The sinking state
This is what happens when climate change forces an entire country to seek higher ground

By Joshua Keating
JULY 26, 2018

The central Pacific nation of Kiribati has a few claims to fame. Its flag-bearer at the past two summer Olympics won international attention and became a meme because of his memorable dancing. The country — known under British colonial rule as the Gilbert Islands (the name Kiribati, pronounced KI-ri-bahss, is a local transliteration of “Gilberts”) — has 33 islands spread over more than 1.3 million square miles, making it one of the world’s largest nations in terms of sea area, though one of the smallest in terms of land. But what it gets the most attention for these days is its impending doom: The nation may be one of the first in line to be wiped out by the effects of climate change.

Joshua Keating, a staff writer and editor at Slate, is the author of "Invisible Countries," from which this essay is adapted. Follow @joshuakeating

Illustration by Andrea Ucini for The Washington Post

In the century to come, we’re likely to see dramatic alterations to the physical shape of the world as we know it, thanks to rising sea levels and other environmental changes. But the immediate challenges faced by most countries pale in comparison to those of Kiribati, which has an average elevation of less than six feet. The atoll of Tarawa, where nearly half the country’s 110,000 residents live, could soon be substantially underwater. “By 2050, 18-80% of the land in Buariki, North Tarawa, and up to 50% of the land in Bikenibeu, South Tarawa could become inundated,” the government told the United Nations in 2015. Kiribati’s smaller outlying islands could be wiped out even sooner. “The results of sea level rise and increasing storm surge threaten the very existence and livelihoods of large segments of the population,” officials wrote.

Small island states like Kiribati and the Maldives have become symbols of the potential impacts of global warming. At the 2015 Paris climate summit, they pressured larger countries to accept the goal of limiting global warming to 1.5 degrees Celsius, rather than two degrees, over preindustrial levels. (It was mostly a symbolic victory: Barring unforeseen circumstances, particularly since the Trump administration pulled the United States out of the accord, both targets will be exceeded.) They are also working to develop first-line defenses against the effects of sea-level rise, including planting mangroves to prevent coastal erosion and improving rainwater-collection systems to protect water quality.

But if none of that works, they may have to consider more drastic options. And so, in 2014, Kiribati purchased about eight square miles on the Fijian island of Vanua Levu for a little less than $9 million, potentially for the purpose of moving its population there one day. “We would hope not to put everyone on one piece of land,” the country’s then-president, Anote Tong, said. “But if it became absolutely necessary, yes, we could do it.” Fiji would become the new home of the nation’s inhabitants, known as the I-Kiribati.

The relocation of people due to climate change isn’t unprecedented. Papua New Guinea has already begun moving the population of the Carteret Islands, a group of low-lying atolls, to the mainland. But this would be the first time an entire country had to relocate because the land on which it was built no longer existed. This raises a new and frightening question: If a country no longer exists in physical form, can it still exist as a political entity? Can a nation just up and move?

I knew Tong by reputation from the impassioned speeches he delivered at U.N. General Assemblies and climate change conferences during his time as president, from 2003 to 2016. So when I visited Kiribati in 2016 to research a book about border changes and the future of the world map, I called him. When we met one afternoon in Tarawa, he had just come in from fishing and was relaxing in shorts and a sleeveless T-shirt in the maneaba, or meeting house, outside his family’s home in a crowded residential neighborhood. John Denver played softly from a Bluetooth speaker. But the former president was troubled. “One of the most difficult things I’ve had to expect is planning for the demise of my country,” Tong told me. He wants the I-Kiribati to stay if it’s even remotely possible. But, he rued, relocation is probably unavoidable. “The science is pretty clear: zero emissions, we’ll still go underwater. Unless some drastic work is undertaken, there will be no option. That’s the reality. It’s not a hope. It’s not a desire. It’s the brutal
yet no one’s quite sure what that reality will look like. When I visited Secretary of Foreign Affairs Akka Rimon, she cracked the joke I’d been afraid to make: “Climate change really put us back on the world map. The irony is that we’re being erased from the world map.” Rimon had tried to think through what relocation could entail, though she didn’t really know how Kiribati’s nationhood could be preserved. “We don’t have the answer. There doesn’t seem to be any entity that looks after that. Sovereignty exists within the borders of your nation, but what happens when that changes? Nobody has the answer,” she said.

