

Consequences of the Typhoon 18 (Sep. 2013) and associated runoff on Lake Biwa.

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Lake Biwa experiences storm with strong winds and heavy rains every year, leading to potential substantial changes in the ecosystem of the lake. The impact can be seen with sudden increase of rivers inflow from the rivers. The fact that several agricultural and industrial water treatment facilities surround the lake may lead to worrisome scenarios for the lake's ecosystem. Typhoon 18 (September 2013) is an example of the consequences of runoffs upon the lake, with an increase of turbid water influx into the lake and strong winds. The combination of rivers runoffs and high wind is complex, and the consequences of this combination should be better understood.

To clarify the impact of Typhoon 18 on the lake, we performed a three dimensional simulation of the typhoon event by using observed wind from the Japanese Meteorological Agency and we compare with space-borne images of the lake surface for consistency. To provide informations on the turbid water we included in the simulation the advection of a passive tracer (that can be associated to dissolved materials for instance dissolved oxygen) and a sediment module.

With the aim of understanding and providing more information on the particles propagation within the lake we added a particle tracking algorithm. Our algorithm uses the results of the simulation.

During this presentation we show the results of the numerical simulation on the typhoon 18 event (September 2013), including passive tracer, sediment and particle computations. We conclude the presentation by stating what we learned from this work about the run-offs that occurred during the Typhoon 18.

Keywords: Lake Biwa, runoff, typhoon, sediment, particle tracking