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Addressing the Great Salt Lake Desiccation: Exploring Support for Alternative Frameworks on Rights of Nature and Multispecies Justice

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ADDRESSING THE GREAT SALT LAKE DESICCATION: EXPLORING SUPPORT FOR ALTERNATIVE FRAMEWORKS ON RIGHTS OF NATURE AND MULTISPECIES JUSTICE

by

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ABSTRACT

Addressing the Great Salt Lake Desiccation: Exploring Support For Alternative Frameworks on Rights of Nature And Multispecies Justice

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Currently, there is a lack of social science research on the Great Salt Lake – a shrinking lake that faces potential ecological collapse as water upstream is increasingly diverted for human consumptive uses. The drying lake has received national attention due to the implications it poses: degradation of wildlife habitat, risk to public health from lakebed dust, and a substantial loss in Utah's economy due to the diminishment of lake-dependent extractive industries and recreational amenities. In response to this issue, environmental scientists and activists have pressured policymakers to prioritize actions to conserve water for the lake. However, while polices have been implemented, water saved from these efforts are not guaranteed to make it to the lake. Strategies that are currently implemented focus on market-based solutions which, according to scholars, are not always successful. This study contributes to the sociological literature by exploring how political orientation, neoliberal ideology, and demographic characteristics are associated

with Utahns' support for alternative solutions to address the Great Salt Lake desiccation such as rights of nature and multispecies justice approaches. Using logistic regression analysis, this study utilizes data from a statewide representative survey conducted by researchers at Utah State University called the Utah People and Environment Poll, which was designed to track Utahns' perceptions on environmental issues of importance in the state. Findings include that nearly 29% of Utahns strongly support a rights of nature approach and over 37% strongly support a multispecies justice approach as solutions to save the lake. Key findings from the logistic regression models reveal that while some demographic factors such as age, gender, education, and religion are associated with support for these alternative approaches, once political orientation and neoliberal ideology are added to the models they mediate the effects of previous associations. Being more politically conservative and supporting a free-market economic system reduces the odds of strongly supporting the rights of nature and multispecies justice approaches in saving the lake. These results will help inform Utah policymakers, stakeholders, nonprofit and other advocacy groups to foster collaborative strategies best for promoting a viable and just management of the Great Salt Lake.

(124 pages)

PUBLIC ABSTRACT

Addressing the Great Salt Lake Desiccation: Exploring Support For Alternative Frameworks on Rights of Nature And Multispecies Justice

Sadie Braddock

Currently, there is a lack of social science research on the Great Salt Lake – a shrinking lake that faces potential ecological collapse as more water is taken upstream for human uses before it can get to the lake. The drying lake has received national attention, as it will lead to a loss of wildlife habitat, contribute to public health concerns, and impact Utah's economy. In response to this issue, environmental scientists and activists have pressured policymakers to prioritize actions to conserve water for the lake. However, while polices have been implemented, water saved from these efforts are not guaranteed to make it to the lake. Further, lake advocates stress that such efforts are not enough to meet the urgency of this issue. Therefore, this study explores Utahns' support for alternative solutions to address the drying of the Great Salt Lake such as rights of nature and multispecies justice approaches. Rights of nature is an earth-based social movement and legal strategy recognizing nature as an entity deserving of rights, while multispecies justice is a holistic framework examining how harmful structures in society contribute impact humans, animals, and all other types of species. If applied to the Great Salt Lake, these approaches could pave the way to grant the lake its own water rights to ensure water does get to the like while also taking into consideration what is helpful for humans and all other species that depend on the lake. Using logistic regression analysis, this study

utilizes data from a statewide survey conducted by researchers at Utah State University called the Utah People and Environment Poll, which was designed to track Utahns' views on environmental issues of importance in the state. Key findings include that nearly 29% of Utahns strongly support a rights of nature approach and over 37% strongly support a multispecies justice approach as solutions to save the Great Salt Lake. These results will help inform Utah policymakers, stakeholders, nonprofit and other advocacy groups to foster collaborative strategies best for promoting a viable and just management of the Great Salt Lake.

DEDICATION

I would like to dedicate this research to the Great Salt Lake, and to the people working tirelessly on solutions to protect this intricate ecosystem and the diverse life it sustains, from Utah policymakers, scientists and researchers at academic institutions, state and federal agencies, non-profits, voices from Tribal Nations, and the broader community of lake advocates in and surrounding the State. Your work has not gone unnoticed. I hope my contribution can add to one of the many pieces of the puzzle to ensure a sustainable water future for Utahns and the many species within the Great Salt Lake watershed basin.

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Shout out to my friends and mentors in the offices of Sustainability at Weber State University who have been cheering me on in my academic pursuits from afar. As a first-generation college student, I would not have been able to come this far without your guidance and support. Thank you for teaching me how to navigate the world of academia and environmental sustainability, reminding me to trust my own wisdom, and helping me realize my own strength.

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CHAPTER 1: INTRODUCTION

Where there is water there is life. Though exceptionally salty, as the name implies, the Great Salt Lake (GSL) supports a diverse ecosystem and hydrates the needs of over three million humans. Located in the semi-arid region of Northern Utah, this important lake holds cultural significance as demonstrated in the name of Utah's capital city: Salt Lake City. However, this namesake could very well disappear within the next five years (Abbott et al. 2023). Lake level elevation is rapidly declining far past historic lows, signaling the beginning of an ecological collapse. The health of this ecosystem is vital to and intricately tied with the social and economic well-being of the state. To address the GSL desiccation, numerous water management and conservation efforts have been discussed and implemented since the 2019 Utah State Legislative session. However, lake scientists and advocates stress that these efforts to restore and maintain optimal lake elevations are inadequate, and suggest that perhaps what is needed to address the GSL issue is not only a change in water management, but also a change in values (Abbott et al. 2023; Crimmel 2014; Miller 2023; Winslow 2022) that are inspired and guided by Indigenous leadership (Parry 2024; Peery 2022; Seymour 2024).

At this time, there is little research on the social aspects of the GSL. The aim of this research is to conduct a sociological analysis on the human-nature dynamics involved in the GSL desiccation as a direct response to Utah environmental sociologist Dr. Carla Trentelman: "Environmental needs have not always been a priority in Utah…This speaks to the need for further social science research on perceptions of the lake, and on the degree of willingness that exists to support policy changes" (Trentelman 2020, p. 82).

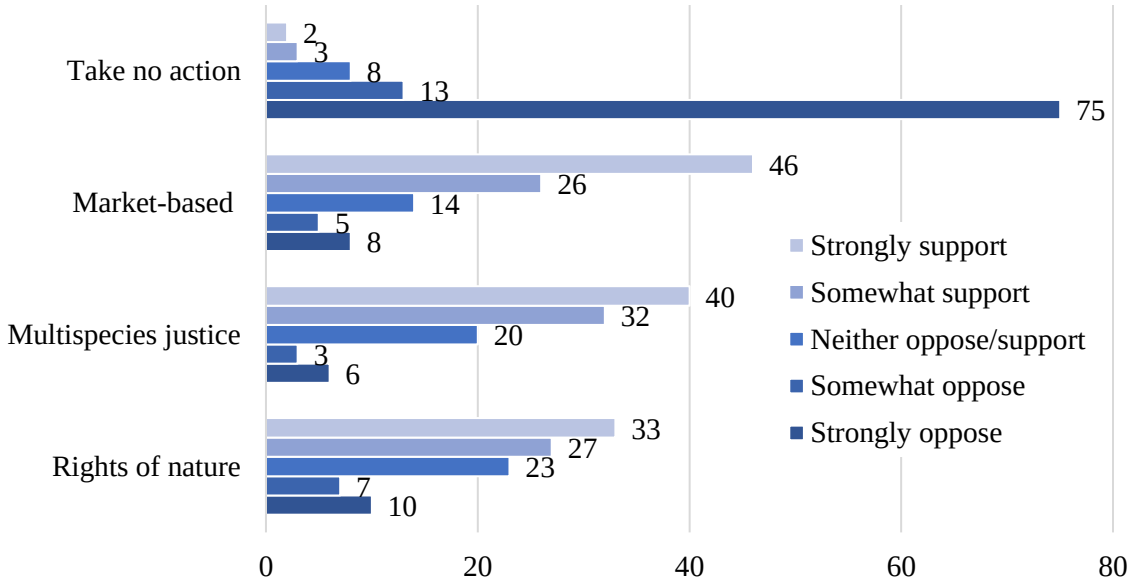
Applying a sociological analysis to literature on how Utahns understand and interact with water reveals how water management stems from unsustainable frameworks (Abbott et al. 2023, p. 5), some of which affect current water management policies and conservation measures that will only become less viable as climate change advances. Exploring alternative approaches to water management may provide useful solutions to reverse the drying of the lake.

This thesis analyzes data from the Utah People and Environment Poll (UPEP), a statewide representative survey conducted in 2023 assessing Utahns' perceptions of environmental issues in the state (USU 2023c). Weighted data showing statewide proportions in response to various questions is available in the UPEP Descriptive Report (Schad, Braddock and Lancaster 2023). Regarding the GSL, the report reveals that over 90% of Utahns are either *somewhat aware* or *very aware* of the GSL desiccation. Further, 86.6% are concerned about "the drying up of the Great Salt Lake and related issues," with more than half (54.8%) indicating that they are *very concerned*.

I designed two sets of questions within the Great Salt Lake section of the UPEP assessing how strongly Utahns oppose or support a total of 18 different strategies to protect the GSL (Appendix A and Appendix B). According to data pulled from the UPEP Descriptive Report in Figure 1, nearly 75% of respondents indicated that they *strongly oppose* the option of 'take no action, let the GSL dry up.' It is clear from these results that there is strong public support for saving the lake. However, as far as the specific strategies to mitigate the desiccation, Utahns are divided. While most Utahns (72.5%) either *somewhat support* or *strongly support* the creation of incentives that could induce farmers to shift to water-saving technologies or crops, Utahns also showed a considerable

amount of support for two additional strategies. A total of 60.1% respondents either *somewhat support* (27.3%) or *strongly support* (32.8%) a rights of nature (RoN) approach while 71.7% of respondents either *somewhat support* (32%) or *strongly support* (39.7%) a multispecies justice (MSJ)approach. These approaches are immersed in earth-based values and are relatively understudied in present sociological literature. Therefore, this thesis further investigates these findings.

Figure 1. *Percentage of Support for Strategies to Protect the Great Salt Lake*



Data: 2023 Utah People and Environment Poll (UPEP)

In the literature review section of this thesis, I first give a brief overview of the GSL including causes and impacts of the desiccation, then I discuss the growing awareness around the issue. This is accompanied by a summary of prior sociological

research on the lake, a review of legislative action by Utah policymakers, and environmental advocacy efforts to protect the lake. Secondly, I cover the topic of paradigms: I identify two dominant paradigms operating in Utah that contribute to the GSL desiccation, and explore two non-dominant paradigms that I propose as alternative approaches to addressing the desiccation issue.

The two dominant paradigms are the *nature-society divide* and *neoliberalism*. The nature-society divide is a concept describing how the biophysical environment and the social world are perceived as separate (Freudenburg, Frickel, and Gramling 1995). This dichotomous narrative disregards the intertwined realities between the two, resulting in a lack of intimate understanding of the interconnected relationship between people and their environments, as explored through a brief historical examination of early settlement and water infrastructure in Utah. Neoliberalism is a political ideology that favors a free-market economy with little to no government regulation and relies on market-based mechanisms such as financial incentives to solve society's problems, including environmental issues (Malin 2014; Malin et al. 2017; Mayer, Olson-Hazboun, and Malin 2022). In this form of governance, "Jobs and economic development can be privileged over environmental and public health concerns" (Mayer et al. 2022, p. 756). In the context of water governance in the management of the GSL, Utah's water infrastructure history has a past of prioritizing economic development over environmental and social concerns, though recent awareness of GSL and environmental advocacy has influenced policymakers to address the GSL through new water policies and management strategies contributing to acknowledgment of environmental and social concerns.

With the outcomes from these two dominant paradigms in mind, I explore lake-facing advocacy support for a paradigm shift in re-valuing water (Crimmel 2014; Miller 2023) guided by Indigenous leaders and values of responsibility and reciprocity that shape many Indigenous worldviews (Crimmel 2014; Kimmerer 2013; Miller 2023; Norgaard 2019; Parry 2024; Peery 2022; Seymour 2024; Whyte 2013). To aid in the re-valuing and rethinking of current water management and conservation measures, such a paradigm shift could involve shifting towards the two non-dominant paradigms of RoN and MSJ. The RoN framework is an ecological-based social movement arising in response to environmental degradation all over the world (Borràs 2016; Cano Pecharroman 2018; CELDF 2024; Earth Law Center 2024; Fitz-Henry 2018, 2022; Lyons 2022; O'Donnell, Poelina, Pelizzon and Clark 2020; O'Donnell and Talbot-Jones 2018; Stone 2010; Te Aho 2019). RoN focuses on earth jurisprudence, with the aim of establishing legal personhood for entities of nature (e.g., trees, mountains, rivers, lakes etc.) to ensure they receive proper rights to thrive and be protected. It is important to note how in this biocentric legal approach the inclusion of all voices, especially Indigenous peoples, are crucial when it comes to establishing legal protection for nature (Lyons 2022; O'Donnell et al. 2020). In the context of the GSL, this lake body is not currently recognized as an entity with such rights (Baxter and Butler 2020, pp. 43-44; Conover and Bell 2020, p. 258; Crimmel 2014, p. 93; Wurtsbaugh et al. 2016, p. 1). If the GSL had such rights, a case could be brought to court to guarantee an adequate flow of water to its dry basin. Further, under this legal framework, future water projects and development would be required to take the GSL's legal rights into consideration. A group of environmental advocates are working on ways to establish rights for the GSL (Seymour

2024; SOGSL 2024b; Winslow 2022). However, Utah politicians have currently blocked such efforts via the passing of H.B. 249 (Hufham 2024; Utah State Legislature 2024a; Williams 2024).

Extending this legal approach for protecting nature, a MSJ framework emphasizes the need for holistic justice that considers how oppressive social structures simultaneously impact human and non-human communities (Celermajer et al. 2021; Fitz-Henry 2022; Tschakert et al. 2021). This is similar to a RoN approach, except a MSJ approach takes protecting nature a step further by including multiple species in protection (i.e., bringing nature and human species into consideration at the same time when developing justice measures). Applying this inclusive approach to water policy in the context of the GSL would add a holistic lens for Utah policymakers to consider all aspects of the environment and society. Action is already being taken in Utah by environmental advocates to protect the multiple species on the lake, such as the Wilson's phalarope, a type of shorebird (Carle et al. 2024; Larsen 2024; Seymour 2024).

Third in the literature review section, I incorporate several theoretical perspectives. This research builds on work from Givens, Olson-Hazboun, Briscoe and Krannich (2021), who test the anti-reflexivity thesis to examine how conservative political orientation and support for a free-market economic system is associated with lower support for pro-environmental attitudes and behaviors. However, instead of focusing on general concerns about climate change and support for renewable energy, this study addresses a local issue (i.e., Utah's drying GSL) with a particular focus on approaches from the RoN and MSJ frameworks. Therefore, the aim of this thesis is to understand how political orientation, support for a free-market economic system, and

various sociodemographic factors are associated with Utahns' level of support for these two strategies to address the GSL desiccation. From these considerations, two research questions emerge:

1. How do Utahns' political orientation, level of support for a free-market economic system, and other demographic factors influence support for a RoN approach in addressing the GSL desiccation?
2. How do Utahns' political orientation, level of support for a free-market economic system, and other demographic factors influence support for a MSJ approach in addressing the GSL desiccation?

These research questions are tested using data from the UPEP, a statewide representative survey assessing Utahns' perceptions of environmental issues in the state (USU 2023c). I provide additional information in the methods section. I then present the results.

Lastly, I conclude with a discussion section that addresses policy implications of the current study, limitations, and possible directions for future research. Investigating how political orientation, neoliberal ideology, and general demographic characteristics predict strong support for RoN and MSJ approaches to address the GSL desiccation can help inform policymakers and advocacy groups how to move forward. Results from this research may help inform Utah policymakers, stakeholders, nonprofits and advocacy and community groups on how strategies from these alternative frameworks can be added to the broader picture of solutions best for promoting a viable and just management of the lake.

CHAPTER 2: LITERATURE REVIEW

The Great Salt Lake (GSL)

The Great Salt Lake (GSL) is a remnant of prehistoric Lake Bonneville, which once covered most of Utah. Now the shallow lake only has a maximum depth of 33ft and covers about 1,600 square miles at its average water elevation (Davis, Gwynn, and Rupke 2022). Three main tributaries feed the lake, the Bear, Weber and Jordan Rivers. Since the lake is terminal or endorheic – meaning there are no outlets – all water that flows in from these tributaries leaves only through evaporation. As a closed basin, the lake naturally fluctuates between 4,190-4,200 feet; however, it has not reached its maximum elevation since the early 2000s (Davis et al. 2022). The lake elevation is on a downward trend declining far past historic lows reaching a record low of 4,188 feet in November 2022 (USGS 2023).

Contributing Factors to the Lake Desiccation

Research reveals that the shrinking of the GSL is driven by increased upstream water diversions for human consumptive uses (GSL Strike Team 2023, 2024). Typically, (about 63%) of this diverted water goes towards agriculture (Null and Wurtsbaugh 2020; Wurtsbaugh et al. 2017), though recent work estimates that this is now closer to 74% (Abbott et al. 2023, p. 6). The remaining 20% is used by cities and industry (10%) and mineral extraction (10%) (Abbott et al. 2023). As more water is diverted, less can enter the lake. According to research by Wurtsbaugh et al. (2016), this consumption has "reduced the lake level by 11 feet, decreased its volume by 48%, increased lake salinity,

and exposed approximately 50% of the lake bed" (p. 6). Recent research shows that human consumption now accounts for 67-73% of depletion, while natural precipitation variability is 15-23% and direct evaporation from climate warming is 8-11% (GSL Strike Team 2023, p. 11). Though diversions are the primary reason for lake depletion, natural precipitation variability and drought-induced climate change will exacerbate the issue, as will Utah's projected population growth that is expected to nearly double by the year 2060 (Abbott et al. 2023; GSL Strike Team 2023, 2024; Null and Wurtsbaugh 2020; Steed 2024).

