

Critical Zone and Ecosystem Dynamics: Abandonment & Rebound

July 10, 2023-July 19, 2023



Summer Course on Critical Zone and land-use change and their
impacts on water and soils and social impact
In Tsukuba, Japan

Critical Zone and Ecosystem Dynamics: Abandonment & Rebound

Summer Course on Critical Zone and land-use change and their impacts on water and soils and social impact
July 10- 19, 2023

Director: Timothy White (The Pennsylvania State University, USA)

Scientific Secretary: Yuichi Onda (University of Tsukuba, Japan)

Lectures by

Timothy White (The Pennsylvania State University, USA)

Ashlee Dere (University of Nebraska-Omaha, USA)

Suzanne Anderson (University of Colorado, USA)

Jr-Chuan Huang (National Taiwan University, Taiwan)

Adam Wymore (University of New Hampshire, USA)

William McDowell (University of New Hampshire, USA)

Sharon Billings (University of Kansas, USA)

Wendy Yang (University of Illinois, USA)

Osamu Saito (Institute for Global Environmental Strategies, Japan)

Herlin Chien (National Pingtung University of Science and Technology, Taiwan)

Janet Swim (Pennsylvania State University, USA)

Takehiko Fukushima (Ibaraki Kasumigaura Environmental Science Center, Japan)

Yasushi Mori (Okayama University, Japan)

Takashi Gomi (Tokyo University of Agriculture and Technology, Japan)

Yuichi Onda (University of Tsukuba, Japan)

Overview

The Critical Zone (CZ) is the system that supports all terrestrial ecosystems and extends from the unweathered rocks to the top of any vegetation canopy in the CZ. Physical, biological, geological, and hydrological processes interact at multiple temporal and spatial scales.

This 9-day summer course will focus on aspects related to hydrology, soil geochemistry and weathering, vegetation dynamics and distribution, microbiota, biodiversity, ecosystem processes, geological processes related to the CZ, and the relationship of the CZ to sustainable development goals, with a basic focus on the relationship between critical zone function and ecosystem dynamics.. The course will cover in-situ data, long-term ecosystem studies, chemical and isotope laboratory analysis, remote sensing observations, and numerical modeling.

It also includes field trips to three different locations, including Fukushima, Hokkaido, and Tochigi, for lectures and experiments, as well as discussions with local people.

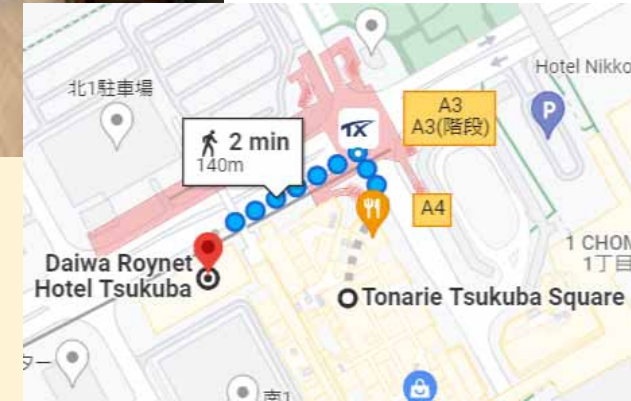
The course is intended for PhD students, post-doctoral fellows and researchers working or planning to work on Critical Zone processes and ecosystem dynamics. The lectures will be held mainly in the lecture rooms of the Research Building A at the University of Tsukuba. This ABRESO Summer School is organized by CRIED (Center for Research in Isotopes and Environmental Dynamics) at the University of Tsukuba in collaboration with The Pennsylvania State University.

For more information, please contact: Yuichi Onda (University of Tsukuba
email: onda@geoenv.tsukuba.ac.jp)

July 10 (Mon) arrival

Welcome to Japan!!

During your time in Tsukuba, you will stay at Daiwa Roynet Tsukuba.

