

Learning From Tribal Innovations: Lessons in Climate Change Adaptation

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Summary

Although a vast literature focuses on the efforts of states on climate change, they are not the only sovereigns who are working to address its negative impacts. This Article argues that though tribal governments are not part of the federalist system, they are still capable of regulatory innovation that may prove helpful to other sovereigns, such as other tribes, states, and the federal government. It examines the steps tribes are taking on climate change adaptation and mitigation, and demonstrates that tribal climate change adaptation planning is truly innovative in notable ways when compared to state planning. First, the inclusion of traditional ecological knowledge is unique to tribes and can prove quite beneficial. Tribes also involve their communities by surveying and involving community members in the implementation phase. Further, tribal adaptation plans promote the preservation of cultural resources. Other sovereigns would do well to learn from how tribes are providing valuable paths forward to develop effective climate adaptation measures.

The United States is facing a national catastrophe. American landscapes have changed and lives are at risk. The warning signs are visible across the country.¹ Once-in-a-generation weather events are becoming common occurrences, as wildfires rage in the West, powerful hurricanes ravage the Southeast, and the Northeast suffers brutal cold in the winter and heat in the summer.² This plague is not limited to the United States, as its effects are felt across the globe.³ Some, such as former President Barack Obama, view this as the single greatest threat to the future of humanity.⁴ And what is the federal government of the United States currently doing to address or prepare for this catastrophe? Very little.

This plague facing the United States and the world is climate change, and, rather than helping to curb the greenhouse gas emissions that lead to climate change or preparing for its negative impacts through adaptation planning, Pres. Donald Trump has expressed skepticism about the reality of climate change on numerous occasions.⁵ As if that were not enough, the Trump Administration is walking back regulations implemented by the Obama Administration to both mitigate and adapt to climate change.⁶ A lack of leadership on this issue therefore exists at the national level.⁷

Several sovereigns have stepped in to fill the void. States, for example, have developed their own climate change-related regulations and also partnered with other sovereigns to attempt to either mitigate or adapt to cli-

Authors' Note: The authors would like to thank the faculty at the S.J. Quinney College of Law at the University of Utah for their comments on an earlier draft of this Article.

1. National Aeronautics and Space Administration (NASA), *The Effects of Climate Change*, <https://climate.nasa.gov/effects/> (last updated Oct. 9, 2019); National Oceanic and Atmospheric Administration, *Climate Change Impacts*, <https://www.noaa.gov/education/resource-collections/climate-education-resources/climate-change-impacts> (last updated Feb. 2019).
2. NASA, *The Effects of Climate Change*, <https://climate.nasa.gov/effects/> (last updated Oct. 9, 2019); National Oceanic and Atmospheric Administration, *Climate Change Impacts*, <https://www.noaa.gov/education/resource-collections/climate-education-resources/climate-change-impacts> (last updated Feb. 2019).
3. See generally INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), CLIMATE CHANGE 2014: SYNTHESIS REPORT (Core Writing Team et al. eds., IPCC 2014), https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf.
4. *President Obama: Climate Change Greatest Threat to Future Generations*, UNITED NATIONS CLIMATE CHANGE, Jan. 21, 2015, <https://unfccc.int/news/president-obama-climate-change-greatest-threat-to-future-generations>.
5. Coral Davenport & Mark Landler, *Trump Administration Hardens Its Attack on Climate Science*, N.Y. TIMES, May 27, 2019, <https://www.nytimes.com/2019/05/27/us/politics/trump-climate-science.html>.
6. See *infra* notes 53-67 and accompanying text.
7. Admittedly, some federal agencies have worked on issues related to climate change adaptation, see *infra* notes 46-52 and accompanying text.

mate change.⁸ Cities committed to adhere to the promises made by the United States under President Obama in the Paris Agreement.⁹ As demonstrated by this Article, tribes, a third category of sovereigns within the United States, are also actively engaged in designing and implementing adaptation plans to address the negative impacts of climate change.

