

ENVIRONMENTAL TOXINS

BalticSea2020

THE BALTIC SEA & ENVIRONMENTAL TOXINS - LESSONS TO LEARN

STUDY GUIDE TO THE DOCUMENTARY
THE SECOND WAVE

STUDENTS COMPENDIUM



Our Baltic Sea
Media Project



2007
2017

ULLA ARNBY
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MEDIA PROJECT



The Baltic Sea is surrounded by some of the world's most environmentally conscious societies. And scientists all agree on the most important steps to take. Still, in many respects, the state of this sensitive and almost landlocked sea is deteriorating. The efforts to save the sea are spoiled by national disagreements and short-term interest.

The future and life quality of 85 million people are affected by the Baltic Sea environment. The next ten years will be critical. Can we save the sea that ties us together?

Filmmakers Mattias Klum and Folke Rydén are spending ten years documenting efforts to save the Baltic Sea. Focusing on the decision-making processes for environmental, scientific and political issues, the aim is to produce a television documentary every other year in cooperation with public service broadcasters around the region.

More information: www.saveourbalticsea.com.

BalticSea2020

BalticSea2020 is a private foundation with the main goal to contribute to turning the negative environmental trend of the Baltic Sea in a positive direction by the year 2020. This is achieved through using a donation of 500 million SEK for concrete measures such as: research, opinion making and active engagement in projects.

Read more about BalticSea2020 at: www.balticsea2020.org.

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BEFORE WATCHING THE DOCUMENTARY

MINDMAPPING

Before you see the documentary *The Second Wave* and get started with your work on the Baltic and environmental toxins, it is a good idea to do a mind map on the theme "Our Sea".

**Work in groups. Use a large white sheet of paper to work on.
Brainstorm – there are no wrong answers!**

Save all mind maps and return to them later. Use them at the end of the project and see what you can add in terms of new knowledge to the original mind map or just appreciate the fact that the knowledge among the pupils has increased!

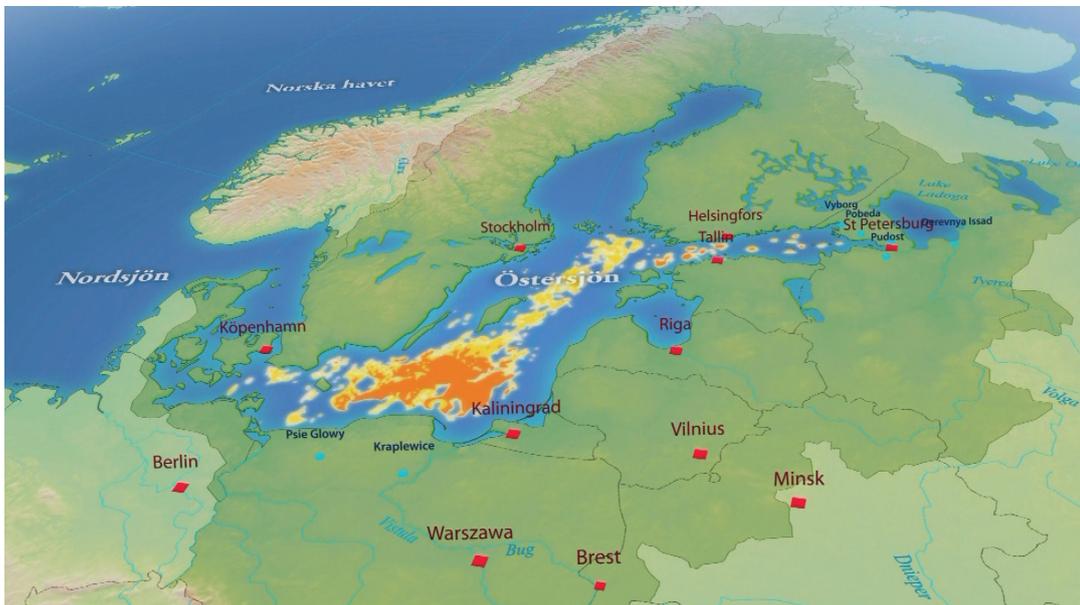


THE DEAD SEA

In the documentary *Dirty Waters* we learned how eutrophication affects the Baltic Sea. The researchers can today see that a large part of the ocean floor is dead. The image below is taken from the documentary.

