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Protecting Tribal Public Health from Climate Change Impacts

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Protecting Tribal Public Health from Climate Change Impacts

Heather Tanana¹

Abstract²

The COVID-19 pandemic brought national attention to challenges that tribal communities have been facing for decades, such as limited health services and lack of water access. Although the end to the pandemic seems to be in sight, climate change will continue to threaten the public health and survival of tribal communities. Since time immemorial, Native Americans have recognized the sanctity of water. Water is life. However, climate change impacts are shifting the landscape across the country and many tribes lack the necessary infrastructure to protect their communities. For example, located in the Southwest, approximately 30-40 percent of homes on the Navajo Nation lack plumbing and drinking water access. These households must haul water long distances from wells and other community point sources. Due to climate change, the region is experiencing prolonged droughts in the region and groundwater supplies are drying up. As a result, residents must increasingly compete for limited water resources to fulfill all of the community's needs—from agricultural to domestic.

The lack of infrastructure in Indian country is the direct result of federal policies. Stemming from treaty obligations, the federal government is responsible for providing health services to Native Americans. Recognizing the intrinsic connection between access to clean water and public health, the Indian Health Service (IHS) Sanitation Facilities Construction Program was established in 1959 to support drinking water and sanitation projects in tribal communities. However, IHS (including the sanitation program) has been historically underfunded and understaffed, hindering the federal agency's ability to fulfill its mission to raise the physical, mental, social and spiritual health of Native Americans to the highest level. Climate change presents another challenge that must be addressed in efforts that seek to promote tribal public health.

With a special emphasis on water, this article identifies climate-change related health threats to tribal communities and analyzes the federal government's treaty and trust responsibility to protect Native Americans from those threats. It also explores how the federal government can better support tribes in exercising self-determination to the fullest to be drivers of their own future.

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² This article refers to the Indigenous people of what is now referred to as the United States using various terms including American Indian and Alaska Native, Native, Indian, and Indigenous. Each of these terms is used regularly in practice and, depending on the context, can be appropriate. Some primary sources will use other terms such as “Native American.” If quoting or describing these primary sources, this article will also utilize the language used by the source. In the context of indigenous lands and law, this article employs “Indian country” and “Indian law,” commonly used terms in scholarship concerning Indigenous peoples.

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Introduction

Climate change is a global phenomenon affecting everyone. However, the experiences of particular people and communities vary greatly, from increasing heat waves and prolonged droughts to rising sea levels and catastrophic flooding. Within the United States, the adverse impacts of climate change are falling disproportionately on underserved and underrepresented communities, including Native Americans.³ Colonization and subsequent federal policies have contributed to tribal vulnerabilities to climate change by creating systemic inequities. Federal Indian law—the body of law that defines the unique legal and political status of federally recognized tribes and establishes the relationship between tribes, states, and the federal government—is grounded in racism and the belief that Native Americans were savages, inferior to white settlers.⁴ Within this framework, tribes were relegated to a “state of pupilage,” which

³ There is no official consensus regarding the terminology used to refer to Indigenous peoples in the United States. Federal law often utilizes the terms “American Indian and Alaska Native” or “Indian.” In this article, Native American generally is used, unless referring to a specific law or policy that uses another term.

⁴ See Joubin Khazaie, *Fanon, Colonial Violence, and Racist Language In Federal American Indian Law*, 12 U. MIA RACE & SOC. JUST. L. REV. 297 (2022) (“[R]acist language enshrined in foundational Supreme Court decisions involving Native tribes continuously enacts a form of colonial violence that seeks to preserve a white racial dictatorship.”); Adam Crepelle, *Lies, Damn Lies, and Federal Indian Law: The Ethics of Citing Racist Precedent in Contemporary Federal Indian Law*, 44 NYU REVIEW OF LAW & SOCIAL CHANGE 529, 532 (2021) (“Jurisprudence

necessitated that they look to the federal government “for protection; rely upon its kindness and its power; appeal to it for relief to their wants; and address the president as their great father.”⁵ And yet, the federal government has largely failed tribes by not upholding its treaty and trust responsibilities, as evident by the extensive unmet needs experienced today.⁶ “Due at least in part to the failure of the federal government adequately to address the wellbeing of Native Americans over the last two centuries, Native Americans continue to rank near the bottom of all Americans in health, education, and employment outcomes.”⁷

The COVID-19 pandemic brought national attention to the historic inequities faced in Indian country.⁸ Media outlets across the world highlighted the virus’ disproportionate impact on Indigenous peoples, particularly within the United States. Native Americans have experienced substantially greater COVID-19 incidence, hospitalization, and death rates compared with other racial groups. As of June 24, 2022, Native Americans are 1.5 times more likely to have COVID-19, 3.0 times more likely to be hospitalized, and 2.1 times more likely to die as a result of COVID-19 than White, non-Hispanic persons.⁹ While no tribe was immune to the pandemic, several tribal communities were particularly ravaged, including the Navajo Nation. This disproportionate impact has been attributed to challenges that tribal communities have been facing for decades, such as limited health services, inadequate housing, and lack of infrastructure, including water access. The Navajo Nation, which has the largest reservation in the country, experienced more per capita cases and deaths than any state. When testifying before the House of Representatives, Navajo Nation President Jonathan Nez largely attributed the outbreak of COVID-19 on the Navajo Nation to lack of water in the homes of Navajo people, emphasizing that “clean water is a sacred and scarce commodity.”¹⁰

Even after the COVID-19 pandemic, climate change will continue to threaten the public health and survival of tribal communities. Aside from exacerbating future pandemic threats,¹¹ climate change presents an increasing risk to water security. From prolonged droughts to coastal flooding, climate change impacts are shifting the landscape across the country, further contributing to the water-related challenges many tribes experience. For example, the Colorado River provides water to approximately 40 million people, seven states, and 30 federally recognized tribes. Tribes hold water rights to more than 3 million acre-feet of the Colorado

loaded with grotesque 19th-century racist stereotypes and factual errors about American Indians remain valid precedent.”).

⁵ *Cherokee Nation v. Georgia*, 30 U.S. 1, 17 (1831).

⁶ See generally U.S. COMM’N ON C.R., *BROKEN PROMISES: CONTINUING FEDERAL FUNDING SHORTFALL FOR NATIVE AMERICANS* (2018) [hereinafter *BROKEN PROMISES*].

⁷ U.S. Comm’n on C.R., Opinion Letter (Dec. 20, 2018), as reprinted in *BROKEN PROMISES*.

⁸ Indian country is defined as all lands within Indian reservations, including rights-of-way; dependent tribal communities; and Indian allotments. 18 U.S.C. 1151. This widely-accepted definition of Indian country derives from a criminal statute, however, it also “generally applies to questions of civil jurisdiction.” *Alaska v. Native Village of Venetie*, 522 U.S. 520, 527 (1998).

⁹ CENTERS FOR DISEASE CONTROL AND PREVENTION, *RISK FOR COVID-19 INFECTION, HOSPITALIZATION, AND DEATH BY RACE/ETHNICITY* (2022), <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html>.

¹⁰ *Addressing the Urgent Needs of Our Tribal Communities: Hearing Before the H. Comm on Energy and Commerce*, 116th Cong. 7–8 (2020) (statement of Jonathan Nez, President, Navajo Nation).

¹¹ Xavier Rodo et al., *Changing Climate and the COVID-19 Pandemic: More than Just Heads or Tails*, 27 *NATURE MEDICINE* 576, 76-84 (2021).

River, which equates to roughly 25 percent of the river's average annual flow.¹² However, a substantial portion of tribal water rights are unrealized, in part due to the lack of necessary infrastructure and funding.¹³ Meanwhile, “decisions made a century ago overallocated the river’s water...[and] climate change has magnified the problem—21st century flows are 20 percent below the already inadequate 20th century average, with a substantial portion of that reduction attributed to climate change, and continued declines are predicted.”¹⁴

Many tribes in the Colorado River Basin already faced water security challenges, and climate change is exacerbating the problem. These challenges can relate to clean drinking water access, as mentioned with the Navajo Nation, or agricultural use. Both have direct impact on tribal public health. With respect to agriculture, the Ute Mountain Ute Tribe Farm & Ranch Enterprise, a 7,700-acre operation owned by the tribe, has been profitable since its formation in the late 1980s and helps to financially support the tribe.¹⁵ But in 2021, due to drought and associated water cuts, the enterprise received only 10 percent of their water allocation from a main water source, the McPhee Reservoir. The decrease in water led to a decrease in crop production, which necessitated laying off 50 percent of its employees (half of whom are tribal members). In addition to the economic implications, unemployment has been associated with negative health consequences, including depression and other stress-related illnesses.¹⁶ To protect its community, the Ute Mountain Ute Tribe is looking for help, by way of more water or the federal government.¹⁷ However, based upon climate projections, it is increasingly likely that any assistance will have to be provided by the government rather than mother nature.

In contrast, tribes in other parts of the country are dealing with the effects of too much water. After ceding more than 800,000 acres of land, the Quileute Tribe was forced onto a one square mile reservation on the coast of the western Olympic Peninsula in Washington, surrounded by Olympic National Park. Home to approximately 400 people, the tribal village is being threatened by the rise in the Pacific Ocean due to climate change.¹⁸ The single road into their community is often under water and tribal members live in fear that a tsunami would lead to the extinction of their people.¹⁹ In seeking federal legislation to facilitate a move to higher ground, Chairwoman Bonita Cleveland testified:

¹² WATER & TRIBES INITIATIVE, POLICY BRIEF #4: THE STATUS OF TRIBAL WATER RIGHTS IN THE COLORADO RIVER BASIN 1 (2021), <http://www.naturalresourcespolicy.org/publications/policy-brief-4-final-4.9.21-.pdf> [hereinafter TRIBAL WATER RIGHTS].

¹³ *Id.*

¹⁴ John Fleck & Anne Castle, *Green Light for Adaptive Policies on the Colorado River*, 14 WATER 2, 2 (2022).

¹⁵ Sarah Troy, *As Drought in the West Worsens, the Ute Mountain Ute Tribe Faces a Dwindling Water Supply*, COLLECTIVE COLORADO (July 19, 2021), <https://collective.coloradotrust.org/stories/as-drought-in-the-west-worsens-the-ute-mountain-ute-tribe-faces-a-dwindling-water-supply/>.

¹⁶ ROBERT WOOD JOHNSON FOUNDATION, HOW DOES EMPLOYMENT—OR UNEMPLOYMENT—AFFECT HEALTH? (2013), http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2013/rwjf403360.

¹⁷ Nina Kravinsky, *Drought is Forcing Farmers in Colorado to Make Tough Choices*, NPR (Nov. 6, 2021), <https://www.npr.org/2021/11/06/1051527449/drought-farmers-southwest-colorado-climate-change>.

¹⁸ Ben Tracy, *Climate Change Forces Native American Tribes to Relocate*, CBS (Nov. 4, 2021), <https://www.cbsnews.com/news/quileute-tribe-climate-change/>.

¹⁹ *Quileute Tribe Tsunami Protection Legislation: Hearing on S. 636 Before the S. Comm. on Indian Affs.*, 112 Cong. (2011) (statement of Bonita Cleveland, Chair of the Quileute Tribe), <https://www.indian.senate.gov/sites/default/files/upload/files/Bonita-Cleveland-testimony-S-636-and-attachment.pdf>.

As Tribal Chair, I am constantly asked why it has taken so long for the federal government to recognize the injustice to our Tribe and the danger we face. Our Tribal School is at sea level next to the Pacific Ocean and the students ask their teachers: “Could we be killed by the wave?” and “Could we get out in time?”²⁰

Recognizing that most of the reservation is located within the coastal flood plane—with tribal administrative buildings, school, and housing all located in a tsunami zone—Congress passed legislation in 2012, returning 785 acres of Olympic National Park land to the Quileute Tribe.²¹ While the land transfer has enabled the tribe to gradually move tribal structures and homes to higher ground, further measures will be necessary to protect the tribe from future climate impacts, as illustrated through the tribe’s subsequent hazard mitigation plan, vulnerability assessment, and climate plan.²²

Regardless of the specific climate impacts experienced, whether it is water shortages or excess as demonstrated by the Ute Mountain Ute and Quileute Tribe respectively, it is clear that the federal must do more to uphold its promises and protect tribal communities. The federal responsibility to tribes is based, in part, on the fact that the United States is a settler nation, founded upon indigenous land.²³ “Historical research shows that land dispossession and forced migration are the primary means by which settler populations achieve large-scale political and economic control over Indigenous populations.”²⁴ The United States is no exception. This country was built upon millions of acres of stolen land, beginning in the 17th century with the arrival of European settlers. Through treaty or by force, the federal government continued to usurp land, often displacing the Native community. Such action created the groundwork for contemporary conditions in which Native Americans “face greater vulnerabilities to their health and food security, lack access to culturally appropriate education, and have heightened exposures to contaminants.”²⁵ These disparities are particularly egregious given the federal government’s special relationship and legal responsibility to tribes.

Stemming from treaty obligations, the federal government agreed to promote tribal well-being and support their basic needs, including critical items such as health (e.g., medical facilities and clean drinking water).²⁶ Treaties between the United States and tribes frequently included provisions for medical services, physicians, or hospitals for the care of Native Americans.²⁷ “Federal health services to maintain and improve the health of the Indians are

²⁰ *Id.*

²¹ An Act to Provide the Quileute Indian Tribe Tsunami and Flood Protection, Pub. L. No. 112-97, 126 Stat. 257 (2012) (codified at 16 U.S.C. §§ 1131-1132, 25 U.S.C. 2701).

²² QUILEUTE TRIBE, *Climate Change*, <https://quileutenation.org/natural-resources/climate-change/>.

²³ Alex Tallchief Skibine, *Towards a Trust We Can Trust: The Role of the Trust Doctrine in the Management of Natural Resources*, in *TRIBES, LAND, AND THE ENVIRONMENT* 7 (Sarah A. Krakoff & Ezra Rosser eds., 2012) (discussing theories of the source of the trust doctrine, including that it originated from land transfers between the United States and tribes).

²⁴ Justin Farrell et al., *Effects of land dispossession and forced migration on Indigenous peoples in North America*, 374 *SCIENCE* 4943 (2021).

²⁵ *Id.*

²⁶ *BROKEN PROMISES*, *supra* note 6, at 2.

²⁷ *See, e.g.*, U.S. DEP’T OF HEALTH AND HUM. SERVICES, *Basis for Health Services*, INDIAN HEALTH SERVICE (Jan. 2016), <https://www.ihs.gov/newsroom/factsheets/basisforhealthservices/>; Treaty with the Kiowa, Comanche, and

consonant with and required by the Federal Government’s historical and unique legal relationship with, and resulting responsibility to, the American Indian people.”²⁸ Today, the Indian Health Service (IHS) is the federal agency responsible for providing health services to Native Americans. Recognizing the intrinsic connection between water and public health, the IHS Sanitation Facilities Construction Program was established in 1959 to provide safe water, wastewater, and solid waste systems for federally recognized tribes. However, IHS—including the sanitation program—has been historically underfunded and understaffed. IHS health care expenditures are approximately one-third of federal health care spending nationwide.²⁹ Not only are laws and policies meaningless without resources to enforce them, but in this case, such under-funding violates the basic tenants of the trust relationship between the federal government and Native peoples.³⁰

Overall, “[t]he efforts of the federal government have been insufficient to meet the promises of providing for the health and wellbeing of tribal citizens, as a vast health disparity exists today between Native Americans and other population groups.” Native Americans experience a life expectancy that is 5.5 years less than the national average and die at higher rates than those of other Americans from various chronic diseases, including heart disease, diabetes, and chronic liver disease and cirrhosis.³¹ The federal government’s failure to meet its treaty and trust responsibilities also extends to basic infrastructure and has created unsafe and unsanitary living conditions. “A century ago, the U.S. government invested in modern water and sanitation systems as a means of eradicating water-borne diseases and stimulating economic prosperity, but this government investment in water infrastructure of the past one hundred years has largely bypassed reservations.”³² Many tribes lack the necessary water infrastructure to protect their communities against public health threats not experienced in the rest of the country. Over half a million Native Americans—nearly 48 percent of homes in tribal communities—do not have access to reliable water sources, clean drinking water, or basic sanitation, as compared to less than 1 percent of homes in the United States as a whole.³³ Lack of access to clean water and sanitation contributes to the high rates of morbidity and mortality experienced among Native Americans.³⁴ Indian country is in a deficit, and if left unchecked, climate change will compound the disparity.

Apache art. 14, Oct. 21, 1867, 15 Stat. 581 (“The United States hereby agrees to furnish annually to the Indians the physician . . . and that such appropriations shall be made from time to time, on the estimates of the Secretary of the Interior, as will be sufficient to employ such [person].”).

²⁸ 25 U.S.C. § 1601 *et seq.*

²⁹ INDIAN HEALTH SERVICE, 2017 IHS Expenditures Per Capita and Other Federal Health Care Expenditures Per Capita (In fiscal year 2017, IHS health care expenditures per person were \$3,332, compared to \$9,207 per person for federal health care spending nationwide).

³⁰ BROKEN PROMISES, *supra* note 6, at 2.

³¹ U.S. DEP’T OF HEALTH AND HUM. SERVICES, *Disparities*, INDIAN HEALTH SERVICE (Oct. 2019), <https://www.ihs.gov/newsroom/factsheets/disparities/>.

³² *Addressing Tribal Needs Through Innovation and Investment in Water Resources Infrastructures through the U.S. Bureau of Reclamation: Hearing on Energy and Water Development Appropriations for 2022 Before the H. Comm. on Appropriations & Subcomm. on Energy and Water Development*, 117th Cong. 2 (2021) (statement of Bidtah N. Becker, Associate Attorney, Navajo Tribal Utility Authority) [hereinafter *Energy and Water Development Hearing*].

³³ DEMOCRATIC STAFF OF H. COMM. ON NAT. RES., 114TH CONG., WATER DELAYED IS WATER DENIED: HOW CONGRESS HAS BLOCKED ACCESS TO WATER FOR NATIVE FAMILIES (2017), [https://naturalresources.house.gov/imo/media/doc/House Water Report_FINAL.pdf](https://naturalresources.house.gov/imo/media/doc/House%20Water%20Report_FINAL.pdf).

