

# SEA LEVEL RISE

**What is Sea Level Rise?** Like the surface of the earth, the surface of the ocean is not uniformly flat. The term Global Mean Sea Level (GMSL) is used to refer to the average height of all the Earth's ocean basins. Since oceans cover about 70 percent of the world, defining GMSL requires millions of measurements to be recorded. NASA satellites measure the distance from the center of the earth to itself and, from the ocean surface to itself. The difference is the sea level<sup>i</sup>. Since 1993, GMSL has increased by more than 90 millimeters (3.543 inches) at a range of 3.3 millimeters per year<sup>ii</sup>. Local measurements of sea level refer to the height of the water measured along the coast relative to a specific point on land<sup>iii</sup>.

The primary cause of sea level rise, according to the International Panel on Climate Change (IPCC), is the melting of the Antarctic and Greenland ice sheets, which are melting six times faster than they did four decades ago. If all glaciers and ice sheets melted, global sea level would rise by more than 195 feet (60 meters)<sup>iv</sup>. Rising ocean temperatures (the seas absorb 93% of the extra heat trapped on Earth by greenhouse gases) also cause sea levels to rise regardless of ice melt, since water expands when heated. Of the total sea level rise of approximately 3 millimeters per year (about 1/8 of an inch per year), about one-third comes from Greenland and Antarctica, one-third from glaciers like those in Alaska or the Himalayas, and one-third from the expansion of seawater as it warms<sup>v</sup>.

**What Global Regions Are Most Exposed to Sea Level Rise?** According to C40 Cities, by 2050 over 570 low-lying coastal cities will face projected sea level rise by at least 0.5 meters putting over 800 million people at risk<sup>vi</sup>. The following map visualizes locations most at risk globally.

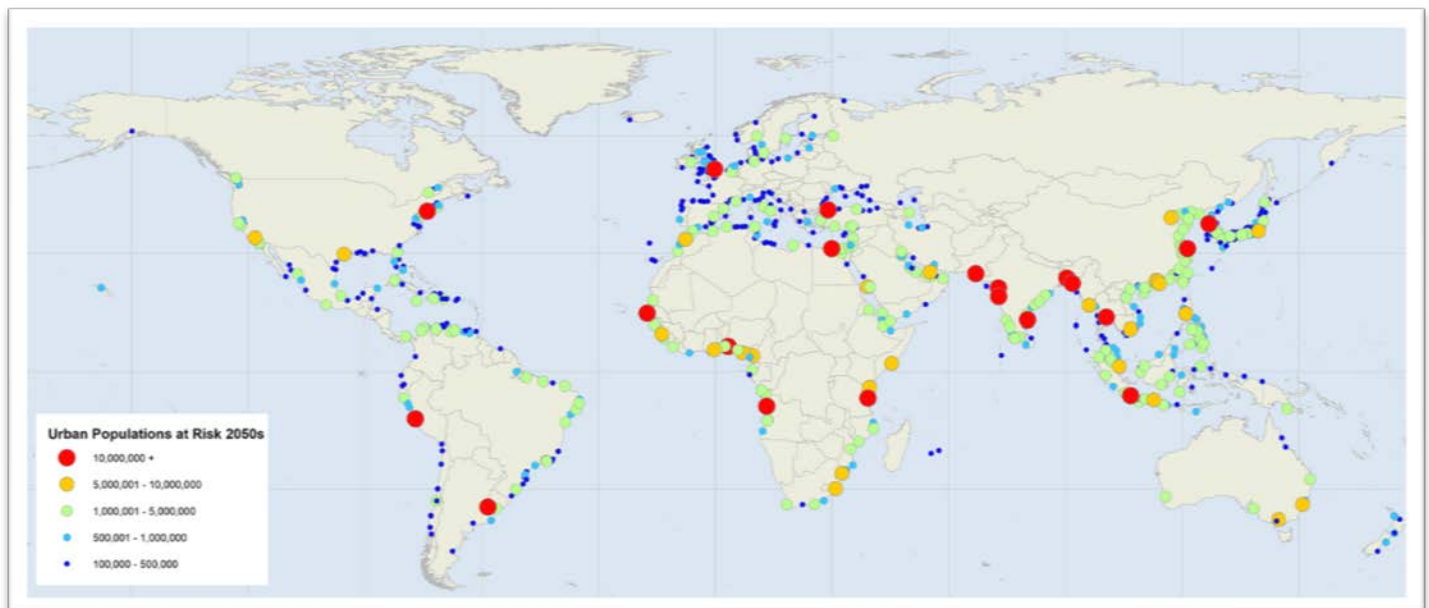
### Did You Know...

Rising sea levels **could cost US \$14 trillion** worldwide annually by 2100, if the target of holding increasing global temperatures within 2°C of pre-industrial levels is missed.

(Source: [National Oceanography Centre](#))

About **two-thirds of the world's population** live **within 60 kilometers of the coast**, and almost **half of the world's cities** with more than one million people are sited in and around the tide-washed river mouths known as estuaries.

(Source: [UN Atlas of Oceans](#))



## What Are Some Leading Tools for Evaluating Sea Level Rise?

[Climate Central Coastal Risk Screening Tool](#) – an interactive mapping and visualization platform for conducting risk screenings and identifying locations that may require deeper investigation of risk.




[NOAA Sea Level Rise Viewer](#) – a tool to map the increased risk of high tide flooding based on calculated sea level rises.

