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Debating Desalination: Stakeholder Participation and Decision-Making in Southern California

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ABSTRACT: As desalination gains rapid traction worldwide, it is instructive to investigate how various stakeholders debate this water supply infrastructure and how decision-making processes incorporate stakeholder input. This paper conducts a discourse analysis of public comments and official deliberations tied to the permitting of Poseidon Water's proposed \$1.4 billion seawater desalination facility in Huntington Beach, California, which state regulators ultimately denied in May 2022. The facility was the first and largest desalination project to undergo permitting since the state passed desalination-specific legislation in 2015. This paper analyses public hearings between 2020 and 2022 at two key permitting agencies to detail the main storylines that proponents and opponents of this desalination facility used to justify their positions for, or against, the facility. Seven key themes are identified within the storylines. The paper shows that discursive tactics can create temporary openings for desalination debates to be depoliticised or (re)politicised in ways that influence permitting decisions on the margins, but that the decision-making process remains largely rigid to stakeholder participation. The results have implications for understanding desalination-specific issue areas for stakeholders and motivating decision-making processes to be more collaborative and engaging with stakeholders on newer water policy issues.

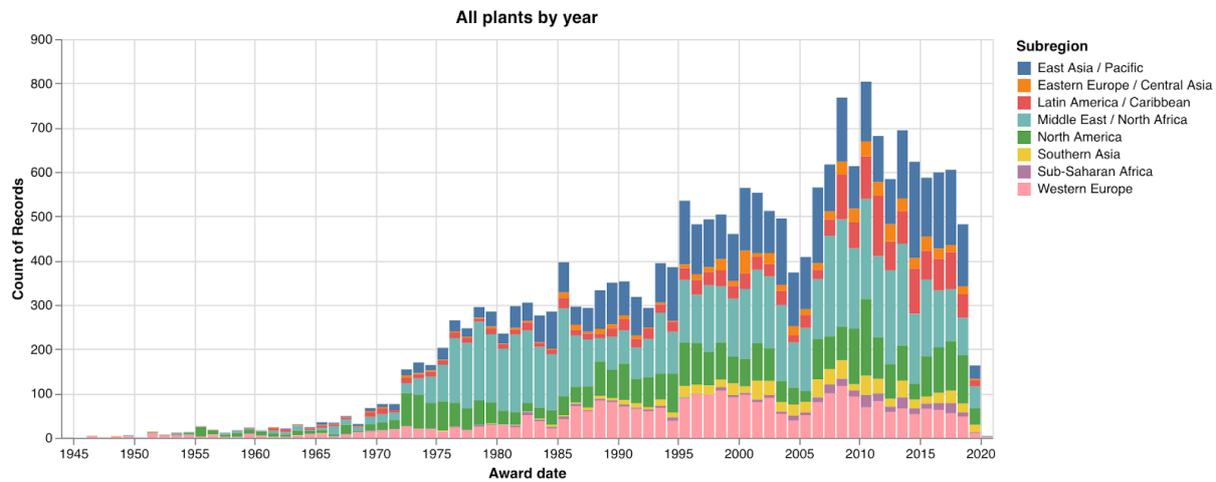
KEYWORDS: Desalination, stakeholder participation, decision-making, storylines, California

INTRODUCTION

As humans continue to exhaust freshwater supplies globally, many governments and water providers are looking to large and complex coastal infrastructures for desalination, the technological process that transforms salty water into drinking water (Gleick and Cooley, 2021). Since the 1990s, desalination has been gaining rapid traction worldwide, albeit unevenly, after having predominantly been established in the Middle East and small island nations (see Figure 1). Over 20,000 desalination plants have been approved in over 150 countries to date (Feitelson and Jones, 2014; World Bank, 2019). Interest is further growing in cities facing unexpected water rationing, as happened in Cape Town, South Africa, in 2018, and in regions with increasing drought cycles, like the western United States (Cooley et al., 2006; Scheba and Scheba, 2018).

Amid global climate change-induced droughts and uncertainties about water availability, desalination is touted as a technical supply 'solution', with local water managers and international organisations alike advocating its use to provide 'new' water supplies and maintain support for economic growth and expansion (World Bank, 2019). But desalination's high financial costs, large energy needs, local community impact, and harm to marine life, as well as other yet unseen effects, make it socially, economically, environmentally, and politically contentious (Meehan et al., 2013; Fragkou, 2018; Williams and Swyngedouw, 2018). Indeed, when developed as a technological supply-side fix to water scarcity, desalination can be seen as addressing the issue without changes to water consumption patterns and circumventing political tensions tied to water management. Yet, desalination projects do not necessarily address the structural problems of water management systems and can instead exacerbate those issues and generate new vulnerabilities (McEvoy, 2014).

Figure 1. All desalination plants (n = 21,055) approved for construction as of January 2020.



Source: GWI DesalData (2020)

While these factors are increasingly acknowledged as areas for caution, it remains unclear which ones matter to decision-making processes for desalination and in what ways (Swyngedouw, 2013; McEvoy and Wilder, 2012). Framing desalination as a fix could reduce public scrutiny in decision-making processes if the general public does not have the technical knowledge to engage in informed discussion and alternatives such as demand management are downplayed to discourage questions on the broader implications of desalination projects (McEvoy, 2014). Yet, whether, and how, relevant authorities incorporate meaningful stakeholder participation into decision-making processes about desalination remains underexplored (McEvoy, 2014; Scheba and Scheba, 2018). Using discourse theory and analysis, this paper investigates two linked research questions:

- First, who participates, and what key storylines do stakeholders use to show support or opposition?
- Second, in what ways do their issue framings and storylines affect regulatory decisions in turn?

This paper examines these questions through the study of the permitting processes behind the private company Poseidon Water's proposed Huntington Beach Desalination Plant in southern California. Following a marathon public hearing in May 2022, the state-level California Coastal Commission unanimously rejected the proposed \$1.4 billion desalination facility, which had received approval from the Santa Ana Regional Water Quality Control Board (hereafter Santa Ana Board), a regional organization, in April 2021. Subsequently, the company formally rescinded its interest in the facility, effectively terminating the project, which had been under consideration on-and-off since 1998. The Huntington Beach plant was the first desalination facility to undergo a permitting process since California enacted strict environmental guidelines, including desalination-specific rules added in 2015. This case presents an opportunity to examine if, and how, stakeholder participation can affect precedent-setting permit decisions regarding desalination.

This paper analyses public comments and official deliberations tied to the permitting processes at both the California Coastal Commission and the Santa Ana Board to understand which arguments were central for stakeholders and which were key to producing the divergent permit decisions. Data analysis involved transcribing 53 hours of public hearings between 2020 and 2022, which were held virtually

because of the COVID-19 pandemic.¹ Due to the nature of regulatory decision-making, where water projects are approved or denied, the debates largely reflected two polarised sides of proponents versus opponents with varying justifications.

This paper reveals that the Huntington Beach facility – heralded for its technical potential to quell tensions related to decreasing water supplies, looming mandatory water cuts, and unreliable imported water in the area – was deeply contested. Multiple stakeholder groups, including government officials, residents, environmental organisations, labour groups, and tribal representatives, debated the facility along seven themes: environmental damage, water supply, cost considerations, climate change, privatisation, the human right to water, and stakeholder representation. In turn, this paper shows that these debates influenced permit decisions on the margins, especially those related to environmental damage, but that the conventional decision-making process remained rigid against debating broader stakeholder concerns. The next section explores the storylines in evaluating stakeholder participation, followed by case details, methods, and results. The paper concludes with reflections on this case for future desalination facilities and their permitting processes.

STAKEHOLDER PARTICIPATION AND DISCOURSES

To achieve good governance in the water sector, it is crucial to understand whether the decision-making processes that shape water management facilitate meaningful stakeholder participation and incorporate information from key stakeholders. Since the 1980s, the global adoption of integrated water resource management (IWRM) has decentralised water management and heightened expectations for greater accountability, transparency, equity, environmental sustainability, and stakeholder participation in water management processes – democratic principles that serve as ideals for how governments ought to manage water in contexts with strong institutional frameworks and a culture of collaboration (Rogers and Hall, 2003; Bakker, 2014). IWRM has influenced decisions on desalination through promoting water management that considers several available water sources, with desalination as one option, and encouraging the consideration of its environmental consequences, such as energy consumption. Yet, in certain contexts, IWRM's influence is limited by incomplete implementation of its principles, weak institutional frameworks, and financial and political pressures that prioritise short-term gains and particular political interests (Swyngedouw, 2013; McEvoy, 2014). Among IWRM's principles, stakeholder participation is considered a democratic right in many places because it is claimed to increase accountability, legitimacy, and trust in governance (Lubell and Lippert, 2011; Bakker, 2010). Involving stakeholders is tied to longer-lasting and higher-quality water-related decisions and supports water equity and fairness in the decision-making process (Gerlak et al., 2022). Otherwise, a lack of active participation in decision-making processes can lead to public discontent, the erosion of public confidence in political or regulatory processes, and social protests (Robinson, 2013).

Meaningful stakeholder participation entails active two-way communication – usually with the public – where information is exchanged between government and non-government stakeholders (Rowe and Frewer, 2000; Reed, 2008). While providing information to non-government stakeholders has a longer tradition and has been implemented through more passive means such as education campaigns or public meetings, incorporating information from stakeholders into decisions requires more active effort to learn, understand, collaborate, and co-generate knowledge. Doing so allows citizen preferences and local knowledge to be valued in decision-making processes (Lynam et al., 2007). More active, frequent participation helps government officials understand evolving public concerns and address them while affording public and civil society actors the chance to contribute to decision-making on environmental issues.

¹ The research protocol (2021-0464) was approved by the Duke Institutional Review Board. The hearings are a matter of public record, and while informed consent is not required, all names have been withheld to maintain confidentiality.

In water governance literature, stakeholder participation has been evaluated concerning the management of specific natural water bodies like watersheds and river basins (Wester et al., 2003; Uhlendahl et al., 2011; Calizaya et al., 2010), the opportunities for marginalised groups like Indigenous communities and women to engage (Jackson et al., 2012), and the use of funding arrangements like public-private partnerships (Marana et al., 2018). Participatory outcomes have largely been deemed unsatisfactory. Reasons include ineffective implementation, 'token' participation, high transaction costs for representative participation, and the continued privileging of elite and technical voices (Lubell et al., 2009; Conca, 2006; Huitema and Meijerink, 2014). Furthermore, participation has leaned towards information dissemination instead of two-way communication where stakeholder knowledge is valued during consultations and in decision-making processes (Wester et al., 2003). When governments opt to 'fast-track' projects like those for renewable energy, the standard tribal consultation process can be rushed or fail to offer reliable ways to capture Indigenous concerns (Bathke, 2014).

To determine whether participation is meaningful, it is important to examine the knowledge claims of stakeholders and how they are considered by decision makers. One way to do so is through studying discourses and storylines. Discourses are "specific ensembles of ideas, concepts, and categorization that are produced, reproduced, and transformed in a particular set of practices" (Hajer, 1995: 44). They capture the plurality of arguments, knowledge claims, and narratives – also known as 'storylines' when condensed – that frame and give meaning to a certain topic (Hajer, 2006; Rosenbloom et al., 2016; Baka et al., 2019). Scholars recognise the usefulness of this approach for understanding environmental policy with topics as broad as the environment generally or with more specific issue areas like forest policy, hydraulic fracturing, and water infrastructure (Arts and Buizer, 2009; Baka et al., 2019; Takman et al., 2023). For example, views on nature are articulated through discursive tactics where nature is framed as a resource for human exploitation and as an entity with intrinsic rights worthy of protection (Hajer and Versteeg, 2005). Multiple discourses provide different interpretations on the same topic, revealing the range of knowledge and struggles that exist on particular environmental issues. Language and narratives distil these discourses into particular storylines conveying key messages; groups of actors using similar storylines form alliances known as 'discourse coalitions' (Hajer, 1995). As these coalitions come and go, the storylines they push become legitimised and connected to the policy process (Hajer, 1995 ; Baka et al., 2019; Takman et al., 2023). As such, examining how storylines are incorporated into policy can reveal not only which, and whose, knowledge claims are privileged but also to what end.

