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Message from Director

Flood governance and investment in response to climate change

To address recurring severe flood disasters right after the end of World War II, a method for determining a B/C by dividing the statistically expected value of direct flood damage by the total construction cost was established in Japan in the 1960s to rationally promote investment in flood control under a limited national budget. Today, when hazards are intensified due to climate change, what kind of additional perspective should be introduced in governance and investment in flood risk reduction?

In order to enhance a nation's capacity to prevent, respond to, and recover from disasters, a platform should be developed for all stakeholders, including policymakers, practitioners, private companies, civil organizations, and the science and technology community. Then, they can share the understanding of disaster risks, improve information literacy, fulfill the responsibility according to their roles and positions, and cooperate to reduce disaster risks. By preparing for an emergency through the effective use of science and technology in data integration and communication, all stakeholders will be able to take timely actions in each stage of a disaster starting from the pre-event stage with some signs of a disaster, followed by evacuation advisories and orders, emergency response, recovery, rehabilitation and reconstruction. To achieve a society where each individual is sure of being protected safely, it is critical to provide adequate assistance for them to build the ability to protect themselves and demonstrate it as necessary.

As roads, city blocks and other infrastructure are developed, more businesses are attracted to the area and more houses are built. This urbanization brings about various external economic effects and consequently leads to more tax revenues. Similarly, it is possible to evaluate the effectiveness of river improvement by calculating how much tax revenue may be lost and for how long such loss may last in case of a flood disaster. Considering that the tax revenue loss can be prevented or recovered through river improvement, it is possible to see river improvement as creating extra tax revenues, part of which can be earmarked for further river improvement. If such a mechanism can be established, more investment in river improvement can be encouraged. Professor YOSHINO Naoyuki, the dean of the Asian Development Bank Institute, points out that good investment creates the spill-over effect, or external economic effects, and prevents decreases in tax revenues from riverside areas.

As much effort as possible should be made for recovery, rehabilitation and reconstruction from recurring severe flood disasters. Still, equally important is to present a basic policy which shows the necessity of governance and investment in flood control for further growth at all levels. Such a policy is the key factor to promote the implementation of essential proactive measures.



Speech at the Cochin University of Science and Technology, Kerala, India on December 19, 2019
コチン科学技術大学にて、インド・ケララ州 (2019年12月19日)

気候の変化に対応する治水ガバナンスと投資

終戦直後の打ち続く激甚水害に対応するために、日本では限られた国家予算の下で治水投資を進めるために、確率的に期待される洪水の直接被害額を治水施設の建設費用で除したB/Cの決定手法が1960年代に確立されました。気候の変化による災害外力の激甚化を迎えて、河川整備のためのガバナンスと投資にはどのような考え方が必要でしょうか。

災害に対する国全体としての予防力・対応力と被害からの回復力を高めるために、政策決定者、実務家、民間企業、市民団体、科学技術コミュニティなど、すべての関係当事者(ステークホルダー)が議論を深める場を構築して、災害リスクの理解を共有し、情報リテラシーを向上させ、各ステークホルダーが相応に責務を果たし、災害リスクの軽減に協力して取り組むことができます。発災予兆、避難情報発令、応急、復旧、復興に滞りなく移行できるよう、平常時と異常時を境目なくつなぐための平常時からのデータ統合・対話機能の利用推進をあわせて、ひとりひとりが「自らを守る力」を蓄え、適時に発揮できることを支援することこそが、「誰もが守られていると実感できる社会」の実現につながります。

道路や街区等のインフラが整備されると、企業の誘致や住宅建設が進み、さまざまな外部経済効果によって税収が増えます。同様に考えると、河川整備の場合は水害によってどの程度の期間、どの程度の税収が減少するかが鍵となります。つまりこれを定量的に評価できれば、河川整備投資によって税収の落ち込みを取り戻した分、つまり増収分の一部を河川整備への投資主体に還元する仕組みを構築することによって投資を促進することができます。アジア開発銀行研究所所長の吉野直行教授は、よい投資であればスπιルオーバー効果、つまり外部経済効果によって、河川周辺地域の税収の落ち込みを防ぐことが可能と提案しています。

打ち続く激甚水害からの復旧・復興に全力を尽くすことは元よりですが、成長につながるガバナンスと投資の道筋を描く基本方向を設定することが、必要不可欠な事前対応の活路を見いだす鍵です。

January 31, 2020
KOIKE Toshio
Director of ICHARM



Special Topics

3. ICHARM Director given the Chinese Government Friendship Award and AOGEO Fellow / 小池俊雄センター長が中国政府友誼賞および AOGEO フェローを受賞しました
3. Field Surveys of disaster damage by the torrential rainfall due to Typhoon No.19 (Hagibis) / 2019 年台風第 19 号に関する現地調査

International Flood Initiative (IFI)

6. The Workshop, "Orientation on Climate Change", held in Davao City, the Philippines / フィリピン・ダバオ市における気候変動オリエンテーションの開催

Research

8. ICHARM held an AWCI session at the 12th AOGEO Symposium / 第 12 回 AOGEO シンポジウムにおけるアジア水循環イニシアティブ (AWCI) セッションの開催
9. 11th River, Coastal and Estuarine Morphodynamics Symposium, RCEM 2019 / RCEM: 第 11 回河川、沿岸、及びエスチュアリーの状態力学に関するシンポジウム
9. Introduction of ICHARM research projects / 研究紹介
10. Development of IFAS Calibrator / IFAS キャリブレーターの開発

Training & Education

11. Educational Program Updates / 修士課程研修 活動報告
13. Hands-on training on RRI in JICA short-term training/ JICA 短期研修での RRI ハンズ オントレーニング
14. Action Reports from ICHARM Graduates
14. Myo Myat Thu, Deputy Staff Officer, Assistant Forecaster in River Forecasting Section, Department of Meteorology and Hydrology under the control of the Ministry of Transport and Communications, Myanmar

Information Networking

15. The International Atomic Energy Agency (IAEA) activities: the Regional Cooperative Agreement for Asia and Pacific (RCA) final meeting of RAS/7/030 project / 国際原子力機関 (IAEA) の活動: RAS/7/030 プロジェクトのアジア太平洋地域協力協定 (RCA) 最終会合
16. Typhoon Committee 8th meeting of working group on hydrology in Seoul, ROK and 14th integrated workshop in Guam, USA / 台風委員会 第 8 回水文部会 (韓国・ソウル) および第 14 回統合部会 (米国・グアム)
17. ICHARM held a technical session and a poster presentation at the World BOSAI Forum 2019 / 世界防災フォーラム 2019 におけるセッション開催及びポスター発表
18. Participation in the 27th UNESCO-IHP Regional Steering Committee Meeting for Asia and the Pacific / 第 27 回ユネスコ IHP アジア太平洋地域運営委員会への参加

Others

19. Comments from visiting researchers / 招聘研究員からのコメント
20. Awards / 受賞リスト
20. Business trips / 海外出張リスト
21. Visitors/ 訪問者リスト
24. Publications / 発表論文リスト

Special Topics

ICHARM Director given the Chinese Government Friendship Award and AOGEO Fellow 小池俊雄センター長が中国政府友誼賞および AOGEO フェローを受賞しました

On September 30, 2019, Prof. KOIKE Toshio, the director of ICHARM, received the 2019 Chinese Government Friendship Award at the Great Hall of the People in Beijing, China. The Award is the highest honor given by the Chinese government to foreign experts who have made outstanding contributions to the social and economic development of the country. Grateful for the highest recognition from the Chinese government, Director KOIKE commented, "I have been involved in research on the water cycle in the Tibetan Plateau since 1991, and the research has been very productive. I thank everybody for that. I also would like to say that it has been a real privilege to work closely with many Chinese researchers."

Director KOIKE was also awarded the AOGEO Fellow for his long-term leadership in the activities of earth observation and his significant contributions to its development at the closing ceremony of the 12th Asia-Oceania Group on Earth Observations (AOGEO) Symposium held at Australian National University in Canberra, Australia on November 2-4 in 2019.



Chinese Government Friendship Award
中国政府友誼賞



Awarding ceremony of AOGEO Fellow
AOGEO フェロー授与式

(Written by KIKUMORI Yoshito)

9月30日、当センターの小池俊雄センター長は中国・北京の人民大会堂にて「2019年 中国政府友誼賞」を授与されました。「中国政府友誼賞」は、中国の社会・経済的發展に顕著な貢献をした外国人専門家に贈られる最高栄誉の賞です。受賞に際し、小池センター長から以下のコメントが寄せられました。

「1991年からチベット高原の水循環に関する研究をさせていただき、良い成果が得られたので大変ありがたいと思っています。多くの中国の研究者と協働できたことに感謝申し上げます。」

また、11月2日から4日にオーストラリアのキャンベラ（オーストラリア国立大学）で開催された「第12回アジア・オセアニア地域地球観測に関する政府間会合（AOGEO：Asia-Oceania Group on Earth Observations）シンポジウム」の閉会式において、小池センター長は地球観測に関する活動を長年に渡り牽引し、その進展に大きく貢献した功績により AOGEO フェローが授与されました。

Field Surveys of disaster damage by the torrential rainfall due to Typhoon No.19 (Hagibis) 2019年台風第19号に関する現地調査

On October 12, 2019, Typhoon No.19 (Hagibis) hit the Izu Peninsula and brought record-breaking heavy rainfall over a wide area of Japan. At one location, the accumulated precipitation exceeded 1,000 mm. At many locations, mainly in eastern Japan, the 3-, 6-, 12-, and 24-hour precipitations reached a record high, causing floods with a massive transport of sediment as well as slope failures and debris flows.

Considerable damage resulted, including 102 people dead or missing throughout Japan. Since this event, ICHARM has been conducting research on floods with a massive transport of sediment, which have occurred frequently in recent years, to clarify their mechanisms and phenomena and study effective methods for sharing information in the event of a disaster.

(The damage statistics cited in this section is quoted from the Disaster Report issued by Cabinet Office on December 12, 2019.: (http://www.bousai.go.jp/updates/r1typhoon19/pdf/r1typhoon19_42.pdf)

2019年10月12日に大型で強い勢力を保ったまま伊豆半島に上陸した台風第19号は、日本全国の広い範囲に記録的な大雨をもたらしました。総降水量が1,000mmを超える地点（神奈川県箱根）もあり、東日本を中心とした多くの地点で3、6、12、24時間降水量について観測史上1位の記録を更新し、多くの地域で洪水氾濫や土砂災害による被害が発生しました。その結果、102人の死者・行方不明者を含む甚大な被害が生じました^{*1}。ICHARMでは、近年頻発化している洪水氾濫について、その発生メカニズムや現象の解明、さらには災害時の効果的な情報共有方法の検討等を目的とした研究を継続的に実施しており、今回の台風第19号による災害状況を把握す

るため、災害発生直後から、栃木県、新潟県及び宮城県において現地調査を行なっています。

※ 1: 被災数値は 12 月 12 日付内閣府被災報告 (http://www.bousai.go.jp/updates/r1typhoon19/pdf/r1typhoon19_42.pdf) より

