



LABORATORY
OF
GEOENVIRONMENTAL ENGINEERING FOR AGRICULTURAL FACILITIES
G-EGGs

2026 autumn 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:

Diagnostic techniques for evaluating dam performance

Quantification of solute transport phenomena in heterogeneous aquifers

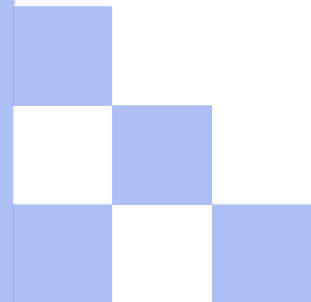
Development of eco-friendly construction materials and high-performance concrete

Artificial intelligence and machine learning for dam management



01

RESEARCH TOPICS



SUBSURFACE DAM



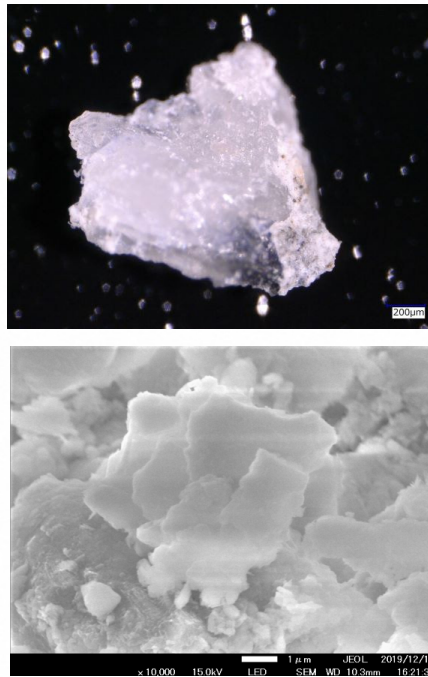
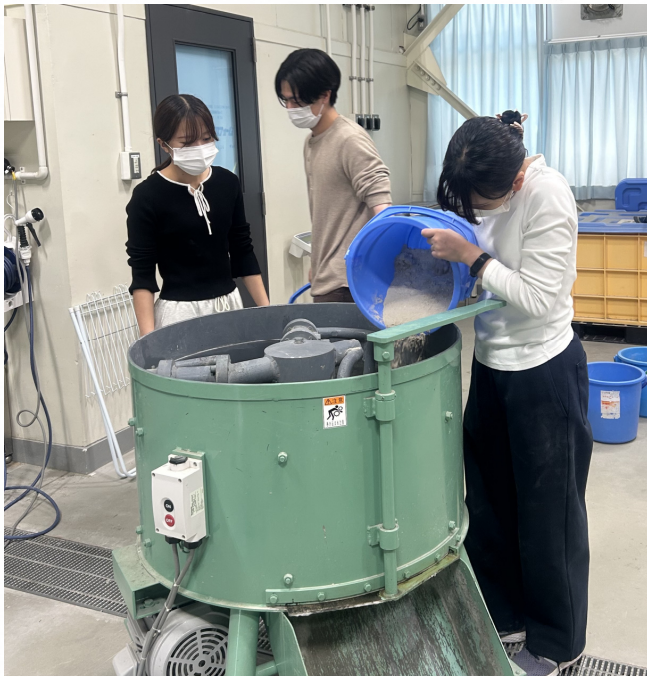
TOPIC #01

DAM

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



UNIQUE CONCRETE



TOPIC #02

CONCRETE

Concrete is used in a wide range of structures, including roads, pipelines, dams, and buildings. Its performance varies significantly depending on the proportions of these components such as water, cement, aggregates, and admixtures. Designing an appropriate mix for its intended application is an important aspect of concrete engineering. We are developing mix design methods for anti-crack concrete using curing agents, expansive additives, and short fibers to reduce cracking, one of the major forms of concrete deterioration.

DAMS & ARTIFICIAL INTELLIGENCE



TOPIC #03

AI

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.

STATE OF THE ART



TOPIC #04

MATERIALS

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.



02

MEET OUR PROFESSORS & 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

STUDENTS



Hokuto OKABE, D1



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



Shun INOUE, M2



Alerting water resources in aquifer using
artificial intelligence

*Jerónimos Monastery,
Lisbon, Portugal*



NEXT



Tamami KOMOIKE, M2

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



*Oscar Fredrik Church,
Gothenburg, Sweden*



Kanako FUJIEDA, M2

Solute transport dynamics in **randomly and highly heterogeneous** porous formations



PREV



NEXT



*Verzasca (Contra) dam,
Locarno, Switzerland*



PREV



Chihiro OMORI, M1

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



Moe MANABE, M1

A proposal of construction methods and
simplified testing for the effective utilization of
dredged soil from irrigation ponds



NEXT



Marina barrage,
Singapore



Yousei IMAI, B4



Persistent homology and
structural analysis in limestones



Kento HORIUCHI, B4



Impacts of **upscaling** on solute
transport phenomena



Yui YOSHITOMI, B4



Evaluation of blended materials for improving
properties of **crushed stone** dehydrated cake



Upper Belvedere, Vienna, Austria



PREV



Hazuki INO, B3

Sustainable Construction Materials
for a Circular Society



Ryota KIYA, B3

Water and Solute Transport
in Soil and Groundwater Systems



NEXT





Lower Belvedere, Vienna, Austria



Haruto MARUYAMA, B3

Sustainable Construction Materials
for a Circular Society



Haruto YAMAUCHI, B3

Sustainable Construction Materials
for a Circular Society





03

GET IN TOUCH WITH US

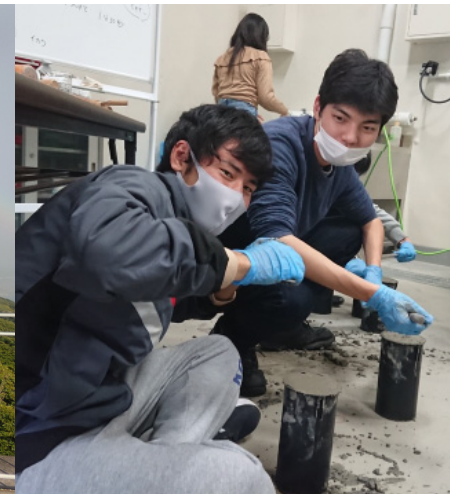


How does **E**GGs help other areas of society?

Knowledge and technologies by EGGs are applied to a wide range of fields:

- Contributing to a better environment, with novel and more efficient ways
- Society 5.0, increasing efficiency and automation
- Developing technologies expected to have significant impact in the future





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>

