

Navigating Blue Risk: Divergent Pathways in Tasmanian Aquaculture

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Abstract

The blue economy is commonly framed as a pathway to sustainability, promising the reconciliation of economic growth with environmental protection and social equity. In practice, however, industries seeking to operate *blue* face significant challenges translating high-level principles into practice. The study examines how the Tasmanian aquaculture sector (i.e., salmon, oyster, and seaweed industries) operationalise blue economy principles on the ground, and where gaps and burdens emerge. Survey data were drawn from the *CSIRO Tasmanian Coastal Waters and Seas Survey 2025*, a statewide stakeholder survey ($n = 931$). Results suggest widespread stakeholder concern in relation to environmental decline, strong expectations for transparency and accountability, and low perceived public influence over marine decision-making. While these conditions appear to have intensified social risk, the response by industry has been varied and includes enhanced environmental monitoring, regulatory compliance beyond minimum requirements, third-party certification, community engagement, and investment in mitigation and adaptation measures. However, stakeholder perceptions of the effectiveness and legitimacy of these actions vary markedly. Salmon aquaculture remains highly contested, with polarised views reflecting tensions around environmental performance and governance, while oyster and seaweed farming sit in lower conflict but more uncertain spaces. The findings suggest that navigating social risk in the blue economy requires industry-specific strategies that extend beyond formal policy alignment and regulatory compliance to provide the nuance and innovation needed to address cumulative impacts, accountability, and community expectations.

Keywords

aquaculture; blue economy; conflict; governance; marine risks; social risk; social licence

1. Introduction

The blue economy is frequently presented as a framework for reconciling marine-based economic growth with environmental protection and social equity (World Bank, n.d.). However, as this agenda has gained policy traction, a persistent gap has emerged between its normative promise and the realities of implementation (Antonio Pérez Agúndez et al., 2025; Stephenson & Hobday, 2024). While blue economy discourse frequently emphasises innovation, sustainability, and investment (FAO, 2024), comparatively less attention has been given to the social conditions under which marine industries secure legitimacy (Alexander, 2022; Brugere et al., 2023). Here the challenge extends beyond regulatory compliance or alignment with policy frameworks, to encompass whether industries are perceived as credible, accountable, and responsive to community expectations (Antonio Pérez Agúndez et al., 2025; Olsen et al., 2024).

Recent research highlights the relative stagnation of aquaculture in Europe, South America, North America, and Australia, despite strong policy support, industry ambition, and advanced technological capacity (FAO, 2024; Guillen et al., 2025). It is suggested that although environmental, economic, and social factors jointly shape sectoral trajectories, regulatory emphasis on ecological impacts has not translated into broader social acceptance and legitimacy—particularly in coastal communities where competing ocean uses and values are more pronounced (Antonio Pérez Agúndez et al., 2025; Jueterbock et al., 2025). Studies in the US (Guthrie et al., 2024), Canada (Weitzman et al., 2022), Europe (Guillen et al., 2025), and Australia (Alexander, 2022) highlight that tensions are increasingly centred on procedural fairness, transparency, and the equitable distribution of benefits, with more limited stakeholder engagement and fragmented governance arrangements eroding trust and hindering sectoral development. Contemporary findings suggest that addressing this impasse will require a shift towards more inclusive and adaptive governance frameworks that embed participation, equity, and knowledge co-production (Antonio Pérez Agúndez et al., 2025; Condie et al., 2026a).

This article examines these issues through the lens of social risk. Social risk is defined here as the likely social and political consequences that arise when government or industry actions generate real or perceived stakeholder concerns, typically related to environmental harm, fairness, or norm violations (Graetz & Franks, 2016; Kemp et al., 2016; Kytle & Ruggie, 2005). This definition includes expectations of future social impacts, whether or not those impacts are ultimately realised. This framing is particularly relevant in marine settings, where environmental change is often uncertain, cumulative, and difficult for publics to independently verify (Nelson, 2025), and legitimacy depends not only on environmental performance, but also on how performance is communicated, monitored, and governed.

The risk associated with a specific activity is often defined in terms of potential negative consequences associated with the activity and the likelihood of those consequences (Graetz & Franks, 2016). This perspective can be extended by recognising that risk is also shaped by patterns of exposure and by judgements of what constitutes an acceptable level of impact, reflecting the role of values, equity, and stakeholder judgement in risk evaluation (Lacey et al., 2015). In this study, stakeholder attitudes are used as an indicator of the potential consequences of social risk, on the basis that negative views towards an industry can erode legitimacy, reputation, market confidence, and future development opportunities, particularly where those attitudes are widely shared (Bueno, 2008; Franks et al., 2014). Attitude certainty is used as an indicator of the likelihood that these consequences may become socially or politically consequential. That is, attitude certainty is used to distinguish between views that are weak, unsettled, or

susceptible to change, and views that are more established and more likely to be expressed, defended, or mobilised (Petrocelli et al., 2007; Rucker et al., 2014; Tormala & Rucker, 2007). However, this measurement framework does not assume a direct or automatic relationship between certainty and action. Highly certain attitudes do not necessarily translate into behavioural, political, or economic consequences, as this depends on factors such as opportunity, organisational leadership, institutional responsiveness, and the broader political context. Rather, attitudes and certainty are used here as indicative measures of social-risk conditions, allowing comparison of where legitimacy is more secure, conditional, or vulnerable to contestation across sectors. This approach is common in the evolution of conflict related to aquaculture (Condie et al., 2023; Galparsoro et al., 2020; Maciel et al., 2019).

This study examines how social risk is generated and distributed across three aquaculture industries operating within the same blue economy setting: salmon, oyster, and seaweed aquaculture in Tasmania. Its purpose is to move beyond general accounts of social licence or sector-wide sustainability by comparing how industries with different histories, scales, visibility, and institutional maturity encounter distinct legitimacy challenges. In doing so, the study contributes a comparative account of blue economy governance that shows why environmental performance, economic opportunity, and regulatory compliance are insufficient on their own to explain public acceptance or contestation. The analysis is anticipated to be relevant beyond Tasmania, particularly for coastal regions where marine industries are expanding under heightened expectations for transparency, accountability, and community influence.

1.1. Study Region and Aquaculture Industries

Tasmania is an island state located off the south-eastern corner of mainland Australia (population 550,000) with a land area comparable to Switzerland or Ireland. It provides an ideal population within which to examine social risk in marine environments as it is geographically, jurisdictionally, and legislatively bounded (state governance extending three nautical miles offshore) with a history of socio-ecological conflicts (e.g., forestry, trawler fishing, salmon aquaculture) that have been extensively documented through media coverage, survey data, and policy records (Condie et al., 2023; Cullen-Knox et al., 2019; Tracey et al., 2013).

The Tasmanian aquaculture sector includes the farming of salmon, oysters, and seaweed. Although each of these industries operates within the same regulatory and environmental context, they differ in scale, visibility, intensity, development trajectory, and level of public engagement:

1. Salmon aquaculture is positioned in the mature stage of the industry lifecycle and is the largest in scale, with an estimated value of AUD\$1.3 billion (Tuynman et al., 2024). The industry has grown from a single locally-owned operation in the mid-1980s to three large wholly foreign-owned companies. For the first 30 years of development, salmon aquaculture held an “enviable social license to operate” (Cullen-Knox et al., 2019; Sams, 2015). However, over the past decade, as production has increased and farming has intensified, the industry has come under sustained public scrutiny (Alexander, 2019; Condie et al., 2022a). Key stakeholder concerns have focused on water and sediment quality; environmental impacts on threatened and endangered species; use of antibiotics; the accessibility, transparency, and independence of environmental monitoring and reporting processes; and perceptions of institutional and regulatory capture (Condie et al., 2022b; Tasmanian Legislative Council, 2022). These widespread concerns have contributed to an increasing level of social risk and a

fragile social licence (Condie et al., 2026b), exacerbated by the industry's low engagement strategy (Cullen-Knox et al., 2019).

