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Estimation of particulate and dissolved ^{137}Cs discharge from rivers to the ocean near the Fukushima Dai-ichi Nuclear Power Plant using a simple model

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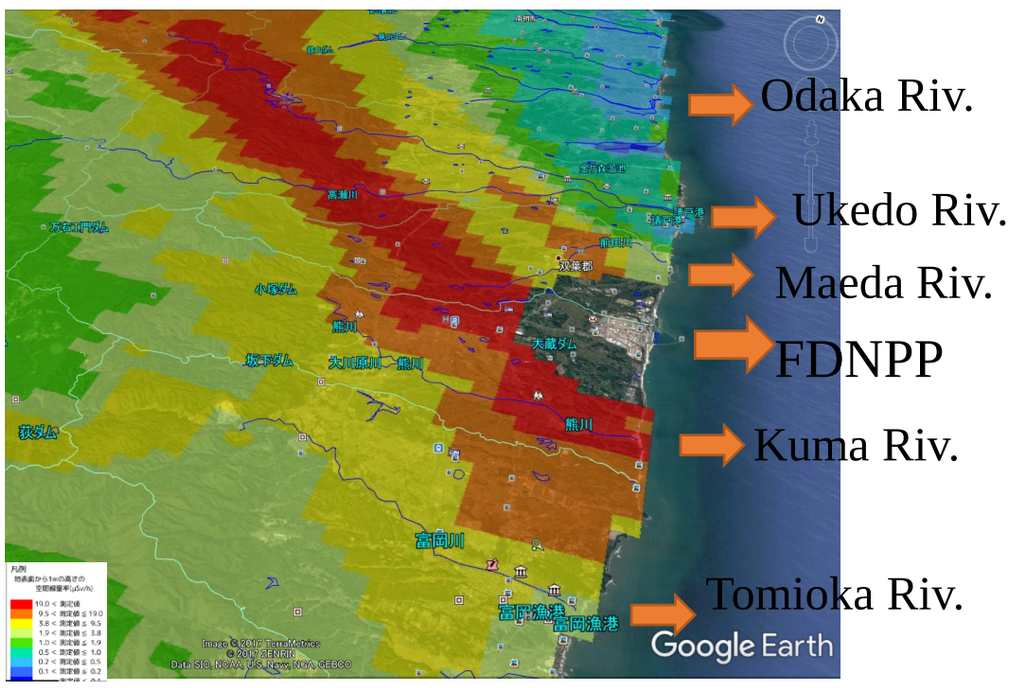
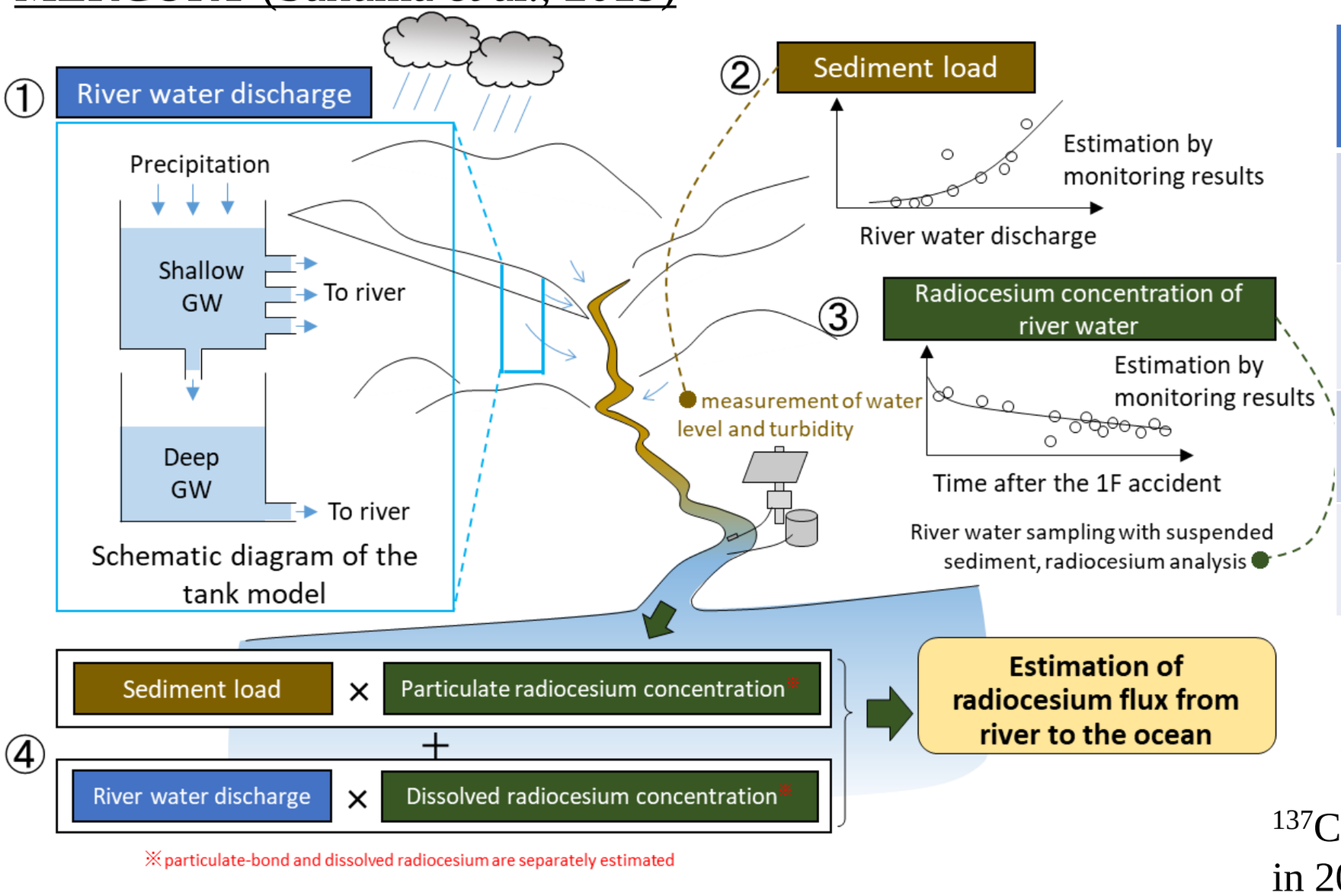
1. Introduction

