



# Endeavoring to engage in cooperative fisheries research in a contentious socio-political climate

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## Abstract

Cooperative Fisheries Research (CFR) aims to incorporate different types of knowledge into fisheries science through the convergence of diverse perspectives, skills, and expertise. CFR can facilitate knowledge co-production and the salience, credibility, and legitimacy of science, yet it can be difficult to operationalize. In Maine's American lobster fishery, where CFR is a hallmark of the fishery, pressure to implement conservation measures to protect North Atlantic right whales, one of the world's most endangered large whale species, poses a major challenge for harvesters. Endeavoring to follow best practices associated with CFR, our research team set out to work with state management and fishing industry partners to evaluate the socioeconomic impacts of new whale conservation regulations on the fishery. We co-defined relevant and actionable research questions and designed a sampling approach that included multiple efforts to contact industry participants. Although the process we engaged in had some of the key ingredients for success, ultimately participation was too low to achieve our research aims. We use this paper to discuss our failure and draw on the theory of scalar politics from critical geography to reflect on challenges we encountered, including how the contentious socio-political backdrop within which the initiative transpired impacted our research.

**Keywords:** cooperative research; collaborative research; politics of scale; Maine; fisheries; *Homarus americanus*; engagement

## Introduction

Cooperative fisheries research (CFR) and other related approaches build off conventional fisheries research by emphasizing collaboration between scientists, members of the fishing industry, and community organizations (National Research Council 2004, Hartley and Robertson 2008). CFR has become increasingly popular since the mid-1990s as fisheries managers and policymakers have become more aware that western scientific knowledge alone is often inadequate for addressing natural resource management concerns (Murray et al. 2005, Taylor Singer 2006, Hartley and Robertson 2008, Stephenson et al. 2019, Holm et al. 2020, Steins et al. 2020). Approaches to CFR range from hiring members of the fishing industry to collect data to involving industry members in all stages of the research process—from the co-development of research questions to the integration of results into management (National Research Council 2004, Hartley and Robertson 2008). One of the key goals of CFR is to integrate the fishing industry's experiential knowledge—or the knowledge derived from experiential and place-based observations—with the knowledge produced by researchers and managers to bolster, improve, and contextualize scientific research (Murray et al. 2005, Carruthers and Neis 2011, Hind et al. 2015, Ebel et al. 2018, Stephenson et al. 2019, Calderwood et al. 2023a, Calderwood et al. 2023b). When successful, CFR improves data collection, empowers industry, increases social capital, improves management outcomes, and drives the credibility, legitimacy, and salience of research (Runnebaum et al. 2019, Baker et al. 2023, Calderwood et al. 2023a).

While efforts to advance CFR are increasingly common (National Research Council 2004, Gawarkiewicz and Malek

Mercer 2019), collaborative research has proven to be difficult to execute in practice because, for example, of a lack of communication, transparency, or funds (Kretser et al. 2018, Holm et al. 2020). Out of the constellation of past CFR initiatives has come a body of writing that offers useful insights into the strategies and best practices that facilitate and, conversely, hinder the effectiveness of CFR. Generally, these strategies can be parsed into several broadly applicable lessons that can be applied throughout the different stages of a research endeavor (Table 1). During project inception, success often hinges on the relationship(s) researchers have with the communities they are working with and the level of trust (or distrust) they garner (Hartley and Robertson 2008, Yochum et al. 2011, Dörner et al. 2015, Suldovsky et al. 2017, Ebel et al. 2018, Cornish et al. 2023). Building relationships and trust with industry and stakeholders often begins by identifying interested collaborators, attending public meetings and events, and developing personal relationships (Yochum et al. 2011, Cornish et al. 2023). Scholars also point to the need for involving a wide range of collaborators in CFR, including, but not limited to, community members, non-governmental organizations, and management agencies (Johnson and Van Densen 2007, Hartley and Robertson 2008, Yochum et al. 2011, Cornish et al. 2023). Involving managers is important because it can increase knowledge of the management process and timeline, thus increasing the relevance of the research (Kaplan and Kite-Powell 2000, Baker et al. 2023). During project development, researchers point to the importance of designing questions with stakeholders that reflect and balance different viewpoints and encourage shared ownership (Conway and Pomeroy 2006, Suldovsky et al. 2017, Gawarkiewicz and