Utah Water Law, Water Rights and the Public Trust Doctrine

Although Utah is one of the driest states in the United States, Utahns have "the second highest municipal and industrial per capita water use of the United States" (Null and Wurtsbaugh 2020, p. 15). Therefore, as a vital resource in an arid region with high use, the way water is managed and allocated is crucial, affecting both use and perception of water. In Utah, water is allocated through western water law and water rights. According to climate scientist Dr. Daniel Bedford, the GSL desiccation issue comes down to water rights which work "against preservation of the natural environment" (Crimmel 2014, p. 92).

Both private and public water users have a right to use public water, but only if the water diverted is put to utilitarian 'beneficial use'. Defined as what is beneficial to society, this does not take into consideration what might be beneficial for ecological systems. Bedford explains how "Leaving water in a natural streambed wasn't beneficial…because it wasn't being put to human use" (p. 44). This contributes to the

perception that ‘water not used is water wasted’ or, in other words, water that is not used for a beneficial purpose and instead finds its way back into the natural ecosystem is viewed as ‘wasted’. This leads to the ‘use it or lose it’ mentality practiced in water rights laws; if you do not use the amount of water you have, you could potentially lose your rights to it.

Utah water law operates through the public trust doctrine, a legal doctrine established by the U.S. Federal Government “which mandated that individual states would hold navigable water bodies and related resources ‘in trust’ for the benefit of the people of that state” (Baxter and Butler 2020, p. 43). Similar to state common law, this doctrine varies from state to state, shaped uniquely by each respective state’s histories, needs and problems (Craig 2010). In Western states like Utah, water law systems operate by prior appropriation which allocates water on a first come, first serve basis (p. 182). In this legal system, seniority takes priority; those with the oldest water rights receive their share of water first, leaving junior water rights holders next in line with the possibility of not receiving their share if it is a dry year. An exception to this however is Tribal water rights. “Although Indian reserved water rights are not expressed in treaties, they are inherent or implied rights,” under Federal law on reservation lands (Mitchell 1997, p. 47). The 1908 Winters Doctrine “established a vested right…whether or not the resource was actually put to use” enabling Tribes to use water on reservation lands and expand their “water use over time in response to changing reservation needs” (p. 47).

Prior appropriation acknowledges that “water supplies from a given source will sometimes – maybe often – be insufficient to meet all needs”, recognizing that “fresh water is in short supply” (Craig 2010, p. 57). Unfortunately, even with this

acknowledgment this system allows water right holders “to drain streams and rivers dry, making obvious the loss of public values such as navigation, fishing and other recreation, aesthetics, species, biodiversity, water quality, ecological health, and, more recently, ecosystem services” (p. 57). This spells out the negative impacts this doctrine imposes on ecosystems, especially with the case of the drying up of the GSL. Further, Daniel McCool, a political scientist in Utah, critiques the “distributive fairness” of the Prior Appropriation Doctrine by observing how “Water projects allocate not just water but power, wealth, prestige, and security…despite early proclamations that irrigation and hydropower would serve the common people” (Crimmel 2014, p. 229). These intricacies highlight the sociological importance of understanding power dynamics involved in water: who controls it, who has access to it, who does it benefit, and who does it leave out?

Bedford critiques this western water law and its consequential impacts on the GSL, identifying how prior appropriation and ‘beneficial use’ act “against water conservation for natural ecosystems, because they encourage extracting water as quickly and fully as possible from its natural settings” (Crimmel 2014, p. 92). This is especially challenging for the GSL since most water is diverted upstream, preventing it from ever reaching the lake (p. 93). These dynamics highlight the role the public trust doctrine has in contributing to the drying of the GSL. However, recent efforts in Utah legislation have ameliorated this impact which will be explored in the *Growing Momentum of Awareness, Support and Collaborative Action* section of this paper (Utah State Legislature 2022a).

Impacts of the Lake Desiccation

A declining lake has serious consequences for the surrounding environment, society and economy. The balance of this delicate ecosystem is drastically impacted by the lake size and elevation: as the lake shrinks, salinity increases. Increased salinity threatens the viability of the lake's keystone species, the brine shrimp. This species plays a vital role in the food chain – without them, the entire ecosystem faces potential collapse. Millions of migratory birds as well as various other species depend on the brine shrimp as a crucial food source (Conover and Bell 2020; Null and Wurtsbaugh 2020). Further, less water means more land exposed – resulting in the formation of land bridges that predators use to access waterfowl nests, thus diminishing the safety of wetland habitats (Baxter and Butler 2020).

The environmental health of the lake is also intrinsically tied to both the social and economic well-being of the State of Utah. The downward trajectory of the lake's elevation poses a public health crisis. Human activities such as coal burning, historic mining, industrial and agricultural wastes, and urban runoff deposit sediments, minerals and toxic heavy metals into the lakebed which can bioaccumulate throughout the GSL food chain (Abbott et al. 2023; Baxter and Butler 2020). As mentioned earlier, the GSL is a terminal lake with no outlets, meaning that all water flowing into the lake only leaves through evaporation while all sediments that enter the lake stay there. The concentrations of some of these heavy metals exceed the EPA Residential Regional Screening and Industrial Screening Levels (Null and Wurtsbaugh 2020; Perry, Crosman, and Hoch 2019). A receding lake exposes these harmful sediments in the lakebed and, once airborne, these can transform into toxic dust storms contributing to Utah's already poor

air quality caused primarily by temperature inversions during wintertime (Baxter and Butler 2020). Exposure to this fine particulate matter can enter the lungs and ultimately the bloodstream, resulting in a number of health impacts including complications to reproductive, respiratory and cardiovascular systems, cognitive impairment and cancer (Abbott et al. 2023; Null and Wurtsbaugh 2020, p. 13; Wurtsbaugh et al. 2017). Further, the effects of air pollution are disproportionately experienced among low-income and racially diverse communities in Utah, such as Salt Lake City's west side. According to an environmental justice report funded by the Environmental Protection Agency (EPA) and conducted by Salt Lake City's Westside Coalition, these neighborhoods and communities experience higher exposure to air pollutants from various sources (including dust from the GSL) and consequentially higher risk of health impacts. (Cabrera 2023; Larsen 2022; Westside Coalition 2023).

Without the GSL, Utah's economy risks losing nearly $2 billion and 7,700 jobs (GSL 2023). The GSL supports many extractive industries including brine shrimp harvesting and mineral extraction which are important to global markets. The brine shrimp industry, including corporations like *Great Salt Lake Artemia*, is committed to the sustainable harvesting of brine shrimp eggs, or cysts, which are a crucial food source to fish hatcheries in the aquaculture industry all around the world (GSL Artemia 2024). The mineral extraction industry, including corporate entities such as *Compass Minerals* and *U.S. Magnesium*, harvests salt, "magnesium metal, potassium sulfate, magnesium chloride, and other products" (UDNR 2013). The salt is used for keeping ice off roads during the winter and softening water, while the magnesium metal is used for aluminum and steel production, and the sulfate is used for fertilizer (Baxter and Butler 2020, p. 32).

The lake also brings in economic value from recreational amenities such as waterfowl hunting, fishing, birdwatching, swimming, boating, and other shoreline recreational activities (Bioeconomics Inc. 2012, p.18). Further, the lake also "contributes 5-10% to the lake effect snow that supports the ski industry, which includes another 20,000 jobs and an additional $1.2 billion" (GSL 2023).

The primary drivers and socio-economic consequences of the shrinking of the GSL are not unique – other saline lakes around the globe are also drying through increased diversions for consumptive uses, resulting in toxic dust storms, loss of wetland habitats, decline in brine shrimp populations, and costly mitigation programs designed to restore these lakes (AECOM 2019; Wurtsbaugh et al. 2017). There are two examples of desiccating saline lakes in California. On the one hand, there is Owens Lake which represents a cautionary tale where strategies were not put in place to preserve the lake at all. This resulted in an increase of harm to human health due to lakebed dust exposure which "has exceeded US air quality standards for large particulate particles (PM10)" (Null and Wurtsbaugh, 2020, p. 13). Mitigation control strategies are required to keep the lakebed dust from becoming airborne, costing the City of Los Angeles to "spend US$3.6 [*sic*] billion over 25 years" (p. 13). The environmental, social and economic consequences of Lake Owens in California is "one of the leading sources of PM10 emissions in the United States," leading the U.S. Environmental Protection Agency (USEPA) to declare this as "the worst dust problem in the United States" (AECOM 2019, p. 34). This case warns against what could happen to the GSL if Utah policy makers do not allow water to replenish its basin.

On the other hand, there is Mono Lake, a hopeful tale and a good example to look towards when thinking about how to restore the GSL. This is a successful case where stakeholders came together to collaborate on solutions such as invoking the State of California's public trust doctrine (Baxter and Bulter 2020, p. 43). The result was the Mono Lake Basin Water Right Decision in 1994, a Settlement Agreement ruled by the California Supreme Court which prohibited diversions from the lake until water elevation returned to safe levels (AECOM 2019, p. 50).

The GSL is bigger than Lake Owens and Mono Lake, therefore desiccation impacts and mitigation costs to address such impacts will be more costly. Further, unlike these rural lakes in California, a unique characteristic of the GSL in Utah is that it is near a populous city, meaning the public health crisis from lakebed dust storms is more urgent. The research report on the *Consequences of Drying Lake Systems Around the World,* concluded that "There is an opportunity to protect and preserve the Great Salt Lake before restoration costs become too high to manage. Although the mitigation and restoration costs are high, the economic, social, and environmental consequences are likely much higher" (AECOM 2019, p. 53). The lake is not beyond repair, but improvements need to be taken now to ensure the lake is protected, guaranteeing environmental, social, and economic benefits can still be enjoyed (ECONorthwest 2019, p. 85). "Restoration of other terminal lakes has shown that it is more costly to restore lakes and the ecosystem services they provide than to preserve them from the outset" (Null and Wurtsbaugh 2020, p. 17). With continued development and anticipated population growth, sustainable management of the GSL is crucial to ensure sustainable water access for future generations of Utahns.

Growing Momentum of Awareness, Support and Collaborative Action

As a "sovereign land entrusted to the state of Utah for long-term management and care," the bed of the GSL is managed through Utah Department of Natural Resources (DNR) Division of Forestry, Fire & State Lands (DFFSL) "under the public trust doctrine, balancing uses against navigation, fish and wildlife habitat, aquatic beauty, public recreation and water quality in the interest of public health, safety and welfare" (GSL 2024a). In the early 2000s, the DFFSL released a Great Salt Lake Comprehensive Management Plan (CMP) focusing on the concern of flooding from high lake elevations. However, as a decade passed the new concern was on low lake levels (UDNR 2013). Therefore, starting in 2010, the DFFSL began work on the 2013 CMP to provide updates on data and research to address fluctuating lake levels and develop "long-term collaborative approach[es] necessary to holistically manage the complex GSL ecosystem" (p. 2). Also in the same year of 2010, the Great Salt Lake Advisory Council (GSLAC) was formed through House Bill (H.B.) 343 "to advise on the sustainable use, protection, and development of the Great Salt Lake" (UDEQ 2022). As over another decade has passed since 2013, another updated CMP is expected soon (GSL 2024b; Steed 2024).

The many partners involved in this collaborative management effort for GSL include: state agencies, including a number of divisions under the Utah DNR and the Utah Department of Environmental Quality (DEQ); federal agencies such as the United States Geological Survey (USGS), Natural Resources Conservation Service and the Fish and Wildlife Service; non-profit agencies like The Nature Conservancy, National Audubon Society, and Friends of Great Salt Lake (FoGSL); academic institutions such as the Great Salt Lake Institute at Westminster University, the Utah State University Janet

Quinney Lawson Institute for Land, Water, and Air (ILWA), the Wilkes Center for Climate Science & Policy at the University of Utah and the Belovsky Lab at the University of Notre Dame; and a number of committees and councils including GSLAC and the Salinity Advisory Committee (GSL 2024d).

Prior Sociological Research

As mentioned earlier, there is a lack of research exploring the complex social dynamics of the GSL. A professional report conducted in 1999 to inform nature-based tourism as an economic strategy identified a lack of awareness on outdoor recreational opportunities (Brunson and Nicholson). A 2005 case study grounded in social constructionism emphasized the importance of collaborating with diverse perspectives among different stakeholders to foster inclusive environmental communication, resulting in a successful wetland education master plan (Eisenhauer and Nicholson 2005).

The first prominent research contribution to the GSL from a sociological perspective and the first ever systematic attempt to study the socially-constructed views of the lake comes from Dr. Carla Trentelman. As an environmental sociologist, she studied the human-nature relationship between people and the GSL, assessing sense of place and place attachment in relation to how locals think, feel and connect to the lake (Trentelman 2009, 2011, 2020). Perceptions of the lake were mixed with both positive, negative and neutral meanings leading Trentelman to conclude that "people's relationships with GSL are diverse" (2009, p. 497). Though Trentelman found a collection of various feelings towards the GSL among those living close to it, including "considerable evidence that the lake is unappreciated by many" (2020, p. 54), she found

that “a substantial majority of research participants” held a sense of place for the lake and “felt positively about the lake, including feeling protective towards it” (2009, p. 516). Differences in these senses of place and attachment came down to direct exposure to and experience with the lake; finding that more time at and involvement with the lake contributed to stronger relationships with held meanings of the lake (2009, p. 502; 2011, p. 133). According to Trentelman, past research “on sense of place, place attachment, and caring for a place has found these dynamics can be associated with valuing the environmental traits of the place, environmentally responsible behavior and concern, sensitivity to environmental impacts, and increased commitment to the place” (2020, p. 57). Understanding these social dynamics “can assist resource management, policy decisions, education endeavors, and other efforts related to the care of the place” (Trentelman 2011).

More recent research includes the surveys conducted in 2022 and 2023 by researchers at Utah State University (USU): the aforementioned Utah People and Environment Poll (UPEP) conducted in conjunction with the USU Community and Natural Resources Institute (CANRI) (USU 2023a, 2023c) and the Future of Great Salt Lake Survey (USU 2023b; Welsh et al. 2023). As mentioned earlier, the UPEP found that over 90% of Utahns are aware, and over 85% are concerned about the GSL desiccation (Schad et al. 2023). The Future of the Great Salt Lake Survey assessed public support on strategies to get water to the GSL, finding that Utahns support coordinated water conservation effort at the individual, local community, and state scales, as well as policies designed to dedicate saved water for the GSL. Similar to the UPEP, this survey found that nearly 90% of respondents reported being aware of the decline of the GSL, while “83%

of respondents agreed that Great Salt Lake is important to them" (Welsh et al. 2023, p. 10). Further, in this extensive look in Utahns values and attitudes towards the GSL, 7 key findings are highlighted: 1) Utahns are aware of the issue; 2) Utahns view the quality of life and the quality of the GSL as interconnected; 3) Utahns are committed to environmental preservation of the lake; 4) Utahns want to see coordinated action on water conservation across the three different sectors at the individual, community and state scales; 5) Utahns want more action from government; 6) Utahns prioritize environmental and societal uses over economic uses when it comes to water; and finally, 7) Utahns expressed collective responsibility to preserve the GSL (Welsh et al. 2023).

Though 15 years ago Trentelman (2009) found that a considerable majority of Utahns held strong sense of place to the GSL, during that time there was little knowledge and understanding about the GSL, with a lack of awareness on recreational amenities the lake provided (Brunson and Nicholson 1999) and concern that "the average Utahn knows very little about the lake" (Crimmel 2014 p. 177). Trentelman (2020) recalls that the "GSL has a history of being unappreciated as well as understudied" (p. 56). However, it appears that as the lake shrinks, awareness and support has grown. The summer before the GSL hit its record low of 4,188 feet in November of 2022 (USGS 2023), the downward trend of the GSL reached national attention in *The New York Times* (Flavelle 2022). Now, according to a poll done by *Deseret News*, 80% of Utahns are concerned about GSL's declining lake level (O'Donoghue 2022). This is supported in the earlier mentioned findings from the UPEP (Schad et al. 2023) and The Future of Great Salt Lake Survey (Welsh et al. 2023), where now "Utahns recognize the connections between Great

Salt Lake, ecosystem health, human health, and the economic well-being of the state" (p. 41).

Its seems that just as Trentelman (2009) postulated, media campaigns designed to "increase awareness of the interconnection between people, their communities and the lake" might just "increase feelings of connection and perhaps attachment to the lake, rather than GSL seeming like something that is 'out there' somewhere" (p. 518). Thanks to groups like The Great Salt Lake Collaborative – a solutions journalism initiative with a mission to increase awareness of the lake (GSL Collaborative 2023) – and a number of lake-facing non-profits and community groups ((e.g., Save Our Great Salt Lake (SOGSL), FoGSL, Utah Rivers Council, Grow the Flow, Great Basin Water Network, Utah Physicians for a Healthy Environment (UPHE), Healthy Environment Alliance of Utah (HEAL), Great Salt Lake Interfaith Action Coalition (GSLIAC), The Nature Conservancy, Center for Biological Diversity, the Utah Chapter of Sierra Club, and youth groups including Utah Youth Environmental Solutions (UYES) and Youth Coalition for Great Salt Lake)), – attention on the GSL desiccation has indeed increased. This increased attention has resulted in a number of research studies assessing the lake's environmental, societal and economic impact and collaborative work on policy recommendations and proposed strategies to address the GSL issue.

