

# **Global Environmental Systems Leader Program**

**Global Environmental Research and Education for  
KEIO SFC & Science–Technology Master and Ph.D  
course with Science/Technology and Governance:**

<https://mdbl-lecture.sfc.keio.ac.jp/gesl/wordpress/>

**KEIO University, SFC**

**GESL**

# Call for Application for Master & PhD students who enter after April 2023

- The GESL Certificate of completion is awarded with the doctoral degree to **the GESL course students who enter after April 2023** when conditions 1, 2, 3, 4, and 5 indicated in the following new requirements is fulfilled.
- If you plan to receive the GESL Certificate of completion, please declare your will to the GESL representative professors (\*).
- To **the GESL course students who enter by AY2022**, the old requirements for GESL Certificate indicated in “GESL Guide” is applied continuously.

<GESL Representative Professors>

Graduate School of Media & Governance: Prof. Ikumi Waragai (ikumi[at]sfc.keio.ac.jp)

Graduate School of Science and Technology: Prof. Kenji Yasuoka (yasuoka[at]mech.keio.ac.jp)

# GESL Certificate Requirement (After April 2023)

1. Students must obtain a total of four credits or more as “GESL 1 (Major)” from the specified lecture courses.
2. Students must obtain a total of two credits or more as “GESL 2 (Minor)” from the specified lecture courses.
3. Students must participate in fieldwork/internships and obtain a total of eight credits or more as part of their International Training Activities.
4. Students must make at least two presentations in English at international conferences.
5. Students must satisfy an English proficiency requirement.

The GESL Certificate is awarded with the doctoral degree when conditions 1, 2, 3, 4, and 5 are fulfilled, the final evaluation at “GESL Workshop” is passed, and completion requirements for the doctoral course are completed.

# コース履修生募集 (2023年4月以降の入学生対象)に ついて

政策・メディア研究科修士・博士課程 2023年度4月以降に入学した  
大学院生を対象に、本コース履修生の募集を行います。

- **2023年4月以降からのコース履修者(修士・博士課程学生)**のうち、GESLサティフィケートの取得を希望する学生は、政策・メディア研究科(SFC)または理工学研究科(矢上)の担当教員に希望を申し出てください。
- 2023年4月以降からのコース履修者(修士・博士課程学生)のうち、GESLサティフィケートの取得を希望する学生は、新しいGESLサティフィケート要件に従い、以下の1, 2, 3, 4, 5の要件と後期博士課程の修了要件を満たしてください。
- **2022年度までのコース履修者(博士課程学生)**については、従来までの『GESLガイドライン』に記載されている通りのサティフィケート要件が適用されます。

GESL担当教員

政策・メディア研究科: 藁谷 郁美 (ikumi[at]sfc.keio.ac.jp)

理工学研究科: 泰岡 顕治 (yasuoka[at]mech.keio.ac.jp)

# GESLサティフィケート要件 (2023年4月以降)

1. 「GESL 1(メジャー科目)」として、所定の科目群から1~2科目を履修し、合計4単位以上取得すること。
2. 「GESL 2(マイナー科目)」として、所定の他研究科の科目群から1科目を(自由科目として)履修し、合計2単位以上取得すること。
3. 「国際トレーニング科目」として、所定のフィールドワーク/インターンシップ(合計8単位)を実施すること。
4. 国際会議(プログラム委員会が組織され、英語で発表が行われるシンポジウム・カンファレンスなど)で2回以上の英語による発表を行うこと。
5. 英語能力条件を充足すること。

以上の結果を、年1回開催される「GESLワークショップ」において口頭発表を行い、審査に合格すること。

# GESL Visions and Missions

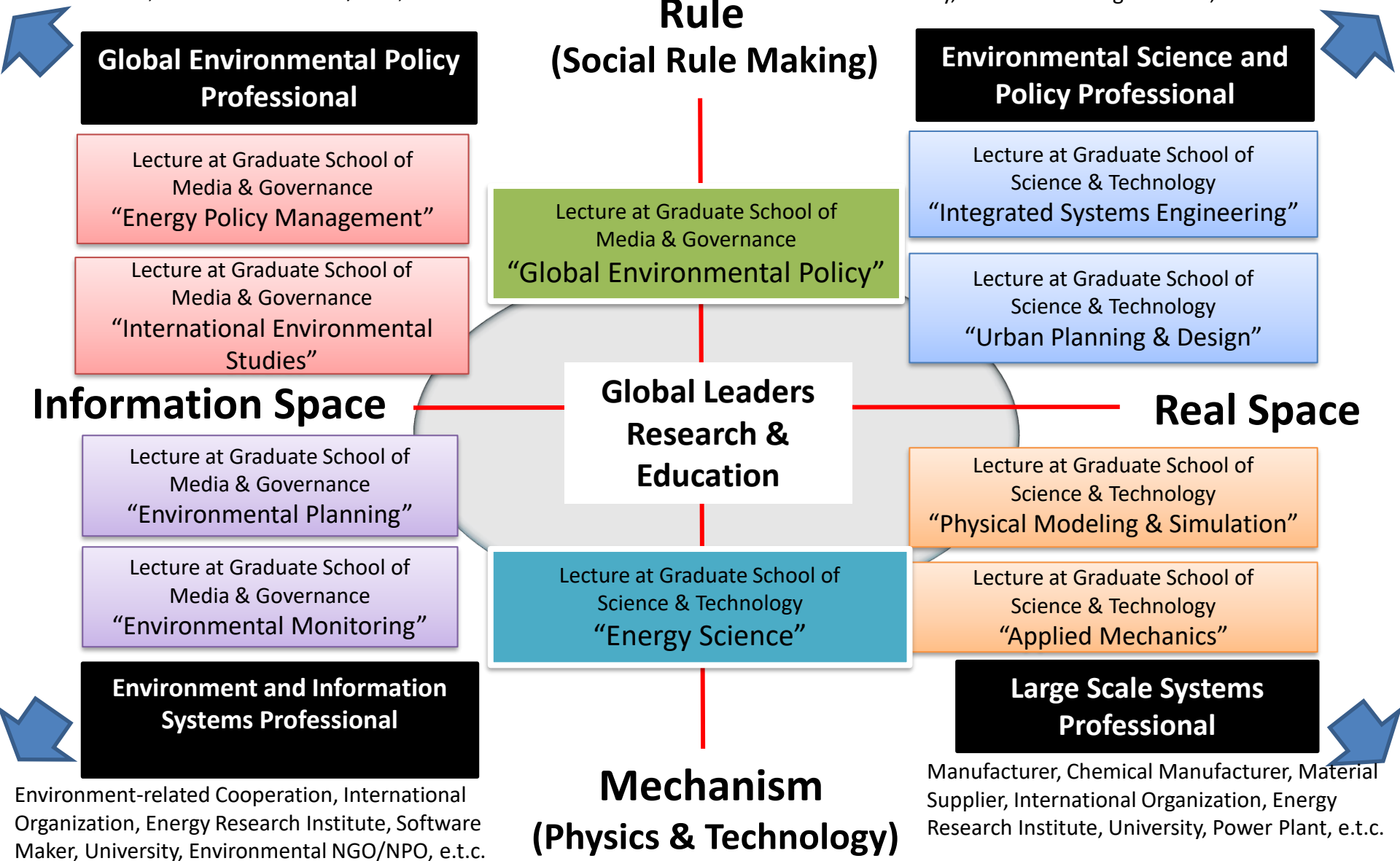
- GESL aims to realize world-class master and doctoral courses by combining **a team of professionals, graduate students and international collaborative institutes** in academic, industrial, and governmental sectors from all over the world.
- The important mission of GESL is to educate and bring up PhD students to be Global Environment System Leaders, with **interdisciplinary and international aspects** including social rule making and science and engineering to achieve the recovery, continued improvement and safekeeping of the global environment, and the initiative to drive the design and creation of technological and social environmental systems.



