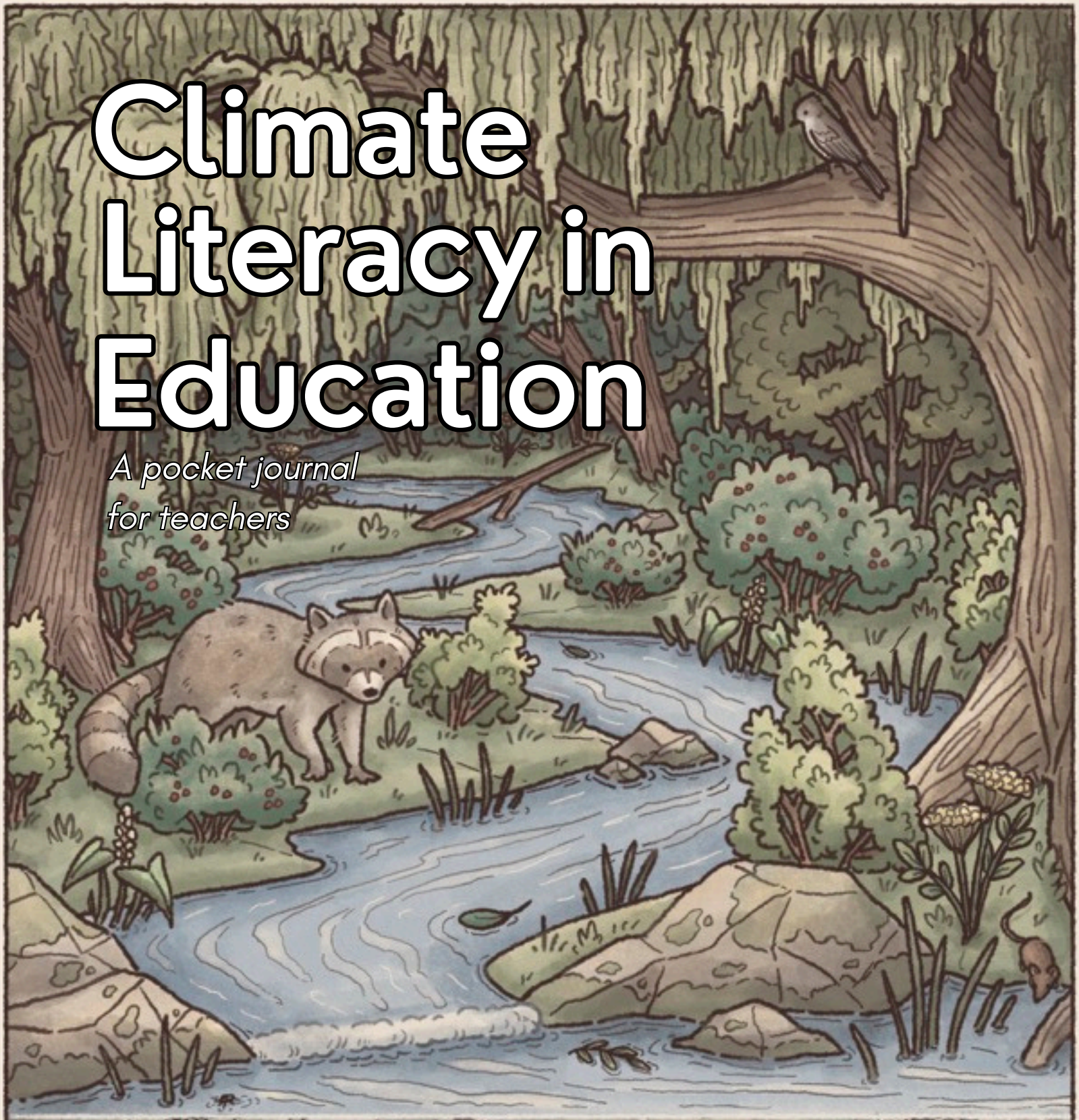
Climate Literacy in Education

A pocket journal for teachers



Special Issue:

Water as Conflict, Water as Commons

Volume 2 | Issue 2 Winter 2024

About *CLE*

Climate Literacy in Education (*CLE*) is an open-access, double-blind, peer reviewed journal sponsored by the Center for Climate Literacy at the University of Minnesota and published through University of Minnesota Libraries. *CLE* publishes practical, teacher-oriented content on all aspects of climate literacy education at all grade levels and across all subject areas (primarily K-16 but including teacher education and professional development). We are a pocket journal focused on classroom practice which is why the articles we publish are short: 2000 words or less. Our content is written in jargon-free prose accessible to the general audience. All submissions are peer-reviewed by two anonymous readers. Authors can expect to hear results within two weeks after submission. We publish on a rolling basis.

We welcome submissions in the following categories: Curriculum, Reflections, Critical Essays, and Creative & Multimedia. For detailed submission criteria pertaining to each category, please visit our journal website.

We look forward to working with you!

Editorial Collective

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Emma Ambrosi provided the cover illustration.

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Introduction to the Special Issue: Water as Conflict and Water as Commons

Stephanie Rollag Yoon, Minnesota State University, Mankato, MN, USA
Alexandra Panos, University of South Florida, St. Petersburg, FL, USA
Candance Doerr-Stevens, University of Wisconsin, Milwaukee, WI, USA

"Speak for the water. Sing for the water. Dance for the water."

Thus speaks the water in Carole Lindstrom's most recent picture book, *Autumn Peltier, Water Warrior*. (Lindstrom, 2023). In this picturebook, water warriors Autumn Peltier and Grandmother Josephine speak, sing, and dance for water. In turn, the water gives life to all who care for it. This presentation of water as both life-giving and needing care calls upon us to consider our relationships and stories related to water. How do we speak, sing, and dance for water in our classrooms and our teaching?

In this issue, we invited educators to share their teaching and learning experiences with water. We received an enthusiastic response from educators, researchers, artists, and learners. As a result, this special issue explores investigations of water learning in the classroom and beyond as they relate to climate issues facing our local neighborhoods and larger global contexts. Investigations of water learning include water for thirst, growth, and play. Some also draw attention to concerns related to water access, safety, possession, drought, and flooding. We are excited to share lessons and reflections that grapple with *conflict* that arises around access to and care for water. At the same time, stories explore reconceptualizations of water that move beyond a product to be bought, sold, and protected, to water as *commons*, a living entity requiring reciprocal relations.

We have organized this special issue through the authors' various foci on curricular examples, resources, reflections, research, critical essays, and creative works. The variety, depth, originality, and exploration of water as commons, as life, as story, as performance alongside water as death-bringer, as healer, and as friend complicated our own relationships to water. We hope also that these pieces offer stories and ways forward for all that explore the pages of this issue.

Our colleagues' descriptions of their curricular activities with students of all ages offer concrete ideas for use in classrooms of all kinds. Tiffany Hagey shares with us a text set from her unit on local and global water issues and describes how she invited students to publish their learning through pocket zines. Katherine Werthwine similarly focuses on visual composing with her 9th and 10th grade intensive reading students as they explore local water concerns and create visual argumentation for community-based solutions. Water as symbolism is explored in Jay Bullock's reflective description of his high school students writing and reading their way through what water means to them personally and the many forms it can take in life and literature. Arts-based approaches to water stories are further highlighted and explored in an easily translatable lesson by Melanie Ariens and Rhonda Nordstrom who position drawing our own water stories as building empathy with human and more-than-human kin alike. Kristine M. Schutz and Rebecca Woodard use beloved recent children's books to support their preservice teacher education students in explorations of water protection and how such texts can support informational reading and writing in the elementary classroom.

Across the pages of the special issue authors describe many resources and reflect on their own work as educators and scholars interested in water. Candance Doerr-Stevens, for example, shares an online collection of picture books, chapter books, young adult novels, and media all focused on water as resource, relative, and place. Julianna Lopez Kershen digs deeply into one award-winning middle grades novel, *Ninth Ward*, to explore standards-based opportunities for engaging young people in investigations of the complicated ways water was experienced and portrayed during Hurricane Katrina. Sonja R. Braucht revisits a unit of study she shared in a previous issue of the journal, reflecting on the significance of community in project-based learning and its social-emotional resonance in climate literacy education.

Our colleagues also shared examples of research-in-action to deepen our orientations to the roles water might play in our work as educators and scholars of climate literacy. Global Water Dances are described as a rich space to conduct large university-public school partnerships focusing on transdisciplinary ways to raise awareness about water issues, promote sustainability, and inspire action to project water resources, all guided by children's messages about their rights to clean water. Rebecca Rogers and Inda Schaenen offer an approach to discourse analysis centered

on water justice by examining curricular artifacts from their Literacy Clinic, arguing that changing our discourses, linguistic systems, and narratives is necessary to shift our relationships to water and all forms of life. Wenyan Yang uses multimodal discourse analysis to explore how pictures in two recent and award-winning children's books highlight how visual narratives might evoke emotional response and environmental awareness for young readers.

Critical examinations of water and water narratives by authors who contributed to this special issue dug deeply into both healing and confrontation necessary to explore water with students. Danielle Haque invites readers to consider with her how she uses water with her college-age students to examine climate change as the defining crisis of the present moment and its entanglement with environmental racism, colonialism, and inequality. Sean P. Connors shares the critical lens of intersectional environmentalism and introduces key questions to explore for students and teachers to examine interconnectedness and social justice. Milena Renee Rodriguez examines two films that prioritize Indigenous ways of knowing around intergenerational healing through embodied water practices and rituals as starting points for integrating anti-oppressive and ecojustice-oriented discussions within multigenerational and culturally safe educational environments.

We also share a digital version of Christina Randazzo's children's book, *My Friend, the Lake* in this special issue. The book builds from Randazzo's previous research and personal narratives about Lake Erie that address the Lake's importance, impact, and an awareness of the problems that face Lake Erie, and Earth, today.

Across the stories, we invite readers to engage in their own learning and connections, as we collectively consider: How do we relate to water on a personal level? How do we connect to water as a family or larger culture? How does water shape us, our daily lives, and the traditions that define our families and cultures? How do we consume water? When and how do we study water? To whom does water belong? How do we protect and give back to water?

Thank you to our many authors for sharing your voices, songs, and dances for water. Thank you also to the readers and educators of these pages for your curious minds and active commitments to exploring what it means to care for water in our classrooms and beyond.

Guest Editor Biographies

Candance Doerr-Stevens (PhD) is a former middle and high school English Language Arts teacher and currently works as an associate professor of literacy education at the University of Wisconsin, Milwaukee. She teaches courses on the teaching of reading and writing, as well as digital and multimodal composition. She is most energized by her work with teachers, especially in her current role as Director of the UWM Writing Project. Her research focuses on the literacy practices and creative responses we enact for problem-solving and hope in the face of challenging social issues. She can be reached at doerrste@uwm.edu.

Alexandra Panos (PhD) is a former Middle Grades ELA teacher and currently serves as an Assistant Professor of Literacy Studies and Affiliate Faculty in Measurement and Research in the College of Education at the University of South Florida. She centers her scholarship on the embodied reality that, to quote Octavia Butler, "there is no end to what a living world demands of you." For her, this means prioritizing place-based, community-engaged, and postcritical activities that center the ecological and geographic dimensions of education for equity and justice.

Stephanie Rollag Yoon (PhD) is an assistant professor of English at Minnesota State University, Mankato, where she teaches preservice and practicing English Language Arts teachers. Her teaching aligns with her research interests around digital literacies, critical writing pedagogy, and climate literacy. Drawing on her experiences as a middle and high school English teacher, Dr. Rollag Yoon sees students and teachers as brilliant readers and multimodal composers. Across her teaching, professional development, and mentorship, her practices are grounded in feminist pedagogies that center stories of hope.

Climate Literacy in Education

Zines and Water: How Zines Can Help Students Understand Water Issues

Tiffany Hagey, Alexander Hamilton High School, Milwaukee, WI, USA

Abstract

This water stimulus packet was developed to model College Board's Advanced Placement Seminar Performance Task Two stimulus packet. The intention to offer students opportunities to practice skills and strategies needed to work through a text set and successfully then conduct further water-issue research. In particular, this text set aimed to give junior students a varied base of knowledge about water issues, both locally and globally, while identifying thematic connections and using it to launch their own research. This specific lesson centered around AP Seminar students individually reading a book chapter and organizing their key takeaways and summarized text in the form of a pocket zine.

Keywords

multimodal text, zine, Advance Placement, youth activism

I designed and taught this water stimulus packet to one section of an Advanced Placement (AP) Seminar class with a mix of both sophomore and junior students in the spring semester of 2023 at an urban high school in Milwaukee, Wisconsin. I was inspired to design this unit around the theme of water after a graduate course allowed

me to experience various climate literacies and undergraduate students' enthusiasm about zines. That experience encouraged my own teaching practices—particularly to use water as the central theme of a text set. AP Seminar students would use this text set to practice some reading strategies, including close reading annotations, connecting text to class, pulling main ideas and key details, and generating possible questions that arise while reading the water text set. To help students generate reading notes, they were encouraged to note a "golden line" per page: a line, a number, a fact, or an expert opinion that drew them in. They were then tasked to display that "golden line" either in a direct quote, a paraphrase, or an image on their zine. This approach followed the AP Seminar QUEST framework, in which students work on questioning and exploration, as well as understanding and analyzing arguments. These very skills are necessary for AP Seminar students' success with future performance tasks.

This specific lesson focuses on the text *A World Without Fish* by Mark Kurlansky. The book focuses on key perspectives on fish and water. This was immediately relevant for my students, most of whom live in a city nestled right next to Lake Michigan, and many of these water issues hit close to home with toxic runoff, lead contamination, and other water pollution. The AP Seminar class did not have ample time to read the whole text, so it was divided into chapter reads. Two students were required to thoroughly read one chapter and display their findings in an eight-page zine. Zine-making also served as a note-taking strategy that offered a new and creative way for students to display their learning after reading. Students had to make critical decisions on what information was key and worthy, as they only had eight small pages to convey their reading notes. Students then were put into small groups, with one student representing each chapter and sharing their pocket zines. This small group collaboration allowed students to discuss key findings and share knowledge gained about water issues.

Narrative Framing

A World Without Fish is a unique nonfiction text written by author and former fisherman Mark Kurlansky. This text examines at the critical issue from multiple perspectives, leads the reader through possible solutions, and, ultimately, suggests the

best solution moving forward. This text layout is very similar to how AP Seminar students will have to explore a topic in the future, so Fish was an excellent mentor text. The text is specifically made for young readers as it is full of amazing illustrations by Frank Stockton, a small graphic novel, and visually appealing statistics. The eleven chapters in *A World Without Fish* can be read as standalone text, which make reading complex issues more manageable in chapter chunks, or assigned via individual chapters.

At a Glance

Title	Zines and Water
Unit Time	3-4 weeks Schedule: 8 class periods, 90-minute class
Grade Level(s)	10th and 11th AP Seminar class
Core Text of lesson	Students read a chapter of *A World Without Fish*, by Mark Kurlansky, to complete this activity.
Supporting Texts within Unit	Water Stimulus Packet also includes the following texts: • *A Long Walk to Water* by Linda Sue Park • *We Are Water Protectors* by Carole Lindstrom • *Down to Earth with Zac Efron*, Season 1, Episode 2 "France" • Mari Copeny, "Water for Flint", Rebel Girl Podcast (11:21) • Websites: Lead in Milwaukee Drinking Water and EPA's Environmental Justice Screening and Mapping
Climate Literacy Terms **(from Climate Lit Glossary)**	Individual Action Interconnectedness Youth Activism
Objectives for lesson	Students will create a zine to document and reflect on key points, main ideas and golden lines from a specific chapter, enhancing their comprehension and engagement with the non-fiction text through creative expression.

	Students will present their chapter zines in small groups, practicing collaborative learning and critical discussion as they share zine insights, provide feedback, and deepen their understanding of the water text through peer interaction.
Materials and Resources	Teacher Theme Tracker

Going Forward

The students voiced they felt more confident and less pressure in reading one chapter, rather than the whole text. With that confidence, each excelled at displaying their text understanding and note-taking skills via a zine. Zines were a new concept for many students—a fresh multimodal writing task that was not seen as a writing obstacle. While in small groups, students were able to share their zines and collectively compile their learning from *A World Without Fish*. This particular text lent itself very well to this task and I will be looking for more texts for my English Nine classes to explore zine note-taking as well.

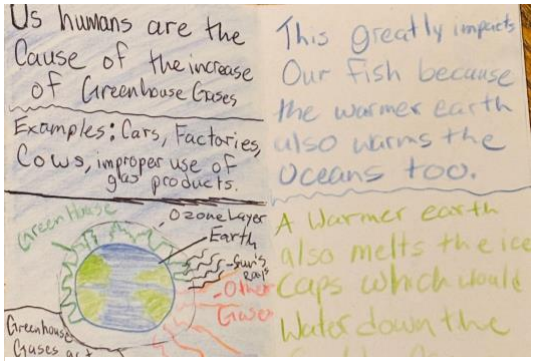

Figure 1: Martin R., 11th grade

The water stimulus packet allowed students to engage with the multitude of issues around water. Some students commented that they took access to drinking water for granted. Others were able to layer learning with the work they were doing in their Environmental Science class. I believe I will continue to use water as a central theme for a text set and will continually add new multimodal texts to the stimulus packet.

