

The past, present and future of
Paddy and Water Environment Engineering
- A bridge between UTokyo and NTU built by my teacher, professor Shirai



2015.12.9

@Yayoi Auditorium, UTokyo

水田・水環境工学

Paddy and Water Environment Engineering

- The science and technology of water and environment-related disciplines in paddy-farming
- Agricultural engineering in paddy farming regions
 - irrigation and drainage
 - soil and water conservation
 - land and water resources management
 - paddy multi-functionality
 - agricultural policy
 - regional planning
 - bioenvironmental systems
 - ecological conservation and restoration



Prof. Hidesaburo Ueno (1871-1925) is the Founder of this field

Taiwan vs. Japan (台灣 vs. 日本)

University department (大学)

生物・環境工学専攻 Biological Environmental Engineering	生物環境工程学系 Bioenvironmental Systems Engineering
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Academic Society (学会)



社團法人台灣農業工程學會 Taiwan Agricultural Engineers Society



The Japanese Society of Irrigation, Drainage and Rural Engineering

公益社団法人 農業農村工学会

Land improvement (土地改良)



農田水利會聯合會 TAIWAN JOINT IRRIGATION ASSOCIATION, R.O.C.



みどり
全国水土里ネット
—新・田舎人フォーラム—

International Society of Paddy and Water Environment Engineering (PAWEES)

Agriculture

Home > Life Sciences > Agriculture



SUBDISCIPLINES

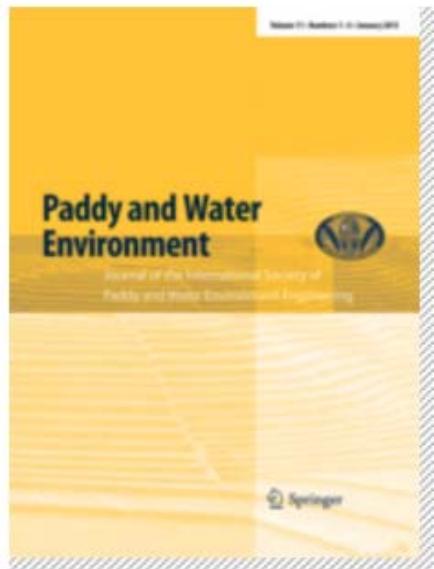
JOURNALS

BOOKS

SERIES

TEXTBOOKS

REFERENCE WORKS



Paddy and Water Environment

Editor-in-Chief: **Masaru Mizoguchi**

ISSN: 1611-2490 (print version)

ISSN: 1611-2504 (electronic version)

