



Laboratory of hydraulic Structures and
GeoEnvironmental engineering
EGGs

2025 spring version



OUR MOTTO

Pursuit of Knowledge and Technology for Future Generations

Several *keywords* we have are

Dam management

Solute transport

Groundwater

Materials

AI

SDGs

Diagnosis

REPRESENTATIVE RESEARCH TOPICS:

Quantification of groundwater and solute transport phenomena in heterogeneous aquifers

Development of eco-friendly construction materials and high-performance concrete

Diagnosis of surface and subsurface dams using machine learning and artificial intelligence

RESEARCH TOPICS



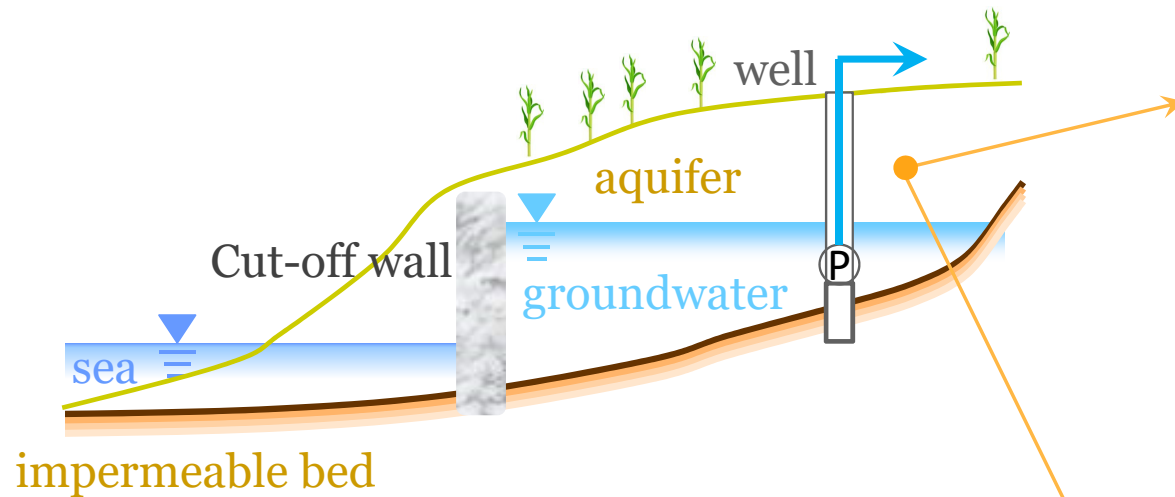
OUR RESEARCH TOPICS

SUBSURFACE DAM

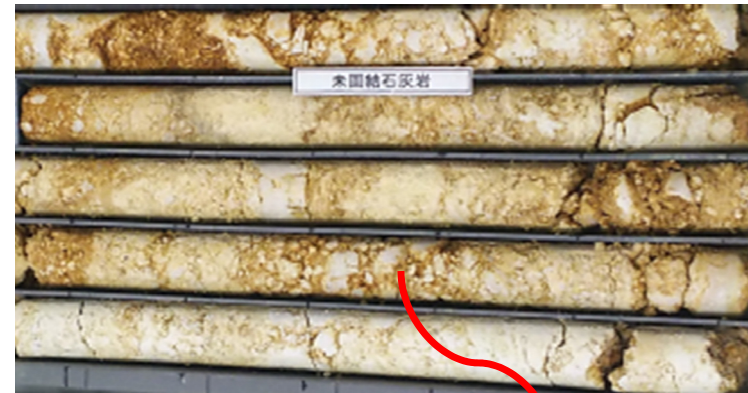
We have a research field in KIKAI island, Kagoshima prefecture in order to clarify the water and solute transport phenomena and to contribute **an effective management of subsurface dam** reservoir. Laboratory scale experiments related to salt water intrusion and solute transport in **highly heterogeneous porous formations** are also conducted.



Subsurface dams



Subsurface dam is a wall structure designed to dam up the **groundwater flow** and store groundwater in a suitable geological formation and contribute to the increase of agricultural production and sustainable water use.