Work Cited

Kurlansky, M. (2011). *World without fish*. Workman Publishing.

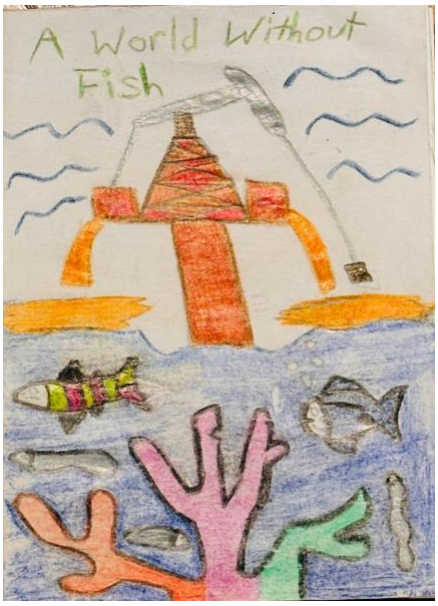

Figure 1: Martin R., 11th grade

Figure 3: Malachi W., 11th grade

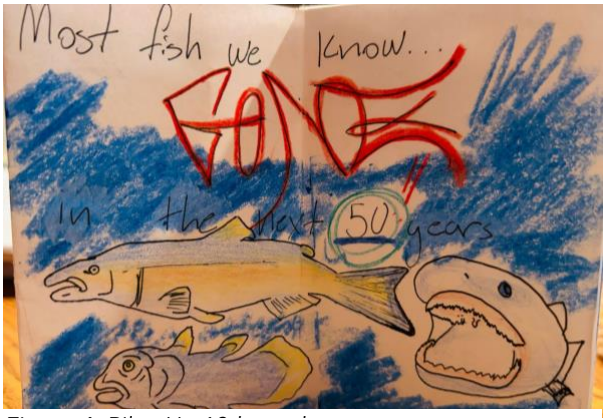

Figure 4: Riley H., 10th grade

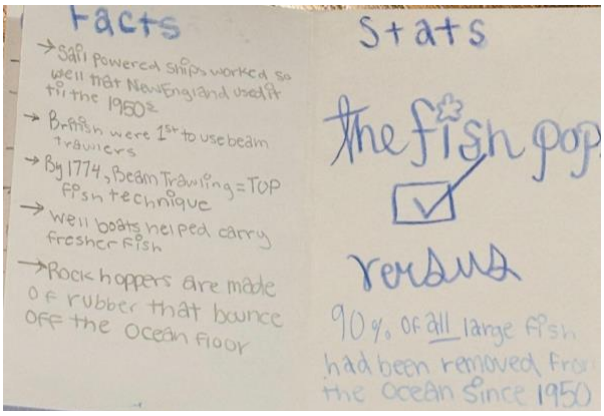

Figure 5: Ava T., 11th grade

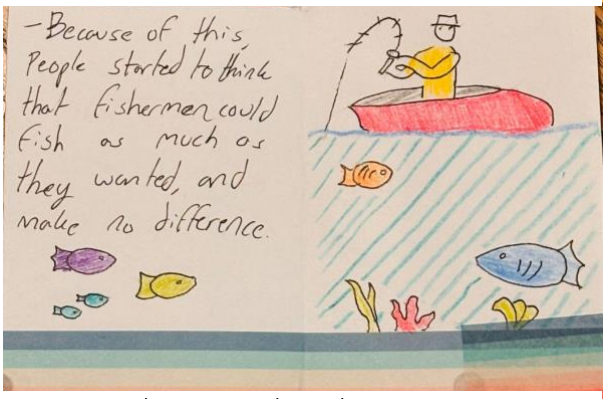

Figure 6: Jackson M., 11th grade

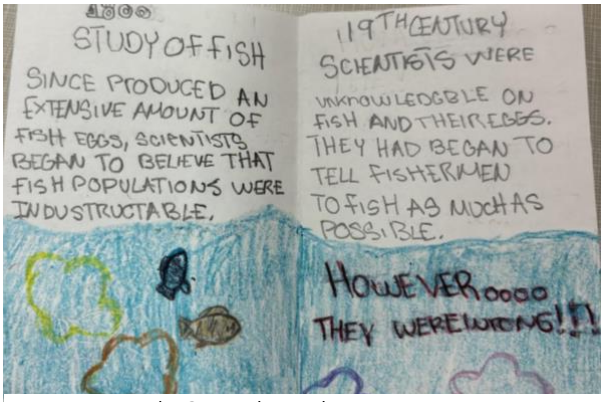

Figure 7: Farida Q., 11th grade

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City of Pure Water: A Place-Based Argumentative Writing Unit

Katharine Werthwine, Pasco County Schools, FL, USA

Abstract

This 9th and 10th grade multimodal writing unit takes a place-based approach to argumentative writing. Over ten lessons, students explore a local environmental issue through teacher-curated text sets before working with a partner to create a visual essay arguing for a community-based solution. The unit was originally designed and implemented in an Intensive Reading/English Language Arts combination classroom and aims to support and scaffold diverse learners. The unit is aligned to both 9th-10th Grade Common Core and Florida BEST standards on argumentation and organization. The goal of the unit is to foster students' abilities to write and develop specific claims in their arguments.

Keywords

Intensive Reading, multimodal writing, argument, water crisis, place-based learning

I originally developed and implemented this unit for my 9th and 10th grade Intensive Reading/English Language Arts combination courses. My students in these courses include English Language Learners (ELLs) and students with a diverse set of disabilities, including specific learning disabilities and language impairments. Aware of how often these students are discussed only in the context of achievement gaps and learning loss, I wanted to create a writing unit that focused on the strengths of my students, rather than their perceived weaknesses, and to create an opportunity for my students to speak for themselves. To start, I reflected on how I could bring my students' lived experiences into the classroom.

I am privileged to live and teach along the Gulf Coast of Florida around the Hillsborough River Watershed, a confluence of ancient water sources that has supported human communities for at least 12,000 years (Cooper, 2011). Water, here, is both a constant and a contradiction. Our community faces regular flooding during the rainy season. At the same time, rapid construction has created a water crisis. The communities in the Hillsborough River Watershed are running out of usable water, while being inundated by flooding and violent storm surges. My students live in this tension. They are frustrated by the rapid construction in our rural area but also depend on it for income. They know our water is needed for our agricultural economy but also that the water is polluted by fertilizer runoff. They love a day at the beach but also know the dangers of the hurricanes that come off the Gulf. Therefore, taking a place-based approach in designing this unit—that is, a pedagogical approach that emphasizes the local community and its environment in students' learning—challenged my students to consider how we navigate that tension (Martusewicz et al., 2021).

My goal in using a place-based approach was to facilitate conversations students were already having about the issues impacting their lives. I considered what questions and concerns they brought to my classroom and compiled a list of local environmental issues for students to choose from, including hurricanes, our local Harmful Algal Bloom (HAB) known as red tide, and drought-induced sinkholes. Taking a place-based approach also lessened the amount of Tier 3 vocabulary my ELLs and students with disabilities would need to learn. These were words they were experiencing and living.

Narrative Framing

For this unit, I decided that students would work collaboratively in pairs in order to encourage my ELL students to practice speaking and listening. In addition, I wanted students to learn from each other and share their lived experiences. I asked students to work together to identify and argue for a community-based solution to an environmental issue with a local impact. So often the discussion on hurricane preparation ends with a checklist of materials for the individual to collect. Instead, I wanted students to think about what solutions could be enacted on the community level to better prepare all of us for hurricanes. Likewise, I wanted students to think about what changes could be made to mitigate red tide's impacts on our community, rather than issue another warning for individuals to avoid the beach during a bloom.

A couple years prior, a colleague had shared the outlining method called "The Tree of Reasoning," one I had used before with students to some success (Pavich 2016). I thought I could take the visual outline and repurpose it into a visual essay, encouraging my students' visual and spatial creativity. In taking a multimodal approach to argumentative writing, I asked my students to thoughtfully combine words with a visual structure, illustrating the coherence of their argument.

First, we practiced breaking apart an argument in a common anchor text using the tree structure. We identified the argument's trunk (or thesis statement), then its branches (or reasoning), and the leaves (or the evidence). For this exercise, I used an article from the local newspaper on how our county's largest city—where some of my students reside—is addressing the usable water shortage by issuing a building moratorium. This allowed us the opportunity to practice not only argumentation, but also how to have a productive dialogue around a difficult topic.

Next, I provided students with a choice of text sets, each representative of an environmental issue with local impacts. Each text set included multimodal texts with audio and visual supports to be more accessible for my diverse learners. Likewise, the multimodal elements of their final product helped scaffold students' writing to best demonstrate their knowledge of argumentation and the issue being discussed.
My students focused on writing their three claims with clear logical and research-backed evidence with the visual structures they designed acting as logographic cues, replacing the need for additional language like transitional words and phrases. Using

the tree of reasoning as inspiration, they illustrated the coherency of their arguments. The shape of a hurricane wove claims and evidence together as students argued for things like mangrove restorations and changes to residential construction codes as a means of preparing for hurricanes. Diagrams of the Tampa Bay estuary emphasized the relationship between red tide and the need to prevent fertilizer run-off. Sinkholes highlighted the urgent need for drought reduction measures. All in all, the visual and spatial aspects of their multimodal writing supported the linguistic aspects, helping grow my students' confidence as writers.

At a Glance

Title	*City of Pure Water: A Place-Based Argumentative Writing Unit*
Unit Time	*10, 55-minute instructional blocks*
Grade Level(s)	*Grades 9-10*
Core Text	*Tampa Times* Article: "Zephyrhills to halt new development as water availability evaporates"
Supporting Texts	*Students will then choose one curated text set focused on their selected topic.*
Climate Literacy Terms	Harmful Algal Blooms (HABs); red tide; hurricanes; storm surge, watershed, drought, erosion, sinkholes
Objectives	• Students will work together collaboratively to identify and argue for community-based solutions to an environmental issue with local impacts. • Students will be able to construct a logical and coherent argument using a visual structure.
Materials and Resources	• Unit Scope & Sequence and Example Text Sets • Poster paper • Color pencils, crayons, and/or markers • Digital or paper access to text sets for students

Going Forward

The second year I taught this unit, my grade level team adapted it and expanded on it to work across the 10th grade, including honors and on-level classes. The visual essay was reframed as a Public Service Announcement and the proper application of rhetorical appeals was emphasized. Students were expected to not only construct a coherent text using both writing and logographic cues, but also to consider pathos in designing their visuals, logos in writing out their reasonings, and ethos in referencing their sources. In addition, students were encouraged to use rhetorical devices, like antithesis, to write a tagline for their campaign. My grade level team also expanded the list of topics to include other local environmental issues. This unit could also be expanded to include time for students to research their selected issue on their own.

Both years I taught this unit, students selected their topic based on the issue they felt posed the most significant threat to their own quality of life. Students with asthma worked on solutions to red tide. Likewise, students frightened by past hurricanes made plans to weaken future storms. As a result, their visual essays became powerful testimonies of the potential in our community to navigate the tension between our impact and our dependence on our environment. The creativity and resiliency my students demonstrated in their writing gives me hope that they will continue to use their voices to advocate for themselves and our home.

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Drawing Our Water Stories

Melanie Ariens, Milwaukee Water Commons, Milwaukee, WI, USA
Rhonda Nordstrom, Milwaukee Water Commons, Milwaukee, WI, USA

Abstract

As living beings, we are united by our universal dependence on water. We cannot live without it. Whether it is an innate connection or a deep-seated fear, we all have a water story to share. Drawing our water stories can generate empathy with one another and the non-human world.

Keywords

art, active listening, sharing, interdependence, empathy, kinship

Introduction

Water unites us in our humanity and as living beings on this planet. We each have our own personal water stories. Those stories may be of immigration, with water serving as a pathway to freedom and a new life. It may be a story of trauma of knowing how your ancestors were transported across seas. It may be a story loss due to flooding or drowning. It may be a story of scarcity and need, or a story of recreation, sustenance, joy, relief, calm, or celebration. There are so many ways that water intersects with our lives.

Drawing Our Water Stories serves as an exercise in reflection and connection. It asks participants to reflect on at least one aspect of their personal water story and share it with someone else who is actively listening and recording. We find there is

something deeply intimate in sharing a story in this way that allows for a moment of deep empathy and care, for both the water and for another human.

We also find it fascinating to observe people engaging in this activity—an activity that requires participants to be vulnerable in both sharing and in recording. There is no need to be an excellent artist, as participants can include words and draw symbols to convey the story. It is not expected to be a full illustration. Simplicity and creativity are key.

Overview

Drawing Our Water Stories is an active listening exercise that fosters deeper personal, interpersonal, and environmental connections to water through reflection and active listening. Participants pair up and take turns sharing their water story while the other draws it. These drawings are not meant to be masterpieces but rather serve to promote active listening. Afterward, pairs can report out to the larger group, with each person sharing their partner's story and how they chose to depict it.

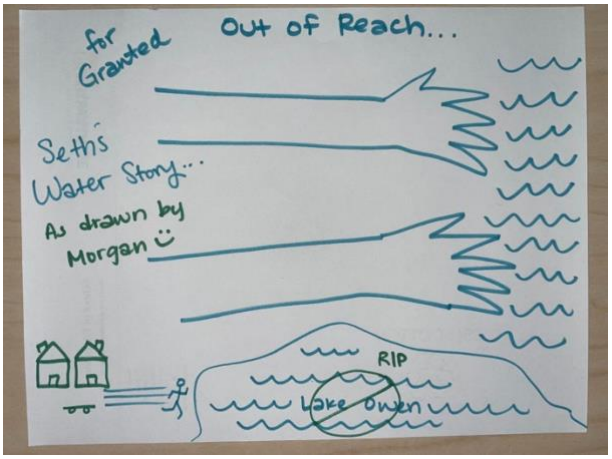
This exercise could also be done as a group exercise with a visual note-taker asking the group to share their water stories and drawing or painting them on a big banner. In short, Drawing Our Water Stories:

- Creates a collection of personal or community water stories
- Invites conversation
- Generates confidence in talking about water and their experiences

Title	Drawing our Water Stories
Unit Time	30 minutes-50 minutes. (10-15) minutes for each drawing, followed by sharing out to the group)
Grade Level(s)	6th grade to adult
Climate Literacy Terms	Water, dependence, resource, necessity, understanding

Objectives	Deeper personal and environmental connections, confidence in sharing and communicating.
Materials and Resources	Blank Paper, colored markers, colored pencils

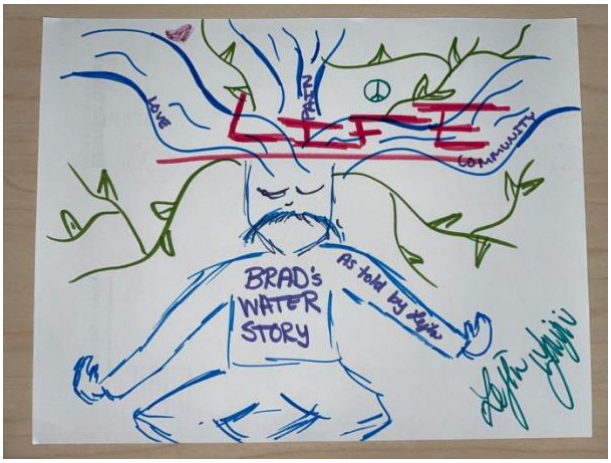
Examples: Fostering Kinship



Acknowledgments

Milwaukee Water Commons is a cross-city network that fosters connection, collaboration and broad community leadership on behalf of our waters. We promote stewardship of, equitable access to, and shared decision-making for our common waters. We recognize that:

- Water is an essential element for all life on Earth.
- Water belongs to no one and cannot be owned.
- We recognize the gift of the Great Lakes; they have nurtured our ancestors and shaped us as a people and as a community. They continue to sustain us.



Climate Literacy in Education
Climate Literacy in Education

Water Aways Means *Something*: A Symbolism Unit Plan

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Abstract

In this article, I present the outline of and possibilities for a high school English unit examining writers' symbolic use of water. Water typically symbolizes life, change, or cleansing. I suggest multiple possible texts in varying genres, as well as climate connections, for each of those meanings. I offer a student assessment prompt, "What water means to *me*," which students can write to at the beginning of the unit and revisit at the end. I provide a link to a Google folder with references, more resources, customizable activities, and a Spotify playlist.

Keywords

Symbolism, literature, multimodal texts, authentic connections

Students walk into my classroom and look at the piles, stacks, mounds, and accumulated detritus on my teacher desk and pause. "I'm like water," I say, reassuringly. "I spread out to cover every available surface."

And that's the cool thing about water—it not only makes for a good metaphor, it goes everywhere. It doesn't matter what you're teaching. You can teach with, about, and through water. As a high-school English teacher, the symbolism of water is a deep well to draw from (I will just say this up front: every water pun that follows is 100% intended. I could have tried to take them all out, but that kind of thinking is all wet). So, I will share, here, a unit I call "Water Always Means *Something*."

