

Appendix C.
Blue Hill Hydraulics Report

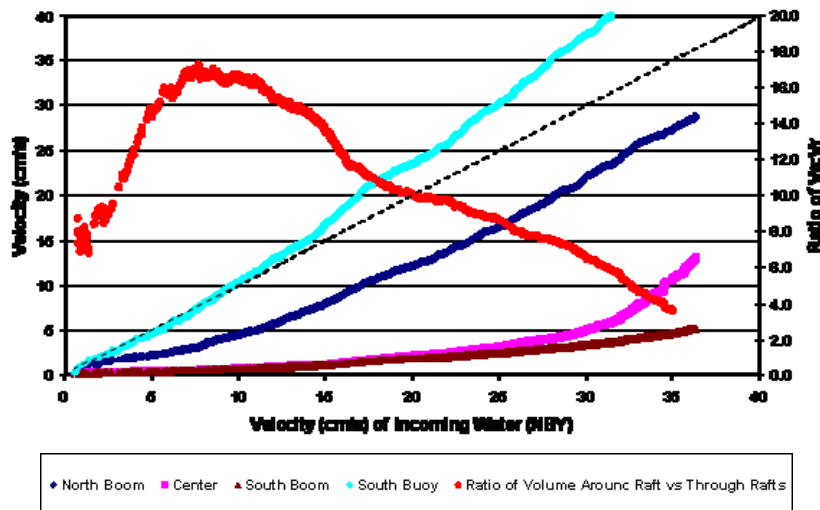


Taylor Shellfish Farms Mussel Raft Wake Study

1. Executive Summary

Model Setup

- The numerical model originally developed to predict flow speeds and Chl a depletion within rafts deployed at Totten Inlet was adapted for the study of wake development downstream of eight raft strings deployed over a sloping bottom.
- Using the same program settings as those used in the Totten Inlet study, Chl a depletion was calculated in the wake of the raft strings and the results were correlated with field data (Figure 1).
- Velocity distributions calculated in the wake of the rafts were compared to field data gathered about 70 meters downstream of the Totten Inlet rafts (see light blue line below). The size of the calculated wake regions appear to be a bit larger than the size of the measured wake regions. Additional work could be performed to improve these comparisons if required.



Results

- The analysis shows that the area of measured Chl a depletion downstream of the rafts deployed over the sloping beach should be similar to the area Chl a depletion measured downstream of the Totten Inlet rafts.
- The size of the area of Chl a depletion downstream of the rafts is inversely proportional to the ambient current speed according to this analysis. Thus, as ambient current speeds increase the size of the area of measured Chl a depletion decreases (NOTE: this finding would not apply to slack-tide conditions).