1. 栃木県佐野市での現地調査

10 月 16 日には原田大輔専門研究員、南雲直子専門研究員が、利根川水系渡良瀬川支流の秋山川において洪水氾濫の実態把握を目的とした現地調査を行いました。秋山川流域は栃木県佐野市にあり、下流域で佐野市中心部を縦断するように流下した後、渡良瀬川に注いでいます。今回の台風第 19 号による豪雨では、中・下流域で河岸部の侵食や橋梁への流木の集積、堤防の決壊が生じ、低地の広い範囲が浸水しました。写真 1～3 に佐野市内の被害の様子を示します。写真 1 は、同市水木町で撮影されたものです。秋山川が大きく蛇行するこの場所では、外岸側の河岸が激しく侵食されて道路が崩落しています。また、河床には今回の出水により輸送されたとみられる砂礫が堆積している様子も見られます。写真 2 は同市豊城町にある常盤橋で、流木が集積し、桁下空間が閉塞していることが分かります。写真 3 は同市中心部赤坂町の秋山川の様子です。海陸橋の上流にあたるこの場所では、10 月 12 日午後 9 時頃に右岸堤防が約 50 m にわたって決壊し、近隣の住宅地に洪水や細粒な土砂が流入しました。写真 3 に示すように、決壊点近くの堤防天端には大量の流出した草木やごみが堆積する様子が認められました。ICHARM では今後も調査・研究を進め、洪水氾濫が顕著であった同河川の氾濫プロセスと被害の実態把握に関する研究を推進する予定です。

2. 新潟県阿賀町での現地調査

10 月 17～18 日には、藤兼雅和上席研究員と傳田正利主任研究員、諸岡良優研究員が新潟県東蒲原郡阿賀町において現地調査を実施しました。阿賀町では町内を流れる阿賀野川の越水により、家屋の全半壊 13 棟、床上浸水 10 棟、床下浸水 71 棟^{※2}の被害が発生しました。阿賀野川本川からの越水以外にも、小さな沢からの内水氾濫によって浸水被害が発生した地域もあります。今回の調査では、浸水痕跡の調査や、発災当時の浸水や避難の状況について、現地の方からお話を伺うことができました。写真 4 は同町角島地区で撮影されたもので、最大浸水深は約 70cm 程度であったと推測されます。また、写真 5 は同町谷沢地区で撮影されたもので、阿賀野川本川からの越水により堤防裏のりが侵食された様子が分かります。同地区では、支川の谷沢川堤防から漏水があったことなどを現地の方から伺いました。ICHARM では、阿賀町と研究等に関する覚書を締結しており、今回の台風第 19 号についても氾濫解析やそれに基づくリスク評価に関する調査・研究を引き続き実施していく

(1) Field survey in Sano City, Tochigi Prefecture

On October 16, Research Specialists HARADA Daisuke and NAGUMO Naoko visited the Akiyama River, a tributary of the Watarase River, in the Tone River basin and conducted field surveys to investigate the post-flood situation there. The Akiyama River flows through central Sano City, Tochigi Prefecture, which lies in the lower part of the basin, and finally merges with the Watarase River. As a result of torrential rainfall induced by Typhoon No.19, bank erosion, driftwood accumulation under the bridges, and dike breaches occurred in the middle and lower reaches of the Akiyama River, causing inundation over a large part of the city's low-lying area. Photos 1, 2, and 3 show damage found at different places in Sano City. In Photo 1, taken in Mizuki Machi, where the Akiyama River forms a big meander, the outer bank has heavily eroded, causing a collapse of the riverside road. The photograph also shows that sediment accumulated in the river bed apparently after being transported in significant discharges of river water resulting from the severe rainfall. Photo 2 shows driftwood accumulation and occlusion of underclearance at Tokiwa Bridge in Toyoshiro Machi. Photo 3 displays the Akiyama River in Akasaka Machi, the central part of Sano City located upstream of Kairiku Bridge. A dike breach of about 50 m wide occurred in the right bank around 9 p.m. on October 12, and floodwaters flowed into a surrounding residential area, carrying fine sediment with them. The same photo shows plant debris and garbage having accumulated on the dike top.

In addition to this survey, ICHARM will continue conducting field surveys and research focusing on flood processes and resulting damage in the Akiyama River.



Photo 1. Bank erosion in Mizuki Machi
写真 1 水木町の河岸侵食



Photo 2. Driftwood accumulated in Tokiwa Bridge
写真 2 常盤橋に集積した流木



Photo 3. Akiyama River around the dike breach site
写真 3 秋山川の決壊地点付近

(2) Field survey in Aga Town, Niigata Prefecture

On October 17-18, Chief Researcher FUJIKANE Masakazu, Senior Researcher DENDA Masatoshi, and Researcher MOROOKA Yoshimasa conducted a field survey in Aga Town, Niigata Prefecture. In the town, 13 houses were destroyed partially or completely, 10 houses inundated above the floor level, and 71 houses inundated below the floor level due to overflow from the Agano River, which runs through the town. In addition to the overflow from the mainstream of the Agano River, small streams also flooded inland and inundated other parts of the town. In this survey, the research team investigated inundation marks and interviewed local people about the inundation and evacuation at the time of the disaster. Photo 4 was taken in the Tsunoshima district of the town, and the maximum flood depth is estimated

to have been about 70 cm. Photo 5 was taken in the Yazawa district of the same town and shows how the bank slope was eroded by the overflow from the Agano River. Local people told the research team that there were also water leaks from levees along its tributary Yazawa River in the area.

As it has concluded an R&D memorandum of understanding with Aga Town, ICHARM is planning to continue the investigation and risk assessment based on inundation analysis about Typhoon No.19.

(The damage statistics cited in this section is quoted from the Disaster Report issued by Aga Town.: http://www.town.aga.niigata.jp/sysimg/topics/1192_4.pdf)



Photo 4. Investigate the inundation marks
写真 4. 痕跡浸水深の調査



Photo 5. Eroded the bank slope
写真 5. 侵食された堤防裏のり

(3) Field survey in Marumori Town, Miyagi Prefecture

On November 11-12, 2019, a group of ICHARM researchers conducted another field survey in Marumori Town, Miyagi Prefecture. The survey team consisted of Research and Training Advisor EGASHIRA Shinji, Senior Researcher KIKUMORI Yoshito, Researcher MOROOKA Yoshimasa, Research Specialists NAGUMO Naoko, Robin Kumar Biswas, and KAKINUMA Daiki, and Exchange Researcher NAKAMURA Yousuke. Egashira, Nagumo, Harada, and Robin went back to the same town for still another field survey on December 4-5.

Marumori Town was devastated by flooding with a massive transport of sediment when Typhoon No.19 swept through eastern Japan last October, for the town's central part is located near the confluence of the Uchikawa River and the Kijio River, right tributaries of the Abukuma River. The disaster left 10 people dead and 1 person missing, 952 houses destroyed partially or completely, 827 houses inundated above the floor level, and 194 houses inundated below the floor level. The traces of the flooding with a massive transport of sediment were found particularly clear around the confluence of the Shinkawa River and the Gofukuya River, tributaries of the Uchikawa River, and in the flat area lying along the Uchikawa River. From the observations, it is reasonable to assume that the flooding occurred due to the blockage of the channels caused by sediment deposition and the levee breaches induced by overflow due to the rise of the river bed, especially in sections where the river topography changes drastically (e.g., where the slope suddenly becomes far gentler).

Driftwood accumulation and deposition were also found severe in areas significantly affected by flooding with a massive transport of sediment. Photo 6 shows a post-flood situation with a massive volume of sediment on a steep slope where the Gofukuya River enters a plane area. The occurrence of flooding with a massive transport of sediment, such as the one in Marumori Town, was also confirmed in the July 2017 torrential rain disaster in northern Kyusyu and the July 2018 torrential rain disaster in western Japan, and these phenomena have been found similar in many aspects.

ことを予定しています。

※ 2: 阿賀町「令和元年 10月台風 19号被災状況報告資料」
(http://www.town.aga.niigata.jp/sysimg/topics/1192_4.pdf) より

3. 宮城県丸森町での現地調査

11月11～12日には、江頭進治研究・研修指導監、菊森佳幹主任研究員、諸岡研究員、南雲専門研究員、Robin Kumar Biswas 専門研究員、柿沼太貴専門研究員、中村要介交流研究員が、また12月4～5日には、江頭研究・研修指導監、南雲専門研究員、原田専門研究員、Robin 専門研究員が宮城県伊具郡丸森町において現地調査を実施しました。丸森町は、阿武隈川の右岸に流入する支川の内川および雉子尾川との合流点近傍に中心市街地が形成されており、このたびの土砂・洪水氾濫によって甚大な被害が発生しました。町内では、死者10名、行方不明者1名、家屋の全半壊991棟、床上浸水866棟、床下浸水207棟の被害が発生しました^{※3}。町内で発生した土砂・洪水氾濫は、内川に合流する新川と五福谷川の合流点近傍や内川本川沿いの平坦部において顕著に見られ、特に勾配が急減するような河川地形の変化が大きい箇所付近において、土砂堆積に伴う流路閉塞や、河床上昇に伴う越水破堤等によって発生していると考えられます。こうした土砂・洪水氾濫現象が顕著なところでは流木の集積や堆積も顕著に見られました。写真6は、五福谷川が平地部に出るところの勾配急変部における土砂・洪水氾濫の状況です。丸森町で見られた土砂・洪水氾濫は、2017年九州北部豪雨災害及び2018年西日本豪雨災害においても顕著に見られ、これらの氾濫現象には多くの面で相似性が見られます。ICCHARMでは、このような情報を将来の川づくり・地域づくりに活かすべく、地形解析や現地調査に基づく土砂・洪水氾濫の実態把握に努めるとともに、数値解析に基づく現象の再現、ならびに災害リスクに関する研究を進めているところです。

※ 3: 丸森町ホームページ (<http://www.town.marumori.miyagi.jp/soumuka/bousai-info/emergency/taifu19-saigaiosirase.html>) より
(閲覧日: 2020年1月21日)

In order to utilize such information for future river improvement and regional development planning, ICHARM is working to better understand the mechanism of floods with a massive transport of sediment based on topographic analysis and field surveys and conducting research on the reproduction of the phenomena and related disaster risks based on numerical analysis.

(The damage statistics cited in this section was available at the website of Marumori Town on January 21, 2020.: http://www.town.marumori.miyagi.jp/soumuka/bousai-info/emergency/taifu19_saigaioisirase.html)



Photo 6. Flooding with a massive transport of sediment in Marumori Town
写真 6. 丸森町内で発生した土砂・洪水氾濫の状況

(Written by NAGUMO Naoko, MOROOKA Yoshimasa and EGASHIRA Shinji)

International Flood Initiative (IFI)

国際洪水イニシアティブ (International Flood Initiative: IFI) はユネスコ (UNESCO)、世界気象機関 (WMO)、国連大学 (UNU)、国連防災機関 (UNDRR) などの国際機関が世界の洪水管理推進のために協力する枠組みで、ICHARM は、IFI の事務局を担当しています。

2016年10月に承認された「洪水リスク軽減と持続可能な開発を強固にするための学際的な協力に向けた宣言文 (ジャカルタ宣言)」を受け、各国および関係機関と協働しながら、統合洪水マネジメントに貢献する活動を進めています。特に、フィリピン・スリランカ・パキスタン・ミャンマーにおいては、各国の関係機関による「水のレジリエンスと災害に関するプラットフォーム」の構築に向けた取り組みが始まり、ICHARM はファシリテーターとしてその活動を促進を図ってきました。

本号では、フィリピン・ダバオ市における気候変動オリエンテーションの開催について報告します。

The International Flood Initiative (IFI) is a worldwide framework to promote collaboration in flood management among international organizations such as UNESCO, the World Meteorological Organization (WMO), the United Nations University (UNU) and the United Nations Office for Disaster Risk Reduction (UNDRR). ICHARM has been its secretariat since the establishment of IFI.

In October 2016, the Jakarta Statement towards an interdisciplinary and transdisciplinary partnership to consolidate flood risk reduction and sustainable development, was adopted by the member organizations of IFI. As part of this effort, the Philippines, Sri Lanka, Pakistan and Myanmar have already decided to establish a Platform on Water Resilience and Disasters involving various government agencies, and ICHARM has been supporting their decision as facilitator.

This article reports the Workshop, “Orientation on Climate Change”, held in Davao City, the Philippines.

