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TOPICAL REVIEW

Tales of river and ice: Indigenous art and water justice in the Arctic and the Amazon

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Abstract

Indigenous water knowledge recognizes water as living, and that the relationship between people and water is one of reciprocity. Yet, Indigenous Peoples continue to struggle for water justice due to centuries long and ongoing colonial legacies that have intergenerational effects on self-determination, culture, and wellbeing. Using a narrative review, this paper explores how published research has used art and arts-based approaches to explore dimensions of water injustice, wellbeing and mental health with Indigenous communities living in the Arctic and Amazon regions. Within the three central themes of the review (wellbeing, water justice, and arts-based research approaches), the most discussed emergent themes were: relationship to place, kinship, the lived experience of water, ongoing changes to water, and storytelling and art as instruments of resistance and to make visible what is not visible. The paper discusses those themes from the literature, and possible areas of future research. The findings underscore the importance of including diverse voices, worldviews and knowledges in water governance, and the potential for arts-based approaches to facilitate intercultural and intergenerational efforts to address water injustice and advance Indigenous Peoples' rights to self-determination.

1. Introduction

'Water provides lifeways, subsistence, and has undeniable spiritual significance.' 'Water is the first medicine' and 'water is life' are common refrains in North American Indigenous communities, including those in Alaska and Canada (McGregor 2014, Wilson *et al* 2019, Craft *et al* 2021). Water is 'a language, a community, and a source of knowledge and law' (NWAC 2024). For the Peruvian Amazon's Awajún peoples, among the three most powerful beings is Tsuqki, the spirit of water who, along with the spirits of the forest and earth, protect and heal the Awajún (Tallman 2019). Conceptualizations of water by Indigenous Peoples are richly diverse and complex. While there is no universal definition of Indigenous Peoples, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) states that 'Indigenous Peoples have in common a historical continuity with a given region prior to colonization and a strong link to their lands. They maintain, at least in part, distinct social, economic and political systems. They have distinct languages, cultures, beliefs and knowledge systems. They are determined to maintain and develop their identity and distinct institutions, and they form a non-dominant sector of society' (UN 2024). The term Indigenous Peoples encompasses a wide range of beliefs, cultures, languages and livelihoods. This paper does not wish to generalize on what Indigenous Peoples' perception of water is, or is not, but aims to illuminate findings from the literature that discuss water justice, wellbeing, and arts-based research approaches. We recognize that amidst the diversity of ways of knowing

and understanding water, there are some shared values between Indigenous Peoples, such as the importance of water to life, and a holistic view of the world that emphasizes connectedness and relationships. According to Leonard *et al* (2023), Indigenous water knowledge recognizes water as living, and that relationships with water are embedded in many living concepts, such as kinship and reciprocity.

Indigenous Peoples continue to struggle for water justice across the globe, stemming from centuries long, and ongoing colonial legacies that have had profound effects on Indigenous Peoples' right to self-determination, socio-economic development, cultural identity and health outcomes (UN 2022). In recent years, alongside the UNDRIP, Indigenous-led water justice movements have been gaining policy momentum. For example, in 2022, for the first time, a forum within a major United Nations water conference was dedicated to Indigenous Peoples, recognizing Indigenous Peoples as global leaders, actively shaping, through their knowledge and wisdom, national and international water governance (UNESCO 2022).

There are many facets to water justice, including equity of access to water, recognition of distinct water traditions and cultures, and expectations for fair participation in wider, multi-stakeholder governance processes. Water justice involves understanding the complex layers of water-related injustices, including the visible issues like water extraction or pollution, as well as more subtle forms of exclusion, such as biased policies or marginalization (Biggs *et al* 2013, Harris *et al* 2017, Sohns *et al* 2021). Recent research has investigated the lived experience of water (in)security, and how it is embodied and manifests 'under the skin', and in mental health, through feelings of shame, anger, and humiliation (Eichelberger 2017, Rosinger *et al* 2021, Wutich *et al* 2022, Martin-Ortega 2023). For many Indigenous Peoples, the complex, collective, cumulative, and intergenerational psychosocial impacts that resulted from the depredations of past colonial subjugation, including water injustices and water colonialism, remain an ongoing challenge (Tuck 2009, Nelson and Wilson 2017, Leonard *et al* 2023).

While many government-led mental wellness programs and services have sought to support Indigenous communities, they have rarely incorporated Indigenous knowledge, perspectives, values and practices, and they remain largely disassociated from long-standing systemic water injustices. There is an urgent need to explore alternative explanatory models that frame Indigenous Peoples' distress as historical and intergenerational trauma, especially through a return to Indigenous governance, language, and cultural practices (Moggridge *et al* 2022, Leonard *et al* 2023). Such practices are simultaneously art, religious practice, ritual models and markers of governance structures and territorial heritage, as well as expressions of individual and community identity and lineage (Phillips and Collison 2004).

A growing body of evidence demonstrates the importance of art to mental health, linking creative practices directly to the vitality of individual and collective identity, strength, resiliency, and overall well-being (Arsenault *et al* 2018, Collier *et al* 2020, Van Uffelen 2021). Storytelling, canoeing, boat-building, subsistence practices, totem pole carving, among other art approaches reflect Indigenous Peoples' connections with the land, with kin, and with cultural symbols, spiritual values, and material assets of the individual and communities that draw on traditional knowledge, language, and practice (Tuck 2009). These art practices and forms of knowledge connect generations, and stories often serve as a central focus of Indigenous epistemologies (Iseke 2013, Moggridge *et al* 2022). While traditional and contemporary art has long been used by Indigenous Peoples to promote intergenerational healing and connection, the contribution of arts practices to long-term changes in cognition, emotion, and behavior to deliver water justice remains underexplored.

In this paper we present a narrative review to explore the question: how have art and art-based approaches been used in research processes with Indigenous communities in relation to water justice and wellbeing in the Arctic and Amazon regions? We use a narrative review to synthesize our search, describe the state of existing literature and summarize the connections between art approaches and well-being in the context of water justice (Greenhalgh *et al* 2018). We also present possible areas of future research based on the findings.

1.1. Background

In both Arctic and Amazon communities, water justice is challenged by many factors, including a disregard of Indigenous water ontologies and traditions, unequal participation of Indigenous Peoples in water governance, damaging socio-ecological relationships, ongoing expropriation of water from Indigenous Peoples, resource extraction, colonialization, and economic pressures (Harris *et al* 2017, Hartwig *et al* 2022). A growing literature documents Indigenous water injustices due to settler-colonial states, which have engaged in a process of systematic exclusion of Indigenous Peoples and colonial imperialism of peoples, lands and waters (Taylor *et al* 2019, Leonard *et al* 2023). Dimensions of perpetrated injustices are embedded in governance, policies and institutions and have direct and indirect impacts on wellbeing.

Water justice studies have focused on the distribution of water, especially the security of access to

sufficient quantities and quality of water and sanitation, and their associated reliability, accessibility and affordability (Hartwig *et al* 2022). Research in Newfoundland and Labrador and Alaska documents how the exclusion of Indigenous groups in the development of engineered water systems and legal frameworks has led to household water insecurity (Hanrahan *et al* 2014, Wilson 2014). Across Arctic Canada, boil water advisories (BWA) and poor water quality are commonplace due to water treatment issues, presence of microbes, and human error (Jones-Bitton *et al* 2016, Minnes and Vodden 2017, Sohns *et al* 2019b). As of 28 January 2022 Indigenous communities across Canada were under a short-term drinking water advisory, and 29 communities had long-term advisories (Canada 2019). The Neskantaga First Nation in northern Ontario has experienced a BWA for more than 28 years which has forced the community to fully evacuate for periods of 1–3 months in 2019 and 2020 (Matawa 2023). Many communities do not trust their water utilities because of the high cost of purchasing water and frequent breakdowns (Sarkar *et al* 2015).

