

**INFORMATION ON ACADEMIC AND THEORETICAL CONTRIBUTIONS
OF THE DOCTORAL DISSERTATION**

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1. Dissertation title: *Computations of Storm Surge Taking into account Wave Induced Water Level Rise, Applying to Hai Phong Coastal Areas*

Code: 62440227 Specialization: Oceanography

2. PhD candidate: *Nguyen Xuan Hien*

Advisor: *Prof. Dr. Tran Thuc; Prof. Dr. Dinh Van Uu*

Place of education: Institute of Meteorology, Hydrology and Environment

3. Dissertation introduction:

Storm surge is one of phenomena causing dyke breaks and inundations in coastal areas, particularly when storms coincide with high tide. In Vietnam, there are a number of studies on storm surges, but less attention has been paid to investigating maximum water level in storms, where wave setups take place near shoreline.

In this dissertation, numerical models and empirical formulas are used to compute maximum water level in storms along the coast of Haiphong. The results show that maximum water level along the coast is caused by the combination of tide, storm surge and wave induced water level rise, in which, water level rise due to wave setup contributes about 22% of maximum water level in storm near the shore.

Impact of sea level rise due to climate change on the astronomical tidal regime in the Haiphong coastal areas is also assessed. It is found that the amplitude of astronomical diurnal waves tends to increase, while the amplitude of semi-diurnal waves tends to decrease. Effects of sea level rise due to climate change on maximum water level are also studies. It is found that the existing Haiphong's sea dyke system cannot to meet the requirements for flood prevention from maximum water level caused by storm in the condition of sea level rise due to climate change.

4. New academic contributions of dissertation

- *Quantitative assessment of the contribution of wave induced water level rise to the maximum water level near the coastline in storm, and recommendation for the inclusion of wave setup in the computations of total storm surge. The recommended procedure is then applied for Haiphong coastal areas.*
- *Assessment of the impacts of sea level rise due to climate change to the astronomical tidal waves and to the maximum water level rise.*

Supervisors

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