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A critical review of children and young people's
voices and experiences*

This is the Published version of the following publication

Verlie, Blanche, Rousell, David, de Kleyn, Lisa, Hartup, Michael, Rickards, Lauren, St Clair, Jeanti, Bayes, Chantelle, Widdop Quinton, Helen, Blom, Simone, Hotko, Katie, Cutter-Mackenzie-Knowles, Amy, de Rivera, Liberty, Lasczik, Alexandra and Ofosu-Asare, Yaw (2025) Between flood vulnerability and watery pedagogies: A critical review of children and young people's voices and experiences. *Geoforum*, 166. p. 104413. ISSN 0016-7185 (In Press)

The publisher's official version can be found at
<https://doi.org/10.1016/j.geoforum.2025.104413>
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Verlie, B., Rousell, D. S., de Kleyn, L., Hartup, M., St Clair, J., Bayes, C., Widdop Quinton, H., Blom, S. M., Hotko, K., Cutter-Mackenzie-Knowles, A., de Rivera, L., Lasczik, A., & Ofosu-Asare, Y. (2025). Between flood vulnerability and watery pedagogies: A critical review of children and young people's voices and experiences. *Geoforum*, 166(), Article 104413. <https://doi.org/10.1016/j.geoforum.2025.104413>
Document Version: Published (Version of record)

Published Version: <https://doi.org/10.1016/j.geoforum.2025.104413>

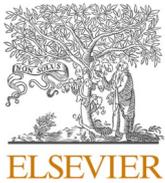
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Between flood vulnerability and watery pedagogies: A critical review of children and young people's voices and experiences

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ARTICLE INFO

Keywords:

Child and youth voice
Floods
Education
Climate disasters
Water
Intersectionality
Climate change education

ABSTRACT

This critical review explores how child and youth voices have been largely overlooked or “submerged” within existing scholarly literature on floods and education. It considers whether children’s experiences might be recuperated or recovered by including intersectional, decolonial, place-based and child-centred approaches to understanding the confluence of education and climate-induced disasters. We engage a political ecology framework to review literature from a diverse range of fields, primarily disaster studies focusing on floods and education, and childhood/youth studies and education/pedagogy research focusing on children’s relationships with water. We find that modernist epistemologies operating in disaster studies provide important insights about risk, vulnerability, and disaster prevention but largely overlook children’s voices and experiences. Alternatively, in the childhood, youth, and pedagogical literatures, we find richly detailed studies of children and young people’s relations with water, but minimal engagement with the severe consequences of climate-intensified floods. In response to these findings, we propose a research agenda calling for scholarship that can adequately theorise children’s educational lives as unfolding amidst complex social, economic, cultural and political relations with floods and other catastrophic waters across local and global scales.

1. Introduction

Children and young people are inordinately affected by the harmful impacts of climate-induced flood events globally (Cadag, et al., 2017; Gibbons, 2014; Krishna et al., 2018). In 2022, UNICEF reported more than 27 million children, mostly in Majority World¹ countries, were exposed to flooding with devastating health and wellbeing impacts (UNICEF, 2022). In 2024, UNICEF found at least 242 million children in 85 countries (again, mostly in Majority World countries) had their schooling disrupted by extreme climate events, with floods being one of

the major causes of these disruptions (UNICEF, 2024). In addition to the direct harms that floods cause, floods and their impacts expose children to additional forms of violence and trauma, including long-term displacement and disruptions to their education, all of which can harm children’s longitudinal health, development, and learning trajectories (Convery et al., 2014; Fulton & Drolet, 2018; Lassa et al., 2023; Shah et al., 2020). These impacts affect education systems and population-wide learning outcomes and are directly mediated by structures of marginalisation and vulnerability associated with social class, age, gender, sexuality, race, ethnicity, caste, geography, ability,

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¹ In recognition of the significant disparity in access to resources for populations from different countries (due to historical regimes of colonisation, structural adjustment and neoliberal trade agreements), in this paper we refer to the “Majority World” and by contrast, the “Euro-Western World.” These terms are inadequate for recognising the similarities between different nations and the internal diversity within each nation and risk simplifying what is a complex picture. Nevertheless, such a nuanced discussion is beyond the scope of this paper and these terms are used to emphasise the role that socio-economic resourcing plays in children’s experiences of floods.

and living conditions (Cadag et al., 2017; Johnson, 2008; Akhter et al., 2015; Mudavanhu, 2014; Shah et al., 2022; Zoleta-Nantes, 2002).

Our scholarly engagement with the impact of floods on the educational lives of children and young people stems from the Floods + Me project, a participatory research project involving child and youth researchers in the Northern Rivers region of Australia, principally the town of Lismore, on the lands of the Widjabul/Wia-bal people of the Bundjalung Nation. Between late February and March 2022, the town and surrounding region faced two catastrophic major flooding events, with Lismore recording an observable flood level of 14.4m AHD (Australian Height Datum) on February 28, which was considered unprecedented in the region's recorded settler history (Lismore City Council, 2022). These floods impacted 944 education facilities, including 331 schools in the state of New South Wales which ceased operations temporarily, 613 education facilities in the state of Queensland which were impacted, and 88 schools across the region which suffered significant damage such that some school sites were permanently closed and relocated (Royal Far West & UNICEF Australia, 2022). This forced many children and young people to study at makeshift schools in temporary shelters and the local university campus (see e.g. School Infrastructure NSW, 2024; White et al., 2022). Many children and young people were also rendered homeless by floodwaters and faced compounding impacts. These high-level outcomes indicate that the floods created significant educational impacts but provide little insight into what the experiential effects of these events might have been, nor how children and young people understood and narrated their experiences.

It is in these gaps that the Floods + Me project seeks to work. Towards that goal, this article critically reviews publications on children and young people, education, water, and floods across a range of disciplines and fields. To guide this critical analysis, we use a political ecology framework (Loro-Bidart, 2015; 2016; Watts, 2015). Political ecology affords attention to the politics of knowledge operating within these literatures, and to the distinct approaches that shape how the diverse and pervasive impacts of floods within educational systems, cultures, and lives are mapped. In mobilising a political ecology framework, we focus on how child and youth voices have been largely overlooked or 'submerged' within existing literature, and how children's experiences of more-than-human hydrologies might be recuperated or recovered by including intersectional, decolonial, place-based, and child-centred approaches to understanding the confluence of education and climate-induced disasters.

