



OPEN ACCESS

EDITED BY

Kum Fai Yuen,
Nanyang Technological
University, Singapore

REVIEWED BY

Jesús Ernesto Arias González,
National Polytechnic Institute of Mexico
(CINVESTAV), Mexico
Robin Kundis Craig,
University of Southern California,
United States

*CORRESPONDENCE

Kelly Dunning
✉ kdunnin3@uwyo.edu

†PRESENT ADDRESS

Kelly Dunning,
University of Wyoming Haub School of
Environment and Natural Resources,
University of Wyoming,
Laramie, WY, United States

RECEIVED 11 April 2023

ACCEPTED 07 August 2023

PUBLISHED 31 August 2023

CITATION

Bailey S, Morris D and Dunning K (2023)
Biodiversity conservation, advocacy
coalitions, and science-focused disputes:
the case of Caymanian coral reef
conservation and the proposed port
expansion project.
Front. Mar. Sci. 10:1204139.
doi: 10.3389/fmars.2023.1204139

COPYRIGHT

© 2023 Bailey, Morris and Dunning. This is
an open-access article distributed under the
terms of the [Creative Commons Attribution
License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or
reproduction in other forums is permitted,
provided the original author(s) and the
copyright owner(s) are credited and that
the original publication in this journal is
cited, in accordance with accepted
academic practice. No use, distribution or
reproduction is permitted which does not
comply with these terms.

Biodiversity conservation, advocacy coalitions, and science-focused disputes: the case of Caymanian coral reef conservation and the proposed port expansion project

Sabine Bailey, Daniel Morris and Kelly Dunning*†

College of Forestry, Wildlife, and Environment, Auburn University, Auburn, AL, United States

An environmental dispute arose in the Cayman Islands where politicians and multinational cruise companies sought an infrastructure upgrade that would destroy 15 acres of coral reef habitat. A competing coalition emerged to contest this project resulting in important policy change: the first ever people's-initiated referendum. Our research uses the Advocacy Coalition Framework (ACF) to study how policy change is enacted in a biodiversity conservation policy system. We find differences between two coalitions in members, policy beliefs, resources, and strategy. Policy beliefs of both coalitions reveal two competing realities, especially on the subject of science needed to inform a sustainable tourism economy, with scientific misinformation becoming increasingly impactful in policy making. Second, we find that one coalition leveraged the interests of powerful politicians and international corporations to advocate for the infrastructure project, even though the destruction of coral reefs was in defiance of laws. To contest this, the second coalition leveraged volunteers and small donations to enact policy change, successfully triggering the referendum. Our research is significant because in places where volunteering and small donations are less possible, such as in emerging market economies, it is easy to see how well-resourced interests could degrade biodiversity even with domestic laws protecting species and habitats.

KEYWORDS

public policy, coral reefs, Advocacy Coalition Framework (ACF), Cayman Islands, policy process

1 Introduction

In 2013, the Cayman Islands Government announced a large infrastructure project anticipated to increase tourism revenue through a more modernized cruise industry. The proposed George Town Harbour cruise berthing facility project would update the harbor's reliance on tendering passengers (e.g. having cruise ships anchor offshore with smaller tender boats bringing passengers to the island). The project would include two extended piers, land reclamation, and dredging work. The project became a policy priority as cruise companies stated that their new larger ships would exclude tender ports. The cruise industry accounts for over 80% of Cayman's tourism and contributes \$200 million to the economy annually (Lopez, 2022).

In 2015, the government published an environmental impact assessment which revealed that increased sedimentation and turbidity from dredging would destroy approximately 15 acres of coral reefs and associated marine habitats, as well as impact an additional 15–20 acres. While the project footprint accounts for ~1% of the existing corals in the Cayman Islands, coral reefs are some of the most productive and valuable resources on earth, and among the world's most imperiled, with 75% of Atlantic and Caribbean reefs classified as threatened (Reef Resilience Network, 2023). They provide critical coastal storm protection and contribute close to 5% of the Cayman Islands' GDP through the tourism and fishing industry (International Coral Reef Initiative, 2019). Furthermore, the project's footprint included coral reef sites of global importance to recreational divers, such as Eden Rock and Devil's Grotto, as well as historic shipwrecks such as the Balboa and the Cali shipwrecks, all of which are ecologically, culturally, and historically important to Caymanians. Coral reefs are also protected by strict international commitments, such as the Aichi Biodiversity Targets,¹ and national policies, such as The National Conservation Law (Law 24 of 2013) (2014), Habitat Action Plan (2009), National Conservation Law (2013), which the proposed project would be in violation of (see Appendix A for more details).

An environmental impact assessment was put up for public consultation, a process wherein a majority of comments (73%) expressed a lack of support. This led to the creation of two opposing coalitions. The first coalition was called "Cruise Port Referendum Cayman" (CPR Cayman), and was led by the National Trust of the Cayman Islands,² non-governmental organizations (NGOs), citizens, and members of the legislative assembly, all of which

questioned the benefits of the project. CPR Cayman emphasized the environmental impacts, uncertainty over the proposed coral mitigation efforts, and concerns over how the project would be financed.

The second coalition included government leaders, such as the Cayman Island Premier and Minister of Tourism³ adopting the name "Support Our Tourism." The Verdant Isle Port Partners, the firm awarded the contract to design,⁴ build, and finance the \$240 million cruise berthing facility project, was also part of the pro-port coalition. This coalition argued for the benefits of increased economic growth, creation of job opportunities, staying competitive in the cruise industry, risk-free financing option, and enhancing cargo facilities (which was an additional benefit of the proposed project). Support Our Tourism claimed that the design, build, finance and maintenance was risk-free, and it would pay for itself over 25 years. Verdant Isle Port Partners agreed to invest US \$200 million in designing, building, and maintaining the berthing facilities. In turn, the Cayman Islands would surrender US\$2.32 from their passenger fees to repay their investment over the next 25 years and obtain ownership after those 25 years.

One major policy change that resulted from these opposing coalitions was the first ever planned people's-initiated referendum which would empower the Caymanian public to decide whether the project would proceed. Under the Cayman Islands Constitution (2009), Section 70, Caymanians are allowed to trigger a people-initiated referendum by collecting signatures from 25% of eligible Caymanians voters. CPR Cayman successfully campaigned to collect signatures of Caymanian voters to trigger the first ever people's-initiated referendum, a process which took 9 months in 2019 with volunteers collecting 5,289 signatures (just over 25% of eligible voters). Our research asks how coalitions in an environmental dispute impacted and changed the policy process in the Cayman Islands, specifically policy processes dedicated to protecting biodiversity.

To answer our question, we use the Advocacy Coalition Framework (ACF) (Jenkins-Smith et al., 2018) (Figure 1). The ACF states that breaking complex events into coalition members, their beliefs on desired policy, their respective resources, and

1 The Aichi Targets aim to reduce pressure on biodiversity, preserve and enhance ecosystems to ensure the longevity of ecosystem services provided by biodiversity (United Nations, 2018).

2 The National Trust is a non-governmental organization with statutory authority established in 1987 with the purpose of preserving natural resources and historical sites under Cayman Law. Its authority to protect natural and cultural heritage is established in the National Conservation law of 2013 and its presence is required on the National Conservation Council, a core component of Caymanian environmental management under the National Conservation Law.

3 The Cayman Islands is a parliamentary democracy. Parliament comprises 21 members, 19 of whom are elected based on the Cayman Islands' 19 constituencies. The leader of the political party that wins the majority of the elected seats in Parliament is appointed as the Premier by the Governor. The two remaining seats, the Deputy Governor and Attorney General, are non-voting and appointed by the Governor. The Governor of the Cayman Islands is appointed by the Queen of the United Kingdom. The Cabinet is led by the Premier and seven other Ministers. The Governor, in accordance with the Premier, appoints the Ministers (Cayman Islands Government n.d.).

4 Verdant Isle Port Partners is a consortium which consists of four businesses including McAlpine Ltd, Carnival Corporation, Royal Caribbean Cruises Ltd., and Orion Marine Construction Inc. Carnival and Royal Caribbean are two of the world's largest cruise corporations. McAlpine Limited is a construction company in the Cayman Islands, and Orion Marine Construction Inc. is an international marine construction company.

