Experiment Name: Simulation of Water Quality Model with Tracer

Snapshots of Water Quality Spatial Plot

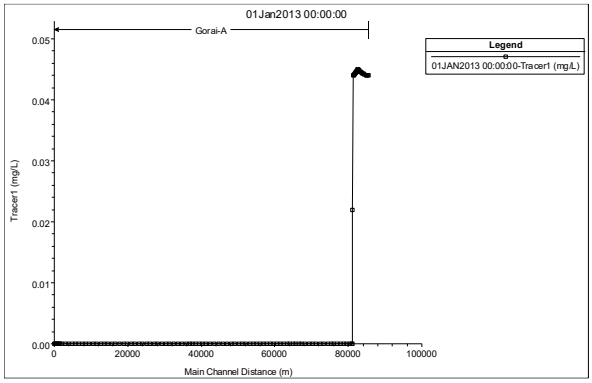


Figure 1 Snapshot 01

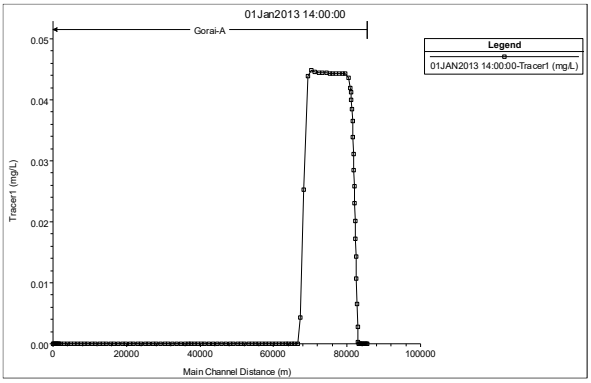


Figure 2 Snapshot 02

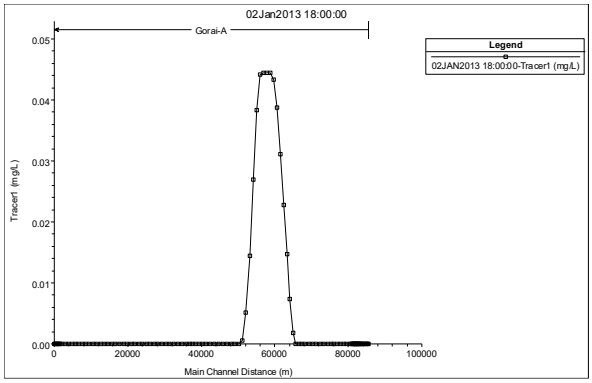


Figure 3 Snapshot 03

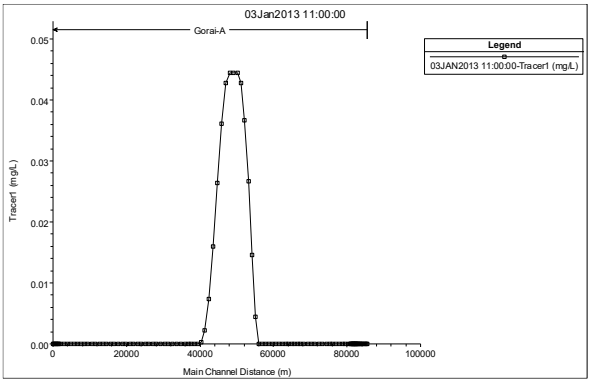


Figure 4 Snapshot 04

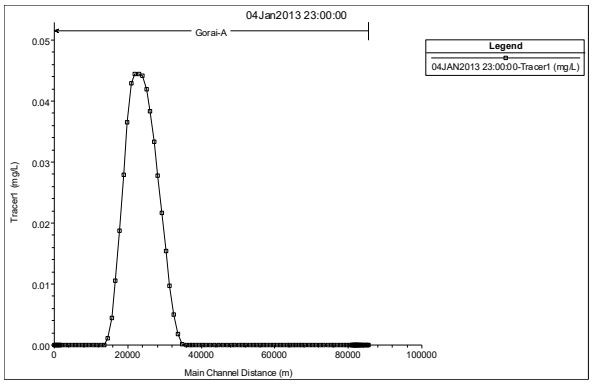


Figure 5 Snapshot 05

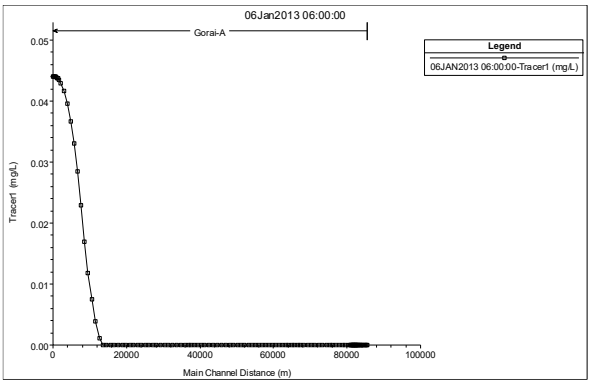


Figure 6 Snapshot 06

Discussion

The water quality simulation was carried out for the Gorai River using 31 days of simulation data for January 2013. A tracer with a triangular concentration distribution was introduced to examine its movement through the river reach. The simulated results showed the tracer gradually moving downstream, with its concentration increasing as the tracer plume arrived at a section and subsequently decreasing as it moved farther downstream. The results therefore represented the expected formation and movement of a tracer plume within the river.

The observed behavior can be explained by the combined effects of advection and diffusion. Advection transported the tracer downstream along with the flowing water, while diffusion caused the tracer to spread and its concentration to gradually diminish. This is consistent with the principle used by HEC-RAS to simulate constituent transport through a river using the one-dimensional advection-diffusion approach.

Overall, the simulation provided a practical demonstration of contaminant transport in the Gorai River. It showed how the concentration and spatial distribution of a tracer can change with time and distance as it is carried and dispersed by the river flow.