Journal no. 10333

Chief Managing Editor: Yu-Pin Lin (2009-2013) @NTU

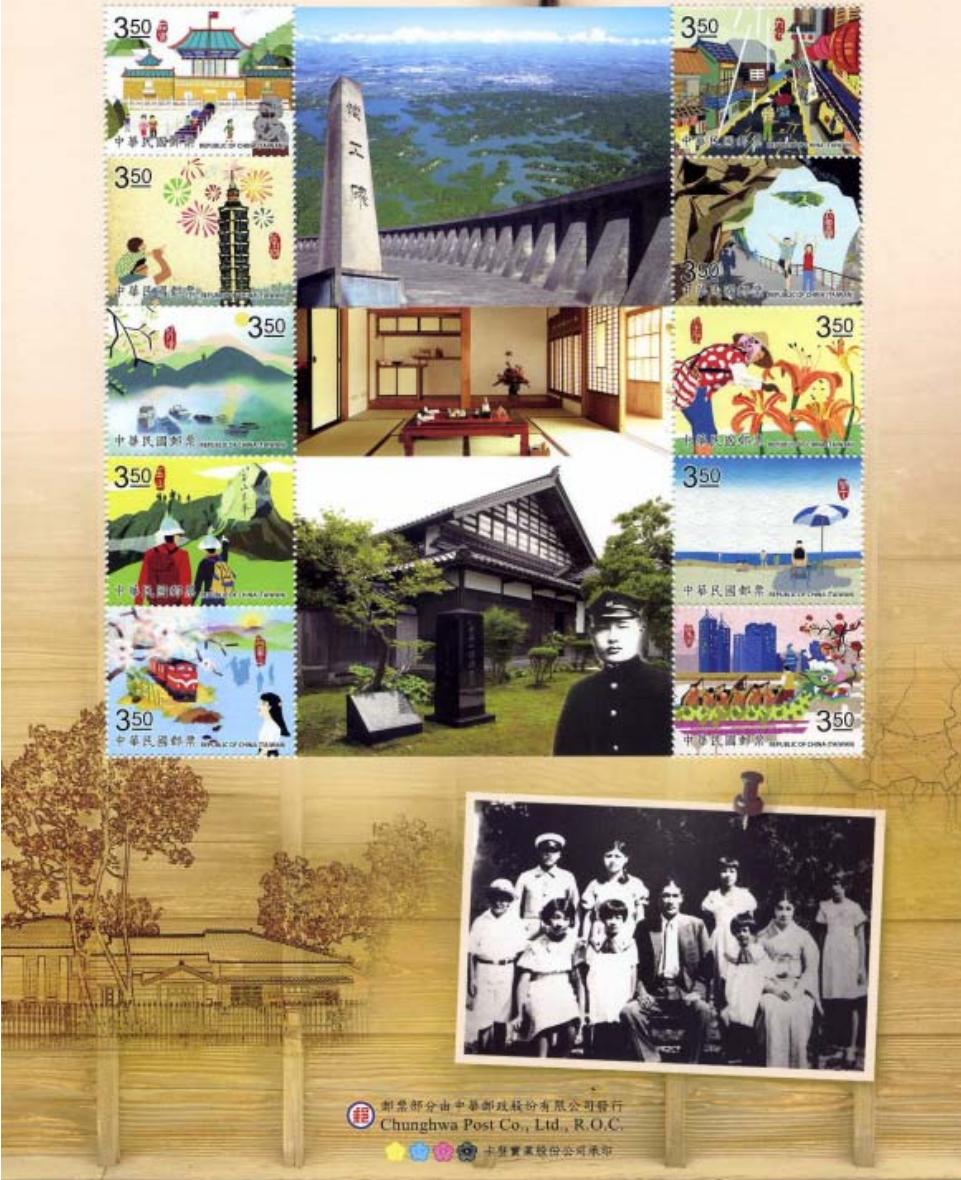


2014 Impact Factor

1.151

Past

八田與一技師及烏山頭水庫
旅行臺灣 邮票



烏山頭水庫



(2014.10.31)



Present

My Taiwan visit

- PAWEES 2011 International Conference
 - 27-29 October, 2011
 - National Taiwan Univ.
- AFITA/WCCA 2012
 - September 5, 2012
 - Taipei, Taiwan
- APAN 38th meeting
 - 13 August, 2014
 - National Chi Nan University, Taiwan
- PAWEES 2014 International Conference
 - 30-31 October, 2014
 - Kaohsiung, Taiwan



Collaboration between UTokyo and NTU

FY 2012: 1 faculty, 4 graduate students from NTU to UTokyo

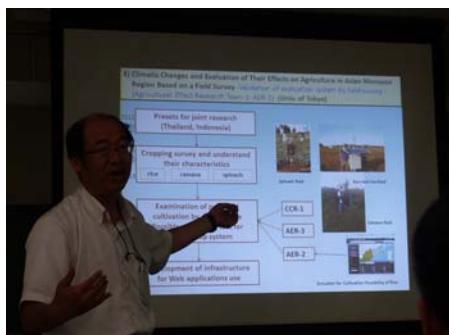
- ✓ Workshop of GRENE-RECCA Agriculture Workshop at UTokyo (2 July, 2012)
Global Environmental Changes and ICT-Agriculture
<http://www.iai.ga.a.u-tokyo.ac.jp/mizo/seminar/GRENE-RECCA-workshop.pdf>

FY 2012: 1 faculty from UTokyo to NTU

- ✓ Small seminar and Discussion on cooperation of ICT-agriculture (6 Sept, 2012)



Yayoi campus



 **Green Network of Excellence**
environmental information

 **RECCA**
Research Program on Climate Change Adaptation

The Second GRENE-RECCA Agriculture Workshop Global Environmental Changes and ICT-Agriculture