# Outline of GESL Program and Career Path (Major / Minor)

International Organization, Energy Research Institute, Governmental Agency, International University, Local Government, Environmental NGO/NPO, e.t.c.

Energy Research Institute, Governmental Agency, Local Government, Environmental NGO/NPO, International University, International Organization, e.t.c.



# Advantages for graduate students in GESL

GESL has the following three advantages:

- Advantage 1 International Advisory with Academia-Industry-NPO collaboration
- Advantage 2 International Training Activities
- Advantage 3 Distant Collaboration System
- Advantage 4 Application for JST Scholarship  
[New]

[New]

# ● Advantage 4 Application for JST Scholarship

- GESL students are highly recommended to apply to “JST Doctoral Program Student Support Project” with Academic Advisor’s recommendation letter, to make international research progress in GESL activities and GESL International Training.

✂ GESL students can apply to the support. Please check application guideline and NEWS for more information.

<https://www.research.keio.ac.jp/external/org/spring/index.html>



The screenshot shows the website for the 'PhD Postgraduate Course Student Support Project' (博士後期課程学生支援プロジェクト) at Keio University. The page is titled '選抜学生の応募と採用' (Selection of Applicants and Admission). It provides information about the project's purpose, which is to support students in the 'Future Society Grand Design' program. The page includes a 'Recruitment Schedule' (応募のスケジュール) section with the following items:

- 2022年度[第2期]の募集を開始しました  
募集要項はこちら   
Click here for the application guidelines for the 2nd term of AY2022. 
- 2022年度[第1期]の応募：終了しました  
Applications for FY2022 (1st period) have been closed.
- 2021年9月入学の応募：終了しました

The right sidebar contains a 'Research Advancement Support System' (研究推進支援体制) menu with the following items:

- トップページ
- 慶應義塾大学の研究推進支援体制
- 研究連携推進本部 本部会議・運営委員会
- 博士後期課程学生支援プロジェクト
  - トップページ
  - 選抜学生の応募と採用
- 研究大学強化促進事業
  - トップページ
  - 事業概要
  - Research Videos
  - 活動概要
  - 2019年度
  - 2018年度
  - 2017年度
  - 2016年度
  - 2015年度

[New]

# ● Advantage 4 Application for JST Scholarship

Excerpted from JST Doctoral Program Student Support Project Recruitment call above:

## <Assistance details>

In addition to financial assistance we will provide ongoing career and professional development support for active engagement with the diverse career paths of doctoral students.

## <Assistance amount>

We will pay an amount to cover living expenses in addition to subsidizing research expenses.

**Amount to cover living expenses:** 2.2 million yen per academic year (to be paid per month from the month in which support begins in AY 2021)

**Research funding:** Base payment of 300,000 yen per academic year

**Assistance subsidies for pioneering initiatives:** An appropriate amount (up to 1 million yen) in addition to the above amount may be paid towards initiatives for career and professional development including overseas exchange, fieldwork (including domestic fieldwork), internships, or pioneering initiatives such as those involving the development of research based on new ideas. We will provide an additional opportunity to apply for these subsidies following approval of candidacy.



[New]

# ● Advantage 4 Application for JST Scholarship

- GESL参加学生は、国際産学NPO研究指導体制・国際トレーニングを実施するGESLにおける活動を推進するために、下記奨学金へ申請することが推奨される。下記の申請要件を満たす学生は、指導教員の推薦と共に「**JST博士後期課程学生支援プロジェクト**」に補助(生活費相当額・研究費)の申請を行うことが出来る。
- JST博士後期課程学生支援プロジェクト募集について
- <https://www.research.keio.ac.jp/external/org/spring/index.html>  
詳細は<https://www.research.keio.ac.jp/>のニュースを適宜ご確認ください。

以下、JST博士後期課程学生支援プロジェクト応募要領より抜粋：

## ■ 支援内容・支給額

<支援内容> 資金補助だけではなく、博士後期課程学生が将来にわたって多様なキャリアパスで活躍するためのキャリア開発・育成コンテンツを提供します。

<支給額> 生活費相当額および研究費を支給します。

- ・生活費相当額：一律年間220万円(2021年度は支援開始月からの月割とします)
- ・研究費：年間30万円を基礎額とします・挑戦的取り組み補助費：海外交流、フィールドワーク(国内含む)、インターンシップ等のキャリア開発・育成コンテンツでの取り組み、あるいは、新たな発想による研究の展開など、挑戦的な取り組みに対して、申請内容により適切な額(上限100万円)を上記に上乗せで支給する場合があります。こちらは採択決定後も、追加申請の機会を設けます。



## 2. 3 Pillars in GESL International Training System

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### A. International Advisory

Each graduate student is encouraged to contact with specialist in multiple fields: professors in KEIO graduate schools of “Media and Governance and Science and Technology” and International Institute.

### B. International Training Activities

Each graduate student is encouraged to conduct international training activities (e.g. 3 months in master course and 6 months in PhD course) at international organizations and research institutes.

### C. Distant Collaboration System

Multiple access distant collaboration system for educating and studying environmental systems, mechanisms and governance.





# GESL International Research/Education Collaboration and Partnerships

**Univ. of Jyväskylä**  
(Finland)



**VNU-UET**  
(Vietnam)



**Beijing Normal Univ.**  
(China)



**UCSD (U.S.)**



**Princeton Univ.**  
(U.S.)



**Tampere Univ. of Tech.**  
(Finland)



**Keio Univ.**



**Univ. of Cambridge**  
(U.K.)



**University of Hawaii**  
(U.S.)



**Charles Univ.**  
(Czech Rep.)



**CAU at Kiel**  
(Germany)



**EPPIS-ITS** (Indonesia)



**NECTEC** (Thailand)



**Chulalongkorn Univ.**  
(Thailand)



## B. International Training Activities

- GESL students have studied abroad for total six months during their doctoral work - at **international collaboration institutes** (foreign partner institutions), such as **Princeton University (USA)**, **University of Cambridge (UK)**, **Tampere University of Technology (Finland)** and **United Nations ESCAP**.
- By exposing students to foreign cultures and research environments during the GESL course, this program aids in developing human resources with design, implementation and communication skills for global environmental systems.
- Because of COVID-19 situation, a remote/online style of International Training with Distant Collaboration System is also encouraged after Fall 2019.)