With officials exploring new water supply options like desalination, there is limited understanding on how decision-making processes over their adoption include meaningful participation (Brannstrom et al., 2022). In the few studies examining participation in desalination decisions, such as in Spain, Chile, and Baja California Sur, Mexico, the focus is on whether decision makers share information with stakeholders, and even then, evidence shows participation is non-existent or employs some degree of tokenism (Fuentes-Bargues, 2014; McEvoy, 2018; Fragkou, 2018). Certain stakeholders are missing entirely, such as locally marginalised and low-income groups, or are represented predominantly, such as government elites and those with financial stakes in the project. Due to the many processes that dictate desalination adoption decisions, it is critical to examine how they purposefully engage with various stakeholders (Loftus and March, 2016). Using discourse analysis, this paper extends on the work evaluating whether and how a key tenet of IWRM – meaningful stakeholder participation – is applied to the case of desalination at the stages of public debate and decision-making (Molle, 2008; McEvoy, 2014; Scheba and Scheba, 2018). As such, the paper uncovers which storylines stakeholders advance to show their position on the Huntington Beach desalination facility and how those storylines as discursive elements influence permitting decisions.

WATER SUPPLY DECISION-MAKING AND DESALINATION IN SOUTHERN CALIFORNIA

Despite California's adoption of IWRM principles, its geography and water management history show that decision-making processes have continued to largely support managerial approaches even if the water projects themselves have transitioned from being centralised and interdependent to decentralised and independent (Schlager and Blomquist, 2000; Morgan, 2020). Much of the state's freshwater resources and supplies are in the wetter northern parts of the state, while most city centres are in the drier southern areas, where climate change impacts are acutely felt through altered precipitation patterns and enduring droughts. Over half of California's 40 million residents live on just ten percent of the state's land in and around its southern coastal cities – an imbalance that has entrenched power relations between those involved in water supply transfers to the south. In this context, desalination has emerged as a 'new' and local water supply option in southern California.

Before the 1970s, water planning was centralised, with water agencies working with state and federal authorities to greenlight large-scale, capital-intensive projects like dams, reservoirs, and other water conveyance and irrigation projects for water supply, energy, flood protection, and economic growth. These investments included projects to import water from northern California and the Colorado River to southern California that still endure today (Cooley et al., 2006). Decisions were made top-down by water agencies with support from technical experts and without real avenues for public stakeholder participation. Although parts of the western US considered desalination for municipal water supply, desalination's high energy needs and costs could not compete economically with dam infrastructure (Low, 2020).

Since the 1970s and 1980s – once the damaging social and environmental consequences of large water infrastructures were revealed through community displacement, land and natural resource loss, and water pollution – water planning at the state (and also federal) level has incorporated more robust regulations for environmental protection (Gleick, 2000). These include establishing decentralised regulatory agencies to advance local water management and promote neoliberal principles. Ushering a shift away from large infrastructure projects, this paradigm promotes more local supply-side options as well as 'soft path' or demand-side water management (Gleick, 2000). Although California has made inroads with collaborative and inclusive decision-making through adopting IWRM principles, this approach can be resource intensive and requires addressing power imbalances across stakeholders (Schlager and Blomquist, 2000). As such, decision-making continues to be government-led and managerial, with a mix of local, regional, and state regulatory agencies controlling water management. Public stakeholders can advocate for their interests through votes, public comments, and other tools like consultations to influence the decision makers but with little direct authority over decisions. Local authorities have sought to implement decentralisation by diversifying local water supply options, including desalination, which the city of Santa Barbara in southern California pursued in 1991. Facing a long stretch of drought conditions that created acute shortages in rainfed water supplies, Santa Barbara approved and built a seawater desalination facility. However, due to the return of rains, reduced water demand from conservation measures, and high costs, this facility was decommissioned within months and only reactivated in 2017 after another extended drought (Cooley et al., 2006).

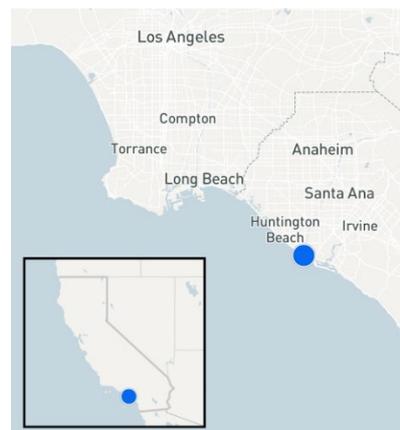
Since the late 1990s, desalination proposals have continued under the same logic of local water agencies wanting to meet current and future water demand in ways that reduce reliance on rainfed and non-local water networks whose water politics have intensified with climate change impacts. The appeal is especially heightened when water rights are less legally contentious as is the case for ocean-based desalination. While pursuing local desalination can remove certain stakeholders from water management, it introduces others in the form of private companies who can offer to fulfil managerial desires for water supply through taking on the risk to finance individual facilities. In exchange for water, these infrastructures can produce stable financial profits over the several decades that a facility stays online (Pryke and Allen, 2019). In California, this has taken the form of large-scale desalination that was

operationalised in San Diego in 2015 and other coastal and inland proposals that are in various stages of development. In the past decade, heightened interest has prompted desalination-specific regulations (detailed in the next section) and also led to one of the first denials for large-scale desalination infrastructure with the Huntington Beach facility.

Case setting: Huntington Beach, California

This paper studies desalination storylines and decision-making tied to the proposed \$1.4 billion Huntington Beach Desalination Facility in southern California (see Figure 2). Poseidon Water (Poseidon) first proposed building and operating this facility in 1998 through a non-binding contract with the Orange County Water District (OCWD), a water wholesaler. Remarkably, OCWD was not soliciting bids for desalination facilities at the time, so Poseidon’s proposal to co-locate a facility with the existing AES Power Plant in Huntington Beach was the only option considered. Under the terms, OCWD would purchase the plant’s roughly 56,000 acre-feet per year (AFY)² of potable water or 50 million gallons per day (MGD) from Poseidon for its 19 urban water suppliers. The water would be supplied directly to users or pumped underground for storage. With its large size and operational life of anywhere from 30-50 years, this facility would secure not only water but reliable revenues for Poseidon’s globally dispersed shareholders from local ratepayers.

Figure 2. Map of southern California, with the proposed Huntington Beach desalination site marked.³



This case was selected because it is the first desalination facility to have sought approval and been denied under California’s desalination-specific guidelines – which makes this a precedent-setting case – and because there were explicit opportunities for stakeholders to comment and provide input during the stages of the permitting process. Because this desalination facility has been under review on-and-off for 22 years, in part because Poseidon chose not to prioritise obtaining permits for this facility in the 2000s, the case likely presents a fuller range of the storylines associated with desalination that stakeholders deem critical.

Before finalising a contract with OCWD to begin construction, Poseidon needed permits for different aspects of the project from three main regulatory bodies (see Table 1): the California State Lands Commission (CSLC), the Santa Ana Board, and the California Coastal Commission (CCC). This paper focuses on the permitting processes at the Santa Ana Board and the CCC because Poseidon already received

² This quantity is expected to serve 450,000 people. The Orange County Water District and its 19 member agencies distribute to approximately 3 million California residents.

³ Own visualisation licensed under CC BY-SA 3.0 using data © Mapbox and OpenStreetMap

approval from the CSLC in 2017 to lease existing intake and outtake pipes. These two venues were also noted as being contentious due to their public-facing deliberations and potential for setting precedence for desalination (Boxall, 2019).

Table 1. Summary of the permits Poseidon needed for the Huntington Beach desalination facility. This paper analyses the permitting processes at the Santa Ana Board and the CCC.

Agency and permitting process	Final decision
<p><i>1. California State Lands Commission (CSLC)</i></p> <ul style="list-style-type: none"> Permit needed to lease offshore seawater intake and outtake pipes and to comply with the California Environmental Quality Act (CEQA) and other state rules 	<p><i>Permit Approved (October 2017)</i></p> <ul style="list-style-type: none"> The three-person CSLC board unanimously (3-0) renewed the lease which was updated in accordance with the 2015 Ocean Plan The permit was initially approved in September 2010
<p><i>2. Santa Ana Regional Water Quality Control Board (Santa Ana Board)</i></p> <ul style="list-style-type: none"> Permit needed for water discharge compliance with the National Pollutant Discharge Elimination System (NPDES) and the California Ocean Plan The Santa Ana Board staff did not offer a suggestion on how to vote but provided a range of options, including rejection, approval, and approval with modifications. 	<p><i>Permit Approved (April 2021)</i></p> <ul style="list-style-type: none"> With a 4-3 vote, the Santa Ana Board approved the discharge permit with modifications on mitigation. The three dissenters favoured more lenient terms for Poseidon, making the effective vote 7-0. The permit was first approved in 2006 and renewed in 2012, although this permit expired and was effectively nullified with the passage of stricter environmental regulations in 2015.
<p><i>3. California Coastal Commission (CCC)</i></p> <ul style="list-style-type: none"> Permit needed for coastal development and to comply with the California Coastal Act The public meeting was postponed from the end of 2021 to 12 March 2022 and again to 12 May 2022. The CCC staff recommended denial due to the project's nonconformity to several policies, including the California Coastal Act. In 2013, the staff had recommended conditional approval. 	<p><i>Permit Denied (May 2022)</i></p> <ul style="list-style-type: none"> With a 12-0 vote, the CCC unanimously denied the coastal development permit. In 2015, the CCC was reviewing the Huntington Beach desalination plant proposal when the State Water Board adopted the desalination amendment to its Ocean Plan. Poseidon withdrew its permit in 2013 and again in 2016 due to stipulated conditions and missing information, respectively. The third attempt in 2022 resulted in denial.

The Santa Ana Board, with seven governor-appointed members, is one of California’s nine semi-autonomous regional water boards. It manages surface and groundwater quality within its jurisdictions and operates under standards set by national and state statutes.⁴ The permit Poseidon sought from the Santa Ana Board had to do with the conditions of its intake water from the Pacific Ocean and its output brine.⁵

⁴ These include the Clean Water Act, Safe Drinking Water Act, and the California Porter-Cologne Water Quality Control Act (California Water Code) as well as regional water quality control plans (Basin plans).

⁵ The discharge permit must abide by the Waste Discharge Requirements (WDRs) and the federally mandated National Pollutant Discharge Elimination System (NPDES).

Established in 1972 and codified by the California Coastal Act of 1976, the CCC is a state-level agency. Its 12 appointed commissioners approve coastal development permits along the state's 1,100-mile coast, ensuring projects abide by the California Coastal Act. Over the intervening decades, the CCC has come to hold significant regulatory authority over coastal land use. Poseidon was seeking a development permit from CCC to 1) remove pre-existing infrastructure at the building site, 2) remediate soil and groundwater contaminants, and 3) construct the seawater desalination facility and water delivery pipeline(s).

State-level studies in the US suggest that regulatory agencies have significant discretion during the decision-making process, although how that discretion is exercised in new or unprecedented cases remains understudied (Crow et al., 2016). Regulatory decisions⁶ often hinge on the extent of stakeholder inclusion and how public feedback is incorporated (Crow et al., 2016; Rinfret and Furlong, 2012). Procedurally, decision makers receive this input through spoken comments at public meetings and written comments collected and summarized by each agency's staff. Agencies delegate this task to their technically skilled staff to reduce duplication efforts and establish shared baselines for board members and commissioners. The staff also help decision makers follow the agency's rules and procedures.

New state rules pertinent to this case include a desalination amendment added to California's Ocean Plan⁷ in 2015. Since 1972, the Ocean Plan has served as the key water quality control plan for the ocean water along California. It is updated infrequently; only five changes occurred in the last decade, including adding the desalination amendment. The 2015 desalination amendment requires "new or expanded seawater desalination plants to use the best available site, design, technology, and mitigation measures feasible to minimise intake and mortality of all forms of marine life". No guidelines detail how to implement this new requirement, granting permitting agencies broad discretion in determining compliance. The decision on this desalination facility will thus shape the standards for future seawater desalination facilities.

