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## **STRANGE DAYS ON PLANET EARTH: SEASON II** “Dirty Secrets”

Along the shores of rivers, estuaries, islands and the sea a disturbing set of mysteries is unfolding. Striped bass are succumbing to flesh-eating bacteria in Chesapeake Bay. Majestic seabirds are starving in Hawai'i. Coral reefs are weakening under a growing assault of invisible contaminants. A known hormone-disrupting chemical is showing up in streams and rivers across the country, potentially jeopardizing the health of animals and humans alike. All these mysteries share a similar culprit. Each is linked to insidious hitchhikers silently riding the currents of the world's water system. Something is amiss in our water supply, and expert teams of researchers are racing the clock to find clues and devise lasting solutions.

Water — it's our most essential ingredient. Throughout the millennia, humanity has naturally been drawn to water, and the larger the body of water, the greater the draw. Nearly half the planet's population now lives within a mere 75 miles of the ocean, and coastal development is escalating worldwide. Few places showcase this massive seaward migration more dramatically than Mexico's Mayan Riviera where some of the fastest growth on Earth is taking place. Yet all this development depends on a hidden and vulnerable underground water supply. Expert researchers plunge us into a spectacular watery underworld to investigate the impacts of Yucatan's fast-growing economy on the region's freshwater supplies and nearby coral reefs.

Further north in Chesapeake Bay, researcher Wolfgang Vogelbein is tracking a disease that's eating the flesh of the region's prime sport fish — striped bass. Through forensic analysis, his team reveals how opportunistic bacteria are getting a foothold in bass populations due to the fish's increasingly stressful living conditions. With a community-assisted tagging program, Vogelbein's team reveals how the disease may be linked to warmer waters and daily doses of excess nutrients streaming from surrounding lands. Together, these conditions are leading to low oxygen levels and creating dead zones. In recent decades, Chesapeake's dead zone has tripled — and similar dead zones are growing across the globe.

Far out at sea other experts are discovering the disturbing consequences of another hitchhiker in our waters — plastics. On the remote islands in the Pacific, a team of researchers has discovered adult albatrosses unwittingly administering a daily diet of plastics to their chicks — a practice that prevents the chicks from digesting food and eventually leads to starvation. Where are the adults collecting all the plastic? Through tagging studies, scientists reveal the birds are likely foraging in a region known as the North Pacific Gyre — the same area where Capt. Charles Moore recently found more plastic than plankton in some places. While plastic is often dumped directly at sea, Moore relates that most comes to the ocean by way of big city storm drains and rivers. What's more worrisome is that along the way much of this plastic can leave a menacing wake. A known hormone-disrupting chemical called bisphenol A has been found to leach into water from commonly used polycarbonate plastics. Endocrinologist Fredrick vom Saal and his colleagues have linked this chemical to a wide range of serious medical conditions from cancer to diabetes in numerous species, including humans.

As researchers and policymakers scramble to encourage smarter use of plastics, hundreds of miles south, researchers in Mexico are investigating what might be the greatest threat to our water system yet. Roberto Iglesias-Prieto and his colleagues are studying how CO<sub>2</sub>, one of our largest industrial waste products, is impacting coral reefs. For 20 years he's charted how Earth's second-largest reef system is changing in response to rising sea temperatures. Now he and others are turning their attention to the fact that CO<sub>2</sub> has not only increased ocean temperatures, but has also altered its pH, essentially making it more acidic. As CO<sub>2</sub> levels continue to rise in the water, organisms comprising the very foundation of the marine food web are in jeopardy, with potentially devastating consequences on everything from snails to sharks, whales, and ultimately humankind. Meanwhile, across the world, innovative and ingenious researchers race against time to reduce the daily dose of contaminants flowing into our world water supply and to stem the tide of change.