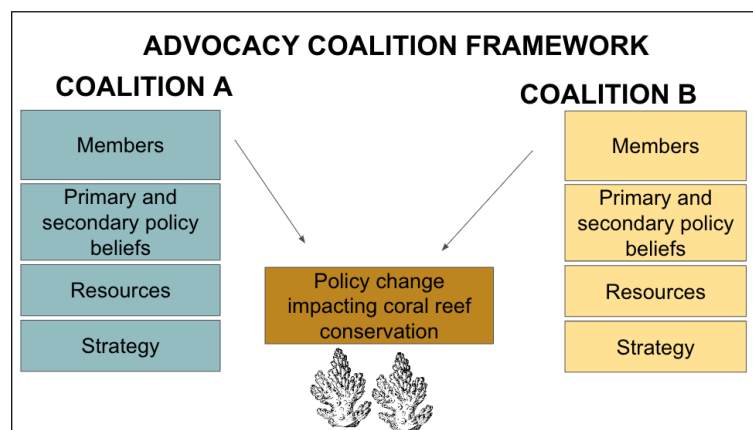


FIGURE 1
Illustrates the ACF theoretical framework used in this research.

strategies will generate insight into how environmental disputes such as this one can change policy and policy processes. The significance of our research is urgent, because many more countries are considering or implementing similar infrastructure projects that damage coral reefs, and defy existing endangered species laws to accommodate cruise ship or cargo ship traffic. The ACF can help shed light on how coalitions seek to change biodiversity conservation policy.

Through the use of the ACF, we made two important contributions to the field of public policy process. First, in our case study, we found that there was only a very broad point of agreement between the two coalitions: that tourism was important to the island. However, there were no substantive overlapping points of agreements between the two opposing coalitions on how to ensure Caymanian tourism was sustainable. This is contrary to the literature and other ACF case studies on environmental disputes, which have found that there are often substantive points of agreement shared between coalitions on their policy beliefs, which can increase the likelihood of compromise (Weible, 2007).

Instead, we find that the policy beliefs of both coalitions suggest two competing realities, especially on the subject of environmental science that underpins a sustainable tourism economy. The main point of contestation revolved around the emerging scientific practice of large-scale coral reef restoration and its underlying uncertainties. Second, we found that the pro-project coalition used public money to fuel their campaign in support of the proposed cruise berthing facility, which was in defiance of Caymanian international commitments and biodiversity conservation laws due to the projected destruction of coral reefs. To contest this, the anti-port project coalition rallied volunteers and collected small donations strategically to enact policy changes and processes by successfully triggering the first ever people's-initiated referendum. However, in places where volunteering and donations are less possible, such as in emerging market economies, it is easy to see how well-resourced interests could degrade biodiversity even with strong domestic laws protecting species and habitats.

1.1 The Advocacy Coalition Framework

The ACF is set within a policy subsystem, which is defined as a system where policy actors, or members of an advocacy coalition, influence the events of a policy issue, within a particular territorial scope (Jenkins-Smith et al., 2018). For this study, the environmental dispute that arose from the violation of biodiversity and conservation policies and laws, is our subsystem and unit of analysis (defined in more detail in Appendix A). Members have *core policy beliefs*, based on desired policy solutions, and *secondary policy beliefs* which address the means of achieving the core belief. Members have *resources*, or leadership and funds that enable them to influence policy, as well as *strategy*, or ways to coordinate members (e.g. information sharing). Our research is qualitative, so instead of using hypotheses we instead use expectations. Our expectations are that two coalitions will differ in our case according to their members, core and secondary policy beliefs, resources, and strategy. Differences will enable us to better understand how the biodiversity policy conservation subsystem can be strengthened to better protect important and imperiled habitats like coral reefs.

The Advocacy Coalition Framework is one of the most popular theoretical frameworks applied across disciplines to understand policy processes and has steadily grown over three decades (Weible et al., 2009; Pierce et al., 2017; Wellstead, 2017; Jenkins-Smith et al., 2018). One of its major strengths includes the causal explanations that it provides for policy change and learning, most prominently, via coalitions. Others include its generalizability, ability to combine with other frameworks, and its continuous growth and self-assessment to improve and advance the theory (Wellstead, 2017; Jenkins-Smith et al., 2018). Since its inception in the early 1980s in the United States (U.S.) by Paul Sabatier and Hans Jenkins-Smith, it has undergone at least four major revisions as a result of hundreds of papers applying the ACF to study coalitions, policy change, and policy-oriented learning (Sabatier, 1986; Sabatier, 1988; Sabatier and Weible, 2007; Wellstead, 2017; Jenkins-Smith et al., 2018; Weible et al., 2020).

Although developed in the context of the U.S. democratic system, the ACF has been applied to case studies on every continent save Antarctica (Weible et al., 2009; Pierce et al., 2017). While the ACF application in Western governments, such as North America and Europe, is widespread, applying the ACF in many different regions, such as China and South Korea, is increasing (Kim, 2003; Park and Weible, 2017; Pierce et al., 2017; Lim and Eun, 2018; Li and Weible, 2019; Li and Wong, 2020; Zhou et al., 2021). For example, a meta-analysis of 81 applications of the ACF in China by Li and Weible (2019) found that the ACF hypotheses were still functional in an authoritarian government and market-based economy. Another meta-analysis by Park and Weible (2017) also found that the ACF was applicable in South Korea, after having transitioned from an authoritarian to a democratic government. They discovered that the main source of policy change in South Korea is from external shocks and that coalitions are more centralized than in democratic systems, with government agencies and affluent businesses taking a central role. In both countries and generally, authors have found that the ACF can be adapted to better suit their respective policy processes by refining the hypotheses provided by the framework.

Pierce et al. (2017) identified nine policy domains analyzed in papers that apply the ACF published between 2007 and 2014. These domains are still relevant and include public health, education, science and technology, social welfare, foreign relations and national defense, urban planning and transportation, energy, and environment. Generally, applications of the ACF in the public health sector have examined the role of advocacy coalitions to promote health policies, such as the Maternal and Child Healthcare policy in Nigeria (Ritter et al., 2018), social health determinants and the prevention of chronic disease in Canada (Nykiforuk et al., 2009; Kershaw et al., 2017), actions against stunted growth in Zambia (Harris, 2019), and promotion of Breastfeeding-Friendly bills in Washington State (Steinman et al., 2017). The ACF has also been employed in the education sector to identify the role of coalition groups and their respective belief systems to implement education bills and policies (Wang, 2020). In the social welfare sector, the ACF has been used to examine the efficacy of opposing coalitions and legislation concerning the fictitious depictions of sexual violence in Japan (Ferraz Ribeiro, 2020), why policy brokers and negotiations between opposing coalitions were key to pension reform in South Korea (Lee and Jung, 2018), and why a civic group turned into an advocacy coalition to increase food security in Ohio, US (Clark, 2018). The ACF has also been used to describe how external events, such as invasions, and strong policy entrepreneurs have led to unusual military effectiveness and sophistication in the United Arab Emirates military (Roberts, 2020). Similarly, in the wake of nuclear disasters as external events, such as the 1979 Three Mile Accident and Chernobyl in 1986, coalition stability and beliefs and political learning were important to drive policy change regarding nuclear energy policy in Sweden (Nohrstedt, 2010). The ACF also offers an efficient framework to explain continuity and change in foreign policy, such as the US nuclear diplomacy with Iran via coalitions (Lantis, 2019).

Lastly, and more relevant to this research, environmental applications of the ACF are globally abundant and have ranged from forest policies (Elliott and Schlaepfer, 2010; Anderson and Maclean, 2015; Manuschevich and Beier, 2016; Wilkes-Allemann et al., 2020), to water quality policies such as those that manage acid mine drainage management, and related environmental and conservation policies (Capelari et al., 2020; Koebele, 2020; Lovrić et al., 2018), to an ever increasing literature concerning climate change policy (Aamodt and Stensdal, 2017; Wellstead, 2017; Wagner and Ylä-Anttila, 2018). Broadly, these studies have looked at how policies can be implemented and the role advocacy coalitions play in the management of natural resources and driving policy change.

Most relevant to this case study, the ACF has also been used to assess marine policy, coral reef management, and sustainable development. Papers on the California Marine Protected Area policy found that stakeholders with scientific management preferences supported empirical claims about the benefits of the marine protected area, while stakeholders with pro-collaborative preferences supported local knowledge and an analytical approach to preventing adverse fishing practices (Weible et al., 2004). Further studies on the California Marine Protected Area found that shared beliefs subsystems were the best predictor for ally-networks and coordination among coalitions in a collaborative and multi-stakeholder policy such as the marine protected area policy (Weible and Sabatier, 2005; Weible and Sabatier, 2005). On a global scale, it was found that scientific evidence driving marine protected area policies is patchy and marine protected area regulations are often based on assumptions such as the precautionary principle or moral commitments (Caveen et al., 2012). In collaborative marine aquaculture governance in the US, scientific uncertainty led to greater knowledge acquisition among stakeholders and improved collaboration between coalitions that led to changing belief systems (Leach et al., 2014; Siddiki and Goel, 2015). External disturbances, such as new team members and changes to a political administration, can place risks on formerly efficient teams to implement regulations and mitigation policies for marine protected species, such as the harbor porpoise (McDonald and Rigling Gallagher, 2015). A paper on coastal and marine conservation policy in Sweden confirmed that the four pathways (external events, internal events, negotiated agreements, and policy-oriented learning) proposed by the ACF all played a role in policy change and was also influenced by beliefs between opposing coalitions (Sandström et al., 2020).

