



北海道大学
HOKKAIDO UNIVERSITY

国連気候変動枠組条約 (UNFCCC) 第50回補助機関会合(SB50) 参加報告

北海道大学大学院工学研究院

山田朋人

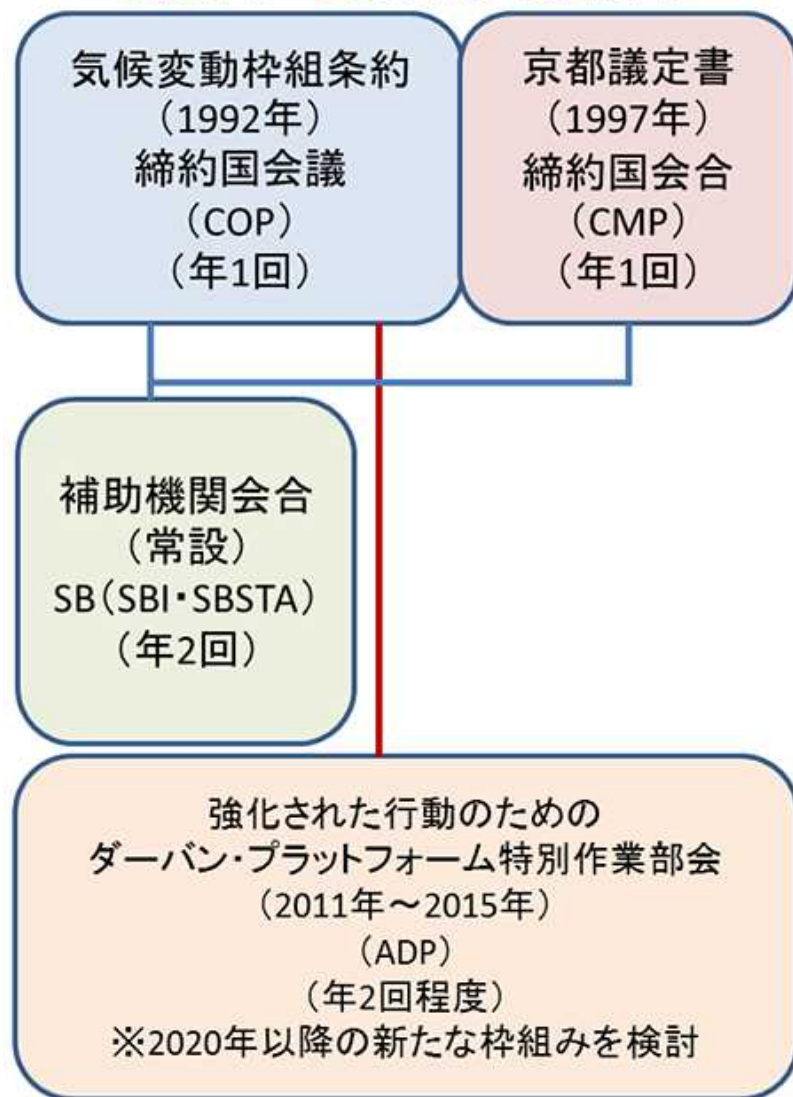
(tomohito@eng.hokudai.ac.jp)