Because tribes may enact tribal adaptation plans as part of their inherent sovereignty, a brief introduction to tribal sovereignty is helpful. Prior to colonization by foreign sovereigns, most tribes existed as independent, self-governing communities.¹⁰ Contact with foreign sovereigns certainly impacted tribal governments. Despite this contact, however, tribal governments continue to be recognized as independent, sovereign governments. As the U.S. Supreme Court acknowledged in *Worcester v. Georgia*, tribes are “distinct, independent political communities.”¹¹ The federal government recognized tribal sovereignty through the Indian Commerce Clause of the U.S. Constitution,¹² as the Indian Commerce Clause acknowledges that Indian tribes are separate entities from federal or state governments.

Today, inherent tribal sovereignty persists. “Tribal powers of self-government are recognized by the Constitution, legislation, treaties, judicial decisions, and administrative practice.”¹³ Unless a tribe is divested of its inherent sovereignty, the tribe’s sovereignty remains intact.¹⁴ Tribes maintain sovereign authority over their members and territory to the extent not limited by federal law.¹⁵ “Indian tribes

are neither states, nor part of the federal government, nor subdivisions of either. Rather, they are sovereign political entities possessed of sovereign authority not derived from the United States, which they predate.”¹⁶ Tribal sovereignty has never been extinguished.¹⁷

The nature of tribal sovereignty, however, has changed over time and largely as a result of tribes’ interactions with the federal government. Today, tribes maintain those aspects of sovereignty that have not been removed by virtue of treaty, statute, or “by implication as a necessary result of their dependent status.”¹⁸ Accordingly, any examination of tribal authority should start with the presumption that the tribe in question possesses sovereignty, unless the tribe has been divested of its sovereignty through one of the aforementioned ways.¹⁹

Given that tribal governments possess the authority to enact regulations related to climate change adaptation by virtue of their status of sovereigns, it is helpful to also consider why tribal involvement in climate change matters. As argued below, given the Trump Administration’s failure to engage in comprehensive climate change adaptation planning, state, local, and tribal actors are left to develop regulations that will combat the negative impacts of climate change. As a result, the innovations being developed by tribes in this space may prove valuable to other sovereigns, such as other tribes, states, and localities, as they look to develop their own climate change adaptation policies.

Further, tribes occupy huge territories within the United States. Approximately 56.2 million acres of land are held in trust by the federal government for the benefit of tribes and individual Indians.²⁰ Because of the sovereign status of these tribes, states and localities have little jurisdictional control over the regulatory activity on these lands. Tribal adaptation planning therefore helps to ensure that such

8. See *infra* note 42 and accompanying text.

9. Climate Mayors, *407 US Climate Mayors Commit to Adopt, Honor and Uphold Paris Climate Agreement Goals*, <http://climatemayors.org/actions/paris-climate-agreement/> (last visited Oct. 15, 2019).

10. COHEN’S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2012 ed.) (“Most Indian tribes were independent, self-governing societies long before their contact with European nations, although the degree and kind of organization varied widely among them.”) (citing STEPHEN CORNELL, *THE RETURN OF THE NATIVE: AMERICAN INDIAN POLITICAL RESURGENCE* 72-76 (Oxford Univ. Press 1988)).

11. 31 U.S. 515, 559 (1832). The *Worcester* Court went on to explain that even though the Court had described tribes as “domestic dependent nations” in *Cherokee Nation v. Georgia*, 30 U.S. 1 (1831), that tribal sovereignty still existed and tribes were not dependent on federal law. COHEN’S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2005 ed.) (citing *Worcester*, 31 U.S. at 559).

12. COHEN’S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2005 ed.).

13. COHEN’S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2012 ed.).

14. *Id.*

15. COHEN’S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][b] (Nell Jessup Newton et al. eds., LexisNexis 2005 ed.) (citing *Worcester*, 31 U.S. at 555 (absent tribal or federal approval “[t]he Cherokee nation, then, is a distinct community occupying its own territory, with boundaries accurately described, in which the laws of Georgia can have no force”); *Ex parte Crow Dog*, 109 U.S. 556 (1883) (affirming exclusive tribal authority to impose criminal punishment on tribal members absent federal law to the contrary); *Fisher v. Dist. Court*, 424 U.S. 382 (1976) (upholding exclusive tribal jurisdiction over an adoption proceeding in which all parties were tribal members and reservation residents); 25 U.S.C. §1911(a) (reinforcing the *Fisher*

holding by declaring exclusive tribal jurisdiction over certain child custody matters involving children who are tribal members or eligible to be tribal members, so long as the children are domiciled or residing on the reservation, or wards of a tribal court)).

