

IELP and GP-RSS SUMMER SCHOOL

International Environmental Leadership Program

International Joint Graduate Program in Resilience and Safety Studies

Graduate School of Environmental Studies

*“Cutting-edge innovation, policy and research
for a sustainable and resilient society”*

TOHOKU
UNIVERSITY

August 31 – September 4, 2020

Online Host: **Google Meet**

<https://meet.google.com/lookup/hkbd62jgei>

classroom code: **ssamoes**



PROGRAM SCHEDULE

	August 31 (Monday)	September 1 (Tuesday)	September 2 (Wednesday)	September 3 (Thursday)	September 4 (Friday)
AM (09:00-12:00)			Guest Speakers		Guest Speakers
PM 1 (13:00-16:00)	Student Presentations			Student Presentations	
PM 2 (16:00-19:00)		Guest Speakers			

August 31



Noriyoshi Tsuchiya, PhD
Dean, GSES, Tohoku University



Student Presentations

September 1
Guest Speakers



Michael Hagenlocher, PhD
United Nations University



Joerg Szarzynski, PhD
United Nations University

September 2
Guest Speakers



David Banis, MS
Portland State University



Hunter Shobe, PhD
Portland State University

September 3



Student Presentations

September 4
Guest Speakers



Yunshi Wang, MS
University of California - Davis



Tatsuya Kawada, PhD
Tohoku University



AUGUST 31 (MONDAY)

STUDENT PRESENTATIONS

TIME

13:00 – 13:10	Opening message ----- Dean, Prof. Noriyoshi Tsuchiya
13:10 – 13:15	Presentation guidelines ----- IELP Coordinators
13:15 – 13:45	Topic presentation ----- Chikako Ogane and Shinya Yamauchi
13:45 – 14:15	Topic presentation ----- Astin Nurdiana and Pei Shiyu
14:15 – 14:30	Conference presentation ----- Jay Mar D Quevedo
14:30 – 14:45	Internship presentation ----- Nga Duong Thanh
14:45 – 14:50	Break
14:50 – 15:20	Topic presentation ----- Fang Chen and Du Runda
15:20 – 15:50	Topic presentation ----- Tanmoy Roy Tusher and Christine Wiyono
15:50 – 16:00	Interactive session ----- IELP Coordinators



SEPTEMBER 1 (TUESDAY)

GUEST LECTURE

TIME: 16:00 – 17:30

Understanding disaster risk to build resilience in the context of global change: progress, challenges and future directions

MICHAEL HAGENLOCHER, PhD

ABSTRACT

Natural hazards (e.g. floods, droughts, storms, earthquakes) and climate change impose a heavy burden on communities, ecosystems, and entire economies across the globe. Efforts to build and strengthen resilience through disaster risk reduction, risk transfer and adaptation are hence increasingly prioritised in key policy documents and agendas at the national (e.g. National Adaptation Plans) and international (e.g. the Sendai Framework for Disaster Risk Reduction, Paris Climate Agreement) level. In response to that, the need for improved knowledge about the drivers, spatial patterns and dynamics of disaster risk to inform resilience-building efforts and strategies has been repeatedly stressed by scientists, practitioners and decision-makers. This lecture aims at introducing key concepts in the field of vulnerability, risk, resilience, and adaptation research. The lecture shall enable students to not only know and understand the field's basic concepts, but to transfer and link these concepts and the underlying paradigms of risk management to the current policy frameworks for applied risk reduction and adaptation. Thereby, the lecture will also reflect on the role of risk assessments to provide necessary baselines, discuss persisting challenges, and outline possible future directions.