Historically, countries are not physically destroyed; they simply become other countries, the land they occupy controlled by someone else. But at a minimum, to exist, a country needs a government, a population and a piece of real estate within a defined territory — the boot of Italy, the hanging triangle of India, the narrow strip of Chile. The shape of a nation has long been defined by two kinds of lines: the borders that separate it from other countries and the coasts that separate it from the sea. We may understand why political borders are subject to change, but in an era of rising seas and increasingly extreme weather and natural disasters, we have to get used to the fact that coastal boundaries can’t be taken for granted, either. Indeed, our land-water borders are changing quickly and significantly, and in ways that will probably never be reversed.

Environmental-law scholars have begun to discuss the notion of “ex-situ nationhood,” under which governments, with some financial support from the international community, would continue to represent their populations on an international level at bodies like the United Nations, without any connection to a physical territory. Under one model, the I-Kiribati would retain some rights as citizens, even as they dispersed around the globe. As Maxine Burkett of the University of Hawaii, who has written extensively on the political dilemmas facing small island states, told me in 2014: “A number of us understand the modern notion of citizenship, where people have ties to more than one country. But the notion of that happening without a physical territory is quite novel.”

In a 2013 essay, Jenny Grote Stoutenburg, a law professor at the University of Colorado at Boulder, recommended that, to maintain international recognition, island states facing destruction should reinforce their territory to keep at least some physical structure above water and keep a small group of inhabitants behind, even if the bulk of the population has relocated. The Kiribati of the future, in other words, may be little more than a skeleton crew, a reinforced platform with a flag perched in the open ocean after the rest of the population has moved to another piece of land or to several of them. This is a very different notion of national sovereignty than anything the world has seen before. There are understandable motivations behind plans like these: The people of small island states want to continue to have political representation in the international community, and they have economic interests to protect — rights to fisheries and natural resources in their territory, for instance. But these plans also offer a version of cartographical stasis taken to the point of parody: the erection of a fig-leaf physical presence in the middle of the ocean just so that maps showing a country in a particular place will be technically correct.

Still, a nation ending entirely, with no successor, might be a wholly new event in human history. In grappling with the possibility, some scholars have dusted off models and concepts that predate the modern nation-state. One is the Sovereign Order of Malta — a Catholic order that controls no physical territory but has existed in multiple locations, including Jerusalem, Cyprus, Malta and Rome, throughout its nearly 1,000-year history. In an odd geopolitical quirk, despite controlling no territory today, the order has diplomatic relations, including embassies, with dozens of countries and observer status at the United Nations. The order’s sovereign status makes it a throwback to an earlier, more fluid era of international politics, when sovereignty was tied more closely to ruling families or dynasties than to territories with fixed locations. Today, for instance, the historical kingdom of Burgundy is associated with the central French region of that name. But in his book “Vanished Kingdoms,” British historian Norman Davies identifies 15 kingdoms of Burgundy dating back to 410 and occupying locations from the west bank of the Rhine to what is now Switzerland to the Netherlands. Describing the disintegration of Burgundy in the 13th century, Davies writes: “The typical Burgundian count was no longer the ruler of one straightforward fief dependent on one overlord. More often he was head of a complex clutch of lands, titles and claims, assembled over the generations by the combined efforts of his family’s knights, wives, children and lawyers.”