We begin by outlining the critical review methodology that we developed through an iterative series of search processes across multiple bodies of literature, primarily from (1) disaster studies focusing on floods and education and (2) childhood/youth studies and education/pedagogy research focusing on children's relationships with water. We then proceed with three sections based on specific analyses of these literatures. The first of these sections focuses on common themes from the disaster literature, specifically around how children are understood in relation to floods. Similarly to scholars considering education and other disasters (i.e. not floods) (Bertoli et al., 2023; Gough, Towers and Verlie, 2021; Healy, Laurie and Hope, 2023), we find that the floods literature focuses primarily on constructs of risk, vulnerability and disaster prevention, and that while this offers some important benefits, these framings often serve to marginalise or 'drown out' children's voices, experiences, and agencies. Secondly, we glean submerged material – from these same fields of floods research – that provides glimpses into children's lived experiences of floods and education, as narrated by children. Thirdly, we consider contemporary pedagogical research emerging from within political ecology frameworks, including decolonial, intersectional, and relational materialist approaches to the study of water, childhood, and education. In these literatures, we find richly detailed approaches that attune to children's embodied, subjective relations with diverse waters. However, we find there is minimal engagement with the severe risks and consequences of climate-

intensified floods, which is a significant shortcoming within that literature.

Bringing the insights of these fields together would suggest that children's and young people's lived experiences of preparing for, surviving, and recovering from floods are likely to be culturally complex, geographically situated, and educationally significant phenomena, which need to be investigated through foregrounding their voices. As such, we conclude briefly with a research agenda calling for scholarship that recognises the educational lives of children and young people as unfolding amidst the unsettling of local and global waters whose patterned rhythms are being heightened, distorted, and disrupted by the colonial and capitalist violences inflicted on Earth's hydrology. In so doing, we add to research advocating for more child-centred, decolonial and more-than-human studies of education and wider climate disasters, such as Bertoli et al. (2023), Somerville and McGavock (2022) and Bell et al. (2024). Such an approach would offer not only a multifaceted understanding of children's experiences of education within the climate crisis, but also pedagogies for disaster prevention, response, and recovery that seek to not simply return to existing capitalist-developmental models of human society, but to transform ways of living, learning, relating, and doing towards practices that embed care for hydrological cycles along with pragmatic skillsets for surviving climate catastrophes. Practices of surviving and thriving in floodscapes would thus become pedagogical – as a regenerative form of educational life in which communities strive to learn how to negotiate unforeseeable and uncontrollable waters together (Rousell & Chan, 2022).

Assembling a critical review methodology within a political ecology framework

This paper's original aim was to review literature that examined children's experiences of the impacts of floods on their education, foregrounding child and youth voices. Our methods began with literature searches in Web of Science, Scopus and Google Scholar using search terms including 'floods', 'education', 'childhood', 'children', 'youth' and 'climate change' as a broad search strategy. These searches primarily included results from disaster management and recovery/resilience literatures that focus on school infrastructures (e.g. Cadag et al., 2017; Shah et al., 2018), as well as fields such as Disaster Risk Reduction Education (DRRed) (e.g. Proulx & Aboud, 2019), public health (e.g. Dehghani et al., 2023) and psychology (e.g. Krishna et al., 2018). We also found publications that explored the impact of floods on quantitative educational outcomes, such as school attendance rates and academic performance (e.g. Ahmed et al., 2022; Ardales et al., 2016; Mudavanhu, 2014; Shah et al., 2022); some that considered children's experiences of flooding but did not discuss this in relation to education (Whittle et al., 2011; Walker et al., 2012); and others that explored children's educational experiences of flooding as described by adults, such as teachers or parents, but not by children themselves (e.g. Convery et al., 2014; Convery et al., 2010). A systematic review of these fields by this research team is forthcoming. However, within the scope of this paper, only a very small amount of scholarship provided significant qualitative exploration of children and young people's narration of their experiences of flooding and how this affected their education. We note that had our search expanded to consider other kinds of disasters beyond floods, we may have found more material that met our criteria for centring children's voices, such as the recent work on bushfires and El Niño coming from Australia and Peru respectively (Gough, Towers and Verlie, 2021; Somerville and Powell, 2022; Bell et al., 2024; Healy, Laurie and Hope, 2023). A broader review of disasters education literature is beyond the scope of this paper, but such research would be highly beneficial in assessing the dominant theoretical and empirical approaches to education amid climate crisis, as well as identifying what potential avenues for creative and critical innovation exist within the field.

As such, underpinned by our research team's strengths in critical

climate adaptation and creative and child-centred educational research, we developed a political ecology framework, which we employed to analyse the literature we found. Political ecology has historically explored the intersections between “the politics of knowledge, political economy, and environmental change” (Meek & Lloro-Bidart, 2017, p. 2013). The field is concerned with whose knowledges matter when it comes to issues of environmental disasters, management, adaptation and development under increasingly precarious and unpredictable climatological conditions. It refuses the contention that environmental policy, decision-making, and action can be staged on neutral grounds, divested of political hierarchies, commitments, and agendas. Increasingly, political ecology is used as a framework for bridging intersectional and decolonial social theories with studies of environmental impacts within diversely situated communities and environments, resulting in highly nuanced accounts of the political stakes and ramifications of climate-related disasters such as floods (Andreucci & Zografos, 2022). Our political ecology framework brings together a range of critical theories including intersectionality (Crenshaw, 1991; Raza, 2017; Udo & Naidu, 2024), relational materialism (Hadfield-Hill & Zara, 2019; Nxumalo & Villanueva, 2019; 2020), more-than-human studies (Alaimo & Hekman, 2008; Coole & Frost, 2010; Braidotti, 2013), Indigenous studies and decolonisation (Bawaka Country et al., 2016; Bertoli et al., 2023; Carrigan, 2015) and feminist pedagogies (Pacini-Ketchabaw & Clark, 2014; Hultman & Lenz Taguchi, 2010), all of which challenge the categories and conventions of disaster-focused literatures. While these permutations vary significantly in their political and ethico-onto-epistemo-logical orientations, they typically share a commitment to non-dualist readings of social life that refuse the categorical separation of society from nature, mind from body, theory from practice, and human from nonhuman.

