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A Scenario-based investigation of storm surge in Thai Gulf: A Simulation with Finite Volume Coastal Ocean Model

Dr. Sirisup and Mr. Tomkratoke

National Electronics and Computer Technology Center, Large-Scale Simulation Research Laboratory, Klong Luang, Pathumthani, Thailand (sirod.sirisup@nectec.or.th, 662-5646776)

The Gulf of Thailand is a semi-enclosed sea located in the southwestern part of the south china sea covering approximately 320,000 km^2. The length from the shelf edge to the head of the Gulf is aproximately 1,500 km and the width is about 460 km. It is relatively shallow with average depth of 40 m enclosed by slightly incline bottom with the deepest bottom depth located in the middle of the Gulf. Many Thai major cities lie along the Thai Gulf coasts including the capital of Thailand, Bangkok. Current rapid growth in tourism industry leads to an intensive use of seashores. These facts and together with the changing climate can make storm surge lead to a high natural catastrophe losses in this area. However, a scenario-based investigation based on simulation can provide means for a disaster management sections to efficiently plan and promptly react to any forecoming storm surge events.
In this study, we employ the finite volume coastal ocean mode to perform a scenario-based investigation in the Thai Gulf area. The finite volume method is considered here because of its geometric flexibility, computational efficiency as well as volume and mass conservation assurance. In the current investigation, we focus on studying the effects of the storm intensity, radius of maximum wind speed, storm forward speed as well as the land fall timing. All of the factors in the current scenario-based studies are based on those of the Linda typhoon.