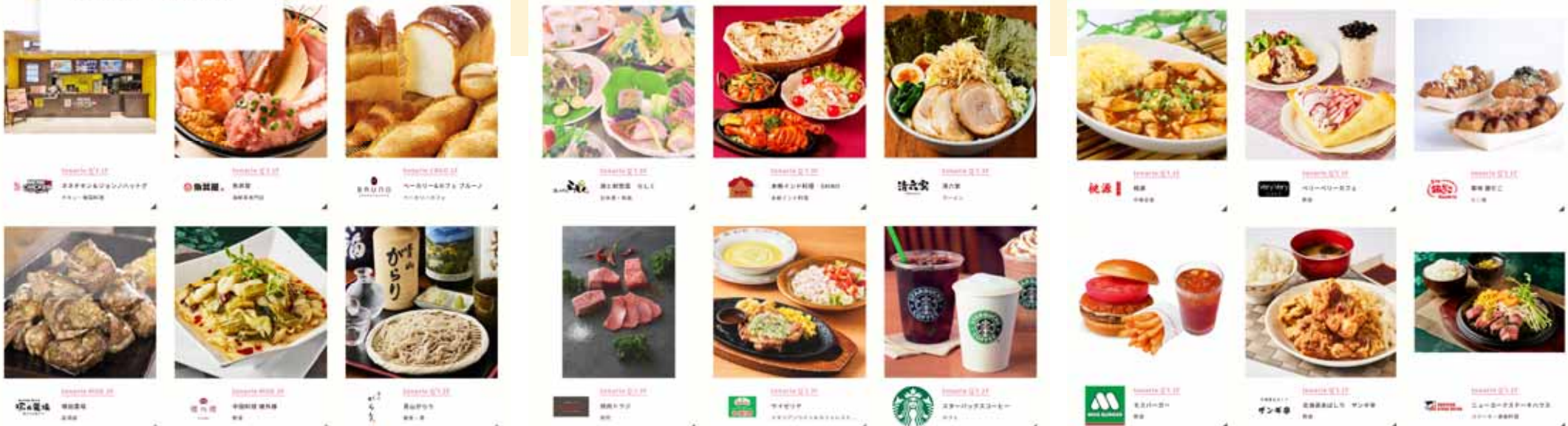


<https://tonarie-tsukuba.jp/restaurant/>

A few minutes' walk away is a shopping complex called Tonarie.

The Q't in the shopping complex contains a food court and restaurants.

On arrival day or on days when you do not have a joint dinner, it is convenient to use the Q't.



Access to University of Tsukuba from Daiwa Roynet Hotel

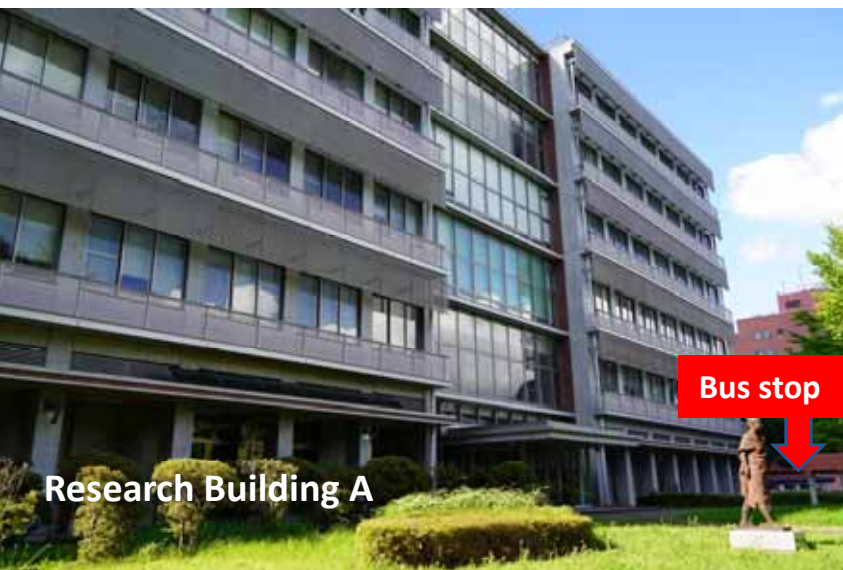
We are planning to hire a bus from the hotel to the campus, but you can also easily get to the campus by public transport!



It takes about 2mins by walk from Daiwa Roynet hotel to Tsukuba station Bus terminal and Tsukuba Station



Take the Bus from TSUKUBA Station Bus terminal No.6 bound for "University of Tsukuba Loop" or "Tsukuba Daigaku Chuo" for 10-15 minutes to "Tsukuba Daigaku Chuo." Please get off at "Tsukuba Daigaku Chuo". Research Building A is located next to that bus stop.