Figure 1: QR code to resources

Usually, I tell students, water represents one of three big things: life, change, and cleansing. What follows is by no means comprehensive of everything you *could* teach in such a unit, but it is also significantly more than you need to get started. The accompanying link (https://bit.ly/WaterMeans) and QR code (Figure 1) will lead you to a Google Folder of resources beyond even this overview, including links and full references for texts discussed, as well as a Spotify playlist of songs about water for analysis—or simply as a soundtrack.

Assessment

At the end of the unit, students answer the prompt "What water means *to me*." Students should know this assessment is coming from the start of the unit (backwards design and all…), and it also actually makes a great way for students to dip their toes in, to spitball ideas about water and its importance in their lives to set up the learning for the rest of the unit.

To remind students they're not the only ones swimming in this pool, you can put them in conversation with each other or a mentor text. Something like Gary Soto's poem, "Saturday at the Canal," which is full of teen angst—the speaker watches the flowing water, jealous that it can leave town while they cannot—makes for an accessible comparison. So does Alice Walker's poem, "When You See Water," which

explicitly says that water cannot be held or shaped or owned: "And so it is with you," Walker concludes.

Indeed, throughout the unit, students should be encouraged not only to analyze or criticize one text at a time, but draw connections across texts from different eras, regions, genres, and perspectives. By the end of the unit, students will have an ocean of additional perspectives and ideas to synthesize as they reexamine what water means literally, symbolically, and ecologically in their lives.

Water Means Life

Our human bodies are on average just over 60% water—we are literally just human-shaped water balloons. We can live for weeks without food, but four or five days without water is the limit. And our culture is drowning in this symbolism, from the Book of Genesis opening with "The Spirit of God moved upon the face of the waters" to Gremlins (from the movie) reproducing when you get them wet. Alice Walker is on this path with her poem mentioned above.

I have used Daniel Wallace's novel *Big Fish* many times to anchor a water symbolism unit. Before we read, I give students the first line: "The day Edward Bloom was born, it rained." Water means life!, they shout. It's obvious! And it is. But students have just this one sentence; I ask them to write the rest of the story. Who is Edward Bloom? Why is it important to start with the fact that it rained on the day he entered the world? Who were his parents? What did he do as he grew up? This builds anticipation for what actually happens in the rest of the book, which is so erratic that the students' predictions never even come close. The great thing about Wallace's text, which does differ in some significant ways from the (also excellent and watery) Tim Burton film, is water holds all three meanings that at different times in the narrative. It just happens to start with water meaning life.

But you might be looking for shorter texts, so here are three of my favorites, in three different genres. In Leslie Marmon Silko's short story "The Man to Send Rainclouds," a Catholic priest is awkwardly inserted into an Indigenous funeral, and his holy water literally evaporates into the dry desert air. It's hard for students to miss this. Mary Oliver's "Waterfall" is as poignant as all her lovely poetry, personifying the falling

water, her inevitable succumbing to gravity, "always underfoot." E.B. White's classic essay "Once More to the Lake" is a meditation on mortality and the

Climate Connection

But this special issue is not just for gushing over texts that use water symbolically. Luckily, it is very easy to make connections between "water means life" and some contemporary ecological crises. In 2023, National Public Radio released a podcast series called *Thirst Gap: Learning to live with less on the Colorado River* that explores how human overuse of natural water sources and climate change are making life harder in the American Southwest.

Water Means Change

This symbolic meaning of water, change and adaptation and movement, feels as natural (or inevitable) as April showers. Think about any text with a river, *The Adventures of Huckleberry Finn* being an obvious one. There's a great excerpt of Mark Twain's *Life on the Mississippi*, often anthologized as "Two Ways of Seeing a River," that is significantly less problematic than *Huck Finn* and details how Twain's initial "speechless rapture" in awe of the Mississippi changed the more he learned. In the end he laments, "No, the romance and the beauty were all gone from the river." The Mississippi also appears Langston Hughes' poem "The Negro Speaks of Rivers," and in former U.S. Poet Laureate Natasha Trethewy's "Elegy ['I think by now the river must be thick']." People sing about change and the Mississippi too Johnny Cash's "Big River," Noel Gourdin's "The River," Credence Clearwater Revival's "Proud Mary," Pete Seeger's anti-war "Waist Deep in the Big Muddy," and the too-on-the-nose-titled "A Change is Gonna Come" by Sam Cooke.

Beyond the Mississippi, waters of change flow everywhere. Sandra Cisneros's "Woman Hollering Creek" (fun connection: the legend of *La Llarona*), Doris Lessing's "Through the Tunnel," and Margaret Atwood's "The Whirlpool Rapids." The mythical river Styx beckons, and Sylvia Plath's "Crossing the Water" answers. Linda Pastan's poem "Erosion" is an ode change: "We are slowly/ undermined," it begins. "The waves move their long row/ of scythes over the long beach."

Climate Connection

Depending on where you are, there is almost certainly a local angle to climate and change. From my classroom windows I can see Lake Michigan, for example. For the Great Lakes, the United States Environmental Protection Agency (EPA) documents both the temperature and how much the height of the water deviates from historical averages—an opportunity to both talk about climate change and sprinkle in some data literacy. The internet teems with sites like Great Lakes Now and The Alliance for the Great Lakes are great sources of news, essays, and science about the Great Lakes. And local news is always talking about one thing or another related to Lake Michigan's health and safety, from invasive species to bacterial overgrowth that jeopardizes swimmers. Would we listen to "The Wreck of the *Edmund Fitzgerald*"? Reply hazy, says my Magic 8 Ball.

Water Means Cleansing

There is, of course, the biblical story of the rains and the flood, just one of many examples of the mythic archetype of cleansing waters. There's every movie and TV show ever that had a character experience an epiphany in a rainstorm. Plus, there's every poet or lyricist who wished for the rain to wash away tears. Credence Clearwater Revival, again, asking "Have You Ever Seen the Rain?" and "Who'll Stop the Rain?" Rain, in general, is a giant blue arrow pointing at some kind of cleansing theme. But it isn't just rain.

I love teaching "No Name Woman," the first chapter of Maxine Hong Kinston's *Woman Warrior: Memoirs of a Girlhood Among Ghosts*. I hate to spoil this book that dropped in 1976, but the chapter ends with the No-Name Woman of the title throwing herself and her newborn baby into the family well. She cleanses her own sin (which isn't really *her* sin) while fouling the water of the family that refused to stand up and support her.

Climate Connections

This way of looking at water flows easily into climate *change* and thus climate activism. It might be worth starting with children's books, like Carole Lindstrom's books *Autumn Peltier, Water Warrior* and *We Are Water Protectors*. As an Ohio expatriate, I might

throw in Barry Wittenstein's *The Day the River Caught Fire*, and then have students read about the formation of the EPA and the clean-up of the Cuyahoga River. (Counterpoint: Have students read about the 2024 summer Olympic Games and why swimmers did not want to compete in the River Seine.) As I write this, the *New York Times* published a story headlined "Heat Raises Fears of 'Demise' for Great Barrier Reef Within a Generation." There is no shortage of frightening news about the state of the world's water.

Wrapping It Up

At this point, it should be clear that students will have a very different answer to that prompt of "What water means to *me*" by the end of the unit compared to the beginning. Of course, we English teachers want to know if students can identify and analyze the way writers are using water in literature. But all of this I've included here—and so much more that's out there, I could barely skim the surface—should encourage students to think about water as not just important symbolically, but environmentally and personally.

Water is such an immediate, integral part of the human story that—like the piles and piles on my teacher desk—student responses should not be constrained. They should instead be allowed to spread and spill and overflow the classroom walls. Students can do more than mere formal essays or research (though students could do that if they choose). Students should be encouraged to adopt authentic means to express their new understanding and connections. For example, students could lean into climate activism and write letters, op-eds, informational booklets, or persuasive tracts. If students have a more literary bent, they could write in imitation of the unit's many poems, stories, memoirs, essays, and songs. They could present their written creations in zines, performances, anthologies of creative writing and visual art, or interconnected and linked pages of a class website.

The possibilities are, like open water, nearly endless.

Climate Literacy in Education

Water Protection: An Inquiry Unit with Pre-service English Language Arts Teachers

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Abstract

This six-week water inquiry unit with pre-service teachers in an English Language Arts (ELA) elementary education methods course explores the guiding question: *Why is it important to protect water, and how can water be protected*? Core whole-class texts include *We are Water Protectors* by Carole Lindstrom (2020) and *Thirst* by Varsha Bajaj (2022). Multiple assessment projects that support pre-service teachers' informational reading and writing are included.

Keywords

inquiry, pre-service teachers, water, sustainability, climate change

For the past five years, we've taught and iterated a water protection inquiry unit in our pre-service English language arts methods course. We've written about why we focus on the urgent topic of water justice and how we intentionally "layer" a variety of multimodal texts to support "worthwhile learning" (see Muhammad, 2020, p. 145) in this unit (Schutz & Woodard, 2022), as well as about how the unit supports meaningful inquiry, knowledge-building through text-rich inquiry, and collaborative, multimodal informational writing (Woodard & Schutz, 2022). In our recent book, *Teaching Climate*

Change to Children: Literacy Pedagogy That Cultivates Sustainable Futures (Woodard & Schutz, 2024), we shared a revised version of the unit that would be appropriate for fourth graders. However, we have never had a chance to share about and reflect on our full unit design for pre-service teachers. We hope that this piece will support pre-service literacy teacher educators who are interested in teaching about climate change and sustainability. In particular, we hope they will see how units like this can support novice teachers to read a variety of texts (including informational, stories, and poetry/art, as well as print and multimodal) in different instructional formats (including whole class read alouds and book clubs), write extensively (including notebook writing, informational writing, and multimodal writing), and understand through experience how a curriculum oriented to interdisciplinary inquiry and knowledge-building can support engaged and meaningful learning.

Narrative Framing

In our most recent iteration of the unit, in our first session, we read and learned about inquiry-driven instruction. Then, we posed our guiding question ("Why is it important to protect water, and how can water be protected?") and read aloud *We are Water Protectors* by Carole Lindstrom (2020).

In the second session, we learned about informational texts (e.g., analyzing informational text structures and children's informational writing, identifying the topic vs. main idea of an informational text about a contemporary water issue, etc.). PSTs (pre-service teachers) submitted their preferred expert group topics.

In the third session, PSTs met to collaborate on a project related to the class novel, *Thirst*, which they had finished in advance of this session (see table below). Then, they met with their Water Expert groups and began reading/listening to/watching their assigned texts together. They also analyzed informational writing in preparation for their upcoming informational writing assignment.

In the fourth session, PSTs shared their projects related to the class novel, *Thirst*. They signed up for the informational writing assignment, each responsible for a letter in a Class ABC Water Justice Book. They met with their Water Expert groups to begin working on their presentations.

In the fifth session, PSTs worked in their Water Expert groups to synthesize and document their learning in their presentation.

In the sixth session, PSTs shared their Water Expert group presentations and their Class ABC Water Justice Book. They reflected on their learning across the unit. Across and prior to the first three sessions of this unit, we engaged in a class read aloud of *Thirst*. We read this novel across five sessions, sometimes reading and discussing chapters aloud in class, and other times assigning reading for homework. Graduate student Evelyn Pollins used "A Discussion Guide to Thirst" (Qarooni, 2022) to design the class novel read aloud activities.

Title	Water Protection
Unit Time	6 weeks
Grade Level(s)	Pre-service Elementary Teachers
Core Texts Read by Whole Class	• *We are Water Protectors* by Carole Lindstrom and Michaela Goade (illus.) (2020) • *Thirst* by Varsha Bajaj (2022)
Supplementary Texts for Assigned Expert Groups	
Group 1: Water Scarcity	• Documentary: "Living Without Water" (Kingsley & Richards, 2016) • Text 1: "California to Tackle Water Scarcity by Converting Seawater" (NewsELA, 2014) • Text 2: "Dwindling Freshwater Resources" (NewsELA, 2019a) • Text 3: "Mexico City's Long-Running Water Issues are Getting Even Worse" (Green, 2024) - 3-minute listen
Group 2: Indigenous Cultures and Water Protection	• Documentary: "Awake: A Dream from Standing Rock" (Dewey, Fox, & Spione, 2017) • Text 1: "'We are all of water': Meet Josephine Mandamin, Water Walker" (Pogue, 2014) • Text 2: "Native Americans Protest North Dakota Pipeline, Cite Effects on Water" (NewsELA, 2016)

	• Text 3: "Ojibwe Elder Sharon Day and the Mother Earth Water Walkers" (Treichel, 2013)
Group 3: Water Pollution and Inequality	• Documentary: "Flint's Deadly Water" (Ellis, 2019) • Text 1: "Five years after Flint Water Crisis, Unresolved Issues Remain" (NewsELA, 2019b) • Text 2: "How Cholera Spread So Quickly through Haiti in 2010" (NewsELA, 2019c) • Text 3: "Coal Producer to Pay Hundreds of Millions for Pollution" (PBS News Hour, 2014) - 6-minute listen
Group 4: Water and Renewable Energy	• Documentary: "Thirst for Power" (Hames, 2019) • Text 1: "Types of Renewable Energy" (NewsELA, 2020) • Text 2: "Why Hydropower is the Forgotten Giant of Clean Energy" (Brigham, 2022) • Text 3: 'Water Batteries' Could Store Solar and Wind Power for When it's Needed (Charles, 2022) - 4-minute listen
Group 5: Oceans and Biodiversity	• Documentary: "Troubled Waters: A Turtle's Tale" (Fielding, 2019) • Text 1: "Just 13% of the Ocean is Untouched by Humans" (Taylor, 2018) • Text 2: "UN Biodiversity Report Reveals World has far to go" (Sternberg, 2020) • Text 3: "How Much Plastic is in the Ocean" (PBS Digital Studios, 2017) - 5-minute listen
Climate Literacy Terms	water scarcity, water quality, water contamination, droughts, desalinization, reciprocity, advocacy, decontamination, renewable energy, groundwater, wastewater
Objectives	By the conclusion of the unit, PSTs will be able to respond to the unit's guiding question: *Why is it important to protect water, and how can water be protected*? By engaging in a class novel study, explorations of informational texts, and group text-based inquiry, PSTs acquire knowledge about issues and solutions related to water protection and the ways in which social structures of power influence access to safe water. In addition,

	PSTs will: (1) determine story themes by attending to textual details, including character traits, relationships, and interactions, summarizing the text, and synthesizing understandings, (2) use text structures and features of informational text to comprehend and composed texts that address the guiding question.
Materials and Resources	*Class Novel Project* Teachers had 3 options for a group project to demonstrate their engagement with our class novel, *Thirst* (Bajaj, 2022): ● Option 1: Illustrated blackout poem ● Option 2: Quadrama (i.e., representing four parts of the story three-dimensionally using pictures and words in each quadrant) (see Figure 1) ● Option 3: Comic of a key scene *Water Expert Group Presentation* ● Slide 1: Hook ● Slide 2: Concept Map ● Slide 3: Review of Readings ● Slide 4: Sculpture ● Slide 5: Curated Text Set ● Slide 6: Ecological Restorying ● Slide 7 (optional): 3-Panel Comic *Class ABC Water Justice Book* Create a two-page spread that includes: ● the chosen letter and the word selected ● at least 2 printed or drawn images ● information teaching readers about the topic ● at least 2 different informational text structures (description, sequence, cause and effect, problem/solution) ● at least 4 informational text features (headings/subheading, photos/illustrations, captions, timelines, diagram, flowchart, table, bolding). ● citations

Figure 2: PST Culminating Projects: Blackout Poem, ABC Book Page, Quadrama

Going Forward

As our PSTs share their projects, presentations, and ABC Water Justice Book pages on our last day of class each semester, we are impressed by the meaning they have made not only about water protections during the unit, but also about the importance of providing learners with opportunity to be curious using text-rich inquiry learning. As they reflect individually and as a class, PSTs express how this kind of learning—learning about "something"—differs from what they typically see in their school placements, where emphases on literacy processes and practices dominate. They recognize that they've grown their understandings about water protection. They come to value and seek out perspectives on challenges that are often silenced. They are practiced in navigating texts that they'll need to support readers, writers, and makers in their elementary classrooms.

The joy they exhibit as they recognize all they have learned, as well as the questions they identify as needing further investigation of to explore topics related to climate justice and sustainability with children, affirm our ongoing commitment to incorporate a focus on issues related to climate and environmental sustainability into our courses and propel us forward as we begin to plan for the subsequent year.

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Climate Literacy in Education

Troubling the Waters: Using Stories to Complicate and Deepen our Connections to Water

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Abstract

This article provides an overview of "Water as Resource, Relative and Place": an online collection of eco texts including picturebooks, chapter books, YA novels, and media texts that illustrate a wide range of relationships with water. The article includes a brief history on how the online resource was started and reflects on how we all wear multiple hats in how we relate to water. In better understanding our multifaceted relationship to water, we can better position ourselves in our teaching about, caring for, and flourishing with water.

Keywords

water narratives, eco-fiction, ecocentrism, interdependence

I was born in Minnesota, United States, known to many as "The Land of 10,000 Lakes." I grew up canoeing on, camping alongside, fishing from, and hiking around many lakes and rivers. In many ways, bodies of water were playful companions in my childhood, an escape from the busyness of school and, later on, work. When I moved to the neighboring state of Wisconsin in 2013, I feared that I would have to give up my playful

friendship with lakes and rivers. Hoping to preserve this connection in my own children, I sought out stories in the form of picturebooks to read to them. Titles such as *Up North at the Cabin* (Chall, 1992) and *Owl Moon* (Yolen, 1987) shaped the relationship I wanted to preserve and pass on to my children.