Very few papers have applied the ACF directly to coral reef policy and policy for major coastal infrastructure projects like ports. One paper by Fidelman et al. (2014) studied the convergence of policy beliefs of the nascent and collaborative Coral Reef Triangle Initiative in Southeast Asia to help determine the long-term sustainability of this regional-scale initiative. They found that presently, there was general policy belief convergence to mitigate threats on coral reefs. However, the authors warned that specifying policy beliefs might lead to conflicts, such as unilateral prioritization over local priorities. Finally, they suggest that a policy negotiator

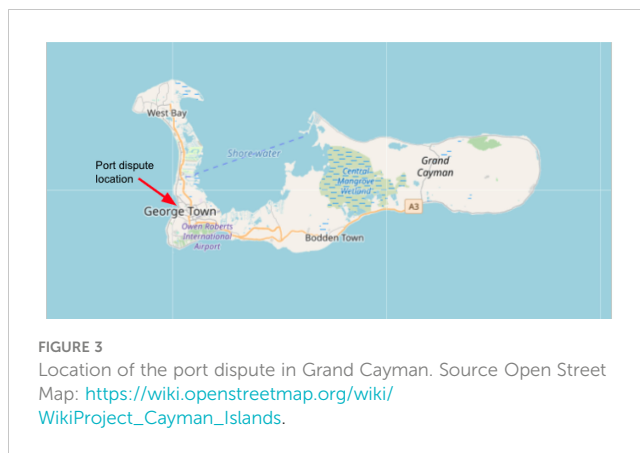
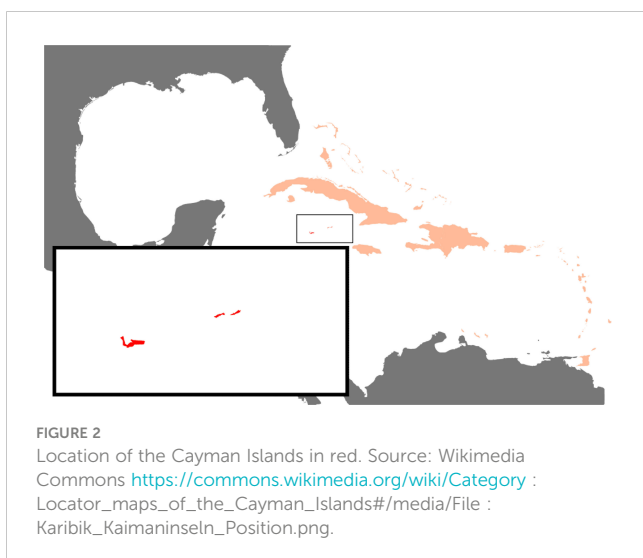
could be beneficial to gain trust and consensus among various stakeholders. A study on port governance proposed three policy core beliefs that guide port governance and identified eight types of governing coalitions and their link to port efficiency (de Oliveira et al., 2021). Out of the eight types of coalitions, authors found that port governance in the form of decentralized governing coalitions are the highest performing ports.

Applications of the ACF to sustainable development have primarily involved environmentally focused minority coalitions advocating for a more sustainable form of development, a dynamic which is similar to this case study. In Sweden, an area was turned into a nature preserve rather than a developed lot due to the strong value-based commitment, extensive network, and personal relations across actors of the ornithologist coalition influencing interactions with competing coalitions. In China, a news media outlet was able to influence top officials to redirect the redevelopment of Enning Road, an area of significant cultural heritage, from a property-focused to a conservation-focused development project (Lee, 2016). In India, coalitions, primarily environmentally focused, were able to stop the development of a dam after 75 years of planning and against the wishes of prominent national actors. The India study indicated that discourse coalitions, defined as coalitions based on storylines that desire similar conclusions, allowed policy actors to communicate and rescale the conflict on local, national, and global levels to increase values, connections, and resources (Somokanta et al., 2021).

2 Materials and methods

The case study site for this research is the proposed cruise berthing facility project in the Cayman Islands. Figure 2. Illustrates the location of the Cayman Islands, with Figure 3 indicating the location of the proposed port expansion project.

This site was selected due to the on-going environmental dispute that arose between two coalitions beginning in 2013. The dispute focused on the potential economic benefits versus potential environmental impacts, where both coalitions ran campaigns that



pushed their policy beliefs to persuade the public. This research was a critical case study, as described by Yin (2018), due to the ability to gain in-depth and contextual insights over a complex and contemporary issue. Researchers performed desk research and collected data from local Caymanian newspapers to determine that the case study qualified as an environmental dispute.

Employing the ACF as a guide, a qualitative approach for content analysis was used, wherein key patterns and themes were deduced via coding processes as outlined in Saldana (2016). The patterns of information were based on concepts from the ACF including *policy beliefs* (subdivided into policy core beliefs and secondary beliefs) and *coalitions* (subdivided into resources and coordination). Definitions and examples for when text would receive these codes are outlined in Appendix B., with a presence or absence style of coding applied across news articles reviewed for this study.

A total of 420 news articles were collected as the data for this paper from the two most important Caymanian newspapers: *The Cayman News Service* and *The Cayman Compass*. Newspaper sources were chosen because the port project overtook national headlines for 7 years with stories running daily for weeks at a time between 2018 and 2019. While many articles were neutral, *The Cayman News Service* emphasized the views of and expressed support for the anti-port coalition, while *The Cayman Compass* generally supported the pro-port coalition. The earliest article was dated on June 8, 2015 and the latest on September 9, 2021. $n=308$ articles exist under the tag “cruise dock facility” in *The Cayman News Service*, of which $n=283$ were included. $n=201$ articles are found under the “Port Vote 2019” issue in *The Cayman Compass*, of which $n=137$ were included. Those that were excluded often repeated a prior article and did not give new information.

Articles were coded using a codebook in Appendix B (see Table 1). The structural coding methodology was used, in which the researcher codes the data according to components of a theoretical framework (Elo and Kyngas, 2008; Saldana, 2016). Structural coding enables the researcher to take a larger data-set, such as a collection of newspaper articles, and break them down into smaller components for further analysis. In this case, the theory relevant concepts that were coded for included coalition members, policy beliefs (primary and secondary), coalition resources, and coalition strategies.

TABLE 1 Data collection summary.

	Tag/Keyword	Number of Articles	Date Range
The Cayman News Services	“Cruise dock facility”	283	June 2015- September 2021
The Cayman Compass	“Port Vote 2019”	137	February 2016- April 2021
Total		420	June 2015- September 2021

3 Results

3.1 Members

Members in an advocacy coalition include policy actors that attempt to sway or maintain the policy subsystem, in this case the cruise berthing facility project. The pro-port Support Our Tourism consisted of four main actors: 1) elected leaders, 2) appointed officials, 3) private sector firms from the cruise industry and sectors associated with the construction of the project, and 4) tourism and retail firms. Government officials such as the Premier occupied the most noteworthy roles along with executives of multinational corporations such as Royal Caribbean Cruises, a member of the Verdant Isle Port Partners consortium, along with construction companies and engineering firms. Several major luxury waterfront shops,⁵ including those located in areas frequented by cruise ship passengers, supported the project. While the majority of scientists were in the opposing coalition, there were scientists whose NGOs were promised contracts to mitigate damage from the project. Construction firms, coral mitigation consultants, and some elected and appointed officials held substantial financial interests in the project's success.

The anti-project coalition consisted of five groups including 1) local NGOs, 2) elected political leaders from the opposition party, 3) youth/students, 4) domestic and international scientists, and 5) local businesses that were concerned about potential environmental impacts. Leaders in CPR Cayman collected signatures from 25% of eligible Caymanian voters to trigger the first ever people's-initiated referendum. The National Trust of the Cayman Islands, an NGO with statutory authority to protect the environment and cultural heritage, was the leading organization, alongside several prominent members of the public who volunteered their time to lead the coalition.

3.2 Policy beliefs

Coalition members have core policy beliefs, based on social values or desired solutions, and secondary policy beliefs, which address the means to achieving their core policy beliefs. Two

diverging policy beliefs were identified and depicted in Figures 4, 5 below. For both coalitions, primary policy beliefs focused on costs (emphasized by the anti-port coalition) or benefits (emphasized by the pro-port coalition). Secondary policy beliefs focused entirely on public messaging on three topics: 1) scientific uncertainty over environmental mitigation; 2) the nature of risk-free public financing; and 3) whether a referendum was the proper political process.