Given the minimal publications within disasters literature that met our criterion of centring children’s voices, we expanded our search by adding terms including ‘decolonisation’, ‘intersectionality’, ‘affect’, ‘more-than-human’, and ‘posthuman’ – and, due to the lack of material on floods, we added ‘water’ and/or ‘rivers’, ‘oceans,’ and related terms. This revealed many relevant search results, mostly from the fields of children’s geographies, youth studies and pedagogical scholarship, which were otherwise occluded or ‘submerged’ by the disaster literatures that had dominated the previous searches.

This paper offers a critical review of both the flood literatures and child/youth/pedagogical literatures that were identified through this iterative process. Critical reviews require reading extensively across diverse literatures and critically evaluating the ways that bodies of literature are constructed and represented, offering innovative analysis and conceptual development (Grant & Booth, 2009; Paré et al., 2015; and Chukwuere 2023). A critical review “develops through a process of evolution or accretion, with each successive version adding to its predecessors”, and “the critical component of this type of review is key to its value” (Grant & Booth, 2009, p. 93) as it “can lead to new insights” (Chukwuere, 2023, p. 40). Our political ecology-informed critical review attends to the politics of knowledge systems and the structures of marginalisation encoded in hierarchical disciplinary categories and conventions of theory and practice (Watts, 2015). We critically analyse and bring into conversation these literatures that are quite distinct in form and method but not topic. In doing so, this article explores connections and opportunities arising between the policy-oriented, action-driven focus of disaster literatures and the careful consideration of geographically situated, ecologically entangled, and intersectionally differentiated perspectives found in recent scholarship in childhood, youth, and education studies.

Children’s experiences of floods and education as discussed in the disasters literature

One of the most prevalent themes in the floods literature is the critically important discussion of children and young people as being

both vulnerable and/or resilient to floods (e.g. McDonald-Harker et al., 2021; Peek, 2008; Shah et al., 2022). Vulnerability is heavily emphasised due to the grave impacts floods can have on children and young people, including death, injury, displacement, trauma, loss and grief, abuse, starvation, malnutrition, illness and impacts to their long-term mental health and functioning (Cadag et al., 2017; Convery et al., 2014; Fulton & Drolet, 2018; Krishna et al., 2018; Shah et al., 2020; Morote and Hernández 2020; Dehghani et al., 2023). Vulnerability, therefore, understands children and young people in terms of “risk” within the construct and discourse of disaster. In such work, children and young people are often understood as vulnerable individual humans whose needs must be considered by adults and authorities who are planning and leading flood management (Shah et al., 2022). In efforts to support the development of children’s flood preparedness, response and recovery approaches, qualitative and quantitative research is used to understand their perceptions of flood risk, knowledge, and behaviour (e.g. Carone & Marincioni, 2020; Kimura et al., 2014; Zhong et al., 2021). Disasters literature also frequently focuses on the roles and responsibilities of public institutions in protecting children’s lives and health, and often recommends top-down approaches, such as planning tools and education and awareness programs (see e.g. Esnard & Lai, 2021; Shah et al., 2018).

Relatedly, and sometimes conversely to this focus on vulnerability, resilience is also a key construct in the literature. Disaster literature focused on resilience often emphasises children’s and young people’s agency, knowledge and the skills they can bring to flood response and risk mitigation (Haynes & Tanner, 2015; Kimura et al., 2014). Resilience discourses, therefore, understand children and young people as agential “assets” within the construct of disaster (McDonald-Harker et al., 2021). The disaster risk reduction education literature asserts that children and young people have many capabilities including: learning about floods and learning during floods; contributing to flood preparedness, response, and recovery; developing their resilience as children, which also integrates into their adult lives; and having an important role in influencing families and communities in flood preparedness, and more broadly, as future environmental stewards (Boon & Pagliano, 2015; Williams et al., 2017; Williams & McEwen, 2021). For example, research relating to the floods in Hull, in Northeast England, found that children are “able to contribute to child-led, adult facilitated discussions about flooding, adaptation and agency” and contribute to intergenerational and inter-community learning (Williams et al., 2017; Williams & McEwen, 2021, p. 1651). This understanding opens opportunities to recognise children and young people for their capabilities, inquire about their experiences, and involve them in all aspects of flood over time. Nevertheless, children’s ability to proactively initiate actions to help themselves cope in the short term can lead to a decrease in their longer-term resilience, as demonstrated, for example, in Zimbabwe through skipping school to forage for food (Mudavanhu & Bongo, 2015).

Similarly to this focus on children’s welfare, needs and capacities, literature in the Majority World often engages with children’s rights, as defined by the United Nations Convention on the Rights of the Child (UNCRC), to advocate for the inclusion of youth voice and expertise in both flood recovery and prevention (Lawler & Patel, 2012; Gibbons, 2014; Mudavanhu et al., 2015). For example, in work that took place in Broome, Australia, involving both Indigenous and non-Indigenous young people, this focus on the UNCRC document allowed for “an approach that invests in young people and encourages them to reclaim their rights, as effective recipients and sources of risk information as well as active agents of change” (Harwood et al., 2014, p. 39). However, Mudavanhu et al. (2015) acknowledge that while child participation in accordance with the UNCRC focuses on “protection, provision, and participation” (p. 269), what “participation” means is often not clear (Muzenda-Mudavanhu et al., 2016), and is sometimes forgotten or resisted within some Majority World countries because it could be understood to “undermine adult authority” (Mudavanhu et al., 2015, p. 269). As multiple studies find, efforts to include children’s voices do not

always prevent children being ignored or excluded (Mudavanhu et al., 2015; Shah et al., 2020).

