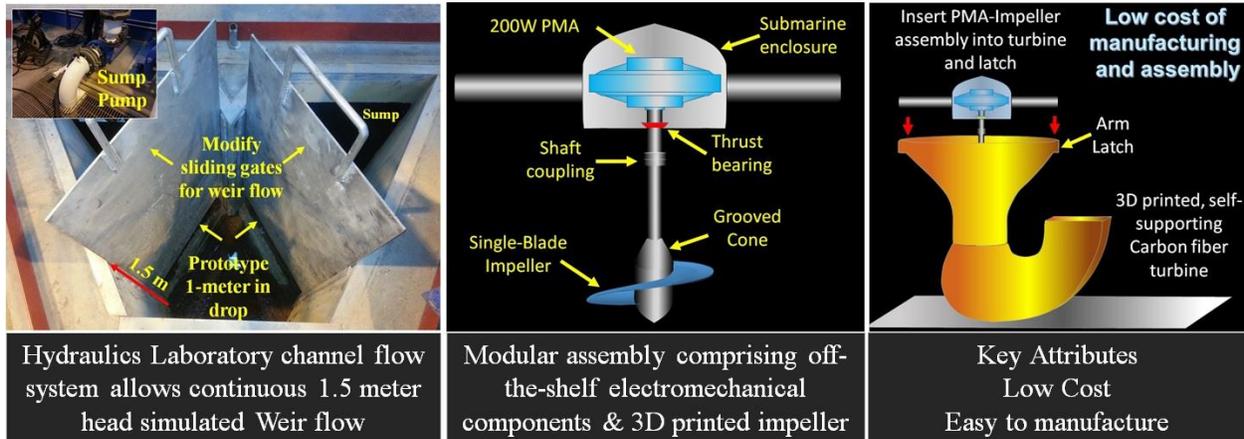


**Trip Report Summarizing Poster Presentation at  
NM WRRRI's 60th Annual New Mexico Water Conference in Taos  
October 7-9, 2015**

**Hydro-Weirs: A Scalable Revolutionary Low-Head Hydropower Technology**



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### **Trip Purpose and Outcomes**

The Poster presentation in Taos, NM, on October 9, 2015, provided a significant and a unique opportunity for NMSU faculty and students to share recent work in hydropower development. The presentation focused on the design and engineering of a revolutionary laboratory-scale harvester prototype to harvest the unused energy from water flowing over weirs. Success from laboratory scale model prototype testing will provide the basis for further development towards full-scale implementing and testing. The presentation was made to a wide audience of other students researchers and professionals from government and industry in Water Resources and Management.

Poster preparation and its subsequent presentation served to accomplish three significant milestones in our design and development process. 1) The time spent in preparation allowed the development of a clear physical Concept for harvesting hydropower from weir-flow. Through the fundamental Physics of fluid flow, the concept for harvesting the hydro potential and hydrokinetic energy from the drop caused due to Weir-flow appears feasible. The conceptual design takes into account the shape and form of the fluid motion that offers scalability in conversion from hydraulic to electrical energy. The modular design shows the potential for low-cost fabrication and will be the basis for further design optimization. Establishing a foundation for the design, therefore, is indeed the first significant design milestone of the Hydro-Weir Project. We will pursue the optimization through fluid dynamic simulations to modify the shape and form of turbine parameters. 2) The anticipated feedback strongly suggested the need to integrate into the Hydro-Weir design, a novel and reliable means to deflect and pick up trash. And finally, 3) the Poster presentation served as a deliverable to the NM WRRI as part of the 2015 Student Research Grant, showing work progress.

### **Conference Impact on the Project**

The audience was a conference of water conservation professionals from around the western US and regionally. Many asked about the cost effectiveness of our project, and how it could be applied to their particular water management problems. On behalf of the Capstone Design Team, I mentioned how we are in the simulation phase of our project. Many questions that were asked were project-specific making it necessary for us to actually test the weir flows in the lab. This meant we would not have applicable data until we test our system in the hydraulics lab. From the questions asked, it would be important to scale our design based on real weir-flow data that can be simulated in the hydraulics laboratory. There were quite a few questions from the: Bureau of Land Management, the Taos Pueblo, and the U.S. Army Corps of Engineers who work with the Elephant Butte Dam and Reservoir. A common question pertained to the cost per kilowatt efficiency of our design. One scientist was interested in the cost-effectiveness of our design, and the actual output of our machine.

### **Broader Impact**

The broader impact of this technology is the possibility it offers to harvesting energy from spillways where a substantial amount of energy is dissipated.

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