The pro-port coalition's core policy belief was that benefits, mainly economic growth, outweighed potential environmental impacts. Pro-port stakeholders emphasized three main benefits that the project would bring to the Cayman Islands: 1) staying competitive in the cruise industry; 2) job protection and creation; and 3) enhanced safety. Pro-port stakeholders believed that the cruise sector would decline significantly without new facilities, a genuine concern because some cruise lines publicly announced that they would remove locations without berthing facilities from their itineraries. The pro-port coalition believed the project would protect over 4,600 jobs currently associated with the cruise industry and create hundreds more such as laborers, electricians, planners, engineers, foremen. Furthermore, removing the tender boat experience was framed as a safety issue.

Secondary policy beliefs of the pro-port coalition emphasized 1) the risk-free financial model to pay for the improvements; 2) novel scientific mitigation efforts to restore damaged coral reefs; and 3) there being no need for the referendum. Due to the initial investment from Verdant Isle Port Partners to finance the US \$240 million project, they claimed that it was a risk-free project. The Cayman Islands Government would just have to surrender US \$2.32 from their passenger fees to repay their investment and obtain

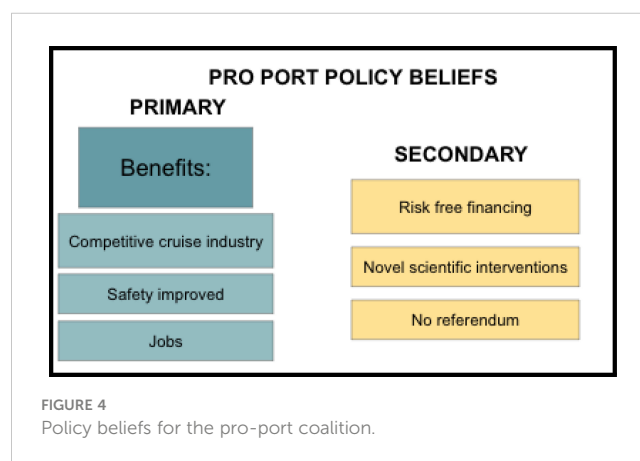


FIGURE 4 Policy beliefs for the pro-port coalition.

⁵ Waterfront shops supportive of the projects included the Freeport Jewellery and Duty free outlets, Sunsplash Watersports, Tortuga Rum Company, De Medicine Man retail outlet, and the Cayman Turtle Farm.

ownership after 25 years.⁶ Pro-project stakeholders further claimed that passenger numbers would increase from 1.9 million to 2.5 million annually, meaning an increase in US\$1.5 million in government revenue annually.

An additional secondary policy belief included the use of novel scientific interventions to restore damaged coral reefs, with supporters ensuring the public that the benefits gained from the project would lead to minimal costs since new ways to mitigate or restore damaged reefs were possible. These interventions, led by scientists and NGOs formed for this purpose, included placing and monitoring silt curtains during dredging to minimize the spread of sediment, relocating the Balboa wreck piece by piece, and transplanting all impacted corals to another location. Furthermore, Verdant Isle Port Partners pledged to increase the current coral cover and diversity for all corals, and then later, by ten-fold through the process of coral fragmentation and restoration.⁷

The pro-port coalition did not believe that a referendum was a necessary political process, stating that the berthing project had been in the works for over a decade. Furthermore, the Premier had promoted building the cruise berthing facilities during his election campaign, arguing that the election was sufficient to demonstrate public support. When the Cayman Islands Government acknowledged that a people's-initiated referendum had been triggered, they sought to provide a referendum as quickly as possible to not delay the project.

Policy beliefs for the pro-port and anti-port coalitions are depicted in Figures 4, 5.

Anti-port stakeholders' primary policy belief was that the potential environmental and social costs would threaten tourism and Caymanian way of life. Following the 2015 environmental impact assessment's determination that 15 acres of coral reefs would be directly impacted, a later design was proposed to decrease environmental impact by 20%. However, a comprehensive environmental impact assessment of the new design was never completed, which the anti-port coalition argued was illegal.

Beyond the direct impact to reef habitat, the anti-port coalition emphasized additional environmental impacts that growth to the cruise sector may bring with it. Tourist and hotel operators as well as tender boat businesses⁸ highlighted the risks of overcrowding popular destinations, such as Stingray City and Seven Mile Beach, compromising the safety of visitors and local lifestyle. Hotel operators cited a potential loss of the pristine beaches (due to

erosion from removed reefs) that make up the exclusive experience that Cayman is reputed for, thereby losing long-term economic revenue. Tender boat businesses emphasized their role as a long-standing culturally important business for the Cayman Islands.

The anti-port coalition questioned whether the economic benefits of the project were certain, noting that while the cruise industry makes up 80% of the tourism sector, it contributes less than 30% of tourism revenue. Whereas, *stay-over* passengers, or tourists who fly in and stay overnight, only make up 20% of tourists but contribute over 70% of revenue generated by the tourism sector. Some anti-port stakeholders argued that decreasing cruise passenger numbers could lead to an improved and more sustainable tourism sector for the Cayman Islands. Anti-port stakeholders publicly pointed out that the environmental impact assessment conducted in 2015 stated there would be a direct loss of US\$9-10.5 million annually from associated jobs due to the destruction of coral reefs and historic wrecks, borne by the tourism industry. They also emphasized the possible loss of jobs from the tender businesses, as well as the waterfront shops and restaurants that would have to close during construction. Some stakeholders believed the loss would accumulate to US\$407-670 million over 25 years.

Secondary policy beliefs included publicly emphasizing the scientific uncertainties on the proposed solutions to mitigate reef damage; raising questions about the risk-free financial model; and social organizing to ensure a fair referendum. The anti-port coalition was concerned with the proposed novel scientific interventions for mitigation, mainly coral replanting efforts, arguing that restoration at the scale proposed by the pro-port coalition had never been done before.

Anti-port stakeholders held public meetings, posted information on social media, conducted radio engagements, and wrote in the press that presenting coral restoration as a solution to project damages was a gamble at best given the large amount of scientific uncertainty. They also argued that it was green washing at worst—overpromising the ability of coral restoration, a technology still in its early days, when implemented at large scales to offset intentional damage. Leaders in this coalition also asked who would be held responsible if restoration and replanting projects failed? Caymanian law and the risk-free financing models did not provide an answer to this question. Furthermore, if there is no set method at this scale to determine if a restoration project has worked, anti-port coalition members asked, how will people know?

The anti-port coalition also communicated to the public doubts about the supposedly risk-free financial model. They emphasized that surrendering \$2.32 per passenger head translates to a direct loss of \$4.4 million of government revenue. Furthermore, economic benefits from building the cruise berthing facility were highly contingent on cruise passenger numbers increasing, which was not guaranteed, a prescient prediction which was later realized with the COVID-19 pandemic ending all cruise tourism for years. Considering the port project would be one of the most expensive projects the Cayman Islands would ever undertake, the anti-port coalition believed greater transparency and information from the government as well as enhanced opportunity for public input was merited. They wanted greater certainty of the costs and the benefits, suspecting that economic benefits would narrowly accrue to certain

6 The Cayman Islands Government collects three types of fees from each cruise passenger including 1) a departure fee (US\$7.32), 2) Port Authority fee (US\$3.00) and an Environmental Protection fee (US\$1.90-3.90) for a total of US\$12.27 per cruise passenger. The US\$2.32 deduction of fees to finance the project would come from the departure fee (Klein, 2019).

7 This is a technique that uses the process of coral micro-fragmentation. This helps promote coral growth that is 25-40 faster than their natural growth rate. Once fragmented, these small fragments are outplanted and placed onto the reef to let them grow (Forsman et al., 2015).

8 Local businesses that were concerned with the project included the largest tender boat operator, Caribbean Marine Services, Cayman's highest end hotel, the Ritz-Carlton, and popular beach bar, Calico Jack.

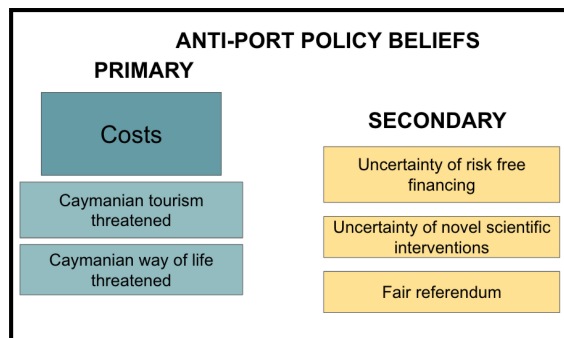


FIGURE 5
Policy beliefs for the anti-port coalition.

interest groups, businesses, and cruise lines. They also wanted greater clarity on the transparency of the economic burden the Cayman Islands would have to bear, the environmental impacts of the newly proposed project, and greater assurance that it would bring the claimed benefits. The anti-port coalition cited failures of similar projects and impacts in locations like Jamaica and Florida where coral relocation efforts had questionable long term results, as well as a decrease of cruise ship arrivals after having built berthing facilities.