Research Building A

Click here for details on bus stops.

https://www.tsukuba.ac.jp/en/about/campus-access/tsukuba-access/campusbus_route_en.pdf



Day 1: July 11 (Tue)

The lectures will be held mainly in the lecture rooms of the Research Building A at the University of Tsukuba.

Lithosphere

9:30-11:40

Intro to CZ + Geoscience in context of CZ

Timothy White (The Pennsylvania State University, USA)

13:00-15:10

Regolith and soils and soil Geochemistry

Ashlee Dere (University of Nebraska-Omaha, USA)

15:30-17:40

Regolith, weathering engine, and geomorphology

Suzanne Anderson (University of Colorado, USA)

with some tie vie aspect and weathering engine to climate to lead into next day



Reception



Kappo Ichinoya
5,000JPY x 40 people
with all-you-can-drink
(Bus transportation)

Day 2: July 12 (Wed)

Land-atmosphere/Climate (TBD)

9:30-11:40

- Water cycle/Hydrology
Jr-Chuan Huang (National Taiwan University, Taiwan)

Hydro continued with focus on aquatic Geochem, Geochem cycles, etc

13:00-15:10

- C/Q
Adam Wymore (University of New Hampshire, USA)

15:30-17:40

- Nutrient cycles etc
William McDowell (University of New Hampshire, USA)

Night Lecture: 19:00-20:00

- Geography, Climate of Japan and sustainability
Takehiko Fukushima (Ibaraki Kasumigaura
Environmental Science Center, Japan)

Day 3: July 13 (Thu)

9:30-11:40

- Ecology in the context of CZ
Sharon Billings (University of Kansas, USA)

12:40-14:50

- Microbiological processes
Wendy Yang (University of Illinois, USA)



Afternoon tour & Dinner at Mt. Tsukuba

3pm- Mt. Tsukuba Tour



Bus trip (30minute ride: Japan side will pay)
Using bus and cable-car

<http://best-hike-japan.com/hiking/mt-tsukuba/>



https://tsukubasan-kandaya.com/wp-content/themes/kandaya_theme/images/kandaya_dantaisama_menu.pdf
(2000JPY+drink)

Day 4: July 14 (Fri)

9:30-11:40

Vegetation-Land a (TBD)

and-Atmosphere exchange

Social sciences and stakeholder engagement

13:00-15:10

Osamu Saito (Institute for Global Environmental Strategies, Japan)

15:30-17:40

Herlin Chien (National Pingtung University of Science and Technology, Taiwan)



Research building A110



Research building A107

Day 5: July 15 (Sat)

9:30-11:40

Janet Swim (Pennsylvania State University, USA)

Paddy field and the effect of carbon storage

13:00-15:10

Yasushi Mori (Okayama University, Japan)

Stay @Hotel Sano Sensuikaku

<https://sensuikaku.co.jp/>

1night breakfast approx.

6,000JPY =50\$/45Euro

Dinner at Sensuikaku 3,000JPY



After the 2nd lecture,
we will head to Tochigi Pref!!



4pm Transfer to Tochigi Pref. (about
1h40min)