[Coastal Flood Web Tools Comparison Matrix](#) – a summary created to provide the planning and coastal management communities with an expandable chart to compare the functions and methods of publicly available sea level rise and coastal flood web tools.

[Sea Level Rise Risk Analysis Tool](#) – a tool providing state-specific sea level rise analysis and forecasting for the United States.

[Global and European Sea-Level](#) – a compilation of historical and projection data on global and European sea level rise.

**How Can Sea Level Rise Impact the Beverage Industry?** Sea level rise can affect businesses across the value chain, as well as impacting the local community and environment. The following are common business considerations:

<p><b>Upstream / Sourcing</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Which first and second tier suppliers are most susceptible to sea level rise? Are any of these suppliers sole source or business critical?</li> <li><input type="checkbox"/> Do suppliers that are susceptible monitor the potential for increased salination of soil and water sources due to sea level rise?</li> <li><input type="checkbox"/> Do key suppliers have business continuity plans that includes sea level rise, storm surges, and flooding?</li> <li><input type="checkbox"/> Could transport of raw materials be impacted due to sea level rise? Are business continuity plans in place to assess and mitigate disruptions?</li> <li><input type="checkbox"/> Are sourcing disruptions incorporated into insurance (e.g. a stock throughput program (STP) for goods in transit and/or stock and inventory)?</li> </ul>
<p><b>Beverage Manufacturing</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Is your facility located in or near an area more likely to experience impacts from sea level rise?</li> <li><input type="checkbox"/> Are there monitoring tools to evaluate acute and longer-term sea level rise specific to your location?</li> <li><input type="checkbox"/> Does the facility have adequate insurance? What is and is not covered?</li> <li><input type="checkbox"/> Can mechanical, electrical, HVAC, and IT equipment be better protected by moving or elevating to a higher level or floor?</li> <li><input type="checkbox"/> What options exist if facilities or assets are displaced and must be moved due to sea level rise?</li> </ul>
<p><b>Downstream / Market</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Does the local community have adequate mitigation and resiliency plans for sea level rise?</li> <li><input type="checkbox"/> Are plans based upon engineering, nature, and/or people-based (displacement) approaches?</li> <li><input type="checkbox"/> How can businesses support mitigation and resiliency plans for sea level rise within the local community?</li> <li><input type="checkbox"/> Could transport of products to customers, especially in densely populated urban areas, be disrupted due to sea level rise?</li> </ul>

**What Are the Potential Financial Impacts from Sea Level Rise?** The following provides guidance on considering the potential financial impacts associated with sea level rise. It is important to point out that while negative impacts are summarized in this section, proper assessment and mitigation of related risks can create positive impacts, cost avoidance, and competitive advantages.

Financial Category	Description	Potential Business Impacts
Revenue and Sales	Income from normal business activities, usually from the sale of goods and services	<ul style="list-style-type: none"> <li>▪ Loss of revenue from operational disruption (facility downtime, raw material supply, and/or distribution)</li> </ul>
Expenditures: OpEx	Ongoing operating expenditures to run a facility	<ul style="list-style-type: none"> <li>▪ Higher expenses for mitigation measures, insurance premiums, and/or recovery expenses</li> </ul>
Procurement Costs	Volatility in cost and/or availability of raw materials	<ul style="list-style-type: none"> <li>▪ Increased costs due to need for sourcing from alternative producers, delays in receiving products, and/or supply versus demand price volatility</li> </ul>
Assets: CapEx	Capital expenditures where the benefit continues over a long period; non-	<ul style="list-style-type: none"> <li>▪ Higher capital expenditures for mitigation measures, asset protection, and/or displacement</li> </ul>

	recurring nature; results in acquisition of permanent assets	
Assets: Tangible	Changes in the value of tangible assets (land, equipment, facilities, reserves, cash, etc.)	<ul style="list-style-type: none"> <li>Increased cost due to physical damage or impairment of assets</li> </ul>
Assets: Intangible	Changes in the value of intangible assets (brand, copyrights, goodwill)	<ul style="list-style-type: none"> <li>Not material for sea level rise</li> </ul>
Liabilities and Financing	Changes in current liabilities, long-term debt liabilities, and equity capital	<ul style="list-style-type: none"> <li>Restricted access to capital and debt markets</li> <li>Increased exposure to divestment risk</li> </ul>

**What is BIER?** The Beverage Industry Environmental Roundtable (BIER) is a technical coalition of leading global beverage companies working together to advance environmental sustainability within the beverage sector and beyond. Formed in 2006, BIER aims to accelerate sector change and create meaningful impact on environmental sustainability matters. Through development and sharing of industry-specific analytical methods, best practice sharing, and direct stakeholder engagement, BIER accelerates the process of analysis to sustainable solution development. For more information, please visit: [www.bierroundtable.com](http://www.bierroundtable.com).

BIER is facilitated by Antea Group (<https://us.anteagroup.com>)



## References

- <sup>i</sup> <https://sealevel.nasa.gov/news/188/keeping-a-steady-eye-on-sea-level-change-from-space>
- <sup>ii</sup> <https://sealevel.nasa.gov/understanding-sea-level/key-indicators/global-mean-sea-level>
- <sup>iii</sup> <https://oceanservice.noaa.gov/facts/sealevel.html>
- <sup>iv</sup> <https://sealevel.nasa.gov/understanding-sea-level/global-sea-level/ice-melt>
- <sup>v</sup> <https://sealevel.nasa.gov/faq>
- <sup>vi</sup> <https://www.c40.org/other/the-future-we-don-t-want-staying-afloat-the-urban-response-to-sea-level-rise>