



*Tackling*  
**WASTEWATER  
POLLUTION**

**Every hour, over 100 million gallons of wastewater, equivalent to two hundred Olympic-sized pools, flow into our oceans, threatening the water quality that our coral reefs and coastal ecosystems depend upon.**

Mangroves, seagrasses, coral reefs, salt marshes and kelp forests are among the world's most vital marine and coastal habitats. They act as biodiversity hotspots, serving as essential feeding grounds, nursery areas, and migratory pathways for an array of species, ranging from tiny invertebrates to marine megafauna. However, these iconic ecosystems are under severe threat from wastewater pollution. Coral reef ecosystems experience intensified coral bleaching and the introduction of coral-disease-causing pathogens like *Serratia marcescens* - which has been directly linked to sewage contamination. Wastewater pollution also leads to significant habitat loss of seagrass meadows and wetlands, which function as important blue carbon sinks, and degradation of ecosystems traditionally perceived as nature's filters, including bivalve reefs, salt marshes and wetlands. The repercussions of this pollution are far-reaching with 52% of seagrass beds and 79% of coral reefs worldwide exposed to nitrogen pollution derived from wastewater.

***In order to achieve ambitious goals for ocean recovery and ecosystem resilience, we must first safeguard water quality by addressing wastewater pollution.***

Throughout history, wastewater management has underestimated its true environmental impact, relying on conventional treatment methods that fall short in safeguarding the environment and enhancing community resilience. In areas with centralized sewer systems, traditional wastewater treatment can be insufficient in removing excess nitrogen and other contaminants, leading to the concentration and direct discharge of pollutants into coastal waters. In more rural settings, onsite treatment systems, such as traditional septic, do not remove all contaminants and can contribute to nutrient pollution, undermining the health of nearby aquatic ecosystems. Additionally, our existing infrastructure lacks the resilience needed to withstand the challenges posed by climate change. This includes the risk of flooding and saltwater intrusion, which can disrupt treatment processes and result in sewer overflows.

With climate change, coastal population growth and development, and aging wastewater infrastructure, tackling wastewater pollution is an urgent challenge. ***However, this problem is solvable - nature has proven time and time again to be resilient — if we give it a chance.*** This is our opportunity to rethink how we manage wastewater and generate meaningful, positive change for both human well-being and ecosystem health. The Nature Conservancy is emerging as a leading conservation organization dedicated to this issue, by providing scientific expertise, technological solutions, policy guidance, and cross-sector community engagement tools to drive strategic investments in vulnerable areas.

The Nature Conservancy  
is committed to a future where  
thriving, resilient reefs and nearshore  
coastal waters are protected from the  
impacts of wastewater pollution.

# OUR APPROACH

To put this vision into action, The Nature Conservancy's Pacific Division is focused on a strategic set of investments to coordinate partners, develop foundational science and understanding of the problem, and implement scalable, innovative solutions. Initially, we are concentrating our efforts in Hawai'i and Micronesia, both regions that are rich in marine biodiversity and have communities deeply invested in healthy reefs and oceans for fishing and tourism-driven economies. The knowledge and tools cultivated in these regions will become a blueprint for wider implementation across the Pacific.

## **INTEGRATE**

Sustainable wastewater management must become an integral part of community conservation planning and restoration efforts. TNC and our partners are working to create an environment where conservationists actively participate in the solution space. We have established cross-sector networks including the Ocean Sewage Alliance and integrated this threat into platforms like the Reef Resilience Network — both of which connect decision-makers and conservation practitioners to knowledge and solutions. Simultaneously, we are strengthening the scientific foundation for this body of work through research that solidifies the link between wastewater pollution and its impact on critical coastal ecosystems.

## **INFORM & INSPIRE**

Prioritizing wastewater improvements is challenging due to limited understanding of the condition and vulnerabilities of existing infrastructure, impact on coastal ecosystems, and long-term viability of alternative solutions. Our science-based approach will equip communities with resources to proactively identify vulnerable coastal zones and prioritize interventions, even in data-scarce areas. Comprehensive wastewater infrastructure assessments underway in Hawai'i will guide expanded efforts in priority regions in Micronesia, enabling informed interventions and monitoring. We're also collaborating with experts to explore innovative wastewater treatment technologies that safeguard both communities and the environment and creating educational resources to support community-led adoption of these sustainable wastewater solutions.

## **INVEST & INNOVATE**

Recognizing that this critical issue requires urgent on-the-ground action, we are strategically scoping demonstration projects which are dependent on key enabling conditions, including a financial landscape that can facilitate scaling and investment in proven solutions. Despite wastewater pollution's profound impact on ecosystems targeted for conservation and restoration, wastewater pollution management and interventions receive insufficient investment. We are advocating for the added socioeconomic benefits of wastewater treatment and its positive ripple effects on both people and the environment through targeted economic assessments. We are also evaluating potential public funding sources, including climate financing mechanisms, and translating these findings into actionable steps.

By focusing on these four core areas, we're enabling local communities to pivot to sustainable wastewater management while reducing impacts to coral reefs and other vital coastal ecosystems.

Join us as we work together to build a sustainable oceans future.