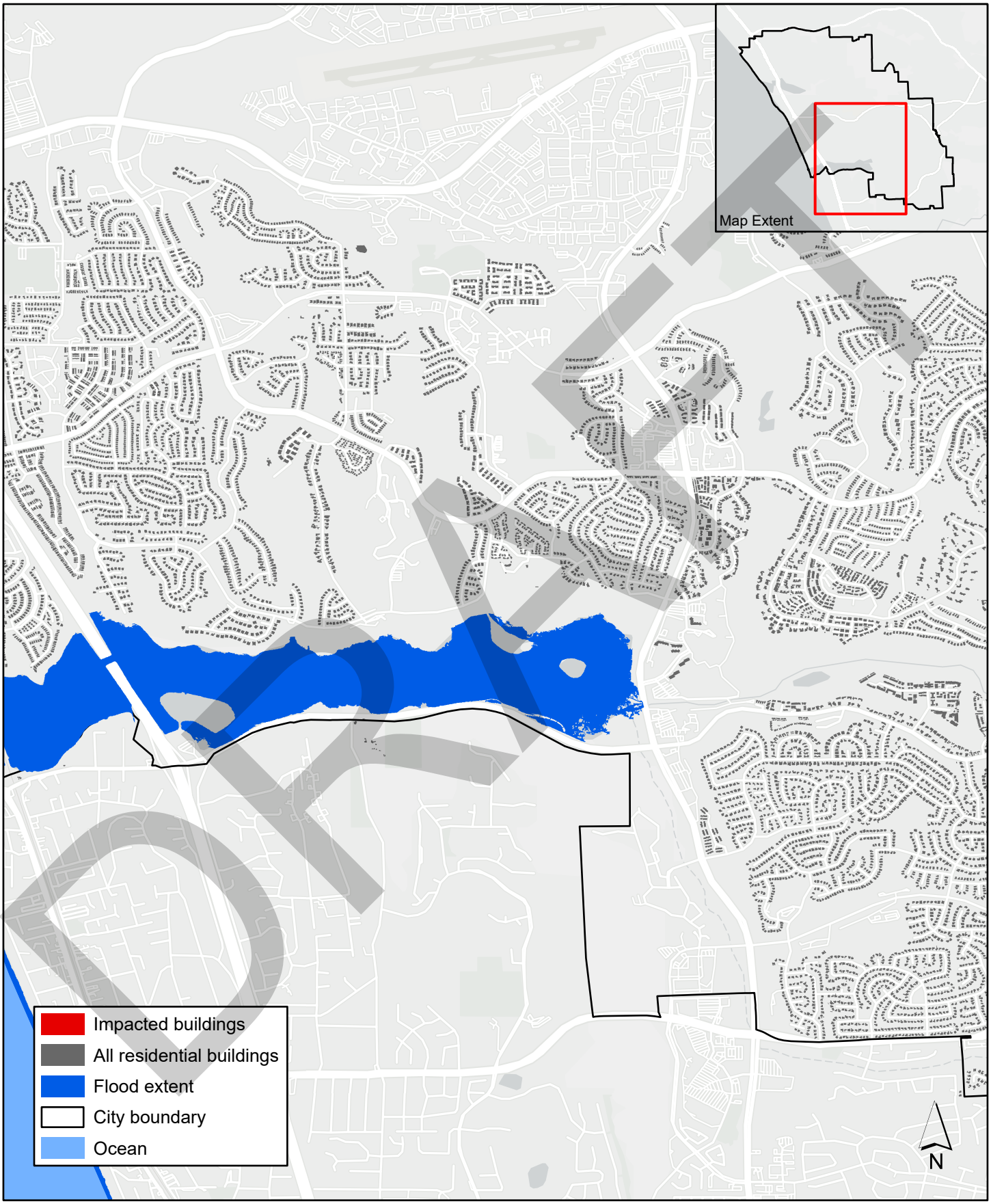
Carlsbad Area 2

Sea Level Rise 0.5 m - 100 year storm



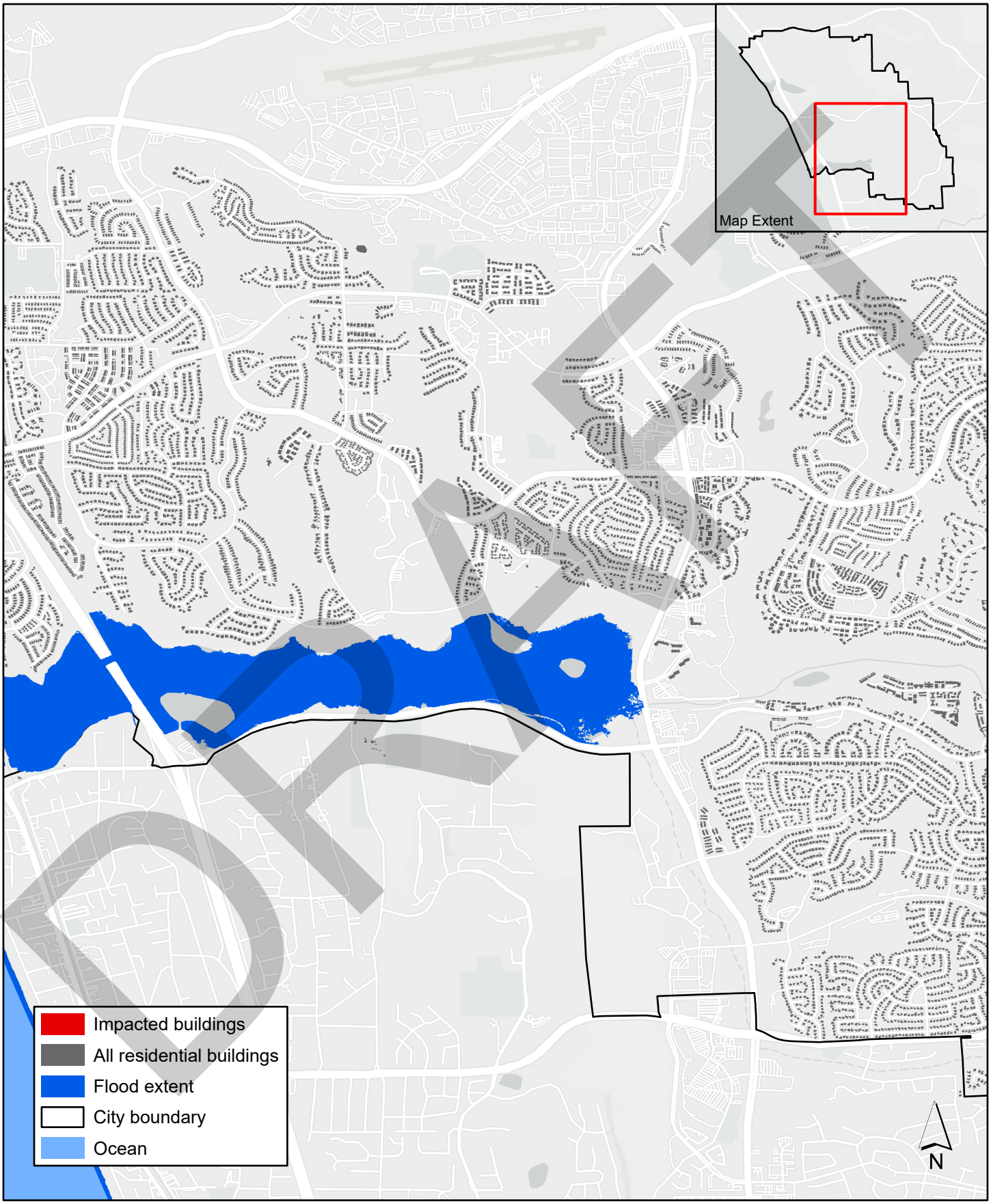
Carlsbad Area 2

Sea Level Rise 0.75 m - No storm



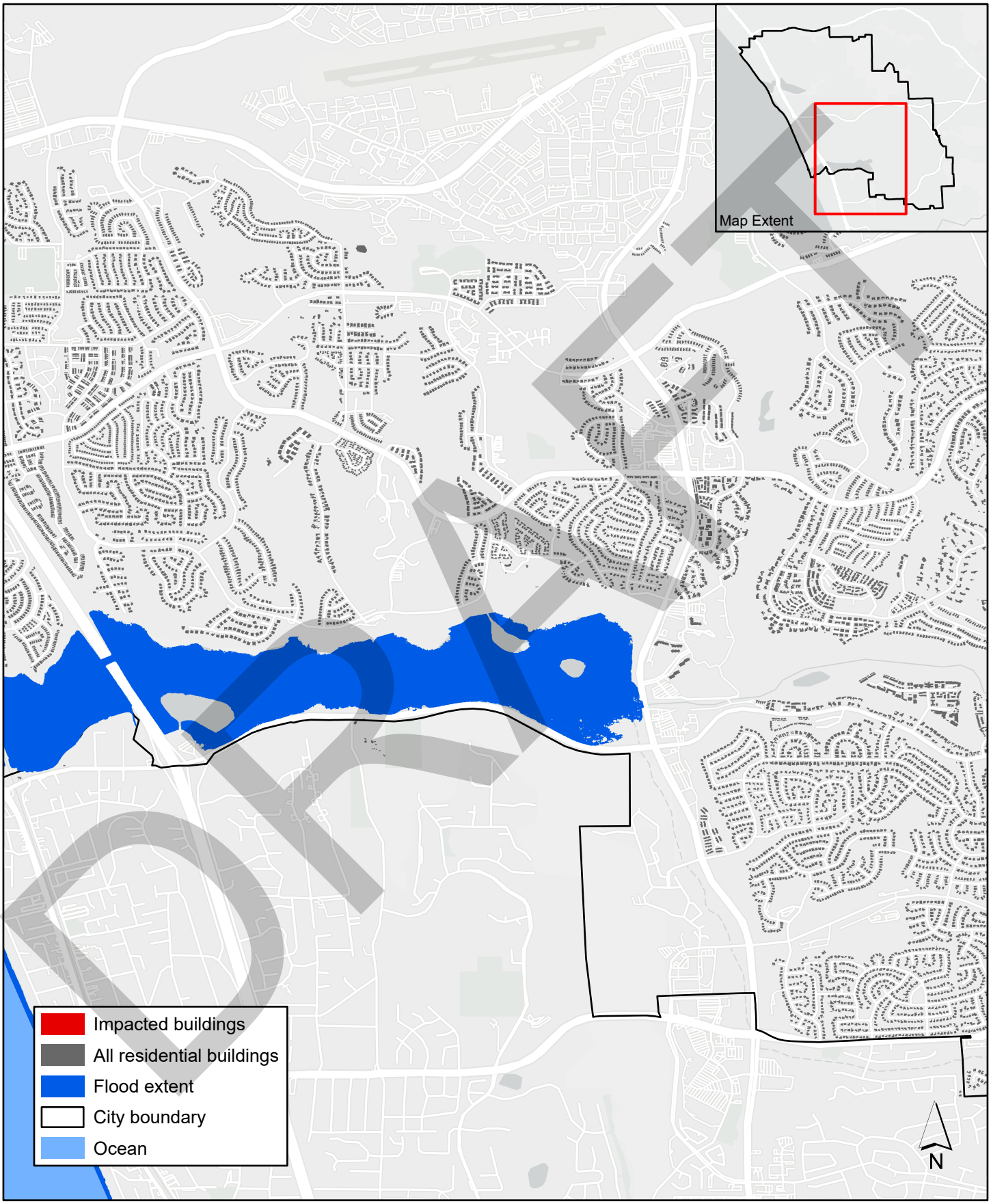
Carlsbad Area 2

Sea Level Rise 0.75 m - 001 year storm



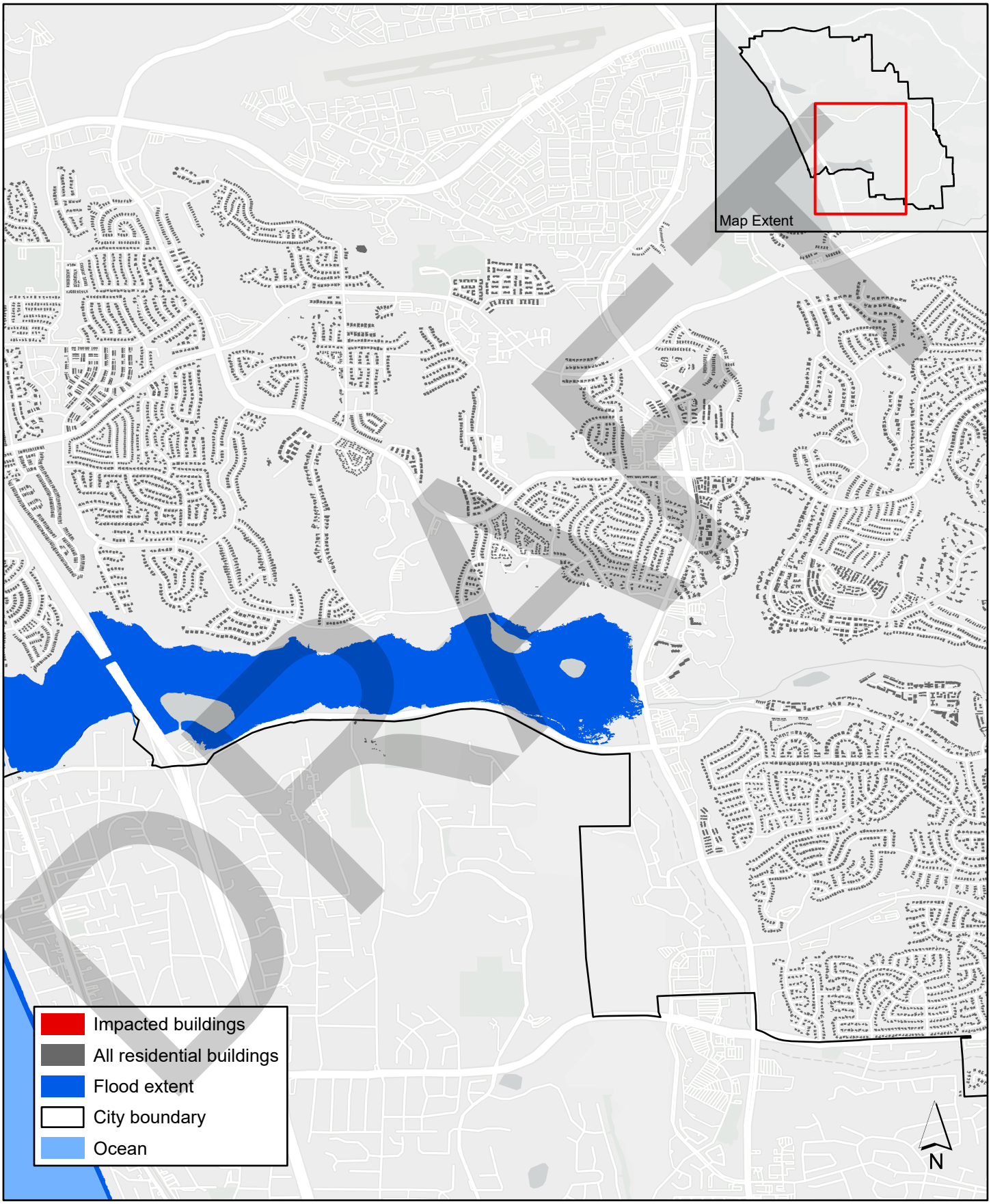
Carlsbad Area 2

Sea Level Rise 0.75 m - 020 year storm



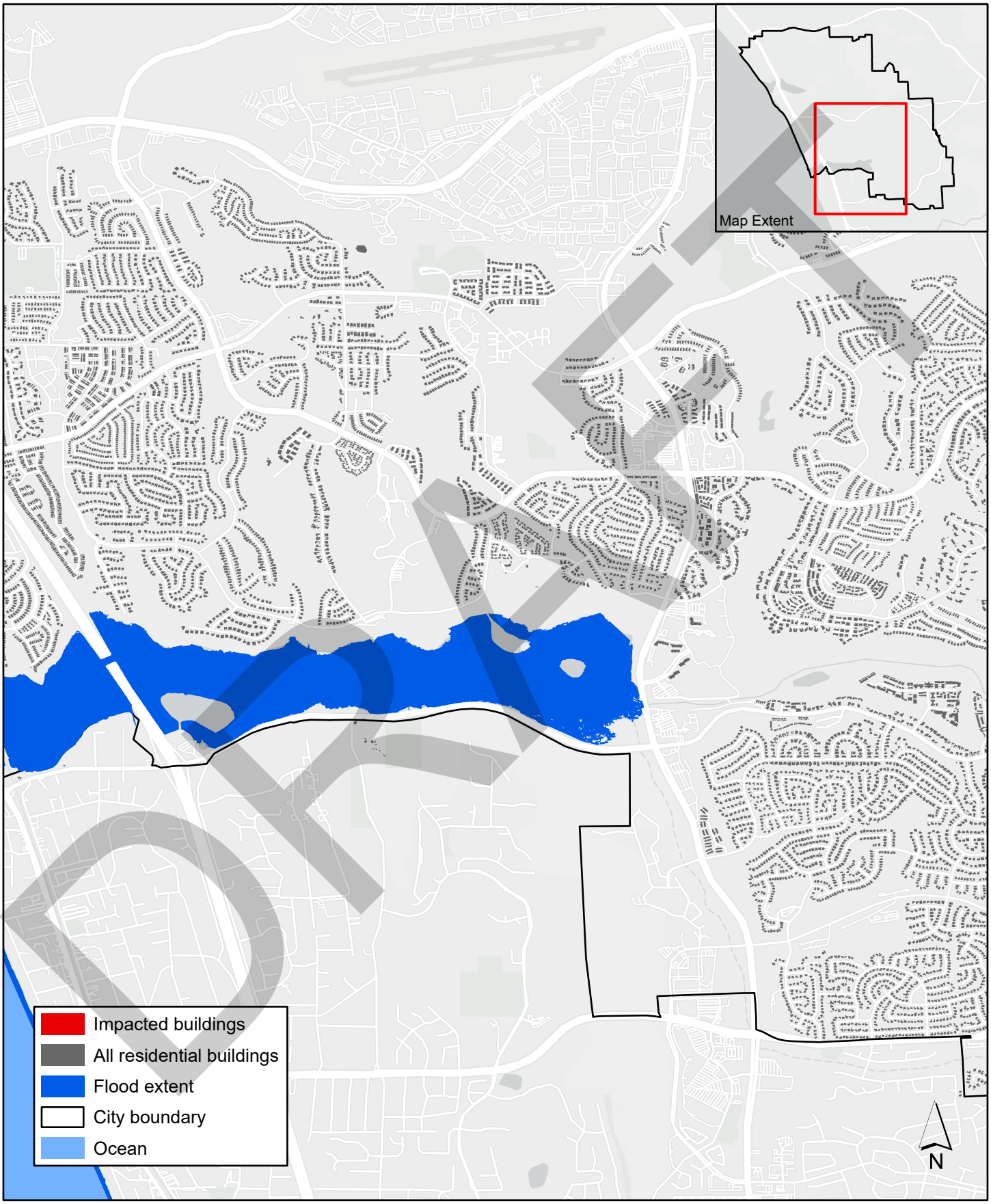
Carlsbad Area 2

Sea Level Rise 0.75 m - 100 year storm



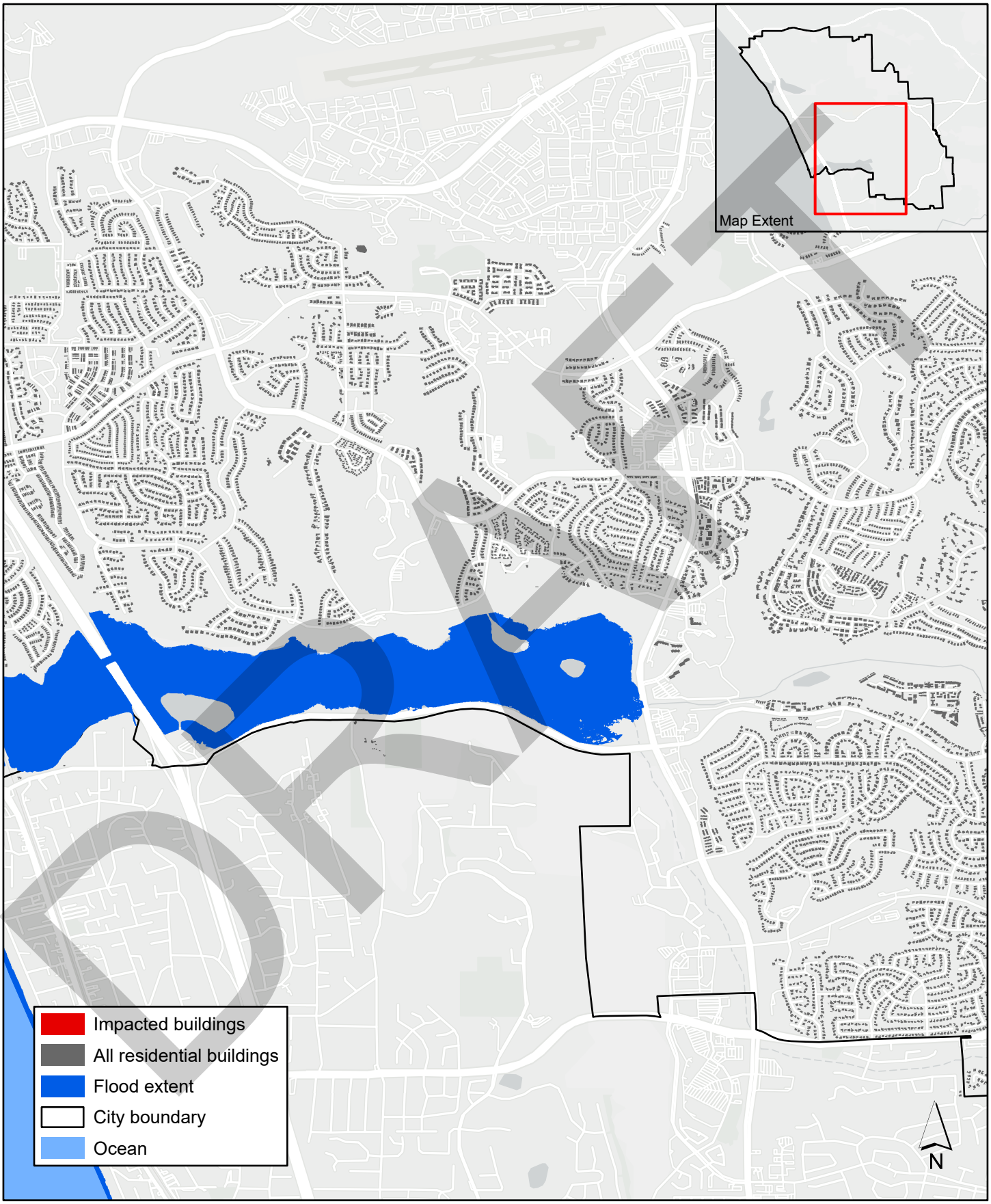
Carlsbad Area 2

Sea Level Rise 1.0 m - No storm