As I've settled into my new home in Milwaukee, Wisconsin, my playmate connection to water has been troubled in several productive ways. Lake Michigan, the largest in surface area among the great lakes, is more than a playful friend to the city of Milwaukee. Lake Michigan's presence and impact on the city is humbling. More than a hard boundary of where human-dominated land ends and the vast mass of fresh water begins, the lake impacts several socio-political forces within the city and beyond. Less playful than the water stories I grew up with, I read in the papers and heard on the news how people argued over who has access to the lake and its waters. Health officials caution us about the lead or PFAS in the water and Business owners litigate over rights to dump sewage and build pipelines. Instead of the lake being a respected neighbor we care for, visit and honor, the lake is too often described as an object to be controlled and commodified, barring access to some, and building pipelines to others.

In her 2014 speech for the Bioneers convention, Robin Wall Kimmerer argues that hope for our environment begins with a shift in how we connect to our surroundings. She states that it is not the land or waters that are broken or in need of repair, but rather our relationship to them that is broken and needs healing. How we relate to each other matters. These relationships shape what Cree scholar Shawn Wilson (2008) calls our relationality in the world, which is a shared sense of interconnectedness and accountability to other living beings both human and non-human. In thinking about how we relate to land and water, we begin to see them less as fixed objects and more as dynamic beings with needs for care and attention. Perhaps one of the first steps toward building healthy relationships with our shared environments is by asking whether we see the land and waters as our neighbors or our possessions.

One vehicle for shaping our relationships with each other and the living non-humans surrounding us is by developing climate literacy through engagement through stories. Climate literacy emphasizes the importance of story and its narrative capacity,

"to create ecocentric ways of thinking, being, and acting." (Oziewicz, 2023, p. 35). Through stories we begin to see ourselves in relationship with our surroundings.

Diving into the Online Water Collection

In an attempt to cultivate a more dynamic and diverse set of relationships to water for myself, my children, and the many teachers I work with, I have begun collecting and sharing titles of water narratives that present bodies of water in different ways. Through my teaching at the University of Wisconsin-Milwaukee and my work with the UWM Writing Project, I work with hundreds of teachers who teach about water with their students. Their input has helped to jumpstart this collection and will continue to build and expand it. The collection currently includes picturebooks, chapter books, graphic novels and media texts that illustrate a wide range of relationships with water. Hoping to emphasize that our connections to water comprise so much more than water as an object to be bought and sold, I have organized the stories into three relational themes: water as natural resource, water as living relative, and water as place (Figure 1). The full online list of 30+ titles can be accessed here. Each theme is explained in more detail below.

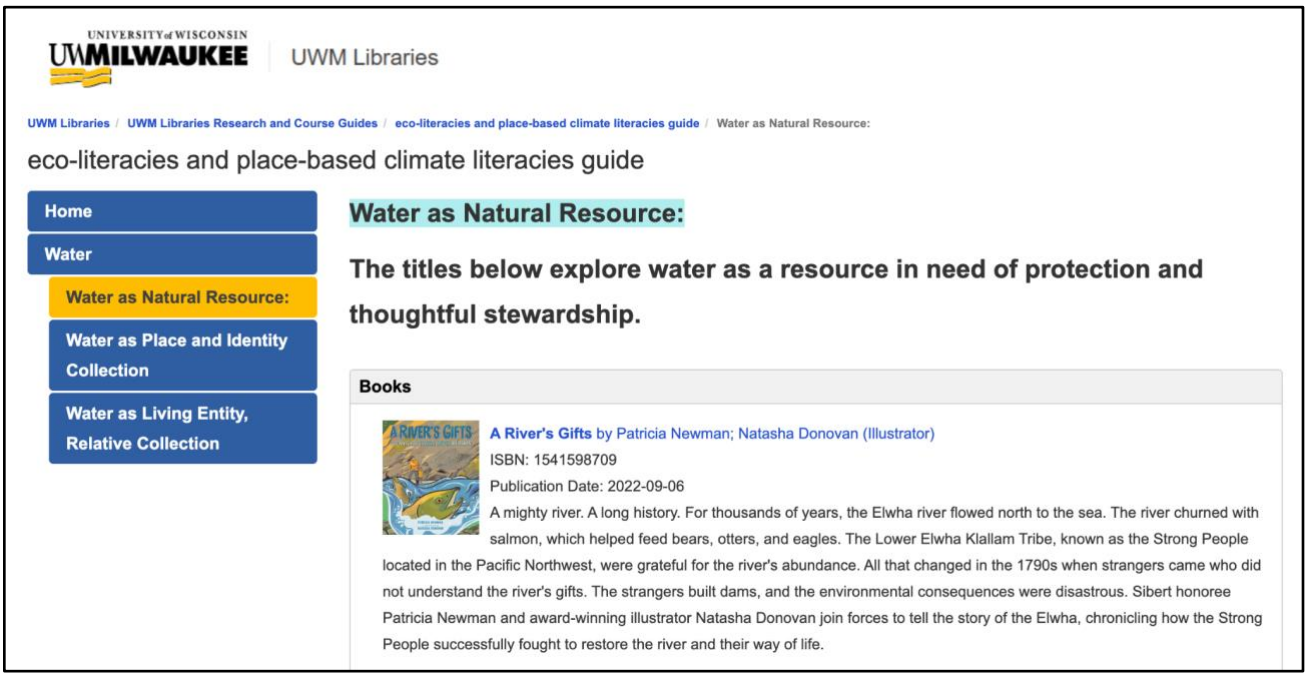
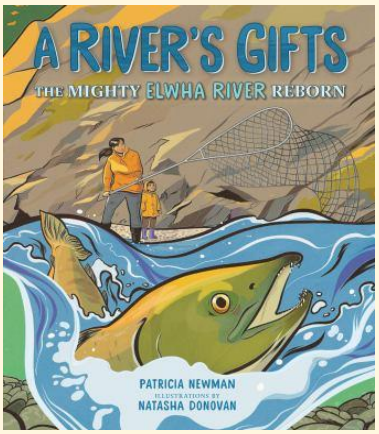


Figure 1: UWM Library Online Guide

Water as Natural Resource Worthy of Care and Protection

The first category of water narratives depict water as a natural resource essential for the life of many living animals and ecosystems, one that needs protection and thoughtful stewardship. The titles in this theme often feature humans who are working alongside water and/or with other humans to protect and honor bodies of water. Some familiar titles fitting into this theme include the classic, *A River Ran Wild* (Cherry, 1992), as well as other familiar titles such as *The Water Princess* (Verde, 2016), and *A Voice for the Everglades* (Conrad, 2021). Additional titles include *A River's Gifts: The Mighty Elwha River Reborn* (Newman, 2023; Figure 2).



A River's Gifts: The Mighty Elwha River Reborn
by Patricia Newman; Natasha Donovan (Illustrator)
ISBN: 1541598709
Publication Date: 2022-09-06

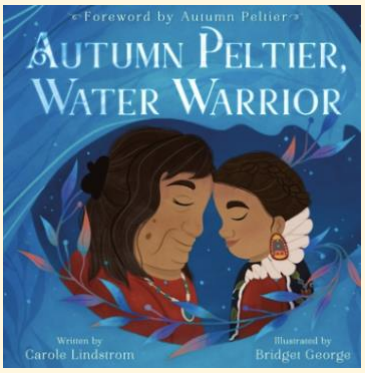
A finalist for the 2023 Orbis Pictus Award for children's nonfiction, this is a story of water and human interdependence within ecosystems. The book recounts the story of the Elwha River, in Washington State, and how it was dammed for over 100 years, disrupting salmon migrations and then restored to a flowing, vibrant ecosystem recently in 2011. Humans are presented as both exploitative of the water and restorative, showing persistence toward restoring the ecosystem.

Figure 2: Example text for Water as Natural Resource Worthy of Care and Protection

Water as Living Relative

The second narrative category portray water as a living relative of humans. Whether positioned as a distant or close relative, water is represented as a non-human person with rights of its own. Recognizing water's personhood rejects human dominion over it, insisting on a kinship relation. In some titles such as in *My Mighty Journey* (Coy, 2019), *Autumn Peltier, Water Warrior* (Lindstrom, 2023; Figure 3), and *Hello from Renn Lake*

(Hurwitz, 2020), water is given a voice to address the humans in the story or speak directly to the reader. In other cases, water is presented not as a speaking relative but a living entity demanding attention, respect, and a space to thrive within the ecosystem.



Autumn Peltier, Water Warrior
by Carole Lindstrom; Bridget George (Illustrator); Autumn Peltier (Introduction by)
ISBN: 1250795273
Publication Date: 2023-09-19

This picturebook opens with the water speaking directly to the reader, "I am nibi. I have a spirit. I have feelings. I remember." The water continues to tell the story of Indigenous women and their cultural and historical roles in protecting and stewarding water for future generations. Featuring water activists, Grandma Josephine and her great-niece, Autumn Peltier, young readers are called to care for and speak for water not only for themselves but for the health of animals and plants for the next seven generations to come.

Figure 3: Example text for Water as Living Relative

Water as Place

The third category of narratives include descriptions of water as a place, rooted in memory and cultural practices. These stories feature humans as the central characters who turn to water as a mirror to reflect an understanding of themselves and their identities. In these stories, water is often positioned as a character or setting in the narrative, a key force that shapes how the humans see themselves and their lives moving forward. For example, Prema, the main character in *Ganesha Goes Green* (Thamizhmani, 2023), partners with friends to figure out a way to both honor the religious practices of her culture and protect the river that provides life-giving elements for her community (Figure 4). *Ganesha Goes Green* also suggests what many other narratives do, which is that children are better able to envision new ways to accomplish

traditional practices. In these narratives, youth leadership helps adults reimagine their own relationships to history and culture.

Ganesha Goes Green
by Lakshmi Thamizhmani; Debasmita Dasgupta (Illustrator)
ISBN: 1646869974
Publication Date: 2023-09-05

Prema is concerned about how the Ganesha statues for the Hindu religious festival are thrown into the river after their use and polluting the community's water source. Prema suggests a change but receives pushback from local vendors who benefit from the sale of the statues. Working together with friends and community members, Prema devises a solution that benefits many stakeholders, even those who initially felt threatened by Prema's initial concerns.

Figure 4: Example text for Water as Natural Resource in Need of Stewardship

Making Your Own Waves

I invite you to dive into your own exploration of water relations. While all water narratives listed here could fit into multiple categories, each story offers a unique doorway to reimagine relations with water. As students reconsider their own relationships with water, consider posing some of the questions below.

- *What is water? Who is water?*
- *How do we see water differently if we consider it a character, living being, or nonhuman person with its own needs?*
- *What needs does water have to maintain its wellbeing? To flourish?*
- *How do we care for water? How do we let water care for us or themself?*
- *If water had a voice in a givenx situation, what might it say or ask for?*
- *How would water describe its relationship with you now? as a child?*

Water is not an independent life force on its own. It depends on the reciprocity of many living entities to maintain its vitality. To that end, this collection of narratives is not fixed. The UWM Librarian Tiffany Thornton and I hope for the collection to become a dynamic list of texts and resources that grows as both a repository of narratives and also a curation of resources that pushes us to ask critical questions of our relationships with water and other non-human relatives. Stay tuned for more collections of stories that ask us to be curious about our relationships to animals large and small, as well as our living plant and tree friends who reside above and below the ground. For now, I invite you to dive into the different ways you partner with water on a daily basis and how your own relationship with this flowing life-force shapes your world. In partnership with story, we can better position ourselves in our teaching about, caring for, and flourishing with water.

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Climate Literacy in Education

Life-giver, Death-bringer: Instructional Ideas for Exploring Water in the Middle Grades Novel *Ninth Ward*

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Abstract

Teaching children about water and symbolism through literature can be an excellent way to engage their imagination while developing their analytical skills. Jewell Parker Rhodes's award-winning middle grade novel, *Ninth Ward*, offers a rich opportunity for interdisciplinary, ecocritical inquiry within standards-based learning and teaching expectations. This article suggests youth participatory action research as an active learning strategy for engaging youth in community-based investigations of water connected to their study of water's literal and figurative significance in the novel.

Keywords

ecocriticism, middle grades, magical realism, environmental justice, youth research

Teaching children about water and symbolism through literature can be an excellent way to engage their imagination while developing their analytical skills. Jewell Parker Rhodes's award-winning middle grades novel, *Ninth Ward* (2010), offers a rich opportunity for interdisciplinary, ecocritical inquiry within standards-based learning and teaching expectations. Ecocritical inquiry of literature easily fits within the scope of

Next Generation Science Standards for middle grade students (e.g., grades 5-8), specifically *MS-ESS3-3 Earth and Human Activity* and *MS-Human Impacts*. Using shared novel reading as an organizing framework builds in strategic opportunities for standards-based literacy instruction focused on reading comprehension, literary analysis (e.g., focusing on author's craft and structure within the novel), and writing production from both historical and literary disciplinary lenses. In this way, *Ninth Ward* offers a unique opportunity for younger readers to engage with a magical realist text that weaves together a highly believable, yet supernatural, story of young adults living through Hurricane Katrina and the devastating floods that followed when the levees broke in New Orleans, Louisiana in 2005.

Contemporary magical realism often blends realistic and fantastic elements with the intention of disrupting hegemonic assumptions in realistic fiction on similar topics (Zamora & Faris, 2000, p. 3). For example, in *Ninth Ward*, Rhodes employs magical realism to challenge notions of objectivity and singularity in stories of environmental disasters, inviting readers to consider the multivocal and differential effects of disaster experiences. At the same time, the novel centers the perspective of a Black female protagonist whose family celebrates African diasporic cultures and histories. In addition to being a multi-layered resource for studying water's symbolism, ownership, and relation to characters and cultures within the novel, *Ninth Ward* is also a rich repository for classroom inquiry into other aspects of the natural world, including trees, sensory embodiment (i.e., characters' use of smell, sight, sound, feeling, and taste), wind, and nonhuman companions.

Ninth Ward is a magical realism novel that includes the liberatory elements of Afrofuturism and Afrosurrealism to celebrate the realistic material worlds of African American girls and their families, while incorporating magical events in matter-of-fact terms. Rhodes employs the narrative mode of magical realism to connect to the genre forms of Afrofuturism (Toliver, 2019) and Afrosurrealism (Toliver, 2021). These narrative modes are used by authors to create new opportunities and (re)imagine historic and ongoing inequities often faced by members of communities in African countries, the African diaspora, and African Americans (Dery, 1994). Afrofuturism has been used by authors like Octavia Butler as a genre form to recenter and humanize neutralizing and ahistorical narratives of enslaved peoples in her novel *Kindred* (1979). Afrosurrealism

has also served as a narrative mode for the creation of emancipatory spaces (Toliver, 2021). In similar ways, *Ninth Ward* offers teachers rich opportunities for centering the stories of Black girls in their classrooms, as well as providing an engaging, accessible text for younger readers that serves as an introduction to Rhodes's *oeuvre* (Kershen, 2023).

In *Ninth Ward* the central narrator and protagonist, Lanesha, and her caretaker, Mama Ya-Ya have gifts of "the sight" (Rhodes, 2010, p. 2). Lanesha can see ghosts—in particular, the ghost of her mother, who died at Lanesha's birth. Mama Ya-Ya has the ability to see ghosts and foresee future events. Completely believed by characters, and believable within the story for readers, these supernatural elements help the characters to interpret and prepare for the impending hurricane. Lanesha's magical gift also serves to humanize the people who experienced the trauma of Hurricane Katrina, as she narrates the events in her Ninth Ward neighborhood. Lanesha's narration reminds readers of the multifocality of disasters and invites them to inquire into environmental justice issues (Kershen, 2024).

This article takes up the latter inquiry into environmental justice, focusing on water's literal and figurative transformative power. Within the novel, water is understood to be lifesaving, cleansing, and restorative, and those aspects are juxtaposed against water's destructive power. The extended metaphor of transformation through water runs throughout the novel, and while readers may leave the novel with a heart-warming message of survival and resilience, the emotional arc of the novel is steep, even harrowing. Importantly, attending to water through an ecocritical lens affords the reader a valuable repositioning of the concepts of natural disaster and environmental disaster. I intentionally use the framing of environmental disaster here, because as students investigate the reasons why Hurricane Katrina was so devasting for Gulf bayou communities and New Orleans in particular, they should be challenged to recognize that there was very little "natural" about the aftermath of flooding and the people who were affected. Decades of human impacts on the environment, human built design, and racist infrastructure policy resulted in levee breakage that decimated New Orleans neighborhoods and continues to harm Louisiana communities.

To begin a unit that forwards an ecocritical inquiry focused on water, students must decide together what "ecocritical" means. While not a scholarly or literary resource, collectively analyzing the Ecocriticism Wikipedia page offers a footing for students to begin asking questions to guide their shared reading. Building on the definition that "ecocriticism is the study of the relationship between literature and the physical environment," taking "an earth-centered approach to literary studies" (Glotfelty, 1996, p. xviii), students can combine their new definitions of ecocritical reading with an analysis of the book's front and back covers. Considered an early advocate for ecocriticism, Glotfelty's scholarship emphasizes the importance of studying the relationship between literature and the physical environment, exploring how texts represent and engage with ecological issues.