**Table 1.** Best practices for successful CFR across stages of the research process.

Research stage	Best practice	Selected references
Project inception	Build relationships and trust with industry and stakeholders	Dörner et al. (2015), Cornish et al. (2023), Ebel et al. (2018), Johnson and van Densen (2007), Hartley and Robertson (2008), Runnebaum et al. (2019), Yochum et al. (2011), Suldovsky et al. (2017)
	Involve a respected community member or boundary organization as a liaison	Hartley and Robertson (2008), Cornish et al. (2023)
	Involve agencies for which data are relevant	Johnson and van Densen (2007), Yochum et al. (2011)
Project development	Understand the management process and timeline	Kaplan and Kite-Powell (2000), Baker et al. (2023)
	Co-design research questions with stakeholders	Conway and Pomeroy (2006), Johnson and van Densen (2007), Suldovsky et al. (2017), Cornish et al. (2023)
Project duration	Balance inputs from academia/government and fishing industry	Gawarkiewicz and Mercer (2019)
	Offer incentives for participation	Conway and Pomeroy (2006), Calderwood et al. (2023b)
	Promote multi-way communication	Conway and Pomeroy (2006), Calderwood et al. (2023b), Ebel et al. (2018), Johnson and van Densen (2007), Suldovsky et al. (2017), McGreavy et al. (2022)
Post-project	Be transparent	Johnson and van Densen (2007), Baker et al. (2023), Calderwood et al. (2023b), Runnebaum et al. (2019)
	Disseminate information to participants, industry, management agencies, and scientific community	Gawarkiewicz and Mercer (2019), Cowie et al. (2020), Steins et al. (2020)
	Continue multi-way communication	Gawarkiewicz and Mercer (2019)
	Seek feedback on research findings and outcomes	Carruthers and Neis (2011)

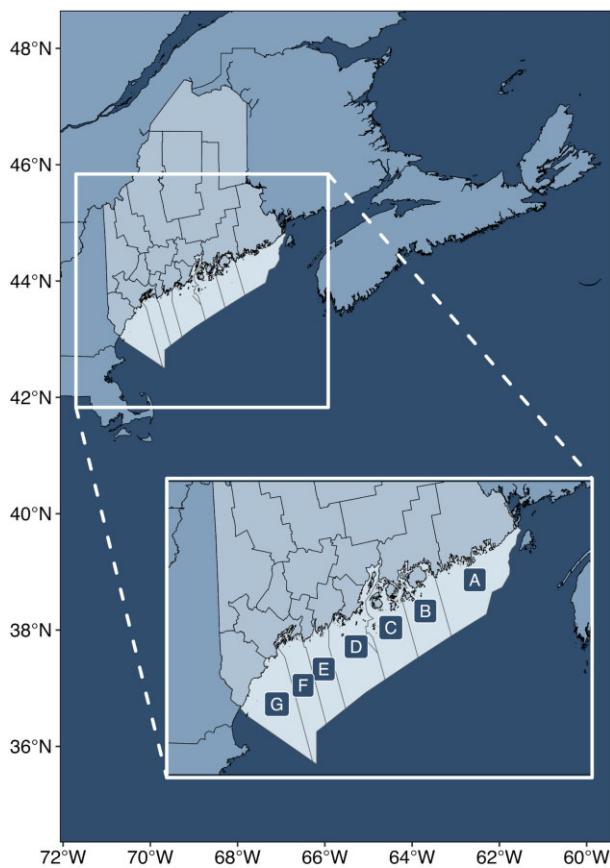
Malek Mercer 2019, Cornish et al. 2023). Shared ownership and control of the research enhances collaboration while minimizing the potential for people to feel exploited by the process (Ashley 2021). Additionally, involving stakeholders early in project development helps to establish effective communication that is mutually beneficial for both the researchers and participants (Conway and Pomeroy 2006, Suldovsky et al. 2017, Ebel et al. 2018, Ashley 2021, McGreavy et al. 2022, Calderwood et al. 2023a). As the research begins, it is important to recognize the time commitment made by participants by offering incentives, engaging in transparent, multi-way communication, and clearly describing the research process, goals, and target uses (Conway and Pomeroy 2006, Baker et al. 2023, Calderwood et al. 2023a). Communication and collaboration should extend beyond the duration of the study itself, continuing throughout data analysis, dissemination of research findings, and the process of engaging with feedback on research outcomes (Johnson and Van Densen 2007, Carruthers and Neis 2011, Gawarkiewicz and Malek Mercer 2019). Together, these insights serve as a roadmap of best practices that can serve those who endeavor to engage in CFR (Table 1).

Our paper builds on this history of reflexive writing about CFR and their associated lessons learned by sharing our own experience working on a research project associated with the American lobster (*Homarus americanus*) fishery in Maine, United States (US). We start by situating our research within the context of the Maine lobster fishery and the controversy surrounding efforts to protect the critically endangered North Atlantic right whale (NARW; *Eubalaena glacialis*). We then describe our research project and how, ultimately, despite having some of the key ingredients for successful CFR, our

research failed to gain traction with the fishing industry at large. Finally, we sift through the fragments of our failure to try to make sense of what happened. While our story has some of the usual plot twists that have been described in the literature in the past, we aim to add to the literature by drawing on critical geography and the politics of scale to explore the confounding role of national politics in local fisheries management and its contribution to shaping the social relationships that underpin CFR (Smith 1992, MacKinnon 2011).

