

Jennifer Lane Jemison – BS Civil Engineering: "Tidal Basin Power Generator Project"

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Abstract:

The world's most predictable energy resource comes in the form of the ebbing and flooding of the tides. Every 12.5 hours the cycle repeats. It is this predictability that makes the concept of harnessing energy from the tides attractive. In recent years, the study of the energy of waves and tides has come to the forefront of energy engineering. Many methods have been designed and developed to change the mechanical energy of the moving water into electrical power. Some systems use the action of the waves, while others focus on the potential energy from the difference in the height of the tides. The Knik Arm has a 48ft difference in tidal heights, one of the largest in the world. This makes it a perfect place to pilot a system that exploits the potential energy locked within the tides. Before this can become a reality, a thorough study must be completed to determine the capacity and efficiency of a tidal basin power generation system for the Knik Arm near Anchorage, Alaska. First, a design must be completed to theoretically maximize electrical output. Second, a lab scale model should be built to experiment with the theoretical design. And last, the testing should be done to determine the potential output and efficiency of a tidal basin power generator. c