PROTECTING TRIBAL PUBLIC HEALTH FROM CLIMATE CHANGE

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ABSTRACT

The COVID-19 pandemic brought national attention to challenges that tribal communities have been facing for decades, such as limited health services and a 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, in the Southwest, approximately 30 to 40% 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 and groundwater supplies are drying up. As a result, residents increasingly compete for limited water resources to fulfill all the community's needs–from agricultural to domestic.

The lack of infrastructure in Indian country is the direct result of federal policies. 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.

INTRODUCTION

Climate change is a global phenomenon affecting everyone. However, the experiences of particular people and communities[1] vary greatly, ranging 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,[2] including Native Americans.[3] Colonization by the United States, coupled with its subsequently enacted federal policies, have exacerbated tribal vulnerabilities to climate change by creating systemic inequities.[4] 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—originated from the racist belief that Native Americans were savages,

1 This Article refers to the Indigenous people of what is now called the United States using various terms including Native American, American Indian and Alaska Native, Indian, and Indigenous. 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." Each term is used regularly in practice and, depending on the context, can be appropriate. In this Article, Native American is generally used, unless referring to a specific law or policy that uses another term. If quoting or describing 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. 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 (2022).

2 *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. U.S. Environmental Protection Agency*, EPA 430-R-21-003 (2021), https://www.epa.gov/cira/social-vulnerability-report (quantifying the degree to which socially vulnerable populations may be more exposed to the highest impacts of climate change). "The impacts of climate change will not be equally distributed across the U.S. population. Those who are already vulnerable due to a range of social, economic, historical and political factors have a lower capacity to prepare for, cope with, and recover from climate change impacts." *Id.* at 9. *See also* U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT (NCA4), VOL. 2, IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES 27 [hereinafter NCA4 VOL. 2], https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf ("Populations including older adults, children, low-income communities, and some communities of color are often disproportionately affected by, and less resilient to, the health impacts of climate change.").

3 *See* Section I of this Article discussing the different impacts of climate change on tribal communities.

4 *See* Section II.A of this Article, providing a brief history of federal Indian policies.

inferior to white settlers.[5] Within this framework, tribes were forced into a "state of pupilage," where "[t]heir relations to the United States resemble[d] that of a ward to his guardian."[6] This required them to rely on 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."[7] And yet, the federal government has largely failed to uphold the treaty and trust responsibilities it owes to the tribes, as evidenced by the extensive unmet needs experienced today.[8] "Due at least in part to the failure of the federal government to adequately 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."[9]

The COVID-19 pandemic brought national attention to the historic inequities faced in Indian country.[10] Media outlets across the

5 *See* Joubin Khazaie, *Fanon, Colonial Violence, and Racist Language in Federal American Indian Law*, 12 U. MIA. RACE & SOC. JUST. L. REV. 297, 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."); *see also* Adam Crepelle, *Lies, Damn Lies, and Federal Indian Law: The Ethics of Citing Racist Precedent in Contemporary Federal Indian Law*, 44 N.Y.U. REV. OF L. & SOC. CHANGE 529, 532 (2021) ("Jurisprudence loaded with grotesque 19th-century racist stereotypes and factual errors about American Indians remains valid precedent.").

6 Cherokee Nation v. Georgia, 30 U.S. 1, 2 (1831).

7 *Id.* at 17.

8 *See generally* U.S. COMM'N ON C.R., BROKEN PROMISES: CONTINUING FEDERAL FUNDING SHORTFALL FOR NATIVE AMERICANS (2018) [hereinafter BROKEN PROMISES] (examining the federal government's failure to fully fund treaty and statutory obligations).

9 *Id.* at "Letter of Transmittal".

10 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 (2022). 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 Tribal Gov't, 522 U.S. 520, 527 (1998). Established by the House of Representatives at the beginning of the pandemic, the Select Subcommittee on the Coronavirus Crisis was charged with examining any disparate impacts of the coronavirus. *An Unequal Burden: Addressing Racial Health Disparities in the Coronavirus Pandemic*, SELECT SUBCOMMITTEE ON THE CORONAVIRUS CRISIS, https://coronavirus.house.gov/subcommittee-activity/briefings/coronavirus-panel-hold-member-briefing-racial-health-disparities (last visited Jan. 20, 2023). During a June 4, 2020 subcommittee briefing, Fawn Sharp (President of the National Congress of American Indians) testified about the federal government's neglect of its legal obligations to tribes and the resulting disparities that heightened their vulnerability to the pandemic. *Hearing on An Unequal Burden: Addressing Racial Health Disparities in the Coronavirus Pandemic*

world highlighted the virus's disproportionate impact on Indigenous peoples, particularly within the United States.[11] Native Americans have experienced substantially higher rates of COVID-19 incidence, hospitalization, and death compared with other racial groups.[12] As of September 15, 2022, Native Americans were 1.6 times more likely to contract COVID-19, 2.7 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.[13] While no tribe was immune to the pandemic, several tribal communities were particularly ravaged, including the Navajo Nation.[14] This disproportionate impact has been attributed to challenges that tribal communities have faced for decades, such as limited health services; inadequate housing; and a lack of infrastructure, particularly for water access.[15] The Navajo Nation, which has the largest reservation in the country, experienced more cases and deaths per capita than any state.[16] "At the start of the COVID-19 outbreak, the Indian Health Service (IHS) identified approximately 9,650 homes on the Navajo Nation without piped water in their homes."[17] When testifying before the House of Representatives, Navajo Nation President Jonathan Nez largely attributed the outbreak of COVID-19 among the Navajo Nation to the lack of water in the homes of Navajo people, emphasizing that "clean water is a sacred and scarce commodity."[18]

Before the Select Subcomm. on the Coronavirus Crisis, 116th Cong. 2 (2020) [hereinafter Sharp Testimony] (written testimony of Fawn Sharp, President of the National Congress of American Indians).

11 *See, e.g.*, Simon Romero, *Checkpoints, Curfews, Airlifts: Virus Rips Through Navajo Nation*, N.Y. TIMES (Apr. 9, 2020) (updated Apr. 20, 2020), https://www.nytimes.com/2020/04/09/us/coronavirus-navajo-nation.html.

12 *Hospitalization, and Death by Race/Ethnicity*, CTR. FOR DISEASE CONTROL AND PREVENTION, https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html (last updated Dec. 28, 2022).

13 *Id.*

14 Romero, *supra* note 11. *See also Dikos Ntsaaígíí-19 (COVID-19)*, NAVAJO DEP'T OF HEALTH, https://ndoh.navajo-nsn.gov/COVID-19.

15 *See* Sharp Testimony, *supra* note 10, at 3–6.

16 Hollie Silverman et al., *Navajo Nation Surpasses New York State for the Highest COVID-19 Infection Rate In the US*, CNN (May 18, 2020), https://www.cnn.com/2020/05/18/us/navajo-nation-infection-rate-trnd/index.html.

17 *Protecting You and Your Family's Health*, NAVAJO SAFE WATER, https://storymaps.arcgis.com/stories/1b4dc0d978c74d97a559e615730d4cd4 (last updated Sept. 15, 2022).

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

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,[19] 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.[20] For example, the Colorado River provides water to approximately 40 million people, 7 states, and 30 federally recognized tribes with "Basin Tribes hold[ing] water rights to approximately 3 million acre-feet of Colorado River water, which equates to about 25% of the river's current average annual flow."[21] However, a substantial portion of tribal water rights are unrealized, in part due to the lack of necessary infrastructure to access the water and funding to create such access.[22] Meanwhile, "decisions made a century ago overallocated the river's water . . . [and] climate change has magnified the problem . . . ."[23]

Many tribes in the Colorado River Basin ("the 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 a direct impact on tribal public health. Through ownership of a 7,700-acre farm, known as the Ute Mountain Ute Tribe Farm & Ranch Enterprise, the tribe has provided agricultural and financial support to its members since its formation in 1962.[24] But in 2021, due to drought and associated

19 *See* Xavier Rodó et al., *Changing Climate and the COVID-19 Pandemic: More than Just Heads or Tails*, 27 NATURE MED. 576, 576 (2021).

20 *See* Part I.A. of this Article discussing climate impacts to water and tribes.

21 Letter from Tribal Leaders, to Deb Haaland, Sec'y of the Interior, U.S. Dep't of the Interior (Nov. 15, 2021), https://s3.documentcloud.org/documents/21165278/2021-11-15-tribes-letter-to-sec-haaland.pdf; *see also* WATER & TRIBES INITIATIVE, POLICY BRIEF #4: THE STATUS OF TRIBAL WATER RIGHTS IN THE COLORADO RIVER BASIN 1 (2021) [hereinafter TRIBAL WATER RIGHTS], http://www.naturalresourcespolicy.org/publications/policy-brief-4-final-4.9.21-.pdf.

22 *See* TRIBAL WATER RIGHTS, *supra* note 21, at 1–2.

23 John Fleck & Anne Castle, *Green Light for Adaptive Policies on the Colorado River*, 14 WATER no.1:2, Dec. 2021, at 2.

24 UTE MOUNTAIN UTE TRIBE FARM & RANCH ENTERPRISE, https://www.utemtn.com/ (last visited Dec. 25, 2022); Sarah Troy, *As Drought in the West Worsens, the Ute Mountain Ute Tribe Faces a Dwindling Water Supply*, THE COLO. TRUST: COLLECTIVE COLO. (July 19, 2021), https://collective.coloradotrust.org/stories/as-drought-in-the-west-worsens-the-ute-mountain-ute-tribe-faces-a-dwindling-water-supply/; Rachelle Todea, *Ute Mountain Ute Tribe Faces Another Devastating Drought Year, but Recent Rain, Wheat Prices Bring Hope*, WATER EDUCATION COLO. (June 8, 2022), https://www.watereducationcolorado.org/fresh-water-news/ute-mountain-ute-tribe-faces-another-devastating-drought-year-but-recent-rain-

water cuts, the enterprise received only 10% of its water allocation from a main water source, the McPhee Reservoir. [25] The decrease in water led to a reduced crop production, which necessitated laying off 50% of the farm's employees, half of whom are tribal members.[26] In addition to the obvious economic implications, unemployment has been associated with negative health consequences, including depression and other stress-related illnesses.[27] To protect its community, the Ute Mountain Ute Tribe is looking for help by way of more water or assistance from the federal government.[28] Based upon climate projections, it is increasingly likely that any assistance will have to come from the government rather than Mother Nature. [29]

In contrast, some tribes in other parts of the country are dealing with the effects of too much water. Take for instance the Quileute Tribe, who sought federal assistance over a decade ago to respond to climate change. 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.[30] Home to approximately 400 people, the tribal village was being threatened by the rising Pacific Ocean.[31] The community's single road was often under water, and tribal members feared that a tsunami would lead to the extinction of their people.[32] Seeking federal legislation to facilitate a move to higher ground, Chairwoman Bonita Cleveland testified in 2011:

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wheat-prices-bring-hope/.

25 Troy, *supra* note 24.

26 Todea, *supra* note 24.

27 ROBERT WOOD JOHNSON FOUNDATION, HOW DOES EMPLOYMENT—OR UNEMPLOYMENT—AFFECT HEALTH? 1 (2013), http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2013/rwjf403360.

28 *See* 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.

29 Fleck & Castle, *supra* note 23, at 5 (discussing climate change projections for reductions in Colorado River flows).

30 Ben Tracy, *Climate Change Forces Native American Tribes to Relocate*, CBS NEWS: CBS EVENING NEWS WITH NORAH O'DONNELL, (Nov. 4, 2021, 6:49 PM) (UPDATED 7:53 PM), https://www.cbsnews.com/news/quileute-tribe-climate-change/.

31 *Id.*

32 *Quileute Tribe Tsunami Protection Legislation*: *Hearing on S. 636 Before the S. Comm. on Indian Affs.*, 112th Cong. 1 (2011), https://www.indian.senate.gov/sites/default/files/upload/files/Bonita-Cleveland-testimony-S-636-and-attachment.pdf (statement of Bonita Cleveland, Chair of the Quileute Tribe).

> 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?"[33]

Recognizing that most of the reservation was located within the coastal flood plain—with tribal administrative buildings, the 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.[34] 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.[35]

Regardless of the specific climate impacts experienced, whether a water shortage or excess as demonstrated by the Ute Mountain Ute and Quileute Tribe respectively, the federal government 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.[36] "Historical research shows that land dispossession and forced migration are the primary means by which settler populations achieve large-scale political and

33 *Id.*

34 Act of Feb. 27, 2012, Pub. L. No. 112–97, 126 Stat. 257 (2012) (providing the Quileute Indian Tribe tsunami and flood protection, and for other purposes) (codified at 16 U.S.C. §§ 1131-1132, 251; 25 U.S.C. § 2701).

35 Richard Arlin Walker, *Tribal Nations Adapt to Being at "Ground Zero" of the Climate Crisis*, HIGH COUNTRY NEWS (Apr. 14, 2021), https://www.hcn.org/articles/climate-change-tribal-nations-adapt-to-being-at-ground-zero-of-the-climate-crisis; QUILEUTE NATION, *Climate Change*, https://quileutenation.org/natural-resources/climate-change/ (last visited Dec. 25, 2022). The Quileute Tribe's climate plan specifically notes that some important structures, such as the marina, are "water-dependent and won't be moved." Katherine Krueger, *Climate Plan for the Quileute Tribe of the Quileute Reservation*, QUILEUTE NAT. RES., 51–2 (2017), https://quileutenation.org/wp-content/uploads/2021/05/April-2017-UPDATE-to-Climate-Plan-QT-of-the-QR.pdf. The tribe is pursuing structural protections for these facilities. *Id.*

36 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, 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).

economic control over Indigenous populations."[37] The United States is no exception. This country was built upon millions of acres of stolen land, beginning with the arrival of European settlers.[38] Through treaty or by force, the federal government continued to usurp land, often displacing Native communities.[39] Such action "created the groundwork for contemporary conditions in which Indigenous peoples . . . face greater vulnerabilities to their health and food security, lack access to culturally appropriate education, and have heightened exposures to contaminants."[40] These disparities are particularly egregious given the federal government's special relationship and legal responsibility to tribes.

Specifically, according to the Indian Health Care Improvement Act (IHCIA), "Federal health services to maintain and improve the health of the Indians are consonant with and required by the Federal Government's historical and unique legal relationship with, and resulting responsibility to, the American Indian people."[41] Stemming from treaty obligations, the federal government agreed to promote tribal well-being and support tribes' basic needs, including critical items such as health care (e.g., medical facilities and clean drinking water).[42] Such treaties between the United States and tribes frequently included provisions for medical services, physicians, or hospitals for the care of Native Americans.[43] Today, the IHS is the federal agency responsible for providing health services to Native Americans.[44] 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

37 Justin Farrell et al., *Effects of Land Dispossession and Forced Migration on Indigenous Peoples in North America*, 374 SCIENCE, no. 6567 (Special Issue), Oct. 2021, at 1.

38 *Id.*

39 *Id. See also* BROKEN PROMISES, *supra* note 8, at 15.

40 Farrell et al., *supra* note 37, at 1.

41 25 U.S.C. § 1601.

42 BROKEN PROMISES, *supra* note 8, at 2.

43 *Basis for Health Services*, INDIAN HEALTH SERV. (Jan. 2015), https://www.ihs.gov/newsroom/factsheets/basisforhealthservices/; *see e.g.*, Treaty with the Kiowa and Comanche, art. 14, Oct. 21, 1867, 15 Stat. 581, https://treaties.okstate.edu/treaties/treaty-with-the-kiowa-and-comanche-1867.-(0977) ("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].").

