Risk Retirement

Numerous strategies have been implemented globally for consenting/permitting marine renewable energy (MRE) projects, such as adaptive management, marine spatial planning, and risk retirement. Adaptive management takes uncertainty into account, enabling MRE projects to be consented and increasing knowledge over time. Marine spatial planning is an approach to managing multiple marine activities with the goal of reducing conflicts amongst users, balancing environmental, social, and economic interests. This document focuses on risk retirement, which allows for potential risks that are unlikely to cause harm to be retired and for available data and information to be applied to investigate potential environmental effects from similar new MRE projects.

RISK RETIREMENT

Risk retirement is a term that originated in other technology-focused industries and has been used loosely by the MRE community to describe a means of simplifying consenting processes by retiring low-level risks and focusing research on key concerns. Ocean Energy Systems (OES)-Environmental created a risk retirement process to explore retiring potential environmental risks for small MRE projects (defined as single devices and small arrays, or about one to six devices). The box on the right provides more information on risk retirement for MRE as developed by OES-Environmental.

Risk retirement is a process for facilitating consenting for MRE developments whereby each potential risk need not be fully investigated for every project. Instead, MRE regulators, advisors, developers, and consultants can rely on what is known from consented projects, related research studies, or findings from analogous offshore industries to help determine which interactions are better understood and can be considered retired or low risk. If new information becomes available, a retired risk can (and should) be re-examined and a new decision made about risk retirement.

This process aims to distinguish between perceived and actual risk, provide assistance for regulatory decision-making, and inform the MRE community what is likely to be required for consenting small-scale MRE projects.

Risk retirement does not take the place of any existing regulatory processes or replace the need for appropriate data collection before, during, and after MRE device deployment.

APPLICATION OF RISK RETIREMENT

OES-Environmental has developed resources to aid application of the risk retirement process: a risk retirement pathway which serves as a guide for using risk retirement for MRE projects; a series of guidance documents to help evaluate environmental and socioeconomic effects in a general, internationally-applicable regulatory framework, detailed documents for key MRE interactions with the environment and marine life (called stressor-receptor interactions), and MRE environmental regulations specific to individual OES-Environmental countries; as well as a Monitoring Datasets Discoverability Matrix to aid in discovering data and information from existing projects and research studies.

OES-Environmental has sought to retire key stressor-receptor interactions, using evidence bases of the most relevant studies and data, and engaging with subject matter experts around the world. Candidate stressor-receptor interactions included electromagnetic fields, underwater noise, changes in oceanographic systems, and changes in habitats. While these risks can be retired for small numbers of devices, certain caveats and additional data collection needs were identified. Entanglement was also evaluated and considered to be non-existent or very low risk for single devices and small arrays. For other key stressor-receptor interactions, such as collision risk, additional strategic research and information is needed before these risks can be retired. The table below shows the status of risk retirement for these key stressor-receptor interactions.

	STRESSOR-RECEPTOR INTERACTION	READINESS FOR RISK RETIREMENT
	Collision risk	Need more information.
	Underwater noise	Retired for small numbers of devices. May need to revisit as the industry moves to larger-scale arrays.
	Electromagnetic fields	Retired for small numbers of devices. May need to revisit as the industry moves to larger-scale arrays.
	Changes in habitat	Retired for small numbers of devices. May need to revisit as the industry moves to larger-scale arrays.
	Oceanographic systems	Retired for small numbers of devices. May need to revisit as the industry moves to larger-scale arrays.
	Entanglement	Need more information as the industry moves to larger-scale arrays.
	Displacement	Need more information as the industry moves to larger-scale arrays.

By focusing on risk retirement and data transferability research and outputs, OES-Environmental strives to decrease scientific uncertainty, support a common understanding of the environmental effects of MRE devices, assure that monitoring required around deployed devices is commensurate with the risk, lower costs and risks to the MRE industry, and accelerate consenting processes.

Additional information on risk retirement, the guidance documents, and data transferability can be found on Tethys: *https://tethys.pnnl.gov/risk-retirement*.

OES-Environmental 2024 State of the Science report and executive summary available at: *https://tethys.pnnl.gov/publications/state-of-the-science-2024*

Go to *https://tethys.pnnl.gov* for a collection of papers, reports, presentations, and other media about environmental effects of MRE.

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