The Workshop, “Orientation on Climate Change”, held in Davao City, the Philippines フィリピン・ダバオ市における気候変動オリエンテーションの開催

2019年10月25日にフィリピン南部のダバオ市において気候変動オリエンテーションをフィリピン科学技術省ダバオ地方局と ICHARM が共同で開催しました。気候変動オリエンテーションは、気候変動に対する適応策を策定するための活動を開始することを目的とした「水のレジリエンスと災害に関するプラットフォーム」の能

The Orientation on Climate Change was hosted jointly by the Davao regional office of the Department of Science and Technology (DOST) and ICHARM on October 25, 2019, in Davao City, the Philippines. The event was a capacity building program of the Platform on the Water Resilience and Disasters, aiming at initiating activities to formulate adaptation measures for climate change. It gathered 46 participants from relevant agencies and stakeholders. Director KOIKE Toshio, Researcher MIYAMOTO Mamoru, and Research Specialist USHIYAMA Tomoki participated from ICHARM,

providing lectures on climate change, introducing climate change impact assessment and related visualization technology currently in operation in Davao City, and giving suggestions to improve disaster resilience. Local agencies, such as Davao City office, DOST, the HELP Davao Network^{※1}, and the University of the Philippines at Mindanao, also presented their ongoing activities to address climate change. Participants earnestly discussed local practices in Davao City with consideration of its rapid growth in socio-economy, specifically in relation to flash floods, which have frequently occurred in urban areas in recent years, and the inhabited areas of indigenous people. The discussions were all meaningful to design activities for future policy recommendations.

On October 24, the day before the Orientation, the ICHARM researchers visited a barangay, a small administrative district of the Philippines, which actively engages in flood management and evacuation promotion activities, and paid a courtesy visit to the Mayor's Office of Davao City. They also visited the hydro-meteorological monitoring center of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) to learn more about their operations. At the center, they had an opportunity to take a close look at a newly installed real-time rainfall and water-level monitoring system and discuss with local researchers the development of a real-time flood forecasting and warning system for the Davao River basin by utilizing the new monitoring system and DIAS^{※2}.



A scene of the Orientation on Climate Change in Davao City
ダバオ市における気候変動に関するオリエンテーションの様子



ICCHARM researchers learning about real-time rainfall and water-level monitoring system
リアルタイム雨量・水位観測データ監視ネットワークシステムの視察

力開発プログラムであり、水災害と気候変動に関係するダバオ市の政府機関や市民団体などから46名が参加しました。ICCHARMからは、小池俊雄センター長、宮本守研究員、牛山朋来専門研究員が参加し、気候変動に関する講義やダバオ市における気候変動影響評価とその視覚化技術の紹介、災害レジリエンス向上のための活動提案がなされました。ダバオ市、科学技術省、HELPダバオネットワーク^{※1}、フィリピン大学ミンダナオ校等の現地機関からは、気候変動に対して現在取り組んでいる活動の紹介があり、参加者は社会経済的に急成長しているダバオ市の特徴を踏まえた現地での実践方法などについて熱心な議論が交わされました。具体的には、近年都市部において頻発している短時間洪水に対する対策や先住民の居住地域の対策なども議題に挙がり、今後の政策提言に向けた活動デザインについて有意義な議論がなされました。

オリエンテーション開催前日の10月24日には、洪水対策や避難促進活動に積極的に取り組んでいるランガイ（行政最小単位）の現地視察やダバオ市長室への表敬訪問、フィリピン大気地球物理天文局の気象水文観測センターの視察を行いました。気象水文観測センターでは、新たに設置されたリアルタイム雨量・水位観測データ監視ネットワークシステムを視察することができ、このシステムとデータ統合・解析システム（DIAS）^{※2}を活用したダバオ川流域のリアルタイム洪水予警報システムの開発が検討されました。

※1 HELP DAVAO Network:
<http://www.helpdavaonetwork.com/>

※2 DIAS:
<https://www.diasjp.net/en/>

(Written by MIYAMOTO Mamoru)

Research

ICHARM held an AWCI session at the 12th AOGEO Symposium

第12回 AOGEO シンポジウムにおけるアジア水循環イニシアティブ (AWCI) セッションの開催

2019年11月2日から4日にオーストラリア・キャンベラのオーストラリア国立大学において「第12回アジア・オセアニア地域の地球観測に関する政府間会合 (AOGEO: Asia-Oceania Group on Earth Observations) シンポジウム」が「地球観測活動の成功をアジア・オセアニア全域へ拡大ー世界的議題のための結果の共有と将来のステップのデザインー」をテーマとして開催されました。AOGEOの第一分科会であるアジア水循環イニシアティブ (AWCI: Asian Water Cycle Initiative) のセッションは、GEO Global Water Sustainability (GEOGLOWS) の議長である Angelica Gutierrez 氏と ICHARM の小池俊雄センター長が共同議長を務め、GEOの事務局長である Gilberto Camara 氏をはじめ、10か国から約40名が参加しました。AWCIセッションでは、国際洪水イニシアティブ (IFI: International Flood Initiative) が推進する水のレジリエンスと災害に関するプラットフォームの実施国であるフィリピン、スリランカ、ミャンマー、インドネシアからの参加者が各国におけるプラットフォームの活動の進捗報告を行うとともに、仙台防災枠組やパリ協定、SDGsの実現に向けたロードマップ、さらには実施国間の地域連携の推進について有意義な議論が交わされました。これらの議論を踏まえ、水災害リスク軽減のためのプラットフォームの活動が各国・地域で今後より一層加速することが期待されます。

AOGEO シンポジウムの最終日である11月4日には、各分科会の成果をまとめたキャンベラスタートメントが採択されました。また、AOGEO フェロー授与式において、小池センター長が地球観測に関する活動を長年に渡り牽引し、その進展に大きく貢献したことが表彰されました。

The 12th Asia-Oceania Group on Earth Observations (AOGEO) Symposium was convened on November 2-4, 2019, at the Australian National University in Canberra, Australia, under the theme of “Scaling up successful Earth Observation activities for all of Asia-Oceania – Share the results and design the future steps for global agendas –.” The sectional meeting of the Asian Water Cycle Initiative (AWCI), co-chaired by Dr. Angelica Gutierrez, the chair of GEO Global Water Sustainability (GEOGLOWS), and Prof. KOIKE Toshio, the director of ICHARM, was attended by about 40 participants from 10 countries, including Dr. Gilberto Camara, the secretariat director of GEO. In the AWCI session, the representatives from countries implementing a Platform on Water Resilience and Disasters promoted by the International Flood Initiative (IFI), such as the Philippines, Sri Lanka, Myanmar and Indonesia, reported the progress of the Platform activities in their countries. Then, fruitful discussions followed on the roadmaps toward the achievement of the Sendai Framework for Disaster Risk Reduction, the Paris Agreement, and Sustainable Development Goals (SDGs) and also on the promotion of a regional cooperative framework among the Platform implementing countries. Based on these discussions, each country and region is expected to further accelerate the activities of the Platform for the risk reduction of water-related disasters.

On November 4, the symposium was concluded by adopting the Canberra Statement, which summarizes the results of all the sectional sessions held during the symposium. In the closing ceremony, Director KOIKE was awarded by AOGEO for his long-term leadership in the activities of earth observation and his significant contributions to its development.



Participants in the AWCI session
AWCIセッションの参加者



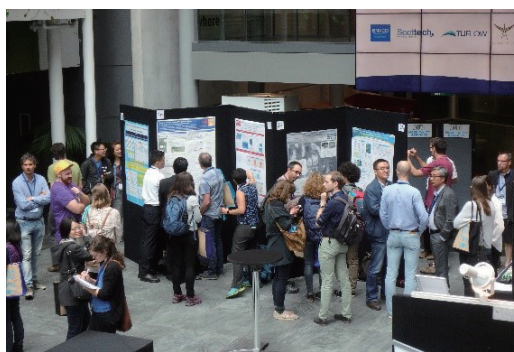
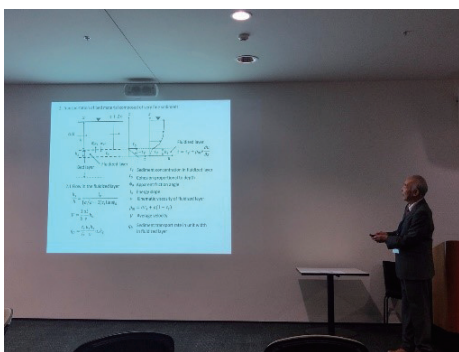
AOGEO Fellow awarding ceremony
AOGEO フェロー授与式での表彰

(Written by MIYAMOTO Mamoru)

11th River, Coastal and Estuarine Morphodynamics Symposium, RCEM 2019

RCEM：第11回河川、沿岸、及びエスチュアリーの状態力学に関するシンポジウム

The 11th River, Coastal and Estuarine Morphodynamics (RCEM) Symposium was held on November 16-21, 2019, in Auckland, New Zealand. The RCEM symposium is an international conference held every two years to discuss research activities in river, coastal and estuarine morphodynamics. The participants from ICHARM included Training and Research Advisor EGASHIRA Shinji, Research Specialists NAGUMO Naoko, HARADA Daisuke, and Robin Kumar Biswas, and Research Assistant Ahmad Tanjir Saif. Senior Researcher YOROZUYA Atsuhiko of the Hydrologic Engineering Research Team, the Public Works Research Institute of Japan, also attended. After the presentation, the ICHARM researchers were asked many questions, for example, about the numerical simulation and morphodynamics of sediment transport in the river and estuary areas, which shows that ICHARM has a worldwide reputation and is expected to play a leading role as an advanced research center in this research field. Among the participants from overseas, many experts were from Dutch organizations such as the Delft University of Technology and particularly impressive in reporting cases of international contribution based on research activities jointly conducted by the academic, governmental and business sectors. The next symposium will be held in Mexico.



An oral presentation by Training and Research Advisor EGASHIRA (left) and a poster session (right)
左：口頭発表の様子（江頭）、右：ポスターセッションの様子

(Written by HARADA Daisuke)

2019年11月16日から21日にかけてニュージーランドのオークランドで11th River, Coastal and Estuarine Morphodynamics Symposium (RCEM：第11回河川、沿岸、及びエスチュアリーの状態力学に関するシンポジウム)が開催されました。RCEMは2年に一度開催される河川、河口域の土砂輸送や地形発達に関する国際会議で、世界からこの分野に関する研究者が参集し、活発な議論が行われました。ICHARMからは江頭進治研究・研修指導監、南雲直子専門研究員、原田大輔専門研究員、Robin Kumar Biswas 専門研究員、Afmad Tanjir Saif リサーチアシスタントが、水文チームから萬矢敦啓主任研究員が参加し、口頭発表およびポスター発表を行いました。ICHARM が発表した河川・河口域の土砂輸送に関するシミュレーションや地形発達に関する発表には多くの質問があり、この分野の先端的な研究拠点として、多くの期待が寄せられました。本シンポジウムではデルフト工科大学をはじめとするオランダからの参加者が特に多く、産官学が連携した研究とそれを基にした国際貢献の観点で存在感を示していました。次回はメキシコにて開催される予定です。

Introduction of ICHARM research projects / 研究紹介

ICHARM sets three principal areas of activity: research, capacity building, and information network. It plans and implements projects in these areas in order to fulfill its mission, always keeping in mind "localism", a principle with which we respect local diversity of natural, social and cultural conditions, being sensitive to local needs, priorities, development stage, etc., within the context of global and regional experiences and trends of disasters.