44 *About IHS*, INDIAN HEALTH SERV. [hereinafter *About IHS*], https://www.ihs.gov/aboutihs/ (last visited Dec.1, 2022).

tribes.[45] However, IHS—including the sanitation program—has been historically underfunded and understaffed.[46] The IHS health care expenditure per capita is only one-third of what the federal government spends per person nationwide on health care.[47] Not only are laws and policies meaningless without resources to enforce them, but in this case, such "[u]nder-funding violates the basic tenants of the trust relationship between the [federal] government and Native peoples."[48]

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."[49] Native Americans experience a life expectancy that is 5.5 years less than the national average and die at higher rates than other Americans from various chronic diseases, including heart disease, diabetes, and chronic liver disease and cirrhosis.[50] The federal government has also failed to meet its treaty and trust responsibilities to provide basic infrastructure, in turn creating unsafe and unsanitary living conditions.[51] "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 over

45 *Division of Sanitation Facilities Construction*, INDIAN HEALTH SERV., https://www.ihs.gov/dsfc/ (last visited Jan. 9, 2023).

46 BROKEN PROMISES, *supra* note 8, at 66–67; HEATHER TANANA ET AL., WATER & TRIBES INITIATIVE, UNIVERSAL ACCESS TO CLEAN WATER FOR TRIBES IN THE COLORADO RIVER BASIN 4 (2021) [hereinafter UNIVERSAL ACCESS], https://tribalcleanwater.org/wp-content/uploads/2021/09/WTI-Full-Report-4.20.pdf.

47 NAT'L CONG. OF AM. INDIANS, *Reducing Disparities in the Federal Health Care Budget*, *in* FISCAL YEAR 2020 INDIAN COUNTRY BUDGET REQUEST 55, 55 (2019), https://www.ncai.org/07_NCAI-FY20-Healthcare.pdf ("In FY 2017, the IHS per capita expenditures for patient health services were just $3,332 compared to $9,207 per person for health care spending nationally.").

48 BROKEN PROMISES, *supra* note 8, at 2.

49 *Id.* at 65.

50 INDIAN HEALTH SERV., INDIAN HEALTH DISPARITIES 1 (2019), https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/factsheets/Disparities.pdf.

51 *Addressing Tribal Needs Through Innovation and Investment in Water Resources Infrastructures Through the U.S. Bureau of Reclamation: Hearing on Energy and Water Dev. Appropriations for 2022 Before the H. Comm. on Appropriations & Subcomm. on Energy and Water Dev.*, 117th Cong. 2 (2021) [hereinafter *Energy and Water Dev. Hearing*] (statement of Bidtah N. Becker, Associate Attorney, Navajo Tribal Utility Authority); *See also* Part II of this Article discussing the federal government's responsibility to tribes and water insecurity in Indian country.

the past one hundred years has largely bypassed reservations."[52]

Thus, many tribes lack the necessary water infrastructure to protect their communities against public health threats not experienced in the rest of the country. Nearly 48% of homes in tribal communities—over half a million Native Americans—do not have access to reliable water sources, clean drinking water, or basic sanitation, as compared to less than 1% of total homes in the United States lacking such access.[53] Inaccessible clean water and sanitation contribute to high morbidity and mortality rates among Native Americans.[54] Indian country is already in a deficit. If left unchecked, climate change will compound the disparity.

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 FUND[55]

52 *Id.*

53 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 1 (Comm. Print 2016), http://blackfeetnation.com/wp-content/uploads/2016/10/House-NRC-Water-Report-Minority-10-10-16.pdf.

54 *Id.* at 3.

55 *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).

Indigenous peoples, including Native Americans, are part of frontline communities that experience the "first and worst" consequences of climate change.[56] Social inequities, exclusion from the decision-making process, and inequitable access to resources have all contributed to higher environmental risks for frontline communities, including climate-related disasters.[57]

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.[58] Numerous studies have documented a "host of other climate variables or 'indicators' consistent with a warmer world," including "melting glaciers and ice sheets, shrinking snow cover and sea ice, rising sea levels, more frequent high temperature extremes and heavy precipitation events."[59] Drier and warmer conditions have also contributed to an increase in wildfires, which magnifies health risks and impacts quality of life by degrading air quality.[60]

While Indigenous peoples "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."[61] In contrast to other frontline communities, tribes possess inherent sovereign authority.[62] There are 574 federally recognized tribes in the United States.[63] Each tribe is unique and independent, but they share a common history of colonization.[64] Many tribal nations were removed from their traditional homelands onto reservations and lands that "were not considered

56 Georgetown Climate Ctr., *Equitable Adaptation Legal & Policy Toolkit*, GEO. L., https://www.georgetownclimate.org/adaptation/toolkits/equitable-adaptation-toolkit/introduction.html?chapter (last visited Dec. 25, 2022).

57 Marla Nelson et al., *Getting By and Getting Out: How Residents of Louisiana's Frontline Communities Are Adapting to Environmental Change*, 32 HOUS. POL'Y DEBATE (SPECIAL ISSUE) 1, 84, 94 (2021).

58 U.S. GLOB. CHANGE RSCH. PROGRAM, *Executive Summary: Highlights of the Findings of the U.S. Global Change Research Program Climate Science Special Report*, *in* CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, VOL. 1 at 12, 12 (2017), https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf.

59 NCA4 VOL. 2, *supra* note 2, at 76.

60 *Id.* at 50, 56.

61 *Id.* at 574.

62 BROKEN PROMISES, *supra* note 8, at 12 ("Tribal nations are distinctive sovereigns that have a special government-to-government relationship with the United States.").

63 *Indian Affairs*, U.S. DEP'T OF THE INTERIOR, https://www.bia.gov/about-us (last visited Dec. 25, 2022).

64 UNIVERSAL ACCESS, *supra* note 46, at 23.

to be located in the most desirable area of the Nation."[65] 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."[66]

Tó éí ííná até (Navajo).[67] *Paatuwaqatsi* (Hopi).[68] *Payy new aakut* (Ute).[69] *Xa 'iipayk* (Quechan).[70] Each tribe has its own language, but the meaning is the same: Water is Life.[71] 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. Water's sensitivities to climate-related events affect every region in the United States.[72] However, there are three main categories of climate-change impacts to water that present threats to tribal communities: rising sea-levels, diminishing water supply, and degrading water quality.

First, sea-level rise is threatening the continued viability of coastal communities.[73] "[T]he combined effects of extreme rainfall

65 Arizona v. California, 373 U.S. 546, 598 (1963).

66 Randall S. Abate & Elizabeth Ann Kronk Warner, *Commonality Among Unique Indigenous Communities: An Introduction to Climate Change and its Impacts on Indigenous Peoples*, *in* CLIMATE CHANGE AND INDIGENOUS PEOPLES: THE SEARCH FOR LEGAL REMEDIES 3, 12 (Randall S. Abate & Elizabeth Ann Kronk Warner eds., Edward Elgar Publ'g 2013).

67 UNIVERSAL ACCESS, *supra* note 46, at iv.

68 *Id.*

69 *Id.*

70 *Id.*

71 *Id.*

72 NCA4 VOL. 2, *supra* note 2, at 149.

73 *See* CONG. RSCH. SERV., SEA-LEVEL RISE AND U.S. COASTS: SCIENCE AND POLICY CONSIDERATIONS 23–25 (2016), https://crsreports.congress.gov/product/pdf/R/R44632 (discussing global and relative sea level, and policy considerations

events and rising sea level are increasing flood frequencies, making coastal and low-lying regions highly vulnerable to climate change impacts."[74] Sea-level rise has amplified coastal flooding and erosion impacts, making some areas uninhabitable (both temporarily and permanently).[75] Furthermore, sea-level rise has exacerbated saltwater intrusion into coastal rivers and aquifers, which threatens drinking water supplies, infrastructure, and ecosystems.[76]

The associated emergency response costs to these impacts carry a heavy price tag for coastal communities, often requiring federal assistance.[77] Between fiscal years 2016 and 2020, federal agencies provided roughly $391 million to Alaska Native villages to repair damaged infrastructure and protect against environmental threats, including erosion, flooding, and thawing permafrost.[78] However, more than one-third of the highly threatened Native villages did not receive assistance during that timeframe, indicating that significant work lies ahead to ensure protection of these communities.[79]

In a recent assessment of the federal budget's exposure to climate risks, the Office of Management and Budget estimated "that annual Federal spending increases on coastal disaster response spending are projected to range from $4 [to] $32 billion" annually.[80] Flooding, in particular, is "the most common and the most expensive natural disaster in the United States."[81] 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,"[82] indicating the federal operation's

related to sea-level rise).

74 NCA4 VOL. 2, *supra* note 2, at 150.

75 *Id.* at 326–29

76 *Id.* at 153–54.

77 *See id.* at 330–35.

78 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 22 (2022) [hereinafter GAO ALASKA NATIVE ISSUES], https://www.gao.gov/assets/gao-22-104241.pdf.

79 *Id.* at 27.

80 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.

81 *Id.* at 281 (internal citations omitted).

82 *Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks*, U.S. GOV'T ACCOUNTABILITY OFF. [hereinafter GAO HIGH RISK LIST—CLIMATE], https://www.gao.gov/highrisk/limiting-federal-governments-fiscal-exposure-better-managing-climate-change-risks (last visited Jan. 25, 2023).

need of transformation to address economy, efficiency, or effectiveness challenges.

While some communities will be able to rebuild after experiencing a coastal disaster, for others, rebuilding may be impossible due to land loss or safety concerns. An estimated 13.1 million people are potentially at risk of needing to migrate to escape rising sea-levels by the year 2100, including many tribal communities.[83] From Alaska and the Pacific Northwest to Louisiana and the Northeast, tribal communities are increasingly facing the reality of displacement.[84]

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 [its people] are subject to a combination of erosion, permafrost degradation, and flooding from storms."[85] In 1994, tribal officials began to evaluate potential resettlement sites—finally agreeing upon a site nine miles southeast of the village and within Newtok's traditional lands, named Mertarvik.[86] 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."[87]

On the other side of 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 800 acres of land on Long Island, New York, adjacent to Southampton, New York.[88] According to tribal projections, almost half the Shinnecock Nation peninsula will be inundated by high water during a 100-year storm[89] by

83 NCA4 VOL. 2, *supra* note 2, at 335.

84 *See* GAO ALASKA NATIVE ISSUES, *supra* note 78; 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 16 (2020) [hereinafter GAO CLIMATE CHANGE], https://www.gao.gov/assets/710/708284.pdf.

85 GAO CLIMATE CHANGE, *supra* note 84, at 17.

86 *Id.* at 18–19.

87 *Id.* at 20.

88 ANCHOR QEA, LLC ET AL., 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.

89 "[T]he term '100-year storm' is used to define a rainfall event that statistically has this same 1-percent chance of occurring. In other words, over the course of 1 million years, these events would be expected to occur 10,000 times." Water Science School, *The 100-Year Flood*, USGS (June 7, 2018), https://www.usgs.gov/

2050.[90] Dr. Kelsey Leonard, a Shinnecock tribal member and Indigenous water justice researcher, reflected on the climate-driven impacts faced by the tribe and suggested ways to apply those teachings 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.[91]

Although the tribe is actively engaged in building up natural defenses (e.g., raising sand dunes, restoring oyster reefs), the success of these efforts is yet to be determined and "depends . . . on how quickly the world as a whole reduces emissions and stems the rate of sea level rise."[92]

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."[93] In the Southwest, intensifying droughts, increasingly heavy downpours, and reduced snowpack combined with a growing population, deteriorating infrastructure, and groundwater depletion contribute to a reduction in "the future reliability of water supplies."[94] In the United States, groundwater is a critical water source and provides more than 40% of the "water used for agriculture (irrigation and livestock) and domestic water supplies."[95] Historically, groundwater has been used as a buffer against water scarcity.[96] However,

special-topics/water-science-school/science/100-year-flood.

90 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.

91 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/.

92 Somini Sengupta & Shola Lawal, *The Original Long Islanders Fight to Save Their Land from a Rising Sea*, N.Y. TIMES (Apr. 22, 2021), https://www.nytimes.com/2020/03/05/climate/shinnecock-long-island-climate.html; *see also* ANCHOR QEA, LLC ET AL., *supra* note 88, at 28–30.

93 NCA4 VOL. 2, *supra* note 2, at 152.

94 *Id.* at 150–51.

95 *Id.* at 152; *see* Water Science School, *Groundwater Use in the United States*, USGS (June 18, 2018), https://www.usgs.gov/special-topics/water-science-school/science/groundwater-use-united-states#overview.

96 NCA4 VOL. 2, *supra* note 2, at 151; Amir AghaKouchak et al. *Water and Climate: Recognize Anthropogenic Drought*, 524 NATURE 409, 410 (2015) (discussing increased groundwater extraction and use in response to droughts).

rising temperatures and prolonged droughts are putting groundwater supplies at risk.[97] Changes in surface water supply also result in groundwater depletions, through further increases in groundwater abstraction and consumption.[98] "Higher temperatures also result in increased human use of water, particularly through increased water demand for agriculture arising from increased evapotranspiration."[99]

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 Basin, where water allocations exceed the average supply.[100] The Basin provides water to 30 federally recognized tribes,[101] 7 states (Colorado, New Mexico, Utah, Wyoming, Arizona, California, and Nevada), and 2 countries (United States and Mexico).[102] Current river flows are "20% below the already inadequate 20th century average, with a substantial portion of that reduction attributed to climate change, and continued declines are predicted."[103] Numerous studies have concluded that climate change has worsened water scarcity in the Basin due to streamflow decline associated

97 *See* Jonathan T. Overpeck & Bradley Udall, *Climate Change and the Aridification of North America*, 117 PROCS. NAT'L ACAD. SCIS. 11856, 11856–57 (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).

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

99 NCA4 VOL. 2, *supra* note 2, at 152. Evapotranspiration is the process by which water moves from the land surface into the atmosphere via evaporation and transpiration (i.e., when plants take water from the soil and release water vapor into the air). Water Science School, *Evapotranspiration and the Water Cycle*, USGS, https://www.usgs.gov/special-topics/water-science-school/science/evapotranspiration-and-water-cycle.

100 TRIBAL WATER RIGHTS, *supra* note 21, at 3.

101 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." *Id.* at 1 n.2.

102 *Colorado River Basin*, U.S. BUREAU OF RECLAMATION, https://www.usbr.gov/ColoradoRiverBasin/ (last visited Jan. 25, 2023).

103 Fleck & Castle, *supra* note 23, at 2.

with increasing temperatures.[104] Every additional one degree Celsius of warming results in an estimated 9% decline in river flow.[105] Tribes have claims to a significant portion of the water in the Basin. Twenty-two of the Basin tribes have either fully or partially resolved their water rights, accounting for approximately 22% to 26% of the Basin's average annual water supply.[106] 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.[107]

"Previous modeling studies have focused on the impact of climate change without considering . . . under-utilized Indian water rights."[108] These omissions contribute to community vulnerability and uncertainty regarding water availability for other users in the Basin.[109] While increases in water-use efficiency has helped, current demand still exceeds supply and future demand is expected to further increase.[110] 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% in the Basin states by the year 2030.[111]

Groundwater depletion is also contributing to the limited water supply and demand gap for the Hopi Tribe, whose reservation is surrounded entirely by the Navajo Nation in northeastern Arizona.[112]

104 Y.C. Ethan Yang et al., *Impact of Climate Change on Adaptive Management Decisions in the Face of Water Scarcity*, 588 J. HYDROLOGY, no 125015, Sept. 2020. at 1, 1.