# GESL International Research/Education Collaboration and Internship Activities

US • CMU



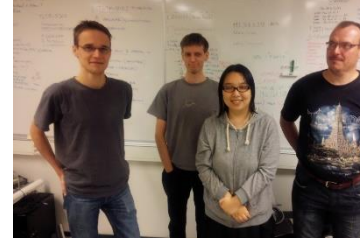
US • UCSD



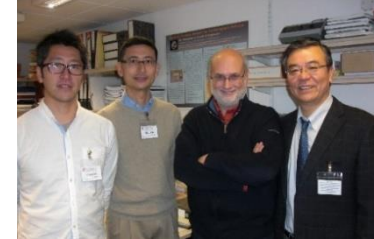
US • UCSB



Finland TUT



UK • Cambridge



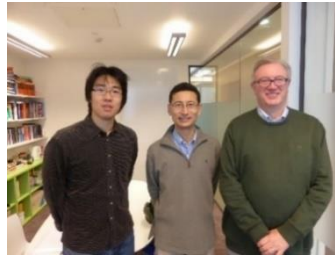
US • HAWAII



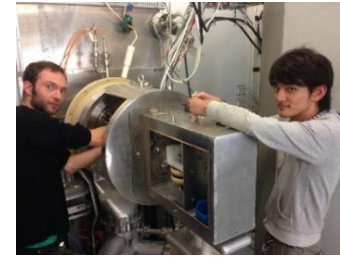
Surabayam ITS/EEPIS



UK • Oxford



Swiss • CERN



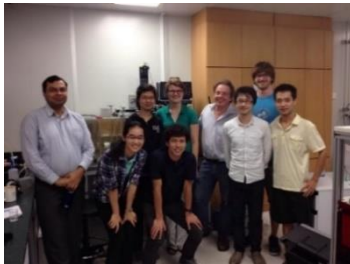
Finland Jyväskylä



Fiji (UNDP)



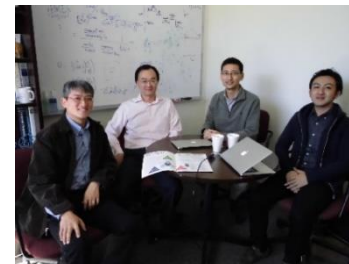
Singapore



Germany



US • Colorado



Thai Chulalongkorn



Fiji USP



Malaysia



US • Nebraska



Thai • NECTEC



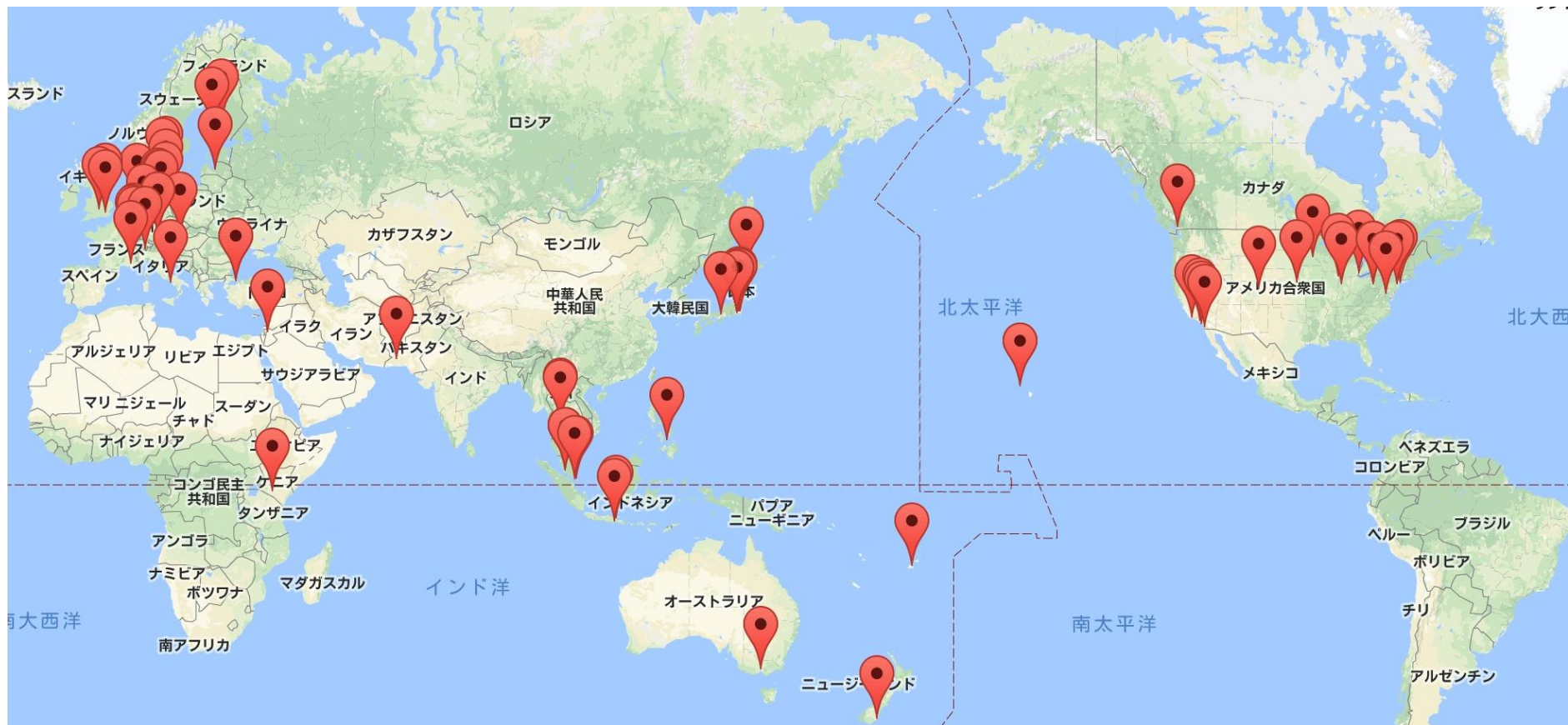
USA: Kakehashi



# International Training Network

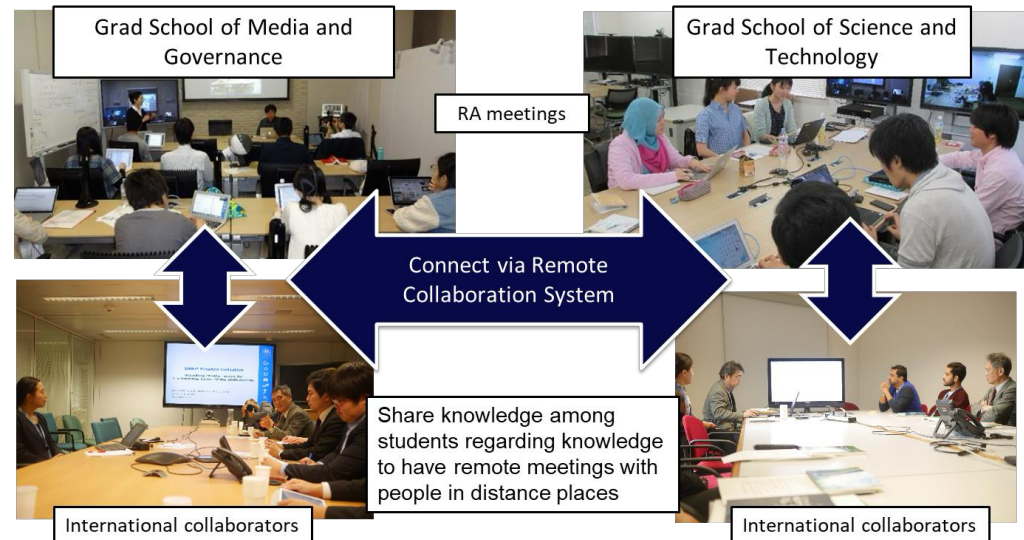
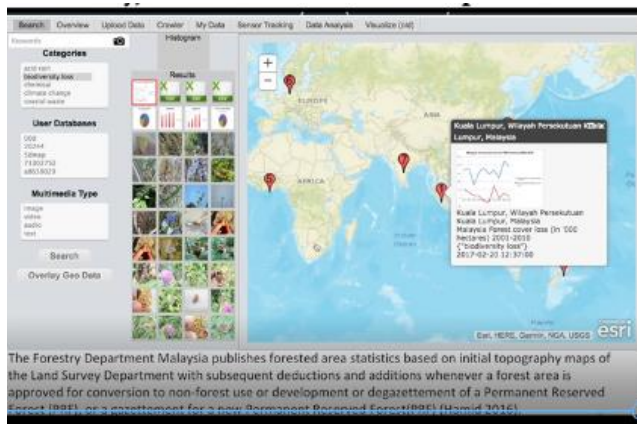
GESL has a strong and wide network with **113** international institute/universities.

