MAPPING CHOICES

CARBON, CLIMATE, AND RISING SEAS
OUR GLOBAL LEGACY

November 2015

CLIMATE CENTRAL

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November 2015

Princeton: One Palmer Square, Suite 330 Princeton, NJ 08542
Phone: +1 609 924-3800
Toll Free: +1 877 4-CLI-SCI / +1 (877 425-4724)
www.climatecentral.org

Cover: Image shows night lights on land that could be submerged by long-term sea level rise after 4°C warming. Night lights satellite imagery data source: NASA.

REPORT AUTHORS

BENJAMIN H. STRAUSS, PhD, Lead

Vice President for Sea Level Rise and Climate Impacts, Climate Central

Dr. Strauss is the Vice President for Sea Level Rise and Climate Impacts at Climate Central, and the founder and scientific and creative driver behind Surging Seas. He has published multiple peer-reviewed papers on sea level rise, which have been downloaded more than 40,000 times; testified before the U.S. Senate; and led development of the SurgingSeas.org suite of sea level and coastal flood risk maps, tools, and visualizations. This research and creative work have led to coverage in more than 2,000 news stories including multiple front-page articles in the New York Times and Washington Post, and repeat appearances for Strauss on NBC, CBS, PBS and NPR national programming. He holds a Ph.D. in Ecology and Evolutionary Biology from Princeton University, an M.S. in Zoology from the University of Washington, and a B.A. in Biology from Yale University.

SCOTT KULP, PhD

Computational Scientist and Senior Developer, Climate Central

Dr. Scott Kulp serves as Computational Scientist and Senior Developer for Climate Central's Program on Sea Level Rise, where his research interests include the impacts of sea level rise on coastal communities. Scott holds a Ph.D. in Computer Science from Rutgers University for his work on the topic of cardiac blood flow simulations. Previously, Dr. Kulp has worked for the U.S. Department of Defense on several research projects, such as the simulation of iris tissue deformation and GPU-accelerated neural networks.

ANDERS LEVERMANN, PhD

Co-chair of the Research Domain Sustainable Solutions at Potsdam Institute for Climate Impact Research and Physics Professor at Potsdam University, Germany

Anders Levermann is a climate scientist and physics professor. He was a lead author of the sea-level chapter of the latest U.N. climate report. His research focuses on large-scale abrupt changes with potentially strong impacts on nature and society, in systems ranging from the Antarctic ice sheet to ocean dynamics to monsoon rainfall. Since 2012 he has led research on global adaptation strategies at the Potsdam Institute, developing an economic damage propagation model for the global production and supply network. Prof. Levermann has published more than 80 scientific papers, and advises government representatives, members of parliament, political parties, economic stakeholders and journalists with respect to climate change issues.

ACKNOWLEDGMENTS

We thank Mark Merrifield for providing high-resolution model outputs of global high tide levels in support of this research, and we thank Claudia Tebaldi, Stanley Jacobs, Nathan Gillett, and Michael Oppenheimer for the contributions they made to our thinking as we wrote the paper upon which this report is based, in the *Proceedings of the National Academy of Sciences United States of America*. We also thank Climate Central's financial supporters for this project and the sea level rise program: the V. Kann Rasmussen Foundation, The Kresge Foundation, The Schmidt Family Foundation, and others.

SUGGESTED CITATION

Strauss, B. H., Kulp, S. and Levermann, A. 2015. Mapping Choices: Carbon, Climate, and Rising Seas, Our Global Legacy. Climate Central Research Report. pp. 1-38.

CONTENTS

EXECUTIVE SUMMARY

Carbon emissions causing 4 degrees Celsius of warming (7.2 degrees Fahrenheit) — a business-as-usual scenario — could lock in enough eventual sea level rise to submerge land currently home to 470 to 760 million people globally. Carbon cuts resulting in the proposed international target of 2 °C warming (3.6 °F) would reduce the rise locked in so that it would threaten areas now occupied by as few as 130 million people. This contrast is one expression of what is at stake in the December 2015 global climate talks in Paris.

This report builds closely on a paper first published online in October 2015 in the *Proceedings of the National Academy of Sciences of the United States of America* by the same authors. That research used relationships between cumulative carbon emissions, warming, and the future global sea level rise they lock in to assess implications for the United States and its cities. What distinguishes the current report is its application of sea level projections to global elevation, tidal, population, and administrative boundary data, instead of U.S. data only.

Among all nations, this report finds that China has the most to lose from business as usual, with 145 million citizens today on implicated land. China also has the most to gain from limiting warming to 2 °C, which would cut the total to 64 million. Twelve other nations have more than 10 million people living on implicated land under 4 °C warming — India, Bangladesh, Viet Nam, Indonesia, Japan, the United States, Philippines, Egypt, Brazil, Thailand, Myanmar, and the Netherlands, in descending order of total threats. A carbon path that limits warming to 2 °C would reduce exposure by more than 10 million in each listed nation except the last two, and by half or more in all listed nations but Viet Nam (still achieving 44% reduction), Brazil (45%) and the Netherlands (13%). Global megacities with the top ten populations in the balance include Shanghai, Hong Kong, Calcutta, Mumbai, Dhaka, Jakarta, and Hanoi. 4 °C warming could lead to submergence of land inhabited by more than half the population of Shanghai, Mumbai and Hanoi, among these.

These results are based on median sea level rise projections. They are also based on global elevation data with a tendency to understate exposure.

Carbon emissions this century can lock in these projected threats, but the associated sea level rise is expected to play out over a longer period, likely centuries.

This report assesses and lists global nations and urban agglomerations at risk by projected total population exposure, percent exposure, and differences in exposure under warming scenarios of 1.5, 2, 3 and 4 °C (2.7, 3.6, 5.4 and 7.2 °F). Results do not account for present or future shoreline defenses, such as levees, that might be built, nor for future population growth, decline or relocation.

In conjunction with this report, Climate Central has extended its interactive and embeddable Mapping Choices platform globally (choices.climatecentral.org). Users can now type in any coastal city name or postal code worldwide, and visually compare the potential consequences of different warming or emissions scenarios on a local map. Climate Central is also serving Google Earth layers for visualizing sea levels associated with 2 °C or 4 °C warming in areas with 3-D building data, available here; and offering spreadsheets for download with analytic results for comprehensive lists of global nations and coastal urban agglomerations, available here.

01. INTRODUCTION AND APPROACH

Carbon pollution casts a long shadow. It is expected to persist in the atmosphere long enough to prolong temperature increases for thousands of years, long after human beings stop burning fossil fuels or clearing forests (Solomon et al. 2009). This research translates global temperature increases from carbon emissions into projections of locked-in long-term sea level rise, and puts these projections into context by assessing the current global population living on land that could be submerged.

Analysis focuses on the consequences of 2 °C warming, a long-standing international target and the widely understood goal for the December 2015 global climate talks at COP21 in Paris; on the consequences of 4 °C warming, the approximate implication from the current path of carbon emissions and representative of a failure of talks; and on the differences between these scenarios. 1.5 °C warming, the preferred goal for many island nations, and 3 °C warming, are also considered.

SEA LEVEL PROJECTIONS

The sea level projections corresponding to these levels of warming are taken from a paper written by the same authors as this report. That paper was published in October 2015 in the *Proceedings of the National Academy of Sciences of the U.S.A.* (Strauss et al. 2015). What distinguishes the current report is its application of sea level projections to global elevation, tidal, population, and administrative boundary data, instead of U.S. data only. Additionally, this report focuses on scenarios defined by warming levels, as opposed to carbon emissions pathways, in order to align most closely with the current global discussion around warming targets.

Four separate models underlie the global sea level projections employed here: one for the expansion of ocean water as it warms; one for melting glaciers; and one each for the decay of Greenland and Antarctic ice sheets. These global projections are then localized based mainly on changes in gravity fields across the surface of the Earth due to mass loss from polar ice sheets, leading to local sea level differences that can exceed a meter. Details of the global models and the localization approach can be found in Levermann et al. (2013). Local projections do not factor in the continuation of current land subsidence or uplift. In most places, these might translate to centimeters per century, but some deltas and urban areas are experiencing much more rapid subsidence due to factors such as sediment compaction, sediment supply reduction, and groundwater withdrawal.

Some research has suggested that the West Antarctic Ice Sheet has already begun an unstoppable collapse (Favier et al. 2014, Joughin et al. 2014, Rignot et al. 2014), which would lead to roughly 3.3 meters (m) of sea level rise by itself (Bamber et al. 2009, Feldmann & Levermann 2015); but the evidence is far from conclusive (Golledge et al. 2015; Strauss et al. 2015). This report does not assume inevitable West Antarctic collapse. If collapse has in fact begun, all locked-in sea levels would be higher than those reported and analyzed here, for example by an expected 1m in the 2 °C warming case, and 0.5 m in the 4 °C case: these scenarios of inevitable collapse are detailed and analyzed in Strauss et al.

01. INTRODUCTION AND APPROACH

The projections in this report do not forecast what sea levels may unfold this century. Rather, they indicate the different post-2100 sea levels that could lock in this century, depending upon the carbon pathway we select and the warming thus achieved. The sea levels described could possibly, but with low probability, occur sooner than 200 years from now (Kopp et al. 2014), or be reached as far as 2,000 years in the future (Levermann et al. 2013). This wide range stems from the fact that it is easier to estimate how much ice will eventually melt from a certain amount of warming, than how quickly it will melt, which involves more unknowns. The same simple contrast would apply to a pile of ice in a warm room.

The sea may rise higher still over longer time frames (Dutton et al. 2015, Winkelmann et al. 2015), but those possibilities are beyond the scope of this analysis.

ELEVATION ANALYSIS AND MAPS

Based on projected sea levels, together with current sea level, tidal and elevation data, this analysis develops maps delineating global areas that could be submerged under different warming scenarios. These maps are the foundation for this study's population exposure assessments, and also for Climate Central's interactive online Mapping Choices platform (choices.climatecentral.org, see **Figure 1**), extended from U.S. to global coverage to coincide with this report release. Users can type in any coastal city name or postal code worldwide, and visually compare the potential consequences of different warming or emissions scenarios on a local map.

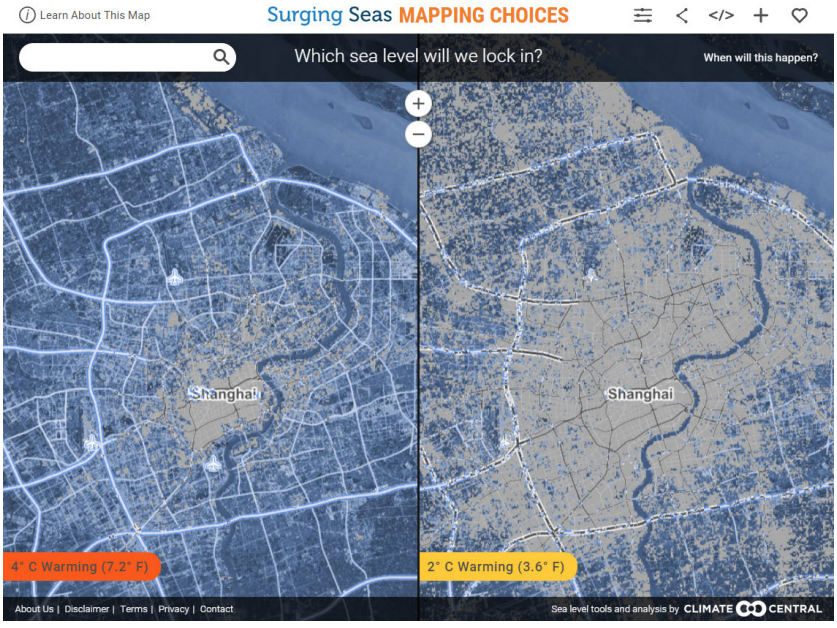

Figure 1. Screenshot from Mapping Choices (choices.climatecentral.org) showing projected locked-in sea levels under different scenarios in Shanghai, China.