令和元年7月26日

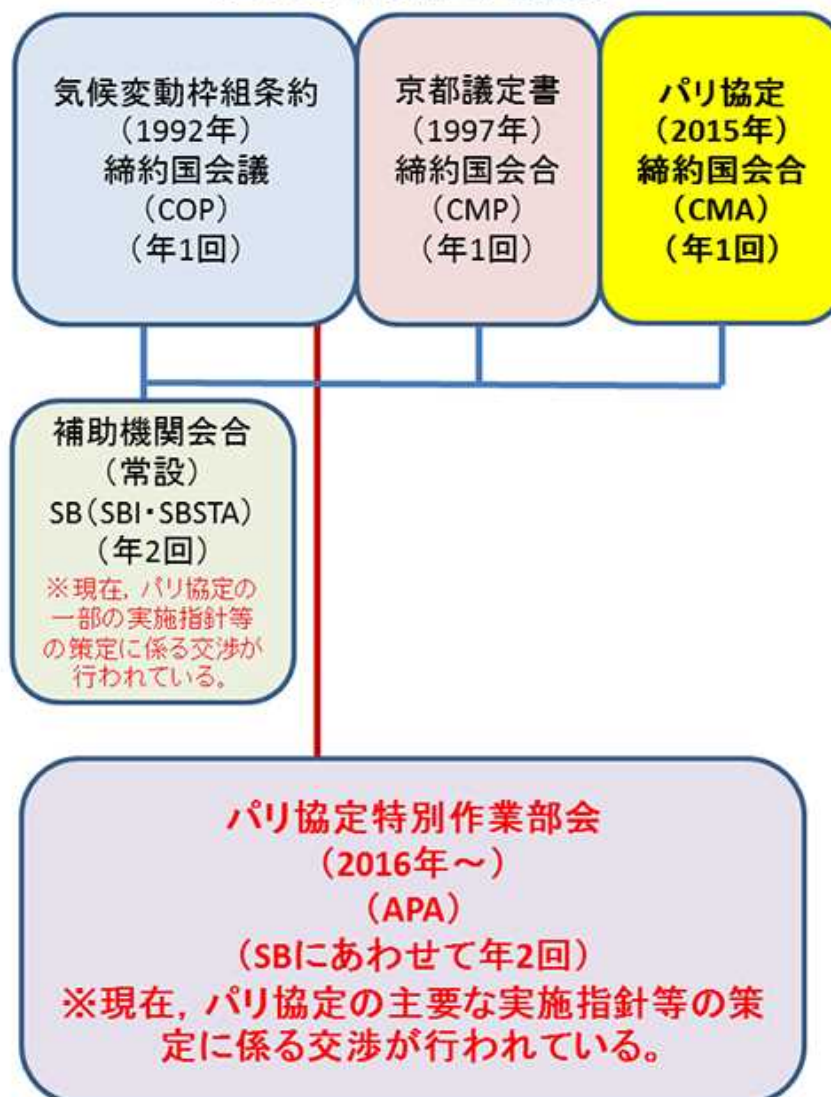
北海道地方における気候変動を踏まえた治水対策技術検討会

気候変動に関する国連交渉の構造

<2011年～2015年までの構造>



<2016年以降の構造>



国連気候変動枠組条約 第50回補助機関会合(SB50)

- 2019年6月20日にドイツ・ボンにて開催された「国連気候変動枠組条約第50回補助機関会合(SB50)」に政府代表団の一員として参加した。
- 文部科学省・外務省からの推薦
- 発表等(パネラー, モデレータ, ポスター発表)を行ったのは「Eleventh meeting of the Research Dialogue: Science for Transformation」という企画。
- 「A case study: Adaptation measures for extreme floods using huge ensemble of high-resolution climate model simulation in Japan」というタイトルで文部科学省SI-CATの支援により筆者らが実施している気候変動予測研究に加え, この研究成果も踏まえて国土交通省が現在開催している「気候変動を踏まえた治水計画に係る技術検討会」や, 同省北海道開発局と北海道が2017年度に実施した「北海道地方における(水分野)気候変動予測技術検討委員会」の内容を含めた我が国の今後の治水計画に係る検討内容を紹介した。

パネルディスカッション:「Transformative adaptation and climate resilient development」

- ・ 壇上にはIPCCの第2, 3作業部会の代表者を含め8名
- ・ 聴衆は各国担当者150名程度
- ・ テーマ:大雨災害に起因する適応方策に関する取り組み(日本,特に北海道での取り組み),世界経済,世界各地の問題(北極圏,アフリカ,南アメリカ各地域)



UNFCCCからの質問に対する筆者の回答

- What does the latest research tell us of the key challenges and approaches to achieve transformative adaptation and climate resilient development?
 - We have applied thousands of dynamical downscaling both for past and future climate conditions and estimated extreme conditions for precipitation. According to this approach, we found that extreme heavy precipitation in future climate could occur even in past climate even though probability is less. The result is supported by our theoretical approach. Therefore, it became possible to future flood control policy based on the probability.
- What do you consider to be the priority topics or questions on which we need to develop further research to succeed in transformative adaptation and climate resilient development?
 - According to our previous results, risks of disasters by heavy precipitation will be higher. However there are many types of risks in our life. We have to pursue universality of values/priorities of risks/benefit of all kinds of factors which affect human life.
- How can innovations in social sciences help achieve and manage the necessary social, economic and cultural changes?
 - Our study showed that extreme precipitation will be stronger in future climate condition in addition to more intense both in temporal and spatial scales. It means that damage due to heavy precipitation will be more severe. Flood control in future needs to be discussed not only in each river basin scale but also in regional scale (community scale). In addition, studies for risk/benefit assessment by incorporating various types of topics/targets to revitalize the community.

