



## PASSAGES OF KNOWLEDGE

ZMT science in a sea of connections

### ON EXPEDITION

The “South Seas” is a popular way of referring to the South Pacific. It evokes a naïve, dreamy image, for example of the Fiji Islands: palm trees, sandy beaches and a paradise for divers thanks to the spectacular diversity of marine life to be seen on the reefs around the 350 plus islands. This is particularly true for reef passages – the “gates” in the reef that do not dry out even at low tide – where pelagic species like trevallies and sharks also hunt for food.

Yet, some disillusioning facts are always close. The fish stocks could feed the islands’ population, but they often do not. “Too big a share of the catch is sold and exported, and the local communities partially resort to imported tinned meat to feed themselves,” explains Annette Breckwoldt who works at ZMT in Marion Glaser’s research group on “Social-ecological Systems Analysis”.

Nearly 70 percent of global tuna catches and an equal quantity of tuna products on the German food retail market come from the Pacific. “But we still don’t know exactly how many local people are dependent on inshore fishing,” says the social ecologist, nor indeed, to what extent the various species are utilised. There is often still no scientific monitoring for sustainable resource management. One attempt to analyse the links between inshore and open-ocean fishing, and to harness them to benefit the population, is the German-French research project “SOCPacific – A Sea of Connections: Contextualizing Fisheries in the South Pacific Region” that was launched in 2018. On the German side it is located at ZMT in Programme Area 4 “Knowledge Systems and Ecosystem Design” and coordinated by Annette Breckwoldt, on the French side by Elodie Fache from the Institut de Recherche pour le Développement - IRD.

#### Multifaceted research

The interdisciplinary research in Fiji, New Caledonia and Vanuatu is based on collaborations with local partners. The goals of the project include a better understanding of the locally intertwined sectors of environmental protection and fishing as well as an analysis of perceptions, knowledge and values relating to the ocean and its resources. Findings show that in stories and pictures, adults and children describe the reef passages as particularly valuable. In some cases, they have spiritual or cultural values - through them, the souls of the deceased pass, and tourists or technologies enter, Breckwoldt relates. “So, reef passages are not only ecological hotspots and locations for fish spawning aggregations, they are also passages for knowledge and for understanding local contextualities.” [>MORE](#)

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# WHY? HOW? FOR WHOM?

## ZMT Programme Area 4 "Knowledge Systems and Ecosystem Design"

Managing ecosystems requires a great deal of knowledge on many different levels. If ecosystems appear to be damaged from an anthropocentric point of view, scientists must first find out why they are damaged and how the damage can be rectified. Then the question arises as to how the ecosystem should be restored – as it was "before" or as it "should" be? What "should" it be like? And why? What should decisions be based upon? Who is supposed to determine what services an ecosystem should provide – and for whom? What knowledge systems already exist on the ground and how can they be accessed? How do local communities perceive ecosystems? Which social groups interact with which ecosystems? What do they need and for what reasons? And who expects what exactly from science? Whose ideas and goals ultimately help inform the design of an ecosystem to be (re)created?

A host of questions shape the projects in ZMT's Programme Area 4 "Knowledge Systems and Ecosystem Design". These questions ensure that the sharing of ideas as well as the inevitable debates that constitute an essential part of the work are at the centre of this programme area.

*"Due to the cross-cutting thematic nature of PA 4, this is one of the places at ZMT which is a particular hub of interdisciplinary work, but also where interdisciplinary and sometimes controversial discussions are held on how best to implement ZMT's mission for sustainable conservation of tropical coastal systems."*  
(Hauke Reuter, ZMT, Spokesperson PA 4)

Social scientist Marie Fujitani and mangrove ecologist Martin Zimmer lead research projects in ZMT's Programme Area 4. Marie Fujitani's project "TransTourism" is about sustainable nature-based tourism in tropical coastal areas of Indonesia, Tanzania and Colombia. For her, this topic raises many fundamental questions.