Climate Central is also offering access to the same map layers for visualizing sea levels associated with 2 °C or 4 °C warming within Google Earth.

This analysis uses elevation data on a roughly 90-meter horizontal resolution grid derived from NASA's Shuttle Radar Topography Mission (SRTM). SRTM provides surface elevations, not bare earth elevations, causing it to commonly overestimate elevations, especially in areas with dense and tall buildings (Gamba et. al, 2002) or vegetation (Shortridge et. al, 2011) . Therefore, this analysis very likely underestimates, and Mapping Choices under-portrays, areas that could be submerged at each locked-in sea level, and so the following analysis and visualization should be seen as likely lower bounds.

SRTM data also do not cover latitudes farther north than 60 degrees or farther south than 56 degrees, meaning that sparsely populated parts of Arctic Circle nations are not mapped or analyzed here.

POPULATION ANALYSIS

Based on the submergence threat areas delineated, plus recent global population and administrative boundary data, this analysis assesses the number of people today living on land implicated under each warming scenario, by city, by nation and globally. The individuals counted will almost certainly not experience anything close to the full sea level rise projected, but population exposure makes a strong proxy for the exposure of infrastructure, landmarks, and areas of economic and cultural importance, due to correspondence between population and development.

Boundary data for cities, defined by the Natural Earth dataset (Natural Earth, 2012), delineate broad urban agglomerations or metropolitan areas, so population totals (across each city as a whole) may exceed familiar population values for city administrative units.

Due to this study's likely underestimation of areas threatened with future submergence, stemming from use of SRTM elevation data, the analysis also likely understates population exposure on this land. As a known example, this report underestimates exposure in the U.S. by 18% after 4 °C of warming, as compared to Strauss et al., and by 36% after 2 °C of warming.

Results do not account for present or future shoreline defenses, such as levees, that might be built, nor for future population growth, decline or relocation.

02. GLOBAL COAST, NATIONS AND CITIES AT RISK

This analysis finds that carbon emissions causing 4 °C of warming could lock in a median of 8.9 m of long-term global sea level rise, enough to submerge land home (in 2010) to 627 million people globally. Carbon cuts resulting in the proposed international target of 2 °C warming could reduce these numbers to medians of 4.7 m in sea level rise and 280 million people. **Table 1** provides 66% confidence intervals for these assessments, and evaluations for 1.5 °C and 3 °C scenarios as well.

Table 1. Global sea level commitments for different warming levels, and current global population on threatened land

Warming (°C)	Locked-in sea level rise (meters)		2010 global population below locked-in sea level (millions)	
1.5	2.9	1.6 - 4.2	137	51 - 291
2	4.7	3.0 - 6.3	280	130 - 458
3	6.4	4.7 - 8.2	432	255 - 597
4	8.9	6.9 - 10.8	627	470 - 760

Shaded columns give 17th-83rd percentile estimates, or the 66% confidence interval

Figure 2 illustrates the complete global distribution of long-term coastal threats from 4 °C warming and 2 °C warming, and the differences, across all nations. China has the most to lose from business as usual, with a median of 145 million citizens today on implicated land. China also has the most to gain from limiting warming to 2 °C, which would cut the total to 64 million. The six most at-risk nations, as measured by total 2010 population on threatened land (**Table 2a**), and 9 of the 10 most at-risk nations, as measured by *percent of* population in the same places (**Table 2b**), are in Asia. More broadly, 74% of the global population on implicated land live in Asia, a larger share compared to the 59% of global population inhabiting Asia overall.

At the same time, every other populated continent except Australia is represented in both top-20 lists, with the most people on implicated land among these in the United States, Egypt, Brazil and the Netherlands.

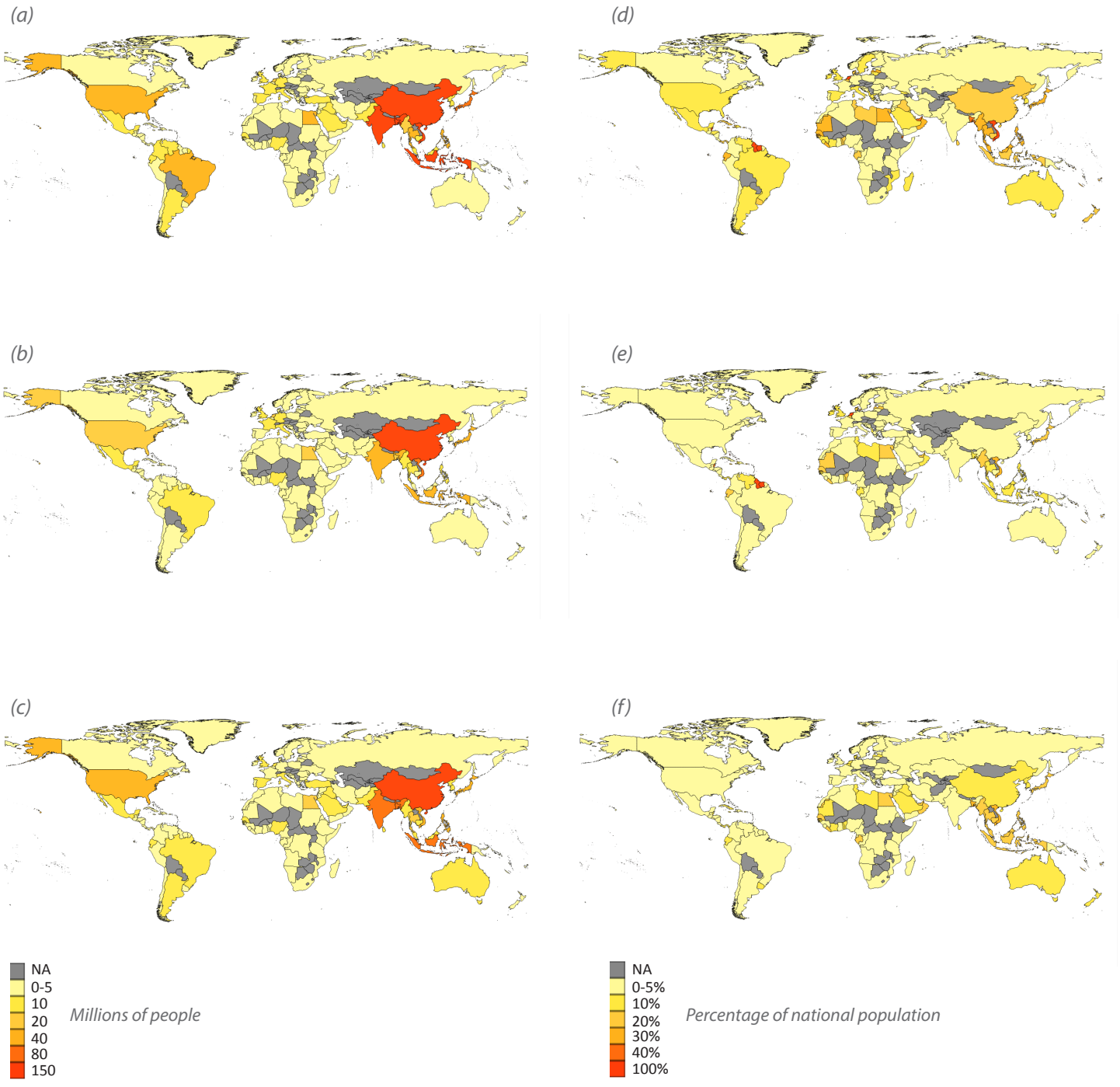

Figure 2. Total population living on land that could be submerged by long-term sea level rise locked in after (a) 4 °C warming or (b) 2 °C warming. Panel (c) reflects the difference between these totals, in other words, the difference achieved by limiting warming to 2 °C instead of 4 °C. Panels (d)-(f) reflect the same quantities except measured as percentages of total national population.

Table 2a. Top 20 countries most affected by locked-in sea level rise from 4 °C warming, by total population, with comparisons to 2 °C warming

	2010 population below median locked-in sea level rise from different warming amounts (millions)		
Country	4 °C	2 °C	Difference
China	145	64	81
India	55	20	35
Bangladesh	48	12	36
Viet Nam	46	26	20
Indonesia	44	16	28
Japan	34	18	17
United States	25	12	13
Philippines	20	7	13
Egypt	19	9	10
Brazil	16	9	7
Thailand	15	6	10
Myanmar	12	5	7
Netherlands	11	10	1
Nigeria	8	4	4
Malaysia	7	2	5
Mexico	6	3	3
United Kingdom	6	4	2
Italy	5	3	2
South Korea	4	1	3
Taiwan	4	1	2

Only larger nations with at least 25 million in total population are shown in **Table 2b**. Several smaller nations have much larger percentages of their population on land at risk from 4 °C warming, with several small island nations (Marshall Islands, 93%; Cayman Islands, 88%; Tuvalu, 81%; Kiribati, 77%; Bahamas, 76%; and the Maldives, 73%), Suriname (84%), Guyana (72%), and the Netherlands (67%) comprising the top ten. Among these, Kiribati and the Maldives would be the greatest beneficiaries of holding warming to 2 °C, reducing exposure by 48 and 42 percentage points, respectively.

Table 2b. Top 20 countries most affected by locked-in sea level rise from 4 °C warming, by percent of population, with comparisons to 2 °C warming

	2010 population below median locked-in sea level rise from different warming amounts (percent)		
Country	4 °C	2 °C	Difference
Viet Nam	52%	29%	23%
Bangladesh	32%	8%	24%
Japan	27%	14%	13%
Egypt	25%	12%	13%
Malaysia	24%	6%	18%
Thailand	23%	9%	14%
Myanmar	23%	10%	13%
Philippines	22%	8%	14%
Indonesia	18%	7%	11%
China	11%	5%	6%
Iraq	11%	5%	6%
United Kingdom	10%	6%	3%
Saudi Arabia	9%	3%	6%
Brazil	8%	5%	4%
Argentina	8%	3%	5%
South Korea	8%	2%	6%
Venezuela	8%	5%	3%
United States	8%	4%	4%
Italy	8%	5%	3%
Spain	6%	3%	3%

Only countries with total 2010 populations exceeding 25 million are included.

