Lecture "Malenter Symposium"

The Future of the Oceans. – Frank Schweikert

Film 1: Intro - Sound of the Sea

What you can hear now is the sound of the seas. These are recordings from a coral reef on the Seychelles, the sound of which we have made audible using underwater microphones. The ocean is no silent habitat, even though it might frequently seem to be concealed under the sea surface, quiet, uncanny, and to a large extent, unexplored.

As is known, our planet is not called *Ocean*, but *Earth*. Nevertheless, the seas are by far the largest habitat of the planet, taking up about 70% of the Earth's surface. More than 99% of all life on Earth is based in water. Even so, deep sea exploration is all but completed. In unknown depths there may exist life forms we cannot begin to imagine, and we are only just beginning to understand the effects of ocean currents, salinity, and tides on land-dwellers and on global climate. Out of the entire mass of ocean waters, only about 0.1% count as well-investigated areas.

Introduction

Human interest in the exploitation of marine resources is rapidly increasing, while education and knowledge about the largest and most important habitat worldwide lag behind. The long-term consequences of human interference are still more than unclear. Considering that the seas are extremely important for human systems like food and nutrition, and to global climate in general, the question of the relationship of human and ocean is more important than ever. What exactly are the changes expected in marine environments, and which implications will this have for humans? And how does human behaviour impact upon the complex habitat of the oceans?

The sea as recreation and living space

We all know that the oceans are vital as recreational and tourist areas. But especially the number of people permanently living on or near the coasts is already high and constantly increasing, also due to climate change induced desertification processes inland. Currently almost half the world's population is living within 100 km from the coast. Seaports and

coastal cities have always been attractive for human settlement, and the population of coastal megacities is rapidly increasing. 8 of the 10 largest cities worldwide are located directly on the coast. UNESCO estimates state that by 2025, about 6.3 billion people will be living in coastal areas, marginally less than the number of people alive today. WSith a growing human population in coastal areas, the pressure on marine ecosystems increases through pollution, industrial and municipal wastes, and the sheer number of inhabitants and tourists. Infrastructure and urban management have to adapt to ever changing environmental demands. The more people settle on the coasts and work in marine industries, the greater the strain on the immediate surroundings. Coastal erosion, declining water quality, increased flood risks, and the loss of swamps and mangrove forests and of biodiversity in the sea and on land are possible effects.

In the following film that you wouldn't see on TV, you can see what a destroyed coral reef system looks like after average water temperatures increased by just two degrees.

Film 2: Coral Desert

The sea as food source

For more than one billion people, the sea is the sole source of protein and thus essential to their survival. According to an FAO (Food & Agriculture Organisation of the UN) survey the demand for fish is increasing even more rapidly than the exploding world population curve. Due to the ever-increasing demands on fisheries, there is great need for the application of new catch technologies, depths and fish monitoring systems, while real conservation of the vital resource fish is almost impossible in the muddle of international industries. By the time the effects of fishing have been researched and transformed into legislation, it is usually too late. Almost half of food fish stocks have been overfished or have simply disappeared. Aquacultures are supposed to be cheap replacements but these cause more damage than benefits in the concerned regions. Even so the World Bank has been funding shrimp farms in a highly sensitive coastal region Belize with exorbitant amounts. UNESCO states that fish farms are no appropriate substitution for natural fishery. Coast populations are just starting to understand that the ocean is no inexhaustible resource.

Ultraviolet radition has increased due to the thinning of the ozone layer, and has negative

effects on plankton, especially on fish larvae and eggs. Quantity and quality of sea food sources suffer under these impacts. Problems through bycatch and other pressures from human activities such as industrial shipping and fishery affect not only fish stock, but also a multiplicity of species ranging from minute plankton to marine mammals.

The sea as biological resource

Like the rainforests, the oceans present an abundance of biodiversity, in particular in coral reefs and deep ocean. Only a few years ago scientists coral reefs not only in tropical but also in cold waters were discovered. At the moment scientists are working on projects to develop cancer drugs by using chemical protection mechanisms from underwater species such as cold water sponges and sea squirts.

Film 3: Apotheke

Global regulation instruments are not applied sufficiently, and the fragile balance of economy and conservation is hard to maintain. The question of human adaptation to changing demands of marine environment and climate change circumstances will remain explosive in future.

Many models show that the effects of climate change on humans will have wide and mainly negative effects. Expected changes due to climate change or variations include: increase of sea surface temperature, increase of mean sea level, decrease of polar ice cover, and various unpredictable changes in salinity and layering of water, waves and ocean circulation, as included in the IPCC report for 2007. The following film is a summary of these results.

Film 4: Factfilm (IPCC)

According to the latest IPCC report, the reduction of quality and quantity of biological resources from the ocean has immediate effects on human society, especially as a large part of coast dwellers depends on marine services like fishing. Humans are record-breaking collectors of data and informations, we can afford high-profile research projects – but we fail in the evaluation of these data and in communicating the results to people

worldwide, who should be transforming these research results into actions. Still, there are individual projects that help support climate and marine environments.
For example, the renaissance of sailing ships: Modern freighters can be towed over the seas using huge kites, saving up to 50% of fuel costs. If only half of commercial ships were fitted with this towing system, pollution equivalent to that of US emissions could be prevented each year. These are first impressions of a test run of the SkySails technology, taken place on a 55 metre research vessel a month ago in the Baltic Sea.

Film 5: Beaufortfilm

In future, human society must learn to bridge the gap between “knowledge about the sea” and action. Reliable cultural forms of adequate contact with the ocean must be reactivated and a new global consciousness created. This should be established quickly, so as not to bite the hand that feeds us... just because we do not know enough yet about the seas and their immense importance for surviving on this planet.
The oceans will only have a future, if people learn to overcome the inconsistencies of resource exploitation and environmental conservation.

Film 6: Mood-final