## Lobsters, whales, and the politics of scale

The lobster fishery is important to many coastal communities in Maine. Travel down any of Maine's coastal peninsulas and it does not take long to see that the lobster fishery is tied to the social, economic, or cultural identity of many people who call the region home. Over the last several decades, the fishery has become one of the most valuable in the US, generating roughly 500 million USD per year in ex-vessel value (NOAA 2022). The fishery's success has long been attributed, in part, to its co-management structure, which has consistently centered harvesters' participation and engagement in the science and management of the fishery through CFR (Acheson 1975, Wilson et al. 2007). This approach has led to a multitude of locally designed conservation strategies that have contributed to the sustainability of the fishery. Examples include restrictions on gear, escape vents to protect small lobsters, and "v-notching," or the practice of cutting a flipper to protect egg-bearing female lobsters (Wilson 1993, Ostrom 2007). Today, the co-management system that exists in the lobster fishery, and the conservation practices associated with it, are institutionalized through the existence of seven lobster manage-



**Figure 1.** Map of the Gulf of Maine showing the seven lobster management zones (A–G) associated with the Maine lobster fishery.

ment zones (A–G). These zones span the length of the coast of Maine between the US–Canada border and New Hampshire (Fig. 1; Acheson 2013). Each of these zones has a Lobster Zone Council that is composed of local fishermen, who share management responsibility with the state. This system of governance in the fishery has helped to squarely anchor lobster management within local communities, thereby foregrounding the policy perspective that those who are directly involved in the fishery are best equipped to inform effective management. This system of co-management has resulted in a multitude of CFR projects where fishermen have worked closely with scientists to better understand the socioeconomic and ecological conditions of the fishery, including but not limited to monitoring lobster population health and testing gear (Waller et al. 2023).

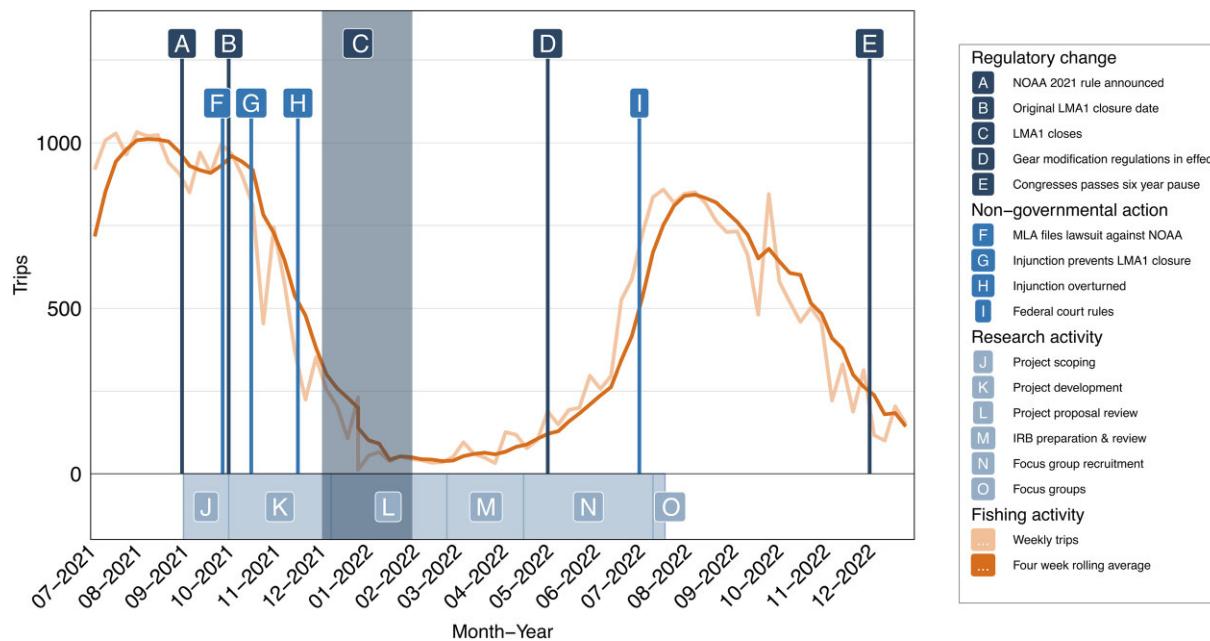
Although the lobster industry continues to engage in many CFR projects, including projects associated with members of our team, the industry is facing a range of difficult socioeconomic and environmental challenges that are testing its resilience. These compounding stressors include market disruptions caused by the COVID-19 pandemic, climate change, and competition for ocean access (Le Bris et al. 2018, Coombs 2020, Smith et al. 2021). In addition, new federal regulations implemented to protect NARW have created intense pressure to implement changes in the fishery, overshadowing many of the other challenges. The NARW is currently one of the world's most endangered large whale species with 372 estimated individuals left (Ross et al. 2021, NOAA 2024b). Initially depleted as a result of historical exploitation, today the