Review of Legislative Action

In 2019, the concern for the GSL's downward trend reached the Utah State Legislature, which resulted in the passing of House Concurrent Resolution H.C.R. 10. This recognized the state of the GSL decline and called for "expeditious and collaborative development of recommendations for policy and actionable solutions to avert economic,

social, and environmental harm" (Utah State Legislature 2019). This led to the development of the GSL Resolution Steering Group in 2020, a group of stakeholders led by the Utah DNR and DEQ who developed 16 strategic opportunities identifying six focus areas to address the GSL desiccation, including education and engagement of the GSL, improving information for decision-makers, optimizing water use within the agricultural, municipal and industrial sectors, improving available legal and policy options, and finding ways to sustain these efforts in the long-run (GSL Resolution HCR-10 Steering Group 2020).

Since then, the Legislature has been paying attention. This has led to a number of actions including the creation of the GSL Watershed Trust and the GSL Basin Integrated Plan from the 2022 Utah Legislative Sessions (GSL 2024b; Utah State Legislature 2022b, 2022c). The GSL Watershed Enhancement Trust came out of H.B. 410, where The Nature Conservancy in Utah and the National Audubon Society's Saline Lakes Program received $40 million to co-manage a Water Trust Fund for the GSL (Utah State Legislature 2022b), empowering the DFFSL "to better study and manage the lake, including working with stakeholders" (Abbott et al. 2023, p. 12). The GSL Basin Integrated Plan was formed out of H.B. 429 which granted a one-time payment of $5 million to the creation of Great Salt Lake Watershed Integrated Water Assessment (Utah State Legislature 2022c), mandating "an assessment to study surface and groundwater flow" (GSL 2024c) to "identify areas where further information is needed and guide water conservation efforts" (Abbott et al. 2023, p. 12).

Other house bills from the 2022 legislative session have focused on optimizing agricultural water use, installing secondary water meters to track water use, and requiring

the implementation of water conservation goals among water suppliers and municipal water users (GSL 2024c). However, the most notable bill from the 2022 legislative session is H.B. 33 (GSL 2024c; Utah State Legislature 2022a). Titled as Instream Water Flow Amendments, this watershed bill provides a legal avenue "to give water rights holders the option" to conserve water (Miller 2022). This challenges the notions of 'beneficial use' and 'use it or lose it' in Utah's water law by allowing the DFFSL to hold in-stream flow rights for sovereign lands like the GSL and eliminating restrictions for private water users. Water rights holders can lease out their water rights to the DFFSL to be held in perpetuity for the benefit of the GSL "without losing their shares up to 10 years at a time" (Abbott et al. 2023, p. 12). This means that water returning to the GSL is no longer viewed as 'wasted', rather, it is now recognized as a 'beneficial use'. However, one caveat that Emily Lewis, a Utah water lawyer, identified is that "Since the bill works under the current water appropriations structure, in-stream flow applications are to obtain existing water rights, not new ones, since the pool of new water rights is essentially nonexistent." In other words, this bill "relies on holders leasing their existing water rights." Therefore, Emily concludes that while this is an "important step in the right direction", it is just one piece of the larger puzzle to save the GSL (Miller 2022).

The first success of this bill came from the Church of Jesus Christ of Latter-day Saints (LDS), which donated 20,000 acre-feet of water shares to the GSL in early 2023 (Fabrizio 2024; GSL Strike Team 2024; Larsen 2023c). However, farmers have been reluctant to lease their water to the GSL, commenting that "there is no way to prove it makes it all the way downhill instead of getting diverted by another downstream user" (Larsen 2023a). Two years later in the 2024 legislative session, Senate Bill (S.B.) 18 on

Water Modifications provided clarifications on ‘saved’ water, clearer definitions and legal protections regarding agricultural water conservation (GSLAC 2024). This aims to give farmers piece of mind to sell or send water conserved from water-saving technologies downstream without the risk of forfeiting their water rights (GSL 2024c).

For the 2023 Utah legislative session, the first policy assessment was prepared by the GSL Strike Team, a team created in the summer of 2022 consisting of researchers from the University of Utah and Utah State University and experts from the Utah DNR, Department of Agriculture and Food, and DEQ, who provide expertise on policy suggestions to “enhance and strengthen Utah’s strategies to improve watershed management and increase water levels” (Steed 2024, p. 23). They identified six key recommendations for Utah policymakers including: explaining how streamflow to the GSL is decreasing due to human and natural systems; providing a list of policy options; urging for water that is conserved to be committed to the GSL; recommending an optimal target elevation range; and taking into consideration how a warming climate further stresses the lake (GSL Strike Team 2023). Policy options were organized into three main categories: water conservation efforts through limiting and optimizing agricultural, municipal and industrial water use, and utilizing water pricing, banking and leasing methods; new water imported from other areas or created through cloud seeding; and engineering solutions such as raising or lowering the adaptive management berm at the Union Pacific Railroad causeway (which would balance optimal salinity levels to benefit brine shrimp populations and extractive industries) and lakebed dust mitigation efforts (GSL Strike Team 2023).

In the second policy assessment for the 2024 Utah legislative session, the GSL Strike Team reflected on the record-breaking snowpack of 2023. This, paired with raising the adaptive management berm at the causeway breach, raised the lake elevation by 3.5 feet from the record low dated in November of 2022 (GSL Strike Team 2024; Miller 2023; USGS 2023). The second policy assessment provided nine different insights: including updates on water and salinity levels; updates on agricultural and industrial water use; predictions on future water availability which will be challenged by rising temperatures and evaporation; provided further conservation management suggestions such as increased investments in water monitoring and data measurement to ensure water conserved via water shepherding does in fact reach the GSL; and repeating how no single solution will save the lake, rather, what is needed is "a wide suite of policies implemental concurrently to bring more water to the lake" (p. 6).

Bills that came out of the 2023 legislative session include S.B. 118 that offered incentives for water efficiency of outdoor residential water use through a landscape conversion program (Utah State Legislature 2023b), S.B. 277 which aided in furthering agricultural water optimization efforts, and H.B. 307 which created Utah Water Ways, a nonprofit dedicated to coordinating water efficiency in the state (GSL 2024c). The most important bill to come out of the 2023 legislative session was H.B. 491 which established the GSL Commissioner's office and appointed Brian Steed – Executive Director of Utah State University's Janet Quinney Lawson Institute for Land, Water, and Air, co-chair of the GSL Strike Team, and former Executive Director of the Utah DNR – as the GSL Commissioner (Utah State Legislature 2023a). Through this bill, Steed and Tim Davis, the Deputy GSL Commissioner, are responsible for collaborating with all agencies and

stakeholders, and “holds the authority to require a state agency to act, or refrain from acting, in order to protect the Great Salt Lake” (GSL 2024e). Another assigned task was to develop and maintain a strategic plan offering “a holistic approach that balances the diverse interests related to the health of the Great Salt Lake…” which Steed released in January of 2024 to gain a sense for where the State should be for the GSL (Steed 2024, p.3).

The goal of the Great Salt Lake Strategic Plan is to increase coordination efforts between a number of state and federal agencies, improving plans and water monitoring data on best available science, and outlining adaptive strategies over three timeframes of short- to long-term to get water to the lake including incentivizing the use of water markets and water banking (Steed 2024). On page 10, the plan highlights the importance of shifting towards a new paradigm of water management: “One thing is clear: every-one living in or moving into the Great Salt Lake Basin needs to embrace a new model for what growth looks like, one that values and limits the amount of water we need for every new home and business” (p. 10). Crucially, this report establishes a target lake elevation range between 4,198-4,205 feet above sea level for the GSL, an optimal lake level range identified by the GSL Elevation Matrix to promote a healthy balance of salinity (Steed 2024; Fabrizio 2024; UDNR 2013). This is something that experts and environmentalists have long been advocating for, but was first blocked by policymakers in 2023 (Abbott et al. 2023; GSL Strike Team 2023; Tatenhove 2023; Utah State Legislature 2023c).

Ben Abbott – an Assistant Professor of Ecosystem Biology at Brigham Young University and Executive Director of Grow the Flow, a citizen-led movement “focused on supporting ongoing efforts and starting new initiatives that strengthen our water

security" (Grow the Flow 2024) – holds positive views towards the strategic plan commenting how it "calls for a number of real changes and paradigm shifts" (Fabrizio 2024). However, he doesn't agree with the 30-year timeframe. Further, aiding in the concerns of farmers who are reluctant to lease their water rights to GSL Watershed Enhancement Trust since there is no guarantee that water would reach the lake (Larsen 2023a), Abbott reveals how only about 6% of water conserved has reached the lake (Fabrizio 2024). Thus, it is important to increase water monitoring data to track how saved water is either shepherded to the GSL or diverted for other uses (GSL Strike Team 2024).

The 2024 Utah legislative session utilized Steed's strategic plan and the 2024 GSL Strike Team assessment to make amendments to water efficiency for landscapes, secondary water metering, agricultural water optimization, etc. (GSL 2024c). According to Tim Hawkes, General Counsel to the GSL Brine Shrimp Cooperative who formerly served in the Utah House of Representatives (2015-2022), the most important legislative changes came from 2020-2023, while 2024 focused more on the state of implementation and refinement on prior policy (GSLAC 2024). Notably, however, there was the monumental ruling of H.B. 453 that addressed the ecological importance of the complex lake system by creating a set of rules for mineral extraction companies to carefully manage how they use water as it impacts the lake (Utah State Legislature 2024b).

Environmental Advocacy

It is clear that there has been a tremendous amount of recent work done for the GSL by the Utah State Legislature. However, according to Steed and Hawkes, this current phase of implementation is going to take some time (GSLAC 2024; Steed 2024).

Lake scientists and advocates stress that these actions may not be enough to address this dire state of emergency to ensure the lake receives an adequate supply of water to replenish optimal and healthy elevations (Abbott et al. 2023; Winslow 2022). Reflecting on legislation needed to restore both the Bear River and the GSL, Darren Parry, a tribal historian and former chairman of the Northwestern Band of the Shoshone Nation, emphasizes how "We are taking baby steps for a problem that require leaps and bounds" (Parry 2024, p. 8).

To address these critiques, environmental groups such as SOGSL, Grow the Flow and others took action throughout Utah legislative sessions, including hosting the Rally for GSL protests at the Utah State Capitol in January of 2023 and 2024 (SOGSL 2024a). Additionally, Grow the Flow partnered with the Great Basin Water Network, Sierra Club Utah Chapter, Center for Biological Diversity, and SOGSL to host GSL Lobby Days every Thursday during the 2024 legislative session (SOGSL 2024a). Further, Nan Seymour – a lake-facing poet, founder of The River Writing Collective and member of SOGSL – led an artistic advocacy approach by holding a GSL Vigil every legislative session since 2022 (Seymour 2024). Throughout the most recent legislative session, the GSL Vigil was held twice a day at the Utah State Capitol building. In the morning, members silently walked with blue cloth representing waves of the lake. Then, in the evening, members dressed up in costumes as, and carried puppets of, various species around the lake, with an emphasis on brine shrimp and birds, dancing and singing as demonstration of love and celebration of all the multiple species the GSL sustains.

Taking it a step further, environmental groups have pushed for legal protection as a strategy to save the GSL. The Center for Biological Diversity, Utah Physicians for a

Healthy Environment, American Bird Conservancy, Sierra Club and Utah Rivers Council filed a lawsuit against the state of Utah for failing to protect the GSL (Center for Biological Diversity 2023; Larsen 2023b). Represented by lawyers from Earthjustice, this lawsuit "invokes the public trust doctrine" (Larsen 2023b), citing that the State of Utah has failed in its public duty to protect the GSL (Center for Biological Diversity 2023). Looking to the example of Mono Lake in California, the reason this lake has had success with conservation efforts is due to the Settlement Agreement in 1994 that employed the State of California public trust doctrine (Baxter and Bulter 2020, p. 43) to prohibit any further water diversions until the lake levels recovered (AECOM 2019, p. 50). This same doctrine in Utah "has not yet been used in legal arguments to preserve inflow to GSL" (Baxter and Bulter 2020, p. 43) until now.

"While GSL is considered to be held in public trust, it has not been assigned a water right" (Baxter and Butler 2020, p. 43), meaning, it has no water rights of its own to protect itself (Conover and Bell 2020, p. 258; Crimmel 2014, p. 93; Wurtsbaugh et al. 2016, p.1). Therefore, a group of lake-facing advocates have turned to the RoN framework as a solution to address the decline of the GSL, supporting the lake to recognized as an entity with legal personhood with its own rights to water, and rights not only exist, but to flourish (Seymour 2024; SOGSL 2024b; Winslow 2022). The group SOGSL, in collaboration with the Earth Law Center in Colorado, are currently working to address this through building a RoN resolution for the GSL, which at this time meant as a symbolic resolution "to start building a movement of support with community groups and local governments" (SOGSL 2024b).

Utah politicians have characterized the artistic expression involving multispecies representation at the Capitol and the lawsuit as "frivolous," expressing that they "only hinder progress long term politically as we work to save the lake" (Winslow 2024). However, Deeda Seed, the Senior Utah Campaigner with the Center for Biological Diversity, argues that the lawsuit helps to keep urgency on the GSL issue (Winslow 2024). Advocates have been working to "keep the pressure on" legislatures to continue focusing on the GSL, especially since the 2023 snowpack provided a reprieve by temporarily increasing lake elevation (Miller 2023). Director of the Great Salt Lake Institute at Westminster University, Bonnie Baxter, informed *The Salt Lake Tribune* that "The future is not likely to bring us conditions that conserve water in the natural system…We need to be 11 feet up — are we going to get 11 winters in a row like this? Absolutely not" (Miller 2023). In addition to calling for adaptive and pro-active solutions, Baxter addresses the need to re-approach the way we think about water: "We need to revalue water, not monetarily, but with a system of love and cherishing the water."

In response to the gaining traction of the RoN movement in surrounding states, H.B. 249: Utah Legal Personhood Amendments was introduced in the 2024 Utah legislative session, prohibiting "a governmental entity from granting or recognizing legal personhood in certain categories of nonhumans" including animals, plants, land and bodies of water (Utah State Legislature 2024a). Though the bill sponsor stated that this was not created with the GSL in mind, activists who support a RoN approach as a solution for the GSL attended the House Business and Labor Committee to testify against the bill (Hufham 2024; Williams 2024). One of the lake advocates, Nan Seymour, stated

that the bill "would block a proven path to restoration [for the GSL] that at least should be considered" (Hufham 2024). In response to this opposition, the committee members expressed how "they are committed to saving the Great Salt Lake, but that granting it personhood was not appropriate" (Hufham 2024), adding how "it could lead to a legal mess somewhere along the way" (Williams 2024). Though the bill was signed into law, GSL activists remain committed to raising awareness and support for a RoN approach to save the lake (SOGSL 2024b). According to Densie Cartwright, co-founder of the SOGSL, "We can still use our time and energy to help right the relation in our community around us even if the law won't recognize it" (Williams 2024).

In addition to work focused on saving the GSL itself, lake-facing advocates are also pushing for awareness of and protection for the many species that depend on the lake such as brine shrimp, bison, and birds (Larsen 2024; Seymour 2024). The Center for Biological Diversity, Utah Physicians for a Healthy Environment, Utah Youth Environmental Solutions, lake scientists, artists and advocates filed a petition to the U.S. Fish and Wildlife Service to protect the Wilson's phalarope under the Endangered Species Act (Carle et al. 2024; Larsen 2024). The Wilson's phalarope one of the many shorebird species that migrates to the GSL and other saline lakes, and is "particularly vulnerable to habitat loss" (Carle et al. 2024, p. 6). If the lake disappears, so too will this tiny shorebird.

Another critique on the strategies Utah policymakers have set forth is the lack of Indigenous representation in environmental management (Larsen 2023d). Darren Parry comments that there is enough science on the GSL (and on environmental problems overall), and suggests that what is needed now is the pairing of western science with

Indigenous knowledge (Larsen 2023d, Parry 2024). According to Parry, "Indigenous-led collaboration has the potential to restore landscapes and relationships across the western landscape" (Parry, 2024 p. 4), but by excluding Indigenous voices in environmental management due to assuming "that scientific knowledge is superior to Indigenous wisdom, you make collaboration impossible" (p. 10). That is why the inclusion of Indigenous representation in environmental management is crucial. Perhaps what is needed in water management for the GSL is not only a paradigm shift in management approaches, but a paradigm shift in values. Indigenous leaders, scholars and allies stress that these changes must involve Indigenous leadership (Fenelon and Alford 2020; Gilio-Whitaker 2019; Kimmerer 2013; Lyons 2022; Martinez, Cannon, et al. 2023; Martinez, Seraphin, et al. 2023; Montgomery 2022; Norgaard 2019; Norgaard and Fenelon 2021; O'Donnell 2020 et al. 2020; Parry 2024; Simpson 2014), and advocates for the GSL also stress the importance of seeking this "guidance from Indigenous leadership to repair our relationship with water" (Seymour 2024). Such an approach would focus on re-valuing water (Crimmel 2014; Kimmerer 2013; Miller 2023; Parry 2024; Peery 2022).

Paradigms

Dominant Paradigms

The Nature-Society Divide

The nature-society divide is a concept that views nature as something separate from society, disregarding the intertwined reality between the two. Ideologies immersed

in this separation produce harmful narratives that inhibit the ability to "adequately explain the complicated interactions that shape our world" or "address a growing number of environmental issues" (Stuart 2016, p. 118). Freudenburg et al. (1995) assert that the physical environment and the social world are not isolated dualisms, rather, they are "conjointly constituted" or intricately inseparable. Strong ongoing dialectal processes take place at the interplay between these two.