105 P.C.D. Milly & K.A. Dunne, *Colorado River Flow Dwindles as Warming-Driven Loss of Reflective Snow Energizes Evaporation*, 367 SCIENCE, no. 6483, Feb. 2020, at 1, 1.

106 TRIBAL WATER RIGHTS, *supra* note 2, at 8; *see generally* HOMA SALEHABADI ET AL., CTR. FOR COLO. RIVER STUDS., THE FUTURE HYDROLOGY OF THE COLORADO RIVER BASIN, WHITE PAPER NO. 4 (2020), https://www.fs.usda.gov/rm/pubs_journals/2020/rmrs_2020_salehabadi_h001.pdf (offering projections of low water supply drought scenarios in the Colorado River, and management strategies).

107 *See* TRIBAL WATER RIGHTS, *supra* note 21, at 8.

108 Yang et al., *supra* note 104, at 1.

109 *Id.* at 2 (identifying under-utilized Indian water rights as a challenge to future water management in the Basin).

110 *See* discussion *infra* Part II (addressing tribal water rights, including the legal basis for tribal water rights and related challenges).

111 Population Growth, SAVE THE COLO., https://savethecolorado.org/threats/population-growth/ (last visited Jan. 2, 2023) (growth compared to population numbers in 2000).

112 Simon Romero, *In Arizona, Drought Ignites Tensions and Threatens Traditions Among the Hopi*, N.Y. TIMES (Oct. 2, 2021), https://www.nytimes.com/2021/10/02/us/arizona-megadrought.html. *See also* JON P. MASON, U.S. GEOLOGICAL SURVEY, GROUNDWATER, SURFACE-WATER, AND WATER-CHEMISTRY DATA, BLACK MESA AREA, NORTHEASTERN ARIZONA—2016–2018 (2021), https://pubs.usgs.gov/of/2021/1124/ofr20211124.pdf (summarizing data collected through the U.S. Geological Survey water-monitoring program in the Black Mesa study area,

Dried up springs have heightened tensions among farmers and ranchers as they compete for limited water on Hopi land.[113] Between 1968 and 2005, the Peabody Coal Company significantly depleted groundwater aquifers underlying the Hopi and Navajo Reservations, jeopardizing crop irrigation.[114] 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.[115]

Over 1,000 miles away, the Standing Rock Sioux Tribe is also confronted with water supply challenges related to drought and deteriorating infrastructure.[116] In 2003, the Standing Rock Sioux Tribe in North Dakota did not have water for several days due to dropped water levels from drought.[117] Silt and sludge clogged the sole intake pipe from the Missouri River, effectively halting the tribe's water supply.[118] Without any other water sources, the IHS hospital was forced to temporarily shut down, requiring tribal members to travel approximately 60 miles to receive medical services.[119] While a new pipeline was completed in 2017 to provide safe and clean drinking water for the community,[120] the tribe continues to experience extreme drought, which prompted the tribe to issue an Emergency Drought and Extreme Fire Declaration in 2021.[121]

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including declining groundwater on the Hopi Reservation in northeastern Arizona).

113 Romero, *supra* note 112.

114 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).

115 MASON, *supra* note 112, at 3 (quantifying declines in water levels in the Black Mesa area, enclosed within the Navajo and Hopi Reservations).

116 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) [hereinafter *Water Problems*], https://www.govinfo.gov/content/pkg/CHRG-108shrg97093/html/CHRG-108shrg97093.htm (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).

117 Cozzetto et al., *supra* note 116, at 578.

118 *Id.*

119 *See Water Problems*, *supra* note 116 (statement of Charles W. Murphy, Chairman, Standing Rock Sioux Tribe).

120 *Standing Rock Rural Water Supply System Delivers Water*, U.S. BUREAU OF RECLAMATION (Aug. 21, 2017), https://www.usbr.gov/newsroom/newsroomold/newsrelease/detail.cfm?RecordID=60316.

121 Morgan Benth, *Standing Rock Issues Emergency Drought and Extreme Fire Declaration*, KFYR TV (Apr. 8, 2021), https://www.kfyrtv.com/2021/04/08/standing-rock-issues-emergency-drought-and-extreme-fire-declaration/. In mid-June of 2021,

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.[122] According to the Environmental Protection Agency (EPA), "about 86[%] of tribal water systems currently comply with health-based drinking water standards, compared to 93[%] of community water systems nationally."[123] In some instances, water quality has been degraded due to traditional energy development.[124] Indian country is rich in mineral and energy resources, containing approximately 20% of known oil and gas reserves, 30% of western coal reserves, and 50% of uranium deposits.[125] Past energy development, however, led to elevated levels of contaminants, such as uranium, in groundwater sources.[126]

> Extraction of over 30 million tons of uranium ore through four decades left a legacy of [roughly] 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.[127]

Such exposure is occurring in part due to consumption of contaminated water.[128]

Naturally occurring contaminants have also plagued tribes, including the Hopi Tribe. The Hopi Reservation's drinking water systems have been contaminated with arsenic—ranging between 2 and 4 times the legal limit set by EPA—since installation in the 1960s.[129] The

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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*, UNIV. OF NEB. (Aug. 10, 2021), https://drought.unl.edu/Publications/News.aspx?id=378.

122 UNIVERSAL ACCESS, *supra* note 46, at 16–17.

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

124 UNIVERSAL ACCESS, *supra* note 46, at 16–17.

125 U.S. GOV'T ACCOUNTABILITY OFF., GAO-19-359, TRIBAL ENERGY: OPPORTUNITIES EXIST TO INCREASE FEDERAL AGENCIES' USE OF TRIBAL PREFERENCE AUTHORITY 4 (2019), https://www.gao.gov/assets/gao-19-359.pdf.

126 *See* UNIVERSAL ACCESS, *supra* note 46, at 16.

127 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, no. 19, 425, Jan. 2022, at 1, 1–2.

128 *See id*. at 426, 437–39, 442.

129 UNIVERSAL ACCESS, *supra* note 46, at 2, 17.

tribe estimates that 75% of residents are drinking arsenic-contaminated water.[130] "The lack of other readily-available water sources, coupled with a high poverty rate (60[%] of Hopi residents live below the poverty line) leaves many with no other option but to drink the hazardous water."[131] "The EPA has ranked the contamination on the Hopi Reservation as one of its highest priorities and longest running arsenic drinking water violations."[132]

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, the situation was created by the federal government when it initially built the system.[133] 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.[134] 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."[135] In an announcement on October 30, 2020, the Trump Administration promised $5 million to assist the tribe in delivering clean water to Hopi villages, the first phase of the water delivery plan.[136] A couple years later, the project received additional funding through the Infrastructure Investment and Jobs Act, allowing the Hopi Tribe to complete a new regional water system.[137]

Climate change is exacerbating the water quality gap in Indian country. Increases in high flow events (e.g., intense storms and flooding) "can increase the delivery of sediment, nutrients, and microbial pathogens" into surface waters.[138] As previously noted, in coastal

130 *Id.* at 17.

131 *Id.*

132 *Hearing Before the H. Appropriations Subcomm. on Interior, Env't & Related Agencies*, 116th Cong. (Mar. 7, 2019) (statement of Timothy Nuvangyaoma, Chairman, Hopi Tribe).

133 *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.

134 Adamic, *supra* note 133.

135 UNIVERSAL ACCESS, *supra* note 46, at 17.

136 *Id.*

137 *Biden-Harris Administration Announces $10 Million in Bipartisan Infrastructure Law Investments for Tribal Water Systems*, U.S. DEP'T OF THE INTERIOR (May 5, 2022), https://www.doi.gov/pressreleases/biden-harris-administration-announces-10-million-bipartisan-infrastructure-law; Hopi Utiliities Corporation, *Hopi Tribe Dedicates Hopi Arsenic Mitigation Project*, HOPI TUTUVENI (Aug. 17, 2022), https://www.hopi-nsn.gov/wp-content/uploads/2022/08/Aug-17-issue-final.pdf.

138 NCA4 VOL. 2, *supra* note 2, at 153.

areas, sea-level rise can increase saltwater intrusion into coastal rivers and aquifers, threatening drinking water supplies.[139] Warming water temperatures and changes in precipitation and runoff affect pollutant transport into and within water bodies.[140] Water temperature increases also contribute to increases in harmful algal blooms, [141] which degrade water quality.[142] Warmer water holds less oxygen, which could lead to decreased dissolved oxygen and therefore impact aquatic ecosystems.[143] Rising temperatures may cause increased evapotranspiration, leading to groundwater salinization.[144]

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."[145] The Yurok Tribe is the largest tribe in California, inhabiting lands surrounding the lower Klamath River.[146] A range of anticipated climate changes in Yurok territory could affect water resources including "warming surface water temperatures," "lower dissolved oxygen concentrations," "expanding harmful algal blooms," "higher pollutant loadings," and "saltwater intrusion."[147] All

139 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, no. 3, September 2017, at 1, 1 (2017), http://dx.doi.org/10.1061/AJRUA6.0000904.

140 *See* 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, 845–47 (2018).

141 Algae are simple plants, which under certain conditions, may grow out of control creating "blooms" that produce toxins or other harmful effects on people and animals. *What Is a Harmful Algal Bloom?*, NAT'L OCEANIC ATMOSPHERIC ADMIN., https://www.noaa.gov/what-is-harmful-algal-bloom (last updated Apr. 27, 2016).

142 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).

143 JULIE NANIA ET AL., CONSIDERATIONS FOR CLIMATE CHANGE AND VARIABILITY ADAPTATION ON THE NAVAJO NATION 45 (Getches-Wilkinson Ctr. Nat. Res., Energy, & the Env't, Univ. of Colo. L. Sch. ed., 2014).

144 *Id.* at 49. Salinization refers to an increase in salt content. *Salinize*, MERRIAM-WEBER DICTIONARY, https://www.merriam-webster.com/dictionary/salinize (last visited Jan. 25, 2023).

145 NANIA ET AL., *supra* note 143, at 45.

146 *Our History*, THE YUROK TRIBE, https://www.yuroktribe.org/our-history (last visited Jan. 25, 2023).

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

of these changes are expected to degrade water quality.[148]

In 2021, faced with deteriorating water conditions, the Yurok Tribe advised residents to boil their water for the foreseeable future and issued a State of Emergency Declaration Due to Drought.[149] The declaration recognized that the Yurok Reservation and Klamath Basin were experiencing drought conditions not projected to resolve in the near future, which resulted in poor instream water quality.[150] Furthermore, 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."[151] As discussed further in the following sections, rising sea levels, diminished water supply, and poor water quality all 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.[152] The link between water and survival is so strong that the United Nations (UN), several countries, and a few states have recognized a human right to water.[153] This right comprises numerous factors, including an ample and safe supply of water for both personal and domestic applications.[154]

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tribes_Yurok.pdf.

148 *Id.*

149 Carlos Olguin, *Yurok Tribe Warns of Drinking Water Issues*, KRCR (July 23, 2021), https://krcrtv.com/north-coast-news/eureka-local-news/yurok-tribe-warns-of-drinking-water-issues; YUROK TRIBAL COUNCIL, RES. NO. 21-059, STATE OF EMERGENCY DECLARATION DUE TO DROUGHT (May 13, 2021) [hereinafter Yurok Emergency Declaration], https://www.waterboards.ca.gov/drought/docs/2021/yurok_resolution_21-59_emergency_decl_drought.pdf.

150 Yurok Emergency Declaration, *supra* note 149, at 1.

151 *Id.* at 4.

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

153 *Id.*; *see also* Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS), *National Systems to Support Drinking-Water Sanitation and Hygiene: Global Status Report 2019*, WORLD HEALTH ORGANIZATION [WHO], at 48–55 (2019), https://apps.who.int/iris/bitstream/handle/10665/326444/9789241516297-eng.pdf?ua=1. Massachusetts and Pennsylvania recognize the right to water in their state constitutions, and California and Virginia have been successful in passing legislation to recognize this right. MASS. CONST., art. XCII; PA. CONST., art. 1, § 27; Assemb. B. 685, 2011-12 Leg. Sess. (Cal. 2012) (codified at CAL. WATER CODE § 106.3); Assemb. B. 401, 2015-16 Leg. Reg. Sess. (Cal. 2015).; H.R.J. Res. 538, 2021 Leg., Spec. Sess. (Va. 2021).

154 U.N. HUM. RTS. OFF. OF THE HIGH COMM'R, THE RIGHT TO WATER, 35, at 8–9 (Aug. 2010), https://www.ohchr.org/sites/default/files/Documents/Publications/

Yet, as climate change makes water more scarce, the right to water will become more difficult to attain, negatively impacting human health.[155] 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.[156] Drought-related increased dust and diminished air quality has been associated with medical conditions including allergies, asthma, and other respiratory disorders.[157] Changes in climate can increase vector-borne disease transmission.[158] Finally, events influenced by climate change, such as natural disasters or heat waves, can negatively impact mental health and exacerbate preexisting mental health conditions.[159]

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.[160] Sanitation and access to running water are important determinants of disease transition.[161] COVID-19 prevention measures include handwashing, physical distancing, and household cleaning—behaviors that require access to sufficient, safe, and affordable water.[162] The Centers for Disease Control and Prevention (CDC) also recognized that "[h]istorical trauma

FactSheet35en.pdf.

155 *Food and Waterborne Diarrheal Disease*, CTRS. FOR DISEASE CONTROL AND PREVENTION (Dec.21, 2020), https://www.cdc.gov/climateandhealth/effects/food_waterborne.htm

156 *Id.*

157 NCA4 VOL. 2, *supra* note 2, at 544–45.

158 *Diseases Carried by Vectors*, CTRS. FOR DISEASE CONTROL AND PREVENTION (Dec. 21, 2020), https://www.cdc.gov/climateandhealth/effects/vectors.htm. Vector-borne diseases are distributed by vectors "(such as fleas, ticks, and mosquitoes, which spread pathogens and cause illness)". *Id.* Lyme, dengue fever, West Nile virus disease, Rocky Mountain spotted fever, plague, and tularemia are examples of vector-borne diseases in North America. *Id.*

159 *Mental Health and Stress-Related Disorders*, CTRS. FOR DISEASE CONTROL AND PREVENTION (June 18, 2020), https://www.cdc.gov/climateandhealth/effects/vectors.htm.

160 *See* James D. Ford et al., *Interactions Between Climate and Covid-19*, 6 THE LANCET e825 (2022) (discussing long-term climate change and pre-pandemic vulnerabilities that increased COVID-19 risk for marginalized communities).

161 *Disease Threats and Global WASH Killers: Cholera, Typhoid, and Other Waterborne Infections*, CTRS. FOR DISEASE CONTROL AND PREVENTION, https://www.cdc.gov/healthywater/global/WASH.html (last visited Jan.8, 2023) ("Many diarrheal diseases spread through unsafe water and sanitation.").

