Japan Geoscience Union Meeting 2010
(May 23-28 2010 at Makuhari, Chiba, Japan)

MIS002-P08 Room: Convention Hall Time: May 25 17:15-18:45

Flume experiment for channel change of a meandering river

Hiroko Okazaki[1*], YOUNGJOO KWAK[2], Hiroomi Nakazato[3]

[1]Natural History Museum& Institute, Chiba, [2]Chiba Univercity, [3]National Institute for Rural Engineering

The purpose of this research is to examine how a meandering river changes in form corresponding to the change of water discharge, the slope and sand supply through flume experiment. The flume is 3.6m in length, 0.9m in width, 0.4m in height, and changes slope gradient. The experimental material is soil used for the gardening of which the average grain size is 1mm. It contains certain percents of mud size particles. The specific gravity is about a 1.2.
Three experiments were made under different conditions. Run 1 was made under no sediment addition, fixed slope gradient and variable water discharge. At Run 2, slope gradient was changed with no sediment addition and fixed water discharge. Run 3 was made by adding sand with fixed slope angle and water discharge.
As a result of all the experiments, the drainage basin was divided into three segments; upper, middle and lower segments. The upper segment was characterized by moving the meandering. In the middle segment, anastomosing of channel was occurred. Small anastomosing channels were combined to a broad river-mouth channel in the lower segment. An average flow velocity and a gradient of slope were measured in each segment. Anastomosing resulted from the increasing velocities and degreasing slope gradient in the middle segment.
The relationship between the channel pattern and each factor (water discharge / slope gradient / sand supply) are as follows. The increasing water discharge makes channels widen. The steepening slope increases degree of the meandering and the depth of channels. Channel form varies rapidly according to sand supply. Sandbars were formed in the channel and a braided channel appeared.

Keywords: Meandering river, flume experiment, channel change