Karakteristik geometri dan resistensi pulau di sungai

Abstrak

In the eco-hydraulic concept development, river island is an important component both for flora and fauna habitat and resistance to flow. The present research aims to identify the characteristic of island geometry in terms of island resistance. The research method is conducted through qualitative analysis on island geometry obtained from direct field measurement, historical maps, maps from literature, and satellite image-maps. While the research on flow resistance is conducted by measuring the resistance coefficient (drag coefficient, CD) of an island model. Analysis is performed on the basic of island geometry, namely the relative length (p) and width (l) and the distance of island from river bank (d). The laboratory experiment on open channel is conducted to determine the correlation of island geometry, to island resistance. It is concluded that the island geometry and its asymmetry have specific value (the average value of p/1 = 4.09; L/p = 0.84 and L/l = 3.01), while the resistance coefficient (CD) of the island with such characeristic is minimal.This result is accordance to the minimal principle of resistance concept, where every structure within flowing fluid in its development will be deformed to stream line form according. Similarly, islands on flowing fluid (river) will have stream line form with minimal resistance to flow. The benefit of this research is that it serves as reference for island construction in river restoration project and as academic information on island geometry and the evidence of the general concept of minimal principle of resistance.