Evaluation of Manado Flood Problem Using Two Dimensional Modeling

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Host Organization

lembaga pengelola dana pendidikan

Background

Flood is a major problem that often happens in various parts of Indonesia, presented in the graph Figure below.

Figure 1. Flood events in Indonesia [1]

The flood problems in Manado reached 20 times the incidence report since 2010 [1].

Objectives

This study uses a two dimensional flood model approach by simulating the effects of changes in land use and the effects of rainfall return period and flood observation to find solutions to the problems of flooding that often occur in Manado.

Methods

In this study, analysis of Manado flood discharge was based on simulation and evaluation of land use data and rainfall quantitatively. Determination of the volume of flood inundation that occurs can be analyzed by using flood modeling with rainfall return period as input data.

Key Findings

- Flood, Flood Evaluation, Flood Inundation, Flood Modeling

Figure 2. Land use and topography of the Tondano and surrounding watersheds [2]

Figure 3. Effects of land use changes in 2014 and 2016 on the Manado floods

Figure 4. Conclusions from the problem of flooding in Manado

Outcomes

Figure 5. Flood simulation with return period 1, 5, and 10 years

Conclusion

Based on the results of a study evaluating the effects of land use change and simulation of floods with rainy days, the authors recommend government of Manado to improve the river side areas which are crowded and inhabited by communities, both legally and illegally. Further sedimentation research studies need to be conducted to determine the situation of sedimentation and capacity of the river in Manado.

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