

Background material – Baltic Sea at Skansen



Open area in front of the Aquatic house and the Education hall. Illustration Topia Landskapsarkitekter/KAWA

Themes

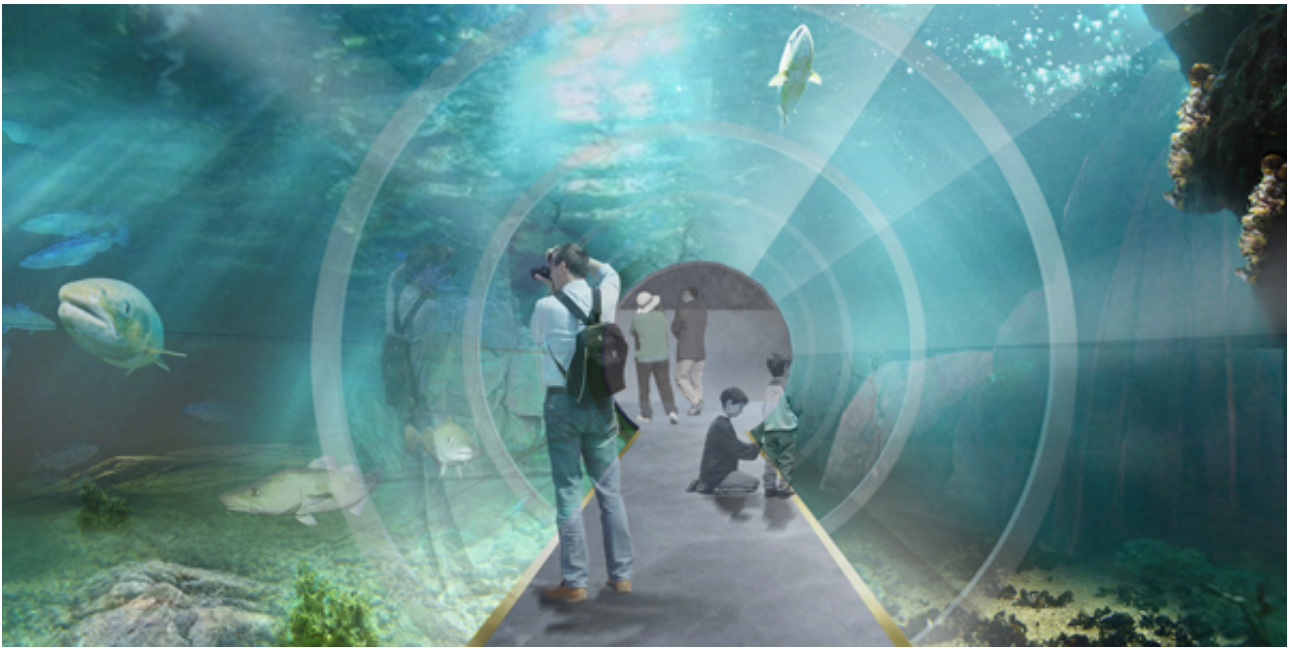
At Skansen's Baltic Sea centre the focus will be on three overall themes that link up with different parts of the centre. Each of these themes, in turn, has from 3 to 5 principal messages. The four major environmental challenges, eutrophication, over-fishing, environmental toxins and depleted biodiversity are present throughout the location.

Beneath the surface – Aquarium site

The principal theme in the aquatic location is to provide a description of a unique inland sea with certain parts showing actual current problem areas.

There will be three aquariums, each with a volume of from 75m³ to 300m³. They will show the underwater environment with transitions from coastal archipelagos to the open sea. They are divided into two different water systems one with a relatively high salinity level and one with a relatively low salinity level from the point of view of the Baltic Sea.

The aquarium with a lower salinity level is suited to large freshwater species like pike, perch, perch-pike, bream, roach, eels, burbot, etc. Part of the aquarium represents shallower, protected conditions that provide a suitable habitat for smaller fish like sticklebacks, two-spotted and black gobies, sand gobies, the viviparous eelpout or blenny, the broadnosed pipefish, straightnosed pipefish, Baltic prawns and mysida. The other system, consisting of two aquariums, is more saline and suits such marine species as cod, salmon, sea trout, lumpfish, fourhorn and shorthorn sculpin, longspined bullhead, Baltic herring, sprats, dabs, plaice, turbot, bladder wrack and others. The greater salinity provides a better environment for these species and it can also check some types of parasites.