This ongoing dialectal process can be seen in the heavily human altered GSL ecosystem (Abbott et al. 2023, p. 15). Trentelman (2020) describes these processes between the lake and people: "The relationships between people and GSL are not static," rather, "they have changed many times, affected by technology, economic forces, the ever-changing lake elevation and people's attempts to manage it, and increasing development" (p. 59). For example, when the GSL reached record high lake elevations in the 1980s, a comprehensive management plan was created in the early 2000s to address flooding (UDNR 2013). Now planning takes into account the natural fluctuation between wet years and dry years, recognizing streamflow variability and incorporating that in sustainable adaptive management plans moving forward (GSL Strike Team 2024; Steed 2024).

The roots of the nature-society divide run deep in our dominant worldviews within western society. Sociologists' William Catton and Riley Dunlap, scholars who were influential to the development of the field of environmental sociology, explain this through the Human Exceptionalist Paradigm (HEP) (Catton and Dunlap 1978, 1980; Dunlap 1980; Rosa and Richter 2008). The underlying assumptions laid out in HEP take a human-centered (i.e. anthropocentric) approach to interacting with the world, where

humans are viewed as exceptionally above or separate from nature and exempt from nature's constraints, while nature is viewed through a utilitarian lens as a set of resources for human use. These taken-for-granted ideologies encourage prioritizing human needs (including extractive economic development which can lead to the exploitation and degradation of natural resources) over environmental concerns, blinding our ability "to deal meaningfully with the social implications of ecological problems and constraints" (Catton and Dunlap 1978, p. 42). Further, these assumptions and ideologies are repeated through the process of socialization, which "makes it difficult to recognize the reality and full significance" of environmental issues (p. 44). Similarly, Freudenburg et al. (1995) explain how physical facts and social facts are influenced by socialization: physical facts that make up our biophysical environment are "shaped strongly by social construction processes" (p. 366), while social facts, which we assume to only exist in the realm of social phenomena, are shaped "by responses to the physical world" (p. 368). The act of assigning meaning or definition to entities (e.g., underlying assumptions about nature, society, and our human relationship with our natural environment) through socially constructed processes that emerge from our pre-conceived notions of reality are symbolic as a reflection of ourselves and our values (Greider and Garkovich 1994).

The nature-society divide is demonstrated in the way Utahns interact with, understand, and use water. Briefly exploring the mythologies of the Old West, where Manifest Destiny encouraged early settlers to occupy Utah, sheds light on this. These ideologies included the religious belief that God granted humans "dominion over nature" with a responsibility to "make the desert bloom" (Crimmel 2014 p. 44). However, an obstacle stood in the settlers' way: aridity. This defining characteristic of the American

West imposed a natural restriction to settlement and growth. Important to note, aridity was not an issue in securing livelihoods for Native Americans in the area – early Fremont peoples and today's federally-recognized Tribal Nations: the Shoshone, Goshute, Ute, Paiute, and Navajo Nations – who have long inhabited these lands continue to hold physical and spiritual connections as active agents in stewarding Great Salt Lake ecosystems (Cuch 2000; Parry 2024; Simms 2023).

Early settlers strived to defy the natural constraints of the GSL watershed through "advanced technologies of irrigation" (Crimmel 2014, p. 63), starting in the mid-1800s to the 1900s such as "dams, canals, and pipelines" to divert natural runoff for human uses (Abbott et al. 2023, p. 5). These water projects "allowed Western cities to grow beyond their natural capacities and allowed agriculture to flourish in places where agriculture should not exist, or should exist only on a small scale" (Crimmel 2014, p. 212). Today, this "complicated system can store and deliver millions of acre-feet of water per year" (Steed 2024, p. 8).

During the 19th century an American scientist and conservationist named John Wesley Powell challenged this "dream of an American empire knowing no environmental constraints" (Worster 2009, p. 114). He proposed the idea that the West's arbitrary political boundaries abide instead by the natural limits of watersheds, arguing that these "should become the definition of [and] the foundation for, local and regional government" (p. 118). According to Powell, dividing land by political boundaries "ignored the realities of aridity" (Crimmel 2014, p. 222). This could be one of the reasons that explain Utahns' high consumptive water use. Much to his dismay, however, Congress dismissed his urgency and disregarded his suggested watershed guidelines.

Sentiments that stress the importance of treating natural boundaries with respect are echoed in work by John Bellamy Foster, an environmental sociologist and Marxist scholar who uses an eco-Marxist lens to critique capitalism and its impact on society and ecology (Foster 1999; Foster, Clark and York 2010; Stuart 2021). In Foster et al. (2010), they explain how HEP logics praising human ingenuity of technological innovations allow us to violate physical limits or 'barriers' of nature, harming not only nature, but humans too (pp. 39-40). These ideologies within our dominant western worldviews have given rise to extractive, exploitive and growth-driven capitalism. Expanding on this, Foster et al. discuss metabolic rift theory which entails a socio-ecological metabolic interaction, i.e., a dialectical relationship between people and nature (p. 401). With a focus on soil health, Karl Marx highlighted how capitalist agriculture would lead to an ecological rift by disrupting soil nutrient cycle and consequentially, a social rift by disrupting large-scale food production systems and economies (Stuart 2021, p. 59), becoming a "robbery system exhausting natural wealth for the sake of private profit" (Foster et al. 2010, p. 405). Just as capitalism has resulted in a rift of soil health as Marx observed, it has also impacted the health of the GSL. Though technological advances like water projects "allow us to live beyond our means", these are often done so in places where we realistically and sustainability should not (Crimmel 2014, p. 212). When reflecting on Commissioner Steed's GSL Strategic Plan, Abbott mentions how "the pathway to continued growth, whether that's in population or economy, is through recognizing that there are limits and achieving water security by living within our means" (Fabrizio 2024). Ignoring these watershed boundaries for the sake of 'making the desert

bloom' has resulted in the depletion of the GSL as we know it today. This unsustainable growth continues today, *unrestricted*.

Opposite of growth is degrowth which centers around the need to reshape our growth-driven capitalistic system instead to a system based on communal caring: "At the heart of degrowth is a collective endeavor to make life viable and enjoyable through material and meaningful support not driven toward profit" (Kallis et al. 2020, p. 71). According to literature on degrowth, there is need for a complete radical system shift towards a socio-ecological revolution based on eco-socialist degrowth (Foster et al. 2010; Kallis et al. 2020; Stuart 2021, p. 103). "What is needed, in other words, is a green cultural revolution, in which humanity as a whole radically redefines its needs in relation to community, equality, and sustainability" (Foster et al. 2010, p. 115).

The way we construct things matters (Greider and Garkovich 1994). Therefore, this history highlights the perceptions of how Utahns understand water and ultimately influences how they interact with water. Current legislation has addressed these unsustainable frameworks within the public trust doctrine to discourage the 'use it or lose it' practice and re-defined water that returns to the GSL as a 'beneficial use' rather than a 'waste' (Utah State Legislature 2022a). Though water-related legislation like H.B. 33, H.B. 410, H.B. 429, S.B. 118 (Utah State Legislature 2022a, 2022b, 2022c, 2023b) and other recent efforts are monumental steps in the right direction, according to lake scientists and advocates, "they are not adequate to help the lake through its current crisis" (Abbott et al. 2023, p. 12). This is explained in greater detail in the following sections.

One way to address this critique in water management decisions may be through exploring alternative earth-based frameworks that recognize the interconnected

relationship between nature and society or, in other words, by engaging with worldviews that bridge the nature-society divide. In response to the HEP issue, Catton and Dunlap (1978) propose an alternative paradigm called the New Ecological Paradigm (NEP), which realizes the falseness of the dichotomous notion between nature and society. Instead of a human-centered, or anthropocentric perspective, the NEP holds an earth-centered, or biocentric perspective. Potentially adopting NEP is not meant only to more adequately address environmental problems, but to shift how society, leaders and sociologists' approach and conduct their work (Catton and Dunlap 1980, p. 35). The assumptions within NEP include how humans are interdependent with the earth (we are not special or above any other species), our actions affect our physical environments and inversely the same environment affects us, and growth must plateau or even decrease since it is unrealistic (as literature on degrowth suggests) to grow exponentially on a planet with finite resources (Catton and Dunlap 1978, p. 45). Crucial to highlight, there are others, including and especially Indigenous communities and scholars, who already understand that what is good for nature is also good for society, urging for the adoption of different ways of being and relating with nature that is guided by Indigenous leaders (Fenelon and Alford 2020; Gilio-Whitaker 2019; Kimmerer 2013; Martinez, Cannon, et al. 2023; Martinez, Seraphin, et al. 2023; Montgomery 2022; Norgaard 2019; Norgaard and Fenelon 2021; O'Donnell 2020 et al. 2020; Parry 2024; Reo and Ogden 2018; Salmón 2000; Simpson 2014). This will be explained more in the *Nondominant Paradigms* section.

While the HEP/NEP debate and even the concept of the NEP is somewhat dated, this concept demonstrates the parallel shift in thinking that we need when it comes to

environmental issues. In the context of the ecological crisis of the GSL desiccation, we need a paradigm shift from current water policies and conservation management towards alternative frameworks such as RoN and MSJ, though such a change is unlikely to occur given the conservative political environment in Utah which will be discussed in the *Theoretical Perspectives* section. In moving forward, I will not be engaging with the HEP/NEP survey scale, instead focusing on RoN and MSJ as current examples that represent this shift. Further, when referring back to the underlying assumptions in HEP/NEP, I will use the terms 'anthropocentrism' and 'biocentrism'.

Neoliberalism

Neoliberalism is "a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by" privatization, free markets, free trade and deregulation of everything (Harvey 2007, p. 2). In this framework state intervention is limited except when preserving this institutional framework so as to be "as friendly to business as possible" (Mayer et al. 2022, p. 736). Further, neoliberalism has a desire for low government oversight of corporate and capitalist activity which, due to its focus on growth-driven accumulation of goods and wealth, requires extraction and exploitation of both human labor and natural resources (Foster et al. 2010; Kallis et al. 2020; Norgaard 2019; Norgaard and Fenelon 2021).

Though the beginning of neoliberalism in the U.S. first emerged in the 1970s as a solution to the crisis of stagflation (where capital accumulation resulted in high rates of unemployment and increasing inflation) to restructure the economy through privatization and deregulation (Harvey 2007, p. 14), it didn't become the "dominant system of

governance around the world" (Mayer et al. 2022, p. 754) until 1979 when Margaret Thatcher was elected as Prime Minister of the U.K., and 1980 when Ronald Reagan was elected as U.S. President (Fremstad and Paul 2022; Harvey 2007). Ever since Reagan entered office, neoliberal thought that strongly appeals to American individualist values of freedom and human dignity has been embedded in the policy and cultural systems within the U.S. (Harvey 2007; Malin et al. 2017). As this political ideology now occupies influential space within the media and educational, financial, state and international institutions, this line of thought has become hegemonic (Harvey 2007, p. 3). In fact, this framework has become so ingrained in the United States, "that to question the logic of free markets is to be anti-American or antifreedom…the core assumptions of neoliberalism are rarely challenged" (Malin et al. 2017, p. 537). Given the dominance of this framework worldwide and in the U.S., this is likely the socioeconomic mechanism taking place in influencing Utah's economy, as well as a majority of water policy and conservation management measures.

To address environmental degradation issues, a neoliberal approach would involve implementing market-based mechanisms like incentives for companies, industries, developers, property owners, etc. to engage in environmental protection. As the assumptions within neoliberalism focus on individual liberty and freedom, these incentives must be optional or engaged in voluntarily. In neoliberal logic, the government should not intervene with the market. Even though "environmental researchers have long argued that regulations are one of the most effective tools available to meet environmental targets" (Fremstad and Paul 2022, p. 6), government regulations are not seen "as useful tools to shape markets," rather, they are seen as unnecessary restrictions

which “increases the cost of doing business and weakens the economy” (p. 3). Consequentially, through the deregulation of everything including “shrinking of the state’s capacity to provide social safety nets, environmental protections, and other measures” (Mayer et al. 2022, p. 736), free-market ideologies prioritize jobs and economic growth over environmental and societal health considerations (p. 756). This ties to the underlying assumptions in anthropocentric worldviews present in the nature-society divide which disregard how the environment is intricately connected to the society and economy. Work from environmental sociologists consistently reminds us that if the environment is neglected in favor of the economy and capitalism, there are environmental and social consequences that in turn harm the economy (Foster et al. 2010; Kallis et al. 2020, Stuart 2021). Prioritizing economic development can lead to reduced environmental concern and increased risks to public health. This is seen, for example, in fossil fuel energy systems where neoliberalism has normalized the development and extraction of oil and gas (Malin 2014; Malin et al. 2017; Mayer et al. 2022).

In a case study among small-scale farmers in Pennsylvania, Malin (2014) describes how neoliberal market-based logics contribute to a new normal of neoliberal governmentality where “decisions filter through cost-benefit frameworks, normalizing market privilege and impacts of development” (p. 21). These influence farmers’ decisions on whether or not to engage in hydraulic fracturing to further natural gas development. Observations from the farmers sampled in the study reveal how market-based neoliberal logics framed concerns related to the environmental impacts of fracking as irrational compared to economic benefits, where “environmental degradation was seen as a necessary cost” (p. 23). Malin attributes part of this normalization to the economic

vulnerability of small-scale farmers, where neoliberalism creates a paradoxical relationship that influences “limited access to agricultural markets and state social safety nets, predisposing [small-scale farmers] to need financial support from private corporations interested in leasing their land” (p. 20). This is supported in Mayer et al. (2022), who conclude that “neoliberalization often produces opposite economic outcomes as are promised by deregulation and the ‘freeing’ of the market” (p. 756).

Similar to the ways neoliberalism has influenced the normalization of oil and gas energy governance, it can also be seen as an influencing factor in Utah water governance. Since the 1900s, Utah has normalized increasing water diversions upstream through “subsidized water projects” like “dams, canals and pipelines” that have “led to unsustainable water consumption”, and consequentially the depletion of the GSL (Abbott et al. 2023, p. 5). However, as explained in the *Review of Legislative Action* section of this paper, thanks to growing awareness of the GSL issue and pressure from environmental advocates, recent efforts made by Utah policymakers now acknowledge the complex environmental and social values of the lake. While these values are now acknowledged in addition to economic values, strategies to address the lake do not prioritize such concerns. As with the case on hydraulic fracturing in Pennsylvania (Malin 2014) where the concern over environmental degradation imposed by hydraulic fracturing was seen as irrational when compared to rational benefits that hydraulic fracturing could bring to the economy, the same thing has happened in Utah on water management and development. Strategies to address the shrinking of the GSL are usually implemented through technological fixes or neoliberal market-based mechanisms. This is no surprise, given how the dominant economic system of capitalism views environmental

crises as technical problems, with solutions to these problems focused on technological fixes and relying on markets (Foster et al. 2010). Pulling from Marx's metabolic rift theory, Foster et al. reminds us that capitalism is responsible for tearing rifts in society and ecology. Technical fixes, like ecological modernization, rely on advancements in technology to engineer our way out of environmental issues like increasing efficiency of natural resource use (e.g., energy, water, etc.). However, this only 'greens' capitalistic development, creating a paradoxical effect; since this approach operates in a growth-dependent capitalist system, increasing efficient use of natural resources would end up increasing natural resource consumption (Foster et al. 2010; Stuart 2021). Though Stuart (2021) asserts that there is no sound evidence for an ecological modernization approach to be effective, others provide a more thorough examination (for more on this see the literature on ecological modernization: Bond 2022; Buttel 2020; Fisher and Freudenburg 2001; Mol 2002; Spaargaren and Mol 1992).

In the context of the GSL, technological solutions have involved increased investment in water optimization technologies to reduce water use through S.B. 118 (Utah State Legislature. 2023b), cloud seeding which involves "artificially augmenting the amount of precipitation that falls inside the basin" (Steed 2024, p. 33), and engineering solutions like raising or lowing the adaptive management berm to manage water and salinity levels, and dust mitigation efforts as a back-up to potentially experiencing similar impacts of Lake Owens and Mono Lake (GSL Strike Team 2023, 2024). As far as market-based solutions, the recent Great Salt Lake Strategic Plan discusses ways to shift around existing water such as through water market-transactions. These involve finding ways for farmers, who hold the majority of water rights, to

voluntarily engage in water banking, water leasing and/or split season leasing (Fabrizio 2024; Miller 2022; Steed 2024). The crucial aspect that makes this a neoliberal approach is that leasing water rights must happen *voluntarily*. The Instream Water Flow Amendments bill from the 2022 legislative session is a pathway for this (Utah State Legislature 2022a), allowing water right shareholders the *option* to donate or lease their water to the GSL through the Watershed Enhancement Trust (Miller 2022; Utah State Legislature 2022b). However, according to the GSL Strike Team and the GSL Strategic plan, further technological solutions are needed, such as increased investment in water monitoring technologies to ensure water shepherded to the GSL does in fact make it all the way to the GSL (GSL Strike Team 2024; Steed 2024). This would address the concern held by farmers regarding if water actually makes it to the lake (Larsen 2023a). As mentioned earlier by Abbott, right now only 6% of water conserved makes it back to the lake (Fabrizio 2024).

In finding pathways forward, it is important to recognize the challenge that neoliberalism poses. In a research paper discussing support for renewable energy policy within the Intermountain West region, Givens et al. (2021) find that "support for a free market economic system" can "obstruct movement toward a renewable energy transition" (p. 114). In another paper, Fremstad and Paul (2022) identify three tenets of neoliberalism that act as obstacles to climate change action: decentralized democracy, low public investment, and deregulation of the economy. In the context of the GSL, the dominant worldview of neoliberalism can obstruct movement towards alternative frameworks based in ecological values like RoN or MSJ.