³⁴ *Id.*

This article looks at how to protect tribal public health from climate change. With a special emphasis on water, Part I discusses climate change impacts, including the related health and cultural threats to tribal communities. Part II analyzes the federal government's treaty and trust responsibility to protect Native Americans from those threats as well as the relevant federal programs. Finally, Part III concludes by exploring how the federal government can collaborate with tribes and better support them to exercise tribal self-determination to the fullest and be drivers of their own future.

I. Climate Change in Indian Country

Indigenous health is based on interconnected social and ecological systems that are being disrupted by a changing climate. As these changes continue, the health of individuals and communities will be uniquely challenged by climate impacts to lands, waters, foods, and other plant and animal species. These impacts threaten sites, practices, and relationships with cultural, spiritual, or ceremonial importance that are foundational to Indigenous peoples' cultural heritages, identities, and physical and mental health.

– United South and Eastern Tribes Sovereignty Protection Fund³⁵

Indigenous peoples, including Native Americans, are part of frontline communities that experience the “first and worst” consequences of climate change.³⁶ Social inequities, exclusion from the decision-making process, and inequitable access to resources have all contributed to higher environmental risk for frontline communities, including the risk of climate-related disasters.³⁷

The impacts of climate change are wide and far-reaching. Rising global temperatures and increasingly severe heatwaves have produced the warmest period in the history of modern civilization.³⁸ Numerous studies have documented a host of climate variables or “indicators” consistent with a warmer world, including “melting glaciers and ice sheets, shrinking snow cover and sea ice, risking sea levels, more frequent high temperature extremes and heavy precipitation events[.]”³⁹ Warmer and drier conditions have also contributed to an increase in wildfires, which increases health risks and impacts quality of life by degrading air quality.⁴⁰

³⁵ *The Impacts of Climate Change on Tribal Communities: Oversight Hearing Before the Subcomm. on Indigenous Peoples of the U.S. of the H. Comm. on Nat. Res.*, 116th Cong. (2019) (statement of United South and Eastern Tribes Sovereignty Protection Fund), <https://www.govinfo.gov/content/pkg/CHRG-116hhrg35199/html/CHRG-116hhrg35199.htm>.

³⁶ GEORGETOWN CLIMATE CENTER, *Equitable Adaptation Legal & Policy Toolkit*, GEORGETOWN LAW, <https://www.georgetownclimate.org/adaptation/toolkits/equitable-adaptation-toolkit/introduction.html?chapter>.

³⁷ Marla Nelson et al., *Getting by and Getting Out: How Residents of Louisiana's Frontline Communities are Adapting to Environmental Change*, 32 HOUSING POLICY DEBATE (SPECIAL ISSUE) 1, 84-101 (2021).

³⁸ U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, VOL. 1, Executive Summary, <https://science2017.globalchange.gov/chapter/executive-summary/>.

³⁹ U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT (NCA4), VOL. 2, Chapter 2: Our Changing Climate, <https://nca2018.globalchange.gov/chapter/2/> [hereinafter NCA4 VOL. 2].

⁴⁰ *Id.* at Chapter 1: Overview, <https://nca2018.globalchange.gov/chapter/1/>.

While tribes may be affected by climate change in ways that are similar to others in the United States, they can also be affected uniquely and disproportionately.⁴¹ In contrast to other frontline communities, tribes possess inherent sovereign authority. There are 574 federally recognized tribes in the United States.⁴² Each tribe is unique and independent, but they share a common history of colonization. Many tribal nations were removed from their traditional homelands onto reservations. However, tribes retained a spiritual and cultural connection to the land and their environment, viewing the Earth as a living being to be cared for and respected. As a result, impacts to the environment extend to the entire community. “As climate change threatens to dramatically change the environment, culture and tradition that is tied to environmental occurrences is threatened.”⁴³

Tó éí iiná até (Navajo). Paatuwaqatsi (Hopi). Payy new aakut (Ute). Xa ‘iipayk (Quechan). Each tribe has its own language, but the meaning is the same: Water is Life. Water is essential to the health and survival of any community. As discussed further below, water also carries significant cultural and spiritual importance for tribes. Recognizing the critical role of water, this Part focuses on the climate change impacts to water resources, beginning with an overview of the physical changes to water, followed by a discussion of the health and cultural-related impacts of these changes.

A. Climate-Related Changes to Water

Water is critical to the public health of all communities. And yet, climate change is significantly impacting water, which in turn influences human health and disease. Every region in the United States is affected by water sector sensitivities to climate-related events.⁴⁴ However, there are three main categories of climate-change impacts to water that present particular threats to tribal communities: sea-level rise, diminishing water supply, and degrading water quality.

First, sea-level rise is threatening the continued viability of coastal communities.⁴⁵ “[T]he combined effects of extreme rainfall events and rising sea level are increasing flood frequencies, making coastal and low-lying regions highly vulnerable to climate change impacts.”⁴⁶ Sea-level rise has amplified coastal flooding and erosion impacts, making some areas uninhabitable (both temporarily and permanently).⁴⁷ Furthermore, sea-level rise has exacerbated saltwater intrusion into coastal rivers and aquifers, which can threaten drinking water supplies, infrastructure, and ecosystems.⁴⁸

⁴¹ *Id.* at Chapter 15: Tribes and Indigenous Peoples, <https://nca2018.globalchange.gov/chapter/15/>.

⁴² Indian Entities Recognized by and Eligible to Receive Services from the United States Bureau of Indian Affairs, 86 Fed. Reg. 7554 (Jan. 29, 2021); U.S. Dep’t. of the Interior, Bureau of Indian Affairs, <https://www.bia.gov/about-us>.

⁴³ RANDALL S. ABATE & ELIZABETH ANN KRONK, CLIMATE CHANGE AND INDIGENOUS PEOPLES: THE SEARCH FOR LEGAL REMEDIES §1 (Randall S. Abate & Elizabeth Ann Kronk Warner eds., Edward Elgar Pub 2014).

⁴⁴ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water, <https://nca2018.globalchange.gov/chapter/3/>.

⁴⁵ See CONG. RSCH. SERV., R44632, SEA-LEVEL RISE AND U.S. COASTS: SCIENCE AND POLICY CONSIDERATIONS (2016), <https://crsreports.congress.gov/product/pdf/R/R44632> (discussing global and relative sea level, and policy considerations related to sea-level rise).

⁴⁶ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water, <https://nca2018.globalchange.gov/chapter/3/>.

⁴⁷ *Id.* at Chapter 8: Coastal, <https://nca2018.globalchange.gov/chapter/8/>.

⁴⁸ *Id.* at Chapter 3: Water, <https://nca2018.globalchange.gov/chapter/3/>.

The associated emergency response costs to these impacts carry a heavy price tag for coastal communities, often requiring federal assistance.⁴⁹ In Alaska alone, federal agencies provided a total of \$391 million in fiscal years 2016-2020 to repair damaged infrastructure in Alaska Native villages and build their resilience to environmental threats, including erosion, flooding, and thawing permafrost.⁵⁰ However, more than one-third of highly threatened Native villages did not receive any assistance during that timeframe, indicating that significant work remains to protect these communities.⁵¹ In a new assessment on the federal budget's exposure to climate risks, the Office of Management and Budget estimates that annual federal spending increases on coastal disaster response spending are projected to range from \$4-\$32 billion annually in 2050.⁵² Flooding, in particular, is "the most common and the most expensive natural disaster in the United States."⁵³ Given the high costs (and projected increases), it is not surprising that since 2013, the U.S. Government Accountability Office has listed the federal government's fiscal exposure to climate change on the "High Risk List," as a federal operation with in need of transformation to address economy, efficiency, or effectiveness challenges.⁵⁴

While some communities will be able to rebuild after experiencing a coastal disaster, for others, that may be impossible due to land loss or safety concerns. An estimated 13.1 million people are potentially at risk of needing to migrate due to sea-level rise by the year 2100, including many tribal communities.⁵⁵ From Alaska and the Pacific Northwest to Louisiana and the Northeast, tribal communities are increasingly facing the reality of displacement.⁵⁶ Newtok, a Yup'ik village on the southwest coast of Alaska, "is emblematic of other Alaska Native villages in low-lying wetlands that have considered climate migration as a resilience strategy and are subject to a combination of erosion, permafrost degradation, and flooding from storms."⁵⁷ Tribal officials began analyzing potential resettlement sites in 1994, ultimately selecting a site nine miles southeast of the village and within Newtok's traditional lands, named Mertarvik.⁵⁸ Almost three decades later, Newtok residents continue to face increased disaster risks "because the relocation to Mertarvik will not be complete before coastal erosion and flooding make Newtok uninhabitable."⁵⁹ Across the country, the Shinnecock Indian Nation is fighting against rising seas to hold onto what remains of their ancestral lands. The tribe's current-day territory comprises

⁴⁹ *Id.* at Chapter 8: Coastal.

⁵⁰ U.S. GOV'T ACCOUNTABILITY OFF., GAO-22-104241, ALASKA NATIVE ISSUES: FEDERAL AGENCIES COULD ENHANCE SUPPORT FOR NATIVE VILLAGE EFFORTS TO ADDRESS ENVIRONMENTAL THREATS (2022), <https://www.gao.gov/assets/gao-22-104241.pdf>;

⁵¹ *Id.*

⁵² OFF. OF MGMT. & BUDGET, EXEC. OFF. OF THE PRESIDENT, FEDERAL BUDGET EXPOSURE TO CLIMATE 280 (2022), https://www.whitehouse.gov/wp-content/uploads/2022/04/ap_21_climate_risk_fy2023.pdf.

⁵³ *Id.* at 281.

⁵⁴ U.S. GOV'T ACCOUNTABILITY OFF., HIGH RISK LIST, <https://www.gao.gov/high-risk-list>.

⁵⁵ *Id.*

⁵⁶ *See supra* note 50; U.S. GOV'T ACCOUNTABILITY OFF., GAO-20-488, CLIMATE CHANGE: A CLIMATE MIGRATION PILOT PROGRAM COULD ENHANCE THE NATION'S RESILIENCE AND REDUCE FEDERAL FISCAL EXPOSURE (2020), <https://www.gao.gov/assets/gao-20-488.pdf>/ [hereinafter GAO CLIMATE CHANGE]; Somini Sengupta & Shola Lawal, *The Original Long Islanders Fight to Save Their Land From a Rising Sea*, NY TIMES, Mar. 5, 2020, <https://www.nytimes.com/2020/03/05/climate/shinnecock-long-island-climate.html>.

⁵⁷ GAO CLIMATE CHANGE, *supra* note 56, at 14.

⁵⁸ *Id.* at 16.

⁵⁹ *Id.* at 17.

800 acres located on Long Island, adjacent to Southampton, New York.⁶⁰ According to tribal projections, almost half the Shinnecock Nation peninsula will be inundated by high water in 2050.⁶¹ Dr. Kelsey Leonard, a Shinnecock tribal member and Indigenous water justice researcher, reflected on the climate-driven impacts faced by the tribe and outlook to the future:

We have seen increasing, unusual mortality events of whale relatives [humpback and right] since 2016 along the Atlantic coast . . . we have a unique relationship as Indigenous people of this coastline with those beings. They are here, they are telling us something: that we need to change the way we are responding to climate changes, to be a witness to those messages and to be able to learn from them and adapt.⁶²

While the tribe is actively engaged in building up natural defenses (e.g., raising sand dunes, restoring oyster reefs), whether these efforts will succeed remains uncertain and depends on how quickly the world as a whole reduces emissions and stems the rate of sea level rise.⁶³

Climate change is also putting the future reliability of water supplies at risk. “As temperatures continue to rise, there is a risk of decreased and highly variable water supplies for human use and ecosystem maintenance.”⁶⁴ Increasing droughts and reduced snowpack combined with a growing population, deteriorating infrastructure and groundwater depletion are exacerbating the gap between water supply and demand.⁶⁵ “Higher temperatures also result in increased human use of water, particularly through increased water demand for agriculture arising from increased evapotranspiration.”⁶⁶ Changes in surface water supply also result in groundwater depletions, through further increases in groundwater pumping.⁶⁷ Groundwater is a critical water source and provides more than 40 percent of the water used for agriculture (irrigation and livestock) and domestic water supplies.⁶⁸ Historically, groundwater has been used

⁶⁰ SHINNECOCK INDIAN NATION, CLIMATE VULNERABILITY ASSESSMENT AND ACTION PLAN 5 (2019), <https://www.peconicestuary.org/wp-content/uploads/2019/10/Shinnecock-Indian-Nation-Climate-Vulnerability-Assessment-and-Action-Plan.pdf>.

⁶¹ SHINNECOCK INDIAN NATION, CLIMATE CHANGE ADAPTATION PLAN 9-11 (2013), https://www.epa.gov/sites/default/files/2016-09/documents/shinnecock_nation_ccadaptation_plan_9.27.13.pdf.

⁶² Meredith Haas, *Indigenous Values to Restore Coastal Areas*, SEA GRANT R.I. (Nov. 16, 2021), <https://seagrant.gso.uri.edu/indigenous-values-to-restore-coastal-areas/>.

⁶³ *Supra* note 60, at 28-30; Sengupta & Lawal, *supra* note 56.

⁶⁴ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water.

⁶⁵ *Id.*; Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2021: The Physical Science Basis*, IPCC AR6 WGI (Aug. 7, 2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf.

⁶⁶ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water. Evapotranspiration refers to the water lost to the atmosphere through evaporation from the land surface and transpiration (water released from plants).

⁶⁷ Richard Taylor, *Hydrology: When Wells Run Dry*, 516 NATURE 179, 179-80 (2014).

⁶⁸ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water. WATER SCIENCE SCHOOL, *Groundwater Use in the United States*, U.S. GEOLOGICAL SURVEY (USGS), <https://www.usgs.gov/special-topics/water-science-school/science/groundwater-use-united-states#overview>.

as a buffer against water scarcity.⁶⁹ However, rising temperatures and prolonged droughts are putting groundwater supplies at risk.⁷⁰

From the Southwest to the Great Plains, tribes are experiencing water access barriers exacerbated by climate change. A common example of the deficit between supply and demand is the Colorado River Basin, where water allocations exceed the average supply. The Colorado River Basin provides water to 30 federally recognized tribes,⁷¹ seven states (Colorado, New Mexico, Utah, Wyoming, Arizona, California, and Nevada), and two countries (United States and Mexico). “Within the Basin, current flows are 20 percent below the already inadequate 20th century average, with a substantial portion of that reduction attributed to climate change, and continued declines are predicted.”⁷² Numerous studies have concluded that climate change has worsened water scarcity in the Basin due to streamflow decline associated with increasing temperatures.⁷³ Every additional 1 degree Celsius of warming results in an estimated nine percent decline in river flow.⁷⁴ Tribes have a claim to a significant portion of the water in the Basin. Recognized tribal rights account for approximately 22 to 26 percent of the Basin’s average annual water supply.⁷⁵ Additionally, several tribes have unresolved water rights that still need to be quantified, and many of the recognized tribal water rights have yet to be fully developed.⁷⁶ Previous modeling studies have focused on the impact of climate change without considering under-utilized tribal water rights.⁷⁷ These challenges contribute to community vulnerability and uncertainty regarding water availability for other users in the Basin.⁷⁸ While increases in water-use efficiency has helped, current demand still exceeds supply and future demand is expected to further increase. Not only will tribes continue to resolve and develop their water rights, but human population growth is also projected to increase an average of 53 percent in the Basin states by the year 2030.⁷⁹

⁶⁹ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water. Amir AghaKouchak et al. *Water and Climate: Recognize Anthropogenic Drought*, 524 *Nature* 409 (2015).

⁷⁰ Jonathan T. Overpeck & Bradley Udall, *Climate Change and the Aridification of North America*, 117 *PROCS. NAT’L ACAD. SCIS.* 11856, 11856–58 (2020); Thomas Meixner et al., *Implications of Projected Climate Change for Groundwater Recharge in the Western United States*, 534 *J. HYDROLOGY* 124, 124-38 (2016).

⁷¹ The Colorado River Basin is home to the Ak-Chin Indian Community, Chemehuevi Indian Tribe, Cocopah Indian Tribe, Colorado River Indian Tribes, Fort McDowell Yavapai Nation, Fort Mojave Indian Tribe, Gila River Indian Community, Havasupai Tribe, Hopi Tribe, Hualapai Indian Tribe, Jicarilla Apache Nation, Kaibab Band of Paiute Indians, Las Vegas Tribe of Paiute Indians, Moapa Band of Paiute Indians, White Mountain Apache, Navajo Nation, Pascua Yaqui Tribe, Quechan Indian Tribe, Salt River Pima-Maricopa Indian Community, San Carlos Apache Tribe, San Juan Southern Paiute Tribe, Shivwits Band of Paiute Indian Tribe of Utah (Constituent Band of the Paiute Indian Tribe of Utah), Southern Ute Indian Tribe, Tohono O’odham Nation, Tonto Apache Tribe, Ute Indian Tribe, Ute Mountain Ute, Yavapai-Apache Nation, Yavapai- Prescott Indian Tribe, and Pueblo of Zuni. *TRIBAL WATER RIGHTS*, *supra* note 12.

⁷² Fleck & Castle, *supra* note 14.

⁷³ Y.C. Ethan Yang et al., *Impact of Climate Change on Adaptive Management Decisions in the Face of Water Scarcity*, 588 *J. HYDROLOGY* 125015 (2020).

⁷⁴ P.C. Milly & K.A. Dunne, *Colorado River Flow Dwindles as Warming-Driven Loss of Reflective Snow Energizes Evaporation*, 367 *SCIENCE* 1252, 1252–1255 (2020).

⁷⁵ *TRIBAL WATER RIGHTS*, *supra* note 12.

⁷⁶ *Id.*

⁷⁷ Y.C. Ethan Yang et al., *supra* note 73.

⁷⁸ Part II further discusses tribal water rights, including the legal basis for tribal water rights and related challenges.

⁷⁹ U.S. Census Bureau, www.census.gov (compared to population numbers in 2000).