Unlike the Claude 'Bud' Lewis Carlsbad Desalination Plant in nearby San Diego – a similar 50 MGD facility that Poseidon also proposed in 1998 but which has been operational since 2015 – several factors explain why the Huntington Beach facility did not seek permitting earlier (Williams, 2018a). In 2006, with both projects on parallel tracks, Poseidon chose to prioritise the San Diego facility over the Huntington Beach facility due to staffing limitations at Poseidon and the CCC (Wisckol, 2019). This timing allowed the San Diego facility to qualify for exceptions related to environmental impact mitigation but did not do the same for the Huntington Beach plant. Consequently, Poseidon has had to make significant, time-consuming design changes to the Huntington Beach facility proposal during which any permits issued by the regulatory agencies expired.

METHODOLOGY

For this paper, I conducted a discourse analysis on the (virtual) public hearings at the regional-level Santa Ana Board in 2020 and 2021 and the state-level California Coastal Commission in 2021. All public comments and official decision-maker deliberations from the hearings, totalling 53 hours, were audio-recorded, transcribed, and qualitatively analysed.

Public hearings

The general structure of the public hearings at the Santa Ana Board and CCC entailed arguments from the permit seeker (Poseidon), regional water board staff presentations on the board's voting options for the permit (for, against, or a conditional stance), public comments (with or without visual aids), and

⁶ Despite the push for deregulation during President Trump's administration (Jan 2017 - Jan 2021), this approach largely affected federal-level rules and had few impacts on California's state-level regulatory processes.

⁷ [California Ocean Plan](#)

decision makers' deliberations. A staff member moderated, and the conversation was an open forum where decision makers could ask follow-up questions, although they rarely did due to arbitrarily decided procedural rules meant "to ensure a productive and efficient hearing" (2020).

Santa Ana Board: Before approving the discharge permit in April 2021, the Santa Ana Board held two multi-day virtual public hearings in 2020 and 2021 to debate the permit application. While there were plans for in-person public hearings in early 2020, the public meetings were postponed and eventually held virtually due to the COVID-19 pandemic per state-level rules. While board meetings typically last one day, the scope and interest in this desalination facility led the 2020 hearing to take three days (July 30, July 31, and August 7) and the 2021 hearing to span two days (April 23 and April 29). The 2021 hearing was necessary because the regional water board postponed their vote in 2020 and unanimously agreed that Poseidon needed to provide a complete mitigation plan. Days spanned seven to twelve hours, with a total time across all five days of 44 hours.

California Coastal Commission: The CCC meeting was held on 12 May 2022 in a hybrid format allowing for participation online or in person at the Hilton Hotel in Costa Mesa, roughly eight miles inland from Huntington Beach. All 12 commissioners, CCC staff, and Poseidon representatives attended in person as did more than half of the public commenters.⁸ Building on the 2020 and 2021 Santa Ana Board meetings, the CCC meeting served as the next and final stage of the same decision-making process. As such, the two government agencies are seen as complementary rather than as competing. The CCC meeting lasted nine hours, concluding with a 12-0 vote denying the coastal development permit and thus the entire project.

Discourse analysis

As part of this 'digital fieldwork', I audio-recorded and transcribed each public hearing virtually and conducted observational analysis throughout (Howlett, 2021). I validated the data by downloading, extracting, and coding transcripts from video recordings⁹ uploaded by the government agencies a few weeks after each hearing on the CAL-SPAN network, which provides webcast and televised public access to California government meetings. I analysed the transcripts twice, first by transcribing and coding all comments and presentations into a spreadsheet, and second by identifying emergent themes and storylines.

I extracted transcripts from two primary Poseidon representatives, seven Santa Ana Board members,¹⁰ 12 commissioners at the CCC, and public commenters in 2020 (n=170), 2021 (n=164), and 2022 (n=145). Public commenters gave spoken statements made in favour of, or against, permitting the desalination plant with reasoned arguments that leveraged evidence and various knowledge claims. Time constraints and extensive public interest led the Santa Ana Board to request that comments last at most two minutes in 2020 and one minute in 2021 – limits that were announced at the hearings. The CCC similarly limited public comments to one minute at the meeting's start. Across all public meetings, individuals representing established organisations had the option to coordinate and present collectively. This paper disaggregates group presentations into their constituent parts as each speaker adhered to individual time limits.

While there is substantial overlap between commenters across the three meetings (two at the Santa Ana Board and one at the CCC), it is important to note that each meeting deliberated on separate issues. For instance, the Santa Ana Board's 2021 meeting focused on debating new information they had requested from Poseidon at the 2020 meeting. In short, the three meetings represent different stages of

⁸ The official meeting notice states, "the Commission strongly encourages continued participation virtually through video and teleconferencing due to changing Covid-19 conditions" (2022).

⁹ All videos are publicly available at [CAL-SPAN:California State Meetings Webcast Video](#)

¹⁰ Of note is that one of the seven board members was replaced between the 2020 and 2021 hearings.

the same decision-making process for whether to approve or deny the Huntington Beach desalination facility.

I conducted discourse analysis on the content from the public commenters and the decision makers. Discourse analysis refers to the study of data to extract the storylines that together construct the knowledge on an issue or topic (Hajer, 2006; Rosenbloom et al., 2016). This approach helps scholars understand the politics of sustainability transitions, such as the struggles over coal phase-out and how discursive tactics can legitimise slower transitions to renewables (Markard et al., 2021). Tracking storylines has also revealed how actors diffuse and legitimise particular types of knowledge like government-sponsored research (Baka et al., 2019).

I categorised the position of each public commenter (total n=479) on the Huntington Beach desalination facility and their main arguments to legitimise their position. I then identified the main storylines emerging from these arguments and grouped them into themes based on content. For the decision maker deliberations, I tracked how decision makers engaged with the public storylines in the permitting process and in their ruling.

While public stakeholders could also submit letters and comments via email (many did), decision makers affirmed that spoken comments carried weight in their decision-making. As one Santa Ana Board member put it in 2020, "We've got a couple thousand pages of documents to look through. Rather than look through it, it would be helpful to get a direct opinion". The CCC similarly received written correspondence that exceeded 1300 pages. Because each agency's staff summarised comments submitted in written form, I checked the extracted storylines against the summaries to validate whether any spoken arguments were unique and missing from the written comments and vice versa. While the written comments expectedly covered a wider range of topics, all spoken arguments were represented in the staff summaries. As such, the spoken comments represent a critical subset of public comments. Moreover, public commenters shared their stance on whether the Huntington Beach desalination facility should be approved or not more generally rather than debating specific permits, allowing for direct comparisons across years and between the two agencies.

RESULTS AND DISCUSSION

The following analysis consists of three parts: 1) information on the public commenters, 2) key stakeholder storylines by theme, and 3) how the decision-making process engaged with those storylines.

Details on public commenters

Public commenters included residents, government officials, and representatives from labour groups, business associations, environmental non-governmental organisations (NGOs), civil-society groups, non-profits, and local Indigenous tribes. Table 2 below lists the distribution of the public commenters at the Santa Ana Board (2020 and 2021) and the CCC (2022) meetings by their position for, or against, the desalination facility. The polarised debates meant that no commenter expressed an indifferent stance. The majority position at each public hearing was against the desalination facility, with most of these coming from NGOs, residents, and tribes and with a higher margin at the 2022 CCC meeting.

Across all years, people affiliated with NGOs and non-profits (29% of all speakers in 2020, 27% in 2021, 35% in 2022) and residents (39% of all speakers in 2020, 45% in 2021, 33% in 2022) had the largest representation, predominantly speaking against permitting this desalination facility. NGOs and non-profits are grouped together because they are issue-specific advocacy organisations and include nationally affiliated and local environmental organisations such as Sierra Club, Orange County Coastkeeper, Surfrider Foundation, Residents for Responsible Desalination, Azul and Oak View ComUNIDAD, CalDesal, and Amigos de Bolsa Chica.

Table 2. Public commenters by speaker type at the Santa Ana Board (2020 and 2021) and the CCC (2022).

Speaker type	Number of speakers					
	2020 (Santa Ana Board)		2021 (Santa Ana Board)		2022 (CCC)	
Government officials	30	<i>For: 26</i> <i>Against: 4</i>	21	<i>For: 20</i> <i>Against: 1</i>	23	<i>For: 18</i> <i>Against: 5</i>
Labour / Business representatives	23	<i>For: 23</i> <i>Against: 0</i>	23	<i>For: 23</i> <i>Against: 0</i>	19	<i>For: 18</i> <i>Against: 1</i>
NGO / Nonprofit	50	<i>For: 8</i> <i>Against: 42</i>	44	<i>For: 8</i> <i>Against: 36</i>	51	<i>For: 9</i> <i>Against: 42</i>
Residents	66	<i>For: 20</i> <i>Against: 46</i>	73	<i>For: 25</i> <i>Against: 48</i>	48	<i>For: 9</i> <i>Against: 39</i>
Tribal representatives	1	<i>For: 0</i> <i>Against: 1</i>	3	<i>For: 0</i> <i>Against: 3</i>	4	<i>For: 0</i> <i>Against: 4</i>
Total	170	<i>For: 77 (45%)</i> <i>Against: 93 (55%)</i>	164	<i>For: 76 (46%)</i> <i>Against: 88 (54%)</i>	145	<i>For: 54 (37%)</i> <i>Against: 91 (63%)</i>

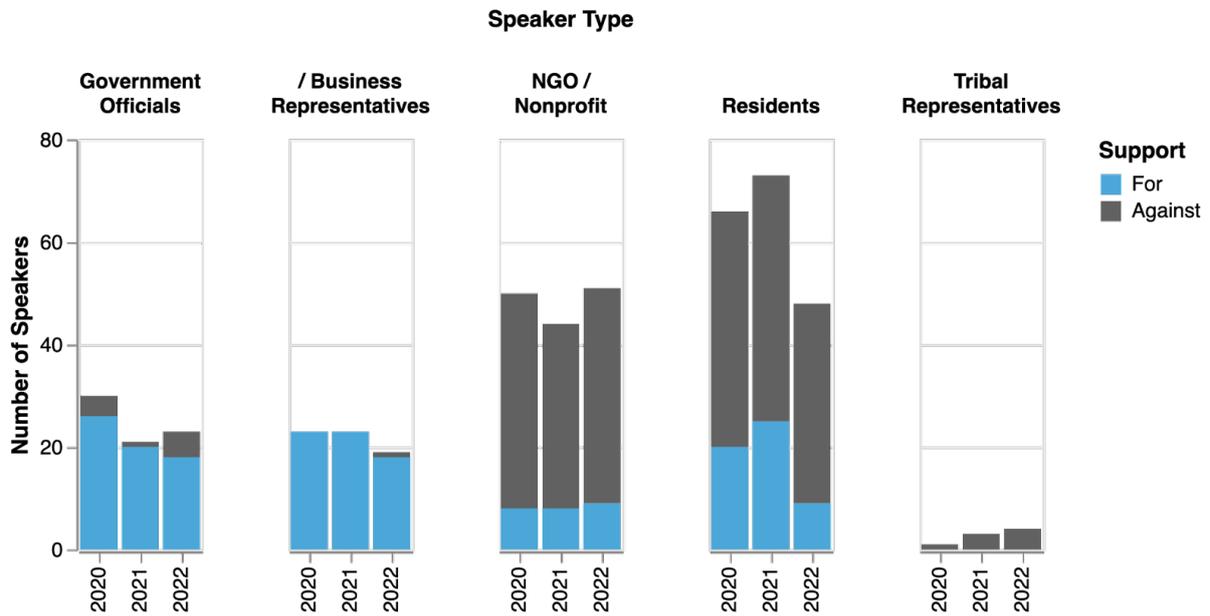
Government officials (18% of all speakers in 2020, 13% in 2021, 16% in 2022) and representatives from labour groups and businesses (14% of all speakers in 2020, 14% in 2021, 13% in 2022) have the next highest representation, speaking dominantly in favour of this desalination facility. Government officials include representatives from local, state, and federal government agencies and appointed members of local water districts. Labour groups and business stakeholders include members of construction worker unions, local retailers, and taxpayer associations. Figure 3 presents a visual representation of the positions of the various stakeholders.