The anti-port coalition believed that triggering a people's-initiated referendum through a vast social organizing process orchestrated by volunteers was the only way to have the voices of Caymanians heard, as well as get the information they sought. The Cayman Islands Government scheduled it for December 19, 2019 while also drafting the wording of the question. Despite the success in triggering the referendum, the anti-port coalition did not believe that the wording of the question or the date was fair. First, they believed that the public still did not have sufficient information regarding the environmental impact and financial consequences of the project to make an informed decision. Second, they thought the question should not include anything about the cargo expansion as the referendum was exclusively about the cruise berthing facility. Third, they also thought that the question was biased by portraying the project as an enhancement and inherent benefit^{9, 10, 11}. Fourth, the date was set too close to the Christmas holidays, resulting in

9 The original wording of the referendum question was, "Should the Cayman Islands continue to move forward with building the cruise berthing and enhanced cargo port facility?" Due to protests from the anti-port coalition, the government revised the question to read as, "Should the Cayman Islands continue to proceed with building the cruise berthing and enlarged and refurbished cargo port facility?" (Cayman News Service 2020).

10 The Conference of the Parties is the decision-making body for the Convention. All Parties that signed the Convention on Biological Diversity are represented. Together they review and promote the implementation of action plans and convene annually.

11 The Marine Conservation Board consists of nine members appointed by the Governor, three of which need to be residents of Cayman Brac or Little Cayman (Marine Conservation Law, 1978).

many voters being abroad and unable to vote. Table 2 below summarizes policy beliefs across both coalitions.

3.3 Resources

According to the ACF, coalition resources include leadership and financial funds (Jenkins-Smith et al., 2018). Leadership for the pro-port coalition included the highest ranking Caymanian politician, the Premier and his government (e.g. cabinet members), executives from multinational cruise companies, and executives from other firms benefiting from the contract. Leadership for the anti-port coalition included several prominent attorneys with an environmental activism focus, senior leadership of the National Trust of the Cayman Islands, several high level bureaucrats from the natural resource agencies of the government, students, several well-known journalists, and scientists. Scientists provided leadership for both coalitions, with scientists funded to perform mitigation through their NGOs supporting the project, and external observer scientists generally opposing the project.

Financial expenditures from both coalitions varied. Due to several freedom of information requests from the anti-port coalition members, the pro-port coalition revealed that they spent over \$130,000 of public (tax payer) money on promotional materials including paid advertisements, radio-time, campaign videos and public relation hires. Part of this money included a \$30,000 contract hire with a local marketing firm to create and manage the Support Our Tourism website and Facebook page and other promotional materials. Over \$80,000 was also dedicated to another local marketing firm for further promotional materials. In addition to the \$130,000, it was uncovered that the Cayman Islands government had run over 4,300 radio ads at no-charge amounting to a value worth over \$87,000. The anti-port coalition also pointed out that another \$21,000 was spent on town halls and stakeholder meetings promoting the project, totaling to over \$230,000 of public money spent. The Premier maintained that it was within their right to use public money to promote a government-supported project.

In October 2019, the anti-port coalition disclosed spending approximately \$12,000 on promotional material costs such as radio and television advertisements, with funds coming from donations. Non-monetary donations included free airtime on radio shows (the

TABLE 2 Summary of pro-project and anti-project coalition policy beliefs ascertained through qualitative coding.

	Pro-project coalition arguments	Anti-project coalition arguments
Primary Policy Beliefs: Benefits/costs		
Economic growth	Cruise berthing facility project will allow the Cayman Islands to stay competitive in the cruise industry and grow the cruise sector; more cruise passengers and time on the island will lead to greater spending.	There is no guarantee that building the cruise berthing facility will increase cruise passengers from 1.9 million to 2.5 million; over 70% of Caymanian tourism dollars come from overnight stays and not from cruise passengers.
Job opportunities	The project will protect over 4,600 jobs currently tied to the cruise industry and provide hundreds of new jobs	There is unguaranteed local job creation and unaccounted job loss due to construction and loss of reefs for tourism opportunities in the future.
Tendering	Tendering presents an unnecessary safety risk and cannot accommodate the next generation of large size cruise ships	There will be a loss of important tender boat businesses that are culturally important to the Cayman Islands, and most cruise passengers enjoy the experience
Environmental impact	The project will only affect 1% of reefs found on Grand Cayman.	The environmental impact and future consequences are uncertain; the reefs and historic wrecks at risk are culturally and ecologically important; the project violates Caymanian environmental laws and policies
Secondary Policy Beliefs: Public engagement on the financial model, environmental mitigation, promotion or rejection of the referendum		
Financial model	This project is funded by a unique model that allows a risk-free and Cayman-owned cruise berthing facility and enhanced cargo facility.	This is not a risk-free model as the Cayman Islands will be giving up \$2.32 tax per cruise passenger until the project is repaid.
Mitigation efforts	Rigorous and beneficial 1:1 coral mitigation and even 10:1 coral mitigation program is possible as is the relocation of historic wrecks.	Coral restoration at this scale has not been done before and success is highly variable.
Sustainable tourism	The Cayman Port Authority will manage and schedule incoming cruise ships allowing for cruise passenger numbers to be better spaced out than they are now.	Tourism hotspots such as Stingray City are already overcrowded and the Cayman Islands is already at its capacity; there is no need to increase cruise passenger numbers.
Referendum	The referendum seeks to cancel the port project which is unjust because the current Premier was elected while promising the project.	The referendum seeks to have the voice of Caymanians heard; the wording of the question and date set by the Cayman Islands Government is unconstitutional.

amount was not revealed) as well as two public education boat tours sponsored by the National Trust to show passengers the reefs that would be impacted by the project. While the anti-port coalition did not disclose individual donors, they stated that their largest single donation was \$20,000. Dive-shop owners using their personal funds also revealed they had donated to the anti-port campaign, for a total contribution of approximately \$100,000 total. On top of these donations, the campaign worked to fundraise \$125,000 primarily to cover legal costs to challenge the Cayman Islands Government in court over the referendum process, wording of the question, and date.

3.4 Strategies

In the ACF, strategy describes how coalitions and members can engage at different levels of coordination. Weak forms of coordination include sharing information while stronger forms include collective planning and implementation (Jenkins-Smith et al., 2018). Just over twenty percent of the articles analyzed (90 out of 420, 21%) described forms of coordination that the coalitions engaged in. Further breakdown showed that 84% of those articles (76 out of 90) were associated with anti-port coalition activities while only 16% were associated with pro-port coalition activities (14 out of 90). This suggested that while superior resources were held by the pro-port coalition, a focus on strategy was a core strength of the anti-port coalition, which ultimately led to the triggering of the referendum.

In the pro-port coalition, sharing information using taxpayer funds was the primary form of coordination. This was

accomplished through the social media outlets and websites managed by the marketing firm hired by the Cayman Islands Government. Sharing information also included newspaper interviews with key pro-port stakeholders, radio-talk and television appearances, cinema advertisements, and press conferences. Coordinated activities included two public meetings, one in 2015 when the environmental impact assessment was published and another in 2018 as well as a few other interspersed meetings with select stakeholders. Once the preferred bidder was announced in 2019, a series of open town halls were held. In town halls, questions had to be written on an index card and were selected by government officials, no open question and answer sessions were held. Two events including one career fair and a Christmas-themed social held by financial backers, such as Royal Caribbean, Carnival Cruises, and Disney were representative of strategy: using government resources to emphasize potential economic benefits. Local businesses in support of the cruise berthing project started their own campaign called “Cayman’s Port. Cayman’s Future.” Their coordination strategy was mainly sharing information via a Facebook page, Youtube videos, and written opinion pieces published in local newspapers.

The anti-port coalition relied on high levels of coordination among members. Sharing information, planning, volunteering, and execution were essential for the success of the anti-port coalition. Similarly to the pro-port coalition, sharing information included ads and promotional material via social media and website platforms, interviews, radio shows, opinion pieces, and presentations. The process of collecting over 5,200 signatures to

trigger a referendum was achieved over nine months by volunteers pooling their resources together, going door-to-door, and setting up tables to collect signatures on the weekends. Members also organized an online petition that collected over 30,000 signatures worldwide, peaceful local protests, open panel discussions bringing various environmental groups, scientists, and other stakeholders together, and hosted a series of community meetings and events for the public to become involved. Other events included a Christmas rally including presentations and a solidarity swim on one of the threatened reefs. Attendance of meetings and events varied from 100 to 1000 people creating momentum for the campaign.

Anti-port coalition members mentioned that they had never seen the community come together like this before. Anti-project stakeholders also appealed to people who disagreed with them on the environmental dispute arguing that all Caymanians should want more transparency on the cruise berthing facility project, even if this ultimately led to the project succeeding. The people's-initiated referendum placed the issue of voting and constitutional rights in the public discourse, imploring citizens to become involved. Another anti-port stakeholder stated that triggering the referendum changed how Caymanians view governance by demonstrating that people can create change. Although the anti-port coalition faced a much more powerful and well resourced coalition, its strategy through information sharing, ensuring high levels of involvement from volunteers, and engagement by the public led to policy change in the form of the referendum.