Groundwater depletion is also contributing to the water supply and demand gap for the Hopi Tribe, whose reservations is surrounded entirely by the Navajo Nation in northeastern Arizona. Dried up springs have heightened tensions among farmers and ranchers as they compete for limited water on Hopi land.⁸⁰ Between 1968 and 2005, the Peabody Coal Company significantly depleted groundwater aquifers underlying the Hopi and Navajo Reservations in order to produce electricity for distant cities, like Los Angeles.⁸¹ While Peabody certainly contributed to the current water conditions on Hopi lands, climate change is further diminishing water supplies through rising temperatures and shifting rainfall patterns.⁸² Over a thousand miles away, the Standing Rock Sioux Tribe is also confronted with water supply challenges related to drought and deteriorating infrastructure. In 2003, the Standing Rock Sioux Tribe in North Dakota did not have water for several days due to dropped water levels from drought.⁸³ Silt and sludge clogged the sole intake pipe from the Missouri River, effectively halting the tribe's water supply.⁸⁴ Without any other water sources, the IHS hospital was also forced to temporarily shut down, requiring tribal members to travel over 60 miles to receive medical services.⁸⁵ While a new pipeline was completed in 2017 to provide safe and clean drinking water for the community,⁸⁶ the tribe continues to experience extreme drought, prompting the tribe to issue an Emergency Drought and Extreme Fire Declaration in 2021.⁸⁷

Finally, water quality is being further threatened by climate change. Inadequate water quality is pervasive in tribal communities, with many tribes experiencing water quality challenges for decades. According to the Environmental Protection Agency, "about 86 percent of tribal water systems currently comply with health-based drinking water standards, compared to 93 percent of community water systems nationally."⁸⁸ In some instances, water quality has been degraded due to traditional energy development. Indian country is rich in mineral and energy

⁸⁰ Simon Romero, *In Arizona, Drought Ignites Tensions and Threatens Traditions Among the Hopi*, NY TIMES (Oct. 2, 2021), <https://www.nytimes.com/2021/10/02/us/arizona-megadrought.html>.

⁸¹ Richard T. Carson et al., *The Existence Value of a Distinctive Native American Culture: Survival of the Hopi Reservation*, 75 ENV'T AND RESO. ECONS. 931, 933 (2020).

⁸² See JON P. MASON, U.S. GEOLOGICAL SURVEY, 2021-1124, GROUNDWATER, SURFACE-WATER, AND WATER CHEMISTRY DATA, BLACK MESA AREA, NORTHEASTERN ARIZONA-2016-2018 (2021), <https://pubs.usgs.gov/of/2021/1124/ofr20211124.pdf> (quantifying declines in water levels in the Black Mesa area, enclosed within the Navajo and Hopi Reservations).

⁸³ Karen Cozzetto et al., *Climate Change Impacts on the Water Resources of American Indians and Alaska Natives in the U.S.*, 120 CLIMATIC CHANGE 569, 578 (2013). See also *Water Problems on the Standing Rock Sioux Reservation: Hearing Before the S. Comm. on Indian Affs.*, 108th Cong. (2004) (testimony received from the Standing Rock Sioux Tribe and several different federal agencies identifying the water challenges the Tribe experienced and highlighting the need for coordinated efforts among the agencies to address the problem), <https://www.govinfo.gov/content/pkg/CHRG-108shrg97093/html/CHRG-108shrg97093.htm>.

⁸⁴ Cozzetto, et al., *supra* note 83.

⁸⁵ *Water Problems on the Standing Rock Sioux Reservation: Hearing Before the S. Comm. on Indian Affs.*, 108th Cong. (2004) (statement of Charles W. Murphy, Chairman, Standing Rock Sioux Tribe).

⁸⁶ U.S. BUREAU OF RECLAMATION, *Standing Rock Rural Water Supply System Delivers Water* (2017), <https://www.usbr.gov/newsroom/newsroomold/newsrelease/detail.cfm?RecordID=60316>.

⁸⁷ Morgan Benth, *Standing Rock issues Emergency Drought and Extreme Fire Declaration*, KFVR TV (Apr. 8, 2021), <https://www.kfyrtv.com/2021/04/08/standing-rock-issues-emergency-drought-and-extreme-fire-declaration/>. In 2021, approximately 42% of the Standing Rock Sioux Reservation was experiencing extreme drought. NAT'L DROUGHT MITIGATION CTR., *U.S. Drought Monitor Now Searchable by Tribal Area*, UNIVERSITY OF NEBRASKA (Aug. 10, 2021), <https://drought.unl.edu/Publications/News.aspx?id=378>.

⁸⁸ Hannah Northey, *EPA Unveils Plan to Address Tribal Water Woes*, E&E NEWS (Oct. 14, 2021), <https://www.eenews.net/articles/epa-unveils-plan-to-address-tribal-water-woes/>.

resources, containing approximately three to four percent of known oil and gas reserves, thirty percent of western coal reserves, and more than a third of uranium deposits.⁸⁹ But, past energy development has led to elevated levels of contaminants, such as uranium, in groundwater sources.⁹⁰ “Extraction of over 30 million tons of uranium ore through four decades left a legacy of ~500 abandoned uranium mines across the Western US and over 1000 associated waste features across Navajo Nation alone, resulting in decades of exposures of Navajo Nation residents to uranium and a wide range of co-occurring metals, including arsenic, cadmium, copper, and lead.”⁹¹ Such exposure is occurring in part due to consumption of contaminated water.⁹² Naturally occurring contaminants have also plagued tribes, including the Hopi Tribe. On the Hopi’s drinking water system has been contaminated with arsenic—ranging between two and four times the legal limit set by the Environmental Protection Agency (EPA)—since it was first installed by the Bureau of Indian Affairs in the 1960s.⁹³ The tribe estimates that 75 percent of residents are drinking arsenic contaminated water.⁹⁴ “The lack of other readily-available water sources, coupled with a high poverty rate (60 percent of Hopi residents live below the poverty line) leaves many with no other option but to drink the hazardous water.”⁹⁵ The contamination on the Hopi Reservation is one of the EPA’s highest priorities and longest running arsenic drinking water violations.⁹⁶ In 2019, the EPA fined the tribe for failing to reduce arsenic levels in its drinking water systems, in violation of the Safe Drinking Water Act—ironically, a situation created by the federal government when it initially built the drinking water system in a contaminated aquifer.⁹⁷ Ultimately, the Hopi Tribe agreed to pay a \$3,800 penalty and secured additional federal support for the Hopi Arsenic Mitigation Project (HAMP) to address arsenic contamination on the reservation.⁹⁸ Through HAMP, the tribe has identified new potable water sources, mapped a path for a regional pipeline to deliver the clean water to the villages, and drilled new wells. On October 30, 2020, the Trump Administration announced that it would provide \$5 million to help the tribe complete the first phase (delivering clean water to Hopi villages).⁹⁹ To complete the second phase (delivering clean water to secondary facilities such as schools and healthcare facilities), the Tribe will need an additional \$15 million.¹⁰⁰

⁸⁹ COHEN’S HANDBOOK OF FEDERAL INDIAN LAW § 17.03[1] (Nell Jessup Newton et al. eds., 2012) [hereinafter COHEN’S HANDBOOK].

⁹⁰ HEATHER TANANA ET AL., WATER & TRIBES INITIATIVE, UNIVERSAL ACCESS TO CLEAN WATER FOR TRIBES IN THE COLORADO RIVER BASIN 16 (2021), available at <https://tribalcleanwater.org/wp-content/uploads/2021/09/WTI-Full-Report-4.20.pdf> [hereinafter UNIVERSAL ACCESS].

⁹¹ Sara S. Nozadi et al., *Prenatal Metal Exposures and Infants’ Developmental Outcomes in a Navajo Population*, 19 INT’L J. ENV’T RSCH. AND PUB. HEALTH 425 (2022).

⁹² *Id.*

⁹³ UNIVERSAL ACCESS, *supra* note 90, at 17.

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ *Hearing Before the Subcomm. on Interior, Environment, & Related Agencies of the H. Comm. on Appropriations*, 116th Cong. (2019) (statement of Timothy Nuvangyaoma, Chairman, Hopi Tribe), <https://www.congress.gov/116/meeting/house/109008/witnesses/HHRG-116-AP06-Wstate-NuvangyaomaT-20190307.pdf>.

⁹⁷ *Id.*; Denise Adamic, *U.S. EPA settles with Hopi Tribe for Safe Drinking Water Act Violations*, EPA (Nov. 25, 2019), <https://www.epa.gov/newsreleases/us-epa-settles-hopi-tribe-safe-drinking-water-act-violations>.

⁹⁸ Denise Adamic, *supra* note 97.

⁹⁹ UNIVERSAL ACCESS, *supra* note 90, at 17.

¹⁰⁰ *Id.*

Climate change is exacerbating the water quality gap in Indian country. As previously noted, in coastal areas, sea-level rise can increase saltwater intrusion into coastal rivers and aquifers, threatening drinking water supplies.¹⁰¹ Warming water temperatures, changes in precipitation and runoff affect pollutant transport into and within water bodies.¹⁰² Water temperature increases also contribute to increases in harmful algal blooms, which degrade water quality.¹⁰³ Warmer water holds less oxygen, which could lead to decreases in dissolved oxygen impacting aquatic ecosystems.¹⁰⁴ Rising temperatures may cause increased evapotranspiration, leading to groundwater salinization.¹⁰⁵ Increases in high flow events (e.g., more intense storms and flooding) can increase the delivery of sediment, nutrients, and microbial pathogens into surface waters.¹⁰⁶

Changes in water quality have been observed on the Navajo Nation. For example, some of the well-water in the southwestern portion of the reservation has “become so saline that the water is unusable for livestock and has corroded the piping and equipment used for bringing the water to the surface.”¹⁰⁷ The Yurok Tribe is the largest tribe in California, inhabiting lands surrounding the lower Klamath River. A range of anticipated climate changes in Yurok territory could affect water resources include warming surface water temperatures, lower dissolved oxygen concentrations, expanding algal blooms, higher pollutant loadings, and saltwater intrusion.¹⁰⁸ All of these changes are expected to degrade water quality.¹⁰⁹ In 2021, faced with deteriorating water conditions, the tribe advised residents to boil their water for the foreseeable future and issued a State of Emergency Declaration Due to Drought.¹¹⁰ The declaration recognized that the Yurok Reservation and Klamath Basin are experiencing drought conditions not projected to resolve in the near future, resulting in poor instream water quality.¹¹¹ And, the tribe resolved to “seek assistance from all federal, state, local, tribal, and volunteer resources to include funding resources available to assist in responding to this emergency.”¹¹² As discussed

¹⁰¹ Chelsea Kolb et al., *Climate Change Impacts on Bromide, Trihalomethane Formation, and Health Risks at Coastal Groundwater Utilities*, 3 ASCE-ASME J. RISK AND UNCERTAINTY ENG'G SY.'S PART A: CIV. ENG'G 04017006-1 (2017), <http://dx.doi.org/10.1061/AJRUA6.0000904>.

¹⁰² Rory Coffey et al., *A Review of Water Quality Responses to Air Temperature and Precipitation Changes 2: Nutrients, Algal Blooms, Sediment, Pathogens*, 55 J. AM. WATER RES. ASS'N 844 (2018), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8048137/pdf/nihms-1603506.pdf>.

¹⁰³ Steven C. Chapra et al., *Climate Change Impacts on Harmful Algal Blooms in U.S. Freshwaters: A Screening-Level Assessment*, 51 ENV'T SCI. & TECH. 8933, 8933-43 (2017).

¹⁰⁴ JULIE NANIA ET AL., CONSIDERATIONS FOR CLIMATE CHANGE AND VARIABILITY ADAPTATION ON THE NAVAJO NATION 45 (Getches-Wilkinson Ctr. For Natural Res., Energy, and the Env't, Univ. of Colo. Law Sch. ed., 2014), https://scholar.law.colorado.edu/cgi/viewcontent.cgi?article=1002&context=books_reports_studies.

¹⁰⁵ *Id.* at 49.

¹⁰⁶ Charles Fant et al., *Climate Change Impacts on US Water Quality Using Two Models: HAWQS and US Basins*, 9 WATER 118 (2017), <http://dx.doi.org/10.3390/w9020118>.

¹⁰⁷ JULIE NANIA ET AL., *supra* note 104, at 45.

¹⁰⁸ YUROK TRIBE, CLIMATE CHANGE ADAPTATION PLAN FOR WATER AND AQUATIC RESOURCES, https://www7.nau.edu/itep/main/tcc/docs/tribes/tribes_Yurok.pdf.

¹⁰⁹ *Id.*

¹¹⁰ Carlos Olguin, *Yurok Tribe Warns of Drinking Water Issues*, KRCR (July 23, 2021), <https://krctrv.com/north-coast-news/eureka-local-news/yurok-tribe-warns-of-drinking-water-issues>; YUROK TRIBE, *State of Emergency Declaration Resolution of the Yurok Tribal Council*, Res. 21-059 (May 13, 2021), https://www.waterboards.ca.gov/drought/docs/2021/yurok_resolution_21-59_emergency_decl_drought.pdf [hereinafter Yurok Emergency Declaration].

¹¹¹ Yurok Emergency Declaration, *supra* note 110.

¹¹² *Id.*

further in the following sections, rising sea levels, diminished water supply, and poor water quality – all of these climate-related changes threaten the health and cultural resources of tribes.

B. Health Impacts of Climate Change

Clean drinking water and sanitation are essential to the full enjoyment of life and integral to the realization of all human rights, including life.¹¹³ The link between water and survival is so strong that the United Nations (UN), several countries, and the state of California have recognized the right to water.¹¹⁴ Among other key aspects, the right to water encompasses a sufficient water supply for personal and domestic uses that is safe and acceptable.¹¹⁵ And yet, as climate change makes water more scarce, attainment of the right to water will become more difficult and human health will be negatively impacted. Each of the climate-related changes to water discussed above influence health in numerous ways. Reduced water supplies limit access to water, which can contribute to malnutrition and diarrheal disease.¹¹⁶ Droughts and aridification have also been connected to an increase in dust and diminished air quality, which can lead to allergies, asthma, and other respiratory issues.¹¹⁷ Changes in water quality can increase infectious disease transmission.¹¹⁸ Finally, the combination of these factors—water insecurity, reduced community health, and higher rates of illness—can threaten mental health which is discussed below. .¹¹⁹

The COVID-19 pandemic has demonstrated the connection between climate change and health. Many of the underlying systems that led to disparate COVID-19 transmission are the same systems that are vulnerable to climate change, including water security. Sanitation and access to running water are important determinants of disease transmission. COVID-19 prevention measures include handwashing, physical distancing, and household cleaning—behaviors that require access to sufficient, safe, and affordable water. The Centers for Disease Control and Prevention (CDC) also recognized that “[h]istorical trauma and persisting racial inequity have contributed to disparities in health and socioeconomic factors” between Native Americans and white populations that have adversely affected Native American communities and likely contributed to the elevated COVID-19 incidence among Native Americans.¹²⁰

¹¹³ United Nations, G.A. Res. 64/292, The Human Right to Water and Sanitation, (July 28, 2010).

¹¹⁴ *Id.*; see also World Health Organization, *National Systems to Support Drinking-Water Sanitation and Hygiene: Global Status Report 2019*, at 48-55 (2019), <https://apps.who.int/iris/bitstream/handle/10665/326444/9789241516297-eng.pdf?ua=1>; California, Assemb. 685, 2012 Leg. (Cal. 2012) and Assemb. 401, 2015 Leg. (Cal. 2015). In 2021, the Virginia House of Delegates approved a resolution recognizing “access to clean, potable, and affordable water” as “a necessary human right.” H.R.J. Res. 538, 2021 Leg., Reg. Sess. (Va. 2021). However, the resolution failed to receive Senate approval. As a result, California remains the only state in the United States to recognize a human right to water.

¹¹⁵ United Nations, *Fact Sheet on Human Right to Water* at 7-11, <https://www.ohchr.org/sites/default/files/Documents/Publications/FactSheet35en.pdf>.

¹¹⁶ CENTERS FOR DISEASE CONTROL AND PREVENTION, *Climate Effects on Health*, <https://www.cdc.gov/climateandhealth/effects/default.htm>.

¹¹⁷ NCA4 VOL. 2, *supra* note 39, Chapter 14: Health, <https://nca2018.globalchange.gov/chapter/14/>.

¹¹⁸ *Supra* note 116.

¹¹⁹ *Id.*

¹²⁰ Sarah M. Hatcher et al., *COVID-19 Among American Indian and Alaska Native Persons—23 States, January 31–July 3, 2020*, 69 MMWR MORBIDITY AND MORTALITY WKLY. REP. 1166, 1167 (2020).

At the beginning of the pandemic, the COVID-19 incidence rate among Native Americans was 3.5 times that among white persons.¹²¹ Native Americans also experienced substantially greater COVID-19 mortality rates compared to other groups.¹²² Morbidity and mortality caused by the disease have been associated with mental health challenges.¹²³ Symptoms of anxiety and depression disorders, suicidal ideation, and substance use increased considerably in the United States during the pandemic.¹²⁴ The limited data available indicates that Native Americans also experienced trauma and mental health issues. A 2021 survey found that seventy-four percent of Native American respondents said someone in their household experienced serious problems with depression, anxiety, stress, or sleeping; compared to fifty-two percent of white respondents.¹²⁵

While the long-term effects and full impact of the pandemic may not immediately be known, it is abundantly clear that Native Americans were disproportionately impacted and have greatly suffered from COVID-19. Many of those taken by COVID-19 were tribal elders, bearers of traditional knowledge, language and culture.

The virus claimed fluent Choctaw speakers and dressmakers from the Mississippi Band of Choctaw Indians. It took a Tulalip family matriarch in Washington State, then her sister and brother-in-law. It killed a former chairman of the Yocha Dehe Wintun Nation in California who spent decades fighting to preserve Native arts and culture. It has killed members of the American Indian Movement, a group founded in 1968 that became the country's most radical and prominent civil rights organization for American Indian rights.¹²⁶

These losses extended beyond immediate family members and friends to the community as a whole. According to the CDC, the disproportionate impact reflects differences in reliance on shared transportation, limited access to running water, household size, and other factors that facilitate COVID-19 community transmission.¹²⁷ Other research has associated the incidence of COVID-19 cases in Indian country with lack of indoor plumbing.¹²⁸ As noted by Senator

¹²¹ *Id.*

¹²² Katherine Leggat-Barr et al., *COVID-19 Risk Factors and Mortality among Native Americans*, 45 DEMOGRAPHIC RESEARCH 1185 (2021).