- **Totten Inlet Calibration**

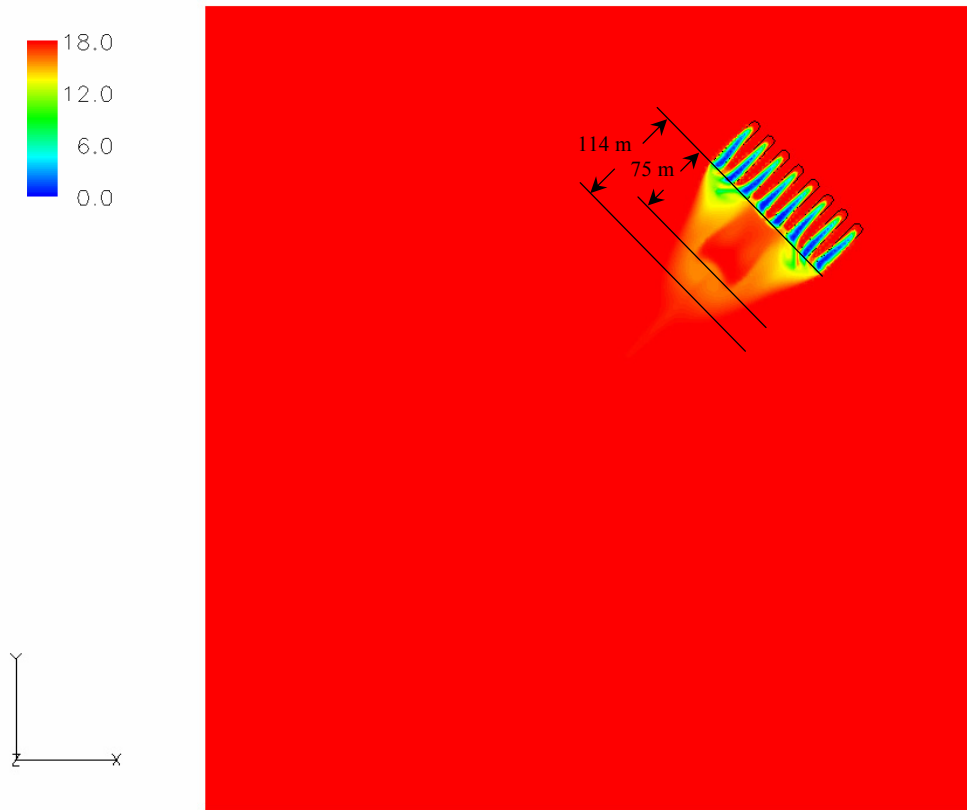


Figure 1: Totten Inlet Calibration – Chl a Distribution
(15 cm/s Approach Velocity)

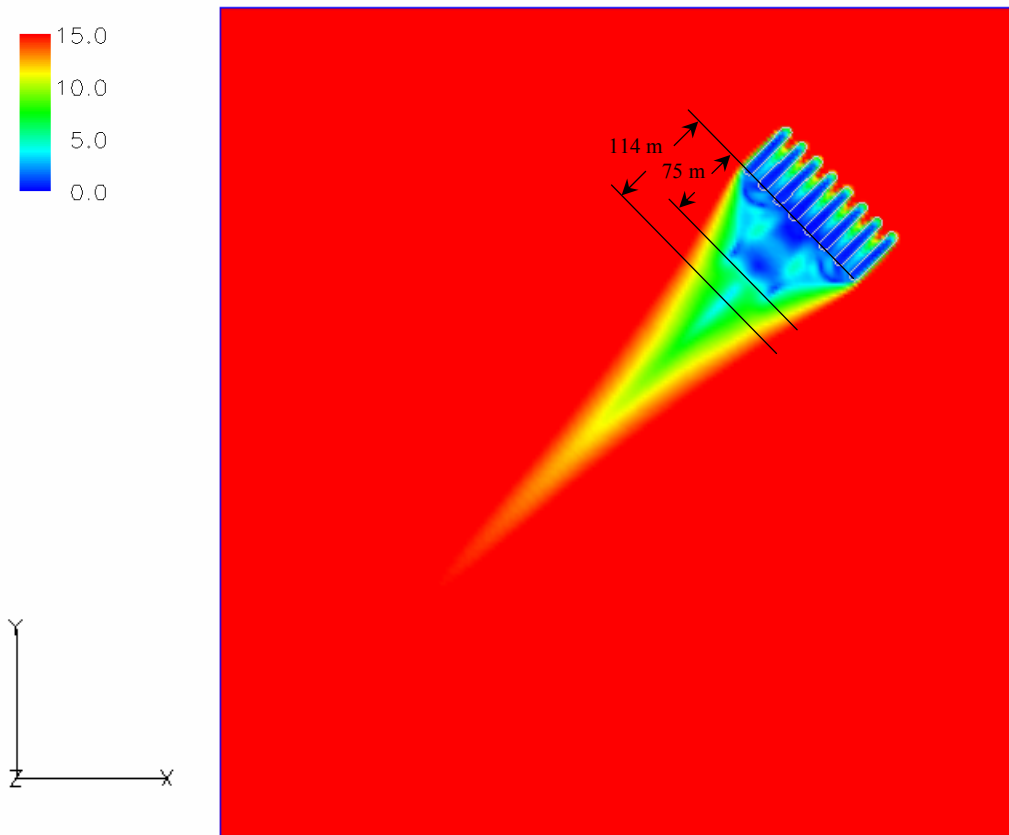


Figure 2: Totten Inlet Calibration – Velocity Distribution
(units are cm/s)