2. Commercial oyster farming was established in the late 1940's, and remained relatively small until the opening of Tasmania's (and Australia's) first Pacific oyster (*Crassostrea gigas*) hatchery in 1980. The industry has subsequently expanded to an estimated value of AUD\$40 million (Tuynman et al., 2024) distributed across 40 predominantly small-sized growers. The industry is framed as producing a premium, organic, low-impact product that is focussed on provenance, small-scale farming practice, a farm-to-plate dining experience, close ties to local communities, and ecological services such as water filtration and ecosystem support.
3. Seaweed farming is an emerging industry with current revenue of AUD\$6.5 million (Tuynman et al., 2024). Unlike longer-established sectors, seaweed farming has not developed through a single phase of expansion. Instead, it reflects the convergence of multiple drivers, including restoration interests, climate mitigation, circular economy narratives, and efforts to establish commercially viable cultivation methods for native species such as kelp. Currently, the industry is centred around a single large company (producing *Asparagopsis* for methane-reducing cattle and sheep feed), and several small community-based growers (producing food for human consumption).

These three industries provide an analytically meaningful comparison because they operate within the same regional marine environment and regulatory setting, but differ in scale, maturity, visibility, development histories, and level of connection to coastal communities. This shared context enables social risk to be examined as more than a function of regulation or environmental setting. Instead, it allows comparison of how industry-specific patterns of exposure, expectation, trust, and contestation shape the conditions under which aquaculture industries are judged.

In summary, a growing body of research shows that aquaculture development is constrained not only by environmental performance or regulatory approval, but by questions of social acceptability, trust, and legitimacy (Antonio Pérez Agúndez et al., 2025; Brugere et al., 2023; Olsen et al., 2024). However, existing studies often examine aquaculture as a broad sector, focus on single industries such as salmon aquaculture, or treat social licence as a general condition of public acceptance. Less is known about how social risk is differentiated across aquaculture industries that operate within the same regional marine environment and regulatory setting. This matters because social risk is not generated uniformly: it reflects how stakeholders interpret industry impacts, procedural fairness, and opportunities for influence (Graetz & Franks, 2016; Kemp et al., 2016; Lacey et al., 2015; Massa et al., 2025). This study addresses this gap by asking: (a) What drives social risk in Tasmanian aquaculture? (b) How do different aquaculture industries experience and manage this risk? And (c) what are the implications for blue economy governance? In doing so, the study advances blue economy and social licence literature by showing how legitimacy is unevenly produced across sectors, and why governance approaches based on compliance or sector-wide sustainability claims may be insufficient for managing differentiated, place-based forms of social risk.

2. Methodology

This study has used a subset of data from the *CSIRO Tasmanian Coastal Waters and Seas Survey 2025*, a statewide self-administered paper-based stakeholder survey conducted between April and May 2025. The questionnaire included 10 sets of closed-ended (fixed-alternative) questions and one open-ended

question. A total of 1,000 questionnaires were distributed across 8 stakeholder groups (aquaculture industry, government/local council, marine scientists, water enthusiasts, other public, marine tourism, commercial fishers, and advocacy groups). Of these, 932 were returned, and 931 were usable. Details of the sample design (including representativeness), stakeholder group classification, survey questions, and coding rules are provided in Supplementary Material A.

A derivative of the expectancy-value model was used to measure the relative attitudinal positions of key stakeholder groups (Supplementary Material B). The model postulates that an individual's attitude towards an object is the product of the evaluative aspect (or belief towards an attribute) and the weight or importance value of that attribute, summed over all attributes for the object (Ajzen, 1993; Eaton & Visser, 2008). For this study, stakeholder attitudes were defined as the sum of attitudes relating to the attributes environmental performance, governance, and responsiveness to concerns, each weighted by the importance of that particular attribute to the stakeholder group (Condie et al., 2023, 2025). The certainty with which these attitudes (for the three attributes) were held was also averaged for each stakeholder group.

Ensemble mean attitudes of each stakeholder group were plotted against the mean certainty of that group (Figure 1), both having been estimated directly from the survey responses. The distribution of stakeholders on this graph allowed the risk to an industry associated with stakeholder perceptions or reputation to be categorised. Specifically, risks to industry are considered highest when negative attitudes are held with high certainty and lowest when positive attitudes are held with high confidence. The position of an individual stakeholder group on the graph also provides insights into which groups have the strongest concerns and hence where risk mitigation strategies should be targeted. This representation will be referred to below as the social risk graph (SRG).

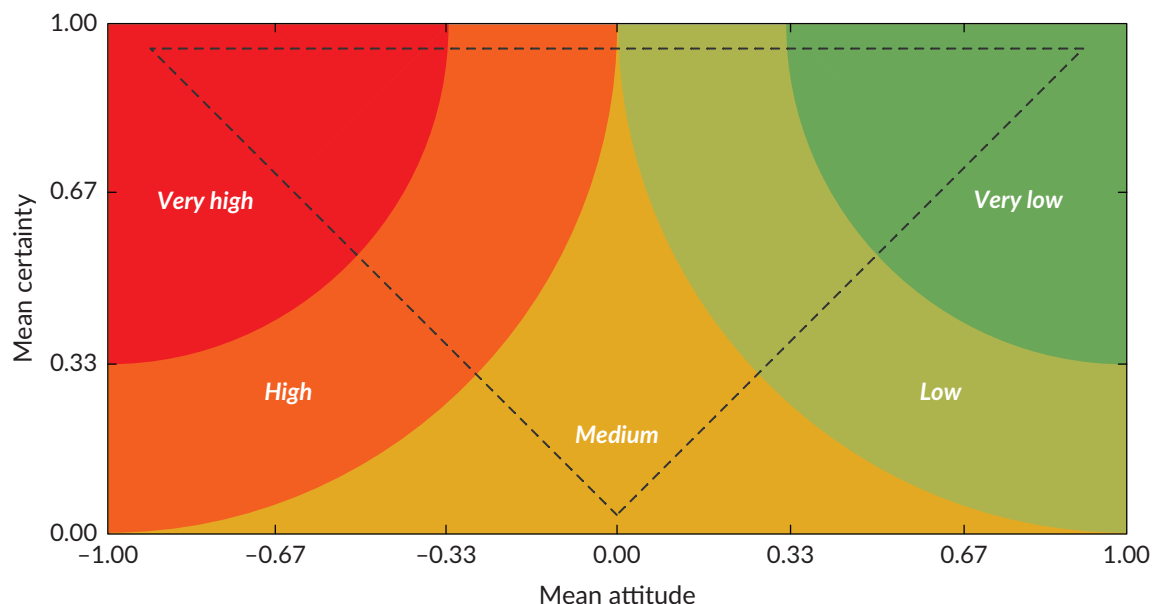


Figure 1. SRG generated by plotting mean attitude against mean certainty for each stakeholder group. Notes: The domain is divided into 5 risk zones, with the dark green segment denoting very low levels of social risk (most positive attitudes with highest certainty), the light green zone denoting low levels of social risk, the amber zone denoting medium social risk, the light red zone denoting high social risk, and the dark red zone denoting very high social risk (most negative attitudes with highest certainty); stakeholder groups are generally expected to fall inside the dashed line, as individuals rarely hold strong views with low certainty.

3. Results

The results are presented in two stages. First, the broader conditions shaping social risk across Tasmanian aquaculture are examined, focusing on stakeholder perceptions of environmental sustainability, confidence in governance, and responsiveness to stakeholder concerns. Second, attention is given to how these risks are managed across the salmon, oyster, and seaweed industries.