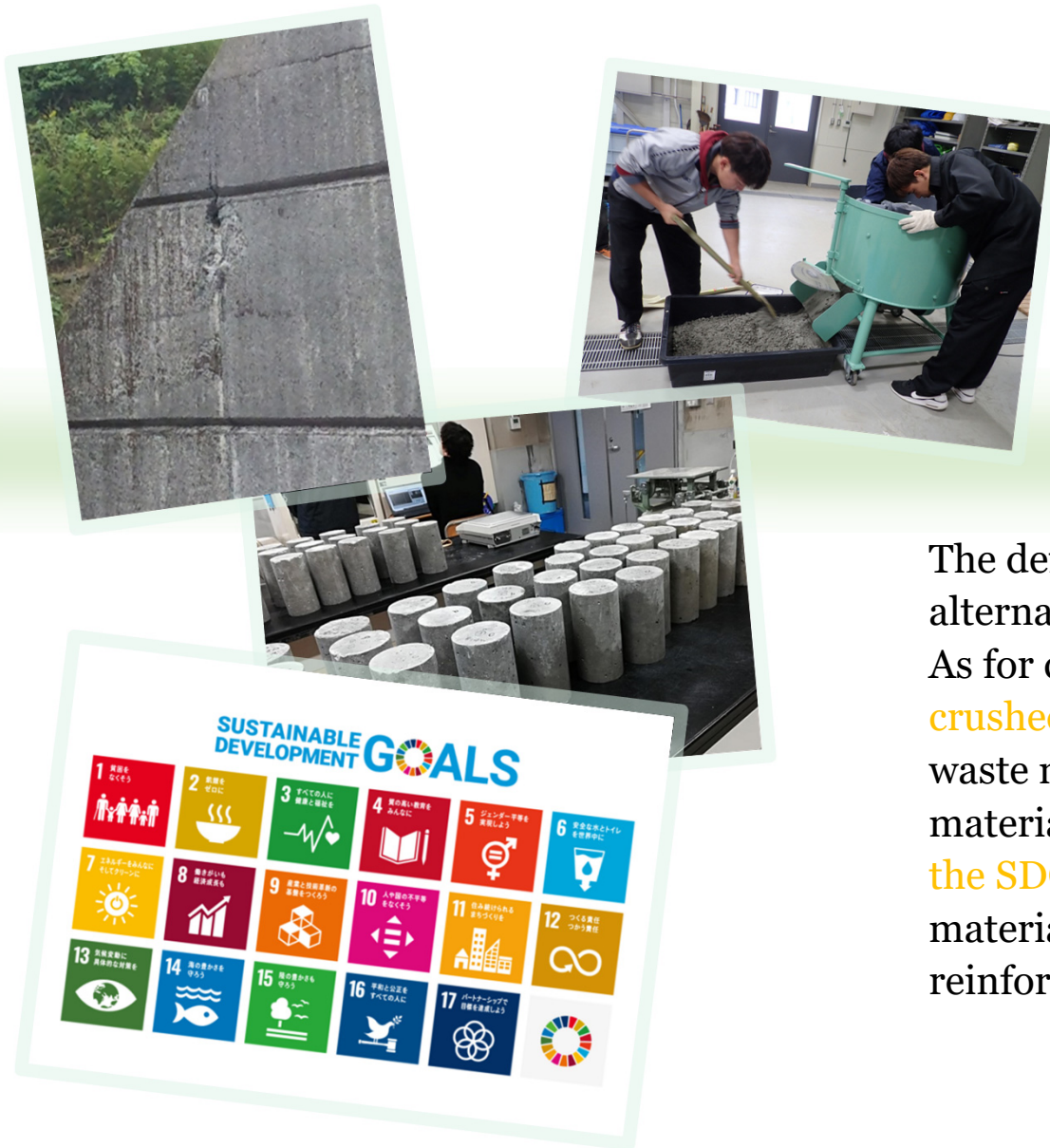
Groundwater is stored within these pores.



OUR RESEARCH TOPICS

UNIQUE CONCRETE

The deficit of natural sand arises the need of alternative materials for replacement of natural sand. As for concrete structure, we explore the utilization of **crushed stone** powder which is locally available stone waste material. This study is expected to reduce the material cost and construction cost and **to promote the SDGs**. We are also developing some concrete materials involving porous concrete and fiber-reinforced concrete.





OUR RESEARCH TOPICS



ARTIFICIAL INTELLIGENCE

Seepage rate through, below, or around dams is **an essential indicator of the health and condition of the dam**. Any abrupt change in the amount of leakage may be a serious sign of deterioration of dam body. We aim to create an artificial intelligence capable of predicting seepage rate and giving an alert for dam management.



