

# **Bond Case Briefs**

*Municipal Finance Law Since 1971*

---

## **Make Data-Driven Decisions with Newly Released Moody's Climate on Demand Sea Level Rise Risk Model**

The potential impact of sea level rise cannot be taken lightly. According to Moody's Climate on Demand application, by 2040, 135 million people and up to 9% of GDP from the world's 10 largest economies will be exposed to rising sea levels and associated flood risk.

Moreover, modeling sea-level-rise (SLR) risk is complex and requires the application of world-class peer-reviewed science and leading risk assessment methods. In addition to climate change model variances and uncertainties, asset locations can vary in coastal proximity, elevation, and connectivity to the ocean – all of which impact a site's relative exposure to sea level rise. Cutting through this complexity is crucial to a wide variety of stakeholders with coastal assets and investments.

Designed to make sense of these complexities, Moody's Climate on Demand is a leading application that provides forward-looking risk scoring on assets and locations globally. Climate on Demand measures the exposure and sensitivity of a given facility or location to six key climate hazards: floods; heat stress; hurricanes & typhoons; water stress; wildfires; and sea level rise.

### **What's new?**

Moody's is continually innovating the modeling approach that underpins the Climate on Demand platform – by further refining hazard scores. Climate on Demand's sea level rise hazard score takes into account the absolute and relative increase in frequency of coastal flooding, as well as capturing inundation related to sea level rise, storm surge, high tides and vertical land movement.

We recently released a significantly enhanced sea-level-rise risk scoring methodology that considers not only topography and coastal proximity, but also connectivity to the ocean.

Prior to this release, our approach to assessing sea-level-rise risk used a set distance from the coast with topographic adjustments to calculate sea-level-rise risk scores. Following the enhancement, our model evaluates locations considering ocean connectivity and evaluating extreme water levels against local topography – thereby capturing nuanced variations in coastal flooding potential. This enables users to assess and identify locations that are hydrologically connected to the ocean and, in turn, more susceptible to flooding. In addition, the application includes a more granular breakdown of risk exposure to capture how certain regions – due to varying degrees of coastal proximity – may be indirectly impacted by flooding.

### **Why does it matter?**

Quantitatively, customers can expect these enhancements to revise and refine some coastal region asset scores. To demonstrate, Figure 1 (below) shows the 2040 sea-level-rise boundary of a segment of Florida's Tampa Bay coastline calculated using the original sea-level-rise risk scoring methodology (left), as well as the revised methodology (right).

With the enhanced approach applied, users can see a far more granular and sophisticated sea-level-rise boundary and, therefore, a significantly larger area considered "at-risk". Previously, assets that fell outside the sea-level-rise boundary set by the original methodology were not flagged for

exposure to coastal flooding, and received a score of zero, as is the case in Figure 2 pictured below. Now, assets in regions with high ocean connectivity and/or low-lying areas can be screened more accurately. For this exercise, we chose to focus on a region with particularly high ocean connectivity. While we do not expect all coastal assets' scores to be impacted to this degree, the methodology update represents a significant leap forward in the accuracy of our insights on low-lying coastal regions.

Measuring exposure to physical climate risks remains a complex business, but high-quality climate data delivered through Climate on Demand is beginning to turn the tide. Moody's newly-released sea level rise methodology will have far-reaching impacts across coastal portfolios and assets, flagging new at-risk locations, and overall providing a more comprehensive view of the physical impact of sea level rise.