3.1. *Environmental Performance*

“Environmental performance” (Attribute 1) captures both broader concern about climate-driven change in Tasmania’s coastal and marine environments and stakeholder perceptions of the environmental sustainability of aquaculture:

- There is broad concern regarding the impact of climate-driven change on Tasmania’s coasts and seas, and the rapidity at which this change is occurring (Figure 2a–c and Supplementary Material C).

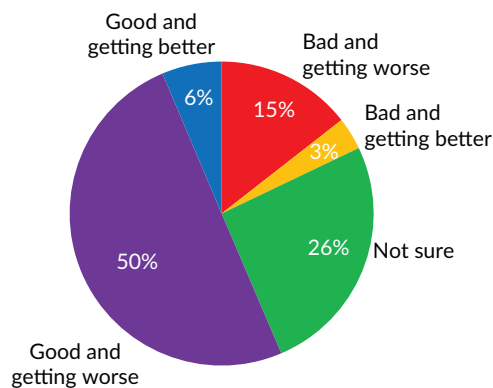
Concern is strongest among those with greater expertise, environmental commitment, or direct connection to marine systems, including marine scientists, commercial fishers, advocacy groups, and water enthusiasts. Those working in government/local council also report substantial concern. In contrast, public groups express more mixed views and higher levels of uncertainty. From a social risk perspective, these conditions are associated with heightened sensitivity to the actual or perceived impacts of marine industries. This may increase the likelihood that such impacts attract scrutiny, mobilise opposition, and contribute to legitimacy challenges, particularly where uncertainty leaves space for perceptions to shift rapidly.

- Stakeholder perceptions of the environmental sustainability of aquaculture industries differ by industry (Figure 2d, Supplementary Material C).

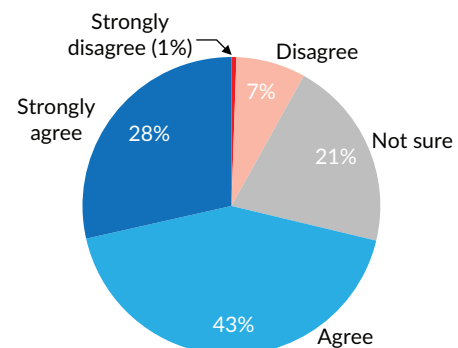
59% of respondents disagreed with the statement “salmon aquaculture is environmentally sustainable” (20% neither agree/disagree and 21% agree). As the industry has expanded and intensified over the past decade, its scale, visibility and maturity, together with higher levels of media scrutiny, have made it a focal point, particularly in relation to perceived impacts on near-shore environments.

In contrast, 32% of respondents agreed with the statement that “oyster farming is environmentally sustainable” (58% neither agree/disagree and 10% disagree). Respondents associated oyster farming with ecosystem services such as water filtration and local food systems. Over the last two decades, the industry has also fostered longstanding relationships between producers and coastal communities, with routine interactions reinforcing trust. Similarly, 51% of respondents agreed with the statement that “seaweed farming is environmentally sustainable” (44% neither agree/disagree and 5% disagree), with perceptions shaped by its framing as low-input, restorative, and aligned with climate mitigation transitions. However, this support appears to be anticipatory and conditional, reflecting both the early stage of industry development and comparatively lower levels of public familiarity, and shaped by expectations that the industry should develop in transparent, science-based, and precautionary ways as it expands. These findings suggest that assessments of environmental performance are not judged as a purely technical matter, but are interpreted through sector-specific histories, relationships, and expectations.

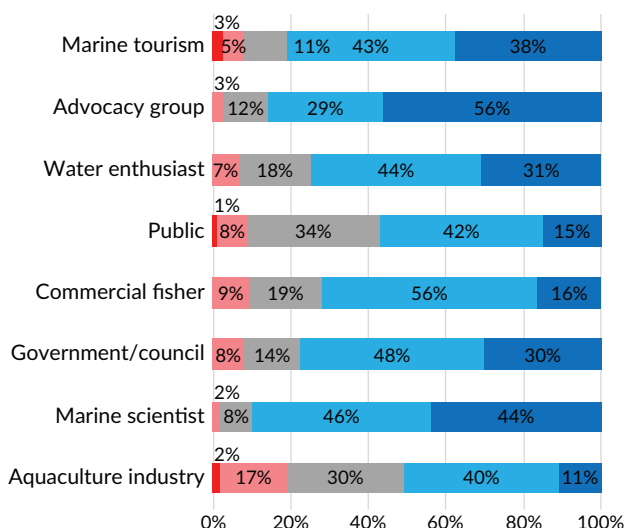
a I think that Tasmania's coast and seas are:



b I am worried about how quickly Tasmania's coasts and seas are changing



c I am worried by the rate of change



d Stakeholder perceptions of the environmental sustainability of aquaculture

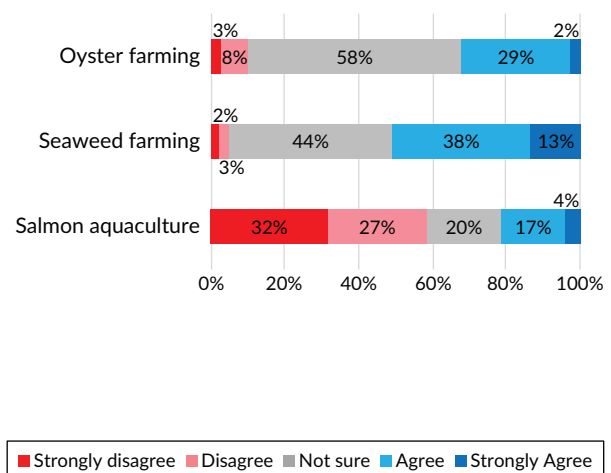


Figure 2. Survey responses relating to community and stakeholder concerns about the Tasmanian coastal and marine environment and their attitudes towards the environmental sustainability of salmon aquaculture, seaweed farming, and oyster farming. Note: Data by stakeholder group in Supplementary Material C.

3.2. Confidence in Governance

Stakeholder perceptions as to whether an industry is “well governed” (Attribute 2) are shaped not only by the existence of formal regulation by governments and regulatory bodies, but also by whether monitoring and compliance systems are seen as transparent, independent, and effective; and whether communication and engagement are experienced as accessible, meaningful, and credible. Where trust in governance is low, concerns may be amplified, even where formal compliance is met. These dynamics are reflected in the survey results below:

- Stakeholder perceptions as to whether Tasmania's aquaculture industries are “well governed” differ (Figure 3, Supplementary Material C).

61% of respondents disagreed with the statement “the salmon industry is well regulated by government” (17% neither agree/disagree and 23% agree), with comparatively lower levels of regulatory confidence among advocacy groups (80%), water enthusiasts (72%), and commercial fishers (63%). Among these groups, concerns centred on transparency and accountability, including perceived limitations in independent verification of environmental monitoring; limited notification of medicant usage; and insufficient public consultation around industry expansion. These perceptions have persisted despite substantial company investment in regulatory compliance and third-party certification designed to demonstrate performance beyond minimum requirements.

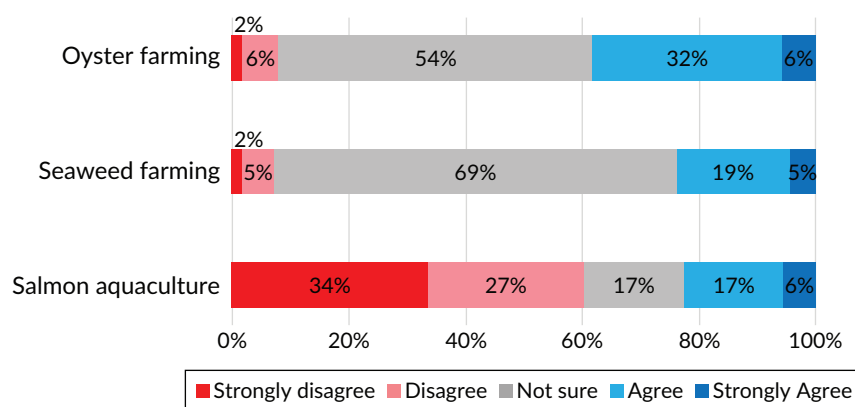


Figure 3. Stakeholder perceptions as to whether salmon aquaculture, seaweed farming, and oyster farming are well governed. Note: Data by stakeholder group in Supplementary Material C.