Date: 2 July, 2012

Venue: Morning sessions(**Session-1**)- Yayoi Campus, Graduate School of Agricultural and Life Sciences
Afternoon session(**Session-2**)- Tanashi Campus, Institute for Sustainable Agro-ecosystem Services, The University of Tokyo

Organizer:

/ Program of "Climatic changes and evaluation of their effects on agriculture in Asian monsoon region" in Green Network of Excellence (GRENE)

/ Program of "Development of decision support system for optimal agricultural production under global environment change" in Research Program on Climate Change Adaptation (RECCA)

/Institute for Sustainable Agro-ecosystem Services, The University of Tokyo

/Agro-informatics group of Agri-cocoon, Graduate School of Agricultural and Life Sciences, The University of Tokyo

CONTENTS

Sesion-1 /Yayoi Campus

10:00-10:05	Opening Remarks (Masaru Mizoguchi, The University of Tokyo)
10:05-10:10	Opening Remarks (Ming-Chi HU, National Taiwan University)
10:10-10:20	Opening Remarks (Naritaka Kubo, The University of Tokyo)
10:20-10:30	Monitoring of frozen soil in Mongolian grass field (Katori Arimitsu)
10:30-10:40	Water temperature in paddy field affected by global warming (Masaomi Kimura)
10:40-10:50	Education material by a Bucket SRI practice in elementary school (Hanae Yokokawa)



Tanashi campus





←本郷
Hongo campus tour
(2 July, 2012)

田無
Tanashi campus tour →
(2 July, 2012)

1. Ming-Che HU, Assistant Professor, Ph. D, male
2. Hsin-I HSIEH, Ph.D. candidate, female
3. Pei-Hsuan YAO, Ph.D. candidate, female
4. Chun-Wei HUANG, Ph.D. student, male
5. Tadashi IKEDA, Ph.D. student, Ph. D, male



細水長流

Friendship goes a long way



博士論文：台湾における地表灌漑の研究(1984)

Study on surface irrigation in Taiwan

農業地水学研究室、農業工学科

Lab. of Chisui, Department of Agricultural Engineering (1984)

Professor Shirai (白井教授)

After retiring UTokyo, he taught at NTU.

- Agricultural Mathematics (農業数学)
- Agricultural Physics (農業物理学)
 - Heat conduction (熱伝導)

$$\frac{\partial T}{\partial t} = \frac{\partial}{\partial x} \left(\lambda \frac{\partial T}{\partial x} \right)$$

$$= \frac{1}{2\pi} \int_{-\infty}^{\infty} f(\lambda) d\lambda \int_{-\infty}^{\infty} \cos \mu(x-\lambda) d\mu = \frac{1}{2\pi} \int_{-\infty}^{\infty} f(\lambda) d\lambda \left[\int_0^{\infty} \cos \mu(x-\lambda) d\mu \right]_0^{\infty}$$

$$+ \int_0^{\infty} \cos \mu(x-\lambda) d\mu \Big] = \frac{1}{\pi} \int_{-\infty}^{\infty} f(\lambda) d\lambda \int_0^{\infty} \cos \mu(x-\lambda) d\mu$$

$$f(x) = \frac{1}{\pi} \int_{-\infty}^{\infty} f(\lambda) \int_0^{\infty} \cos \mu(x-\lambda) d\mu$$

$$= \int_0^{\infty} X d\lambda + \int_0^{\infty} X d\lambda \quad (X = f(x)(\cos \mu x \cos \mu x + \sin \mu x \sin \mu x))$$

$$\lambda = -\lambda' \text{ とおくと, } X = f(x)(\cos \mu x \cos \mu x' - \sin \mu x \sin \mu x')$$

$$\int_0^{\infty} X d\lambda = \int_0^{\infty} f(-\lambda)(\cos \mu x \cos \mu x' - \sin \mu x \sin \mu x') d(-\lambda)$$

$$X \text{ を入力書きなさいせよ}$$

$$= \int_0^{\infty} f(-\lambda)(\cos \mu x \cos \mu x' - \sin \mu x \sin \mu x') d(-\lambda)$$