Even when the quality of the water may meet regulated standards, the quantity may not be sufficient to meet household needs. In Nunavut, Canada, a baseline water volume per capita per day was established for trucked water supply systems to address the prevalence of gastrointestinal and skin disease (Daley *et al* 2014). Yet overcrowded homes due to lack of available housing, and water distribution challenges impede individuals within each household from receiving sufficient quantities of water from municipally delivered sources (Daley *et al* 2014). Such issues of water access and availability are expressions of water injustice that threatens the health and wellbeing of Indigenous Peoples across the Arctic.

Beyond ongoing struggles of water access and distribution are experiences of being marginalized, the continued disregard of Indigenous ontologies and epistemologies, histories of harm, and single-event and chronic water contamination that have contributed to water injustice and wellbeing (Wright *et al* 2018, Wilson *et al* 2023). These themes are central to water justice, especially as scholars argue that water justice transcends questions of equitable distribution and demands and that we consider whose voices are being included in policy, decisions, and rule-making (Hartwig *et al* 2022). Due to the long-term water injustices that Indigenous Peoples have experienced and exclusion from decision-making processes, many communities have come to distrust water governance, and drinking water provided by settler-colonial states (Wilson *et al* 2023). For example, the majority of residents in Newfoundland and Labrador have been found to be very concerned with the overall safety of their water quality (Roche *et al* 2012).

In the Peruvian and Ecuadorian Amazon, communities have been challenged in securing sufficient water supplies due to gold and oil extraction and their associated pollution. Runoff from mines can contain heavy metals and toxic chemicals, contaminating rivers and critical water sources that communities rely on for drinking, fishing, and agriculture. Indeed, there is a long and tragic history of oil spills and mining waste harming communities and contaminating water sources and freshwater environments (Tallman 2019). The pollution is long-lasting and has adverse health impacts.

Through economic pressures and continued settler-colonial mentalities, water, land, and communities are commonly threatened by deforestation and land use changes. Logging and agriculture can disrupt the natural water cycle. Large-scale infrastructure projects, such as hydroelectric dams, can also disrupt water flow and freshwater systems, and displace Indigenous communities. Further, some communities do not have access to water due to the lack of investments from government in infrastructure, governance, and capacity building. This gap in access reflects institutionalized discrimination as funds do not flow to the areas that need them, which disproportionately affects Indigenous Peoples.

State governance structures continue to ignore the perspectives of Indigenous Peoples and how water is conceptualized in terms of relationality, mutual dependence, and as kin (Harris *et al* 2017, Jepson *et al* 2017, Leonard *et al* 2023). Water injustices stem from past and ongoing dispossession of Indigenous Peoples from their lands and waters, and the damage to those lands, waters, and more-than-human kin that are central to Indigenous health and wellbeing (Hartwig *et al* 2022). Indigenous water justice is therefore also a central component of broader efforts for environmental and social justice, self-determination and sovereignty (Robison *et al* 2018).

Water is often at the heart of Indigenous self-determination, such as the Alta Dam controversy implicating the Sámi people's land rights in Norway from 1979 to 1982. The Alta Dam protest led to the creation of the Sámi Rights Commission and the Sámi Parliament, and contributed to the formation of a Working Group on Indigenous Populations in 1982 by the U.N. (Minde 2001, Briggs 2006, Robison *et al* 2018). Water affects the lives and livelihoods of Indigenous Peoples, and 'holds a wide-ranging significance for their health, economy, and social wellbeing' (p 853) (Robison *et al* 2018). Thus, 'water bears unmistakable[ly] on Indigenous Peoples' core social and economic rights' (p 854) and their self-determination (Robison *et al* 2018).

Water injustices also affect public health including through the presence of waterborne and water-washed diseases, as well as mental health outcomes.

The lived experiences of water injustice impact not only the individual, but also cultural and spiritual relationships with water (Ulibarri 2011, Robison *et al* 2018). Research has documented the impact of inadequate access to water on human health from the initial exposure of poor water quality, or shortage, through related health impacts, such as psychosocial stress that has potential intergenerational effects (Rosinger *et al* 2021). Some examples of embodied water justice include water sharing, water borrowing, or water gifts, where water is reciprocally shared between households. Water sharing seeks to mitigate insufficient water supply which has been shown to increase conflict and emotional distress through feelings of shame, anger, and humiliation (Wutich *et al* 2020, 2022).

People without basic water services have been found to experience higher rates of personal water-related injury due to the mental and physical toll of water fetching (Hanrahan *et al* 2014, Rosinger *et al* 2021). These impacts are gendered, and vary depending on geography (Dickin and Caretta 2022). Mental health impacts include feeling unsafe while collecting water or using sanitation facilities, and chronic stress due to constant uncertainty, and concern of waterborne illness (Rosinger *et al* 2021). Water justice has been found to increase psychosocial distress, risk of depression, anxiety, and negative emotions like anger and frustration (Ennis-McMillan 2001, Wutich and Ragsdale 2008, Stevenson *et al* 2012, Cooper and Wheeler 2017, Workman and Ureksoy 2017). A lack of access to safe drinking water has also been shown to increase suicide risk and impact mental health in first nations (Cunsolo Willox *et al* 2013, Hanrahan *et al* 2016, Ansloos and Cooper 2023). Mental health and its relationship to water justice, colonialism, historical trauma and their associated processes have been highlighted as areas that need to be critically investigated (Nelson and Wilson 2017).

Water may also be restricted in terms of governance structures. Indigenous Peoples have long been limited by national and international governance structures and policies from contributing their water ontologies and values to global rules and frameworks. The legacy of such marginalization has threatened Indigenous Peoples' intergenerational water guardianship and stewardship values that flow from Indigenous understandings of water and its intrinsic value and sentience (Ulibarri 2011). The UN Declaration on the Rights of Indigenous Peoples states: 'Indigenous Peoples have "the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard"' (United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) 2007).

In the Arctic context, studies have shown how climate change and extreme weather events add new challenges to existing water injustices and adversely affect mental health as people experience flooding and storm surges that threaten vital water infrastructure, lands, communities, cultural landmarks, and life (Brubaker *et al* 2011, Sarkar *et al* 2015). Psychosocial distress and mental health outcomes may be affected by climate change, including changes to land, ice, snow, weather, and sense of place (Cunsolo Willox *et al* 2012, Hanrahan *et al* 2016). As Krieger (2005:350) explains, 'bodies tell stories about—and cannot be studied divorced from—the conditions of our existence.' Understanding how water injustices may affect health and wellbeing necessitates first understanding the relationships between lands, waters, and peoples, and the complex connections between them. Arts-based approaches have the potential to help identify relationships between water and human perception which may stem from place, culture, language, emotion, among other ways of knowing (Bladow 2019, Rathwell 2020, RiverOfLife *et al* 2022, Martin-Ortega 2023). Further, arts-approaches' use of story, perspective, sounds, among other qualities may deepen understanding of the more-than-human aspects of water as living and the essence of life. Such insights could address existing water injustices and strengthen future water governance frameworks that develop from diverse ways of knowing and Indigenous Peoples' unique voices and perspectives.

2. Methods

Using bibliometric data from academic journals, the narrative review used a systematized process to guide the identification of relevant documents (from peer reviewed journal articles and grey literature), and their selection for coding and review. The following sections detail the systematized review process. The co-authors of this paper are non-Indigenous. Recognizing that literature review methodologies can be tools that inadvertently perpetuate colonial ideas, the co-authors engaged in reflexive practices throughout the review and focused the review on the Peruvian/Ecuadorian Amazon and Arctic due to the co-authors' existing relationships and experience researching and working with Indigenous Peoples and non-Indigenous peoples in these regions. These regions are also the focus of the research grant funding this work (see acknowledgements/funding details).