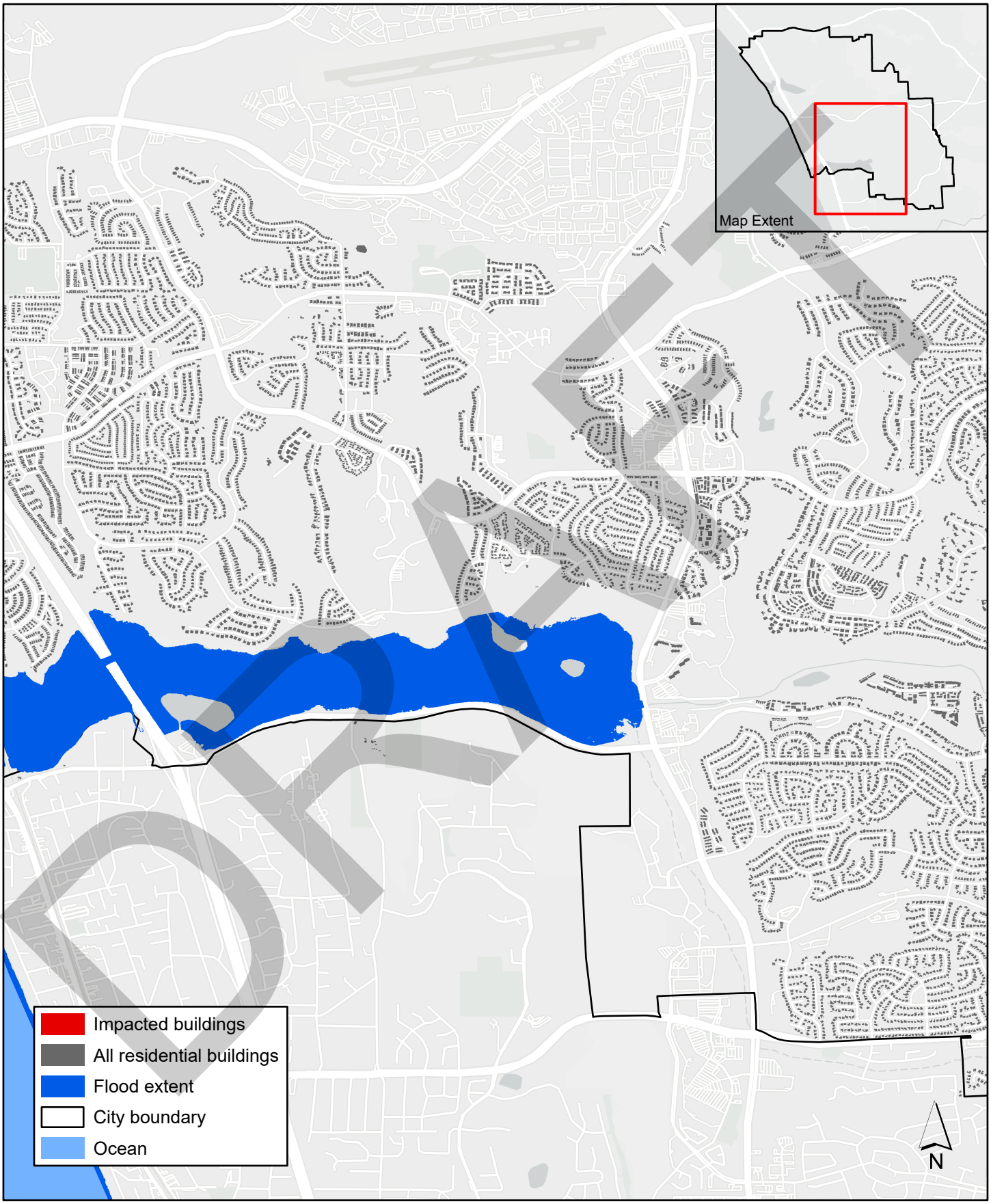
Carlsbad Area 2

Sea Level Rise 1.0 m - 001 year storm



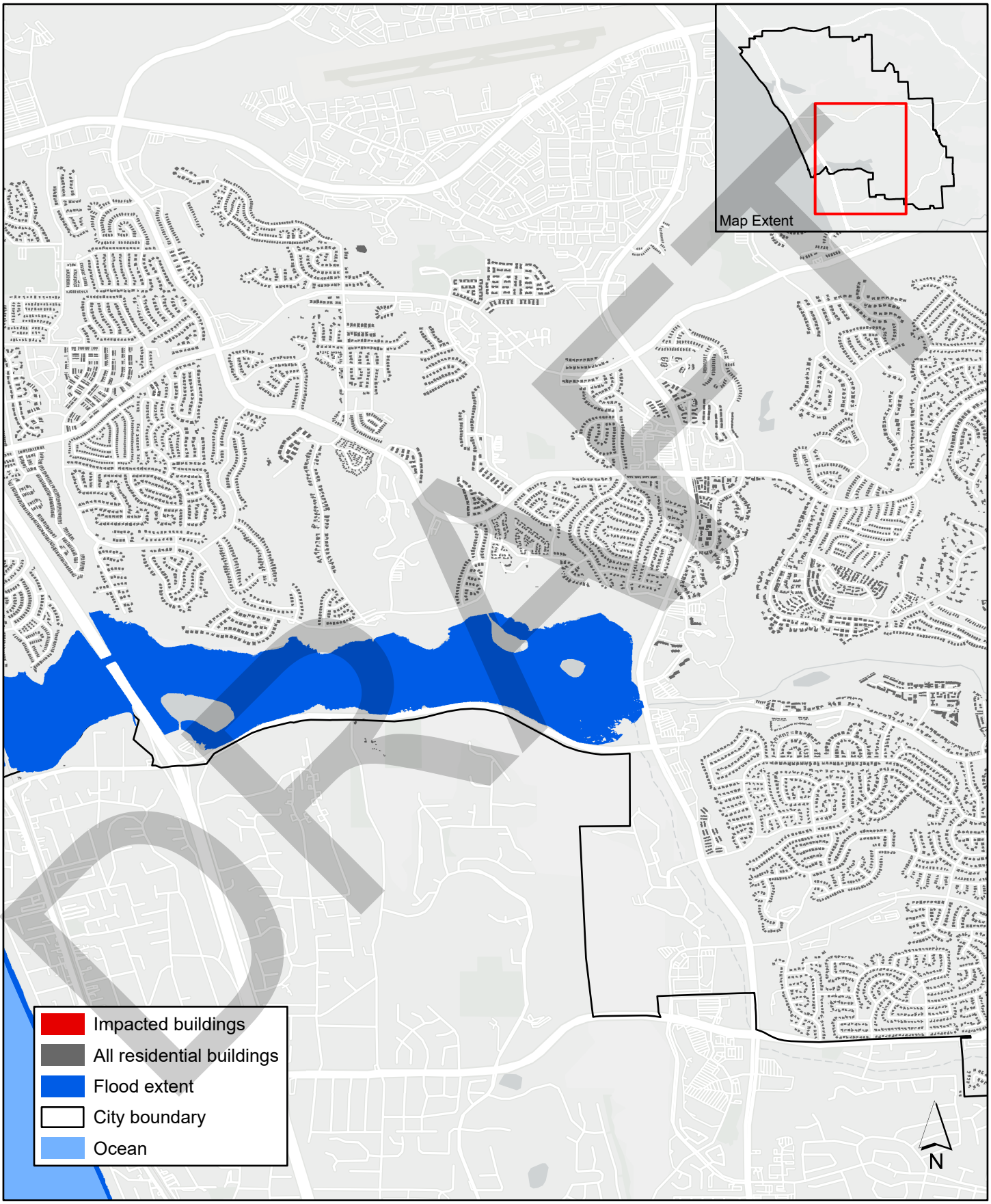
Carlsbad Area 2

Sea Level Rise 1.0 m - 020 year storm



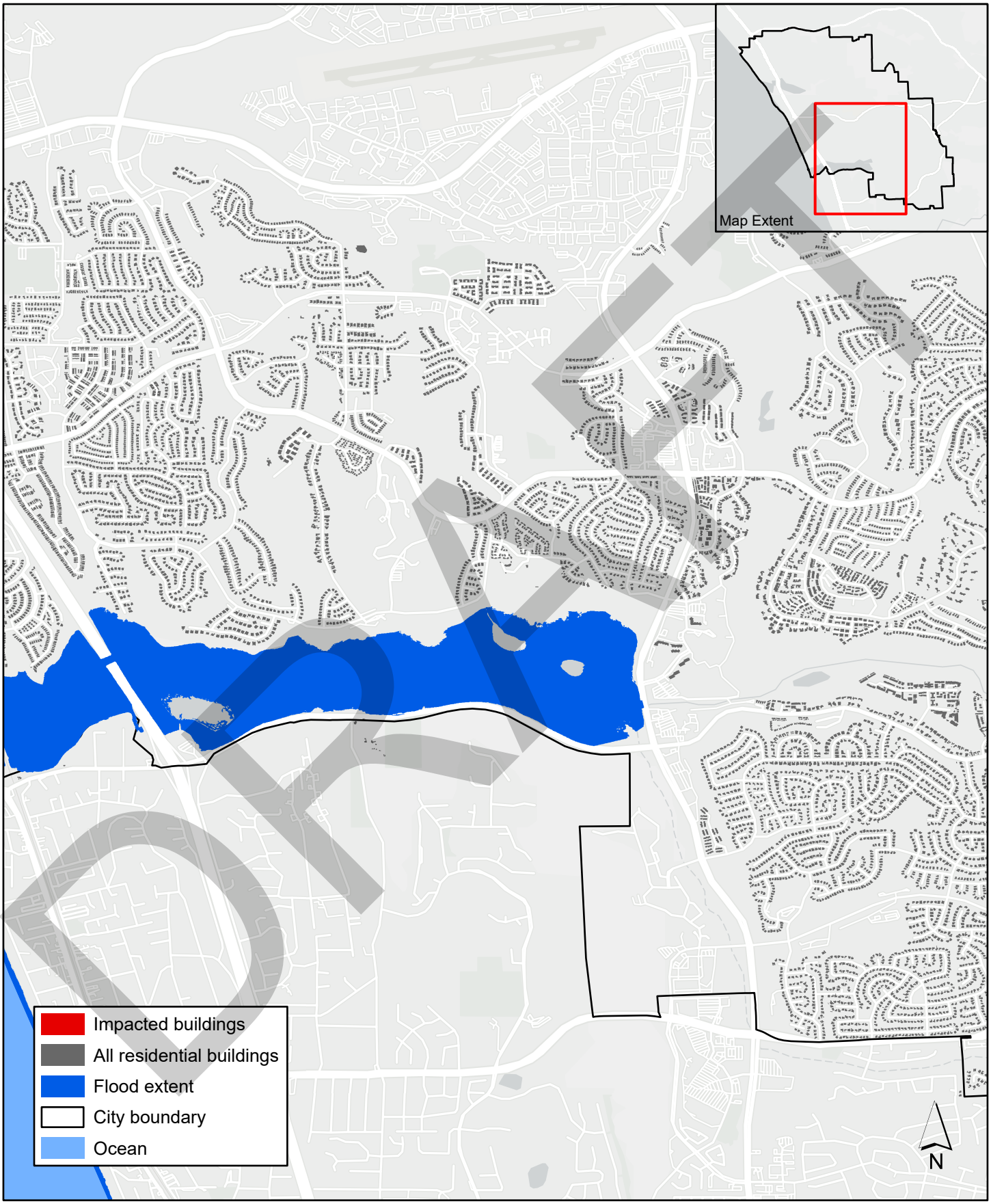
Carlsbad Area 2

Sea Level Rise 1.0 m - 100 year storm



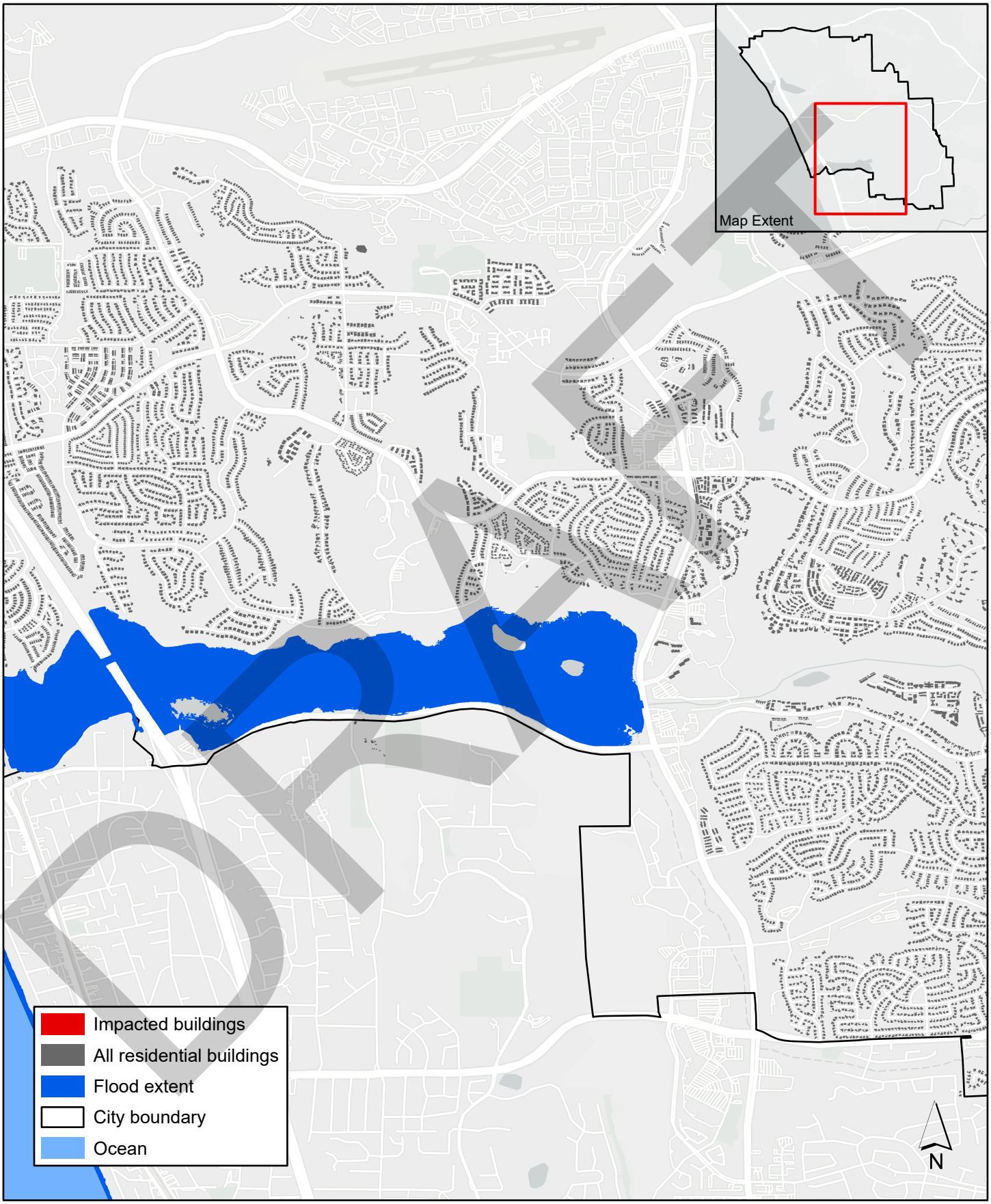
Carlsbad Area 2

Sea Level Rise 1.5 m - No storm



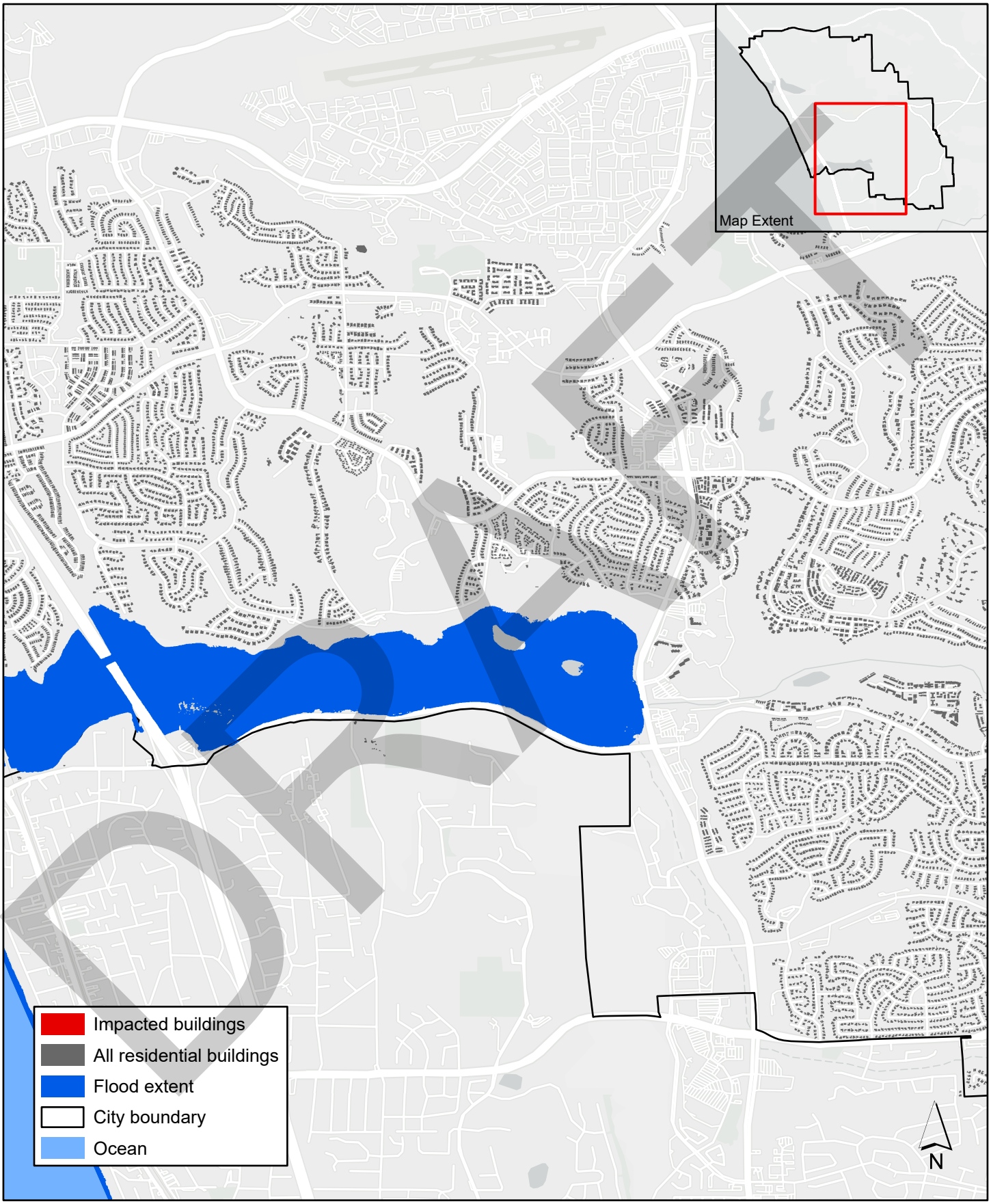
Carlsbad Area 2

Sea Level Rise 1.5 m - 001 year storm



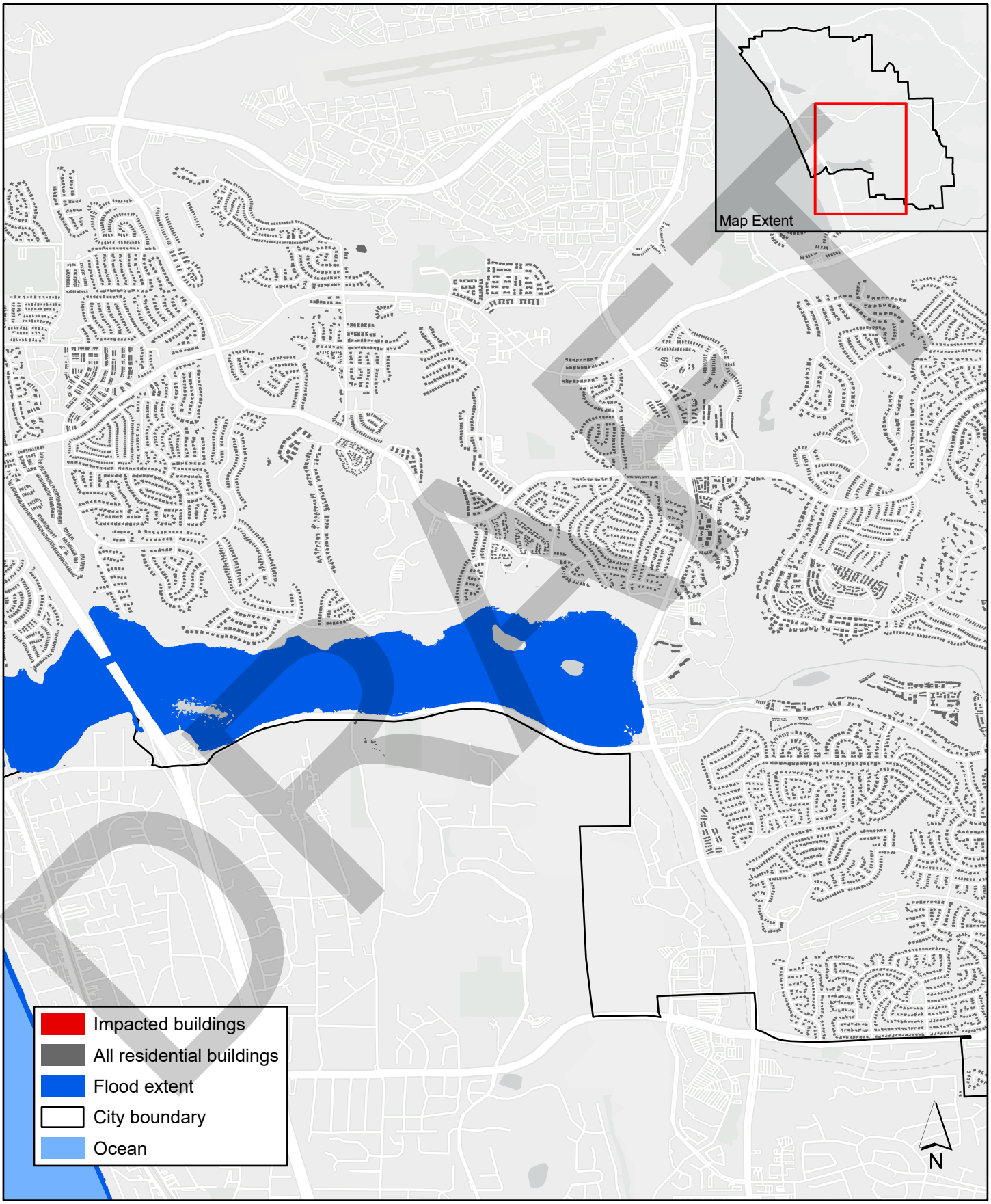
Carlsbad Area 2