In contrast, oyster and seaweed farming occupy less contested governance positions. Oyster farming is viewed more favourably, with 38% of respondents in agreement with the statement “the oyster industry is well regulated by government” (54% neither agree/disagree and 8% disagree). Seaweed farming is characterised by a strong concentration of neither agree/disagree (69%). These patterns suggest that perceptions are either more stable and broadly acceptable in the case of oyster farming, or still emerging and not yet settled, as in the case of seaweed.

- Limitations in communication and engagement activities.

Respondents requested additional information on aquaculture governance (63%), seaweed farming (53%), and the impacts of industry on the marine environment (45%). Respondents indicated that the information gap was not only about quantity, but also about the accessibility, credibility, and verifiability of information. Salmon companies were generally seen to rely on company dashboards and other one-way information platforms rather than direct engagement. Respondents suggested that these formats were seen to provide only a curated snapshot, often lacked local context, and offered limited detail to support independent verification. In contrast, the oyster and seaweed industries were seen to provide a broader range of community-based participatory learning opportunities through in-house activities, open days, and local events including seafood festivals, agricultural shows, science events, and the Tasmanian tasting trail. While these formats were viewed as more effective for information sharing and relationship building, their reach was seen as limited.

These results suggest that perceptions of environmental performance and governance depend not only on whether regulation exists, but on confidence in regulators, clarity of decision-making, and the perceived

independence and credibility of oversight. Furthermore, transparency and accountability cannot be secured through compliance and monitoring alone. Where information is difficult to access, not independently verifiable, or communicated through channels that stakeholders do not regard as sufficiently independent or credible, technical assurance does little to build trust. Under these conditions, a gap may form between formal performance and socially recognised legitimacy, reflecting differences in how stakeholders access, interpret, and engage with information and decision-making processes.

3.3. Responsiveness to Stakeholder Concerns

“Responsiveness to concerns” (Attribute 3) is a key dimension of social risk and is reflected in whether stakeholders feel they have meaningful input into decision-making and whether industry and government are seen to respond to their concerns. These two dimensions are examined below:

- Respondents perceived that they had relatively little influence on industry and government decision-making (Figure 4a, Supplementary Material C).

With the exception of advocacy groups (60%), which reported higher levels of self-efficacy, comparatively few respondents indicated that they were able to frequently or sometimes influence industry and government decision-making, including the public (33%), water enthusiasts (43%), marine tourism (43%), and commercial fishers (48%). These figures are below the national average of 57% of publics who indicated that they “have a say on issues that matter to them locally” (O'Donnell et al., 2025).

- Industry and government responsiveness to stakeholder concerns differ across industries (Figure 4b).

Respondents indicated that the responsiveness of industry and government to stakeholder concerns differed across industries. In relation to salmon aquaculture, 60% of respondents disagreed with the statement “salmon aquaculture is responsive to stakeholder concerns” (20% neither agreed/disagreed and 21% agreed). These responses suggest that, for some stakeholder groups, questions of fairness, recognition, and accountability remain areas of concern, reflecting a gap between institutional compliance and socially

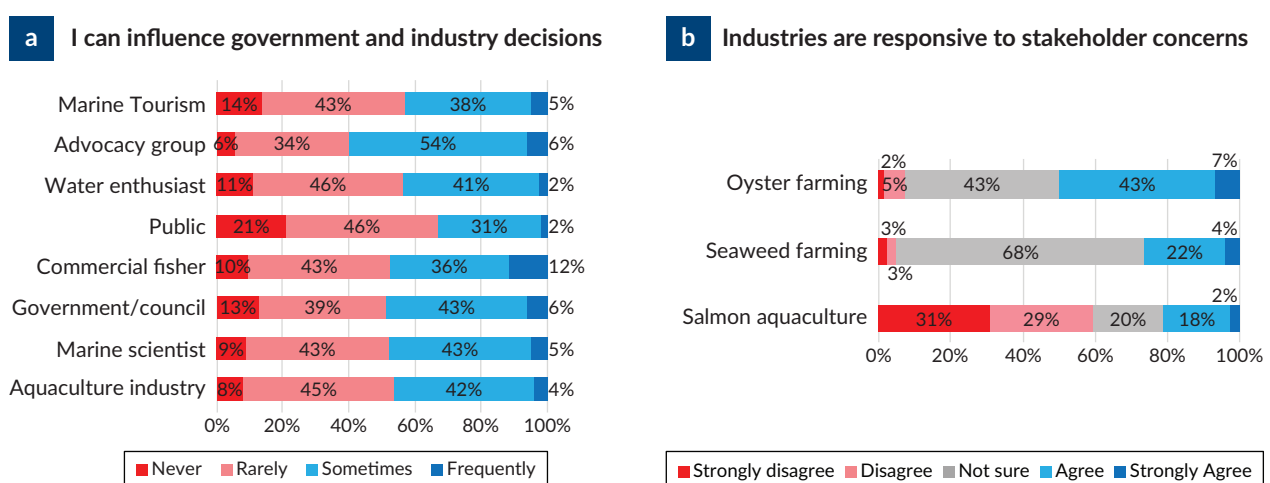


Figure 4. Stakeholder perceptions of (a) their ability to influence governance and decision-making and (b) the responsiveness of industry to their concerns. Note: Data by stakeholder group in Supplementary Material C.

recognised legitimacy. Perceptions of industry responsiveness in relation to oyster farming (7% disagree, 43% neither agree/disagree, and 50% agree) and seaweed farming (5% disagree, 68% neither agree/disagree, and 26% agree) were consistent with stronger local trust in the former, and more conditional but still positive, expectations in the latter. These findings suggest that where stakeholder groups feel they have limited influence over decisions affecting coastal and marine environments, compliance-based governance may be less effective in building trust, and industry activities may be more susceptible to scrutiny, resistance, and disputes over legitimacy.

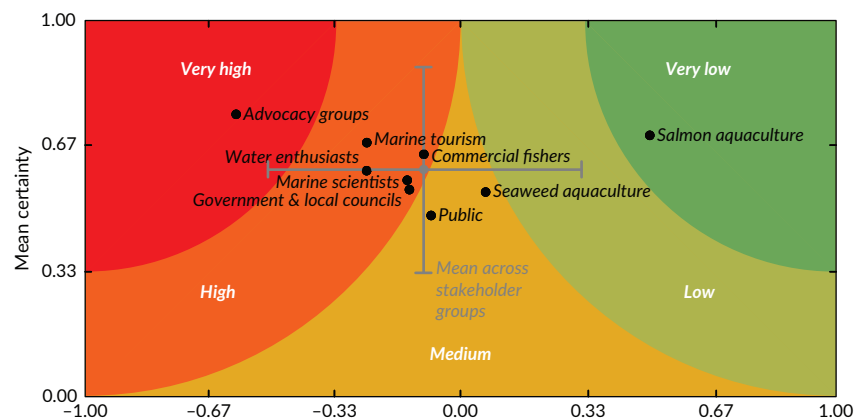
In summary, these three drivers of social risk point to a broader tension within blue economy governance between institutional reliance on compliance and the social conditions through which legitimacy is constituted. These conditions also reflect differences in how risks are experienced (exposure) and evaluated (acceptability) across stakeholder groups. Environmental performance, transparency and accountability, and influence in decision-making emerge not as secondary considerations, but as central to how marine development is interpreted, evaluated, and contested. In this sense, the findings suggest that compliance-based approaches in blue-economy governance may be insufficient on their own to secure legitimacy, as mistrust and contestation appear to be shaped not only by what industries say, but by what they do, and whether stakeholders believe their concerns can influence decision-making and action.

