

## INFO CARD 1

When the average temperature of seawater rises, the amount of microbial pathogens (such as *V. vulnificus* and *V. parahaemolyticus*) could rise as well. These pathogens have been linked to many seafood-associated diseases.



## INFO CARD 2

Changes in the marine environment (rise of sea level or temperature etc) also affect the climate, which, in turn, affects the agriculture – by heavier rainfall or longer drought periods.



## INFO CARD 3

The rise in the medium temperature of seawater by 1-2 degrees might lead to the extinction of the coral reef ecosystems.



## INFO CARD 4

Oceans play a vital part in preventing the climate change. They balance the Earth's temperature and bind 30% of the carbon dioxide that has been caused by human activity.

However, the rise of CO<sub>2</sub> levels in the ocean makes the ocean water more acidic (the pH level used to be 8,2; now it's about 8,0), which has a significant impact on the ocean as a living environment.



## INFO CARD 5

The trash in the sea affects 45% of sea mammals and 21% of sea birds, who either eat the trash or get stuck in it.

Plastic waste affects the animals and birds the most (about 60-80% of sea waste is plastic)



## INFO CARD 6

Approximately 5 billion tons of plastic has been produced between mid-20<sup>th</sup> century and the present. It is estimated that by 2050, the amount of plastic will reach 50 billion tons – enough to wrap the whole planet into six layers of plastic.



## INFO CARD 7

Traces of plastic have been found in several marine organisms that are an important part of our diet, like fish, mussels and crabs. The concentration of plastic compounds in food affects the health of both marine organisms (spawn, accumulation of substances) and humans.

The plastic particles found in living organisms are very small, with a maximum diameter of 5 mm.

## INFO CARD 8

Seafood is rich in proteins, minerals and vitamins. It also contains more omega-3 fatty acids than any other foodstuffs. These acids are vital for our heart and brain activity.

Fish consumption has also been associated with reduced stress symptoms and fewer asthmatic or allergic reactions (or the prevention of their activation).

## INFO CARD 9

In 2010-2012 every European consumed in average 19 kg of seafood per year, by now, this number has risen to 23 kg. In Europe, the most commonly caught fish are Atlantic salmon, rainbow trout and mussels.

## INFO CARD 10

Because of global climate changes, sea level has been constantly rising. During the last 100 years, the sea level has risen for 17 cm; by the year 2100, it will be 18 cm.



## INFO CARD 11

The rise in the temperature of the Barents Sea has caused the cold water cods near Alaska to move into colder sea areas near Russia.



## INFO CARD 12

European Marine Strategy Framework Directive (MSFD) was founded in 2010 with the aim to protect the marine environment and preserve its ecosystem. The greater aim of the directive is to achieve the preservation of marine diversity by 2020. All EU member states must follow the directive.



### INFO CARD 13

In 2019, ships' sewage discharges into the Baltic Sea will be banned. The discharged sewage water causes the algae to flourish, leading to increased use of oxygen and the exhaustion of all oxygen supplies.



### INFO CARD 14

The protection of the Baltic Sea has been a relevant issue since the beginning of the 20<sup>th</sup> century and it has become more topical with the rise of economic activity and its pressure on the marine environment. Compared to some other seas, the Baltic Sea would suffer more severely from an ecological catastrophe, such as oil spill. There are several reasons behind this: the low salinity of the Baltic Sea, its small size and volume, its location in the north and limited water exchange. Since the Baltic Sea is a small, closed sea, the oil spilled in water will quickly reach the coast.



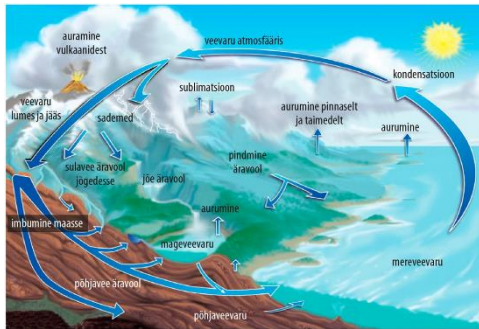
### INFO CARD 15

HELCOM, an intergovernmental organisation for the protection of the Baltic Sea, also known as the Helsinki Convention, was formed in 1974. HELCOM coordinates international cooperation for the protection of marine environment, in accordance with various areas of priority. The aim of the convention is to prevent the disposal of different kinds of waste into the sea and it is a cooperate effort of Denmark, Sweden, Finland, Germany, Estonia, Latvia, Lithuania, Poland, Russia and the EU.