16. *Nanomantube v. Kickapoo Tribe in Kan.*, 631 F.3d 1150, 1151-52 (10th Cir. 2011) (quoting *Nat’l Labor Relations Bd. v. Pueblo of San Juan*, 276 F.3d 1186, 1192 (10th Cir. 2002) (en banc)).

17. *United States v. Wheeler*, 435 U.S. 313, 322-23 (1978). Although this assertion is generally true, it is worth noting that some tribes were “terminated” during the Termination Era of the mid-20th century. COHEN’S HANDBOOK OF FEDERAL INDIAN LAW §1.06 (Nell Jessup Newton et al. eds., LexisNexis 2005 ed.) (citing Charles F. Wilkinson & Eric R. Biggs, *The Evolution of the Termination Policy*, 5 AM. INDIAN L. REV. 139, 151-54 (1977)). “Although the termination acts did not expressly extinguish the governmental authority of such [terminated] tribes, most were unable to exercise their governmental powers after losing their land base. Termination thus weakened the sovereignty of terminated tribes.” *Id.*

18. *Wheeler*, 435 U.S. at 323.

19. COHEN’S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2005 ed.).

20. U.S. Department of the Interior Indian Affairs, *Frequently Asked Questions*, <https://www.bia.gov/frequently-asked-questions> (last visited Oct. 15, 2019).

important work is occurring both within and outside of Indian country. This reality may also increase the likelihood that tribes, states, and localities collaborate on climate adaptation strategies. This examination is therefore valuable for a wide array of reasons.

Given their status as sovereigns located within the United States, tribes are therefore well-placed to innovate in the field of climate change adaptation planning, and, as this Article demonstrates, they are indeed actively enacting novel climate change adaptation plans. Despite their innovative and effective work, however, little scholarly attention has been paid to the exciting work being done by tribes. This Article fills that void by both exploring the types of adaptation planning being done by tribes and identifying some trends among tribal adaptation plans.

To accomplish this goal, the Article begins with a brief discussion of climate change and how it is negatively impacting the United States. It goes on to demonstrate that, although President Obama did take steps to address the impacts of climate change, President Trump and his Administration are rolling back the gains made by the Obama Administration. This creates space for other sovereigns to innovate in this field given the lack of national leadership. Part II then examines whether tribes are capable of innovation and how such tribal innovations may be valuable to other sovereigns, such as tribes, states, and the federal government.

With this background in place, Part III provides an update to a previous article that discussed tribal adaptation planning, and Part IV goes on to examine patterns that have emerged in terms of tribal adaptation planning over the ensuing four years. Ultimately, the Article concludes that tribes are being truly innovative in their adaptation planning, as tribal adaptation plans differ from the adaptation plans of other sovereigns in notable ways.

This Article provides important, first-of-its kind work in several regards. It is the first to provide in-depth discussion of climate adaptation planning being done by tribes across the country, while also identifying patterns between these tribal adaptation plans. Second, building on this examination of the important work being done by tribes, it is also the first to provide concrete examples of where tribes are innovating in the field, and these innovations may prove to be very valuable to other sovereigns considering plans to adapt to the increasingly negative impacts of climate change.

Further, the Article contributes to the broader academic literature surrounding indigenous tribes and people. The stereotype of tribes as “lesser” or “inferior” persists in modern American society.²¹ “As Prof. Rebecca Tsosie observes, the environmental justice movement has been criticized by tribal leaders for stereotyping tribes as dupes of corpo-

rations, victims of federal manipulation, or ‘noble people who live in harmony with the land.’”²² The stereotype is so pervasive that the congressional record itself is replete with examples of individuals testifying to the U.S. Congress and congressional representatives themselves repeating such stereotypes.²³ It is also not uncommon to hear legal scholars talking about what tribes can learn from other sovereigns, such as the federal government and states. This Article therefore “flips” the narrative in that it presumes these other sovereigns have much to learn from tribes, and that indigenous tribes are capable and innovative.