Key stakeholder storylines and the role of expertise in shaping narrative

Based on the arguments from public commenters across all three years (total n=479), I identified multiple storylines that can be grouped into seven broad themes. These include: (1) environmental damage, (2) water supply, (3) cost considerations, (4) climate change, (5) privatisation, (6) the human right to water, and (7) stakeholder representation. The last two were primarily raised by opponents, so proponents provided storylines to counter them.

Storylines supporting the Huntington Beach desalination facility expectedly differ from those opposing it, but the fact that they are contained to select themes indicates that stakeholders are keen to share information on issue areas they see as consequential or to provide rival storylines for opposing narratives. Each theme is wide enough to contain storylines that are used to support or oppose this desalination facility. In a way, these themes serve as 'boundary objects' that bring disparate stakeholders together to discuss contested issues like hydraulic fracturing regulation (Baka et al., 2019). Which storylines dominate each theme and influence the ultimate permit decisions depends on the discourse coalitions that join together to advance and reiterate specific storylines and how the decision-making process engages with them (Hajer, 2006).

Figure 3. Proportional support (for and against) by stakeholder type at the Santa Ana Board (2020 and 2021) and the CCC (2022).



Below, the seven themes are detailed and ordered by the frequency with which they came up at the public hearings. On average, each commenter used storylines on two themes to justify their position (for or against) on the Huntington Beach desalination facility.

Figure 4 below presents proportional data on how many speakers used each of the seven themes and whether it was for, or against, the facility. Table 3 summarises the key storylines across the seven themes with details on which stakeholders advanced them.

Figure 4. Proportional data on support (for vs against) by theme at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings.

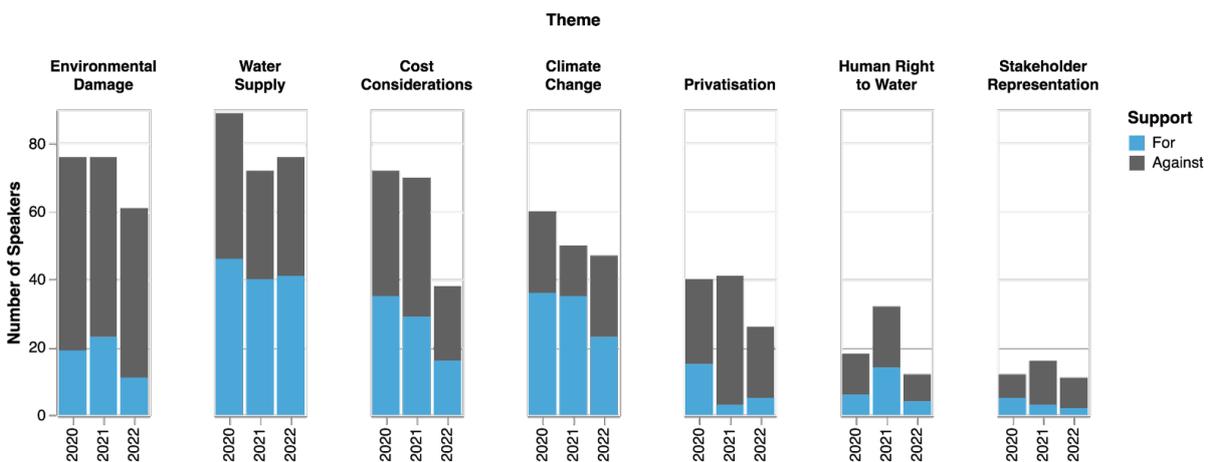


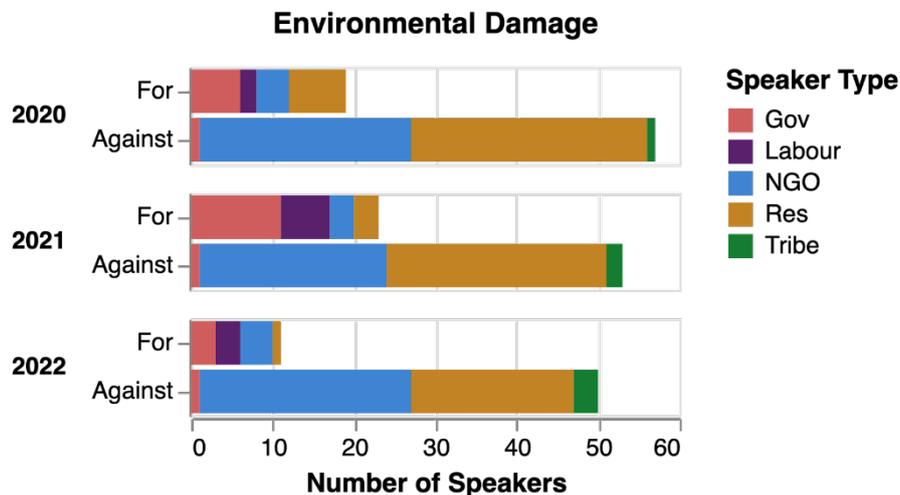
Table 3. Summary of associated storylines in the seven themes and number of stakeholders from the three hearings who advanced each position.

Theme	Storylines for desalination facility	Storylines against desalination facility
<p>1. Environmental damage <i>For: 53</i> <i>Against: 160</i> ←</p> <p><i>Associated stakeholder groups</i></p>	<p>1. This desalination project will provide <i>enough funding to preserve</i> Bolsa Chica Wetlands, which has run out of local and state funding</p> <p>2. The best available design is used per the Ocean Plan, so <i>environmental damage is on par</i> with expectation</p> <p>3. The project is already <i>mitigating more than required</i>, and asking for additional mitigation will raise costs and extend project timeline</p> <ul style="list-style-type: none"> • Government officials (e.g. California State Assembly members, elected officials to local water districts) • Labour groups 	<p>1. <i>Damage to marine life and ecosystems</i> at intake and discharge is irreversible, excessive, and avoidable with better design</p> <p>2. Mitigation of damage should occur before damage and <i>focus on restoration rather than preservation</i></p> <ul style="list-style-type: none"> • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents • Tribal representatives
<p>2. Water supply <i>For: 127</i> ← <i>Against: 110</i></p> <p><i>Associated stakeholder groups</i></p>	<p>1. The water is needed per local water plans and that <i>decision is up to the Orange County Water District</i> and not the regional board</p> <p>2. The area needs local supply that is reliable and <i>independent of imported supplies</i> (25% of current water supply)</p> <p>3. The project is part of having a "<i>locally diverse water portfolio</i>"</p> <ul style="list-style-type: none"> • Government officials (e.g. California State Assembly members, elected officials to local water districts) • Labour groups • Residents 	<p>1. There is <i>no demonstrated need</i> for the expected quantity (56,000 AFY) given that studies expect a deficit of 0 – 22,000 AFY in coming years</p> <p>2. <i>Other options for supply</i> (e.g. recycling and stormwater capture) and conservation should be considered before desalination due to desalination's cost and environmental damage</p> <ul style="list-style-type: none"> • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents • Tribal representatives
<p>3. Cost considerations <i>For: 80</i> <i>Against: 100</i> ←</p> <p><i>Associated stakeholder groups</i></p>	<p>1. Financial <i>costs are high due to mitigation requirements</i>, and adding more safeguards will affect ratepayers (dubbed 'a poison pill')</p> <p>2. The project will create <i>3,000 high-paying construction jobs</i> and generate tax revenues to help fund local schools</p> <p>3. The <i>process has already cost millions</i> of dollars and lasted 21 years</p> <ul style="list-style-type: none"> • Government officials (e.g. California State Assembly members, elected officials to local water districts) • Labour groups • Residents 	<p>1. <i>Desalinated water is expensive at \$2,250 per acre foot</i> compared to imported water (\$1,100 per acre foot), groundwater (\$600 per acre foot), and other supply alternatives</p> <p>2. <i>Monthly water bills will be higher</i> than the OCWD projections of \$3-\$6/month per household and further disadvantage low-income communities</p> <ul style="list-style-type: none"> • Government officials • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents • Tribal representatives

<p>4. Climate change <i>For: 94 ←</i> <i>Against: 63</i></p>	<p>1. Desalination is "<i>drought-proof</i>" and "<i>climate-resilient</i>"</p> <p>2. This project uses energy from the electric grid and will be <i>carbon neutral from offsets</i></p> <ul style="list-style-type: none"> • Government officials (e.g. California State Assembly members, elected officials to local water districts) • Labour groups • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents 	<p>1. The project <i>generates GHG emissions</i></p> <p>2. Desalination is <i>energy intensive</i> and counters action against climate change</p> <p>3. The project will be <i>vulnerable to sea level rise</i></p> <ul style="list-style-type: none"> • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents
<p><i>Associated stakeholder groups</i></p>		
<p>5. Privatisation <i>For: 23</i> <i>Against: 84 ←</i></p>	<p>1. A <i>similar desalination plant in San Diego has been successful</i></p>	<p>1. The project <i>commodifies drinking water</i> and privatises the ocean, a public natural resource</p> <p>2. The project will generate <i>global profits from a local base</i> and has relied on lobbying efforts</p>
<p><i>Associated stakeholder groups</i></p>	<ul style="list-style-type: none"> • Government officials (e.g. California State Assembly members, elected officials to local water districts) • Labour groups 	<ul style="list-style-type: none"> • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents • Tribal representatives
<p>6. Human Right to Water <i>For: 24</i> <i>Against: 38 ←</i></p>	<p>1. Desalination supports the human right to <i>reliable water</i></p>	<p>1. Desalination is <i>unaffordable water</i> and does not support the human right to water</p> <p>2. This project <i>impinges on the rights of nature and Indigenous people</i></p>
<p><i>Associated stakeholder groups</i></p>	<ul style="list-style-type: none"> • Government officials (e.g. California State Assembly members, elected officials to local water districts) • Labour groups 	<ul style="list-style-type: none"> • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents • Tribal representatives
<p>7. Stakeholder representation <i>For: 10</i> <i>Against: 29 ←</i></p>	<p>1. The public has had <i>ample opportunities to comment over the past 21 years</i> on the project</p> <p>2. <i>Virtual hearings have expanded public access</i></p>	<p>1. There have been <i>inadequate opportunities for public comment</i> with arbitrary time limits and lack of clarity on role of public input</p> <p>2. The board and its staff need to look to other experts if it <i>does not have expertise</i> on a topic</p> <p>3. <i>Disadvantaged groups have not been consulted properly</i> and spoke for only 15 minutes at the public meeting</p>
<p><i>Associated stakeholder groups</i></p>	<ul style="list-style-type: none"> • Residents • *other groups are inconsistent in their position 	<ul style="list-style-type: none"> • Local environmental groups (e.g. Coastkeeper, Surfrider, Sierra Club) • Residents • Tribal representatives

Environmental damage

Figure 5. Proponents and opponents using the environmental damage theme to support their position at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings, grouped by speaker type.



The first theme deals with the environmental damage associated with the Huntington Beach desalination facility. This theme’s prominence is expected because the permits from both agencies directly relate to managing the environmental consequences of the proposed facility. The Santa Ana Board controls the discharge permit for the super-saline wastewater (brine) that is produced through the desalting process, with authority to decide the amount of mitigation that can offset damage. Similarly, the CCC controls the coastal development permit that delineates how this desalination facility abides by the standards of the California Coastal Act.

Both proponents and opponents of the facility acknowledged in the public hearings that there would be marine life loss and damage to local marine ecosystems throughout the operation of the plant. Damage would happen at intake, when 100 MGD of seawater would be pulled into the facility, and at discharge, when 50 MGD of brine would be dumped back into the ocean. Yet the main source of dispute on this theme was the extent of damage and the extent of mitigation required in turn.