3. Sloped Beach Simulations

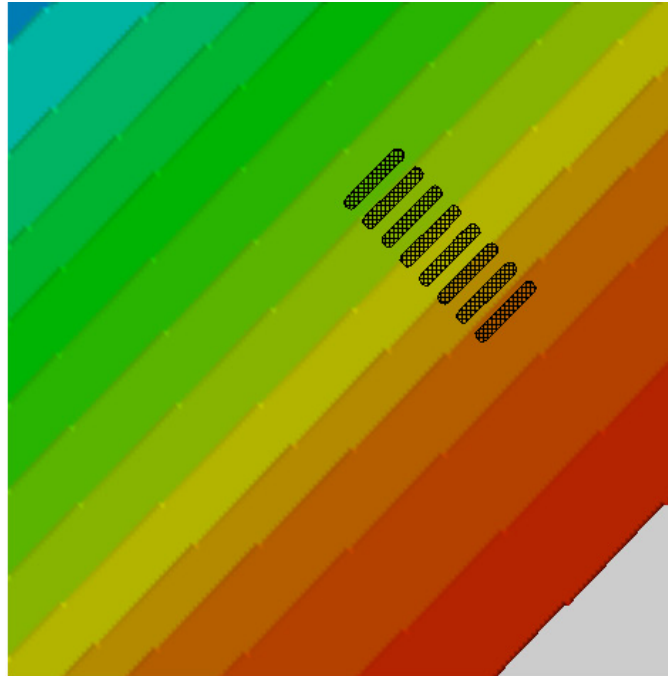


Figure 3: Sloped Beach – Model Setup
(colored by depth, blue is deep)

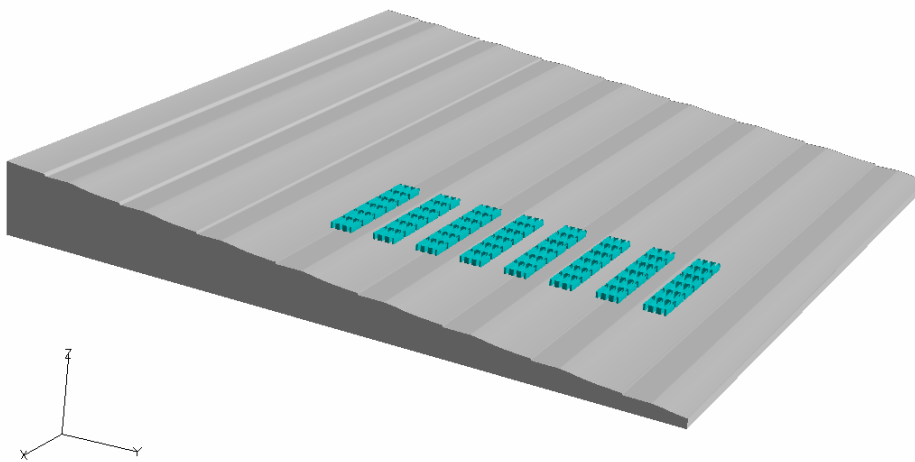


Figure 4: Perspective View
(shellfish rafts are blue)

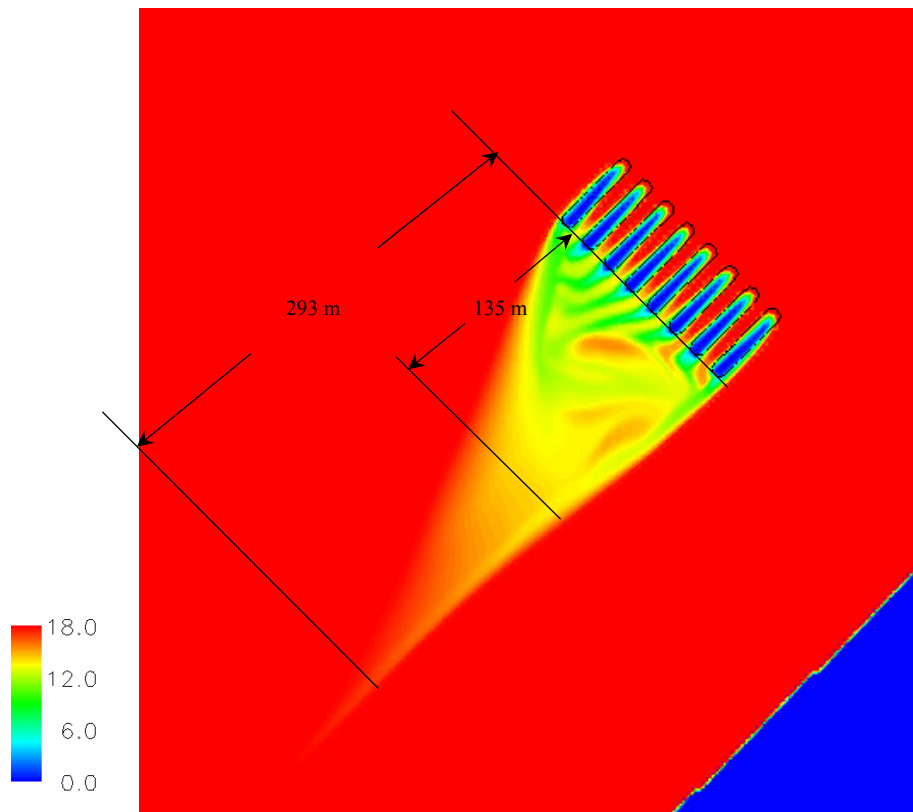


Figure 5: Sloped Beach – Chla Distribution
(5 cm/s Approach Velocity)