Among larger nations, Bangladesh, India and Indonesia — after China — would see the biggest absolute coastal benefits from limiting warming to 2 °C. Overall, 10 countries could each see land home to more than 10 million spared. The most striking relative benefits would be in Malaysia and Bangladesh, where roughly one quarter the people live on land at risk from 2 °C warming, as compared to 4 °C; South Korea, where fewer than one-third do; and fourteen other nations from Tables 2a and 2b where the threat reduces to less than half, including India, Indonesia, Saudi Arabia, Nigeria, Argentina, Mexico and the United States.

Switching focus to urban developments, the majority of the world's megacities are in Asia — including all twenty with the most population on low-lying land implicated by long-term sea level rise after 4 °C warming. Shanghai, Tianjin and Hong Kong in China; Mumbai and Calcultta in India; and Dhaka in Bangladesh each have more than 10 million residents on such land, with Shanghai topping 20 million (**Table 3a**).

Table 3a. Top 20 urban agglomerations most affected by locked-in sea level rise from 4 °C warming, by total population, with comparisons to 2 °C warming

		2010 population below median locked-in sea level rise from different warming amounts (millions)		
Urban Agglomeration	Country	4 °C	2 °C	Difference
Shanghai	China	22.4	11.6	10.8
Tianjin	China	12.4	5.0	7.4
Dhaka	Bangladesh	12.3	2.0	10.3
Calcutta	India	12.0	5.6	6.4
Mumbai	India	10.8	5.8	5.0
Hong Kong	China	10.1	6.8	3.2
Jakarta	Indonesia	9.5	5.0	4.6
Taizhou	China	8.9	6.1	2.8
Khulna	Bangladesh	7.6	2.6	5.0
Hanoi	Viet Nam	7.6	3.6	4.0
Tokyo	Japan	7.5	4.2	3.3
Shantou	China	7.4	3.0	4.3
Haora	India	7.0	1.9	5.2
Chittagong	Bangladesh	7.0	3.8	3.2
Ho Chi Minh City	Viet Nam	6.9	4.4	2.4
Nantong	China	6.5	4.7	1.8
Wuxi	China	6.3	2.1	4.2
Osaka	Japan	6.2	4.2	2.0
Barisal	Bangladesh	6.0	2.6	3.4
Surabaya	Indonesia	5.5	2.7	2.8

Shanghai also leads the list of megacities with the greatest percentage of population on at-risk land (**Table 3b**). Three non-Asian cities make the top-20 percentage list: Rio de Janeiro, New York, and Buenos Aires. A 4 °C warming scenario could lock in enough sea level rise to submerge land inhabited by half or more of today's population in Shanghai and Shantou, China; Haora, Calcutta and Mumbai, India; Hanoi, Viet Nam; and Khulna, Bangladesh.

Table 3b. Top 20 urban agglomerations most affected by locked-in sea level rise from 4 °C warming, by percent of population, with comparisons to 2 °C warming

		2010 population below median locked-in sea level rise from different warming amounts (percent)		
Urban Agglomeration	Country	4 °C	2 °C	Difference
Shanghai	China	76%	39%	37%
Hanoi	Viet Nam	60%	28%	32%
Haora	India	60%	16%	44%
Khulna	Bangladesh	58%	20%	38%
Shantou	China	54%	22%	32%
Calcutta	India	51%	24%	27%
Mumbai	India	50%	27%	23%
Hong Kong	China	46%	31%	15%
Dhaka	Bangladesh	38%	6%	32%
Osaka	Japan	38%	26%	12%
Tokyo	Japan	30%	16%	13%
Tianjin	China	29%	12%	17%
Rio de Janeiro	Brazil	24%	13%	11%
New York	United States	23%	13%	10%
Jakarta	Indonesia	22%	12%	11%
Surabaya	Indonesia	22%	11%	11%
Shenzhen	China	20%	9%	11%
Buenos Aires	Argentina	19%	8%	10%
Cuttack	India	18%	7%	11%
Quezon City	Philippines	18%	9%	9%

Only urban agglomerations with total 2010 populations in this analysis exceeding 10 million are included. Total populations estimated from LandScan data totaled within urban area boundaries from Natural Earth.

Tokyo and Jakarta are among the cities making both total- and percentage-based lists. Across both lists, limiting warming to 2 °C would cut the threat by more than half in thirteen megacities, led by Dhaka, Bangladesh, where fewer than one-sixth as many people live on land at risk after 2 °C warming, as opposed to 4 °C. Haora, India and Wuxi, China would see their risks cut more than threefold.

02. GLOBAL COAST, NATIONS AND CITIES AT RISK

At 2 °C warming, the locked-in sea level rise projected would not submerge land home to more than half of today's population in any listed megacity. Five, however, would still be more than 25% affected: Shanghai, Hong Kong, Hanoi, Mumbai, and Osaka.

The report appendix includes results for all nations, including confidence intervals (**Table A1**), and for not just megacities, but all urban agglomerations with 2010 total populations exceeding one million (**Table A2**). These data and more are also available for download in spreadsheet form.

03. DETAILED METHODS

This analysis employs spatially varying global projections of sea level commitments that are identical to those in Strauss et al. for fixed warming levels of 1.5 °C, 2 °C, 3 °C, and 4 °C. It uses the same 66% confidence intervals developed from independent random sampling of parameter values for each of the four sea level rise component submodels, and the same application of spatial fingerprints modifying the local sea level influence of Greenland and Antarctic ice sheet losses.

In order to work with elevation, tidal and population datasets available globally, as opposed to the U.S. data employed in Strauss et al., this report modifies details of some of the ensuing steps, while preserving the same general approach of assessing population on land below different sea level increments, when added to local high tide lines.

To begin, in place of lidar-based bare earth elevation data, which has very limited availability outside the U.S., this analysis uses 3-arcsecond horizontal resolution SRTM data (Farr et. al, 2007). As distributed by NASA, SRTM is referenced to the EGM96 geoid ($SRTM_{EGM96}$). The analysis employs a series of steps to convert the vertical reference frame to refer to the local mean higher-high water (MHHW) tidal datum ($SRTM_{MHHW}$):

- Begin with the global 2-arcminute mean sea surface MSS_CNES_CLS_11 (Aviso 2014) based on 16 years of satellite altimetry observations (1993-2009), referenced to the Topex-Poseidon ellipsoid, and here called MSL_{TP} (MSL for mean sea level);
- Employ a global MHHW grid, $MHHW_{MSL}$, referenced to the MSL tidal datum, provided by Mark Merrifield of the University of Hawaii, and developed using the model TPXO8 at 2-arcminute resolution (Egbert et. al, 2002);
- Upsample these grids to 3-arcsecond SRTM resolution and georeference using nearest-neighbor interpolation;
- Convert both $SRTM_{EGM96}$ and MSL_{TP} to reference the WGS84 ellipsoid;
- Convert MHHW grid to reference WGS84 through the operation, $MHHW_{WGS84} = MSL_{WGS84} + MHHW_{MSL}$;
- Convert SRTM to MHHW reference through the operation, $SRTM_{MHHW} = SRTM_{WGS84} - MHHW_{WGS84}$.

A series of flood maps are then produced by thresholding $SRTM_{MHHW}$ to elevations 0.5-15 m above MHHW in 0.5 m increments. Each map can be labeled SRTM.THRESH^{Xm}, where X is the flood height. To prevent inclusion of isolated inland areas below sea level, such as the Caspian Sea or Death Valley, from being counted in analyses such as these, a common approach uses connected components analysis to remove those regions that are not directly connected to the ocean; call the resulting flood maps SRTM.CONTING^{Xm}. However, the high-frequency error present in SRTM creates significant speckle noise in threshold-based floodmaps, which causes some truly connected areas to appear isolated.

03. DETAILED METHODS

This analysis instead conducts the connected components analysis at the 10 m and 20 m flood levels, and performs the operation

$$SRTM.HYBRID^{Xm} = SRTM.THRESH^{Xm} \cap SRTM.CONTING^{Ym},$$

where Y=10 if X<=10, and Y=20 if 10<X<=20. This intersection operation ensures that SRTM-$HYBRID^{Xm}$ is not overly sensitive to speckle noise, but isolated, low-lying regions will still not be counted, so long as ridges exceeding 10 m or 20 m separate them from coastal zones. All local sea level rise increments considered for warming below 4 °C are below 10 m, and the great majority of local increments for 4 °C are also below 10 m.

For population density data, this analysis employs the LandScan edition for 2010, produced by Bright et al. (2011), which provides total estimated populations living in 1 km square cells across the Earth. The SRTM Water Body Dataset (SWBD) is utilized to define land cells at SRTM resolution. For each cell in LandScan, the analysis counts the number of SWBD-defined land pixels within it, and divides the cell population by the count to find per-pixel population density. A new raster, LSDensity, is thus defined, georeferenced identically to SRTM, and in which each pixel is set to zero if SWBD defines it as non-land, or otherwise is set to its population density.

This report uses urban agglomeration boundaries defined by the Natural Earth dataset (Natural Earth, 2012) plus level-two (county equivalent) administrative boundaries defined by the GADM dataset (Global Administrative Areas, 2015), to assess threats at metropolitan through national levels. For each feature of interest in Natural Earth and GADM, the following recipe yields population on land below sea level rise locked in by different warming scenarios:

- Compute the population living 0.5-15 m above MHHW in increments of 0.5m, using LSDensity;
- For each of the warming scenarios, look up the local sea level rise commitment, and thus elevation of the future high tide line (MHHW), at the centroid of each feature (Natural Earth and level-two GADM);
- Linearly interpolate among results at 0.5-15 m to find the number of people living on land below this elevation for each feature (completing the recipe for cities); and
- Sum the population exposure within the GADM level-two administrative areas to compute total committed populations within each nation.

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APPENDIX

Spreadsheets containing the same and additional data to what is provided in the following two tables are available for download.