Sea Level Rise 1.5 m - 020 year storm



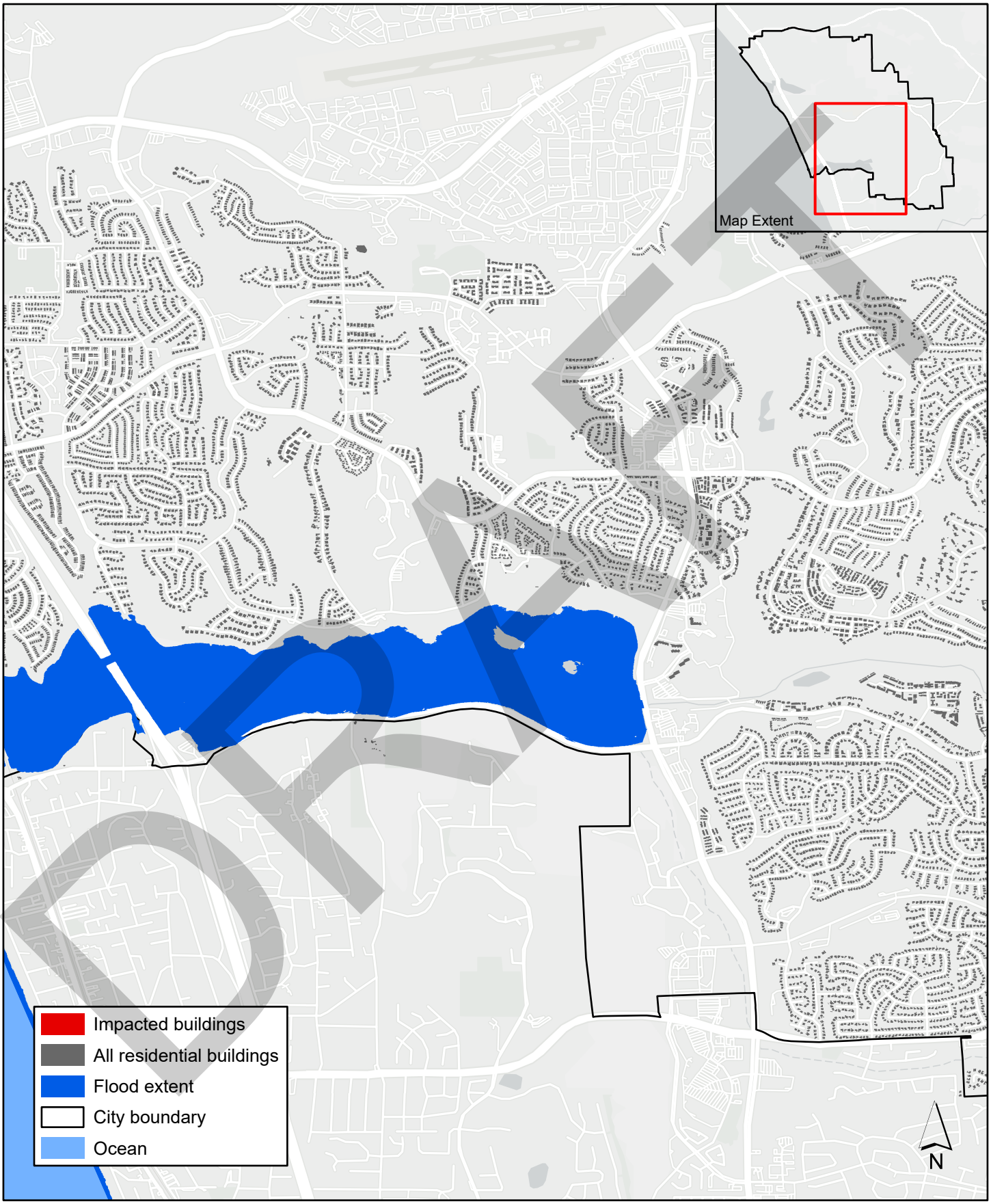
Carlsbad Area 2

Sea Level Rise 1.5 m - 100 year storm



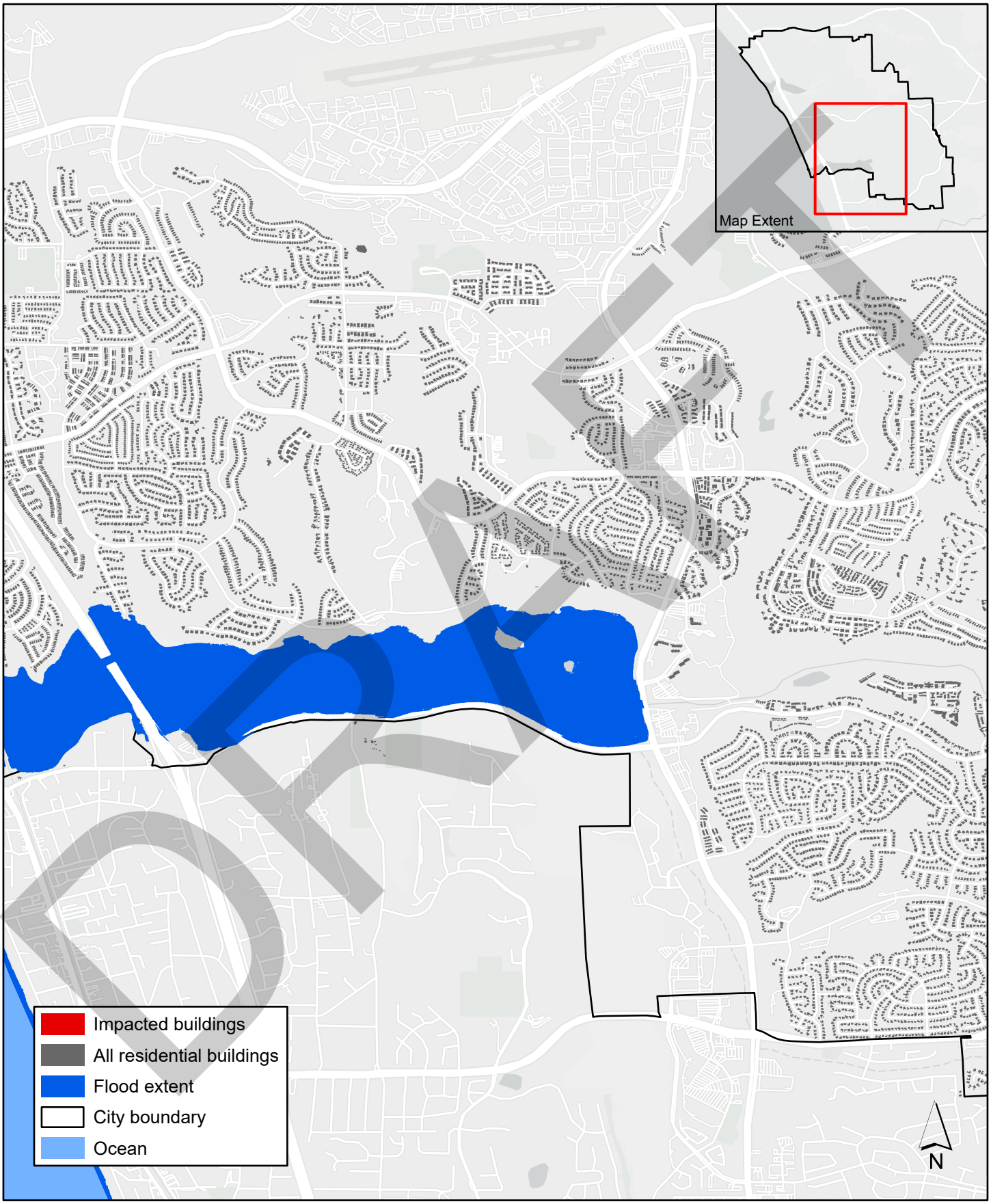
Carlsbad Area 2

Sea Level Rise 2.0 m - No storm



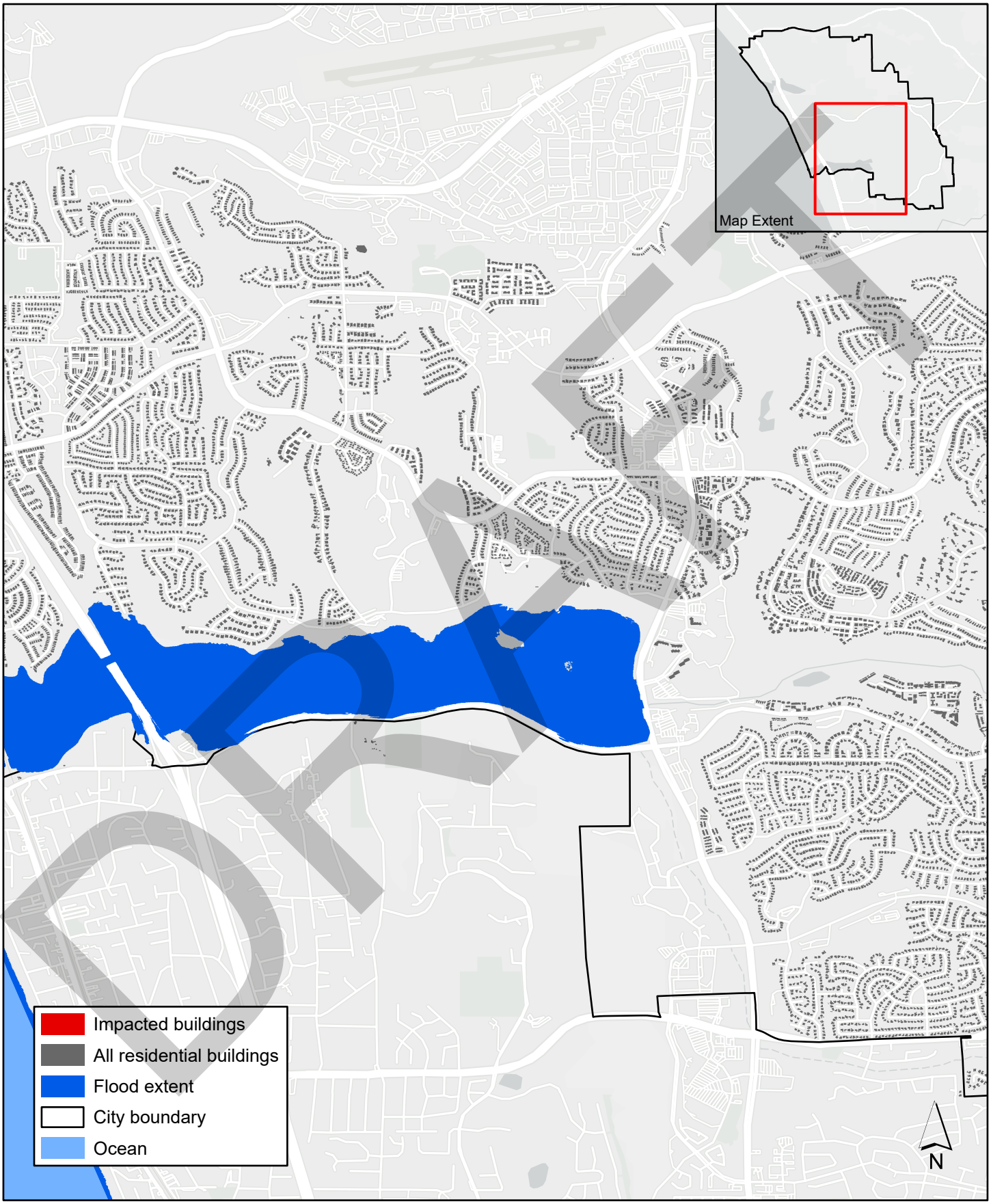
Carlsbad Area 2

Sea Level Rise 2.0 m - 001 year storm



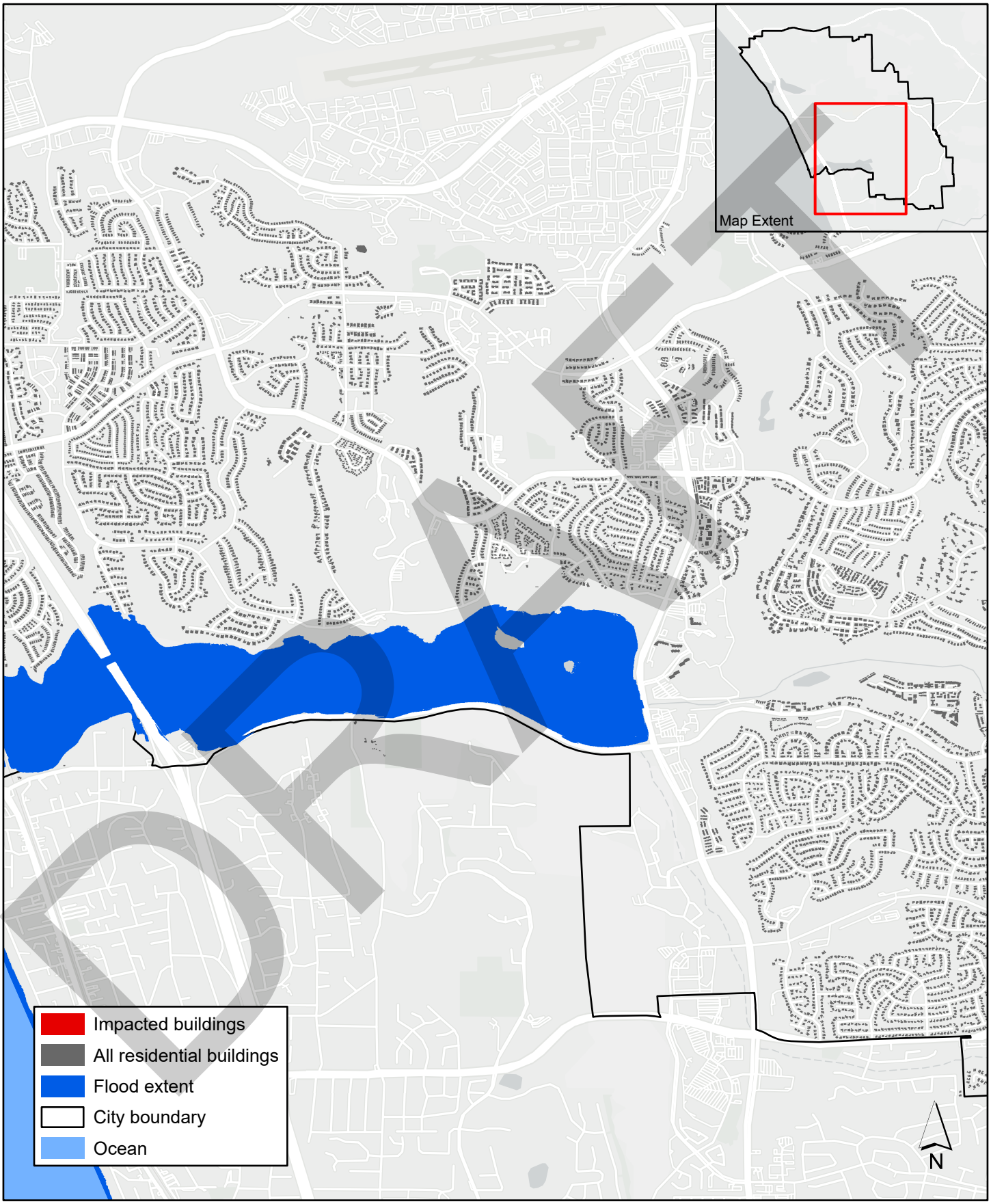
Carlsbad Area 2

Sea Level Rise 2.0 m - 020 year storm



Carlsbad Area 2

Sea Level Rise 2.0 m - 100 year storm



US Army Corps
of Engineers
Baltimore District

March 2019

REGIONAL SEDIMENT MANAGEMENT

Section 204(e) of the Water Resources Development Act of 1992, as amended

Authority and Scope: Subsection (e) of Section 204 of Water Resources Development Act (WRDA) of 1992, as amended by Section 2037 of the WRDA 2007, provides that the Secretary of the Army may cooperate with any State in the preparation of a comprehensive State or regional sediment management plan within the boundaries of the State, encourage State participation in the implementation of the plan, and submit to Congress reports and recommendations with respect to federal participation in carrying out the plan.