Expanding from this close focus on children and young people, scholarship in the disasters literature frequently recognises that children's vulnerability and resilience are influenced significantly by their social relationships and the socio-economic contexts of their lives (e.g. Whittle et al., 2010). Firstly, the family (often, but not exclusively, framed as the nuclear family) is frequently discussed for its influence over children's risk perceptions, preparations, and safety during and after floods (Zhong et al., 2021; Songcayon et al., 2020), with authors finding that strong and nurturing relationships with caregivers can strengthen children's resilience (McDonald-Harker et al., 2021). However, it is noted that this relationship is complex due to the power hierarchies within families that may not fully respect or promote children's agency (Williams et al., 2017). Other studies find that child marriage is a common result of flooding, which indicates that family relationships are themselves subject to larger socio-economic structures of inequality (Mudavanhu, 2014; Akhter et al., 2015).

Secondly, these broader socio-economic structures and the inequalities they produce, often organised around age, gender, class, racial/ethnic minority status, and ability, are noted as significant contributors to children's flood vulnerability and resilience, as are distinct cultural and geographical contexts. For example, research by Krishna et al. (2018) on the South Indian floods describes the significant impacts of caste on children's flood vulnerability and resilience; Mucherera and Mavhura (2020) in the Mbire district of Zimbabwe refer to health, quality of dwellings, and employment as key factors. Further evidencing the significance of economic hierarchies, in the Philippines, the most affected children in the elementary and primary schools studied were those experiencing poverty and in fragile living conditions, including shelters and areas with less access to facilities and services (Cadag et al., 2017). Regarding the role of social hierarchies such as gender, Kimura et al. (2014) reported that female respondents were less prepared than male respondents in a survey of children aged 14 to 17 years old in Croatia. Female children in Tamil Nadu, India, in 2015, were reported to have specific concerns in shelters regarding fears of kidnapping and sexual assault, a lack of privacy, and access to essential items such as clean clothes and menstrual products (Krishna et al., 2018). Research in Hull, in the United Kingdom, showed that migration and cultural differences played a significant role: a family's country of origin influenced perceptions of safety in children aged seven to nine, such that for some children, the United Kingdom was perceived to be safe compared to their home country where families may have experienced flooding (Williams et al., 2017).

To summarise, within the disasters literature there is a well documented body of knowledge about the impacts of diverse kinds of floods on education and rich debates about child and youth vulnerability and resilience and how these factors are structured by social, economic, geographical and cultural contexts. Nevertheless, the majority of this work operates from top-down ontologies which make assumptive statements about children's experiences. Despite drawing on children's rights frameworks, emphasising children's capabilities and agencies, and calling for children's voices to be listened to, very little of this work actually presents children's own voices regarding their experiences of the impacts of floods on their education.

Our review suggests that this lack of attention to child and youth voices influences how both floods and education systems are understood within disaster literatures steeped in top-down managerial frameworks. Within disasters literature, we found that water and hydrological systems are largely positioned as natural resources best controlled by modern centralised managerial systems, and flood events are understood as interruptions that breach the otherwise distinct realms of human society and water as "natural resource." There is, however, a noteworthy distinction between the perceptions of floods in Majority World and Euro-Western contexts. Much of the work from the Majority World, while focused on specific events, frames flood events through a

broader weathered and seasonal context, with floods understood as part of daily life (Haynes & Tanner, 2015; Cadag et al., 2017; Chaudhary & Timsina, 2018; Sajid & Bevis, 2021). For example, Cadag et al. (2017) discuss recurrent small-scale floods and the uneven impact these floods have on poor and marginalised communities in the Philippines, yet these smaller floods are often neglected in Euro-Western disaster management literatures where the focus is predominantly on specific monumental events, such as the 2007 floods in Hull, UK (see Convery et al., 2010; Convery et al., 2014; Sims et al., 2009; Walker et al., 2010, 2012; Whittle et al., 2010, 2012).

When it comes to considering education within the disasters literature, the majority of work that considers floods, children, and learning comes from the field of Disaster Risk Reduction Education (DRRED). The primary agenda of DRRED programs is to increase flood awareness and preparedness in order to reduce the impacts of floods on children in the future (Boon & Pagliano, 2014; Kimura et al., 2014). In recent years, DRRED literature has moved to more inquiry-based, interactive, student-centred pedagogies that seek to build children's general sense of agency and, therefore, build their flood-specific resilience (Carone & Marincioni, 2020; Shah et al., 2020; Williams et al., 2017). Nevertheless, there remains a strong instrumental focus on education as a tool to reduce disaster risks (Boon & Pagliano, 2014; Zhong et al., 2021; Proulx & About, 2019), which, while incredibly valuable, runs the risk of remaining caught in DRRED's historical focus on traditional top-down, teacher-centred pedagogies.

These instrumental approaches to both flood management and education further indicate that the hierarchical Euro-Western logics – which presume humans as largely separate from, and solely capable of managing, hydrologies – are still persistent and pervasive in the disasters literature. We believe this modernist ontology, and its resultant focus on top-down, human-centred asset and risk-based managerialism to be the reason that we struggled to find research that engaged thoroughly with children's own narration of their experiences of the impacts of floods on their education.

Children's voices regarding their experiences of floods and education in the disasters literature

Despite the top-down instrumentalism of much disasters literature, we did find a very small number of studies that engaged significantly with children's voices, which we explore in this section. This included Peek and Richardson's research article (2010), Fothergill and Peek's book (2015) on Hurricane Katrina in the United States, and Walker et al.'s (2010) report on the 2007 floods in Hull (UK). We also found two studies where children had been interviewed and the papers included a small number of quotations (e.g. 1 – 2) from children. These studies were conducted in Bangladesh and Zimbabwe (Akhter et al., 2015; Mudavanhu, 2014, respectively).

One of the common themes we encountered within these few studies was that schools are not just instrumental infrastructure required for outcome-oriented learning to occur. Rather, schools are rich sites of place-based identities and relationships, and they hold specific meaning for many children and young people (Seddon, 2022). This became apparent through the frequent focus on how floods made school and its attendant socio-ecological relations inaccessible to students. The physical lack of access to schools is noted in disasters literature as one of the most common impacts of floods on children's education (Cadag et al., 2017; Fothergill & Peek, 2015; Hadfield-Hill & Zara, 2019; Mort et al., 2018; Walker et al. 2012), which can include needing to change schools (Childs et al., 2005; Esnard et al., 2018; Fothergill & Peek, 2006; Peek & Richardson, 2010). In this small subset of the literature discussed in this section, children's voices evidence that inaccessibility does not just have instrumental impacts on their educational outcomes, but also on their interpersonal relationships, connection to place, motivation to study and sense of identity.