¹²³ Mark E. Czeisler et al., *Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic—United States, June 24–30, 2020*, MMWR MORBIDITY AND MORTALITY WKLY. REP. 1049 (2020).

¹²⁴ *Id.* See also GAO, *Behavioral Health and COVID-19: Higher-Risk Populations and Related Federal Relief Funding*, GAO-22-104437 (Dec. 2021) (“COVID-19 has had widespread repercussions for the behavioral health of the nation as a whole, but certain populations may be at higher risk of behavioral health effects” including people from certain racial and ethnic groups, such as Native Americans.).

¹²⁵ Robert Wood Johnson Foundation et al., *Household Experiences in America During the Delta Variant Outbreak, by Race/Ethnicity* (Oct. 2021), <https://cdn1.sph.harvard.edu/wp-content/uploads/sites/94/2021/10/EthnicityRWJFNPRHROP.pdf>; see generally American Psychiatric Association, *Coronavirus, Mental Health and Indigenous People in the United States*, <https://www.psychiatry.org/File%20Library/Psychiatrists/APA-COVID-19-Mental-Health-Facts-Indigenous-People.pdf>.

¹²⁶ Jack Healy, *Tribal Elders Are Dying From the Pandemic, Causing a Cultural Crisis for American Indians*, NY TIMES (Jan. 12, 2021), <https://www.nytimes.com/2021/01/12/us/tribal-elders-native-americans-coronavirus.html>.

¹²⁷ *Id.*

¹²⁸ Desi Rodriguez-Lonebear et al., *American Indian Reservations and COVID-19: Correlates of Early Infection Rates in the Pandemic*, 26 J. PUB. HEALTH MGMT. & PRAC. 371, 371-77 (2020).

Murkowski, “for so many of our Native communities, particularly in remote villages, that lack basic sanitation infrastructure, where there is no running water, no flush toilets, even basic safeguards like washing your hands was pretty close to impossible.”¹²⁹

While the pandemic highlighted the widespread lack of clean and safe water access in Indian country, tribal communities have suffered from water insecurity for decades.¹³⁰ The federal government documented poor water and sanitation conditions in Indian country as early as 1928.¹³¹ The Meriam Report documented contaminated water and scarce supplies, noting “[s]ometimes it is difficult even to get enough to drink, so lack of cleanliness of body, clothing, and homes is a natural consequence and is found with discouraging frequency.”¹³² Almost a century later, lack of access to clean and safe water continues to be reported.¹³³ Today, Native American households are more likely to lack indoor plumbing than all other households in the United States. For some tribal communities, the disparate access is startling. For example, Navajo residents are 67 times less likely than other Americans to have access to running water,¹³⁴ with approximately 30-40 percent of homes on the Navajo Nation lacking access to a public water system.¹³⁵ These households must haul water long distances from wells and other community point sources.

As a result of climate change, the water sources available to tribal members are being further threatened, both in terms of diminished quantity and quality, as well as related infrastructure challenges. Such impacts directly put tribal public health at risk. The connection between water availability and human health is clear. Up to sixty percent of the human body is water—water is necessary for human survival.¹³⁶ But, as discussed previously, the future reliability of water supplies is at risk and many tribal-community water sources are drying up or otherwise being depleted. Climate change impacts to water quality also present a risk to human and ecosystem health by threatening the progress achieved in the 21st century to reduce infectious disease and other environmental toxins.¹³⁷ Climate change is increasing the occurrence of cyanobacterial bloom events and waterborne pathogens. Both represent a risk to human health. “Waterborne diseases include many different types of infections that are transmitted via water, and include pathogens across a range of taxa (viruses, bacteria, protozoa, and helminths).

¹²⁹ *Examining the COVID-19 Response in Native Communities: Native Health Systems One Year Later: Hearing Before the S. Comm. on Indian Affs.* 117th Cong. 2 (2021) (statement of Sen. Lisa Murkowski, Sen. from Alaska), <https://www.govinfo.gov/content/pkg/CHRG-117shrg45086/html/CHRG-117shrg45086.htm>.

¹³⁰ UNIVERSAL ACCESS, *supra* note 90.

¹³¹ Lewis Meriam, *The Problem of Indian Administration: Report of a Survey Made at the Request of Honorable Hubert Work, Secretary of the Interior, and Submitted to Him*, February 21, 1928. Institute for Government Research: Studies IX Administration. Baltimore, MD: The Johns Hopkins Press; 1928.

¹³² *Id.* at 220.

¹³³ BROKEN PROMISES, *supra* note 6, at 180-83.

¹³⁴ *About the Navajo Water Project*, DIGDEEP: NAVAJO WATER PROJECT, <https://www.navajowaterproject.org/>.

¹³⁵ U.S. BUREAU OF RECLAMATION, COLORADO RIVER BASIN TEN TRIBES PARTNERSHIP TRIBAL WATER STUDY REPORT ch. 5, § 5 (2018), <https://www.usbr.gov/lc/region/programs/crbstudy/tws/chapter5.html>; U.S. Water Alliance & DigDeep, *Closing the Water Access Gap in the United States: A National Action Plan* 38 (2019).

¹³⁶ U.S. Geological Survey, *The Water in You: Water and the Human Body* (May 22, 2019), <https://www.usgs.gov/special-topics/water-science-school/science/water-you-water-and-human-body>.

¹³⁷ Karen Levy, et al., *Climate Change Impacts on Waterborne Diseases: Moving Forward Designing Interventions*, 5 CURR. ENVIRON. HEALTH REP. 272 (2019), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6119235/pdf/nihms-964918.pdf>.

These pathogens can cause an array of symptoms, including diarrhea, fever and other flu-like symptoms, neurological disorders, liver damage, and others.”¹³⁸ Flooding events in particular increase the incidence of the following diseases: hepatitis A virus, bacillary dysentery, and campylobacter.¹³⁹ The rise in waterborne diseases has resulted in substantial health care costs, with an estimated \$2.2 to \$3.7 billion attributable to waterborne pathogens.¹⁴⁰ Finally, poor water quality and related pathogens have also been connected to lower mental and social development in children.¹⁴¹

Infrastructure, water quantity, and water quality are interrelated. When water supplies are depleted, subsidence (i.e., the sinking of the ground) can occur as more groundwater is removed, affecting water infrastructure and leading to the formation of sinkholes.¹⁴² And, poorly maintained infrastructure can hinder water delivery, contribute to system water loss, and degrade water quality.¹⁴³ Inadequate water and sewer infrastructure can also contribute to viral and bacterial contamination.¹⁴⁴ “Disruptions to infrastructure are already occurring and will likely become more common with a changing climate.”¹⁴⁵ In general, drinking water infrastructure in the United States is poorly rated based on current condition, safety, capacity, and other factors.¹⁴⁶ A large portion of water systems were built over a century ago. As a result, they have either reached the end of their expected lifespan, or are not able to handle the additional demands associated with population growth, increased treatment requirements, and climate change impacts.¹⁴⁷ Aging and deteriorating infrastructure contributes to trillions of gallons of water loss each year through leakage,¹⁴⁸ and increases risks of water contamination and non-potable water delivery.¹⁴⁹

The infrastructure challenges that exist across the United States are particularly pronounced in tribal communities. Infrastructure in Indian country is often completely lacking, inadequate, or poorly maintained, which increases tribal vulnerability to flooding, drought, and waterborne diseases.¹⁵⁰ On the Warm Springs Reservation, the Confederated Tribe of Warm

¹³⁸ *Id.*

¹³⁹ Beta Nu et al. *Climate Change-Related Water Disasters' Impact on Population Health*, 49 J. NURSING SCHOLARSHIP 625 (2017). Indeed, a recent study found that almost 60 percent of diseases caused by pathogens have been worsened by climate change. Camilo Mora, *Over Half of Known Human Pathogenic Diseases Can Be Aggravated by Climate Change*, NATURE CLIMATE CHANGE (2022), <https://www.nature.com/articles/s41558-022-01426-1>.

¹⁴⁰ Rory Coffey et al., *supra* note 102, at 844.

¹⁴¹ Faissal Tarrass, *The Effects of Water Shortages on Health and Human Development*, 132 Perspectives in Public Health 240, 241 (2012).

¹⁴² NOAA, *National Integrated Drought Information System*, <https://www.drought.gov/sectors/navigation-and-transportation>.

¹⁴³ Deborah Vacs Renwick et al., *Potential Public Health Impacts of Deteriorating Distribution System Infrastructure*, 111 J. AM. WATER WORKS ASS'N 42 (2019).

¹⁴⁴ NCA4 VOL. 2, *supra* note 39, at Chapter 14: Health.

¹⁴⁵ *Id.* at Chapter 3: Water.

¹⁴⁶ AMERICAN SOCIETY OF CIVIL ENGINEERS, *THE ECONOMIC BENEFITS OF INVESTING IN WATER INFRASTRUCTURE* 4 (2020).

¹⁴⁷ *Id.* at 6.

¹⁴⁸ *Id.* at 4.

¹⁴⁹ Deborah Vacs Renwick, et al., *supra* note 143.

¹⁵⁰ Karen Cozzetto et al., *supra* note 83.

Spring is experiencing infrastructure challenges that carry costs to address.¹⁵¹ Three out of four of their water delivery systems require major upgrades or replacement—some of the pipes are made of wood and clay.¹⁵² Maintaining current systems at status quo costs a minimum of \$5-6 million, with an additional \$40-50 million required to provide for future improvements to meet the growing population.¹⁵³ Climate change contributes to infrastructure challenges in Indian country by further damaging existing infrastructure and disrupting services.¹⁵⁴ Overall, such infrastructure deficiencies harm the social, physical and mental well-being of tribal communities and impair their ability to thrive.¹⁵⁵

Finally, climate change will likely compound the already disproportionate mental health conditions among Native Americans. The high rates of mental health disorders and behavior-related chronic diseases are well documented in tribal communities.¹⁵⁶ Native Americans have reported serious psychological distress as high as 2.5 times more than the general population.¹⁵⁷ Climate change is expected to compound these existing health issues in Native American communities.¹⁵⁸ Various studies have connected negative mental health outcomes with climate change impacts. “People exposed to weather- or climate-related disasters have been shown to experience mental health impacts including depression, post-traumatic stress disorder, and anxiety, all of which often occur simultaneously[.]”¹⁵⁹ For example, individuals who experienced a flood or risk of flood reported higher levels of depression and anxiety; increased alcohol and tobacco use followed climate-disasters and droughts; and higher temperatures have been associated with an increase in aggressive behaviors, including homicide.¹⁶⁰ Those most likely to suffer these impacts are some of society’s most vulnerable populations, including tribal communities.¹⁶¹ As tribes increasingly experience climate-related impacts (e.g., floods, droughts, and rising temperatures), their community members’ health will suffer unless protective measures are put into place.

C. Cultural Impacts of Climate Change

Many tribal communities have a strong connection to the land and environment. Traditional practices are often tied to the environment, with particular locations viewed as sacred

¹⁵¹ *Build Back Better: Water Infrastructure Needs for Native Communities: Hearing Before the S. Comm. On Indian Affs.*, 117th Cong. (2021) (statement of Raymond Tsumpti, Chairman, Confederated Tribes of Warm Springs), <https://www.govinfo.gov/content/pkg/CHRG-117shrg44761/html/CHRG-117shrg44761.htm>.

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ See NCA4 VOL. 2, *supra* note 39, at Chapter 15: Tribes and Indigenous Peoples.

¹⁵⁵ NATIONAL CONGRESS OF AMERICAN INDIANS, TRIBAL INFRASTRUCTURE: INVESTING IN INDIAN COUNTRY FOR A STRONGER AMERICA 4 (2017), <https://www.ncai.org/NCAI-InfrastructureReport-FINAL.pdf>.

¹⁵⁶ Indian Health Service, Behavioral Health Fact Sheet, <https://www.ihs.gov/newsroom/factsheets/behavioralhealth/>.

¹⁵⁷ NAT’L CTR. FOR HEALTH STATS., U.S. DEP’T OF HEALTH & HUMAN SERVS., HEALTH, UNITED STATES, 2017: WITH SPECIAL FEATURE ON MORTALITY tbl.46 (2017), <https://www.cdc.gov/nchs/data/hus/2017/046.pdf> (In the previous thirty days, 3.6% percent of American adults reported experiencing serious psychological distress compared to 9.2% of Native American adults).

¹⁵⁸ See generally NCA4 VOL. 2, *supra* note 39, at Chapter 14: Health.

¹⁵⁹ *Id.* at Chapter 8: Coastal.

¹⁶⁰ *Id.*

¹⁶¹ *Id.* at Chapter 8: Coastal, and Chapter 14: Health.

and certain waters used for ceremonial purposes. As such, climate change not only threatens the physical environment, but tribal traditions and culture as well. The Hopi Declaration of Water captures this special relationship between the Hopi and water:

*As children of water,
we raise our voices in solidarity to speak for all waters.*

*Water, the breath of all life, water the sustainer of all life,
water the voice of our ancestors, water pristine
and powerful.*

*Today we join hands, determined to honor,
trust and follow the ancient wisdom of our ancestors
whose teachings and messages continue to
live through us.*

*The message is clear: Honor and respect water
as a sacred and life-giving gift from the Creator of Life.
Water, the first living spirit on Earth.*

*All living beings come from water,
all is sustained by water,
all will return to water to begin life anew.*

*We are of water, and the water is of us.
When water is threatened, all living things are
threatened.*

What we do to water, We do to ourselves.¹⁶²

“Indigenous peoples are the ones most at risk from the consequences of climate change because of their dependence on and close relationship with the environment and its resources.”¹⁶³ Climate impacts to water, in particular, are threatening tribal sites, practices, and relationships with cultural, spiritual, or ceremonial importance.¹⁶⁴ The loss of tribal land and culturally important resources due to climate change also magnifies historical trauma experienced by many Native Americans, stemming from colonization and subsequent federal policies.

The Yurok Tribe and Klamath River exemplify how climate driven impacts to the environment are impacting tribal traditions. The Yurok Tribe is the largest tribe in California, with more than 5,000 tribal members.¹⁶⁵ The Tribe and its members “have had a strong relationship with ‘We-roy, also known as the Klamath River, since time immemorial and Yurok culture, ceremonies, religion, fisheries, subsistence, economies, residence, and other lifeways are intertwined with the health of the River, its ecosystem, and the multiple species reliant on a

¹⁶² Sandra Cosentino, *Hopi Declaration of Water*, CROSSING WORLDS HOPI PROJECTS (Nov. 19, 2016), <https://crossingworlds.org/hopi-water-declaration/>. The declaration was adopted at the Hopi Hisot Navoti Gather on October 23, 2003.

¹⁶³ United Nations, *Climate Change*, <https://www.un.org/development/desa/indigenouspeoples/climate-change.html>.

¹⁶⁴ Karen Cozzetto et al., *supra* note 83.

¹⁶⁵ Yurok Tribe, *Our History*, <https://www.yuroktribe.org/our-history>.

thriving Klamath River ecosystem[.]”¹⁶⁶ In 2019, the Yurok Tribe passed a tribal resolution granted personhood to the Klamath River, in part, to protect the river from climate change impacts.¹⁶⁷ The Yurok have always lived along the banks of the Klamath River and their creation story emphasizes the importance of living in balance with the natural world.¹⁶⁸ Many aspects of Yurok culture and way of life are intertwined with the health of the river.¹⁶⁹ But, over the past several years, “[t]he Klamath has seen increasing harms of point and nonpoint source pollutants entering its waters, rises in temperature due to dams and climate change, and large toxic algae blooms poisoning its waters.”¹⁷⁰

Climate change also affects traditional food sources. Colonization, forced removal, relocation, and assimilation policies disrupted the relationship between Native Americans and traditional food systems; however, traditional foods remain an important part of individual and community health.¹⁷¹ “The importance of traditional foods for indigenous health surpasses nutritional value.”¹⁷² Traditional foods carry spiritual and cultural importance as well. However, engaging in traditional food practices is becoming challenging due to climate-related impacts. For example, melting sea ice has resulted in a shorter hunting season, making it more difficult and dangerous to hunt seals and whales in Alaska.¹⁷³ In the Northwest, the rise in ocean water temperatures and streamflow pattern changes have stressed salmon populations, threatening the cultural identities and economies of indigenous communities in the region.¹⁷⁴ The loss of traditional foods has a particularly detrimental effect on tribal communities because many of these communities exist within food deserts. “The lack of healthy store-bought foods means that nutrient-rich traditional foods are often replaced with less healthy alternatives.”¹⁷⁵ All of these impacts raise questions about the future availability of resources and continued viability of tribal communities and their traditional way of life.¹⁷⁶

¹⁶⁶ Yurok Tribe, Resolution Establishing the Rights of the Klamath River, Resolution No. 19-40 (May 9, 2019), <http://files.harmonywithnatureun.org/uploads/upload833.pdf>.

¹⁶⁷ Lulu Garcia-Navarro, *Tribe Gives Personhood to Klamath River*, NPR (Sept. 28, 2019), <https://www.npr.org/2019/09/29/765480451/tribe-gives-personhood-to-klamath-river>.

¹⁶⁸ *Id.* (“[T]he Yurok people have always lived along the banks of the Klamath River. And in our creation story, the creator told us that as long as we lived in a balance with the natural world we would never want for anything. And we live that way for a very long time.”). According to the Yurok creation story, Wesona-me’gotol (the one up-above) created salmon and humans, as well as the River to provide a place for them to interact with one another. Eva Cordtz, *It Take Our Purpose*, <https://storymaps.arcgis.com/stories/08d3b5dc6bbf4326bc87466efd55b8fc> “Salmon are truly the essence of Yurok existence and foundational to Yurok identity for they would not exist without them.” *Id.* (citing Kaitlin Reed, *We are Salmon People: Constructing Yurok Sovereignty in the Klamath Basin*).

¹⁶⁹ Geneva E. B. Thompson, *Codifying the Rights of Nature the Growing Indigenous Movement*, 59 JUDGES’ J. 12, 14 (2020).

¹⁷⁰ *Id.* at 12.