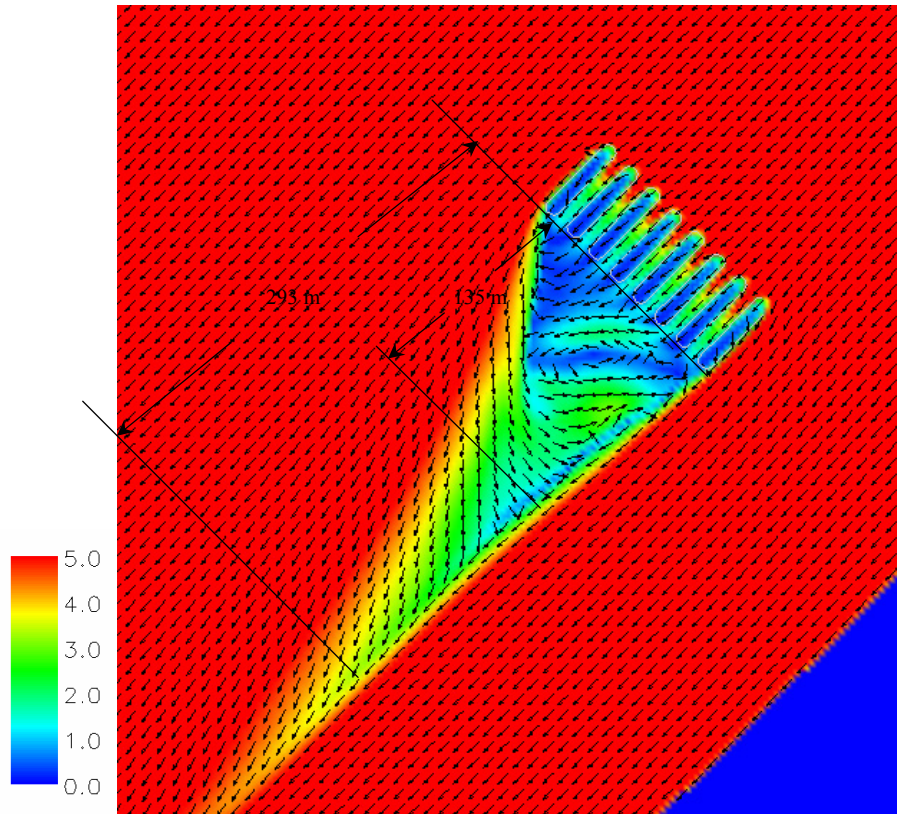


Figure 6: Sloped Beach – Velocity Distribution
(every third vector shown, units are cm/s)