MICHAEL HAGENLOCHER, PhD

Associate Academic Officer, Vulnerability Assessment, Risk Management & Adaptive Planning (VARMAP) and the Environmental Vulnerability & Ecosystem Services (EVES) sections
Institute for Environment and Human Security
United Nations University

PhD (Hons) in Applied Geoinformatics - University of Salzburg, Doctoral College "Geographic Information Science", Austria, in collaboration with the Harvard T.H. Chan School of Public Health, USA

MS (Hons) in Geography (Minors in Sociology and Geoinformatics), University of Tuebingen and University of Stuttgart, Germany

His broad research interests include human-environmental interaction, disaster risk reduction, climate change adaptation and community resilience. His work focuses on developing novel concepts and methods for the assessment of drivers, hotspots and dynamics of vulnerability and risk associated with natural hazards at different scales, and the evaluation of risk reduction and adaptation options in the context of global change and sustainable development.

SEPTEMBER 1 (TUESDAY)

GUEST LECTURE

TIME: 17:30 – 19:00

Early Warning Systems and coordination and interoperability in international disaster risk management and humanitarian response

JOERG SZARZYNSKI, PhD

DESCRIPTION OF LECTURE CONTENT:

Part I of the lecture will introduce to the framework of systematic people-centered early warning systems. Effective early warning systems often require a strong technical foundation and comprehensive in-site or remote sensor-web technologies as well as a scientific sound knowledge of the risks. But at the same time they must have a strong focus on the people, a clearly defined dissemination system capable to reach those exposed to risk, and finally practiced and knowledgeable response procedures by emergency managers and the public society. Public awareness and education are most critical aspects in this context.

Part II will look into assessment and coordination in international Disaster Management and Humanitarian Response. Relevant information will be provided regarding structures, workflows, and practical challenges of international organizations, particularly UN organizations, dealing with disaster management and humanitarian response.



JOERG SZARZYNSKI, PhD

Co-Head, Global Mountain Safeguard Research (GLOMOS)
Institute for Environment and Human Security
United Nations University

PhD in Physical Geography and Atmospheric Sciences (*Summa cum laude*) - Department of Geography, Faculty of Mathematics and Informatics, University of Mannheim

Diploma in Geography (*Magna cum laude*) - Department of Geography, University of Bonn

His research interests focus on intercultural training and innovative education concepts, the use of geospatial information technology for disaster risk reduction and emergency response preparedness, early warning systems, and disaster assessment and coordination.

His expertise includes climatology and earth observation technologies, global environmental change and sustainable development research, capacity-building and web-based data and information management.

SEPTEMBER 2 (WEDNESDAY)

GUEST LECTURE

TIME: 09:00 – 12:00

Cultural Cartography as a Means of Understanding, Representing, and Promoting Social Sustainability and Resilience:

Lessons from *Portlandness*

DAVID BANIS and HUNTER SHOBE

ABSTRACT

In this session we explore the ways in which maps and atlases intersect with social sustainability and resilience. We draw from cultural cartography in discussing how maps can promote different ways of looking at everyday life in cities. The use of maps with supporting text, photographs and graphics can provide a way for people to better comprehend the social dimensions of sustainability and resilience. As people often give maps great authority, mapmakers hold power and thus must exercise responsibility in creating representations of the world. We draw examples from our book *Portlandness: a cultural atlas* and our forthcoming title *Upper Left Cities: a cultural atlas of San Francisco, Portland, and Seattle*. The session will include an in-class mapping exercise.



DAVID BANIS

GIS Lab Manager and Associate Director,
Center for Spatial Analysis and Research
Instructor, Department of Geography, College of Liberal Arts and
Sciences, Portland State University

He teaches courses on cartography and geographic information systems. His work explores the diverse ways that cartographers can tell stories with maps, with a focus on public participatory mapping.



HUNTER SHOBE, PhD

Associate Professor, Department of Geography
College of Liberal Arts and Sciences, Portland State University

PhD in Geography – University of Oregon, Department of Geography

His research explores the cultural and political dimensions of how people connect to and create meaning in different places.