3.4. Managing Social Risk

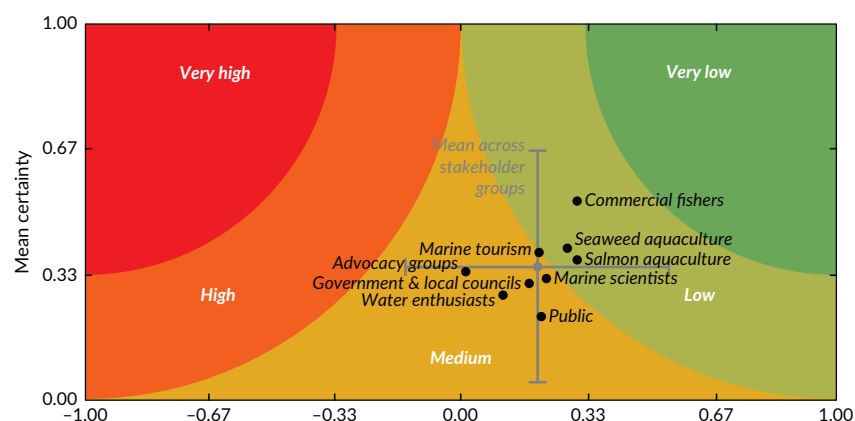
Social risk has been defined as the social and political consequences that are likely to arise when industry activities or processes are perceived to be misaligned with stakeholder values and expectations. This suggests that the social risk faced by aquaculture industries increases as stakeholder attitudes towards their operations diverge and become more entrenched. In this context, entrenched attitudes equate to high levels of certainty that are typically shaped by lived experience, long-standing beliefs, or repeated exposure to an issue. This provides limited scope for considering alternative perspectives, thereby tending to perpetuate conflict. Conversely, those with less engagement in the debate and lower levels of certainty are susceptible to being influenced by new information, misinformation, or disinformation, which may also contribute to increasing levels of conflict. These dynamics also reflect differences in how stakeholder groups experience and interpret industry activities, with uneven patterns of exposure and differing judgements about acceptable impacts potentially consolidating over time into a “conflict legacy” (Colvin et al., 2015).

The SRGs for Tasmania’s aquaculture industries are presented in Figure 5a–c. Stakeholder attitudes and their corresponding levels of certainty have been extracted from survey results and their mean values plotted for each stakeholder group. Also plotted are the mean of stakeholder group means and the mean of stakeholder group standard deviations (within each stakeholder group, attitudes and certainty ratings were approximately normally distributed). While there are high levels of temporal variability within stakeholder groups, there remain substantial differences between stakeholders and between industries that imply major differences in the social risk profile of salmon aquaculture compared to other Tasmanian aquaculture industries.

a Salmon aquaculture



b Oyster farming



c Seaweed farming

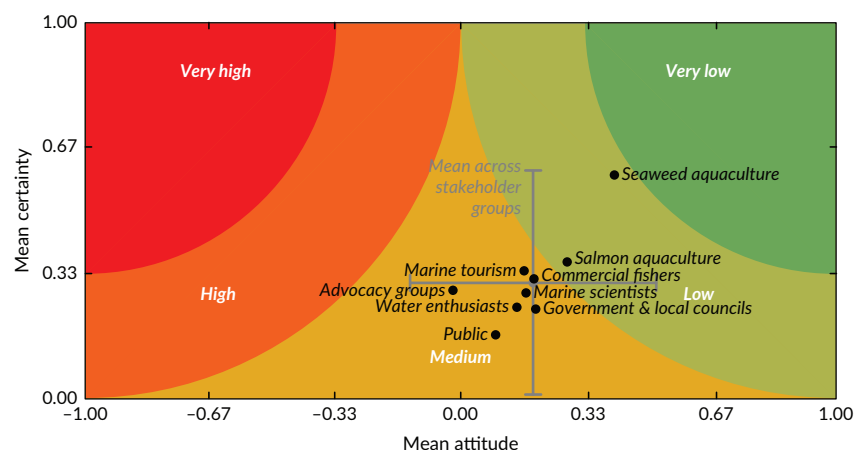


Figure 5. Mean stakeholder attitudes vs. mean stakeholder certainty for (a) salmon aquaculture (b) oyster farming and (c) seaweed farming. Notes: The grey symbol in each plot represents the mean across stakeholder groups, with error bars representing the mean of the standard deviations across stakeholder groups; the dark green segment corresponds to very low levels of risk (very positive attitudes held with high certainty), light green segment corresponds to low levels of social risk (positive attitudes held with moderate certainty), amber corresponds to medium social risk (intermediate attitudes held with low certainty), light red corresponds to high social risk (negative attitudes held with moderate certainty), and dark red corresponds to very high social risk (very negative attitudes held with high certainty).

3.4.1. Salmon Aquaculture

The SRG for salmon aquaculture (Figure 5a) reflects a population that is highly polarised. Groups with links to the industry report positive attitudes and high levels of certainty, which in isolation corresponds to a very low level of social risk. In contrast, advocacy groups, water enthusiasts, governments/local councils, marine tourism, commercial fishers, and marine scientists are clustered around medium to strong negative attitudes with relatively high levels of certainty corresponding to a high to very high level of social risk. Other aquaculture industries and the remainder of public groups (who are not water enthusiasts) have relatively neutral attitudes and moderate certainty, corresponding to a low to moderate level of risk for these stakeholder groups. Only advocacy groups and the salmon industry itself differ substantially from the main cluster of stakeholder groups.

Investigation of public-facing industry dashboards indicates that salmon companies have sought to manage social risk by emphasising two key blue economy principles: (a) contribution to regional economies, employment, and broader economic development and (b) commitment to environmental sustainability. The latter is supported by substantial investment in third-party certifications (such as the Aquaculture Stewardship Council [ASC], Best Aquaculture Practice [BAP], and Global Good Agriculture Practice [GLOBAL GAP]), which are used to demonstrate regulatory compliance beyond minimum requirements and provide assurance to markets and regulators. These strategies are supplemented by a range of public-facing initiatives, including sponsorship opportunities to local, state, and national sports teams, charity food programs, school education programs, and community advisory groups.

In the context of high stakeholder certainty and reported concerns around environmental performance, governance, and transparency, these measures (a and b) appear to have had limited effect in reducing contestation within the surveyed groups. This suggests that while economic contribution, third-party certification, and corporate outreach remain important components of industry strategy, they may not in themselves address underlying social risk.

3.4.2. Oyster Farming

The SRG for oyster farming indicates that almost all stakeholders are clustered within the low to medium risk segments (Figure 5b) and exhibit relatively low certainty and positive attitudes.

Rather than using formalised third-party certification schemes, oyster farmers have tended to manage social risk through more locally embedded and relational approaches. For example, through the Oyster Sensor Network monitoring program, ShellMAP, and ShellPOINT (a water quality and food safety monitoring program that provides open-access public and educational reporting), as well as adaptive responses to climate variability and biosecurity threats such as Pacific Oyster Mortality Syndrome. The industry has also focused on open communication and proactive engagement with local communities (i.e., open house, community forums and events, public field days, and school programs). This has been complemented by visible responses to disease events, and efforts to connect local knowledge, scientific expertise, and industry practice. These strategies appear to be more closely aligned with stakeholder expectations within the surveyed groups, where legitimacy appears to be grounded in everyday visibility, responsiveness, and place-based trust.