Table A1. 2010 national populations below locked-in sea level from different warming amounts (thousands)

	1.5 °C warming		2 °C warming		3 °C warming		4 °C warming	
Country	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles
Aland	0	0 - 0	0	0 - 1	0	0 - 1	1	0 - 2
Albania	174	97 - 227	223	168 - 270	257	208 - 298	299	259 - 341
Algeria	362	134 - 624	612	350 - 835	779	545 - 991	999	788 - 1,204
American Samoa	3	1 - 6	6	3 - 8	8	5 - 10	10	8 - 12
Angola	72	18 - 171	163	67 - 261	249	150 - 340	357	271 - 457
Anguilla	1	1 - 2	2	1 - 2	2	2 - 3	3	2 - 4
Antigua and Barbuda	9	4 - 13	13	9 - 17	16	12 - 20	20	17 - 23
Argentina	650	219 - 1,439	1,350	617 - 2,309	2,214	1,256 - 3,117	3,368	2,526 - 4,136
Aruba	10	4 - 21	21	9 - 32	30	17 - 41	43	32 - 50
Australia	267	60 - 707	668	246 - 1,234	1,114	574 - 1,726	1,885	1,253 - 2,460
Azerbaijan	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Bahamas	115	26 - 206	204	109 - 252	242	182 - 271	275	250 - 287
Bahrain	77	17 - 205	186	65 - 340	307	154 - 442	467	342 - 546
Bangladesh	3,630	516 - 13,426	12,487	3,280 - 28,463	25,793	10,700 - 44,010	48,086	30,194 - 63,866
Barbados	6	2 - 15	15	6 - 29	27	13 - 41	42	29 - 52
Belgium	681	312 - 1,158	1,138	665 - 1,608	1,396	912 - 1,849	1,817	1,361 - 2,180
Belize	90	41 - 118	117	86 - 132	131	113 - 146	147	132 - 164
Benin	567	229 - 1,033	987	527 - 1,445	1,367	900 - 1,659	1,693	1,460 - 1,779
Bermuda	8	4 - 12	12	7 - 16	15	10 - 19	19	15 - 23
Bonaire, Saint Eustatius and Saba	5	3 - 6	6	4 - 8	7	6 - 8	9	8 - 9
Bosnia and Herzegovina	2	1 - 5	5	2 - 7	6	4 - 9	9	6 - 10
Bouvet Island	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Brazil	5,312	2,245 - 9,201	8,965	5,111 - 12,698	12,394	8,644 - 15,630	16,422	13,353 - 19,074
British Indian Ocean Territory	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
British Virgin Islands	2	1 - 4	4	2 - 5	5	4 - 6	6	5 - 7
Brunei	4	1 - 20	20	4 - 66	58	15 - 107	112	67 - 142
Bulgaria	17	6 - 31	29	15 - 40	37	27 - 47	47	38 - 56
Cote d'Ivoire	328	92 - 818	775	307 - 1,341	1,255	690 - 1,694	1,760	1,360 - 1,955
Cambodia	127	13 - 525	502	117 - 1,177	1,093	432 - 1,919	2,122	1,295 - 2,975
Cameroon	49	8 - 153	134	39 - 280	254	111 - 394	425	285 - 567

APPENDIX

Country	1.5 °C warming		2 °C warming		3 °C warming		4 °C warming	
	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles
Canada	540	277 - 767	737	507 - 952	883	671 - 1,105	1,079	861 - 1,339
Cape Verde	42	27 - 52	52	41 - 62	60	50 - 70	71	62 - 80
Caspian Sea	6	5 - 7	6	6 - 7	7	6 - 7	7	7 - 11
Cayman Islands	24	7 - 40	40	24 - 46	46	36 - 49	49	46 - 49
Chile	126	51 - 241	233	121 - 360	349	221 - 503	540	382 - 721
China	27,447	7,844 - 66,338	64,000	25,940 - 106,620	102,182	59,387 - 136,923	144,672	112,649 - 169,664
Christmas Island	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Clipperton Island	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Cocos Islands	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 1
Colombia	981	437 - 1,510	1,475	944 - 1,909	1,851	1,416 - 2,245	2,317	1,933 - 2,680
Comoros	34	22 - 53	52	34 - 67	65	50 - 81	87	69 - 104
Cook Islands	1	1 - 2	2	1 - 4	3	2 - 5	6	4 - 6
Costa Rica	92	54 - 134	132	90 - 170	165	125 - 195	200	172 - 226
Croatia	87	38 - 127	122	81 - 157	148	112 - 182	181	148 - 212
Cuba	289	95 - 572	551	274 - 868	812	500 - 1,135	1,178	857 - 1,510
Curacao	13	6 - 22	22	13 - 30	28	21 - 37	39	30 - 49
Cyprus	7	2 - 20	19	6 - 35	32	15 - 49	51	34 - 72
Democratic Republic of the Congo	1	0 - 3	3	1 - 6	6	3 - 10	11	6 - 18
Denmark	418	166 - 715	673	377 - 955	851	560 - 1,124	1,066	790 - 1,334
Djibouti	35	14 - 112	95	30 - 191	172	72 - 244	259	196 - 294
Dominica	4	2 - 6	6	4 - 9	8	5 - 11	11	9 - 12
Dominican Republic	239	112 - 414	404	228 - 605	560	362 - 755	784	601 - 927
East Timor	15	2 - 46	46	15 - 71	69	41 - 88	90	72 - 106
Ecuador	1,130	420 - 1,996	1,950	1,078 - 2,621	2,550	1,837 - 2,997	3,081	2,664 - 3,369
Egypt	5,362	2,731 - 9,698	9,376	5,095 - 14,679	13,673	8,577 - 18,895	19,350	14,259 - 23,848
El Salvador	37	13 - 71	69	35 - 106	102	66 - 134	138	107 - 162
Equatorial Guinea	7	2 - 15	14	6 - 23	21	12 - 29	31	24 - 41
Eritrea	16	3 - 42	37	13 - 80	67	31 - 117	131	82 - 167
Estonia	6	1 - 16	15	5 - 36	26	10 - 57	52	23 - 88
Falkland Islands	0	0 - 0	0	0 - 0	0	0 - 0	1	0 - 1

APPENDIX

Country	1.5 °C warming		2 °C warming		3 °C warming		4 °C warming	
	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles
Fiji	46	11 - 109	108	45 - 166	162	103 - 212	224	174 - 266
Finland	2	1 - 5	5	2 - 10	7	3 - 14	13	6 - 25
France	1,404	669 - 2,129	2,049	1,313 - 2,682	2,464	1,796 - 3,043	2,989	2,401 - 3,477
French Guiana	40	16 - 70	69	37 - 94	88	61 - 107	110	94 - 119
French Polynesia	26	12 - 53	53	26 - 90	88	50 - 115	121	98 - 136
French Southern Territories	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Gabon	34	7 - 119	119	34 - 214	213	118 - 276	277	214 - 338
Gambia	100	45 - 154	147	92 - 226	200	131 - 293	323	223 - 434
Georgia	59	14 - 126	120	53 - 192	175	104 - 244	252	182 - 305
Germany	2,003	1,323 - 2,712	2,633	1,914 - 3,245	3,028	2,355 - 3,542	3,461	2,927 - 3,862
Ghana	284	155 - 452	439	273 - 645	606	413 - 842	904	654 - 1,156
Gibraltar	6	3 - 9	8	6 - 11	10	8 - 12	12	10 - 13
Greece	201	73 - 376	355	185 - 563	514	313 - 719	732	527 - 924
Greenland	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Grenada	6	3 - 10	9	6 - 12	12	9 - 14	15	12 - 17
Guadeloupe	31	12 - 61	61	30 - 87	83	54 - 108	110	87 - 129
Guam	1	0 - 4	4	1 - 11	10	4 - 15	16	12 - 20
Guatemala	45	13 - 97	93	42 - 147	139	84 - 187	195	148 - 237
Guernsey	11	6 - 16	16	11 - 19	18	14 - 20	20	18 - 22
Guinea	216	134 - 310	304	211 - 410	396	294 - 531	547	411 - 722
Guinea-Bissau	85	28 - 146	144	83 - 191	188	138 - 232	237	192 - 290
Guyana	511	393 - 545	543	506 - 558	555	539 - 564	566	558 - 572
Haiti	395	150 - 699	688	374 - 929	865	603 - 1,072	1,108	925 - 1,275
Heard Island and McDonald Islands	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Honduras	130	44 - 274	261	119 - 374	359	229 - 462	479	376 - 567
Hong Kong	302	124 - 588	586	295 - 894	849	526 - 1,174	1,208	899 - 1,524
India	8,100	2,153 - 20,492	19,782	7,608 - 35,853	33,566	17,634 - 51,356	55,014	37,293 - 73,475
Indonesia	6,239	1,238 - 17,143	16,367	5,799 - 30,429	28,917	15,119 - 41,493	43,891	32,256 - 52,975
Iran	325	74 - 787	699	263 - 1,216	1,132	613 - 1,574	1,628	1,201 - 1,909
Iraq	646	140 - 1,619	1,431	508 - 2,428	2,314	1,302 - 3,197	3,279	2,373 - 3,879
Ireland	169	63 - 288	284	163 - 395	342	226 - 446	419	309 - 518

APPENDIX

Country	1.5 °C warming		2 °C warming		3 °C warming		4 °C warming	
	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles
Isle of Man	3	1 - 7	6	3 - 9	8	4 - 10	10	7 - 12
Israel	34	7 - 92	88	33 - 158	144	76 - 228	240	154 - 337
Italy	1,882	878 - 3,020	2,888	1,744 - 3,958	3,683	2,589 - 4,666	4,653	3,667 - 5,526
Jamaica	176	70 - 298	291	169 - 415	392	268 - 502	518	415 - 588
Japan	9,273	3,526 - 17,887	17,565	9,010 - 26,154	25,329	16,591 - 32,482	34,179	27,709 - 39,603
Jersey	5	2 - 11	11	5 - 17	14	8 - 20	20	14 - 26
Jordan	1	0 - 2	2	0 - 3	3	2 - 5	5	3 - 6
Kazakhstan	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Kenya	60	29 - 100	97	58 - 154	148	93 - 218	227	158 - 295
Kiribati	17	8 - 29	29	17 - 45	43	27 - 67	76	50 - 93
Kuwait	16	5 - 43	43	16 - 95	84	38 - 173	193	95 - 332
Latvia	119	33 - 265	231	88 - 364	334	191 - 473	434	303 - 595
Lebanon	44	7 - 94	88	38 - 149	137	78 - 199	207	144 - 268
Liberia	204	54 - 425	401	181 - 628	567	336 - 774	834	642 - 1,022
Libya	299	94 - 591	577	287 - 853	789	503 - 1,054	1,080	819 - 1,329
Lithuania	48	22 - 85	85	48 - 132	107	65 - 159	159	107 - 203
Macao	39	11 - 78	77	37 - 103	101	74 - 121	128	106 - 150
Madagascar	243	90 - 498	466	220 - 779	730	420 - 1,068	1,168	829 - 1,537
Malaysia	420	64 - 1,812	1,709	382 - 4,156	3,823	1,489 - 6,351	6,876	4,491 - 8,824
Maldives	47	10 - 107	103	44 - 186	170	92 - 231	239	203 - 249
Malta	5	2 - 11	10	5 - 16	15	9 - 21	22	15 - 28
Marshall Islands	22	9 - 36	36	22 - 44	43	35 - 48	49	45 - 51
Martinique	18	7 - 36	35	17 - 53	50	32 - 66	69	54 - 81
Mauritania	424	190 - 609	585	391 - 781	723	525 - 875	893	764 - 966
Mauritius	23	7 - 53	51	22 - 86	82	47 - 117	126	92 - 152
Mayotte	9	4 - 18	17	9 - 27	26	16 - 36	38	29 - 46
Mexico	1,830	841 - 3,156	3,051	1,752 - 4,507	4,220	2,758 - 5,828	6,104	4,519 - 7,652
Micronesia	13	5 - 23	23	13 - 31	30	22 - 37	39	32 - 44
Moldova	8	2 - 18	17	7 - 35	27	13 - 48	48	27 - 69
Monaco	1	1 - 2	2	1 - 2	2	2 - 3	3	2 - 3
Montenegro	10	3 - 21	19	9 - 30	27	16 - 36	36	27 - 43
Montserrat	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Morocco	435	182 - 772	749	418 - 1,105	1,012	652 - 1,353	1,360	1,021 - 1,698
Mozambique	498	149 - 994	971	479 - 1,458	1,412	923 - 1,799	1,857	1,490 - 2,111