For example, Akhter et al. (2015) found that trouble accessing school

led to a loss of interest and motivation in studying, as children explained: “When flood comes we cannot do classes. Sometimes the water stays for days and we have to study at home. I do not like to study at home”; and “School remains closed for a month and everything around is under water. The water contains filth and putrefies. It becomes hard to study” (Akhter et al., 2015, p. 319; see also Mudavanhu, 2014, p.5). Conversely, Walker et al. (2010) found that in the UK, some students found the change of mode of transport interesting, with one student saying it was “fantastic...because I got to walk with my cousins” (p. 66). Transport to school was additionally challenging if students were flooded at home and had to commute from further away, or if their school closed and they then had to attend a school further away. As Walker et al. (2010) report:

Sian (Yr7/11) ended up living in a caravan on a caravan site that was “about an hour away” from her primary school. Getting to and from school was difficult: “It was a disaster getting to school... we had to like wake up at 7 o'clock just to get to school on time” and then at the end of the day she said “I had to stay at my grandmas” and then be collected and taken to the caravan. (2010, p. 65).

Such ruptures in school attendance can have cultural impacts, feelings of identity and belonging can shift, and emergent forms of sociality can take shape. For example, Walker et al.'s (2012) study found the site of the school to be representative of the specific demographics of the particular area, and students' attachment to the school was “very territorial”, to the point where travelling out of the local area, “even to go to the city centre – was not the norm for the children taking part” (p. 146). Subsequently, these feelings of stability, belonging, and identity were disrupted due to flooding. These ruptures are not straightforward though. As detailed later by Walker et al. (2012), students returning to their “newly refurbished school” (p. 146) were reoriented toward a sense of belonging and stability: “when they eventually returned to their original school, they ‘felt a lot more happier with the design and everything else..... There were new toys and all that.... New carpets, new toys, new TV, new books, new everything...’” (Walker et al., 2012, p. 146).

In Fothergill and Peek's (2015) longitudinal study, they report on the experience of Daniel, an African American boy whose family had to move multiple times in the wake of Hurricane Katrina, including away from New Orleans. In Daniel's experience, place-based school identities became xenophobic, and he experienced bullying on the basis of being from New Orleans. As Fothergill and Peek (2015) detail:

Bullying was among the most harmful issues that Daniel faced during the post-Katrina displacement. In Baton Rouge, he quickly became a target of older, hostile youth. As he rode the bus and walked through the hallways of the now overcrowded middle school he was enrolled in after the storm, he encountered rampant anti-New Orleans sentiments. Students at this school were angry about the “newcomers” from New Orleans ... All people from New Orleans, but especially African Americans, had been widely portrayed in negative and highly stereotypical terms: dangerous, criminal, lazy, unintelligent, violent, gang members..... He described the views of the other students in Baton Rouge: “‘cause for the simple fact [we are from New Orleans], some of them do not like us. Our reputation is the highest killer rate in Louisiana. That doesn't base anything on people you meet from New Orleans, you see what I'm saying?”... Over time the hostility toward Daniel became dire. There were several incidents on the school bus where he was hit or otherwise physically hurt by other children. (p. 58–60).

Similarly, Walker et al. (2010) found that children experienced moving schools to be distressing because of the change in social networks, loss of community, and being perceived as an outsider:

Darren also didn't like it at the temporary school. He said, “because you saw loads of kids who you didn't know before...and they were judging and looking at us and saying “who are they?” (p. 68)

Evidently, children's lived experiences of schooling during and following floods can be highly distressing and harmful. Unsurprisingly, this can have a negative impact on their learning, which the children in Peek and Richardson's (2010) study explained, for example: “After Katrina, I didn't know where some of my family was, where my friends were, there was no way I could be thinkin' about my homework” (p. S68).

However, a second finding from this small subset of the literature was that flood events are sometimes viewed by children and young people as “fun” and positive interventions in educational life, often contrasting the experiences of parents (Krishna et al., 2018). This was particularly noticeable within the context of school, given that flooding events sometimes meant school closure (Harwood et al., 2014; Walker et al., 2010). For some children and young people, the experience of engaging with flood produced enjoyment and relief, as well as a desire to play within these novel settings as emergent bodies of water. Hadfield-Hill and Zara (2019) found, for instance, that the “initial onset of the rains” “softened” the weather, and produced “playful opportunities” (p. 740). Children participating in Harwood et al.'s (2014) study “welcomed the water within their play environments and enjoyed splashing in the puddles, and swimming in floodways, parks and roads” (p. 41). Similarly, Walker et al. (2010) noted the impact on infrastructure allowed one child to stay upstairs, sit on the balcony of their home and fish.

Nevertheless, the reality of contaminated water produced by flooding meant that for many children and young people, as Walker et al. (2010) found, the desire to play and enjoy the water was in tension with parents' advice and directives. As one child recounted, they were told that they should be “wearing like plastic bags up to my knees and stuff because my mum said that if any of the water gets on me it could be bad” (Walker et al., 2010, p. 36). It is also clear that for some populations, an immediate positive response to the rain and flood events could shift dramatically. As one participant stated in Hassan et al.'s (2018) work with children impacted by flooding in Kashmir, India: “Initially I was excited to see lots of water, but, as water began destroying houses around us, I started fearing for myself and my parents' lives” (p. 416). It is also important to acknowledge here that most of these discussions of joy, fun and novelty appear to occur within literature documenting the experiences of children and young people in the Euro-Western World. As Cadag et al. (2017) reported, children and young people in Manila during flooding simply had “less time for games and meeting friends because of the disagreeable environment inside the school” (p. 77). As others note, the “intensity of the rain” can produce more pronounced “mental challenges, particularly due to the isolation which the monsoon brought with it” for those in poorer communities (Hadfield-Hill & Zara, 2019, p. 743; See also Mort & Rodriguez-Giralt, 2020).