The Corps' role is to participate in the regional sediment management study in a coordination and collaboration role. Priority will be given to studies that leverage Section 204 funds with other federal and non-federal funds to accomplish broad systemic regional sediment management goals.

This authority can also be used to develop plans for transportation and placement of sediment obtained through construction, operation or maintenance of an authorized federal project, to reduce storm damages to property and to protect, restore, and create aquatic and ecologically related habitats, including wetlands

The Process: A Section 204 regional sediment management planning project consists of collaboration and cooperation in the development of a regional sediment plan. There are no phases as in other CAP projects, and no agreements need to be signed.

Corps assistance can include participation in team meetings, performing analyses to assist in plan development, or other tasks as determined in the planning process.

Section 204 authority limits Federal cost for preparation of comprehensive regional sediment management plans to $5 million Federal per fiscal year for the Nation.

How to Request Assistance: If you are a regional entity conducting a Regional Sediment Management Study, and are interested in Corps assistance, please contact the Baltimore District at the phone number or e-mail below. The Continuing Authorities Program Manager will be happy to assist you and can discuss the desired level of involvement. Upon receipt of a letter of request from a non-Federal project sponsor the Corps of Engineers can initiate the study and request funds to support the effort. Funds are limited.

For Further Information, Contact:

Mr. Anthony Clark
Continuing Authorities Program Manager
Planning Division
anthony.a.clark@usace.army.mil
(410) 962-3413

SAMPLE LETTER OF REQUEST
FOR A
SECTION 204(e) STUDY

John T. Litz, PMP
Colonel, U.S. Army
Commander and District Engineer
U.S. Army Engineer District, Baltimore
2 Hopkins Plaza
Baltimore, Maryland 21201

ATTN: Planning Branch

Dear COL Litz:

This letter is to request the assistance of the U.S. Army Corps of Engineers under Subsection (e) of Section 204 of Water Resources Development Act of 1992, as amended. To participate in a regional sediment management study for *[region or state]*.

[Briefly describe the nature and severity of the problem, any issues that could affect the study, and the desired scope of Corps involvement, if known.]

We understand that funds are limited available, but that there is no requirement for non-Federal funds.

Please contact *[name, address, telephone]* for further information.

[Name and Title of public official authorized to request the study]

Regional Beach Sand Project III (RBSPIII) Feasibility Study & Economic Analysis Scope of Work

INTRODUCTION:

SANDAG is the Metropolitan Planning Organization (MPO) for the San Diego region and plays a key role in the regional coordination of a variety of projects. The San Diego region has 19 jurisdictions, 10 of which are located in the coastal zone and collectively manage approximately 70 miles of coastline which can be accessed via transit, highways, roadways, and bicycle and pedestrian facilities. A number of these facilities are at risk from the impacts of rising seas, high tides, and strong storms. As such, access to beaches, residences, and public facilities may be impacted. This would be particularly impactful to disadvantaged populations living in the cities of Oceanside, Carlsbad, City of San Diego, National City, Chula Vista, and Imperial Beach which have populations that fall in the 70-100 percentile of the demographic index (source: EJSCREEN).

SANDAG proposes to conduct a feasibility study for a regional beach sand nourishment project which would use information from SANDAG's Round 1 SB 1 Caltrans Adaptation Planning Grant effort to identify transportation facilities that will be impacted by sea-level rise and may benefit from beach nourishment. Implementation of a regional beach sand project would involve dredging beach quality sand from offshore borrow sites and placing it on highly eroded beaches in the San Diego region. Beach nourishment is being considered as a sea-level rise adaptation strategy by a number of cities in the San Diego region who have updated their Local Coastal Programs to align with the California Coastal Commission's Guidance on sea-level rise. Wide beaches can help protect coastal communities and coastal transportation facilities by acting as a buffer to alleviate some of the impacts from sea-level rise, strong storm events, and high tides. SANDAG has previously completed two regional beach sand nourishment projects in 2001 and 2012 (RBSP I and RBSP II, respectively), adding approximately 3.5 million cubic yards of sand to the region's local beaches. In addition, SANDAG has an established regional forum (the Shoreline Preservation Working Group) where elected officials are engaged in regional adaptation projects, such as beach nourishment.

SANDAG will coordinate closely with city staff, city council members who serve on SANDAG's Shoreline Preservation Working Group (SPWG), and other technical advisors on this project. Work efforts from this project will be summarized in two final deliverables: the feasibility study and the off-shore borrow site survey plan.

RESPONSIBLE PARTIES

SANDAG will require the assistance of a consulting team to complete this work. SANDAG has not yet selected which firm will provide this assistance, but will utilize the agency's list of on-call consultants, selected through the established procurement procedures, to find the appropriate firm(s) to perform this work. Generally, SANDAG will be responsible for overall project management and administration and will play a role in coordinating with local jurisdictions as well as drafting and editing the feasibility study. The consultant will be responsible for the majority of other tasks including the review of existing monitoring data, completing the offshore borrow site survey plan, completing the economic analysis, and finalizing the feasibility study.

Exhibit A – Scope of Work

OVERALL PROJECT OBJECTIVES:

- Identify beach erosion areas in the San Diego region that may impact coastal transportation infrastructure through review of existing data and coordination with coastal jurisdiction staff.
- Evaluate the economic costs and benefits of implementing a regional beach nourishment project and several alternatives to that project that may include one pilot sand retention strategy.
- Complete a feasibility study for a future regional beach nourishment project and alternatives.
- Create a plan for surveying offshore sand borrow sites to ensure adequate quantities of sand are available to nourish the San Diego region's beaches.

1. Project Management and Administration

- SANDAG will hold a kick-off meeting to discuss procedures and project expectations, including invoicing, quarterly reporting, and other relevant project information. Meeting summary will be documented.
- Utilize an existing on-call agreement to select consultants using the proper procurement procedures.
- SANDAG will hold a kick-off meeting with the consultants to review the scope of work, timeline, communication protocols, and other relevant project information. Meeting summary will be documented.
- Coordinate with the consultants through regular communication (including in-person meetings and/or conference calls) to ensure project remains on time and within budget. Meeting notes will be documented.
- Consultant will invoice SANDAG and provide a brief summary of work efforts on a monthly basis.

Task 1 Deliverables

- Meeting Notes and Summaries
- Subcontractor Agreements
- Invoice Packages and Quarterly Reports

2. Economic Analysis

- Using actual costs from RBSP II, the economic analysis conducted for the 2007 feasibility study (for RBSP II), as a template, the consultant will prepare an economic analysis that will include the following components: preliminary cost estimates of a range of project alternatives that may include one pilot sand retention strategy, a benefit/cost analysis of the project alternatives, and a discussion of economic impacts. This economic analysis will be summarized in the feasibility study and included as an appendix to the final document.

Task 2 Deliverables

- Economic Analysis Technical Appendix

3. Regional Beach Sand Replenishment Project (RBSP III) Feasibility Study

- Using information obtained from Tasks 2, consultant will draft a feasibility study for a future regional beach sand project (RBSPIII). The 2007 feasibility study that was prepared for RBSP II will be used as a template and the updated feasibility study will address the same major topics including, but not limited to: a statement of the problem, a description of existing site conditions, consideration of project alternatives, methods to reduce costs and leverage other efforts in southern California, and economic considerations.

- The feasibility study will also include an explanation of how beach nourishment can be used to protect coastal critical infrastructure in the region from seal level rise. .
- Finally, the feasibility study will identify the various permits and approvals that would be needed for the implementation of this project. Recommendations for streamline permitting will also be included, with emphasis on replicating work done previously, and applying lessons-learned from RBSP I and II, and from other projects in southern California. The consultant should seek ways to leverage opportunities arising from the San Diego Coastal Storm Damage Reduction Project, the Army Corps new west coast dredge and any other southern California beach nourishment project.
- A meeting will be scheduled with interested stakeholders (city staff, members of the SPWG, members of the public) to review the draft feasibility study and solicit feedback. SANDAG will likely use a scheduled SPWG meeting as the forum for this discussion. Comments from stakeholders may also be submitted in writing and revisions to the feasibility study will be made as needed.
- Consultant will incorporate comments from SANDAG staff and interested stakeholders into a final version of the feasibility study.

Task 3 Deliverables

- Draft Feasibility Study
- Host meetings to discuss draft Feasibility Study
- Finalize Feasibility Study

4. Off-Shore Borrow Site

- Conduct a literature review of offshore investigations completed for Regional Beach Sand Projects I and II (RBSP I and RBSP II) to identify any additional candidate borrow sites in the northern portion of San Diego County that could be utilized to implement a future beach nourishment project.
- Prepare a plan and scope of work to conduct an investigation of a minimum of three offshore borrow sites to determine the outer boundaries of the two offshore borrow sites used for RBSP II (MB-1 and SO-5) and at least one new borrow site in the northern portion of San Diego County. Once completed, these surveys will help to estimate the quantity of sand available for beach nourishment on the San Diego coastline.

Task 4 Deliverable

- Perform Off-Shore Borrow Site existing data review
- Prepare Off-Shore Borrow Site Plan and Scope of Work for Three Sites

Exhibit B – Budget Schedule

Regional Beach Sand Project III (RBSPIII) Feasibility Study & Economic Analysis					
Task Name		Description	Budget	State Date	End Date
1	**Project Management and Administration**	SANDAG to monitor Project Management and Administration	$10,000.00		
2	**Economic Analysis**	Subconsultant to prepare an updated Economic Analysis	$50,000.00		
3	**Regional Beach Sand Replenishment Project (RBSP III) Feasibility Study**	Draft RBSP III Feasibility Study, Review, and Finalize	$100,000.00		
4	**Off-shore Borrow Site**	Subconsultant will prepare an Offshore Borrow Site Plan and Scope of Work for Three Sites	$40,000.00		
		Total	**$200,000**	**NTP**	

Regional Beach Sand Project III (RBSPIII) Feasibility Study & Economic Analysis				
Task Name		Description	State Date	End Date
1	**Project Management and Administration**	SANDAG to monitor Project Management and Administration	NTP	
2	**Economic Analysis**	Subconsultant to prepare an updated Economic Analysis	NTP	
3	**Regional Beach Sand Replenishment Project (RBSP III) Feasibility Study**	Draft RBSP III Feasibility Study, Review, and Finalize	NTP	
4	**Off-shore Borrow Site**	Subconsultant will prepare an Offshore Borrow Site Plan and Scope of Work for Three Sites	NTP	

WALLA WALLA COST ENGINEERING
MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT
For Project No. 104713

SPL – San Clemente Beach
Initial & Periodic Nourishments

The San Clemente Beach Nourishment project, as presented by Los Angeles District, has undergone a successful cost update and Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of May 21, 2021, the Cost MCX certifies the estimated total project cost:

INITIAL

FY23 Project First Cost INITIAL:	$15,019,000 (excluding spent costs)
SPENT:	$ 1,218,000
Total Project First Cost:	$16,237,000
FULLY FUNDED w/ SPENT:	$16,237,000

PERIODIC – 8 Renourishments

FY23 Project First Cost (2027-69):	$114,313,000
SPENT:	$ -0-
FULLY FUNDED w/ SPENT:	$239,598,000

Cost Certification assumes Efficient Implementation (Funding). It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management through the period of Federal participation.

Michael P Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
PROJECT No: P2 104713
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

INITIAL BEACH NOURISHMENT

This Estimate reflects the scope and schedule in: Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2023									
						Effective Price Level Date: 1 Oct 2022									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Spent Thru: 1 Oct 2019 ($K)	TOTAL FIRST COST ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*				*M*	*N*	*O*
	INITIAL BEACH NOURISHMENT														
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376		2,376		1,747	629	2,376
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	36%	7,465	4.8%	5,753	2,071	7,824		7,824		5,753	2,071	7,824
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576		9,732		7,500	2,700	10,200		10,200		7,500	2,700	10,200
01	LANDS AND DAMAGES	71	18	25%	89	5.6%	75	19	94		94	0.3%	75	19	94
30	PLANNING, ENGINEERING & DESIGN	2,808	1,011	36%	3,819	5.1%	2,950	1,060	4,010	1,218	5,228		2,950	1,060	5,228
31	CONSTRUCTION MANAGEMENT	501	180	36%	681	5.0%	526	189	715		715		526	189	715
	PROJECT COST TOTALS:	10,536	3,785	36%	**14,321**		11,051	3,968	**15,019**	1,218	**16,237**	0.0%	11,051	3,968	**16,237**

_____ CHIEF, A-E MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.

ESTIMATED TOTAL PROJECT COST: **16,237**

_____ PROJECT MANAGEMENT, Susan M. Ming, P.E.

_____ CHIEF, REAL ESTATE, Cheryl Connett

_____ CHIEF, ENGINEERING, Vangil C. Crisostomo, P.E.

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared:		12 May 2021		Program Year (Budget EC):			2023					
		Effective Price Level:		1 Oct 2020		Effective Price Level Date:			1 Oct 2022					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	INITIAL BEACH NOURISHMENT - CYCLE No. 1													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2021Q4		1,747	629	2,376
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	**36%**	7,465	4.8%	5,753	2,071	7,824	2021Q4		5,753	2,071	7,824
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			7,500	2,700	10,200
01	LANDS AND DAMAGES	71	18	**25%**	89	5.5%	75	19	94	2021Q1		75	19	94
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2021Q1		76	27	103
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2021Q1		76	27	103
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2021Q1		450	162	612
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2021Q1		76	27	103
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2021Q1		76	27	103
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2021Q1		76	27	103
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2021Q4		76	27	103
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2021Q4		76	27	103
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2021Q2		926	334	1,260
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2021Q2		1,042	375	1,417
	Project Operation			36%										
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2021Q4		526	189	715
	Project Operation:			36%										
	Project Management			36%										
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			11,051	3,968	**15,019**
COST SPLIT														
65.0%	**FEDERAL COST TOTALS:**				6,768				7,095					9,762
35.0%	**NON-FEDERAL COSTS TOTALS:**				7,552				7,924					5,257

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
PROJECT No: P2 104713
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

SUBSEQUENT BEACH NOURISHMENTS

This Estimate reflects the scope and schedule in:

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2023									
						Effective Price Level Date: 1 Oct 2022									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Spent Thru: 1 Oct 2019 ($K)	TOTAL FIRST COST ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*				*M*	*N*	*O*
	SUBSEQUENT BEACH NOURISHMENTS														
17	BEACH REPLENISHMENT - Mob/Demob	13,336	4,800	36%	18,136	4.8%	13,976	5,032	19,008		19,008	116.3%	30,229	10,884	41,113
17	BEACH REPLENISHMENT - Dredging Cost	40,290	14,504	36%	54,794	4.8%	42,228	15,201	57,429		57,429	103.0%	85,706	30,851	116,557
	CONSTRUCTION ESTIMATE TOTALS:	53,626	19,304		72,930		56,204	20,233	76,437		76,437	106.3%	115,935	41,735	157,670
01	LANDS AND DAMAGES	568	142	25%	710	5.6%	600	150	750		750	382.9%	2,897	724	3,621
30	PLANNING, ENGINEERING & DESIGN	21,988	7,919	36%	29,907	5.1%	23,099	8,307	31,406		31,406	109.9%	48,482	17,451	65,933
31	CONSTRUCTION MANAGEMENT	4,008	1,440	36%	5,448	5.0%	4,208	1,512	5,720		5,720	116.3%	9,103	3,271	12,374
	PROJECT COST TOTALS:	80,190	28,805	36%	**108,995**		84,111	30,202	**114,313**		**114,313**	109.6%	176,417	63,181	**239,598**

_____ CHIEF, A-E MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.

ESTIMATED TOTAL PROJECT COST: 239,598

_____ PROJECT MANAGEMENT, Susan M. Ming, P.E.

_____ CHIEF, REAL ESTATE, Cheryl Connett

_____ CHIEF, ENGINEERING, Vangil C. Crisostomo, P.E.

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021 Effective Price Level: 1 Oct 2020				Program Year (Budget EC): 2023 Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 2													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2027Q4	12.5%	1,965	707	2,672
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	**36%**	7,465	4.8%	5,753	2,071	7,824	2027Q4	12.5%	6,470	2,329	8,799
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			8,435	3,036	11,471
01	LANDS AND DAMAGES	71	18	**25%**	89	5.5%	75	19	94	2027Q1	11.1%	83	21	104
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2027Q1	10.4%	84	30	114
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2027Q1	10.4%	84	30	114
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2027Q1	10.4%	497	179	676
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2027Q1	10.4%	84	30	114
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2027Q1	10.4%	84	30	114
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2027Q1	10.4%	84	30	114
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2027Q4	12.4%	85	30	115
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2027Q4	12.4%	85	30	115
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2027Q2	11.1%	1,028	371	1,399
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2027Q2	11.1%	1,157	416	1,573
	Project Operation													
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2027Q4	12.4%	591	213	804
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			12,381	4,446	**16,827**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				5,207				5,458					8,414
50.0%	**NON-FEDERAL COSTS TOTALS:**				9,114				9,561					8,414

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021 Effective Price Level: 1 Oct 2020				Program Year (Budget EC): 2023 Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 3													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2033Q4	31.4%	2,296	827	3,123
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	36%	7,465	4.8%	5,753	2,071	7,824	2033Q4	31.4%	7,561	2,722	10,283
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			9,857	3,549	13,406
01	LANDS AND DAMAGES	71	18	25%	89	5.5%	75	19	94	2033Q1	27.9%	96	24	120
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2033Q1	28.8%	98	35	133
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2033Q1	28.8%	98	35	133
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2033Q1	28.8%	580	209	789
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2033Q1	28.8%	98	35	133
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2033Q1	28.8%	98	35	133
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2033Q1	28.8%	98	35	133
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2033Q4	31.4%	100	35	135
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2033Q4	31.4%	100	35	135
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2033Q2	29.7%	1,201	433	1,634
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2033Q2	29.7%	1,351	486	1,837
	Project Operation													
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2033Q4	31.4%	691	248	939
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			14,466	5,194	**19,660**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				5,207				5,458					9,830
50.0%	**NON-FEDERAL COSTS TOTALS:**				9,114				9,561					9,830

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021 Effective Price Level: 1 Oct 2020				Program Year (Budget EC): 2023 Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 4													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2039Q4	54.7%	2,703	973	3,676
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	36%	7,465	4.8%	5,753	2,071	7,824	2039Q4	54.7%	8,900	3,204	12,104
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			11,603	4,177	15,780
01	LANDS AND DAMAGES	71	18	25%	89	5.5%	75	19	94	2039Q1	44.6%	108	27	135
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2039Q1	51.6%	115	41	156
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2039Q1	51.6%	115	41	156
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2039Q1	51.6%	682	246	928
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2039Q1	51.6%	115	41	156
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2039Q1	51.6%	115	41	156
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2039Q1	51.6%	115	41	156
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2039Q4	54.7%	118	42	160
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2039Q4	54.7%	118	42	160
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2039Q2	52.6%	1,413	510	1,923
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2039Q2	52.6%	1,590	572	2,162
	Project Operation													
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2039Q4	54.7%	814	292	1,106
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			17,021	6,113	**23,134**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				5,207				5,458					11,567
50.0%	**NON-FEDERAL COSTS TOTALS:**				9,114				9,561					11,567

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021 Effective Price Level: 1 Oct 2020				Program Year (Budget EC): 2023 Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 5													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2045Q4	83.5%	3,207	1,155	4,362
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	36%	7,465	4.8%	5,753	2,071	7,824	2045Q4	83.5%	10,560	3,801	14,361
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			13,767	4,956	18,723
01	LANDS AND DAMAGES	71	18	25%	89	5.5%	75	19	94	2045Q1	339.8%	330	82	412
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2045Q1	79.7%	137	49	186
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2045Q1	79.7%	137	49	186
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2045Q1	79.7%	809	291	1,100
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2045Q1	79.7%	137	49	186
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2045Q1	79.7%	137	49	186
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2045Q1	79.7%	137	49	186
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2045Q4	83.6%	140	50	190
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2045Q4	83.6%	140	50	190
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2045Q2	81.0%	1,676	604	2,280
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2045Q2	81.0%	1,886	679	2,565
	Project Operation													
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2045Q4	83.6%	966	347	1,313
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			20,399	7,304	**27,703**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				5,207				5,458					13,852
50.0%	**NON-FEDERAL COSTS TOTALS:**				9,114				9,561					13,852

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021				Program Year (Budget EC): 2023								
		Effective Price Level: 1 Oct 2020				Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 6													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2051Q4	117.9%	3,807	1,371	5,178
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	36%	7,465	4.8%	5,753	2,071	7,824	2051Q4	117.9%	12,535	4,513	17,048
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			16,342	5,884	22,226
01	LANDS AND DAMAGES	71	18	25%	89	5.5%	75	19	94	2051Q1	635.1%	551	138	689
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2051Q1	113.3%	162	58	220
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2051Q1	113.3%	162	58	220
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2051Q1	113.3%	960	346	1,306
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2051Q1	113.3%	162	58	220
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2051Q1	113.3%	162	58	220
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2051Q1	113.3%	162	58	220
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2051Q4	118.0%	166	59	225
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2051Q4	118.0%	166	59	225
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2051Q2	114.8%	1,989	718	2,707
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2051Q2	114.8%	2,239	806	3,045
	Project Operation													
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2051Q4	118.0%	1,146	412	1,558
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			24,369	8,712	**33,081**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				5,207				5,458					16,541
50.0%	**NON-FEDERAL COSTS TOTALS:**				9,114				9,561					16,541

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

Estimate based on Chief's Report for FY23 Budget Submittal

WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021				Program Year (Budget EC): 2023								
		Effective Price Level: 1 Oct 2020				Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 7													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2057Q4	158.7%	4,519	1,627	6,146
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	36%	7,465	4.8%	5,753	2,071	7,824	2057Q4	158.7%	14,881	5,357	20,238
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			19,400	6,984	26,384
01	LANDS AND DAMAGES	71	18	25%	89	5.5%	75	19	94	2057Q1	651.8%	564	141	705
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2057Q1	153.2%	192	68	260
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2057Q1	153.2%	192	68	260
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2057Q1	153.2%	1,140	410	1,550
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2057Q1	153.2%	192	68	260
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2057Q1	153.2%	192	68	260
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2057Q1	153.2%	192	68	260
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2057Q4	158.7%	197	70	267
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2057Q4	158.7%	197	70	267
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2057Q2	155.0%	2,362	852	3,214
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2057Q2	155.0%	2,657	956	3,613
	Project Operation													
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2057Q4	158.7%	1,361	489	1,850
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			28,838	10,312	**39,150**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				5,207				5,458					19,575
50.0%	**NON-FEDERAL COSTS TOTALS:**				9,114				9,561					19,575

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
POC: Juan Dominguez, Cost Engineering

PREPARED: May 13, 2021

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WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021				Program Year (Budget EC): 2023								
		Effective Price Level: 1 Oct 2020				Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 8													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2063Q4	207.1%	5,364	1,931	7,295
17	BEACH REPLENISHMENT - Dredging Cost	5,489	1,976	36%	7,465	4.8%	5,753	2,071	7,824	2063Q4	207.1%	17,665	6,359	24,024
	CONSTRUCTION ESTIMATE TOTALS:	7,156	2,576	36%	9,732		7,500	2,700	10,200			23,029	8,290	31,319
01	LANDS AND DAMAGES	71	18	25%	89	5.5%	75	19	94	2063Q1	668.5%	576	144	720
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	72	26	36%	98	4.9%	76	27	103	2063Q1	200.6%	228	81	309
1.0%	Planning & Environmental Compliance	72	26	36%	98	4.9%	76	27	103	2063Q1	200.6%	228	81	309
6.0%	Engineering & Design	429	154	36%	583	4.9%	450	162	612	2063Q1	200.6%	1,353	487	1,840
1.0%	Reviews, ATRs, IEPRs, VE	72	26	36%	98	4.9%	76	27	103	2063Q1	200.6%	228	81	309
1.0%	Life Cycle Updates (cost, schedule, risks)	72	26	36%	98	4.9%	76	27	103	2063Q1	200.6%	228	81	309
1.0%	Contracting & ReprographicsContracting	72	26	36%	98	4.9%	76	27	103	2063Q1	200.6%	228	81	309
1.0%	Engineering During Construction	72	26	36%	98	4.9%	76	27	103	2063Q4	207.1%	233	83	316
1.0%	Real Estate and Planning During Construction	72	26	36%	98	4.9%	76	27	103	2063Q4	207.1%	233	83	316
12.3%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2063Q2	202.8%	2,804	1,011	3,815
13.9%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2063Q2	202.8%	3,155	1,135	4,290
	Project Operation													
39.2%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2063Q4	207.1%	1,616	581	2,197
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	10,536	3,785		14,321		11,051	3,968	15,019			34,139	12,219	**46,358**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				5,207				5,458					23,179
50.0%	**NON-FEDERAL COSTS TOTALS:**				9,114				9,561					23,179

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: San Clemente Beach Nourishment
LOCATION: Orange County, California

DISTRICT: Los Angeles District (SPL)
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WBS STRUCTURE		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Mii Estimate Prepared: 12 May 2021 Effective Price Level: 1 Oct 2020				Program Year (Budget EC): 2023 Effective Price Level Date: 1 Oct 2022								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
	BEACH RE-NOURISHMENT - CYCLE No. 9													
17	BEACH REPLENISHMENT - Mob/Demob	1,667	600	36%	2,267	4.8%	1,747	629	2,376	2069Q4	264.5%	6,368	2,293	8,661
17	BEACH REPLENISHMENT - Dredging Cost	1,867	672	36%	2,539	4.8%	1,957	704	2,661	2069Q4	264.5%	7,134	2,566	9,700
	CONSTRUCTION ESTIMATE TOTALS:	3,534	1,272	36%	4,806		3,704	1,333	5,037			13,502	4,859	18,361
01	LANDS AND DAMAGES	71	18	25%	89	5.5%	75	19	94	2069Q1	685.2%	589	147	736
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	35	13	36%	48	4.9%	37	14	51	2069Q1	256.9%	132	50	182
1.0%	Planning & Environmental Compliance	35	13	36%	48	4.9%	37	14	51	2069Q1	256.9%	132	50	182
6.0%	Engineering & Design	212	76	36%	288	4.9%	222	80	302	2069Q1	256.9%	792	286	1,078
1.0%	Reviews, ATRs, IEPRs, VE	35	13	36%	48	4.9%	37	14	51	2069Q1	256.9%	132	50	182
1.0%	Life Cycle Updates (cost, schedule, risks)	35	13	36%	48	4.9%	37	14	51	2069Q1	256.9%	132	50	182
1.0%	Contracting & ReprographicsContracting	35	13	36%	48	4.9%	37	14	51	2069Q1	256.9%	132	50	182
1.0%	Engineering During Construction	35	13	36%	48	4.9%	37	14	51	2069Q4	264.6%	135	51	186
1.0%	Real Estate and Planning During Construction	35	13	36%	48	4.9%	37	14	51	2069Q4	264.6%	135	51	186
25.0%	***Adaptive Mgmt & Environmental Monitoring***	882	318	36%	1,200	4.9%	926	334	1,260	2069Q2	259.4%	3,328	1,200	4,528
28.1%	***Physical Monitoring***	993	357	36%	1,350	4.9%	1,042	375	1,417	2069Q2	259.4%	3,745	1,348	5,093
	Project Operation													
66.1%														
31	CONSTRUCTION MANAGEMENT													
7.0%	Construction Management	501	180	36%	681	4.9%	526	189	715	2069Q4	264.6%	1,918	689	2,607
	Project Operation: Project Management													
	CONTRACT COST TOTALS:	6,438	2,312		8,750		6,754	2,428	9,182			24,804	8,881	**33,685**
COST SPLIT														
50.0%	**FEDERAL COST TOTALS:**				2,744				2,876					16,843
50.0%	**NON-FEDERAL COSTS TOTALS:**				6,006				6,306					16,843

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

SPL - PN 104716
Solana-Encinitas Coastal Storm Damage Reduction Project

The Solana-Encinitas Costal Storm Damage Reduction Project, as presented by the Los Angeles District, has undergone a successful Cost Agency Technical Review (Cost ATR) of remaining costs, performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the cost products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of October 26, 2022, the Cost MCX certifies the estimated total project cost:

INITIAL

FY23 Project First Cost INITIAL:	$47,115,000 (excluding spent costs)
SPENT:	$ 499,000
Total Project First Cost:	$47,614,000
FULLY FUNDED w/ SPENT:	$49,584,000

PERIODIC: Encinitas - 9 Renourishments, Solana - 4 Renourishments

FY23 Project First Cost (2028-72):	$206,062,000
SPENT:	$ -0-
FULLY FUNDED w/ SPENT:	$416,499,000

Note: Cost Certification assumes Efficient Implementation (Funding). Cost ATR was devoted to remaining work. It did not review spent costs, which requires an audit process. It remains the responsibility of the District to correctly reflect these cost values and to implement effective project management controls and implementation procedures including risk management through the period of Federal participation.

Michael P Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: **Encinitas-Solana Beach Coastal Storm Damage Reduction - LPP**
PROJECT NO: P2 104716
LOCATION: San Diego County, CA

DISTRICT: **Los Angeles District, SPL**
POC: **JUAN DOMINGUEZ, P.E., C.C.E.**

PREPARED: **10/21/2022**

INITIAL NOURISHMENT EVENT

This estimate reflects the scope and schedule in Chief's Report.