I. The Status Quo: The Need for Climate Change Adaptation and Federal (In)Action

To truly understand the valuable work being done by tribes in response to climate change, the “playing field” must be set. Accordingly, this section begins by demonstrating that the effects of climate change are real, profound, and will only worsen without effective intervention. With this brief introduction to the disastrous impacts of climate change, the section then goes on to examine what, if anything, the federal government is currently doing to address these impacts. As the section ultimately demonstrates, the Trump Administration is doing little or nothing to actively address these negative impacts of climate change, which in turn creates a regulatory void into which other sovereigns, such as tribes, may step.

A. The Need for Climate Change Adaptation

Numerous studies and reports have concluded that the increased emissions of greenhouse gases²⁴ have led to climate change.²⁵ In fact, at least 97% of climate scientists agree that climate change is occurring and likely due to human activities.²⁶ The Intergovernmental Panel on Climate Change (IPCC), co-recipient of the 2007 Nobel Peace Prize for its work on climate change,²⁷ is a leading voice on the effects of climate change across the planet, as it is the United Nations body dedicated to assessing sci-

21. For example, this stereotype is so pervasive that it can be found on Wikipedia, see *Stereotypes of Indigenous Peoples of Canada and the United States*, WIKIPEDIA, https://en.wikipedia.org/w/index.php?title=Stereotypes_of_indigenous_peoples_of_Canada_and_the_United_States&oldid=919496565 (last visited Oct. 15, 2019).

22. Brigham Daniels et al., *Just Environmentalism*, 37 YALE L. & POL'Y REV. 1, 48 (2018) (citing Rebecca Tsosie, *Indigenous People and Environmental Justice: The Impact of Climate Change*, 78 U. COLO. L. REV. 1625 (2007)).

23. See, e.g., Elizabeth Ann Kronk, *Tightening the Perceived “Loophole”: Reexamining ICRA’s Limitation on Tribal Court Punishment Authority*, in THE INDIAN CIVIL RIGHTS ACT AT FORTY 219-25 (Kristen A. Carpenter et al. eds., UCLA American Indian Studies Center 2012) (citing to excerpts of the congressional record where congressmen referred to the inadequacy of tribal courts).

24. A greenhouse gas is “any of various gaseous compounds (such as carbon dioxide or methane) that absorb infrared radiation, trap heat in the atmosphere, and contribute to the greenhouse effect.” MERRIAM-WEBSTER, *Greenhouse Gas*, <https://www.merriam-webster.com/dictionary/greenhouse%20gas> (last visited Oct. 15, 2019).

25. NASA, *Scientific Consensus: Earth’s Climate Is Warming*, <https://climate.nasa.gov/scientific-consensus/> (last updated Oct. 9, 2019).

26. *Id.*

27. The Nobel Prize, *The Nobel Peace Prize 2007*, <https://www.nobelprize.org/prizes/peace/2007/summary/> (last visited Oct. 15, 2019).

ence related to climate change.²⁸ The IPCC has released numerous reports and studies over the years detailing the impacts of climate change across the planet. In 2018, it released a special report detailing how the impacts from climate change would differ between a 1.5 degree Celsius (°C) increase and a 2°C increase.²⁹ The special report's conclusions are dire.