However, not all market-based logics inhibit action to meaningful environmental protection. Though there has been activism against neoliberalism on a number of environmental issues, there has also been acceptance of neoliberal logics (Malin 2014). Malin briefly reviews literature on different cases involving Indigenous communities in Ecuador, small-scale farmers in Chile and environmental justice advocates who have utilized and adapted market-based logics which, according to research, has encouraged desirable environmental outcomes (p. 21). These examples include how environmental-related management such as community forestry (McCarthy 2005), fisheries (Mansfield 2007), and environmental policy (Holifield 2004) can result in a hybridization between neoliberalism and nature (Malin 2014; McCarthy 2005). Community forestry sites are supplementary, rather than oppositional to neoliberal logics (McCarthy 2005, p. 1010). The quota systems in Alaska Native fisheries – which are a mechanism of privatization within neoliberalism – have a contradictory effect of neoliberal goals and social justice concerns; securing market value and at the same time protection from those who have been dispossessed by capitalism (Mansfield 2007). Residents in these communities have responded favorably to these systems "because it allows them self-determination in both market and subsistence economies" (p. 485). Lastly, the environmental justice movement influenced decision-making of the EPA in remedying hazardous waste sites through emphasizing compatible themes of neoliberalism such as "economic self-sufficiency" (Holifield 2004, p. 287).

Therefore, perhaps a RoN and/or MSJ approach could potentially work within markets in the existing systems, such as the instream amendments bill designed to transact water from different water rights holders, allowing that water to be held in

perpetuity for the GSL through the GSL Watershed Trust (Utah State Legislature 2022a, 2022b). However, while lake scientists and advocates agree that these actions take great strides in water management to address the GSL issue, they are still not sufficient; what may be needed in addition to these actions is a paradigm shift in values (Abbott et al. 2023; Crimmel 2014; Miller 2023; Seymour 2024). Reciprocal values are central within many Indigenous worldviews and the implementation of such values must be spearheaded by Indigenous leadership (Gilio-Whitaker 2019; Kimmerer 2013; Norgaard 2019; O'Donnell 2020 et al. 2020; Parry 2024; Whyte 2013). This paradigm shift is explained in more detail in the *Nondominant Paradigms* section.

Nondominant Paradigms

Before exploring RoN and MSJ, it is important to note how these frameworks stem from values that characterize many Indigenous epistemologies, ontologies and ethics. While there is a diversity of Indigenous cultures, many do share reciprocal values and kinship approaches that are in opposition to the nature-society divide and contest current capitalist and neoliberal values. Reciprocal values assume that humans and the more-than-human world hold responsibilities to one another, that the relationship between humans, land, water, fire, and other species is not one of dominion but one of reciprocity (Kimmerer 2013; Whyte 2013). This relationship practiced by many Indigenous cultures involves a kinship approach towards natural elements and other species (Celermajer et al. 2021; Chao, Bolender, and Kirksey 2022; Ishiyama and Tallbear 2022; Martinez, Cannon, et al. 2023). Enrique Salmón (2000), a member of the Rarámuri (Tarahumara) Indigenous people in Mexico and a Professor of American Indian

Studies Program at California State University, explains this kinship as “kincentric ecology” (p. 1331) which recognizes that “humans are at an equal standing with the rest of the natural world.” Humans have an interdependent relationship with nature and are responsible for practicing reciprocity with other species and ecosystems which promotes harmony (Cano Pecharroman 2018). This entails stewarding the land and caretaking for our more-than-human kin (Kimmerer 2013; Reo and Ogden 2018; Salmón 2000; Whyte 2013). This also involves the understanding “that what’s good for the land is also good for the people” (Kimmerer 2013, p. 195), because “The health of the people will always parallel the health of our water and environment” (Parry 2024, p. 9).

Dominant western worldviews tend to interact with nature as property to own, rather than an entity of equal standing. In the documentary *The Rights of Nature: A Global Movement*, Kirsti Luke, the Chief Executive of Tūhoe Te Uru Taumatua and member of the Māori tribe in New Zealand, questions western ideas of ownership of nature and makes the powerful statement: “No human owns your mother” (Goeckeritz 2020). In the United States, the concept of landownership was first introduced with the arrival of European colonizers who imposed their foreign worldviews, ingrained within the nature-society divide, onto the Native Americans. The settler colonial ideologies facilitated both immense ecological and social changes for the European’s ‘New World’, justifying the commodification of nature to be treated merely as an object or property to privately own resulting in mistreatment and degradation of both lands and Indigenous peoples (Cronon 1983). Martinez, Cannon et al. (2023) characterize this as “settler ecology, an ecological expression of domination through which settlers completely reshape ecosystems to meet their needs and worldviews” (p. 203).

Norgaard (2019) explains that colonialism goes hand in hand with capitalism. While colonialism focuses on assimilation, capitalism focuses on extraction (p. 28). Colonialism imposes the dominant view that commodifies nature as resources, which then capitalism extracts, ignoring the values and meaning that Indigenous peoples have attributed to nature (p. 28). As Norgaard links colonialism to capitalism, Fitz-Henry (2022, 2023) links white supremacy to the mix and examines the ways in which harm to people and ecosystems are enforced through the state/corporation nexus (2018, 2022, 2023).

In Anishinaabe ideologies, the reason for the degradation of our more-than-human world is due to societies neglecting our responsibilities of reciprocity. It is through these notions of respect, responsibility and reciprocity towards nature that Indigenous communities have long cohabitated with and sustainably managed their lands for centuries (Cano Pecharroman 2018; Kimmerer 2013; Reo and Ogden 2018; Whyte 2013). With this understanding, Reo and Ogden (2018) urge for the adoption of Indigenous knowledge and values in the context of environmental degradation because "Addressing global environmental change requires comprehensive and proactive approaches to Earth stewardship that value and incorporate diverse knowledge systems" (p. 1450). Looking to Indigenous leaders and ways of knowing offers explanations for how we got where we are, and offers "a multitude of sophisticated, time-tested, and pragmatic solutions" (Norgaard 2019, p. 239). These intimate insights on how to approach sustainable conservation management foster an ecological consciousness that can act as a powerful tool for re-approaching our relationship with nature, decolonizing our knowledge systems, and creating the sustainable future we need (Fenelon and Alford 2020;

Kimmerer 2013; Norgaard 2019; Norgaard and Fenelon 2021; Montgomery 2022; Simpson 2014; Whyte 2013).

In addition to current legislation on Utah water policies and management for the GSL, perhaps what is needed is a paradigm shift inspired by these relational values. According to Parry (2024), this paradigm shift needs to involve braiding together western science with Indigenous stewardship values "to create watershed institutions and create policy to steward our water and our environment and climate for future generations" (p. 10). However, such a shift requires advocating for Indigenous knowledge sovereignty and leadership in decision-making to avoid settler misappropriation of Indigenous knowledges. Indigenous sovereignty is "a community's right to self-determination and self-governance, [which] is intimately tied to the ability of Indigenous peoples to exercise, renew, and protect Indigenous knowledges that are place-based and culture-specific" (Martinez, Seraphin, et al. 2023, p. 149). Misappropriation of Indigenous knowledge can take place through a Traditional Ecological Knowledge rush, or "TEK rush" where "settlers respond to large-scale environmental change" through exploiting this knowledge "for the benefit of settlers and the settler state…leaving settler colonial relations of power and property largely intact" (p. 151). Colonialism is not just a thing in the past; dominant western ideologies contribute to ongoing practices of colonialism embedded in contemporary social structures that continue to objectify nature, and either intentionally or unintentionally silences the voices, experiences, and contributions of Indigenous individuals and groups in academic settings and beyond (Gilio-Whitaker 2019; Martinez, Cannon, et al. 2023; Martinez, Seraphin, et al. 2023; Mills 1997; Montgomery 2022; Norgaard 2019; Norgaard and Fenelon 2021; Simpson 2014). That is

why it is important to include Indigenous-led collaboration in environmental management efforts. As mentioned earlier, GSL advocates are currently inviting Utah lawmakers to engage with and "Seek guidance from Indigenous leadership to repair our relationship with water" (Seymour 2024).

Rights of Nature

RoN is an earth-centered framework asserting that nature (e.g., trees, mountains, rivers, and lakes) deserves to be protected and recognized as entities with legal standing (CELDF 2022; Earth Law Center 2024; Stone 2010). This biocentric legal strategy is also a social movement that is steadily gaining momentum at the local level among community groups across the world as a useful alternative to managing natural resources and protecting ecological diversity. In 2008, Ecuador was the first country to include RoN legally into their constitution, followed by Bolivia in 2009, then New Zealand and others (Borràs 2016; Cano Pecharroman 2018; CELDF 2024; Earth Law Center 2024; Fitz-Henry 2018, 2022; Lyons 2022; O'Donnell et al. 2020; O'Donnell and Talbot-Jones 2018; Stone 2010; Te Aho 2019). For the most part, court "rulings have been more prevalent regarding the rights of rivers than those of other ecosystems" (Cano Pecharroman 2018, p. 6). For instance, in 2011 the Vilcabamba River in Ecuador was granted rights in response to environmental damages caused by human construction and development. In 2016, Colombia received legal rights in response to illegal mining that was polluting the Atrato River. In 2017 the Ganga and Yamuna Rivers in India also received rights. Additionally earning legal personhood in 2017 was the Whanganui River in New Zealand (Cano Pecharroman 2018; Te Aho 2019).

Support for RoN has also begun to appear in the U.S. in places like California, Colorado, Ohio, and Pennsylvania, just to name a few, though not all have been successful (CELDF 2024; Fitz-Henry 2018; Garcia-Navarro 2019; Hufham 2024; Hynek 2022). In 2014, the people of Grant Township in Pennsylvania successfully formed a community bill of rights designed to protect the Little Mahoning Watershed. However, later that same year the Pennsylvania General Energy Company sued the Township and RoN for the watershed was denied (Fitz-Henry 2018). Similarly, in 2019, community members in Toledo, Ohio formed the Lake Erie Bill of Rights (LEBOR) which "is the first law in the U.S. to secure legal rights of a specific ecosystem" (CELDF 2024), though it was struck down a year later. The Yurok Tribe in California, however, was more successful in their feat of securing RoN for the Klamath River (Garcia-Navarro 2019; Hufham 2024). More recent success in the U.S. also includes three communities in Colorado – Crestone, Nederland, and Ridgway – that "have all created resolutions with the collective goal to give Nature a voice in local government and, eventually, result in statewide action to permanently protect and restore Colorado's ecosystems" (Hynek 2022).

Prior literature on RoN highlights the need for a paradigm shift in our legal systems; one that transitions from anthropocentric approaches to biocentric ones (Borràs 2016; Cano Pecharroman 2018; Gilbert et al. 2023). An anthropocentric approach towards environmental protection focuses on ensuring a healthy environment for the sake of human well-being (Borràs 2016, p. 115). In other words, nature is valued only instrumentally as an object to exchange or commodify, rather than valued intrinsically as an entity with inherent worth that "should be protected for its own sake" (Gilbert et al.

2023, p. 369). Borràs (2016) adds that “Within this [anthropocentric] paradigm, the recognition of a human right to the environment cannot be sufficient to ensure the protection of the environment” (p. 129). O’Donnell and Talbot-Jones (2018) discuss how the public trust doctrine is an example of this, which “places emphasis on the public use of natural resources rather than the protection of nature itself” (p. 3). Alternatively, biocentrism takes a more holistic approach where “nature becomes not the object of protection but a legal subject: all forms of life have the right to exist, persist, maintain and regenerate their vital cycles” (Borràs 2016, p. 129).

Cano Pecharroman (2018) acknowledges the challenge that this paradigm shift would impose on the tension between balancing environmental protection and development, raising the concern that respecting nature would inhibit economic growth and development. However, she offers the perspective that “we only need to develop enough to live well and in harmony with nature” (p.10). She explains how an anthropocentric approach embedded in growth-driven capitalism is “associated with a perpetually increasing pattern of natural resource exploitation and growth”, and how “In an earth-centered paradigm, the rights of humans do not clash with the rights of nature because they have the same objective: to live in harmony.” Therefore, she concludes that “if this paradigm was followed, the human approach to development would also shift.”

Clearly, the RoN approach is more than just granting nature legal standing in court. This paradigm shift also involves “a radical move away from the assumption that nature is property” (Borràs 2016, p.114). In the U.S. legal system, nature is currently treated as property under environmental law, making environmental law a subset of property law (Fitz-Henry 2018, p. 89). When nature is treated merely as property, “The

consequence is that domestic laws and regulations on environmental protection effectively legalize environmental damage by regulating how much pollution or natural destruction of nature may lawfully occur" (Borràs 2016, pp. 128-129).

Once a RoN approach is successfully ruled by a government to protect an ecosystem, prior research finds implementation and enforcement challenges (Cano Pecharroman 2018; Te Aho 2019, p. 1620). RoN can also pose unintended consequences if not done properly. In the case of Bogatá, Colombia, in the Amazon, this strategy could end up further oppressing certain groups of people (Lyons 2022). Incorporating biocentric rights into legislation is a powerful thing – ONLY when judges are trained on the complex realities of the area's historical context and socioenvironmental conflicts, and open up needed community-driven dialogue with local Indigenous peoples whose voices, knowledge and decisions are often excluded (p. 56). Recognition needs to be given to Indigenous communities whose knowledge contributes to the RoN framework. Potential solutions include putting normative assumptions aside on what is thought of as right, train judges, focus on Indigenous community-led decisions (Intercultural pact), and create "unexpected alliances" (p. 71) through dialogue on conflicts and disagreements among all relevant actors/stakeholders.

Further, it is just as important that these voices are given space to lead the way when it comes to environmental protection: "The proliferations of sentences recognizing rights of nature cannot occur at the expense of excluding the voices of inhabitants who are born in, live in, die in, and defend the same territories and ecosystems that are being legally recognized and protected, only with their participation as an afterthought" (pp. 72-73). If anything, diverse voices need to be at the table (Gilio-Whitaker 2019; Norgaard

2019; O'Donnell 2020 et al. 2020, or else Indigenous communities may become disempowered due to the lack of representation in water management policy decisions, as was the case for the Kurdish community when water management decisions were made for Lake Urmia in Iran (Henareh Khalyani, Mayer, and Norman 2014). This is something that Utah is lacking when it comes to the management of the GSL. Again, Darren Parry, who commented on the GSL Watershed Enhancement Trust that came out of the 2022 Utah legislative session (Utah State Legislature 2022b), critiqued how Indigenous voices are still not at the table in the management of water in Utah (Larsen 2023d).

In the context of the GSL desiccation in Utah, a RoN approach could look like extending legal personhood to the GSL, granting the lake its own rights to water so as to maintain a healthy balanced ecosystem, and appointing legal guardians to speak on behalf of the lake. Considering the recent developments mentioned earlier among GSL-related advocacy groups including the resolution for rights for the GSL (SOGSL 2024b) and the GSL lawsuit (Center for Biological Diversity 2023; Larsen 2023b), a RoN approach could indeed become a very realistic strategy for saving the GSL. Though with the pushback from H.B. 249: Legal Personhood Amendments, which is essentially an anti-RoN bill against granting nonhuman entities personhood, such a strategy will take longer to achieve (Utah State Legislature 2024a).

Interestingly though, the U.S. legal system is already familiar with granting legal personhood to non-human entities. However, these are only applied to corporations. In an article challenging corporate personhood, Fitz-Henry (2018) explores the debate between rights for nonhuman entities between corporations and ecosystems, raising questions about "how U.S. law currently imagines, solidifies, defends, and polices the lines

between personhood and property, granting and withholding “rights” to a range of nonhuman entities in ways that remain strongly biased toward corporations” (p. 86). He examines court cases in Pennsylvania that utilize similar language used by corporations to justify legal rights, and juxtaposes that language by applying it to the context of personhood for the Little Mahoning Watershed. Though the case for legal personhood for the Pennsylvania Watershed was denied, it opens the door for future contestation for the RoN framework (p. 95), contributing to growing grassroots momentum sparking “broader national conversations about what it means to be a rights-holder, and at whose expense…” which “exposes the legal architecture that so powerfully supports corporate persons at the expense of both communities and other rights-bearing nonhumans” (p. 96).

Critics of RoN fear that the strategy of establishing legal personhood for ecosystems will result in “frivolous” or “illegitimate” court cases (Fitz-Henry 2018, p. 96), which is evident in the response of the House Business and Labor Committee on the opposition of H.B. 249 (Hufham 2024; Williams 2024). Granting legal personhood to the GSL is a challenging goal – especially in the state of Utah where the idea of giving nature a voice goes against dominant ideologies like the nature-society divide and neoliberalism which act as barriers to such an implementation. Though the dominant worldview in Utah, which consists of the LDS religion, holds strong environmental stewardship ethics (Handley 2001) as seen with the work the LDS Church has done with water efficiency efforts (Larsen 2023c; Waddell 2024), the faith holds notions of human dominion over nature (Brehm and Eisenhauer 2006). This is opposite from relational approaches to nature within many Indigenous worldviews.

Not only would a RoN proposal go up against dominant worldviews engrained in the nature-society divide or neoliberal ideologies, it could also act in competition with social justice movements. Gathering support for protecting nature is difficult when there are politically marginalized people who are still fighting for justice (e.g., BIPOC, LGBTQ+, women and non-binary folks, etc.). However, seemingly different movements need not be in competition with one another. Fitz-Henry (2018, 2022, 2023) describes the state/corporation nexus and its impacts on both people and ecosystems since it is dominated by white supremacy and colonization. He suggests that through solidarity, movements like Black liberation and Indigenous-led decolonization can mutually benefit (2022, 2023). MSJ might provide an alternative framework that simultaneously engages injustice against oppressed peoples and other exploited species and ecosystems.