3.4.3. Seaweed Farming

The SRG for seaweed farming illustrates that all stakeholder groups are clustered within the low to medium social risk band. With the exception of the seaweed industry itself, all groups exhibit weakly positive attitudes (Figure 5c) and, although advocacy groups express some concerns, their attitudes are held with relatively low levels of certainty. As the industry develops, certainty levels are likely to increase, and attitudes may change. The direction of this shift is likely to be influenced by factors such as the availability, quality, and framing of information, including the role of both information and misinformation in shaping stakeholder understanding.

The seaweed industry has sought to manage social risk by emphasising a precautionary approach to growth, clear, and accessible monitoring of environmental outcomes, and strong alignment with science-based restoration and climate mitigation efforts. In practice, this has involved activities such as cautious scaling, verifiable environmental reporting, early stakeholder engagement and communication, and close association with restoration initiatives (e.g., Sea Forest Foundation) and high-profile nature-based innovation narratives (e.g., Earthshot and GreenWave). These strategies appear to be broadly consistent with current survey respondent expectations, where legitimacy appears to be tied not only to low-impact production, but to whether the industry continues to develop in ways that are precautionary, transparent, and demonstrably aligned with broader public-benefit outcomes (Condie et al., 2026a).

In summary, the three industries demonstrate how differences in visibility, scale, cumulative impact, place-based expectations, and public engagement shape the conditions under which social risk is established and maintained. Salmon aquaculture operates in a highly visible and contested space, where legitimacy appears to be more fragile and closely tied to transparency, environmental credibility, and trust in governance. In contrast, oyster farming is smaller in scale and more locally embedded, with legitimacy grounded in place-based relationships and sustained through ongoing trust and environmental performance. Seaweed farming occupies an emerging position, where legitimacy is currently supported by alignment with restoration and climate narratives, but remains conditional on how the industry develops. These three industries illustrate that legitimacy in the blue economy is uneven, and that governance responses may need to reflect the sectoral and place-based ways in which social risk is experienced.

4. Discussion

Social risk is used here as an integrative concept that captures the likelihood that stakeholder concern will become socially or politically consequential. It is therefore related to, but distinct from, social licence or social acceptability. Social licence and acceptability refer to stakeholder judgements about whether an activity is acceptable, trusted, or legitimate at a given point in time (Guthrie et al., 2024; Olsen et al., 2024), whereas social risk refers to the conditions under which those judgements may translate into reputational, regulatory, political, or conflict-related consequences (Franks et al., 2014; Graetz & Franks, 2016; Kemp et al., 2016). This distinction is important because it shifts attention away from whether an industry is accepted in general terms to the conditions under which concern becomes more durable, mobilised, and consequential.

The findings address the study's first research question by showing that social risk in Tasmanian aquaculture is driven by the interaction of stakeholder perceptions of environmental sustainability, governance credibility, and responsiveness to stakeholder concerns. In this respect, the study supports recent aquaculture research

in Europe and the US, which identifies trust, transparency, and procedural legitimacy as central to social acceptability (Antonio Pérez Agúndez et al., 2025; Guthrie et al., 2024; Massa et al., 2025). However, it also extends this work by demonstrating how these dynamics operate across multiple industries within a shared blue economy setting. The comparison indicates that formal compliance certification and technical monitoring may not be sufficient to secure legitimacy where stakeholders question the independence, accessibility, or credibility of information, or perceive that they have limited ability to influence decision-making. Additionally, where stakeholder concerns are high, normative expectations placed on industry increase (as described in Supplementary Material D).

Legitimacy is therefore best understood here as a mechanism through which social risk is either reduced or intensified. Where environmental performance is regarded as credible, governance processes are trusted, and stakeholders perceive decision-making as fair and responsive, legitimacy is more secure and social risk is lower. Conversely, where transparency, trust, or procedural legitimacy are weak, social risk may increase even when formal regulatory requirements are met. This is particularly evident where stakeholders report low perceived influence over decisions affecting coastal and marine environments. Such perceptions can signal exclusion or power imbalance, weakening trust and increasing the likelihood that governance decisions become subject to scrutiny, resistance, or politicisation. This aligns with broader justice scholarship, which shows that conflict is shaped not only by material outcomes, but also by deficits in recognition, voice, and procedural fairness (Fraser, 2009; Scharpf, 1999; Walker, 2012).

The Tasmanian case also illustrates the difference between environmental performance and environmental credibility. Third-party certification and regulatory adherence remain important, but they do not necessarily generate trust where information is seen as inaccessible, insufficiently independent, or poorly connected to local concerns. In highly contested sectors such as salmon aquaculture, managing social risk is therefore likely to require more than maintaining compliance or certification status. It also requires clear and accessible reporting of environmental outcomes, confidence in independent monitoring and oversight, and more meaningful opportunities for stakeholder input into decision-making. Without these conditions, gaps between certified performance and stakeholder perceptions are likely to persist, reinforcing contestation and limiting the capacity of compliance-based governance to secure socially recognised legitimacy (Baumgartner et al., 2025; Bleakley, 2019).

The contribution of the SRG to this debate is both analytical and practical. Analytically, it helps clarify how social risk differs from general social acceptability by distinguishing between weak, uncertain, or conditional attitudes and more settled forms of concern. Practically, it provides a decision-support tool for identifying where governance responses may need to be differentiated across sectors and stakeholder groups. Areas characterised by uncertain or conditional support may require early engagement, accessible information, and monitoring of changing expectations, while areas characterised by negative and certain attitudes may require more substantive responses focused on transparency, accountability, and place-based negotiation. In this sense, the SRG supports more anticipatory forms of blue economy governance by helping identify where legitimacy is secure, vulnerable, or already contested.

4.1. Implications for Blue Economy Governance

The findings suggest that managing social risk in aquaculture requires industry-specific governance responses. For salmon aquaculture, higher levels of concern around environmental performance, transparency, regulatory confidence, and responsiveness point to the need for clearer reporting, independent monitoring, and more meaningful stakeholder input. For oyster farming, lower but more place-based concerns suggest the importance of maintaining local trust through visible environmental management, biosecurity responses, and ongoing community engagement. For seaweed farming, current support appears conditional, indicating that transparent planning, early engagement, and monitoring will be important as the sector expands.

These industry-level findings provide the empirical basis for broader governance implications. Concerns about environmental sustainability, information credibility, public influence, and shared marine pressures suggest that project-level assessment may be insufficient where impacts are experienced cumulatively and across places (Fulton et al., 2025). While integrated spatial planning and cumulative-impact assessment extend beyond the survey results, the findings indicate why these approaches are relevant: stakeholder judgements are shaped not only by individual industry performance, but by how multiple activities interact within local environments, governance systems, and community expectations (Lyth et al., 2016; Stephenson & Hobday, 2024; Thébaud et al., 2026). Without this alignment, tensions may persist between development goals and stakeholder expectations.

This study has several limitations. First, the analysis is based on a stakeholder network survey rather than a general population survey, meaning the findings may be influenced by stakeholder-network clustering. The results also capture perceptions at a single point in time, and therefore cannot establish whether reported attitudes translate into behaviour or longer-term shifts in legitimacy. Second, the SRG requires longitudinal validation to assess whether changes in attitude and certainty correspond with changes in legitimacy, conflict, or acceptance over time. Third, Indigenous responses were grouped within the broader category of advocacy groups, limiting the extent to which Indigenous rights, knowledge systems, and place-based relationships could be examined separately. Finally, while the Tasmanian case offers insights relevant to other coastal regions, transferability should be assessed in relation to the specific governance, ecological, cultural, and industry contexts in which aquaculture development occurs.

5. Conclusion

This study examined how social risk is generated and managed across aquaculture industries operating within a shared regional marine environment and governance context. The findings suggest that social risk is unevenly distributed across sectors: salmon aquaculture is positioned in a higher-risk and more contested space, shaped by perceptions of environmental performance, governance credibility, transparency, and public influence; oyster farming is associated with lower, more place-based forms of risk linked to environmental change, biosecurity, and community trust; and seaweed aquaculture currently occupies a lower-risk but conditional position, supported by restoration and climate narratives but dependent on how the sector expands in scale, visibility, and spatial footprint.