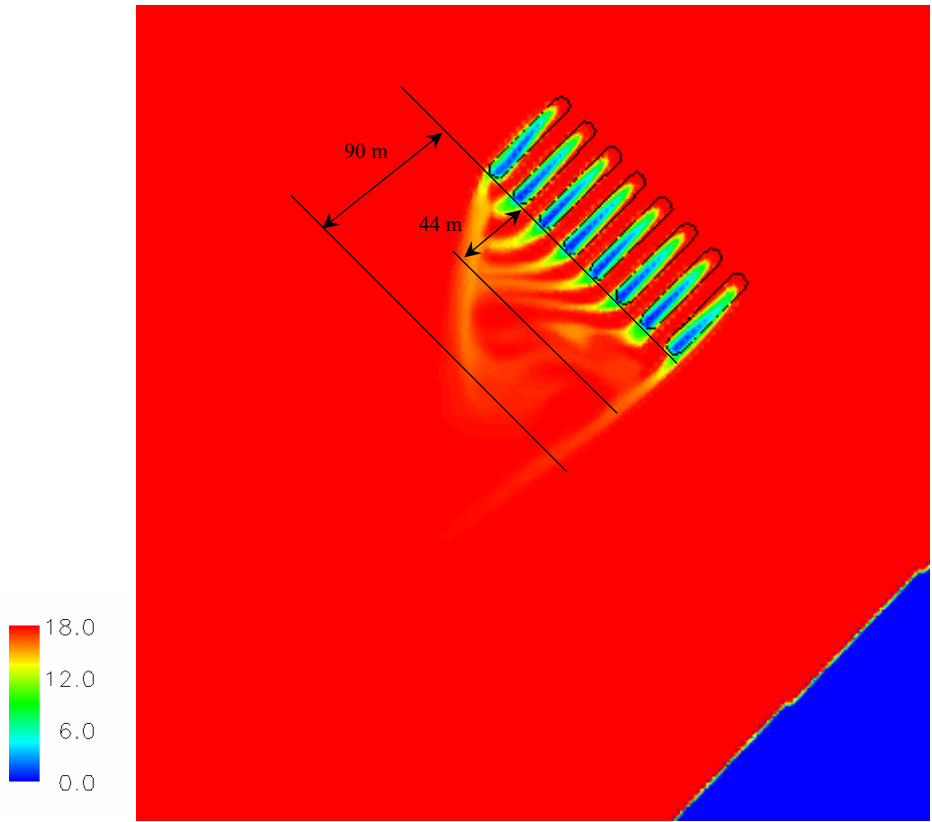


Figure 7: Sloped Beach – Chl a Distribution
(15 cm/s Approach Velocity)

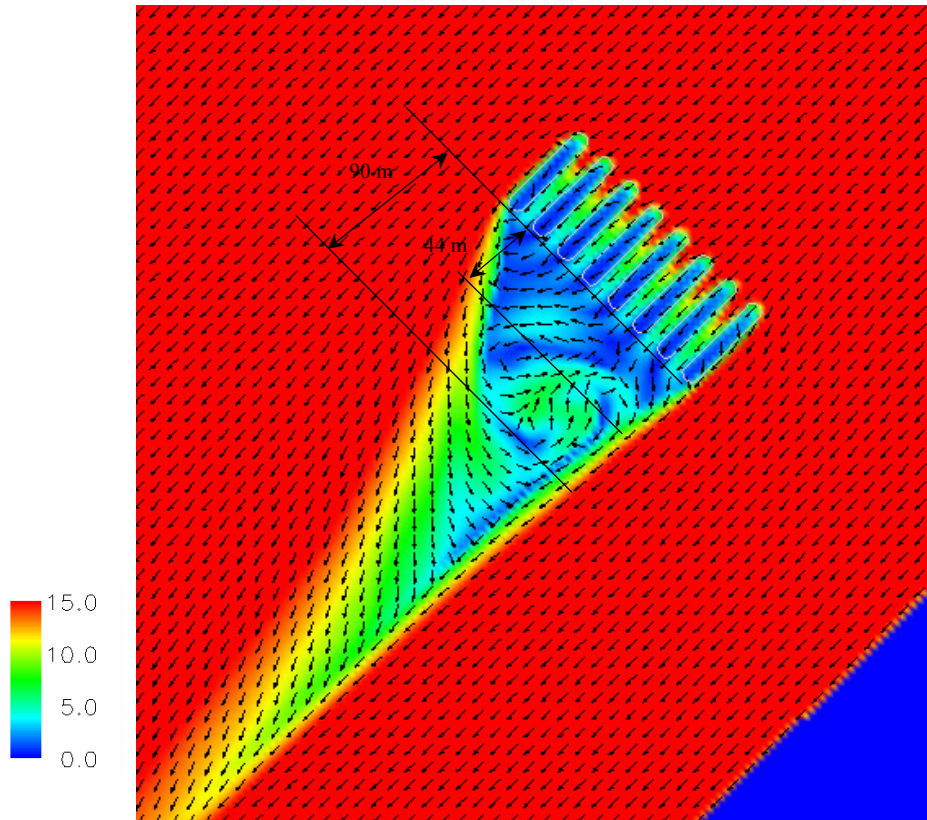


Figure 8: Sloped Beach – Velocity Distribution
(every third vector shown, units are cm/s)