Multispecies Justice

MSJ is similar to RoN, only that instead of focusing solely on justice for nature, this framework offers a holistic approach that takes into consideration justice for multiple species, both human and non-human. MSJ was first coined by Donna Haraway (Haraway 2013) and has more recently been utilized and expanded by scholars as a framework capable of examining how dominant oppressive social structures (e.g. settler colonialism, racism, patriarchy, and capitalism) simultaneously exploit politically marginalized peoples and more-than-human species and ecosystems (Chao et al. 2022). These oppressive structures intersect with one another and are all enforced by the power of the state and the state/corporation nexus (Fitz-Henry 2022, 2023; Pellow 2018; Norgaard 2019; Norgaard and Fenelon 2021). Further, this framework seeks “to understand the types of relationships humans ought to cultivate with more-than-human beings so as to

produce just outcomes" which comes from adopting "relational ontologies" (Celermajer et al. 2021, p. 120). Furthermore, via the context-dependent application of various typologies of justice (such as transformative justice, distributive justice, or procedural justice, to name a few), MSJ seeks to identify solutions that restore social and ecological wellbeing at various scales (Chao et al. 2022).

RoN and MSJ are not just about adopting new worldviews or paradigms, rather, it requires the difficult "work of fostering deliberation about radical political pathways for making amends for ongoing colonial violence" (Fitz-Henry 2022, pp. 344-345). Fitz-Henry emphasizes how although RoN has been recognized in more and more countries, it does not mean it is "a productive move toward bi-cultural legal pluralism" (p. 348), rather, it "must always foreground political support for Indigenous sovereignty." Thus, the importance of involving Indigenous leaders in not only the management of natural resources (Gilio-Whitaker 2019; Henareh Khalyani et al. 2014; Martinez, Cannon, et al. 2023; Martinez, Seraphin, et al. 2023; Montgomery 2022; Norgaard 2019; Parry 2024), but also when engaging with RoN frameworks as well (Lyons 2022; O'Donnell 2020 et al. 2020; O'Donnell and Talbot-Jones 2018). Tschakert et al. (2021) summarize this perfectly: "This pervasive exclusion, silencing, and dehumanizing based on race, class, or gender, and in particular harm done to Indigenous peoples, is often replicated in climate justice advocacy when devoid of understandings of colonial and capitalist domination" (p. 3).

Further, Fitz-Henry describes how within the Black Lives Matter movement, there is tension between "conflating struggles for full human personhood with struggles for the fiction of legal personhood for ecosystems" (p. 353). In other words, this questions how it

could possibly be acceptable to fight for non-humans to have rights when humans are without basic 'bread of and butter' justice "e.g., affordable housing, education, and healthcare" (p. 339). However, the concept within the RoN framework highlights how rights for nature "are not the opposite of human rights, but rather human rights are a subset of natural rights, because humans are a part of nature" (Borràs 2016, p. 143). Fitz-Henry concludes by saying how though Indigenous decolonization movements and Black liberation movements have different focused agendas, at the end of the day, we are all human and we all cannot thrive without a sustainable environment (p. 355). Further, the best way to obtain justice for all is to find common ground and combine efforts to fight against the "system of law and government [that is] founded in white supremacy and colonization and is dominated by corporations" (p. 354).

The impacts of the GSL's desiccation simultaneously affects more-than-human species reliant on the lake, such as brine shrimp and the Wilson's phalarope (Carle et al. 2024; Larsen 2024; Seymour 2024), and politically marginalized humans. As mentioned earlier, low-income and racially diverse neighborhoods and communities within Salt Lake City's west side are disproportionately impacted by air pollutants from different sources including lakebed dust (Cabrera 2023; Larsen 2022; Westside Coalition 2023). With these impacts in mind, there is a need to radically re-define our notion of justice towards an understanding that incorporates 'moral considerability' (Wienhues 2020) for both humans and non-humans impacted by the GSL desiccation. When addressing the GSL issue, McCool states how, "We cannot have justice without water justice" (Crimmel 2014, p. 228) and that this justice should include the ethical "responsibility to consider how our actions affect others, including other species" (p. 229). The "notions of

responsibility and relationships", as laid out earlier within many Indigenous values, "inform deep criteria for justice" in relation to sustainable futures (Norgaard and Fenelon 2021, p. 485); and according to Whyte (2013), it is important to view this "justice as situated within systems of responsibilities" (p. 20). Justice, or MSJ for the GSL could look like: incorporating a holistic water management approach that takes into consideration securing water rights for the lake (a RoN approach); establishing environmental stewardship responsibilities inspired by values within many Indigenous cultures to ensure that all species that inhabit and migrate to the lake can continue to exist and flourish there; and addressing the human aspect of MSJ by finding ways to safeguard public health especially for groups that have been subject to oppression and/or political marginalization.

As I conclude this *Nondominant Paradigms* section of my paper, I want to end on the paradigm shift from anthropocentric to biocentric worldviews that RoN literature calls for (Borràs 2016; Cano Pecharroman 2018; Gilbert et al. 2023) while applying it to the context of water management in addressing the shrinking of the GSL. McCool touches on this need for a paradigm shift in proposing solutions for Utah water issues (Crimmel 2014). He expands on Aldo Leopold's classic Land Ethic to call for a new water ethic in Utah, which would entail understanding socioecological systems as interconnected and recognizing the responsibility of stewardship (p. 223). Like John Wesley Powell, who understood that "Protecting the watershed requires learning to work toward the common good" (Worster 2009, p. 125), McCool believes that adopting a new water ethic should involve cooperation and a "heightened sense of community" (Crimmel 2014, p. 229). Similarly, the GSL Strategic Plan highlights the need for a new model in

water management (Steed 2024, p. 10). Though Abbott congratulates this plan for offering “a framework recognizing that our wellbeing depends on the lake, of our watershed, our home” (Fabrizio 2024), the values within that plan are more focused on instrumental rather than intrinsic values. Therefore, while the new model that Steed (2024) proposes as well as recent legislative efforts for water management recognize the environmental and societal importance of the lake, it is done from an anthropocentric worldview, which according to Borràs (2016) is not “sufficient to ensure the protection of the environment” (p. 129).

Theoretical Perspectives

Political Orientation and Neoliberal Ideology

For this study, I engage with theoretical perspectives on how political orientation and support for a free-market economy system influence environmental attitudes and consequentially support for environmental policies. I apply these theoretical conceptions to this context of understanding what shapes support for different solutions to address the GSL desiccation in Utah, with specific focus on RoN and MSJ approaches. Prior research conducted in the U.S. Intermountain West region (Givens et al. 2021; Howe et al. 2015; Olson-Hazboun, Briscoe, Givens and Krannich 2019; Olson-Hazboun, Krannich and Robertson 2017) consistently characterizes Utah as a politically conservative region. According to previous research, political ideology is consistently a strong predictor for environmental concerns, views and support for environmental protection (Givens et al. 2021; McCright 2016; McCright et al. 2016; McCright, Xiao, and Dunlap 2014; Olson-

Hazboun et al. 2019, 2017). For example, Xiao and McCright (2014) find that "politically liberal adults perform more private environmental behaviors than do their…politically conservative counterparts," (p. 253). They operationalize political ideology as conservative to liberal. Party identification on the other hand, operationalized as identifying either as a Republican or Democrat, has a weak effect.

Further, there is a growing trend that political orientation influences polarization on environmental issues (Givens et al. 2021; McCright and Dunlap 2011b; McCright et al. 2014). Though it is clear from prior research that there is political polarization on environmental issues, we can't assume that these issues are correlated in the context of strategies to address the GSL desiccation in Utah. Political variables shape environmental views, but they can vary by issue. According to the literature, "public policy support varies based on geography, political viewpoints, and other factors" (Olson-Hazboun et al. 2019, p. 9). For example, in Utah we find there is less political divide on the topic of air pollution than there is for climate change (Olson-Hazboun et al. 2019). Understanding political polarization and its impacts on support for strategies involved in environmental protection (McCright et al. 2014, p. 258) provide useful insights to understanding political views in the context of support for different strategies to address the GSL desiccation.

This study builds off of Givens et al. (2021) who contribute work on anti-reflexivity theory (McCright 2016; McCright et al. 2016; McCright and Dunlap 2010). This theory asserts that there are forces that deter the ability to reflect upon the harms caused by industrial capitalist system. Givens et al. find consistent empirical support for the thesis in the context of concern for climate change, support for renewable energy

policy, and engagement in pro-environmental behaviors within the U.S. Intermountain West region (Colorado, Idaho, Montana, Utah and Wyoming). There are three forces of anti-reflexivity: “conservative political orientation, identification with the Republican Party, and support for the free-market industrial capitalist system” (p. 104). The free-market component of anti-reflexivity refers to neoliberal ideologies. Givens et al. (2021) utilize prior research on neoliberalism from Malin et al. (2017) who discover that these free-market ideologies are “an important predictor of a range of environmental attitudes” and concludes that the presence of this “reduces concern for environmental well-being and support for environment regulation.” (p. 527). Givens et al. (2021) conclude a negative association with environmental worldviews and “conservative political ideology, Republican political party affiliation, and support for the free-market economy” which “highlights the power of belief in the current free-market, industrial capitalist system to obstruct movement toward a renewable energy transition and extends the consideration of energy transition to the system scale” (p. 114).

Olson-Hazboun et al. (2019) also include political ideology and neoliberal ideology in their study, assessing support for renewable energy in the same Intermountain West Region. They conclude their work calling for future research on how political and neoliberal ideologies influence environmental policy support, specifically in the context of renewable energy as they explain “neoliberals’ support for an unregulated economy would likely lead them to dislike policies that artificially manipulate the energy market” (p. 9).

Based on this literature showcasing the influence of political orientation and neoliberal ideology on environmental attitudes and behaviors, I hypothesize the following associations:

Hypothesis 1: Politically conservative respondents are less likely to strongly support a RoN approach to the GSL desiccation than their liberal counterparts.

Hypothesis 2: Politically conservative respondents are less likely to strongly support a MSJ approach to the GSL desiccation than their liberal counterparts.

Hypotheses 3: Support for a free-market economic system will be associated with less support for a RoN approach to the GSL desiccation.

Hypothesis 4: Support for a free-market economic system will be associated with less support for a MSJ approach to the GSL desiccation.

Demographics

Prior literature controls for sociodemographic factors, such as age, gender, level of education completed, religious identity, race and income, that influence pro-environmental attitudes, concerns, perceptions and behaviors. When it comes to the variable of age, prior literature contains mixed findings (Hamilton, Hartter and Bell 2019; Howe and Mathieu 2018; Xiao and McCright 2012, 2014). Hamilton et al. (2019) find that younger generations, such as millennials, aged 18 to 39, are more likely to support and prioritize renewable energy and understand climate change than older generations, although support for these pro-environmental topics are increasing among every age group. “Age has significant positive effects on both climate and energy views” where young people, aged 18 to 29, respond favorably to renewable energy and climate change

more so that people who are over the age of 65 (p. 16). In another study that controls for age as it relates to environmental issues, Howe and Mathieu (2018) find that younger age groups (18-24, 25-34) are more likely than older age groups (55-64) to participate in environmental programs (pp. 8-9). In this case, the environmental programs were the focus of renewable energy sources for electric load control programs which aid in the management of energy consumption. Xiao and McCright (2012) find that age increases worry about health-related environmental problems. Two years later, Xiao and McCright (2014) hypothesize that younger and older people would engage in more environmental behaviors than middle-age people. However, their results showed no evidence of a statistically significant relationship. Given these mixed findings, I include the variable of age in this study to learn if it results in a statistically significant relationship on support for a RoN and/or MSJ approaches to address the GSL desiccation.

Previous literature consistently finds that gender is a strong predictor of environmental attitudes and behaviors (Briscoe et al. 2019; Kennedy and Kmec 2018; Stern, Dietz and Kalof 1993; Xiao and McCright 2012). Stern et al. (1993) explore pro-environmental attitudes by assessing three value orientations: concern for self (egoism), concern for others (altruism), and concern for nonhuman species and environments (biospheric). Their results suggest that gender differences on environmental concern are not mediated by value orientations; rather, it appears to be gender socialization that influences how women are more attentive to how the environment affects the things they value (p. 340).

Xiao and McCright (2012) use several years of data from the Gallup Organization's annual environment survey to understand gendered differences on

environmental concern, finding consistent support for both the safety concerns hypothesis and gendered risk perception hypothesis. These hypotheses posit that women are more concerned than men regarding safety around health-related environmental problems, and women hold higher risk perceptions than men on what environmental problems would pose to social and economic systems, which were indicated in the results (p. 1081). The authors say how "women may be more likely than men to support those public policies meant to protect or conserve environmental quality that are couched in terms of minimizing or managing risk" (p. 1080). From these findings I anticipate that due to the gendered differences in risk perception, women are more likely than men to support RoN and MSJ strategies to save the GSL, as saving the lake will minimize risks. In another study conducted two years later, Xiao and McCright (2014) utilize 2010 data from the General Social Survey to test the biographical availability argument, a theory that offers an explanation about gender differences in behavior engagement and applies it to understanding the differences in gender engagement between private and public environmental behaviors. Their study finds partial support for this thesis and confirms the hypothesis that women do engage in private environmental behaviors more so than men, and further, that there is no gendered difference in public environmental behavior engagement.

Kennedy and Kmec (2018) critique the gender differences on engagement in pro-environmental behaviors found by Stern et al. (1993) and Xiao and McCright (2014) for lacking to link these findings to "broader gender inequalities" (p. 301). Through an ecofeminist theory lens, they add to this gap in the literature by examining the connection between gendered engagement in environmental behaviors and economic status. Through

their study using data from the 2010 International Social Survey Program (ISSP), they confirm that women do engage in pro-environmental behaviors more so than men, while finding the connection that economic status plays: women self-report higher engagement in pro-environmental behaviors than men in all three measures of economic status: employment, full-time employment, and having workplace supervisory status.

Briscoe et al. (2019) utilize the three theories on gender socialization, safety concerns hypothesis, and ecofeminism in the context of transportation behavior to find that, consistent with other studies, women are more likely to engage in private pro-environmental behaviors than men. They also found statistical significance of women engaging more than men in public pro-environmental behaviors, except that result disappeared when controlling for other factors (p.12). Like in Kennedy and Kmec (2018), this study extends analysis on the broader gender inequities that can be understood through gendered differences in environmental behaviors. For example, Briscoe et al. (2019) briefly cite environmental justice literature (Pellow 2018) detailing how gender inequities and justice for society and the environment go hand-in-hand (p. 13).

Given the consistent evidence gender has on influencing engagement in environmental behaviors, I include this as a control variable for this study. The variable of education is also applied to understanding environmental attitudes and behaviors (Briscoe et al. 2019; Givens et al. 2021; Xiao and McCright 2014). Xiao and McCright (2014) describe the effect of education as they test the biographical availability argument. Whereas Xiao and McCright's analysis finds that adults with more education "perform more private environmental behaviors than do their lesser educated" counterparts (p.

253), Briscoe et al. (2019) find no statistical significance for education as it relates to engagement pro-environmental transportation behaviors.

In addition to being a politically conservative area (Givens et al. 2021; Howe et al. 2015; Olson-Hazboun et al. 2019, 2017), Utah also has a unique religious context. According to the Pew Research Center (2014), 55% of Utahns belong to the Church of Jesus Christ of Latter-Day Saints (LDS), though in recent years changes in the population has resulted in a decline to 42% (Cragun, Gull, and Philips 2023). The LDS religion is overrepresented in the Utah legislature, with 86% of legislative seats belonging to members of the LDS Church (Davidson 2021). While the LDS worldview contains a strong environmental stewardship ethic (Crimmel 2014; Handley 2001), Brehm and Eisenhauer (2006) note that LDS theology includes notions of human dominion over nature. Recall from previous discussion that this worldview stems from the nature-society divide. However, George B. Handley, a Professor of Interdisciplinary Humanities at Brigham Young University and an LDS Environmental Advocate, reinterprets LDS beliefs to find common ground on pro-environmental ethics. He cites from LDS doctrine the moral obligation and commitment to becoming environmental stewards of God's creations, and spiritually recognizing that all living things have "intrinsic worth" and the "right to enjoy posterity" (Crimmel 2014, pp. 68-70). This may be supported through the LDS Churches' donation of 20,000 acre-feet of water to the GSL (Fabrizio 2024; Larsen 2023c), and their steps in adopting water-wise practices (Waddell 2024). Handley argues that given these environmental stewardship ethics within the LDS doctrine, the root of the decline of the GSL lies in Utah's political ideologies, not religion (Crimmel 2014, p. 71).

Olson-Hazboun, Krannich and Robertson (2017) utilize survey data from 2014 in the Intermountain West region to understand the relationship between political orientation, religious affiliation and environmental attitudes in the context of support for renewable energy production and belief in climate change. They find a majority of respondents held the LDS faith, and that these respondents were more politically conservative than the other religious groups studied. Further, analyses indicate that political ideology is a stronger predictor than religious affiliation in determining environmental views, specifically, regarding views on climate change and renewable energy (pp. 206-207). Consistent with previous studies, Olson-Hazboun et al. support that religion has a negative relationship with environmental views, operationalized through the validated NEP scale, noting that respondents of the LDS faith held the strongest negative relationship. Interestingly however, "Mormons appear more likely than those of no religious affiliation to support renewable energy" (p. 207). In other words, LDS members have lower environmental concern than other religious faiths, except when supporting renewable energy.

