

## Study on water environment and atmospheric environment

Professor Dr. Masahide Ishizuka

Kagawa University, Faculty of Engineering and Design, Program in Architecture, Civil  
and Environmental Engineering



ishizuka.masahide@kagawa-u.ac.jp

In my laboratory, I focus on various substances contained in both water and atmosphere and on their dynamics.

Regarding the water environment, we are targeting nutrients such as nitrogen, phosphorus and silicon, phytoplankton, sand, and microplastics contained in river water those flow into the Seto Inland Sea. We are also conducting research on water stress and water environmental stress using GIS (Geographic Information System). We are also using a numerical simulation model to analyze water runoff and inundation after rain.

Regarding the atmospheric environment, we are targeting airborne substances such as Asian dust and PM<sub>2.5</sub> generated from the Gobi Desert in Mongolia, and bioaerosol such as mushroom spores and radioactive cesium contained in spores released from forests. Since these substances affect public health, ecosystems, climate, and human health, it is important to clarify how much and when and how they are emitted and transported.

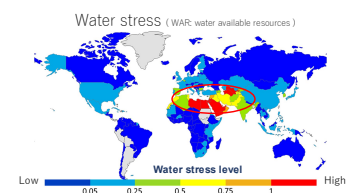
Some of the substances that move in water and atmosphere are naturally occurring, but others are human-caused. In addition, natural environments such as precipitation, wind, and soil in desert are also affected by human factors such as changes in the global environment due to global warming caused by social activities. In other words, research on water and atmospheric environment has both natural and social scientific aspects.

Environmental research is not easy to take a single answer and solution by solving equations. The phenomenon occurring at this moment cannot be reproduced again. That is why measuring observation data is so important. In addition, it is also important to see phenomena from multiple angles by using big data. It is difficult to think about why this is happening, but it is also fun and real pleasure to face unknown phenomena.

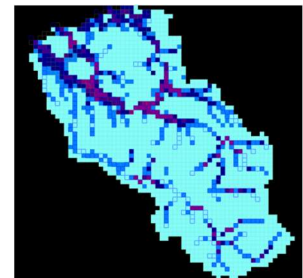
In many cases, measures to deal with environmental problems are delayed. However, even if it doesn't happen, we understand what is happening now and consider the risks and sustainability that may occur in the future. I do researches together with students about what to do now.



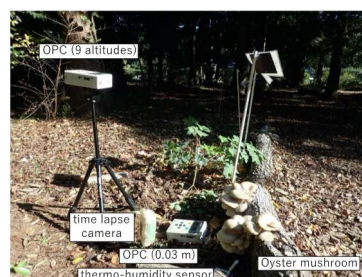
Microplastic survey in rivers  
of Takamatsu City



Water stress map in the  
world



Simulation of river flood and  
inundation



Field measurements of  
mushroom spores at the  
Tsukuba Botanical Garden



Observations of Arian dust  
and meteorology in the  
Mongolian Gobi Desert