

**THESIS INFORMATIONS WITH NEW SCIENTIFIC  
CONTRIBUTIONS, THEORETICAL STUDY**

1. **Thesis name:** Research on the effects of rainwater runoff to the quality of Saigon River surface water
  - Code: 62850101
  - Major: Natural Resources and Environment Management

2. **Name of PhD. student:** Nguyen Van Hong
  - Supervisor: Assoc. Prof. Dr. Duong Hong Son  
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**3. Introduction:**

Saigon River is located in the Southeast region of the country. The river's water is exploited and used for many different purposes, including the role of providing clean water for millions of people. Rapid urbanization and industrialization, increasing number of industrial parks, factories, and enterprises together with population growth in this region has put more pressure on water resources. Besides, rainwater runoff flows through the catchments, sweep away and transport the waste, pollutant loads and contribute to the increased river water pollution in the most downstream areas, especially the section from the Ho Chi Minh City to the river mouth.

The thesis: "Research on the effects of rainwater runoff to the quality of Saigon River surface water" provides a scientific basis on rainwater resource in order to protect river water resources, prevent degradation while restore water resources for a sustainable development.

The study focused on the rain-water runoff and the quality of Saigon River surface water (for the river section from after Dau Tieng reservoir to Mui Den Do) to assess the current status of the river water quality, pollution sources; to assess the effects of rainwater runoff to the surface water quality, and propose solutions to reduce river water pollution affected by rainwater runoff.

Methods used in the study include field survey and monitoring, laboratory analysis and statistical method to examine rainwater runoff on catchments with different land use purposes, to assess characteristics of the runoff on small basins during raining period and to assess the quality of Saigon River surface water. The study also used the advanced modeling method, namely the hydraulic model MIKE, to

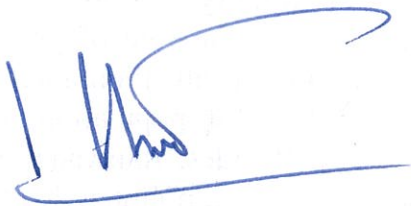
assess the effects of rainwater runoff to the river water quality. The modules used in the study include Rainfall - runoff, hydraulic, pollution load and water quality modules.

### 3. List of new scientific contributions

The results of the survey and analysis of the rainwater surface flow have shown the evolution of pollutant load of the flow during the rain event in different watersheds. For a typical rain event, the first flush of the surface runoff of the rain (about one third of the total volume of the flow) on residential and industrial clusters carries more than 50% of the cumulative load of pollutants (TSS, BOD5 and P-PO<sub>4</sub><sup>-3</sup>). Meanwhile, surface runoff on agricultural land accounts for only about 30% of the cumulative load of pollutants.

The simulation results from the model show the effect of rain water overflow on the quality of Sai Gon river water. For the early rain (R=36 mm; 20-21/05/2014) and mid-season rain (R=43,3mm; 18-19/08/2014), the concentrations of pollutants in the river at the confluences have increased starting from the beginning of the rain and reached the peak (C<sub>max</sub>) in between 240 and 270 minutes (about 4 – 4 hours 30 minutes). After that, the pollutants of river water continue to diffuse and gradually decrease from the minutes of 240 and afterwards. Under the effects of tide, the maximum exposure time (C<sub>max</sub>) of pollutants does not depend on the delay or early phase compared to the maximum flow (Q<sub>max</sub>) of river water.

**Supervisor**

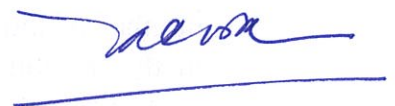


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