2.1. Search process and document selection

The literature review search was conducted on 21 July 2023 using selected search terms under the broad categories of wellbeing, water justice, arts-based approach, and geographic location in Scopus

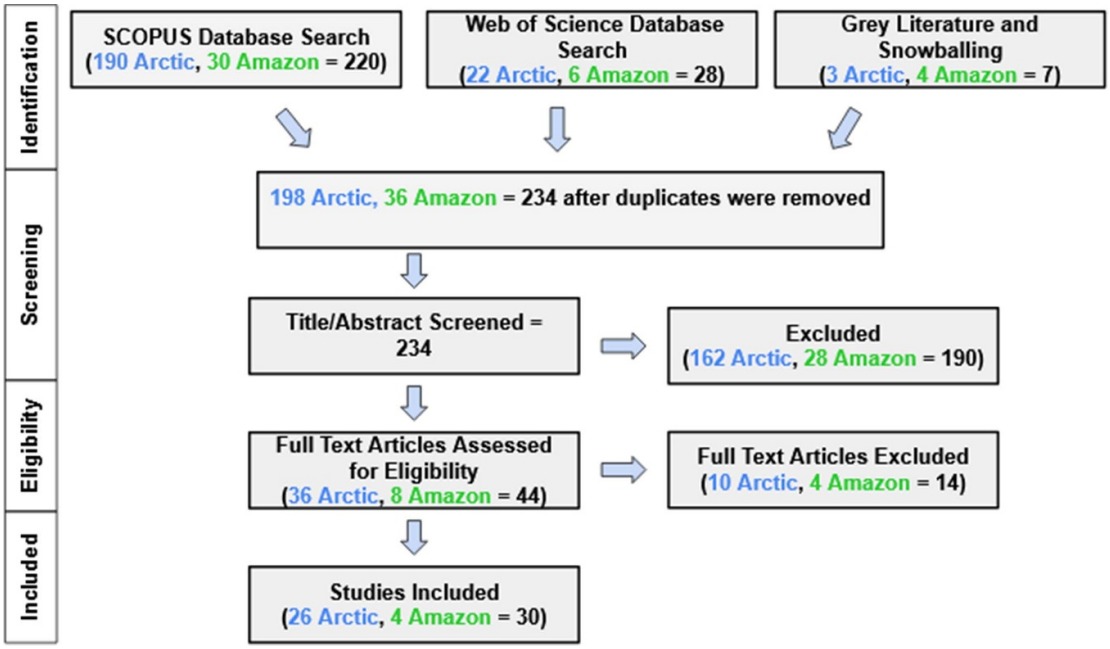

Figure 1. Flow chart of inclusion-exclusion process.

and Web of Science (see tables 1 and 2 in supplementary materials for the search terms in the Arctic and Amazon, respectively). The search required that all search term categories (as defined by their subset of terms) be present in the paper in order to be returned as a result.

The search terms used in Web of Science returned 28 results, while the same terms used in Scopus returned 220 papers (see figure 1). After combining results from Scopus and Web of Science ($n = 248$) and removing duplicate documents ($n = 21$), a total of 227 documents remained. Two of the co-authors searched for grey literature documents to include in the literature review through a process of snowballing references from peer-reviewed journal articles, Google, and knowledge of key organizations working on water, mental health and arts-based approaches in Indigenous communities. From this search, an additional 7 documents were identified for inclusion in the final review.

The first round of inclusion/exclusion for the documents returned from the databases examined the titles and abstracts of the articles. Documents were included if they: (1) were peer-reviewed articles; (2) were written in English; (3) specified a region or area of study in the Arctic or Amazon; (4) engaged meaningfully with an Indigenous population in the Arctic or Amazon, and (5) were methodologically appropriate.

For example, in our measurement of meaningful engagement (criteria 4), epidemiological papers and scientific studies of climate change were excluded if the paper did not focus on or include Indigenous perspectives. Additionally, papers that studied broad or mixed populations were excluded if they did not provide specific analysis concerning Arctic or Amazon Indigenous communities. To be methodologically appropriate (criteria 5), the articles had to use an arts-based approach, or art in the research. Participatory research methods using arts-based approaches were included in the review. To account for the many varied expressions of art, this review opted for an expansive definition of art. The main criteria were whether (1) the art demonstrates a relationship to water or mental wellbeing and (2) if the creative action produced an object or account of the artistic process. Art can include approaches from storytelling, narrative and language, animation, theater, basketweaving, drawing, canoe-building, or fashion, among other art forms. This definition is purposefully broad to recognize the diversity of art forms and understandings of art, which in many Indigenous cultures is a life perspective. Art is the sky, is language, 'is a way of existing' (Audet 2012).

Hence, documents were excluded due to the paper's methodology ($n = 127$), geographic scope ($n = 46$), population of interest ($n = 16$), or being written in a language other than English ($n = 1$). After finalizing the list for inclusion in the review, an additional 14 documents were removed once the full text of the document was read, and it was apparent that the document did not fit inclusion criteria. Seven documents were added to the literature review from the grey literature and snowballing references. Those documents went through the same inclusion/exclusion review process, except the documents did not have to be peer-reviewed articles (criteria 1 stated above). In total, 30 documents were reviewed, including 26 from the Arctic study and 4 from the Amazon.

2.2. Analysis

Qualitative content analysis was used to examine the included documents focusing on arts-based approaches to wellbeing and water justice in the Arctic and in the Amazon. Deductive and inductive coding were used to analyze the included documents. A coding scheme and data extraction table were created to appraise and synthesize the literature. The main categories included descriptive information regarding the article (journal, year, location, and author's country affiliation) and thematic content. Proximate codes were used to group underlying factors for organizational purposes.

The code book was piloted to ensure consistency in the coding process (see table 3 in supplementary materials). After deductive coding was completed on the general characteristics of each article, such as geographic scope and focus of the paper, inductive coding was conducted in Atlas TI. The papers were each read to discern factors and themes that explicitly related to wellbeing, water justice and arts-based approaches. Each of the included documents was read by two of the co-authors and then codes were compared and discussed. The results include the analysis and codes from these independent readings. The emergent codes centered on recurring conceptual topics mentioned in the literature.

3. Results and discussion

3.1. Description of studies

The studies came from a diverse range of authors, academic interests, and locations. Authors in the Arctic study were predominantly researchers affiliated with Canadian (15 studies) and American (8 studies) universities and organizations, with two of the American research teams from Alaska. Due to the lack of positionality statements across papers it is not possible to determine if the authors of the papers included in the review identify as Indigenous or non-Indigenous Peoples. A smaller number of authors were distributed across Finland (1 study), Russia (1 study), Australia (1 study), and the United Kingdom (2 studies). Two of the studies were co-produced with other research teams, including a Canadian–Australian collaboration and an Alaskan-United Kingdom study. Authors in the Amazon study were affiliated with institutes from Peru, the United Kingdom, the United States, and Ecuador, with one study from each of these regions. The included studies were published between the years 2006 and 2022. Of the 26 Arctic articles, 15 studied populations in Canada, 7 in Alaska, 2 in Siberia and 2 in Finnish Sapmi. Of the 4 Amazonian articles identified, 3 were in the Peruvian Amazon and 1 in the Ecuadorian Amazon. Figures 2(a) and (b) map the locations of included studies across both regions.

3.2. Emergent themes

Within the three central themes of this review, (1) wellbeing, (2) water justice, and (3) arts-based approaches, several key themes emerged from the literature, (figure 3) related to: (1) relationship to place, kinship, and lifestyle; (2) lived experience of water, and changes to water quality; and (3) instruments of resistance and decolonialism, storytelling, and making visible what is not visible. Figure 3 highlights these emergent themes, while recognizing that the complexity of these ideas is not fully represented by the Figure. For example, there are many interlinking ideas that cross between themes, such as colonialism and storytelling.

As figure 3 illustrates, arts-based approaches are the overarching theme, with wellbeing and water justice comprising the two central sub-themes explored using these approaches. Across the papers, arts-based approaches were both used as a research method to discuss and analyze concepts as well as to create art from the research process. Arts-based approaches as research method can create a shared experience between researcher and project participants, and rebalance power dynamics inherent to the research process. Through the use of arts-based approaches, researchers may also cross barriers limited by language or cultural differences. For example, Rathwell (2020) describes how when she was 'visiting people's homes, language barriers limited my ability to speak freely with my hosts. However, playing music, dancing, and singing together created a shared experience' (p 69). The following sections detail some examples of arts-based approaches used as research methods and as forms of expression to explore and examine concepts of wellbeing and water justice.