As this small subset of the disasters literature demonstrates, children's experiences of the educational impacts of floods appear to be much more varied than quantitative top-down studies might indicate through the proxies of drop-out rates and lowered academic performance. What floods *mean* within children's educational lives may be much more expansive, diverse, uncertain, nuanced, and detailed than what these statistics can infer.

Common currents in political-ecology informed studies of childhoods, educations, and bodies of water

In this section, we explore key themes arising from a separate set of literatures: publications from the fields of education, childhood/youth studies, and children's geographies, which engage political ecology frameworks (including one or more elements of intersectional, decolonial, more-than-human and/or feminist approaches) and focus on

children's engagements with water. While we found much of value in these literatures, the change in focus from floods to water is due to the distinct lack of research in these fields that centrally explores disastrous floods, and as we will show, this can result in romanticised interpretations of children's interactions with water, which can fail to consider the grave risks and vulnerability that the disasters literature illuminates so explicitly.

Noting the step change in the kinds of approaches between this section and those preceding, we begin by briefly outlining the theoretical and ethical orientations of political ecology approaches to water. In contrast to disaster studies' positioning of water as a resource to be managed, political ecology frameworks seek to disrupt the pervasive human/nature and mind/matter binaries, which figure the human as an independent and objective observer who can rationally measure and manage nature (Braidotti, 2013). Subfields such as "critical ocean studies" (Blum, 2013; DeLoughrey, 2019), "hydrofeminism" (Neimanis, 2017) and the "blue humanities" (Mentz, 2023) work to establish less human-centred understandings and relationships with waters. These approaches stem from long histories of eco-feminist, Indigenous and decolonial, queer and Black studies that seek relational autonomy and liberation for all, including for "nature" and nonhumans (Bawaka Country et al., 2016; Nxumalo and Villanueva, 2020). They understand subjectivity, culture, knowledge, and feeling as material elements of the world, and they position all matter as relational, which is to say, deeply interwoven, and thus, always dynamic and rife with vitality and political agency (Hultman & Lenz-Taguchi, 2010). Gibbs (2013) argues, for instance, that western determinations of water as an inert, discrete, and manageable substance are grounded in colonial logics which rationalise the violent displacement of First Nations peoples from their traditional waters, skies, and lands (see also Moreton Robinson, 2015). First Nations' approaches, in particular, provide significant counter-perspectives that cultivate respect and reciprocity for water's own agencies and sovereignties through non-dualist onto-epistemologies that understand hydrological and social phenomena as inextricably linked (Bawaka Country et al., 2016; Nxumalo and Villanueva, 2019; Nxumalo and Villanueva, 2020). As an elemental materiality that connects and sustains all planetary life, thinking through and with the "nonhuman depth and scale" (Blum, 2013) of water has the potential to broaden and establish a different orientation to studies of educational life related to floods. From a "blue" relational materialist perspective (Neimanis, 2017), children are themselves bodies of water, inseparable from hydrological weather patterns and waterways (Hadfield Hill & Zara, 2019).

The first major convergence we find in political ecology studies of child-water-education entanglements is a keen attention to water's agency, specifically its affective capacities and the ways these agencies bind children and waters together into place- and time-specific entanglements (Djohari et al., 2018; Nxumalo & Villanueva, 2019). These entanglements are often understood, in relational materialist terms, to be in processes of "becoming" or "becoming-with" (Pacini-Ketchabaw & Clark, 2014). The shift here is from the anthropocentric centring of hydrological management towards an attention to embodied affects and engagements in the watery worlds in which we live, with a specific focus on embodiment and the ways that humans both make and are made by waterscapes (Bruzzone & Stridsberg, 2023; Djohari et al., 2018; Nxumalo & Villanueva, 2019; Pacini-Ketchabaw & Clark, 2014). To this end, much of this work attends to the affective and/or embodied to draw attention to the intimate scale at which these watery entanglements are lived (Djohari et al., 2018; Hadfield-Hill & Zara, 2019; Nxumalo & Villanueva, 2019).

There is less coherence within the literatures on the purpose of such efforts: for some, the objective is to attend to young people's embodied experiences of water (Hadfield-Hill & Zara, 2019), for others, it is to ask questions of watery relations even if we cannot answer them (Pacini-Ketchabaw, Blaise & Wintoneak, 2021). Yet others offer alternative rationales: for Taylor (2020) it is to expand our imaginaries to better

encompass watery scales of planetary destruction, while for Nxumalo and Villanueva (2019) the aim is to decolonise water pedagogies with young children. Experimenting with and changing the ways children and young people's relations with water are practiced and understood is perhaps the common thread undergirding these aims (Blaise & Wintoneak, 2021; Bruzzone and Stridsberg, 2023; Pacini-Ketchabaw & Clark, 2014). Children and young people are, from this perspective, never solid or static in their constitution as bodies, let alone in their constitution as learners and subjects/selves (Pacini-Ketchabaw & Clark, 2014; Rousell & Cutter-Mackenzie-Knowles, 2023).

Some detailed examples from the literatures help bring these ideas to life. Blaise and Wintoneak (2021) discuss young children's affective encounters with a mass death of blowfish as they walk-with Derbarl Yerrigan (a tidal river in Western Australia). Children puzzle over why the fish have died, and experiment with appropriate explanations and responses, including returning the bloated bodies to the water. Blaise and Wintoneak (2021) note the children's wide eyes and sandy hands as they pause, pick up the dead fish, and wade into the shallows, in efforts to learn to care appropriately for this situation, in this place. One girl says: "I like holding him. I am gentle with the fish. He died. He needs to get back in the water" (p. 142). Blaise and Wintoneak consider the children to be learning-with and becoming-with the dead blowfish, as their bodies touch and move each other in the littoral zone.

Similarly, Dhojari et al. (2018) discuss angling (fishing) as a coping practice that supports "disaffected" young people as they work through socio-emotional challenges. They observe that "learning to be-in-the-world as an angler is about knowing, being and acting with(in) waterscapes" (p. 362), and discuss how young people develop a keen attunement to water's qualities, such as its eddies and barely-noticeable vibrations, and how this activates precise embodied practices, states of mind, and skills among the anglers. The young people note that this attentiveness to bodies of water helps them relax and cope with their wider socio-economic worlds:

Fishing relaxes me so much. I used to have panic attacks at school... Whereas tying hooks and all that, having something to do where I'm just sitting here, something to relax. It calms me down. (cited in Dhojari et al. 2018, p. 364).