162 *How to Protect Yourself and Others*, CTRS. FOR DISEASE CONTROL AND PREVENTION (Oct. 19, 2022), https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html; UNIVERSAL ACCESS, *supra* note 46, at 8.

and persisting racial inequity have contributed to disparities in health and socioeconomic factors between [American Indian/Alaska Native, or "AI/AN"] and white populations that have adversely affected [American Indian/Alaska Native] communities; these factors likely contribute to the observed elevated incidence of COVID-19" within this population.[163]

At the beginning of the pandemic, the COVID-19 incidence rate among Native Americans was 3.5 times that among white persons.[164] Native Americans also experienced substantially greater COVID-19 mortality rates compared to other groups.[165] Morbidity and mortality caused by the disease have been associated with mental health challenges.[166] Symptoms of anxiety and depression disorders, suicidal ideation, and substance use increased considerably in the United States during the pandemic.[167] The limited data available indicates that Native Americans experienced trauma and mental health issues at greater rates than white Americans.[168] A 2021 survey found that 74% of Native American respondents said someone in their household experienced serious problems with depression, anxiety, stress, or sleeping compared to 52% of white respondents.[169]

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

164 *Id.* This rate was calculated based upon the 23 states that had adequate COVID-19 related race/ethnicity patient data. "Arizona, which accounts for at least one third of all COVID-19 cases among AI/AN persons nationwide, was excluded" due to missing race/ethnicity data. *Id.* at 1166. Overall, the authors noted that the analysis underestimated the actual COVID-19 incidence among AI/AN persons due to several factors, including incomplete reporting and misclassification of AI/AN persons. *Id.*

165 Katherine Leggat-Barr et al., *COVID-19 Risk Factors and Mortality Among Native Americans*, 45 DEMOGRAPHIC RSCH. 1185, 1205 (2021).

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

167 *Id.*; *see also* U.S. GOV'T ACCOUNTABILITY OFF., GAO-22-104437, BEHAVIORAL HEALTH AND COVID-19: HIGHER RISK POPULATIONS AND RELATED FEDERAL RELIEF FUNDING 1, 11, 13 (2021) [hereinafter GAO BEHAVIORAL HEALTH AND COVID-19].

168 GAO BEHAVIORAL HEALTH AND COVID-19, *supra* note 167, at 13. "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. *Id.* at 11.

169 NPR ET AL., HOUSEHOLD EXPERIENCES IN AMERICA DURING THE DELTA VARIANT OUTBREAK, BY RACE/ETHNICITY 2 (2021), https://cdn1.sph.harvard.edu/wp-content/uploads/sites/94/2021/10/EthnicityRWJFNPRHORP.pdf; *see generally* AM. PSYCHIATRIC ASS'N, CORONAVIRUS, MENTAL HEALTH AND INDIGENOUS PEOPLE IN THE UNITED STATES 2, https://www.psychiatry.org/File%20Library/

While the long-term effects and full impact of the pandemic may not immediately be known, it is abundantly clear that Native Americans have been disproportionately impacted by 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.[170]

The COVID-19 impact felt by Native families and the community as a whole reflects disparate exposure to factors facilitating viral transmission, including shared transportation, water access, and large household sizes.[171] Other research has associated the incidence of COVID-19 cases in Indian country with a lack of indoor plumbing.[172] As noted by Senator Lisa Murkowski, "[F]or so many of our Native communities, particularly in remote villages, that lack basic sanitation infrastructure[—]where there is no running water [or] flush toilets[—]even basic safeguards like washing your hands was pretty close to impossible."[173]

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.[174] In the Meriam Report, the federal government documented poor water and sanitation conditions in Indian country as early as 1928.[175] The report detailed the conditions of

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Psychiatrists/APA-COVID-19-Mental-Health-Facts-Indigenous-People.pdf.

170 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.

171 *Id.*

172 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).

173 *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), https://www.govinfo.gov/content/pkg/CHRG-117shrg45086/html/CHRG-117shrg45086.htm (statement of Sen. Lisa Murkowski, Vice Chairman, S. Comm. on Indian Affs.).

174 UNIVERSAL ACCESS, *supra* note 46.

175 LEWIS MERIAM, THE PROBLEM OF INDIAN ADMINISTRATION: REPORT OF A SURVEY MADE

American Indians across the country, documenting scarce supplies and noting that "[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."[176]

Almost a century later, lack of access to clean and safe water continues to be reported.[177] Today, Native American households are more likely to lack indoor plumbing than all other households in the United States.[178] 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,[179] with approximately 30% to 40% of homes on the Navajo Nation lacking access to a public water system.[180] These households must haul water for long distances from wells and other community point sources.[181]

Such impacts directly put tribal public health at risk. The connection between water availability and human health is clear. Up to 60% of the human body is water—water is necessary for human survival.[182] But, as discussed previously, the future reliability of water supplies is at risk as 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.[183] Climate change is increasing the risk

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AT THE REQUEST OF HONORABLE HUBERT WORK, SECRETARY OF THE INTERIOR, AND SUBMITTED TO HIM, Feb. 21, 1928, 220 (The Johns Hopkins Press 1928) [hereinafter MERIAM REPORT].

176 *Id.* at 220.

177 BROKEN PROMISES, *supra* note 8, at 180–84.

178 U.S. WATER ALLIANCE & DIG DEEP, CLOSING THE WATER ACCESS GAP IN THE UNITED STATES: A NATIONAL ACTION PLAN 22, 38 (2019) [hereinafter CLOSING THE WATER ACCESS GAP].

179 *About the Project*, DIGDEEP: NAVAJO WATER PROJECT, https://www.navajowaterproject.org/project-specifics (last visited Jan. 8, 2023).

180 U.S. BUREAU OF RECLAMATION, COLORADO RIVER BASIN TEN TRIBES PARTNERSHIP TRIBAL WATER STUDY REPORT ch. 5, § 5.5 (2018), https://www.usbr.gov/lc/region/programs/crbstudy/tws/docs/Ch.%205.5%20Navajo%20Current-Future%20Water%20Use%2012-13-2018.pdf; CLOSING THE WATER ACCESS GAP, *supra* note 178, at 23, 38.

181 CLOSING THE WATER ACCESS GAP, *supra* note 178, at 38.

182 Water Science School, *The Water in You: Water and the Human Body*, U.S. GEOLOGICAL SURV. (May 22, 2019), https://www.usgs.gov/special-topics/water-science-school/science/water-you-water-and-human-body.

183 *See* Karen Levy et al., *Climate Change Impacts on Waterborne Diseases: Moving Forward Designing Interventions*, 5 CURRENT. ENV'T HEALTH REPS. 272, 272 (2019).

of waterborne diseases, endangering human health.[184] "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). These pathogens can cause an array of symptoms, including diarrhea, fever, and other flu-like symptoms, neurological disorders, liver damage, and others."[185] "Flooding events in particular increased the incidence of the following three diseases: hepatitis A virus, bacillary dysentery, and campylobacter."[186] The rise in waterborne diseases has resulted in substantial health care costs, with an estimated $2.2 to $3.7 billion attributable to fighting waterborne pathogens.[187] Finally, poor water quality and related pathogens have also been connected to lower mental and social development in children.[188]

Infrastructure, water quantity, and water quality are interrelated. When water supplies are exhausted, subsidence (the sinking of the ground) can occur as more groundwater is removed, affecting water infrastructure and leading to the formation of sinkholes.[189] Poorly maintained infrastructure can hinder water delivery, contribute to system water loss, and degrade water quality.[190] Viral and bacterial contamination is further propagated by a deficient water and sewer infrastructure.[191] "Disruptions to infrastructure are already occurring and will likely become more common with a changing climate."[192]

In general, drinking water infrastructure in the United States is poorly rated based on its current condition, safety, capacity, and other factors.[193] A large portion of water systems were built over a

184 *Id.* at 273, 282.

185 *Id.* at 273.

186 Tener Goodwin Veenema et al., *Climate Change-Related Water Disasters' Impact on Population Health*, 49 J. NURSING SCHOLARSHIP 625, 628 (2017). Indeed, a recent study found that almost 60% 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*, 12 NATURE CLIMATE CHANGE 869, 870 (2022).

187 Coffey et al., *supra* note 140, at 844.

188 Faissal Tarrass, *The Effects of Water Shortages on Health and Human Development*, 132 PERSPS. IN PUB. HEALTH 240, 241 (2012).

189 *Navigation and Transportation*, NAT'L INTEGRATED DROUGHT INFO. SYS., https://www.drought.gov/sectors/navigation-and-transportation (last visited Jan. 3, 2023).

190 Deborah Vacs Renwick et al., *Potential Public Health Impacts of Deteriorating Distribution System Infrastructure,* 111 J. AM. WATER WORKS ASS'N, no. 2, Feb. 2019, at 42, 43, 48 (2019).

191 NCA4 VOL. 2, *supra* note 2, at 545.

192 *Id.* at 150.

193 AM. SOC'Y CIV. ENG'RS, THE ECONOMIC BENEFITS OF INVESTING IN WATER INFRASTRUCTURE 4 (2020).

century ago and therefore require upgrades or enhanced systems to handle the demands of increased population growth, increased treatment requirements, and climate change.[194] Aging and deteriorating infrastructure increases risks of water contamination and non-potable water delivery[195] and contributes to trillions of gallons of water loss each year through leakage.[196]

The infrastructure challenges that exist across the United States are particularly pronounced in tribal communities. Infrastructure in these communities is often completely "lacking, inadequate, or poorly maintained, increasing tribal vulnerability to flooding, drought, and waterborne diseases."[197] On the Warm Springs Reservation, the Confederated Tribes of Warm Springs is experiencing infrastructure challenges that carry prohibitive costs to address.[198] Three out of four of its water delivery systems require major upgrades or replacement, with some pipes made of wood and clay.[199] Maintaining the current systems at status quo costs a minimum of $5 to $6 million, with an additional $40 to $50 million required to provide for "future improvements to meet the growing population."[200] Climate change contributes to infrastructure challenges in Indigenous communities by further damaging existing infrastructure and disrupting services.[201] Overall, such infrastructure deficiencies harm the social, physical, and mental well-being of tribes and impair their ability to thrive.[202]

Finally, climate change will likely exacerbate 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.[203] Indigenous

194 *Id.* at 6.

195 *See generally* Vacs Renwick et al., *supra* note 190 (discussing how the deterioration of water distribution systems affects water supply, water quality, and public health).

196 *Id.* at 10.

197 Cozzetto et al., *supra* note 116, at 574.

198 *Build Back Better: Water Infrastructure Needs for Native Communities: Hearing Before the S. Comm. On Indian Affs.*, 117th Cong. 10 (2021), https://www.govinfo.gov/content/pkg/CHRG-117shrg44761/html/CHRG-117shrg44761.htm (statement of Raymond Tsumpti, Chairman, Confederated Tribes of Warm Springs).

199 *Id.* at 11.

200 *Id.*

201 *See* NCA4 VOL. 2, *supra* note 2, at 580.

202 NAT'L CONGRESS OF AM. INDIANS, TRIBAL INFRASTRUCTURE: INVESTING IN INDIAN COUNTRY FOR A STRONGER AMERICA 4, at 326–329 (2017), https://www.ncai.org/NCAI-InfrastructureReport-FINAL.pdf.

203 *See generally Behavioral Health Fact Sheet*, INDIAN HEALTH SERV., https://www.ihs.

people have reported serious psychological distress as high as 2.5 times that of the general population.[204] Various studies have connected adverse mental health outcomes with climate change impacts,[205] suggesting that climate change will likely compound existing mental health issues in Native American communities. "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."[206] In individuals whose households were victim to flood, risk of flood, or drought, higher frequencies of depression, anxiety, as well as alcohol and tobacco use have been reported.[207] In addition, higher temperatures have also been associated with heightened aggressive behaviors, including homicide.[208] Those most likely to suffer these impacts are some of society's most vulnerable populations, including tribal communities.[209] As tribes increasingly experience climate-related impacts, their community members' health will suffer unless protective measures are put into place.

C. Cultural Impacts of Climate Change

"Indigenous peoples are among the first to face the direct consequences of climate change, due to their dependence upon, and close relationship, with the environment and its resources."[210] 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 and certain waters used for ceremonial purposes.[211] As such, climate change not only threatens the physical

gov/newsroom/factsheets/behavioralhealth/; *see also* NCA4 VOL. 2, *supra* note 2, at 546.

204 NAT'L CTR. FOR HEALTH STATS., HEALTH, UNITED STATES, 2017: WITH SPECIAL FEATURE ON MORTALITY xi, tbl.46 (2017), https://www.cdc.gov/nchs/data/hus/hus17.pdf (noting a 2015 to 2016 study observation that, in the antecedent thirty days, 3.6% of American adults reported experiencing serious psychological distress, compared to 9.2% of Native American adults).

205 *See, e.g.*, NCA4 VOL. 2, *supra* note 2, at 540–52.

206 *Id.* at 326.

207 *Id.* at 546.

208 *Id.*

209 *Id.* at 333, 541.

210 *Climate Change*, U.N. DEP'T OF ECON. & SOC. AFFS., https://www.un.org/development/desa/indigenouspeoples/climate-change.html (last visited Jan. 3, 2023).

211 *See* NCA4 VOL. 2, *supra* note 2, at 578 ("[T]he lands, waters, and other natural resources of Indigenous peoples hold sacred cultural significance.").

environment, but also threatens tribal traditions and culture. 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.*[212]

Climate impacts to water are threatening tribal sites, practices, and relationships with places of cultural, spiritual, or ceremonial importance.[213] The loss of tribal land and culturally important resources due to climate change also magnifies historical trauma experienced by many Native Americans, trauma that stems from colonization and subsequent federal policies.[214]

212 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 gathering on October 23, 2003. *Id.*

213 *See* Cozzetto et al., *supra* note 116.

214 NCA4 VOL. 2, *supra* note 2, at 582.

The Yurok Tribe and Klamath River exemplify how climate-driven impacts to the environment are affecting tribal traditions. The Yurok Tribe, the largest tribe in California, has over 5,000 tribal members.[215] Members of the Yurok Tribe are characterized as:

> [Having] 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 all other lifeways are intertwined with the health of the River, its ecosystem, and the multiple species reliant on a thriving Klamath River ecosystem.[216]

In 2019, the Yurok Tribe passed a tribal resolution granting personhood to the Klamath River, in part to protect the river from climate change impacts.[217] Historically, the Yurok have lived along the Klamath River, and their creation story emphasizes the importance of living in balance with the natural world.[218] The Yurok's cultural practices are dependent on the continued health of the river.[219] But, over the past several years, "[t]he Klamath River 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."[220]

Climate change also affects traditional food sources. "[C]olonialism and associated experiences of forced removal, relocation, and assimilation" disrupted the relationship between

215 *Our History*, YUROK TRIBE, https://www.yuroktribe.org/our-history (last visited Jan. 4, 2023).

216 YUROK TRIBAL COUNCIL, RES. NO. 19-40, RESOLUTION ESTABLISHING THE RIGHTS OF THE KLAMATH RIVER (May 9, 2019), http://files.harmonywithnatureun.org/uploads/upload833.pdf.

217 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.

218 *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 Takes Our Purpose': How the Decline of the Chinook Salmon Threatens the Yurok Tribe*, (Jan. 25, 2020), 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.* (internal citation omitted).

219 Geneva E. B. Thompson, *Codifying the Rights of Nature: The Growing Indigenous Movement*, 59 JUDGES' J., Spring 2020, at 12, 14.

220 *Id.* at 12.