3.3. The power of arts-based approaches

Water justice and wellbeing are complex and interconnected issues that have causes and consequences that may not be readily apparent to an outside observer. Arts-based approaches, such as song or visual arts, can help to make visible peoples' experiences that are often left unarticulated or hidden, and overcome barriers of knowledge mobilization (Bradford and Bharadwaj 2015). In the review, several prominent arts-based approaches emerged as connected to wellbeing and to water justice, including storytelling through song, the importance of Indigenous languages and oral history. Arts-based approaches were also described as instruments of resistance. The following sections detail these emergent themes.

3.3.1. Importance of storytelling

Storytelling is central to Indigenous ways of knowing and wellbeing (Caughey *et al* 2022). Storytelling is both a form of expression and an arts-based research method. Decolonizing research methods

Figure 2. (a) Map of arctic articles. (b) Map of Peruvian and Ecuadorian Amazon articles. background map data © 2024 Google, INEGI.

have approached storytelling as a 'culturally appropriate research tool for representing the "diversities of truth", where the storyteller retains control, and not the researcher… the connectedness that is inherent to storytelling can function to engage community members in research and ensure that research participants are respected as equal partners in the research' (pg. 6) (Caughey *et al* 2022). Centrally, storytelling creates and strengthens intergenerational relationships, and preserves traditional knowledge (Thornton 2012, Bradford and Bharadwaj 2015, Caughey *et al* 2022). Other arts-based approaches

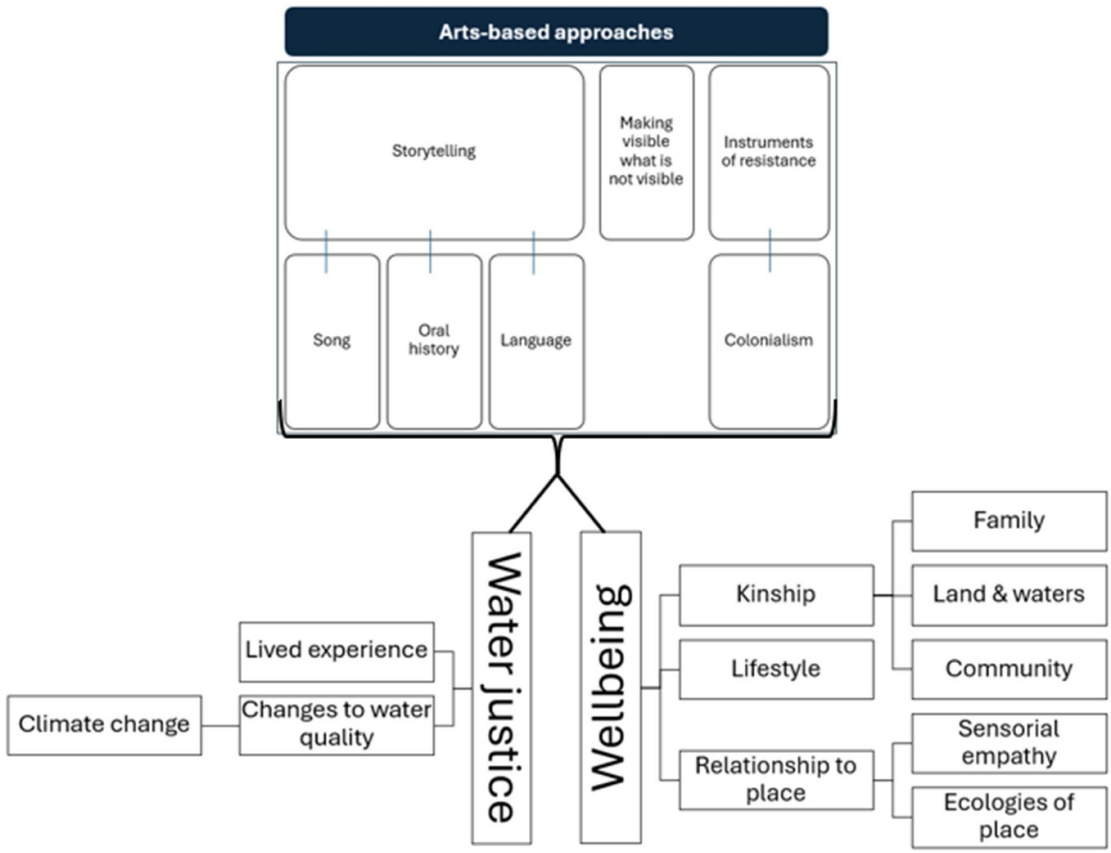

Figure 3. Emergent themes of the review centered around water justice, art-approaches, and wellbeing.

that papers highlighted in addressing water justice and wellbeing were poetry, storytelling, participatory action strategies such as photovoice, video creation, photomapping, and whiteboard animation.

Bradford and Bharadwaj (2015) describe how '[t]he digital storytelling and whiteboard animation design emerged from stakeholder feedback indicating a desire to have results from traditional knowledge interviews relayed back to the community in a non-textual format, and a format that would endear youths in the community.' The whiteboard animation and video were therefore art that emerged from the project, and the method by which the authors researched. The authors used interviews to hear community stories and 'ethnographical accounts of the changes in the river and delta across their lifetimes' (p 2). In a different paper that also used whiteboard video as an arts-based approach and research method, the 'whiteboard video tool was collaboratively developed by Rigolet youth, community members, the research team and key regional stakeholders to share public health recommendations for reducing the risk of [acute gastrointestinal illness' (p 1) (Saini *et al* 2020). The videos depict 'hand draw[n] images on a whiteboard, accompanied by narration, sound effects and music' (pg 51) (Saini *et al* 2020).

Storytelling is described as an 'action of living' and the stories are reciprocally 'alive' (Cusack-McVeigh 2008, Caughey *et al* 2022). Through the act of talking and storytelling, youth are 'touching history' through the words of their Elders and being carried through time or transcending experience to a 'space that the audience inhabits' (Oakdale 2005, Cusack-McVeigh 2008). These stories therefore create a narrative for knowledge production and transmission, as well as develop a deeper understanding of cultural values, of intergenerational experiences, and of the importance of place (Kral *et al* 2011, Eichelberger 2014).

Traditional knowledge is embedded in the stories, as the stories emerge from life experience that is connected to the land and waters. Stories may serve as a guide both of warning and of clarity to ground identity within the uncertainty of the future (Cusack-McVeigh 2008). The use of storytelling as a research method allowed researchers to share the stories with project participants, their communities, and the public as both art and a research outcome. The stories and related interviews were also used for narrative analysis, helping deepen understanding of issues that communities were facing (Kral *et al* 2011, Frandy 2021).

Arts-based approaches also discussed the importance of language, and how language is a model of cultural conceptions of space (Frandy 2021). There is a social life to language, and a collective sense-making through the stories, words, and place-names. As language is embedded in the social processes of a place, colonialism and assimilation pressures worked to suppress Indigenous languages and resulted in language loss (Bradford and Bharadwaj 2015, Frandy 2021, Mustonen and Shadrin 2021). Many Indigenous languages are now endangered and arts-based approaches, including storytelling, publishing, and music are seeking to bring forth a renaissance of Indigenous languages that allows for immersion in the language and its cultural meanings (Frandy 2021). Through song, papers highlighted the expression of identity and awakening, and of strong positive feelings and deep hope (Audet 2012, Sanches and Futemma 2020). Songs also were described as providing a connection to the dream world, and of transmitting Elders' words, and deep emotions such as grief or loss (Audet 2012).

Additionally, papers identified forced relocation and mandatory schooling as central to intergenerational trauma due to disrupted cultural traditions, undermined language immersion, removal from sacred lands and practices, and disregard for Indigenous knowledge and self-determination (Kral *et al* 2011, Thornton 2012, Cunsolo Willox *et al* 2013, Bradford and Bharadwaj 2015, Frandy 2021). Colonialism is also perpetrated through resource extraction for oil, minerals, timber, and fish, among other natural resources. These extractive practices contribute to the legacy of waste that remains from past extractive activities and military presence which has left pollution, contaminated waters and land, as well as violent trauma to the people and environment (Bradford and Bharadwaj 2015, Bravo Díaz 2021, Frandy 2021).

