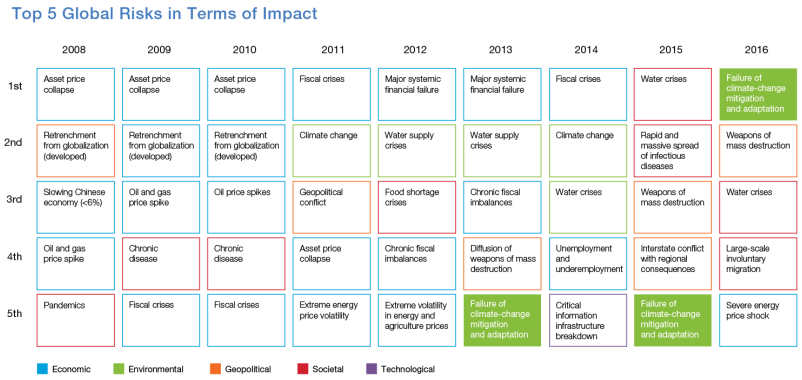


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Completely Different Definition of 'Underwater' And Its Impact on Housing

What has just moved from fifth place in the World Economic Forum's list of **global risks** to the top of the heap? The "failure of climate change mediation and adaptation" now ranks ahead of weapons of mass destruction, water crises, large-scale involuntary migration, and severe energy price shock in terms of global impact. Freddie Mac cites this in a new report on its *Insights* blog discussing what climate change can mean to housing, specifically the associated risk of flooding.

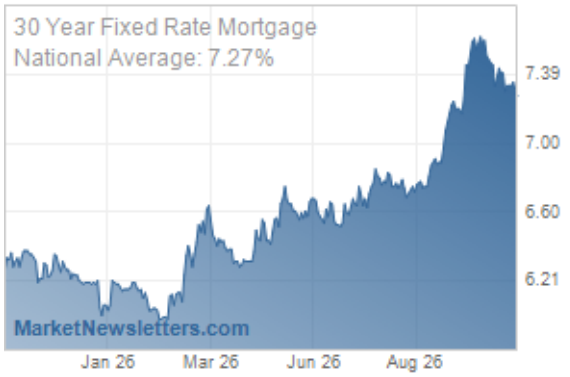


Source: World Economic Forum, (2016) The Global Risks Report 2016, p11

At the current rate of climate change, rising seas, changing weather patterns, and increasing temperatures accompanying it are becoming a challenge to millions of people. And even as uncertainty (not to mention disbelief) surrounds the pace and magnitude of change, rising sea levels are already a global threat to coastal cities. World-wide it is estimated a hundred million people live within three feet of mean high tide and another hundred million within six feet of it.

Everyone loves the beach and many want to live near it. There is, for example, a coastal community on Cape Shoalwater in Washington State. Freddie Mac points to it as a place where waterfront property is still affordable. The reason? The original location of the nearest town, North Cove - and its homes, cannery, lighthouse, Coast Guard station, post office and so forth is **now a mile off shore - underwater**. Still homes near "Wash Away Beach" do sell, but at prices that reflect that the structure **may not survive** another

National Average Mortgage Rates



Mortgage News Daily

	Rate	Change	Points
30YR Fixed	7.27%	-0.02	0.00
15YR Fixed	6.92%	-0.03	0.00
30YR FHA	6.90%	-0.01	0.00
30YR Jumbo	7.55%	0.00	0.00
7/6 SOFR	6.78%	-0.10	0.00
30YR VA	6.91%	-0.01	0.00

Rates as of: 10/30

MBS and Treasury

	Price / Yield	Change
MBS UMBS 6.0	99.81	-0.02
10 YR Treasury	4.9299	+0.0084
30 YR Treasury	5.3082	+0.0081

Pricing as of: 10/30 5:59PM EST

Recent Housing Data

		Value	Change
Mortgage Apps	Oct 21	195	+3.39%
Building Permits	Sep	1.4M	+0.43%
Housing Starts	Sep	1.22M	-4.24%
New Home Sales	Sep	676K	-1.17%
Pending Home Sales	Aug	71.2	0%
Existing Home Sales	Oct	3.99M	+0.25%
Builder Confidence	Oct	29	-9.38%

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season.

Many communities around the world may soon face a similar situation. South Florida is **one of our more-vulnerable areas**. Daily high-water levels in the Miami area have been increasing **almost an inch a year**, much faster than the average global rate and Miami Beach already has spent around $100 million to combat recurrent flooding. Other cities on the U.S. eastern seaboard are experiencing a 10-fold increase in the frequency of ocean flooding. Often it is minor but the saltwater still kills lawns and trees, blocks streets, clogs storm drains, and threatens freshwater resources.

It is doubtful many insurance companies will write a policy for a home on Wash Away Beach, but flood insurance does make it possible to obtain mortgages for areas with identified flood risk. But other areas, and not just those subject to rising sea levels but to changing rainfall and flooding patterns and increasing temperatures may already be uninsurable. This could change the nature of housing finance.

Mortgage lenders require borrowers to carry insurance against risks that might damage property that serves as collateral. This usually includes insurance on the validity of the home's title and homeowners' insurance that covers fire and other damage. However, most homeowners' insurance does not cover floods.