At present, ICHARM conducts innovative research in the following five major areas:

- (1) Data collection, storage, sharing, and statistics on water related disasters
- (2) Risk assessment on water related disasters
- (3) Monitoring and prediction of changes in water related disaster risk
- (4) Proposal, evaluation and application of policy ideas for water related disaster risk reduction
- (5) Support in constructing the applicability of water-related disaster management

This issue introduces a researcher as listed below:

MIYAMOTO Mamoru, Researcher

Development of IFAS Calibrator

ICHARM は、その使命を果たすため、世界及び地域での災害の傾向及び経験と災害対応に関する地域のニーズ、重要課題、開発段階等を踏まえつつ、自然、社会及び文化といった地域の多様性を考慮する原則というローカリズムを念頭に、研究、能力育成及び情報ネットワーク構築の3本柱を有機的に連携させて、現地実践活動を実施しています。

- そのうち、研究としては
- (1) 水災害データの収集、保存、共有、統計化
 - (2) 水災害リスクのアセスメント
 - (3) 水災害リスクの変化のモニタリングと予測
 - (4) 水災害リスク軽減の政策事例の提示、評価と適用支援
 - (5) 防災・減災の実践力の向上支援
- の5つの柱のもと、革新的な研究活動を行っています。

本号では、宮本守研究員の行っている「研究紹介：IFAS キャリブレーターの開発」を紹介します。



Development of IFAS Calibrator IFAS キャリブレーターの開発

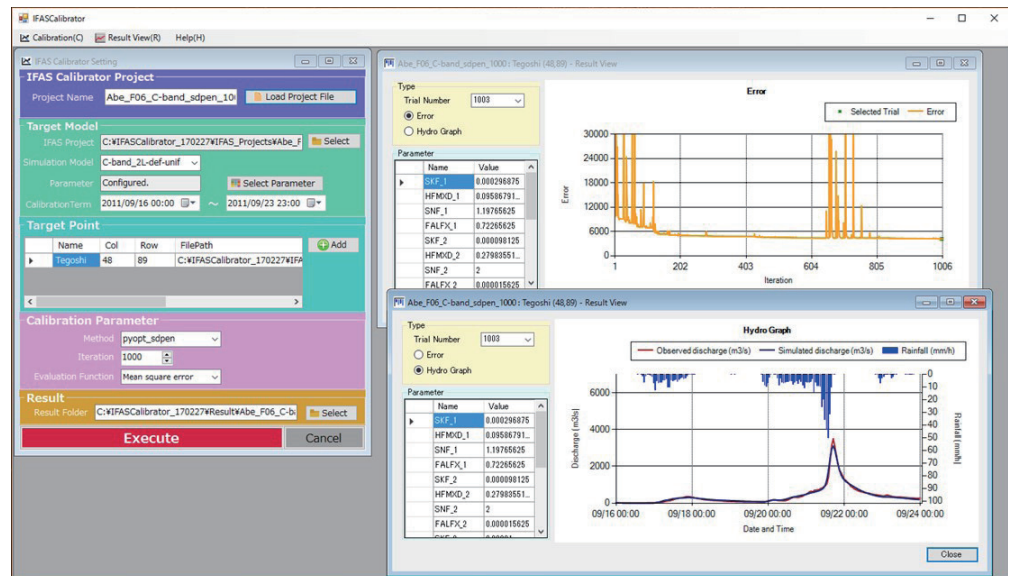
MIYAMOTO Mamoru, Researcher

洪水発生時に被害を回避・軽減するためには水防活動や避難活動が必要不可欠であり、そのためには迅速かつ正確な洪水予測が求められます。洪水を予測するための解析モデルのパラメータは一般に過去の洪水実績に基づいて事前に同定されますが、特に分布型モデルの場合はパラメータの数が多く同定が煩雑になるため最適なパラメータを決定することは簡単ではありません。

ICHARM では統合洪水解析システム (IFAS) を開発し、水文データが不十分な地域における洪水予測モデルおよび予警報システムの構築を推進していますが、その利便性と汎用性を向上させることを目的として、株式会社富士通研究所との数理最適化に関する共同研究成果に基づいてパラメータ自動最適化ツール「IFAS キャリブレーター」を開発しました。IFAS キャリブレーターでは、既存の IFAS のプロジェクトファイルと河川流量の実測値を読み込んだ上で、最適化対象パラメータおよびその探索範囲、誤差評価対象期間、誤差評価関数を選択することで、最適化のための繰り返し計算を実行することができます。最適化アルゴリズムは、遺伝的アルゴリズムや粒子群最適化法など複数のアルゴリズムを搭載しており、その中から選択することができます。また、複数の目的関数による多目的最適化機能も開発しました。最適化結果としては、最も精度よく河川流量を再現するパラメータとその誤差値、流量ハイドログラフを表示することができます。これにより様々な流域に IFAS を適用する際にキャリブレーションの煩雑さを軽減することができ、多くのユーザーが容易に洪水予測を行うことができます。また研修等における教育ツールとして使用することで洪水流出モデルの構造やキャリブレーションの必要性を学ぶことも期待されます。IFAS キャリブレーターは、ICHARM のウェブサイトから無償でダウンロードすることができます。


Flood prevention and evacuation activities are indispensable for avoiding and mitigating damage in the event of a flood, and prompt, accurate flood forecasting is required to support such activities. While the parameters of a flood forecasting model are generally calibrated according to past floods, it is not easy to properly optimize the parameters because the number of parameters is often so large that calibration becomes complicated, particularly in the case of a distributed model.

ICHARM has developed the Integrated Flood Analysis System (IFAS) to promote the formulation of flood forecasting models and warning systems in poorly-gauged areas. To improve the convenience and versatility of IFAS, an automatic parameter optimization tool, "IFAS Calibrator," has also been developed based on the achievements of collaborative research with Fujitsu Laboratories Ltd. on numerical optimization. IFAS Calibrator can iterate simulations for parameter optimization after importing existing IFAS project files and observed river-discharge data and setting target parameters, their search ranges, a target period, and an error evaluation function. IFAS Calibrator is equipped with multiple optimization algorithms, such as the genetic algorithm and the particle swarm optimization method, from which the user can select one for his purposes. A multi-objective optimization function with multiple objective functions has also been included in the software. When the optimization process ends, the system displays the parameters that reproduce the river flow with the highest accuracy, error values, and a discharge hydrograph. IFAS Calibrator helps reduce the complexity of calibration in the application of IFAS to various basins and allows users to easily make flood forecasts. It can also be used as a very effective tool in training to learn the structure of a flood runoff model and the necessity of calibration for accurate forecasting. IFAS Calibrator can be downloaded free of charge from the ICHARM website.



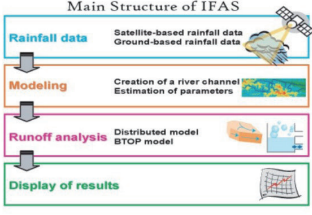
Display of IFAS Calibrator
IFAS キャリブレーターの画面

Integrated Flood Analysis System (IFAS)
Flood Forecasting System Using Global Satellite Rainfall

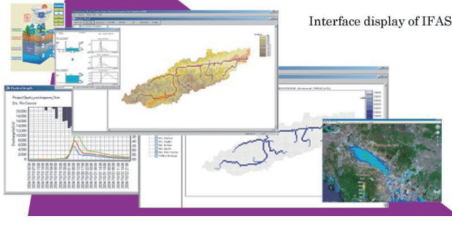


ICHARM has developed a concise flood-runoff analysis system as a toolkit for more effective and efficient flood forecasting in developing countries. This system is called "Integrated Flood Analysis System (IFAS)". IFAS provides interfaces to input not only satellite-based but ground-based rainfall data, as well as GIS functions to create river channel network and to estimate parameters of a default runoff analysis engine (PWRI distributed hydrological model) and interfaces to display output results. ICHARM has been conducting training seminars for users to utilize IFAS and to do a co-operative study with local governments, organizations, etc. ICHARM hopes that IFAS will be widely used as a basic tool for preparing flood forecasting and warning systems in insufficiently gauged basins.

Main Structure of IFAS




Interface display of IFAS



IFAS ver. 2.0 Win 7, Win 8, Win 10: 32bit, 64bit
update:
IFAS ver.2.0 (20 April 2017)

NEW!
IFAS Calibrator ver. 2.0 Win 10: 32bit, 64bit
IFAS Calibrator ver. 1.0 Win 10: 32bit, 64bit
IFAS Calibrator is a tool of parameter optimization for IFAS
update:
IFAS Calibrator ver.2.0 (4 March 2019)
IFAS Calibrator ver.1.0 (6 December 2017)

For more information, please contact: esimon@pwri.go.jp



This system is produced by cooperative research project with IDI and a private companies.

Download site of IFAS Calibrator
IFAS キャリブレーター のダウンロードサイト
<http://www.icharm.pwri.go.jp/research/ifas/index.html>

(Written by MIYAMOTO Mamoru)

■ Training & Education

Educational Program Updates

修士課程研修 活動報告

The 2019-2020 M.Sc. course began with the opening ceremony held on October 1, 2019. A new set of 11 students have started the thirteenth year of the master's program. Lectures started a week after the opening ceremony, including Basic Concepts of Integrated Flood Risk Management by Prof. TAKEUCHI Kuniyoshi and WATANABE Masayuki of International society development cooperation institute and Flood Hydraulics and River Channel Design by Prof. FUKUOKA Shoji. At about the same time also started Hydrology by Prof. KOIKE Toshio and Practice on GIS and Remote Sensing Techniques.

In November, Hydraulics by Prof. EGASHIRA Shinji and Practice on Flood Forecasting and Inundation Analysis were added to the list of the ongoing lectures, and so did Mechanics of Sediment Transportation and Channel Changes by Prof. EGASHIRA in December.

2019年度修士コース開講式が10月1日に行なわれました。本年度は、11人の新たな学生が13期目の1年間の修士プログラムに取り組み始めました。第2週目からは、本格的な講義が開始され、竹内邦良前センター長、国際社会開発協力研究所の渡辺正幸先生による Basic Concepts of Integrated Flood Risk Management、中央大学研究開発機構福岡捷二教授による Flood Hydraulics and River Channel Design 等が始まりました。ほぼ同時に、小池俊雄センター長による Hydrology、実習科目 Practice on GIS and Remote

Sensing Technique、11月からは江頭進治研究・研修指導監によるHydraulics、実習科目Practice on Flood Forecasting and Inundation Analysisが始まりました。さらに12月からは江頭研究・研修指導監によるMechanics of Sediment Transportation and Channel Changesが始まりました。この修士コースは1年間で実施されるため、コース前半は1日3講義のこともあり、学生にとって非常に多忙なスケジュールとなりますが、今年の学生達も意欲的に聴講しています。

10月11日は、前半は東京の荒川下流河川事務所を訪問し、災害対応に関する講義を受けました。後半は国立研究開発法人 建築研究所 国際地震工学センターの学生と東京消防庁本所防災館を訪問しました。

10月23日から25日は、第1回目の研修旅行として、北関東の鬼怒川流域等を訪問しました。この旅行では、2015年9月の関東・東北豪雨災害によって被災した鬼怒川の復旧工事現場、鬼怒川上流の川治ダム、五十里ダムなどを見学しました。11月8日は、国土地理院を訪問し、災害時における活動などについての講義を受けました。11月25日から12月6日は、東京に滞在し、政策研究大学院大学 (GRIPS) において実施された集中講義を受講しました。

12月18日から20日は、第2回目の研修旅行として、山梨県と静岡県を訪問し、御勅使川や富士川などを見学しました。また、都市型の洪水対策を学ぶ為に神奈川県にある鶴見川多目的遊水地及び川和遊水地並びに埼玉県にある首都圏外郭放水路を見学しました。

Since this master's degree program is a one-year course, the class schedule can be very tough particularly in the first half of the year; the students sometimes have three lectures a day. However, they are so motivated that they have been vigorously working on the coursework.

On October 11, the students visited the Arakawa Downstream River Office in Tokyo and attended a lecture on disaster response. After that, they visited the Honjo Life Safety Learning Center of the Tokyo Fire Department with the students studying at the International Institute of Seismology and Earthquake Engineering (IISEE) of Building Research Institute.