FY23 Economic Re-evaluation Report (ERR)

Civil Works Work Breakdown Structure		ESTIMATED COST				PROGRAM / BUDGET YEAR COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2023									
						Effective Price Level Date: 1 OCT 22									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	**TOTAL ($K)**	Spent Thru: **1-Oct-21** ($K)	**TOTAL COST** ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*		*K*	*L*	*M*	*N*	*O*
17	BEACH REPLENISHMENT (w/ Shoreline Monitoring)	$18,470	$7,388	40%	$25,858	17.2%	$21,639	$8,656	$30,295		$30,295	3%	$22,257	$8,903	$31,160
06	FISH & WILDLIFE FACILITIES: REEF CONSTRUCTION	$2,672	$1,470	55%	$4,142	27.8%	$3,415	$1,878	$5,294		$5,294	8%	$3,675	$2,021	$5,697
06	FISH & WILDLIFE FACILITIES MITIGATION: MONITORING AND LAGOON SEDIMENTATION	$2,751	$1,513	55%	$4,264	27.8%	$3,516	$1,934	$5,450		$5,450	11%	$3,898	$2,144	$6,042
18	CULTURAL RESOURCE PRESERVATION	$43	$9	21%	$52	36.8%	$59	$12	$71		$71	3%	$60	$13	$73
	CONSTRUCTION ESTIMATE TOTALS:	$23,936	$10,380	43%	$34,316	19.8%	$28,629	$12,480	$41,110	$0	$41,110	5%	$29,890	$13,081	$42,971
01	LANDS AND DAMAGES	$68	$14	20%	$82	5.9%	$72	$14	$86		$86	0%	$72	$14	$86
30	PLANNING, ENGINEERING & DESIGN	$2,943	$589	20%	$3,532	6.4%	$3,131	$626	$3,757	$499	$4,256	1%	$3,150	$630	$4,279
31	CONSTRUCTION MANAGEMENT	$1,694	$339	20%	$2,033	6.4%	$1,802	$360	$2,162		$2,162	2%	$1,843	$369	$2,211
	PROJECT COST TOTALS:	$28,641	$11,321	40%	$39,962		$33,634	$13,481	**$47,115**	$499	**$47,614**	4%	$34,955	$14,094	$49,548

CHIEF, A-E MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.

PROJECT MANAGER, Susie Ming, P.E.

CHIEF, REAL ESTATE, Cheryl Connett

CHIEF, ENGINEERING, Pamela J. Lovasz, P.E.

ESTIMATED TOTAL PROJECT COST: **$49,548**

PREVIOUS TPCS: **46,961**
Dated: August 26, 2022

THIS TPCS REFLECTS A PROJECT COST INCREASE OF: **2,587**

THE 902 COST LIMIT IS:
Dated:

O&M OUTSIDE OF TOTAL PROJECT COST: **N/A**

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Encinitas-Solana Beach Coastal Storm Damage Reduction - LPP
LOCATION: San Diego County, CA
This estimate reflects the scope and schedule in Chief's Report.

DISTRICT: Los Angeles District, SPL
POC: JUAN DOMINGUEZ, P.E., C.C.E.

PREPARED: 10/21/2022

FY23 Economic Re-evaluation Report (ERR)

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
	PLANNING, ENGINEERING & DESIGN	Estimate Prepared: / Effective Price Level:			21-May-21 / 1-Oct-20	Program Year (Budget EC): / Effective Price Level Date:			2023 / 1 OCT 22					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	ENCINITAS & SONATA BEACH NOURISHMENT INITIAL EVENT													
17	Solana - Encinitas Initial Beach Nourishment (Yr 2023)	$17,887	$7,155	40%	$25,042	17.2%	$20,956	$8,382	$29,338	2023Q4	2.7%	$21,522	$8,609	$30,130
06	Solana - Reef Mitigation (Yr 2025)	$2,672	$1,470	55%	$4,142	27.8%	$3,415	$1,878	$5,294	2025Q4	7.6%	$3,675	$2,021	$5,697
17	Shoreline Monitoring (Yearly - Yr 2022 thru Yr 2027)	$583	$233	40%	$816	17.2%	$683	$273	$956	2025Q4	7.6%	$735	$294	$1,029
06	Habitat Monitoring Plan (Yearly - Yr 2022 thru Yr 2025)	$307	$169	55%	$476	27.8%	$392	$216	$608	2024Q4	4.9%	$412	$226	$638
06	Surfing Monitoring Plan (Yearly - Yr 2022 thru Yr 2027)	$150	$83	55%	$233	27.8%	$192	$105	$297	2025Q4	7.6%	$206	$113	$320
06	Borrow Site Monitoring Plan (Yearly - Yr 2022 thru Yr 2025)	$224	$123	55%	$347	27.8%	$286	$157	$444	2024Q4	4.9%	$300	$165	$465
06	Encinitas - Lagoon Sedimentation: San Elijo and Batiquitos - (Yearly - Yr 2023 thru Yr 2027)	$240	$132	55%	$372	27.8%	$307	$169	$475	2025Q4	7.6%	$330	$182	$512
06	Solana - Lagoon Sedimentation: San Dieguito, San Elijo, and Peñasquitos (Yearly - Yr 2023 thru Yr 2032)	$1,830	$1,007	55%	$2,837	27.8%	$2,339	$1,286	$3,625	2027Q4	13.3%	$2,650	$1,457	$4,107
18	Cultural Resources Plan (Yr 2023)	$43	$9	21%	$52	36.8%	$59	$12	$71	2023Q4	2.7%	$60	$13	$73
	CONSTRUCTION ESTIMATE TOTALS:	$23,936	$10,380	43.4%	**$34,316**		$28,629	$12,480	$41,110			$29,890	$13,081	$42,971
01	LANDS AND DAMAGES	68	$14	20%	$82	5.9%	$72	$14	$86	2023Q4	0.0%	$72	$14	$86
30	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	$88	$18	20%	$106	6.4%	$94	$19	$112	2022Q4	0.0%	$94	$19	$112
0.0%	Planning & Environmental Compliance	$14	$3	20%	$17	6.4%	$15	$3	$18	2022Q4	0.0%	$15	$3	$18
0.0%	Engineering & Design	$1,530	$306	20%	$1,836	6.4%	$1,627	$325	$1,953	2022Q4	0.0%	$1,627	$325	$1,953
0.0%	Reviews, ATRs, IEPRs, VE	$408	$82	20%	$490	6.4%	$434	$87	$521	2022Q4	0.0%	$434	$87	$521
0.0%	Life Cycle Updates (cost, schedule, risks)	$37	$7	20%	$44	6.4%	$39	$8	$47	2022Q4	0.0%	$39	$8	$47
0.0%	Contracting & Reprographics	$45	$9	20%	$54	6.4%	$48	$10	$57	2022Q4	0.0%	$48	$10	$57
0.0%	Engineering During Construction	$646	$129	20%	$775	6.4%	$687	$137	$825	2023Q4	2.3%	$703	$141	$843
0.0%	Real Estate & Planning During Construction	$175	$35	20%	$210	6.4%	$186	$37	$223	2023Q4	2.3%	$190	$38	$228
0.0%	Project Operations													
31	CONSTRUCTION MANAGEMENT													
0.0%	Construction Management	$1,694	$339	20%	$2,033	6.4%	$1,802	$360	$2,162	2023Q4	2.3%	$1,843	$369	$2,211
0.0%	Project Operation:													
0.0%	Project Management													
	CONTRACT COST TOTALS:	$28,641	$11,321		**$39,962**		$33,634	$13,481	$47,115			$34,955	$14,094	**$49,049**

PROJECT: **Encinitas-Solana Beach Coastal Storm Damage Reduction - LPP**
PROJECT NO: P2 104716
LOCATION: San Diego County, CA

DISTRICT: **Los Angeles District, SPL**
POC: **JUAN DOMINGUEZ, P.E., C.C.E.**

PREPARED: **10/21/2022**

SUBSEQUENT RE-NOURISHMENT EVENTS

This estimate reflects the scope and schedule in Chief's Report.

FY23 Economic Re-evaluation Report (ERR)

Civil Works Work Breakdown Structure		ESTIMATED COST				PROGRAM / BUDGET YEAR COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2023									
						Effective Price Level Date: 1 OCT 22									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	**TOTAL ($K)**	Spent Thru: **1-Oct-21** ($K)	**TOTAL COST** ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*		*K*	*L*	*M*	*N*	*O*
17	BEACH REPLENISHMENT (w/ Shoreline Monitoring)	$87,316	$34,926	40%	$122,242	17.2%	$102,297	$40,919	$143,216		$143,216	107%	$212,263	$84,905	$297,168
06	FISH & WILDLIFE FACILITIES: REEF CONSTRUCTION				$0	-			$0		$0	-			$0
06	FISH & WILDLIFE FACILITIES MITIGATION: MONITORING AND LAGOON SEDIMENTATION	$11,967	$6,582	55%	$18,549	27.8%	$15,296	$8,413	$23,708		$23,708	105%	$31,327	$17,230	$48,556
18	CULTURAL RESOURCE PRESERVATION				$0	-			$0		$0	-			$0
	CONSTRUCTION ESTIMATE TOTALS:	$99,283	$41,508	42%	$140,791	18.6%	$117,593	$49,332	$166,925	$0	$166,925	107%	$243,589	$102,135	$345,724
01	LANDS AND DAMAGES	$440	$88	20%	$528	5.9%	$466	$93	$559		$559	644%	$3,468	$694	$4,162
30	PLANNING, ENGINEERING & DESIGN	$24,471	$4,894	20%	$29,365	6.4%	$26,030	$5,206	$31,236		$31,236	72%	$44,816	$8,963	$53,779
31	CONSTRUCTION MANAGEMENT	$5,752	$1,150	20%	$6,902	6.4%	$6,118	$1,224	$7,342		$7,342	75%	$10,695	$2,139	$12,834
	PROJECT COST TOTALS:	$129,946	$47,641	37%	$177,587		$150,208	$55,855	**$206,062**	$0	**$206,062**	102%	$302,569	$113,931	$416,499

CHIEF, A-E MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.

PROJECT MANAGER, Susie Ming, P.E.

CHIEF, REAL ESTATE, Cheryl Connett

CHIEF, ENGINEERING, Pamela J. Lovasz, P.E.

ESTIMATED TOTAL PROJECT COST: **$416,499**

PREVIOUS TPCS: **406,779**
Dated: August 26, 2022

THIS TPCS REFLECTS A PROJECT COST INCREASE OF: **9,720**

THE 902 COST LIMIT IS:
Dated:

O&M OUTSIDE OF TOTAL PROJECT COST: **N/A**

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Encinitas-Solana Beach Coastal Storm Damage Reduction - LPP
LOCATION: San Diego County, CA
This estimate reflects the scope and schedule in Chief's Report.

DISTRICT: Los Angeles District, SPL
POC: JUAN DOMINGUEZ, P.E., C.C.E.

PREPARED: 10/21/2022

FY23 Economic Re-evaluation Report (ERR)

Civil Works Work Breakdown Structure		ESTIMATED COST				PROGRAM / BUDGET YEAR COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: / Effective Price Level:			21-May-21 / 1-Oct-20	Program Year (Budget EC): / Effective Price Level Date:			2023 / 1 OCT 22					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	ENCINITAS - 9 PERIODIC BEACH NOURISHMENTS ON 5-YR CYCLES 50-FT beach width)													
17	Encinitas - Subsequent Beach Nourishment (Yr 2028)	$6,357	$2,543	40%	$8,900	17.2%	$7,448	$2,979	$10,427	2028Q4	16.2%	$8,656	$3,462	$12,119
17	Encinitas - Subsequent Beach Nourishment (Yr 2033)	$4,950	$1,980	40%	$6,930	17.2%	$5,799	$2,320	$8,119	2033Q4	32.1%	$7,663	$3,065	$10,728
17	Encinitas - Subsequent Beach Nourishment (Yr 2038)	$6,357	$2,543	40%	$8,900	17.2%	$7,448	$2,979	$10,427	2038Q4	50.2%	$11,189	$4,476	$15,665
17	Encinitas - Subsequent Beach Nourishment (Yr 2043)	$4,950	$1,980	40%	$6,930	17.2%	$5,799	$2,320	$8,119	2043Q4	70.8%	$9,906	$3,962	$13,868
17	Encinitas - Subsequent Beach Nourishment (Yr 2048)	$6,357	$2,543	40%	$8,900	17.2%	$7,448	$2,979	$10,427	2048Q3	92.9%	$14,370	$5,748	$20,118
17	Encinitas - Subsequent Beach Nourishment (Yr 2053)	$6,357	$2,543	40%	$8,900	17.2%	$7,448	$2,979	$10,427	2053Q4	120.8%	$16,444	$6,578	$23,021
17	Encinitas - Subsequent Beach Nourishment (Yr 2058)	$6,357	$2,543	40%	$8,900	17.2%	$7,448	$2,979	$10,427	2058Q4	151.0%	$18,696	$7,478	$26,174
17	Encinitas - Subsequent Beach Nourishment (Yr 2063)	$6,357	$2,543	40%	$8,900	17.2%	$7,448	$2,979	$10,427	2063Q4	185.4%	$21,256	$8,502	$29,758
17	Encinitas - Subsequent Beach Nourishment (Yr 2068)	$6,357	$2,543	40%	$8,900	17.2%	$7,448	$2,979	$10,427	2068Q4	224.5%	$24,167	$9,667	$33,833
17	Shoreline and Surfing Monitoring (Yearly - Yr 2028 thru Yr 2072)	$3,825	$1,530	40%	$5,355	17.2%	$4,481	$1,793	$6,274	2052Q4	115.2%	$9,644	$3,857	$13,501
06	Borrow Site Monitoring (Yrs 2028, 2033, 2038, 2043, 2048, 2053, 2058, 2063, 2068)	$1,809	$995	55%	$2,804	27.8%	$2,312	$1,272	$3,584	2043Q4	70.8%	$3,949	$2,172	$6,122
06	Encinitas - Lagoon Sedimentation: San Elijo & Batiquitos (Yearly - Yr 2028 thru Yr 2072)	$2,160	$1,188	55%	$3,348	27.8%	$2,761	$1,518	$4,279	2052Q4	115.2%	$5,941	$3,268	$9,209
	CONSTRUCTION ESTIMATE TOTALS:	$62,193	$25,473	41.0%	**$87,666**		$73,287	$30,076	$103,363			$151,880	$62,236	$214,116
01	LANDS AND DAMAGES	320	$64	20%	$384	5.9%	$339	$68	$407	2048Q4	643.5%	$2,519	$504	$3,023
30	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	$541	$108	20%	$649	6.4%	$575	$115	$691	2047Q4	70.4%	$981	$196	$1,177
0.0%	Planning & Environmental Compliance	$105	$21	20%	$126	6.4%	$112	$22	$134	2047Q4	70.4%	$190	$38	$228
0.0%	Engineering & Design	$10,501	$2,100	20%	$12,601	6.4%	$11,170	$2,234	$13,404	2047Q4	70.4%	$19,034	$3,807	$22,840
0.0%	Reviews, ATRs, IEPRs, VE	$1,370	$274	20%	$1,644	6.4%	$1,457	$291	$1,749	2047Q4	70.4%	$2,483	$497	$2,980
0.0%	Life Cycle Updates (cost, schedule, risks)	$546	$109	20%	$655	6.4%	$581	$116	$697	2047Q4	70.4%	$990	$198	$1,188
0.0%	Contracting & Reprographics	$360	$72	20%	$432	6.4%	$383	$77	$460	2047Q4	70.4%	$653	$131	$783
0.0%	Engineering During Construction	$3,054	$611	20%	$3,665	6.4%	$3,249	$650	$3,898	2048Q4	73.8%	$5,646	$1,129	$6,775
0.0%	Real Estate & Planning During Construction	$1,320	$264	20%	$1,584	6.4%	$1,404	$281	$1,685	2048Q4	73.8%	$2,440	$488	$2,928
0.0%	Project Operations													
31	CONSTRUCTION MANAGEMENT													
0.0%	Construction Management	$4,105	$821	20%	$4,926	6.4%	$4,367	$873	$5,240	2048Q4	73.8%	$7,589	$1,518	$9,107
0.0%	Project Operation:													
0.0%	Project Management													
	CONTRACT COST TOTALS:	$84,415	$29,917		**$114,332**		$96,923	$34,803	$131,726			$194,406	$70,741	**$265,146**

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Encinitas-Solana Beach Coastal Storm Damage Reduction - LPP
LOCATION: San Diego County, CA
This estimate reflects the scope and schedule in Chief's Report.

