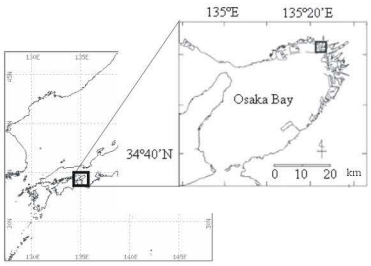

Figure1 Amagasaki Harbor and Nishinomiya seawall at Osaka bay in Japan

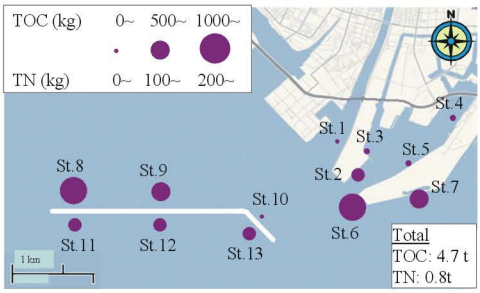

Figure2 The Amount of TOC and TN per the length seawall 1m at each sites in summer

Impact of damming and eutrophication on DSi: DIN ratio in river water, a case study of Yahagi River, Japan

Masashi KODAMA [1*], Katsuhisa TANAKA [2], Tomoki SAWADA [3], Motoi TSUZUKI [4], Yuji YAMAMOTO [4] & Toyoshige YANAGISAWA [3]

[1] Marine Productivity Division, National Research Institute of Fisheries Science, Fisheries Research Agency (FRA), Japan, Fukuura 2-12-4, Kanazawa-ku, Yokohama, 236-8648 Japan
*E-mail: mkodama@fra.affrc.go.jp

[2] Fisheries Division, Japan International Research Center for Agricultural Sciences (JIRCAS),Ohwashi 1-1, Tsukuba, Ibaraki, 305-8686 Japan

[3] Marine Resources Research Center, Aichi Fisheries Research Institute, Japan, Toyoura 2-1, Toyohama-cho, Minamichita, Aichi, 447-3412 Japan

[4] Freshwater Resources Research Center, Aichi Fisheries Research Institute, Japan, Ichi-no-wari 56-6, O-oka, Hosokawa, Issiki-cho, Hazu, Aichi, 444-0425 Japan

Dissolved silicate (DSi) is one of the key nutrients to determine structure of phytoplankton communities. In recent years, significant reductions in the transport of DSi from river have been reported after construction of dams, with severe consequences for food web structure in the coastal areas as diatoms are replaced by non-siliceous (potentially toxic) species. These issues are not a regional problem, but likely to occur in many freshwater and marine systems throughout the world.

To assess current status and possibility of Si depletion in Japanese river, variations of DSi and ratio to dissolved inorganic nitrogen (DSi:DIN ratio) were investigated in the Yahagi River, Japan over three years (from June 2000 to June 2003). DSi concentration and DSi:DIN ratio in the Yahagi River ranged from 75 to 254 M (average: 162 M) and from 0.74 to 4.3 (average: 2.3), respectively. Referring to the DSi:DIN ratio, there is a possibility of Si depletion in the Yahagi River and Mikawa Bay during the low flow period. DSi:DIN ratio in the river were reduced by high DIN loading from the lower tributaries, and its effect was stronger during the low river discharge period. From November to May, the low water exchange rate of the dam water leads to diatom blooms and results in the reduction in DSi:DIN ratio in the river water.

It is suggested that the increased nitrogen loading from agricultural and urbanized catchments and lower river flow induced by the water utilization, brought about not only a decrease in the DSi supply to the coastal sea but also a reduction in the DSi:DIN ratio.

Suspended sediment dynamics at the Mekong Floodplains: data analysis

Matti KUMMU [1]*, Juha SARKKULA [2], Kim IRVINE [3], Yin SAVUTH [4], Olli VARIS [1] & Lu XIXI [5]

[1] Water Resources Laboratory, Helsinki University of Technology (TKK), P.O. Box 5200, FIN-02015 HUT, Finland
*E-mail: matti.kummu@iki.fi

[2] Finnish Environment Institute (SYKE), P.O. Box 140, FIN-00251 Helsinki, Finland

[3] Geography and planning department, Buffalo State University, 1300 Elmwood Avenue, Buffalo, 14222 NY

[4] Department of hydrology, Ministry of Water Resources and Meteorology, Phnom Penh, Cambodia

[5] Department of Geography, National University of Singapore 119260, Singapore

Sediments are an essential part of the floodplain ecosystems providing nutrients for the primary and secondary production. The sediments are also an important part of the ecosystem processes in the Lower Mekong floodplains in Cambodia, including the Tonle Sap system and other floodplains downstream from Kratie. However, the present sediment dynamics there is still rather poorly understood, especially outside the Tonle Sap.