NARW faces threats of entanglements in fishing gear and vessel strikes, along with shifting prey distributions that lead to whale malnutrition and challenges for managers in regions that are not used to NARW presence (Ross et al. 2021, Gulland et al. 2022). In 2021, federal regulations were modified following a court ruling finding that the American lobster industry violated the US Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) in regard to its impacts on the NARW population (Boasberg 2024). The resulting new regulations on the Northeast lobster fisheries included new closures off the coast of Maine and Massachusetts, increases in the minimum number of traps per trawl, modified weak link insert requirements, and requirements for new gear markings.

Because of the NARW regulations' potential to have a significant impact on harvesters, they faced widespread opposition in Maine, as many harvesters felt as if "...the entire closure has literally fallen from the sky..." (LaClaire 2022), and like they had "been singled out, and wrongfully so, and [their] fishery is at risk of going away because of it" (Hirschhorn 2021). In response, legal action was taken by stakeholders on both sides of the argument, creating a highly charged political climate around the fishery (McGuire 2021, Andrews 2022, Fig. 2). This controversy quickly escalated, attracting the attention of local, state, and national political figures, including members of the US Congress. Even the standing US president held an industry-specific rally in Bangor, Maine, in support of the fishing industry (Bever 2020, Mistler and Miller 2022).

In many ways, the politicalization of the lobster fishery around NARW regulations is not a new phenomenon. Fisheries have long been contested domains where rules, norms, and practices are negotiated and renegotiated among fishing industry members, scientists, conservation organizations, managers, and decision-makers (Ludwig 1998, Bavinck 2005). However, the politicalization is notable in the Maine fisheries context because of the state's history of local governance. In particular, as the controversy surrounding NARW regulations unfolded, it pulled the Maine lobster fishery into the national political spotlight. In doing so, this process changed the scale at which the politics of the fishery are occurring—shifting the epicenter of an important management decision from coastal communities in Maine to the national stage.

Critical geography theory brings attention to the scale at which governance interactions unfold, highlighting how the spatial and temporal scales of governance processes can shape social-ecological interactions (MacKinnon 2011, Gruby and Basurto 2013). This geography of politics is commonly referred to as the "politics of scale" (Smith 1992). The supersizing of lobster politics in Maine from local to national is not an inherently "good" or "bad" evolution, but by changing the scale at which the politics are unfolding, it alters who, and how people working in and around the fishery, are able to engage in the governance process. It also weakens the importance of local engagement in governance, thereby theoretically diminishing the utility of the co-management system and raising important questions about how it will affect social relationships in the fishery and harvesters' engagement in management and CFR. This concern coincides with existing signs that harvesters' engagement in local management processes has been waning, as evidenced by their decreasing participation in zone council activities that have long been a hallmark of the fishery. While a full interrogation of changing



**Figure 2.** Timeline mapping out the regulatory changes, legal events, and our research process against fishing activity (number of fishing trips taken per week).

engagement in co-management is well beyond the scope of this paper, our experience engaging in CFR during this particularly contentious period in the lobster fishery surrounding large whale conservation measures (2021–2022) offers potential insights into how the politics of scale can shape CFR.

## Research

The initial impetus for our project was derived from an interdisciplinary graduate student class at the University of Maine taught as part of a National Research Training (NRT) program funded by the National Science Foundation focused on the intersection of human, animal, and environmental health (called “One Health”). Programs like this exist across the US and are designed to foster stakeholder-relevant convergent research. As part of the culmination of the program, graduate students had an opportunity to design and implement a team-based research project related to the theme of the NRT. A subset of these students, including the lead authors on this paper, and their faculty mentors (the co-authors on this paper) approached staff at the Maine Department of Marine Resources (ME-DMR), the state agency responsible for co-managing the lobster fishery, about offering research capacity and funding to address needs identified by the state. Through this process, we developed a project in partnership with the state to evaluate the socioeconomic impacts of NOAA’s NARW-related 2021 regulations on Maine’s lobster industry (Boasberg 2022).