Modern-day colonialism continues through green colonialism, such as tourism or environmental policies that encroach on Indigenous land and waters and disregards their sovereignty (Frandy 2021). Green colonialism therefore reinforces historic oppression. As Sámi folklorist Tim Frandy defines it,

> 'Environmental sciences and sustainability studies have been entwined with ethnocentric thought, "colonial logics", and the reproduction of social power. That is, people do not simply manage an environment, but rather we nurture a specific set of cultural relationships to that environment–and the relationships of the privileged tend to be reified through policy and development' (p 56) (Frandy 2021).

Our review findings support other research documenting the importance of arts-based approaches as a research methodology to address historical, intergenerational trauma, systemic violence and racism perpetrated against Indigenous Peoples, and land rights and enduring social inequalities. In the U.S., totem healing projects and canoe journeys have worked to confront historical trauma, such as when the Douglas Indian Village was burned down by local government in 1962 (Baxter 2018). Totem healing projects are but one example of how arts-based approaches may address historical violence perpetrated against Indigenous Peoples using art, cultural symbolism, storytelling, and community engagement in a healing journey. Through the creation and installation of totem poles, such projects emphasize the revitalization of Indigenous cultures by reclaiming traditional art forms and symbols, fostering a sense of unity and empowerment within Indigenous communities. This collaborative process allows community members to actively participate in healing, remembrance, and reconciliation; create a dialogue; and promote a shared understanding of historical trauma.

Kumasaka *et al* (2022) also used an arts-based approach and research method of a 'graphic notetaking method to help all participants track the workshop dialogue… The graphic representation maps the workshop… across the themes and experiences. At the end, the participants dipped their hands in paint and placed these in the center of the diagram symbolizing our collaborative purpose' (p S316–S317). Such art-based approaches to research allow for rich and transparent discussion. Arts-based approaches can portray multiples levels of knowledge and serve as intimate observations of change (Mustonen and Shadrin 2021).

3.3.2. Instruments of resistance

Arts-based approaches can be used as instruments of resistance, such as through narratives to challenge ideology, promote discussion and preserve culture (Audet 2012). These narrations of protest can occur in many mediums, including fashion and story. Some of the papers described this type of arts-based approach as *artivism,* a form of activism to cultivate awareness, make perspectives visible and challenge dominant narratives (Diverlus 2016). Artivism combines artistic production and activism to advocate for specific causes, and push for transformation through empowerment and representation (Rhoades 2012, Diverlus 2016, Martins and Campos 2023). When discussing Indigenous arts-based methods of achieving water justice, artivism is an especially important outlet of political and environmental expression. This review found that artivism is global in nature, with examples coming from Canada, Finnish Sapmi, and even an interdisciplinary Canada–Australia project (Audet 2012, Takach 2021, Higgins 2022). We found that artivism had a strong tendency to use arts-based approaches as a means of representation and advancing understanding. In the following three examples,

voice was used not only to emphasize water's personhood, but interestingly, to also synthesize voices of opposition to water injustices.

For example, to voice opposition to historic and continuing water injustices in Canada, the screenwriter and university researcher, Geo Takach uses the arts-based approach of a theatrical play (Takach 2021). Takach chose to use arts-based research 'which is rooted in the quest for social justice [and engages] the artistic process, the actual making of artistic expressions in all of the different forms of the arts, as a primary way of understanding and examining experience' (p 1081) (Takach 2021). Arts-based approaches in research seek to 'engage the wider public on more visceral and impactful levels… [and can] be seen as compatible with Indigenous ways of knowing the world and preserving culture, for example, through research storytelling' (pg 1081) (Takach 2021).

Takach's use of language in the play stresses how language is social and imbued with power dynamics. He explores concepts such as Indigenous 'knowledge integration' which, though common 'in the literature' (Takach 2021, p 1076), implies 'absorb[ing] one knowledge into the other' (Bohensky and Maru 2011). Takach instead emphasizes 'knowledge interweaving' as a terminology that can respectfully incorporate multiple knowledge systems (Takach 2021, p 1076). Through Takach's arts-based research, he seeks to share 'subjugated perspectives, access multiple meanings and promote dialogue, all while bringing scholarship to wider audiences' (p 1081).

Takach's play additionally explores issues of water justice through the sounds he includes in the play's scenes, such as 'We hear a TOILET flush…We hear a TAP CREAK OPEN and LIQUID GUSH OUT…We hear water GURGLING down a drain…' (Takach 2021, p 1073–1079). These sounds emphasize Western consumption of water, and abuse of it. To the audience, Takach makes explicit, water is literally background noise. He then juxtaposes his mention of 'poisoned water' in Indigenous communities directly after an announcer declares that 'clean water is a fundamental human right. One that we can take for granted in this great country' (Takach 2021, p 1075). But the play's sound sampling, notably its usage of the national anthem *O Canada* overlaid on an advertisement about the righteousness of oil pipelines, shows how discussions of water sovereignty are drowned out by 'national interests"' (Takach 2021). As a work of artivism, Takach's play is a great device for contextualizing not only how water injustice can be made invisible in Canada, but also how to rise above taking water for granted.

Whereas Takach voices the opposition, 'Hearing, Voicing, and Healing: Rivers as Culturally Located and Connected' takes on the issue of water justice from a different voice entirely: the river itself. By voicing two rivers—Unamen Shipu from Canada, and Matuwarra from Australia, the story experiments with what it would look like to treat water with personhood in the way that Indigenous epistemologies do. In the process, they contrast Indigenous knowledge from Western systems, which treat water as a 'dead' resource. As Unamen Shipu argues, 'They [colonial settlers] have discussed, argued and negotiated, but have never listened to my voice. They eventually came to the conclusion that they needed to harness Unamen Shipu. So, the "hydropower pioneers of the 21st century" came to excavate, backfill, divert, flood…They subjected kin River to the laws of the market economy…Yet River will remain River' (p 428) (RiverOfLife *et al* 2022). In this narrative, the clash between understandings of the 'market economy' and the river's sentience challenges the hegemony of Western knowledge, asking the reader to consider what respectful knowledge interweaving might instead look like.

Through different mediums, arts-based approaches are powerful forms of artistic expression, and their creation provides a platform for Indigenous artists and communities to convey complex emotions and narratives related to historical violence against their communities, lands, and waters. Arts-based approaches as a research method can therefore contribute to the healing process by acknowledging the past, fostering unity, and creating spaces for reflection and resilience within Indigenous communities.

3.4. Arts-based approaches and wellbeing

Through arts-based approaches primarily of storytelling, oral tradition and language, papers in the review conceptualized wellbeing broadly as harmony, a feeling of connectedness between individual, community, and the land (Barletti and Pablo 2016, Bravo Díaz 2021). Wellbeing is conceptualized as holistic, encompassing physical, mental, emotional, and spiritual dimensions. Health was described as interconnected with the wellbeing of the community and the environment, and in harmony with the health of the land, waters, and wildlife. Indeed, several papers referred to the importance of a holistic perspective to mental health, where 'significant aspects of life are viewed as intertwined rather than discrete' (p 429) (Kral *et al* 2011). While there is significant diversity among Indigenous cultures, some common themes emerged through arts-based approaches in expressions and understanding of wellbeing, which are discussed in the following sections.

3.4.1. Relationship to place

The theme of relationship to place was one of the most important to emerge from the review and was represented through several sub-themes, including tensions between economic development and its destruction of nature; place-based emotional processes; ecologies of place; and place-names. Arts, such as stories and songs result from lived experience, and are deeply connected to place (Cusack-McVeigh 2008). People

not only have a life history, but also have a life space (Cusack-McVeigh 2008). The use of arts-based methods allows for the making visible of emotions related to place, which directly affect wellbeing.