APPENDIX

Country	1.5 °C warming		2 °C warming		3 °C warming		4 °C warming	
	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles
Myanmar	2,045	414 - 5,407	5,205	1,873 - 8,497	8,207	4,824 - 11,166	11,798	8,932 - 13,988
Namibia	8	2 - 28	27	7 - 46	45	25 - 53	54	48 - 56
Nauru	1	0 - 1	1	1 - 3	3	1 - 3	4	3 - 4
Netherlands	8,356	6,101 - 9,838	9,741	8,257 - 10,774	10,388	9,166 - 11,334	11,183	10,255 - 11,990
New Caledonia	15	6 - 28	28	15 - 43	41	25 - 57	60	45 - 74
New Zealand	79	22 - 210	185	66 - 357	332	163 - 518	552	372 - 712
Nicaragua	46	20 - 77	75	44 - 100	97	70 - 119	124	100 - 152
Nigeria	1,872	572 - 3,871	3,720	1,756 - 5,946	5,676	3,433 - 7,640	7,852	5,987 - 9,349
Niue	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Norfolk Island	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
North Korea	210	32 - 824	772	192 - 1,736	1,634	712 - 2,666	2,940	1,918 - 3,890
Northern Mariana Islands	2	0 - 10	10	2 - 20	19	8 - 23	24	20 - 25
Norway	32	6 - 72	69	30 - 115	94	49 - 142	122	74 - 173
Oman	108	33 - 257	243	100 - 434	403	215 - 613	654	442 - 874
Pakistan	190	47 - 574	509	161 - 1,210	1,009	389 - 1,971	2,307	1,283 - 3,487
Palau	0	0 - 1	1	0 - 2	2	1 - 4	4	2 - 6
Palestina	6	1 - 13	11	4 - 21	19	9 - 29	30	19 - 42
Panama	119	50 - 232	222	112 - 339	326	210 - 430	458	351 - 580
Papua New Guinea	34	8 - 90	87	32 - 184	172	79 - 288	319	200 - 451
Peru	138	40 - 303	292	131 - 468	455	280 - 618	662	498 - 806
Philippines	2,307	481 - 7,184	7,029	2,227 - 13,638	13,096	6,504 - 18,973	20,346	14,765 - 24,639
Pitcairn Islands	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Poland	405	236 - 552	539	389 - 664	617	480 - 731	722	605 - 818
Portugal	198	102 - 316	309	193 - 431	393	268 - 515	509	386 - 624
Puerto Rico	295	129 - 430	424	286 - 529	513	405 - 603	616	528 - 700
Qatar	15	3 - 39	35	13 - 68	60	29 - 92	99	69 - 132
Republic of Congo	7	1 - 18	17	6 - 34	29	14 - 54	66	37 - 123
Reunion	5	2 - 12	12	5 - 26	25	11 - 45	50	30 - 67
Romania	47	16 - 87	83	42 - 129	115	70 - 165	166	116 - 216
Russia	445	223 - 744	700	418 - 1,085	1,012	638 - 1,429	1,413	1,027 - 1,839
Saint Helena	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Saint Kitts and Nevis	3	2 - 5	4	3 - 6	6	4 - 7	8	6 - 9

APPENDIX

Country	1.5 °C warming		2 °C warming		3 °C warming		4 °C warming	
	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles
Saint Lucia	12	4 - 25	24	11 - 32	31	23 - 37	39	32 - 43
Saint Pierre and Miquelon	1	1 - 2	2	1 - 2	2	2 - 3	3	2 - 3
Saint Vincent and the Grenadines	5	3 - 8	8	5 - 11	11	7 - 15	15	11 - 18
Saint-Bartholemy	1	0 - 1	1	1 - 2	2	1 - 2	2	2 - 2
Saint-Martin	7	4 - 9	9	7 - 11	11	8 - 12	12	11 - 13
Samoa	10	3 - 23	22	10 - 34	33	22 - 44	47	36 - 55
Sao Tome and Principe	9	3 - 24	23	9 - 43	41	21 - 60	64	45 - 74
Saudi Arabia	421	145 - 942	886	389 - 1,664	1,499	771 - 2,347	2,501	1,656 - 3,250
Senegal	648	236 - 1,364	1,308	598 - 2,216	1,939	1,086 - 2,863	3,055	2,196 - 3,662
Seychelles	10	5 - 14	14	9 - 17	16	13 - 20	20	17 - 22
Sierra Leone	123	48 - 193	189	120 - 253	248	184 - 306	314	255 - 375
Singapore	22	8 - 61	59	22 - 185	166	53 - 455	537	210 - 1,011
Sint Maarten	5	3 - 8	8	5 - 9	9	7 - 11	11	9 - 12
Slovenia	15	6 - 23	23	15 - 28	26	19 - 30	30	26 - 32
Solomon Islands	52	25 - 83	82	51 - 106	103	78 - 126	132	110 - 153
Somalia	110	38 - 198	191	102 - 281	263	178 - 365	399	289 - 532
South Africa	126	38 - 322	292	112 - 569	536	265 - 854	952	634 - 1,247
South Georgia and the South Sandwich Islands	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
South Korea	411	94 - 1,204	1,155	384 - 2,379	2,216	1,046 - 3,595	3,977	2,667 - 5,344
Spain	929	418 - 1,547	1,454	848 - 2,120	1,949	1,297 - 2,633	2,610	1,926 - 3,268
Spratly islands	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Sri Lanka	130	14 - 566	534	118 - 1,288	1,183	466 - 2,163	2,443	1,419 - 3,743
Sudan	55	19 - 134	132	54 - 258	239	119 - 390	412	258 - 520
Suriname	375	252 - 415	414	366 - 430	426	406 - 437	439	430 - 445
Sweden	155	45 - 311	292	138 - 470	398	227 - 575	537	357 - 714
Syria	8	1 - 33	26	5 - 71	65	20 - 110	111	67 - 160
Taiwan	670	192 - 1,513	1,488	653 - 2,532	2,452	1,411 - 3,585	3,871	2,731 - 5,409
Tanzania	89	22 - 212	211	88 - 394	390	209 - 601	626	408 - 869

APPENDIX

Country	1.5 °C warming		2 °C warming		3 °C warming		4 °C warming	
	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles	Median estimate	17th - 83rd percentiles
Thailand	1,814	275 - 6,131	5,786	1,594 - 11,301	10,324	4,788 - 14,632	15,397	11,697 - 17,622
Togo	169	81 - 370	368	167 - 680	674	361 - 868	870	681 - 951
Tokelau	0	0 - 1	1	0 - 1	1	1 - 1	1	1 - 1
Tonga	17	5 - 36	36	17 - 54	53	35 - 65	67	55 - 74
Trinidad and Tobago	64	24 - 118	116	62 - 174	164	105 - 228	239	176 - 305
Tunisia	497	211 - 864	839	474 - 1,214	1,124	747 - 1,480	1,499	1,148 - 1,799
Turkey	582	130 - 1,371	1,261	504 - 2,112	1,930	1,081 - 2,776	2,822	1,977 - 3,598
Turkmenistan	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Turks and Caicos Islands	11	6 - 15	15	11 - 18	17	14 - 19	19	18 - 21
Tuvalu	4	2 - 6	6	4 - 7	7	6 - 8	8	7 - 9
Ukraine	222	81 - 416	400	210 - 614	548	336 - 743	750	556 - 924
United Arab Emirates	933	404 - 1,649	1,611	902 - 2,276	2,222	1,525 - 2,716	2,747	2,283 - 3,044
United Kingdom	2,455	1,078 - 4,021	3,850	2,287 - 5,388	4,734	3,165 - 6,217	5,925	4,417 - 7,312
United States	7,012	3,142 - 12,817	12,084	6,438 - 19,268	17,355	10,517 - 24,329	24,837	18,129 - 30,059
United States Minor Outlying Islands	0	0 - 0	0	0 - 0	0	0 - 0	0	0 - 0
Uruguay	97	49 - 163	161	96 - 247	245	159 - 328	342	258 - 428
Vanuatu	11	4 - 17	17	11 - 23	22	16 - 29	31	24 - 38
Venezuela	1,039	497 - 1,619	1,568	979 - 2,028	1,942	1,452 - 2,300	2,379	2,034 - 2,668
Vietnam	13,445	4,736 - 26,443	25,830	12,951 - 37,617	36,311	23,936 - 44,813	46,118	38,582 - 51,016
Virgin Islands, U.S.	6	3 - 10	10	6 - 13	13	9 - 15	16	13 - 18
Wallis and Futuna	2	1 - 4	4	2 - 5	5	4 - 6	6	5 - 7
Western Sahara	10	4 - 21	20	9 - 54	43	17 - 96	102	49 - 127
Yemen	95	34 - 204	201	94 - 343	333	194 - 537	551	344 - 780

APPENDIX

Table A2. Urban agglomeration populations below locked-in sea level from different warming amounts, for agglomerations with total populations exceeding one million. Total populations estimated from LandScan data tabulated within urban area boundaries from Natural Earth, and may vary from listed populations based on administrative or other boundaries.