*"As a social scientist who wants to understand people's relationships with their environment, I ask myself what priorities people in a particular place have with regard to their ecosystems, and what values they attach to the environment. Then what might be in the background, such as social hierarchies or knowledge politics. There are so many different ways people see the world and how they come to acquire knowledge. Knowledge is always plural. If we as scientists try to support healthy and functioning ecosystems in the world, we must first become aware of the different knowledge systems. This is what we do in PA 4."*  
(Marie Fujitani, ZMT, Spokesperson PA 4).

Martin Zimmer's projects focus on ecosystem services of mangrove forests. In PA 4, he enters the debates from a different angle:

*"For me as a natural scientist, it is particularly important to understand how my scientific knowledge about an ecosystem is in turn perceived by people; how it is then transferred to the public to ultimately become knowledge as well as awareness."*  
(Martin Zimmer, ZMT, Spokesperson PA 4)

The term "ecosystem design" has its own pitfalls in communication. How do people respond to the concept? Marie Fujitani points out that every decision about the goal-oriented management of an ecosystem involves something normative. "But people sometimes only realize this when the terms ecosystem and design are combined. It then sounds a bit provocative to many." But that is also the intention, Martin Zimmer says. At which point an inspiring conversation between the disciplines and the two ZMT scientists is launched – on the next page of this newsletter.

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PA 4 also includes ZMT research on the coexistence of aquaculture and mangroves as well as on restoration methods for tropical seagrass, coral or mangrove species or activities aimed at promoting regional ocean governance in the West Indian Ocean region. [>MORE](#)

## CONTROVERSY IS NOT A BUG, IT'S A FEATURE

Marie Fujitani and Martin Zimmer on ecosystem design and the example of tourism

### What is ecosystem design?

**Martin Zimmer:** The concept assumes that social groups always have expectations, needs and requirements in relation to ecosystems – no matter from which perspective they look at them. The core of ecosystem design is that there is a goal formulated by people. Let's say the goal is to restore a degraded ecosystem. Then the ecosystem should be designed in a way that provides exactly the services that people need or want most urgently. This could be coastal protection or carbon storage with a view to global climate change, but it could also be nature-based tourism. So, ecosystem design is always about ecosystem services for someone or something. These considerations assign a value to ecosystems that they do not have from an ecological point of view.

**Marie Fujitani:** It is good you point out that people assign values to ecosystems. Importantly, the concept of 'ecosystem services' was not introduced to 'put a price tag on nature' but to make it clear that nature is not a kind of empty space on a map. Ecosystems offer people something existentially valuable, and ecosystem services give concrete examples. But that does not detract from the fact that to some, an ecosystem has value in itself, or is an entity with personality. Ecosystem design moves us away from the problematic concept of 'virgin' wilderness restoration. Carefully curated and productive cultural landscapes have been mistaken for 'wilderness'. This is why knowledge systems and ecosystem design go hand in hand.

**Martin Zimmer:** That's an important point, ecosystem design doesn't necessarily aim to resemble a previous state of the ecosystem. On the contrary, the ecosystem according to human-formulated goals will probably somehow look rather different from 'before'. It is also a matter of first

designing an ecosystem that is as 'simple' as possible, which then provides the targeted ecosystem services.

### Does ecosystem design provoke conflicts?

**Martin Zimmer:** We have heated, controversial discussions with environmental organisations because restoring ecosystems mostly aims at reinstating the exact state before degradation and is understood as aiming at biodiversity, i.e., complex ecosystems. But a design does not have to be diverse. Take, for example, a mangrove forest that is to be reforested for more coastal protection. There are mangrove species that are really not especially suitable for the purpose. It makes sense not to plant those but to concentrate on species that are efficient for coastal protection. This means I have less diversity, but still achieve the socially motivated goal.

**Marie Fujitani:** Knowledge plays a role here: cultural landscapes don't have to look complicated to be complex.

### Can tourism be a goal of ecosystem design?

**Martin Zimmer:** If ecotourism is the goal of ecosystem design, one has to start a conversation about what the communities in the region need for it. This does not necessarily have to be biodiversity. But what that is exactly can't be measured with scientific methods.

**Marie Fujitani:** This is the point where controversial negotiations about ecosystem services begin, which in turn bring knowledge systems into play: who benefits in which way from what services and is also entitled to them? It is in the nature of things that there are conflicts here. The programme area pushes us to consider them all. I think that's fantastic. So controversy is not a bug, it's a feature.

