"Integrated Knowledge on Disaster and Environmental Risk Management"

「環境・災害データ・情報統融合学 E」

Lectures: Akiyuki Kawasaki (Associate Professor), Petra Koudelova (Research Associate), and Toshio Koike (Professor)

Schedule: Winter semester (October 9th, 2015 – January 22nd, 2016)

Learning objectives: Inter-disciplinary approach – collaboration among academic disciplines – is required for tackling complex environmental problems on sustainability of earth system and human beings, including resource depletion, poverty issue, degradation of biodiversity, and addressing climate change and mega disasters. Such collaboration requires effective work with so called Big Data, which is a common term for large volumes and large variety of data and information. Presently, innovative technologies are being developed to facilitate sharing and exploitation of Big Data for addressing the abovementioned issues, with the Data Integration and Analysis System (DIAS) of Japan being an example, which is now ready for practical use.

"Integrated Knowledge" is an area of academic field that systemizes the technical background, fundamental concept, methodologies, and international framework of the data integration for promoting inter-disciplinary and trans-disciplinary in the field of environmental and disaster field, which is highly demanded by the society. The objectives of this lecture is teaching "Integrated Knowledge" as an academic area of linking among various disciplines and working with Big Data in practical manner, through analyzing actual cases of data integration and analysis system in disaster and environmental fields.

Course outline

Category	Lecture topic	Frequency	Lecturer
Introduction	Importance of inter-linkage: Why do we need data integration (integrated knowledge)?	1	Kawasaki
Case study	DIAS (Data Integration and Analysis System): Advanced data integration system developed at UTokyo	1	Koike
	Big data in civil engineering:	1	Kawasaki
	E-infrastructure in the world:	1	Kawasaki
Method (Framework and tool)	Water Cycle Integrator: A framework for Integrating water circulation model and data	1	Koike
	CMIP5 (Coupled Model Intercomparison Project Phase 5): A tool for climate Big Data analysis	4	Koudelova
	GIS (Geographic Information System): A tool for overlay analysis between natural environment and human activities; visualization; spatial modeling	2	Kawasaki
Linkage to the society	From data to knowledge, and to action: Environmental psychology	1	Koike
	Community development, consensus building: AWCI, GEO, Future Earth	1	Kawasaki

Course schedule (Friday, 16:50-18:35, 2015, at Room No.17)

	Date	Lecture topic	Lecturer
1	Oct. 9th	**Introduction**	Kawasaki
2	Oct. 16th	**Case study:** DIAS (Data Integration and Analysis System)	Koike
3	Oct. 23rd	**Method:** Water Cycle Integrator	Koike
4	Oct. 30th	**Case study:** Big Data in civil engineering	Kawasaki
5	Nov. 6th	**Method:** GIS (Geographic Information System)	Kawasaki
6	Nov. 13th	**Method:** DIAS tool for CMIP5 (Coupled Model Intercomparison Project Phase 5): Lecture	Koudelova
7	Nov. 20th	**Method:** DIAS CMIP5 tool: Hands-on Exercise	Koudelova
8	Nov. 27th	**Method:** DIAS CMIP5 tool: Hands-on Exercise	Koudelova
9	Dec. 4th	**Method:** DIAS CMIP5 tool: Hands-on Exercise	Koudelova
	Dec. 11th	*Consultation day for CMIP5 – optional*	Koudelova
10	Dec. 18th	**Method:** GIS (Geographic Information System) : Hands-on Exercise	Kawasaki
11	Dec. 25th	**Case study:** E-Infrastructure in the world	Kawasaki
12	Jan. 8th	**Linkage to society:** From data to knowledge and to action: Environmental psychology	Koike
13	Jan. 12th	**Linkage to society:** Community, consensus building: AWCI, GEO, Future Ear	Kawasaki
	Jan. 22nd	Option (if needed): Feedback to the report	

Evaluation

Attendance: 30%, Report 70% (A (due date: end of Dec.); B (due date: mid-Jan.))

Lecture Notes

http://aqua.t.u-tokyo.ac.jp/REEL/lecture_note/ (Login:IK2015 Password:IK2015)