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Algiers	Algeria	4,436	89	138	175	237	2%	3%	4%	5%	2.9	4.7	6.2	8.3
Oran	Algeria	1,229	35	41	47	54	3%	3%	4%	4%	2.9	4.7	6.1	8.2
Luanda	Angola	2,101	22	45	63	93	1%	2%	3%	4%	2.9	4.8	6.5	9.0
Buenos Aires	Argentina	13,208	520	1,102	1,714	2,440	4%	8%	13%	19%	2.8	4.6	6.4	9.0
Rosario1	Argentina	1,235	0	0	1	5	0%	0%	0%	0%	2.8	4.6	6.3	8.8
Adelaide	Australia	1,014	7	19	49	102	1%	2%	5%	10%	2.6	4.3	5.8	8.1
Brisbane	Australia	1,143	40	92	129	176	4%	8%	11%	15%	2.8	4.6	6.3	8.7
Melbourne2	Australia	3,307	5	14	39	113	0%	0%	1%	3%	2.6	4.2	5.8	8.0
Perth2	Australia	1,266	7	14	23	43	1%	1%	2%	3%	2.7	4.3	6.0	8.3
Sydney1	Australia	3,696	39	90	130	218	1%	2%	4%	6%	2.7	4.4	6.1	8.4
Barisal	Bangladesh	6,908	795	2,604	4,282	6,048	12%	38%	62%	88%	3.0	4.9	6.6	9.2
Chittagong	Bangladesh	9,107	1,890	3,807	5,544	6,995	21%	42%	61%	77%	3.0	4.8	6.6	9.1
Comilla	Bangladesh	3,749	51	429	1,344	2,814	1%	11%	36%	75%	2.9	4.8	6.5	9.0
Dhaka	Bangladesh	32,179	319	2,018	5,875	12,297	1%	6%	18%	38%	2.9	4.8	6.5	8.9
Jamalpur	Bangladesh	4,868	0	0	0	1	0%	0%	0%	0%	2.9	4.7	6.5	8.9
Khulna	Bangladesh	13,220	809	2,609	4,644	7,623	6%	20%	35%	58%	3.0	4.9	6.6	9.2
Mymensingh	Bangladesh	10,083	14	139	544	1,307	0%	1%	5%	13%	2.9	4.7	6.5	8.9
Narayanganj	Bangladesh	4,523	97	638	1,897	3,542	2%	14%	42%	78%	2.9	4.8	6.5	9.0
Rajshahi	Bangladesh	36,351	1	3	5	16	0%	0%	0%	0%	2.9	4.8	6.5	8.9
Sylhet	Bangladesh	6,563	2	26	178	701	0%	0%	3%	11%	2.9	4.7	6.4	8.9
Tangail	Bangladesh	7,544	10	24	58	205	0%	0%	1%	3%	2.9	4.8	6.5	8.9
Brussels	Belgium	3,199	279	444	552	734	9%	14%	17%	23%	2.8	4.5	5.8	7.5
Cotonou	Benin	1,336	496	857	1,110	1,217	37%	64%	83%	91%	2.9	4.8	6.5	8.9
Belem	Brazil	2,033	397	534	633	794	20%	26%	31%	39%	3.0	4.9	6.7	9.2
Fortaleza	Brazil	3,112	16	34	61	122	1%	1%	2%	4%	3.0	5.0	6.8	9.3
Manaus	Brazil	1,637	-	0	1	2	0%	0%	0%	0%	2.9	4.7	6.4	8.8
Natal	Brazil	1,072	40	51	58	65	4%	5%	5%	6%	3.1	5.0	6.9	9.4
Niteroi	Brazil	1,797	76	126	178	256	4%	7%	10%	14%	3.0	4.9	6.7	9.3
Porto Alegre	Brazil	3,667	351	621	872	1,136	10%	17%	24%	31%	2.9	4.8	6.6	9.1

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Recife	Brazil	3,458	367	775	1,177	1,602	11%	22%	34%	46%	3.1	5.0	6.8	9.4
Rio de Janeiro	Brazil	10,278	797	1,307	1,795	2,429	8%	13%	18%	24%	3.0	4.9	6.7	9.3
Salvador	Brazil	3,109	261	357	437	551	8%	12%	14%	18%	3.0	5.0	6.8	9.4
Santos	Brazil	1,470	256	600	907	1,153	17%	41%	62%	78%	3.0	4.9	6.7	9.3
Sao Luis	Brazil	1,104	208	271	320	393	19%	25%	29%	36%	3.1	5.0	6.8	9.4
Vitoria1	Brazil	1,067	349	403	437	476	33%	38%	41%	45%	3.0	4.9	6.8	9.4
Phnom Penh	Cambodia	1,515	-	0	0	39	0%	0%	0%	3%	3.0	4.9	6.7	9.3
Douala	Cameroon	1,577	74	154	235	356	5%	10%	15%	23%	2.9	4.7	6.4	8.7
Montreal	Canada	2,832	5	10	22	54	0%	0%	1%	2%	2.7	4.4	5.7	7.4
Vancouver2	Canada	1,814	295	340	368	396	16%	19%	20%	22%	2.9	4.7	6.2	8.4
Anshan	China	2,079	3	15	33	80	0%	1%	2%	4%	3.0	4.8	6.6	9.1
Beijing	China	17,115	1	12	67	270	0%	0%	0%	2%	3.0	4.9	6.7	9.2
Dalian	China	2,658	87	201	323	469	3%	8%	12%	18%	3.1	5.1	6.9	9.5
Fuzhou	China	2,125	38	132	311	697	2%	6%	15%	33%	3.1	5.0	6.8	9.4
Haikou	China	1,184	145	254	359	476	12%	21%	30%	40%	3.1	5.1	6.9	9.6
Hefei	China	2,611	0	0	3	33	0%	0%	0%	1%	2.9	4.8	6.6	9.1
Hong Kong	China	21,993	4,949	6,841	8,351	10,054	23%	31%	38%	46%	3.0	5.0	6.8	9.4
Huaiyin	China	7,858	2,398	3,321	3,935	4,745	31%	42%	50%	60%	3.0	4.9	6.7	9.3
Huizhou	China	2,832	230	428	646	902	8%	15%	23%	32%	3.0	4.9	6.7	9.3
Jiangmen	China	5,894	2,394	3,241	3,916	4,504	41%	55%	66%	76%	3.0	5.0	6.8	9.3
Jiaojing	China	2,588	516	1,463	1,959	2,225	20%	57%	76%	86%	3.1	5.1	6.9	9.6
Lianyungang	China	3,014	2,281	2,776	2,915	2,981	76%	92%	97%	99%	3.0	5.0	6.8	9.3
Linyi	China	8,264	555	957	1,216	1,363	7%	12%	15%	17%	3.0	4.9	6.6	9.2
Macau	China	1,541	289	418	553	750	19%	27%	36%	49%	3.1	5.0	6.8	9.4
Maoming	China	3,789	140	222	311	447	4%	6%	8%	12%	3.0	5.0	6.8	9.3
Nanjing	China	3,841	7	33	104	276	0%	1%	3%	7%	3.0	4.8	6.6	9.1
Nantong	China	6,527	1,736	4,711	6,076	6,463	27%	72%	93%	99%	3.1	5.0	6.9	9.5
Ningbo	China	2,664	511	1,376	1,889	2,303	19%	52%	71%	87%	3.1	5.1	6.9	9.5
Pingdu	China	1,265	15	33	54	85	1%	3%	4%	7%	3.1	5.0	6.8	9.4
Putian	China	2,582	430	709	921	1,109	17%	27%	36%	43%	3.1	5.0	6.8	9.4

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Qingdao	China	3,980	130	308	525	858	3%	8%	13%	22%	3.1	5.0	6.8	9.4
Quanzhou	China	5,870	179	486	894	1,502	3%	8%	15%	26%	3.0	5.0	6.8	9.4
Rizhao	China	1,078	133	211	270	344	12%	20%	25%	32%	3.0	5.0	6.8	9.3
Shanghai	China	29,514	4,238	11,582	17,509	22,421	14%	39%	59%	76%	3.1	5.0	6.8	9.4
Shantou	China	13,565	1,131	3,044	5,159	7,382	8%	22%	38%	54%	3.0	5.0	6.8	9.4
Shaoxing	China	2,448	19	178	670	1,599	1%	7%	27%	65%	3.0	5.0	6.8	9.3
Shenzhen	China	10,964	596	997	1,475	2,169	5%	9%	13%	20%	3.0	5.0	6.8	9.4
Shijianzhuang	China	14,030	0	0	2	16	0%	0%	0%	0%	2.9	4.8	6.5	9.0
Shuyang	China	3,218	409	841	1,185	1,512	13%	26%	37%	47%	3.0	4.9	6.7	9.2
Suzhou	China	3,628	831	1,791	2,518	3,151	23%	49%	69%	87%	3.0	5.0	6.8	9.4
Taizhou	China	9,085	3,649	6,054	7,876	8,870	40%	67%	87%	98%	3.0	5.0	6.8	9.3
Tianjin	China	42,743	1,610	4,985	8,462	12,397	4%	12%	20%	29%	3.0	5.0	6.8	9.3
Weifang	China	4,198	13	60	150	329	0%	1%	4%	8%	3.0	4.9	6.7	9.3
Wenzhou	China	4,345	740	1,653	2,395	3,250	17%	38%	55%	75%	3.1	5.0	6.9	9.5
Wuhu	China	1,551	1	6	32	201	0%	0%	2%	13%	3.0	4.8	6.6	9.1
Wuxi	China	7,454	697	2,105	4,294	6,312	9%	28%	58%	85%	3.0	4.9	6.7	9.3
Xiamen	China	1,247	27	61	119	246	2%	5%	10%	20%	3.0	5.0	6.8	9.4
Yangzhou	China	1,493	5	55	180	384	0%	4%	12%	26%	3.0	4.9	6.7	9.2
Yantai	China	1,373	48	143	257	362	4%	10%	19%	26%	3.1	5.1	6.9	9.5
Yingkow	China	1,541	561	950	1,093	1,182	36%	62%	71%	77%	3.0	4.9	6.7	9.2
Zhangzhou	China	1,345	148	278	383	518	11%	21%	29%	39%	3.0	4.9	6.7	9.3
Zhanjiang	China	1,262	53	106	187	320	4%	8%	15%	25%	3.0	5.0	6.8	9.4
Zhenjiang	China	1,426	21	67	203	456	2%	5%	14%	32%	3.0	4.9	6.7	9.2
Zibo	China	5,359	0	2	21	111	0%	0%	0%	2%	3.0	4.9	6.7	9.2
Barranquilla	Colombia	1,171	79	108	128	150	7%	9%	11%	13%	3.0	5.0	6.7	9.2
Abidjan	Cote d'Ivoire	4,047	398	777	1,111	1,363	10%	19%	28%	34%	2.9	4.8	6.5	8.9
Havana	Cuba	2,185	93	161	233	307	4%	7%	11%	14%	3.0	5.0	6.6	9.0
Copenhagen	Denmark	1,398	176	255	325	391	13%	18%	23%	28%	2.8	4.6	5.8	7.5
Santo Domingo	Dominican Republic	3,101	56	87	113	158	2%	3%	4%	5%	3.0	5.0	6.7	9.0