Native Americans and traditional food systems.[221] Traditional foods are integral to the holistic health of individual and community health.[222] "The importance of traditional foods for [I]ndigenous health surpasses nutritional value."[223] Traditional foods carry spiritual and cultural importance as well.[224] However, engaging in traditional food practices, such as seal and whale hunting, is becoming more dangerous due to climate-related impacts; for example, warmer temperatures will cause sea ice to thin, increasing the likelihood of hunters sustaining injuries from falling through thin sea ice.[225] 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.[226] The loss of traditional foods has a particularly detrimental effect on tribal communities, because many of these communities exist within food deserts.[227] "The lack of healthy store-bought foods means that nutrient-rich traditional foods are often replaced with less healthy alternatives."[228] All of these impacts "raise questions about the future availability of resources" and "continued viability of these traditional cultures."[229]

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.[230] These communities increasingly must consider whether to relocate away from tribal lands that have become uninhabitable.[231] In Alaska, permafrost is melting, destabilizing the ground upon which villages have long stood.[232] Between 2003 and 2009, the federal government identified 31 Alaskan Native villages that were imminently threatened by erosion,

221 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 24 (2016).

222 *Id.*

223 *Id.*

224 *Id.*

225 *Id.* at 25.

226 NCA4 VOL. 2, *supra* note 2, at 150.

227 NORTON-SMITH ET AL, *supra* note 221, at 25.

228 *Id.*

229 Daniel Cordalis & Dean B. Suagee, *The Effects of Climate Change on American Indian and Alaska Native Tribes*, 22 NAT. RES. & ENV'T 45, 47 (2008).

230 NCA4 VOL. 2, *supra* note 2, at 585.

231 *See id.* at 585–86.

232 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 7 (2009).

12 of which had considered migrating to reduce their exposure.[233] 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 some areas along the U.S. coastline" in coming decades.[234]

With the recognition that relocation due to climate change will be unavoidable in some coastal areas, the federal government has begun to explore ways to improve climate resilience, including preemptively relocating people and property away from severe impact areas.[235] 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 98% of its land area over the last six decades due to rising sea levels.[236] "[E]ven 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.[237]

Like the Isle de Jean Charles Band, many tribal communities are hesitant to relocate.[238] Because tribal jurisdiction generally extends to reservation boundaries, moving from tribal lands can "cut [tribes] off from their origins, the places of their collective memory, and the rights to self-determination."[239] Indigenous people across the contiguous United States have already lost 98.9% of their historical lands.[240] For the tribes that have retained a land base, the average present-day size is only 2.6% of their estimated historical areas.[241] 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.

Climate-related relocation also compounds historical trauma experienced by many Native Americans.[242] Historical trauma is defined as "cumulative emotional and psychological wounding across generations,

233 *Id.* at 12.
234 GAO CLIMATE CHANGE, *supra* note 84, at 30.
235 *Id.* at 1, 3.
236 Nelson et al., *supra* note 57, at 85.
237 *Id.* at 87. Notably, the Isle de Jean Charles Band of Biloxi-Chitimacha-Choctaw is a state-recognized tribe. *Id.*
238 NORTON-SMITH ET AL., *supra* note 221, at 9.
239 *Id.*
240 Farrell et al., *supra* note 37, at 3.
241 *Id.*
242 *See* NCA4 VOL. 2, *supra* note 2, at 582.

including the lifespan, which emanates from massive group trauma."[243] "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."[244] The boarding school era perpetuated historical trauma among tribal communities, once again removing Native Americans from their homes, but focusing on children.[245] Between 1819 and 1969, 408 federal Indian boarding schools were in operation.[246] Enrollment at these schools ranged from one child to over 1,200 children.[247] As recently reported by the Bureau of Indian Affairs, "[T]he 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."[248] The U.S. Senate 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.[249]

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.

243 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).

244 NCA4 VOL. 2, *supra* note 2, at 582. Historical trauma has been connected to depression, substance abuse, and other psychological issues. Brave Heart et al., *supra* note 243, at 284.

245 BUREAU OF INDIAN AFFAIRS, FEDERAL INDIAN BOARDING SCHOOL INITIATIVE INVESTIGATIVE REPORT 88–89 (2022).

246 *Id.*

247 *Id.* at 7.

248 *Id.* at 3.

249 *Id.* at 21 (citing S. REP. NO. 91-501, at 143 (1969)).

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. governments [sic] *solemn promise to uphold and protect our Tribes* [sic] *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.*

— W. RON ALLEN, TRIBAL CHAIRMAN, JAMESTOWN S'KLALLAM TRIBE[250]

The federal government has a unique responsibility to tribes that includes promoting tribal health. While international law supports fulfillment of this responsibility,[251] the underlying legal basis is found in domestic law.[252] 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.[253] President Joe Biden recommitted the federal government to honoring trust and treaty responsibilities to tribes when 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

250 *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).

251 The United Nations Declaration on the Rights of Indigenous Peoples recognizes that "Indigenous individuals 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 distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters . . . and other resources." G.A. Res.61/295, ¶ 24–25 (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: Can Self Determination Be Actualized Within the U.S. Constitutional Structure?* 15 LEWIS & CLARK L. REV. 923, 925–28 (2011) (discussing the significance of international human rights law in forming the substrate for the promotion of Indigenous rights).

252 BROKEN PROMISES, *supra* note 8, at 61–62 (discussing the basis for the federal government's special trust responsibilities and legal obligations to provide health care for Native Americans).

253 *About IHS*, *supra* note 44.

which disproportionately harm Native Americans.[254]

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.[255] 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 EPA's site dedicated to climate change.[256]

While the United States has not had a strong track record towards mitigating climate change, in the past few decades, there has been steady Congressional momentum to identify climate change impacts in the United States.[257] 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."[258] The U.S. Global Change Research Program (USGCRP) is the federal program responsible for carrying out this mandate.[259] USGCRP is currently developing the Fifth National Climate Assessment, which is set to be released in 2023 and includes a chapter dedicated to tribes and Indigenous peoples.[260] The Biden Administration has also taken steps to make climate change a federal priority, including issuing presidential executive orders to address climate change and promote environmental justice.[261] Additionally, Congress recently passed a landmark climate

254 Memorandum No. 02075, 86 Fed. Reg. 7,491, 7,491 (Jan. 26, 2021).

255 *See* CONG. RSCH. SERV., U.S. CLIMATE CHANGE POLICY (2021), http://crsreports.congress.gov/product/pdf/R/R46947 (providing a history of United States federal climate policy and identifying recent legislative and executive action).

256 Chris Mooney & Juliet Eilperin, *EPA Website Removes Climate Science Site from Public View After Two Decades*, WASH. POST (Apr. 29, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/04/28/epa-website-removes-climate-science-site-from-public-view-after-two-decades/.

257 15 U.S.C. § 2931(b).

258 Global Change Research Act, Pub. L. No. 101-606, 104 Stat. 3096, § 101(b).

259 15 U.S.C. § 2933.

260 *Fifth National Climate Assessment*, U.S. GLOBAL CHANGE RESEARCH PROGRAM, https://www.globalchange.gov/nca5 (last visited Nov. 21, 2022). The First National Climate Assessment was published in 2000, the Second National Climate Assessment in 2009, the Third National Climate Assessment in 2014. *Previous Assessments*, U.S. Global Change Research Program, https://www.globalchange.gov/what-we-do/assessment/previous-assessments (last visited Nov. 21, 2022). The Fourth National Climate Assessment was published in 2018. *Fourth National Climate Assessment*, U.S. GLOBAL CHANGE RESEARCH PROGRAM, https://www.globalchange.gov/nca4 (last visited Nov. 21, 2022).

261 *See, e.g.*, Exec. Order No. 13,990, 86 Fed. Reg. 7,037 (Jan. 20, 2021).

bill known as the Inflation Reduction Act of 2022, which includes $369 billion in climate investments (e.g., clean energy tax credits; incentives for carbon capture and storage technologies) aimed at reducing greenhouse gas emissions.[262] The Act has been recognized as an important step towards averting the worst consequences of global warming.[263]

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 throughout the United States, particularly by tribal communities. As the federal government seeks to uphold its promise to promote tribal health, climate change must be considered when fulfilling this responsibility.[264]

This Part discusses 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 IHS's past and present actions to combat water insecurity are examined.

A. Federal Responsibility to Provide Health Services

The federal government and tribes historically have a contentious relationship.[265] Tribes pre-date the formation of the United

262 *See* H.R. 5376, 117th Cong. (2022). The Act also included several health provisions that relate to Medicare drug prices and Affordable Care Act subsidies. *Id. See also* CONG. RSCH. SERV., SELECTED HEALTH PROVISIONS OF THE INFLATION REDUCTION ACT (2022), https://crsreports.congress.gov/product/pdf/IF/IF12203.

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

264 Notably, tribes are not idly standing by. *See* Elizabeth Kronk Warner, *Indigenous Adaptation in the Face of Climate Change*, 21 J. ENV'T & SUSTAINABILITY L. 129, 130 (2015). Tribes have enacted their own laws and policies targeting climate change to protect their community. *Id.* at 146–165 (discussing several different tribal adaptation and mitigation actions). 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.

265 *See generally* NED BLACKHAWK, VIOLENCE OVER THE LAND: INDIANS AND EMPIRES IN THE EARLY AMERICAN WEST (Harvard University Press, 6th ed. 2006) (discussing the origins of the United States and subsequent conflict and violence upon which it

States and have retained their inherent sovereignty to this day.[266] That sovereignty, however, is not absolute. In a series of cases, commonly known as the *Marshall* trilogy, the Supreme 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.[267] Yet, tribes are also "domestic dependent nations," and based upon this status, they necessarily look to the federal government for protection.[268] This unique relationship imposes certain federal responsibilities and obligations on behalf of and for the benefit of tribes, including the duty to protect tribes and their members.[269]

Since the 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."[270] The vast majority of federal policies were directed at removing tribes from their homelands to open up land for white settlers and assimilating Native Americans into mainstream society.[271] Beginning in the 1960s with the Self-Determination and Self-Government Era, the federal government shifted its stance to engage with tribes on a sovereign-to-sovereign

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was built, focusing on the West).

266 Heather Tanana & John Ruple, *Synching Science and Policy to Address Climate Change in Tribal Communities*, 36 NAT. RES. & ENV'T 37, 37 (2021)*; see also* BROKEN PROMISES, *supra* note 8, at 5.

267 *See, e.g.*, Cherokee Nation v. Georgia, 30 U.S. 1, 4 (1831) ("[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."). "The history of Indian law in the Supreme Court opens with the Marshall Trilogy—*Johnson v. M'Intosh*, 21 U.S. 543 (1823); *Cherokee Nation v. Georgia*, 30 U.S. 1 (1831); and *Worcester v. Georgia*, 31 U.S. 515 (1832)." Matthew L.M. Fletcher, *A Short History of Indian Law in the Supreme Court*, ABA (2014), https://www.americanbar.org/groups/crsj/publications/human_rights_magazine_home/2014_vol_40/vol--40--no--1--tribal-sovereignty/short_history_of_indian_law/.

268 *Cherokee Nation*, 30 U.S. at 17.

269 *See, e.g.*, COHEN'S HANDBOOK OF FEDERAL INDIAN LAW § 4.01(2)(d) (Nell Jessup Newton et al. eds., 2012) [hereinafter COHEN'S HANDBOOK] (citing *Ex parte* Crow Dog, 109 U.S. 556, 568 (1883)).

270 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) [hereinafter *Learning from the Past*]; *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).

271 *Learning from the Past*, *supra* note 270, at 195; *see also* COHEN'S HANDBOOK, *supra* note 269, §§ 1.01–1.07 (summarizing the Indian federal policies).

basis and promote tribal self-governance.[272] 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."[273] Many treaties identified health services as part of the United States' payment to tribes for the cessation of millions of acres of tribal land.[274] "Of the 389 ratified Indian treaties, 31 (12%) contain provisions specifically related to Indian health care: 28 providing for a physician and 9 providing for a hospital."[275] The obligation to provide health services also "has been interpreted to be a part of the federal government's trust responsibility to tribes."[276]

272 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).

273 *Learning from the Past*, *supra* note 270, at 198*; see also Basis for Health Services*, *supra* note 43 (discussing the "legal basis for the federal obligation to provide health care to American Indians").

274 DAVID N. DEJONG, IF YOU KNEW THE CONDITIONS: A CHRONICLE OF THE INDIAN MEDICAL SERVICE AND AMERICAN INDIAN HEALTH CARE, 1908–1955 at 5 (Lexington Books 2008).

275 *Id.*

276 *Learning from the Past*, *supra* note 270, at 198. 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 61, 68 (Everett R. Rhoades ed., 2000) (citing AMERICAN INDIAN POLICY REVIEW COMMISSION, 95TH CONG., 1ST SESS., FINAL REP. (Comm. Print 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 ("IHCIA"). 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 8th 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). However, claims to enforce this duty are strongest when paired with treaty and statutory obligations under the IHCIA or Indian Self-Determination Education Assistance Act. *See, e.g.*, Rosebud Sioux Tribe v. United States, 9 F.4th 1018, 1023 (8th Cir. 2021). In contrast, the Ninth Circuit has found that neither the general federal-tribal trust relationship nor the IHCIA create a judicially enforceable duty on behalf of the United States

In the early 1800s, administration of tribal affairs was based in the Department of War.[277] During this time, military physicians provided episodic care to Native Americans near military posts.[278] With limited resources for tribal health care, however, these services were minimal.[279] In 1849, the Department of Interior assumed jurisdiction over tribal matters, including health services, leading to a more organized, systematic approach.[280] "In subsequent decades, the federal government gradually assumed increasing obligations to provide health care, usually a physician and medications, to tribes." [281]

However, healthcare needs continued to exceed available assistance.[282] Following exposure to Europeans explorers, the Indigenous inhabitants of North America were devastated by the high morbidity and mortality rates of infectious diseases.[283] It is estimated that the Native population attrition rate from infectious diseases was as high as 75% between 1520 and the late 1800s.[284] "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."[285]

To bring about reform, a committee of 100 academics, social scientists, and specialists were assembled to advise on Native American affairs.[286] The committee's report acknowledged the federal government had 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 [necessary] to quickly and effectively"

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to provide a specific standard of medical care. Quechan Tribe of Fort Yuma Indian Rsrv. v. United States, 599 F. App'x 698, 699 (9th Cir. 2015).

277 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 74, 74 (Everett R. Rhoades ed., 2000).

278 *Id.*

279 DEJONG, *supra* note 274, at 10–11.

280 Everett R. Rhoades & Dorothy A. Rhoades, *The Public Health Foundation of Health Services for American Indians & Alaskan Natives*, 104 AM. J. PUB. HEALTH 278, 279 (2014).

281 *Id. at* 279–280.

282 *Id.* at 281.

283 Edwin Asturias et al., *Infectious Diseases*, *in* AMERICAN INDIAN HEALTH: INNOVATIONS IN HEALTH CARE PROMOTION, AND POLICY 362 (Everett R. Rhoades ed., John Hopkins Univ. Press 2000).