¹⁷¹ KATHRYN NORTON-SMITH ET AL., U.S. DEP’T OF AGRIC., PNW-GTR-944, CLIMATE CHANGE AND INDIGENOUS PEOPLES: A SYNTHESIS OF CURRENT IMPACTS AND EXPERIENCES 25-26 (2016), https://www.fs.fed.us/pnw/pubs/pnw_gtr944.pdf.

¹⁷² *Id.*

¹⁷³ *Id.*

¹⁷⁴ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water.

¹⁷⁵ *Id.* at 25.

¹⁷⁶ Daniel Cordalis & Dean B. Suagee, *The Effects of Climate Change on American Indian and Alaska Native Tribes*, 22 NAT. RES. & ENV’T 45 (2008).

Some tribal communities—most notably those in Alaska, the Southeast, and the Pacific Northwest—also risk displacement due to coastal and riverine flooding, land erosion, and permafrost thawing.¹⁷⁷ These communities may increasingly have to decide whether to relocate, away from tribal lands that have become uninhabitable.¹⁷⁸ In Alaska, permafrost is melting, destabilizing the ground upon which villages have long stood. As tribal lands become uninhabitable due to flooding and erosion, tribes are being forced to either remain and endanger human lives, or relocate. In 2009, the federal government identified thirty-one Alaskan Native villages that were imminently threatened by erosion, twelve of which had considered migrating to reduce their exposure.¹⁷⁹ The threat has only grown more severe over the last decade. As sea levels continue to rise, “retreat or migration will become an unavoidable option” in coming decades for some areas along the U.S. coastline.¹⁸⁰

Recognizing that relocation due to climate change will be unavoidable in some coastal areas, the federal government has begun to look at ways to support climate migration—the preemptive movement of people and property away from areas experiencing severe impacts—as one way to improve climate resilience.¹⁸¹ For example, the state of Louisiana received \$48.3 million in Community Development Block Grant-Disaster Recovery funds to resettle residents of Isle de Jean Charles, a community that has lost more than 89% of its land area over the last six decades due to rising sea levels.¹⁸² Even though the funds were intended to help tribal members resettle, the Isle de Jean Charles Band of the Biloxi-Chitimacha-Choctaw Tribe officially withdrew from participating in the resettlement due to concerns that relocation would make their claim for federal recognition more difficult and sever their connection to their land.¹⁸³

Like the Isle de Jean Charles Band, many tribal communities are hesitant to relocate. Moving from tribal lands can cut tribes off from their origins, the places of their collective memory, and the rights to self-determination (given that the tribal jurisdiction generally extends to their reservation boundaries).¹⁸⁴ Indigenous people across the contiguous United States have already lost 98.9 percent of their historical lands.¹⁸⁵ For the tribes that retained a land base, the average present-day size is only 2.6 percent of their estimated historical areas.¹⁸⁶ Having been dispossessed of so much of their land already, it is understandable that tribes would be reluctant to cede more land, except as a last resort.

¹⁷⁷ ELIZABETH K. MARINO, FIERCE CLIMATE, SACRED GROUND: AN ETHNOGRAPHY OF CLIMATE CHANGE IN SHISHMAREF, ALASKA 122 (2015); Robin Bronen et al., *Climate Change and Displacement: Challenges and Needs to Address an Imminent Reality*, in CHALLENGING THE PREVAILING PARADIGM OF DISPLACEMENT AND RESETTLEMENT: RISKS, IMPOVERISHMENT, LEGACIES, SOLUTIONS 252-72 (Michael M. Cernea & Julie K. Maldonado eds., 2018).

¹⁷⁸ NCA4 VOL. 2, *supra* note 39, at Chapter 15: Tribes and Indigenous Peoples.

¹⁷⁹ U.S. GOV'T ACCOUNTABILITY OFF., GAO-09-551, ALASKA NATIVE VILLAGES: LIMITED PROGRESS HAS BEEN MADE ON RELOCATING VILLAGES THREATENED BY FLOODING AND EROSION (2009).

¹⁸⁰ GAO CLIMATE CHANGE, *supra* note 56.

¹⁸¹ *Id.*; Marla Nelson et al., *supra* note 37.

¹⁸² Marla Nelson et al., *supra* note 37.

¹⁸³ *Id.* Notably, the Isle de Jean Charles Band of Biloxi-Chitimacha-Choctaw is a state-recognized tribe.

¹⁸⁴ KATHRYN NORTON-SMITH ET AL., *supra* note 171, at 9.

¹⁸⁵ Justin Farrell et al., *Effect of Land Dispossession and Forced Migration on Indigenous Peoples in North America*, 374 SCIENCE 3 (2021).

¹⁸⁶ *Id.*

Climate-related relocation also compounds historical trauma experienced by many Native Americans.¹⁸⁷ Historical trauma is defined as “cumulative emotional and psychological wounding across generations, including the lifespan, which emanates from massive group trauma.”¹⁸⁸ “Many Indigenous peoples still experience historical trauma associated with colonization, removal from their homelands, and loss of their traditional ways of life, and this has been identified as a contributor to contemporary physical and mental health impacts.”¹⁸⁹ The boarding school era perpetuated historical trauma among tribal communities—once again removing Native Americans from their homes, but focusing on children. Between 1819 to 1969, 408 Federal Indian boarding schools were in operation.¹⁹⁰ Enrollment at these schools ranged from one child to over 1,200 children.¹⁹¹ As recently reported by the Bureau of Indian Affairs, “the United States directly targeted American Indian, Alaska Native, and Native Hawaiian children in the pursuit of a policy of cultural assimilation that coincided with Indian territorial dispossession.”¹⁹² Congress summarized the federal government’s intentions as follows:

Beginning with President Washington, the stated policy of the Federal Government was to replace the Indian’s culture with our own. This was considered “advisable” as the cheapest and safest way of subduing the Indians, of providing a safe habitat for the country’s white inhabitants, of helping the whites acquire desirable land, and of changing the Indian’s economy so that he would be content with less land. Education was a weapon by which these goals were to be accomplished.¹⁹³

From colonization, and most recently the boarding school era, tribal communities are still healing from historical and intergenerational trauma. Climate change is likely to inflict further trauma by threatening remaining ties to land and the ability to practice traditional ways of life.

II. The Convergence of Federal Treaty and Trust Responsibilities, Tribal Health, and Climate Change

“Our Tribe relinquished vast tracks of our Tribal homelands and resources in exchange for the U.S. government’s solemn promise to uphold and protect our Tribe’s inherent right to Self-Governance and to provide adequate resources to secure the well-being of our community and Tribal citizens. This trust responsibility is a legally enforceable fiduciary obligation on the part of the U.S. to protect Tribal treaty rights, lands, assets and resources.”

¹⁸⁷ Joanna Petrusek MacDonald et al., *Protective Factors for Mental Health and Well-Being in a Changing Climate: Perspectives from Inuit Youth in Nunatsiavut, Labrador*, 144 SOC. SCI. & MED. 133 (2015), <http://dx.doi.org/10.1016/j.socscimed.2015.07.017>.

¹⁸⁸ Maria Yellow Horse Brave Heart et al., *Historical Trauma Among Indigenous Peoples of the Americas: Concepts, Research, and Clinical Considerations*, 43 J. PSYCHOACTIVE DRUGS 282, 283 (2011).

¹⁸⁹ NCA4 VOL. 2, *supra* note 39, at Chapter 15: Tribes and Indigenous Peoples. Historical trauma has been connected to depression, anxiety, suicidality, and substance abuse. Maria Yellow Horse Brave Heart et al., *supra* note 188, at 284.

¹⁹⁰ BUREAU OF INDIAN AFFAIRS, FEDERAL INDIAN BOARDING SCHOOL INITIATIVE INVESTIGATIVE Report at 6 (May 2022), https://www.bia.gov/sites/default/files/dup/inline-files/bsi_investigative_report_may_2022_508.pdf.

¹⁹¹ *Id.* at 7.

¹⁹² *Id.*

¹⁹³ *Id.* at 21 (citing Committee on Labor and Public Welfare, *Indian Education: A National Tragedy – A National Challenge*, S. Rep. No. 91-501 at 143 (1969)).

– W. Ron Allen, Tribal Chairman, Jamestown S’Klallam Tribe¹⁹⁴

The federal government has a unique responsibility to tribes that includes promoting tribal health. While international law supports fulfillment of this responsibility,¹⁹⁵ the underlying legal basis is found in domestic law. Rooted in treaties and the trust responsibility, the federal government is responsible for providing health care services to raise the health status of Native Americans to the highest possible level. President Biden recommitted the federal government to honoring trust and treaty responsibilities to tribes, in which the Administration acknowledged:

The United States has made solemn promises to Tribal Nations for more than two centuries. Honoring those commitments is particularly vital now, as our Nation faces crises related to health, the economy, racial justice, and climate change—all of which disproportionately harm Native Americans.¹⁹⁶

The United States’ obligation to provide health services to tribal communities is well-established and long-standing. However, federal efforts to address climate change impacts are relatively new and still evolving. Historically, the United States has not been a leader on climate change. Indeed, during the Trump Administration, several federal agency websites containing climate data and scientific information were removed, including the Environmental Protection Agency’s site dedicated to climate change.¹⁹⁷ However, at Congressional direction, the federal government has taken steps to identify climate change impacts in the United States for the past few decades. The Global Change Research Act of 1990 mandated the development and coordination of “a comprehensive and integrated United States research program . . . to understand, assess, predict, and respond to human-induced and natural processes of global change.”¹⁹⁸ The U.S. Global Change Research Program (USGRP) is the federal program responsible for carrying out this mandate. USGRP is currently developing the Fifth National Climate Assessment, which is set to be released in 2023 and includes a chapter dedicated to tribal and indigenous peoples.¹⁹⁹ The Biden Administration has also taken steps to make climate

¹⁹⁴ 2020 Appropriations Testimony for EPA, BIA and HIS: Hearing Before the H. Appropriations Subcomm. on Interior, Env’t & Related Agencies, 116th Cong. (2019) (statement of Hon. W. Ron Allen, Chairman/CEO, Jamestown S’Klallam Tribe), <https://www.congress.gov/116/meeting/house/109006/witnesses/HHRG-116-AP06-Wstate-AllenW57440-20190306.pdf>.

¹⁹⁵ The United Nations Declaration on the Rights of Indigenous Peoples recognizes that indigenous peoples have an equal right to the enjoyment of the highest attainable standard of physical and mental health; as well as the right to maintain and strengthen their spiritual relationship with their traditionally owned or otherwise occupied lands, territories, waters, and other resources. United Nations, G.A. Res.61/295, art. 24, Declaration on the Rights of Indigenous Peoples, (Sept. 13, 2007). Principles of international law also were used to create the initial framework of federal Indian law. See Rebecca Tsosie, *Reconceptualizing Tribal Rights: The Interface of Federal Indian Law and International Human Rights Law*, 4 RMLF-INST. 10 (2017) (discussing the Doctrine of Discovery and “law of nations” that governed relationships between independent sovereign, and calling for adoption of international human rights law in the United States).

¹⁹⁶ Pres. Memorandum, White House Briefing Room, Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships (Jan. 26, 2021).

¹⁹⁷ Chris Mooney & Juliet Eilperin, *EPA Website Removes Climate Science Site from Public View after Two Decades*, THE WASHINGTON POST (Apr. 29, 2017).

¹⁹⁸ Public Law 101-606, 104 Stat. 3096 *et seq.*

¹⁹⁹ U.S. Global Change Research Program, Fifth National Climate Assessment, <https://www.globalchange.gov/nca5>. The First National Climate Assessment was published in 2000, the Second National Climate Assessment in 2009,

change a federal priority, including issuing presidential executive orders to address climate change and promote environmental justice.²⁰⁰ And, Congress recently passed a landmark climate bill. The Inflation Reduction Act of 2022 includes \$369 billion in climate investments (e.g., clean energy tax credits, incentives for carbon capture and storage technologies) aimed at reducing greenhouse gas (GHG) emissions.²⁰¹ The Act is the largest investment to address global warming in U.S. history and has been recognized as an important step toward averting the worst consequences of global warming.²⁰²

While these actions will help limit irreversible impacts of climate change on human health and the environment, the fact remains that the effects of global warming are already being experienced, particularly by tribal communities. As the federal government seeks to uphold its promise to promote tribal health, climate change must be taken into account when fulfilling this responsibility.²⁰³ This Part lays the foundation by discussing the federal government's treaty and trust responsibility to protect against the threats identified in Part I. First, a brief history is provided on the federal government's efforts to provide health services to Native Americans, as well as the legal basis for doing so. Next, the establishment of reservations as permanent homelands for tribes and related principles of water law are discussed. Finally, as the primary federal agency responsible for the health and welfare of Native Americans, the Indian Health Service's past and present actions to combat water insecurity are examined.

A. Federal Responsibility to Provide Health Services

The federal government and tribes have had a contentious relationship. Tribes pre-date formation of the United States and have retained their inherent sovereignty to this day. However, that sovereignty is not absolute. In a series of cases, commonly known as the *Marshall* trilogy, the Court established the basic framework of federal Indian law, recognizing that tribes are sovereign nations with the retained power to govern their people and land.²⁰⁴ However, tribes are also “domestic dependent nations,” and based upon this status, they necessarily look to the federal government for protection.²⁰⁵ This unique relationship imposes certain federal

Third National Climate Assessment in 2014, and the Fourth National Climate Assessment in 2018. USGCRP, Previous Assessments, <https://www.globalchange.gov/what-we-do/assessment/previous-assessments>.

²⁰⁰ Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, Exec. Order No. 13,990, 86 Fed. Reg. 7,037 (Jan. 20, 2021).

²⁰¹ H.R. 5376. The Act also included several health provisions that relate to Medicare drug prices and Affordable Care Act subsidies.

²⁰² See Ben King et al. *A Congressional Climate Breakthrough* (July 28, 2022), <https://rhg.com/research/inflation-reduction-act/>.

²⁰³ Notably, tribes are not idly standing by. Tribes have enacted their own laws and policies targeting climate change to protect their community. While other literature has addressed tribal responses to climate change, this article focuses on the federal government's responsibility to promote the health and welfare of Native Americans, including protection from climate change impacts. See, e.g., Elizabeth Kronk Warner, *Indigenous Adaptation in the Face of Climate Change*, 21 J. ENVTL. & SUSTAINABILITY L. 129 (2015).

²⁰⁴ See, e.g., *Cherokee Nation*, 30 U.S. 1, 4 (“[Tribal] nations have been recognized as sovereign and independent states; possessing both the exclusive right to their territory, and the exclusive right of self-government within that territory.”).

²⁰⁵ *Cherokee Nation*, 30 U.S. 1, 17.

responsibilities and obligations on behalf of and for the benefit of tribes, including the duty to protect tribes and their members.²⁰⁶

Since formation of this country, the federal government has enacted different policies directed toward tribal nations. “Federal policies have shaped the landscape in Indian country, leaving a lasting effect on the well-being of Tribal communities.”²⁰⁷ The vast majority of federal policies were directed at removing tribes from their homelands to open up land for white settlers and to assimilate Native Americans into mainstream society.²⁰⁸ Beginning in the 1960s with the Self-Determination and Self-Government Era, the federal government shifted its stance to engaging with tribes on a sovereign-to-sovereign basis and to promote tribal self-governance.²⁰⁹ Despite changes in the underlying goal sought through different federal Indian policy eras, the federal government generally has recognized its responsibility to provide health care services to Native Americans over the past century.

Rooted in treaty obligations, the federal government is primarily responsible for providing health services to Native Americans.²¹⁰ Many treaties identified health services as part of the United State’s payment to tribes for the cessation of millions of acres of tribal land. “Of the 389 ratified Indian treaties, 31 (12%) contained provisions specifically related to Indian health care: 28 providing for a physician and 9 providing for a hospital.”²¹¹ The obligation to provide health services has also been interpreted to be a part of the federal government’s trust responsibility to tribes.²¹²

²⁰⁶ See, e.g., COHEN’S HANDBOOK, *supra* note 89, at § 4.01 (citing *Ex parte Crow Dog*, 109 U.S. 556, 568 (1883)).

²⁰⁷ Heather Tanana, *Learning from the Past and the Pandemic to Address Mental Health in Tribal Communities*, 2 ARIZ. ST. L. J. ONLINE 191, 192 (2020). See also Betty Pfefferbaum et al., *Learning How to Heal: An Analysis of the History, Policy, and Framework of Indian Health Care*, 20 AMERICAN INDIAN LAW REVIEW 265 (1996) (providing an overview of federal law and policy affecting Native American health since the 1800s).

²⁰⁸ Tanana, *supra* note 207, at 195; see also COHEN HANDBOOK, *supra* note 89, at §§ 1.01–1.07 (summarizing the Indian federal policies).

²⁰⁹ Tribal self-governance is an expression of tribal sovereignty and refers to the right to regulate “internal and social relations,” including the right to prescribe laws applicable to tribal members and to enforce those laws. See e.g., *United States v. Wheeler*, 435 U.S. 313, 322 (1978).

²¹⁰ See U.S. DEP’T OF HEALTH AND HUM. SERVICES, *supra* note 27 (discussing the “legal basis for the federal obligation to provide health care to American Indians”).

²¹¹ David N. Dejong, *IF YOU KNEW THE CONDITIONS: A CHRONICLE OF THE INDIAN MEDICAL SERVICE AND AMERICAN INDIAN HEALTH CARE, 1908-1955* at 9 (2010).

