Sewage treatment in the East may be enough to reduce Baltic algal blooms

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(PhysOrg.com) -- Upgrading sewage treatment in the southeastern Baltic Sea states to Swedish standards may suffice to reduce algal blooms in the Baltic to levels of the 1950s. This is shown in a study performed by Andreas Bryhn at Uppsala University that is published in the journal *PLoS ONE*.

"Sewage treatment lags behind in Poland, Russia, and the Baltic countries. This is where our major, significant measures to combat phosphorus emissions can be implemented at relatively low cost," says Assistant Professor and engineering PhD Andreas Bryhn at the Department of Earth Sciences.

Some 7,000 to 10,000 tons of phosphorus would have to be removed from the annual phosphorus load from the Baltic countries, at a cost of SEK 2-5 billion each year (0.2-0.4 billion Euro).

"It sounds like a lot, and it is a lot of money, but it needs to be compared with the eutrophication part of the Baltic Sea Action Plan, which the governments of the countries on Baltic signed in 2007 and is estimated to cost 3.1 billion euro per year," says Anders Bryhn.

In the study he looked at various environmental measures that would make it possible to achieve the conditions of the 1950s in the Baltic. The reason for choosing this target is that comprehensive studies have previously been performed regarding what the populations surrounding the Baltic Sea would be willing to pay to restore the environment to its

1950s state.

"Algal blooms have occurred in the Baltic throughout the life of this inland sea, but the problem of eutrophication has primarily received attention in the 1960s and 1970s and later," says Andreas Bryhn.

"Of course, if we want to be more ambitious in our environmental work, then greater measures must be taken. But it's nevertheless important to start in the right place, with these major flows from the sewage of densely populated areas, which are relatively simple and inexpensive to do something about. This work is already underway, but the more effort we put into cheap and effective measures, the sooner we can expect to see improvements in the environment."

The study shows that the establishment of wetlands and agricultural measures are poorer and more expensive alternatives for counteracting eutrophication. If costs are kept low, the impact of these measures on the phosphorous load is limited or uncertain.

Another measure put forward in the study is to prohibit the use of phosphates in laundry and dishwashing detergents. In Sweden phosphates were forbidden in laundry detergents in 2008, and the Swedish government has put forward a bill prohibiting dishwashing detergents with high levels of phosphates as of 2011.

"Phosphate prohibition is an especially inexpensive and effective environmental measure for countries on the Baltic that have poor sewage purification. On the other hand, the compounds replacing phosphates in the new detergents have other undesirable environmental effects, including increased production of sludge," says Andreas Bryhn.

"As we get better at reclaiming phosphorus from sewage sludge and using it as fertilizer, it might even be a good idea to reinstate phosphates

in detergents, since phosphates may then be the best environmental alternative."

More information: Read the article in PLoS One.

Provided by Uppsala University (news : web)