The aquatic tunnel through the predators' aquarium. Illustration Topia Landskapsarkitekter/KAWA

Along the coast

This space includes the entire Baltic region. A climate-controlled room shows the influence of human activity along the beaches and coastal areas. The location can be studied on a map that can indicate catchment areas, saline variations, distribution of species, population centres, agricultural areas and so on. There is also a large open space that can be used for displays that will complement the map. This exhibition gallery links the Future Hall with the Education Hall above ground, creating a link between the buildings beneath the roof.



The display area in the Aquatic house with the map on the floor. Illustration Topia Landskapsarkitekter/KAWA

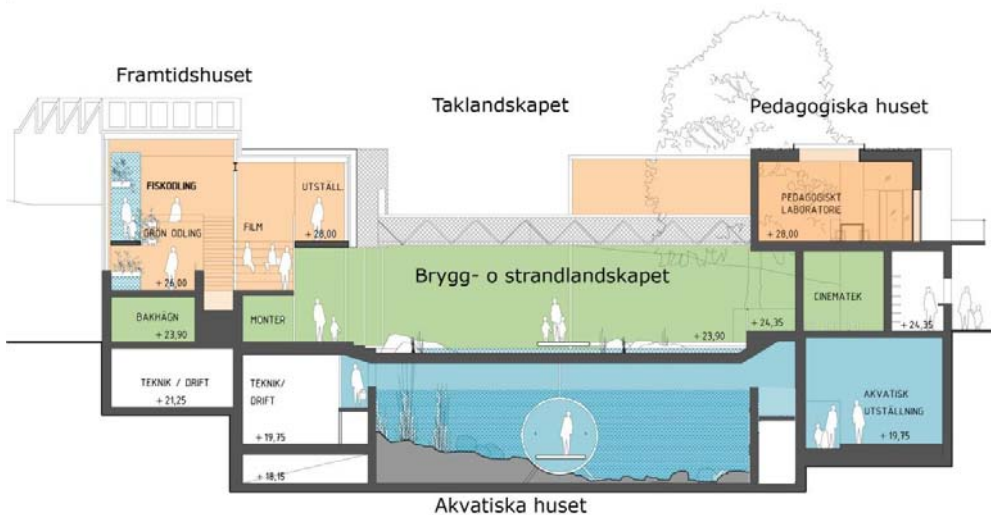


Future Hall. Illustration Topia Landskapsarkitekter/KAWA

Future Hall

The aim of this part of the project is to show how our human choices in everyday matters influence the future development of the Baltic Sea. The display surfaces in the building have a theatrical idea illustrating the four environmental challenges that currently exist: Eutrophication, Over-fishing, Environmental toxins and Depleted biodiversity.

An extensive façade or wall for displays as well as stand-alone display cases allow for interactivity in connection with these displays. This part of the project will have clear links to current research. There will be space for reporting on interesting current projects.



An early plan with the Future hall on the left upper hand, Education hall on the right, Along the coast in the middle and the Aquatic hall on the lower level. Along the coast is now situated on the middle floor. Illustration Topia Landskapsarkitekter/KAWA

Education Hall

The educational activities will focus on secondary-school pupils. There will be room for teaching with a classroom and laboratory as well as public areas on the ground floor with information and a cinema. The cinema will show sequences from existing films from BalticSea2020 and other current films that may interest visitors.

On the floor above there will be space for educational activities involving the laboratory. At the lower level there will be a control room and service area. Here the aquatic tunnel will link up with the staircase. Skansen will become a natural centre for teaching about the Baltic Sea, sustainable development and biodiversity.

The educational operations will be focused on secondary-school pupils. The choice of this age group is based on the fact that there is much evidence to suggest that one needs to have reached a certain level of maturity in order to be able to understand the relatively complex processes that influence the Baltic Sea.

A stimulating range of courses directed at the upper-secondary level will help to widen Skansen's educational programme, providing a useful complement to existing courses.

Skansen has consulted the School Board in Stockholm, Utbildningsförvaltning Stockholms stad, which has agreed to help with developing the educational content. Accordingly, Skansen sees even greater opportunities for creating really interesting and attractive lessons. Existing materials have already been developed a number of times while Skansen's educators have been asked to produce examples of exercises that will provide positive educational experiences in the new development that link up clearly with the official curriculum.

This collaboration between Skansen and BalticSea2020 is intended to improve the conditions for a viable sea in the future by means of greater insights on the part of the general public as to how we are currently influencing the sea in the wrong direction. The aim is to create an educational centre with displays, aquariums, classrooms and laboratory. An education programme will raise the awareness of schoolchildren and other visitors to Skansen of the uniqueness of the Baltic Sea and will help us to understand the serious challenges facing the inland sea as well as indicating what we can do to prevent the biological systems of the Baltic Sea from collapsing.