On October 23-25, the students went on the first study tour to the Kinu River basin in the northern Kanto region to see progress in recovery from the damage caused by the Kanto Tohoku heavy rain in September 2015. They visited restoration project sites along the Kinu River and the Kawaji and Ikari dams located in the upper Kinu River. On November 8, they visited the Geospatial Information Authority of Japan (GSI) and learned the roles of GSI in case of disasters. From November 25 to December 6, they stayed in Tokyo for two weeks and attended intensive lectures at the National Graduate Institute for Policy Studies (GRIPS).

The second study tour took place on December 18-20. The students visited the Midai River in Yamanashi Prefecture and the Fuji River in Shizuoka Prefecture. They also visited the Tsurumi River multi-purpose retarding basin and the Kawawa retarding basin in the Tsurumi River basin in Kanagawa Prefecture and the Metropolitan Area Outer Underground Discharge Channel in Saitama Prefecture to learn about flood control measures specifically designed to protect urban areas.



Scenes from the lectures
講義風景



Site Visit to the Kawaji dam
川治ダム見学



Site Visit to the Metropolitan Area Outer Underground Discharge Channel
首都圏外郭放水路見学

(Written by NAKAMURA Tomoki)

Hands-on training on RRI in JICA short-term training

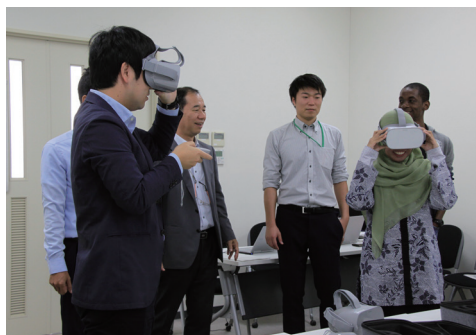
JICA 短期研修での RRI ハンズ オントレーニング

Research specialist KAKINUMA Daiki and Senior Researcher MOCHIZUKI Takafumi gave a lecture and hands-on training about a flood forecasting model at ICHARM on November 7, 2019, as part of JICA training, "JFY2019 Disaster Management on Infrastructure (River, Road and Port)," held from October 20 to December 17. Training participants consisted of six practitioners from Bangladesh, Guyana, Indonesia, Kenya, Myanmar and Sri Lanka. They first received a lecture on flood forecasting and hands-on training on how to use the Rainfall Runoff Inundation (RRI) model. Then, they practiced operating the RRI model on their personal computers for a sample basin, basin models, calculating river discharge, and displaying results such as water depth and flood area. In addition, Researcher MOROOKA Yoshimasa introduced virtual reality (VR) technology, which has been a popular theme in recent disaster prevention research, and provided an opportunity for the participants to experience a virtual flood using VR. Overall, the participants engaged actively in the training, asking many questions, including ones about ICHARM's efforts in flood forecasting. Some of the practitioners whose main job is urban planning also made presentations on flood management projects in their countries. In the end, they said that they would like to utilize the contents of the training in the future for further technological improvement in their countries.

JICA の 2019 年度課題別研修「インフラ施設（河川・道路・港湾）における災害対策コース」が 10 月 20 日から 12 月 17 日まで実施され、11 月 7 日に ICHARM にて柿沼太貴専門研究員と望月貴文主任研究員が「洪水予測モデルの概要と演習について」に関する講義・演習を行いました。研修の参加者はバングラディッシュ、ガイアナ、インドネシア、ケニア、ミャンマー、スリランカの 6 名の実務者で、洪水予測に関する講義と RRI モデルを用いたハンズオントレーニングを行いました。実際の流域を事例としたトレーニングでは、各自のコンピュータで実際に RRI モデルを操作し、流域モデルの作成や流量の算出、そして、水深、氾濫エリア等の結果の表示までを習得しました。加えて、諸岡良優研究員から近年の防災研究のテーマとして普及してきている仮想現実 (Virtual Reality :VR) 技術の紹介を行い、それを活用した洪水疑似体験を実施しました。全ての参加者が意欲的に受講し、ICHARM での洪水予測に関する取組内容について質問がなされました。また、都市計画を主な業務とする受講者が自国での取組の現状について紹介するとともに、研修内容を活用し、自国の技術のさらなる向上に繋げていきたいとの発言がありました。



Scenes from the technical training
技術研修風景



The practitioners experienced a virtual flood by wearing a goggle-type device
洪水疑似体験ツールを体験している様子

(Written by KAKINUMA Daiki)

Action Reports from ICHARM Graduates

ICHARMでは、政策研究大学院大学 (GRIPS)、国際協力機構 (JICA) と連携して、世界各国から洪水対策の行政官を対象として、1年間の修士課程「防災政策プログラム 水災害リスクマネジメントコース」を実施するとともに、3年間の博士課程「防災学プログラム」を実施しています。これまで100名を超える実務者・研究者の方々から各課程を修了し、帰国後、本研修で習得された知識や経験を生かして、様々な分野において活躍されています。

ICHARMニュースレターでは、こうした卒業生の方々から、ご活躍の様子について寄稿していただくこととしております。本号では2015年度 (9期) 修士課程卒業のMyo Myat Thu氏 (ミャンマー) から寄稿いただきましたので、ご紹介します。

ICHARM provides graduate-level educational programs for foreign government officers in charge of flood risk management in collaboration with GRIPS and JICA: a one-year master's program, "Water-related Risk Management Course of Disaster Management Policy Program," and a three-year doctoral program, "Disaster Management Program."

Since their launches, over 100 practitioners and researchers have completed either of the programs. They have been practicing knowledge and experience acquired through the training in various fields of work after returning to their home countries. This section is devoted to such graduates sharing information about their current assignments and projects with the readers around the globe. Ms. Myo Myat Thu, who graduated from the master's program in 2016, has kindly contributed the following article to this issue.

Myo Myat Thu

Deputy Staff Officer, Assistant Forecaster in River Forecasting Section, Department of Meteorology and Hydrology under the control of the Ministry of Transport and Communications, Myanmar

Along with my study of Master's Degree in Disaster Management Policy at ICHARM, I have gained a lot of experience and knowledge to develop effective disaster risk management, including those of semiology, tsunami, and water-related disasters. The study experiences in Japan, the light from the glittering stars, are guiding me to participate in the role of disaster management activities in my country.

After graduating in ICHARM, I was pointed as the Deputy Staff Officer, Assistant Forecaster in River Forecasting Section, Department of Meteorology and Hydrology under the control of the Ministry of Transport and Communications. I am assisting the forecasting in issuing daily water level forecasts, flood warnings, and bulletins.

There are many training courses conducted in DMH, since technology transfer to the young generation is one of the prioritized programs of DMH. Courses on Meteorology and Hydrology ranging from Level I to Level III were offered annually to a staff of DMH. Regarding this training, I had the great opportunities to share my experience and knowledge of a Master's degree in ICHARM to my colleagues in the field of Hydrology, Water-related Disaster Analysis and Remote Sensing and GIS. Besides, our Department is promoting capacity building by offering internal pieces of training as Meteorological/Hydrological Grade I, II & III and B.Sc Honours Course (Met/Hydrological Subjects) every year. Since I had been working in the Research and Training Section, one of my responsibilities is to share my experiences with the trainees. By using the experiences where I got in Japan, I promote the student's intrinsic motivation in the subjects of disaster management as a tutor.

On the other hand, I could join to participate in many disaster management projects on a national and regional scale as career development. These projects aim to ensure the effective early warning system (EWS) while minimizing the potentially harmful effects on the people and the environment in Myanmar's River Basin.



The 5th Workshop on Disaster Management Collaboration Dialogue between Myanmar and Japan. (6th February, 2019)



The 10th Follow up Seminar (17th December, 2017)

In the monsoon season of 2019, torrential monsoon rains and rising river levels caused flooding in Myanmar. Search and Rescue activities were undertaken by Tatmadaw, Fire Services Department, local government in affected States and Regions. Ministry of Social Welfare, Relief, and Resettlement (MSWRR) have provided relief items and humanitarian assistance, and humanitarian partners and donors have done. As of 16th August, the total amount of assistance provided by MSWRR was about 404.6 million Kyats. My department, Department of Meteorology and Hydrology provided flood warnings and bulletins to mitigate losses in human life and property among the community. According to my career development, I researched quantifies the drought hazards in the central dry area in Myanmar to investigate the effectiveness of drought monitoring system in Myanmar.

In my conclusion, there can be no doubt that the master student's life in ICHARM was valuable to play the role of disaster management system in Myanmar.

Ministry of Transport and Communications
Department of Meteorology and Hydrology

"On the Use of Standardized Precipitation Index (SPI) for Drought Intensity Assessment in Dry Zone Area, Myanmar"

Presented By

Myo Myat Thu
Deputy Superintendent
Hydrological Division

23 March, 2018 Nay Pyi Taw

Information Networking

The International Atomic Energy Agency (IAEA) activities: the Regional Cooperative Agreement for Asia and Pacific (RCA) final meeting of RAS/7/030 project

国際原子力機関 (IAEA) の活動 : RAS/7/030 プロジェクトのアジア太平洋地域協力協定 (RCA) 最終会合

On September 23-27, 2019, Prof. TSUJIMURA Maki of the University of Tsukuba and Research Specialist Gusyev Maksym of ICHARM were dispatched by the Ministry of Foreign Affairs of Japan to Ulaanbaatar, Mongolia, for participation in the final meeting of the Regional Cooperative Agreement for Asia and Pacific (RCA) RAS/7/030 project of the IAEA as a national project coordinator (NPC) and an alternate NPC of Japan, respectively. The IAEA RAS/7/030 project was approved by the IAEA Governing Board from 2016 to 2019 under the RCA framework, which is an inter-governmental agreement to promote application and training of isotopic techniques in each participating government parties. The Mongolian Academy of Sciences hosted the final meeting with 26 participants from 15 IAEA/RCA member countries and the IAEA headquarters, and the final meeting was opened by welcome remarks from Mr. Chadraabal M., the director of the Department of Nuclear Technology, the Nuclear Energy Commission of Mongolia, and Ms. Munkhzul Ch., the director of the Division of Water Resources, the Mongolia Ministry of Environment and Tourism, followed by the IAEA representatives. In the meeting, each country representative gave a presentation on the investigation results of groundwater dynamics and the achievements for the sustainable use of groundwater resources under the RAS/7/030 project. The participants also summarized previously completed RCA projects in water resources, sharing outcomes and outputs in each country. As a result, the final meeting confirmed that RAS/7/030 and other past RCA projects successfully carried out activities to provide useful knowledge and information for addressing water quantity and quality issues at each country in the Asia and Pacific Region.



