JACKKNIFE FLOW; GET WET REPORT

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Get Wet Assignment
Section 1
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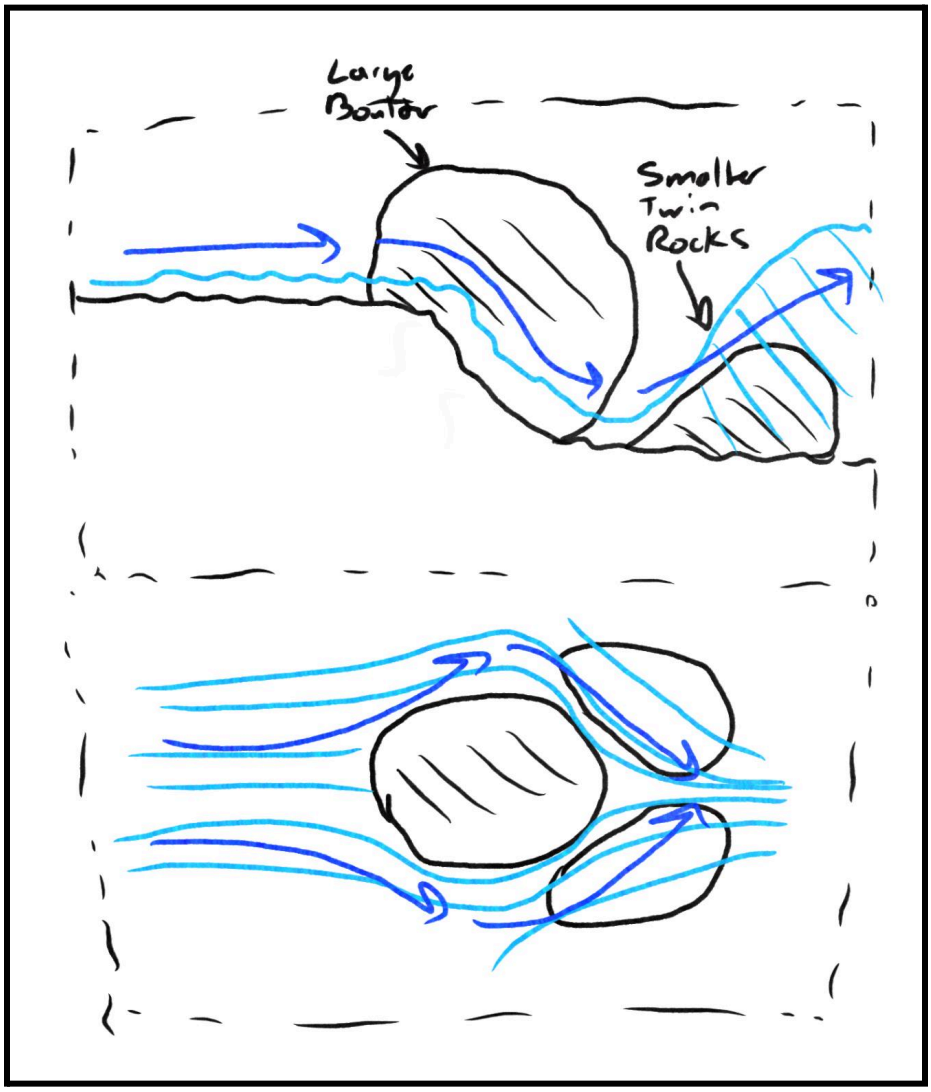
For my Get Wet assignment, I chose to replicate a river feature that I have known from my childhood, A jackknife rock formation. I grew up in the midwest and in the midwest, a common activity it white water rafting. I remember vividly that on one of these escapades, though I can't find a set-in-stone definition of this on the internet, it is common to see a jackknife, or, razorblade, rock formation, A rock formation that produces a specific turbulent flow. The basic theory behind this is that a large boulder sits in the middle of a river and splits the river's flow. Immediately after this, there is a dip in the two flows pushing the water down, followed by two rocks pushing the water back up and together again, behind the large boulder. This creates that thin plane of water that shoots upward, the jackknife. And so, in remembering this and living close to Boulder Creek, I decided to use this assignment to capture something similar to this.

My flow apparatus in my setup was Boulder Creek. The only two forces working on this system are normal forces and gravity. Shown below, the water would flow into

the large boulder and be split. They would flow into the dip and be accelerated by gravity, then moved up by normal forces and pushed together. Their horizontal forces are cancelled out when they collide and they are pushed upward, forming the jackknife. For the calculation of the Reynolds Number, we need to make some approximations. For velocity, I used the external footage to determine this. In one second, the water traveled past the 1 foot length of the system and moved about 4 more feet, giving a velocity of 5 ft/s. Then the characteristic length is 1 foot, measured during shooting. And the kinematic viscosity for water at 10 degrees celsius is 0.000014083 ft^2/s. And plugging this into the equation we get 355,027, which means the system is turbulent.



Preliminary sketch of the jackknife system

For materials, this setup was incredibly simple. Choosing the day of shoot was important, since it was outdoors, the lighting was tied to the weather condition. The sunny day is visible in the final format.

The camera was obviously an important part of the shoot. I used a Canon Rebel T2i, a common DSLR. I tried to capture a mix of both the turbulent and laminar flow. In the picture, the left side is somewhat laminar, steady state, and the right side is very turbulent, with a large boulder in the middle. I was about 5 feet from the system, with a large lens on the camera. I used the auto feature on the camera, this way it could hopefully counterbalance my very little experience with photography. And with image processing, I cropped the frame to make everything even and also increase the color grade of the green/blue specter, making the hidden colors pop more.

While the image did come out a little blurry, I think the overall quality of this picture shows my effort in this project.