Biomimetic Vortex Dredger

Stalker, Bradley

Introduction: Dredging has stopped in the European Union as of result of the water framework directive (2000), global climate change is on the rise and floods are hitting communities very hard, the cost of dredging means is does not take place as frequent as it should and it is harder to do as current methods damage the environment and damage or destroy habitats. These are the problems my community in Cumbria face when storm Desmond hit and in 2009 when Cockermouth got beat by the very river keeping it alive. My friends and family were scared of the damage being caused. Problem: Regulations prevented the damage of habitats and the environment, sediment built up as a lack of dredging took place decreasing the capacity of the rivers and dredging costs were in the millions, materials harm the environment and are not easy to manufacture. Procedures: I had studied Vortexes and Viktor Schauberger (a dead Austrian Naturalist) who inspired me and I proceeded to apply my knowledge and see how vortexes were used by nature to move sediment naturally. I learnt the principles that applied and started designing vortex generators. I tested them in Computational Fluid Dynamics and analysed the results. I then made a prototype, when I found my design and tested in my local river and recorded the results on my camera. Results: The results of the test was positive, sediment was suspended and moved by the water. Testing in faster flowing conditions (Like found in the cool sections of rivers or after rain fall) proved the vortex energy increased significantly. Conclusion: To conclude, the use of Vortexes to suspend sediment and move it away from clogged sections of rivers does work and is a plausible solution for the dredging of rivers anywhere there is a flow of water.

Awards Won:

Third Award of $1,000