GESL students conducted their international training **125** times.



# C. Distant Collaboration System

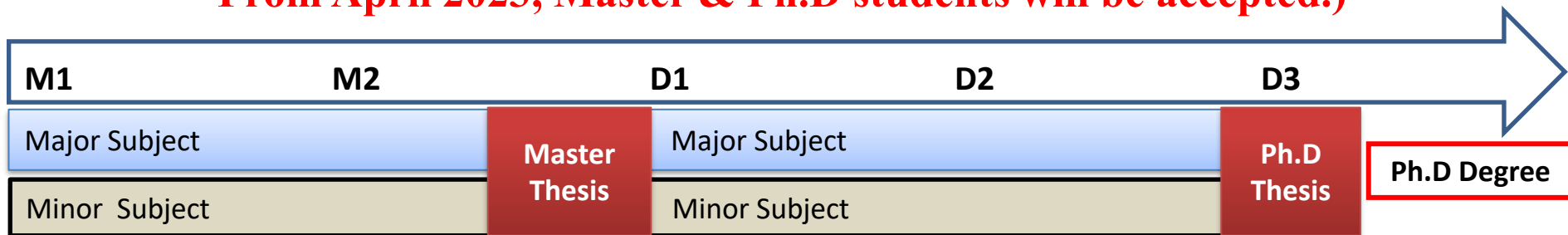
- Students are educated by using multiple access distant collaboration system which combines 5D data visualization, and high-definition real-time video communications in order to communicate with their advisory committee.



# GESL Program Course

(Since 2018, only Ph.D students are accepted.)

**From April 2023, Master & Ph.D students will be accepted.)**



Student-Advisory Group Meetings by GESL Faculty Members  
(Black Wednesday) Every Semester

International Supervising Group  
( Professors in KEIO graduate schools of “Media and Governance , Science and Technology” and an International member)

- International Internship and Field Work (3 months in master course)

- International Internship and Field Work ( total 6 months in PhD course)

Master Course Lectures (4 Main Subjects :  
Global Environmental Policy Professional,  
Environment and Information Systems  
Professional, Environmental Science and  
Policy Professional, Large Scale Systems  
Professional)

PhD Course Lectures (4 Main Subjects :  
Global Environmental Policy  
Professional,  
Environment and Information Systems  
Professional, Environmental Science  
and Policy Professional, Large Scale  
Systems Professional)

Ph.D Candidate  
Evaluation (Syllabus,  
Lecture, 2ndary  
Language, Skill  
Subject)

Formal  
Presentation

Final  
Presentation

Final  
Examination

Degree-  
Regulations

# GESL Certification

When a student complete Ph.D. course and receive a Ph.D. degree, the certification of GESL will be indicated onto the diploma.



別表3-2 (第18条関係)

学位記

氏名

慶應義塾大学長 氏名 印

平成 年 月 日

博士課程教育リーディングプログラム(プログラムの名称)を修了したことを証する

博士( )の学位を授与する

修得し学位論文の審査ならびに最終試験に合格したことを証し

本大学大学院 研究科 専攻の博士課程所定の単位を

なお、ペンマークの上部に修了年度、下部に創立年(1858)を箔押しで記載するものとする。  
博士課程教育リーディングプログラムの名称は次のとおりとする。  
超成熟社会発展のサイエンス  
グローバル環境システムリーダープログラム

- 和文：「グローバル環境システムリーダー (博士) 」
- English：「Global Environmental System Leader (Ph.D)」

<http://gesl-keio.org>

GESL

INFORMATION

PROGRAM

CURRICULUM

EVENT

MOVIE

FOREIGN INSTITUTES

FACULTY

ACCESS

Bringing-up Global Environmental System Leaders as

# PLANET-LEVEL PROGRESS-MAKING CHALLENGERS

for Nature & Society

2021.10.05

GESL Assembly 2021 (2021/11/06)

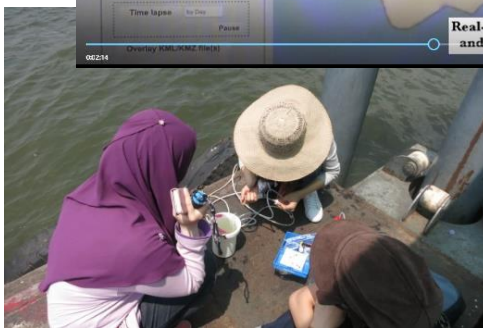
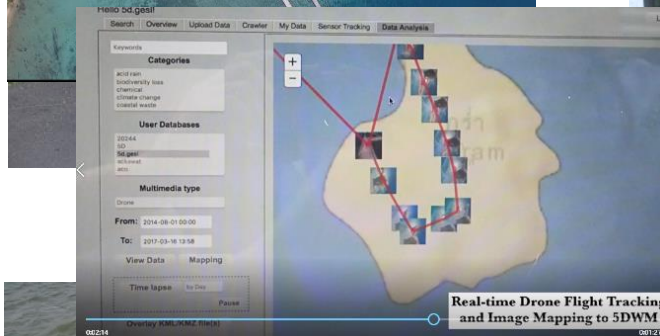
# Introduction of GESL students' activities

# International Collaborative Research via Distant Collaboration System (5D World Map System) 1/3

インドネシア・国際会議KCIC (2012- )