Study it and discuss the following questions:

- How can you explain the words “the seabed is dead”?
- What are your thoughts on what caused the seabed to die?
- Study the map and describe what parts of the Baltic Sea have dead zones!
- How much of the ocean floor is dead according to the illustration?



¹ The second documentary in the Baltic Media Project. Watch it at this link:
<http://www.saveourbalticsea.com/index.php/education/education-materials>

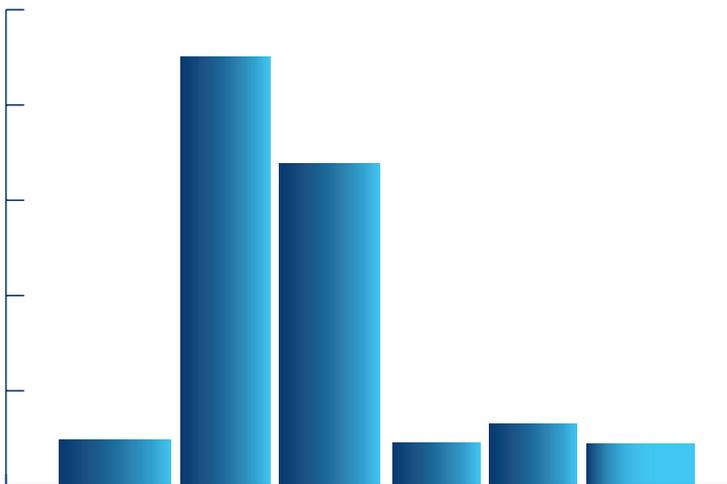
BALTIC SEA POPULATION

Find out which countries border the Baltic Sea and how large the population is for each country. Produce a graph or chart showing the size of the different countries populations.

Continue with the country area.

Also illustrate it on a graph to demonstrate the differences in size

COUNTRY	POPULATION	AREA



OLD GRUMPY AND THE OTHERS

Select one of the animals and record the facts presented about that animal while watching the documentary.



There are many scientists, zoologists, who specialize in studying different animals. Björn Helander has spent almost all his life researching the behavior of eagles. Through hard work and a lot of patience, he has had the opportunity to follow "Old Grumpy" throughout his life. It's an eagle that you will get to know in the documentary *The Second Wave*. Otters, gray seals, porpoises and guillemots also feature in the documentary. Select one of the animals and write about how the animal lives.

Use the following questions in your work:

1. Which animal did you choose?
2. What type of animal is it? (mammal, insect, reptile ...)
3. Where does this animal live? (land, water, air ...)
4. Describe the environment, nature and climate where the animal lives!
5. How does the animal adapt to its environment?
6. Describe its appearance and size.
7. What does the animal eat?
8. How does the animal care for its young?
9. Does the animal have any natural enemies? If so, which ones?

Write down the facts you will learn about the animal while watching the documentary:

10. What special information do you learn about the animal in the documentary

THE IMPORTANT RESEARCH

In the documentary *The Second Wave* you will meet several scientists passionate about their work. They want to learn more in order to better understand the interaction between people and nature. Many times they stand bewildered before the mystery as they have not yet found a solution. But they continue to work hard in their quest for answers...

In the documentary, you will meet, among others:

Eagle researcher Björn Helander, who for almost half a century has been following the eagle in the Baltic Sea: "The eagle is extremely exposed to environmental toxins because it's so high up in the food web, it eats other fish, it eats mergansers, it eats even dead animals ... it can be used to look for new environmental toxins as it gets so high levels of concentration in the body."

Lennart Balk has devoted his life to bird death: "We are seeing huge changes. Many of the populations are at risk of extinction. It looks as if humans have introduced a disturbance in the environment that we do not really understand and it causes diseases, the birds lack certain things in their bodies that they need to function."

Jessika Hagberg, Örebro University, working with the UN mission to study environmental toxins: "We have analyzed both your (The mother in the documentary) breast milk and your serum and Alfred's serum and we have found a total of 35 different toxins in the blood, but we were able to retrieve 24 of them in your blood. There are pesticides, PCBs, and perfluorinated compounds that we found in your blood and breast milk."