Background: Eutrophication

There are currently large areas of the floor of the Baltic Sea that lack oxygen as well as large volumes of oxygen-free or anoxic water.

Anoxic seafloors do not bind phosphorus which is freed and returned to the water where they promote eutrophication. This, in turn leads to increased production of algae which ultimately reach the seafloor where they decompose. Oxygen is used up as they decompose and the ability of the water to bind phosphorus is further reduced. This creates a vicious circle of increasing eutrophication.

When sediment and water are anoxic, i.e. totally lacking oxygen, only certain bacteria can survive. This means that large areas where quantities of small crustaceans, flatfish and other species of fish, such as cod used to live now disappear. The reproduction of cod is also negatively affected by the anoxic water since the eggs die in this environment.

The supply of nutrients from land into the Baltic Sea must be reduced. The nutrients that are produced in the form of fertilizers and latrine on land needs to be dealt with in a secure manner. In a functioning recycling system they can be returned to farmland and can replace artificial fertilizers. One way for the consumer to make a positive contribution is simply to eat less meat.

Background: Overfishing

Over a long period more fish have been taken out of the Baltic Sea than have regrown and stocks have, accordingly, declined. This has led to there now being fewer and smaller fish in the sea and the interplay between species has changed. Relatively small stocks of predatory fish have led to more medium-sized fish such as herrings, sprats and roach. These feed on large amounts of animal plankton so that stocks diminish; and when animal plankton disappears, vegetable plankton can increase unchallenged as we have seen in the form of algal bloom. We are back with the eutrophication that leads to anoxic, dead seafloors and problems for the cod, for example, to reproduce.

In 2014 the EU's common fisheries policy (CFP) came into force. BalticSea2020 has been very active in trying to ensure that the new legislation leads to a better marine environment, viable fish stocks and the necessary conditions for a profitable fishing fleet. The new policy has five central aspects from the point of view of the Baltic Sea:

Eco-system: that fisheries management shall be an aspect of the management of the marine environment in its entirety.

Maximum sustainable yield (MSY): that fishing is managed in accordance with the principle of maximum sustainable yield.

A discard ban: all fish that are caught are to be landed and are to be counted as part of the quota.

Regionalization: that the management of the sea region shall be in the hands of the adjacent countries.

That subsidises to the fishing industry shall be phased out.

The policy will be introduced and implemented in all of the countries round the Baltic Sea. We consumers should choose MCS-marked fish which has been fished in a sustainable manner.

Background: Environmental toxins

The Baltic is often classed as the world's most polluted sea. Besides eutrophication there are large quantities of environmental toxins in the water, particularly in the sediment. The toxins come from industrial emissions from paper manufacturing, transportation, combustion, garbage

disposal plants, nuclear power generation, sewage purification plants and other facilities round the Baltic Sea. Some of the toxins have been transported here in the air from other parts of the world.

The reason that the levels of toxins are so high in the Baltic is that more than 90 million people live round the coast and thus contribute to a high level of consumption of products that leave their mark on the environment, as well as the fact that there is a limited exchange of water in the Baltic and that the water is subject to layering.

The water at the bottom of the Baltic is seldom exchanged. The classic environmental toxins PCB, DDT, dioxins, mercury, lead and cadmium clearly affected species like seals, eagles and fish, mainly during the 1970s and 1980s. During the 1990s there was much talk about PBDEs, flame-retardants and paints for boat hulls. During the 2000s the remains of pharmaceuticals, PFOS and PFOA began to be seen in the Baltic and in the 2010s microplastics and nanoparticles from makeup, shampoos and suchlike began to be discovered. In order to deal with the problems caused by environmental toxins we need both to work towards introducing stricter and more effective legislation pertaining to using and emitting unknown substances, adequate marking of products and information to consumers so that they can take responsibility for the environment when making purchases.

Background: Exploitation of coastal marine environments

The shallow coastal inlets and the archipelagos are the Baltic's nurseries. They provide the breeding grounds for most species of fish and this is where seabirds bring up their young. They are also sites for houses, jetties, harbours and boat yards. And they are waters that small boats drive through, churning up sediment.

The coastal regions also provide an important filter for capturing nutrients and organic materials from the land. And it is on the coasts that sewage purification plants can be found. At present more than 100 different habitats for animal species have been identified along the entire coastline of the Baltic, whereof some 25% are red-listed by HELCOM and about 10% are directly threatened.

We really need to be careful when allowing the exploitation of the coast since it plays such an important role throughout the Baltic Sea.

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