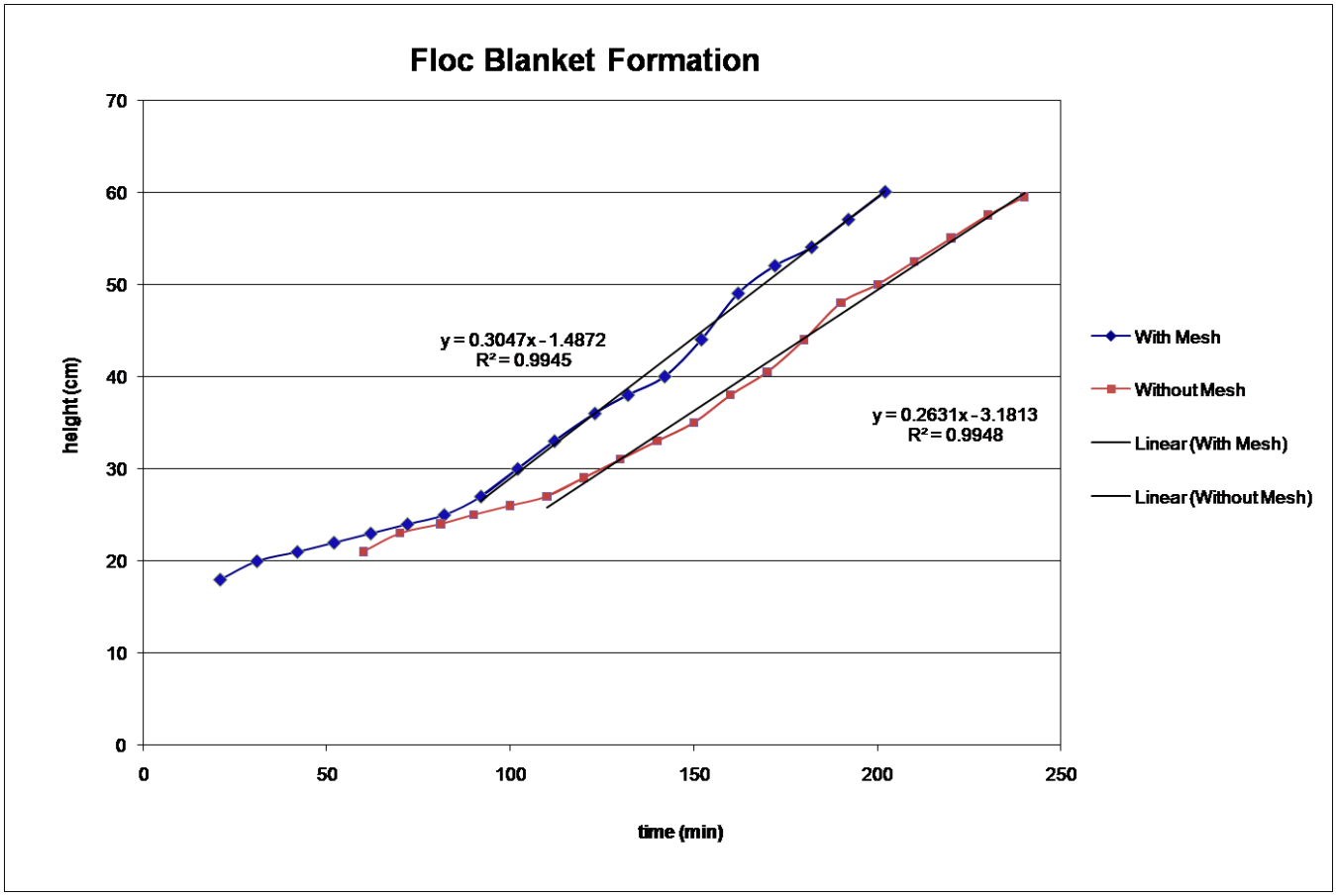
PSS Floc Blanket Formation

Floc Blanket Formation

Although the plate settler spacing team is not directly concerned about the formation of floc blankets, we cannot ignore how they affect our system because of the effect they have on the quality of the effluent. Floc blankets may form at different rates based on how the system is set up; one of the differences we are testing is the presence of a mesh.

Our mesh is made out of a circular piece of plastic with the same diameter as the channel with lots of holes drilled into it. These holes are about 3/4 of a centimeter in diameter, so as to not break up the flocs that were formed during flocculation. The whole purpose of this mesh is to assist the water to disperse evenly coming into the sedimentation channel.
For our tests, we have a digital camera set up that takes pictures of the floc blanket during formation. These pictures are taken every minute, allowing us to track the height of the floc blanket at any given time. We have tape on the sedimentation column that marks the height of the floc blanket to use as a reference.

Results



This graph shows the height of the floc blanket in relation to the time the system has been on. There is a gap at the beginning of the data because there needs to be an initial accumulation of flocs in the column in order to form a blanket.
We noticed that the latter portions of both graphs were linear, and created trendlines to give the data about the rate of formation. This would imply that in the presence of a mesh, about an hour and a half into formation, the floc blanket builds at a rate of about 0.30 cm per minute. It is hypothesized that during the initial hour and a half, the floc blanket is beginning to form and to compact upon itself, but only starts growing at a steady rate after this time has passed. When a mesh is not present, we saw the linear trend begin around two hours into the experiment, and the rate of formation was about 0.26 cm per minute. The full floc blanket in this situation took about 4 hours to form, as opposed to 3.5 hours with a mesh.

Significance

There is only a difference of about 13% between these two rates of formation; therefore with this one experiment, it is difficult to conclude that the mesh in our setup makes an impact. Further experimentation would need to be done to determine the significance of the mesh in the formation of the floc blanket and how this information would impact future plant designs.