An aerial photograph of the Baltic Sea coastline. The water is a deep blue, but a large, irregular area along the coast is tinted with a greenish-yellow hue, indicating eutrophication. A small white sailboat is visible on the water in the upper left quadrant.

## Reducing Eutrophication in the Baltic Sea

one sea

twelve countries

85 million people

32,000 tonnes of phosphates

## Save the Baltic Sea

## A shared sea



What makes the Baltic Sea special also makes this inland sea more sensitive than other sea areas.

The mixture of fresh water and salt water results in fewer species of plants and animals than in the “real” sea. If one species decreases significantly in number or disappears, it may have a big impact on the ecosystem at large. The same applies when new foreign species become established.

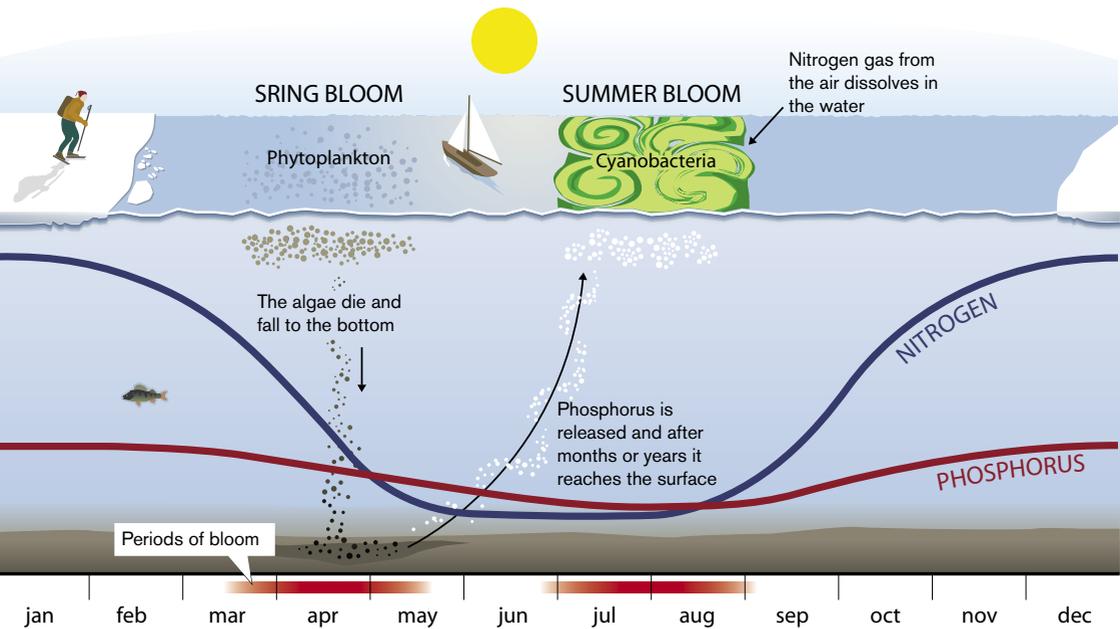
The water exchange is slow. This is because fresh water is lighter than salt; the Baltic Sea is stratified at a depth of approximately 60–80 metres, which means that the surface and bottom water not mix in what is known as the Baltic Sea Proper, south of Åland. Very large saltwater inflows through the Danish Straits are required to replace the water

in the deeper parts. This used to happen with some regularity, but is more sporadic nowadays.

The Baltic is situated in a densely populated area, and sewage from 85 million people is discharged into the sea, making our inland sea one of the world’s most polluted. Eutrophication, environmental toxins, oil spills, overfishing and the introduction of foreign species are among the most serious problems – problems that can only be solved jointly by those of us who live around the Baltic Sea.

The Baltic Sea catchment area  
(dark green markings)





MARTIN THELANDER/PARIS GRAFIK

## Nitrogen and phosphorus fertilise the sea

The basis of life in the sea is the microscopic algae. Some are “real” algae, i.e. plants, simply called phytoplankton. The other type, the blue-green algae are in fact a kind of bacteria, cyanobacteria.

Both types need the nutrients nitrogen and phosphorus to grow. The Baltic Sea was originally an oligotrophic sea, but human discharges have changed this. The algae are able to mass-propagate, and in summer they turn the sea into a yellowish-green soup. This is how it happens (see graphics).

In winter, the nutrient concentrations in the sea are at their highest. When the spring light returns, there are therefore plenty of nutrients for many types of phytoplankton, which start to propagate rapidly. Only nitrogen restricts the growth. When the nitrogen begins to run out, the algal bloom decreases and the turbid water clears. The spring bloom is over, and gradually most of the phytoplankton die and fall to the bottom.