4 Discussion

This study uses the ACF to conduct an evaluation of an environmental dispute, closely examining the biodiversity conservation policy subsystem and its members, policy beliefs, resources, and strategies. Similar studies, like Weible, 2007's work on California Marine Protected Areas (MPAs) and the ACF showed that although coalitions disagreed on specifics, there were general points on which they agreed (e.g. MPAs are useful for protecting marine ecosystems). Our work finds this to be a point of difference. In our Cayman case, there is no agreement to be found other than a general belief that tourism is important to the Cayman Islands, but with ideas on how to manage tourism in a sustainable way a major source of disagreement.

In terms of presenting a vision for future Caymanian tourism, two competing realities are present, especially where the science is concerned. For example, on one side, the pro-port coalition argued that the project should go on to modernize cruise tourism, but with 1:1 mitigation (e.g. for every coral that was lost, one would be replanted), ultimately promising 10:1 mitigation in later public meetings. In public meetings and radio ads, the anti-port coalition publicized the work of a scientist claiming that his NGO can undo the damages done to coral with novel restoration methods. On the other side, the anti-port coalition pointed out that coral restoration cannot yet do what its advocates were promising, as its success has been highly varied, with no standardized way to measure and monitor successful replanting efforts, and with fewer than 5% of existing studies monitoring

success of restoration for more than 5 years (Hein et al., 2017). Likewise, replanting coral is only one area of uncertainty, impacts to communities of fish and other reef organisms remain understudied and somewhat poorly understood (Seraphim et al., 2020). Finally, reef restoration may work when other options have run out, as in a case where a vessel runs aground on a reef and extensive repairs are the only option. Reef restoration has never been attempted at such a large scale when other options, such as locating the project in an area without reefs (e.g. a "no build" option), are possible.

This case illustrates a dispute where competing versions of reality are secondary policy beliefs of coalitions, where different sets of facts, and indeed, different "science" is presented by both coalitions. In West and Bergstrom's recent article on misinformation in science, they argue that misinformation is at a crisis point, defining misinformation as undermining a process where humans learn about the world (2020). They argue that data plays an increasingly important role in decision-making and public communication, but these data can be cherry-picked and misrepresented to pursue an agenda. In our case, the pro-port coalition did not disclose to the public that coral replanting technology at the planned scale was still in its infancy, with best practices for coral restoration only established by the United Nations in 2019. Likewise, best practices for restoration are aimed largely at responding to the devastation of climate change and other stressors, not as a voluntary choice to accommodate the cruise industry. Hein et al. reviewed 83 peer reviewed studies of coral transplantation finding that in 53% of studies, survival of coral was only monitored for one year or less, with only 5% of studies monitoring corals for 5 years or more (2017). This lack of long term survival data for transplanted coral means that transplanting *can* be an option to respond to degradation, but that its high uncertainty, risks, and its status as an emerging technology should be described transparently to the public. The pro-port coalition in our case instead portrayed replanting as a simple and effective solution with uncertainty never mentioned.

Similarly, the pro-port coalition argued that the original environmental impact assessment for a 2015 version of the project, was sufficient for analyzing social and environmental impacts, whereas the anti-port coalition argued that a new project redesign required a new environmental impact assessment by Caymanian law, citing the 2001 Cayman Islands Environment Charter which ensures that natural resources are extracted sustainably and that the risks and benefits are assessed before any project with an environmental impact proceeds. Additionally, Part I of the Cayman Islands Constitution says it is the government's job to limit ecological degradation, promote conservation, and sustainable development for uses like tourism (Duning, 2021). The National Conservation Law (Law 24 of 2013) explicitly protects coral and bans the destruction of reef species. While other literature has shown the pitfalls of environmental impacts either legalizing prior decisions that have already been made, or ignoring significant impacts (Fearnside, 2015), our work shows that without an opposing coalition in an environmental dispute, powerful leaders in government and multinational executives (acting in the name of personal financial interests) will try and avoid engaging in the environmental impact assessment process at all. Both the uncertainty around coral mitigation and insisting on an accurate and up to date version of the environmental

impact assessment show the important role that coalitions play in transparency and accountability in policy-making.

The majority of ACF research focuses on policy change, beliefs, and coalition membership (Weible, 2007). Our research sheds light on an underutilized component of the ACF: relative power of the two coalitions, with insights gained from our coding work on the concepts of *members* and *resources*. Members of the pro-port coalition include prominent executives from the cruise industry, with global revenue over \$25 billion in 2023 (Statista, 2016). Likewise, the highest ranking elected official and his cabinet used \$230,000 of taxpayer money to finance their campaign in support of this project. Contrast this with the anti-port coalition made up of NGOs, scientists, youth/students, and volunteers donating time and personal funds to enact the first referendum and ensure challenges in the courts to ensure a fair referendum. What our case shows is that strategy, in the case of the anti-port coalition, has the power to be more impactful than power created by differences in resources. However, our research suggests that this may only be possible due to the formidable economy and educated populace within the Cayman Islands, and less possible in places with fewer resources in emerging market economies. The case we present shows how multinational corporations and powerful politicians can join a single coalition to try and control public discourse, circumvent biodiversity conservation laws, and use taxpayer money to do so. In this case, members of the public successfully organized to delay this project for now, but similar projects are increasing worldwide, meaning understanding the dynamic of similar coalitions will be essential for biodiversity conservation.

Data availability statement

The datasets presented in this article are not readily available because Currently being used for additional publications. Will be available by 2025. Requests to access the datasets should be directed to khd@auburn.edu.

References

- Aamodt, S., and Stensdal, I. (2017). Seizing policy windows: Policy Influence of climate advocacy coalitions in Brazil, China, and India, 2000–2015. *Global Environmental Change* 46, 114–125. doi: 10.1016/j.gloenvcha.2017.08.006
- Anderson, W. F. A., and Maclean, D. A. (2015). Public forest policy development in new Brunswick, Canada: Multiple streams approach, advocacy coalition framework, and the role of science. *Ecol. Soc.* 20 (4). doi: 10.5751/ES-07795-200420
- Capelari, M. G. M., de Araújo, S. M. V. G., Calmon, P. C. D. P., and Borinelli, B. (2020). Large-scale environmental policy change: analysis of the Brazilian reality. *Rev. Administração Pública* 54 (6), 1691–1710. doi: 10.1590/0034-761220190445X
- Caveen, A. J., Gray, T. S., Stead, S. M., and Polunin, N. V. C. (2012). *MPA policy: What lies behind the science?* *Marine Policy* 37 (2013), 3–10. doi: 10.1016/j.marpol.2012.04.005
- Cayman Islands Constitution. (2009). Available at: <https://legislation.gov.ky/cms/legislation/constitution/current.html>.
- Clark, J. K. (2018). From civic group to advocacy coalition: using a food policy audit as a tool for change. *J. Agricult. Food Sys. Community Dev.* 8 (1), 1–18. doi: 10.5304/JAFSCD.2018.081.004
- de Oliveira, H. C., You, J., and Coelho, A. P. (2021). Governing coalitions and key performance indicators of port governance. *Maritime Transport Res.* 2 (May), 100023. doi: 10.1016/j.martra.2021.100023
- Dunning, K. H. (2021). Adaptive Governance: The proposed port expansion in the Cayman Islands and its impacts to coral reefs. *Marine Policy* 124, 104248.
- Elliott, C., and Schlaepfer, R. (2010). The advocacy coalition framework: application to the policy process for the development of forest certification in Sweden. *J. Eur. Public Policy* 8(4), 642–661. doi: 10.1080/13501760110064438
- Elo, S., and Kyngas, H. (2008). The qualitative content analysis process. *J. Adv. Nurs.* 62, 107–115. doi: 10.1111/j.1365-2648.2007.04569.x
- Fearnside, P. M. (2015). Brazil's São Luiz do Tapajós dam: the art of cosmetic environmental impact assessments. *Water Alternatives* 8 (3).
- Ferraz Ribeiro, D. R. (2020). An advocacy coalition analysis of the game Rapelay: The regulation of sexual violence and virtual pornography in Japan. *Civitas* 20 (3), 454–463. doi: 10.15448/1984-7289.2020.2.30279
- Fidelman, P., Evans, L. S., Foale, S., Weible, C., von Heland, F., and Elgin, D. (2014). Coalition cohesion for regional marine governance: A stakeholder analysis of the Coral

Author contributions

SB made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work as well as and drafting the work or revising it critically for important intellectual content. DM made substantial contributions analyzing data and drafting the work or revising it critically for important intellectual content. KD made substantial contributions to the conception or design of the work, the interpretation of data for the work, and drafting the work or revising it critically for important intellectual content. All authors contributed to the article and approved the submitted version.