²¹² Trust duties of the United States fall within three broad categories: (1) protection of trust property; (2) protection of the tribal right to self-government; and (3) provision of social, medical, and education services necessary for survival of the tribes. Kirke Kickingbird & Everett R. Rhoades, *The Relation of Indian Nations to the U.S. Government* in AMERICAN INDIAN HEALTH: INNOVATIONS IN HEALTH CARE PROMOTION, AND POLICY at 68 (citing American Indian Policy Review Commission 1977). Promoting the health of Native Americans falls within the third category and has been recognized by Congress as “the policy of this Nation, in fulfillment of its special trust responsibilities and legal obligations to Indians.” Indian Health Care Improvement Act, 25 U.S.C. § 1602. While the few courts that have directly addressed this issue acknowledge the federal trust responsibility, a split exists regarding whether the trust responsibility alone creates an enforceable legal duty to provide health care services. The Eighth Circuit has recognized that the trust responsibility includes a duty to provide health services, see e.g., *White v. Califano*, 437 F. Supp. 543, 555 (D.S.D. 1977), *aff’d*, 581 F.2d 697 (8th Cir. 1978); although claims to enforce this duty are strongest when paired with treaty and statutory obligations under the IHCA or Indian Self-Determination Education Assistance Act, see *Rosebud Sioux Tribe v. United States*, 9 F.4th 1018 (8th Cir. 2021). In contrast, the Ninth Circuit has found that neither the general federal-tribal trust relationship nor the IHCA create a judicially

In the early 1800s, administration of tribal affairs was based in the Department of War. During this time, military physicians provided episodic care to Native Americans near military posts.²¹³ However, with limited resources for tribal health care, these services were minimal.²¹⁴ In 1849, the Department of Interior assumed jurisdiction over tribal matters, including health services.²¹⁵ “In subsequent decades, the federal government gradually assumed increasing obligations to provide health care, usually a physician and medications, to tribes.”²¹⁶ However, need continued to exceed available assistance. Following contact with Europeans, tidal waves of infectious diseases decimated the indigenous inhabitants of North America.²¹⁷ It is estimated that the Native population was reduced by as much as 75 percent from infectious diseases from 1520 to 1899.²¹⁸ “The challenges of infectious disease were so acute that after 1908 every Indian commissioner gave health matters a prominent place in their annual report to Congress.”²¹⁹ To bring about reform, a committee of 100 academics, social scientists, and specialists were assembled to advise on Native American affairs.²²⁰ The committee’s report acknowledged the federal government has a unique responsibility to provide health care to Native Americans—“to combat such evils as tuberculosis, pyorrhea, and trachoma”—and urged the use of “whatever means to quickly and effectively” meet their needs.²²¹ The committee also recommended that Congress appropriate adequate funding for more hospitals and health professionals serving Native Americans.²²²

Several federal laws have impacted the health and general welfare of Native Americans.²²³ The Snyder Act of 1921 was one of the first major laws passed that helped established the underlying framework for the Native American healthcare system that exists today. The Snyder Act authorized funds for the “benefit, care, and assistance of the Indians throughout the United States for . . . relief of distress and conservation of health,” including the employment of physicians and delivery of health services.²²⁴ Under the Department of Interior, the Bureau of Indian Affairs was responsible for providing these services at the time. While the Snyder Act formally authorized Native American health programs, the Act established these programs as discretionary, subject to “such moneys as Congress may from time to time appropriate[.]”²²⁵

enforceable duty on behalf of the United States to provide a specific standard of medical care. *Quechan Tribe of Ft. Yuma Indian Reservation v. U.S.*, 599 F. App’x 698, 699 (9th Cir. 2015).

²¹³ Emery A. Johnson & Everett R. Rhoades, *The History and Organization of Indian Health Services* in AMERICAN INDIAN HEALTH: INNOVATIONS IN HEALTH CARE PROMOTION, AND POLICY at 74.

²¹⁴ David N. Dejong, *supra* note 211, at 11.

²¹⁵ Act of March 3, 1849, 9 Stat. 395.

²¹⁶ *Id.*

²¹⁷ Edwin Asturias et al., *Infectious Diseases* in AMERICAN INDIAN HEALTH: INNOVATIONS IN HEALTH CARE PROMOTION, AND POLICY at 362.

²¹⁸ *Id.*

²¹⁹ David N. Dejong, *supra* note 211, at 27.

²²⁰ Joseph E. Otis, *The Indian Problem*, Resolution of the Committee of One Hundred Appointed by the Secretary of the Interior and a Review of the Indian Problem (1924).

²²¹ *Id.* at 2.

²²² *Id.* at 3, 36.

²²³ See Donald Warne & Linda Bane Frizzell, *American Indian Health Policy: Historical Trends and Contemporary Issues*, 104 AM J. PUB. HEALTH 263, 263 (2014) (discussing key federal laws impacting Native American populations).

²²⁴ 42 Stat. 208 (codified as amended at 25 U.S.C. § 13).

²²⁵ *Id.*

A few years later, another review was completed of Native American conditions that again found widespread impoverishment and poor health within tribal communities. The renowned Meriam Report was completed in 1928.²²⁶ The report found “inadequate health facilities and equipment, unqualified and/or a shortage of health personnel, inadequate salaries and housing for health professionals, and a system of purchasing obsolete and outdated medical supplies and medicines from excess army and navy supplies.”²²⁷ “Taken as a whole, practically every activity undertaken by the national government for the promotion of the health of Indians is below a reasonable standard of efficiency.”²²⁸

“The end of World War II sparked a wave of conservatism and nationalism in the United States[.]”²²⁹ Under the Truman Administration, the executive branch considered integration, consolidation and elimination of duplicative governmental programs to reduce government waste.²³⁰ In 1951, the federal government adopted a policy of providing services only when Native Americans could not receive care elsewhere through state and local health facilities.²³¹ In furtherance of consolidation efforts, “all functions, responsibilities, authorities, and duties . . . relating to the maintenance and operation of hospital and health facilities for Indians, and the conservation of the health of Indians” were transferred from the Department of Interior to the Public Health Service (PHS) in 1955, and the Division of Indian Health was created (what is now known as the Indian Health Service (IHS)).²³²

Still seeking to assimilate Native Americans into broader society, Congress directed the PHS to conduct a comprehensive survey of Native American health conditions.²³³ The results, published in a 1957 report entitled *Health Services for American Indians*, identified the disparate health conditions faced by Native Americans and the challenges that the newly formed Division of Indian Health would have to address to improve these conditions (e.g., inadequate health services, substandard and overcrowded housing, and lack of domestic water and adequate sanitation facilities).²³⁴ The report recognized that a substantial federal health program would be required to correct these gross deficiencies.²³⁵ The report also recommended that plans to

²²⁶ Lewis Meriam, *The Problem of Indian Administration* (Baltimore: John Hopkins Press, 1928) at 189.

²²⁷ David N. Dejong, *supra* note 211, at 55. See Meriam Report, *supra* note ____, at 189-345 (chapter devoted to Native American health).

²²⁸ Meriam, *supra* note 226, at 189.

²²⁹ *Id.* at 148.

²³⁰ *Id.*

²³¹ *Id.* at 149.

²³² Transfer Act, Pub. L. No. 83-568, 68 Stat. 674 (1954). “It was anticipated that improved funding and more efficient operations would result from expertise within the PHS and its relationships with state and local authorities.” Johnson & Rhoades, *supra* note 213, at 75. The Division of Indian Health was elevated to bureau status and redesignated as the Indian Health Service in 1968. National Archives, Records of the Indian Health Service, <https://www.archives.gov/research/guide-fed-records/groups/513.html>.

²³³ In the early 1950s, the termination era of federal Indian policy began, wherein the federal government sought to end federal supervision of Native Americans. However, “if Indians were to be emancipated from federal supervisions and services, they first had to be free of disease.” David N. Dejong, *supra* note 211, at 157.

²³⁴ U.S. Dep’t of Health, Education and Welfare, *Health Services for American Indians* (1957). The report had a gold cover and became commonly known as the “1957 IHS Gold Book.”

²³⁵ *Id.*

increase tribal community health resources should be developed in cooperation with tribal communities, on a reservation-by-reservation basis.²³⁶

In 1970, President Nixon issued an Indian Policy Statement to Congress, firmly shifting federal relations with tribes into a new era: the Self-Determination and Self-Governance Era.²³⁷ President Nixon emphasized that the federal responsibility to tribes is not “an act of generosity toward a disadvantaged people,” but instead the result of “solemn obligations which have been entered into by the United States Government” through treaties and other agreements.²³⁸ He also advanced the concept of tribal “self-determination,” proposing that federal programs can be taken over and managed by tribes. The Indian Self-Determination and Education Assistance Act of 1975 established President Nixon’s policy in law.²³⁹ The Act authorized IHS to enter into agreements with tribes, allowing them to assume management of health-related programs and services.²⁴⁰ Under such agreements—often referred to as 638 contracts and compacts—tribes are able to tailor programs and services to their specific community needs.²⁴¹

The Indian Health Care Improvement Act (IHCIA) is another major law passed during the Self-Determination and Self-Governance Era in 1976.²⁴² After authorizations of appropriations expired in 2000, IHCIA was permanently reauthorized in 2010.²⁴³ The IHCIA set forth two national goals:

- (1) “[T]o provide the resources, processes, and structure that will enable Indian tribes and tribal members to obtain the quantity and quality of health care services and opportunities that will eradicate the health disparities between Indians and the general population of the United States” and
- (2) “[T]o provide the quantity and quality of health services which will permit the health status of Indians to be raised to the highest possible level and to

²³⁶ *Id.*

²³⁷ President Nixon, Special Message to Congress on Indian Affairs (July 8, 1970), available at <https://www.presidency.ucsb.edu/documents/special-message-the-congress-indian-affairs>. The Self-Determination and Self-Governance Era recognized government-to-government relationships between the federal government and tribes, and supported the exercise of tribal sovereignty to be the primary driver of Indian policy. *See e.g.*, COHEN’S HANDBOOK, *supra* note 89, at § 1.

²³⁸ President Nixon, Special Message to Congress on Indian Affairs (July 8, 1970).

²³⁹ Indian Self-Determination and Education Assistance Act, Pub. L. No. 93-638, 88 Stat. 2203 (enacted in 1975).

²⁴⁰ *Id.* at § 109.

²⁴¹ OFF. OF THE INSPECTOR GEN., DEP’T OF HEALTH & HUM. SERVS., OEI-09-93-00350, TRIBAL CONTRACTING FOR INDIAN HEALTH SERVICES 1 (1996), <https://oig.hhs.gov/oei/reports/oei-09-93-00350.pdf>. Notably, the Act authorized the Secretary of Interior, Secretary of Health, Education, and Welfare and other government agencies to enter into agreements with tribes and allow tribal administration of programs formerly administered by these agencies. A major difference between a contract (under Title I) and a compact (under Title V) is federal oversight. *See* Indian Health Service, *Differences Between Title I Contracting and Title V Compacting Under the Indian Self-Determination Education Assistance Act (ISDEAA)* for a comparison of Title I contracting and Title V compacting, https://www.ihs.gov/sites/selfgovernance/themes/responsive2017/display_objects/documents/TitleIandV.pdf.

²⁴² Indian Health Care Improvement Act, 25 U.S.C. § 1601 *et seq.*

²⁴³ Permanent Authorization of the IHCIA was part of the Patient Protection and Affordable Care Act, Pub. L. No. 111-148, 124 Stat. 119, 935.

encourage the maximum participation of Indians in the planning and management of those services.”²⁴⁴

The IHCIA also confirmed the federal government’s responsibility to improve the health of Native Americans, allocated additional resources for health services, and established Urban Indian Health Programs.²⁴⁵

Indian Health Service (IHS) remains the primary agency charged with fulfilling the federal treaty and trust responsibility to provide health services to Native Americans. The mission of IHS is “to raise the physical, mental, social, and spiritual health of American Indians and Alaska Natives to the highest level.”²⁴⁶ Based upon a broad definition of health, IHS health services include “not just hospitals and medical services, but also preventative services, community and social well-being, and environmental improvements.”²⁴⁷ Today, this health care delivery system is known as the “I/T/U” system and refers to three different means of service: “I” for IHS; “T” for Tribal programs under the ISDEAA; and “U” for urban health centers. The I/T/U system is the only source of health care for many Native Americans.²⁴⁸

For the most part, the federal government has consistently acknowledged its responsibility to provide health services to Native Americans. However, Congress historically has failed to appropriate sufficient funding to meet the health-related needs of Native Americans.²⁴⁹ “Indeed, when adjusted for inflation and population growth, the IHS budget has remained static in recent decades, with little additional funding available to target the chronic health disparities facing Native communities.”²⁵⁰ While the life expectancy of Native Americans has increased, rising from fifty-one in 1954 to seventy-three in 2019, it has remained stagnant for the past two decades and still remains below the general U.S. population.²⁵¹

B. Federal Promises to Provide a Permanent Homeland

Beyond the laws discussed above, water law also intersects with federal responsibilities to tribes, impacting public health and climate change. In the west, the prior appropriation doctrine governs allocation of scarce water resources, which recognizes water rights based upon the date they are first put to beneficial use.²⁵² However, tribal water rights are unique. “Although

²⁴⁴ 25 U.S.C. § 1601. The IHCIA also included other provisions, such as establishment of a scholarship program to support Native American education and authority to receive reimbursement through Medicare and Medicaid programs for care provided to Native Americans eligible for services under these programs. *Id.* §§ 1613, 1641-47.

²⁴⁵ 25 U.S.C. §§ 1601, 1651-58.

²⁴⁶ U.S. DEP’T OF HEALTH AND HUM. SERVICES, *About IHS*, INDIAN HEALTH SERV., <https://www.ihs.gov/aboutihs/>

²⁴⁷ Emery A. Johnson & Everett R. Rhoades, *supra* note 213, at 76.

²⁴⁸ BROKEN PROMISES, *supra* note 6, at 64.

²⁴⁹ *Id.* at 66-67.

²⁵⁰ *Id.* at 67.

²⁵¹ David N. Dejong, *supra* note 211, at 165 and GBD U.S. Health Disparities Collaborators, *Life Expectancy by County, Race, and Ethnicity in the USA, 200-19: A Systematic Analysis of Health Disparities*, 400 THE LANCET 25 (2022), [https://doi.org/10.1016/S0140-6736\(22\)00876-5](https://doi.org/10.1016/S0140-6736(22)00876-5).

²⁵² See Shannon M. McNeeley et al., *Anatomy of an Interrupted Irrigation Season: Micro-drought at the Wind River Indian Reservation*, 19 CLIMATE RISK MANAGEMENT 61 (2018), <http://dx.doi.org/10.1016/j.crm.2017.09.004>; SUHINA DEOL, THE EFFECTS OF WATER QUANTIFICATION ON TRIBAL ECONOMIES: EVIDENCE FROM THE WESTERN U.S. RESERVATIONS 111 (Bonnie Colby eds., 2017), <http://hdl.handle.net/10150/624150>.

most water rights in the western United States have a priority based on when they were first put to beneficial use, rights on . . . Indian lands have a priority dating back to at least as early as the reservations were established even if water use begins long after others have appropriated waters from the stream.”²⁵³ Consequently, tribal water rights are not measured by actual use and cannot be lost by nonuse.²⁵⁴ Additionally, because tribal water rights generally have priority dating back to the reservation’s formation, they represent some of the most senior water rights.

The law reflects the history of Native Americans and special relationship between tribes and the federal government. Many tribes entered into treaties with the United States in which the federal government established a reservation as a permanent homeland for the tribe.²⁵⁵ As noted by Clement Frost, a former Chairman of the Southern Ute Indian Tribe, the federal government has not always upheld its end of the deal:

When the Ute Bands signed the treaty establishing the Ute Reservation in 1868, the United States promised the Ute people that the Reservation would be a permanent home that would support our people forever. The key to carrying out that promise is water—a fact that the Tribal leadership has always known but which the United States has sometimes forgotten.²⁵⁶

Although treaties often did not explicitly address the water-related needs of reservations, *Winters v. United States*—a 1908 U.S. Supreme Court ruling—held that tribes have a reserved right to water sufficient to fulfill the purposes of their reservation, including the residential, economic development, and governmental needs of the tribe.²⁵⁷ Aside from treaty promises, the federal government also has an underlying trust responsibility “to protect Tribal treaty rights, lands, assets, and resources, as well as a duty to carry out the mandates of federal Indian law.”²⁵⁸ Combined, federal treaty and trust responsibilities create a federal duty to ensure water security in Indian country. Access to a clean, reliable supply of water is necessary in order to fulfill the basic standards of living and ensure a permanent homeland. Accordingly, the *Winters* rights that attach to reservations are sufficient to create an enforceable obligation on the federal government to secure, protect, and develop adequate water supplies for tribes.²⁵⁹

Although tribes are entitled to these federally reserved water rights, quantifying and securing their water rights is a challenging process, often requiring significant expenditures of

²⁵³ TRIBAL WATER RIGHTS, *supra* note 12, at 2.

²⁵⁴ *Id.*

²⁵⁵ See e.g., Treaty with the Navajo, Article IX (Sept. 9, 1849).

²⁵⁶ *Colorado Ute Settlement Act Amendments of 1998: Hearing on H.R. 3478 Before the H. Comm. On Natural Res.*, 105th Cong. (1998) (statement of Clements Frost, Chairman, Southern Ute Indian Tribe).

²⁵⁷ See also *Navajo Nation v. U.S. Dep’t of the Interior*, 26 F.4th 794, 810 (9th Cir. 2022) (internal citations omitted) (“While the specific purposes of an Indian reservation . . . were often unarticulated, the general purpose, to provide a home for the Indians, is a broad one and must be liberally construed. It is clear that the Reservation cannot exist as a viable homeland for the Nation without an adequate water supply.”).

²⁵⁸ U.S. DEPT. OF THE INTERIOR, *What is the Federal Indian Trust Responsibility?* INDIAN AFFAIRS (2017), <http://www.bia.gov/FAQs/index.htm>. See also *Navajo Nation*, 26 F.4th at 812 (holding that common-law sources of the trust doctrine firmly establish the federal government’s duty to protect and preserve a tribe’s right to water).

²⁵⁹ *Navajo Nation*, 26 F.4th at 812-13.

time and money.²⁶⁰ Nonetheless, quantification of water rights is viewed by many as necessary to design and plan adaptation strategies that secure water for all of the community needs.²⁶¹ Tribal water rights may be quantified through either litigation (adjudication) or negotiated settlements.²⁶² In adjudications, tribes may rely on the federal government to assert and protect their water rights, as trustee for the tribe, or waive their sovereign immunity by intervening as party defendants.²⁶³ Since the *Winters* decision, 46 tribes have quantified their water rights through adjudications.²⁶⁴ Recognizing that litigation is time-consuming (the average adjudication took 22 years to complete) and can carry other disadvantages, federal policy began to strongly favor settlement over litigation in the 1970s.²⁶⁵

Negotiated settlements, also referred to as Indian or tribal water rights settlements, involves four phases: pre-negotiation, negotiation, settlement, and implementation.²⁶⁶ Similar to adjudications, the federal government participates in negotiations to fulfill its trust responsibility to tribes by assisting them with their reserved water right claims. Once negotiated, settlements typically require congressional authorization to implement the terms.²⁶⁷ Since 1978, the federal government has entered into 38 tribal water rights settlements, and 34 of these settlements have been congressionally approved.²⁶⁸

Even when tribal rights have been quantified, many tribes lack funding to develop their water resources, resulting in what is referred to as “paper,” rather than “wet,” water rights.²⁶⁹ “[I]n the water-short West, billions of dollars have been invested, much of it by the Federal Government, in water resource projects benefiting non-Indians but using water in which the Indians have a priority of right if they choose to develop water projects of their own in the

²⁶⁰ See Heather Tanana & Elisabeth Parker, *The Unfulfilled Promise of Indian Water Rights Settlements*, 37 NATURAL RESOURCES & ENVIRONMENT ___ (forthcoming Fall 2022) (discussing the challenges associated with tribal water rights settlements).

