

「第15回 JICE研究開発助成 成果報告会」
古地図・古書による歴史的洪水災害の数値解析に関する研究

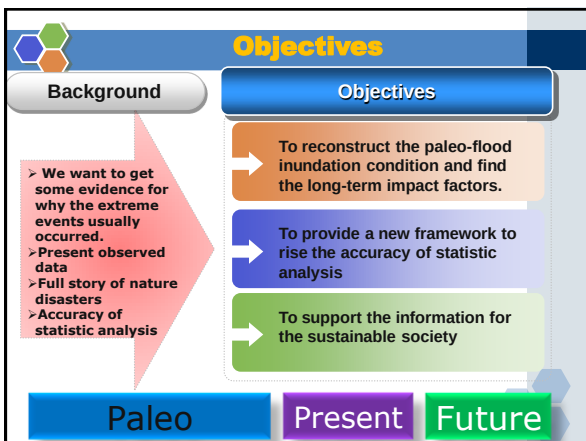
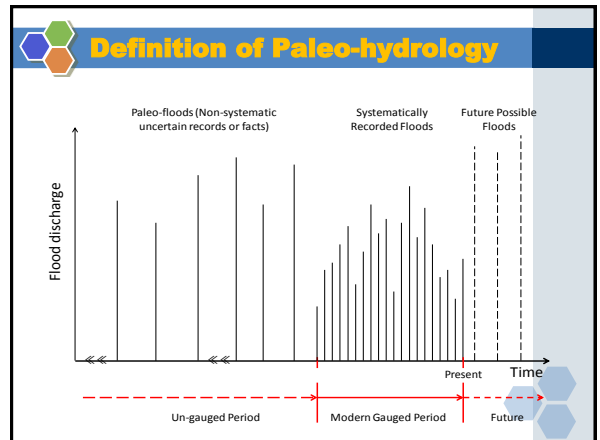
Numerical Assessment of historical flood disaster based on the old maps and books

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2015/6/4



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Assessment of Paleo-hydrology and Paleo-inundation Conditions: the Process