Our collaboration with ME-DMR began in August 2021 (Fig. 2) and continued throughout the duration of our research project. We met on a monthly basis to develop research questions, discuss our methodological approach, design an institutional review board (IRB)-approved protocol for focus group discussions, and to request advice and assistance with recruiting participants. As this process unfolded, we invited stakeholders involved with the lobster industry to collaborate to the extent they were willing or able to, including fishing associations [the Maine Lobstermen’s Association (MLA),

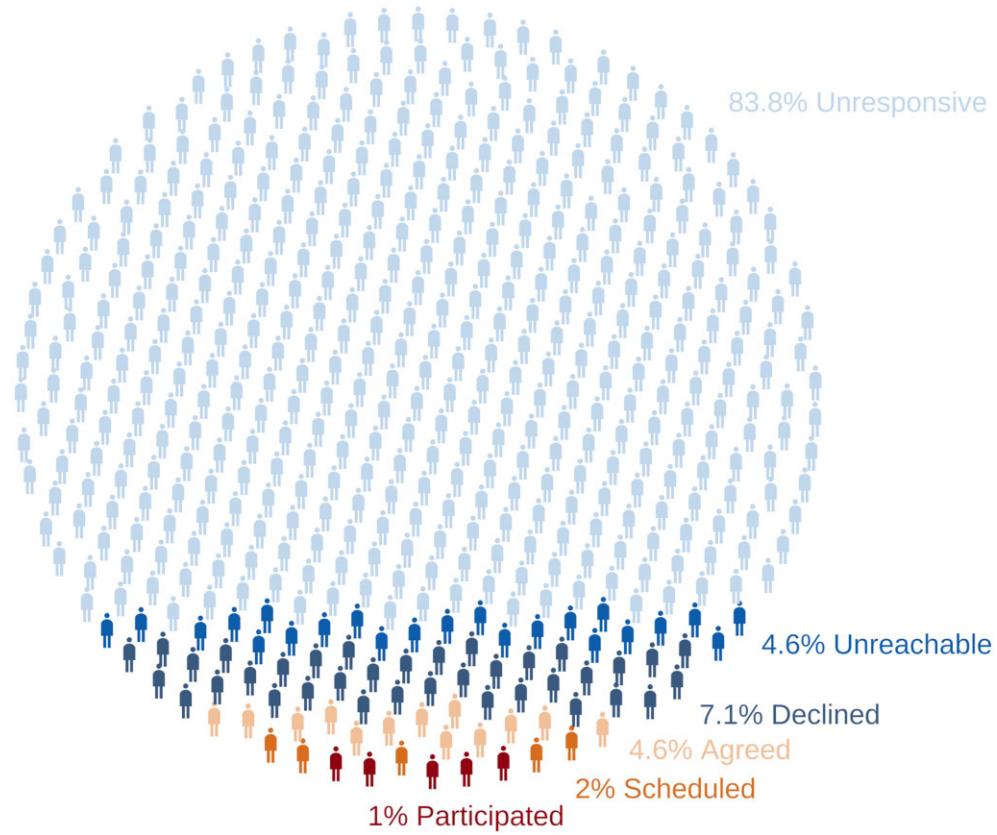
Downeast Lobstermen’s Association (DELA)], a boundary spanner [Maine Center for Coastal Fisheries (MCCF)], and federal managers from NOAA’s Northeast Fisheries Science Center.

Focus groups, or organized group discussions, were chosen as a methodology due to their ability to gather qualitative data that provide a deeper understanding of themes, attitudes, beliefs, patterns of behavior, and relationships on a topic (Morgan 1996, Krueger and Casey 2015). We worked with a social and community psychologist at the University of Maine with experience facilitating conversations pertaining to charged topics to host focus groups. For our detailed focus group question guide, see *Supplemental I*.

Our goal was to solicit input from a representative sample of participants from across the fleet acknowledging the industry’s demographic heterogeneity and associated variability in fishing strategies (Gurney et al. 2021). Maine state lobster harvesters license data were retrieved from ME-DMR for the years 2016–2021. In Maine’s lobster fishery, licenses are granted in a variety of classes and categories related to the harvesters’ age, student status, tribal status, and the scale of the fisherman’s operation. Harvesters who did not fish in the relevant time period, students, subsistence fishers, and those missing contact information were excluded. Remaining harvesters were organized by simplified license class and fishing zone (A–G, Fig. 1).

We aimed to host six focus groups with six to eight individuals in each group, as is considered standard practice (Morgan 1996). Expecting a 10% response rate, we took a stratified random subsample of 500 lobster harvesters to ensure we would recruit at least 48 participants that were representative of the Maine lobster industry by fishing zone, license class, age, and vessel length (Fig. S1). All data cleaning, filtering, and subsampling was done in R v. 4.2.0 (R Core Team 2023) using the package *tidyverse* (Wickham et al. 2019).

The subsample of 500 harvesters was randomly split into two groups. For each group, three emails were sent, including



**Figure 3.** Total number of people that we contacted and their response.

an initial email (on May 31 and June 5, 2022), follow-up email (~7 days post initial contact), and a final email (~12 days post initial contact). The initial email contained information regarding researcher positionality, research objectives and goals, expected time commitment, information about our incentive (a \$25 Amazon gift card), an informed consent form, and contact information. If harvesters were interested in participating, they were asked to fill out a short Google Form to collect contact information, scheduling details, and preliminary data on changes in fishing behavior after NOAA's 2021 NARW regulations were implemented. We aimed to schedule participants for one of six virtual (Zoom) focus groups over the course of two weeks that were planned on different days of the week to accommodate varying schedules.