The study contributes to blue economy governance debates by distinguishing formal compliance from socially recognised legitimacy. Regulatory approval, third-party certification, and technical monitoring

remain important, but they do not necessarily secure legitimacy where stakeholders question the accessibility, independence, or credibility of information, or perceive limited influence over decision-making. Legitimacy is therefore not simply an outcome of compliance, but is produced through trusted governance, demonstrable responsiveness, and the perceived alignment of industry activity with local values, expectations, and place-based concerns.

These findings suggest that managing social risk in the blue economy requires industry-specific, transparent, and place-sensitive governance approaches. This includes clearer and more accessible reporting of environmental sustainability outcomes, independence in monitoring and oversight, and greater opportunities for meaningful stakeholder engagement and input. While the Tasmanian case offers insights for other coastal regions where marine development is visible, contested, and subject to public scrutiny, transferability should be assessed in relation to specific governance, ecological, cultural, and industry settings.

Future research could build on these findings by validating the SRG over time, examining how attitudes shift as sectors expand, and giving closer attention to Indigenous and place-based perspectives across different governance, ecological, cultural, and industry settings.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

Data is available on request with a signed data agreement.

LLMs Disclosure

During the preparation of this work, the authors used Copilot in Word to assist with copyediting and improving clarity. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

References

- Ajzen, I. (1993). Attitude theory and the attitude-behavior relation. In D. Krebs & P. Schmidt (Eds.), *New directions in attitude measurement* (pp. 41–57). De Gruyter. https://www.researchgate.net/publication/264655146_Attitude_theory_and_the_attitude-behavior_relation
- Alexander, K. A. (2019). *Conflicts over marine and coastal common resources: Causes, governance and prevention*. Routledge.
- Alexander, K. A. (2022). A social license to operate for aquaculture: Reflections from Tasmania. *Aquaculture*, 550, Article 737875. <https://doi.org/10.1016/j.aquaculture.2021.737875>

- Antonio Pérez Agúndez, J., Filgueira, R., Ahmed, N., Asif, F., Billing, S.-L., Fanning, L., Himes-Cornell, A., Johnson, T. R., Krause, G., Kreiss, C., Mikkelsen, E., Stead, S. M., van den Burg, S., Vecchio, Y., & Villasante, S. (2025). Strengthening policy action to tackle social acceptability issues in European aquaculture. *ICES Journal of Marine Science*, 82(7), Article fsaf100. <https://doi.org/10.1093/icesjms/fsaf100>
- Baumgartner, U., Fry, A., & Atkinson, S. (2025). Certifying ‘not yet sustainable’ fisheries—The uncertain journey to global best practice. *Marine Development*, 3, Article 3. <https://doi.org/10.1007/s44312-024-00043-0>
- Bleakley, P. (2019). Big fish, small pond: NGO–corporate partnerships and corruption of the environmental certification process in Tasmanian aquaculture. *Critical Criminology*, 28, 389–405. <https://doi.org/10.1007/s10612-019-09454-8>
- Brugere, C., Bansal, T., Kruijssen, F., & Williams, M. (2023). Humanizing aquaculture development: Putting social and human concerns at the center of future aquaculture development. *Journal of the World Aquaculture Society*, 54(2), 482–526. <https://doi.org/10.1111/jwas.12959>
- Bueno, P. B. (2008). *Social risks in aquaculture*. In M. G. Bondad-Reantaso, J. R. Arthur, & R. P. Subasinghe (Eds.), *Understanding and applying risk analysis in aquaculture* (pp. 209–228). FAO. <https://www.fao.org/4/i0490e/i0490e01j.pdf>
- Colvin, R., Witt, G. B., & Lacey, J. (2015). The social identity approach to understanding socio-political conflict in environmental and natural resources management. *Global Environmental Change*, 34, 237–246. <https://doi.org/10.1016/j.gloenvcha.2015.07.011>
- Condie, C., Alexander, K. A., Fulton, E. A., Vince, J., & Haward, M. (2023). Polarised perspectives in salmon aquaculture warrant a targeted long-term approach to communication. *Aquaculture Reports*, 30, Article 101557. <https://doi.org/10.1016/j.aqrep.2023.101557>
- Condie, C., & Condie, S. A. (2026b). *Troubled waters or shared futures: Navigating social risk in Tasmania’s marine industries*. CSIRO. <https://doi.org/10.25919/h7gx-vj93>
- Condie, C., Condie, S. A., & Spillias, S. (2026a). *Low conflict pathways for seaweed aquaculture*. FRDC. <https://www.frdc.com.au/project/2023-101>
- Condie, C., Melbourne-Thomas, J., Spillias, S., & Condie, S. A. (2025). *CSIRO Tasmania coastal waters and seas survey 2025*. Commonwealth Scientific and Industrial Research Corporation. <https://research.csiro.au/cor/wp-content/uploads/sites/282/2026/03/Summary-coastal-waters-and-seas.pdf>
- Condie, C., Vince, J., & Alexander, K. A. (2022a). The long-term evolution of news media in defining socio-ecological conflict: A case study of expanding aquaculture. *Marine Policy*, 138, Article 104988. <https://doi.org/10.1016/j.marpol.2022.104988>
- Condie, C., Vince, J., & Alexander, K. A. (2022b). Increasing polarisation in attitudes to aquaculture: Evidence from sequential government inquiries. *Marine Policy*, 136, Article 104867. <https://doi.org/10.1016/j.marpol.2021.104867>
- Cullen-Knox, C., Fleming, A., Lester, L., & Ogier, E. (2019). Publicised scrutiny and mediatised environmental conflict: The case of Tasmanian salmon aquaculture. *Marine Policy*, 100, 307–315. <https://doi.org/10.1016/j.marpol.2018.11.040>
- Eaton, A. A., & Visser, P. S. (2008). Attitude importance: Understanding the causes and consequences of passionately held views. *Social and Personality Psychology Compass*, 2(4), 1719–1736. <https://doi.org/10.1111/j.1751-9004.2008.00125.x>
- FAO. (2024). *In brief to the state of world fisheries and aquaculture 2024—Blue transformation in action*. <https://doi.org/10.4060/cd0690en>
- Franks, D. M., Davis, R., Bebbington, A. J., Ali, S. H., Kemp, D., & Scurrah, M. (2014). Conflict translates environmental and social risk into business costs. *Proceedings of the National Academy of Sciences*, 111(21), 7576–7581. <https://doi.org/doi:10.1073/pnas.1405135111>