## INFO CARD 16

The water cycle on Earth can be divided into large and small cycle. Small water cycle consists of the atmosphere and the world ocean; large water cycle also includes inland water and the water in living organisms.



## INFO CARD 17

The water on Earth is in constant circulation. Sun heats up the water and vaporises it, the vapour rises to the atmosphere, where it becomes precipitation (rain, snow etc), reaching the rivers, lakes and groundwater, and moving to the ocean again. The amount of water on Earth stays more or less constant, despite its constant circulation and changes in its state.

## INFO CARD 18

The biggest threat to the Baltic Sea is eutrophication, or algal bloom. The most common causes of eutrophication are the mass disposal of nitrogen and phosphorus into seawater. About 75% of nitrogen and 95% of phosphorus reaches the sea by rivers and half of that inflow is agricultural waste. Other sources of waste are forestry, industrial and municipal sewage, waste from ships and other vehicles. Appr. 25% of nitrogen comes from air. Laundry and dishwashing detergents are an important source of phosphorus (up to 24%).

## INFO CARD 19

In terms of ship traffic, the Baltic Sea is one of the busiest areas in the world. This inevitably affects the environment. Dredging (for new navigation routes) affects the underwater habitat. The natural habitat may also be affected by constructions, for example wind turbines. Hydrotechnical constructions, such as bridges, breakwaters and harbours cause changes in the sediment transport, which in turn leads to the accumulation of sand and the covering of reefs.



## INFO CARD 20

To use marine resources, one has to have thorough knowledge of the biological processes of ecosystem, to ensure that the planned activities (ship traffic, tourism, fishing) wouldn't burden the marine environment too much. Marine spatial planning (MSP) is a common tool used for balancing the different activities and protecting the seas. It is an analysis on what, when and how different activities are carried out at sea and what are the environmental, economic and social implications.



## STORY CARD 1

Minna, 35



Minna works as a water quality specialist at the Environmental Board. She has noticed that people often don't care about the environmental regulations and go fishing in the time when it's forbidden, or don't have the fishing license that the Environmental Board issues each year.

In Minna's opinion, the only solution is to impose larger fines on the trespassers. She also thinks that the Environmental Inspection should impose stricter control.

## STORY CARD 2

Kunno, 20



Kunno studies environmental technology at the University of Tartu. His aim is to invent and develop various devices that could help to reduce the concentration of phosphor and nitrogen compounds in seawater, or to prevent the said compounds from getting into the water in the first place.

## STORY CARD 3

Liina, 45



Liina is the CEO of the biggest cruise ship company at the Baltic Sea region. They arrange sea cruises to Denmark, Sweden, Finland, Estonia and Russia. The entertainment program on cruise ships is top-notch: passengers can enjoy SPA procedures, dine in tens of different restaurants, cafes and bars and go shopping.

Effective marketing has made the cruises very popular. The financial capacity of cruise passengers has also risen significantly, as demonstrated by the sales numbers of the ship restaurants, shops etc.

The company's profit is growing with each year and this is also good for Estonian economy. However, the changes in wastewater regulations mean that Liina has to make some new arrangements to not dispose the waste water into the Baltic Sea from 2019. New technology is expensive and Liina doesn't want to invest in it, otherwise the company won't have resources for their marketing and economic activities.

## STORY CARD 4

Mati, 55



Mati is a biologist who mostly studies seals. He lives on the island of Saaremaa and he's worried that in the future, a bridge (or worse, a tunnel) might be built between the mainland and Saaremaa, crossing an important seal migration area. The building process of either a bridge or a tunnel would significantly alter the paths of the seals; moreover, it would contaminate the seawater and cause noise pollution.

## STORY CARD 5

Kati, 12



Kati is a primary school student from Tallinn. She is also an active member of the student council, where she annually organises environment awareness weeks. Each time she focuses on different problems, this year, she decided to focus on the seas and marine environment and invite people to preserve the seas. Since most of the trash in seas is man-made plastic waste, Kati invented practical workshops where she taught everyone to reuse plastic objects instead of throwing them away.

Kati believes that if she's a good role model to the others and if everyone takes even one step towards protecting the nature, then we can preserve the environment together.

## STORY CARD 6

Kalev, 33



Kalev lives in Jõgeva, but he likes to spend his holidays in his summer home in Pärnu, which is located right by the sea. Kalev likes to keep tidy and he's convinced that car wash service is an elaborate robbery scheme. Therefore, he always washes his car on the beach by his summer home, where the soapy water flows directly onto the sand. Kalev is certain that he doesn't do any damage to the environment, because he thinks that the sea is capable of cleaning itself of any pollution.