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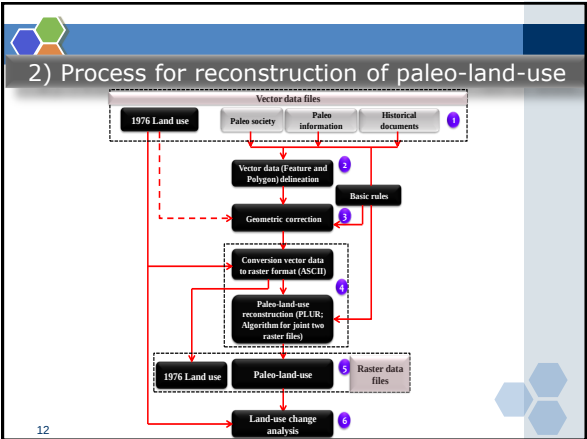
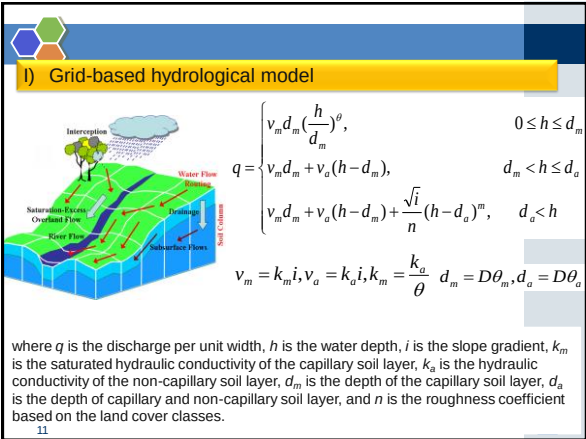
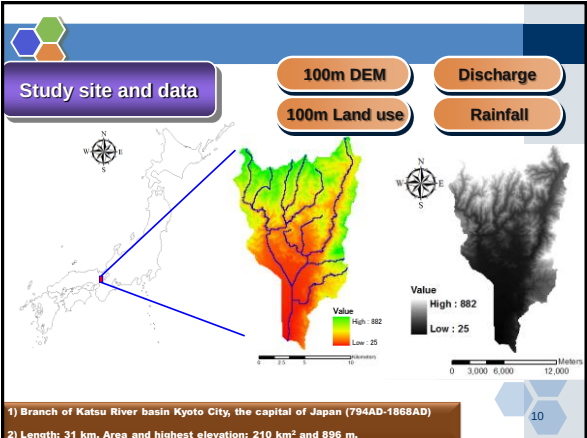
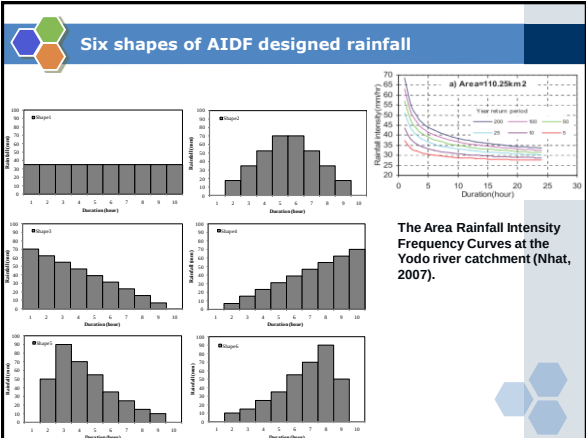
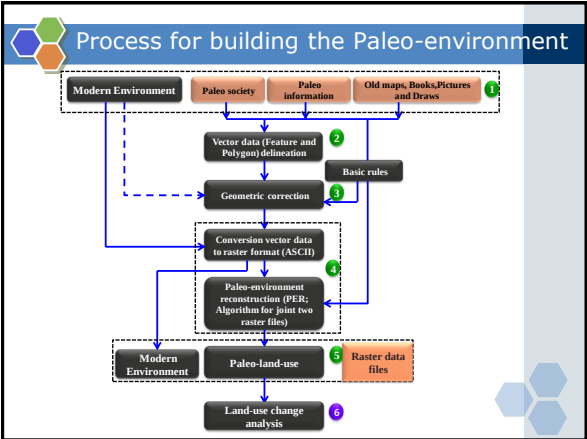
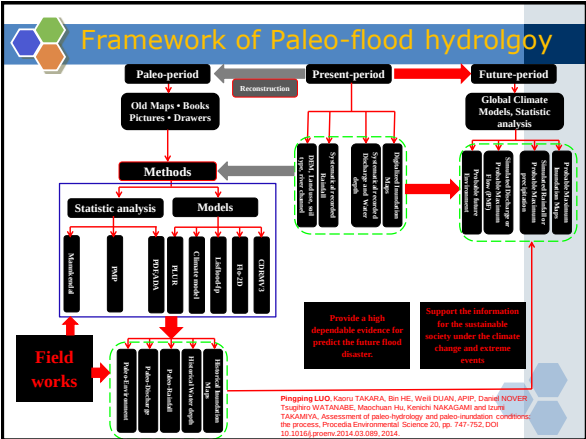
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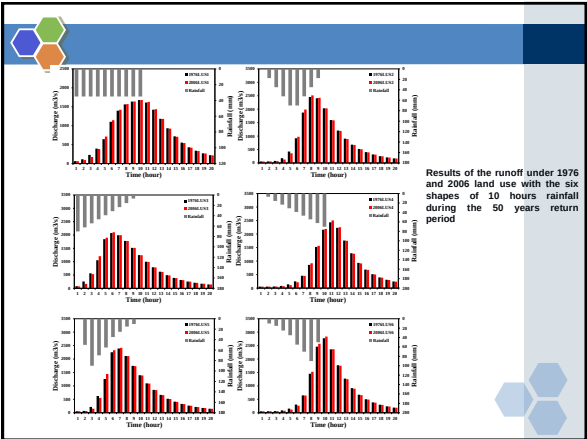
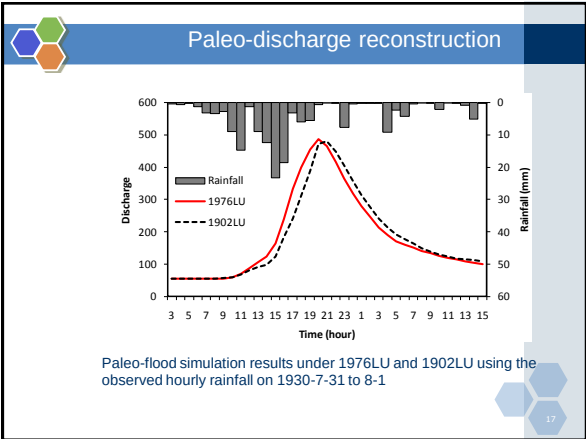
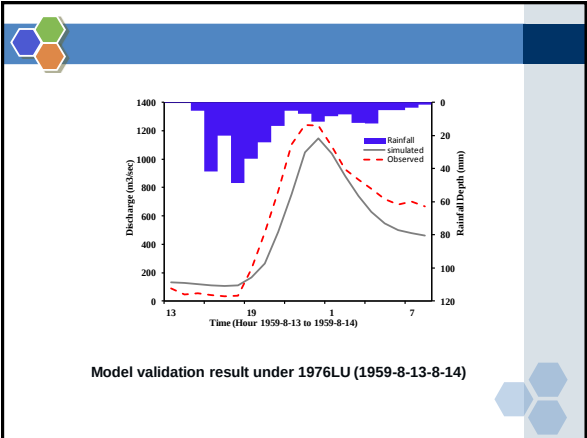
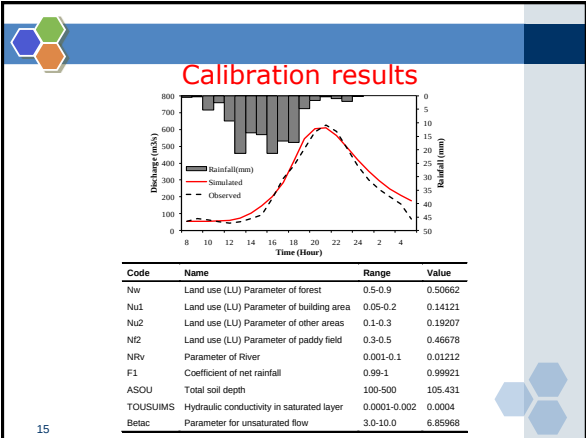
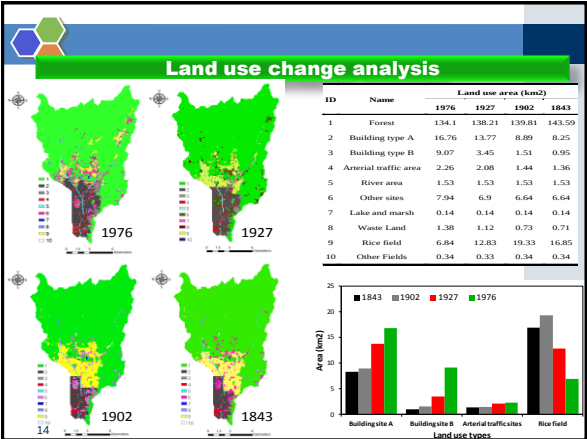
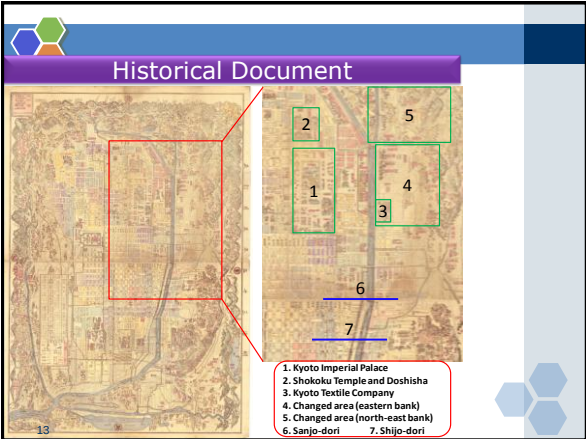
Abstract