284 *Id.*

285 DEJONG, *supra* note 274, at 24.

286 H. JOURNAL, 68th Cong., 1st sess., 638 (1924); 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).

address their needs.[287] The committee also recommended that Congress appropriate adequate funding to provide more hospitals and health professionals to serve Native Americans.[288]

Several federal laws have impacted the health and general welfare of Native Americans.[289] The Snyder Act of 1921 was one of the first major laws passed that 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.[290] Under the Department of Interior, the Bureau of Indian Affairs was responsible for providing these services at the time.[291] 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."[292]

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 published in 1928.[293] 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."[294] The report concluded that "[t]aken as a whole[,] practically every activity undertaken by the national government for the promotion of the health of the Indians is below a reasonable standard of efficiency."[295]

"The end of World War II sparked a wave of conservatism and nationalism in the United States."[296] Under the Truman Administration, the executive branch considered integration, consolidation, and

287 OTIS, *supra* note 286, at 2.
288 *Id.* at 3, 35–37.
289 *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 the health and welfare of Native American populations).
290 Act of Nov. 2, 1921 (Snyder Act), Pub. L. No. 67-85, ch. 115, 42 Stat. 208 (1921) (codified as amended at 25 U.S.C. § 13).
291 *Id.*
292 *Id.*
293 MERIAM REPORT, *supra* note 175, at 189.
294 DEJONG, *supra* note 274, at 55. *See* MERIAM REPORT, *supra* note 175, at 189–345 (chapter devoted to Native American health).
295 MERIAM REPORT, *supra* note 175, at 189.
296 DEJONG, *supra* note 274, at 109.

elimination of duplicative governmental programs to reduce government waste.[297] 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.[298] 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, now known as the IHS.[299]

Still seeking to assimilate Native Americans into broader society, Congress directed the PHS to conduct a comprehensive survey of Native American health conditions.[300] 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).[301] The report recognized that "[a] substantial Federal Indian health program [would] be required [to correct these] gross [] deficiencies."[302] The report also recommended that plans to increase tribal community health resources should be implemented in collaboration with tribal communities "on a reservation-by-reservation basis."[303]

In 1970, President Richard Nixon issued an Indian policy

297 *Id.*

298 *Id.* at 149.

299 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 health authorities." Johnson & Rhoades, *supra* note 277, at 75. The Division of Indian Health was elevated to bureau status and redesignated as the Indian Health Service in 1968. *Records of the Indian Health Service*, NAT'L ARCHIVES, https://www.archives.gov/research/guide-fed-records/groups/513.html (last updated Aug 15, 2016).

300 *See* DEJONG, *supra* note 274, at 157. "[I]f Indians were to be emancipated from federal supervision and services, they first had to be free of disease." *Id.*

301 U.S. DEP'T OF HEALTH, EDUC. & WELFARE, HEALTH SERVICES FOR AMERICAN INDIANS (1957) [hereinafter 1957 IHS GOLD BOOK] (reflecting the report that had a gold cover and became commonly known as the "1957 IHS Gold Book"); *see also* George St. J. Perrot & Margaret D. West, *Health Services for American Indians*, 72 PUB. HEALTH REPS. (1896-1970) 565 (1957).

302 1957 IHS GOLDBOOK, *supra* note 301, at 6; Perrot & West, *supra* note 301, at 570.

303 1957 IHS GOLDBOOK, *supra* note 301, at 174.

statement to Congress, firmly shifting federal relations with tribes into a new era: the Self-Determination and Self-Governance Era.[304] 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.[305] 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.[306] The Act authorized IHS to allow tribes to manage health-related programs and services.[307] "Under such agreements—often referred to as 638 contracts and compacts—[t]ribes are able to tailor programs and services to their specific community needs."[308]

The Indian Health Care Improvement Act (IHCIA) is another major law that passed during the Self-Determination and Self-Governance Era in 1976.[309] After the authorizations of appropriations expired in 2000, IHCIA was permanently reauthorized in 2010.[310] The

304 President Richard Nixon, *Special Message to Congress on Indian Affairs*, THE AM. PRESIDENCY PROJECT (July 8, 1970), 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 269, § 1.07.

305 Nixon, *supra* note 304.

306 *Learning from the Past*, *supra* note 270, at 198; *see also* Indian Self-Determination and Education Assistance Act, Pub. L. No. 93-638, 88 Stat. 2203 (1975) (codified as amended at 25 U.S.C. §§ 450-450n, 455-458e, 458aa-458hh, 458aaa-458aaa-18 (2006)).

307 *Learning from the Past*, *supra* note 270, at 198–199; *see also* OFF. OF THE INSPECTOR GEN., DEP'T OF HEALTH & HUM. SERVS., OEI-09-93-00350, TRIBAL CONTRACTING FOR INDIAN HEALTH SERVICES 1, 5 (1996). 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. *See* Indian Self-Determination and Education Assistance Act, *supra* note 306. A major difference between a contract (under Title I) and a compact (under Title V) is the degree of federal oversight. For a comparison of Title I contracting and Title V compacting, *see* INDIAN HEALTH SERV., DIFFERENCES BETWEEN TITLE I CONTRACTING AND TITLE V COMPACTING UNDER THE INDIAN SELF-DETERMINATION EDUCATION ASSISTANCE ACT (ISDEAA).

308 *Learning from the Past*, *supra* note 270, at 198–199.

309 Indian Health Care Improvement Act, 25 U.S.C. §§ 1601–1683.

310 Permanent Authorization of the IHCIA was part of the Patient Protection and

IHCIA set forth two national goals:

> [First,] to 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 second], to 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 encourage the maximum participation of Indians in the planning and management of those services.[311]

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."[312]

IHS remains the primary agency charged with fulfilling the federal treaty and trust responsibility to provide health services to Native Americans.[313] The mission of IHS is "to raise the physical, mental, social, and spiritual health of American Indians and Alaska Natives to the highest level."[314] Based upon a broad definition of health, IHS services go beyond hospital and medical services to also include "preventative services, community and social well-being, and environmental improvements."[315] The present day Native American health care delivery system is called the I/T/U system, representing three means of service: "'I' for IHS; 'T' for Tribal programs under the ISDEAA; and 'U' for urban health centers. For many Native Americans, the I/T/U system is the only source of health care services."[316]

For the most part, the federal government has consistently acknowledged its responsibility to provide health services to Native

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Affordable Care Act. Patient Protection and Affordable Care Act, Pub. L. No. 111-148, 124 Stat. 119, 935; *see also* U.S. Dep't. of Health and Hum. Servs., *Indian Health Care Improvement Act Made Permanent*, INDIAN HEALTH SERV (Mar. 27, 2010), https://www.ihs.gov/newsroom/pressreleases/2010pressreleases/indianhealthcareimprovementactmadepermanent/.

311 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.

312 *Learning from the Past*, *supra* note 270, at 199; *see also* 25 U.S.C. §§ 1601, 1651–58.

313 *About IHS*, *supra* note 44.

314 *Id.*

315 Johnson & Rhoades, *supra* note 277, at 76.

316 *Learning from the Past*, *supra* note 270, at 199; BROKEN PROMISES, *supra* note 8, at 64; *see also* Warne & Frizzell, *supra* note 289, at 265 (describing the I/T/U system).

Americans. However, "Congress has historically failed to appropriate sufficient funding to meet the health-related needs of Native Americans."[317] "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."[318] While the life expectancy of Native Americans has increased, rising from 51 in 1954 to 73 in 2019, it has remained stagnant for the past two decades and still remains below that of the general United States population.[319]

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.[320] However, tribal water rights are unique.

> Although 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.[321]

Consequently, tribal water rights are not measured by actual use; these rights cannot be lost by nonuse.[322] Additionally, because tribal water rights generally have priority dating back to the reservation's formation,

317 *Learning from the Past*, *supra* note 270, at 199; *see also* BROKEN PROMISES, *supra* note 8, at 66–67.

318 BROKEN PROMISES, *supra* note 8, at 67.

319 DEJONG, *supra* note 274, at 165; GBD U.S. Health Disparities Collaborators, *Life Expectancy by County, Race, and Ethnicity in the USA, 2000-19: A Systematic Analysis of Health Disparities*, 400 LANCET 25, 28 (2022).

320 *See* Shannon M. McNeeley et al., *Anatomy of an Interrupted Irrigation Season: Micro-Drought at the Wind River Indian Reservation*, 19 CLIMATE RISK MGMT. 61, 66 (2018); Suhina Deol, Effects of Water Quantification on Tribal Economies: Evidence from the Western U.S. Reservations 11, 22–23, 32, 62 (Apr. 28, 2017) (M.S. thesis, University of Arizona) (on file with UA Campus Repository, University of Arizona Libraries), https://repository.arizona.edu/bitstream/handle/10150/624150/azu_etd_15583_sip1_m.pdf?sequence=1&isAllowed=

321 TRIBAL WATER RIGHTS, *supra* note 21, at 2 (internal quotations omitted).

322 *Id.*

they typically represent some of the most senior water rights.[323]

The law reflects the history of Native Americans and special relationship between tribes and the federal government. Several tribes formed treaties with the United States in which "the federal government promised to establish a reservation as a permanent homeland for the tribe."[324] As noted by Clement Frost, 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 a treaty establishing the Ute Reservation in 1868, the United States promised the Ute people that the Reservation would be our permanent home that would support our people forever. *The key to carrying out that promise is wet water*—a fact that the tribal leadership has always known but what the United States has sometimes forgotten.[325]

Although treaties often did not explicitly address the water-related needs of reservations, a 1908 Supreme Court ruling, *Winters v. United States*, 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."[326] 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."[327]

323 CHARLES V. STERN, CONG. RSCH. SERV., INDIAN WATER RIGHTS SETTLEMENTS, R44148, 2 (2022) [hereinafter INDIAN WATER RIGHTS SETTLEMENTS], https://crsreports.congress.gov/product/pdf/R/R44148.

324 *See e.g.*, Treaty with the Navajo Tribe of Indians, U.S.-Navajo, art. IX, Sept. 9, 1849, 9 Stat. 974; UNIVERSAL ACCESS, *supra* note 46, at 3.

325 *Colorado Ute Settlement Act Amendments of 1998: Hearing on H.R. 3478 Before the Subcomm. on Water & Power of the H. Comm. On Nat. Res.*, 105th Cong. (1998) (statement of Clements Frost, Chairman, Southern Ute Indian Tribe) (emphasis added).

326 *See* UNIVERSAL ACCESS, *supra* note 46, at 23; *see also* Navajo Nation v. U.S. Dep't of the Interior, 26 F.4th 794, 810 (9th Cir. 2022) *cert. granted sub nom.*, Arizona v. Navajo Nation, 143 S. Ct. 398 (2022) "([W]hile '[t]he specific purposes of an Indian reservation . . . were often unarticulated, '[t]he general purpose, to provide a home for the Indians, is a broad one and must be liberally construed.'") (internal citation omitted). It is clear that the Reservation cannot exist as a viable homeland for the Nation without an adequate water supply.

327 *What Is the Federal Indian Trust Responsibility?*, U.S. DEPT. OF THE INTERIOR, BUREAU OF INDIAN AFFS. (Nov. 8, 2017), https://www.bia.gov/faqs/what-federal-indian-trust-responsibility; *see also Navajo Nation*, 26 F.4th at 812 (holding "that common-law sources of the trust doctrine . . . firmly establish the Federal Appellees' duty to protect and preserve [a tribe's] right to water").

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."[328]

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 time and money.[329] 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.[330] Tribal water rights may be quantified through either adjudication (litigation) or negotiated settlements.[331] 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.[332] Since the *Winters* decision, 46 tribes have quantified their water rights through adjudications.[333] As litigation is a time-consuming process (the average tribal adjudications having taken 22 years to complete) and can carry other disadvantages, settlement may be favored over litigation.[334]

328 *Navajo Nation*, 26 F. 4th at 812–13.

329 *See* Heather Tanana & Elisabeth Parker, *The Unfulfilled Promise of Indian Water Rights Settlements*, 37 NAT. L RES. & ENV'T 12 (forthcoming 2023) (discussing the challenges associated with tribal water rights settlements).

330 U.S. GLOB. RSCH. PROGRAM, *Tribes and Indigenous Peoples*, *in* FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME II: IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES 572, 579 (2018). *See generally* Deol, *supra* note 320; Judith V. Royster, *Climate Change and Tribal Water Rights: Removing Barriers to Adaptation Strategies*, 26 TUL. ENV'T L.J. 197 (2013).

331 *See* COHEN'S HANDBOOK, *supra* note 269, §§ 19.05(1)–(2) (discussing the determination of tribal water rights).

332 *Id.* at § 19.06 (discussing federal protection of tribal water rights). Indeed, in *Navajo Nation*, the Navajo Nation asserted that the United States breached its trust obligation to assert and protect the tribe's unresolved water rights in the Colorado River. 26 F.4th at 799.

333 Leslie Sanchez et al., *Beyond "Paper" Water: The Complexities of Fully Leveraging Tribal Water Rights*, FED. RSRV. BANK OF MINNEAPOLIS (May 3, 2022), https://www.minneapolisfed.org/article/2022/beyond-paper-water-the-complexities-of-fully-leveraging-tribal-water-rights.

334 *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-tribal interests from the source under litigation. COHEN'S HANDBOOK, *supra* note 269, § 19.05(2).

Negotiated settlements—also referred to as Indian or tribal water rights settlements—involve four phases: pre-negotiation, negotiation, settlement, and implementation.[335] 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.[336] Once negotiated, settlements typically require congressional authorization to implement the terms.[337] "Since 1978, the federal government has entered into 38 tribal water rights settlements . . . and 34 of these settlements have been congressionally approved."[338]

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.[339] "[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 future."[340] As previously noted, water infrastructure is aging across the United States and is in particularly poor condition in Indian country. Decaying water infrastructure exacerbates climate risks[341] and contributes to water insecurity,[342] 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.[343] However, settlements also have disadvantages, namely that "[v]irtually all tribes

335 INDIAN WATER RIGHTS SETTLEMENTS, *supra* note 323, at 3–5.

336 *Id.* at 1, 4–5.

337 *Id.* at 5.

338 *Id.* at 6.

339 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. *Id.* at 2. Water development projects and establishment of delivery systems allow tribes to access their water, turning "paper" rights into "wet" rights. *Id.* "[U]nlike Congress, the 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.* 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.*

340 NAT'L WATER COMM'N, WATER POLICIES FOR THE FUTURE 476 (1973).

341 NCA4 VOL. 2, *supra* note 2, at 154.

342 UNIVERSAL ACCESS, *supra* note 46, at 17–19.

343 Heather Tanana & Elisabeth Parker, *The Unfulfilled Promise of Indian Water Rights Settlements*, 37 NATURAL RESOURCES & ENVIRONMENT 12, 14 (2022).

agree to a lesser quantity of water than they would claim in litigation."[344]

Congress generally directs either the Bureau of Reclamation or the Bureau of Indian Affairs to oversee federal projects approved in a tribal water settlement.[345] 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.[346] Construction on the NGWSP began in 2012 and is projected to be completed by year-end of 2029.[347] Project conception and planning actually began decades earlier, in the 1950s.[348] Many community members were skeptical that the project would ever be realized.[349] But the Bureau of Reclamation was able to establish and maintain a strong working relationship with the community and ultimately partnered with IHS to serve some homes sooner, without the need to complete the rest of the NGWSP first.[350] 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.[351] 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.[352]

344 COHEN'S HANDBOOK, *supra* note 269, § 19.05(2).

345 INDIAN WATER RIGHTS SETTLEMENTS, *supra* note 323, at 5.

346 Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, tit. X, pt. III, 123 Stat. 991, 1365.

347 *Navajo-Gallup Water Supply Project, General*, BUREAU OF RECLAMATION, https://www.usbr.gov/projects/index.php?id=580 (last visited Jan.5, 2023). Notably, according to the authorizing legislation, construction was supposed to be completed by 2024. *Id.*

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

349 *Energy and Water Dev. Hearing*, *supra* note 51, at 6.

