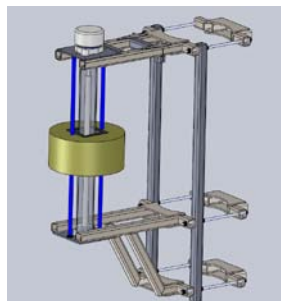


Ocean Sciences/Clean Energy

- Title:** ***Systems and Methods for Wave Energy Conversion (UMD 11-03)***
- Inventors:** ***Daniel MacDonald***
- Applications:** A low cost, low maintenance solution for generating electricity from ocean waves, which can also be used in powering sensor arrays, communication nodes, or other uses within the coastal zones, having implications for environmental monitoring, security, and communications.
- Benefits:** Among the benefits of this invention are low cost and low maintenance compared to existing wave energy conversion devices, and the novel design which protects the working parts from harsh marine environments.
- Technology Description:** This invention is an improvement over existing methods of wave energy conversion (WEC). Like most point absorber WEC technologies, the device of this invention uses a buoy following the up and down motion of passing ocean waves to capture energy from the wave and transfer it to the mechanical device. The most unique aspect of the system is a magnetic coupling device that allows the linear motion of the buoy to be translated through the central tube into the core mechanical system, which allows the mechanical components to be completely isolated from the corrosive marine environment. A prototype of the device has been built, and dry testing has yielded a maximum power generation on the order of 100 Watts. Initial embodiments of the invention feature energy-generating devices that can be mounted to fixed infrastructure (docks, piers, etc.) in the coastal zone, while second generation designs are under development in which WEC devices are implemented in a free-floating mode, potentially at greater distances away from the shore. The technology will help to break down multiple barriers (power and communication), and accelerate development of coastal sensor networks across multiple sectors (environment, security, commerce, etc.), growing the market in the process. Once established as a reliable power source, the technology can be scaled towards utility-scale applications.
- Patent Status:** This technology is the subject of a pending U.S. patent application.



A prototype of the wave energy converter has demonstrated effectiveness in converting up-and-down wave motion to rotation.



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