The Mekong region is developing with increasing

pace and especially hydropower construction is starting to boom in upstream countries, especially in Lao PDR and China. The impacts on the downstream sediment balance, by trapping the sediments in reservoirs, might be severe. Thus, it is highly important and timely to enhance the understanding of the present sediment dynamics in order to be able to predict the possible future impacts.
This paper aims to analyse the suspended sediment dynamics at the Lower Mekong floodplains in Cambodia downstream from Kratie based on the data from extensive field work during the last years, Mekong River Commission database and other relevant sources. Moreover, the upstream development impacts on the sediment balances are discussed and briefly analysed.

Assessment of shellfish farming ecosystem contamination due to watershed disturbances: the cases of Le Croisic and the Auray River (France)

Nicolas ROLLO [1*], Marc ROBIN [1], Gildas LEVESQUE [2] & Cédric LOMAKINE 1

[1] Department of Geography, Nantes University, Laboratory Géolittomer, Nantes, France
*E-mail: nicolas.rollo@univ-nantes.fr

[2] Syndicat Mixte du Loc'h et du Sal, Grand-Champ, France

The European Union legal framework for shellfish water quality refers to the Directive 2006/115/CE. This Directive is based on the Water Framework Directive which specifies the use of an integrated approach for watershed management in order to reach a good chemical and ecological status of groundwater, surface and estuarine waters by 2015. The impacts of watershed disturbances are more and more blamed to contaminate shellfish farming ecosystem. These contaminations could be due to non-point source pollution including animal manure spreading or just flawed treatments of sewage. Therefore, it seems to be critical to use an integrated approach to study theses processes. The aim of this study is to assess an integrated approach using the agro-hydrological model SWAT (Soil and Water Assessment Tool) in order to make a spatial analysis of pollutant transfers from the watersheds to the coastal waters. This method has been experimented on two shellfish framing areas on the west coast of France which are confronted to recurring problems of deterioration of their coastal water quality.
The physically based model SWAT, developed by the Agricultural Research Service of the United State Department of Agriculture to predict the impacts of land management practices in large heterogeneous watersheds (Neitsch et al., 2002; Di Luzio et al., 2002), has been implemented on the different sub-watersheds of both areas to simulate the pollutant flows (mainly nitrogen, phosphorus, pesticides and bacteria). To calibrate and validate the different simulations, the simulated outputs have been compared to the water samplings from the monitoring gages. According to the Nash and Sutcliffe efficiency criterion (Nash and Sutcliffe, 1970), the simulated pollutant concentrations and flows are close to the measurements. Indeed, depending on which simulation, but the efficiency criteria range from 0.67 to 0.98. The simulations enabled to determine the sub-watersheds which contributed the most to the coastal water eutrophication and to the bacteriological pollution of these shellfish farming areas. Therefore, it is now possible to suggest priority areas of intervention for the actions of restoration of the coastal water quality. In a near future, this modelling tool is expected to be coupled with a hydrodynamic model in order to predict the dispersion of the pollutants in the coastal waters and to realise prediction scenarios with practice modifications on watersheds.

References

Di Luzio M, Srinivasan R, Arnold J G., et al (2002). ArcView interface for SWAT 2000, User's guide. Blackland Research and Extension Center, Grassland, Soil & Water Research Laboratory, Texas, 351

Nash J E, Sutcliffe J V (1970). River flow forecasting through conceptual models. Journal of Hydrology, 10: 282290

Neitsch S L, Arnold J G, Kiniry J R, et al (2002). Soil and Water Assessment Tool, Theoretical document, version 2000. Blackland Research and Extension Center, Grassland, Soil & Water Research Laboratory, Texas, 506

Role of discharge regulation and over population on hydrochemistry and total loading of the Nile River and its estuary to Mediterranean Sea

Elrayis OSMAN

Oceanography Dept.. Faculty of Science, Alexandria University , Moharrem Bek 21511, Alexandria, Egypt
E-mail: elrayis@yahoo.com