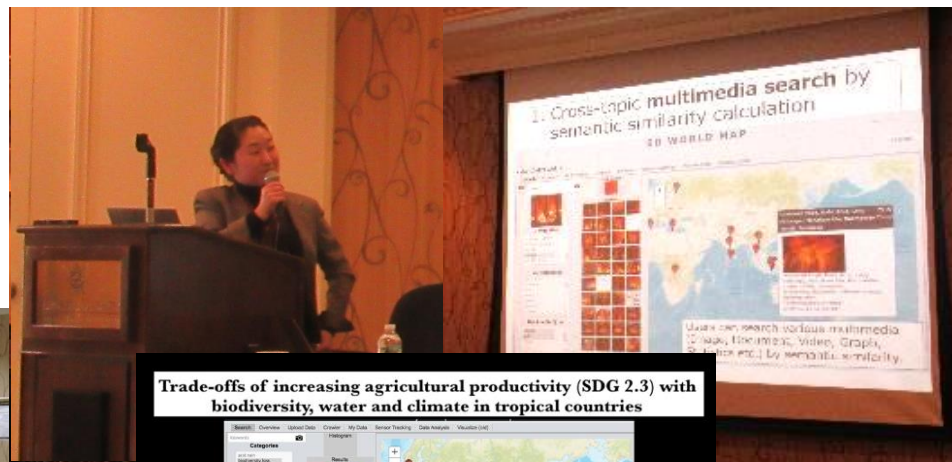
タイ・環境センシングフィールドワーク



協働研究者 : Dr. Ali Ridho Barakbah, Dr. Sritsta Sukaridhoto, Dr. Dadet Pramadiyanto, Dr. Wahjo Sesulihatien, Dr. Tri Harsono他, EEPIS, インドネシア (ワイヤレスセンサネットワーク, IoT, ロボティクス)、Prof. Chawan Koopipat, Prof. Aran Hansuebsai, チュラロンコーン大学, タイ (画像処理・リモートセンシング), Hazard and Disaster Research Center, インドネシア(環境・災害分析)、Prof. Virach somlertlamvanich, タマサート大学, タイ (ビッグデータ分析), Prof. Petchporn Chawakitchareon, チュラロンコーン大学, タイ (環境工学), Prof. Hannu Jaakolla, タンペレ工科大学、フィンランド(ソフトウェア工学、モバイル・コンピューティング), Prof. Bernhard Thalheim, Christian-Albrechts University, ドイツ(データモデリング)等

# International Collaborative Research via Distant Collaboration System (5D World Map System) 2/3

SUSTAINABLE DEVELOPMENT GOALS  
17 GOALS TO TRANSFORM OUR WORLD



NY国連SDGsワークショップ  
(2017年7月)



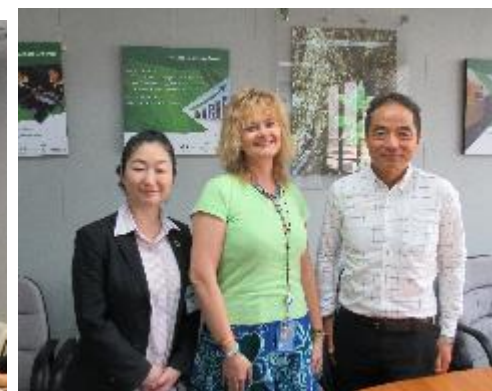
NY国連SDGsワークショップ(2017年3月)



国連大学との国際模擬交渉・合同ワークショップ(2014 - 2017)

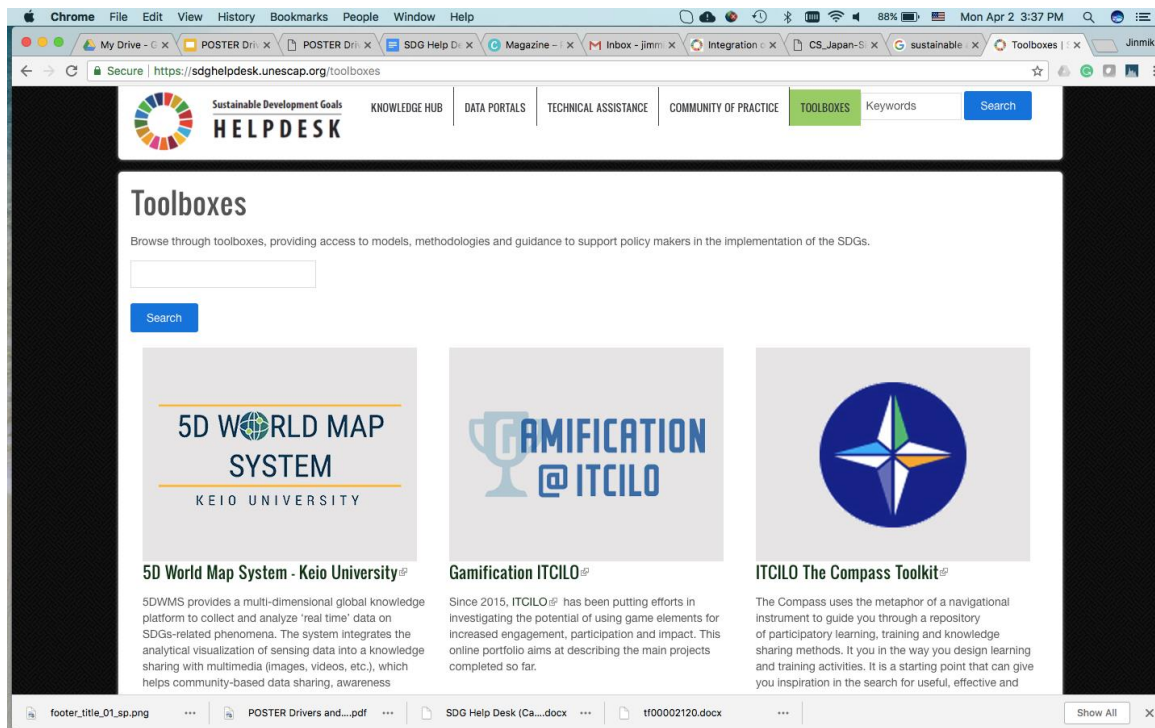


Asia Pacific Ministerial Summit(2017年9月)より、  
国連SDGs Help Desk Teamとの共同研究教育開始



# International Collaborative Research via Distant Collaboration System (5D World Map System) 3/3

## Collaboration with UN ESCAP SDG HELPDESK



The screenshot shows a web browser displaying the UN ESCAP SDG HELPDESK website. The page title is "Toolboxes" and it includes a search bar and a list of three toolboxes:

- 5D World Map System - Keio University**: SDWMS provides a multi-dimensional global knowledge platform to collect and analyze 'real time' data on SDGs-related phenomena. The system integrates the analytical visualization of sensing data into a knowledge sharing with multimedia (images, videos, etc.), which helps community-based data sharing, awareness.
- Gamification ITCILO**: Since 2015, ITCILO has been putting efforts in investigating the potential of using game elements for increased engagement, participation and impact. This online portfolio aims at describing the main projects completed so far.
- ITCILO The Compass Toolkit**: The Compass uses the metaphor of a navigational instrument to guide you through a repository of participatory learning, training and knowledge sharing methods. It you in the way you design learning and training activities. It is a starting point that can give you inspiration in the search for useful, effective and



<http://sdghelpdesk.unescap.org/toolboxes>

# International Activities of GESL program

GESL has international collaborative network with **113** international institutions. GESL provides several opportunities to conduct international activities (workshop, seminar, conference, paper co-writing, etc.) based on this network.

The GESL method for fostering global leaders is becoming popular among the international institutions in the network.



# Workshop for Career-Path Development in US University of Washington(UW), Microsoft Research, Gates Foundation, Boeing



University of Washington

GESL students have made a plan to hold a workshop for career-path development by them selves at University of Washington(UW), Microsoft Research, Gates Foundation, Boeing etc.

They have created young-researcher's network and promote the collaborative researches.



Microsoft Research



Gates Foundation, Boeing

# Workshop for Career-Path Development in Paris and Geneva [1/2]

GESL offers a opportunity to hold a workshop for career-path development.

In 2017, we visited several UN-related international organizations in Paris and Geneva.