350 RECOMMENDATIONS FOR REFORM, *supra* note 348, at 7.

351 UNIVERSAL ACCESS, *supra* note 46, at 28–43 (discussing the roles and programs of the Indian Health Service, Environmental Protection Agency, U.S. Department of Agriculture, and Bureau of Reclamation related to drinking water in Indian country).

352 *Id.*

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 that 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 Supreme Court has affirmed the federal government's continuing obligation to do so. In *McGirt v. Oklahoma*, the Supreme Court upheld treaty promises made to the Muscogee (Creek) Nation to establish a reservation.[353] Writing for the court, Justice Neil Gorsuch stated: "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."[354] 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.

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 comprising at least 23 different programs that afford some type of funding for tribal water and sanitation projects.[355] However, as discussed below, the IHS mission most aligns with this intersection, and IHS is one of the primary agencies involved in supporting tribal drinking water and sanitation infrastructure.

Tribal communities have faced water insecurity for decades. Throughout the 1950s, reservation-wide sanitation surveys were conducted and revealed that "[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."[356] At

353 McGirt v. Oklahoma, 140 S. Ct. 2452, 2459 (2020).
354 *Id.* at 2482.
355 UNIVERSAL ACCESS, *supra* note 46, at 5.
356 DEJONG, *supra* note 274, at 161.

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 did not have statutory authority to transfer such projects to state, local, or tribal entities.[357] To address these issues, Congress passed the Indian Sanitation Facilities Act (ISFA) in 1959 to improve sanitation conditions in Indian country by authorizing the use of federal funds to design and construct water, wastewater, and solid waste facilities.[358]

At present, this authority is carried out by IHS through its Sanitation Facilities Construction (SFC) Program.[359] The goal of the SFC Program is:

> To improve the health of the American Indian and Alaska Native people by improving the environment in which they live. The SFC Program accomplishes that goal by providing . . . safe water supplies, adequate means of waste disposal, and other essential sanitation facilities. An additional goal is to build tribal capability to operate and maintain the facilities provided in a safe and effective manner.[360]

As part of the SFC Program, IHS collects sanitation data—information about water supply and sewage disposal—for homes within its service areas.[361] IHS currently has identified 245,802 homes that have some form of water or sanitation deficiency.[362] 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).[363]

357 *Id.* (citing INDIAN SANITATION FACILITIES, S. REP. No. 86-589, at 4 (1959)).

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

359 *Division of Sanitation Facilities Construction*, *supra* note 45.

360 INDIAN HEALTH SERV. ET AL., CRITERIA FOR THE SANITATION FACILITIES CONSTRUCTION PROGRAM 1-1 (1999) [hereinafter CRITERIA FOR SFC PROGRAM], https://www.ihs.gov/sites/dsfc/themes/responsive2017/display_objects/documents/Criteria_March_2003.pdf.

361 *Id.* at 2–7. IHS is mandated to maintain this inventory and report annually to Congress on existing sanitation deficiencies pursuant to the 1988 amendments to the Indian Health Care Improvement Act. *Id.*

362 INDIAN HEALTH SERV., AMERICAN RESCUE PLAN ACT, INFRASTRUCTURE INVESTMENT AND JOBS ACT, AND BUILD BACK BETTER BILL 20 (2021), https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/2021_Speeches/IHSTribalandUIOUpdateandLearningSession120921.pdf.

363 INDIAN HEALTH SERV., SANITATION DEFICIENCY SYSTEM (SDS): A GUIDE FOR REPORTING SANITATION DEFICIENCIES FOR AMERICAN INDIAN AND ALASKA NATIVE HOMES AND COMMUNITIES 18 (2019), https://www.ihs.gov/sites/dsfc/themes/

As mentioned in Part I, funding has been a persistent challenge for IHS. Historically, the SFC Program has received a fraction of the funds required for the program.[364] 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.[365] However, due to the Infrastructure, Investment and Jobs Act (IIJA), for the first time in its history, the SFC Program received the full amount of funding for its reported need, plus administrative costs.[366] As part of IIJA, the SFC Program will receive $3.5 billion over five years, or $700 million per year for fiscal years 2022 to 2026.[367] "With the additional IIJA funding, IHS total annual funding for SFC projects is now four times greater than in previous years."[368] 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.[369]

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responsive2017/display_objects/documents/Final_SDS_Guide_v2.pdf; INDIAN HEALTH SERVICE, ANNUAL REPORT TO THE CONGRESS OF THE UNITED STATES ON SANITATION DEFICIENCY LEVELS FOR INDIAN HOMES AND COMMUNITIES 4 (2019), https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/FY_2019_RTC_Sanitation_Deficiencies_Report.pdf.

364 "With the additional IIJA [Infrastructure, Investment and Jobs Act] funding, IHS total annual funding for SFC projects is now four times greater than in previous years." SUZANNE MURRIN, OFFICE OF INSPECTOR GENERAL, INITIAL OBSERVATIONS OF IHS CAPACITY TO MANAGE SUPPLEMENTAL $3.5 BILLION APPROPRIATED TO SANITATION FACILITIES CONSTRUCTION PROJECTS 2 (2022), https://oig.hhs.gov/oei/reports/OEI-06-22-00320.pdf. *See also* UNIVERSAL ACCESS, *supra* note 46, at 29 (comparing IHS SFC Program needs to appropriations from 2009-2019).

365 *See* Email from Mark Calkins, Dir., Div. of Sanitation Facilities Const., Indian Health Serv., to author (Mar. 2, 2021) (on file with author) ("[T]he end of year 2020 total cost of SDS projects has been finalized at $3,086,773,153."); *Operating Plan for FY 2021*, INDIAN HEALTH SERV. https://www.ihs.gov/sites/budgetformulation/themes/responsive2017/display_objects/documents/FY2021_OperatingPlan.pdf (last visited Jan. 5, 2023).

366 *FY 2021 Annual Report of Sanitation Deficiency Levels*, INDIAN HEALTH SERV., https://www.ihs.gov/sites/dsfc/themes/responsive2017/display_objects/documents/FY_2021_Appendix_Project_Listing.pdf (last visited Jan. 5, 2023); Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429, 1411 (2021). *See also IHS Allocates $700 Million from President Biden's Bipartisan Infrastructure Law to Improve Tribal Water and Sanitation Systems*, HEALTH AND HUM. SERVS. (May 31, 2022), https://www.hhs.gov/about/news/2022/05/31/ihs-allocates-700-million-dollars-from-president-bidens-bipartisan-infrastructure-law-to-improve-tribal-water-sanitation-systems.html.

367 *IHS Allocates $700 Million from President Biden's Bipartisan Infrastructure Law to Improve Tribal Water and Sanitation Systems*, *supra* note 366.

368 MURRIN, *supra* note 364.

369 The lack of clean water access in Indian country received significant attention

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.[370] These recommendations include improving the SFC Program database, removing unnecessary matching fund requirements, and updating eligibility and criteria positions in consultation with tribes.[371] The IHS database is the most comprehensive inventory of drinking water and sanitation deficiencies in tribal communities.[372] While IHS has made improvements to their database, it does not identify all tribal homes that are eligible to receive funding from IHS.[373] IHS updates the database annually and collaborates with tribes to identify their drinking water and wastewater infrastructure needs; however, it can be difficult to identify where tribal members are residing in communities with a large non-Native population, and some tribes may choose not to provide information to IHS for a variety of reasons.[374] In order to

during the COVID-19 pandemic, both in Congress and in the media. *See, e.g.*, *Energy and Water Dev. Hearing*, *supra* note 51; Nina Lakhani, *Tribes Without Clean Water Demand an End to Decades of US Government Neglect*, THE GUARDIAN (Apr. 28, 2021), https://www.theguardian.com/us-news/2021/apr/28/indigenous-americans-drinking-water-navajo-nation. The CARES Act and American Rescue Plan Act of 2021 included additional funding for IHS and tribal water projects. CARES Act, Pub. L. No. 116-136, 134 Stat. 281, 550 (2020); More specifically, the CARES Act providing funding directly to tribes as well as $10 million to IHS that was used to increase water access in Indian country. *IHS Statement on Allocation of Final $367 Million from CARES Act*, INDIAN HEALTH SERV. (Apr. 23, 2022), https://www.ihs.gov/newsroom/pressreleases/2020-press-releases/ihs-statement-on-allocation-of-final-367-million-from-cares-act/. The American Plan Act authorized $20 million to the Bureau of Indian Affairs to provide and deliver potable water. American Rescue Plan Act of 2021, Pub. L. No. 117-2, 135 Stat. 4, 241 (2021).

370 RECOMMENDATIONS FOR REFORM, *supra* note 348, at 17–23.

371 *Id.*

372 IHS is the only agency with a statutory mandate to maintain a sanitation deficiency database. That database is used to provide a "wide variety of information" to Congress, the Office of Management and Budget, the General Accounting Office, and various other federal entities. CRITERIA FOR SFC PROGRAM, *supra* note 360, at 2–7. Indeed, the Environmental Protection Agency utilizes the IHS database to administer its Clean Water Indian Set-Aside Program, which provides funding to tribes for wastewater infrastructure. *Clean Water Indian Set-Aside Program*, ENVT'L PROTECTION AGENCY, https://www.epa.gov/small-and-rural-wastewater-systems/clean-water-indian-set-aside-program (last visited Jan. 25, 2023).

373 RECOMMENDATIONS FOR REFORM, *supra* note 348, at 17–19.

374 U.S. GOV'T ACCOUNTABILITY OFF., GAO–18–309, DRINKING WATER AND WASTEWATER INFRASTRUCTURE: OPPORTUNITIES EXIST TO ENHANCE FEDERAL AGENCY NEEDS ASSESSMENT AND COORDINATION ON TRIBAL PROJECTS 16–17, 19–20 (2018), https://www.gao.gov/assets/gao-18-309.pdf. *See also* RECOMMENDATIONS FOR REFORM,

enhance transparency, it is important that 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 (through the Surgeon General) to provide sanitation facilities to "Indian homes, communities, and lands."[375] 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 that would be served by water and wastewater infrastructure.[376] 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.[377] The matching requirement creates an insurmountable financial obstacle for many tribal communities.[378] With adequate funding now available through IIJA, 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 criteria[379] for providing service to "Indian homes, communities, and lands" under ISFA, the agency does not have regulations that define Indian community for this purpose.[380] Under current criteria, IHS assistance depends upon the community size and Native American population.[381] In Indian communities (currently identified as 50% or more federally recognized Native American people), non-Indian persons or organizations must contribute funds to cover the prorated

supra note 348, at 18.

375 Indian Sanitation Facilities Act, *supra* note 358.

376 Jojo Phillips, *'Unserviced': Why Some Western Alaska Villages Lack Basic Sanitation Infrastructur*e, ANCHORAGE DAILY NEWS, https://www.adn.com/alaska-news/rural-alaska/2020/05/19/unserviced-why-some-western-alaska-villages-lack-basic-sanitation-infrastructure/ (last updated May 20, 2020).

377 RECOMMENDATIONS FOR REFORM, *supra* note 348, at 18.

378 Phillips, *supra note* 376.

379 CRITERIA FOR SFC PROGRAM, *supra* note 360, at 5–3.

380 RECOMMENDATIONS FOR REFORM, *supra* note 348, at 19.

381 CRITERIA FOR SFC PROGRAM, *supra* note 360, at 5–3.

cost of facilities required to serve them.[382] 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.[383] 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.[384] These community and population distinctions are both unnecessarily complex and confusing, and they 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.[385] In consultation with tribes, IHS should clarify the definition of an Indian community through new regulations or other agency direction in order 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 Murkowski, "[I]t 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."[386]

Recognizing that there are statutorily placed limitations on IHS's 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.[387] Federal agencies involved include the U.S. Department of Agriculture (USDA), U.S. Department of Housing and Urban Development, U.S. Department of Health and Human Services (DHHS, which includes IHS), U.S. Department of the Interior, and the EPA.[388] For example, the EPA plays a major role in ensuring that water quality standards are met.[389] The USDA has water-focused programs that can be utilized to promote economic development.[390] And most recently, the Bureau of Reclamation received $550 million to assist disadvantaged

382 *Id.* at 5–7.
383 *Id.*
384 RECOMMENDATIONS FOR REFORM, *supra* note 348, at 23.
385 *Id.* at 20.
386 Lisa Murkowski, *Senator Murkowski Speaks on Improving Health Care Outcomes and Sanitation in Indian Country*, YOUTUBE, (Dec. 12, 2019), https://www.youtube.com/watch?v=8--PHorWar0.
387 RECOMMENDATIONS FOR REFORM, *supra* note 348, at 5.
388 *Id.* at 5–6.
389 *See* UNIVERSAL ACCESS, *supra* note 46, at 30–33 (discussing EPA programs).
390 *See id.* at 33–37 (discussing USDA programs).

communities in the planning, design, or construction of water projects that will "provide domestic water supplies to communities or households that do not have reliable access to domestic water supplies."[391] Each of these agencies has their own expertise and federally-funded programs that can help address the water-related needs of tribal communities.[392]

There are a variety of ways to achieve a whole of government approach,[393] however, utilization of the Tribal Infrastructure Task Force established in 2007[394] may be the easiest. This working group "was created to develop and coordinate federal activities in delivering water and wastewater infrastructure . . . to tribal communities."[395] 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.[396] 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."[397] 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,

391 The Inflation Reduction Act of 2022, Pub. L. 117-169, 136 Stat. 1818, Section 50231.

392 For a more detailed discussion of the programs related to drinking water, see UNIVERSAL ACCESS, *supra* note 46, at 429–43.

393 *See* RECOMMENDATIONS FOR REFORM, *supra* note 348, at 10–11.

394 *Federal Infrastructure Task Force to Improve Access to Safe Drinking Water and Basic Sanitation to Tribal Communities,* EPA, https://www.epa.gov/tribal/federal-infrastructure-task-force-improve-access-safe-drinking-water-and-basic-sanitation (last updated June 23, 2022).

395 *Id.*

396 EPA, 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 (Feb. 9, 2022), https://www.epa.gov/system/files/documents/2022-02/2022-approved-itf-mou.pdf.

397 *Id.* at 1.

provided in a sporadic manner through emergency-based services.[398] "While preventative medicine was becoming the norm across the United States, it was slow to materialize in Indian Country, where the emphasis remained curative."[399] History is repeating itself and requires another paradigm shift. The same conditions that made tribal communities susceptible to infection and chronic diseases are those that remain today and make tribal communities 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.[400] However, IHS is an agency within the DHHS, and therefore follows DHHS policy.[401] DHHS recognizes that "[c]limate change poses current and increasing threats to human health."[402] In 2021, DHHS launched the Office of Climate Change and Health Equity (OCCHE).[403] 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."[404] These efforts have primarily focused on securing commitments by the health care sector to lowering their greenhouse gas emissions and building more climate resilient infrastructure.[405]

398 DEJONG, *supra* note 274, at 105.

399 *Id.* at 43.

