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INDONESIA: Bali's Reef Constructors
How to chase tsunamis and restore the marine ecosystem

Length: 52 minutes

Summary:

Artificial reefs – the so called Bio-Rock structures - offer an amazing solution to one of Indonesia's most serious problems: the devastating effect of tsunamis!

Story: The documentary will give an inside view on current efforts in building artificial reefs on Bali, Indonesia. The film will show how artificial coral reefs can help to restore the maritime ecosystem and to reduce the impacts of marine erosion and freak waves such as the tsunami in December 2004 or the recent tsunami on Java Island.

Dramatic composition: The documentary accompanies renowned marine biologist Dr. Tom Goreau and his international team as they are constructing new Bio-Rock structures on Bali. The sequences about the actual construction are combined with scientific experiments and surveys on coral reefs. The audience will be fascinated not only by high quality shots of one of the world's most diverse underwater areas but also by compelling stories about Balis rich culture and colourful ceremonies that are related to the marine topic. The intention is to present the viewers a freshening mixture between science and its cultural involvement on Bali.

Protagonists: Dr. Tom Goreau (marine biologist, Harvard degree) and Dr. Wolf Hilbertz (architect and marine biologist, Texas AM University degree)

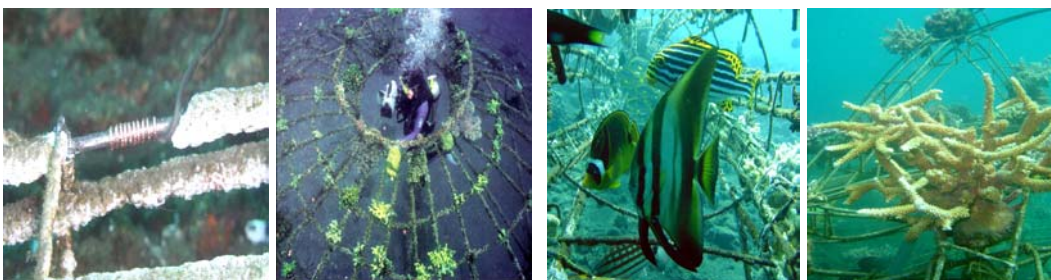
Side stories are closely related to the marine main topic: A Balinese fisherman introduces old legends about coral reefs and invites the viewers to accompany him on a trip. Members of a rearing station for sea-turtles try to ensure the survival of this endangered species in the surroundings of Bio-Rock structures and a Balinese priest invites the audience to take part in a holy sacrifice for the island's sea gods.

List of content and planned sequences in the film:

Less than one percent of the earth's surface are covered by coral reefs, however even from space their lucent pattern is clearly visible along the tropical coast-lines. Although position and dimensions of global reefs are well known scientists surprisingly do not have much cognition on these ecosystems. Data on rates of biodiversity are mostly based on rough estimates rather than on real knowledge, says renowned marine biologist Dr. Tom Goreau. According to his scale of rating 0.5 to 2 million still unknown species can be expected to be added to the 100.000 types that have been discovered till now.



Just as little is known about relations or symbiosis between coral reefs and other marine organisms. That much is proved: The growth of the impressing “gardens below sea-level” is made possible by tiny amounts of electrical current that are barely measurable. With an exceptional technique Dr. Tom Goreau and his team try to imitate this principle and to reveal the secret of the coral reefs. Their method is simple, yet the results are impressive: At first they transform sea-water into stone. Iron structures are placed on the bottom of the sea and supplied by a low electric voltage. Due to electrolysis a crust of limestone starts to deposit on the iron structures and corals begin to settle down immediately: An artificial reef is born!



The so called Bio-Rock method appears to be the “philosopher's stone” alchemists used to search for hundreds of years. Fortunately there are plenty of raw materials for the construction of artificial reefs. More than 55 billion tons of salt are dissolved in the world's oceans. A gigantic resource that might offer a solution to one of Indonesia's biggest problems - the devastating effect of tsunamis!

The islands of Indonesia are located on the “ring of fire”, a belt of more than 70 volcanoes in the Pacific Ocean that causes earthquakes and monster waves

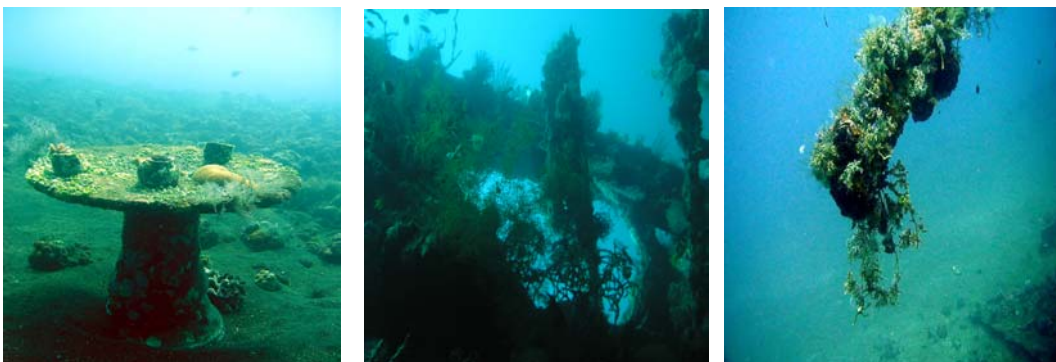
almost regularly. The dreadful tsunami in December 2004 and the recent tsunami on Java Island were triggered by seismic activities. Marine studies have shown that the impact of tsunamis is minimized on sites where offshore coral reefs have remained in good condition. Healthy coral reefs provide a natural safe belt. Even 140 years ago Charles Darwin was impressed by the strength of coral reefs that were able to resist freak waves and seaquakes without getting harmed. The limestone crusts of today's Bio-Rock structures are stronger than ferro-concrete and do not only help to restore the marine ecosystem but also provide sufficient tsunami protection for the coastal lines.

Bio-Rock structures might even help to prevent the collapse of Bali's most famous sanctuary. For centuries the sea-temple of Tanah Lot has defied against the tides of the ocean. Due to the rise of the sea-level the fundamentals of Tanah Lot are now constantly exposed to the waves. All efforts to restore the holy shrine have failed due to the forces of marine erosion. Tanah Lot will be destroyed by the ocean within the next ten to twenty years says local archeologist Mutchar Suendra.



In our documentary Mutchar Suendra will join Tom Goreau and his team to examine the fundament of the temple below sea-level. Given that corals accept their new artificial home on the fundamentals of Tanah Lot, the holy sanctuary almost certainly can be saved.

To find out more about the complex correlation between corals and metal Tom Goreau proceeds into the fascinating underwater world of Indonesia once more, heading for the wreck of US Liberty. For about 50 years the former warship has been laying on the seabed offshore the northern coast of Bali, now being completely covered by corals.



Goreau advances deeper and deeper into the labyrinth of metal. In the shipping space of US Liberty he hopes to find the crucial evidence. Under normal circumstances corals need a constant supply with sunlight for their survival. Will Goreau find coral polyps within the dark rooms of the shipwreck? If so, an enduring correlation with metal would be proved and the books on corals would have to be rewritten.

The structures of Bio-Rocks are not only a fascinating world for Goreau and his team. For the inhabitants of the Balinese coast-lines artificial reefs have an enormous value. Since several bombing attacks have shocked the famous holiday island tourist figures have inclined massively.



Some indigenous families are trying to take a chance on Bio-Rock structures to attract new tourists and hobby divers. A big competition about the most imaginative structure is about to start...