Before any public hearings, Poseidon had offered to restore parts of the Bolsa Chica Wetlands, a local saltwater marsh, and pay for inlet dredging that would keep the marsh open to the ocean. Using this commitment as a starting point, proponents of the facility largely sought to avoid *additional* mitigation requirements. Their key argument was that the mitigation work at Bolsa Chica was sufficient per the requirements of the desalination amendment in the Ocean Plan and that adding more mitigation would add unnecessary financial and time costs to the project. Opponents, on the other hand, argued against the facility entirely by stating that the proposal 1) violated the desalination amendment by not using the best available technology in its design, 2) would produce irreversible, excessive, and avoidable environmental damage, and 3) included mitigation plans that would happen after the plant was operational rather than before.

While the Ocean Plan’s desalination amendment recommends subsurface pipes, which suck seawater through the sand and avoid damage to small marine life, Poseidon’s proposal used open pipes with slight modifications.¹¹ Provisions in the Ocean Plan allow this more environmentally harmful option if

¹¹ These modifications included outfitting the intake pipe with a 1mm fine-mesh screen to keep larger organisms from being sucked in and applying diffusers to the discharge pipe to mix and dilute the brine.

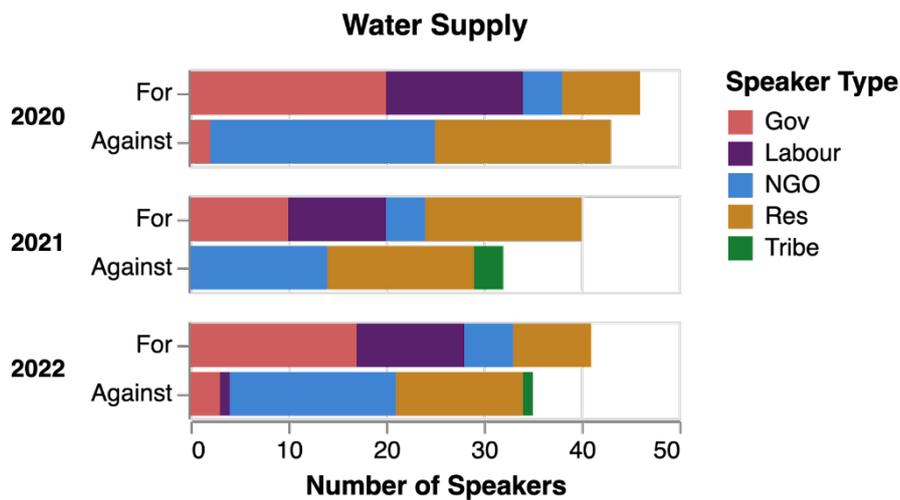
subsurface pipes are "technically or economically infeasible", a claim made by Poseidon that the permitting agencies had to evaluate. Independent advisors have also suggested that given the facility's size, subsurface pipes would jeopardise inland groundwater and substantially increase the facility's initial costs.

Storylines from proponents, including government officials and labour groups, strategically evoke the sunk cost fallacy and push for project approval due to the time, finances, and effort already spent in evaluating it for over two decades. They further argue that the judgement of independent authorities should receive special accommodation as it represents "unbiased expertise" – something that receives unquestioned trust – and that the leeway in the state Ocean Plan strengthens their case. Placing high value on 'technical' expertise, which is viewed as objective and neutral, during decision-making can lead to privileging a small group of stakeholders over community members and other stakeholders whose opinions may be undervalued and seen as more subjective (Bäckstrand, 2003).

Conversely, opponents, including environmental organisations, residents, and tribal representatives, emphasise absolute environmental damage as undesirable and a product of the pursuit of an unnecessarily large desalination facility. Yet in the event the permits are approved, opponents preemptively engage in conversations about trade-offs with language on which mitigation projects to pursue and when. As such, they argue for mitigation projects that *replace* damage through restoration rather than preservation projects that come before or concurrent to the damage. This point is made by citing rulings on past water projects that required mitigation before any discharge was released into the environment. They further cite Poseidon's delays in implementing the mitigation associated with its similarly large desalination plant in nearby San Diego – a facility that has been operational since 2015 but has only started mitigating damage. Taken together, commenters differ in the ways they see the risks, costs, and uncertainty of environmental damage.

Water supply

Figure 6. Proponents and opponents using the water supply theme to support their position at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings, grouped by speaker type.



Stakeholders latched onto the role of desalination in local water supply, with proponents of the facility voicing dissatisfaction with the existing sources of water. In northern Orange County, an area with 3 million people that the proposed desalination facility would service, 3/4 of the water supply currently

comes from local groundwater sources that are refilled from various sources, including purified wastewater, while 1/4 of the water is imported from the Colorado River and Northern California.¹²

Evoking the ongoing drought and past experience with mandatory and voluntary water rationing, proponents framed imported water as an unreliable source that will impede "life as usual" in the near and far future and will restrain imagined development for the area. Indeed, phrases such as "we can't conserve our way out of this drought and future water shortages" were shared by representatives of local water districts and residents alike. When Poseidon approached the OCWD with the project in 1998, southern California was just recovering from a multi-year drought. As confirmed at the public hearings, it was the uncertainty of the imported supply (and uncertainty about how to secure water for future growth) that led OCWD to sign onto the project. To emphasise water supply uncertainties, proponents referred to studies from the Metropolitan Water District of Southern California (MWD), the regional wholesaler of imported water, which forecasts a water shortage of 0-22,000 AFY in northern Orange County in coming decades.¹³ (The proposed desalination facility would produce 56,000 AFY.) Showing their low risk tolerance for future uncertainties, proponents advocated for the desalination facility as a way to "insure against water risk" and promote a "locally diverse water portfolio" that could support the region's unspecified future needs and growth. Proponents who recognised the vast difference between the forecast of 0-22,000 AFY and the facility's projected output of 56,000 AFY argued that decisions about local water supply management should rest with the local water district (OCWD) and not the regional and state permitting agencies.

Opponents exclusively focused on this discrepancy between the projected 'need' (0-22,000 AFY) and the facility's output (56,000 AFY). Opponents homed in on the lower end of the projection to delegitimize any desalination projects in the area. Yet the projection's wide range led several opponents to also use language that indicated desalination *could* have a future in that part of southern California. Although this storyline would support a facility with a maximum output of 22,000 AFY (an offer Poseidon has preemptively dismissed as being financially unviable), it did lend some credence to the proponents' argument. As if to offer a 'solution' to projected supply deficits, opponents encouraged alternative supply-side options, such as rainwater harvesting and wastewater recycling, and demand-side policy options, such as conservation. In doing so, the facility's opponents inadvertently sent desalination to the end of the "loading order", reinforcing desalination as an *option* for these opponents, even if it is one of last resort (Williams, 2018b).

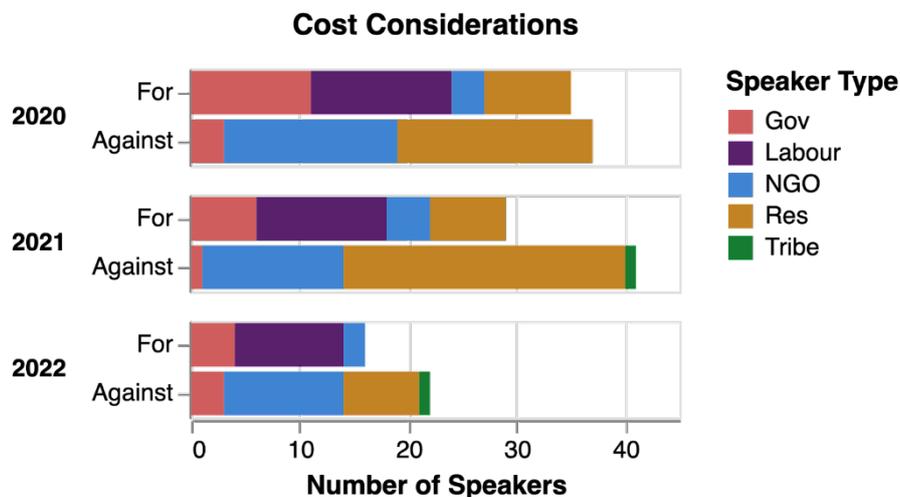
Cost considerations

Some proponents, including the wide range of government officials, residents, and labour and business groups, focused on cost considerations, arguing that the years and money spent in obtaining the key permits and the resources needed to conduct mitigation had to be recouped through approving the facility as soon as possible. This sunk cost argument was often jointly deployed with storylines that minimised the environmental damage of the desalination plant. Poseidon estimated that the 21-year-long regulatory process had cost them over \$50 million, and proponents noted that federal and state grants could help offset building costs – both points reframing the costs borne locally to promote the facility as an economic opportunity. Moreover, proponents situated economic *benefits* to the local by highlighting the facility's potential to support jobs and welfare through an estimated 3,000 new construction jobs it would create and the facility's tax revenues that would help fund local schools.

¹² [OC Water Reliability Study](#)

¹³ [2018 Reliability Study](#)

Figure 7. Proponents and opponents using the cost considerations theme to support their position at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings, grouped by speaker type.



Opponents, particularly residents and environmental and community advocacy groups, were unified in their argument that the financial cost of this specific facility was unreasonably high. To them, the costs would be borne by the American public through the federal and state grants and loans that would subsidise the fixed building costs of this local facility. Then, the facility’s building and operating costs would be passed to ratepayers through higher water bills that would "unjustifiably burden" low-income communities. These environmental justice claims were particularly salient at the CCC hearing in 2022 because the CCC adopted an Environmental Justice Policy in 2018 to consider fair outcomes and include perspectives from historically marginalised people in government processes.

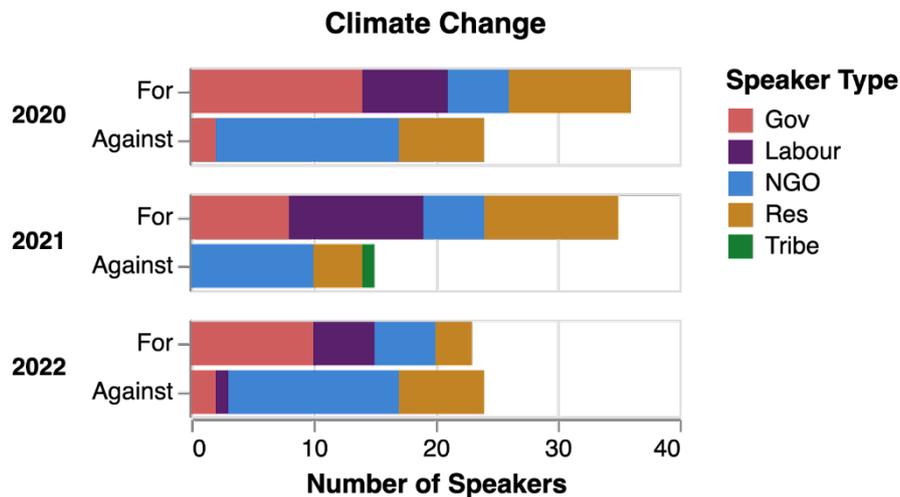
On expected water rates, both proponents and opponents relied on different aspects of the same information from OCWD. The water district expects the facility’s water to cost \$2,250 per acre foot, which is significantly higher than the current cost of imported water (\$1,100 per acre foot) or groundwater (\$600 per acre foot) and would add an estimated \$3 to \$6 (and perhaps more) to household bills per month. Much of this price differential would result from costs associated with the facility’s projected (non-renewable) energy use. With the price of imported water expected to increase every year under drought conditions, OCWD expects the cost of desalinated water to be competitive in 15 years. In arguments, proponents focused on this eventual cost balancing, while opponents emphasised immediate costs on a per-acre foot and monthly cost basis. Proponents also gravitated towards the lower end of the monthly cost range (\$3) and dismissed it as an insignificant amount for "guaranteed water" while opponents focused on the high end of the range (\$6) or rejected the range entirely as an underestimate, instead citing uncertainty on key cost determinants such as contract terms.