When it became clear that our initial response rates were low, we incorporated additional recruitment strategies recommended in the literature (Morgan 1996). A representative from MLA posted our recruitment emails on their Facebook page with a link to our Google Form. We used snowball sampling techniques, asking potential participants to recommend other potential participants, and added phone calls to our recruitment protocol.

## Project failure

From the perspective of participant engagement and data production, our research project failed. In total, across our diverse outreach and active recruitment methods (email and phone calls), 1700 points of contact across 505 individuals were attempted, in addition to over 5000 impressions via MLA's Facebook post. This effort resulted in 26 individuals indicating

their interest in participating. Of these, only five individuals ultimately participated in our focus groups and we decided to pause the process after two focus groups (Fig. 3). When attempting to contact harvesters, we encountered non-working email addresses, disconnected phone numbers, and full phone voice mailboxes. On a few occasions, we received response emails requesting that we cease communication. When MLA posted to their social media about our study, our sign-up form was flooded with over 260 responses from people who were not affiliated with the Maine lobster fishery and demonstrated an obvious lack of knowledge about it. While some harvesters initially expressed interest in participating, and several of them went on to schedule focus group times, others did not follow through and sign up or simply did not show up for the focus groups.

## Deciphering what happened

While our project did not lead to the results we had anticipated, it provides a useful opportunity to reflect on CFR and our research aims and processes. To some extent, we had many of the necessary ingredients for successful CFR (Table 1). We engaged key individuals and organizations early, and we offered monetary incentives (Conway and Pomeroy 2006), though they did not appropriately cover the cost of harvesters' time as experts. To limit the time costs and increase accessibility, we held our focus groups virtually, though this may have impeded participation for folks who dislike, or have trouble engaging with, technology. We leveraged existing relationships with managers and fishing organizations to co-develop stakeholder-identified questions and contribute to

credibility during recruitment efforts (Ebel *et al.* 2018, Cornish *et al.* 2023). We also aimed for honest and transparent communication by describing the research team, motivations, our connection to ME-DMR, and the expected outcomes of our work in recruitment materials (Baker *et al.* 2023).

Despite these efforts, our project failed to reach (or even near) the level of fishing industry participation necessary to achieve our research aims. In reflecting on this failure, we identify several limitations that challenged our ability to conduct successful CFR, including four of the usual traps (distrust, timing, research fatigue, track record), which have been previously described in the literature, as well as a fifth trap related to the socio-political context. We explore each of these traps individually below, though expect that multiple factors acted in concert and acknowledge that we cannot distinguish the relative importance of their roles in our failure given lack of data on why harvesters chose not to participate.

## The usual traps

### Distrust

Mutual trust and respect stemming from positive relationships underlie successful CFR, but decades of relationship degradation in New England have eroded trust between the fishing industry, government, and researchers (National Research Council 2004, Woodard 2004, McClenaghan *et al.* 2020, Ford and Stewart 2021). Without trust, fishermen may question researcher motivation for fear that their contributions will be used against them, e.g. to implement fishing restrictions (National Research Council 2004, Conway and Pomeroy 2006, Ebel *et al.* 2018). For example, trust is eroded when data contributed by fishermen is not used in research or management as much as expected or is used in ways that are perceived as counter to fishing interests (Conway and Pomeroy 2006, Hartley and Robertson 2008, Ebel *et al.* 2018). Beyond eroding trust, these experiences can leave fishermen feeling disempowered in management outcomes (Hartley and Robertson 2008). In regard to the recent regulations to reduce whale entanglement, many fishermen have voiced during public scoping meetings and our focus groups that NOAA failed to use the “best scientific information available” when making the 2021 rule. Fishermen reported a mismatch between their own experience and scientific model outputs, which can lead to a belief that the science underpinning management decisions is inaccurate (Maltby *et al.* 2023). Further, the scientific data and methods underlying regulatory decisions are often not intuitive and easily accessible to fishermen, exacerbating uneasiness and distrust of scientific evidence. This distrust and lack of clarity builds upon deep-rooted skepticism from past management failures in the region (e.g. cod), where incomplete or insufficient scientific evidence led to species collapse (Acheson 2006).