- 国際エネルギー機関(IEA),
- 経済協力開発機構環境局(OECD),
- 国際連合教育科学文化機関環境セクション(UNESCO),
- 国連環境計画産業技術経済局(UNEP)



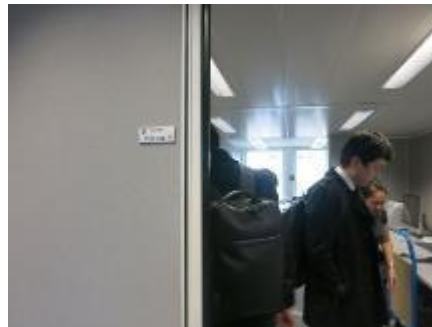
IEA



Mr. Rintaro Tamaki  
Deputy Secretary-General, OECD

OECD

# Workshop for Career-Path Development in Paris and Geneva [2/2]



## UNEP Chemicals



UNESCO

UNEP

# International Negotiation Role-play with United Nations University [1/2]



Ms. Jimena Leiva Roesch (Policy Analyst,  
the International Peace Institute, Austria,  
元グアテマラ国 外交官)

Ms. Ye - Min Wu (Directorate, Ministry of  
Foreign Affairs, Singapore, 現職シンガ  
ポール国 外交官)



In one of GESL 4 lecture courses, “Global Environmental Policy Management”, we offers a joint workshop on International Negotiation Role-play (simulation) with UN University and 2 guest lecturers (active diplomats).

# International Negotiation Role-play with United Nations University [2/2]



GESL students discuss on UNFCCC or other international negotiation on water-resources for example at the role-play (simulation) as a representative of each developing or developed county.

# C. RA Activities with Remote Collaboration System

## Public Relations Team: Information transmission of GESL activities for outside



RAによるWebページの公開、Newsletterの編集・発行

- Newsletterとホームページを利用して情報発信し、新たなコラボレーション、活動エリアの拡大、キャリアパスの構築を促進
- メンバー(12名):花野井俊介(リーダー)、今西智哉、野澤拓磨、小松万里子、湯原大輔、徳島泰、野村昂太郎、林侑江、矢本昌平、Goumehei Elham、Shaheen Maisoon、梁俊晗

## Research & Education Team: Effective Management of GESL equipment and contents



- RA同士の知識共有 データベースである”5D World Map”や、遠隔コラボレーションシステム”3D collaboration system”を始め、3Dスキャナ&プリンタ、大規模並列計算マシン、電子走査型顕微鏡、フライス盤等、他分野に渡る10種以上の物品を管理
- メンバー(13名): Haitham Alkhalaf(リーダー)、Tatiana Endrjukaite、友部勝文、山下達也、Iza Husna Mohamad Hashim、Siti Nor Khuzaimah Amit、Ahmad Muzaffar bin Baharudin、近藤智貴、Chalisa Veessommai、今城哉裕、巽瞭子、山口雅己、Marco Capitanio

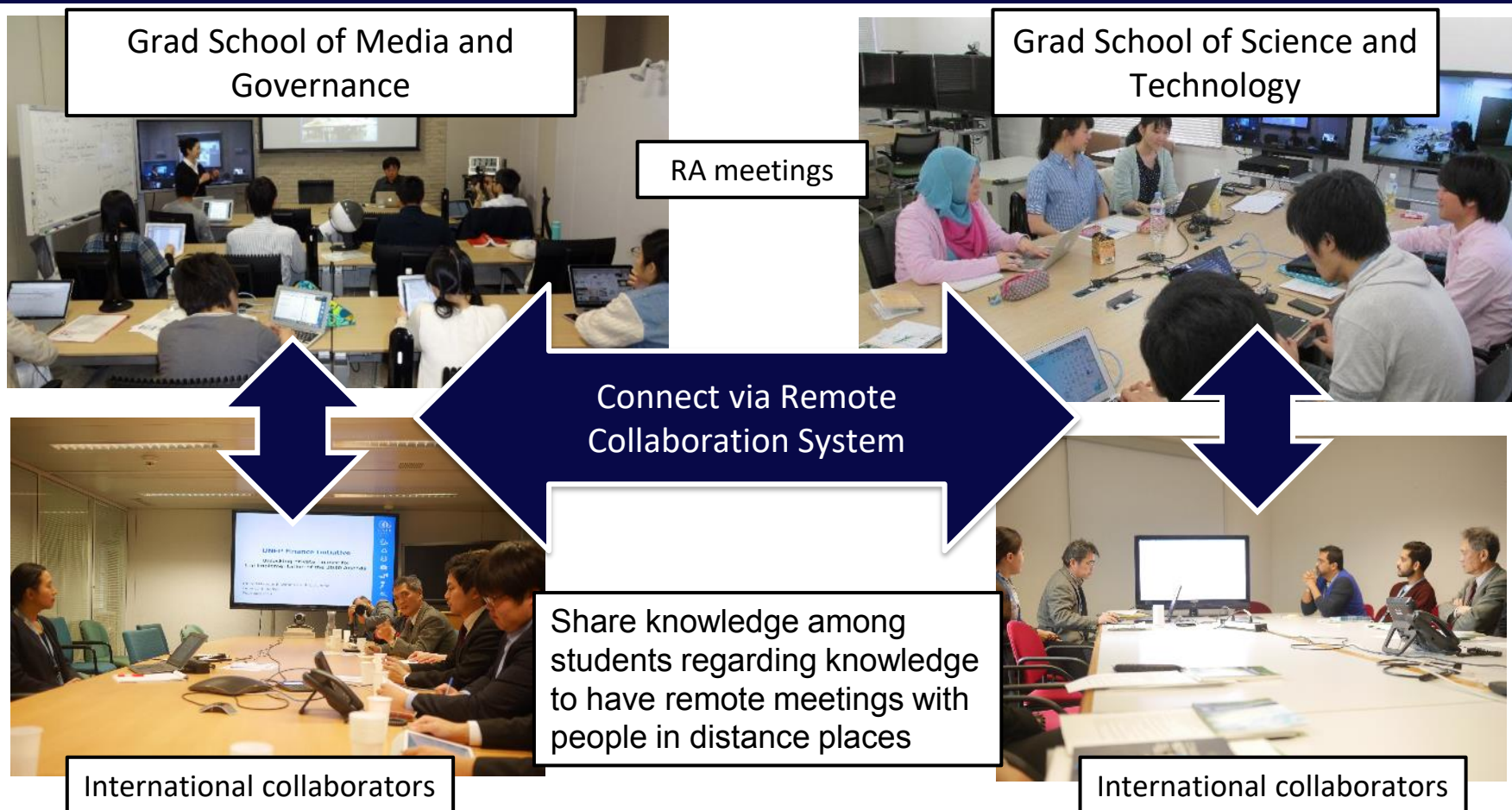
## Capacity Building Team: Support for RA activities & Communication among RA-Faculty-Secretariat Office



- RA間のコラボレーションを促進するためのミーティング/ワークショップの企画・実施として、新入生RAや留学生RAのサポート、国際トレーニング円滑化のための準備ガイドの作成企画、新入生を支援するためのメンターシステムの構築
- メンバー(17名): 小林周(リーダー)、前田知貴、西山勇毅、鈴木悠、鈴木良、井上岳、西田健治朗、西岡宗、姜ソウウ、中曾爽香、小川愛実、遠藤冬玲、Helena Machin Cavalle, Soyeng Kaku, Xie Lijun, Jinmika Wijitdechakul, Wahyu Sesulihatien

# C. Daily and continuing international collaboration environment by applying Remote Collaboration System

Daily and continuing international collaboration environment by applying Remote Collaboration System makes it possible to have tight and mutual relationship between Graduate School of Media and Governance, Graduate School of Science and Technology, and international collaborative institutes.