Investigating the book's covers as document containing a variety of features and peritextual elements, students can proffer up predictions and inferences. Bringing these two sets of evolving knowledge together, one set that informs the inquiry as focused on how the story conveys, interacts, and describes the physical environment, and second set containing inferential knowledge gleaned from the book's covers, readers are well-prepared to begin reading with eyes open to overarching understanding questions like, *How do we connect to water as a family or larger community? To whom does water belong? How does water serve as a metaphor in the novel?*

Initially, students can engage the literal roles water plays in the novel, charting their thinking in marginal writing, in reader-response notebook entries, on chart paper, and other forms of dialogic interaction. These ways of recording thinking become rehearsal sites of assurance and confidence for students, as they articulate their thinking into writing that can be used as discussion notes, outlines, and evidence for longer writing and class conversations. Within the novel's plot, water is both life sustaining and life ending, as Lanesha stocks clean drinking water before the storm and later experiences the destructive power of the hurricane and rising flood waters. Water also shows up in unexpected ways, as tears characters shed and baths that cleanse and renew. Each of these literal meanings also connect to a central theme of the novel, transformation.

Supplementing a focused ecocritical exploration of water in the novel, students will likely want to investigate what caused the catastrophic flooding and why the levees broke. This investigation brings forward issues of environmental racism and justice that highlight both human impacts on the environment and the disproportionality extant in many environmental disasters. Rhodes's novel does not address the history of racism and redlining in housing opportunities in New Orleans, nor does it explain the lack of infrastructure investment that resulted in deadly flooding throughout New Orleans neighborhoods, particularly in the majority African American neighborhoods of the Ninth Ward. However, the novel creates space for students to begin asking questions around these topics and the larger social justice issues of environmental racism and environmental justice (Kershen, 2024; Figure 1).

Writing prompts for inquiry and interdisciplinary study
• How has the history of water in your community shaped the geography of where you live? • How does access to ample clean water inform your decision-making day-to-day?
• How have storms, such as hurricanes, tsunamis, and tornadoes, changed over time during a set time period in your state or region (for example, in the last five years, ten years, or one hundred years)?
• Where is water scarce in the world? • How is "scarcity" defined in that context, and how does the need for water shape the day-to-day lives of the people and nonhuman species in that environment?
• How are communities effected by extreme flooding? • How do communities respond when flooded?
• Hurricanes Katrina and Rita hit the Gulf coast of the United States in 2005. • How do Gulf communities continue to experience the effects of these storms? • How do the lasting effects of large storms shape human life and nonhuman flora and fauna?

Figure 1: Examples of writing prompts for inquiry and interdisciplinary study.

Ninth Ward offers a resonant opportunity for interdisciplinary studies in the middle grade classroom. Whether read as a whole class shared text, within small group literature circles, or as an independent novel read during a student choice unit, the incorporation of social studies, science, and English language arts learning outcomes and instruction cohere well. Literature can contextualize real-world examples of

scientific principles as well as scientific concepts, models, and processes that may otherwise be abstracted from student experience and real-world contexts (e.g., climate change, storm development, and infrastructure engineering). *Ninth Ward* contains multiple opportunities for students to develop lines of inquiry into many pressing environmental issues that will continue to shape our lives. Students can also engage in nonfiction writing projects resulting in the creation of feature articles, scientific reports and presentations, and interviews with local leaders and community experts in fields such as city planning, storm water, and water maintenance. These modes of community engaged research connect to models of youth participatory action research (YPAR) (Cammarota & Fine, 2008; Ozer, 2017), in which students are given opportunities to conduct student-led research on issues relevant to their lives. Within this framework, teachers serve to mentor and model engaged research, supporting students as they collaborate in research they design and enact in their local communities. YPAR affords students interactions to serve as mentors to one another and to be mentored by community members with whom they might not otherwise intersect, whose expertise can open new paths of understanding academic concepts in authentic, real-time situations and contexts. YPAR also positions students as developing experts with a chance to give back to their communities. In the case of ecocritical analysis and water studies, students can share their learning with the community in school and civic club meetings, city council sessions, and in art or other performance mediums. These opportunities bridge school-based academics and social justice learning to empower students as community activists (Cammarota & Fine, 2008; Ozer, 2017).

Reading *Ninth Ward* from an ecocritical literary perspective also opens students to creative and personal writing to explore the ways in which water has shaped their cultures, histories, and everyday lives. Students may choose to write from personal experience to examine the ways in which water shapes their geographies and daily priorities. As it is in *Ninth Ward*, water can also be a powerful source of memory, emotion, and recognition of self. Students can select other forms and genres of writing, including poetry, myth, character/setting studies, and short story, to explore their personal experiences with water and the ways interactions with water make them feel and have informed who they are (Figure 2).

Writing prompts for creative writing
• Using sensory language, describe an interaction with water in your life. • How does it feel? What does it sound like? Look like? Smell like?
• Like in *Ninth Ward*, water is often portrayed in literature as having transformative power. • Describe a time in your life when water changed you.
• Write about a family tradition or celebration involving water. • How does water bring people together?
• Create a myth or short story in which water is a character. • What role would water play in your story? • What character traits would you use to define the persona of water in your story?
• Create a hero whose strength comes from water. What's their origin story?
• Describe a magical creature that lives in water. • How does this creature interact with its environment?
• Write a diary entry from the perspective of a raindrop traveling from a cloud to the ocean.
• Imagine you can breathe underwater. • What secrets would you discover in a local lake or river?
• Write about a character who gains a new skill or power related to water. • How does it change them?
• Write a conversation between a river and a child. • What does the river teach the child?

Figure 2: Examples of writing prompts for creative writing.

Ninth Ward is a unique text for exploring the complex effects of water in our lives. Before Hurricane Katrina arrived in her New Orleans neighborhood, Lanesha interacted with water in a series of positive, yet mundane ways—she enjoyed a hot bubble bath, bathed a found puppy and played in the sprinkler with a friend, and helped Mama Ya-Ya washup dishes after a birthday dinner. These innocuous interactions reiterate the many ways we rely on water in everyday activities. At the same time, these interactions are bittersweet, as by the novel's end Lanesha's life has been irrevocably changed by the flooding that followed the storm. Water that was cleansing and sustaining becomes a powerful enemy. Water also serves as a transformative force in the novel, as Lanesha begins as a child and ends as an adolescent, washed anew in the flood waters. There is much for middle grades readers to explore in *Ninth Ward*, as teachers can support student-centered research into water use in local communities, combine content to craft interdisciplinary studies, and analyze the figurative and literary references to water with students.

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Climate Literacy in Education

Water in Balance with Mind and Body: Reflections of Expanding a Water Unit to the Community

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Abstract

This article offers reflections of a thematic unit centered on water, which was part of an earlier issue of *Climate Literacy in Education 1*(1) This discussion emphasizes the significance of community involvement, the role of project-based learning in enhancing student engagement, and the integration of social-emotional learning within the broader context of climate literacy.

Key Words

youth climate activism, ecosystem services, sustainability

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Water is life. Our bodies are composed of mostly water, as is our planet, reflecting a deep connection between us and the world around us. The water within us is linked to the water all around us. Water is fundamental to everything, maintaining balance on our planet. With this authentic connection, I became passionate about using water as a

theme for my 8th-grade English Language Arts classroom. Little did I know that this theme would introduce an organic and evolving dynamic to my curriculum.

The thematic unit I presented to my students was closely tied to resources shared during the first Climate Literacy Summer Institute in 2022, at The University of Minnesota. This unit is also referenced in the February 2023 issue of *Climate Literacy in Education* (Braucht, 2023). While this serves as a starting point, there is great potential to develop this work further.

The "Seeing Through Water" unit proved to be a solid introduction to concepts that engaged students and fostered critical thinking. My three key takeaways from this unit were the importance of community input, project-based student engagement, and social-emotional learning considering the environment. Like many teachers, I continually seek ways to integrate the real world into my classroom. During a visit to the local Great Outdoor Store, I learned about summer events, including a river cleanup, and connected with Friends of the Big Sioux River, an organization based in Sioux Falls, South Dakota. Through Friends' education outreach, my students participated in a river experiment focusing on runoff, learned about their impact on the watershed in their community, and applied the life science and chemistry they had previously learned as they analyzed water quality results. The students gained a general sense of the healthy ecosystem services in community ecosystems. This place-based learning resonated with my students far more than simply telling them to be mindful of water usage—they could see firsthand the impact they have on their community.

Student engagement was high as we integrated activities such as sewing, drawing, and expressing our voices through actions. I invited a community member, Grandma Karen, to share her quilting expertise with my students. They practiced constructing and sewing a quilt that was later donated to a local charity auction. Students used fabric markers to draw pictures on fabric squares representing their theme of caring for the earth, resulting in collaborative beautiful earth care quilts. Youth climate activism can take many forms, and my students proudly presented their earth care themes to family members and community groups through these quilts. After the project, many students requested to borrow their class quilts for graduation, reflecting their pride in the work they had done.

Perhaps the most notable outcome of the water unit was the social-emotional learning that took place. Students developed a sense of water as a sentient being and practiced framing perspectives as if they were the water itself. This approach made it easier for them to express and define feelings, leading to meaningful discussions about how to create positive action steps to protect the water. We also engaged in mindfulness journaling for sustainable consumption, often writing outside to connect with our environment (Fritzsche et al., 2018) Students embraced the freedom of being outdoors, which led to richer content and vocabulary in their writing. They also reported feeling calmer, which ultimately inspired us to create a school garden space to more formally learn outdoors.

Water can flow gently, or it can hit with immense power. We have the opportunity to continue integrating environmental themes across all areas of our students' curricula. By fostering cross-curricular partnerships and connections in literacy, we can harness this power to educate our students about sustainability, helping them develop a strong sense of voice and embrace opportunities to create a sustainable world. As we balance student experiences of mind and body, we can draw deeper connections to water. Water is life.

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Climate Literacy in Education

"We are Water Warriors": Children Perform Chicago Global Water Dances

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Abstract

Elementary-aged children with a team of science, theater, and literacy educators performed the Chicago Global Water Dances in 2023. Global Water Dances (GWD) is an international initiative to raise awareness about water issues, promote sustainability, and inspire action to protect water resources through dance performed by a local body of Water. Through the Chicago Global Water Dances, children articulated several messages about the necessity of, and right to, clean water and highlighted the collective responsibility to protect this precious resource.

Keywords

Water Dance, science, theatre, dramatization, youth climate advocacy

The call for this special issue began with the following lines from Carole Lindstrom's (2023) most recent picturebook, *Autumn Peltier, Water Warrior*: "Speak for the water. Sing for the water. Dance for the water."

This is exactly what elementary-aged children with a team of science, theater, and literacy educators and researchers did as part of the Chicago Global Water Dances. Global Water Dances (GWD) is an international initiative to raise awareness about water issues, promote sustainability, and inspire action to protect water resources through dance performed by a local body of Water. The initiative coordinates

> a biennial multinational, community-oriented event that takes place at different water-related sites around the world, to raise awareness about water issues and to celebrate water through movement… [they] connect and support a global community of choreographers and dancers to inspire action and international collaboration for water issues through the universal language of dance (Global Water Dances, 2024).

Global Water Dances was a generative opportunity for our team's long-term collaboration, Project STAGE (Science Theater for Advancing Generative Engagement), a university-school partnership in urban, public elementary schools. The project aims to build on and advance children's imagination, creativity, meaning making, agency, and ingenuity by supporting children to compose and share embodied performances of various sizes and scales. These performances dramatize and enact science ideas, processes, phenomena, and intersections of ideas in the natural and social worlds. For example, in some of our publications, we have shown how fifth graders in Project STAGE classrooms act out water pollution (Kotler et al., 2024); how first graders work in small groups to act out the parts of an ant (Woodard, Kotler et al., 2023); and how whole classes of sixth graders have created and performed plays about climate change (Varelas et al., 2021) and pollution (Varelas et al., 2024).

A teaching artist, co-author Rodriguez, worked with three Project STAGE classes (two 5th grade and one 3rd grade), taught by co-authors Dougherty, Rosario, and Soto, to prepare for and perform their very own Chicago Global Water Dance while studying climate change and water issues facing the earth as a global community, and

specifically the Chicago community. Classes performed near a body of local water for their classmates, families, and community members (see Figure 1).

Figure 1: Global Water Dance

Global Water Dances are performed near water to emphasize the connection between the performance and water sustainability. The third-grade bilingual class and fifth grade classes performed their dances in local parks with small bodies of water to highlight the impact of local water issues, such as pollution, and the importance of clean water.

There are four sections in a Global Water Dance: (a) an opening ritual that is specific to each site in the world, (b) a local dance that is created and performed around a local water issue, (c) the global dance that includes performing the same choreographed dance globally (see Global Water Dances, 2021), and (d) a participatory dance that engages the audience in a single sequence of movements (Figure 2). You can watch a 10-minute video overviewing the entire Chicago Global Water Dances on

YouTube (Global Water Dances, 2023). Below, we elaborate on parts of this production before sharing ideas on how such activities can be a part of the curriculum.

Section 1: Opening Ritual	Section 2: Local Dance	Section 3: Global Dance	Section 4: Participatory Dance
		 	 
The fifth graders' opening ritual featured both a narration and a dance. Four students took turns narrating the impacts of plastic waste on the local water supply and the contamination from lead pipes, emphasizing the importance of not giving up despite the severity of these issues. Their classmates performed a dance that depicted people walking through, drinking, and getting affected by polluted water, then creatively removing the pollution by imagining filters playfully trapping and pulling it away.	The bilingual Spanish-English third-grade class wrote a poem called "Ode to Water / Odal al Agua" about the pollution in Lake Michigan. The poem's themes inspired the students to create movements that represented the concepts and emotions conveyed in the poem. In this image, they position their hands in the shape of a heart while reciting the lines "When we help to clean the Earth, we are truly yours. / Si le ayudamos estar limpia, Somos suyos por seguro."	"We were doing the ocean, in and out, and the first time, we were in dehydration, that we didn't have no water. [See top image.] And then, one dot of rain came, and then we started dancing and doing all our moves. [See bottom image.]" In the top image the student walks slowly, bending forward, and struggling to complete his steps as his body does not have the water it needs. In the bottom image, joy, happiness, smiles, and effortless arm movements symbolize the power of water and the energy it provides the body.	At the end of their GWDs, the students guided the audience in a movement sequence that connected both the performers and the audience. This interactive dance invited the audience to move beyond their role as observers and become active participants in the performance. The top image shows fifth graders performing the participatory dance, and the bottom image shows the audience completing the same moves.

Figure 2: Images from Chicago Global Water Dances

The whole production, including the vignettes summarized here, show how these young children were literally stepping up to "[s]peak for the water. Sing for the water. Dance for the water." Their dances exhibited their beautiful sense making of science ideas (e.g., polluting the water, working hard to clean it up by removing the deposited toxins, being exhausted when dehydrated, being joyful when water is available–even a "dot of rain"). The Chicago Global Water Dance choreographies and performances gave children opportunities to engage with science that matters for their community, advocate for collective action, and show audiences of families, school staff, and park goers their science knowledge outside of the classroom. In this way, it gave children a space to express their scientific understandings and how environmental issues are relevant in local and global contexts beyond traditional science assessments.

The children's performances communicated essential ideas related to the significance of water problems faced globally and locally. In the fifth graders' combined opening ritual and local dance, several powerful ideas were communicated:

Idea 1

We are water warriors…Not a lot of people are aware of what is happening to our water supply and how they are so polluted. There are also people who are aware but aren't doing anything and are just leaving other people to fix it…Our water supply is being harmed and people just give up seeing how big the problem is and don't want to help fix it.

Idea 2

We used things [in our costumes] that we consume and throw away a lot. For example, plastic, cardboard and candy wrappers, and other recyclable materials. We used these materials to show how polluted our oceans are and to take a stand against creating so much waste. There are not just problems with our oceans, but also problems with our water supply in Chicago.

Idea 3

There are also problems with our drinking water. A lot of homes still have lead pipes, and people drink water from those pipes. Lead is especially dangerous for children,

and it's a devastating harm to last a lifetime. The Center for Disease Control and Prevention and other scientists agree that any amount of lead in the blood during childhood is harmful. Children are particularly vulnerable during the first six years of life, because their brains are in critical stages of development.

Idea 4

People need to step up and work with their communities to save our water supply. Even though the problems are too big, people need to learn not to give up when a problem becomes too difficult. If we don't start making changes and protect our planet, our future generations will be the ones who suffer.

The children articulated several messages about the necessity of, and right to, clean water and highlighted the collective responsibility to protect this precious resource. They addressed both the global issue of ocean pollution and the garbage accumulation in oceans, and the local issue of lead in water due to old lead water pipes in Chicago buildings including schools. They called out the harm that pollution produces, and they raised the alarm especially for children younger than them. They expressed their agency, claiming that they "are water warriors," creating a call to action. They acted in intentional ways by crafting sustainable costumes. They acknowledged the responsibility of current generations for the well-being of future generations.