Anna Roos, seal researcher: "Even if we say that it is getting better for the gray seal and that they are increasing in number, they still have a lot of pollutants in their bodies that should not be there. There are many different theories about what it could be and it is very difficult to identify a single poison as causing a disease. It can also be a combination of new environmental toxins that we do not know much about."

Lars Förlin researches the perch: "Everyone is concerned about climate change, but environmental toxin problem is still as bad as it was 40 years ago. We use a lot more chemicals in society today than 40 years ago."

Go through the quotes above and discuss the scientists' main tasks.

Work in groups or individually and consider what researchers you would like to work with? Present in class or in small groups.

- Which scientist would you like to work with?
- Why?
- What could be the solution to the researchers' particular problem?

TRUE OR FALSE

When you have watched the documentary *The Second Wave* you will have learned a lot. Answer the following statements on your own or together in groups. If you have different opinions, discuss them and try to work out a collective response.

	TRUE	FALSE
1. Around 85 million people live around the Baltic	<input type="checkbox"/>	<input type="checkbox"/>
2. 35 out of 49 environmental toxins is found in Cecilia's blood	<input type="checkbox"/>	<input type="checkbox"/>
3. The substance PFOS is forbidden since this year	<input type="checkbox"/>	<input type="checkbox"/>
4. Young specimen/animals have higher levels of toxin	<input type="checkbox"/>	<input type="checkbox"/>
5. "Old Grumpy" was 15 years old when he was found dead (the old eagle)	<input type="checkbox"/>	<input type="checkbox"/>
6. Thirteen countries have coastlines along the Baltic	<input type="checkbox"/>	<input type="checkbox"/>
7. DDT and PCB are toxins that are now forbidden	<input type="checkbox"/>	<input type="checkbox"/>
8. Toxins accumulate in breast milk	<input type="checkbox"/>	<input type="checkbox"/>
9. 40 years ago, a toxic scandal was revealed	<input type="checkbox"/>	<input type="checkbox"/>
10. The toxic chemical PFOA is still permitted	<input type="checkbox"/>	<input type="checkbox"/>
11. If you are pregnant you should not eat freshwater fish	<input type="checkbox"/>	<input type="checkbox"/>
12. Toxic chemicals are found in casual sportswear	<input type="checkbox"/>	<input type="checkbox"/>
13. Seals suffer from ulcers and parasites	<input type="checkbox"/>	<input type="checkbox"/>
14. The higher in the food chain – the more affected by toxins	<input type="checkbox"/>	<input type="checkbox"/>
15. "The cocktail effect" is a drink	<input type="checkbox"/>	<input type="checkbox"/>
16. A "persistent substance" is a substance that is quickly broken down	<input type="checkbox"/>	<input type="checkbox"/>
17. The Baltic Sea is an inland sea	<input type="checkbox"/>	<input type="checkbox"/>
18. Fetuses and infants are more vulnerable to environmental toxins than adults	<input type="checkbox"/>	<input type="checkbox"/>
19. An eagle may eat dead seals	<input type="checkbox"/>	<input type="checkbox"/>

The correct answers can be found in the appendix

QUESTIONS

Answer the questions together after you have seen the documentary and see how much data the class picked up together!

1. Describe the exchange of water in the Baltic Sea?
2. What are the major threats to the environment that has long existed in and around the Baltic Sea?
3. What new threats are described in the documentary?
4. Which pollutants, mentioned in the documentary, were widely used 50 years ago but are now banned?
5. How old can eagles become?
6. Which vitamin is the sea birds lacking?
7. What changes can be seen in the bowels of the gray seal?
8. What chemical is used in the production of Teflon?
9. What ominous signs do the scientists find in otters?
10. Which has the highest concentration of the contaminant itself, older or younger animals?
11. What does the term "cocktail effect" mean?
12. Where are traces of contaminants found in Cecilia?

FURTHER INFORMATION

Here are some suggested websites for further information and inspiration:

- Baltic Sea Media Project www.saveourbalticsea.com
- BalticSea2020 www.balticsea2020.org
- The Baltic Sea Portal www.fimr.fi/en_GB
- Helcom www.helcom.fi