DISTRICT: Los Angeles District, SPL
POC: JUAN DOMINGUEZ, P.E., C.C.E.

PREPARED: 10/21/2022

FY23 Economic Re-evaluation Report (ERR)

Civil Works Work Breakdown Structure		ESTIMATED COST				PROGRAM / BUDGET YEAR COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared:			21-May-21	Program Year (Budget EC):			2023					
		Effective Price Level:			1-Oct-20	Effective Price Level Date:			1 OCT 22					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	SOLANA - 4 PERIODIC BEACH NOURISHMENTS ON 10-YR CYCLES (150-FT beach width)													
17	Solana - Subsequent Beach Nourishment (Yr 2033)	$5,821	$2,328	40%	$8,149	17.2%	$6,820	$2,728	$9,548	2033Q4	32.1%	$9,012	$3,605	$12,616
17	Solana - Subsequent Beach Nourishment (Yr 2043)	$5,821	$2,328	40%	$8,149	17.2%	$6,820	$2,728	$9,548	2043Q4	70.8%	$11,649	$4,659	$16,308
17	Solana - Subsequent Beach Nourishment (Yr 2053)	$6,857	$2,743	40%	$9,600	17.2%	$8,034	$3,213	$11,247	2053Q4	120.8%	$17,737	$7,095	$24,832
17	Solana - Subsequent Beach Nourishment (Yr 2063)	$6,857	$2,743	40%	$9,600	17.2%	$8,034	$3,213	$11,247	2063Q4	185.4%	$22,928	$9,171	$32,099
17	Shoreline and Surfing Monitoring (Yearly - Yr 2028 thru Yr 2072)	$3,736	$1,494	40%	$5,230	17.2%	$4,377	$1,751	$6,128	2050Q4	104.4%	$8,948	$3,579	$12,527
06	Borrow Site Monitoring (Yr 2033, Yr 2043, Yr 2053 and Yr 2063)	$678	$373	55%	$1,051	27.8%	$867	$477	$1,343	2038Q4	50.2%	$1,302	$716	$2,018
06	Solana - Lagoon Sedimentation: San Dieguito, San Elijo and Peñasquitos (Yearly - Yr 2033 thru Yr 2072)	$7,320	$4,026	55%	$11,346	27.8%	$9,356	$5,146	$14,502	2052Q4	115.2%	$20,134	$11,074	$31,208
	CONSTRUCTION ESTIMATE TOTALS:	$37,090	$16,036	43.2%	**$53,126**		$44,306	$19,256	$63,562			$91,709	$39,899	$131,608
01	LANDS AND DAMAGES	120	$24	20%	$144	5.9%	$127	$25	$152	2049Q4	646.4%	$948	$190	$1,138
30	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	$203	$41	20%	$244	6.4%	$216	$43	$259	2048Q4	73.8%	$375	$75	$450
0.0%	Planning & Environmental Compliance	$39	$8	20%	$47	6.4%	$41	$8	$50	2048Q4	73.8%	$72	$14	$87
0.0%	Engineering & Design	$3,938	$788	20%	$4,726	6.4%	$4,189	$838	$5,027	2048Q4	73.8%	$7,281	$1,456	$8,737
0.0%	Reviews, ATRs, IEPRs, VE	$514	$103	20%	$617	6.4%	$547	$109	$656	2048Q4	73.8%	$950	$190	$1,140
0.0%	Life Cycle Updates (cost, schedule, risks)	$205	$41	20%	$246	6.4%	$218	$44	$262	2048Q4	73.8%	$379	$76	$455
0.0%	Contracting & Reprographics	$135	$27	20%	$162	6.4%	$144	$29	$172	2048Q4	73.8%	$250	$50	$300
0.0%	Engineering During Construction	$1,145	$229	20%	$1,374	6.4%	$1,218	$244	$1,462	2049Q4	77.3%	$2,159	$432	$2,591
0.0%	Real Estate & Planning During Construction	$495	$99	20%	$594	6.4%	$527	$105	$632	2049Q4	77.3%	$933	$187	$1,120
0.0%	Project Operations													
31	CONSTRUCTION MANAGEMENT													
0.0%	Construction Management	$1,647	$329	20%	$1,976	6.4%	$1,752	$350	$2,102	2049Q4	77.3%	$3,106	$621	$3,727
0.0%	Project Operation:													
0.0%	Project Management													
	CONTRACT COST TOTALS:	$45,531	$17,724		**$63,255**		$53,284	$21,052	$74,336			$108,163	$43,190	**$151,353**

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INSIGHT

Infrastructure Investment and Jobs Act (IIJA) Funding for U.S. Army Corps of Engineers (USACE) Civil Works: Policy Primer

Updated January 10, 2023

Congress authorizes and funds the U.S. Army Corps of Engineers (USACE) to undertake civil works activities, including planning and construction of water resource projects and maintenance of navigation improvements and other infrastructure.

Division J, Title III, of the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58), which became law on November 15, 2021, provided $17.1 billion in emergency appropriations to various USACE accounts (see **Figure 1**), with the majority going to three accounts:

- Construction (68%)
- Operation and Maintenance (O&M; 23%)
- Mississippi River and Tributaries (MR&T; 5%)

IIJA also provided

- $251 million for repair of damages to existing projects, including nonfederal levees and shore protection through the Flood Control and Coastal Emergencies (FCCE) account
- $75 million to the Water Infrastructure Finance and Innovation Program (WIFIP) account for USACE to implement a direct loan and loan guarantee program, which IIJA limited to nonfederal dam safety work (similar to a limit applied to FY2021 and FY2022 annual appropriations)

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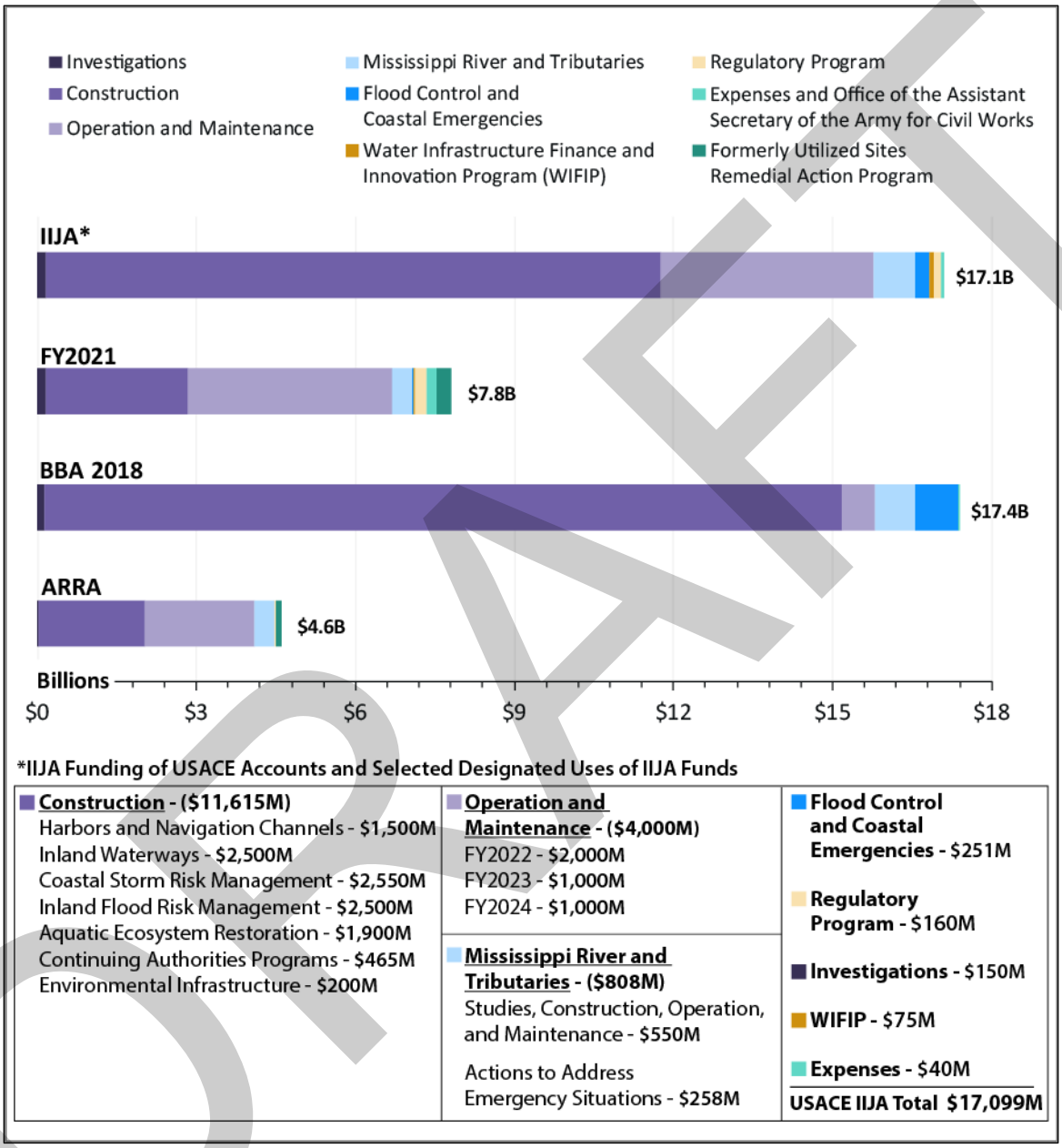
Figure 1. IIJA's USACE Funding in Context of Other USACE Appropriations and Selected IIJA Designated Uses, by Account

(amounts are nominal and in billions [B] or millions [M] of dollars)



Sources: CRS using P.L. 117-58, P.L. 116-260 (Consolidated Appropriations Act, 2021), P.L. 115-123 (Bipartisan Budget Act of 2018, BBA 2018), and P.L. 111-5 (American Recovery and Reinvestment Act of 2009, ARRA).

IIJA Funding in Context

Figure 1 shows IIJA funding in the context of annual civil works appropriations preceding IIJA enactment (FY2021; Division D, Title I, of P.L. 116-260) and two emergency appropriations:

- Bipartisan Budget Act of 2018 (BBA 2018; P.L. 115-123), which funded USACE flood disaster repair and recovery and flood risk management studies and projects

- American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5), which funded USACE activities for economic stimulus purposes and other policy objectives

As shown in **Figure 1**, IIJA provided funding equal to multiple years of recent annual appropriations, particularly for the Construction account. Below are some project types that IIJA funded, with FY2021 funding levels provided in parentheses:

- $2.50 billion for inland waterways construction ($0.81 billion)
- $2.55 billion and $2.50 billion for risk management of coastal floods and inland floods ($0.81 billion and $0.36 billion), respectively
- $1.90 billion for aquatic ecosystem restoration ($0.56 billion)
- $465 million for continuing authorities programs ($69.5 million)
- $30 million in FY2023 for a new USACE pilot program for flood risk management feasibility studies for economically disadvantaged or rural communities

Similar to other emergency appropriations legislation, Congress applied some but not other statutory requirements and common USACE annual appropriations policy limitations to IIJA funds (see **Table 1**). IIJA included the following direction for USACE in using the $2.50 billion for inland flood risk construction: prioritize projects benefitting "economically disadvantaged communities," and consider prioritizing projects benefiting areas with minority groups and populations in poverty greater than the national average percentages.

Table 1. Selected Requirements and Policies Applied to Certain USACE Funding

Statutory Requirements or Other Policies (Source)	IIJA	FY2021	BBA 2018	ARRA
Project Costs and Starts				
Limit to increases in project cost without obtaining congressional authorization (33 U.S.C. §2280)	Not applied	Applied	Not applied	Not applied
Limit to number of construction starts[a] (annual appropriations bills)	Not applied	Applied (limit was seven new starts)	Not applied	Applied[b] (no new starts)
Trust Fund Contributions				
Harbor Maintenance Trust Fund (HMTF) pays eligible harbor maintenance costs (33 U.S.C. §2238)	Not applied	Applied	Applied	Applied
Inland Waterways Trust Fund pays a portion of certain waterway construction costs (33 U.S.C. §2212; §109, Division AA, of P.L. 116-260)	Not applied	Applied	NA (construction funds were for flood activities)	Not applied
Nonfederal Construction Cost Share (e.g., 33 U.S.C. §§2211-2213 for most water resource projects)				
Ongoing construction	Applied[c]	Applied	Not applied	Applied
New construction	Applied[c]	Applied	Applied (waived for Puerto Rico and U.S. Virgin Islands)	Applied
Nonfederal Share of Costs for Repair of Certain Damaged Flood Control Works (33 U.S.C. §701n)				
Repairs to damaged shore protection	Not applied	Applied	Not applied	NA

Statutory Requirements or Other Policies (Source)	IIJA	FY2021	BBA 2018	ARRA
Other eligible repairs (e.g., inland levees)	Applied	Applied	Applied	NA

Sources: CRS using P.L. 117-58; P.L. 116-260; P.L. 115-123; P.L. 111-5; the *U.S. Code*; U.S. Congress, House Committee on Transportation and Infrastructure, *Recovery Act: One-Year Progress Report for Transportation and Infrastructure Investments*, hearing, 111th Cong., 2nd sess., February 23, 2010 (Washington, DC: GPO, 2010), p. 102; and USACE, *ARRA Financial and Operational Review Report*, undated.

Notes: NA = Not applicable.

a. Congress limited the number of new starts in USACE annual appropriations from FY2014 to FY2021.

b. The Administration interpreted ARRA as limiting new construction starts and providing for HMTF contributions.

c. IIJA maintained nonfederal construction cost-share requirements, except for certain projects and assistance related to restoring fish and wildlife passage.

Next Steps

IIJA included account-specific language regarding reporting to congressional appropriations committees. IIJA required the USACE Chief of Engineers to deliver

- *Spend plans* within 60 days of enactment on use of IIJA funds available in FY2022 for the Investigation, O&M, and MR&T accounts and use of IIJA funds available in FY2022, FY2023, and FY2024 for the Construction account
- Monthly reports on allocations and obligations for the Investigations, Construction, and MR&T accounts, beginning within 120 days of enactment (March 15, 2022)
- Spend plans as part of the President's FY2023 budget request for IIJA FY2023 Investigations and O&M funds and FY2024 budget request for IIJA FY2024 O&M funds

USACE has published IIJA spend plans for FY2022 and FY2023 that include project names and locations. USACE has not released IIJA spend plans for FY2024; they may accompany the President's FY2024 budget request. Some FY2022 funds remain unassigned to specific projects as of the end of CY2022.

Issues for Congress may include the pace of USACE implementation of IIJA funded projects and plans for funding the completion of partially funded IIJA projects. IIJA oversight may occur in the context of broader congressional inquiries into USACE supplemental appropriations. Many in Congress have previously expressed concerns about USACE challenges with execution, cost overruns, and delays with projects funded by BBA 2018 and completion of projects partially funded by the Disaster Relief Supplemental Appropriations Act, 2022 (P.L. 117-43).

Author Information

Nicole T. Carter
Specialist in Natural Resources Policy

Anna E. Normand
Analyst in Natural Resources Policy

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