400 Notably, the IHS Indian Health Manual includes a chapter on Environmental Compliance, Stewardship, and Sustainability. *See Indian Health Manual, Chapter 13 – Environmental Compliance, Stewardship, and Sustainability*, INDIAN HEALTH SERV.,https://www.ihs.gov/ihm/pc/part-1/chapter-13-environmental-compliance-stewardship-and-sustainability/ (last visited Jan. 25, 2023). While the chapter does not explicitly mention climate change, it does establish IHS policy, procedures, and responsibilities for reducing the environmental impact of IHS operations (including reduction of greenhouse gas emissions). *Id.* at 1-13.1. The IHS Sustainability Advisory Board supports IHS sustainability efforts, which refers to "the long-term management of IHS facilities and operations in a manner which minimizes our impact on the environment." *Sustainability Advisory Board – Charter*, INDIAN HEALTH SERV. (Mar. 12, 2013), https://www.ihs.gov/IHM/circulars/2013/sustainability-advisory-board-charter/.

401 *About IHS*, *supra* note 44.

402 *Climate Change and Health Equity*, U.S. DEP'T OF HEALTH & HUM. SERV., https://www.hhs.gov/ocche/climate-change-health-equity/index.html (last visited Jan. 5, 2023).

403 *About the Office of Climate Change and Health Equity*, U.S. DEP'T OF HEALTH & HUM. SERV., https://www.hhs.gov/ash/ocche/about/index.html. (last visited Jan. 5, 2023).

404 *Id.*

405 *See Fact Sheet: Health Sector Leaders Join Biden Administration's Pledge to Reduce Greenhouse Gas Emissions 50% by 2030*, THE WHITE HOUSE (June 30, 2022), https://

The success of the OCCHE remains yet to be seen. However, any action seeking to address climate change impacts experienced by tribal communities—particularly impacts on water security—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. As previously noted, 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. The federal government will be more likely to achieve demonstrable success if it works in collaboration with individual 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."[406] However, the ability to adapt to climate change depends on the availability of data and ability to engage in decision-making. Historically, tribes have not been supported—or even invited—to have a seat at the table.[407] Climate

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/.

406 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 No. 37, 2021, at 1, 11.

407 Bob Gruenig et al., Tribal Climate Change Principles: Responding to Federal Policies and Actions to Address Climate Change 7 (2015), https://atnitribes.org/climatechange/wp-content/uploads/2017/12/Tribal-Climate-Change-Principles_9-23-2015.pdf ("The federal government's various consultation policies with Tribes are not resulting in adequate levels of communication with Tribes on climate change issues."). The exclusion of tribal involvement is particularly apparent when looking at management of the Colorado River. Jason Robison et al., *Community in the Colorado River Basin*, 57 Idaho L. Rev. 1, 34–36 (2021) (discussing the history of the laws and policies governing the Colorado River, known as the "Law of the River," and the intentional disregard of tribal interests and participation). "Modern water policy sits on a 200-year-old foundation of laws written and executed by non-Indigenous politicians." Pauly Denetclaw, *Colorado River, Stolen by Law*, High Country News (Mar. 1, 2022), https://www.hcn.org/

change policy "should respect . . . self-determination in governance and knowledge exchange."[408] 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/or resources."[409] In order to be successful, access to information and funding is critical. In a recent survey, tribes reported that increasing the amount of information on "climate change impacts on tribal lands, water, and economies" was their top priority.[410] Climate data can help tribes assess their climate adaptation needs and engage in resiliency planning for their communities. The same goes for water quality data. Many tribes have identified water quality as a critical environmental issue for their community, however, water quality data is not easily accessible.[411] "[W]ater quality data collection and analysis are labor intensive," and some tribes may not have the capacity to generate the data on their own.[412] Relevant water quality data is also not easily accessible through federal sites (e.g., USGS's online data portal) or is "too limited in scope to inform tribal water management decisions" (e.g., EPA's water quality data).[413] To fill the data gap and obtain the sought-after data, tribes have begun partnering with third parties, including academic institutions.[414] While tribes have been sensitive to participating in research due to historic ethical abuses,[415] these partnerships have been successful because the tribe is in charge of initiating the work and can

issues/54.3/indigenous-affairs-colorado-river-stolen-by-law (discussing history and current efforts to promote tribal inclusion). Tribes are calling for the law of the river to change, this time with tribal input and leadership. *Id.*

408 *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., Inst. For Tribal Env't Pros).

409 Fillmore & Singletary, *supra* note 406, at 11.

410 *Id.* at 9.

411 *Id.* at 15.

412 *Id.*

413 *Id.*

414 *Id.* at 17.

415 *See* Christina M. Pacheco et al., *Moving Forward: Breaking the Cycle of Mistrust Between American Indians and Researchers*, 103 AM. J. PUB. HEALTH 2152, 2155 (2013).

then use the resulting data and research to help solve a tribe-identified problem.[416] Data collection and reporting are particularly important because IHS relies upon its SFC program database to identify and fund water projects in Indian country. It is therefore critical that tribes work with IHS to ensure that their community needs are accurately identified in the database.

Overall, improvements are needed to making data more relevant to tribal communities. 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."[417] 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."[418]

Furthermore, for any efforts to be successful, tribes must be able to easily access and understand the resources available to them. Currently, tribes have access to federal programs and funding that can assist with planning and implementing climate change adaptation actions.[419] While these programs have been severely underfunded for decades,[420] the IIJA and other recent legislation represent historic investments in tribal water infrastructure and climate change initiatives. Even so, tribes continue to face various hurdles accessing these resources. For one, given the extensive number of federal programs, each with their own requirements and deadlines,[421] it can be difficult for tribes to navigate the system. In addition, many programs require submission of

416 *See e.g.*, Crescentia Cummins et al., *Community-Based Participatory Research in Indian Country: Improving Health Through Water Quality Research and Awareness*, 33 FAM. COMTY. HEALTH 166, 167, 171 (2011) (describing a project initiated by tribal community members, and using community-based participatory research, to evaluate water quality).

417 Fillmore and Singletary, *supra* note 406, at 18.

418 *Id.*

419 *Tribal Climate Change Guide: Funding*, UNIVERSITY OF OREGON, https://tribalclimateguide.uoregon.edu/ (last visited Jan. 10, 2023) (providing information on grants, programs and plans available for tribes to address climate change).

420 GRUENIG ET AL., *supra* note 407, at 15.

421 *See generally* JACOB BERNAL, FUNDING OPPORTUNITIES FOR TRIBAL WATER PRIORITIES: A GUIDEBOOK FOR INDIGENOUS COMMUNITIES IN THE COLORADO RIVER BASIN, WESTERN RESOURCE ADVOCATES (Aug. 2022), https://westernresourceadvocates.org/wp-content/uploads/2022/08/2022_0823_WRA_Tribal_-Funding_Guidebook_Final.pdf (identifying federal funding programs related to water, eligibility criteria, and period of availability).

a grant proposal.[422] Not all tribes may have an experienced grant writer capable of submitting a competitive application. Therefore, a one-stop-shop website with information about all the funding opportunities available to tribes would help ensure that tribes are aware of all the different federal programs.[423] Since projects that are "shovel-ready" [424] are more likely to be prioritized and funded by federal agencies, federal assistance, when utilized to the fullest, can help tribes move projects from shovel-worthy to shovel-ready.

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."[425] Since 2000, Executive Order 13,175 has required agencies to have a process to ensure impactful and timely input by tribal officials in the development of policies that have tribal ramifications.[426] Tribal consultation requirements stem from the federal government's trust responsibility. [427] 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."[428] Yet meaningful consultation has remained largely undefined by the statutes, executive orders, and presidential

422 *Id.*

423 UNIVERSAL ACCESS, *supra* note 46, at 11.

424 "Shovel-ready" refers to the stage when the necessary engineering reports and environmental review are completed, and construction can begin. *See generally* EPA ET AL., OVERVIEW OF TRIBAL INFRASTRUCTURE FUNDING APPLICATION PROCESSES AND RECOMMENDED STREAMLINING OPPORTUNITIES 4, 7 (2011), https://www.epa.gov/sites/default/files/2015-07/documents/application-processes-recommended-paperwork-streamlining-opportunities.pdf. (discussing the application and selection process for tribal infrastructure projects).

425 Aila Hoss, *Securing Tribal Sovereignty to Support Tribal Health Sovereignty*, 14 NE. UNIV. L. REV. 155, 160 (2022).

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

427 Elizabeth Kronk Warner et al., *Changing Consultation*, 54 U.C. DAVIS L. REV 1127, 1137 (2020) [hereinafter *Changing Consultation*].

428 *Id.* at 1139.

memoranda that have required such tribal consultation.[429] Although Executive Order 13,175 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."[430]

On January 26, 2021, the Biden Administration issued a memorandum on "Tribal Consultation and Strengthening Nation-to-Nation Relationships."[431] 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."[432] The plan must be developed "after consultation by the agency with Tribal Nations and Tribal officials" in accordance with Executive Order 13,175.[433] Various federal agencies, including IHS, are in the process of reviewing and updating their tribal consultation policy and procedures.[434] Meanwhile, IHS conducted several tribal consultation sessions and solicited written comments with respect to allocation of IIJA and other IHS funding.[435]

Despite the tribal consultation requirements, the current consultation process is procedural rather than substantive.[436] The National Congress of American Indians has argued that such a process does not "focus on the goals of tribal self-government and fulfillment of the federal trust responsibility."[437] Additionally, there are "no mechanisms for accountability" when "federal agencies ignore or refuse to carry out

429 *Id.* at 1154–56.

430 *Id.*

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

432 *Id.*

433 *Id.*

434 Letter from Elizabeth A. Fowler, Acting Dir., U.S. Dep't of Health and Hum. Serv., to Tribal Leader (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).

435 Letter from Elizabeth A. Fowler, Acting Dir., U.S. Dep't of Health and Hum. Serv., to Tribal Leader (May 31, 2022), https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/2022_Letters/DTLL-05312022.pdf) (announcing allocation decisions for IIJA funding).

436 *Changing Consultation*, *supra* note 427, at 1139, 1162.

437 *Id.* at 1162 (citing NAT'L CONG. OF AM. INDIANS, WHITE HOUSE MEETING WITH TRIBAL LEADERS: BACKGROUND PAPER ON TRIBAL CONSULTATION AND TRIBAL SOVEREIGNTY 2 (2009)).

their responsibilities" under consultation policies.[438] 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.[439] Further, because federal agencies are carrying out the requirements of Executive Order 13,175, tribes have a remedy under the Administrative Procedure Act (APA) in a similar manner to agency actions under Executive Order 12,898, which requires environmental justice impacts to be considered.[440]

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.[441] However, tribal capacity is a necessary component of effective consultation. Tribes must have the capacity (i.e., 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."[442] 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.[443] Such knowledge generally incorporates a more holistic view of environmental health and recognizes that all

438 *Id.*

439 *Id.* at 1139.

440 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).

441 *See Changing Consultation*, *supra* note 427, at 1179–83 (providing recommendations to realize effective tribal consultation, which occurs on a government-to-government level and increases opportunities for tribal management).

442 UCLA SCH. OF L., NATIVE NATIONS L. & POL'Y CTR., THE NEED FOR CONFIDENTIALITY WITHIN TRIBAL CULTURAL RESOURCE PROTECTION 4 (2020).

443 OFF. OF SCI. AND TECH. POL'Y & COUNCIL ON ENV'T QUALITY, MEMORANDUM FOR HEADS OF FEDERAL DEPARTMENTS AND AGENCIES, GUIDANCE FOR FEDERAL DEPARTMENTS AND AGENCIES ON INDIGENOUS KNOWLEDGE 11 (2022), https://www.whitehouse.gov/wp-content/uploads/2022/12/OSTP-CEQ-IK-Guidance.pdf.

things are connected, emphasizing the need to be in balance with our surroundings.[444] For example: "To be Hopi is to embrace peace and cooperation, to care for the Earth and all of its inhabitants, to live within the sacred balance."[445] Similarly, Navajo traditional teachings embrace this concept through *hózhó*, which roughly translates to balance and beauty, or living in harmony.[446]

Within the health field, IHS has recognized the importance of Native healers in improving community health. Following passage of the American Indian Religious Freedom Act in 1978, IHS issued its first formal policy affirming the importance of traditional healing practices in 1979.[447] Since then, IHS has supported training programs for traditional medicine men and has incorporated Native health structures into IHS facilities, among other actions.[448] As part of its policy, IHS recognizes the value of traditional beliefs and "encourages a climate of respect and acceptance in which traditional beliefs are honored as a healing and harmonizing force within individual lives, a vital support for purposeful living, and an integral component of the healing process."[449] There is increased impetus to involve Indigenous communities with their traditional knowledge in climate adaptation research. For example, traditional ecological knowledge may be able to extend the environmental record in data sparse regions and improve monitoring design.[450] However, climate adaptation research involving tribes has predominantly focused on "environmental observations, environmental uses, governance, and cultural perspectives, rather than capacity-building."[451] As noted above, increasing tribal capacity is critical to ensuring that tribes are equal collaborators, if not leaders, on matters

444 *Id.* at 4; *Traditional Ecological Knowledge*, NAT'L PARK SERVICE, https://www.nps.gov/subjects/tek/description.htm (last updated Aug. 5, 2020).

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

446 Dana E. Powell & Andrew Curley, *K'e, Hozhó, and Non-governmental Politics on the Navajo Nation: Ontologies of Difference Manifest in Environmental Activism*, 81 ANTHROPOLOGICAL Q. 109, 123 (2008).

447 Johnson & Rhoades, *supra* note 277, at 82; Everett R. Rhoades & Dorothy A. Rhoades, *Traditional Indian and Modern Western Medicine Services, in* AMERICAN INDIAN HEALTH: INNOVATIONS IN HEALTH CARE PROMOTION, AND POLICY at 408–09 (discussing IHS and its initial efforts to support traditional medicine).

448 Johnson & Rhoades, *supra* note 277, at 82.

449 *Traditional Cultural Advocacy Program Policy Statement*, INDIAN HEALTH SERVS. (July 29, 1994), https://www.ihs.gov/ihm/sgm/1994/sgm-9408/.

450 Fillmore & Singletary, *supra* note 406, at 6, 11, 16; *see also* Cozzetto et al., *supra* note 116, at 574–75.

451 Fillmore & Singletary, *supra* note 406, at 2.

impacting their community.

Because traditional knowledge is often central to tribal identities, 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.[452] "For some tribes, centuries of forced assimilation and criminalization of their religious practices mandated the adoption of internal confidentiality protocols," to safeguard their traditions, customs, and ways of life.[453] With few legal safeguards to protect sensitive tribal information,[454] tribes must take affirmative steps to retain tribal ownership and control of traditional knowledge. As such, tribes are increasingly seeking research ethics protocols that protect traditional knowledge from misappropriation.[455]

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.[456] 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 impacted, making it unsafe for consumption. Water is necessary to sustain life. However, for many tribes, water also carries

452 *See generally* UCLA SCH. OF L., NATIVE NATIONS L. & POL'Y CTR., *supra* note 442 (emphasizing the need to protect the confidentiality of tribal knowledge and detailing strategies for doing so).

453 *Id.* at 6.

454 *See id.* at 7–12.

455 *See id.* at 13–17.

456 *See e.g.*, *Climate Change is Here in Blackfeet Country*, BLACKFEET COUNTRY AND CLIMATE CHANGE, https://blackfeetclimatechange.com/ (last visited Nov. 19, 2022).

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 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 American households 19 times more likely to lack clean water access than white households.[457] 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, IIJA has appropriated significant funds to help obtain water security for tribal communities, primarily through the IHS SFC 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 that projects meet all the tribal community needs and are not restricted by one program's limitations. IHS can also take steps to make the SFC 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

457 CLOSING THE WATER ACCESS GAP, *supra* note 178, at 22.

tribes know their community needs best, but they also have 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.