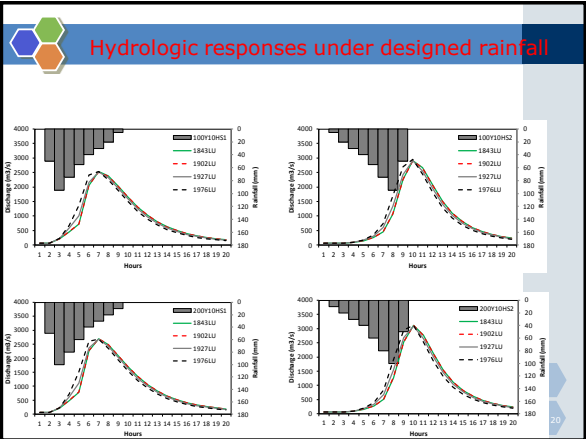
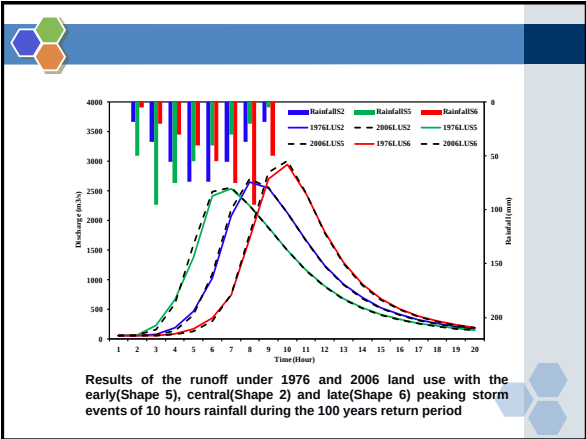
Paleo-hydrology is an important study which simulates the historical hydrology at the lack of observed period, calibrated at the present period and predicted the future hydrological condition. The study of paleo-hydrology is to obtain the historical evidence for the present hydrology and improve the accuracy of the statistical analysis and the prediction modeling assessment. Paleo-inundation assessment is the study of historical inundation under flood events which occurred prior to direct measurement of hydrologic parameters using modern methods. The ultimate objectives of this study were to estimate paleo-inundation under extreme floods using historical literature and incomplete data records. This paper focused on an application of estimating historical inundation conditions under paleo-floods using modern technologies at the river basin scale.