### Timing

Working across sectors (academia, government, industry) requires an immense amount of time and effort from all parties, each of which works within their own timeline. Some researchers, such as graduate student researchers and contractors, may be working within short and inflexible timelines that hinder some critical components of successful CFR such as relationship building and responding to partner time constraints (Wray *et al.* 2020, Cornish *et al.* 2023). Harvesters

have often noted time as an important factor that limits their participation in CFR, as research tends to overlap with their busy fishing seasons (Conway and Pomeroy 2006). We began developing our research project shortly after implementation of NOAA's new rule in August 2021, but factors outside of our control (e.g. proposal and budget review, IRB approval) delayed the start of our research activities. As such, our recruitment efforts began in April 2022 and our focus groups were scheduled for July 2022, both periods of time in which harvesters are focusing time and energy on their businesses (Fig. 2).

In addition to the challenges of time constraints within project timeframes, perceptions of delays in research impact after a project is completed can also hinder successful CFR. It often takes years from when data are collected to when the findings are published, and even longer until the findings can be applied, contributing to a perceived lack of responsiveness (Cornish *et al.* 2023). Our research, while timely in that harvesters were concurrently experiencing the impacts of regulatory changes, would not have been utilized to make immediate modifications to regulations. In this case, legal action, in the form of lawsuits by MLA and other stakeholders that challenge the biological opinion used in the federal rulemaking, was more effective in achieving immediate goals for the lobster industry (Ginsberg 2023).

### Research fatigue

Though celebrated for its impact on co-management, the decades of successful collaboration between researchers, managers, and fishermen in the lobster industry may have come with an additional unintended negative consequence: research fatigue. Collaboration may come at a steep monetary, temporal, personal, and impersonal cost, especially when the subject matter is contentious in nature (Clark 2008). Sensitive or stressful subjects and time-intensive research practices both lead to increased research fatigue and, in turn, decreased participation in new research projects (Ashley 2021). In particular, areas and communities facing change are scientifically interesting, with researchers clamoring to answer questions to better understand impacts, learn lessons, and prepare communities in similar situations (Clark 2008). Communities in this position can therefore face increased stress as they navigate not only the initial change, but also the increased research attention (Clark 2008, Ashley 2021).

In Maine, the lobster fleet has participated in various ecological monitoring programs for decades, and as climate change has started affecting the region, there is increasing concern over how the lobster stock will adapt. Wind developers, citing a need to work with communities to find solutions, have hosted workshops and public hearings to determine coastal community needs (Burgess and Johnson 2023). NOAA, working to finalize new regulations for NARW and other issues, has hosted public scoping meetings, workshops, and webinars for the lobster industry (NOAA 2024a). Researchers from Maine institutions are seeking to understand not just biological and ecological changes, but socioeconomic impacts of those changes through studies like ours (Johnson and Mazur 2018, Silver and Stoll 2019). This non-exhaustive list of outreach paints a picture of a community being pulled in many directions for both research and management objectives, each vital and important, each time-consuming and costly. The steady stream of requests from various organizations and individuals may create an environment in which

participants are psychologically and emotionally overwhelmed, creating a disincentive to expend energy participating (Ashley 2021). Such research fatigue can be further compounded and exacerbated by issues of distrust (see section “Distrust” above), as communities try to navigate what is worthwhile and who they can trust (Clark 2008, Patel et al. 2020, Ashley 2021).

### Track record

Fishing industry members often rely on perceived credibility of researchers or their institutions when deciding to engage in CFR (Cash et al. 2003, Runnebaum et al. 2019). While graduate student researchers may sometimes be seen as less entrenched in viewpoints or agendas than more seasoned researchers, they also often lack proven track records with individuals and communities. Furthermore, when research aims include giving voice to existential anxieties, fears, and anger, it can be easy to dismiss graduate students as either naive and overpromising, or as untrustworthy stewards of data and information (Wray et al. 2020, Ashley 2021). We attempted to bridge this gap by collaborating with fishing organizations and boundary spanners, but the extent of their involvement, dictated by their own capacity, may not have been sufficient to overcome industry concerns about researcher credibility in this case.

### Politics of scale in CFR

While the usual traps certainly played a role in shaping the lack of success of our study, our experience suggests there may also be new factors at play. In particular, we posit that recent and ongoing shifts in the scale of politics play an important emerging role, both in the scale of the conservation challenge (i.e. migratory protected species) and the actors involved (e.g. elected officials). This shift weakens the emphasis on local decision-making and ensnares CFR in broader socio-political debates about the legitimacy of science—both of which reduce the perceived need for and palatability of CFR. Here, we further discuss both the drivers of this shift and its impacts as seen in our research experience.

Risk of right whale interactions and the related conservation efforts, which are largely dictated by the MMPA and ESA, have played an important role in shifting the scale of politics to broader scales. These issues have forced all those involved in lobster management, from harvesters to policymakers, to shift their attention away from local decision-making and the governance structures that make this possible. This scaling up of the politics of lobster management stands in contrast to the existing co-management system in Maine that has relied upon and incentivized learning, discussion, and collaboration across various stakeholder groups at the local level (Folke et al. 2005, Armitage et al. 2008). Federal rulemaking is relatively top-down, with managers making decisions affecting broad geographic scales, and while agencies may make an effort to involve local communities in their processes, the approaches are not designed to center local scales.