If the vanishing countries of the future are to survive in any form, they’re likely to look less like contemporary nation-states and more like the Knights of Malta or medieval Burgundy, political creations set up to represent a group of people, and their political interests, who will be increasingly dispersed geographically and culturally.
would come to an end.
I heard several odd pseudoscientific arguments from Kiribati people during my time there, including that hotter weather would evaporate all the water released by the melting polar ice caps and that the coral in the Kiribati atolls would help the islands float as the water rose. Many people pointed out, correctly, that the shape of the islands regularly shifted before sea-level rise — and that the impacts of climate change so far had been difficult to disentangle from other factors. Most people I met weren’t making plans to relocate anytime soon. In contrast to Tong, the new government has not made the evacuation of Kiribati a priority, even a theoretical one.

Instead, I heard a lot of frustration that the rest of the world seems to take notice of the I-Kiribati only to tell them they’re doomed. Several people I spoke with had already given interviews about climate change to foreign reporters. “In my case, you are the fifth person,” remarked Teewata Aromata, the director of Te Toa Matoa, an organization for people with disabilities. “People come and ask us the same questions. They see pictures of us and think we are drowning in the ocean.”

Yet the stubborn facts remain. Countries like the Maldives and Kiribati are probably disappearing — and not that long from now. I came to Kiribati expecting to find a place planning for its own destruction, but instead I found something more dispiriting: a place that, with a few exceptions, wasn’t even contemplating that destruction. “Who wants to believe that their home won’t be here?” said Tong. It was an understandable sentiment. “People here don’t even like to plan for next week. But we’ve got to be hardheaded about it.”

The mental block that prohibits thinking about what will happen when the islands are no longer inhabitable seems to be a major impediment to planning for that eventuality. In this regard, too, Kiribati is a microcosm of the world’s unwillingness to face the reality of the future. A nation disappearing off the map is something that’s never happened before and, so far, is something people seem unable to imagine.

The military paid for a study on sea level rise. The results were scary.


By Chris Mooney and Brady Dennis
April 25
Email the author

This story has been updated.

More than a thousand low-lying tropical islands risk becoming “uninhabitable” by the middle of the century — or possibly sooner — because of rising sea levels, upending the populations of some island nations and endangering key U.S. military assets, according to new research published Wednesday.

The threats to the islands are twofold. In the long term, the rising seas threaten to inundate the islands entirely. More immediately, as seas rise, the islands will more frequently deal with large waves that crash farther onto the shore, contaminating
their drinkable water supplies with ocean saltwater, according to the research.

The islands face climate-change–driven threats to their water supplies “in the very near future,” according to the study, published in the journal Science Advances.

The study focused on a part of the Marshall Islands in the equatorial Pacific Ocean. Hilda Heine, president of the Marshall Islands, said in an interview that Wednesday’s journal article “brings home the seriousness” of the predicament facing her island nation.

“It’s a scary scenario for us,” she said.

The research also has ramifications for the U.S. military, whose massive Ronald Reagan Ballistic Missile Defense Test Site sits, in part, on the atoll island of Roi-Namur — a part of the Marshall Islands and the focus of the research.

The U.S. military supported the research in part to learn about the vulnerability of its tropical-island installations. The Pentagon base on Roi-Namur and surrounding islands supports about 1,250 American civilians, contractors and military personnel.

“This study provided a better understanding of how atoll islands may be affected by a changing climate,” Defense Department spokeswoman Heather Babb said in a statement. “While no decisions have been made about Department of Defense activities on the islands based on the study, DOD continues to focus on ensuring its installations and infrastructure are resilient to a wide range of threats. The department’s understanding of rising sea levels will enable the military services and agencies in affected areas to make informed decisions on how to continue to execute their missions.”

The low-lying island, which rises barely six feet above the current sea level, is part of the vast Kwajalein coral atoll, a structure that formed as coral reefs grew around a sinking volcanic island long ago. That is the origin of more than a thousand other low-lying, ring-shaped atoll islands or atoll island chains across the Pacific and Indian oceans. Most are not populated, but some, such as the Marshall Islands and Maldives, are home to tens or even hundreds of thousands.