Climate change

Both proponents and opponents incorporated climate change into their arguments, with no stakeholders denying climate change outright. Proponents focused singularly on the facility as an adaptation response to climate change impacts – mainly worsening drought – while opponents described the facility as an infrastructure that would contribute to climate change and one that would be vulnerable to climate risks, namely sea level rise. Proponents, including government officials and residents, rarely used climate data in their arguments, instead evoking recent drought years as the expected and undesirable norm. Repeating phrases such as 'drought-proof' and 'climate-resilient', proponents saw the facility as an adaptation response that would provide 'limitless seawater' to counter droughts. This framing turns global climate change into a local phenomenon and helps cast the global oceans as a local resource for

use. Such arguments are not unique to this setting, with officials from nations such as Israel and Australia echoing the "desalination as adaptation" connection (Barnett and O’Neill, 2010).

Figure 8. Proponents and opponents using the climate change theme to support their position at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings, grouped by speaker type.



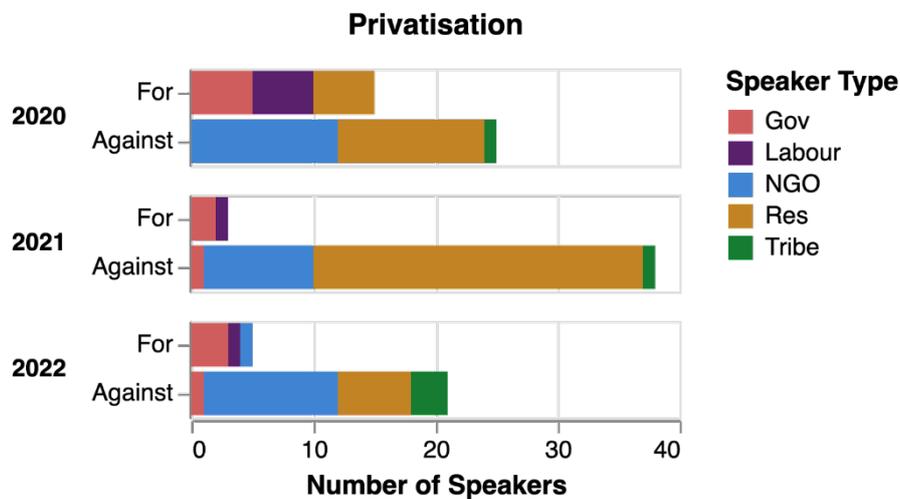
Although comparatively fewer in number, opponents, including environmental groups and residents, focused on the desalination facility’s energy use to frame desalination as a 'maladaptation', or a climate change response that engenders new vulnerabilities (Tubi and Williams, 2021). To them, the facility was not "worth the greenhouse gas emissions" that would be produced across the entire chain of operations. They were also quick to counter proponent claims that the plant would be carbon-neutral through offsets, instead arguing that adding any new significant energy user undercuts climate change mitigation. Opponents further noted the facility’s future vulnerability to sea level rise and coastal hazards due to its location on the Pacific Ocean coast, which they supported with 'expert knowledge', such as climate data and sea-level projections from the National Oceanic and Atmospheric Administration (NOAA). Unlike their responses on other themes, proponents did not offer rival arguments to counter the 'science-based' evidence here. Again, stakeholders on either side trust expert knowledge, even if it promotes uncertainties (Beck, 1999).

Privatisation

The privatisation theme captures the debate on what roles private companies and their interests can play in water supply. The sentiment that water is an essential good that needs financing came up throughout the hearing, although proponents of the facility using this theme were outnumbered by the opponents. Proponents such as government officials highlighted the San Diego Carlsbad Desalination Plant as a model to follow that showed the benefits of working with private companies, including sharing greater financial risks on large infrastructure.

Opponents, such as environmental organisations and residents, largely took aim at the commercialisation of water and the profits for non-local actors that would be generated from local ratepayers (Loftus and March, 2016). As an international company that intends to invite global investors for this project, Poseidon would build profits into the final contract with OCWD. And with the plant poised to receive federal- and state-level financial assistance (e.g. grants and loans), opponents posed normative questions on the level of public assistance a private company should be able to access. Indeed, opponents saw the process of how this plant was initiated – with Poseidon coming to OCWD with the project idea

Figure 9. Proponents and opponents using the privatisation theme to support their position at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings, grouped by speaker type.



without competing with other bids – as a means for the multinational corporation to 'accumulate wealth'. Transforming seawater from a global commons into a private good (water and profits) belied the frustrations from opponents. Interestingly, some opponents offered contradicting arguments when they denounced the profit-seeking objectives of desalination on one hand and conceded that desalination could be used as 'a last resort' on the other, demonstrating NIMBYism and punting their privatisation objections to the future. Proponents avoided the capital motivations of the plant entirely, signifying that arguments against profiting may not matter to them against other perceived benefits such as 'adapting to climate change' and maintaining growth without water cuts.

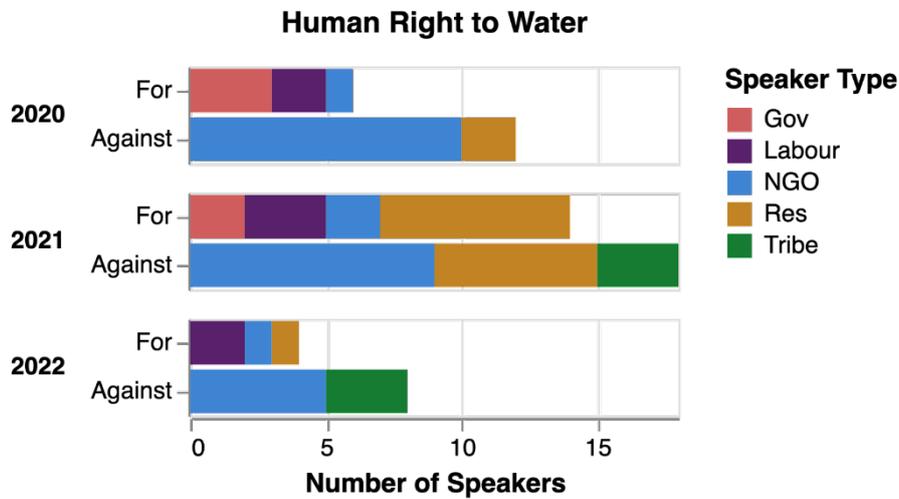
The human right to water

A sixth theme concerns California’s Human Right to Water. In 2012, California signed AB 685 into law to explicitly recognise the human right to water and sanitation. In 2019, the state governor further passed SB 200 to fund projects that aim to "provide safe drinking water in every California community".¹⁴ While safe and clean water are understood as foundational in supporting the human right to water, facility proponents contended that water had to be *reliable* – a condition they believed the desalination facility would help local water providers meet. This theme was rarely used alone, with proponents almost always accompanying their arguments with the facility’s image as a local water supply option that would counter unreliable rainfall-dependent and import-dependent supplies.

Opponents sidestepped the reliability argument and focused instead on the *affordability* of water as critical to supporting the human right to water – a condition they argued the Poseidon facility failed to meet and a point that reinforced the cost considerations presented above. In emphasising elements of the human right to water, opponents, such as tribal representatives, also called for the agencies to consider the right of the environment and incorporate Indigenous values before deciding on this facility. They argued that the human right to water could not be supported when marine life is damaged, exposing the tensions in implementing the human right to water and how it connects to broader water management.

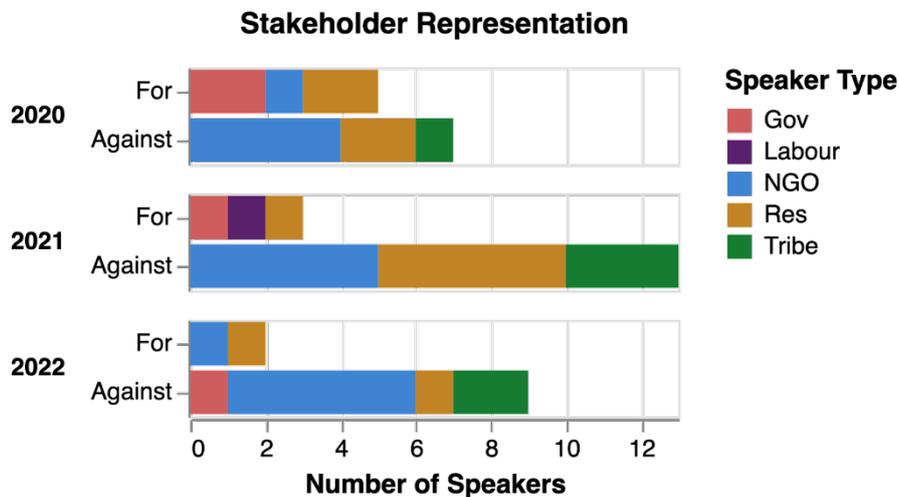
¹⁴ [Bill Text - SB-200 Drinking water](#)

Figure 10. Proponents and opponents using the human right to water theme to support their position at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings, grouped by speaker type.



Stakeholder representation

Figure 11. Proponents and opponents using the stakeholder representation theme to support their position at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings, grouped by speaker type.



The last theme focused on participation and the (lack of) opportunities various stakeholders had to engage in information sharing on this project. The few proponents using this theme actively lauded the public workshops the Santa Ana Board staff held to discuss contents of the discharge permit and the transition to virtual hearings, which they argued expanded public access. This was also the first CCC meeting to be simultaneously broadcasted in Spanish with options for real-time translations for stakeholders who shared comments in Spanish.

Conversely, opponents centred their arguments against the facility on grounds that some procedural details, such as time limit rules at the public hearings, were arbitrary. Speakers had to sign up for two-

minute time slots several days before the hearings, and opponents argued this process created access barriers. Opponents also discredited the process because it lacked official Indigenous consultations with the local Tongva, Chumash, and Acjachemen tribes until early 2022 at the behest of the CCC staff and after complaints were voiced at the 2020 and 2021 Santa Ana Board hearings. While the CCC requires tribal consultation unlike the Santa Ana Board, opponents assumed it was an informal rule and argued it should have been prioritised earlier. Opponents also questioned the expertise of the Santa Ana Board staff, who are mostly geologists, and suggested experts from other fields should have been consulted throughout the project. Some of these comments may have resulted from the staff admitting during the 2020 and 2021 meetings that they were "not experts in finance". Generally, what qualified as appropriate participation was a consistent point of frustration.

Permitting decisions

This section examines if and how the competing stakeholder storylines along the seven themes were addressed in each agency's permitting decisions. I compare each agency's starting position on each of the seven themes to its final position for the associated permit (i.e. discharge permit at the Santa Ana Board and coastal development permit at the CCC). The final position is derived from the decision makers' deliberations, which include the justifications the agencies offered to qualify their final votes as well as any back-and-forth they had with their staff, Poseidon, and other stakeholders. The before-and-after presentations provide valuable description, which can help illuminate patterns and relationships. Although "mere description" does not provide causal mechanisms to theorise what influences the positions of each agency, it does provide critical details that precede explanation (Gerring, 2012).

Santa Ana Board

For the Santa Ana Board, the *before* position is based on the 477-page draft permit that the Board's staff shared publicly in 2019. In it, the staff did not provide a definitive recommendation on how to vote, with available options including approval, conditional approval, and denial. The *after* position is based on the final permit issued at the end of the 2021 public hearing. The Santa Ana Board approved the facility's discharge permit with a 4-3 vote, with the members voting against the permit wanting more lenient terms for Poseidon. This stance effectively rendered the vote 7-0 in favour of the desalination facility. Table 4 below summarises the Santa Ana Board positions and shows how the Board engaged stakeholder storylines.

