

Controlling Wastewater on Puakō Reef



Overview

More than 53 million gallons of untreated sewage flow into the ground each day from 88,000 cesspools in the State of Hawai'i [1]. When the wastewater moves through the ground and enters coastal waters, chemicals and bacteria in the wastewater can degrade the health of coral reefs [2]. In 2017, the Hawaii Legislature passed Act 125 requiring that all cesspools be replaced by 2050 [3]. By partnering with county and state government and other stakeholders to reduce the use of cesspools in coastal communities, concerned citizens can play a key role in protecting coastal ecosystems and improving human health.

In the residential community of Puakō in South Kohala, Hawai'i Island, cesspools at about 160 homes contribute wastewater to the 3.5 kilometer stretch of coastline adjacent to a rich coral reef [4]. In 2013, amidst growing concern about the deterioration of Puakō's reef, the Puakō community hired researchers from the University of Hawai'i and The Nature Conservancy to identify potential effects of sewage discharge on the coastal marine ecosystem. The entire coast of Puakō was characterized as polluted by wastewater containing harmful nutrients (nitrates, phosphorus), fecal bacteria, and other contaminants known to harm corals and marine wildlife [5,6,7,8].

Galvanized by the Puakō community's desire to solve the wastewater problem, the Coral Reef Alliance launched the Clean Water for Reefs Puakō project in 2014 [9]. An Engineering Study explored options and recommended construction and operation of a wastewater treatment facility through a public-private partnership [10]. Efforts are ongoing to implement the solution [11], and a monitoring plan has been designed to assess the impacts of wastewater treatment upgrades [12].

Clean Water for Reefs Puakō is a community-driven project that seeks to reduce wastewater pollution on the Puakō Reef. Wastewater released off the coast of Puakō contains fecal bacteria, nitrates, and other chemicals that negatively affect corals, marine wildlife, and people.

Ecological Risk Assessment

Puakō is well-known for having some of the most diverse reefs in the state. However, coral coverage has decreased from 80% in 1975 to 33% in 2010 [8], with concurrent decreases in fish abundance and increases in algal cover. Coral health has declined while disease has increased in recent years [5, 8]. Sewage and other land-based pollutants brings several stressors to the reefs of Puakō, including excess sediment, nutrients, and toxic chemicals [8].

Coral reefs provide ecological services to other marine species. When coral reefs decline, other organisms that use the reefs for food, shelter, and spawning sites lose a valuable resource. If the coral reefs are not healthy enough to provide the ecosystem services required by other species, then the entire ecosystem can become dysfunctional and species can be lost from the area.



References and Links:

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