If a property is located within a high risk area on Federal Emergency Management Agency (FEMA). Flood Insurance Rate Maps the **borrower must obtain a flood insurance policy**, and while private insurance is available, it is often obtained from the FEMA administered National Flood Insurance Program (NFIP). NFIP offers policies through a network of over 80 private insurance companies and sets national rates that do not vary across insurance companies or agents. These policies are available only in communities that participate in NFIP and FEMA scores them according to their floodplain management activities. Flood insurance premiums can be reduced by as much as 45 percent in communities that adopt management standards that exceed the NFIP minimum.

FEMA produces flood risk maps through a community Flood Insurance Study which includes statistical data on river flow, storm tides, hydrologic/hydraulic analyses, and rainfall and topographic surveys and divides the community into areas defined by the level of risk. FEMA has a risk measure called the "base flood" or the 100-year flood; i.e. a flood having a one percent chance of being equaled or exceeded in any given year. But Freddie Mac says 100-year floods can occur **multiple years in a row** and have a 26 percent probability of occurring during the term of a 30-year mortgage. In addition, the magnitude of such a flood can change over time as weather patterns or the terrain changes. There is also a lower-risk zone-the 500-year flood zone which has a 0.2 percent probability of flooding.

The base flood elevation (BFE) is the height that would be reached by a base flood and areas lower than this are divided into eight Special Flood Hazard Areas (SFHAs). In coast areas FEMA also takes wave effects into account in determining flood levels and zones and its formula in some cases further limits coverage by property age and location.

The GSEs require flood insurance for properties within SFHAs and lenders often require it for portfolio loans and sometimes also require it for properties outside of SFHAs if exposed to some level of flood risk. Approximately 20 percent of flood insurance claims come from outside of SFHAs.

There is **great uncertainty** about the current pace and magnitude of sea level rises which is exacerbated by uncertainty about the ability and willingness of the world's nations to act on climate change. However, one measure of the possible impact is an estimate in a 2013 study for FEMA in which areas identified as SFHAs are expected to increase by 35 percent nationally by the end of this century. In coastal areas, SFHAs will increase by 55 percent, assuming no change in the shoreline. Under the more-likely assumption that shorelines recede, there will be no change in SFHAs; new ones will simply replace those that become submerged.

Any growth in SFHAs represents an increased burden on taxpayers. The Government Accountability Office estimates that the premiums set by FEMA for NFIP insurance do not cover the risk and estimates the government subsidy for the years between 2002 and 2013 at between $16 and $25 billion. Depending on assumptions about climate change and the amount of shoreline erosion, another study projects an increase between 20 and 90 percent in expected losses.

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The Risky Business Project estimates that **three-to-four percent** of the US population will live in coastal SFHAs by 2100 and 11 percent of the US population will live in riverine (inland) SFHAs. An estimated $66 to $160 billion in real property could be below sea level by 2050, rising to $238 billion to $507 billion by century end

These estimates refer to insured properties with a high risk of flooding however other areas will become permanently submerged, generating even larger losses. The Risky Business estimate of structures likely to be lost due to shoreline movement by 2100 is at 2 to 4 percent of the cumulative insurance premiums paid to then. In Florida alone, this study estimates a 1-in-20 chance that more than $346 billion in current property will be underwater by 2100.

Even if the world takes action like that proposed at the Paris climate conference some projected impacts appear unavoidable and while technical solutions may stave off some of the worst effects of climate change, rising sea levels and spreading flood plains appear likely to destroy billions of dollars in property and to displace millions of people.

While the losses and disruptions may be gradual they are likely to ultimately surpass those in the housing crisis and Great Recession. That experience illustrated the difficulty in allocating loses among homeowners, investors, and other stakeholders, with delays in resolution exacerbating the losses. This could occur again as the nation deals with climate change.

Freddie Mac concludes its blog with what it calls some **thorny issues** to ponder:

- The government currently subsidizes NFIP insurance and suggestions to increase premiums or reduce the subsidy have met with homeowner resistance. However, taxpayers may balk at covering losses as risk increases on the basis that homeowners have had ample time to prepare.
- A large share of homeowners' wealth is locked up in their equity in their homes. If those homes become uninsurable and unmarketable, the values of the homes will plummet, perhaps to zero and, unlike in the recession, with no expectation of recovery.
- During the housing crisis a significant share of homeowners in negative equity continued to make their mortgage payments. It is less likely they would do so if their homes are literally underwater and lenders, servicers and mortgage insurers are likely to suffer large losses.
- There will be economic disruption as businesses are forced to close or relocate, affecting employment and business opportunities for those outside the affected areas.
- Increased demand for homes close to impacted areas will increase.
- Non-economic losses may be substantial as some communities disappear or unravel and social unrest may increase.

Sean Becketti, Chief Economist, Freddie Mac said, housing economists face the challenge of predicting how and when house prices will be affected in areas likely to be impacted by climate change. Will the price of a beachfront property likely to be eventually submerged decline gradually as its life expectancy decreases or will its value and that of nearby homes plunge the first time a mortgage is denied or an insurer refuses to issue a homeowner policy? Perhaps the price slide will be triggered by a few homeowners who decide to sell defensively.

"As the market shakes out in the affected areas some residents will cash out early and suffer minimal losses, Becketti said. "Others will not be so lucky. And newcomers may appear, finally able to live out their dreams of living at the seashore, if only for a short time."

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