The final meeting participants from Bangladesh, Cambodia, China, India, Indonesia, Japan, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, the Philippines, Pakistan, Sri Lanka, Thailand, and Vietnam, and the IAEA headquarters.
 বাংলাদেশ,カンボジア、中国、インド、インドネシア、日本、マレーシア、モンゴル、ミャンマー、ネパール、ニュージーランド、フィリピン、パキスタン、スリランカ、タイ、ベトナム、IAEA 本部からの最終会合参加者

9月23～27日、日本国外務省の要請により、Maksym Gusyev 専門研究員は、国家プロジェクト・コーディネーター (NPC) を務める辻村真貴筑波大学教授と共に、副 NPC として、モンゴル国ウランバートルで開催された IAEA RAS/7/030 プロジェクト最終会合に参加しました。本プロジェクトは、各国政府組織による同位体技術の適用と訓練の促進を支援する政府間協定であるアジア太平洋地域協力協定 (RCA) に基づいて、IAEA 理事会が 2016 年から 2019 年の実施を承認しているものです。プロジェクトの最終会合は、モンゴル科学アカデミーが主催し、IAEA/RCA 加盟 15 カ国と IAEA 本部から 26 名が参加しました。会合は、モンゴル原子力委員会原子力技術局の Chadraabal 局長とモンゴル環境・観光省水資源部の Munkhzul 部長による歓迎の言葉から始まり、続いて IAEA 各代表の挨拶がありました。その後、各国代表から、RAS/7/030 プロジェクトとして実施された地下水動態調査の結果および地下水資源の持続可能な利用に関する成果の発表がありました。さらに、参加者間で各国の成果を共有しつつ、これまでに完了した水資源に関する RCA 関連プロジェクトについて取りまとめを行いました。これらの報告から、RAS/7/030 プロジェクトをはじめとする RCA プロジェクトが効果的に実施され、アジア太平洋地域各国における水量・水質に関わる問題解決に有益な知識や情報が提供されていることが確認されました。

(Written by Maksym Gusyev)

Typhoon Committee 8th meeting of working group on hydrology in Seoul, ROK and 14th integrated workshop in Guam, USA

台風委員会 第8回水文部会（韓国・ソウル）および第14回統合部会（米国・グアム）

2019年10月15日から17日にかけて韓国・ソウルにおいて、台風委員会（TC）第8回水文部会（WGH）が開催されました。会議には日本、米国、中国、韓国、タイ、ベトナム、ラオス、フィリピン、マレーシアの9か国と台風委員会事務局（TCS）から合計26名の参加がありました。日本からは国土交通省・村瀬勝彦国際室長他1名が、ICHARMから池田鉄哉上席研究員（水文部会議長）及び富澤洋介主任研究員が、国際建設技術協会（IDI）から1名が参加しました。会議では村瀬室長から基調発表が行われたほか、各国からの報告や現在実施中の7つの年間実行計画（AOPs）についての議論が行われました。

また、11月4日から7日にかけて米国・グアムにおいて台風委員会第14回統合部会（IWS）が開催されました。初日の全体会合では16名による基調講演が行われました。その後、各部会、最終日には各部会からの報告と閉会式が行われました。ICHARMからは水文部会議長である池田上席研究員が参加しました。

全体会議において、日本から来年10月に熊本で開催される第4回アジア太平洋水サミットに合わせ第9回水文部会を開催することを提案し了承されました。また、最近の台風委員会の活動で重要事項となっている部会横断的活動について議論されました。これに関して、日本から気象庁の永戸久喜アジア太平洋気象防災センター所長及び池田上席研究員から台風委員会の枠組みにおいて、連携してIFIの取り組みを推進していくことが提案されました。

ICHARMでは今後ともこのような国際枠組みの場を通じて活動の推進、研究成果の普及に努めていく所存です。

The 8th meeting of the Working Group on Hydrology (WGH) of the Typhoon Committee (TC) was held in Seoul, the Republic of Korea, on October 15-17, 2019. A total of 26 participants from 9 countries (Japan, the United States, China, Korea, Thailand, Vietnam, Laos, the Philippines, and Malaysia) and the TC Secretariat gathered for the meeting. From Japan, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) sent Dr. MURASE Masahiko, the director of International Affairs, and another official of the ministry. ICHARM sent Chief Researcher IKEDA Tetsuya, who presently serves as the chair of the WGH, and Senior Researcher TOMIZAWA Yosuke. The Infrastructure Development Institute sent a staff member as well. During the meeting, a keynote presentation was given by Dr. MURASE. The participants presented their member reports and discussed seven Annual Operating Plans (AOPs), which are currently under implementation.

In the meantime, TC convened the 14th integrated workshop (IWS) in Guam, USA, on November 4-7. At the plenary session on the first day, 16 experts delivered a keynote speech. After that, each TC working group held a meeting, which was followed by the plenary session on the fourth day, where each working group reported the outcomes of the meeting they had. From ICHARM, IKEDA participated in the workshop as the WGH chair.

On this occasion, Japan proposed hosting the 9th meeting of the WGH in Kumamoto, Japan, back to back with the 4th Asia Pacific Water Summit in October 2020, and this proposal was approved. At the plenary session, cross-cutting projects involving different working groups were discussed as a key issue of TC. Dr. EITO Hisaki, the head of the Tokyo Typhoon Center, the Japan Meteorological Agency (JMA), and IKEDA proposed enhancing the collaboration of IFI activities under TC.

ICHARM will continue striving to progress its activities and disseminate research outcomes for other experts and organizations through such international frameworks as TC.



Participants of 8th meeting of WGH in Seoul
第8回水文部会参加者



Participants of 14th IWS in Guam
第14回統合部会参加者

(Written by TOMIZAWA Yosuke)

ICHARM held a technical session and a poster presentation at the World BOSAI Forum 2019

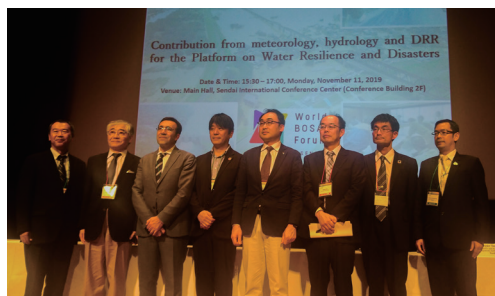
世界防災フォーラム 2019 におけるセッション開催及びポスター発表

The World BOSAI Forum 2019 was convened on November 9-12, 2019, at Sendai International Center in Miyagi, Japan. ICHARM held a technical session, "Contribution from meteorology, hydrology and DRR for the Platform on Water Resilience and Disasters," on the 11th. The session started with a keynote speech delivered by Prof. IMAMURA Fumihiko, the director of the International Research Institute of Disaster Science (IRIDeS), Tohoku University. After the keynote, under the moderation of ICHARM Director KOIKE Toshio, the speakers introduced programs and policies for water-related disasters such as flood and typhoon-induced disasters by the representatives from the Japan Meteorology Agency (JMA), the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), and the Asian Disaster Reduction Center (ADRC) and the participants from Thailand, Korea and Turkey. They continued discussions in order to promote more effective collaborative schemes from the fields of meteorology, hydrology and DRR against disasters, while analyzing the current situations of disaster management in Japan and other Asian countries.

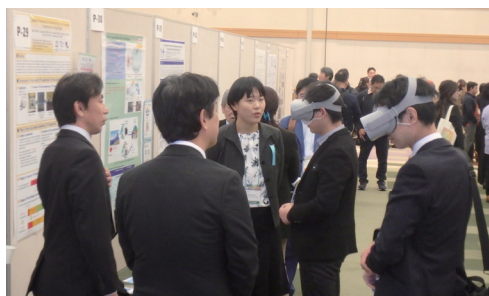
On the morning of the same day, the Typhoon Committee (TC) held a session titled "Public Understanding on Typhoon and Related Disaster (Lessons Learned from the Past Disaster)." As the chair of the TC Working Group on Hydrology, Chief Researcher IKEDA Tetsuya of ICHARM, reported its activities.

At the forum, ICHARM also exhibited a poster on a VR-driven tool with which people can experience a flood virtually with the results of a verification test of its effects, while giving visitors a chance to try out the tool and have a VR flood experience.

Following the one in 2017, the World BOSAI Forum 2019 was held in Sendai, where the United Nations World Conference on Disaster Risk Reduction took place in 2015 and adopted the Sendai Framework for Disaster Risk Reduction 2015-2030. ICHARM has continued to contribute to these events through organizing technical sessions. By making use of these international opportunities, ICHARM will continue disseminating information on disaster risk reduction in collaboration with the partner organizations.



Panelists of the Technical Session
テクニカルセッション参加者



Poster presentation with visitors trying out a VR-created flood
VRを活用した洪水疑似体験

2019年11月9日から12日に仙台国際センターにおいて世界防災フォーラム2019が開催されました。ICHARMは11日にテクニカルセッション「水のレジリエンスと災害に関するプラットフォーム」を主催しました。テクニカルセッションでは東北大学 災害科学国際研究所 (IRIDeS) 所長の今村文彦教授の基調講演の後、ICHARMの小池俊雄センター長がモデレーターとして議論をリードして、気象庁アジア太平洋気象防災センター、国土交通省水管理・国土保全局、アジア防災センターの他、タイ、韓国、トルコからの参加者が洪水や台風等の水災害に対する具体的な施策・方策を紹介し、日本及びアジア諸国における実情を明確にするとともに、災害に対する気象・水文・防災分野の効果的な協働枠組みの推進について意見交換を行いました。

また、同日午前には台風委員会によって開催されたセッション「台風及び関連災害への公共の理解(過去の災害からの教訓)Public Understanding on Typhoon and Related Disaster (Lessons Learned from the Past Disaster)」においてICHARMの池田鉄哉 首席研究員が台風委員会水文部会議長として部会の活動内容について発表しました。

さらに同期間中に開催されたポスターセッションでは、ICHARMで開発した洪水疑似体験ツールの内容紹介と効果検証に関するポスター展示および来場者へのデモンストレーションを行いました。

この世界防災フォーラム2019が開催された仙台は、2015年の国連防災世界会議の開催地であり、そこで仙台防災枠組2015-2030が採択されました。その後、仙台では2017年に続いて、世界防災フォーラム2019が開催され、ICHARMでは前回に引き続きセッションの開催等を通じて貢献してきました。こうした機会を活用しつつ、ICHARMでは、パートナー機関と連携して防災に関する情報の発信に努めることとしています。

(Written by TOMIZAWA Yosuke)

Participation in the 27th UNESCO-IHP Regional Steering Committee Meeting for Asia and the Pacific

第27回ユネスコ IHP アジア太平洋地域運営委員会への参加

2019年10月29～31日、ミャンマー・交通通信省 (MOTC) 気象水文局 (DMH) のホストにより、第27回ユネスコIHPアジア太平洋地域運営委員会 (RSC-AP) がミャンマー・ネピドーで開催されました。2年前の第25回会合で本委員会がアジア太平洋全域を対象とすることとされ、今回はカザフスタン、ソロモン諸島、ウズベキスタンの3ヶ国が初めて参加しました。そしてICHARMからは池田鉄哉 席上研究員が参加しました。

10月29日午前には、IHP・9期 (2022-2029年) の戦略的計画について、またRSC-APの独自の取り組みとしてCatalogue of Hydrologic Analysis (CHA)について議論が行われました。CHAについては、各国での洪水ハザードマップの取り組み状況を盛り込んだ第1巻の発行について発表されました。そして午後にはミャンマーの水関連災害についてのテーマティック・ワークショップが開催され、ミャンマーで水関連災害に携わる各政府機関から、それらの災害リスク軽減についての取り組みについて発表が行われました。ワークショップの最後には、この度、日本に襲来した台風第19号 (Hagibis) による洪水被害やその影響について、池田上席研究員より簡単に報告する機会が得られ、参加者から高い関心が寄せられました。

10月30日にはMOTCのU Kyaw Myo副大臣から歓迎の挨拶が行われ、その後、アジア太平洋エコハイドロロジーセンター事務局長でRSC-AP議長を務めるDr. Ignasius Sutapaの代理として同事務局長の立川康人 (京都大学教授) から、またユネスコ・ジャカルタ事務所のDr. Hans Dencker Thulstrupからそれぞれ挨拶がなされました。参加者からは各国の報告が行われるとともに、ユネスコ・カテゴリー2センターやユネスコ・チェアからはそれぞれの活動について紹介がなされました。ICHARMからは池田上席研究員より、IFIプラットフォームに関する活動や地方政府機関に対する支援活動、台風委員会への貢献などの地域連携といった最近の取り組みについて発表を行いました。最後には次回会合が2020年10月にベトナム・ハノイで開催されることが決定され、また次期RSC-AP議長として中国・河海大学のProf. Zhongbo Yuが指名されました。そしてCHAの新しいウェブサイトを立てることが決定されました。

なお、本会合では、アジア太平洋水フォーラム (APWF) 事務局の朝山由美子氏より2020年10月19～20日に熊本で開催される第4回アジア太平洋水サミットについて紹介されました。ICHARMでは、その専門的知見を通じて、本サミットに貢献することとしておりますが、今回の

The 27th UNESCO-IHP Regional Steering Committee Meeting for Asia and the Pacific (RSC-AP) was held on October 29-31, 2019, in Nay Pyi Taw, Myanmar, hosted by the Department of Meteorology and Hydrology (DMH) of the Ministry of the Transport and Communication (MOTC), Union of Myanmar. As the 25th meeting in 2017 agreed to expand its coverage to include the Asia and the Pacific region, three countries (Kazakhstan, Solomon Islands and Uzbekistan) attended the meeting for the first time. From ICHARM, Chief Researcher IKEDA Tetsuya participated.

