Team Second/IV 3
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With help from Will Dietz, Meredith Stading, and Ryan Wells
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1: Introduction

This image was created for the second team project, and the third IV assignment of the semester. I worked in collaboration with Will Dietz, Meredith Stading, and Ryan Wells to capture water running over a plastic object using the flume in the ITLL. Will, Maridith, and Ryan helped me inject red dye into the flume while I captured my final image.

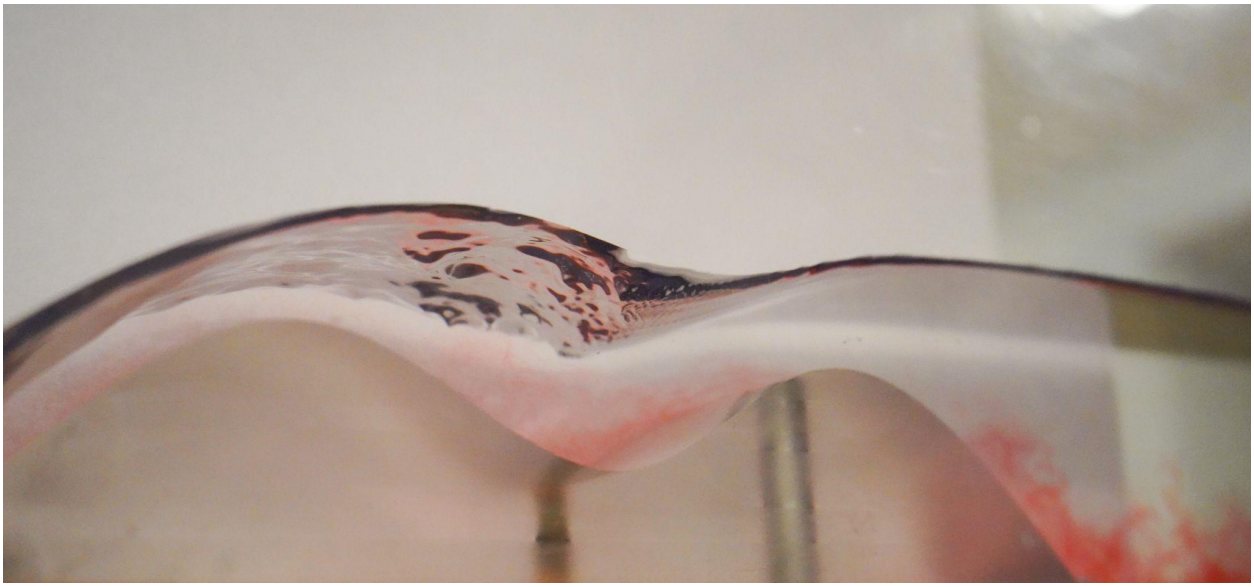

Figure 1: Final Flume Image

2: Set Up and Relevant Physics

The flow that is being captured here is water being released in an open channel water flume, with a plastic obstacle interrupting the water flow about a third of the way down the flume. The water was significantly deeper closer to the source, and became shallower after interacting with the obstacle. In my photo, I injected red food coloring using a syringe near the base of the obstacle.