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Guayaquil	Ecuador	2,411	954	1,433	1,683	1,858	40%	59%	70%	77%	3.0	4.9	6.7	9.2
Alexandria3	Egypt	4,901	2,377	2,755	3,045	3,421	49%	56%	62%	70%	2.9	4.8	6.4	8.7
Cairo	Egypt	15,519	3	31	103	341	0%	0%	1%	2%	2.9	4.7	6.3	8.5
Dumyat	Egypt	1,266	570	868	1,019	1,139	45%	69%	81%	90%	2.9	4.8	6.4	8.7
El Giza	Egypt	5,780	-	0	0	0	0%	0%	0%	0%	2.8	4.6	6.2	8.4
El Mansura	Egypt	1,268	45	298	585	822	4%	24%	46%	65%	2.9	4.7	6.4	8.6
Tanta	Egypt	9,466	32	169	730	2,487	0%	2%	8%	26%	2.9	4.7	6.3	8.5
Lille	France	1,301	0	0	1	3	0%	0%	0%	0%	2.8	4.5	5.8	7.5
Marseille	France	1,071	18	30	38	54	2%	3%	4%	5%	2.9	4.6	6.0	8.0
Hamburg	Germany	2,075	170	247	281	313	8%	12%	14%	15%	2.8	4.5	5.8	7.4
Accra	Ghana	2,619	18	40	76	211	1%	2%	3%	8%	3.0	4.8	6.5	8.9
Conakry	Guinea	1,576	155	222	308	446	10%	14%	20%	28%	3.0	4.9	6.6	9.0
Port-au-Prince	Haiti	2,383	182	253	300	363	8%	11%	13%	15%	3.0	5.0	6.7	9.0
Ahmadabad	India	7,957	0	1	4	27	0%	0%	0%	0%	2.9	4.7	6.4	8.9
Brahmapur	India	1,877	2	18	44	91	0%	1%	2%	5%	3.0	4.9	6.7	9.2
Calcutta	India	23,760	2,607	5,586	8,174	11,990	11%	24%	34%	51%	3.0	4.9	6.7	9.2
Chennai	India	9,206	455	1,048	1,845	3,034	5%	11%	20%	33%	3.0	4.9	6.6	9.1
Cochin	India	5,932	406	749	1,168	2,051	7%	13%	20%	35%	3.0	5.0	6.8	9.3
Cuttack	India	10,492	332	752	1,247	1,925	3%	7%	12%	18%	3.0	4.9	6.7	9.2
Haldia	India	3,135	1,098	1,970	2,554	3,018	35%	63%	82%	96%	3.0	5.0	6.7	9.3
Haora	India	11,789	739	1,881	3,627	7,033	6%	16%	31%	60%	3.0	4.9	6.7	9.2
Kakinada	India	2,199	108	397	783	1,178	5%	18%	36%	54%	3.0	4.9	6.7	9.2
Kanchipuram	India	1,738	4	11	17	23	0%	1%	1%	1%	3.0	4.9	6.6	9.1
Kozhikode	India	9,427	169	263	387	668	2%	3%	4%	7%	3.0	4.9	6.7	9.2
Krishnanagar	India	5,207	1	7	35	122	0%	0%	1%	2%	3.0	4.8	6.6	9.1
Machilipatnam	India	1,133	31	271	639	910	3%	24%	56%	80%	3.0	4.9	6.7	9.2
Madurai	India	7,041	71	213	382	639	1%	3%	5%	9%	3.0	4.9	6.7	9.2
Mangalore	India	1,059	13	39	88	150	1%	4%	8%	14%	3.0	4.9	6.7	9.2
Medinipur	India	6,915	17	58	137	344	0%	1%	2%	5%	3.0	4.9	6.6	9.1
Mumbai	India	21,719	3,560	5,830	8,060	10,840	16%	27%	37%	50%	3.0	4.9	6.6	9.1

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Pondicherry	India	4,855	112	271	459	900	2%	6%	10%	19%	3.0	4.9	6.7	9.2
Puri	India	1,484	10	77	217	422	1%	5%	15%	28%	3.0	4.9	6.7	9.3
Rajahmundry	India	4,166	1	9	61	248	0%	0%	2%	6%	3.0	4.9	6.6	9.1
Surat	India	5,699	141	394	766	1,278	3%	7%	13%	22%	2.9	4.8	6.5	9.0
Tiruchchirappalli	India	7,869	99	252	418	676	1%	3%	5%	9%	3.0	4.9	6.7	9.2
Trivandrum	India	12,622	558	793	1,071	1,661	4%	6%	9%	13%	3.1	5.0	6.8	9.4
Vadodara	India	4,651	1	4	8	15	0%	0%	0%	0%	2.9	4.7	6.5	8.9
Vijayawada	India	5,210	5	59	205	371	0%	1%	4%	7%	3.0	4.8	6.6	9.1
Visakhapatnam	India	2,986	39	108	232	410	1%	4%	8%	14%	3.0	4.9	6.7	9.2
Cilacap	Indonesia	6,025	233	483	747	1,096	4%	8%	12%	18%	3.1	5.0	6.8	9.3
Jakarta	Indonesia	42,645	2,664	4,961	7,218	9,528	6%	12%	17%	22%	3.1	5.0	6.8	9.4
Kotabumi	Indonesia	2,395	29	61	87	126	1%	3%	4%	5%	3.0	5.0	6.8	9.3
Medan	Indonesia	5,123	139	337	543	760	3%	7%	11%	15%	3.1	5.0	6.8	9.4
Padang	Indonesia	1,186	115	271	509	701	10%	23%	43%	59%	3.0	5.0	6.7	9.3
Palembang	Indonesia	1,877	38	193	665	1,358	2%	10%	35%	72%	3.1	5.0	6.8	9.4
Pontianak	Indonesia	1,020	468	894	999	1,017	46%	88%	98%	100%	3.1	5.1	6.9	9.5
Praya	Indonesia	2,903	23	48	91	187	1%	2%	3%	6%	3.1	5.0	6.9	9.4
Semarang	Indonesia	9,360	386	969	1,715	2,605	4%	10%	18%	28%	3.1	5.0	6.8	9.4
Serang	Indonesia	3,903	367	605	787	1,066	9%	16%	20%	27%	3.1	5.0	6.8	9.4
Sukabumi	Indonesia	2,312	26	57	86	127	1%	2%	4%	6%	3.1	5.0	6.8	9.3
Sumenep	Indonesia	1,878	20	52	82	122	1%	3%	4%	7%	3.1	5.1	6.9	9.5
Surabaya	Indonesia	24,682	1,094	2,700	4,165	5,499	4%	11%	17%	22%	3.1	5.0	6.8	9.4
Surakarta	Indonesia	11,127	-	0	0	0	0%	0%	0%	0%	3.0	5.0	6.8	9.3
Tegal	Indonesia	8,120	558	1,197	1,933	2,703	7%	15%	24%	33%	3.1	5.0	6.8	9.4
Tuban	Indonesia	3,723	91	273	416	568	3%	7%	11%	15%	3.1	5.0	6.8	9.4
Ujungpandang	Indonesia	2,799	133	357	812	1,364	5%	13%	29%	49%	3.1	5.1	6.9	9.5
Yogyakarta	Indonesia	4,824	4	10	17	29	0%	0%	0%	1%	3.0	5.0	6.8	9.3
Ahwaz	Iran	1,213	-	-	-	0	0%	0%	0%	0%	2.8	4.6	6.2	8.5
Basra	Iraq	1,167	552	936	1,104	1,145	47%	80%	95%	98%	2.8	4.6	6.2	8.5
Dublin2	Ireland	1,189	49	78	91	108	4%	7%	8%	9%	2.8	4.6	5.7	7.2

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Tel Aviv-Yafo	Israel	2,504	4	10	18	27	0%	0%	1%	1%	2.9	4.7	6.3	8.5
Naples2	Italy	3,226	52	101	145	194	2%	3%	5%	6%	2.9	4.7	6.2	8.3
Fukuoka	Japan	2,640	279	510	733	966	11%	19%	28%	37%	3.1	5.2	7.0	9.7
Hamamatsu	Japan	1,084	132	229	295	379	12%	21%	27%	35%	3.1	5.2	7.0	9.7
Hiroshima	Japan	1,280	343	490	607	741	27%	38%	47%	58%	3.2	5.2	7.1	9.8
Kitakyushu	Japan	1,513	215	344	446	578	14%	23%	30%	38%	3.2	5.2	7.0	9.7
Nagoya	Japan	7,949	1,572	2,141	2,654	3,387	20%	27%	33%	43%	3.1	5.1	7.0	9.7
Osaka	Japan	16,258	2,635	4,183	5,229	6,172	16%	26%	32%	38%	3.1	5.1	7.0	9.7
Sapporo	Japan	2,041	9	43	133	313	1%	2%	7%	15%	3.1	5.1	7.0	9.7
Sendai	Japan	1,271	67	147	233	341	5%	12%	18%	27%	3.2	5.2	7.1	9.8
Tokyo	Japan	25,298	2,123	4,153	5,748	7,455	8%	16%	23%	30%	3.2	5.2	7.1	9.8
Yokohama	Japan	7,170	180	393	634	945	3%	6%	9%	13%	3.2	5.2	7.1	9.8
Mombasa	Kenya	1,028	24	34	45	63	2%	3%	4%	6%	2.9	4.8	6.5	9.0
Kuwait	Kuwait	2,418	24	57	113	240	1%	2%	5%	10%	2.9	4.7	6.3	8.6
Beirut	Lebanon	1,823	32	51	68	90	2%	3%	4%	5%	2.9	4.7	6.3	8.5
Monrovia	Liberia	1,036	270	440	566	778	26%	43%	55%	75%	3.0	4.9	6.6	9.1
Tripoli1	Libya	1,349	51	94	155	265	4%	7%	12%	20%	2.9	4.7	6.3	8.4
Johor Bahru	Malaysia	1,042	4	12	35	87	0%	1%	3%	8%	3.1	5.1	6.9	9.5
Kuala Lumpur	Malaysia	4,065	32	104	192	269	1%	3%	5%	7%	3.0	5.0	6.8	9.3
Putrajaya	Malaysia	1,933	65	194	347	481	3%	10%	18%	25%	3.0	5.0	6.8	9.3
Tijuana	Mexico	1,785	27	43	59	88	2%	2%	3%	5%	3.0	4.9	6.6	8.9
Casablanca	Morocco	3,619	210	333	397	489	6%	9%	11%	14%	2.9	4.7	6.2	8.3
Rabat	Morocco	1,914	53	82	103	128	3%	4%	5%	7%	2.9	4.7	6.2	8.2
Maputo	Mozambique	1,245	11	27	38	53	1%	2%	3%	4%	2.8	4.6	6.3	8.8
Rangoon	Myanmar	3,891	51	206	568	1,379	1%	5%	15%	35%	3.0	4.9	6.7	9.3
Amsterdam	Netherlands	1,194	946	1,094	1,135	1,173	79%	92%	95%	98%	2.8	4.6	5.9	7.6
The Hague	Netherlands	2,527	2,198	2,382	2,427	2,481	87%	94%	96%	98%	2.8	4.6	5.9	7.5
Enugu	Nigeria	3,130	-	-	-	0	0%	0%	0%	0%	2.8	4.6	6.3	8.6
Lagos	Nigeria	9,724	1,407	2,255	2,974	3,717	15%	23%	31%	38%	2.9	4.8	6.4	8.8
Port Harcourt	Nigeria	2,418	105	238	346	439	4%	10%	14%	18%	2.9	4.8	6.4	8.8
Pyongyang	North Korea	2,593	3	14	29	54	0%	1%	1%	2%	3.0	5.0	6.8	9.4