Night Lecture: 19:00-20:00

- Forest and Water in Japan

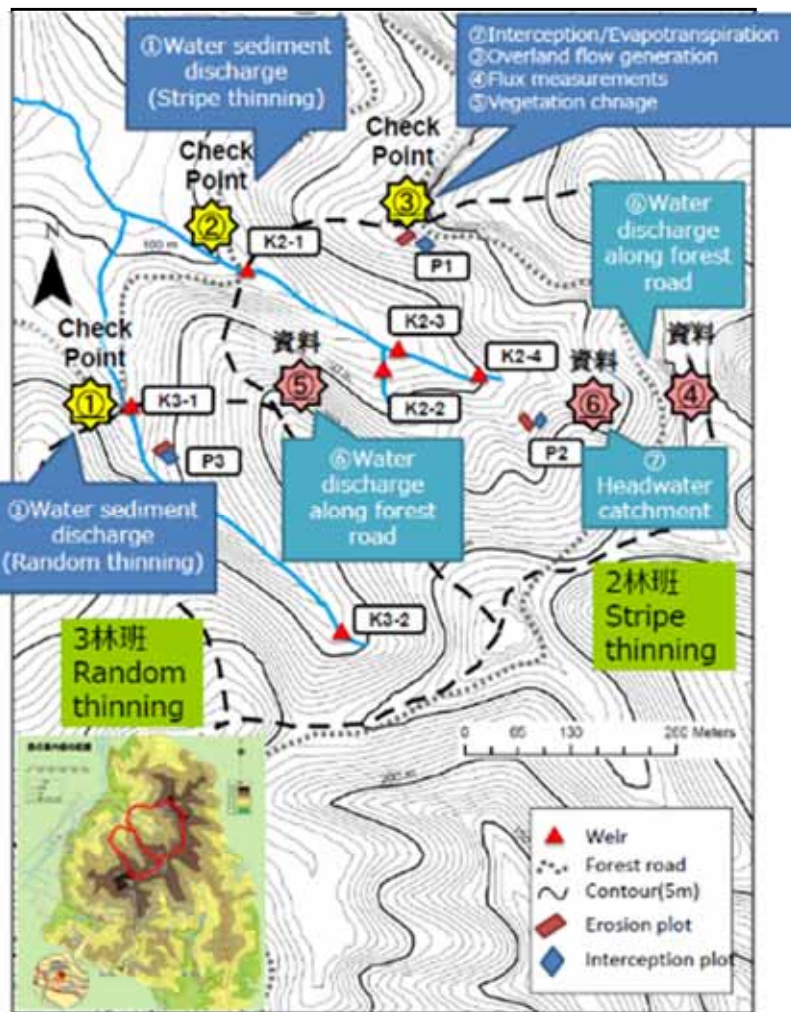
Takashi Gomi (Tokyo University of Agriculture and Technology, Japan)

Overview of natural disturbance and the recovery processes, Hydrologic and Geomorphic aspects of natural disasters

Day 6: July 16 (Sun)

Field Trips to Tochigi, Hokkaido and Fukushima!!

Field Trip : TOCHIGI site (Abandoned forest and recovery)



- Monitoring site, Dense and abundant forest, Management practices, Overall explanation
- Field visit and discussion at Gauging station of Discharge
- Field visit at Monitoring throughfall, stem flow, sap flow, and flux tower
- Analyze data with LiDAR and drone technology

Afternoon meeting

Meet with local people, people in forestry, NPOs, and local government. Furthermore, we invite lecturers from Forestry Agency, Forest Technology Association, etc. about forest management.



Stay @Hotel Sano Sensuikaku

<https://sensuikaku.co.jp/>

1night breakfast approx.

6,000JPY =50\$/45Euro

Dinner at Banquet at Sensuikaku 5,000JPY



Day 7: July 17 (Mon)

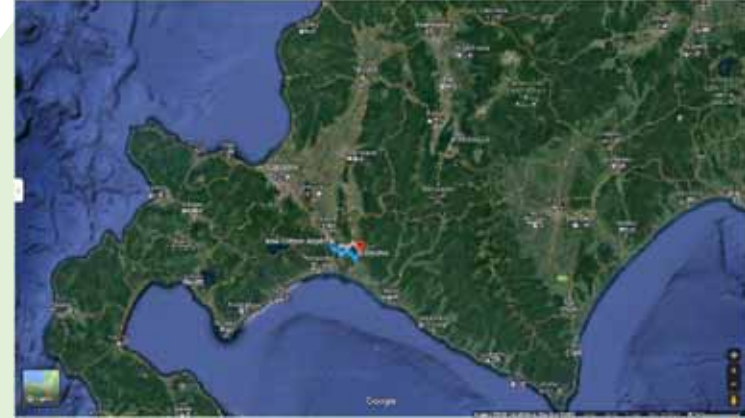
Field Trip : HOKKAIDO site (Disturbed by massive landslides)

Transfer to Ibaraki airport (about 1.5h)

<https://goo.gl/maps/Y2UhH2ovJbW8coxb7>



9:40 Ibaraki airport – 11:00 Sapporo SKY 791 15000JPY



Transfer to Hokkaido Atsuma site (about 40 min)