The second major theme we found in relational materialist child-water studies was an attention to *flows*: the dynamic spatio-temporal scales of fluid affects that result from water's movements, cycles, and rhythms. In this vein, several papers begin by explicitly contesting the ideology of treating water as a spatial asset or resource to be managed, proposing a durational approach of living-with water instead (Pacini-Ketchabaw & Clark, 2014; Hadfield-Hill & Zara, 2019; Bruzzone & Stridsberg, 2023; Nxumalo & Villanueva, 2019). Living-with water rejects romantic notions of nature (in this case, water) as pure, sublime wilderness or a neutral and discrete material substance. Rather, living-with and becoming-with waters involves acknowledging and attuning to the "non-innocent", messy, "unloved", damaged and damaging flows of water across non-linear scales and temporalities (Blaise & Wintoneak, 2021), whether this be degraded river systems or the inescapable drudgery of monsoon mud (Hadfield-Hill & Zara, 2019; Nxumalo & Villanueva, 2019; Wilson et al., 2023). Here it is water's liquid capacity to flow (and evaporate and freeze) that articulates some of its most unique temporal and spatial qualities (Bruzzone & Stridsberg, 2023; Pacini-Ketchabaw & Clark, 2014; Wilson et al., 2023). Child-water relations are shaped not only by the liquid substance's own materiality but also by the materials that waters transport, such as fish or pollution (Blaise & Wintoneak, 2021; Wilson et al., 2023), which bring matters that otherwise might be separated by great temporal or geographical scales into intimate connection (Pacini-Ketchabaw & Clark, 2014; Taylor 2020). These scales of movement mean that watery relations connect humans to place – whether that be very local places, such as a pond, watersheds, or river courses – and to specific temporal rhythms, such as the daily tidal cycles of flood and ebb, faster riverine flows following

rain, or sea levels rising slowly but surely over a lifetime (Jukes et al., 2019; Mikaelis & Asfeldt, 2017; Wilson et al., 2023). These place-based and rhythmic qualities of water are understood to be some of the main ways children and young people are affected, enrolling them into specific social, political, and ecological relations (Djohari et al., 2018; Hadfield-Hill & Zara, 2019).

This affect is demonstrated in Hadfield-Hill and Zara's (2019) exploration of children's monsoonal entanglements in India, which discusses how annual rain cycles, and the inundations they produce intersect with what they term "fluid inequalities": the ways that socio-economic hierarchies affect people's experiences of waters' movements, leaks, and dispersals. One eleven-year-old boy in their study discusses how the rain combines with mud and rocks to infiltrate their home: "we are living at the foothills of the mountain. When the rain comes, all the stones fall down ... then all the mud and whole rain and dust comes down into our houses" (p. 741). By emphasising the cyclical nature of monsoonal patterns from a child-framed, more-than-human perspective, this work provides a significant and compelling alternative to the disaster literatures that currently dominate scholarly and governmental discourses on floods.

Continuing this attention to fluidity, for Nxumalo (2021), water's multi-scaled flows are not simply material but simultaneously political, and demand responsibility. Describing learning activities offered by Coahuiltecan elders to children in Texas, including an altar to water, Nxumalo reflects:

There are many responsibilities, of multiple scales, that come with being welcomed into relationship with Yana Wana [the spirit of the water] These responsibilities include acts of care as embodied in the careful curation and maintenance of this community altar throughout the week. Another responsibility is beautifully expressed by one of the children: "Water is life, she loves to hear us sing her name Yana Wana." (Nxumalo, 2021, p. 5).

In Nxumalo's study, another child's writing acknowledges these flows of water as relations of reciprocity: "Because we are water, I am a river. Because we are flowers, I am alive." (Nxumalo, 2021, p. 5).

Despite the careful focus on inequalities and damaged waterscapes in this literature, we found limited engagement with floods or hydrological emergencies in these political ecology literatures. The multiple temporalities considered within the works often acknowledge "slow emergencies" (Anderson et al., 2019) unfolding in the hydrosphere, such as mass deaths of fish (Blaise & Wintoneak, 2020). However, events more traditionally understood as emergencies or disasters, such as floods, have so far not been engaged with significantly in this field, although a few papers are beginning this work. Much of this emerging research focuses on the pedagogical affordances of place as constituted through sociomaterial relations with water. Do Nascimento's (2019) paper is inspired by torrential rain and dangers, such as landslides, that were generated in the favelas at the time the author was providing extra-curricular educational programs to young children. These would be cancelled on days of heavy rain. Nevertheless, the paper advances an argument similar to much of this political ecology education scholarship: that we should attune to everyday entanglements with water because this attunement will help us live and respond more ecologically when flood events occur. However, what specifically an attunement to watery entanglements might offer children whose lives and educations are endangered by floods is not yet well explored.

An exception is Wilson et al. (2023) who centre the violence of floods as "harmscapes," exploring the place-based pedagogies that emerge in informal settlements where dirty and unwanted waters leak, seep, pool, flood, stagnate and soak everyday life in frustrating, unhealthy, and time-consuming ways. The authors contend that these place pedagogies

"teach" the adults² in their study how to mitigate the worst effects of the waters; that is, how to sustain their lives amid compounding socio-economic-ecological structural violences, despite no formal "educational" program. Yet their conclusion contrasts strongly with the hopeful sentiment offered by much other political ecology research which believes in the emancipatory power of watery attunement:

Although the pedagogies of this place have provided effective lessons in how to get by, repeated cycles of inundation, damage, repair and rebuilding take time, energy and resources that residents then do not have available for anything else. The very effectiveness of their learning confines them to ... reinforce the status quo. It is because of this that local knowledges, which may be so strongly shaped by place, may not be enough to create change. (Wilson et al. 2023, p. 15)

To summarise our findings in this section, our review of child-water-education studies notes that these fields frequently centre water's agency such that it can be understood to constitute a pedagogical agent that produces complex forms of learning. These "hydropedagogies" of educational life are shaped by water's own sovereignties, its non-linear and unpredictable, yet rhythmic, movements and movings of matter across and between places. The learnings these hydropedagogies stimulate are not just cognitive capture of facts, or skills for surveilling and disciplining hydrological assets and risks, but deeply relational ways of becoming-with, living-with and knowing-with wet and fluid worlds. We suggest that such approaches may be able to offer more capacious ways to understand and respond to children's flooded educational lives and, as our search results demonstrate, these literatures are currently being occluded and submerged by dominant disaster literatures and discourse. On the other hand, we are yet to read compelling accounts of what these political ecology accounts might pragmatically offer children and their worlds in instances of hydrological catastrophe.

