

Vital signs

10 riskiest places to buy your seaside dream home

As sea levels rise, real estate investments in these seaside metropolises could amount to throwing money into the sea



Miami Beach mansions like this one could be at risk from rising sea levels. Photograph: Ines Hegedus-Garcia/flickr

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There's no doubt humans are attracted to oceans. Globally, [44% of all people on Earth live within 150 km \(93 miles\) of the shore](#), and eight of the 10 largest cities in the world are near the coast. But global sea levels have risen about eight inches in the last century and [are projected to rise another one to four feet](#) this century.

That growth comes at quite a cost. World Bank economist Stephane Hallegatte led a 2013 study, published in the Nature Climate Change journal, forecasting that average [global flood losses would multiply](#) from \$6bn per year in 2005 to as much as \$1tn a year by 2050 if large coastal cities don't take steps to adapt.

All this means that buying a dream home on the beach could amount to throwing money into the sea.

Luckily, a growing number of studies have measured the risk from rising oceans, taking into account how many people live in low-lying areas, the value of at-risk real estate and business operations, the levels of preparedness (including

countermeasures, such as Amsterdam's dykes, to prevent flooding damage) in different areas - and predictions for how those factors may change in 2030, 2050 or 2070.

If you're looking for coastal property for your dream home - or just dreaming - here are 10 seaside metropolises where investments face high risks from climate change:

Guangzhou, Guangdong province, China



📍 The bright skyline of Guangzhou, China, could be at risk: one study forecasts billions of dollars in damage from sea level rise annually by 2050. [Photograph: Manufish/flickr](#)

Historically known to Westerners as Canton, Guangzhou is the third largest city in China, with a population of nearly 13 million. Located on the Pearl River Delta and the South China Sea, close to Macao and Hong Kong, Guangzhou is a center of car manufacturing, biotechnology and heavy industry.

As Asian economies grow and urban populations boom, Asian cities, especially in China, Thailand and India, will leap to the head of the pack when it comes to risk. Guangzhou is already there, and it lacks strong protection against sea level rise. Even with savvy infrastructure upgrades for resilience, Guangzhou could see \$13.2bn in annual losses by 2050, according to Nature Climate Change.

New Orleans, US



📍 Hurricane Katrina illustrated New Orleans' huge flooding risks. [Photograph: brookcatherine53/flickr](#)

In his prescient 2001 book [Holding Back the Sea](#), Christopher Hallowell

documents New Orleans' numerous flooding risks. It has a poor location that is historically prone to flooding. Oil and gas drilling has lowered the ground elevation while engineering on the Mississippi River has starved the area of rejuvenating alluvial deposits. Meanwhile, its marshes have been weakened by invasive species. Sea levels rise around it as extreme storms batter it.

Over the last century, the sea has swallowed [more than one-third of Louisiana's coastal plain](#). Hurricane Katrina brought that all home in 2005, when the resulting flood lasted for weeks and the recovery reconfigured the city.

In general, wealthier cities have better protection against sea level rise than those in developing countries, but New Orleans, along with Miami and New York, lag behind. Post-Hurricane Katrina investments in New Orleans, however, including decisions to relinquish some areas to the ocean, are helping.

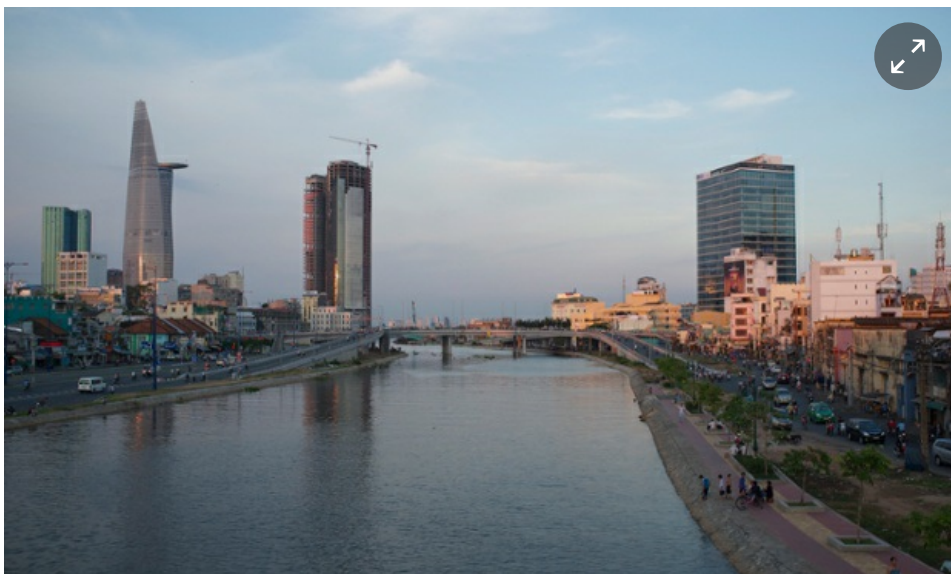
Guayaquil, Ecuador



📷 People climb the steps of Cerro Santa Ana in Guayaquil, Ecuador. Photograph: 1Apix/Alamy

The commercial, manufacturing and population center of Ecuador, Guayaquil sits at the mouth of Guayas River, near the Gulf of Guayaquil the Pacific Ocean. Home to more than 2 million residents, its major industries include business, agriculture and aquaculture. Even with flood protection upgrades, Guayaquil could see \$3.2bn in annual losses by 2050, according to Nature Climate Change.