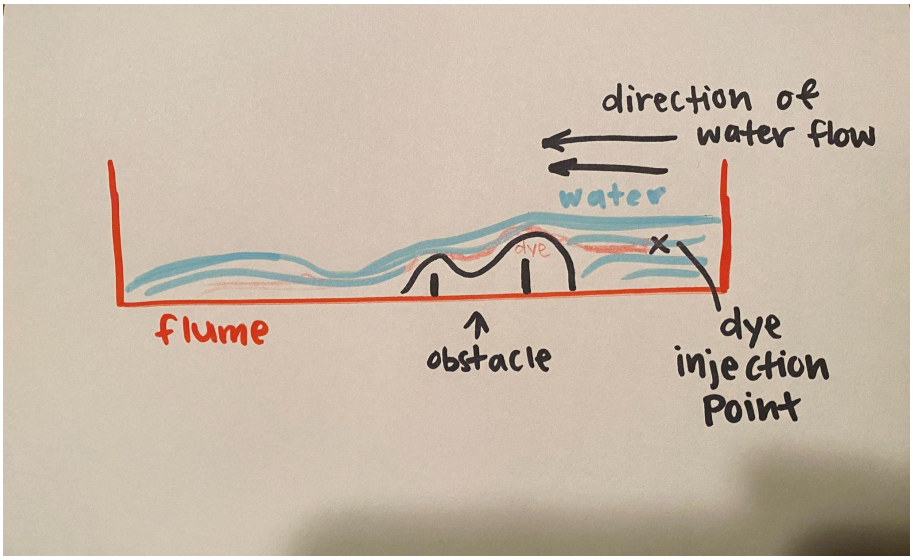

Figure 2: Sketch

The object that was used as an obstacle was about 25cm in length, and about 7cm wide.

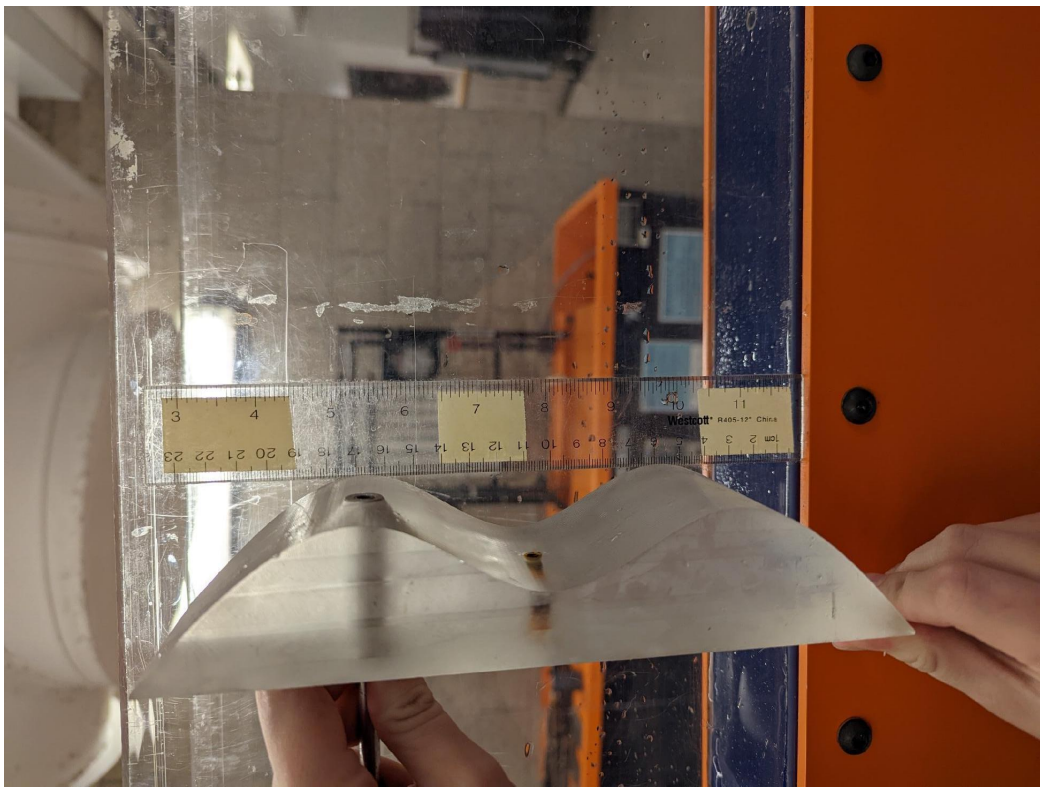

Figure 3: Obstacle used in flume

3: Visualization Techniques

This experiment was done inside, in the Armfield Open Channel Flume located in the ITLL. To make the background white, pieces of printer paper were taped to the far side of the flume, and the lighting that we used were the overhead lights in the ITLL. Dye was used as a visualization technique. The dye used was water based, red food coloring, and it was injected using a syringe and a small plastic tube that was submerged near the base of the obstacle in the flume. Below is the set up that was used to capture my final image.