First, the report reiterated the finding of past reports that there is a high confidence that impacts on natural and human systems from climate change are already occurring.³⁰ As a result, the report explains that adaptation and mitigation efforts³¹ are already occurring in response to these changes, but current efforts will not be adequate to account for changes resulting from increased temperatures.³² The report details impacts of increased warming that range from drought to increased precipitation to flooding to major impacts to the ocean ecosystem and loss of biodiversity to loss of ecosystems.³³

The special report further discusses negative impacts that directly affect humans, including “[c]limate-related risks to health, livelihoods, food security, water supply, human security, and economic growth.”³⁴ Certain human populations are more likely to face “disproportionately higher risk of adverse consequences,” such as “disadvantaged and vulnerable populations, some indigenous peoples, and local communities dependent on agricultural or coastal livelihoods.”³⁵ The IPCC's confidence that humans will suffer negative impacts, such as heat-related morbidity and mortality to the increase of vector-borne disease, ranges from high confidence to very high confidence.³⁶ In sum, the *New York Times* explains that the special report details “a world of worsening food shortages and wildfires, and a mass die-off of coral reefs . . . if greenhouse gas emissions continue at the current rate, the atmosphere will warm up by as much as 2.7 degrees Fahrenheit . . . by 2040, inundating coastlines and intensifying droughts and poverty.”³⁷

The apocalyptic conditions predicted for 20 years from now does not mean that the negative impacts of climate change are not already impacting communities around the

world. Like other places across the planet, the United States is already experiencing the impacts of climate change. The National Aeronautics and Space Administration (NASA) has detailed the impacts of climate change that are being felt around the various regions of the United States:

Northeast. Heat waves, heavy downpours and sea level rise pose growing challenges to many aspects of life in the Northeast. Infrastructure, agriculture, fisheries and ecosystems will be increasingly compromised. Many states and cities are beginning to incorporate climate change into their planning.

Northwest. Changes in the timing of streamflow reduce water supplies for competing demands. Sea level rise, erosion, inundation, risks to infrastructure and increasing ocean acidity pose major threats. Increasing wildfire, insect outbreaks and tree diseases are causing widespread tree die-off.

Southeast. Sea level rise poses widespread and continuing threats to the region's economy and environment. Extreme heat will affect health, energy, agriculture and more. Decreased water availability will have economic and environmental impacts.

Midwest. Extreme heat, heavy downpours and flooding will affect infrastructure, health, agriculture, forestry, transportation, air and water quality, and more. Climate change will also exacerbate a range of risks to the Great Lakes.

Southwest. Increased heat, drought and insect outbreaks, all linked to climate change, have increased wildfires. Declining water supplies, reduced agricultural yields, health impacts in cities due to heat, and flooding and erosion in coastal areas are additional concerns.³⁸

Methods, such as mitigation and adaptation, exist to combat both the causes and impacts of climate change. This Article focuses on the latter, and, in terms of adaptation, the IPCC acknowledges that “there are a wide range of adaptation options that can reduce the risks of climate change.”³⁹ Ultimately, the special report concludes that “[f]uture climate-related risks would be reduced by the upscaling and acceleration of far-reaching, multilevel and cross-sectoral climate mitigation and *by both incremental and transformational adaptation*.”⁴⁰ This Article therefore considers how tribes within the United States have a role to play in terms of developing the incremental and transformational adaptation the IPCC deems necessary to address the impacts of climate change.

B. Federal (In)Action

Despite the fact that the United States is currently facing the negative impacts of climate change and that most agree

28. IPCC, *Home Page*, <https://www.ipcc.ch/> (last visited Oct. 15, 2019).

29. IPCC, *Summary for Policymakers*, in *GLOBAL WARMING OF 1.5°C 4* (Valérie Masson-Delmotte et al. eds., IPCC 2018), https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf [hereinafter *GLOBAL WARMING OF 1.5°C*].

30. *Id.*

31. “Adaptation and mitigation present some notable differences, particularly in their objectives. Mitigation addresses the causes of climate change (accumulation of greenhouse gases in the atmosphere), whereas adaptation addresses the impacts of climate change.” BRUNO LOCATELLI, CENTER FOR INTERNATIONAL FORESTRY RESEARCH, SYNERGIES BETWEEN ADAPTATION AND MITIGATION IN A NUTSHELL (2011), <https://www.cifor.org/fileadmin/fileupload/cobam/ENGLISH-Definitions%26ConceptualFramework.pdf>.

32. *Id.*

33. *Id.*

34. *Id.*

35. *Id.*

36. *Id.*

37. Coral Davenport, *Major Climate Report Describes a Strong Risk of Crisis as Early as 2040*, N.Y. TIMES, Oct. 7, 2018, <https://www.nytimes.com/2018/10/07/climate/ipcc-climate-report-2040.html>.