On the morning of October 29, the participants had discussions on the Strategic Plan for IHP IX (2022-2029) and the Catalogue of Hydrologic Analysis (CHA) as a unique effort of RSC-AP. There, an announcement was also made about publishing the first volume of CHA on the present status of flood hazard map development in the member countries. In the afternoon, an associated thematic workshop on water-related disasters in Myanmar was held, and the representatives of Myanmar's governmental organizations involved in water-related disaster management made presentations on their efforts in disaster risk reduction. At the end of the workshop, Chief Researcher IKEDA also provided a brief report on recent flood disasters and their impacts due to Typhoon No. 19 (Hagibis), an unusually strong typhoon that affected Japan severely this October. The report drew high attention from the participants.

On October 30, the 27th meeting began with welcoming remarks by H.E. U Kyaw Myo, the deputy minister of MOTC, followed by remarks by Prof. TACHIKAWA Yasuto of Kyoto University, the RSC-AP secretary, on behalf of Dr. Ignasius Sutapa, the executive director of Asia Pacific Centre for Ecohydrology and the RSC-AP chairperson, and Dr. Hans Dencker Thulstrup of UNESCO Jakarta Office. The participants presented country reports, and UNESCO Category 2 Centres and Chairs also spoke about their activities. Chief Researcher IKEDA gave a presentation on recent activities of ICHARM, including IFI-led Platform activities, support for local government organizations, and regional cooperation such as contribution to the Typhoon Committee. At the end of the meeting, the participants agreed to organize the next meeting in October 2020 in Hanoi, Vietnam, to appoint Prof. Zhongbo Yu of Hohai University as the next chairperson, and to launch a new CHA website.

In the meeting, Ms. ASAYAMA Yumiko of the Asia Pacific Water Forum (APWF) Secretariat announced that the 4th Asia Pacific Water Summit (APWS4) will be held on October 19-20, 2020, in Kumamoto, Japan. To contribute most to successful APWS4 by offering its expertise on water-related disaster risk reduction, ICHARM wishes to make best use of regional partnership schemes such as RSC-AP and the Typhoon Committee.



Group photo
集合写真



Presentation by Chief Researcher IKEDA
池田上席研究員による発表

(Written by IKEDA Tetsuya)

RSC-APや台風委員会のような地域連携の枠組みを最大限活用していくことが考えられます。

リンク/URL

<https://en.unesco.org/news/growing-regional-unesco-water-science-network-gathers-naypyidaw>

Others

Comments from visiting researchers

招聘研究員からのコメント

ICHARM accepted visiting researchers Mr. Mohamed Hamatan from AGRHYMET Regional Center, Niger and Mr. Salifou Dene from Volta Basin Authority (VBA), Burkina Faso this winter.

They contributed short messages as below while looking back at their studying at ICHARM.

ICHARMでは、西アフリカからの招聘研究員、Mohamed Hamatan氏、Salifou Dene氏を受け入れました。

彼らからの、ICHARMでの研究活動を振り返ったコメントを紹介いたします。

Mr. Mohamed Hamatan (from Niger), AGRHYMET Regional Center

Stay period: November 13 - December 24, 2019

I am a hydraulic expert, hydrologist at the AGRHYMET Regional Center in charge of collecting and managing data on water resources. I was invited by ICHARM within the framework of the implementation of the regional project of reduction of water disasters to strengthen the resilience of populations to climate change in West Africa, called "WADiRe-Africa". This project, which will focus on the eleven countries belonging to the Niger and Volta river basins, aims to set up a regional flood forecasting and risk management system.

The aim of our 1.5 month scientific stay is to take charge of the flood forecasting system and contribute to the development of a risk management strategy to improve the resilience of West African populations. Under the general coordination of Professor KOIKE Toshio, Director of ICHARM, our activities were supervised by the technical staff composed of Doctor Rasmey Mohamed, Doctor OHARA Miho, Doctor Maksym Gussyev, Doctor TAMAKAWA Katsunori, with the supervision of Doctor ITO Hiroyuki. Our stay was facilitated for all that concerns the practical aspects, by the assistance and the availability of Madame SATO Asuka. We also received support from other researchers such as Dr. MOROOKA Yoshimasa, Dr. AIDA Kentaro and Dr. NAGUMO Naoko.

In addition to theoretical courses on hydrology, disaster risk management as well as GIS and satellite data analysis, we have taken in hand the RRI and WEB-RRI hydrological models. I have compiled the WEB-RRI model on the upper basin of the Niger river, in particular the sub-basin delimited upstream by the Dialakoro and Mandiana stations (in Guinea) and at the outlet by the Koulikoro station (in Mali). In view of the lack of rainfall data, the simulations focused only on the years 2003, 2014 and 2015. Apart from the ambition to calibrate the model across all the basins of the Niger and Volta rivers, given the short stay, I aimed at this sub-basin in order to produce information on the city of Bamako, considered a priori as a hotspot. The production of the flood map after the simulations with WEB-RRI, did not reveal significant floods on the selected site of Bamako. However, scenarios are considered in order to develop a contingency plan adapted to the contingency plan developed for the municipality of Calumpit located in the province of Bulacan in the Philippines.

My scientific visit to ICHARM was very rich in lessons and allowed me to be well equipped not only to continue the calibration of the WEB-RRI model, but the analysis of the hotspots in order to develop adequate contingency plans.

Finally, Doctor TAMAKAWA Katsunori brought atmosphere to my stay by showing me the main symbols and historic places of Tokyo as well as research institutions like Jaxa (Japan Aerospace Exploration Agency) and GSI (Geospatial Information Authority of Japan).



Mr. Mohamed Hamatan

Mr. Salifou Dene (from Burkina Faso), Volta Basin Authority (VBA)

Stay period: November 13 - December 26, 2019

As part of the Water related disaster reduction platform to enhance resilience to climate change in west Africa (WADiRe-Africa) project coordinated in West Africa by AGRHYMET I benefited from a month and a half internship at ICHARM (International Center Hazards and Risk Management). I would like to thank Ms. SATO Asuka who made every effort to deal with administrative matters, before and during my stay at ICHARM. For Mr. ITO Hiroyuki, special thanks for the efforts made since my arrival in Japan.

Maksym GUSYEV, PhD, for technical and administrative coordination between UNESCO, the donor of the WADiRe-Africa project.

For my "Japanese brother" TAMAKAWA Katsunori you were available day and night at our services, your brief technical support, Buddha will give you back a hundredfold.

My scientific stay consisted in learning the Hydrological Rainfall-Runoff-Inundation Model (RRI), the WEB RRI which is an application of the DIAS (Data Integration and Analysis System) which makes it possible to process the pluviometry data, flows, establishment a flood map of the area concerned and the contingency plans to be put in place.

So, I could apply the know-how in the Volta Basin and also contribute to the improvement of the tools.

It is a scientific stay which brought more knowledge and more the way of working.

All my supervisors, who during my stay gave me lectures and the technical support so that I can use these tools, I send them my sincere thanks: Professor Emeritus KOIKE Toshio Director of ICHARM who has agreed to receive me at ICHARM, associates professors OHARA Miho and Rasmy Abdul Wahid, the research's specialists TAMAKAWA Katsunori, AIDA Kentaro, MOROOKA Yoshimasa, NAGUMO Naoko.



Mr. Salifou Dene

Awards / 受賞リスト

* October 2019 - January 2020

- Prof. KOIKE Toshio, the director of ICHARM given the Chinese Government Friendship Award and Asia-Oceania Group on Earth Observations (AOGEO) Fellow
*See **Special Topics** on page 3.

- Prof. KOIKE Toshio, the director of ICHARM, jointly received the 2019 SCAT Chairman's Award with Prof. KITSUREGAWA Masaru of the University of Tokyo, the director general of the National Institute of Informatics (NII), and some other researchers.
*SCAT: Support Center for Advanced Telecommunications Technology Research Foundation



小池俊雄センター長が中国政府友誼賞およびAOGEOフェローを受賞しました。

*3ページのSpecial Topics参照。

小池俊雄センター長が東京大学・喜連川優教授（国立情報学研究所長）らと、2019年度テレコム先端技術研究支援センター（SCAT）会長大賞を共同受賞しました。

Business trips / 海外出張リスト

* October - December 2019

- October 6-10, Moscow, Russia, MIYAMOTO Mamoru, to participate in the Sixth Session of Hydrological Services Working Group, WMO Regional Association II (RA-II-Asia)
- October 14 - 18, China, OKADA Tomoyuki, to participate in International Symposium on Green Development and Integrated Risk Governance
- October 15 - 18, Seoul, Korea, IKEDA Tetsuya and TOMIZAWA Yosuke, to participate in The 8th Meeting of TC Working Group on Hydrology of the ESCAP/WMO Typhoon Committee
- October 23 - 26, Philippine, KOIKE Toshio (October 24 -), MIYAMOTO Mamoru and USHIYAMA Tomoki, to participate in Orientation on Climate Change in Davao City

- October 28 - 31, Naypyidaw, Myanmar, IKEDA Tetsuya, to participate in the 27th IHP Regional Steering Committee Meeting for Asia and the Pacific
- October 31 - November 10, Canberra, Australia, KOIKE Toshio, to hold AWCI session in AOGEO and to attend GEO Week events
- October 30 - November 5, Canberra, Australia, KOIKE Toshio (October 31 - November 10), TOMIZAWA Yosuke, YOSHINO Hirosato, Mohamed Rasmy Abdul Wahid, MIYAMOTO Mamoru, USHIYAMA Tomoki, and SANO Maiko (October 30 - November 8), 1) to hold AWCI session in AOGEO 2) To attend GEO Week events
- November 3 - 8, Guam, USA, IKEDA Tetsuya, to participate in ESCAP/ WMO Typhoon Committee 14th Integrated Workshop, "The Smart Service for Typhoon Related Disaster Risk Reduction"
- November 6 - 10, Paris, France, FUKAMI Kazuhiko and OKADA Tomoyuki, 14th Meeting of the HELP: High-level Experts and Leaders Panel on Water and Disasters
- November 16 - 23, Auckland, Christchurch and the south of island in New Zealand, EGASHIRA Shinji, HARADA Daisuke (November 18 - 22), NAGUMO Naoko and Robin Kumar Biswas, to attend the 11th River, Coastal and Estuarine Morphodynamics Symposium (RCEM) and to survey around Christchurch and the south of island
- November 18 - 20, Indonesia, OKADA Tomoyuki, to have meetings for survey of measures for adaption to climate change in Jakarta
- November 18 - 25, Indonesia, TOMIZAWA Yosuke, 1) to have meetings for survey of measures for adaption to climate change in Jakarta 2) to attend HATHI, the 6th international seminar on Advancement of Water Resources Management in a Global Challenge in Kupang
- November 21 - 24, New York, USA, OKADA Tomoyuki, to attend Urban Ecology Meeting at Colombia University
- December 1 - 10, New Zealand, Maksym Gusyev, to attend NZ Hydrological Society Conference, workshop at GNS Sciences, and field work
- December 12 - 14, Beijing, China, IKEDA Tetsuya, To participate in the 3rd International Workshop for Disaster Risk Reduction Knowledge Service
- December 16 - 20, Bangkok, Thailand, MIYAMOTO Mamoru, KAKINUMA Daiki, NAKAMURA Yosuke, to conduct field surveys of the SATREPS project on regional resilience enhancement through establishment of Area-BCM at industry complexes in Thailand
- December 15 - 21, Vientiane, Laos, Maksym Gusyev, to attend the final workshop of the IAEA LAO7002 Project
- December 15 - 21, Washington D.C, USA, Paris, France, Kochi, India, Colombo, Sri Lanka, KOIKE Toshio, Meeting at World Bank, UNESCO west Africa project meeting, International Conference on Frontiers in Marine Science Challenges and Prospects 2019, Japan Embassy visit