- To understand ^{137}Cs migration from seawater and sediment to the ecosystem, predicting ^{137}Cs discharge from rivers to the ocean is important.
- We developed a predictive model [MERCUTY] for ^{137}Cs discharge from rivers to the ocean from early period after the Fukushima Dai-ichi nuclear Power Plant (FDNPP) accident to its long-term behavior.
- We simulated ^{137}Cs discharge from five rivers near the FDNPP using the model and compared its values with ^{137}Cs discharge from the FDNPP.



2. Model / Primary Information

MERCURY (Sakuma et al., 2019)



^{137}Cs discharge to the ocean

Period	5 rivers [TBq]	FDNPP [TBq]
2011	7.5*	1900**
2012-2017	7.2*	3.7-4.2**
2018	0.23	0.12-0.15
2019	0.81	0.11-0.15

*Sakuma et al. J. Environ. Radioact. 208-209 (2019) 106041
**Machida et al. (2020). J. Nucl. Sci. Technol, 57(8), 939-950

^{137}Cs discharge in 2019 was larger than in 2018 due to the two huge typhoons in October 2019

3. Takeaway Message

- The impact on the ocean from the initial ^{137}Cs discharge from rivers can be limited
- However, this study indicate that ^{137}Cs discharge from rivers has recently been one of the sources of ^{137}Cs in seawater in the coastal areas
- Therefore, this model is expected to be useful to evaluate and predict ^{137}Cs discharge from rivers to the ocean