The variables of race (McCright and Dunlap 2011a; Xiao and McCright 2012, 2014) and income (Briscoe et al. 2019; Givens et al. 2021) are included in prior research. McCright and Dunlap (2011a) study the conservative white male effect, finding that the variables of political identity, race and gender are significantly associated with climate change denial. In Xiao and McCright's 2012 study, they found that "seven total effects of race are statistically significant but weak, with nonwhites expressing slightly greater worry about health-related environmental problems in five years and slightly greater worry about global environmental problems in two years than their white counterparts"

(p. 1081). In Xiao and McCright's 2014 study, the variable of race resulted in a weak affect, finding that whites engage more in public environmental behaviors than non-whites, and finding no effect on engagement in private environmental behaviors. As for income, no statistical significance was found in Briscoe et al (2019). Theoretically, I would have liked to look at race and income, but based on limitations in the data I excluded these from analysis. This is explained further in the methods section.

CHAPTER 3: METHODS AND ANALYSIS

Data Overview

This study utilizes data from the Utah People and Environment Poll (UPEP), which is a statewide representative survey conducted in spring of 2023 by researchers at Utah State University affiliated with Utah State University's Community & Natural Resources Institute (CANRI). The purpose of UPEP is to understand Utah residents' attitudes and perceptions on environmental issues and to inform policies that might address these issues (USU 2023a, 2023c). This survey received approval by the Utah State University Institutional Review Board (IRB), with protocol #13287.

The survey is a 20-minute-long self-administered questionnaire that was taken either online or through a mailed booklet copy, with the online version offering both Spanish and English options. This involves a mix of questions designed by Utah State University faculty and graduate students, as well as validated questions used in prior survey research studies. Before distribution, the survey was refined through feedback received from an online pre-test conducted through Qualtrics with nearly 100 participants. Questions are divided into 16 different sections assessing topics ranging from perceptions of various environmental issues in Utah to various demographic characteristics.

The population of interest for this survey is adult residents in the state of Utah. A sampling frame pulled from a list of households was provided by the U.S. Postal Service. For the sampling design, the UPEP first employed simple random sampling to select 3,750 households from the U.S. Postal Service household list. For further randomization,

selected households were instructed to identify one household member with the nearest upcoming birthday and who is at least 18 years old to complete the survey. Following recommended guidelines (Dillman, Smyth, and Christian 2014), residents were invited to participate in the UPEP survey through four waves of contact. In the first wave, an advance letter was mailed out introducing residents to the survey questionnaire. This letter provided a link and a QR code for participants to access the online survey and also offered two incentives: a token pre-incentive of an environmental Utah themed sticker and, if the participants completed the survey, the incentive of being entered into a drawing to receive one of two $500 gift cards. To increase return rates, three subsequent waves were sent every two weeks to nonrespondents: the second wave included a mailed copy of the survey and a return envelope; the third wave included a Utah-themed postcard reminder; and the fourth wave included the final mailed copy of the survey and another return envelope.

A majority of respondents (70%) opted for the online version of the survey. Responses from mail surveys were entered into Qualtrics to build a database for analysis. Out of the 3,750 selected households only one was not used due to an incorrect address, making 3,749 viable for the study. A total of 442 Utahns completed the survey, resulting in a 12% (442/3749) response rate.

Variables of Interest

As mentioned earlier, I created two different questions within the Great Salt Lake section of the UPEP survey asking respondents to indicate how strongly they oppose or support a total of 18 different strategies to protect the GSL (Appendix A and Appendix B). Each strategy is measured on a five-point ordinal Likert-scale (1 = strongly oppose; 2

= somewhat oppose; 3 = neither oppose/support; 4 = somewhat support; 5 = strongly support). A few of the strategies were inspired by the policy options recommended in the 2023 Great Salt Lake Policy Assessment (GSL Strike Team 2023). For the purposes of this study, the two strategies of interest I analyze as key outcome variables focus on measuring Utahns' level of support for a RoN approach to save the GSL and a MSJ approach to save the GSL.

RoN is conceptualized as support for the GSL to have its own rights to water. I operationalize support for a RoN approach through asking respondents to select how strongly they oppose or support the following strategy aimed to protect the GSL: *"Change water rights laws to grant the GSL its own rights to water to guarantee a consistent amount gets to it."* This statement is coded as "gslpolicy_8" in the UPEP. Previously, I intended to also measure support for a RoN approach through analyzing the statement: *"Change water rights laws to further discourage 'use it or lose it' and encourage ranchers and farmers to lease out their water rights and divert water to the GSL."* However, H.B. 033 Instream Water Flow Amendments passed in the 2022 Utah State Legislature which already addresses updating water rights laws on this topic (Utah State Legislature 2022a). I operationalize support for a MSJ approach through asking respondents how strongly they oppose or support the following statement: *"Adopt an approach that takes into account justice for humans, animals, plants, and ecosystems."* This statement is coded as "gslpolicy_9" in the UPEP.

To understand different factors associated with the outcome of strongly supporting the RoN and MSJ approaches, I analyze two key predictor variables: political orientation and neoliberal ideology. Political orientation ("polidentity") is measured in

eight categories (1 = extremely liberal, 2 = fairly liberal, 3 = somewhat liberal, 4 = neutral, 5 = somewhat conservative, 6 = fairly conservative, 7 = extremely conservative, 8 = don't know/not sure), For analysis, I dropped the "don't know/not sure" group and re-coded the variable to "polidenity_2". This will be treated as a continuous variable in the multiple logistic regression analysis in Tables 2 and 3. To assess neoliberal ideology, this study utilizes validated question wording from Malin et al. (2017). Neoliberal ideology is measured by asking respondents to indicate whether they agree or disagree, using a five-point Likert scale (strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, strongly agree), to the following statements: an economic system based on free markets unrestrained by government interference automatically works best to meet human needs; a free-market economy is preferable to any other form of economic system; and preservation of the free-market system is more important than localized environmental concerns (Appendix C). Givens et al. (2021) reported a Cronbach's alpha of 0.80 (p. 109), a large value indicating a high degree of measurement reliability and a good rationale for combining answers from the three statements into a single index. Therefore, these three variables were re-coded by averaging the scores between the three statements into one: "freemarket_new". This new variable will also be treated as a continuous variable in the multiple logistic regression analysis in Tables 2 and 3.

Similar to the literature Givens et al. cites (2021, p. 109), I also control for standard sociodemographic variables, such as age, gender, and education (Briscoe et al. 2019; Hamilton et al. 2019; Olson-Hazboun et al. 2019; Howe and Mathieu 2018; McCright and Dunlap 2011a). Additionally, in consideration of the religious context in Utah, I control for religious affiliation (Olson-Hazboun et al. 2019, 2017). I initially

planned to include the variables of race and income in my analysis. However, after running preliminary descriptive statistics through SPSS, I determined that race lacks sufficient variation (i.e., a large majority is non-Hispanic White) and the variable of income (a) has a considerable amount of missing data, and (b) did not impact the findings for either of my main predictor variables in preliminary regression analyses. Therefore, these variables are excluded from this study.

Age was measured continuously, asking respondents to provide what year they were born. This variable was coded as "born", but later converted into age at survey. Initially, the nominal measure of gender in the UPEP survey had 4 categories: woman, man, transgender/Gender non-conforming/other, and a prefer not to respond option. For analysis, this measure was recoded as "gendermale0", a binary variable where 0 refers to 'male', and 1 refers to 'female/other'.

Education was measured on an ordinal scale, where respondents indicated the highest level of education they have completed (1 = some high school or less, 2 = high school graduate / G.E.D., 3 = some college but no degree, 4 = associates degree, 5 = technical/vocational degree, 6 = bachelor's degree, 7 = graduate or professional degree). Running descriptive statistics in SPSS revealed that only 2 respondents indicated 'some high school or less', and 27 respondents indicated 'high school graduate / G.E.D.' If those two categories were combined, making a total group of 29 respondents, it would be quite small, with adverse implications for my standard errors. Therefore, I combined these two groups with 'some college but no degree', and 'associates degree' and 'technical/vocational degree' into one category with a total 158 respondents. Ultimately, I

created 3 mutually exclusive dummy variables: ‘Less than 4 years of college’, ‘4-year college degree, but no graduate degree’, and ‘graduate degree’.

The variable of religion in the survey is a categorical variable with 9 different options: Atheist or Agnostic, Catholic (Roman), Church of Jesus Christ of Latter-day Saints (LDS), Jewish (Judaism), Muslim (Islam), Other Christian religion, Other non-Christian religion, something else, or no religious preference. It is important to note that the state of Utah has a unique religious context, with 42% of Utahns adhering to the LDS faith (Cragun et al. 2023). This is supported in the UPEP Descriptive Report indicating that nearly half (44.6%) of respondents selected LDS as their religion (Schad et al. 2023). Since the results lacked large subgroups in other religion categories, I recoded the 9-category variable into a binary variable that reflects this situation (0 = non-LDS, 1 = LDS).

Analytic Technique

To account for the multiple independent variables in this quantitative study, I employ inferential statistics to address two research questions and test four hypotheses through the approach of multivariate regression analysis. This approach analyzes the “impact of two or more independent variables on a single dependent variable”; the basic assumptions in this approach are that simple random sampling is used, there are no non-sampling errors, and the data used are continuous interval data (Babbie 2016, p. 466). Due to the ordinal structure of the dependent variables, I use multivariate logistic regression analysis. This involved recoding both RoN and MSJ as binary variables. For both of these variables, sizable majorities of Utah adults indicate some level of support. This can be problematic in logistic regression because odds ratios tend to diverge from

risk ratios when outcomes are “common,” namely 10% or more of the sample (Zhang and Yu 1998). Moreover, literature suggests that persons who strongly support liberal policies like RoN and MSJ are more likely than others to engage in pro-environmental behaviors (Sherman et al. 2016), making them of special interest for my study. Therefore, I created binary variables that distinguished Utahns who strongly support either RoN or MSJ from other participants who feel less strongly about this issue.

Unlike the UPEP Descriptive Report that used weighted data to estimate population proportions (Schad et al. 2023), my analysis uses unweighted data to estimate association between variables. When it comes to analyzing associations through regression analyses, it is sometimes preferable to work with unweighted data to avoid complications such as heteroskedasticity and biased and inconsistent parameter estimates yielding larger standard errors (Solon, Haider, and Wooldridge 2015; Winship and Radbill 1994). Therefore, I conducted unweighted logistic regression analyses through utilizing the statistical package of IBM SPSS Statistics 29.

Two tables were created, one for RoN (Table 2) and one for MSJ (Table 3), to test the aforementioned hypotheses aiming to understand the associations between these two outcomes (i.e., RoN and MSJ) and demographic characteristics, political orientation and neoliberal ideology. Each table shows findings from logistic regression analyses through a stepwise series of 3 models: the first model focuses on the association between the demographic independent variables and the respective dependent variable; the second model adds the first main predictor variable of political orientation to mix; and lastly, the third model adds the second main predictor variable of neoliberal ideology. Sequentially adding the two key predictor variables into the models allows us to understand how

accounting for each one affects our analyses. I use odds ratios, an intuitive way of expressing results from logistic regression that shows the strength and direction of an association (Agresti and Finlay 2009, p. 511), and confidence intervals to assess the statistical significance of results in Table 2 and Table 3.

CHAPTER 4: RESULTS

Table 1. *Descriptive statistics from the 2023 Utah People and Environment Poll (UPEP)*

Rights of Nature		
	Strongly support	28.60%
Multispecies Justice		
	Strongly support	37.40%
Political Orientation		
	Extremely liberal	5.10%
	Fairly liberal	16.60%
	Somewhat liberal	13.40%
	Don't lean to either side	12.20%
	Somewhat conservative	18.60%
	Fairly conservative	25.40%
	Extremely conservative	8.60%
Neoliberal Ideology		
	Mean	2.96
	s.d.	1.14
Age		
	Mean	53.28
	s.d.	17.83
Gender		
	Male	44.40%
	Female/other	55.60%
Education		
	No college degree	37.20%
	BA/BS degree	33.40%
	Graduate degree	29.40%
Religion		
	Not LDS	49.00%
	LDS	51.00%

Table 1 displays unweighted descriptive statistics for the dependent and independent variables I include in the logistic regression models in Table 2 and Table 3. Comparing the percentage of strong support for RoN (28.6%) and MSJ (37.4%) to the results from the weighted data in the UPEP Descriptive Report (Schad et al. 2023) shows only minimal differences: RoN (32.8%) and MSJ (39.7%). Respondent characteristics in this table reveal that a majority (52.6%) lean conservative, nearly 56% belong to the female/other category, and nearly half of the respondents are LDS. The average age of respondents is 53 years old, ranging between 19 to 93 years of age. The mean for neoliberal ideology is 2.96, ranging from a minimum of one to a maximum of five.

Results from logistic regression analyses are shown in Tables 2 and 3. In Table 2, I indicate how different variables predict the outcome of strongly supporting RoN through a series of three models. The first model assesses the association between strongly supporting RoN and sociodemographic factors. Next, the second model adds the first main predictor variable of political orientation. Lastly, the third model adds the second main predictor variable of neoliberal ideology. The asterisk denotes that an association is statistically significant (i.e., its p-value was less than 0.05), meaning the probability of observing such an association by chance is less than 5%. Note that statistical significance can also be inferred from the confidence intervals around odds ratios, as statistically-significant intervals do not contain the odds ratio of 1.0.

Across all models in Table 2, age is significantly and negatively associated with strong support for RoN. With each year of increasing age, the odds of strongly supporting RoN declines. Gender appears to have no effect across all models in support for RoN;

females/other are not significantly different than the referent category of males in any of the models.

In model 1, all variables reach statistical significance except for gender (see Table 2). With each increasing year of age, the odds of strongly supporting RoN decline by 2.5%. For education, those with a 4-year college degree and/or a graduate degree are significantly more likely to strongly support RoN than those without a college degree. And lastly, for religion, those who are LDS are about 65% less likely to strongly support the RoN measure than those who are non-LDS.

When political orientation is added in model 2, the previously observed associations for education and religion lose statistical significance (see Table 2). The most plausible explanation is that political orientation mediates the effect of these demographic variables. As for age, once political orientation is added, the effect is reduced by half a percentage point. With each increasing step of being more politically conservative, the odds of strongly supporting RoN decrease by 26.3%.

When the second main predictor variable, neoliberal ideology, is added in the third model everything that previously held statistical significance in the first two models (except for age) is no longer significant (see Table 2). Once again, the most plausible explanation is that neoliberal ideology mediates the effect of political orientation on RoN. The effect of age continued to hold statistical significance as it did in the first two models, though it decreased by 0.3% from model 2. With each unit increase on support for a free-market economic system, the odds of strongly supporting RoN decline by 51.3%.

Table 3 uses the same steps as Table 2, except I look at predicting the outcome of strongly supporting MSJ instead of RoN. Like the variable of age in Table 2, religion in Table 3 is significantly and negatively associated with strong support for MSJ across all models. Those who are LDS are less likely than those who are non-LDS to strongly support a MSJ approach in saving the lake. Further, like the variable of gender in Table 2, the variables of age and education in Table 3 resulted in no statistically significant effect in any model where MSJ is the outcome.

In the first model, the variables of gender and religion reached statistical significance: the odds of strongly supporting MSJ as a solution to save the GSL are about 1.7 times higher for females/others than for males; and those who are LDS are almost 73% less likely than those who are non-LDS to strongly support MSJ. However, after adding political orientation in model 2, the effect of gender disappeared and the effect of religion decreased substantially. It appears that political orientation completely mediates the effect of gender and partly mediates the effect of LDS religion. With each increasing step of being more politically conservative, the odds of strongly supporting MSJ decrease by almost 31%.

When adding neoliberal ideology in model 3, the effect of religion stayed roughly about the same as it was in model 2, with LDS respondents being 49.2% less likely than non-LDS respondents to strongly support MSJ. Model 3 reveals that with each unit increase on support for a free-market economic system, the odds of strongly supporting MSJ decline by nearly 45%. Interestingly, similar to the findings on what predicts support for RoN, once neoliberal ideology is added, the variable of political orientation no longer shows a significant association in predicting MSJ. This means support for a free-market

economic system likely mediates the effect of general political orientation on MSJ attitudes.

Table 2. *Associations between demographic characteristics, political orientation, neoliberal ideology and rights of nature*

	Model 1			**Model 2**			**Model 3**		
	OR	95%LCI	95%UCI	OR	95%LCI	95%UCI	OR	95%LCI	95%UCI
Age	0.975*	0.962	0.988	0.980*	0.966	0.994	0.983*	0.969	0.997
Gender (Referent=Male)									
Female/other	1.006	0.635	1.594	0.908	0.562	1.468	0.769	0.463	1.277
Education (Referent=no college degree)									
BA/BS degree	1.761*	1.003	3.092	1.566	0.876	2.802	1.328	0.720	2.451
Graduate degree	2.067*	1.171	3.650	1.610	0.886	2.924	1.503	0.806	2.805
Religion (Referent=not LDS)									
LDS	0.353*	0.221	0.565	0.603	0.343	1.060	0.647	0.355	1.180
Political Orientation				0.737*	0.624	0.870	0.958	0.782	1.174
Neoliberal Ideology							0.487*	0.358	0.662

Data: 2023 Utah People and Environment Poll (UPEP)
Coefficients marked for statistical significance: *p < 0.05

Table 3. *Associations between demographic characteristics, political orientation, neoliberal ideology and multispecies justice*

	Model 1			**Model 2**			**Model 3**		
	OR	95%LCI	95%UCI	OR	95%LCI	95%UCI	OR	95%LCI	95%UCI
Age	0.990	0.978	1.002	0.996	0.983	1.009	0.999	0.985	1.013
Gender (Referent=Male)									
Female/other	1.662*	1.069	2.583	1.474	0.929	2.340	1.274	0.787	2.061
Education (Referent=no college degree)									
BA/BS degree	1.283	0.760	2.166	1.157	0.668	2.003	0.986	0.555	1.754
Graduate degree	1.539	0.906	2.616	1.117	0.634	1.968	1.026	0.570	1.846
Religion (Referent=not LDS)									
LDS	0.272*	0.175	0.424	0.516*	0.304	0.875	0.508*	0.291	0.887
Political Orientation				0.691*	0.590	0.811	0.871	0.719	1.055
Neoliberal Ideology							0.551*	0.415	0.733

Data: 2023 Utah People and Environment Poll (UPEP)
Coefficients marked for statistical significance: *p < 0.05

CHAPTER 5: DISCUSSION AND CONCLUSION

This study explored associations between political orientation, neoliberal ideology, demographics, and support for the RoN and MSJ approaches to address the desiccation of the GSL. The results indicate support for all four hypotheses. Model 2 in both Tables 2 and 3 show that conservative political orientation is significantly associated with less support for RoN and MSJ approaches, indicating support for hypotheses 1 and 2. Therefore, in line with previous research, conservative respondents are less likely than their liberal counterparts to strongly support environmental protection strategies (Givens et al. 2021; McCright 2016; McCright et al. 2016; McCright et al. 2014; Olson-Hazboun et al. 2019, 2017).