$$\text{それを上式に代入}$$

$$= \int_0^{\infty} \sin \mu x \sin \mu x' f(x) + \int_0^{\infty} \cos \mu x \cos \mu x' f(x)$$

$$(1) \text{ が偶関数のとき, } f(x) = f(-x) \quad (10)$$

$$\frac{\partial T}{\partial t} = \kappa \left(\frac{\partial^2 T}{\partial r^2} + \frac{1}{r} \frac{\partial T}{\partial r} \right)$$

$$f(x) = \frac{1}{\pi} \int_{-\infty}^{\infty} f(\lambda) \int_0^{\infty} \cos \mu(x-\lambda) d\mu$$

$$f(\mu) = \frac{2}{\pi} \int_0^{\infty} \cos \mu x d\mu \int_0^{\infty} f(x) \cos \mu x d\mu$$

$$F(\mu) = \sqrt{\frac{2}{\pi}} \int_0^{\infty} f(x) \cos \mu x d\mu$$

$$f(x) = \sqrt{\frac{2}{\pi}} \int_0^{\infty} F(\mu) \cos \mu x d\mu$$

$$\text{となる。これは } F(\mu) \text{ が } f(x) \text{ の偶関数を} \dots$$

$$\text{Fourier 余弦変換及び正弦変換と名付ける。} \dots$$

$$\text{関数 } F(\mu) \text{ を与えて } f(x) \text{ を求める積分方程式とす} \dots$$

$$\text{はその解である。} \dots$$

$$\text{又, (9) は } \mu \text{ については偶関数である。} \dots$$

$$f(x) = \frac{1}{2\pi} \int_{-\infty}^{\infty} d\mu \int_{-\infty}^{\infty} f(\lambda) \cos \mu(x-\lambda) d\lambda$$

$$2. 0 = \frac{1}{\pi} \int_{-\infty}^{\infty} d\mu \int_0^{\infty} f(\lambda) \sin \mu(x-\lambda) d\lambda$$

$$\text{邊に } i' \text{ をおいて (9) 式と更々か} \dots$$

$$\text{けで (9) 式を加えよ。} \dots$$

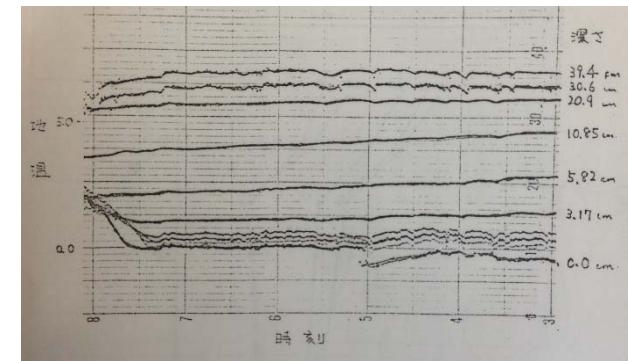
$$f(x) = \frac{1}{\pi} \int_{-\infty}^{\infty} d\mu \int_0^{\infty} f(\lambda) e^{-i\mu(x-\lambda)} d\lambda$$

$$F(\mu) = \frac{1}{\pi} \int_{-\infty}^{\infty} f(x) e^{i\mu x} dx$$

Handmade textbook (手作教科書)

He is my teacher.

- 三重大学
- 東京大学
- 東京農業大学(台湾大学)



My BS thesis supervised by Prof. Shirai.
Measurement of soil temperature (1981)



Google Search



◆ 奨助學金

◎ 學生專區

- 大學部 •
 - 碩士班 •
 - 博士班 •
 - 系學會 •
 - 獎助學金 •
 - 其他規定 •
 - 高中生 •
 - 外籍生 •
 - 國際交流 •
- ◆ 奖助學金
- 一、紀念金城教授獎助金辦法
 - 二、國立台灣大學農業工程學系高阪知武教授紀念論文獎頒授辦法
 - 三、系友會白井清恆教授獎學金頒給辦法
 - 四、紀念鮑衡山系友獎學金辦法
 - 五、易任教授農業工程研究獎學金辦法
 - 六、施嘉昌教授清寒獎學金申請辦法
 - 七、徐玉標教授獎學金辦法
 - 八、生工系研究生助學金申請辦法
 - 九、中興工程公司獎學金申請辦法
 - 十、七星農田水利研究發展基金會獎學金頒授辦法
 - 十一、王鼎盛教授獎學金辦法