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Keywords: Paleo-inundation; Paleo-hydrology; Nile River basin; Flo-TD; Flood risk assessment







Conclusion

We found the Cell-based Distributed Rainfall Runoff Model performs very well for the reconstruction of paleo-flood events in hourly simulation.

Due to the urbanization, the deforestation and the decreasing of the rice field in the Kamo River basin has lead the increasing of discharge and the peak discharge coming early.

The shape of the rainfall is very important for the flood risk management and the land use change impact on the hydrological responses. For the further research, we are going to check the land use change impacts on the inlet hydrologic responses and water storage of whole basin.

Historical assessment on flood management

Academic paper with peer review NO. 1
Pingping LUO, Bin He, Kaoru Takara, Yin E Xiong, Daniel Nover, Weili Duan, and Kensuke Fukushi, Historical Assessment of Chinese and Japanese Flood Management Policies and Implications for Managing Future Floods, Environmental Science & Policy, Vol. 48, 2015, pp. 265-277, DOI: 10.1016/j.envsci.2014.12.015.

Academic paper NO. 1

History of Flood Control Policies

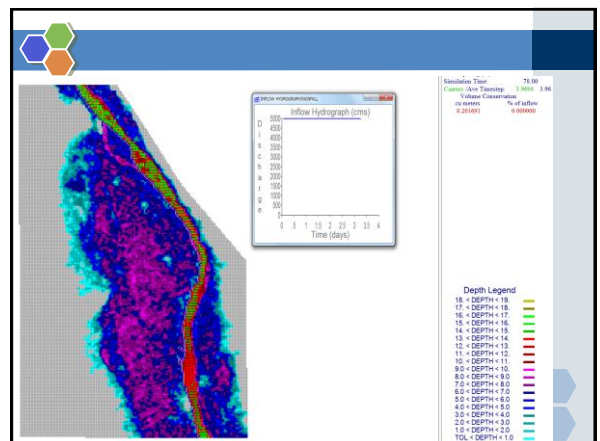
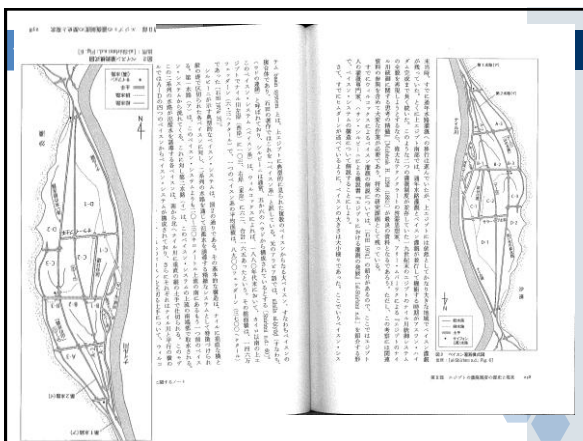
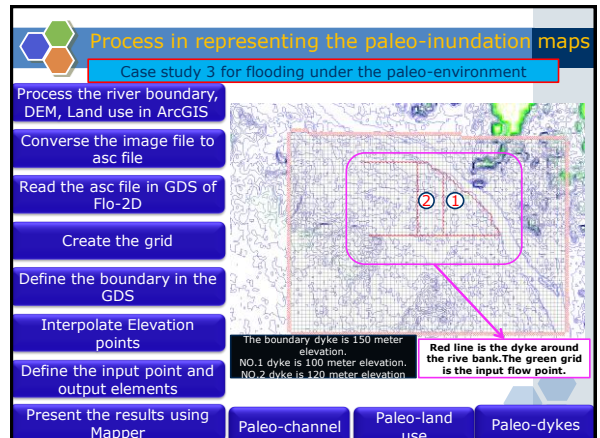
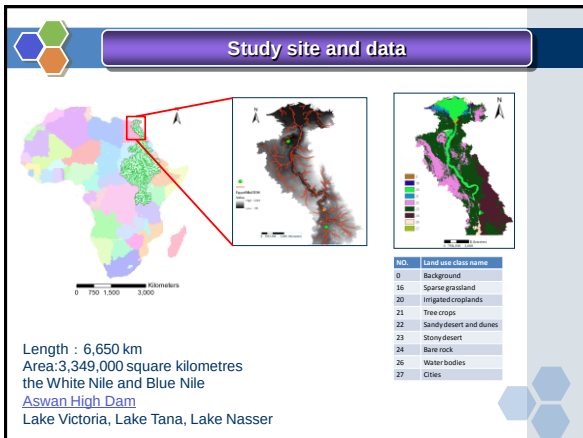
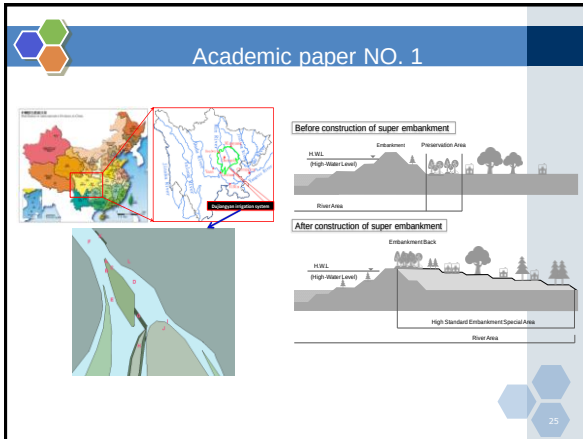
China