When the models shown in Tables 2 and 3 accounted for neoliberal ideology, they revealed that support for a free-market economic system is inversely associated with strong support for RoN and MSJ approaches. Thus, I additionally found support for hypotheses 3 and 4; support for a free-market economic system is associated with less support for a both a RoN and MSJ approach to the GSL desiccation. Similar to findings from prior environmental studies, once neoliberal ideology is accounted for, sociodemographic variables cease to hold statistical significance (Givens et al. 2021; McCright 2016; McCright et al. 2016). However, this was not the case for age in predicting strong support for RoN (Table 2) and LDS religion in predicting strong support for MSJ (Table 3), which consistently held negative and significant associations across all models while associations for other variables were reduced through mediating effects. Nevertheless, after including political orientation and neoliberal ideology, the

effects of age in predicting support for RoN and religion in predicting support for MSJ were substantially reduced. The effect of religion on MSJ was the variable with the most substantially reduced effect once political orientation was taken into consideration.

This study finds that age is a consistent predictor across all models of support for RoN; as age increases, support for RoN declines. This supports previous literature finding that younger people respond more favorably than older individuals to environmental topics such as renewable energy or understanding climate change (Hamilton et al. 2019) and participating in environmental programs (Howe and Mathieu 2018). However, age was not a significant predictor in any model for MSJ (Table 3).

Previous literature on gender finds that men are less supportive than women of pro-environmental strategies (Briscoe et al. 2019; Kennedy and Kmec 2018; Stern et al. 1993; Xiao and McCright 2012, 2014). In this study, the impact of gender was only statistically significant in predicting strong support for MSJ in model 1 (Table 3), where the odds of supporting MSJ for females/others is 1.7 times higher than for males. When controlling for political orientation and neoliberal ideology in the second and third models, the effect of gender was reduced. It seems that that the key predictor variables have a mediating effect on the association between gender and support for MSJ. This mediating effect in tells us that the group of females/others are less likely than men to be politically conservative and neoliberal. Interestingly, gender did not reach statistical significance in any model for RoN (Table 2).

As for education, this variable only reached statistical significance in the first model of predicting strong support for RoN (Table 2)). As with the association between gender and support for MSJ, when political orientation and neoliberal ideology are added

in models 2 and 3, the effect of education on support for RoN is reduced. This mediating effect tells us that the more highly educated people are, the less likely they are to be politically conservative and neoliberal. This supports previous literature which finds that highly educated people are more likely than lesser educated people to be concerned about environmental problems (Givens et al. 2021) and to engage in pro-environmental behaviors (Xiao and McCright 2014). However, since education did not reach statistical significance in any other models within Table 2 or Table 3, this supports past research finding no statistical significance (Briscoe et al. 2019). Interestingly, education did not reach statistical significance in any model for MSJ (Table 3).

In accordance with findings from Cragun et al. (2023), the religious affiliation of nearly half of the respondents is LDS. As anticipated, this study finds support on the impact of LDS respondents in predicting support for RoN and MSJ. LDS affiliation is negatively associated with strong support for RoN, though only in the first model in Table 2; in the second and third models, political orientation and neoliberal ideology reduced the association of religion on RoN through a mediating effect. This mediating effect tells us that non-LDS adherents are less likely than those who are LDS to be politically conservative and support free markets. As for MSJ, LDS affiliation is consistently negatively associated within all MSJ models in Table 3. Specifically, LDS respondents in this study are less supportive than non-LDS respondents for RoN (in model 1) and MSJ (in all models) approaches to address the GSL desiccation. The LDS faith has a strong environmental stewardship ethic (Crimmel 2014; Handley 2001); nevertheless, these findings are consistent with prior literature showing that the human dominion over nature perspective (a concept connected with the nature-society divide) within the LDS

worldview contributes to a negative relationship with environmental views (Brehm and Eisenhauer 2006; Olson-Hazboun et al. 2017). Further, these findings are partially consistent with Olson-Hazboun et al. (2017) who find that political ideology is a stronger predictor than religious affiliation in determining environmental views, and Handley's (Crimmel 2014, p. 71) argument that it is political ideology, not religion, that is contributing to the shrinking of the GSL. As seen in the RoN models (Table 2), when political orientation is added it mediates the effect of religion. While in the MSJ models (Table 3), even after accounting for political differences, the effect of religion is not fully mediated; LDS adherents are about 49% less likely than others to support justice efforts for MSJ.

Policy Implications

As indicated in the weighted data from the UPEP Descriptive Report and the Future of GSL Survey, Utahns are overwhelmingly aware of the lake and hold strong public support for saving the lake (Schad et al. 2023; Welsh et al. 2023). Due to the increased awareness of lake desiccation and pressure from environmental advocates, Utah policymakers have implemented a myriad of plans, policies and technologies to conserve water and get water to the GSL. Some strategies are more effective than others, but lake scientists and advocates stress that these strategies are not sufficient (Abbott et al. 2023; Winslow 2022). Though policies like the Instream Water Flow Amendment and the GSL Watershed Enhancement Trust are currently trying to shepherd water to the GSL, sufficient water is not guaranteed to make it back to the lake under current law. Furthermore, despite efforts to increase investment in water monitoring and data to help

ensure that shepherded water makes it back to the lake, only about 6% of water addressed by current policy actually arrives at the GSL (Fabrizio 2024).

As research continuously points out, no single solution will save the lake. Rather, addressing the GSL desiccation will require a multitude of actions across all institutions and scales (Abbott et al. 2023, p. 13; Steed 2024, p. 6; Welsh et al. 2023). Therefore, it is important not to take strategies off the table, like RoN or MSJ. These alternative frameworks invite a more holistic understanding of society's intertwined dependence on the environment. Adopting these as solutions may prove useful not only to reverse the desiccation of the GSL, but to mend Utahns' relationship with the broader environment and all that encompasses it.

As this study shows, opposition to both RoN and MSJ frameworks are driven primarily by respondents who prioritize free-market economics – a characteristic of politically conservative populations. Therefore, policy implications of this research could be to develop messaging of RoN and MSJ strategies for the GSL that bridge conservative values and fosters bipartisan collaboration as a way to find common ground on environmental stewardship and water management of the GSL. Like prior environmental-related management work mentioned in the *Neoliberal* section that have leaned into neoliberal logics through community forestry, the quota system in fisheries, or establishing environmental justice policy through the EPA (Holifield 2004; Malin 2014; Mansfield 2007; McCarthy 2005), perhaps there are avenues to combine neoliberal logics where RoN and/or MSJ approaches work within our existing systems.

Limitations

This study has a few limitations. First, one of the limitations is the low response rate. Though best practice tactics were made in the development and implementation stage of the UPEP survey to increase response rates (i.e., applying mixed-modes by offering participants the option to respond either through mail or online, having four waves of contact, and providing incentives), the result was a 12% response rate (Schad et al. 2023). While a low response rate is not an indicator of survey quality, it does have the concern of nonresponse error. Meaning the estimates in this sample could have bias, limiting the ability to generalize from these data and findings (Dillman et al. 2014; Stedman et al. 2019). Unfortunately, there is a growing trend in declining response rates to mail surveys over time (Dillman et al. 2014; Stedman et al. 2019).

Another potential limitation in this study is measurement error in the statement wording for the MSJ strategy in the UPEP survey (see second to last statement in Appendix A). Survey questions should be written clearly and concisely, while being broad enough for respondents to understand (Dillman et al. 2014). However, there is only so much that can be done to clarify questions without confusing the broader public. MSJ is about restoring justice for politically and historically marginalized humans and non-humans, but the statement did not explicitly mention this. The statement was written so broadly that it may have been misinterpreted; this means it could be lacking validity due to not accurately measuring what I hoped it would measure. Further, the weighted descriptive statistics from the UPEP Descriptive Report show surprisingly high support for this strategy in a conservative political context (Schad et al. 2023), supporting a critical assessment of the MSJ measure. A majority of respondents were “fairly

conservative" and, from what we know in the literature, this characteristic could contribute to low support for a MSJ approach. However, a majority of respondents were also LDS, and given what we know about the strong stewardship ethic in this religion, this may be what explains high support for this strategy. Nonetheless, the MSJ measure in this study does demonstrate features consistent with concurrent validity suggesting that, regardless of this limitation, the measure broadly captures the intended construct since it correlates with others measures in the database ((e.g., in statements within the *Guiding Values* section of the UPEP Descriptive Report (Schad et al. 2023)).

Lastly, a final limitation is the fact that this study did not include the factors of race or income. After running preliminary descriptive statistics, I determined that the variable of race lacked sufficient variation since the majority of respondents identified as non-Hispanic White. Further, for income, a considerable amount of data was missing. I tested a few preliminary logistic regression models and found that income did not impact any of my main findings. Therefore, I excluded these variables from this study.

Future Research

Future research could address these limitations. While there are methods to improve response rates, there is still a trend of decline in engagement with surveys (Dillman et al 2014). As Stedman et al. (2019) suggest, this trend could be an opportunity to creatively "reengage and re-consider the relationships between methods and core social science constructs" (p. 14). Therefore, future researchers could take this advice as it applies to the context of the GSL or more broadly. In the case of MSJ measurement, future studies can improve on the validity of statement wording to more accurately measure support for this approach through developing multiple MSJ measures and

establishing convergent and discriminant validity by using quantitative measurement tools like factor analysis (Babbie 2016; Dillman et al. 2014). Future work should also explore ways to increase survey participation among diverse racial/ethnic groups in studies of GSL issues. Race is a critical component in the analysis of environmental studies, with racism intersecting with other oppressive social structures already touched upon in this research such as capitalism, colonialism, and patriarchy (Pellow 2018; Norgaard 2019; Norgaard and Fenelon 2021).

The RoN and MSJ frameworks are relatively understudied in sociology; this research contributes to the literature by extending a sociological lens to the RoN and MSJ as applied to the context of the GSL. Future research could continue to extend a sociological analysis on measuring support for engagement of these frameworks to address Utah's GSL, as well as investigating the effects of political orientation and neoliberal ideologies in predicting this engagement. As this study takes place in Utah, an area characterized by a politically conservative outlook coupled with the unique religious aspect of the dominance of the LDS religion, another avenue for future research could be to apply these alternative frameworks and the effect of political orientation and neoliberal ideology to other ecological contexts and in different states.

Concluding Remarks

The literature on RoN calls for a paradigm shift from anthropocentric to biocentric worldviews (Borràs 2016; Cano Pecharroman 2018; Gilbert et al. 2023). In proposing solutions for Utah's water issues as they impact the GSL, McCool called for a shift towards a new water ethic, which should involve cooperation, a "heightened sense of community" and ethical "responsibility to consider how our actions affect others,

including other species" (Crimmel 2014, p. 229). A new ethic, or model, for water management is currently in the implementation stage through the Great Salt Lake Strategic Plan (Steed 2024, p. 10). According to Abbott, this plan provides "a framework recognizing that our wellbeing depends on the lake, of our watershed, our home" (Fabrizio 2024). However, while it does address the need for collaborative efforts, the values this plan highlights are not the same as the values within RoN and MSJ. As discussed earlier, Gilbert et al. (2023) make the distinction between 'instrumental' values that align with anthropocentric worldviews, and 'intrinsic' values aligning with biocentrism. So, while a shift in instrumental values has taken place through recent water-related legislative efforts like H.B. 33, H.B. 410, H.B. 429, and S.B. 118 that acknowledge the 'beneficial use' of water returning to the lake and facilitating avenues to incentivize shepherding that water to the GSL (Utah State Legislature 2022a, 2022b, 2022c, 2023b), lake scientists and advocates are saying this is inadequate (Abbott et al. 2023; Winslow 2022; Parry 2024). It is because these shifts are informed by instrumental values backed by anthropocentric worldviews that these are inadequate. That is why these lake scientists and advocates are calling instead for a paradigm shift towards intrinsic values to build a new relationship with water (Abbott et al. 2023; Crimmel 2014; Miller 2023; Winslow 2022) through collaboration of western science and Indigenous knowledge guided by Indigenous leadership (Parry 2024; Peery 2022; Seymour 2024).

Moving towards this radical transformation will take an earth-based revolution (Kallis et al. 2020; Stuart 2021) which could repair social and ecological rifts (Foster et al. 2010, p. 49). Of course, change doesn't happen overnight. Therefore, while grassroots groups like SOGSL and others build this paradigm shift towards implementing RoN

and/or MSJ frameworks as strategies to address Utah's GSL, environmental advocates can take inspiration from other environmental-related management work that has leaned into neoliberal logics (Holifield 2004; Malin 2014; Mansfield 2007; McCarthy 2005) to find ways to potentially combine RoN and MSJ within these existing systems. For example, they could support neoliberal actions that are already in place through the optional incentives to engage in landscape removal programs (Utah State Legislature 2023b) and voluntarily shepherding water (2022a, 2022b).

Though there is pushback in Utah with H.B. 249 (Utah State Legislature 2024a), adopting a RoN framework could still be possible. First, there is "an emerging consensus that Indigenous knowledge is fundamental to conserving biodiversity and ecosystem services" (Reo and Ogden 2018, p. 1450). Though Indigenous knowledge is not synonymous with RoN frameworks, what Reo and Ogden are arguing for is the adoption of reciprocal and kinship values that are used by but many, but not all, Indigenous cultures. These values of respect, responsibility and reciprocity toward nature have been central to many Indigenous communities in sustainable management for centuries (Cano Pecharroman 2018; Kimmerer 2013; Reo and Ogden 2018; Whyte 2013). According to Kimmerer (2013), the key to healing our environment is "in restoring a relationship of respect, responsibility, and reciprocity" (p. 336), and further adds how "Restoring land without restoring relationship is an empty exercise" (p. 338). These same values guide the RoN framework in its attempt to establish legal protection for entities of nature, recognizing nature's intrinsic value to be protected and respected. Additionally, while this study and prior research suggests otherwise (Brehm and Eisenhauer 2006; Olson-Hazboun et al. 2017), perhaps given the strong environmental stewardship ethic (Handley

2001) that spiritually recognizes the “intrinsic worth” in all of God’s creations (Crimmel 2014, p. 68), there could be support for RoN and MSJ by more adherents to the dominant LDS religion down the line.

Lastly, while there are “practical difficulties” in establishing a RoN approach, the precedents taking place all over the globe are raising awareness and facilitating dialogues on the “need to change the way in which humans treat nature” (Borràs 2016, p. 143). According to Cano Pecharroman (2018), “History has proven that law often lags behind social change” and “the rights of nature are here to stay” (p. 10). She concludes that “As the planet strives to achieve a more sustainable way of living, the rights of nature will offer a legal tool to regulate our relationship with nature from a different and more harmonious perspective.” The same can be argued for a MSJ approach, a still relatively early concept. Perhaps if a RoN approach takes hold as a strategy to address the GSL desiccation, a MSJ approach can work in tandem, offering a more robust lens in environmental protection that holistically balances justice for both human and non-human species, as well as the ecosystems surrounding the GSL.

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APPENDICES

Appendix A. UPEP: Great Salt Lake Section, Question 7

7. How strongly do you oppose or support the following strategies to protect the Great Salt Lake (GSL)?

Statement	Strongly oppose	Somewhat oppose	Neither oppose/ support	Somewhat support	Strongly support
Increase price of water in UT					
Create more policies to reduce outdoor watering					
Limit growth of municipal water use					
Limit growth of industrial water use					
Create incentives for farmers who grow water-intensive crops like alfalfa to shift to water-saving technologies/crops					
Restrict farmers' planting of water-intensive crops like alfalfa					
Change water rights laws to further discourage "use it or lose it" and encourage ranchers and farmers to lease out their water rights and divert water to the GSL					
Change water rights laws to grant the GSL its own rights to water to guarantee a consistent amount gets to it					
Adopt an approach that takes into account justice for humans, animals, plants, and ecosystems					
Increase winter precipitation with cloud seeding					

Appendix B. UPEP: Great Salt Lake Section, Question 8

8. How strongly do you oppose or support the following strategies to protect the Great Salt Lake (GSL)?

Statement	Strongly oppose	Somewhat oppose	Neither oppose/ support	Somewhat support	Strongly support
Incentivize reduction of household water consumption					
Mandate reduction of household water consumption					
Incentivize reduction of business water consumption					
Mandate reduction of business water consumption					
Incentivize reduction of agriculture water consumption					
Mandate reduction of agriculture water consumption					
Take no action; the GSL will recover on its own					
Take no action; let the GSL dry up					

Appendix C. UPEP: Policymaking Section, Question 5

5. How much do you agree or disagree with the following statements?

Statement	Strongly disagree	Somewhat disagree	Neither agree/ disagree	Somewhat agree	Strongly agree
An economic system based on free markets unrestrained by government interference automatically works best to meet human needs.					
A free-market economy is preferable to any other form of economic system.					
Preservation of the free-market system is more important than environmental concerns.					