Visitors / 訪問者リスト

* October - December 2019

- Visited by delegates from Water Resources Agency, MOEA, November 1, 2019

Purpose: to learn ICHARM's experience of international support

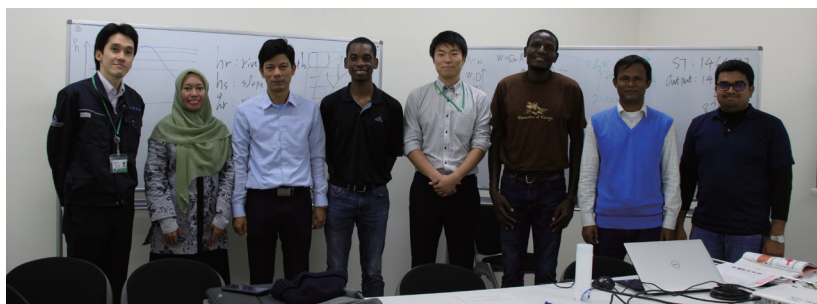
- Chen, Jiann-Fong
- Chang, Chih-Hui
- Lu, Chih-Ming
- Chen, Chin-Hsing
- Huang, Cheng-Chun
- Wu, Hung-Yi
- Suen, Jian-Ping



- Visited by trainees from JICA, November 7, 2019

Purpose: as part of JICA course work "Disaster Management on infrastructure (river, road and port)", Dr. KAKINUMA (ICARM Research Specialist), MOCHIZUKI (Senior Researcher) and Dr. MOROOKA (Researcher) gave lecture and RRI model training "Overview of Flood Forecasting".

- Ray Hridaya Chandra
- Tucker Joel Anthony
- Lutfitiana Prita
- Kisuya Jacob Mechumo
- Aung Ye Htet
- Bandaranayake Mudiyansele Lakmal Sanjaya



● Visited by Professor Heejun Chang, November 18, 2019

Purpose: to conduct expert interviews on the perception and governance of urban floods among flood experts and practitioners.

- Professor Heejun Chang, Portland State University, USA



● Visited by Professor Tsang-Jung Chang, Hydrotech Research Institute, National Taiwan University (NTU), December 10, 2019

Purpose: Technical discussion and exchange between NTU and ICHARM

- Professor Tsang-Jung Chang
- Professor Ke-Sheng Cheng
- Associate Professor Gene Jiing-Yun You
- Kai-Chih Shih
- Chia-Chu Chu



● Visited by delegates from China Meteorological Administration, December 11, 2019

Purpose: to study on Japan's prevention and mitigation measures against weather related disasters and capacity development on risk management

- ZHANF Jing
- LIANF Feng
- FENG Lei
- WANG Zhihua
- Total of 20 delegates from China Meteorological Administration



● Visited by Professor Vladimir Smakhtin, Director, United Nations University - Institute for Water, Environment and Health (UNU-INWEH), December 13, 2019

Purpose: to give a presentation on "UNU-INWEH current work and new strategy 2020-2024 and have a discussion
- Professor Vladimir Smakhtin



● Visited by delegates from Nanjing Hydraulic Research Institute, NHRI, December 17, 2019

- Jianyun Zhang
- Jiufu Liu
- Guoqing Wang
- Ruimin He
- Junliang Jin
- Yanli Liu

On December 17, 2019, a group of 6 Chinese researchers, led by Prof. Jianyun Zhang, the former president of the Nanjing Hydraulic Research Institute (NHRI), visited the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the Zempukuji River intake facility of the Kanda River/Loop Road No.7 Underground Regulating Reservoir. Chief Researcher IKEDA Tetsuya accompanied the group during their visit.

At MLIT, they paid a courtesy visit to Mr. GODO Hitomi, the director general of the Water and Disaster Management Bureau and received an explanation of MLIT's strategy for urban flood management by Dr. MURASE Masahiko, the director of International Affairs. Then, IKEDA spoke about ICHARM's activities.



Group Photo with Mr. GODO, Director General, MLIT.
五道局長との集合写真

At the Zempukuji River intake facility, the Chinese researchers were given explanations about the facility through videos, slides, and models. After that, they moved down to an underground tunnel and took a close look at the tunnel, feeling how large it actually is and observing how the storage of floodwater works. They also noticed traces of floodwaters having gone up to the top of the tunnel ceiling when stored during Typhoon No.19 (Hagibis) in October 2019.



Inside the tunnel
トンネル内

12月17日に中国の南京水利科学研究所・前院長のJianyun Zhang教授をはじめ、計6名の研究者が国土交通省を訪問するとともに、神田川・環状七号線地下調節池の善福寺川取水施設を視察しました。

国土交通省では水管理・国土保全局の五道仁実局長を表敬訪問するとともに、村瀬勝彦国際室長から国土交通省の都市洪水対策について説明を受けました。そしてICARMからは池田鉄哉首席研究員がICARMの活動概要を紹介しました。

神田川・環状七号線地下調節池の善福寺川取水施設では、動画、スライド、模型の実演により説明がなされ、その後地下トンネルへ下って実際のトンネルの大きさを視察しました。そこでは2019年の台風第19号（ハギビス）での洪水貯留による痕跡水位が天井間近に迫っていたことが確認でき、大きな治水効果を発揮したことをうかがえました。

1. Journal, etc / 学術雑誌 (論文誌、ジャーナル)

- OHARA Miho and NAGUMO Naoko, Mortality by Age Group and Municipality in the July 2018 Torrential Rainfall, *Journal of Disaster Research*, Vol.14, No.6, pp. 912-921, 2019.
- 中村要介, 池内幸司, 小池俊雄, 伊藤弘之, 江頭進治, 粒子フィルタによる水位と河床変動の逐次推定, *水工学論文集*, Vol.64, pp.1_205-1_210, 水文・水資源学会
- 原田大輔, 江頭進治, Tanjir Saif Ahmed, 片山直哉, 連行の概念を用いた河床の侵食率に関する研究, *水工学論文集*, *水工学講演会*, *土木学会水工学委員会*, pp.1_967-1_972, 大宮ソニックシティ, 2019年11月4日~6日
- Robin K. Biswas, EGASHIRA Shinji, HARADA Daisuke, NAKAMURA Yousuke, Lateral and Longitudinal Sediment Sorting in Seri River, Japan, *水工学論文集*, *水工学講演会*, *土木学会水工学委員会*, pp.1_895-1_900, 大宮ソニックシティ, 2019年11月4日~6日
- Malik Rizwan Asghar, USHIYAMA Tomoki, Muhammad Riaz, MIYAMOTO Mamoru, Flood and Inundation Forecasting in the Sparsely Gauged Transboundary Chenab River Basin Using Satellite Rain and Coupling Meteorological and Hydrological Models, *Journal of Hydrometeorology*, Vol.20, No.12, pp.2315-2330
- 南雲直子, 江頭進治, 2017年九州北部豪雨による赤谷川流域の氾濫の実態と地形分類に基づく被災家屋の立地分析, *地学雑誌*, Vol.128, No.6, pp.835-854, 2019年12月
- Mohamed Rasmy, SAYAMA Takahiro, KOIKE Toshio, Development of Water and Energy Budget-based Rainfall-Runoff-Inundation Model (WEB-RR) and Its Verification in the Kalu and Mundeni River Basins, Sri Lanka, *Journal of Hydrology*, Vol.579, pp.1-20, December 2019

2. Oral Presentation (Including invited lecture) / 口頭発表 (招待講演含む)

- 中村要介, 池内幸司, 山崎大, 近者敦彦, 日本域表面流向マップを活用したRRモデルの洪水再現性に関する研究, 2019年度研究発表会要旨集, pp.30-31, 2019年度研究発表会, 水文・水資源学会, 千葉工業大学, 2019年9月11日~13日
- 深見和彦, 水災害分野の気候変動影響評価を支える技術開発と適応策実装への戦略 - 一発展途上国における取組 -, 令和元年度土木研究所講演会講演集, 第4391号, pp.25-32, 2019年10月16日
- 牛山朋来, 瀬古 弘, 藤田実季子, 小司禎教, 船舶搭載GPS PWVの同化インパクト実験その2, 日本気象学会2019年度秋季大会予稿集, p.268, 日本気象学会2019年度秋季大会, 日本気象学会, 福岡国際会議場, 2019年10月
- Tanjir Saif Ahmed, EGASHIRA Shinji, HARADA Daisuke, YOROZUYA Atsuhiko, B. B. Srestha, Numerical simulation of sand bar deformation in Sittaung river estuary, Myanmar, 11th River, Coastal & Morphodynamics Symposium, November 2019
- Tanjir Saif Ahmed, EGASHIRA Shinji, HARADA Daisuke, YOROZUYA Atsuhiko, Sediment Transportation and Sand Bar Deformation owing to Tidal Currents in Sittaung River Estuary, Myanmar, *水工学論文集*, November 2019
- 筒井浩行, 澤田洋平, 生駒栄司, 喜連川 優, 小池俊雄, ブラジル北東域における植生動態-陸面結合データ同化手法による長期濁水解析に基づく穀物生産量・必要灌漑水量の推定に関する研究, *水工学論文集*, *水工学講演会*, *土木学会水工学委員会*, pp.1_283-1_288, 大宮ソニックシティ, 2019年11月4日~6日
- HARADA Daisuke, EGASHIRA Shinji, Evaluation of driftwood behaviour in terms of convection-diffusion equation -In the Akatani reach at the flood disaster in July, 2017-, 11th River, Coastal & Morphodynamics Symposium, 11th River, Coastal & Morphodynamics Symposium, IAHR, Auckland University of Technology, November 16-21, 2019
- EGASHIRA Shinji, HARADA Daisuke, Tanjir Saif Ahmed, Entrapment of Very Fine Sediment in Treating the Estuary Bed Evolution, 11th River, Coastal & Morphodynamics Symposium, IAHR, Auckland University of Technology, November 16-21, 2019
- Robin K. Biswas, HARADA Daisuke, NAKAMURA Yousuke, EGASHIRA Shinji, Riverbed evolution and sediment sorting during flood, 11th River, Coastal & Morphodynamics Symposium, IAHR, Auckland University of Technology, November 16-21, 2019
- TOMIZAWA Yosuke, Climate Resilience for Sustainable Development, 6th HATHI International Seminar, p.34, HATHI: Indonesian Association of Hydraulic Engineers, Kupang, Indonesia, November 22-24, 2019
- TAMAKAWA Katsunori, Introduction of WEB-DHM and application to Saigawa basin in Japan, The 4th UTokyo-NTU Joint Conference, The University of Tokyo, December 9, 2019
- 牛山朋来, 数値天気予報を用いた洪水予測と発電ダムの効率的運用について, 第19回PCクラスターシンポジウム, PCクラスターコンソーシアム, 秋葉原コンベンションホール, 2019年12月12日~13日

3. Poster Presentation / ポスター発表

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5. PWRI Publication / 土研刊行物 (土研資料等)

None / 該当者無し

6. Others/ その他

None / 該当者無し

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