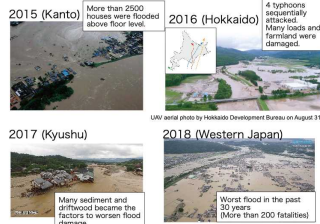
ポスター発表内容

A case study

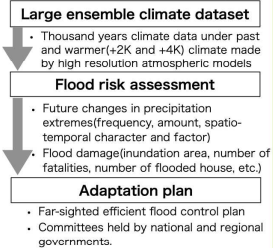
Adaptation measures for extreme floods using huge ensemble of high-resolution climate model simulation in Japan

Hokkaido University Tomohito J. Yamada

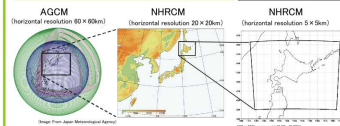
Recent heavy rainfall in Japan



Process to adaptation



Flood risk assessment



Ensemble members

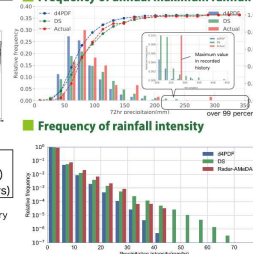
Past experiment: 60(years)x50(members)=3000(years)

+2K experiment: 60(years)x6(SST)x9(members)=3240(years)

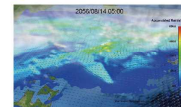
+4K experiment: 60(years)x6(SST)x15(members)=5400(years)

d4PDF was produced with the Earth Simulator under corporations among science programs (SOLSEI, TOUGOU, SH-CAT, DIAS) sponsored by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT), Japan.

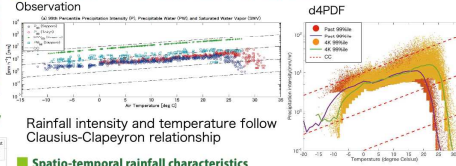
Validity of 5kmDS results



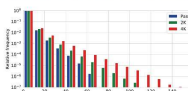
Model result



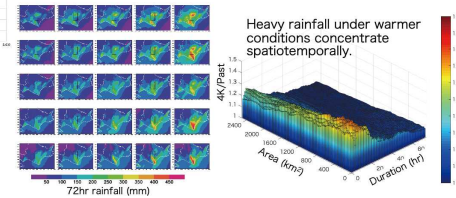
Relationship between temperature and precipitation



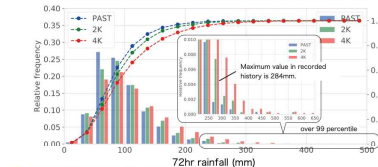
Frequency of rainfall intensity



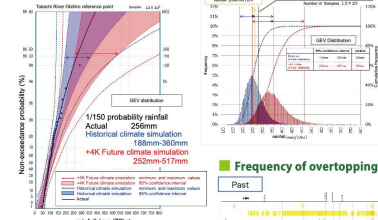
Spatio-temporal rainfall characteristics



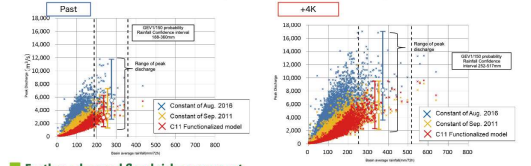
Frequency of annual maximum rainfall over Tokachi river basin



Probability evaluation of heavy rainfall occurrence



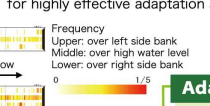
Relationship between basin averaged rainfall and peak discharge



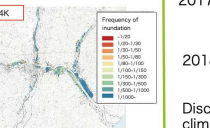
Further advanced flood risk assessment

Advanced risk assessment based on the huge high resolution ensemble data with risk based approach is going to be developed in order to help planning for highly effective adaptation strategy.

