Red tide detection based on high resolution broadband optical satellite data

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Introduction

Red tide is a phenomenon caused by Algal Blooms, which become so abundant that they foul coastal waters. Blue-green algae can also deplete oxygen in the water and release toxins that can cause disease in humans and other animals [1,2]. Other studies have shown that nitrates and phosphates in farm runoff can cause red tide. Organisms that consume HABs are harmed by neurotoxins contained in dinoflagellates. One such neurotoxin, sax toxin, is found in crustaceans that ingest harmful dinoflagellates. Patients who eat shellfish containing this toxin experience symptoms such as amnesia, diarrhoea, disorientation, amnesia, nausea, paralysis, vomiting, and eventually serious respiratory, gastrointestinal, and nervous system problems. Death usually results from respiratory failure. Key factors influencing red tide events include warm sea surface temperature, low salinity, high nutrient levels, calm seas, and sunny rainfall (NOAA) during the summer months. Additionally, red tide-associated algae can be spread or carried over long distances by wind, currents, storms, or ships. Red tides are a global phenomenon. Since the 1980s, however, damaging red tide events have become more frequent and widespread. Diffusion detection is thought to be influenced by increased awareness of red tide, better instruments for detecting and analysing red tide, and nutrient loading from agricultural and industrial effluents.

Description

Red tide algae are powerful natural toxins. It is not known why these toxins form, but some may become dangerous to larger organisms through processes of biological expansion and bioaccumulation. Grass animals such as fish and krill are not affected by the toxin, so when algae eat algae, the toxin becomes concentrated and accumulates to levels that are toxic to the organisms that eat it. Sickness and death have been attributed to crustacean consumption during red tide algae breeding season. Technological advances such as satellite imagery have allowed scientists to better track and monitor the growth of harmful algae. Tracking and monitoring red algae can help mitigate the harmful effects of algae by warning against eating infected shellfish or swimming in infected waters. The Coastal Oceans Observation Lab has developed an instrument that can test red tide algae in coastal waters. Finally, researchers are trying to develop an antidote for red tide toxin. Interestingly, in developing such an antitoxin, researchers discovered a potential treatment for cystic fibrosis. , is an event that occurs on the coast when algae, plant-like organisms, grow out of control. The name "red tide" comes from the fact that algae growth can lead to changes in the colour of the water [3-5]. Red tides can endanger human health and marine life. Red tides are caused by algae. Algae are small microorganisms that grow in water.

Conclusion

Almost all bodies of water are home to algae, but during red tide, there are more algae in the water than usual. In fact, during red tide, the algae population in the water becomes so dense that the water changes colour. Red tides existed long before the dawn of mankind. However, certain human activities make them more common. Chemicals from agriculture, factories, sewage treatment plants, and other sources can dissolve in land-based water. This water, called runoff, can eventually flow into the ocean, accelerating algae growth and causing red tides. Red tides are sometimes called harmful algae blooms. Some algae that cause red tide produce powerful toxins and harmful chemicals that can kill fish, crustaceans, mammals, and birds. If you eat fish or shellfish that have been soaked in water, you are also ingesting toxins that can make you sick. For this reason, many areas limit fishing during the red tide season. Other types of harmful algae blooms are caused by non-toxic species of algae that still cause problems. For example, when large amounts of algae bloom, they eventually die and begin to decompose. As they decompose, oxygen levels in the water begin to drop. The water becomes so depleted in oxygen that underwater animals can either swim away to healthier water or die. It

can be covered with dead fish and other animals.

Acknowledgement

None.

Conflict of Interest

The author declares there is no conflict of interest in publishing this article.

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