As teachers look to create experiences like this in their classrooms, the Chicago Global Water Dances point to some useful possibilities:

- Move water studies beyond the classroom. Connect to local water issues and sites.
- Couple traditional water studies (e.g., observing water in class and studying water's properties), with explorations of water quality in the school's community and local histories with water including structural injustices often associated with particular communities (Kotler et al., 2024).

- Act, dance, and move for water. These can range from very small- to large-scale enactments. Our team has published a number of publications with examples of what this can look like.
- Read and write for water. Write arguments. Write poems. Make videos (Woodard, Diaz et al., 2023). Share writings with families, friends, and others.
- Explore Global Water Dances and consider how you can get involved.

Beyond the vibrant and joyful Global Water Dances we witnessed Chicago children perform, we are heartened, too, by their knowledge-building, identity-building, and developing agency. The world needs more scientists, more dancers, more poets, and more water warriors.

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Climate Literacy in Education

Looking Upstream: Discourse Analysis and Water Justice in Literacy Education

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Abstract

"Looking upstream" refers to going beyond the negative effects of the current problems which disproportionately impacts historically marginalized families—water contamination, flooding, and scarcity—to see causation: why is the problem happening in the first place? In this article, we "look upstream" at our language and literacy practices and attempt to see how these are entangled with representations of our place in the water cycle. We examine a few curricular artifacts from our Literacy Clinic—dually focused on responsive literacy instruction and water justice—to illustrate our entanglements with linguistic systems, discourses, and narratives. Part of the way forward, we argue, is changing the ways we speak, write, and read in relation to our shared environment, including water and all forms of life.

Keywords

water justice, teacher education, positive discourse analysis, Literacy Clinics

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The effects of global climate change in Missouri include dangerous heat and extreme precipitation. Situated in the largest river drainage basin in the United States, we are experiencing increasingly extreme flooding in the spring, warmer winters, more drought in the summer, and more violent storms (Hensen & Masters, 2022). As literacy educators serving in metropolitan St. Louis, we also see inequitable access to high quality literacy instruction. In 2023, fewer than half of all Missouri 4th graders scored proficient or advanced in English Language Arts. Among 7th graders, just 37% scored proficient or advanced. We are in a place and a time to bring our strivings toward water justice and literacy justice into an integrated field of practice.

Folding the granular work of explicit and responsive literacy instruction into water justice practice is not easy, but it can be done. For example, a teacher in our Literacy Clinic describes how the poetic rhythm of Jorge Tetl Argueta's *Agua, Aguita: Water, Little Water* brings students into the text to explore issues of water justice: "[My] students …looked at [the book] again and used the author's poetry style to write their own poems about water issues that resonated with their own lives while focusing on specific writing objectives such as writing in full complete sentences."

To understand the complexities of water justice here in St. Louis, we must highlight the context of everyday life. Ongoing inequities across Black and white school districts, including disparities in school funding, map onto multiple water-related hardships: contamination at superfund sites, health disparities consequent to extreme heat and lack of hydration, and outdated infrastructure (Interdisciplinary Law Clinic, 2019; NRDC, 2024). The Ferguson Commission's report "Still Separate, Still Unequal" (2020) proposes that we *look upstream* from our intertwined problems, a metaphor that encourages us to seek and see causation: why is this happening, what adjustments would help us change the course? In this article, we shift our gaze upstream to see how our Clinic practices are enmeshed with representations of our

place in the water cycle. Part of our collective way forward, we argue, includes changing the ways we speak, write, read and teach about our shared environment.

Critical Ecoliteracies in a Literacy Clinic Setting

Our Literacy Clinics are free, supervised learning environments nested within a land grant university. Here, teachers teach evidence-based literacy 1:1 or in small groups. We have recently redesigned a Clinic to focus on literacy instruction in the context of the environment and, in particular, water justice. After administering literacy assessments, teachers develop text sets, beginning with student curiosity: *What meaning does water have in our lives?* With respect to textual heterogeneity, teachers are coached to attend to syntactic complexity, genre, voice, morphology, grammatical construction, semantics, perspective, and authorship. Teachers notice and name intra-textual layers of meaning making and intertextual connections with respect to subject matter. When read together as a set, these collections offer opportunities to look for the root causes of water-related inequities *and also* to appreciate joyful, responsible, relationships with water. Drawing on backwards design principles, teachers prepare culturally responsive and explicit lessons in phonics, fluency, comprehension, and writing. By the light of their own textual understandings and inquiry, teachers can guide students in strategic decoding and comprehension. With the understanding that critical language awareness helps nourish climate literacies, teachers explore the scholarship of advanced literacy instruction, climate literacy, and children's literature. Together, we read Richard Beach, Barbara Comber, Rebecca Woodard, Grace Lee Boggs, Autumn Peltier, Carole Lindstrom, Janice Harrington, and Jorge Tetl Argueta, to name just a few of our inspirations. The clinic culminates in a presentation.

Ecolinguistics is the study of the ways language use can exploit or protect a sound and sustainable existence (Chawla, 1991; Halliday, 1990). Stibbe (2014) writes, "ecolinguistics… is about critiquing forms of language that contribute to ecological destruction, and aiding in the search for new forms of language that inspire people to protect the natural world" (p. 1). Halliday (1990) illuminates the assumptions built into language, noting that "[l]anguage makes it hard for us to take seriously the notion of inanimate nature as an active participant in events" (p. 29). With these ideas in mind, we position humans as a species inhabiting a living planet where all living and nonliving

beings are interdependent and all life is dependent on water, which neither increases nor decreases in total amount, but rather flows and is transformed from place to place and from state to state (gas, liquid, solid) in an ongoing cycle. The total water content of our planet dates from four billion years ago. 96.5% of the water on this planet is in the oceans. The rest is stored in polar ice caps, glaciers, snow, groundwater, lakes, rivers, streams, soil, atmospheric water vapor, plants, and all of us animals. The water we rely upon in St. Louis comes from the Missouri River, the longest river in the United States. Near the confluence of the Missouri and Mississippi Rivers, the City of St. Louis Water Division operates two water treatment plants. In 2023, these two facilities filtered and processed an average of 124 million gallons of Missouri River water per day (St. Louis City Water Division 2023). Our very existence here depends on a colossal and ongoing system of re-routing, collecting, and filtering water that was always and already passing by our city in the form of a giant river making its way across the continent from Montana to the Gulf of Mexico.

An Example of Text Analysis from the Textual Ecosystem of our Clinic

Historically, critical discourse studies have focused on negative critique of texts in an effort to expose injustices. This is important in literacy teacher education but not enough; we also need to examine and affirm texts that arc toward justice. In recent years, scholars practicing Positive Discourse Analysis have taken up multimodal content in search of the discursive construction of positive social change: expressions of liberation, solution-making, and organizing (e.g. Rogers, 2018; Calle-Díaz, L. & Rogers, 2023; Bartlett, 2012; Macgilchrist, 2007). To clarify the distinction between deconstructive and reconstructive approaches, we will turn to an example from a text we use in our Clinic from the 2014 *National Geographic Kids* book titled *Water*:

> Water Warning
> We drink water. We use it to cook, clean, and carry waste out of our homes.
> Farmers use it to grow crops, and companies use it to make products.
> Since the 1950's the amount of water people use has tripled. But the supply hasn't.
> In some places, water is being used faster than it can be replaced.

> Scientists worry that soon there won't be enough water for us and the creatures who share our world.
> What can you do to help?
> Use water wisely (p. 41).

A deconstructive analysis of this text might emphasize how it describes consumerism's drive for an extractive relationship with water—e.g. "the amount we've used has tripled since the 1950s." The text leaves unsaid what has tripled the demand, whether it is population growth or that people are using more water. Obscuring the reality of population growth makes it seem like the onus of responsibility for using too much lies with the individual. Logically, that means the solution does too: the reader must use water wisely. In addition, the grammar of the text (the passive construction "water is being used") hides social actors, including anyone who profits from access to a disproportionate amount of water. There is a factual inaccuracy in the assertion that water can be replaced; water cannot be replaced. As a concept, water in this text is acted upon; it is not characterized by its own activity (e.g. flowing, gurgling, streaming). Erased is our embodied relationship with the water cycle, that each of our bodies is, on average, 60% water.

A positive discourse analysis (PDA) picks up where critical discourse analysis leaves off, searching for alternative discourses and possibilities. A PDA of this text might emphasize how the language calls attention to shared use of water by repeating the collective pronoun "we." Warnings are for everyone. The text surfaces emotionality (e.g. scientists worry), inviting the reader to worry, too. The text implicitly stretches the reader to think beyond their individual desires (e.g. consumption) and consider relationships with "creatures who share our world." Finally, the text invites the active participation of the reader, "What can you do to help?"

Practicing both CDA and PDA can help us see dynamic tensions connecting two bodies of practice that are often thought of separately: responsive literacy instruction and environmental inquiry (Figure 1 provides guiding questions for text analysis). For example, science teachers may teach a "water cycle unit" without addressing how to decode multisyllabic words such as *contamination*. They may not be prepared to teach the morphology of words, nor to conceptualize the water cycle in an equity frame. In a

similarly siloed process, literacy teachers may plan learning outcomes associated with reading fluency and comprehension using a text that addresses water justice (e.g. *We are Water Protectors*), without pausing to inquire, follow students' questions, and teach social scientific concepts.

Figure 1: Critical Questions Educators Can Ask Texts about Water Justice

- What are the dominant and resistant messages, ideas, narratives, and perspectives related to our relationship to water, water hardship and stewardship in this text? Is conflict or collaboration emphasized?
- How are the nonhuman beings and features of Earth represented in this text? Are they positioned as resources to be "used," i.e. passive objects of human doings (rather than subjects actively living and being)?
- Are the verb tenses in the active or passive voice? Is human agency with respect to acting in/upon water and the environment masked or explicit?
- Does the text implicitly or explicitly put the onus of water stewardship on individuals or on power structures, interlocking systems, and legacies of colonial exploitation?
- Does the text posit or present factual understandings that are grounded in the scientific method of inquiry (for example: we've had a finite quantity of water on Earth for nearly 4 billion years).

Conclusion

Discourse analysis can help us look upstream of present-day urgencies to embed literacy pedagogy in understandings about water justice. What gives us hope is creating opportunities for all teachers to initiate their own climate literacy journeys upstream. In doing so, teachers see, feel, and hear the ways in which literacies are central to cultivating responsive pedagogies. So, too, is continually striving to center students' deep, extended engagement with connected text even as they are learning and practicing phonics patterns, fluency, word recognition strategies and comprehension. In our literacy teacher education, we can model deconstructive and reconstructive reading of texts; bringing a water *justice* lens where none exists and appreciating attempts to center our relationship to water where it does exist in the texts we read, write, and design.

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Climate Literacy in Education

Visual Stories as Educational Tools: Multimodal Discourse Analysis of Children's Picturebooks on Environmental Awareness

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Abstract

This study explores the efficacy of children's picturebooks in communicating complex environmental issues to young audiences, focusing on *We Are Water Protectors* and *Autumn Peltier, Water Warrior*. These books utilize the approach of Multimodal Discourse Analysis, to explore how pictures engage and educate about water protection. Through a detailed examination of interactions within these books and with readers, this article highlights how visual narratives can effectively evoke emotional responses and foster environmental awareness among young readers. The findings suggest that such visual narratives not only enhance understanding of sustainability challenges but also serve as powerful tools for social change, inspiring activism, and cultural engagement.

Keywords

multimodal discourse analysis, water protection, picturebooks, education for sustainable development

The pressing sustainability challenges we face today, including climate change, air pollution, and water pollution, are caused by complex interactions between humans and the environment. These issues have captured the concern of global communities, highlighting the urgent need for shifts in public perceptions, values, attitudes, and behaviors (Scoones et al., 2018). In response, UNESCO initiated the Climate Change Education for Sustainable Development (CCESD) program, advocating for Education for Sustainable Development (ESD) across all educational levels, from preschool through high education, as articulated in the 2030 Agenda for Sustainable Development (Cebrián, Junyent, & Mulà, 2020). This means teachers play a critical role in meeting these challenges as they educate and guide students about necessary actions (Ferguson, Roofe, & Cook, 2021). However, introducing such complex issues to young learners is a significant challenge in itself (Goller, & Rieckmann, 2022; Glavič, 2020). For this latter challenge, an increasing number of children's picturebooks have emerged, focusing on themes of sustainable development. These books utilize visual storytelling as an effective tool in ESD, aiding teachers throughout the educational process (Cebrián, Junyent, & Mulà, 2020). While educators continue to employ diverse learning strategies, including problem-based learning, project-oriented learning, experiential learning, simulation games, and case studies (Cebrián, Junyent, & Mulà, 2020; Boulianne et al., 2020; Bascopé, Perasso, & Reiss, 2019), this study concentrates on picturebooks related to water protection. It aims to analyze how these books present complex sustainability concepts to young learners and explore how authors and illustrators effectively engage their audience.

Methods

This study examines two children's picturebooks, *We Are Water Protectors* and *Autumn Peltier, Water Warrior*, which were selected for their thematic focus on water protection. Given the nature of picturebooks that narratively integrate visuals and text, I utilized multimodal discourse analysis (MDA) as an investigative framework. MDA is an approach that delves into communication across multiple expressive modes—not only language but also visual, auditory, and spatial components. This analytical method acknowledges that meaning is constructed and deciphered through semiotic resources

including text, images, layout, gestures, and spoken language (Kress & van Leeuwen, 2020). This study specifically explores the interaction between images and readers, investigating how the illustrator communicates through visual elements.

Analysis

The focus of both *We Are Water Protectors* and *Autumn Peltier, Water Warrior* is on water protection. According to the Next Generation Science Standards (NGSS, 2013) the concept of water is integrated into curricula at all grade levels, tailored to the cognitive and developmental stages of students. For Pre-K and Kindergarten, the curriculum introduces water through sensory experiences and basic concepts such as simple water play, learning about different water sources (i.e. rivers, lakes, rain), and fundamental conservation practices like turning off taps. Students in grades 1-3 delve deeper into understanding the water cycle and the vital role of water in sustaining life. Picturebooks, which offer a multimodal experience combining text and images, are particularly effective in these lower-grade settings, facilitating accessible learning for younger students.

Interaction within the pictures

Characters, settings, and objects were depicted within the illustrations that serve as subjects of the visual narrative. Within these picturebooks, the interaction between characters, subjects, and readers plays a critical role in conveying messages. For instance, physical closeness is a way to indicate relationships (Kress, & Van Leeuwen, 2020; Painter, Martin, & Unsworth, 2013). Characters shown in physical contact often suggest strong bonds or intimate relationships (ibid). In Figures 1 and 2, people, the community members, put their hands into the river,

Figure 1: We Are Water Protectors *(Lindstrom, 2020)*

Figure 2: Autumn Peltier, Water Warrior *(Lindstrom, 2021)*

representing the close relationship between humans and water. In classrooms with young readers, teachers encourage students to observe details and make connections between what happens in the text and similar experiences they might have. This helps students connect with the visuals and begin forming their interpretations. Teachers may ask guiding questions such as: What are the characters doing in this picture? Have you done something like that before? What did you feel when you were doing that? Look at the characters' faces and bodies. How do you think they are feeling? How do you know?

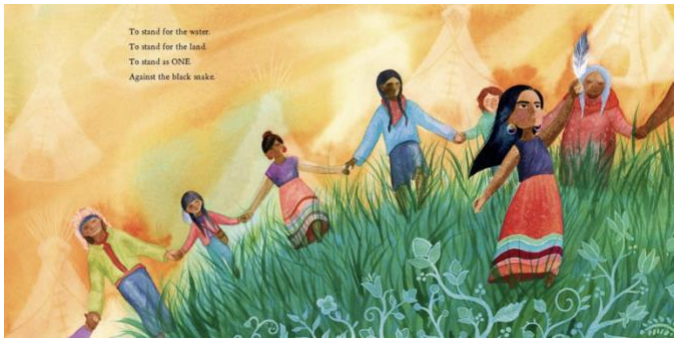

Figure 3: We Are Water Protectors *(Lindstrom, 2020)*

Figure 4: Autumn Peltier, Water Warrior *(Lindstrom, 2021)*

In Figures 3 and 4, depictions of community members with their hands joined together suggest unity and a shared commitment to the cause. Images of activists linking arms or physically supporting one another during confrontations with authorities showcase the physical and metaphorical support within the community. These pictures show groups in discussion or action, emphasizing collective effort rather than individual reactions. After reading these pages, teachers may guide students to reflect on their personal reactions and emotions related to the characters' actions. The guiding questions might be: Do you hold hands with your family members sometimes? What about with your friends? What do you feel when holding hands with others? Can you think of a time when you felt like one of the characters? What happened? Such questions help build empathy and help students relate to the themes of environmental protection on a personal level.

Interaction with readers

The illustrators leverage visual elements to evoke emotional and cognitive responses, aiming to inspire reader engagement and action. For example, the cover of *We Are Water Protectors* (Figure 5) features a close-up of the protagonist whose direct gaze

Figure 3: We Are Water Protectors *(Lindstrom, 2020)*

Figure 6: Autumn Peltier, Water Warrior *(Lindstrom, 2021)*

challenges the viewer, setting a serious tone and immediately drawing the reader into the narrative (Kress, & Van Leeuwen, 2020; Painter, Martin, & Unsworth, 2013). This use of direct gaze—a visual tool where characters look out at the reader, also appears in *Autumn Peltier, Water Warrior*, where the protagonist's direct gaze on the final page accompanies the text "What will you do for me?" (Figure 6) effectively making a visual "call to action". Teachers could direct students to pay special attention to characters' facial expressions, including gaze explaining that illustrators communicate certain things to viewers this way. Follow up with questions like: What do you think the character wants the viewer to do? How does the way the character is gazing at you, the viewer, make you feel? What do those feelings make you want to do?