- 一、紀念金城教授獎助金辦法
- 二、國立台灣大學農業工程學系高阪知武教授紀念論文獎頒授辦法
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- 十一、王鼎盛教授獎學金辦法



本網站著作權屬於國立臺灣大學生物環境系統工程學系，請詳見[使用規則](#)。

電話：02-33663443 傳真：02-23635854

地址：台北市 106 蘿斯福路四段一號

E-Mail：ntubse@ntu.edu.tw

RulingDigital 銳綸數位建置

建議使用IE 6/7 或 Mozilla Firefox 3，並將螢幕解析度設定為 1024*768，以獲得最佳瀏覽效果

系友會白井清恆教授獎學金頒給辦法

1. 獎學金來源：以白井清恆教授捐款新台幣參拾伍萬元為基金及
今後追加捐款之利息為獎學金。
2. 頒給對象：國立台灣大學農業工程學研究所在學研究生為限。
3. 申請資格：
 - a. 學業成績平均八十分以上者。
 - b. 未申請其它獎學金者。
4. 申請日期：每年五月一日以前以填具申請表向主任提出申請
5. 頒獎方式：頒給獎金與獎狀資學術交流，或其它。其方式名額
及金額將視該年孳息情形，經審查小組開會商定（以往每年一
至三名，每名新台幣壹萬元整）。
6. 審查公布：所主任將所有申請表及有關資料交請審查小組審。
於五月二十日以前將審查結果於六月一日公布，並擇期公開頒
獎。
7. 審查小組：擬請國立台灣大學農業工程所學術招生委員會負責
審查。
8. 本辦法依八十四年八月十八日由國立台灣大學農業工程系友會
理監事聯席會議決議處理。

白井清恆教授獎學金歷年得獎名單

年度	得獎學生
2005 年	林嘉佑
2006 年	張高華
2007 年	魏嘉徵
2008 年	劉俊志
2009 年	王承龍
2010 年	連琮勛
2011 年	黃浚瑋
2012 年	曾怡菱
2013 年	魏嘉徵
2014 年	陳沛莞



Future

From the viewpoint of International agro-informatics

- Climate changes and evaluation of their effects on agriculture in Asian monsoon region
 - ICT Agriculture in Asian monsoon region



Green Network of Excellence
GRENE

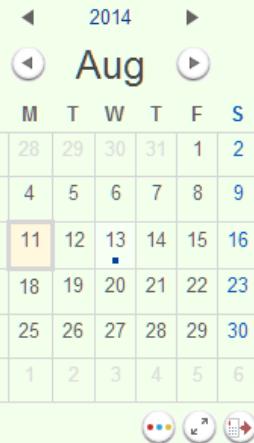
Climatic Changes and Evaluation of Their Effects on Agriculture in Asian Monsoon Region

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Event Calendar



Search

Counter

000021109 Since 2012-01-13

APAN 38th in Nantou

We have a joint session with APAN AgWG in APAN 38th Meeting in Nantou, Taiwan, 14:00 - 15:30, August 13, 2014 (Wednesday)

<http://www.apan.net/meetings/Nantou2014/Sessions/GRENE.php>

We will update our session program soon.

Announcement

Please change password.

Dear GRENE-ei CAAM friends,

Date-Time: **2014-04-14 11:00:00 JST**

I successfully updated OpenSSL package and renewed SSL CERT again.

Please do, even if you already do following before **2014-04-04 11:00:00 JST**.

