Toxic Algal Blooms Case Study

In June 2005,a ban on clamming was instituted along much of the Oregon coast after razor clams in that area were found to contain high levels of domoic acid, a naturally occurring toxin produced by algae in the genus *Pseudo-nitzschia.* Filter-feeding mollusks, such as clams and mussels, accumulate high levels of domoic acid during periods of robust algal growth known as blooms. Ingestion of domoic acid by humans causes amnesiac shellfish poisoning, which is marked by headache, dizziness, nausea, confusion, and potentially permanent loss of short-term memory. In severe cases, respiratory paralysis and death may occur within a day.

A different kind of shellfish illness, paralytic shellfish poisoning, results from ingesting saxitoxins, which are, like domoic acid, produced by certain species of algae. In this case, algae in the genus *Alexandrium* produce the toxin, which then accumulates in mussels, clams, scallops, oysters, crabs, and lobsters during periods of greater than usual algal growth. Ingestion of saxitoxin by humans can lead to numbness, paralysis, disorientation, and death due to respiratory failure. Neither domoic acid nor saxitoxin is affected by temperature, so cooking or freezing has no effect on the toxin.

* The number of cases of seafood poisoning is far greater in the summer months. Besides the fact that people are more likely to harvest seafood when the weather is warm, why else would illnesses due to ingestion of harmful algae be more prevalent in the summer?
* The number and size of harmful algal blooms seem correlated to an increased use of fertilizers. Speculate on a possible connection between these two events.