²⁶¹ Karletta Chief et al., *Engaging Southwestern Tribes in Sustainable Water Resources Topics and Management*, 8 WATER 350 (2016), <http://dx.doi.org/10.3390/w8080350>; Shannon M. McNeeley, *Sustainable Climate Change Adaptation in Indian Country*, 9 WEATHER, CLIMATE, & SOC'Y 393 (2017), <http://dx.doi.org/10.1175/wcas-d-16-0121.1>; SUHINA DEOL *supra* note 262; Judith v. Royster, *Climate Change and Tribal Water Rights: Removing Barriers to Adaptation Strategies*, 26 TUL. ENV'T L. J. 197 (2013), <http://www.jstor.org/stable/24673666>.

²⁶² See COHEN'S HANDBOOK, *supra* note 89, at § 19.05 (discussing the determination of tribal water rights).

²⁶³ *Id.*

²⁶⁴ Leslie Sanchez et al., *Beyond “Paper” Water: The Complexities of Fully Leveraging Tribal Water Rights* (May 8, 2022), <https://www.minneapolisfed.org/article/2022/beyond-paper-water-the-complexities-of-fully-leveraging-tribal-water-rights>.

²⁶⁵ *Id.* The disadvantages of adjudications are well-documented and include a potentially hostile state forum, lack of funding for water development projects or delivery systems, and continued use of available water by non-Indian interests from the source under litigation. COHEN'S HANDBOOK, *supra* note 89, at § 19.05.

²⁶⁶ CONG. RSCH. SERV., R44148, INDIAN WATER RIGHTS SETTLEMENTS 3-5 (2022), <https://crsreports.congress.gov/product/pdf/R/R44148>.

²⁶⁷ *Id.*

²⁶⁸ *Id.*

²⁶⁹ The concept of “paper” rights refers to when a tribe has quantified water rights, recognized in the law, but is unable to develop and utilize those rights. Water development projects and establishment of delivery systems allow tribes to access their water, turning “paper” rights into “wet” rights. “[U]nlike Congress, courts cannot provide tangible ‘wet water’ by authorizing new water projects and/or water-transfer infrastructure (including funding for project development) that would allow the tribes to exploit their rights.” *Id.* at 2. As a result, adjudicated water rights have been more likely to result in “paper” rights than negotiated settlements, which frequently include provisions to construct water infrastructure, increasing access to newly quantified tribal resources. *Id.*

future.”²⁷⁰ As previously noted, water infrastructure is aging across the United States and is in particularly poor condition in Indian country. Deteriorating water infrastructure compounds climate risks²⁷¹ and contributes to water insecurity, ultimately harming tribal public health. Negotiated settlements can help address these challenges by including funding authorization—or even better, mandatory appropriations—for infrastructure projects to facilitate access and development of tribal water resources. However, settlements also have disadvantages, namely that “[v]irtually all tribes agree to a lesser quantity of water than they would claim in litigation.”²⁷²

Congress generally directs either the Bureau of Reclamation or the Bureau of Indian Affairs to oversee federal projects approved in a tribal water settlement. For example, as part of the 2009 Navajo Nation San Juan River Settlement, Congress authorized the Bureau of Reclamation to construct the Navajo Gallup Water Supply Project (NGWSP) to provide water to the Navajo Nation, Jicarilla Apache Nation, and the City of Gallup, New Mexico. Construction on the NGWSP began in 2012 and is projected to be completed by year-end of 2024. However, project conception and planning actually began decades earlier, in the 1950s. Many community members were skeptical that the project would ever be realized.²⁷³ But Reclamation was able to establish and maintain a strong working relationship with the community and ultimately partnered with IHS to be able to serve some homes sooner, without the need to complete the rest of the NGWSP first. Aside from demonstrating how a negotiated settlement can include a water infrastructure project, the NGWSP also reveals how collaboration among federal agencies can help achieve water access more quickly. Multiple federal agencies possess unique expertise and statutory authority that can be drawn upon to secure clean water access for tribal communities. Negotiated settlements that include water infrastructure projects should also include consultation requirements with sister agencies to take advantage of the particular expertise and funding sources each agency may bring to a project.

Finally, while negotiated water settlements and quantification of tribal water rights can help facilitate much needed water infrastructure projects, they should not be a pre-condition to obtaining water security in Indian country. The federal government has a responsibility to protect tribal health and ensure the lands upon which tribes were relegated have the necessary water to be permanent homelands, as promised. Notwithstanding the federal government’s failure to uphold treaty promises with tribes in the past, the U.S. Supreme Court has affirmed the federal government’s continuing obligation to do so. “Unlawful acts, performed long enough and with sufficient vigor, are never enough to amend the law. To hold otherwise would be to elevate the most brazen and longstanding injustices over the law, both rewarding wrong and failing those in the right.”²⁷⁴ In short, water security remains a critical issue for tribal communities and the federal government plays a central role in ensuring clean water access to protect tribal futures.

²⁷⁰ NAT’L WATER COMM’N, WATER POLICIES FOR THE FUTURE 476 (1973).

²⁷¹ NCA4 VOL. 2, *supra* note 39, at Chapter 3: Water.

²⁷² COHEN’S HANDBOOK, *supra* note 89, at § 19.05.

²⁷³ *Energy and Water Development Hearing*, *supra* note 32 (statement of Bidtah N. Becker).

²⁷⁴ *McGirt v. Oklahoma*, 140 S. Ct. 2452, 2482 (2020).

C. Protecting Public Health from Climate Change through Water Security: The Role of the Indian Health Service

Several federal agencies have programs available that can be used to assist tribes in responding to climate change and protecting tribal public health. Indeed, there are at least seven different federal agencies with at least 23 different programs that provide some type of funding for tribal water and sanitation projects.²⁷⁵ However, the IHS mission most aligns with this intersection and is one of the main agencies involved in supporting tribal drinking water and sanitation infrastructure. Accordingly, this section focuses on the efforts of IHS.

Tribal communities have faced water insecurity for decades. Throughout the 1950s, reservation-wide sanitation surveys were conducted that revealed “[m]ore than 80% of Indian and Alaska Native families hauled or otherwise imported domestic water supplies, with over 70% of this water coming from contaminated or likely contaminated sources. Less than 20% of Indian homes were equipped with adequate waste disposal, with 12% having no facilities at all.”²⁷⁶ At the time, the PHS did not have statutory authority to construct sewage and water supply facilities. And although the Department of Interior possessed authority to construct sanitation facilities, it could not transfer such projects to state, local, or tribal entities.²⁷⁷ To address these issues, Congress passed the Indian Sanitation Facilities Act (ISFA) in 1959 to mitigate “the serious environmental problems” and to improve sanitation conditions in Indian country by authorizing the use of federal funds to design and construct water, wastewater, and solid waste facilities.²⁷⁸ At present, this authority is carried out by IHS through its Sanitation Facilities Construction (SFC) Program. The goal of the SFC Program is “to improve the health of the American Indian and Alaskan native people by improving the environment in which they live.” The SFC Program accomplishes this goal by providing safe water supplies, adequate means of waste disposal, and other essential sanitation facilities. An additional goal of the SFC Program is to build tribal capability to operate and maintain the facilities provided.²⁷⁹ As part of the SFC Program, IHS collects sanitation data—information about water supply and sewage disposal—for homes within its service areas. IHS currently has identified 245,802 homes that have some form of water or sanitation deficiency.²⁸⁰ These deficiencies can range from Level I (where the sanitation system complies with all applicable water supply and pollution control laws but requires routine replacement, repair, or maintenance) to Level V (where there is no safe water supply or sewage disposal system).²⁸¹

²⁷⁵ UNIVERSAL ACCESS, *supra* note 90, at 5.

²⁷⁶ David N. Dejong, *supra* note 211, 161.

²⁷⁷ *Id.* (citing Indian Sanitation Facilities, Senate Report No. 589, 86th Cong, 1st session, June 29, 1959 at 4).

²⁷⁸ Indian Sanitation Facilities Act of 1959, Pub. L. No. 86-121, 73 Stat. 267.

²⁷⁹ INDIAN HEALTH SERV., CRITERIA FOR THE SANITATION FACILITIES CONSTRUCTION PROGRAM Ch. 1-2 (1999), https://www.ihs.gov/sites/dsfc/themes/responsive2017/display_objects/documents/Criteria_March_2003.pdf.

²⁸⁰ INDIAN HEALTH SERVICE, AMERICAN RESCUE PLAN ACT, INFRASTRUCTURE INVESTMENT AND JOBS ACT, AND BUILD BACK BETTER BILL (2021), https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/2021_Speeches/IHSTribalandUIOUpdateandLearningSession120921.pdf.

²⁸¹ INDIAN HEALTH SERVICES, SANITATION DEFICIENCY SYSTEM (SDS): A GUIDE FOR REPORTING SANITATION DEFICIENCIES FOR AMERICAN INDIAN AND ALASKA NATIVE HOMES AND COMMUNITIES 18 (2019); INDIAN HEALTH SERVICE, ANNUAL REPORT TO THE CONGRESS OF THE UNITED STATES ON SANITATION DEFICIENCY LEVELS FOR INDIAN HOMES AND COMMUNITIES 4 (2019),

As mentioned in Part I, funding has been a persistent challenge for IHS because appropriations levels have generally not been sufficient to fund all the services needed. Historically, the SFC Program has received a fraction of the funds required for the program. For example, the SFC Program end of year need in 2020 was over \$3 billion, but only \$196.6 million was appropriated by Congress for fiscal year 2021.²⁸² However, for the first time in its history, the SCF Program received the full amount of funding for its reported need in the Infrastructure, Investment and Jobs Act (IIJA).²⁸³ As part of IIJA, the SCF Program will receive \$3.5 billion over five years; in other words, \$700 million per year for fiscal years 2022-2026. This amount is on top of additional funding that IHS received from COVID-19 related legislation, such as the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) and the American Rescue Plan Act.²⁸⁴

With this unprecedented funding, it is now up to IHS to effectively deploy the funds. There are several changes that IHS can implement to ensure that the SFC Program funding is dispersed in an equitable manner that provides the greatest benefit to tribal communities.²⁸⁵ These recommendations include improving the SFC Program database, removing unnecessary matching fund requirements, and updating eligibility and criteria positions in consultation with tribes.²⁸⁶ The IHS database is the most comprehensive inventory of drinking water and sanitation deficiencies in tribal communities. While IHS has made improvements to their database, it does not identify all tribal homes that are eligible to receive funding from IHS. In order to enhance transparency, it is important that the IHS improve its compilation and dissemination of the most current and up-to-date data and that this information be available to the public, Congress, and tribes. Ongoing tribal consultation is critical to ensure that tribal needs are accurately captured and that tribes have the opportunity to meaningfully comment on prioritized projects.

The ISFA authorized IHS to provide sanitation facilities to “Indian homes, communities, and lands.”²⁸⁷ Likely due to historically insufficient funding, IHS has adopted a restrictive interpretation of this responsibility, providing funding only to projects that serve Native homes directly, and requiring communities to find matching funds for other structures in the community

https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/FY_2019_RTC_Sanitation_Deficiencies_Report.pdf.

²⁸² See email from Mark Calkins (Director, Division of Sanitation Facilities Construction, Indian Health Service) to Heather Tanana (Mar. 2, 2021) (“[T]he end of year 2020 total cost of SDS projects has been finalized at \$3,086,773,153.”) and FY 2021 IHS Operating Plan, https://www.ihs.gov/sites/budgetformulation/themes/responsive2017/display_objects/documents/FY2021_Operating_Plan.pdf.

²⁸³ Infrastructure Investment and Jobs Act, Pub. L. 117-58, 135 Stat. 249 (2021), Division J – Appropriations.

²⁸⁴ The lack of clean water access in Indian country received significant attention during the COVID-19 pandemic. The CARES Act and American Rescue Plan Act included additional funding for IHS and tribal water projects.

²⁸⁵ WATER & TRIBES INITIATIVE, UNIVERSAL ACCESS TO CLEAN WATER FOR TRIBES: RECOMMENDATIONS FOR OPERATIONAL, ADMINISTRATIVE, POLICY, AND REGULATORY REFORM Chapter 3 at 17-23 (2021), <https://tribalcleanwater.org/wp-content/uploads/2021/11/Full-Report-11.21-FINAL.pdf> [hereinafter RECOMMENDATIONS FOR REFORM].

²⁸⁶ *Id.*

²⁸⁷ Pub. L. 86-121.

that would be served by water and wastewater infrastructure.²⁸⁸ Matching funds are required even for structures that are essential to the life of the Native communities and provide indispensable educational, economic, and community services, such as schools, nursing homes, and tribal offices. The matching requirement creates an insurmountable financial obstacle for many tribal communities. With adequate funding now available, IHS should remove this unnecessary matching fund requirement and adopt a broad interpretation of its responsibility to provide sanitation facilities, including structures essential to the educational, economic, and health needs of the community.

Additionally, although IHS has established basic eligibility criteria²⁸⁹ for providing service to “Indian homes, communities, and lands” under ISFA, the agency does not have regulations that define Indian community for this purpose. Under current criteria, IHS assistance depends upon the community size and Native American population.²⁹⁰ In Indian communities (currently identified as 50 percent or more federally recognized Native American people), non-Indian persons or organizations must contribute funds to cover the prorated cost of facilities required to serve them. In non-Indian communities, IHS can only provide funding to improve or replace existing sanitation facilities in communities with less than 10,000 people, and that funding is prorated to cover only the cost to serve tribal homes. In non-Indian communities with more than 10,000 people, IHS is only able to support connecting individual tribal homes to public infrastructure, making these communities entirely reliant on state or other sources of funding for upgrades to existing systems. These community and population distinctions are both unnecessarily complex and confusing, and create barriers and disadvantages for both Native Americans households that are located within non-Indian communities, and non-Native American households that are located within Indian communities. In consultation with tribes, IHS should clarify the definition of an Indian community through new regulations or other agency direction to better provide drinking water and sanitation to all tribal members, regardless of the makeup of the communities in which they live. As noted by Senator Lisa Murkowski of Alaska, “it makes sense to provide some incidental benefits to non-Indians in an Indian community in order to get the full sanitation benefits to the folks that are there.”²⁹¹

Finally, recognizing that there are statutorily placed limitations on IHS’ authorized services, collaboration and coordination through a “whole of government” approach can help eliminate duplication and optimize resources among agencies to create synergies and deliver seamless services.²⁹² For example, the Environmental Protection Agency (EPA) plays a major role in ensuring that water quality standards are met. The U.S. Department of Agriculture (USDA) has water-focused programs that can be utilized to promote economic development. Each of these agencies has their own expertise and federally-funded programs that can help

²⁸⁸ Jojo Phillips, *‘Unserviced’: Why Some Western Alaska Villages Lack Basic Sanitation Infrastructure*, KNOM NEWS (May 20, 2020), <https://www.adn.com/alaska-news/rural-alaska/2020/05/19/unserved-why-some-western-alaska-villages-lack-basic-sanitation-infrastructure/>.

²⁸⁹ Indian Health Service, *Criteria for the Sanitation Facilities Construction Program*, at 5-3 (2003).

²⁹⁰ *Id.* at 5-7.

²⁹¹ Lisa Murkowski, *Senator Murkowski Speaks on Improving Health Care Outcomes and Sanitation in Indian Country*, YOUTUBE, (Dec. 12, 2019).

²⁹² RECOMMENDATIONS FOR REFORM, *supra* note 285, at 5.

address the water-related needs of tribal communities.²⁹³ There are a variety of ways to achieve a whole of government approach,²⁹⁴ however, utilization of the Tribal Infrastructure Task Force established in 2007 may be the easiest. The Infrastructure Task Force was created to develop and coordinate federal activities in delivering water and wastewater infrastructure to tribal communities.²⁹⁵ Federal agencies involved include the USDA, U.S. Department of Housing and Urban Development, U.S. Department of Health and Human Services (including IHS), U.S. Department of the Interior, and EPA.²⁹⁶ Although the Infrastructure Task Force was dormant for a period of time, the federal agencies entered into a new Memorandum of Understanding (MOU) in 2022.²⁹⁷ The new MOU is intended to be “a framework for all parties to enhance interagency coordination and to cultivate greater cooperation in carrying out their authorized federal government responsibilities[.]”²⁹⁸ While the renewed MOU is commendable, it lacks a formal directive for coordination and does not include any metrics to be able to evaluate measurable progress. Achieving a whole of government approach in reality will require a formal directive mandating interagency coordination, clear responsibilities and identified goals, as well as metrics to be used to measure progress and ensure accountability.

Finally, to truly protect the health of tribal communities and achieve water security in Indian country, IHS must incorporate the effects of climate change into its policies and programmatic activities. In the past, federal efforts to provide health services and care were inadequate, provided in a sporadic manner through emergency-based services.²⁹⁹ “While preventative medicine was becoming the norm across the United States, it was slow to materialize in Indian Country, where the emphasis remained curative.”³⁰⁰ History is repeating itself and requires another paradigm shift. The same conditions that made tribal communities susceptible to infection and chronic diseases are the same conditions that remain today and make them susceptible to climate change impacts: inadequate health services, substandard and overcrowded housing, and lack of domestic water and adequate sanitation facilities.