38. NASA, *supra* note 1.

39. *GLOBAL WARMING OF 1.5°C*, *supra* note 29, at 10.

40. *Id.* at 5 (emphasis added).

these impacts will only worsen without significant changes to the amount of anthropogenic greenhouse gas emissions, the United States has failed to develop a comprehensive solution to the negative effects of climate change.⁴¹ Admittedly, some states have taken actions to address climate change.⁴² For example, the Regional Greenhouse Gas Initiative is a regional effort of several states to cap carbon dioxide emissions from power plants in the region. The program was so successful that additional states joined the initiative.⁴³ Further, California is a leader among states, as it has developed its own cap-and-trade market and mandated that electricity be generated from a less-polluting source.⁴⁴ Additionally, some individual cities within the United States have taken steps to mitigate their greenhouse gas emissions.⁴⁵ Despite these efforts, however, at the time of writing, the U.S. federal government lacks a comprehensive plan for addressing climate change either through mitigation, adaptation, or some combination of both.

Notably, the Obama Administration took strides to address climate change. For example, in 2013, the Administration launched the Climate Action Plan, which detailed plans to “cut carbon pollution, help prepare the United States for the impacts of climate change, and continue to lead international efforts to address global climate change.”⁴⁶ In 2015, President Obama acknowledged that climate change was the “greatest threat” to future generations.⁴⁷ The United States under the Obama Administration also made efforts to advance its international commitment to climate change mitigation under the United Nations Framework Convention on Climate Change (UNFCCC).⁴⁸

In 2015, Parties to the UNFCCC—including the United States and virtually every other nation on earth—took a significant step to reinvigorate decades of international

climate negotiations with a new climate accord, the Paris Agreement.⁴⁹ In this agreement, parties renewed the shared commitment to prevent global temperatures from rising more than 2°C above pre-industrial levels and to increase the ambition of domestic policy measures to achieve this goal.⁵⁰ The Agreement, which entered into force in November 2016, called on Parties to pledge nationally determined contributions (NDCs) to the common cause.⁵¹ The United States submitted its NDC, stating an intention to “achieve an economy-wide target of reducing its [greenhouse gas] emissions by 26-28% below its 2005 level in 2025 and to make best efforts to reduce its emissions by 28%.”⁵²

The Trump Administration, however, changed course dramatically in terms of how it addressed climate change.⁵³ President Trump has repeatedly expressed skepticism about the connection between man-made greenhouse gases and climate change.⁵⁴ Further, the Administration is trying to undo the steps taken by the Obama Administration. For example, in June 2017, President Trump announced that the United States will exit the Paris Agreement entered into under the Obama Administration.⁵⁵

Although there are state and local governments continuing to advance the Paris Agreement objectives,⁵⁶ the failure to accelerate climate mitigation at the federal level risks dire consequences. Despite efforts by these sub-federal governments and other countries to fill the void created by the American exit from the Paris Agreement, it will be much harder to stop the world from warming less than 2°C without action from the United States.⁵⁷ Further, that President Trump’s turn away from the Paris Agreement is part of his

41. This is not to say that no federal agencies are working on issues and policies related to climate change. For example, the U.S. Department of Defense continues to take the impacts of climate change into consideration despite certain statements and policies from the president. Tara Copp, *Pentagon Is Still Preparing for Global Warming Even Though Trump Said to Stop*, MIL. TIMES, Sept. 12, 2017, <https://www.militarytimes.com/news/your-military/2017/09/12/pentagon-is-still-preparing-for-global-warming-even-though-trump-said-to-stop/>. The point this subsection strives to make is that the federal government is not working on a nationwide solution, and has even rescinded the progress that was made during the Obama Administration. The result of this federal inaction is that spaces exist for other sovereigns, such as tribes, to innovate and develop programs that may be helpful to other sovereigns.

42. See generally Georgetown Law Climate Center, *State and Local Adaptation Plans*, <https://www.georgetownclimate.org/adaptation/plans.html> (last visited Oct. 15, 2019).