On the whole, the Santa Ana Board changed their position in line with the environmental damage storylines from opponents of the facility largely because the permit it controls deals with the facility's discharge, incentivising them to scrutinise the project's environmental consequences. Once the public comments wrapped up, the Board debated the merits of the distinction in preservation versus restoration for mitigation projects and when mitigation projects had to commence relative to the facility's operations. In the end, the Board included "compromises" in approving this key permit, albeit arbitrarily. The approved permit prohibited the desalination facility's operations until the Santa Ana Board signed off on the designs and costs of 60 percent of the planned mitigation,¹⁵ with financial penalties for Poseidon if they delayed mitigation under the logic that penalties would disincentivize the company. When 60 percent was offered by one Board member without reason, others quickly approved it. Plans to disallow mitigation *after* operations arose because stakeholders opposing the facility highlighted past precedent. One Board member noted that in the "majority of infrastructure plans, mitigation is done before commercial operation", although this sentiment did not translate into a requirement for 100 percent of the mitigation for this facility. On the type of mitigation that should be pursued, the Santa Ana

¹⁵ The planned mitigation included restoring the Bolsa Chica marshes, creating an artificial reef habitat, and funding the dredging of the ocean inlet to the Bolsa Chica Wetlands – a project without adequate support from state and local funds.

Table 4. Changes to the Santa Ana Board position on the discharge permit.

Santa Ana staff position before	Theme	Santa Ana Board position after
<ul style="list-style-type: none"> ✓ Mitigate 112 acres worth of damage through preservation and some restoration at Bolsa Chica Wetlands (108 acres credit worth of preservation), with options to add more credits APPROVE ✗ Mitigation can happen after plant is operational APPROVE 	<p>1. <i>Environmental damage</i></p>	<ul style="list-style-type: none"> ✓ Mitigation policies sufficiently counter environmental damage APPROVE ★ Mitigation must happen before or concurrent EITHER Consensus of 75% restoration projects and 25% preservation projects EITHER ★ Reduce Bolsa Chica Wetlands preservation credit to 45 acres EITHER
<ul style="list-style-type: none"> ✓ Need is decided by OCWD APPROVE 	<p>2. <i>Water supply</i></p>	<ul style="list-style-type: none"> ✓ Need is decided by OCWD APPROVE
<ul style="list-style-type: none"> ✓ Water cost concerns are at the discretion of OCWD APPROVE 	<p>3. <i>Cost considerations</i></p>	<ul style="list-style-type: none"> ✓ Water cost concerns are at the discretion of OCWD APPROVE
<ul style="list-style-type: none"> ✓ Climate change impacts include droughts, for which desalination is being pursued APPROVE 	<p>4. <i>Climate change</i></p>	<ul style="list-style-type: none"> Climate change impacts include droughts, for which desalination is being pursued APPROVE ★ GHG emissions and vulnerability to climate impacts not considered EITHER
<ul style="list-style-type: none"> ✓ Not considered EITHER 	<p>5. <i>Privatisation</i></p>	<ul style="list-style-type: none"> ✓ Not considered EITHER
<ul style="list-style-type: none"> ✓ Considered addressed APPROVE 	<p>6. <i>Human right to water</i></p>	<ul style="list-style-type: none"> ✓ Considered addressed although the reliability and affordability of water was debated APPROVE
<ul style="list-style-type: none"> ✓ Process is considered fair, with opportunity for any stakeholder to contribute APPROVE 	<p>7. <i>Stakeholder representation</i></p>	<ul style="list-style-type: none"> ✓ Process is considered fair, with opportunity for any stakeholder to contribute APPROVE

Note: The labels 'approve', 'reject', and 'either' show whether the position tends to favour approval or disapproval, or whether it remains open to either outcome for the facility's current proposal, respectively. Three distinct labels are chosen for illustrative purposes.

Legend

- ✓ Present before/after
- ✗ Removed after
- ★ Added after

Board sided with environmental organisations who referenced the Ocean Plan's preference for "enhancement, restoration, or creation". Preservation remained central due to the desire to help save the local Bolsa Chica Wetlands. Again, when a Board member offered a compromise of 75 percent restoration and 25 percent preservation, the majority accepted. Much of the Santa Ana Board debate on environmental damage was possible because opponents of the facility made explicit links between the discharge permit and how it could interpret the Ocean Plan. As the leader of a local coastal conservation group noted, "the ocean plan doesn't allow ignoring this mandate or making up for all of those avoidable impacts associated with an oversized facility with compensatory mitigation".

For two theme issues – water supply and the human right to water – the Santa Ana Board sidestepped conversation by saying that it was not the appropriate forum for debating those topics in relation to the facility's permit, even if the stakeholders deemed it so. No changes along either of these themes were made to the approved permit. For water supply concerns, particularly whether desalinated water was needed, the Board declared the local water agency (OCWD) had sole discretion. One Board member said

OCWD "just want certainty and reliability and less imported water. At the end, it's in their purview to want this" and directed stakeholders to take their testimonies to OCWD. Another member evoked the authority of the Ocean Plan as the guide for deliberation, stating, "I do think that the Ocean Plan asks that you defer to the water agencies and does not address situations where agencies give different answers". Yet in the deliberations leading up to the decision, the majority of the Board sided with the facility's opponents that there may not be a need for the plant. One member posed, "do you need this water? No", while another lamented the "missed opportunity for conservation" (2020). Even the Board's staff jumped into the deliberation to point out Poseidon's influence on local water supply options and known profit motivations:

If you recall, we asked OCWD why 50 million gallons is needed. And the response we got is that actually this was for Poseidon. The response was they need the water. To further clarify, we did ask for a lower volume, and how that relates to the economy of scale, going to a lesser volume won't satisfy the economy of scale. But they still maintain going to a lesser volume won't be as economical as doing the 50 MGD facility.

On the human right to water (HRW), the Board wrestled with the reliability and affordability concerns and ignored claims over the rights of the environment. In addition to the state-level 2012 statute on the HRW, the Santa Ana Board explicitly adopted a resolution in December 2019 recognizing the HRW. However, as listed in the staff report, "neither the statute nor the resolutions define the terms used in the human right to water policy" (p. 17). The Board ultimately concluded that the "cost of water, as far as human right to water, has been considered" (2021) and chose not to elaborate what factors were critical to realising the right. They further disassociated the Santa Ana Board as the forum for this conversation, asking, "for human right to water, is it for the OCWD to decide?" (2021).

Similarly, the Board decided to not actively discuss the remaining three themes – climate change, privatisation, and stakeholder representation – either because the issues ran as an undercurrent throughout the deliberation (climate change and privatisation) or because they chose not to respond (stakeholder representation). Again, none of these stakeholder storylines on these themes directly altered the permit, and stakeholder participation in decision-making was confirmed to involve predominantly one-way sharing of information. For climate change, the Board voiced concern over impacts such as droughts on water supply but chose to not deliberate the facility's adaptation versus maladaptation features. For privatisation, the Board recognized that Poseidon would reap profits from the project throughout, but again, they withheld an opinion on whether and how to address concerns about water supply privatisation. For stakeholder representation, the Santa Ana Board was visibly caught off guard when tribal representatives and environmental groups revealed no Indigenous consultations had taken place and only "letters were sent" for input (2021). When the Board realised some of their deliberations were veering into direct conversation with only Poseidon, they self-corrected and noted "it's like opening the public discussion without letting in others to argue" (2021). On the whole, the Board seemed to believe their decision-making procedures had created space for meaningful participation as evidenced through self-congratulatory remarks.

California Coastal Commission

For the CCC, the *before* position is based on the 204-page staff report issued publicly in February 2022. The CCC staff recommended denial based on the proposal's inconsistencies with environmental protection rules and "unclear but likely significant burdens on environmental justice communities". Although such recommendations can guide final votes, the CCC has the authority to go against staff recommendations (and has done so in the past). The *after* position is based on the deliberation before the coastal development permit was unanimously denied on 12 May 2022 with a 12-0 vote (see Table 5).

Table 5. Changes in the CCC position on the coastal development permit before and after the 2022 public hearing.

CCC Staff position before	Theme	CCC position after
<ul style="list-style-type: none"> ✓ Poseidon's proposed mitigation package does not meet appropriate standards REJECT ✗ Mitigation credits are determined by the Santa Ana regional board but it is "far less than needed to ensure conformity to Coastal Act provisions" REJECT ✓ Need is decided by OCWD APPROVE ✗ OCWD has not identified an immediate need for much of the water REJECT ✓ Environmental Justice groups noted that there is uncertainty and little information on potential rate increases REJECT Water cost concerns are at the discretion of OCWD EITHER 	1. <i>Environmental damage</i>	<ul style="list-style-type: none"> ✓ Poseidon's proposed mitigation package does not meet appropriate standards REJECT ★ Mitigation requirements are not possible to determine due to uncertainty in scale and extent of damage expected EITHER
<ul style="list-style-type: none"> ✓ Desalination of both brackish waters and seawater will likely have a key role to play in providing a new, drought-proof water supply for the region APPROVE ✓ CCC guidance from 2018 and 2021 requires this facility to consider sea level rise and incorporate proactive risk assessment and adaptation planning REJECT ✓ Tribal leaders raised issue of private, for-profit company controlling public water resources and "commodifying" water REJECT 	2. <i>Water supply</i>	<ul style="list-style-type: none"> ✓ Need is decided by OCWD APPROVE ★ Other supply options should be considered to meet identified water need EITHER
<ul style="list-style-type: none"> ✓ The project's main effect on California's Human Right to Water (2012) policy will be to increase water rates REJECT 	3. <i>Cost considerations</i>	<ul style="list-style-type: none"> ✓ Environmental Justice groups noted that there is uncertainty and little information on potential rate increases REJECT ★ Energy usage and costs will be enormous EITHER ★ Private company will mean government will lose control over financial costs REJECT
<ul style="list-style-type: none"> ✓ There are opportunities for any stakeholder to contribute and participate, including Spanish translations APPROVE ✓ Staff reported local tribes found consultation lacking from Poseidon and government agencies REJECT ✗ Staff recognized it is likely that underserved communities were unable to participate EITHER 	4. <i>Climate change</i>	<ul style="list-style-type: none"> ✓ Desalination of both brackish waters and seawater will likely have a key role to play in providing a new, drought-proof water supply for the region APPROVE ✓ Building a critical infrastructure that is susceptible to sea level rise and coastal hazards is inadvisable REJECT ★ GHG emissions will be significant REJECT
	5. <i>Privatisation</i>	<ul style="list-style-type: none"> ✓ Tribal leaders raised issue of private, for-profit company controlling public water resources and "commodifying" water REJECT ★ Cannot forbid corporations from being involved EITHER ★ Private company will mean government will lose control over financial costs REJECT
	6. <i>Human right to water</i>	<ul style="list-style-type: none"> ✓ The project's main effect on California's Human Right to Water (2012) policy will be to increase water rates REJECT ★ Reliability and affordability of water debated, but this was generally considered addressed APPROVE
	7. <i>Stakeholder representation</i>	<ul style="list-style-type: none"> ✓ There are opportunities for any stakeholder to contribute and participate, including Spanish translations APPROVE ✓ Acknowledged Tribal consultation lacking from Poseidon and government agencies REJECT

Note: The labels 'approve', 'reject', and 'either' show whether the position tends to favour approval or disapproval, or whether it remains open to either outcome for the facility's current proposal, respectively. Three distinct labels are chosen for illustrative purposes.

Legend
 ✓ Present before/after
 ✗ Removed after
 ★ Added after

As the next agency in the permitting process, the CCC effectively picked up where the Santa Ana Board had left off in 2021. Their starting position is based on the CCC's staff analysis of issues pertinent to the coastal development permit and CCC-specific policies. Rather than recommend options on how the CCC could vote, the staff recommended only one option: denial. Affirming the managerial decision-making model at play here, the leader of the CCC staff noted:

All staff can do is provide you, the decision makers, with our best independent professional recommendation based on the facts, sound science, and the spirit intent of the law without bias or malice. And this is what we have done. So now it's your turn to weigh all the evidence, the testimony, the science and the law, and render your good judgment (2022).