At the same time, we have also observed the lobster fishery and its associated governance shift into a political arena outside of what is typically considered a fisheries management domain. Politically appointed and elected figures at all levels from state to federal have become key players in negotiating rules and regulations in a way that has typically been left to the delegated authorities that oversee fisheries management

(e.g. NOAA, ME-DMR, and lobster zone councils). The role these actors have played in the lobster fishery cannot be understated. Responding to widespread public outcry, policymakers were able to leverage their status at the national stage to add language to a federal omnibus spending bill that blocked NOAA from further regulating the lobster fishery for six years (until 2028). This addition to the bill was termed a “Christmas miracle” for harvesters (LaClaire 2022).

These shifts have arguably led to highly effective management decisions that came at a crucial time to the industry, but as they reshape the governance process, they also alter relationships between harvesters, managers, and scientists, which have long been critical to successful co-management of the fishery. Recently, there has been a notable decline of industry participation in the lobster fishery management process at the local level. For example, zone councils, long the backbone of the lobster industry’s co-management system, are struggling to reach minimum attendance requirements for decision-making in some zones. Instead, fishermen have needed to shift focus from traditional avenues of participation (e.g. attending local zone meetings and participating in CFR) to new modes of engagement that shape discourse at the national stage (e.g. hiring a corporate law firm to file a lawsuit in federal court against NOAA’s regulations). In public forums and during some of our conversations, harvesters shared feelings of inefficacy, expressing frustration and concern over zone councils’ inability to impact federal rulemaking in a meaningful way. The same concern is also salient to CFR, which can provide key insights about local socioeconomic and environmental dynamics but has limited utility more broadly.

Similar feelings of frustration are increasingly felt towards researchers studying the fishery and its management process. The scaling up of politics erodes the importance of local relationships and can exacerbate existing “us” versus “them” factionalism that is on the rise globally. The contemporary socio-political landscape has created a climate in which participating in research or management processes may signal tacit agreement with the agendas of “them.” Exemplifying this conflict, some respondents to our recruitment efforts expressed general opposition to our academic institution, citing its involvement in unrelated federal government research and the development of offshore wind, which are viewed by some as being linked to broader political agendas. We also recall one phone call with a harvester who responded to our request by saying they “[didn’t] want to be in a room full of Subaru drivers.” Notably, the graduate student caller owns a Subaru; when she informed them of this, they both shared a laugh before the harvester ultimately declined to participate. Of course, this harvester does not have any qualms about Subarus themselves, nor our research team personally, but rather a particular identity often ascribed to the brand. A “Subaru driver” belongs to the “them,” representing a type of person this harvester sees as different from themselves, belonging to a group that they do not feel comfortable around or supported by.

Greater focus on the broader scales of politics driving lobster management and the concurrent erosion of trust and interest in research that aims to support co-management may be reducing the perceived need for and palatability of CFR, respectively. The full implications of this shift are still unknown; however, what we do know is that Maine’s history of CFR and co-management has enabled the sustainability and prosperity of this industry for decades. Researchers, harvesters, and

managers alike will need to rethink the way we engage in order to ensure a similarly successful future.

## Conclusions

CFR has been widely used in the past several decades as a way to incorporate knowledge from the fishing industry in scientific research and management decisions, resulting in a large body of literature on “best practices” to follow when conducting CFR. While we aimed to follow these best practices in our venture to assess socioeconomic impacts of federal regulations on the Maine lobster industry, the project was ultimately unsuccessful. While some of the usual traps persisted (e.g. distrust, misaligned timelines), we also found that increasing environmental, social, and political pressures caused a disinterest in participating in CFR. Our case study suggests the upscaling of politics may contribute to polarization and have the potential to inhibit collaboration between sectors. Reflecting on our failure and subsequent lessons learned has led us to beg the question: will we as academics need to change the way we approach and engage with fisheries that are facing intense pressures to ensure success for the fishing industry, science, and managers, alike? Further, can we work together with industry to identify the path forward?

## Author contributions

The first two authors (J.K. and C.M.) contributed equally to this work. JK: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Validation, Visualization, Writing—original draft, Writing—review & editing. CMM: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Validation, Visualization, Writing—original draft, Writing—review & editing. KMC: Conceptualization, Funding acquisition, Supervision, Writing—review & editing. JSS: Conceptualization, Funding acquisition, Methodology, Supervision, Writing—review & editing.

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## Supplementary data

Supplementary data is available at *ICES Journal of Marine Science* online.

*Conflict of interest:* None declared.

## Data availability

No new data were generated or analyzed in support of this research.

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