

STONY CORAL TISSUE LOSS DISEASE

Understanding & Preventing Disease Transmission

FACT SHEET | JANUARY 2023



What is stony coral tissue loss disease?

Coral reefs support a large diversity of marine life and hold enormous ecological, economic, and cultural value to hundreds of millions of people around the world. They provide valuable ecosystem services, including nutrition, economic security, and protection from natural disasters, particularly for tropical island nations. Unfortunately, coral reef ecosystems are in peril worldwide due to a number of global and local stressors. Recently, an unprecedented coral disease outbreak has been devastating coral reefs throughout the western Atlantic and Caribbean, compounding recent losses to coral reef cover and diversity.

Stony coral tissue loss disease (SCTLD) was first detected off the coast of Florida in 2014 and as of November 2022, has spread to 25 countries and territories throughout the wider Caribbean.¹ The disease is one of the most lethal ever recorded due to the large number of coral species that are susceptible, high levels of mortality, and wide geographic extent.³ The exact cause of the disease remains unknown.



SCTLD PROGRESSION *Number of Affected Caribbean Locations from 2014 to 2022*



How is SCTLD transmitted?

Research has confirmed that SCTLD can be transmitted via seawater and direct contact with sick corals and sediments.^{2,3,4,5} Over small-scale distances, such as Florida's Coral Reef, the disease is likely transmitted via ocean currents.^{6,7} However, ocean currents alone cannot explain the disease's sporadic spread throughout the wider Caribbean, suggesting other transmission pathways may also play a role.⁷

Ships (i.e., ballast water and biofouling) have been identified as the most common pathway for the introduction of non-native marine species.⁸ Ballast water is fresh or seawater held in a ship's hull to provide stability. It is taken up from the surrounding environment (both in port and while in transit), and may consequently also contain sediment and aquatic organisms, including bacteria and viruses. Pathogens are sometimes also found in this ballast water, in the biofilms that form on internal vessel surfaces, and in the sediment at the bottom of ballast tanks, and may be released during ballast water discharge events.⁷ Recently, shipping has been identified as a potential mechanism for the transport of SCTLD, especially to explain counter-current shifts in SCTLD distribution and SCTLD outbreaks across geographically distant locations.⁹ In some locations, SCTLD outbreaks appear to correspond with shipping traffic and major port locations.^{9,10} For example, in the Bahamas, mortality and infection rates were greatest close to commercial shipping ports, the two largest of which are located in Freeport, Grand Bahama and Nassau, New Providence, located over 200 km (124 mi) apart. While no definitive connection between SCTLD and ballast water discharge events has been demonstrated, it is reasonable to consider that ships may play a role in disease transmission dynamics.⁹

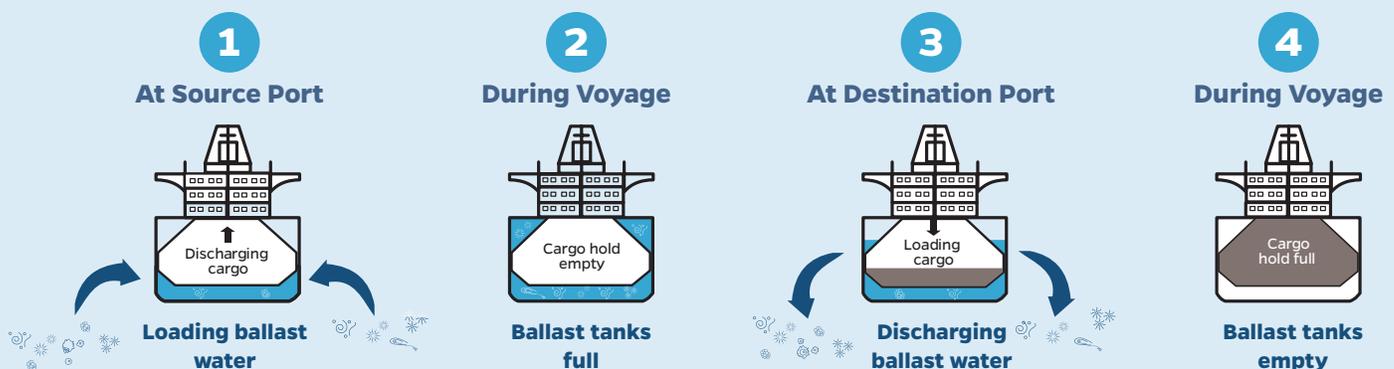
There are several ongoing research efforts to better understand potential shipping-related disease transport mechanisms and