Historically, IHS has not established its own policy related to climate change. However, IHS follows the Department of Health and Human Services policy (DHHS). And, DHHS recognizes that “[c]limate change poses current and increasing threats to human health.”³⁰¹ In

²⁹³ For a more detailed discussion of the programs related to drinking water, see UNIVERSAL ACCESS, *supra* note 90, at Chapter 4.

²⁹⁴ See RECOMMENDATIONS FOR REFORM, *supra* note 285, at Chapter 2.

²⁹⁵ EPA, Federal Infrastructure Task Force to Improve Access to Safe Drinking Water and Basic Sanitation to Tribal Communities, <https://www.epa.gov/tribal/federal-infrastructure-task-force-improve-access-safe-drinking-water-and-basic-sanitation>.

²⁹⁶ *Id.*

²⁹⁷ *Id.*

²⁹⁸ Memorandum of Understanding among the Department of Agriculture, Department of Housing and Urban Development, Department of Health and Human Services, Department of the Interior, and the Environmental Protection Agency to better coordinate the federal government efforts in providing infrastructure and promoting sustainable practices to support the provision of safe drinking water and basic sanitation in American Indian and Alaska Native communities, available at <https://www.epa.gov/system/files/documents/2022-02/2022-approved-itf-mou.pdf>.

²⁹⁹ David N. Dejong, *supra* note 211, at 143.

³⁰⁰ *Id.*, at 43.

³⁰¹ U.S. DEP’T OF HEALTH AND HUM. SERVICES, *Climate Change and Health Equity*, HHS, <https://www.hhs.gov/ocche/climate-change-health-equity/index.html>.

2021, DHHS launched a new Office of Climate Change and Health Equity (OCCHE). The OCCHE’s mission is to protect the population from health threats posed by climate change, especially those experiencing a higher share of exposures and impacts.³⁰² These efforts have primarily focused on securing commitments by the health care sector to lowering their GHG emissions and building more climate resilient infrastructure.³⁰³

The success of the OCCHE remains yet to be seen. However, any action seeking to address climate change impacts experienced by tribal communities—particularly water security issues—must account for the unique nature of tribal water rights and address the lack of infrastructure in Indian country. Moreover, as discussed further in Part III, tribes must be the drivers of their own future.

III. Building a Resilient Future

Climate change is threatening tribal public health and the future of tribal communities. Federal treaty and trust responsibilities to promote the health of Native Americans and ensure reservations are permanent homelands must account for climate change impacts to water. Although tribes share common experiences of colonization, removal, and assimilation, each of the 574 federally recognized tribes in the United States is unique and has its own individual needs based upon its community. The federal government will be more likely to achieve demonstrable success if it works in collaboration with tribes. Compared to non-indigenous communities, tribes have more readily recognized and acknowledged evidence of climate change impacts; and consequently, they have been among the first to initiate and actively engage in climate adaptation initiatives.³⁰⁴ However, the ability to adapt to climate change depends on the availability of data and ability to engage in decision-making. And historically, tribes have not been supported, or even invited, to have a seat at the table. Climate change policy should respect self-determination in governance and knowledge exchange.³⁰⁵ Tribes must have a voice in the decisions that impact their land and people. The ability to meaningfully engage on a government-to-government level and to make those decisions requires tribal capacity, which can be built through improved access to information and effective consultation, as discussed further below.

A. Access to Information and Funding

Many tribes are undertaking efforts to assess climate impacts and develop climate adaptation plans for their communities, lands, and resources. In order to be successful, access to

³⁰² U.S. DEP’T OF HEALTH AND HUM. SERVICES, *About the Office of Climate Change and Health Equity*, HHS, <https://www.hhs.gov/ash/ocche/about/index.html>.

³⁰³ See White House, *Fact Sheet: Health Sector Leaders Join Biden Administration’s Pledge to Reduce Greenhouse Gas Emissions 50% by 2030* (June 30, 2022), <https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/30/fact-sheet-health-sector-leaders-join-biden-administrations-pledge-to-reduce-greenhouse-gas-emissions-50-by-2030/>.

³⁰⁴ Helen Fillmore & Loretta Singletary, *Climate Data and Information Needs of Indigenous Communities on Reservation Lands: Insights From Stakeholders in The Southwestern United States*, 169 CLIMATIC CHANGE 37 (2021).

³⁰⁵ See *Advancing Environmental Justice Through Climate Action: Hearing Before the H. Select Comm. on the Climate Crisis*, 117th Cong. (2021) (statement of Nikki Cooley, Co-Manager and Interim Ass. Dir., Institute for Tribal Environmental Professionals), <https://docs.house.gov/meetings/CN/CN00/20210715/113894/HHRG-117-CN00-Wstate-CooleyN-20210715.pdf>.

information and funding is critical. In a recent survey, tribes identified their top prioritized information need as “climate change impacts on tribal lands, water, and economies.”³⁰⁶ Climate data can help tribes assess their climate adaptation needs and engage in resiliency planning for their communities. Tribes also have difficulty accessing water quality data. Many tribes have identified water quality as a critical environmental issue for their community. However, water quality data collection and analysis are labor intensive, and some tribes may not have the capacity to generate the data on their own. Relevant water quality data is also not easily accessible through federal sites (e.g., USGS online data portal) or is too limited in scope to inform tribal water management decisions (e.g., EPA’s water quality data).³⁰⁷ To fill the data gap, tribes have begun to partner with third-parties, including academic institutions. While tribes are sensitive to participating in research due to historic ethical abuses,³⁰⁸ these partnerships have been successful because tribes initiate the work, the data is useful to tribes and the research is helping to solve a problem identified by the tribe.³⁰⁹

Overall, improvements in data relevant to tribal communities is clearly needed. However, any future research must ensure that it protects tribal data sovereignty. To do so, future research should include protocols when working with tribes to ensure voluntary participation and to protect sensitive traditional knowledge from misuse that could inadvertently harm tribal nations. Such efforts should aim to support locally led community-based adaptation efforts rather than extract knowledge or resources from historically marginalized populations, including indigenous communities.³¹⁰

Finally, tribes have access to federal programs and funding that can assist with planning and implementing climate change adaptation actions. For decades, these programs were severely underfunded. Although IJA and other recent legislation represents a historic investment in tribal water infrastructure and climate change initiatives, tribes will continue to face various hurdles accessing these resources. Given the extensive number of federal programs, each with their own requirements and deadlines, it can be difficult for tribes to navigate the system. Additionally, many programs require submission of a grant proposal. Not all tribes may have an experienced grant writer capable of submitting a competitive application. A one-stop-shop website with information about all the funding opportunities available to tribes would help ensure tribes are aware of all of the different federal programs. Because IHS relies upon its SFC program database to identify and fund water projects in Indian country, it is critical that tribes work with IHS to ensure that their community needs are accurately identified in the database. Projects that are “shovel-ready” will also be more likely to be prioritized and funded by federal agencies.³¹¹ Federal assistance must be available to help tribes move projects from shovel-worthy to shovel-ready.

³⁰⁶ Fillmore & Singletary, *supra* note 304.

³⁰⁷ *Id.*

³⁰⁸ See Christina M. Pacheco et al., *Moving Forward: Breaking the Cycle of Mistrust Between American Indians and Researchers*, 103 AM. J. PUBLIC HEALTH 2152 (2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3828980/>.

³⁰⁹ See C. Cummins et al., *Community-Based Participatory Research in Indian Country: Improving Health Through Water Quality Research and Awareness*, 33 FAM. COMMUNITY HEALTH 166 (2011).

³¹⁰ *Id.*

³¹¹ “Shovel-ready” refers to the stage when the necessary engineering reports and environmental review are completed, and construction can be begin.

B. Consultation and Integration of Traditional Knowledge

Tribes know their communities best—their needs and strengths. As such, any future effort to promote tribal health and respond to climate change should be guided by the tribe through consultation, accounting for indigenous knowledge and innovation. “Tribal consultation is essential for effective Indian health policy.”³¹² Since 2000, Executive Order 13175 has required agencies to have a process to ensure meaningful and timely input by tribal officials in the development of policies that have tribal implications.³¹³ Tribal consultation requirements stem from the federal government’s trust responsibility.³¹⁴ In order to fulfill the federal obligation to protect tribal rights, it is necessary for the federal government to initiate meaningful consultation with tribal sovereigns “to determine what services are most needed for tribal members, to understand how federal and state actions may be encroaching on tribal sovereignty, and to analyze whether a federal project will have an adverse effect on tribal resources.”³¹⁵ Yet meaningful consultation has remained largely undefined by the statutes, executive orders, and presidential memorandums that have required such tribal consultation.³¹⁶ Although E.O. 13175 requires the creation of an internal consultation process, and subsequent presidential administrations have reaffirmed the need to consult with tribes in the decision-making processes of federal agencies, “consultation policies remain vague and ineffective.”³¹⁷

On January 26, 2021, the Biden Administration issued a memorandum on “Tribal Consultation and Strengthening Nation-to-Nation Relationships.”³¹⁸ The memorandum requires the head of each federal agency to submit “a detailed plan of actions the agency will take to implement the policies and directives of Executive Order 13175.”³¹⁹ The plan must be developed “after consultation by the agency with Tribal Nations and Tribal officials” in accordance with E.O. 13175.³²⁰ Various federal agencies, including IHS, are in the process of reviewing and updating their tribal consultation policy and procedures.³²¹ Meanwhile, IHS conducted several tribal consultation sessions and solicited written comments with respect to allocation of IIJA and other IHS funding.³²²

³¹² Aila Hoss, *Securing Tribal Sovereignty to Support Tribal Health Sovereignty*, __ NORTHEASTERN UNIVERSITY LAW REV. __ (2022).

³¹³ Exec. Order No. 13,175, 65 Fed. Reg. 67,249 (Nov. 6, 2000).

³¹⁴ Elizabeth Kronk Warner et al., *Changing Consultation*, 54 U.C. DAVIS L. REV 1127 (2020); U.S. DEPT. OF INT. BUREAU OF INDIAN AFFAIRS, FREQUENTLY ASKED QUESTIONS, <https://www.bia.gov/frequently-asked-questions>.

³¹⁵ Elizabeth Kronk Warner et al., *supra* note 314.

³¹⁶ *Id.* at 22.

³¹⁷ *Id.*

³¹⁸ Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships (Jan. 26, 2021), <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/26/memorandum-on-tribal-consultation-and-strengthening-nation-to-nation-relationships/>.

³¹⁹ *Id.*

³²⁰ *Id.*

³²¹ ELIZABETH A. FOWLER, U.S. DEP’T OF HEALTH AND HUM. SERVICES, DEAR TRIBAL LEADER LETTER (May 6, 2022), https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/2022_Letters/DTLL-05062022.pdf (providing an update on IHS Tribal Consultation Policy and process).

³²² ELIZABETH A. FOWLER, U.S. DEP’T OF HEALTH AND HUM. SERVICES, DEAR TRIBAL LEADER LETTER (May 31, 2022), https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/2022_Letters/DTLL-05312022.pdf (announcing allocation decision for IIJA funding).

Despite the tribal consultation requirements, the current consultation process is procedural rather than substantive. Federal agencies still have discretion to proceed as they wish as long as the agency has completed the consultation step. Because the consultation process is an extension of the government's trust relationship with tribes, there are potential remedies for a breach of fiduciary duty.³²³ Further, because federal agencies are carrying out the requirements of E.O. 13175, tribes have a remedy under the Administrative Procedure Act (APA) in a similar manner to agency actions under Executive Order 12898, which requires environmental justice impacts to be considered.³²⁴

Effective tribal consultation is particularly important because tribes have historically been denied a "seat at the table" and the opportunity to be involved in the decisions governing their environment. Effective consultation recognizes tribal sovereignty and the right to self-determination, and empowers tribes to have greater control over their future. However, tribal capacity is a necessary component of effective consultation. Tribes must have the capacity (e.g., information and expertise) to meaningfully engage on an issue and to protect their interests.

Finally, as stewards of the land since time immemorial, tribes have traditional knowledge systems that can be integrated into health services and support comprehensive climate adaptation and response strategies. "Traditional knowledge is knowledge, know-how, skills, and practices developed, sustained, and passed on from generation to generation within a community, often forming part of its cultural identity."³²⁵ Even for tribes that have been removed from their traditional homelands, certain tribal members (e.g., leaders, elders, and healers) hold special, cultural knowledge that can be used to protect the tribal community. Such knowledge generally incorporates a more holistic view of environmental health and recognizes that all things are connected, emphasizing the need to be in balance with our surroundings. For example, Navajo traditional teachings embrace this concept through *hózhó*, which roughly translates to balance and beauty, or living in harmony. Similarly, "[t]o be Hopi is to embrace peace and cooperation, to care for the Earth and all of its inhabitants, to live within the sacred balance."³²⁶

Within the health field, IHS has recognized the importance of native healers in improving community health. The agency established a formal policy affirming the importance of native healing in 1979. Since then, IHS has supported traditional medicine men training programs and incorporated native health structures into IHS facilities, among other actions.³²⁷ Increasing efforts also seek to involve indigenous communities and their traditional knowledge in climate adaptation research. For example, traditional ecological knowledge may be able to extend the

³²³ Elizabeth Kronk Warner et al., *supra* note 314, at 11 (2020).

³²⁴ Exec. Order No. 13,175, 65 Fed. Reg. 67,249 (Nov. 6, 2000); *see also* Exec. Order No. 12,898, 59 Fed. Reg. 7,629 (Feb. 11, 1994).

³²⁵ UCLA Native Nations Law & Policy Center, *The Need for Confidentiality within Tribal Cultural Resource Protection 4* (2020), https://law.ucla.edu/sites/default/files/PDFs/Native_Nations/239747_UCLA_Law_publications_Confidentiality_R2_042021.pdf.

³²⁶ Dennis Wall & Virgin Masayeva, *People of the Corn: Teachings in Hopi Traditional Agriculture, Spirituality, and Sustainability*, 28 AM. INDIAN QUARTERLY 435, 436 (2004).

³²⁷ Emery A. Johnson & Everett Rhoades, *The History and Organization of Indian Health Services and Systems in American Indian Health: Innovations in Health Care, Promotion, and Policy* (2000) at 82.

environmental record in data sparse regions and improve monitoring design.³²⁸ However, climate adaptation research involving tribes has primarily focused on environmental observations, environmental uses, governance, and cultural perspectives, rather than capacity-building.³²⁹ As noted above, increasing tribal capacity is critical to ensuring that tribes are equal collaborators, if not leaders, on matters impacting their community. Additionally, tribes are increasingly seeking research ethics protocols that protects traditional knowledge from misappropriation.³³⁰ Traditional knowledge is often central to tribal identities and in some instances, tribes may want to keep that information confidential, particularly when it relates to cultural resource protection or is considered sensitive because of internal tribal considerations.³³¹ For some tribes, forced assimilation and criminalization of their religious practices mandated the adoption of internal confidentiality protocols to safeguard their traditions, customs, and ways of life.³³² With few legal protections to protect sensitive tribal information,³³³ tribes must take affirmative steps to retain tribal ownership and control of traditional knowledge.

As more tribes complete climate change assessments and adaptation plans, they are incorporating their traditional knowledge and utilizing indigenous health indicators specific to their community.³³⁴ In doing so, tribes are also able to dismantle colonial power structures through tribally-driven strategies. While the federal government retains a legal obligation to protect tribes and ensure their future, efforts to address climate-related impacts will be more successful if they are done in consultation with tribes to accurately identify tribal needs and incorporate tribal strengths, including traditional knowledge.

Conclusion

Across the United States, climate change is jeopardizing human health and the environment. As a result of past federal policies, tribal communities are being disproportionately impacted by climate change. These impacts are affecting water in ways that are threatening tribal public health. In the West, droughts are causing historic declines in available water supplies. On the coast, sea-level rise is causing increased floodings, and in some cases, displacing entire communities. Water quality is also being impacted, making it unsafe for consumption. Water is necessary to sustain life. However, for many tribes, water also carries spiritual or cultural significance. As water sources dwindle or become contaminated, tribes are unable to continue with their traditional way of life. The loss of certain traditional practices further perpetuates the historical trauma experienced by Native Americans from colonization, removal, and assimilation.

The COVID-19 pandemic has helped bring national attention to these historic inequities. Recent actions by the federal government, specifically the Biden administration and Congress, indicate that we are entering a new era of federal–tribal relations—one where the federal

³²⁸ Karen Cozzetto et al., *supra* note 83.

³²⁹ Fillmore & Singletary, *supra* note 304.

³³⁰ *Id.*

³³¹ UCLA Native Nations Law & Policy Center, *supra* note 325.

³³² *Id.* at 6.

³³³ *Id.* at 7-12.

³³⁴ See e.g., BLACKFEET COUNTRY AND CLIMATE CHANGE, *Climate Change is Here in Blackfeet Country*, <https://blackfeetclimatechange.com/>.

government delivers on its promises. However, the federal government has a fraught history with Native Americans. Despite having treaty and trust responsibilities to tribes, the federal government has failed to protect tribal communities. While the federal government helped build infrastructure across the United States, it largely ignored Indian country. As a result, many tribes do not have adequate infrastructure to support their growing communities. The primary factor determining whether a household has access to clean drinking water is race, with Native Americans 19 times more likely to lack clean water access than white households. Native Americans also experience significant health disparities compared to the general population. The federal government retains treaty and trust responsibilities to provide health services to Native Americans and ensure that they have a permanent homeland on which they can prosper. As climate change further threatens tribal health and culture, it has become increasingly important that the federal government fulfill its promises to tribes.

Historically, federal tribal programs have been chronically underfunded. However, IJA has appropriated significant funds to help obtain water security for tribal communities, primarily through the IHS SCF Program. To ensure these funds are deployed in an efficient manner, IHS must work with sister agencies to combine their expertise and program authorities to better ensure projects meet all of the tribal community needs and are not restricted by one program's limitations. IHS can also take steps to make the SCF Program more accessible to tribes and more effective in its implementation.

In this new era, the federal government must build off the current momentum to protect future generations through tribal capacity building, effective tribal consultation, and utilization of traditional knowledge. To truly avoid mistakes of the past, tribes must be part of the process on decisions impacting their communities. Not only do tribes know their community needs best, they also specialized knowledge to contribute. If true partnership is achieved, the federal government may finally reach its goal of raising the physical, mental, social, and spiritual health of American Indians and Alaska Natives to the highest level.