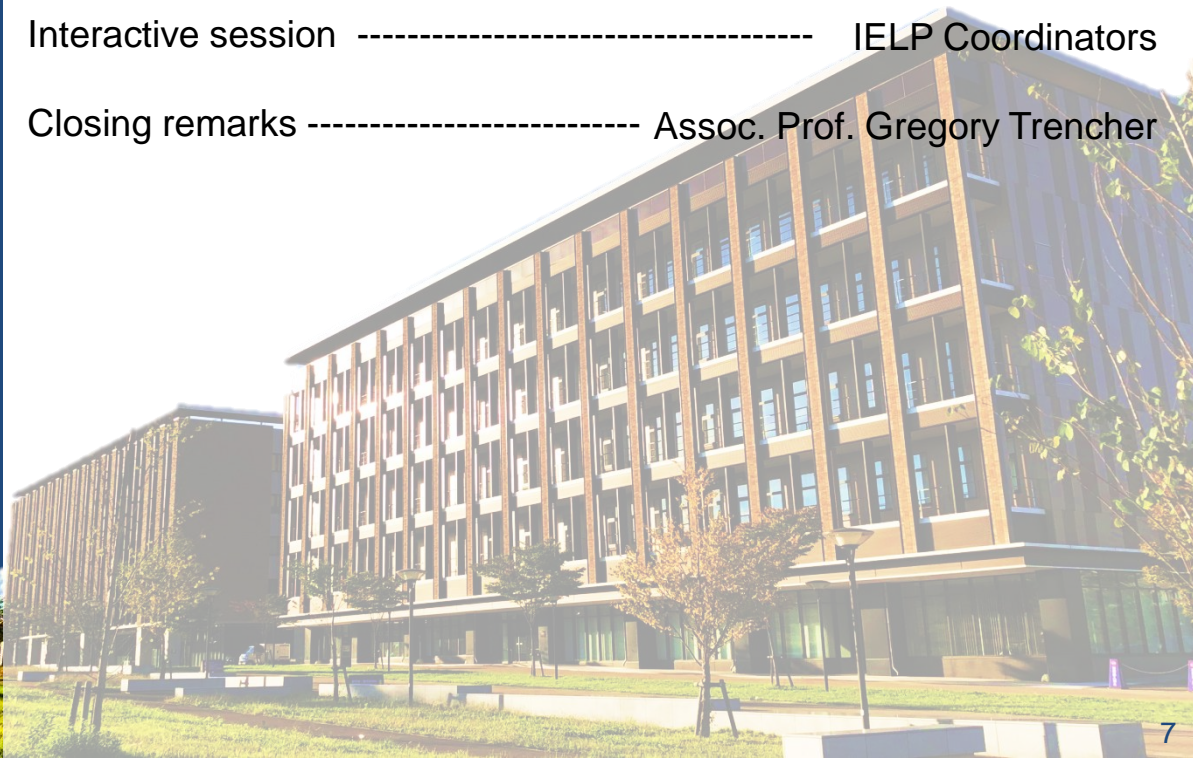
IELP and GP-RSS SUMMER SCHOOL

GRADUATE SCHOOL OF ENVIRONMENTAL STUDIES

SEPTEMBER 3 (THURSDAY)

STUDENT PRESENTATIONS

TIME	
13:00 – 13:05	Presentation guidelines ----- IELP Coordinators
13:05 – 13:35	Topic presentation - Taufik Ardiansyah and Amarsaikhan Tsogtbaatar
13:35 – 14:05	Topic presentation ----- Imam Eko Setiawan and Shiori Osanai
14:05 – 14:20	Conference presentation ----- Astin Nurdiana
14:20 – 14:35	Internship presentation ----- Tanmoy Roy Rusher
14:35 – 14:40	Break
14:40 – 15:10	Topic presentation ----- Rong Chao and Guo Guangze
15:10 – 15:40	Topic presentation ---- Jay Mar D. Quevedo and Nga Duong Thanh
15:40 – 15:45	Interactive session ----- IELP Coordinators
15:45 – 16:00	Closing remarks ----- Assoc. Prof. Gregory Trencher



SEPTEMBER 4 (FRIDAY)

GUEST LECTURE

TIME: 09:00 – 10:30

The projection of China's Vehicle Growth, Past, Present, and Future with a focus on New Energy Vehicles

YUNSHI WANG

ABSTRACT

This lecture will focus on the past under-projection of China's vehicle market and fleet growth by major international energy organizations and companies and the reasons behind their underestimates of the growth. I will further explain that the same reasons will make them over-project the future of China's vehicle market. In addition, I will describe my on-going project to project China's future vehicle market and fleet growth.