Figure 4: Set Up

4: Photographic Technique and Choices

Shot on a Sony A7III, the plexiglass window of the flume was about an inch away from the camera lens, with the focal length at 41mm. The field of view was about 30cm x 30cm. The frame rate was set to 1/800, and the f/stop was set to f/4.5 The original image

was 6000 x 4000 pixels, while the cropped, final image is 5860 x 2715 pixels. In addition to slight cropping, all that was done was in editing were adjustments in exposure, saturation, and highlights, to make the the dye used pop more against the white background.

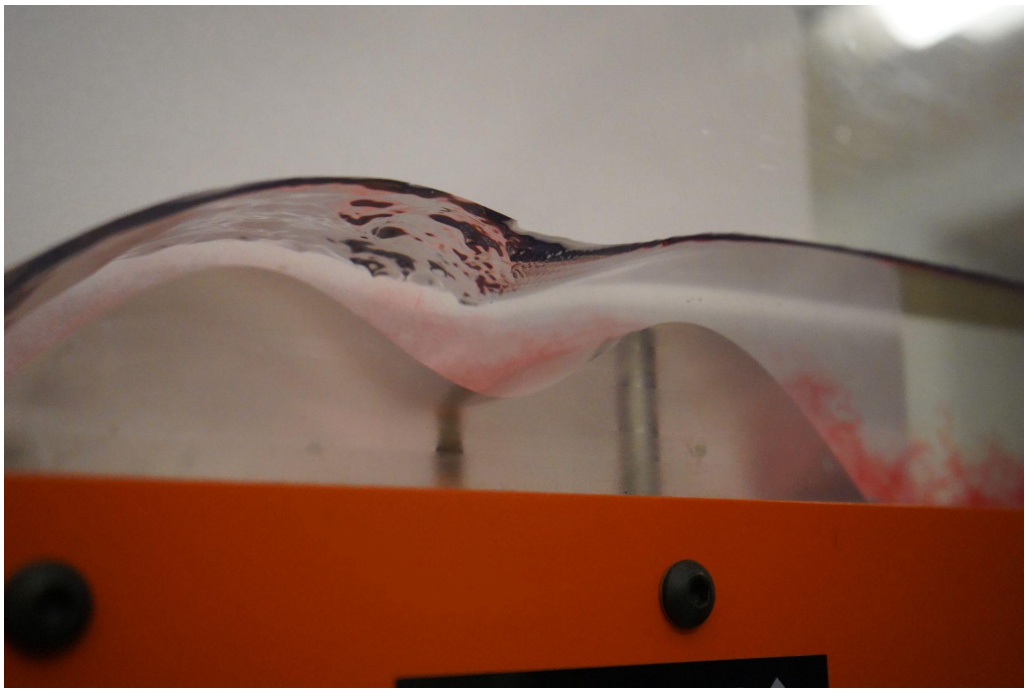

Figure 5: Original Image

5: Further Work

I think that this picture successfully highlighted the way that water interacted with the obstacle that was placed in the flume in a controlled environment. It would have been interesting experiment with other dye techniques, and photograph it from different angles. I would like to understand more of what is happening with the flume, as it was super interesting to interact with it for the first time. I tackled this in more of a visual sense because of my background, but I think that the fluid physics that are happening are captured in an artistic way.

6: Sources

Armfield flume. (n.d.). University of Aberdeen. Retrieved November 7, 2022, from https://www.abdn.ac.uk/engineering/research/armfield-flume-212.php