These visual strategies demonstrate how *We Are Water Protectors* and *Autumn Peltier, Water Warrior* not only tell a story but also engage readers in a dialogue about environmental and cultural issues. Both books use the power of visual design to create impactful and meaningful interactions, with *We Are Water Protectors* highlighting a spiritual connection to the environment and *Autumn Peltier, Water Warrior* focusing on active and physical resistance. Teachers can use these visual strategies to help students

empathize more deeply with the characters and better comprehend the important messages in these books. These activities not only make the lessons on environmental protection more engaging, but they also empower students to consider their own potential for impact.

Discussion and Implications

The analysis of *We Are Water Protectors* and *Autumn Peltier, Water Warrior* underscores the potent role of visual narratives in advocacy for environmental education. The illustrations within these picturebooks elicit strong emotional responses, significantly enhancing the impact of their environmental messages. These books demonstrate the educational value of utilizing multimodal resources, combining text, visuals, and narrative to discuss complex topics like activism, environmental policy, and social responsibility. Such resources prove particularly effective in engaging younger audiences, making complex subjects accessible and relatable. Educational institutions can leverage these strategies to deepen students' understanding of critical issues like environmental science, enhancing their engagement and comprehension, especially in early education.

Furthermore, the artistic approaches in these books highlight how art can be a formidable tool for social change. By integrating visual art with narrative, these books not only communicate messages but also inspire action, serving as examples for other campaigns and movements seeking to influence public opinion and behavior. Ultimately, *We Are Water Protectors* and *Autumn Peltier, Water Warrior* exemplify how children's literature can be strategically used to shape societal values and actions. These books engage readers not merely as observers but as participants emotionally connected to the narrative, illustrating the importance of visual elements in enriching the story and theme. For young readers, teachers could focus on the characters' actions and expressions. Older readers can dive deeper into details, such as hue, lines, art forms, etc. This study reveals that thoughtfully crafted picturebooks are more than educational tools; they are catalysts for cultural engagement and change, with the potential to significantly influence future generations.

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Climate Literacy in Education

Water is Life: Teaching Climate in the Classroom

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Abstract

What does it mean for a classroom of college students in Minnesota to read these words? How can they contemplate the idea that water is life, considering both their Dakota neighbors in Standing Rock and the people of Gaza? This essay is a reflection on how I use water in my Minnesota State University undergraduate humanities courses to teach about climate change as the defining crisis of our moment, and its emergence from environmental racism, colonialism, and inequality.

Keywords

affective ecologies, decoloniality, environmental racism, empathy

In "A Letter from Gaza to the Natives of Standing Rock," Israa Suliman (2016) writes

> Like you, we don't control our natural resources. Just as you were not consulted about the Dakota Access Pipeline that will traverse your land and contaminate your water supply if installed, we are not consulted by Israel, which wants to mine the gas supply in our harbor for its own use and monopolizes the water supply in the West Bank for the green lawns of its own residents—leaving Palestinians parched and dry. In Gaza, where I live, only 10 percent of our water

> supply is drinkable due to the conditions in which we must live. We too know that "water is life" (n.p.).

What does it mean for a classroom of college students in Minnesota to read these words? How can they contemplate the idea that water is life, considering both their Dakota neighbors in Standing Rock and the people of Gaza? This essay is a reflection on how I use water in my Minnesota State University undergraduate humanities courses to teach about climate change as the defining crisis of our moment, and its emergence from environmental racism, colonialism, and inequality. In these conversations, we discuss water in its tangible form—its molecules, its structure, and its cycle from groundwater to atmosphere. We also explore how it serves as a conduit to understanding broader climate change issues.

Water is a monopoly by nature—nothing else fulfills its essential role for life—and everyone must have the right to access it. Like air, water has no substitute. We begin our class by reflecting on our relationships with water, exploring not only how we utilize it but our experiences with it throughout our upbringing. I'm from the coast of Southern California, and I reminisce about standing by the water's edge, breathing in the salt air, swimming, and surfing. Most of my students hail from Minnesota, where their memories are shaped by lakes, cabins, and boats. The city of Mankato sits at the confluence of two rivers, the Blue Earth and the Minnesota. Our lives are also filled with domesticated water: tap water, swimming pools, fishponds, and saturated lawns. Water often serves as the backdrop to their Midwestern summers—the gentle hum of sprinklers, the distant buzz of lawnmowers, and the joyful shrieks of children playing in swimming pools or on the lake. We talk about water as weather phenomena, such as monsoons, snowstorms, and droughts, where the landscapes and their inhabitants react to its sudden scarcity or abundance. We engage with water in the shape of fog, rain, ice, wetlands, urban rivers and creeks, city fountains, and reclaimed urban spaces.

Students quickly connect their experiences with pollution and climate change. I recollect Southern California's years-long droughts and the wildfires, near and far, that covered my childhood home in ash. They might recall the nearby dam nearly breaking from last year's heavy rains, and agricultural runoff creating algae blooms and dead zones in their hometown lakes and ponds. The Minnesota Center for Environmental

Advocacy reports that 40% of Minnesota waters are impaired, and hundreds of lakes and rivers are not drinkable, fishable, or swimmable. Three-fourths of Minnesotans depend on groundwater to drink, and 500,000 Minnesotans drink polluted groundwater with nitrate pollution above safe levels. When we talk about two billion people not having access to clean water, we can include our neighbors and sometimes ourselves. What connects Standing Rock to Gaza is lost water sovereignty tied to settler colonialism, which also links Southern California to Minnesota. Our geographic distance is bridged through our shared connection to water. Although the challenges faced in these locations differ, they all stem from inequity, imperialism, and capitalism.

In the class, we read Donna Haraway's (2016) work on "staying with the trouble" alongside the idea that as long as humans view themselves as separate from nature—or as superior to it in some arbitrary hierarchy—we will continue to damage the world around us until it becomes unlivable. Therefore, we must learn to see ourselves as kin with nature, living and interacting as part of it. When we view water as kin, we consider not only how it flows through our cities but also how it circulates within our bodies. We read Craig Santos Perez, an Indigenous Chamorro from the Pacific Island of Guåhan (Guam), a territory of the United States. In his poem, "Chanting the Water," (2020) he commands us to "Say: 'Water is ____!'" (p. 27). Many of the poem's lines reference our bodies, that amniotic fluid is 90 percent water, our bones 30 percent water, our eyes 95 percent water. We must protest that water is life, Santos Perez writes, "because they bring their bulldozers and drills and drones" and "dogs and paychecks and pepper spray and bullets" and "we bring our songs and schools and prayers" (pp. 28-29). His poem links the water within our bodies with the water that connects our planet:

> Because ocean-sky-rain-lake flows into the Missouri River –
> because ocean-sky-rain-lake-river returns
> to the Pacific and connects us
> to our cousins at Standing Rock –
> because our blood is 90 percent water –

The reference to the water protectors of Standing Rock and the phrase "water is life" underscores the connection between the oil pipelines and groundwater of the prairies and US colonialism in the Pacific, links facilitated by the ever-continuous cycle of water.

In our discussion of environmental literature, we explore whether literature can do more than just make us contemplate the "wilderness" – however sublime the waters may be– or foster sentiment for others or evoke fear for our own survival. Can it also inspire us to empathize with the planet itself in a meaningful way? I use Alexa Weik von Mossner's (2017) work on affective ecologies, where she combines insights from cognitive science to explore how environmental stories can strategically foster empathy. Her focus on the moral aspects of our empathetic responses to these stories helps me understand how they can be more effective in the classroom. Von Mossner questions if experiencing environmental stories can create emotional connections that drive social change. I ask how we can frame or encourage these emotional connections and representative thinking in the classroom. How do we turn our imaginations to connect with the Earth and the species we share it with, using the fiction we read as our vehicle?

As we discuss these questions, the class juxtaposes poems from Santos Perez's collection, *Habitat Threshold* (2020), with poems about Standing Rock by Demian DineYazhi and Karenne Wood. We read these alongside poems about water occupation in Palestine by Rasha Abdulhadi (2016) and Dawud Mulla (2016). With a different approach, reading these texts can lead students to merely feel sympathy for the people described, which sometimes results in viewing them as distant others enduring US-funded colonialism and conflicts, and their resultant environmental disasters. Given this, we ask ourselves in class whether understanding context, reflecting on our own position and complicity, and desiring justice for others are sufficient. Part of our discussions center on how these poems relate to our initial conversations, our own experiences of water. Students explore what poems like Santos Perez's "Thirteen Ways of Looking at a Glacier" have to do with their own experience of flooding: "Do you not see how the glacier/ already floods the streets/ of the cities around you?" (p. 19). By connecting students' personal experiences with broader global struggles, like the melting of glaciers, and even the funding of war, these texts can inspire students to see themselves as part of a larger ecological system – as kin to people and planet - and to advocate for both biospheric and human justice.

I'm still trying to determine whether my students' responses show that the literature I believe models planetary care and multispecies kinship inspires something

beyond just human survival. I keep returning to the question of whether this type of climate literacy is sufficient. For instance, can art and literature help us remember, imagine, and even embody the vital role of water in sustaining life on this planet? Can they help us appreciate its beauty, its part within our bodies, its habitat for other species, and the way it connects us beneath the soil, on the ground, and through the air? I ask students to reframe our reading to focus on how specific texts express the idea of mutual liberation, wherein people find freedom through caring for the planet. Through this framework, students express something for the planet beyond self-interested preservation and concern for future generations. Instead, we attend carefully to the modes of familial care-taking and fellow feeling for land and water expressed by this literature. Ultimately, this approach aims to cultivate a deeper sense of connection and responsibility, text by text, encouraging students to see themselves as active participants in a global movement for environmental justice and planetary care.

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Climate Literacy in Education

"We are all in this together": Critiquing the Issue of Water Equity through a Lens of Intersectional Environmentalism

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Abstract

As carbon emissions from the burning of fossil fuels warm the planet, altering the climate and causing severe drought in some regions and unprecedented flooding in others, and as state and local governments privatize once-public water systems in the name of fiscal austerity, the connection between water equity and social justice is increasingly evident. This article introduces a critical lens of intersectional environmentalism and identifies three questions that teachers and students can ask to examine how a society's treatment of water is connected to its treatment of people. When students understand how the well-being of people, animals, natural resources, and the Earth itself are interconnected, they are better prepared to explain how working for environmental justice necessitates their working for social justice as well.

Keywords

water equity, intersectional environmentalism, social justice, environmental justice

In Eliot Schrefer's (2012) young adult novel *Endangered*, the protagonist, a biracial, Congolese American teenage girl named Sophie, summarizes her conservationist mother's philosophy as follows: "The way we treat animals goes hand in hand with the way we treat people'' (p. 51). When I ask the predominantly white, middle-class college students that I work with to talk in groups and decide whether they agree or disagree with this assertion, some dismiss it, but many more are willing to accept it, presumably because they recognize animals as sentient beings that warrant respect. When I amend the assertion, however, and substitute the word "water" in place of "animals," the opposite is the case: the vast majority of students struggle to connect caring for water, a resource that many of them don't often think about due to its ready availability, with caring for people.

As carbon emissions from the burning of fossil fuels continue to warm the planet and alter the climate, giving rise to severe drought in some regions and unprecedented flooding in others, and as state and local governments privatize once-public water systems in the name of fiscal austerity (Hutton, 2024), the connection between water equity and social justice is becoming more evident. In this article, I argue that teachers can use a critical lens of intersectional environmentalism to support students' examining how social justice and environmental justice are connected. In the section that follows, I define intersectional environmentalism and identify three questions that teachers and students can ask to investigate the connection between water equity and social justice. To demonstrate how a society's treatment of water reflects its treatment of people, I next apply the questions to a water equity issue that people on the Navajo Nation confront. To conclude, I examine the implications for educators of inviting young people to apply a lens of intersectional environmentalism to investigate water equity issues and recommend two works of literature for young people they can use to do so.

What is Intersectional Environmentalism?

Intersectional environmentalism builds on the work of ecofeminist scholars, who argue that the same hierarchical thinking that rationalizes human exploitation of nature is also behind different systems of oppression, including sexism, racism, and classism (Warren, 2000). As Connors and Trites (2021) explain, hierarchical thinking relies on oppositional

binaries that privilege one group over another. In the case of sexism, racism, and classism, these binaries include *male/female*, *white/black*, and *rich/poor*. Oppositional binaries also shape people's understanding of their relationship with the natural world. In positioning people over and above animals, for example, the *human/animal* binary (which conveniently ignores that humans are a type of animal) offers an implicit rationale for anthropocentrism, and thus a justification for our slaughtering animals for food, using them as test subjects for research, and confining them in zoos for our entertainment. For ecofeminists, then, addressing systems of oppression necessitates exposing and critiquing the hierarchical thinking on which they depend.

Intersectional environmentalism also owes a debt of gratitude to Kimberlé Crenshaw's (1991) work on intersectionality, which acknowledges that marginalized groups of people can experience multiple forms of discrimination in ways that amplify their oppression. This includes forms of oppression that are attributable to environmental racism (Washington, 2019). Recent scholarship demonstrates how Indigenous peoples, Black people, and other marginalized communities are more likely to experience the consequences of environmental degradation than are people in affluent white communities (Taylor, 2014; Washington, 2019). Likewise, though industrial nations in the Global North are largely responsible for producing the carbon emissions that have led to global warming, Kings (2017) describes research which suggests that women and girls in the Global South are more likely to "bear the brunt of the extra burdens created by climate change and environmental degradation" (p. 73). This includes a "higher risk of reproductive/fertility health issues caused by drinking from a contaminated water supply" (p. 73). With that in mind, in this article, I rely on Thomas's (2022) definition of intersectional environmentalism as "acknowledg[ing] how social justice and environmentalism are intrinsically linked and how *both* must be considered to achieve environmental justice" (Thomas, 2022, p. 32, emphasis added).

It is worth noting that in its rejection of hierarchical thinking, intersectional environmentalism bears a resemblance to Indigenous epistemologies that value interdependence and co-existence over self-enclosed individualism and exploitation. Justice (2018), for example, argues that "Indigenous traditions are well stocked with warnings against human destructiveness and lessons for more respectful co-existence with our other-than-human relatives" (p. 39). He cautions, "When we don't recognize

or respect our interdependencies, we don't have the full context that's necessary for healthy or effective action" (p. 5). Similarly, Tynan (2021) notes that "Relationality with land is understood by many Indigenous Peoples as an ethic of responsibility, in contrast to an ethic of rights-based entitlement that is present in many Western logics" (p. 604). In asking us to consider how our actions could impact other people, non-human animals, and plants and vegetation, intersectional environmental invites us to reject these same logics.

To support students' applying a lens of intersectional environmentalism to critique the topic of water equity, teachers can invite them to investigate the following:

1) What is the nature of the water equity issue under consideration?
2) Who is affected by the water equity issue, and who is not?
3) How does addressing the water equity issue also necessitate addressing social inequities?

In the next section, I apply these questions to a water equity topic that people on the Navajo Nation confront to demonstrate how applying a critical lens of intersectional environmentalism can support students' teasing out connections between environmental justice and social justice.

Critiquing the Topic of Water Equity

Early in my career teaching high school English, I worked with students at a charter school in a small community on the western Navajo Nation. According to the most recent census report, the median household income on the Navajo Nation, which occupies land in parts of northern Arizona, northwestern New Mexico, and southern Utah, is $33,578, and approximately 35.5% of people live below the poverty line (Navajo Nation Reservation, n.d.). The Navajo Nation is also plagued by infrastructural challenges, one of which involves people's ability to access potable water. According to the Navajo Nation Department of Water Resources (n.d.), approximately 30% of people living on the Navajo Nation lack access "to clean reliable drinking water" (para 5). Likewise, Gerlak, Louder, and Ingram (2022) argue that in some areas, people and livestock are "exposed to groundwater contamination" that is attributable to "industrial waste from uranium mining, raising issues of safety and quality of available well water;

this, in turn, necessitates [people's] buying water from expensive and faraway sources" (p. 5).

Aside from retail and construction jobs in smaller communities, such as the one where I lived and worked, and subsistence farming and sheep and cattle grazing, mines and power plants have historically represented one of the largest employers of people on the Navajo Nation (Rainey, 2017, para. 10). On the western part of the reservation, this included a power plant and two strip coal mines that were owned and operated by Peabody Energy (formerly Peabody Western Coal Company). One of these mines used train cars to deliver coal to other parts of the US, but up until 2005, the second relied on a slurry pipeline to transport coal to a plant in southern Nevada, where it was burned to generate electricity for parts of southern Arizona, California, and Nevada (but *not* the Navajo Nation).