1. visit <https://grene.agrid.org/>
2. click UserLogin at right-top
3. click Forget your Password?
4. enter registered e-mail address and press send
5. read and follow received e-mail

Regards,

--
Takuji Kiura

What's new

view number **5**

[Joint Session with APAN AgWG](#)

05/30 13:07

Location:Nantou, Taiwan
Contact:<http://www.apan.net/meetings/Nantou2014/index.html>
Details:<http://www.apan.net/me...>

Funded by



MINISTRY OF EDUCATION,
CULTURE, SPORTS,
SCIENCE AND TECHNOLOGY-JAPAN

DIAS



GRENE-ei Sites

 **Green Network of Excellence**
GRENE-ei environmental information

 Biodiversity	 Carbon Cycle
 Water	 City
 Agriculture	 Health

Member's Institutes



首都大学東京

TOKYO METROPOLITAN UNIVERSITY



JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY



National Agriculture and Food Research Organization



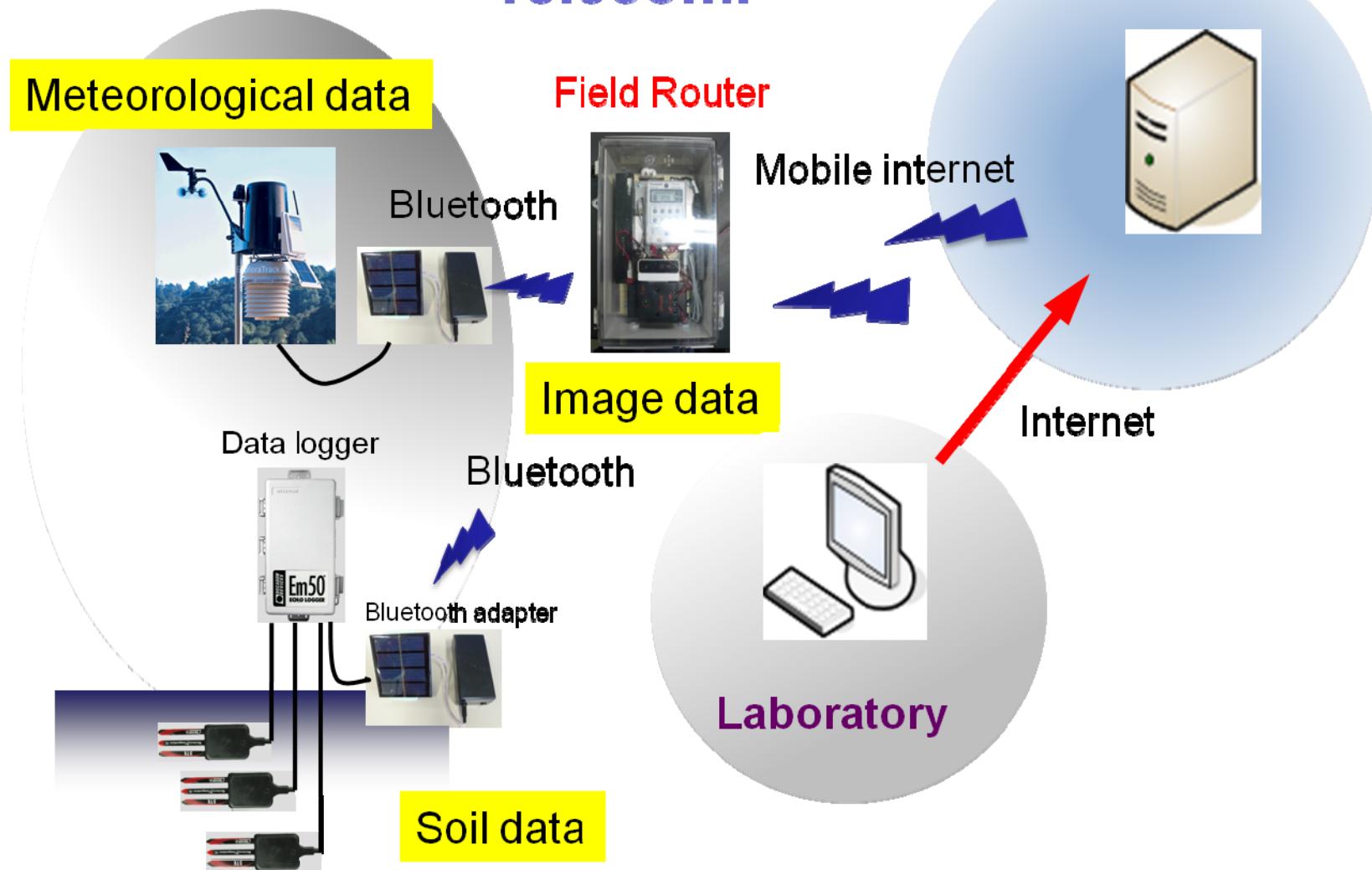
National Institute for

Agro-Environmental Sciences

7

Field Monitoring System (FMS)

In-situ data → Telecom. → Data Server



(Soil sensor : Soil moisture, temperature, electrical conductivity...)