Similar to the deliberations at the Santa Ana Board, the CCC focused primarily on the theme of environmental damage due to the nature of the coastal development permit. The staff report notes: "The Commission would need to add mitigation measures in addition to those approved by the Board to allow for the necessary Coastal Act and LCP [Local Coastal Program] conformity. This does not create a conflict with the Board decision" (2022). While the staff's statement meant that mitigation projects could be used to address outstanding concerns, the commissioners decided that the question at hand was not "how much mitigation is needed" but rather "how do we mitigate for these deserts we're creating in the sea?" This commissioner line echoed comments from the facility's opponents, including environmental organisations, residents, and tribal representatives, who were emphasising that environmental damage was "so extensive" that "there aren't enough mitigation projects available to begin to address the problem that they created" (2022).

This discursive shift in the officials' deliberation at the CCC, when compared to deliberations at the Santa Ana Board, upgraded the value of opponent storylines against the desalination facility on grounds of its environmental damage. Indeed, the facility's opponents at the CCC emphasised environmental damage associated with various aspects of the desalination facility over its projected operating life of 30-50 years, including construction and daily intake, outflow, and brine. While stakeholders and the CCC staff continued to reference known statistics around damage (e.g. estimates on marine life lost per day, which ocean areas would be most affected, and how different desalination technology could reduce marine life harm), the CCC latched onto unknown environmental risks and did not venture into debating potential mitigation projects.

While the CCC primarily incorporated information from the staff report and the public hearing alone, it is essential to note that the CCC was operating under broader political pressure from the state governor. Just two weeks prior to the 2022 hearing, the governor noted publicly that "in the staff report, I appreciate they made a few recommendations that the Coastal Commission can pick up on. That's related to offsets and mitigation on wetlands and other things that Poseidon would be required to do. Those are longer term. Perhaps they can move those sooner" (Rogers, 2022). As if in rebuke to this comment and to assert itself as an independent agency, the CCC largely ended their 'no' votes with reference to the potential marine life damage for which mitigation was not possible.

On climate change, the CCC more readily accepted the credibility of the opponents' storyline that the facility would increase GHG emissions and be vulnerable to sea level rise. As one commissioner noted: "The project would vastly increase energy consumption and emissions, which I am not convinced at all could be mitigated based on what I heard today". Although the ongoing drought loomed large over the hearing and in the stakeholder arguments, the CCC more willingly acknowledged that the facility would be maladaptive, i.e. generate vulnerabilities while being an adaptive response to drought. In response to another quip from the governor two weeks before the meeting that "we need more tools in the damn tool kit ... what more evidence do you need that you need to have more tools in the tool kit than what we've experienced? Seven out of the last ten years have been severe drought", the CCC acknowledged two things that the facility's proponents had emphasised: 1) "desalination definitely is a tool in our water supply toolkit" and 2) "desalination projects are part of the water future of California". Indeed, general

desalination was framed as inevitable throughout the 2022 meeting without clarity on when this future would come and under what assumptions of continued growth and water use. Underlying this sentiment was the loading order where desalination would be an option that will be prioritised after options to manage water supply have been mobilised to meet demand, effectively kicking stakeholder concerns along other themes to an imagined but expected future (Williams, 2018b).

The CCC combined the remaining three themes – water supply, cost considerations, and privatisation – in their deliberations. While the CCC did not question OCWD's authority in determining water needs for their local jurisdiction, they did question the judgement of pursuing large-scale desalination for this area. As the CCC put it, "water is largely managed at the local and regional level, and needs vary tremendously by location", but "how do we increase the amount of effort made in recycling water?" While this point maintained the supply-driven model for water management rather than considering demand-side options, the CCC did confirm that agency decisions around pursuing water strategies were murky. As proponents asked the CCC to lend "trust" to the suppliers, it became clear that not trusting other government agencies meant questioning their independence, which could undermine the current form of managerial decision-making. Indeed, elected members of various water districts pressed the CCC to "please give the Orange County Water District the benefit of the doubt that we will do the right thing for Orange County, for our region, and for our state". To such points, the CCC clarified that this particular desalination facility was separate from desalination in general. When opponents, including environmental organisations and residents, repeated that this desalination facility impinged on the 'public trust' by generating profits for a private company through higher costs for residents, the CCC quelled the NIMBYism in this argument by assuring "desal must be and will continue to be a fundamental part of our state's water portfolio" and "we can't say like no corporations are able to participate in these things", effectively confirming that CCC did not see itself as the venue to arbitrate water privatisation. The CCC thus hedged concerns over reliability and affordability that the Santa Ana Board had left unaddressed while maintaining the appearance of alignment between local (OCWD), regional (Santa Ana Board), and state (CCC) agencies.

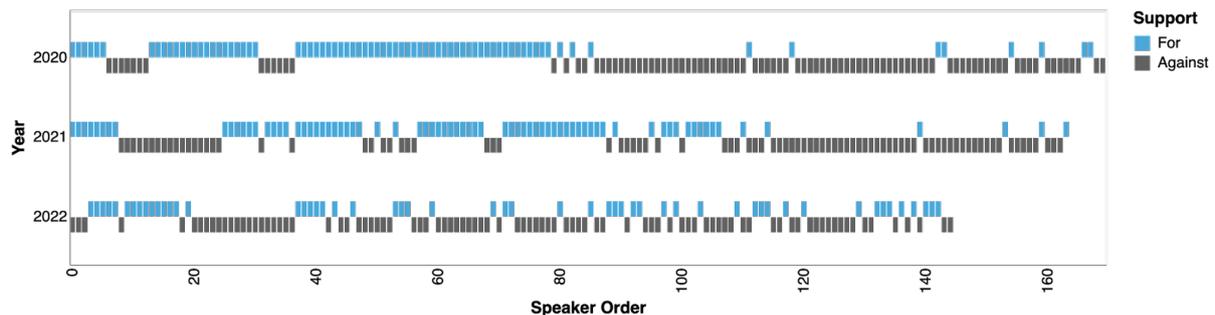
On the remaining two themes – the human right to water (HRW) and stakeholder representation – the CCC maintained both had been addressed with the caveat that they could be revisited in the future. Unlike the Santa Ana Board, the state-level CCC has two explicit policies for public outreach to underrepresented groups: a Tribal Consultation Policy (adopted in 2018) and an Environmental Justice policy (adopted in 2019). Yet despite this desalination facility being under consideration since 1998 and more formally since it received the CSLC permit in 2017, the first consultation with local tribes happened in February 2022 with two follow-ups in April 2022. Part of this delay was attributed to the CCC being the last agency to deliberate on the facility. When stakeholders presented the polarised debate between affordability and reliability together with the HRW, the CCC noted "people citing the human right for water as a reason to support or oppose this project was really interesting", revealing how information was being linked in unexpected ways. For issues on collaboration and tribal outreach, which were raised predominantly by the facility's opponents, the CCC punted prime responsibility to Poseidon. Doing so allowed the CCC to strengthen their case for why they were rejecting this specific desalination facility. Yet the CCC did acknowledge how the permitting process fell short, even if it did not offer ways to enhance stakeholder participation directly:

This entire conversation, to me, feels a little bit like a fundamental breakdown in process, like the culmination of a long-term failure for us to effectively collaborate, whether it's a failure of the applicant to engage in good faith, whether it's a failure of our staff to effectively communicate what needs to be done (2022).

Nevertheless, some of the procedures that the facility's opponents criticised, such as the short time limits for verbal comments and potential bias in the order of speakers, were at the discretion of the government agencies. Rules that curate the sequence of stakeholder exchanges can restrict access to public participation and limit the standing and influence of stakeholders in decision-making processes (Senecah,

2004). For instance, arguments from proponents of the facility were largely heard during the first half of each hearing (Figure 12). This is not to say there should be 'balance' in rhetoric – doing so can potentially create a "veneer of fairness" that further undermines stakeholder influence (Carroll and Bsumek, 2021). Rather, this information reveals that one-way idiosyncratic rules are consequential to decision-making processes. Addressing rigid procedures and capacity constraints that can be at the discretion of agencies, such as time allocated to public engagement and the use of expertise, is likely to support meaningful participation (Ulibarri et al., 2022).

Figure 12. Speaker order at the Santa Ana Board (2020 and 2021) and the CCC (2022) hearings.



CONCLUSION

By evaluating the public comments and official deliberations tied to the Huntington Beach desalination facility, this paper reveals the issue areas that matter in debating and permitting desalination and, by extension, contested infrastructures. The paper identified seven themes and the key storylines therein that various stakeholders used to justify their position on this facility, including environmental damage, water supply, cost considerations, climate change, privatisation, the human right to water, and stakeholder representation. Stakeholder positions were reduced to approval or denial due to the nature of the regulatory process, and the two groups were largely split between government officials and labour groups on one side and environmental organisations and tribal representatives on the other, with residents split between both sides.

In line with recent literature, stakeholders presented competing arguments on desalination’s environmental damage and its merit as a local water supply option, but the addition of other themes showed that desalination debates are multipronged and connect to location-specific water management issues such as the human right to water (Williams and Swyngedouw, 2018). Discussions on the human right to water have been, to some extent, enabled by California’s proactive approach to adopting policies that recognize and support the human right to water. Places without similar policies are likely to face challenges in evaluating this theme for contested infrastructure projects. Deliberations among officials at the Santa Ana Board and the CCC further revealed that stakeholder storylines on the theme of environmental damage weakened the case to approve the facility, especially when stakeholders highlighted how the proposal did not abide by agency policies, while storylines on the theme of water supply and climate change – particularly those advancing desalination as a supply-side adaptation response – strengthened the facility’s proposal. While the CCC was the only agency to take up debates on cost considerations and the human right to water because of agency-specific rules for considering environmental justice, debates that problematised privatisation and (lack of) stakeholder representation were left off at both agencies. Indeed, stakeholders are having debates that the regulatory agencies are unable or unwilling to address, showing that stakeholder participation is included for information-sharing purposes in the current managerial decision-making process. In regions with comparatively weaker institutions, even fewer themes and storylines are likely to be meaningfully debated.

The polarised debates reflect on not only this facility and California's water future but also on the tensions related to using conventional decision-making processes to deliberate emerging, unconventional infrastructures. While the Santa Ana Board responded to stakeholder storylines by requesting mitigation requirements to 'offset' damage while approving the desalination facility, the CCC, which abides by stricter environmental protection regulations, was convinced to deny the facility outright. This shows that centralised decision-making processes that encourage polarised debates risk entrenching issue areas like desalination's environmental consequences as a trade-off for its potential to support "water independence" (Morgan, 2020). While one consequence of denying this infrastructure is that it can boost other supply-side and demand-side water management options, another is that the denial simply sets the benchmark for the type of desalination facility that cannot pass through the permitting process currently, perhaps enabling projects that differentiate themselves from this facility to receive regulatory support. Despite denying this particular facility, the regulatory agencies in this case affirmed the uncritical view of desalination as a technical local fix for water scarcity that will provide 'new' water supply for urban expansion and development (March et al., 2014). This takeaway risks undermining stakeholder perspectives and deferring desalination's social and environmental debates, even in California, where regulators and stakeholders are more likely to have the tools to support IWRM than in most other locations (McEvoy, 2014; Williams, 2018b). Indeed, after denying this facility in May 2022, the CCC approved two smaller seawater desalination facilities in quick succession in October 2022 and November 2022 – two cases that warrant comparison to this case (Xia, 2022).

Beyond encouraging the need for collaborative decision-making, the findings of this study have broader implications for desalination projects and stakeholder participation in other regions. While some of the identified themes and storylines, such as environmental damage and water supply, may be relevant in different contexts, others might vary depending on specific socio-political and institutional settings. To improve public hearing procedures and support stakeholder participation in desalination projects worldwide, agencies should actively engage underrepresented stakeholders and collaborate across scales to facilitate broader conversations on emerging water management options. Depending on location, many agencies may be involved in the decision-making process, so to reduce cross-agency uncertainties on how to review project proposals, environmental and desalination procedures should be further standardised (Cooley et al., 2006). Ultimately, the decision to deny the Huntington Beach facility showed that centralised decision-making processes can be influenced by stakeholder perspectives and that these debates are closely tied to location-specific water management issues.

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