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Hydrokinetic resource assessment using remote sensing data

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With $\sim 16\%$ of the world's population currently without electricity, improved access to electricity has clear socio-economic benefits for these disadvantaged and rural communities. Hydropower can be an effective mechanism to provide electricity to these communities and as a low-carbon form of renewable energy, will help reduce greenhouse gas emissions and demands on dwindling fossil fuel reserves. Smaller scale "in stream" hydropower plants (~ 100 kW) offer some advantages over larger plants, being environmentally and socially less impactful. They are also lower cost, quicker to construct, and face less planning consent. For isolated communities with little or no access to electricity, small hydropower plants in rivers can offer a cost-effective solution to energy needs. A number of companies are now developing such devices, suitable for terrestrial and marine environments, but global identification of suitable locations for deployment and the potential market is currently not well known. Theoretical and technical resource assessments provide the first steps in determining feasibility and suitable site selection. This study utilises global data sets constructed from satellite data, in combination with the technical criteria determined by industry, to provide new information that can support the deployment of small-scale hydrokinetic devices.