



## SUNSCREEN CITIZEN SCIENCE

Did you know that the type of sunscreen you use affects the ocean? Research has been conducted in the last few years, showing that chemical sunscreens are proving troublesome for the seas and your health. The State of Hawaii and the City of Key West have both sought to put bans on chemical-based sunscreens. Instead, many scientists are suggesting that "physical" or "mineral-based sunscreens are healthier for us, and the rest of the ocean.

### What is chemical sunscreen?

According to David Harvey, M.D., a Piedmont dermatologist, and Mohs surgeon, "Chemical sunscreen absorbs into the skin and then absorbs U.V. rays, converts the rays into heat, and releases them from the body. The active ingredients in chemical sunscreens include avobenzone, octinoxate, and oxybenzone."

### What is a physical sunscreen?

Physical sunscreen, unlike chemical sunscreen, contains active mineral ingredients, such as titanium dioxide or zinc oxide. These minerals sit on top of the skin to deflect and scatter damaging UVA rays away from the skin rather than being absorbed into the skin. It creates a barrier on top of the skin that blocks out the sun. This type of sunscreen additionally is not as easily absorbed into the ocean water and the life that lives in it. Scientists are starting to believe this type of sunscreen might be healthier for all!

### Is Mineral Based/Physical Sunscreen better for the ocean (and you)?



This is the question The Reef Institute has set out to discover. During a research trial, six sunscreens that were claiming to be reef safe or reef-friendly were tested on Pacific corals as to whether or not they were actually "safe." We discovered that for a sunscreen to be considered healthier for the ocean, it needed to meet a few criteria. "Safer" sunscreen has to ensure that the concentration of titanium dioxide is not too high. All minerals must be "non-nano" in these lotions. Finally, there must be no, parabens or mineral oil listed in the ingredients. Additionally, this summer, students at our camps, interns and staff tried multiple physical "reef-friendly sunscreens." We researched the most popular at how well they covered, how they feel, and whether or not we would continue to wear them in the future.

## **Favorite “Reef Friendly” Sunscreens:**

Everyone has different favorites in lotions, sunscreens, and skincare. The following products are those who were continuously liked by various people of all ages. While we do not endorse any particular company, the following are the products we return to:

### **Favorite Over All:**

#### **Blue Lizard Australian Sunscreen, Sensitive Skin SPF 30+**

We like the coverage, the feel, and the staying power of this sunscreen. This also was one of the sunscreens we tested in house and left coral healthy. (Find on Amazon)

### **Most Cost Effective:**

#### **Trader Joe’s Zinc Oxide Sunscreen Lotion, SPF 40 Bare Republic Mineral Sunscreens (All Products)**

Both of these sunscreens have decent coverage, feel nice and smell good. We like these two sunscreens because they can be purchased on the go. Trader Joe's can be purchased at Trader Joe's stores, and Bare Republic can be found at most Target Stores and Pharmacies.

## **Other Companies and Products We Like:**

### **Stream2Sea**

A cosmetic chemist created Stream2Sea products with a love of the ocean. They have done a tremendous amount of research on what is healthy for people and the sea. This company also offers ocean healthy body wash and leave in conditioner that we love. This Florida based company was created specifically for the health of Florida's Barrier Reef.

### **TropicSport:**

Another company created for the care of the ocean; this Australian based company has numerous products including facial cleansers that are biodegradable and better for us and the sea.

### **Babo Botanicals Sheer Zinc Continuous Spray Sunscreen SPF 30 :**

Babo Botanicals offers an array of natural products, many of which are better for you and the environment. This was the one spray sunscreen that we really enjoyed.

## Why Are Chemicals Bad In Sunscreen?

There are currently 16 active ingredients used in sunscreens in the U.S., and 14 of them are under scrutiny by the FDA. "In February of 2019, the FDA called for additional testing of a dozen common sunscreen ingredients after finding that high levels of four of them -- avobenzone, Oxybenzone, ecamsule, and octocrylene -- can enter a person's bloodstream after just one day of use. " The chemicals remained in the body for at least 24 hours after the last sunscreen application.

Sunscreen enters the bloodstream after just one day of use, says the FDA. The most-studied chemical in sunscreens, Oxybenzone, has been linked to damage to coral reefs and marine life. It has also shown to lower testosterone levels in adolescent boys, cause hormone changes in men, as well as shorter pregnancies and disrupted birth weights in babies. In fact, Oxybenzone and octinoxate have been banned in several states because of their negative effect on the environment and ocean wildlife." CNN: May 21, 2019.

**Oxybenzone:** also called benzophenone-3 or BP-3, is linked to cancer, endocrine disruption, and allergies, including photo-allergies, meaning allergic reactions caused by light exposure. Also found in cosmetic products, Oxybenzone's threat reaches far past just the world of sunscreen users. MarineSAFE states that "One drop of oxybenzone in the equivalent of six-and-a-half Olympic-size swimming pools' worth of water is sufficient to damage coral." According to the Center for Disease Control (CDC), 97 percent of Americans have this chemical circulating in our bodies.

**Avobenzone:** Once it is exposed to the sun or chlorine in pools, avobenzone begins to break down and cause issues. For avobenzone to work longer, more chemicals must be used, which make it worse for humans. This chemical helps other chemicals better go into the skin. In addition to breaking down quickly and sometimes toxically, avobenzone has been found to cause hormone disruption, accelerate the aging process, and cause cancer and kidney failure.

**Octinoxate:** This ingredient It is popular because it dissolves easily in oil; however, it has been found harmful because of its link to endocrine disruption and reproductive toxicity.

Octinoxate and Oxybenzone are the two specific chemicals that are banned in Hawaii and Key West for its proven destructive effect on marine life.

If you want to understand how nanoparticles and other chemicals are working in sunscreen, check out these articles:

(<https://tinyurl.com/S2SAvoid> <https://tinyurl.com/BanHawaii>)