Meet our professors and students





Dr. Mariko SUZUKI

Associate Professor

- Eco-friendly construction materials
- High performance concrete
- Embankment

Professors



Dr. Kazuya INOUE

Professor

- Seepage & solute transport
- Inverse analysis & random walk theory
- Machine learning & artificial intelligence

Meet our students



Hokuto OKABE, M2

Application of **chaos and fractal theory** to hydraulic conductivity and solute transport modeling



Yuta TERAMOTO, M2

Evaluation of factors affecting the strength of various mortars using **multiple regression analysis**

*Jerónimos Monastery,
Lisbon, Portugal*



Shun INOUE, M1

Alerting water resources in aquifer
using **artificial intelligence**



Tamami KOMOIKE, M1

Characteristics of **advanced processed**
recycled coarse aggregate and recycled
concrete powder



Kanako FUJIEDA, M1

Solute transport dynamics in
randomly and highly
heterogeneous porous formations



*Verzasca (Contra) dam,
Locarno, Switzerland*

Chihiro OMORI, B4

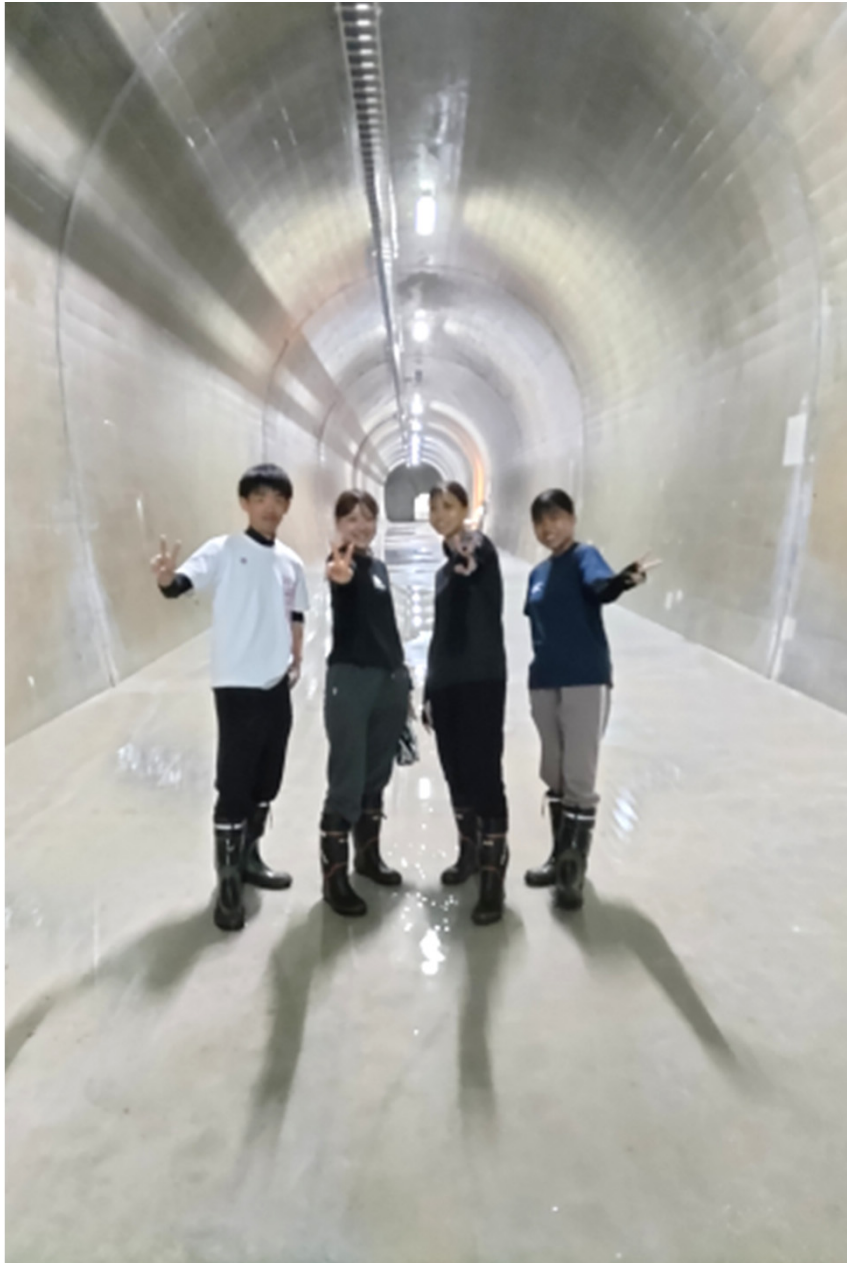
Spatial health diagnosis of
rockfill dams linked with
hammering sounds & artificial
intelligence



Moe MANABE, B4

Concrete, embankment &
state-of-the-art materials





Get in touch with us!

E-mail: mornel@kobe-u.ac.jp (Kazuya INOUE)

E-mail: msuzuki@peridot.kobe-u.ac.jp (Mariko SUZUKI)

URL: <https://www.research.kobe-u.ac.jp/ans-hysteng/index.html>