Setup images of FMS



Fukui



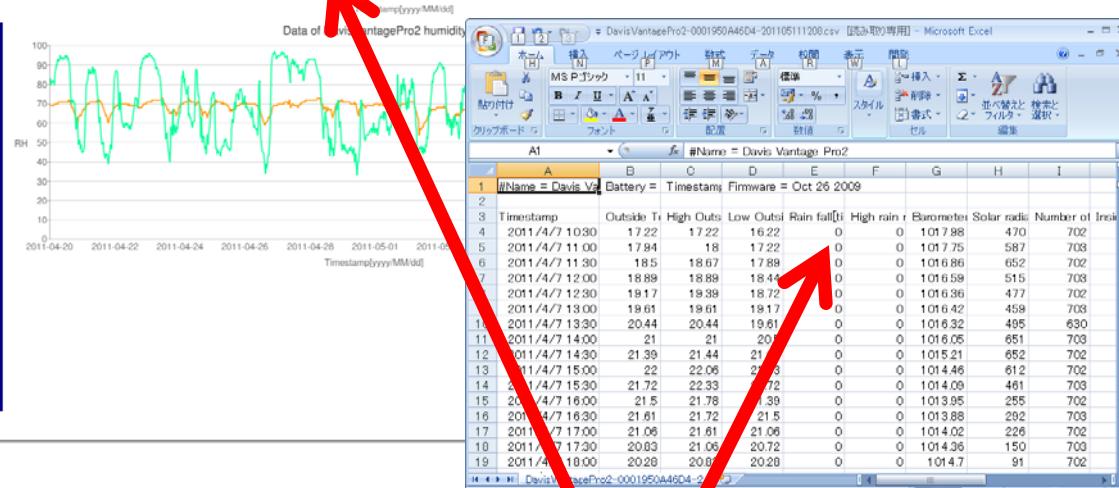
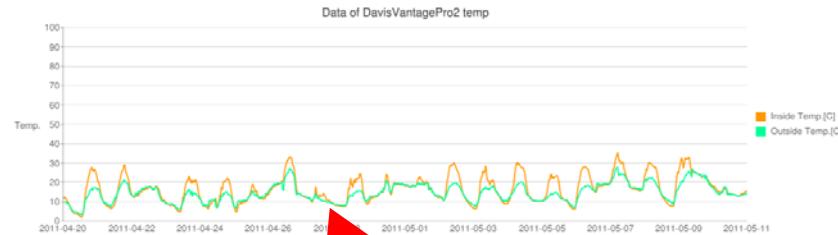
Nagano

View of individual site

[Toyama01](#) last seen: 2011/05/11 12:30 (JST GMT+9)