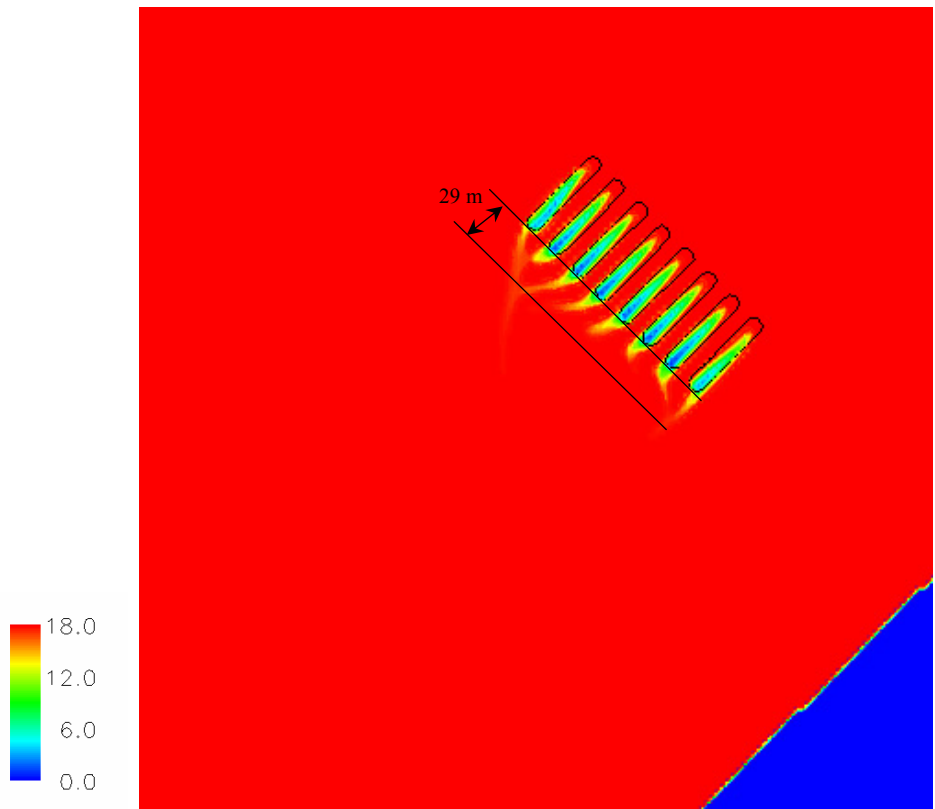


Figure 9: Sloped Beach – Chl a Distribution
(25 cm/s Approach Velocity)

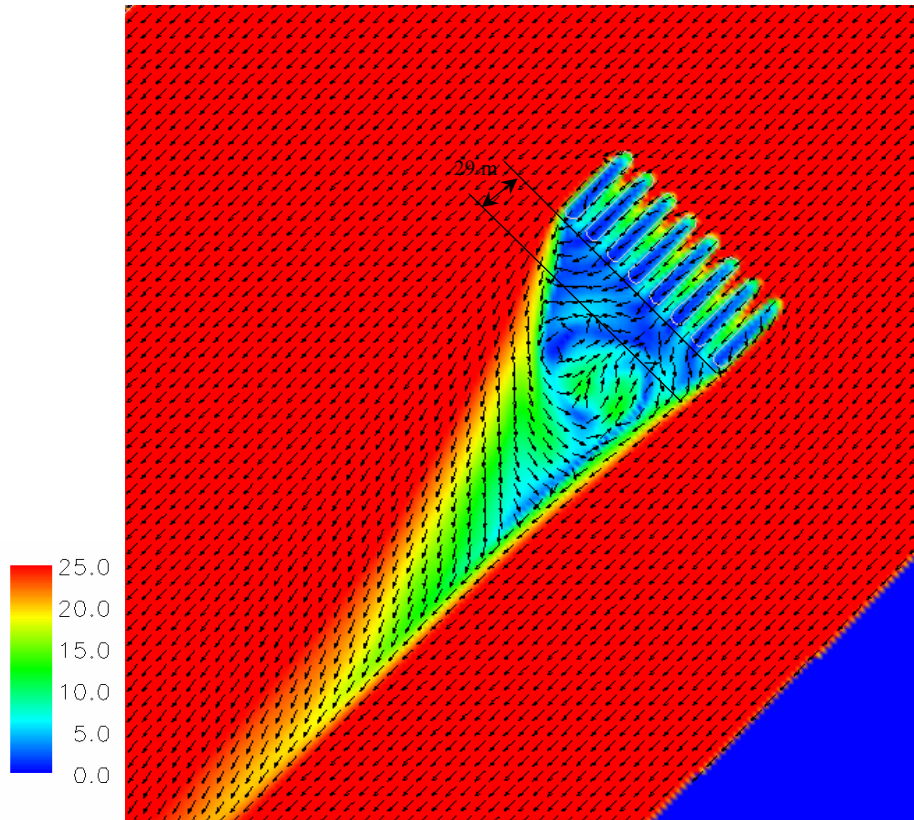


Figure 10: Sloped Beach – Velocity Distribution
(every third vector shown, units are cm/s)