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Karachi	Pakistan	12,742	158	357	636	1,410	1%	3%	5%	11%	3.0	4.8	6.5	9.0
Panama City1	Panama	1,049	33	73	116	181	3%	7%	11%	17%	3.1	5.1	6.8	9.3
Lima2	Peru	8,851	81	144	194	237	1%	2%	2%	3%	3.0	5.0	6.8	9.3
Bacolod	Philippines	1,059	30	118	243	439	3%	11%	23%	42%	3.2	5.2	7.1	9.7
Cebu	Philippines	2,828	134	345	604	968	5%	12%	21%	34%	3.2	5.2	7.0	9.7
Davao	Philippines	1,634	93	280	454	658	6%	17%	28%	40%	3.1	5.1	7.0	9.6
Iloilo	Philippines	1,893	294	638	868	1,078	16%	34%	46%	57%	3.2	5.2	7.1	9.8
Manila	Philippines	7,405	769	1,923	2,855	3,550	10%	26%	39%	48%	3.1	5.2	7.0	9.7
Pasay City	Philippines	9,044	168	633	1,211	1,814	2%	7%	13%	20%	3.2	5.2	7.1	9.8
Quezon City	Philippines	13,114	560	1,220	1,795	2,390	4%	9%	14%	18%	3.1	5.2	7.0	9.7
Lisbon	Portugal	1,891	37	55	67	83	2%	3%	4%	4%	2.9	4.7	6.2	8.2
Porto	Portugal	2,505	23	36	50	65	1%	1%	2%	3%	2.9	4.7	6.0	7.9
San Juan1	Puerto Rico	1,834	225	290	335	386	12%	16%	18%	21%	3.1	5.1	6.8	9.2
Rostov1	Russia	1,046	2	3	5	7	0%	0%	1%	1%	2.8	4.5	6.0	8.1
St. Petersburg2	Russia	4,113	9	22	62	158	0%	1%	2%	4%	2.8	4.5	5.7	7.4
Jeddah	Saudi Arabia	3,762	37	148	388	748	1%	4%	10%	20%	2.9	4.7	6.4	8.8
Dakar	Senegal	2,755	350	735	1,108	1,673	13%	27%	40%	61%	3.0	5.0	6.7	9.1
Singapore	Singapore	4,680	35	101	273	745	1%	2%	6%	16%	3.1	5.1	6.9	9.5
Mogadishu	Somalia	1,105	12	23	38	53	1%	2%	4%	5%	3.0	4.8	6.6	9.1
Cape Town	South Africa	2,846	54	96	152	263	2%	3%	5%	9%	2.8	4.6	6.4	8.9
Durban	South Africa	3,202	69	179	335	537	2%	6%	11%	17%	2.8	4.5	6.3	8.8
Busan	South Korea	3,901	168	384	614	959	4%	10%	16%	25%	3.1	5.2	7.0	9.7
Daegu	South Korea	2,692	-	-	-	0	0%	0%	0%	0%	3.1	5.1	7.0	9.6
Gwangju	South Korea	1,458	0	0	0	2	0%	0%	0%	0%	3.1	5.1	7.0	9.7
Masan	South Korea	1,025	25	65	116	187	2%	6%	11%	18%	3.1	5.1	7.0	9.7
Seoul	South Korea	17,320	94	233	506	1,008	1%	1%	3%	6%	3.1	5.1	6.9	9.5
Suwon	South Korea	4,627	22	61	104	161	1%	1%	2%	4%	3.1	5.1	6.9	9.5
Ulsan	South Korea	1,014	15	46	116	252	1%	5%	12%	25%	3.2	5.2	7.0	9.7
Barcelona1	Spain	3,992	38	74	131	228	1%	2%	3%	6%	2.9	4.7	6.1	8.0
Seville	Spain	1,064	18	41	62	116	2%	4%	6%	11%	2.8	4.6	6.0	8.0
Valencia2	Spain	1,371	61	95	136	184	4%	7%	10%	13%	2.9	4.6	6.1	8.0

Urban Agglomeration	Country	Total 2010 population (thousands)	2010 population below median locked-in sea level from different warming amounts (thousands)				2010 population below median locked-in sea level from different warming amounts (percent)				Median local sea level rise locked-in from different warming amounts (meters)			
			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Colombo	Sri Lanka	2,795	62	200	403	751	2%	7%	14%	27%	3.1	5.0	6.8	9.4
Kotte	Sri Lanka	2,380	25	58	96	156	1%	2%	4%	7%	3.1	5.0	6.9	9.4
Matara	Sri Lanka	1,319	41	98	152	295	3%	7%	12%	22%	3.1	5.1	6.9	9.6
Moratuwa	Sri Lanka	1,396	32	92	174	322	2%	7%	12%	23%	3.1	5.1	6.9	9.5
Stockholm	Sweden	1,440	2	5	7	12	0%	0%	1%	1%	2.8	4.6	5.8	7.4
Chiai	Taiwan	1,145	6	20	43	85	1%	2%	4%	7%	3.1	5.1	7.0	9.6
Kaohsiung	Taiwan	2,427	142	285	443	772	6%	12%	18%	32%	3.1	5.2	7.0	9.7
Taichung	Taiwan	3,149	81	160	239	365	3%	5%	8%	12%	3.1	5.1	7.0	9.7
Tainan	Taiwan	1,402	137	259	398	556	10%	19%	28%	40%	3.1	5.1	7.0	9.7
Taipei	Taiwan	9,596	339	657	1,036	1,618	4%	7%	11%	17%	3.1	5.2	7.0	9.7
Yuanlin	Taiwan	1,352	4	11	19	38	0%	1%	1%	3%	3.1	5.1	7.0	9.6
Dar es Salaam	Tanzania	2,910	91	207	332	487	3%	7%	11%	17%	3.0	4.8	6.6	9.1
Bangkok	Thailand	5,605	851	2,331	3,622	4,904	15%	42%	65%	88%	3.0	4.9	6.7	9.3
Nonthaburi	Thailand	1,713	257	799	1,293	1,641	15%	47%	76%	96%	3.0	4.9	6.7	9.3
Samut Prakan	Thailand	1,755	795	1,389	1,627	1,732	45%	79%	93%	99%	3.0	4.9	6.7	9.3
Lome	Togo	1,264	216	464	724	821	17%	37%	57%	65%	2.9	4.8	6.5	8.9
Tunis	Tunisia	1,942	219	361	475	582	11%	19%	25%	30%	2.9	4.8	6.3	8.4
Bursa	Turkey	1,533	2	3	4	6	0%	0%	0%	0%	2.8	4.6	6.1	8.3
Istanbul	Turkey	11,553	253	383	513	653	2%	3%	4%	6%	2.9	4.6	6.2	8.3
Izmir	Turkey	2,671	161	286	399	543	6%	11%	15%	20%	2.9	4.7	6.2	8.4
Tarsus	Turkey	1,103	9	24	43	71	1%	2%	4%	6%	2.8	4.6	6.1	8.3
Dubayy	United Arab Emirates	1,302	474	741	907	1,029	36%	57%	70%	79%	2.9	4.8	6.5	8.9
Sharjah	United Arab Emirates	1,308	374	564	718	832	29%	43%	55%	64%	2.9	4.8	6.5	8.9
Glasgow2	United Kingdom	1,316	17	33	59	115	1%	3%	4%	9%	2.8	4.5	5.6	7.0
Liverpool2	United Kingdom	1,380	7	19	37	68	1%	1%	3%	5%	2.8	4.5	5.7	7.2
London2	United Kingdom	9,599	447	733	955	1,239	5%	8%	10%	13%	2.8	4.5	5.8	7.4
Manchester2	United Kingdom	2,817	0	1	3	9	0%	0%	0%	0%	2.8	4.5	5.7	7.2

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			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Newcastle	United Kingdom	1,021	20	40	62	100	2%	4%	6%	10%	3.1	5.1	6.9	9.4
Sheffield	United Kingdom	1,288	2	7	18	32	0%	1%	1%	3%	2.8	4.5	5.7	7.2
Boston	United States	2,933	182	310	457	579	6%	11%	16%	20%	2.8	4.6	6.0	7.8
Houston	United States	3,904	8	22	37	65	0%	1%	1%	2%	2.9	4.7	6.3	8.5
Los Angeles1	United States	9,491	137	243	344	552	1%	3%	4%	6%	3.0	4.8	6.5	8.8
Miami	United States	3,944	557	1,703	2,686	3,671	14%	43%	68%	93%	3.0	4.9	6.6	8.9
New York	United States	12,958	1,149	1,693	2,302	2,986	9%	13%	18%	23%	2.9	4.6	6.0	7.9
Newark	United States	3,825	310	440	589	740	8%	12%	15%	19%	2.8	4.6	6.0	7.9
Paterson	United States	1,769	35	53	73	92	2%	3%	4%	5%	2.8	4.6	6.0	7.8
Philadelphia	United States	3,972	99	171	272	383	3%	4%	7%	10%	2.8	4.6	6.0	7.9
Portland2	United States	1,313	4	9	15	29	0%	1%	1%	2%	2.9	4.7	6.3	8.5
Sacramento	United States	1,648	141	250	365	528	9%	15%	22%	32%	2.9	4.7	6.4	8.6
San Diego	United States	2,452	78	105	124	147	3%	4%	5%	6%	3.0	4.8	6.5	8.9
San Francisco1	United States	2,313	293	395	486	596	13%	17%	21%	26%	3.0	4.9	6.6	8.9
San Jose3	United States	1,955	192	261	326	382	10%	13%	17%	20%	3.0	4.9	6.5	8.9
Seattle	United States	2,189	76	122	151	190	4%	6%	7%	9%	2.9	4.7	6.3	8.4
Tampa	United States	2,160	233	436	625	867	11%	20%	29%	40%	3.0	4.8	6.4	8.7
Washington D.C.	United States	6,064	96	144	212	286	2%	2%	4%	5%	2.8	4.6	6.0	7.9

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			1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C	1.5 °C	2 °C	3 °C	4 °C
Montevideo	Uruguay	1,675	73	117	166	203	4%	7%	10%	12%	2.9	4.7	6.5	9.1
Maracaibo	Venezuela	1,839	81	111	139	195	4%	6%	8%	11%	3.0	4.9	6.6	8.9
Can Tho	Viet Nam	1,093	751	976	1,061	1,088	69%	89%	97%	100%	3.1	5.1	6.9	9.5
Da Nang	Viet Nam	1,115	59	148	320	714	5%	13%	29%	64%	3.1	5.0	6.8	9.4
Hanoi	Viet Nam	12,703	1,281	3,553	5,638	7,598	10%	28%	44%	60%	3.0	4.9	6.6	9.2
Ho Chi Minh City	Viet Nam	9,916	2,853	4,446	5,629	6,891	29%	45%	57%	70%	3.1	5.0	6.8	9.4
Nam Dinh	Viet Nam	4,124	1,287	2,992	3,786	4,079	31%	73%	92%	99%	3.0	4.9	6.7	9.2
Ninh Binh	Viet Nam	1,795	639	1,267	1,529	1,644	36%	71%	85%	92%	3.0	4.9	6.7	9.2
Rach Gia	Viet Nam	1,239	587	884	1,076	1,190	47%	71%	87%	96%	3.1	5.1	6.9	9.5
Thai Nguyen	Viet Nam	1,136	0	3	13	59	0%	0%	1%	5%	3.0	4.8	6.6	9.1
Thanh Hoa	Viet Nam	2,341	263	755	1,249	1,721	11%	32%	53%	74%	3.0	4.9	6.7	9.2

Princeton: One Palmer Square, Suite 330 Princeton, NJ 08542
Phone: +1 609 924-3800
Toll Free: +1 877 4-CLI-SCI / +1 (877 425-4724)
www.climatecentral.org