Funding

Grants and grant numbers: NOAA Climate Programs Office Grant 202281-145001-2000.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

- Triangle Initiative. *Ocean Coast. Manage.* 95, 117–128. doi: 10.1016/j.ocecoaman.2014.04.001
- Forsman, Z. H., Page, C. A., Toonen, R. J., and Vaughan, D. (2015). Growing coral larger and faster: micro-colony-fusion as a strategy for accelerating coral cover. *PeerJ*. doi: 10.7717/peerj.1313
- Harris, J. (2019). Advocacy coalitions and the transfer of nutrition policy to Zambia. *Health Policy Plann.* 34 (3), 207–215. doi: 10.1093/HEAPOL/CZZ024
- Habitat Action Plan. (2009). *Department of the Environment*. Available at: <https://cnslibrary.com/wp-content/uploads/Cayman-Islands-National-Biodiversity-Action-Plan-2009.pdf>.
- Hein, M. Y., Willis, B. L., Beeden, R., and Birtles, A. (2017). The need for broader ecological and socioeconomic tools to evaluate the effectiveness of coral restoration programs. *Restor. Ecol.* 25 (6), 873–883. doi: 10.1111/rec.12580
- International Coral Reef Initiative. (2019). *Caribbean Factsheet*. Available at: https://icriforum.org/wp-content/uploads/2019/12/ICRI_Sweden-Caribbean%20_Factsheet_0.pdf.
- Jenkins-Smith, H. C., Nohrstedt, D., Weible, C. M., and Ingold, K. (2018). The advocacy coalition framework: an overview of the research program. *Theories Policy Process*, 135–171. doi: 10.4324/9780429494284-5
- Kershaw, P., Swanson, E., and Stucchi, A. (2017). A surgical intervention for the body politic: Generation Squeeze applies the Advocacy Coalition Framework to social determinants of health knowledge translation. *Can. J. Public Health* 108 (2), 199–204. doi: 10.17269/CJPH.108.5881
- Kim, S. (2003). Irresolvable cultural conflicts and conservation/development arguments: Analysis of Korea's Saemangeum project. *Policy Sci.* 36 (2), 125–149. doi: 10.1023/A:1024866323901
- Klein, M. (2019). *Financing model analysis: Who is paying for the cruise berthing facility?* (Cayman Compass). Available at: <https://www.caymancompass.com/2019/11/25/financing-model-analysis-who-is-paying-for-the-cruise-berthing-facility/>.
- Koebele, E. A. (2020). Cross-coalition coordination in collaborative environmental governance processes. *Policy Studies Journal* 48 (3), 727–753.
- Lantis, J. S. (2019). “Winning” and “Losing” the Iran nuclear deal: how advocacy coalitions and competition shape U.S. Foreign policy. *Politics Policy* 47 (3), 464–505. doi: 10.1111/POLP.12299
- Leach, W. D., Weible, C. M., Vince, S. R., Siddiki, S. N., and Calanni, J. C. (2014). Fostering learning through collaboration: Knowledge acquisition and belief change in marine aquaculture partnerships. *J. Public Admin. Res. Theory* 24 (3), 591–622. doi: 10.1093/jopart/mut011
- Lee, A. K. (2016). Heritage conservation and advocacy coalitions: the state-society conflict in the case of the Enning Road redevelopment project in Guangzhou. *Int. J. Heritage Stud.* 22 (9), 729–747. doi: 10.1080/13527258.2016.1195427
- Lee, K., and Jung, K. (2018). Exploring institutional reform of Korean civil service pension: Advocacy coalition framework, policy knowledge and social innovation. *J. Open Innovation: Technol. Market Complex.* 4 (1). doi: 10.1186/s40852-018-0089-0
- Li, W., and Weible, C. M. (2019). China's policy processes and the advocacy coalition framework. *Policy Stud. J.* 0 (0), 1. doi: 10.1111/PSJ.12369
- Li, W., and Wong, W. (2020). Advocacy coalitions, policy stability, and policy change in China: the case of birth control policy 1980–2015. *Policy Stud. J.* 48 (3), 645–671. doi: 10.1111/PSJ.12329
- Lim, H., and Eun, J. (2018). Exploring perceptions of sustainable development in South Korea: an approach based on advocacy coalition framework's belief system. *J. Open Innovation: Technol. Market Complex.* 4 (4), 54. doi: 10.3390/JOITMC4040054
- Lopez, A. M. (2022). “Cayman Islands: cruise passenger arrivals 2018, by age,” in *Statista*. (New York, United States: Statista). Available at: <https://www.statista.com/statistics/1014248/cayman-islands-cruise-passenger-arrivals-age/>.
- Lovrić, M., Lovrić, N., Schraml, U., and Winkel, G. (2018). Implementing Natura 2000 in Croatian forests: An interplay of science, values and interests. *Journal for Nature Conservation*. doi: 10.1016/j.jnc.2018.02.005
- Manuschevich, D., and Beier, C. M. (2016). Simulating land use changes under alternative policy scenarios for conservation of native forests in south-central Chile. *Land Use Policy* 51, 350–362. doi: 10.1016/j.landusepol.2015.08.032
- McDonald, S. L., and Rigling Gallagher, D. (2015). A story about people and porpoises: consensus-based decision making in the shadow of political action. *Environ. Manage.* 56 (4), 814–821. doi: 10.1007/s00267-015-0545-6
- National Conservation Law. (2013). *Supplement No.1 published with Extraordinary Gazette No. 9 dated 5th February, 2014*. Available at: https://doe.ky/wp-content/uploads/2015/01/NationalConservationLaw-Es052014_web.pdf.
- Nohrstedt, D. (2010). Do advocacy coalitions matter? Crisis and change in Swedish nuclear energy policy. *J. Public Admin. Res. Theory* 20 (2), 309–333. doi: 10.1093/jopart/mun038
- Nykiforuk, C. I. J., McGettrick, J. A., Raine, K. D., and Wild, T. C. (2009). Advocacy coalition impacts on healthy public policy-oriented learning in Alberta, Canada, (2009–2016): A difference-in-differences analysis. *Social Science & Medicine*. doi: 10.1016/j.socscimed.2018.10.017
- Park, K., and Weible, C. M. (2017). Developing policy theories in South Korea: lessons from the advocacy coalition framework. *An Emerging Asian Model of Governance and Transnational Knowledge Transfer*. doi: 10.1080/17516234.2017.1412904
- Pierce, J. J., Peterson, H. L., Jones, M. D., Garrard, S. P., and Vu, T. (2017). There and back again: A tale of the advocacy coalition framework. *Policy Stud. J.* 45 (1999), S13–S46. doi: 10.1111/psj.12197
- Resilience Network. (2023). *Status of Coral Reefs*. Available at: <https://reefresilience.org/stressors/reefs-are-at-risk/>.
- Ritter, A., Hughes, C. E., Lancaster, K., and Hoppe, R. (2018). Using the Advocacy Coalition Framework and Multiple Streams policy theories to examine the role of evidence, research and other types of knowledge in drug policy. *Addiction* 113 (8), 1539–1547. doi: 10.1111/add.14197
- Roberts, D. B. (2020). Bucking the trend: The UAE and the development of military capabilities in the Arab world. *Security Studies* 29(2), 301–334. doi: 10.1080/09636412.2020.1722852
- Sabatier, P. A. (1986). Top-down and bottom-up approaches to implementation research: A critical analysis and suggested synthesis. *J. Public Policy* 6 (1), 21–48. doi: 10.1017/S0143814X00003846
- Sabatier, P. A. (1988). An advocacy coalition framework of policy change and the role of policy-oriented learning therein. *Policy Sci.* 21 (2–3), 129–168. doi: 10.1007/BF00136406
- Sabatier, P. A., and Weible, C. M. (2007). “The advocacy coalition framework: Innovations and Clarifications,” in *Theories of the Policy Process, 1st Editio* (Milton Park: Routledge), 32. doi: 10.4337/9781784714871.00020
- Saldana, J. (2016). *The Coding Manual for Qualitative Researchers, 3rd ed* (London: Sage).
- Sandström, A., Morf, A., and Fjellborg, D. (2020). Disputed policy change: the role of events, policy learning, and negotiated agreements. *Policy Stud. J.* 0 (0), 1. doi: 10.1111/PSJ.12411
- Seraphim, M. J., SIoman, K. A., Alexander, M. E., Janetski, N., Jompa, J., Ambo-Rappe, R., et al. (2020). Interactions between coral restoration and fish assemblages: implications for reef management. *J. Fish Biol.* 97 (3), 633–655. doi: 10.1111/jfb.14440
- Siddiki, S., and Goel, S. (2015). A stakeholder analysis of US marine aquaculture partnerships. *Marine Policy* 57 pp. 93–102. doi: 10.1016/j.marpol.2015.03.006
- Somokanta, T., Feitelson, E., and Tubi, A. (2021). *South Asian Dams at a Tipping Point? The Case of Tipaimukh Dam in Manipur, India*. Available at: www.wateralternatives.org.
- Statista. (2016). *Revenue of the cruise industry worldwide from 2017 to 2026 (in billions of U.S. dollars)*. Available at: <https://www.statista.com/forecasts/1258061/revenue-cruises-worldwide>.
- Steinman, L. E., Bradford, V., Quinn, E., Otten, J. J., McNamara, J., Fisher, K., et al. (2017). Examining the Washington State breastfeeding-friendly policy development process using the advocacy coalition framework. *Maternal Child Health J.* 21 (3), 659–669. doi: 10.1007/s10995-016-2154-2
- The National Conservation Law (Law 24 of 2013). (2014). *Extraordinary Gazette No. 9*. Available at: <https://cnslibrary.com/wp-content/uploads/National-Conservation-Law-2013.pdf>
- United Nations. (2018). *Aichi biodiversity targets. Secretariat of the convention on biological diversity*. Available at: <https://www.cbd.int/sp/targets/#GoalD>.
- Wagner, P., and Ylä-Anttila, T. (2018). *Environmental Politics Who got their way? Advocacy coalitions and the Irish climate change law 27(5)*. 872–891. doi: 10.1080/09644016.2018.1458406
- Wang, Y. (2020). Understanding congressional coalitions: A discourse network analysis of congressional hearings for the every student succeeds act. *Educ. Policy Anal. Arch.* 28 (4), 1–34. doi: 10.14507/EPAA.28.4451
- Weible, C. M. (2007). An advocacy coalition framework approach to stakeholder analysis: Understanding the political context of California marine protected area policy. *J. Public Admin. Res. Theory* 17 (1), 95–117.
- Weible, C. M., Ingold, K., Nohrstedt, D., Henry, A. D., and Jenkins-Smith, H. C. (2020). Sharpening advocacy coalitions. *Policy Stud. J.* 48 (4), 1054–1081. doi: 10.1111/PSJ.12360
- Weible, C. M., and Sabatier, P. A. (2005). Comparing policy networks: Marine protected areas in California. *Policy Stud. J.* 33 (2), 181–201. doi: 10.1111/j.1541-0072.2005.00101.x
- Weible, C., Sabatier, P. A., and Lubell, M. (2004). A comparison of a collaborative and top-down approach to the use of science in policy: Establishing marine protected areas in California. *Policy Stud. J.* 32 (2), 187–207. doi: 10.1111/j.1541-0072.2004.00060.x
- Weible, C. M., Sabatier, P. A., and McQueen, K. (2009). Themes and variations: taking stock of the advocacy coalition framework. *Policy Stud. J.* 37 (1). doi: 10.1111/j.1541-0072.2008.00299.x
- Wellstead, A. (2017). Plus ça Change, Plus C'est La Même Chose? A review of Paul Sabatier's “An advocacy coalition framework of policy change and the role of policy-oriented learning therein”. *Policy Sci.* 50 (4), 549–561. doi: 10.1007/s11077-017-9307-z
- Wilkes-Allemann, J., Tschannen, A., and Lieberherr, E. (2020). Policy change and National Forest Programs: a Swiss experience of coalitions, external and internal events. *Scandinavian J. For. Res.* 35 (7), 417–431. doi: 10.1080/02827581.2020.1817540
- Yin, R. K. (2018). “Case Study Research and Applications: Design and Methods,” in *Thousand Oaks, 6th ed* (Thousand Oaks, CA: CA Sage).
- Zhou, X., Li, X., Song, W., Kong, X., and Lu, X. (2021). Farmland transitions in China: An advocacy coalition approach. *Land* 10 (2), 1–20. doi: 10.3390/land10020122