Educational life in times of catastrophic waters: A research agenda

In this paper, we originally set out to review academic literature exploring the impacts of floods on children's experiences of education, as narrated by children themselves. Reviewing publications from disaster studies in the first instance, we found much material concerning the tangible physical impacts of floods on schools and the pervasive impacts of floods on children, including the impacts of floods on their (quantifiable) educational outcomes. Within this literature, we found that children and young people are variously regarded as vulnerable to and resilient in the face of these impacts, and that their vulnerability and resilience are dramatically shaped by the socio-economic contexts they live within. Such research offers particular insights into the life-threatening challenges of reducing the impacts of floods on children, including their educational lives. Nevertheless, across this wide set of literatures, we found scant consideration of children's *experiences* of the impacts of floods on their education, and even less that explored this through children's own voices. Echoing scholars researching education in the context of other disasters (Bell et al., 2024; Bertoli et al., 2023; Gough, Towers and Verlie, 2021), we posit that these literatures' silencing of children's experiences of floods stems from the dominant logic that underpins much of disasters studies: Euro-modernist rationality, and its resultant emphasis on top-down, objective, tangible, quantifiable data and knowledge. Nevertheless, despite these dominant framings, a small subset of those literatures revealed that children report complex experiences of floods and education, which can affect their sense of identity, place and belonging, their personal relationships and their emotional experiences.

Turning to political ecology literatures, we found publications that

² This study focused on adult learning, not children, but is included for its political ecology framework and attention to floods and learning.

comprehensively attended to the myriad ways that the educational lives of children and young people are entangled with waters. In contrast to the human-centric managerialism of disaster studies, these literatures showcased the ways that water affects, moves, shapes, transforms, challenges, dissolves and reconstitutes human bodies and subjectivities, including those of children and young people. Much of this literature positions water not as a resource to be managed, but as a lively force that actively participates in the relational generation of knowledge: that is, water-and-children together enact pedagogy, and through these more-than-human processes of learning, children-and-water become-with each other, and become-different to their prior “selves.” However, despite some attention to the challenges and risks of polluted waters, this field is yet to substantially grapple with catastrophic waters, such as floods, leaving it somewhat out of touch with the intensifying realities of climate crisis and fairly bereft of relevant guidance on how to support children to “live with” – prepare, survive and respond to – floods.

Reading these two fields together reveals major gaps in understandings of how floods are affecting children’s educational lives. On the one hand, we have a disaster-attuned field that systematically overlooks qualitative, cultural, intangible experiences and that perpetuates human-centred, hierarchical forms of knowledge and resource management. On the other, we have a deeply relational, intersectional, and multi-species account that is yet to be tested for its relevancy to disaster and harmscape contexts. In articulating these inadequacies in the literature and heeding the calls to theorise ‘education in a changing climate’ (Verlie & Blom, 2022), we conclude by proposing a research agenda fit for a future which will be repeatedly characterised by one unprecedented ecosystem breakdown after another.

We call for research that brings together the best insights from both disaster studies and political ecology (intersectional, decolonial, Indigenous, more-than-human) studies in education/childhood. Such approaches are becoming more frequent in other disaster contexts (e.g. Bertoli et al., 2023; Gough, Towers and Verlie, 2021; Somerville and Powell, 2022) and are emerging in very recent floods research (e.g. Crinall et al., 2025). In the specific context of floods/waters as mapped in this review, we contend that efforts must recognise that watery worlds are inherently pedagogical, and that they shape and are shaped by human and nonhuman learning processes in complex ways. This learning includes social, ontological, cosmological, and relational learning, that not only leads to new cognitive knowledge but new ways of feeling, sensing, doing and living-with, which is to say, new relationalities, subjectivities, identities, and socialities. Such approaches must also foreground the increasing (in scale, frequency and intensity) catastrophic and unjust impacts of watery disasters such as floods on children and young people, who are not a homogenous category but people whose lives are starkly differentiated according to gendered, racialised, classist, ableist, geo-political, and other hierarchies. Such an understanding of human learners, including children and young people, as intimately entangled in rapidly unravelling, multi-scalar climate disruptions demands significant re-orientations of long-held assumptions that continue to dominate the fields of both education and disaster studies. Developing such approaches will be no easy task, but it is what the conditions of global ecological crisis demands of us as educators and researchers.

CRedit authorship contribution statement

Blanche Verlie: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **David Rousell:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Lisa de Kleyn:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Michael Hartup:** Writing – original draft, Methodology,

Investigation, Data curation, Conceptualization. **Lauren Rickards:** Supervision, Funding acquisition, Conceptualization. **Jeanti St Clair:** Writing – review & editing, Funding acquisition, Conceptualization. **Chantelle Bayes:** Writing – review & editing, Conceptualization. **Helen Widdop Quinton:** Writing – review & editing, Conceptualization. **Simone Blom:** Writing – review & editing, Funding acquisition, Conceptualization. **Katie Hotko:** Writing – review & editing, Funding acquisition, Conceptualization. **Amy Cutter-Mackenzie-Knowles:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization. **Liberty de Rivera:** Funding acquisition, Conceptualization. **Alexandra Lasczik:** Writing – review & editing, Funding acquisition, Conceptualization. **Yaw Ofosu-Asare:** Conceptualization.

Acknowledgements

This research was funded by Southern Cross University’s Vice Chancellor’s Flood Recovery Project Scheme, 2022.

Data availability

No data was used for the research described in the article.

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