To facilitate this process, Peabody Energy annually extracted approximately 1.3 billion gallons of pristine water, estimated to be between 10,000 and 35,000 years old, from a local aquifer (Glennon, 2002, p. 157). In addition to lowering the water table, this process is thought to have led once reliable springs to run dry, further impacting people's access to reliable water, and thus their ability to raise crops and livestock (Glennon, 2002). Global warming attributed to the burning of coal and other fossil fuels will likely compound this problem in the future. Thus, in response to the first two questions—*What is the nature of the water equity issue under consideration*, and *who is affected by it, and who is not*?—the ability to access clean, reliable water constitutes a significant challenge for many people on the Navajo Nation. On the other hand, corporate executives, investors, customers, and other people who directly benefit from the electricity that Peabody Energy, which is headquartered in Saint Louis, Missouri, produces each year are unaffected by these problems due to their geographical distance.

A third question that one can ask of the water equity issue described above is this: *How does addressing the water equity topic also necessitate addressing social inequities?* While the threat of global warming makes transitioning to more sustainable energy sources crucial moving forward, it is also important to consider how these changes will impact people on the Navajo Nation. In addition to losing some of the few well-compensated jobs available to people, a shift away from fossil fuels will adversely

affect the tribal government, which has traditionally relied on revenues generated from land lease agreements and coal royalties to support a range of public services, "from police patrols, to food banks, to health care for the elderly" (Rainey, 2017, para. 12). From this perspective, addressing the water equity issues the Navajo Nation faces will also necessitate rectifying the many economic and infrastructural challenges that the Navajo people have historically confronted as a result of white supremacist policies, environmental racism, and systemic oppression.

Conclusion

Critiquing the water equity issues that adversely affect the welfare of people on the Navajo Nation, one subsistence farmer explained, "The health of our animals is directly tied to the health of the plants and the health of the plants is tied to the health of the air and water …. So *we are all in this together*" (Jacobs, 2017, para. 51, emphasis added). This critique perfectly encapsulates an intersectional environmentalist perspective on the problem: policies and practices that are injurious to plants, animals, and the Earth are also detrimental to people. When students acknowledge and accept their "*togetherness,*" they are better prepared to explain how rectifying environmental problems such as water inequity, climate change, and global warming also necessitates working for social justice and advocating for the rights of people.

Intersectional environmentalism stands in contrast to what I refer to as neoliberal environmentalism. Unlike the former, which emphasizes the interconnectedness of people, animals, and the Earth, neoliberal environmentalism depicts caring for the environment as a purely individual undertaking. From this perspective, an environmentally conscious person is one who practices recycling, properly disposes of waste, limits their consumption, and so on. While these behaviors are undoubtedly important, they are not sufficient to address the scope and complexities of the environmental problems that people around the world confront in the 21st century. In addition to water and air pollution, this includes rapid species extinction, an accumulation of plastics in our oceans, the presence of "forever chemicals" in groundwater, climate change, and global warming. These are systemic problems, and as such, they necessitate systemic solutions that account not only for the welfare of people, but also the well-being of plants, animals, and the Earth.

For teachers who are interested in investigating the relationship between water equity and social justice with students, children's and young adult literature offers a valuable resource. Two recent books in particular examine water equity issues like those that I have argued confront people on the Navajo Nation. For teachers who work with younger students, Alice McGinty and Shonto Begay's (2021) *The Water Lady: How Darlene Arviso Helps a Thirsty Navajo Nation* is a non-fiction picturebook that tells the true story of a Navajo woman who assists her local community by using her water truck to deliver thousands of gallons of water to her neighbors. Likewise, Brian Young's *Healer of the Water Monster* is a gorgeously written work of middle grade fiction that tells the story of eleven-year-old Nathan Todacheenie, who, struggling in the aftermath of his parents' divorce, decides to spend the summer with his grandmother at her remote home on the eastern Navajo Nation. There, he unexpectedly befriends a young Water Monster, a Holy Being who is suffering from a mysterious illness that impedes his ability to bring rain to the region, resulting in a decades-long drought. When Nathan deduces that the Water Monster's illness is likely attributable to contamination from a nearby uranium mine, he embarks on a journey to find a cure for his newfound friend. In examining these books with students, teachers can also direct them to the Navajo Water Project website, where they can learn more about the challenges that water equity poses for not only people on the Navajo Nation reservation, but elsewhere in the United States.

Preparing young people to become responsible stewards of the environment entails more than simply calling their attention to environmental problems that affect their local communities and encouraging them to take individual action. Acknowledging our togetherness, as the aforementioned literary texts invite readers to do, and considering how policies and practices enacted in one part of the world impact people and the environment elsewhere, necessitates nothing less than a paradigm shift.

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Climate Literacy in Education

Intergenerational Healing within Waterscapes: The Spiritual Connection between Girls and Water in *Estiu 1993* and *Whale Rider*

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Abstract

Since time immemorial, humans have had a flowing communication with Water and have been connected to Water in infinite ways through ritual, celebration, storytelling, and contemplative practices (Leonard et al., 2023). We are Water. This essential truth of our interconnected existence has been denied by past and present interrelated systems of violence, such as colonialism, patriarchy, and pollution, which have affected us and our planet (Ansloos, 2023). In this article, I analyze the films *Estiu 1993* (2017) and *Whale Rider* (2003), their girl child protagonists Frida and Pai, and illustrate how young girls find a spiritual connection to themselves, their departed loved ones, and the world through a spiritual connection with the Waterscapes they have access to. I also highlight Indigenous perspectives about intergenerational healing through embodied Water practices and rituals. with the beyond-human world (Rodriguez, 2024). I offer suggestions on approaching the films pedagogically, emphasizing the potential to integrate anti-oppression and eco-justice discussions within multigenerational and culturally safe educational environments.

Keywords

seascape, waterscape, rivers, indigenous youth, rights to water

Intersectional Trauma Awareness

Estiu 1993 (2017), directed by Catalan filmmaker Carla Simón and set in the La Garrotxa Volcanic Zone National Park, won accolades for the vivid and organic portrayal of the Catalan landscapes of healthy lifestyles (Jones & Perriam, 2019). Specifically, *Estiu 1993* depicts the first summer that Frida, the protagonist, spends with her adopted family. *Whale Rider* (2003) is a film set in a coastal town in Aotearoa, directed by non-Indigenous filmmaker Niki Caro and based on a novel written by Māori author Witi Ihimaera in 1987 (De Souza, 2007). The success of the film raised critical debates about the limited Māori control over their representation in the international film industry (Joyce, 2009).

Both films share several characteristics in common, such as being directed by women, the protagonists' loss of their mothers, and contexts portraying the heavy collective historical trauma that minoritized nations bear, such as the Spanish regime in Catalunya (Beaney, 2020; Jones, D. & Perriam, C., 2019) and the British colonial invasion in Aotearoa that impacted the lives of several Maori generations (De Souza, 2007; Joyce, 2009). Land and Water exploitation and dispossession have caused ecosystems detriment and intergenerational trauma in Indigenous families in the form of chronic grief, depression, somatic symptoms, and dissociation that can be transferred and deepened over generations (Avalos Cisneros, 2014). Apart from grief and systemic injustice, patriarchy is also a significant wound carried by families in both films. The urgent need for change gives a chance for a new, emancipated reality embodied by the strong and loving women in the films: Frida's adoptive mother and Pai's grandmother.

In reality, structural oppression continues to affect children's lives, self-awareness, and understanding of the world. Furthermore, Indigenous notions of healing have been stigmatized and invalidated by colonial policies such as the prohibition and criminalization of Indigenous spiritual practices (Avalos Cisneros, 2014). Critically viewing either film can open pathways to talk about these topics with children above nine and their families, as well prepare culturally safe spaces to do so, such as intergenerational circles, cultural revitalization workshops, and art-based community stories production.

Water as sanctuary and young girls' source of spirituality

Estiu and *Whale Rider* make the most of Waterscapes, aquatic sounds, and Water metaphors, which evoke a sense of immersive experience (D'Aloia, 2012). Both films provide a depiction of young girls' nature-based, and particularly Water-based spirituality that promotes personal reflection and intergenerational connectivity. According to Indigenous epistemologies, elements of the nature are alive and sacred, and connectedness to Earth and all beings is a form of spiritual practice, including the practice of perceiving oneself as one with Water, experiencing her vastness and endless liveliness (Boldo, Kephart, and Allouche, 2021).

In *Estiu,* a notable Waterscape that provides Frida with a space for healing is the shrine by the creek (Figure 1) which Frida visits ritualistically and converts into a personal sacred space by seeking connection with her departed mother through the

Figure 1: Frida by the Virgin Mary shrine. The flowing creek and singing birds can be heard clearly.

Figure 2: Frida in awe of the sounds of the approaching storm.

image of the Virgin Mary as the Divine Mother. Close-up shots invite the audience to appreciate Frida's perspective, Water sounds are raw and spotlighted, and the absence of sound effects or background music signifies the director's intention for the audience to feel immersed in the vivid environment together with Frida, like when Frida is in awe by the approaching storm (Figure 2). Frida's moments of introspection occur by the Water (Figures 3 and 4). The connection between Water and Frida's improving emotional state is performed in scenes where she plays with Ana and other local children (Figures 5 and 6).

Frida bursts into tears in the final scene (Figure 7) represents the healing moment of letting her emotions flow, comparable to the power of the rainfall over the land that brings liveliness and health to a dry and fractured soil, and signifies the self-realization of feeling safe, loved, and spiritually connected to a new environment.

Figure 3: Frida's moment of introspection by the river as Ana's parents search for her.

Figure 4: Friday and Ana by the river.

Figure 5: Frida swims, enjoys water, and smiles while playing with Ana.

Figure 6: Frida plays with local children in the river

Figure 7: Frida cries, overwhelmed, realizing and accepting she has a new, loving family.

Whale Rider is, in essence a Water-based Indigenous spirituality film, as is evident from the slow-motion opening (Figure 8). Viewers find themselves submerged in deep Ocean Waters, where recurring shots of whales enforce the idea of Pai's metaphysical connection to these animals. In one specific scene, in which Pai leaves the village with her father in a car, the camera captures elements that form part of her home: Pai sees the traditional boat carved by her dad, her house, and the ocean (Figure 9). The camera moves to trace the transition from Waterscape to landscape (Figure 10) and the shot of a whale is incorporated as a sign for Pai to embrace a spiritual call to leadership (Figure 11). The scene continues and the car remains in motion, while Pai looks out the window. The camera's variable focal length conveys the interconnectedness between Pai and the Ocean (Figure 12). The scene ends when Pai asks her father to stop the car and runs towards a viewpoint (Figure 13) where she requests to be taken back home. Her father's acceptance of her request reveals his respect for Pai's potential leadership based on her passion for revitalizing ancestral culture, which is a key part of Māori's well-being (Walker-Morrison, 2020). Later in the film, the audience grasps more about the importance of the Ocean in one of the most beautiful scenes of the film when, as a metaphor for the

Figure 8: The film begins underwater with an origin story of the Whale Rider

Figure 9: Embracing the spiritual call to leadership in the scene in which Pai leaves town with her father.

Figure 10: Transition from Waterscape to landscape.

Figure 11: A whale and her calf are seen and heard while Pai leaves town.

Figure 12: Varying focal length expresses Pai's connectedness with the ocean.

tremendous difficulty of reclaiming culture, Pai dives to recover her grandpa's *Reiputa* from the bottom of the Ocean and is seen submerged in the depths (Figure 14). Although Pai's life is surrounded by near-death experiences that denote burdensome spiritual journeys, it is noticeable throughout the whole film that Water is for Pai and her people a source of culture, well-being, and spiritual strength.

Figure 13: Pai asks to stop, then runs to a viewpoint. She requests to go back home.

Figure 14: Pai dives deep in search of Reiputa.

The drops of healing ripple across generations

According to Indigenous worldviews, Water, who travels through continents and our bodies, is an ancestor with consciousness and memory of our planet (Diaz, 2021). Connection to Water fosters awareness of time and concern for the future. Ancient cultures from around the world linked Water to rites of renewal (D'Aloia, 2012). In both films, the symbolism of Water as a place to be reborn can be appreciated with different levels of intensity. While *Estiu* offers a serene river-like experience, dark-filtered *Whale Rider* submerges the audience into dramatic waves, near-death events, and rejection. For both Frida and Pai, Water is safe, holding, and caring—like a mother's womb, an inner world, a place for reflection, a sanctuary (Figures 3 and 4).

Stories of children that tap into the multidimensional—physical, emotional, and spiritual—power of restorative waterscapes (Walker-Morrison, 2020) and are supported by loving guardians such as in *Estiu* and *Whale Rider* can help families who have experienced trauma navigate distressing circumstances and redirect their efforts towards healing. As Roni Natov (2018) notes, "[h]ealing from trauma requires an affirmation, a belief in the young person, who cannot possibly sustain a sense of self alone." Frida's and Pai's caretakers understand that "the process of moving back towards one's culture and community can be fragile and requires support and displays

of caring" (Boldo, 2021). Although neither film addresses current struggles of land and Water access, they can ignite conversations about children's rights to healthy Waterscapes (Chi-Kin Lee, 2022; Gearon, 2006) and Water-inspired traditions, which nurture the films' protagonists' sense of purpose and collective belonging. These conversations can take form of an ecocultural heritage storytelling workshop, where multiple generations are invited to share water-related rituals that have moved them and would like to sustain.

Climate change is the most critical intergenerational trauma we face today. Due to its intrinsic relation to coloniality (Sultana, 2022), discussions of Water-related privileges and injustices, health consequences of Water-stressed areas, and hydrocolonialism (Ansloos, 2023) are crucial for finding just solutions. Let us ask ourselves and our communities how observing, resonating, and performing immersive practices within Water transform our relationship with her. Let us be grateful to Water and remember our essence. May Water guide us towards renewed ways of seeing ourselves and the world.

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Climate Literacy in Education

My Friend, The Lake

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Artist Statement

I firmly believe that culture is shaped by the stories we tell. The stories and narratives of a community influence the beliefs and values that surround one's relationship with the Earth, so to create a sustainable future, it is crucial to foster a culture of ecologically conscious narratives, especially for younger audiences. However, many children have limited access to nature or the opportunity to engage in stories that encourage a healthy relationship with the environment. *My Friend, The Lake* seeks to fill this narrative gap and encourages readers to reflect on their connection to the natural world.

My Friend, The Lake is a children's book I created as a capstone project for my minor in sustainability at the University of Notre Dame. This book was inspired by a project I did for my first sustainability class, in which I wrote about my home, Bay Village, Ohio. Bay Village is home to the Huntington Reservation, one of the Cleveland Metroparks, located on the shores of Lake Erie. I grew up playing with my friend, Lake Erie, learning about her at the local nature center, and witnessing firsthand the challenges she faces, such as toxic algae blooms.

For this project, I have built from my previous research and personal narratives about Lake Erie—her importance, impact, and the problems that face her today (specifically toxic algae blooms)—and put them into a picturebook titled *My Friend, The Lake*, for early childhood readers. The story is enriched by colorful photographs that tell the story while providing material for visual learning. The book is self-published

and acts as a piece of ecologically-conscious media for children to read, engage with, and form an awareness of problems facing the Earth—specifically, Lake Erie.

My objectives were to:

1. Find out more about issues facing Lake Erie and gain a better understanding of how to communicate these topics.
2. Adapt the story to be appropriate for early childhood reading (ages 4-8).
3. Photograph Lake Erie to enrich the story and compile a book using Canva Pro.
4. Self-publish, print the book using DiggyPOD and distribute it/upload it online with Issue.

Challenges

Publishing the book ended up being the greatest challenge of this project. There were unanticipated delays and processes I had to navigate to get the book into libraries so that young readers could easily access it.

Engaging with the Book

I was able to share my book with a kindergarten class and actively engaged them with the material as we read together by asking questions from the following categories.

Sensory

- "On this maple tree, the leaves are red! What other colors can leaves be?"
- "What a pretty flower! What color is this flower? What does the flower smell like?"
- "Here's a family of ducks! What sound does a duck make?"
- "These people are swimming in Lake Erie! What do you think the water feels like?"

Numbers

The number of anything in the photographs can be counted together as a group with the reader pointing as the listeners count aloud.

- "Those are a lot of ducks! Can we count together how many there are?"

Knowledge of Nature

- "Do you have a favorite kind of tree? What is your favorite tree called?"
- "What season was this picture taken in? How can you tell? What is your favorite season? Why?"
- "What a beautiful bird! Do you have a favorite kind of bird? What song do they sing?"
- "Do you have any friends like Lake Erie?

Reception

The children with whom I shared *My Friend, The Lake* in turn shared many different responses to the final question above, "do you have any friends like Lake Erie?" Some friends were imaginary, and some were not, such as:

- The cherry tree in their front yard
- The cat in their neighborhood
- The toad under their porch
- The beach they visited in the summer
- The fish in the sea

Problem-solving questions

One of the goals of this book is that it will get readers thinking about how they can have a positive impact on their environment and community. This is a great opportunity to give them the space to think aloud about their ideas.

- "In what ways can we be better listeners with our friends?"
- "How can we be kind to our friends and help to take care of and respect them?"

The audience with whom I was able to share the book actively engaged with the story and afterward, said that they wanted to go see places like Lake Erie! If possible, a fun follow-up activity to reading this book would be discussing the local environment together and then going for a nature walk. To practice ecological literacy, bring a local wildlife identification book along with you and have fun learning the names of local flora and fauna together!