Ho Chi Minh City, Vietnam



📷 Ho Chi Minh City developed its climate adaptation strategy with learnings from Rotterdam in the Netherlands.

Photograph: Aleksandr Zykov/flickr

Home to 7.4 million people, Ho Chi Minh City sits on the banks of the Saigon River, where the Mekong Delta empties out into the South China Sea. One-third of the city is [already exposed to flooding](#), with much land just a meter or so (about three feet) above sea level.

But with the economy and population booming, it is building out towards the coast, exposing new real estate to risk of flooding. Rising sea levels are already turning inland water saltier, making it unsuitable for growing rice.

Rotterdam, another delta city in the Netherlands, is advising Ho Chi Minh City on how best to adapt. The Vietnamese city launched a climate adaptation strategy in 2013 that would wield technologies and policies that have helped Rotterdam fend off the sea.

Abidjan, Ivory Coast

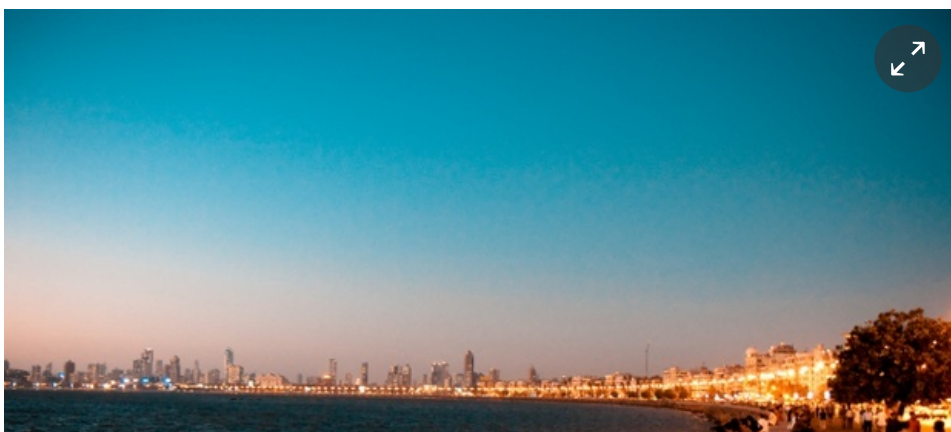


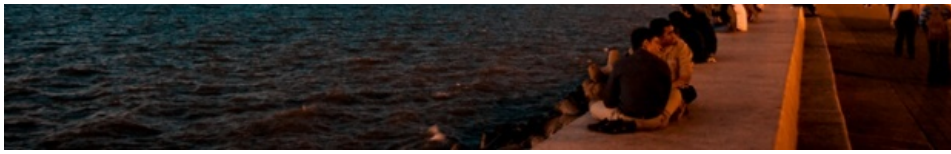
Engineering on the lagoon of Abidjan, in the Ivory Coast, is causing erosion. Photograph: abdallah/flickr

The economic capital of Ivory Coast, Abidjan, lies near the Gulf of Guinea on the Ébrié Lagoon, an industry epicenter. With 13 million people in the greater urban area, its population is second only to Lagos, Nigeria, in the region. Major industries include a large oil refinery as well as food production, lumber and manufacturing, including cars, textiles, chemicals, and soap.

An engineering project to turn the lagoon into a deepwater port, though, is causing erosion problems. Human activity is causing some places along the West African coastline to lose [23-30 meters](#) (75-98 feet) a year, damaging valuable infrastructure such as roads and houses.

Mumbai, India





📷 The Queen's Necklace, or Marine Drive, rings the waterfront in Mumbai, India. [Photograph: Nimish Gogri/flickr](#)

Formerly known as Bombay, Mumbai is one of the world's true megacities, with a metro area population of nearly 21 million. The capital of Maharashtra state, Mumbai is also the financial, commercial and entertainment capital of India. Many of Bollywood's most famous stars own mansions there.

But all this is built upon seven islands, which were fishing colonies in another era. Coastal flooding wouldn't just make homes soggy, it would [reduce the availability of freshwater](#) due to seawater intrusion and flood submerged waste dumps, contaminating the limited water supply. Even with protection upgrades, Mumbai could see \$6.4bn in annual losses by 2050, according to Nature Climate Change.