*Marie Fujitani is the head of the working group Deliberation, Valuation and Sustainability (Social Sciences Department) and leads the project Transdisciplinary Science for Sustainable Tourism (TransTourism). [>MORE](#)*

*Martin Zimmer is at the helm of the Ecology Department and the working group Mangrove Ecology. He coordinates a number of projects investigating sustainable use, management and conservation of mangroves worldwide. [>MORE](#)*

### Top marks for top research

The evaluation of the Leibniz Centre for Tropical Marine Research (ZMT) conducted in 2020 earned the institute top marks. In March 2021, the Leibniz Association Senate recommended the Federal Government and Länder to continue their joint funding of ZMT. The statement emphasises, amongst other things, the “great relevance of ZMT’s activities for environmental management in tropical coastal regions.” ZMT’s interdisciplinary research and its close connection with natural and social sciences also receive a very good report. Finally, the committee recognises the institute’s achievements in transferring its findings to partner countries and developing competences within and outside of academia. [>Statement \(in German\)](#)

### UN Ocean Decade: The Science We Need for the Ocean We Want

The United Nations have declared the period from January 2021 to the end of 2030 the “Decade of Ocean Science for Sustainable Development”. The largest ecosystem on Earth is under massive threat – and at the same time of crucial importance for the survival of nature and mankind. More than ever, science and research must work together with policymakers, society and economic actors to initiate sustainable development. Three events mark the official start of the decade:

- On June 1, 2021, work begins with the first international conference of the Ocean Decade – the High-Level Launch of the Ocean Decade and Ocean Decade Laboratories (see More 1). The multi-stakeholder conference, held jointly by IOC-UNESCO and Germany’s Federal Ministry for Education and Research (BMBF), is opened by German Federal Research Minister Anja Karliczek. [>MORE](#)
- The conference is followed directly by the Virtual Early Career Professional Day (VE COP Day) showcasing the work of young researchers from all over the world in a 24-hour live stream. [>MORE](#)
- On June 2, the Decade is launched for Germany with a kick-off conference by the national Ocean Decade Committee presenting the decade’s goal and opportunities – also with ZMT participation. [>MORE](#)

### Challenge: data management

DatAlumni is the title of ZMT’s initiative to impart the fundamentals of research data management so that research data are globally findable, accessible, interoperable and reusable – i.e., FAIR. Together with its alumni, ZMT is responding to the challenges of data management in various disciplines and national infrastructures. In the process, ZMT alumni become multipliers promoting FAIR handling of data at their own institutes. To this end, the digital conference “Data management and collaboration for tackling marine challenges” was held in March 2021 after nearly two years of the project. [>MORE](#)

### ZMT in the Global Mangrove Alliance

Changed land use, exploitation, coastal development, climate change – all these things affect mangrove forests around the world. More than 50 percent of mangroves have been lost since roughly the middle of the last century. The Global Mangrove Alliance – an international association of research institutions, civil society organisations, governments, local communities, companies, funding organisations and foundations – campaigns for their worldwide protection. By 2030, it wants to facilitate restoration and recovery of 50% of recent (1996-2018) mangrove area loss, and double the area of effective and equitable protection and management of mangroves. ZMT is now an official member – along with organisations like the International Union for the Conservation of Nature (IUCN), The Nature Conservancy, Wetlands International and the World Wildlife Fund (WWF). [>MORE](#)

### Goodbye to one of the first at ZMT



Matthias Wolff was a researcher at ZMT for almost 30 years. He officially retired at the end of March – hugely respected by all his colleagues at ZMT. Wolff was one of two researchers to start working at the still young Bremen Institute in 1991. Since then, he has helped to shape its development – both in research and training. In 1999, for example, he and his colleagues developed the successful interdisciplinary, English-language Master’s programme on tropical coastal and resource management known as ISATEC (International Studies in Aquatic Tropical Ecology) which he headed for 20 years. But even though he has officially retired, Matthias Wolff is not lost to ZMT. He will still continue his ongoing research projects in Peru, Ecuador, East Africa and Colombia. [>MORE](#)