While seas are rising by 3.2 millimeters per year at the moment and expected to rise even faster in years ahead, Roi-Namur has a good chance of avoiding total inundation this century.

But the new research — conducted by researchers from the U.S. Geological Survey, the National Oceanic and Atmospheric Administration and several other institutions in the United States, Monaco and the Netherlands — suggests that saltwater contamination of the island’s aquifers would probably occur at 40 centimeters (about 15 inches) of sea-level rise. A rise of five to six centimeters globally has already occurred since 2000, and the sea-level rise is even faster at the Kwajalein atoll.

The danger comes because of the increasing ability of large waves to spill across the island and sink into its groundwater.

“Historically, there would be an overwash event due to a cyclone or typhoon every 20 or 30 years,” said Curt Storlazzi, a USGS researcher who led the study. “Every 20 or 30 years or more, communities can recover in that time. The concern is that with sea-level rise, those flooding events are going to happen more frequently.”

Wave overwash events already occur — a 20-foot-high wave swept across Roi-Namur in 2014 — but the computer model used by the study finds that they become more likely as seas rise, and once they occur two years in a row, the groundwater could become undrinkable.

The “tipping point” in the study varies depending upon the rate of climate change — and above all the stability of Antarctica. In the worst case, the paper says, it could come “before 2030.” However, a prominent expert in sea-level rise who was not involved in the study, Bob Kopp of Rutgers University, questioned that especially dire finding.

“They’re asking the right questions, they’re doing the right sorts of analysis, but I’m a little skeptical of some of their early-century dates for some things,” Kopp said in an interview with The Washington Post.

For less dire scenarios, the critical moment is pushed further off to the decade between 2030 and 2040 for a high warming scenario without Antarctic collapse, or 2055 to 2065 for a middle-range warming scenario. Kopp said that middle scenario is consistent with what is known and provided an analysis suggesting that while there is indeed a major threat, it won’t arrive as soon as 2030 but could by the 2050s.
“Even if you take their most conservative scenario, the numbers are really disturbing,” Kopp said. “And there’s nothing wrong with their conservative scenario.”

Storlazzi said that, if anything, Roi-Namur is probably somewhat higher in elevation than many other coral atoll islands. Hence the conclusion that so many of them could be at risk — the study says that “most” are — and that the occupied ones might also, in the relatively near future, have to worry about their drinking-water supplies.

The research was commissioned by the Pentagon’s Strategic Environmental Research and Development Program and published in a more lengthy form earlier this year, in a report that partly focused on helping the military identify sites where its assets could be vulnerable.

There, the researchers called the inquiry on Roi-Namur a precursor to a comprehensive examination of numerous atoll islands managed by the Defense Department “that are most vulnerable to sea-level rise and associated impacts over the next 20 to 50 years.”

“If these impacts are not addressed or adequately planned for, as it becomes necessary to abandon or relocate island nations, significant geopolitical issues could arise,” they wrote.

The United States manages military installations or assets not only in the Marshall Islands but also on Wake Island, another Pacific atoll, and the Diego Garcia atoll in the Indian Ocean. There are also decommissioned installations at the Midway and Johnston atolls.

John Conger, director of the Center for Climate and Security and former acting assistant secretary of defense for energy, installations and the environment, said that the department “is increasingly cognizant of threat of sea-level rise on its
installations.”

Part of the risk can be addressed by adaptive measures, he said, but that’s costly. He called the new study “a little bit jarring.”

“They are going to have to make some operational decisions,” Conger said. “This is sort of the front lines of sea-level rise and climate change. It’s not that the entire island is going underwater — it’s that you don’t have drinking water. It’s going to wreck the aquifer.”

Rising seas threaten even some projects that remain under construction.

Case in point: the $1 billion “Space Fence,” a radar installation on Kwajalein Atoll that is intended to track tens of thousands of pieces of space junk — some of them as small as a baseball — in an effort to keep orbiting satellites and astronauts safe. The state-of-the-art project is being constructed for the Air Force by Lockheed Martin and is supposed to be fully operational later this year.