Along the way, I will talk about China's New Energy Vehicle (NEV) policies and the rationale behind these. I will also discuss the current major programs and my projection of China NEV deployment future. There will also be a quick introduction to China's efforts to lead in connected and intelligent vehicle technologies and the differences between the American and Chinese strategies to lead the race. I may also touch on California's role in China's adoption of the Dual Credit Policy that links Corporate Average Fuel Consumption (CAFC) policy with NEV credit policy.



YUNSHI WANG

Director, China Center for Energy and Transportation
Institute of Transportation Studies, University of California - Davis

Co-director of the China–U.S. ZEV Policy Lab | Research fellow, MIT Sloan School of Management

Previous engagements with the World Bank on China-related energy projects and energy demand projection, as well as with the Japanese government (JICA) in Asia, Africa, and Latin America, and United Nations Development Program.

MS International Development -American University | MS English - Boston University
BS Shanghai Maritime University in English and Shipping Law and Business

SEPTEMBER 4 (FRIDAY)

GUEST LECTURE

TIME: 10:45 – 12:15

High Temperature Fuel Cells and Electrolysis: Solid Oxide Electrochemical Technologies for Efficient and Flexible Use of Energy Resources

TATSUYA KAWADA, PhD

ABSTRACT

Large introduction of renewable energies requires mitigation of their fluctuations. For storing the surplus and compensating the shortage, hydrogen is an ideal energy carrier in terms of its abundance and recyclability. The shift of current energy system to hydrogen-based system will take place gradually, starting from blending hydrogen into natural gas pipelines or building a local hydrogen network in a special area or for a special purpose. However, hydrogen is not perfect. It is not as useful as liquid fuels. The energy loss in hydrogen production is still large with currently available electrolyzers.

Solid oxide electrochemical technologies provide another path to promote the introduction of renewable energies. The short- and long- term fluctuations of the natural resources can be compensated with virtual power plant (VPP) network of solid oxide fuel cells (SOFC) which can generate electricity from natural gas with extremely high efficiency. The reverse operation of SOFC; i.e. high temperature electrolysis of water vapor or carbon dioxide; can generate hydrogen or carbon monoxide with “over 100%” efficiency when waste heat is available from outside. Research projects of Power to Gas (P2G) or Power to Liquid (P2L) technologies that utilizes captured CO₂ as carbon source are conducted using solid oxide electrolysis cells (SOEC).

The technology of SOFC/SOEC is based on solid state electrochemistry or solid state ionics. A typical electrolyte material is ZrO₂ doped with Y₂O₃, which is called Yttria Stabilized Zirconia (YSZ). Although YSZ is a hard ceramic material, oxide ion can move through the crystal lattice using a “vacancy” site by jumping in and jumping out. Similar mechanism work also in oxide electrode material such as (La,Sr)CoO_{3-δ}.

In the seminar, mechanism of SOFC/SOEC operation will be explained in more details to understand the reason of high energy conversion efficiency of those devices. The development status, challenges, and future prospects of the technology will be discussed.



TATSUYA KAWADA, PhD

Professor, Department of Mechanical and Aerospace Engineering
Graduate School Environmental Studies
Tohoku University

PhD | MS | BS – Graduate School of Engineering, The University of Tokyo

Professional Experiences - Assoc. Prof. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University | Assoc. Prof. Institute for Scientific Measurements, Tohoku University | National Institute for Materials and Chemical Research, AIST, MITI | National Chemical Laboratory for Industry, AIST, MITI



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