

Flood Control Structures in the River Göta Älv to Protect Gothenburg City (Sweden) during the 21st Century: Preliminary Evaluation

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Abstract : Climate change because of increases in concentration level of greenhouse gases emissions to the atmosphere will result in mean sea level rise about +1 m by 2100. To prevent coastal floods resulted from the sea level rising, different flood control structures have been built, e.g. the Thames barrier on the Thames River in London (UK), with acceptable protection levels at least so far. Gothenburg located on the southwest coast of Sweden, with the River Göta älv running through it, is one of vulnerable cities to the accelerated rises in mean sea level. Developing a water level model by MATLAB, we evaluated using a sea barrage in the Göta älv River as the flood control structure for protecting the Gothenburg city during this century. Considering three operational scenarios for two barriers in upstream and downstream, the highest sea level was estimated to + 2.95 m above the current mean sea level by 2100. To verify flood protection against such high sea levels, both barriers have to be closed. To prevent high water level in the River Göta älv reservoir, the barriers would be open when the sea level is low. The suggested flood control structures would successfully protect the city from flooding events during this century.

Keywords : climate change, flood control structures, gothenburg, sea level rising, water level mode

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