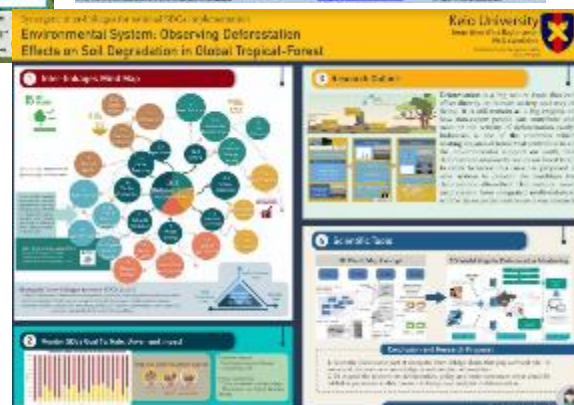
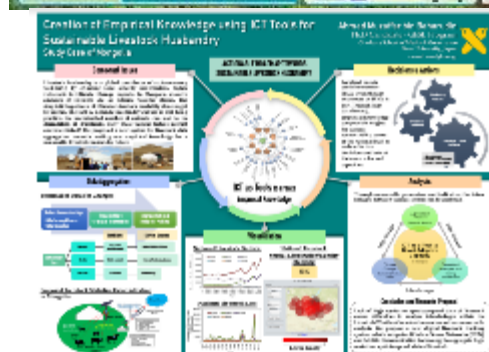
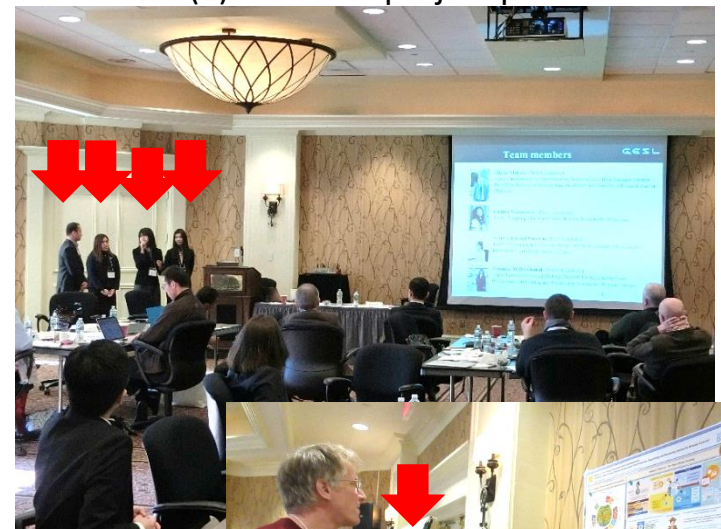
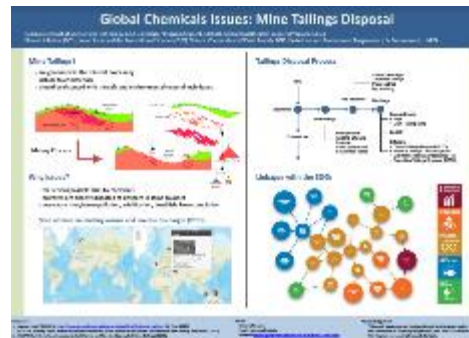


# UN SDGs-GESL Joint Workshop with Remote Collaboration System in NY (March 5-7<sup>th</sup>, 2017)

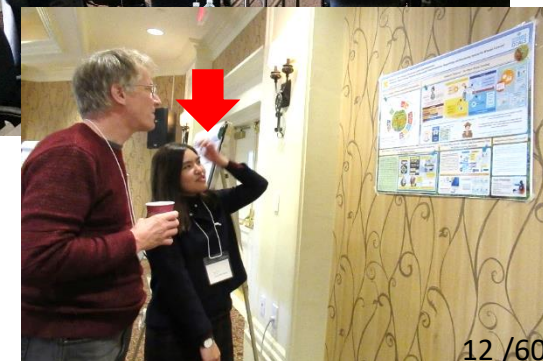


(1) Group Discussion

(2) Research project presentation

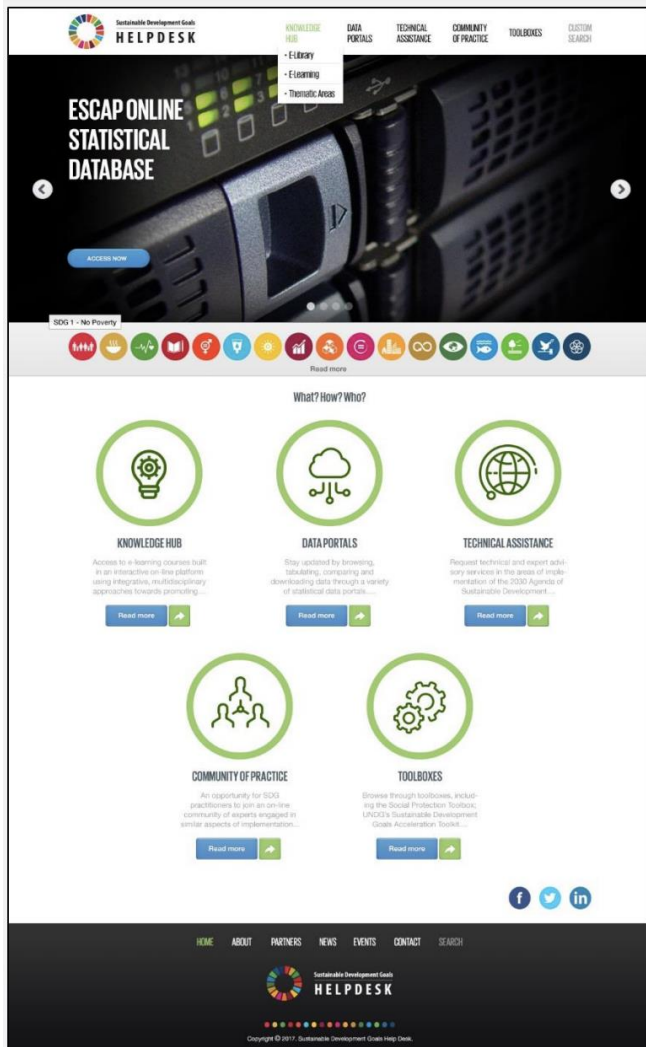


(3) Poster presentation



## A new environmental-semantic computing system for **Ocean Environment-analysis** with 5D

- 5D World Map System provides a platform to collect and analyze '**real time**' information across SDG partnership and **civil societies** members for facilitating **policy making** in the region.
- 5D World Map System, and the applications in the field of Agenda 2030 implementation is to **integrate** the analysis of **sensing data** into a knowledge sharing system with **multimedia**, based on the framework of Sensing-Processing-Actuation of Cyber-Physical Systems that allow to acquire SDG related data and perform **analytical visualizations** from multiple sites around **Asia and Pacific region**.
- By using 5D World Map System integrated with these functions, the users are able to perform a **global analysis** on the environmental **sensing data** along with the related **multimedia** data on a **single view** of time-series maps, based on the spatiotemporal and semantic correlation calculations.