Appendix A

TABLE A.1 International and domestic policies and corresponding governing agencies that protect coral reefs in the Cayman Islands.

Policy/Plan/Law	Agency in Charge	Purpose
International		
Convention on Biological Diversity (1992)	Conference of the Parties ¹⁰	Legally binding international treaty that tasks signatories to develop and implement conservation management plans to preserve species and ecologically important habitat.
Aichi Biodiversity Targets (2011-2020)	Conference of the Parties	Reduce direct pressure on biodiversity, address underlying causes of biodiversity loss across governments, preserve ecosystems, and enhance ecosystem services and biodiversity benefits for all.
Cayman Islands Environment Charter (2001)	Cayman Islands Government and United Kingdom Government	This Charter ensures that the environmental resources are extracted sustainably and used wisely, that the risks and benefits are assessed regarding development projects, that environmental impact assessments are performed prior to development projects, that the government commits to open consultancy and transparency about development projects, that legislation enforces a “polluter-pays” principle, and that natural heritage is passed down generations through education and preservation.
Domestic		
Marine Conservation Law (1978)	Marine Conservation Board ¹¹	The purpose is to preserve the marine environment of the Cayman Islands for future generations. There are different zones, including the Marine Park Zone, which prohibits the taking of any marine life. Violations of these laws result in hefty fines or imprisonment or both.
Cayman Constitution (2009)	Cayman Islands Government	This is the highest order of law in the Cayman Islands. Part I Paragraph 18 outlines that the government should protect the environment for future generations while promoting justified economic development. It should ensure that development is sustainable and limits ecological degradation and promotes conservation.
National Biodiversity Action Plan (2009)	Cayman Islands Department of Environment	The goal of this action plan is to have zero extinction in the Cayman Islands while ensuring the protection of natural resources.
Habitat Action Plan (2009)	Cayman Islands Department of Environment	Attain legislative protection status for all coral reefs, expand marine parks, and oppose developments that result in coral reef loss.
National Conservation Law (2013)	National Conservation Council ¹²	To protect and preserve endemic, endangered, and threatened flora and fauna and their respective habitats and prohibits any development that adversely affects a protected area or priority species such as coral reefs.

Appendix B

TABLE B.1 Advocacy Coalition Framework Codebook used by researchers.

Code	Definition	Inclusion
Policy Beliefs		
Policy core	Policy core beliefs are where an entity stands regarding the policy issue at hand, in this case code for ANTI or PRO project	When the article supports the project, PRO, when article oppose the project, ANTI
Secondary	Secondary beliefs regard the means of achieving the desired policy outcome. This looks at the type of argument an entity uses to support or oppose the project.	When the article mentions something specific why and what their argument is for or against the project
Coalitions		
Resources	Resources and distribution of resources, such as financial resources, is found to be an important source of strength in a coalition.	When the article mentions resources, such as financial, radio/ TV time used by coalitions
Coordination	Coordination refers to how well members of a coalition worked together and shared information and organized events.	When the article mentions the coalition’s coordination/roles among members, sharing information, organizing events

Date	Title	Author	Publisher	URL	Policy Beliefs		Coalitions	
					Core	Secondary	Resources	Coordination
06/08/2015	Reef des NA		CNS	https://ca	Anti	Coral Reef Dest NA		Coordination
06/10/2015	Challeng NA		CNS	https://ca	Anti	Coral Reef Dest NA		NA
06/16/2015	Petition I NA		CNS	https://ca	Anti	Coral Reef Dest NA		Coordination
06/17/2015	Floating NA		CNS	https://ca	Anti	Coral Reef Dest NA		NA
06/17/2015	Mac bad NA		CNS	https://ca	Anti	Coral Reef Dest NA		NA
06/22/2015	Cruise ct NA		CNS	https://ca	Anti	Coral Reef Dest NA		Coordination
06/30/2015	PIR petiti NA		CNS	https://ca	Anti	Coral Reef Dest NA		Coordination
07/01/2015	Taking a Advanceme	CNS		https://ca	Pro	Striking Balance NA		NA
07/03/2015	World's c NA		CNS	https://ca	Anti	Environmental/ E NA		Coordination
07/08/2015	Campaig NA		CNS	https://ca	Anti	Environmental/ E NA		Coordination
07/13/2015	Merchan NA		CNS	https://ca	Pro	Loss of Cruise T NA		Coordination
07/14/2015	Port deni NA		CNS	https://ca	NA	NA		Coordination
07/15/2015	More cor NA		CNS	https://ca	Anti	Coral Reef Dest NA		Coordination
07/16/2015	Tourist st NA		CNS	https://ca	Anti	Coral Reef Dest NA		Coordination
07/20/2015	MLAs ex NA		CNS	https://ca	NA	NA		NA
07/20/2015	Ministry t NA		CNS	https://ca	Anti	NA		Coordination
07/22/2015	FCCA in NA		CNS	https://ca	Anti	Environmental a NA		NA
07/28/2015	FCCA wt NA		CNS	https://ca	Pro	Striking Balance NA		NA

FIGURE B.2
Structural coding spreadsheet.