But its location on the tiny atoll already has raised concerns that the site could face routine flooding threats within a matter of decades and that saltwater could damage its expensive equipment.

The study underscores why many small island nations clamored to ensure that the 2015 Paris climate agreement included language requiring the world to strive to limit global warming to 1.5 degrees Celsius (2.7 degrees Fahrenheit) above preindustrial levels, an extremely stringent target. Atoll-dependent nations that have been heavily involved in the push for climate action include the Marshall Islands, Maldives, Kiribati and Tuvalu.

But with the planet already 1 degree Celsius (1.8 degrees Fahrenheit) warmer, holding warming to 1.5 Celsius seems unlikely, because it would require extremely rapid shifts away from the current energy system toward renewables, rather than the more gradual change now underway.

The new study did not address specific Paris climate targets, but Kopp’s additional analysis found that even under a 2-degree or 1.5-degree Celsius climate scenario, by late in the century, more than 40 centimeters of sea-level rise will probably occur. Still, these scenarios would buy atoll islands some time.

“The research is a reminder of the immediate threat of sea-level rise,” said Simon Donner, a professor at the University of British Columbia who studies coral reefs and climate change and wrote a comment by email from Kiribati.

“It is also a reminder that the people in atoll countries, who are not responsible for climate change, are not receiving the necessary international support,” he continued. “Despite the dire findings of this study, adaptation is not absolutely impossible: the construction by China on atoll islands in the South China Sea is evidence of that. Adaptation is, however, prohibitively expensive for developing countries like Kiribati (where I am currently).”

Heine, the Marshall Islands president, said there is no ignoring the effects climate change already is having. Just last week, she said, waves washed over parts of the island nations, thanks to a combination of wind and ocean currents exacerbated by sea-level rise. Residents were left to clean up flooded roads and neighborhoods.

“It’s more of a nuisance than anything, but things like that are coming every other month or so,” she said. “It makes people feel insecure in their own homes.”

Her government is doing what it can to protect its vulnerable shorelines, building new sea walls with the limited resources it has. But it’s not nearly enough. And she has watched with exasperation as the United States has backed away from the Paris climate accord under President Trump, whose administration has scarcely acknowledged the looming threats posed by climate change.

“The leaders of the United States need to get on board. ... We should stop denying what is happening and help vulnerable countries like ours,” Heine said. “It’s important for people in the U.S. to realize that this is real, it’s happening to people. We are not the ones creating this, but we are the ones who have to live with it.”

A critical issue for the islands in question is the fate of the coral reefs from which they are made and that surround them. Reefs break waves, helping to prevent overwash events, and they also grow to keep pace with sea-level rise — at least to an extent.

But even as seas are rising, coral reefs around the world have been suffering from severe bleaching events and are weakened further by acidifying oceans. This suggests that reefs could be hobbled and unable to protect their islands from waves.

“The coral reefs these days have suffered not only of sea-level rise but mostly in terms of acidification of the ocean and also
increase of temperature,” said André Droxler, a geoscientist at Rice University who has studied how corals succumbed to fast-rising seas at the end of the last ice age. “So climate change will increase the rate of sea-level rise, but also it will decrease the possibility for these corals to keep up.”

The current study suggests that if reefs falter — as they are doing around the world — then the major wave risk to coral atoll islands could come still earlier.

Droxler said the study reminded him of Maldives, where he has worked and which faces a situation similar to that of the Marshall Islands. “The maximum elevation is 2.4 meters, and there are more than 140,000 people living in two square miles,” he said of the capital island of Male.

“It is kind of the ultimate example of the destiny of these tropical islands, which are so low in elevation,” Droxler said.

And each passing year, as seas continue to rise and the nations and the world wrestle with how to cut carbon dioxide emissions, thousands of islands grow closer to a reckoning.

“The longer we talk about this,” Conger said, “the more the distant future becomes the near future.”