All the organic material that falls down to the bottom of the Baltic Sea

consumes oxygen when it decomposes. As there is hardly any mixing of water below the salt water layer, all the oxygen is eventually used up. Large areas of the Baltic Sea proper have had dead, or almost dead, bottoms for a longtime.

Once the bottoms are anoxic, they start to give off phosphorus. The sediments are able to bind phosphorus, but only as long as oxygen is present. Once the oxygen runs out, phosphorus is released instead. The larger the areas with dead bottoms, the more phosphorus is released, and the bottoms of the Baltic Sea have a lot of bound phosphorus.

This suits the blue-green algae, the cyanobacteria, perfectly. Large

amounts of phosphorus and warm and still water are ideal conditions for them. It does not matter that the nitrogen is more or less depleted, as they are able to take nitrogen from the air. In the summer, cyanobacteria can therefore grow so rapidly that large areas are transformed into yellowish-green soup. At the same time, they release enormous quantities of nitrogen into the Baltic Sea, which prepares the way for next year’s spring bloom.

In reality, the interaction between spring and summer bloom is not this direct, and there are other factors that also play a part, including overfishing of cod.

The nutrients nitrogen and phosphorus follow the watercourses naturally out into the Baltic Sea. The discharges have increased sharply through human activity.

In Sweden, the discharges of nitrogen come primarily from agriculture, woodland and felling areas, sewage treatment works, single-household sewage systems and industry. Emissions from traffic and incineration also contribute.

The phosphorus emissions come mostly from the same sources, though not from traffic and incineration. In Sweden, the municipal sewage treatment works remove most of the phosphorus. Although rather few Swedes live in rural areas with single-household sewage systems, their contribution to phosphorus load is quite high. It is therefore important to use phosphate-free washing detergents if you are not connected to a sewage treatment works. In Poland, for example, it is estimated that about half of the total emissions of 12,600 tonnes of phosphorus come from washing detergents.



# 85 million people



Nine coastal countries put emissions into the Baltic Sea: Sweden, Finland, Russia, Estonia, Latvia, Lithuania, Poland, Germany and Denmark. Some of this wastewater has been treated, to varying degrees, but some is completely untreated. Wastewater from Belarus, the Ukraine and the Czech Republic also eventually flows into the Baltic Sea.

Countries such as Germany, Italy and Norway have already introduced restrictions on the use of phosphates in washing detergents.

Sweden, Austria, Italy, Hungary, Estonia and Norway have jointly written to the EU Commission and demanded that the EU act for a joint ban on phosphates. The EU Commission has begun work on the issue.

The goal of the Save the Baltic Sea Campaign 2007 is for Ministers of Environment from all the countries around the Baltic Sea to jointly make sure this decision is taken! And that countries outside the EU, such as Russia, also join a ban.

All countries must help to save our common Baltic. Everyone has a responsibility. Banning phosphates in washing detergents and washing-up liquids is a simple measure that everyone ought to be able to agree on.

*Large areas of the Baltic Sea are covered by cyanobacterial bloom on July 11, 2005. Satellite picture taken by the MODIS AQUA. Data from NASA, processed by SMHI in Sweden.*



An aerial photograph showing a vast expanse of water with a prominent, winding green algal bloom. The water is a deep blue, and the bloom is a vibrant green, creating a stark contrast. The bloom appears to be moving or spreading across the sea.

Eighty-five million people live in the Baltic Sea catchment area. Every time someone washes or washes up, phosphates follow the wastewater. Phosphates contain phosphorus that, together with nitrogen, contributes to eutrophication in the Baltic Sea.

As much as a quarter of the phosphorus in household wastewater comes from washing detergents and washing-up liquids. In some countries, sewage treatment works take care of the phosphates, but in many countries the water runs out untreated into lakes, rivers and – finally - the sea.

Choose phosphate-free washing detergents and washing-up liquids when you shop; if everyone did this it would mean a lot of tonnes less phosphorous into the Baltic Sea. Persuade your EU parliamentarians to work for a ban on phosphates in washing detergents and washing-up liquids in all the countries around the Baltic Sea!

Estonian Green Movement – FoE • VAK, Environmental Protection Club • Ecological Club Zvejone • Polish Ecological Club, PKE • Green Federation GAJA • Friends of the Baltic • Center for Environmental Initiative • Environmental Group FRI • BirdLife Belarus • Ecohome in cooperation with



Swedish Society for Nature Conservation