SHIPPING HAS BEEN IDENTIFIED AS A POTENTIAL MECHANISM FOR THE TRANSPORT OF SCTLD

associated treatment options. Studies are underway to investigate the role of biofouling (i.e., the accumulation of biological material on a ship's submerged surfaces and structures) as a potential transmission pathway (or mode of transmission). Researchers have also examined how long SCTLD remains infectious in seawater and have tested the efficacy of UV sterilization, a commonly-used ballast water treatment method, in reducing SCTLD transmission.¹¹ A recent study showed that UV treatment was not successful on its own in mitigating disease transmission risk, and suggested that the unknown SCTLD pathogen may be able to persist in ballast water over time and that ballast water may contribute to the continued spread of SCTLD. Therefore, it is important to continue research on SCTLD transmission and potential disease treatment methods.

MOVEMENT OF BALLAST WATER



Management efforts to mitigate potential disease treatment methods of SCTLD via ships are underway. In 2019, the United States Coast Guard (USCG) released a Marine Safety Information Bulletin reminding mariners of mandatory ballast water management practices and recommending the adoption of several voluntary ballast water management practices. Additionally, the USCG established a SCTLD Task Force in October 2021 to educate staff in the affected U.S. coral reef jurisdictions of Florida, Puerto Rico, and the U.S. Virgin Islands. The USCG has also been increasing compliance checks, flagging high risk vessels transiting from the Caribbean to the Pacific, and is working to implement a risk profile approach for SCTLD prevention.



ADDITIONAL RESEARCH IS URGENTLY NEEDED ON SCTLD TRANSMISSION AND POTENTIAL DISEASE TREATMENT METHODS

What are the next steps?

There is still a lot to learn about the role that ships may play in transmitting SCTLD. Additional research is urgently needed to help inform future management and policy actions. Of great concern is the potential spread of the disease to the Indo-Pacific. While SCTLD is currently confined to waters of the Atlantic-Caribbean region, it is possible that the disease may continue to spread westward through the Panama Canal, ultimately reaching reefs in the Pacific Ocean. Studies are underway to better understand the susceptibility of Pacific corals to SCTLD and plans to ramp up monitoring for SCTLD on both the Caribbean and Pacific sides of Panama are in place. Creating and sustaining relationships between local stakeholders, academic researchers, and government agencies in Panama will help reduce the risk of the spread of SCTLD and provide us with an early warning system if the disease is spreading west.

Under the umbrella of the U.S. Coral Reef Task Force, an interagency working group has formed that includes the U.S. Environmental Protection Agency, National Oceanic & Atmospheric Administration (NOAA), USCG, U.S. Geological Survey, and state and territorial governments. This group is working to identify research and management priorities to help prevent further spread of the disease. These include examining ballast water treatment methods, determining the susceptibility of Pacific corals, and studying the relationship of ballast water discharge reports and the occurrence of SCTLD in non-U.S. waters. In addition, the newly released Implementation Plan for NOAA's SCTLD Strategy outlines a number of activities to help prevent disease transmission, such as the identification of high-risk ports in the Pacific and enhancing partnerships with regional and international institutions focused on ballast water management.



AN INTERAGENCY SUB-GROUP OF THE USCRTF HAS BEEN CREATED TO IDENTIFY RESEARCH AND MANAGEMENT PRIORITIES TO HELP PREVENT FURTHER SPREAD OF THE DISEASE

SOURCES

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