Miami, US

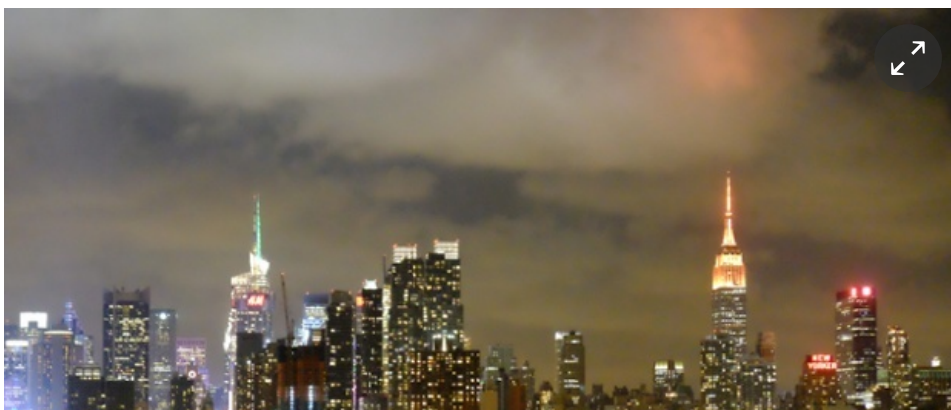


📷 Miami Beach skyline. [Photograph: Chad Cooper/flickr](#)

Located at the mouth of the Miami River, between the Everglades and Biscayne Bay, most of Miami is [just six feet \(1.8 meters\) above sea level](#). The glitzy city, with a metro-area population of 5.5 million, is already seeing [regular flooding of city streets at high tide](#) (pdf).

A two-foot rise in sea levels is expected by 2060, according to the US Geological Survey. Miami has always flaunted its seaside locale, building [\\$16bn of real estate below a two-foot \(0.6 meter\) elevation](#) (pdf). Nevertheless, insurers and lenders continue to support the city's development.

New York City and Newark, US





📷 New York, NY [Photograph: /flickr](#)

New York City needs no introduction as a global hub of finance, art, culture and education. But its location on the Atlantic Ocean, at the mouth of the Harlem River and in a tidal strait, isn't doing it any favors. And despite having a larger GDP than London, Tokyo and Amsterdam, it has lower levels of protection than they do, according to Nature Climate Change.

Aside from sea level rise, NYC is threatened by regional changes in ocean currents. Together these factors are [likely to increase](#) loss of wetlands, coastal flooding, storm surge, erosion and property damage. Hurricane Sandy was an early warning of what could come, pushing floodwaters over barrier islands and into seaside communities, destroying or damaging [305,000 homes](#) in New York and [72,000 homes and businesses](#) in New Jersey.

Shenzhen, China

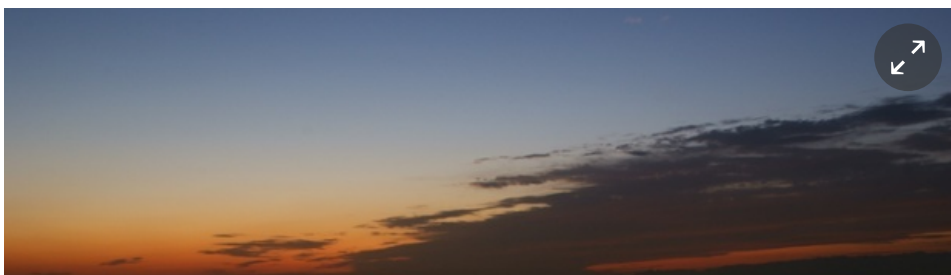


📷 Shenzhen skyline. [Photograph: Ged Carroll/flickr](#)

Located just two hours' drive from Guangzhou, Shenzhen lies at the mouth of the Pearl River Delta. Shenzhen was the first of China's Special Economic Zones, attracting foreign investment, turning it from a small village into the [15 million-person city](#) it is today. It is home to a stock exchange and high-tech companies and is [one of the world's busiest](#) container ports.

As a village, it perched on hills. But most of those hills have now been leveled for development. Migrants from inland are now flowing into the city, and nearby hills are also being leveled to make room for more development. All this increases its risk.

Osaka, Japan





📷 Osaka city view. [Photograph: Martin Abegglen/flickr](#)

Osaka is Japan's third largest city. For centuries, it has been an economic center of Japan, benefitting from its location at the mouth of the Yodo River on Osaka Bay. But now that [location could make it vulnerable to coastal flooding](#) (pdf). More than 10% of greater Osaka's 2.5 million population and more than US\$200bn in economic assets are at risk, according to a report from OECD. As the city continues to expand, those losses could damage nearly US\$1tn in assets by 2070.

● This article was amended 12 January. A previously version mistakenly referred to Osaka as Japan's second largest city. In fact, it is the third largest city in Japan.

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