Figure 1: Updated multi-pronged approach to SLR

### **Example site illustrating improved SLR exposure score**

Previous SLR (Sea Level Rise) Score: 0

Facility is outside the previous SLR boundary

New SLR score: 100

Facility is now inside the SLR boundary

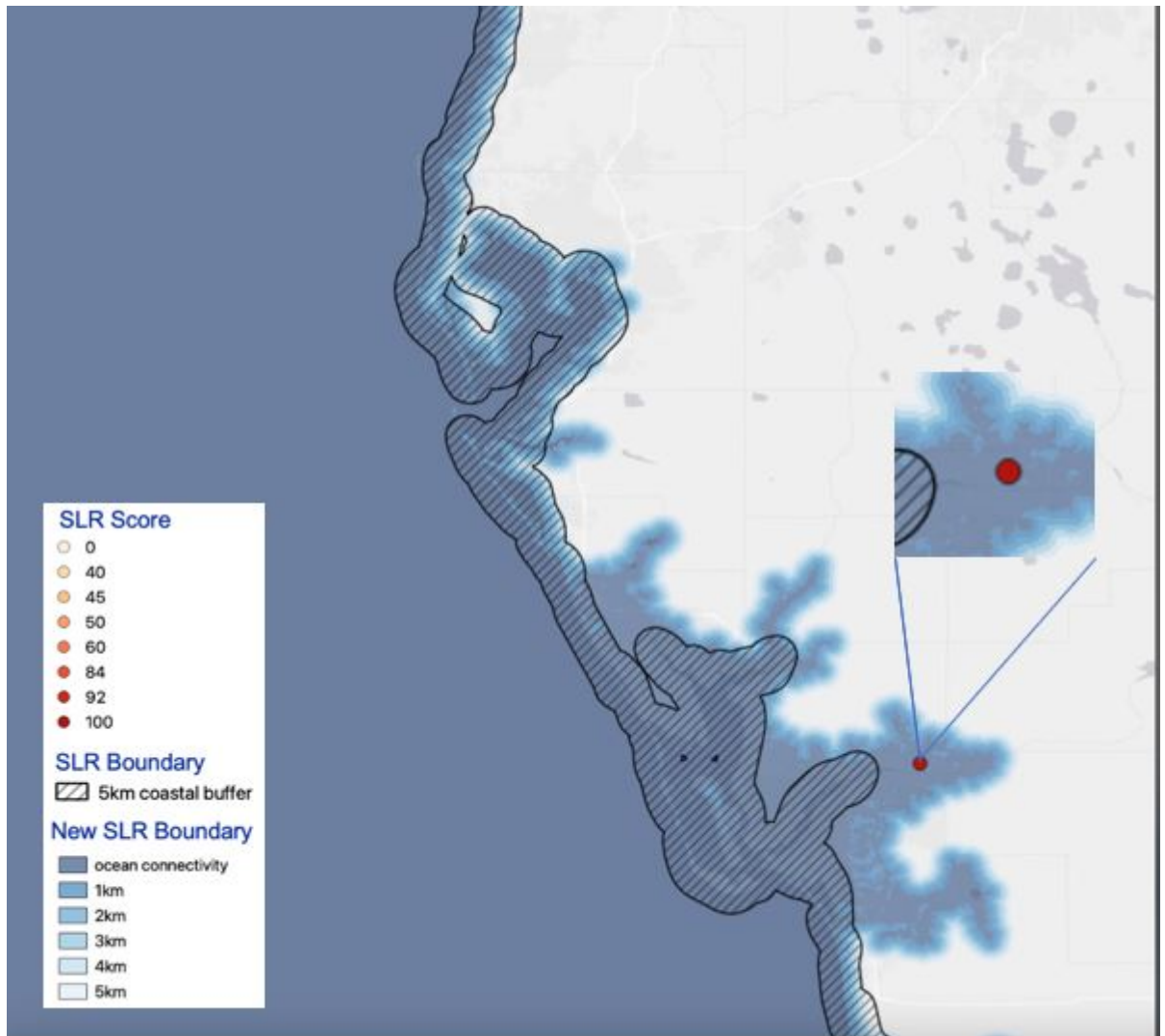


Figure 2: Improvement in accuracy of SLR exposure scores

To learn more about Climate on Demand, please contact [MESG@moodys.com](mailto:MESG@moodys.com).

Existing users can direct any queries to [clientservices@moodys.com](mailto:clientservices@moodys.com)

November 16, 2022