Marco and I met to discuss my questions asked by email, namely why the solution given by the method of characteristics at the boundary, which are at the new time value, t^{n+1}, are of interest, since we are using explicit Euler, which only is concerned with values at t^n. The answer is that Marco had intended that I strongly impose the values given by the characteristics, instead of using them to compute the boundary fluxes, as I had been doing previously.

The other question I had was how to implement wall boundary conditions, namely the condition $\mathbf{v} \cdot \mathbf{n} = 0$ in 2-D; my confusion was that setting the normal component of the velocity only fixed one of two degrees of freedom for the velocity, so I didn't know what the other component was. The answer was that it didn't matter; the boundary fluxes only require knowledge of $\mathbf{v} \cdot \mathbf{n}$. Therefore the wall condition cancels the continuity boundary fluxes and just leaves a "pressure" term in the momentum boundary fluxes.

We also ran the code with entropy viscosity for the perturbed lake-at-rest problem and couldn't find parameters that allowed a steady-state to be achieved. It was suggested that I might try the following:

1. Smoothing the perturbation profile instead of having a step function, and

2. Smoothing the viscosity variations between cells, e.g., take the viscosity to be the maximum of it and its neighbors. This prevents oscillations in the viscosity profile.