Images



Data

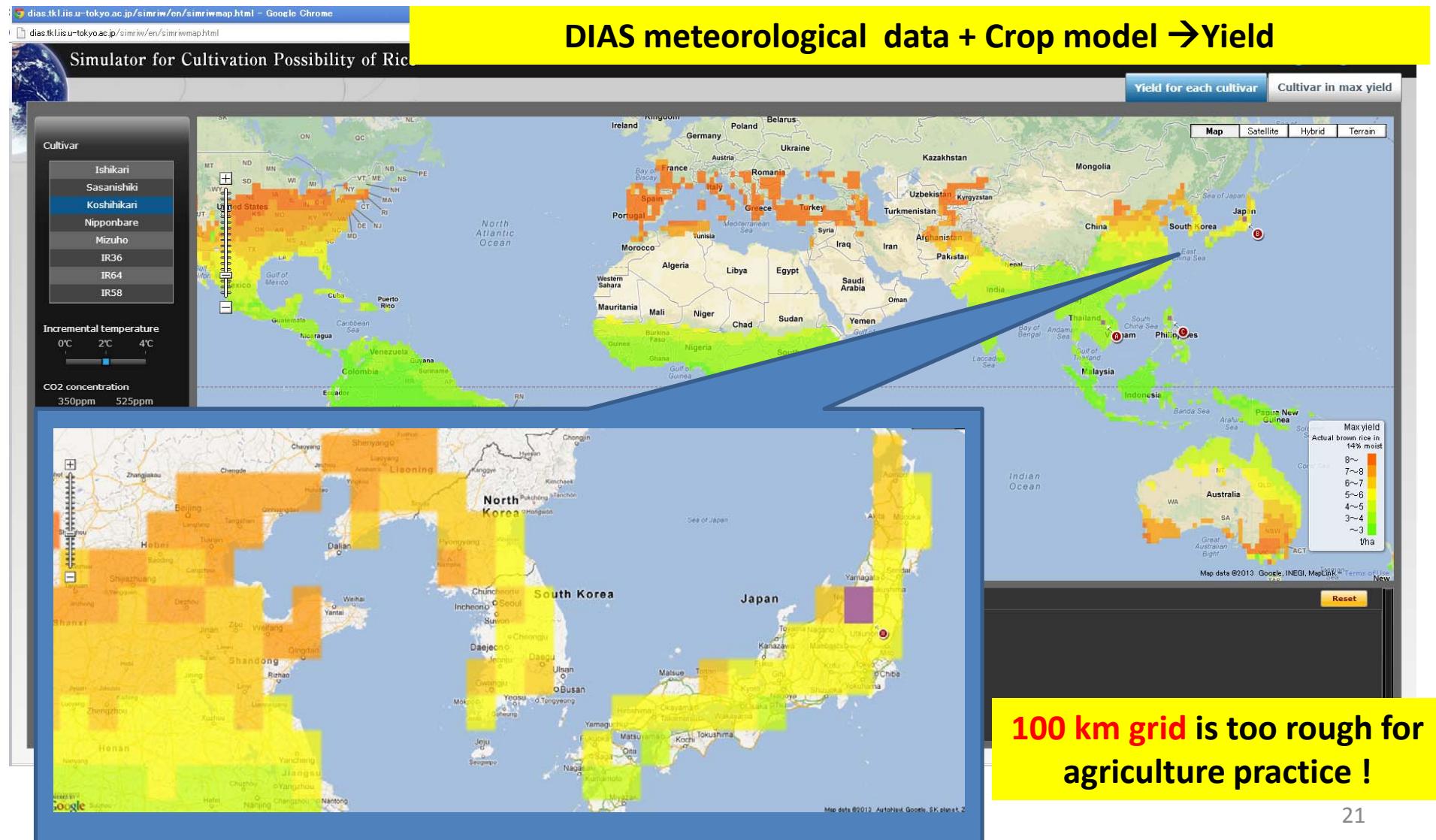
DavisVantagePro2 2011/05/11 12:08 battery:[4.29\(0\)](#) logger time:2011-05-11 12:07:36 [A](#) [B](#) [\(292.2K\)](#)

Toyama01 2011/05/11 12:12 battery:[82](#) logger time:2011-05-11 12:5:36 +36 [A](#) [B](#) [\(301.2K\)](#)

スタート nd10 mizo... Wind... ito te... sp10... ai110... 無題... Toy... 2011... 農業... IPカメ... Re:

- Weather and soil data can be downloaded in CSV format
 - The data can be processed freely using EXCEL

Simulator for Cultivation Possibility using Global observation data



ICT Agriculture

Agroecological monitoring system and its application

Research project title

The Development of Core Technology of NSC WSN Platform in Software and Firmware and the on-site Deployment of NSC WSN - A WSN-based Monitoring System for Pest Population Dynamics in Agriculture

Sponsored by

National Science Council, Executive Yuan

PI

Prof. Joe-Air Jiang
Department of Bio-Industrial Mechatronics Engineering,
National Taiwan University

Managed by

► ▶ 6:13 / 6:45

HD

<https://www.youtube.com/watch?v=gdT9JCsrrk&feature=youtu.be>

細水長流

Friendship goes a long way between UTokyo and NTU



Thank you for your kind attention