<https://sdghelpdesk.unescap.org/>



# Knowledge Platform Creation on **SDG 14** with **SDG HELP DESK** in ESCAP



Sustainable Development Goals  
**HELP DESK**

**SDG 14 TARGETS:**

**14.1** By 2025, prevent and significantly reduce marine pollution of all kinds

**14.2** By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts

**14.3** Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels

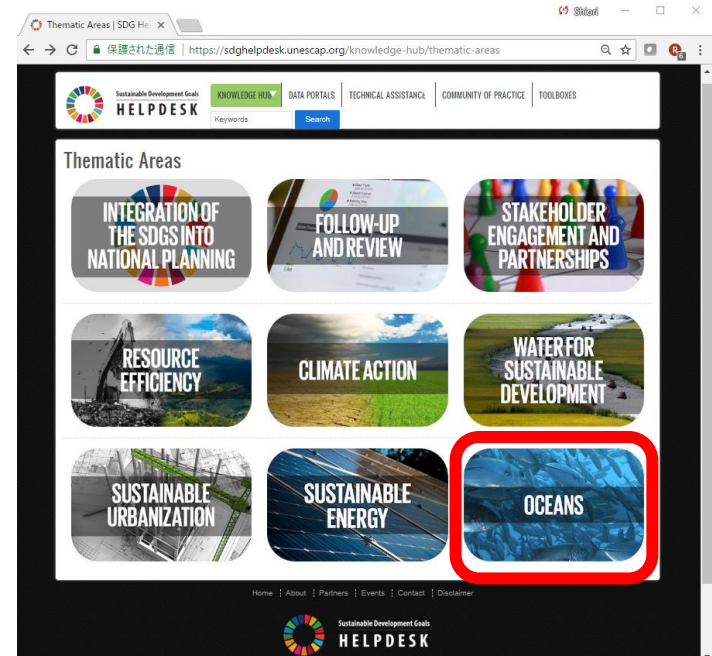
**14.4:** By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices

**14.5:** By 2020, conserve at least 10 per cent of coastal and marine areas

**14.6** By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing

**14.7** By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources

SUSTAINABLE DEVELOPMENT GOALS | NEREUS PROGRAM



<https://sdghelpdesk.unescap.org/>  
**TOP => KNOWLEDGE HUB => OCEANS**

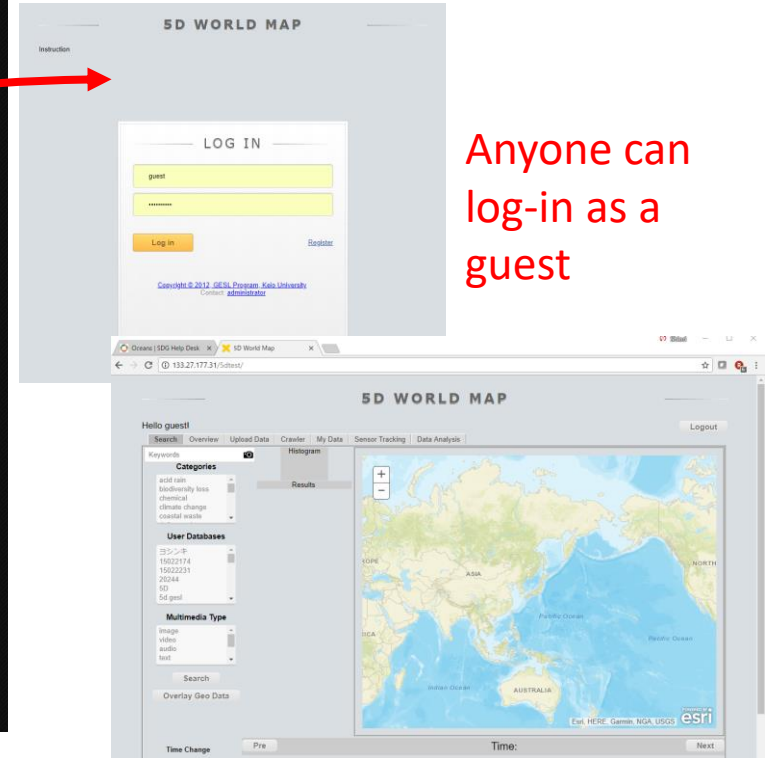
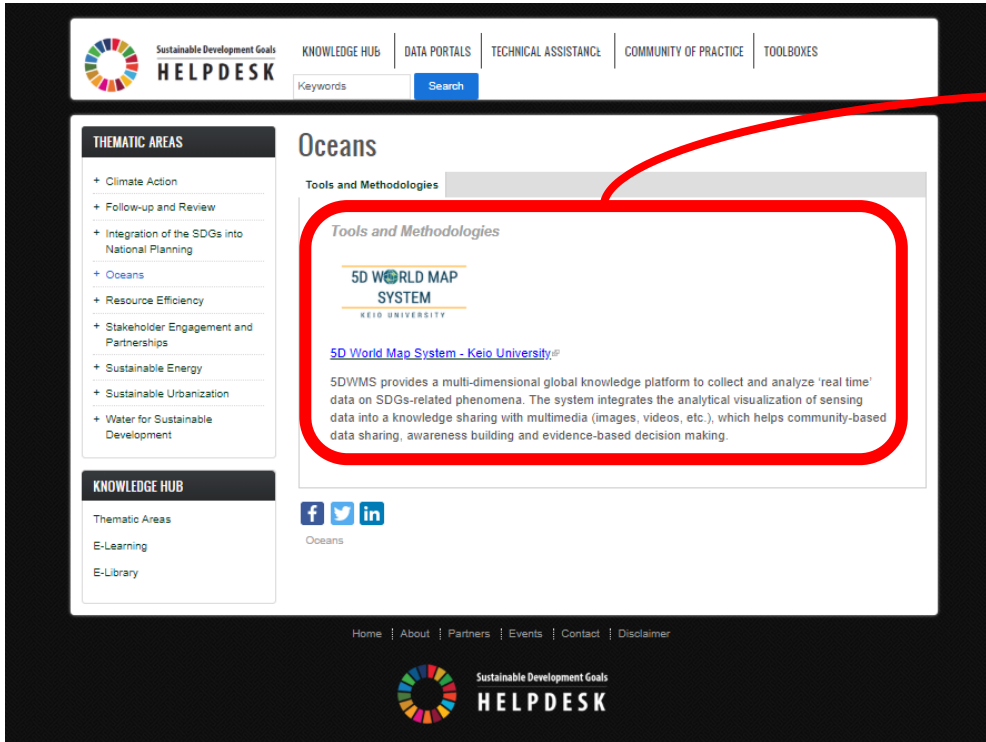
## SDG 14: Life Below Water

Conserve and sustainably use the oceans, seas and marine resources. The increasingly adverse impacts of climate change, overfishing and marine pollution are jeopardizing recent gains in protecting portions of the world's oceans.

Source: <http://www.nereusprogram.org/tag/sdg-14/>

Global Environmental System Leaders Program (GESL), Keio University is developing 5D World Map for implementing Goal 14: Life below water (OCEANS)

# Knowledge Platform Creation on **SDG 14** with **SDG HELP DESK** in ESCAP



Anyone can  
log-in as a  
guest

<https://sdghelpdesk.unescap.org/>

**TOP => KNOWLEDGE HUB => OCEANS**

Conserve and sustainably use the oceans, seas and marine resources. The increasingly adverse impacts of climate change, overfishing and marine pollution are jeopardizing recent gains in protecting portions of the world's oceans.

<http://133.27.177.31/5dtest/>  
Global Environmental System

Leaders Program (GESL), Keio University is developing 5D World Map for implementing **Goal 14: Life below water (OCEANS)**



# Knowledge Platform Creation on SDG 14 with SDG HELP DESK & SDG 9, 11 with IDD in ESCAP