- Ancient era**
 - Gun's and Yu the Great's flood control
 - Li Bing and his father's flood control
- Middle ages**
 - Uniting Water transportation and flood control
 - Wang Anshi "Agriculture rice field water supply method"
- Early modern period**
 - Gao Bin "Divide Yellow river and help the water clean"
 - Pan Jixun "Use water to trash solid, reduce the flood"
- Modern ages**
 - Jia Shumei "Bricks Dam"
 - Wu Dazheng "Reinforce the shoal, Protect Dam"
- Present age**
 - Raise Dyke, Construct Dam
 - Structural measures and non-structural measures

Academic paper NO. 1

Japan

- Ancient era**
 - Yayoi period drains and embankments
 - Kofun period Hori river drain of Namba, Manutanoitsutsumi
 - Tsuderu Ruins Okayama City the period from the late Kofun
- Middle ages**
 - Ritsuryo Country/Buildings Ordinance, Public Water principle
 - Kanshin Sangha flood control
- Early modern period**
 - Beginning of a systematic scale flood control
 - Straighten fix of the river channel fixed
- Modern ages**
 - "low water channel flood control"
 - High water flood control and construction of dams
- Present age**
 - Integrated river development, multipurpose dam
 - Green dam
 - Natural flood control and soft side





List of Publications

- ❖ 1) Luo P., He, B. Takara, K., Xiong, Y. E., Nover, D., Duan, W., and Fukushima, K., 2015. Historical Assessment of Chinese and Japanese Flood Management Policies and Implications for Managing Future Floods, Environmental Science & Policy, Vol. 48, pp. 265-277.
- ❖ 2) Luo P., APIP, He, B. Duan, W., Takara, K., and Nover, D., 2015. Impact assessment of rainfall scenarios and land-use change on hydrologic response using synthetic Area IDF curves, Journal of Flood Risk Management, Article ID: 12164, Proof Editing.
- ❖ 3) Luo P., Takara, K., APIP, He, B., and Nover, D., 2014a. Reconstruction assessment of historical land use: a case study at the Kamo River basin, Kyoto, Japan, Computers & Geosciences 63, 106-115.
- ❖ 4) Luo P., Takara, K., APIP, He, B., Nover, D., and Yosuke YAMASHIKI, Land use change analysis and paleo-flood in the Kamo River basin, Kyoto, Japan, Annual Journal of Hydraulic Engineering, JSCE, Vol.56, pp. 127-132, 2012.
- ❖ 5) Luo P., Takara, K., APIP, He, B. and Nover, D., 2014. Paleoflood simulation in the kamo river basin by using a grid-cell distributed rainfall-runoff model, Journal of Flood Risk Management. Vol.15, pp.1052-1061.



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