

China's Belt and Road infrastructure projects could help or hurt oceans and coasts worldwide

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Mangrove forests like this one in the Bahamas provide natural protection against tropical storms and flooding, but they often are destroyed for development projects. Credit: [Sterling College/Flickr](#), [CC BY](#)

More than [one-third](#) of all people in the world live in cities, towns and villages on coasts. They rely on healthy oceans for many things, including food, income, a stable climate and ready connections to nature.

But as [coastal populations continue to grow](#), governments are under increasing pressure to ramp up [development](#) for transportation, [power generation](#) and economic growth. Projects like these can have heavy impacts on lands, waters and wildlife.

World leaders are gathering in Montreal this week for the long-awaited [Conference of Parties](#) to the United Nations Convention on Biological Diversity, or COP15. This treaty, which was adopted at the 1992 Earth Summit in Rio de Janeiro, is designed to protect biodiversity—the variety of life on Earth, from genes to entire ecosystems.

At the two-week conference, nations are expected to officially adopt the [Post-2020 Global Biodiversity Framework](#), which will guide global conservation efforts over the next decade. China is this year's COP president and chair, which will spotlight its own impacts on the environment.

We study [natural resource management](#) and [global development](#), and have analyzed how China's support for development around the world is affecting nature and Indigenous communities. In a [newly published study](#), we explore the risks that China's development finance projects pose to coastal and marine ecosystems, and to Indigenous communities that depend on healthy oceans.

We find that the risks are low in some places but high in others, particularly West Africa and the Caribbean. As China presides over global conservation talks, we believe it is important to look at China's own potential impacts on biodiversity through its lending for [global development](#).

Belt and Road brings benefit and harm

In 2013, China's president, Xi Jinping, launched the [Belt and Road Initiative](#), China's ambitious push to coordinate hundreds of billions of dollars in finance, investment and trade to better connect its economic partners.

Today, China is the world's [largest bilateral creditor](#). Since 2008, it has lent nearly half a trillion dollars to finance more than 800 overseas development projects. Its highlights include networks of roads, railways, ports and power plants across Latin America, Africa and Asia. Argentina's massive [Cauchari solar farm](#), Kenya's single-gauge railway, and the Central Asia-China [pipeline](#), which is designed to carry natural gas from Turkmenistan, Uzbekistan and Kazakhstan into China, are examples.

Belt and Road projects are intended to help emerging economies grow, but they also can have negative impacts—including [environmental damage](#) that hurts local communities or livelihoods. In Mauritania, for example, a Chinese-financed port brought a fishing deal with a Chinese fishing fleet. The fleet [out-competed](#) traditional small-scale fishermen, [raising alarm](#) amid allegations of [unsustainable overfishing](#).

Mapping risks to biodiversity and people

To analyze how the Belt and Road Initiative could affect oceans and coasts, we located 114 development projects across 39 low- and [middle-income countries](#) financed by China's two most active development finance institutions—China Development Bank and Export-Import Bank of China. Collectively, these loans constitute nearly US\$65 billion in financing commitments from Chinese development lenders between 2008 and 2019. The projects include many different types of coastal

infrastructure, such as ports, roads, bridges, power plants and airports.

Different types of infrastructure projects pose varying risks to marine habitats and species. Ports create the most serious threats, including habitat destruction, pollution and the [spread of invasive species](#) from ships that pass through.

Bridges, roads, power plants and other facilities also threaten nearby coastal waters. These projects can stress aquatic species and habitats with bright lights, loud noises or vibrations, and discharges of toxic heavy metals from [urban runoff](#). These risks are mostly concentrated in small areas around development sites.

In total, we identified 324 [threatened species](#) of fish, marine mammals, marine reptiles, sea birds and sharks and rays that could be affected by Chinese coastal development projects. The size of the risk depends on exposure levels and different species' vulnerabilities. For example, power lines present low risk to marine habitats—but if they are accompanied by bright lights, they threaten sea birds, which are [highly sensitive to light pollution](#).

Overall, we found that Africa and the Caribbean constitute the greatest risk hot spots. Countries with the largest expanses of territorial waters at risk include Antigua and Barbuda, the Bahamas, Cameroon, Mozambique and Sri Lanka.

We estimate that risks may encroach upon important seas for at least 55 coastal Indigenous communities around the world, particularly in Western and Central Africa. For example, [marine habitats](#) adjacent to several Indigenous communities in Ivory Coast that [consume more than 1,000 tons of seafood yearly](#) face relatively high risks from nearby development projects.

Sustainable 'blue' development

Experts widely agree that the Earth is [losing species at an alarming rate](#) and that habitat loss and pollution from development are major drivers of this decline. If China is serious about taking a leadership role in conservation efforts, we believe the Belt and Road Initiative is the place to start.

Sustainable development will define the future of society and the environment, but planning models often struggle to address how development on land [affects the oceans](#). The United Nations aims to bridge this gap by changing humans' relationship with the ocean during what it has designated the [Decade of Ocean Science for Sustainable Development](#). And we see reason for hope.

Our study shows that many development risks to coastal and [marine ecosystems](#) could be tackled at the local level if communities and governments work to prioritize their own development and investment needs and scrutinize how proposed projects will affect the environment. Even seemingly small changes in the siting of ports, coastal highways and other projects can protect ecosystems and the communities that depend on them.

China is starting to address some of these concerns. In 2021, its Ministry of Commerce and Ministry of Ecology and Environment [issued joint guidance](#) urging Chinese investors and lenders to take a "whole lifecycle" approach to project management, beginning with early considerations such as where to site a project.

In 2022, the China Banking and Insurance Regulatory Commission instructed lenders to [develop complaint mechanisms](#) for addressing local environmental concerns and minimizing environmental risks. An important test will come in the next few years, as the World Trade

Organization will begin [negotiating](#) specific rules to curb overfishing. If China [shows leadership](#) on this issue through transparency and knowledge sharing, it can limit environmental and economic damage from the development of future ports in countries like Mauritania.

As COP15 spotlights global biodiversity, we believe it is important to note that even the world's largest bilateral creditor needs the cooperation of local governments in order to get projects approved and built. In our view, transparency and public participation can help make global investment both green and blue.

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