<https://goo.gl/maps/AYCYCUXPe2542mV86>

Earthquake induced landslides

Volcanic layered soil formation and hydrological and sediment transport

**Dinner
&
Stay**

Dinner @Kirin Beer Garden
All you can eat- all you can drink
(Beer- wine- whisky, soft drink)
5,000JPY

<https://www.kirin.co.jp/experience/factory/chitose/restaurant/>



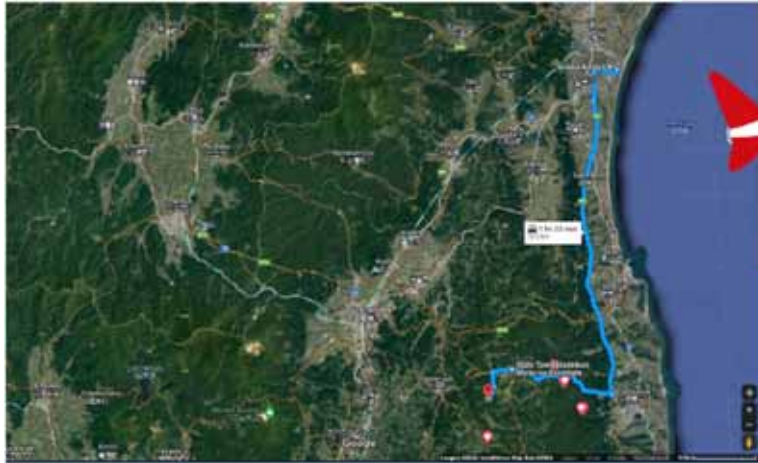
Stay @Hotel Grand Terrace Chitose

<https://breezbay-group.com/hgt-chitose/>

Day 8: July 18 (Tue)

Field Trip : FUKUSHIMA site (Abandoned land by Fukushima Daiichi Nuclear Power Plant accident and their recovery)

Sapporo 7:50 – Sendai 9:00 HD100 (10000JPY)
Transfer from Sendai to Fukushima (about 1.5h)
<https://goo.gl/maps/bydnE6vkuehLUE4r9>



Visit Fukushima decontamination site at IIDATE and NAMIE

and also discuss with
the local people
13:00-

Night Seminar

21:30-22:30

Yuichi Onda : recovery of Fukushima

Dinner
&
Stay



J Village stay overnight
10,000JPY / night with breakfast



Farewell

7pm- Tim cup! Farewell event
Football tournament
Relay
6,500 JPY/hour

Farewell Party
5,000 JPY/person

Day 9: July 19 (Wed)

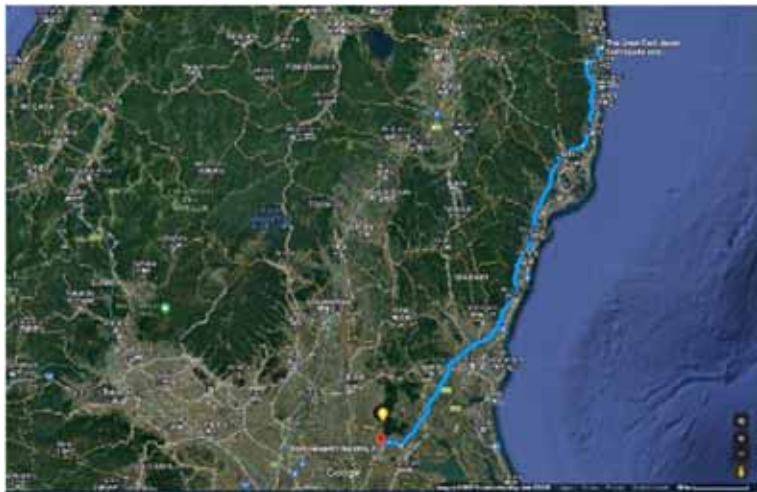
The Great East Japan Earthquake and Nuclear Disaster Museum (storyteller available)

<https://www.fipo.or.jp/lore/>



Arrive Tsukuba at 14:00 (about 3h)

<https://goo.gl/maps/BPyPveEkNugERgAf6>



Narita airport at 15:00

<https://goo.gl/maps/5hDLTYLLDLrpDThP7>