Frequency of overtopping



Frequency of inundation



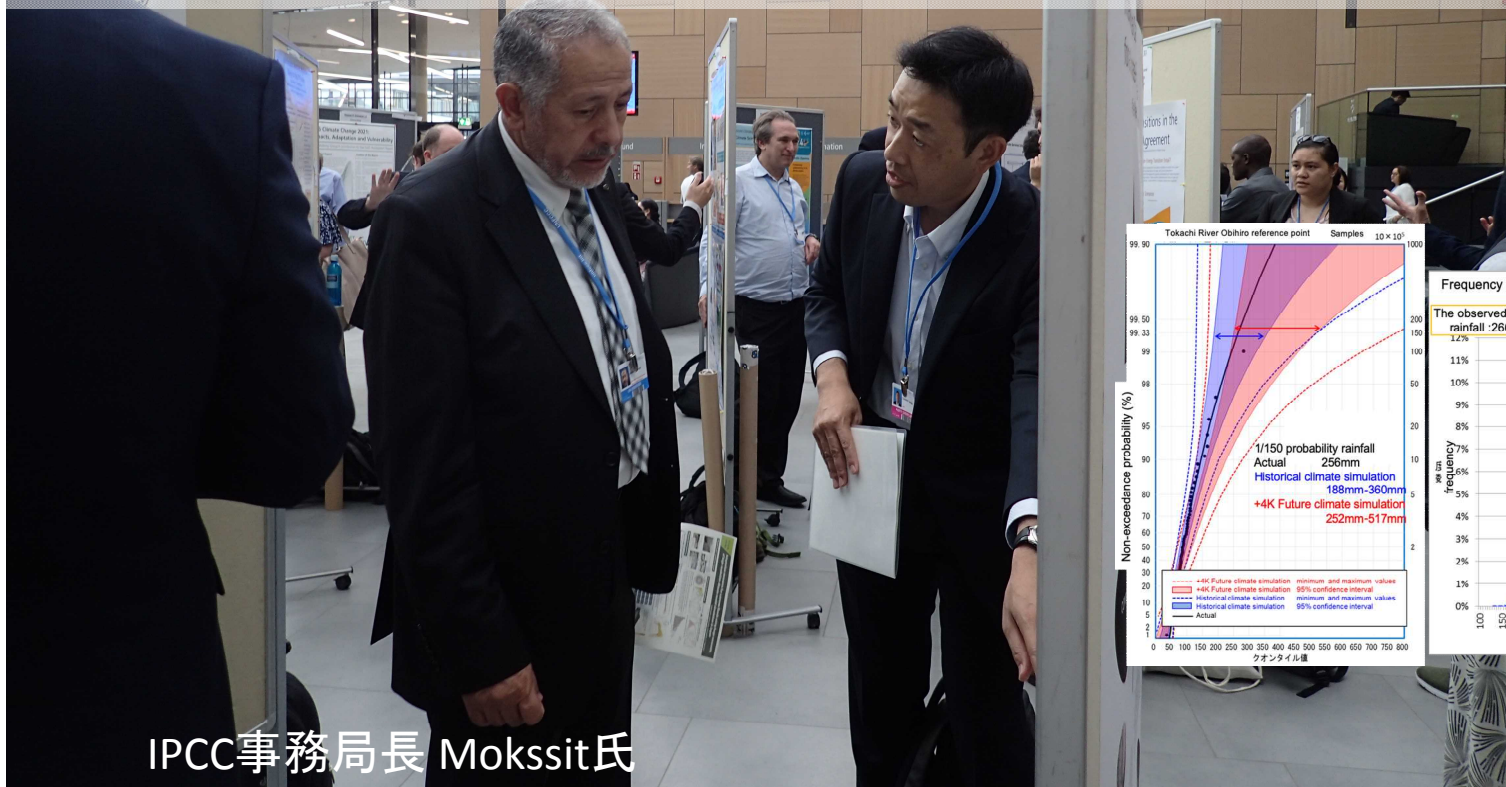
Adaptation

- Committees**
- 2017 Projection of future flood risk in Hokkaido, Japan (Hokkaido development bureau and Hokkaido prefecture)
 - 2018- Projection of future flood risk and consideration of nationwide adaptation plan associate with climate change (MLIT)
- Discussions are based on the large ensemble climate dataset and the risk assessment results.



全体を通して

- IPCC事務局長・第1作業部会副議長 (Abdalah Mokssit 氏) : 本研究を含めた日本での一連の取り組みを紹介させてほしいとのこと。
- 本研究の成果である, 「将来気候での大雨事例はこれまでの気候でも起こりうる」とのメッセージは非常に有用。
- 物理的かつ数理統計的に立脚しつつ, 観測実績と予測情報 (過去・将来気候) を融合した適応方策の進め方は多くの賛同があった。
- 対象地域はどう反応しているのかという質問もあった。



IPCC事務局長 Mokssit氏