- Fraser, N. (2009). *Scales of justice: Reimagining political space in a globalizing world*. Columbia University Press.
- Fulton, E. A., Hobday, A. J., Vince, J., Nursey-Bray, M., Voyer, M., Robins, J., Newman, S., Bessell-Browne, P., Cowlshaw, M., Nicola Waldron, N., & Patterson, R. (2025). *Integrated ocean management and resource allocation and management*. National Marine Science Committee. <https://www.marinescience.net.au/wp-content/uploads/2025/10/NMSC-Integrated-Ocean-Management-White-Paper-18092025-1.pdf>
- Galparsoro, I., Murillas, A., Pinarbasi, K., Sequeira, A. M. M., Stelzenmüller, V., Borja, Á., O'Hagan, A. M., Boyd, A., Bricker, S., Garmendia, J. M., Gimpel, A., Gangnery, A., Billing, S.-L., Bergh, Ø., Strand, Ø., Hiu, L., Fragoso, B., Icely, J., Ren, J., . . . Tett, P. (2020). Global stakeholder vision for ecosystem-based marine aquaculture expansion from coastal to offshore areas. *Reviews in Aquaculture*, 12(4), 2061–2079. <https://doi.org/10.1111/raq.12422>
- Graetz, G., & Franks, D. M. (2016). Conceptualising social risk and business risk associated with private sector development projects. *Journal of Risk Research*, 19(5), 581–601. <https://doi.org/10.1080/13669877.2014.1003323>
- Guillen, J., Asche, F., Borriello, A., Carvalho, N., Druon, J.-N., Garlock, T., Llorente, I., & Macias, D. (2025). What is happening to the European Union aquaculture production? Investigating its stagnation and sustainability. *Aquaculture*, 596, Article 741793. <https://publications.jrc.ec.europa.eu/repository/handle/JRC138076>
- Guthrie, A. G., Barbour, N., Cannon, S. E., Marriott, S. E., Racine, P., Young, R., Bae, A., Lester, S. E., & Michaelis, A. (2024). Assessing socio-environmental suitability and social license of proposed offshore aquaculture development: A Florida case study. *Journal of the World Aquaculture Society*, 55(1), 40–61. <https://doi.org/10.1111/jwas.13031>
- Jueterbock, A., Hoarau-Heemstra, H., Wigger, K., Duarte, B., Bruckner, C., Chapman, A., Duan, D. L., Engelen, A., Gauci, C., Hill, G., Hu, Z. M., Khanal, P., Khatei, A., Mackintosh, A., Meland, H., Melo, R., Nilsen, A. M. L., Olsen, L., Rautenberger, R., . . . Zhang, J. (2025). Roadmap to sustainably develop the European seaweed industry. *Npj Ocean Sustainability*, 4, Article 22. <https://doi.org/10.1038/s44183-025-00122-9>
- Kemp, D., Worden, S., & Owen, J. R. (2016). Differentiated social risk: Rebound dynamics and sustainability performance in mining. *Resources Policy*, 50, 19–26. <https://doi.org/10.1016/j.resourpol.2016.08.004>
- Kytte, B., & Ruggie, J. G. (2005). *Corporate social responsibility as risk management: A model for multinationals*. Mossavar-Rahmani Center for Business and Government. <https://dash.harvard.edu/handle/1/42720441>
- Lacey, J., Howden, S. M., Cvitanovic, C., & Dowd, A.-M. (2015). Informed adaptation: Ethical considerations for adaptation researchers and decision-makers. *Global Environmental Change*, 32, 200–210. <https://doi.org/10.1016/j.gloenvcha.2015.03.011>
- Lyth, A., Harwood, A., Hobday, A. J., & McDonald, J. (2016). Place influences in framing and understanding climate change adaptation challenges. *Local Environment*, 21(6), 730–751. <https://doi.org/10.1080/13549839.2015.1015974>
- Maciel, A. C. D. M., Pardini, D. J., & Monteiro, P. R. R. (2019). Social risk management: Structuring, validation, and testing of a survey in the mining industry. *Social Responsibility Journal*, 15(8), 992–1007. <https://doi.org/10.1108/srj-11-2017-0246>
- Mamat, R., Erdiwansyah., Ghazali, M. F., Rosdi, S. M., Syafrizal., & Bahagia. (2025). Strategic framework for overcoming barriers in renewable energy transition: A multi-dimensional review. *Next Energy*, 9, Article 100414. <https://doi.org/10.1016/j.nxener.2025.100414>
- Massa, F., Hamza, H., Fezzardi, D., Fourdain, L., Cavallo, M., Caruso, F., & Theodorou, J. A. (2025). Enhancing social acceptability of aquaculture: Stakeholder engagement in guidelines development for the Mediterranean and Black Sea. *Marine Policy*, 178, Article 106697. <https://doi.org/10.1016/j.marpol.2025.106697>

- Nelson, R. (2025). Why cumulative environmental problems are difficult and implications for law: Introducing the CIRCle framework. In *Regulating a thousand cuts: Global law and policy solutions to cumulative environmental problems* (pp. 24–55). Cambridge University Press. <https://doi.org/10.1017/9781009091930.004>
- O'Donnell, J., Falkiner, A., & Szachna, K. (2025). *Mapping social cohesion 2025*. Scanlon Foundation Research Institute. https://scanloninstitute.org.au/wp-content/uploads/SI0001_MappingSocialCohesion_2025_v6.pdf
- Olsen, M. S., Amundsen, V. S., Alexander, K. A., Thorarinsdottir, R., Wilke, M., & Osmundsen, T. C. (2024). Social license to operate for aquaculture—A cross-country comparison. *Aquaculture*, 584, Article 740662. <https://doi.org/10.1016/j.aquaculture.2024.740662>
- Petrocelli, J. V., Tormala, Z. L., & Rucker, D. D. (2007). Unpacking attitude certainty: Attitude clarity and attitude correctness. *Journal of Personality and Social Psychology*, 92(1), 30–41. <https://doi.org/10.1037/0022-3514.92.1.30>
- Rucker, D. D., Tormala, Z. L., Petty, R. E., & Briñol, P. (2014). Consumer conviction and commitment: An appraisal-based framework for attitude certainty. *Journal of Consumer Psychology*, 24(1), 119–136. <https://doi.org/10.1016/j.jcps.2013.07.001>
- Sams, L. (2015, October). *What's a social license and where can I get one?* [Panel Discussion 655(8)]. Salmon Aquaculture, Hobart, Australia.
- Scharpf, F. (1999). *Governing in Europe: effective and democratic?* Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780198295457.001.0001>
- Stephenson, R. L., & Hobday, A. J. (2024). Blueprint for blue economy implementation. *Marine Policy*, 163, Article 106129. <https://doi.org/10.1016/j.marpol.2024.106129>
- Tasmanian Legislative Council. (2022). *Fin fish farming in Tasmania inquiry*. Parliament of Tasmania. https://www.parliament.tas.gov.au/committees/legislative-council/sessional-committees/govadmina/former-inquiries/govadmina_fin
- Thébaud, O., Pascoe, S., DePiper, G., Holzer, J., Agnarsson, S., Castilla-Espino, D., Curtin, R., Gourguet, S., Hamon, K. G., Haynie, A., Kourantidou, M., Macher, C., Murillas, A., Nielsen, R., van Oostenbrugge, J. A. E., Pirrone, C., Pfeiffer, L., Rosa, R., Santiago, J.-L., . . . Wu, X. (2026). A guide to navigating the complexities of quantitative trade-off analysis. *ICES Journal of Marine Science*, 83(5), Article fsag077. <https://doi.org/10.1093/icesjms/fsag077>
- Tormala, Z. L., & Rucker, D. D. (2007). Attitude certainty: A review of past findings and emerging perspectives. *Social and Personality Psychology Compass*, 1(1), 469–492. <https://doi.org/10.1111/j.1751-9004.2007.00025.x>
- Tracey, S., Buxton, C., Gardner, C., Green, B., Hartmann, K., Haward, M., Jabour, J., Lyle, J., & McDonald, J. (2013). Super trawler scuppered in Australian fisheries management reform. *Fisheries*, 38(8), 345–350. <https://doi.org/10.1080/03632415.2013.813486>
- Tuynman, H. D. M., Cao, A., & Curtotti, R. (2024). *Australian fisheries and aquaculture outlook to 2028–29*. Department of Agriculture, Fisheries and Forestry. <https://www.agriculture.gov.au/abares/research-topics/fisheries/fisheries-economics/fisheries-forecasts>
- Walker, G. (2012). *Environmental justice: Concepts, evidence and politics*. Routledge. <https://doi.org/10.4324/9780203610671>
- Weitzman, J., Filgueira, R., & Grant, J. (2022). Identifying key factors driving public opinion of salmon aquaculture. *Marine Policy*, 143, Article 105175. <https://doi.org/10.1016/j.marpol.2022.105175>
- World Bank. (n.d.). *PROBLUE*. <https://www.worldbank.org/en/programs/problue>

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