Place-based emotional processes are the lived experiences of places, and how those places manifest in our emotional health. Papers describe how life is 'intimately intertwined with the surrounding land' (p 7) (Cunsolo Willox *et al* 2013), and that we have a 'life place' (p 7) and a self-worth that is based on the land (Cusack-McVeigh 2008). Wellbeing and life are therefore inseparable from place (Barletti and Pablo 2016). The land and waters were described as freedom, as centering, as therapy, as a source of consciousness, and as enriching and replenishing to the spirit (Cunsolo Willox *et al* 2013, Barletti and Pablo 2016).

Several papers discussed emotional health connected to nature in terms of ecologies of place. One form is through the sensorial experiences of nature and sensorial empathy. Papers described the importance of sounds in signaling environmental change, and how sounds are a signature of a particular mode of life (Audet 2012). Arts, such as song, the musicality of language, and storytelling also make up those sounds of the space we inhabit. Through arts-based methods it is possible to explore how the environment within which a body lives is internalized through sound that 'crosses space and borders impermeable to light' and 'music vibrating through every living thing' (Audet 2012, Bravo Díaz 2021).

Unconscious and conscious bodily responses manifest to the external stimuli that exist in the distinct places to which we are connected (Cunsolo Willox *et al* 2013). These bodily responses are shareable and can be transmitted, internalized, mutated, transformed, and re-shared in a process of constant affected-affecting (Cunsolo Willox *et al* 2013). In other words, the 'atmosphere' or the environment literally gets into the individual (Cusack-McVeigh 2008, Cunsolo Willox *et al* 2013). To maintain balance and harmony, arts-based methods recognize the relationship between wellbeing and our unique emotional geographies, each with topographies that map to physical spaces and a sense of place.

Individual and community identities and culture emerge from and are a part of the living world—affecting it and affected by it. Indeed, many Indigenous Peoples' names are identities that are tied to place, such as the Tlingit, the people of the Tides. Community identities reflect the ecologies of place such as migrations of wildlife like the salmon or the caribou (Cunsolo Willox *et al* 2013, Tallman 2019). The land and its living beings, including salmon and cultural keystone species, such as reindeer, are understood to be repositories of environmental knowledge and culture. There is an expressed reciprocal relation between these species and people, and they are frequently honored through gifts, rituals, and ceremonies (Thornton 2012, Frandy 2021). For example, in the northern Pacific cultural areas, first Salmon ceremonies are performed to emphasize the reciprocity between salmon and Indigenous Peoples (Thornton 2012).

In other papers, ceremonies such as Feeding Fire ceremonies and fasting at specific water spaces are practices to become closer to spirit beings (Tallman 2019, Mustonen and Shadrin 2021). For the Awajún, cultural traditions are anchored in the practice of fasting at waterfalls and other sacred sites where people can connect to ancestors, learn important lessons, and find life purpose (Tallman 2019). Through the display of such respect, it is understood that the natural world and people will be healthier and strengthened as a result. Wellbeing is therefore directly connected to these sacred, ancestral lands and spirits, as well as traditional ceremonies that maintain individual and community identity, balance, and harmony.

Wellbeing's connection to place is further expressed through place-names, as representation occurs through naming (Oakdale 2005). Place names convey Indigenous language and knowledge through generations in the stories and maps, furthering the idea of emotional geographies (Thornton 2012). Arts-based methods look at the importance of the language of place names, which are derived from the people who have lived with those lands and waters, and sought to encapsulate the wisdom that sits in the land, and of that specific place in its naming (Cusack-McVeigh 2008).

Papers highlighted the theme of a sentient Earth through descriptions of the 'living land that sustains us' (p 10) (Cunsolo Willox *et al* 2013), 'land as a being among beings' (p 13) (Cusack-McVeigh 2008), the 'water is a living spirit' (p 10) (Thornton 2012), and land as containing spirits and areas of afterlife (Oakdale 2005, Barletti and Pablo 2016). The sentience of Earth, the land and its forests and waters, makes the development pressures that destroy those places damaging to individual and community wellbeing as well (Cusack-McVeigh 2008, Bravo Díaz 2021). Specifically in the Peruvian Amazon, it is believed that the sentient Earth (aipatsite) has become angry due to abuse of Earth by development, extractive industries, and warfare (Barletti and Pablo 2016). The Ashaninka people of the Peruvian Amazon believe that humans live in reciprocity with aipatsite, which now refuses to yield produce or animals due to its mistreatment (Barletti and Pablo 2016). As one person recalls, 'we plant like we used to but it is like it does not want to produce any longer because of all the violence. It is angry with people for all the deaths… aipatsite [has] tasted so much blood…And all those chemicals being used when they make cocaine upriver make it worse, they make aipatsite angrier' (p 49) (Barletti and Pablo 2016). These papers described how environmental change due to

economic development, climate change, and deforestation challenge wellbeing, and in turn cause anxiety, stress, distress, depression, and uncertainty about the future (Cunsolo Willox *et al* 2013, Tallman 2019).

Similarly, studies of Rigolet revealed how climate change impacts communities, trapping individuals in a group sentiment of helplessness (Cunsolo Willox *et al* 2013). In a survey of the warm, mild winter of 2009–2010 in Rigolet, young adults expressed 'It was like being stuck in Rigolet…the conversations were almost all about the weather…It was always conversations about the weather and not being able to go out…It really consumed us' (p 20) (Cunsolo-Willox *et al* 2013). In a later study in the same area, a young woman weighed in that 'when people talk about changes in weather, it makes me mad…we already know and they keep repeating it…it just makes it worse because it is not going to change' (p 366) (Cunsolo Willox *et al* 2012). This emphasizes the importance of storytelling and how group discussions can have rippling impacts on individual wellness. In this case, Rigolet youth found it hard to escape mental and physical impacts of climate change (Cunsolo Willox *et al* 2012).

Like climate change, dam construction can have significant impacts on a local environment, as a dam may inundate sacred and cultural lands, impact the river's flow and existence, and affect all the lands and beings surrounding it. Papers highlighted how dams not only threaten territory, but the identity of peoples and ways of life (Andersen and Midttun 1985, Bladow 2019, Frandy 2021). These pressures thus result in not only ecological damage, but also spiritual damage wrought on the people who intimately live with the land and recognize its being (Oakdale 2005, Cunsolo Willox *et al* 2013).

Papers discussed the damaging effects of land dispossession due to the severance of place-based emotional processes, and the need for place-based justice (Thornton 2012, Cunsolo Willox *et al* 2013). Arts-based methods that focus on storytelling, language and oral tradition may better understand place-based emotional processes and ecologies of place. Improved understanding of relationship to place can then inform reparations and reconciliation, as there is interconnected trauma to Indigenous Peoples and to the land and waters.

3.4.2. Lifestyle

Lifestyle was also described in the review through the connection between mental health and resilience. Resilience is defined and reflected by the deep, complex and harmonious relationships between individuals, kin, communities, the land and waters over time. Several papers describe the connection between mental health, water justice, and art, such as in the depiction of sea ice through a drawing that depicts Elders noticing the break of sea ice much earlier, and not forming as it had in the past (Rathwell 2020). In the drawing, the Elder is facing upwards to represent resilience by keeping their 'head up high' (Rathwell 2020). The artist, Tim Pitsiulak said, 'if I made the face look downward, that would mean that the end is near, but you are always told to keep your head up' (p 71) (Rathwell 2020). Through his art, Tim Pitsiulak thus conveys his concern about rapid changes occurring in the Arctic, such as loss of sea ice, as well as mental health related to the environment. On these themes Pitsiulak said,

> The ice is forming a lot later and it is not as thick as it used to be … in the spring when the ice starts to thaw there will be open areas in some places where it doesn't freeze up at all. So that is some of the risk that is very bad with the global warming … It is very hard, because we need to catch [country foods] for our families and friends … hopefully someday it will bounce back, the climate that we used to have, but you never know … We must be able to deal with the changes that are around us (p 71) (Rathwell 2020).

Wellbeing was also described in the form of lived experiences of lifestyle, such as the impact of modern technology and abuse through forces of assimilation (Kral *et al* 2011, Eichelberger 2014). Thus, wellbeing is directly underpinned by enduring intergenerational trauma, such as sexual and domestic abuse, forced boarding school and access to health services (Kral *et al* 2011, Cunsolo Willox *et al* 2013, Frandy 2021).

