

Historically, research on wave energy has been focused on the development of specific devices, the improvement of methods by which developers design devices, and the potential impacts of the wave energy industry as a whole, such as total potential energy production or generalized environmental impacts. Wave energy research overwhelmingly supports industry, while leaving numerous questions that could support decision making in coastal communities, unanswered. In recent years, community-focused research and community-engaged development have gained momentum in wave energy as well as in renewable energy more generally. Moves to integrate coastal communities into early wave energy developments mean that wave energy research will need to grow to support community decision making.

A community's ability to make informed decisions relies on researchers investigating and synthesizing knowledge that is relevant to their preferences. We need to know the impact of design decisions in terms of the factors that communities care about. Perhaps due to academic disciplinary divisions in which social scientists tend to perform work to understand community needs, interests, and preferences while engineers tend to do technical design work, we have observed a lag in technical research that can support community decision making. The objective of this paper is to develop a research agenda in response to community preferences, highlighting research needed to answer the question, *How do wave energy design decisions impact community needs, questions, and preferences?* Ultimately, our goal is to enable continued and successful community-driven projects by increasing the quality and quantity of scientific knowledge related to community preferences, thereby improving a community's capacity to make decisions based on the outcomes they care most about. We develop the agenda first by conceptualizing 12 research intersections between community concerns and community decisions. Then, we conduct a semi-systematic literature review of publications in wave energy that are comparative in nature and fall within one (or multiple) of those 12 intersections. We identify gaps in research at the intersections and build an agenda that responds to those gaps.

This agenda is immediately relevant in that it is focused on the research tasks that need to occur in order for wave energy to succeed in the sorts of developments that are expected to begin in the coming years. Many research studies look to the future, making estimates and answering research questions by considering a theoretical, mature technology deployed in large arrays. While these studies are important for understanding the potential futures of the industry and for influencing device design, they do not always help communities at the forefront of technology deployment understand what could happen if they pursue a demonstration project or small deployment. This agenda focuses on identifying and getting those communities the information that they need, thus enabling more equitable demonstration projects.