Papers highlighted the importance of technological changes that have affected lifestyle, such as increased sedentarism, and in the perception of some communities, created new vulnerabilities through community detachment (Eichelberger 2014). For example, while technology has helped create new water distribution pathways and improved medical treatment, Indigenous communities expressed an understanding of technology as 'spoiling' them (Eichelberger 2014), distancing communities from old ways of life at the same time it creates dependencies on technology. In this sense, technology does not always correlate to an increase in wellbeing, even when it brings other advancements. In one study in the Ecuadorian Amazon, the Waorani people argued that the Ecuadorian state policy of 'buen vivir' (living well) was harmful, since it pursued that wellbeing through an intense extractive model of development that placed them near oil roads (Bravo Díaz 2021). Technology therefore does not always enact positive lifestyle changes, but can diminish wellbeing by changing interactions with the environment.

3.4.3. Kinship

Wellbeing is understood in the context of community and relationships with others and the natural world. Arts-based approaches such as storytelling cannot be meaningfully separated from the idea of family, or the idea of the land (Kral *et al* 2011). The interconnected characteristics of these themes are important factors in the health of Indigenous youth, wellbeing and feelings of happiness (Kral *et al* 2011).

Papers emphasized how strong social connections, family ties, and a sense of belonging to a community contribute to Indigenous Peoples' understanding of wellbeing. As described above, kinship with family, land, and waters, are connected to language, the sounds of place, and oral tradition. In the Amazon, communities focus on 'living well together' or 'to live well, beautifully, peacefully together' (Kral *et al* 2011, Barletti and Pablo 2016, Bravo Díaz 2021). This ethos emphasizes a physical sense of being in one place, and the social relations that connect people with one another, and with the other-than-human beings (such as the environment, animals, plants, and spiritual or ancestral spaces) (Barletti and Pablo 2016). Papers from the Arctic similarly emphasized the importance of kinship, and how through community and family relations there is healing and sharing and collective happiness (Kral *et al* 2011, Eichelberger 2014). Kin is also understood to be more-than-human, such as the sentient land, beings that can be both human and other-than-human within a lifetime, water as holding memories and trauma, and intergenerational connection to place. Through kin, community works collaboratively to share vital cultural practices, traditions, and language, as well as preserve and strengthen Indigenous knowledge and intergenerational relationships (Kral *et al* 2011).

Mental health should therefore be considered on the community level to understand how community affects individual wellbeing. Wutich and Brewis (2014) propose that multiple pathways may explain the relationship between water insecurity and distress, including unpredictability, social stigma, and perceptions of injustice. Each of these mechanisms may be at play in Awajún communities. As these feelings develop and live in the individual, there are gendered and generational differences in how wellbeing is internalized (Tallman 2019).

Understanding and respecting diverse conceptualizations of mental health and wellbeing are essential for developing policies and initiatives that support the health of Indigenous communities in a culturally sensitive and culturally relevant manner. Arts-based approaches help to include a richer diversity of perspective and gain new awareness of relationships between complex topics of water justice, the environment, wellbeing, and mental health.

3.5. Arts-based approaches and water justice

This review found that arts-based approaches deepened understanding of water justice for Indigenous Peoples in Alaska and Peruvian and Ecuadorian Amazon by encompassing a range of interconnected themes that reflect the complex relationships between Indigenous communities, their traditional lands, and water sources. Water connects generations across time (Sohns 2023). Water, through rivers, and traditions and stories associated with water can transmit knowledge of Elders and act as a passageway through time and collective memory. Indigenous water justice recognizes water as a living entity, and therefore considers the innate rights and needs of water (Leonard *et al* 2023). Water justice thus considers the trauma experienced by people and other life due to water colonialism and contamination, but also of the waters themselves as sentient beings that deserve justice from historical harms (Wilson *et al* 2018, Hommes *et al* 2023).

3.5.1. Lived experience

Central to water justice is its lived experience. Water access and justice are embodied and manifest under the skin, and in our mental health through feelings of loss of self, anxiety, depression, and community detachment (Sarkar *et al* 2015, Wutich *et al* 2022, Ansloos and Cooper 2023). Water injustice in the papers is described in terms of collective loss, such as through the disappearance of traditional water sources, witnessing environmental change, and solastalgia, or the place-based distress related to environmental change (Cunsolo Willox *et al* 2013, Wooltorton 2022). The lived experience of water injustice is also profoundly personal, and may result in feelings of anxiety, powerlessness, insomnia, fear and chronic pain (Audet 2012, Cunsolo Willox *et al* 2013, Tallman 2019). These impacts on wellbeing may then cause further impacts to individual or community wellbeing through long-term depression, anger, and substance abuse (Tallman 2019). Depending on the individual experience of these health impacts, people may suffer from substance addiction and abuse (Eichelberger 2014, 2017). Papers also highlighted how wellbeing's lived experience is related to the embodied trauma of colonialism, including abuse endured during forced schooling and anxieties related to forced sterilization (Kral *et al* 2011, Santos-Granero and Barclay 2011, Frandy 2021).

The review reveals how the themes of colonialism in water justice connect to water governance. Through arts, such as storytelling, especially between Elders and youth, Elders can convey cultural values and respect for water and the land, instilling those ideas in the community and providing a deeper sense of community identity. For example, the Tlingit story

of the Salmon Boy has an embedded moral message for how to treat salmon and watersheds with respect (Thornton 2012). In the story, the boy is transformed into a salmon after treating it disrespectfully, and is taught the ways of the salmon tribe. He learns that there is a covenant between humans and the salmon tribe: if humans refrain from overfishing and treat each salmon with respect, the salmon promise to return each year (Thornton 2012). The boy is then caught and re-converted to a human with the help of a shaman (Thornton 2012). He then passes on his knowledge, later becoming a shaman himself (Thornton 2012). This story demonstrates the power of storytelling as it conveys Tlingit values related to water through the generations. The story has been adapted into a children's book in English and in Lingít, further allowing the story and Indigenous language to communicate essential and irreplaceable knowledge (Marks *et al* 2018).

The Tlingit relationship with the land and principles of respect are echoed in the Sámi Peoples' relationship with water governance and resource management (Frandy 2021). In an interview, Tim Frandy of the Sámi People described how the Sámi enact water governance through sacred sites, which, through their designation as sacred, are protected from human interference. Such places included key salmon spawning grounds, which have now been exploited due to external pressures such as tourism, paired with a lack of Sámi inclusion in water governance. In Frandy's interview with a retired fisherman, Niilo Vuomajoki, Vuomajoki explained:

> 'I recall—near the home where I was born there was a place where my father and uncles and Elders and other people as well were forbidden to go…There was a lovely steep, sandy banked shore in the river to run. They didn't allow us to even walk there at all. I always wondered back then: well, why can't we?… But now I have learned what was there. It was a kind of flowery still-water…there was a lot of blooming vegetation…A really good place for salmon to spawn…And now tourists trod and walk about right in the middle of this unique salmon hole and all over its shore. And they fish in it… It needs to be protected. For our fathers, for my father's brothers, for my mother's brothers, for my ancestors and my father's ancestors, it was a sacred place.' (p 65) (Frandy 2021).

Vuomajoki appeals to the reader to protect the spawning grounds through his narrative and storytelling, calling for justice and respect. He also shows how, through the Sámi understanding of 'sacred' as 'separate' and 'prohibited' (p 65) they were able to enact sustainable water governance for centuries (Frandy 2021). This story further highlights how water justice is closely tied to land rights, the rights of water and the rights of the more-than-human (Leonard *et al* 2023).

3.5.2. Changes to water quality

Water justice was also represented thematically in the review through persisting challenges that Indigenous communities face in accessing clean and safe drinking water. Access to clean water is fundamental to the health and wellbeing of Indigenous communities, as well as reducing the incidence of water-washed and waterborne diseases. Yet, historic discrimination and underfunding of water distribution and sanitation systems in these communities have continued to challenge adequate access (Sohns *et al* 2019b, 2021). Further water commodification, widespread poverty and water pricing have continued to make sufficient access to distributed water a struggle for households and communities (Eichelberger 2010).

Papers underscored issues of access through related resource insecurity, such as energy and food justice (Eichelberger 2014). Arts-based methods allowed for complex interconnections between water justice and food and energy to emerge in stories, discussion and drawings. Food justice is interconnected with water justice due to the importance of subsistence and living off the land and waters through foraging, hunting and fishing (Kral *et al* 2011, Bravo Díaz 2021, Frandy 2021). If the waters are polluted or disappear, Indigenous communities are forced to consume more processed foods, which are often perceived to be less healthy due to their chemical content as well as high sugar and salt content (Thornton 2012, Barletti and Pablo 2016, Dudarev *et al* 2019, Caughey *et al* 2022). Moreover, there is also a scarcity of prepackaged food due to high transportation costs, meaning that purchasing processed food is expensive and economically untenable for many Indigenous communities (Dudarev *et al* 2019). As one Chukotka proverb jokes, grocery shoppers should look for 'the most freshly expired products' (p 696) (Dudarev *et al* 2019). Diet has cascading impacts on wellbeing, not only nutritionally but also culturally, as subsistence practices are important to culture and sovereignty (Caughey *et al* 2022).

Energy justice is interlinked with water justice due to tradeoffs between energy and water, such as the need to fetch water by fuel-powered vehicle or snow-mobile in the Arctic, or using fuel to boil water to improve water quality (Eichelberger 2010, Sohns *et al* 2019a). Importantly, arts-based methods such as storytelling and photography can convey the impacts of resource development on communities and nearby

waters. Oil spills and waste from resource extraction and development damage the environment, the land and waters, and contaminate food. Water quality has been and continues to be degraded by pollution from nearby resource development, population growth, improper trash disposal, and the use of the river as a latrine and waste disposal (Bradford and Bharadwaj 2015, Tallman 2019, Bravo Díaz 2021, Frandy 2021). The Awajún ceremony of fasting at the waterfall highlights how water is a sacred and essential element of their spiritual beliefs and practices (Tallman 2019). As such, water justice not only includes the protection of water quality, but protection of these water spaces. Preserving the waterfall also preserves the cultural and spiritual connections between generations (Tallman 2019).

Papers further discussed diminished water quality in relation to climate change, such as increased turbidity and sedimentation of water sources with erosion of land (Sanches and Futemma 2020). The rise in sea level is causing saltwater encroachment and contamination of water sources (Tallman 2019), while higher temperatures and thawing permafrost are resulting in rivers going dry and the disappearance of fish (Thornton 2012). Communities' well-being and water justice are threatened by increasingly severe storms and storm surge related to climate change, and the lack of disaster relief and assistance (Cunsolo Willox *et al* 2013).

One arts-based response to these problems includes educating communities on how to better prevent water-wash disease while living with water injustice. One of the papers documented a whiteboard video arts-based approach to discuss what causes water-wash diseases using culturally-appropriate media (Bradford and Bharadwaj 2015). Whiteboard videos allow for different means of storytelling and can therefore be inclusive of diverse narratives and ideas (Bradford and Bharadwaj 2015). Water justice advocates for the right to clean and culturally appropriate water sources, addressing issues of water contamination and inadequate infrastructure.

3.6. Future research

Our narrative review identified several areas for future research from the literature, including climate change solutions, culture loss, and inclusion of perspectives and languages. Displacement is discussed throughout the literature review, but only one article explicitly discusses planning for resettlement and relocation because of environmental changes due to climate change ('climigration') (Bronen and Chapin 2013, Kumasaka *et al* 2022). Many researchers write about climate impacts in the Arctic and related community issues, but fewer discuss the possible solution of planned climactic migration. This may be due to community perception that relocation due to climate impacts is yet another form of forced displacement, following historic displacement from colonialization or assimilation. Relocation has often had a lack of support in communities due to connection to place and community. Yet, due to repeat trauma of communities being flooded, enduring extreme weather, and other climate-related impacts, some communities in Alaska, such as Kivalina, Newtok, and Shishmaref have chosen to relocate (Bronen and Chapin 2013).

Another important consideration for future work is developing solutions on how to preserve Indigenous knowledge. Many articles reference the need to preserve Indigenous knowledge in the face of its disappearance, due to climate impacts altering land, and loss of Elders' knowledge. However, few articles highlight means to capture that knowledge. One article discussed translating Indigenous knowledge to an online map (Bennett and Lantz 2014). Through this process, Indigenous knowledge would be preserved and shared with the community and more broadly in a modern, semi-permanent database. An essential aspect of preserving Indigenous knowledge involves ensuring that these databases are owned and managed by Indigenous Peoples to preserve sovereignty and data security. An example of an initiative highlighting the importance of data sovereignty is the First Nations Information Governance Centre (FNIGC) in Canada, which operates under the principles of ownership, control, access, and possession, ensuring that first Nations have control over data collection processes and how their information is used and shared (FNIGC 2024). Another example is the Mukurtu CMS, an open-source platform built with Indigenous communities to manage and share digital cultural heritage (Mukurtu 2024). Mukurtu CMS incorporates cultural protocols for access and use, ensuring that knowledge is shared according to the values and norms of the community. Indigenous knowledge, as highlighted by these examples, must remain under the control of the communities that own and create it. Future research could continue to investigate digital efforts, such as online mapping, to preserve Indigenous knowledge as well as best practices.

The review found that the discussion on governance, laws, and policies of the settler-colonial nation states to be thin, which may reflect a paucity of studies that explore the dimensions of injustice beyond questions of access and the lived experiences of water injustice. Future studies could explore those other dimensions, as well as examine how Indigenous knowledge may be the foundation of emerging water policies and governance frameworks.

Future research could also focus on the role of art and how it can be embedded in research methodologies and combined with other sciences. There were fewer papers on arts-based approaches, water

justice and wellbeing in the geographic regions of the Amazon, as well as in the traditional Sámi territories of northern Scandinavia and Russia. It is possible that the literature review missed important papers in those regions due to language constraints of English. Further, while our search terms for arts-based approaches sought to be broad and inclusive of diverse ways of knowing, it is possible that this review missed arts-approaches. For example, although we had a search term directly related to Peruvian 'Dukug wisewomen,' and by extension, their pottery practices, we were unable to find any sources from our database search that relate to this practice in English.

4. Conclusion

This literature review analyzed papers addressing water justice, arts-based approaches and mental health and wellbeing in Indigenous communities in the Arctic and the Peruvian and Ecuadorian Amazon. The review found within the guiding themes of art-based approaches, water justice, and wellbeing, the most important themes were relationship to place, kinship, the lived experience of water, ongoing changes to water, and storytelling and art as instruments of resistance. Arts and arts-based approaches help to make visible what is not visible and are therefore powerful in researching and communicating issues of water justice and of wellbeing.

The inclusion of diverse voices and perspectives in decision-making, especially those gained from arts-based approaches, support Indigenous Peoples' self-determination and autonomy in governance, as well as efforts to address issues of justice and equity. This review underscores the importance of future mental health programs and wellbeing initiatives focusing on the importance of arts-based approaches, such as storytelling and oral tradition, especially between generations. Additionally, mental health services that have tended to focus on individuals could focus more on families and communities, as family is mentioned the most by youth as important to suicide prevention and intervention (Kral *et al* 2011).

Advancing Indigenous wellbeing and water justice will depend on policies that address and reflect the place-based subtleties of the everyday lived experience, and how those subtleties inform local discourses (Barletti and Pablo 2016). As climate change impacts continue to manifest and threaten Indigenous culture, livelihoods, and place-based identities, it is essential that water governance is inclusive and reflects the diversity of ways of knowing. Water justice in the Amazon and the Arctic will depend on collaborative and representative governance, centered on principles from and representation of Indigenous Peoples in governing frameworks, such as the recognition of the more-than-human qualities of water and Earth, and their associated rights.

Data availability statement

All data that support the findings of this study are included within the article (and any supplementary files).

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