43. David Biello, *7 Solutions to Climate Change Happening Now*, SCI. AM., Nov. 17, 2014, <https://www.scientificamerican.com/article/7-solutions-to-climate-change-happening-now/>.

44. *Id.*

45. *Id.*

46. The White House President Barack Obama, *Climate Change*, <https://obamawhitehouse.archives.gov/energy/climate-change> (last visited Oct. 15, 2019).

47. *President Obama: Climate Change Greatest Threat to Future Generations*, *supra* note 4.

48. Under the UNFCCC, Parties each agreed to “adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs.” UNFCCC, art. 4, May 9, 1992, S. TREATY DOC. NO. 102-38, 1771 U.N.T.S. 107.

49. Paris Agreement to the UNFCCC, art. 2, Dec. 12, 2015, T.I.A.S. No. 16-1104.

50. *Id.*

51. *Id.* art. 4.

52. See UNFCCC, INDCs AS COMMUNICATED BY PARTIES: U.S. COVER NOTE, INDC, AND ACCOMPANYING INFORMATION (identifying carbon pollution standards for existing power plants as among the domestic measures the United States intended to implement for emissions reduction), <https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/United%20States%20of%20America/1/U.S.%20Cover%20Note%20INDC%20and%20Accompanying%20Information.pdf>.

53. See Michael Greshko et al., *A Running List of How President Trump Is Changing Environmental Policy*, NAT’L GEOGRAPHIC, May 3, 2019, <https://news.nationalgeographic.com/2017/03/how-trump-is-changing-science-environment/>.

54. Nicholas Wu, *Trump Says Climate Change Happens “Both Ways,” USA TODAY*, June 5, 2019, <https://www.usatoday.com/story/news/politics/2019/06/05/president-donald-trump-said-that-climate-change-happens-both-ways/1350618001/>.

55. John P. Rafferty, *U.S. Exits Paris Climate Agreement*, ENCYCLOPEDIA BRITANNICA (going on to explain that the United States’ exit from the Paris Agreement will not be complete until 2020), <https://www.britannica.com/story/us-exits-paris-climate-agreement> (last visited Oct. 15, 2019).

56. See We Are Still In, *US Action on Climate Change Is Irreversible*, <https://www.wearestillin.com/us-action-climate-change-irreversible> (last visited Oct. 15, 2019).

57. See UNITED NATIONS ENVIRONMENT PROGRAMME, EMISSIONS GAP REPORT 2018 (2018) (detailing how countries are falling short in efforts toward climate mitigation goal); Kate Wheeling, *The U.S.’ Exit From the Paris Agreement Could Spell Disaster Not Just for the Environment, but Also for Our Economy*, PAC. STANDARD, June 14, 2017:

Less optimistic emissions projections suggest that leaving the accord could result in an extra three billion tons of carbon dioxide added to the atmosphere every year, with the U.S. alone responsible for up to a half a degree of global warming—accelerating ice melt, sea level rise, and the frequency and severity of extreme weather.

stated commitment to stimulate domestic fossil fuel production suggests the United States may be on a path to increasing greenhouse gas emissions instead of merely not assisting in reducing such emissions.⁵⁸

The Administration is also working to roll back the climate change-related regulations enacted during President Obama's tenure. It replaced an Obama-era regulation that would have worked to reduce emissions from coal-fired power plants "with a new rule that would allow plants to stay open longer and slow progress on cutting carbon emissions."⁵⁹ "While the Obama plan would have set national emissions limits and mandated the reconstruction of power grids to move utilities away from coal, the new measure gives states broad authority to decide how far, if at all, to scale back emissions."⁶⁰ The Administration's efforts to roll back these regulations could have profound impacts not only in the short term, but also in the long term. The Obama-era regulations assumed that the U.S. Environmental Protection Agency (EPA) possessed the "authority to set national restrictions on carbon emissions and force states to move away from coal."⁶¹ Under the Trump Administration's policy, however, EPA would only have authority where plants have environmental infractions.⁶²

The Trump regulation not only potentially impacts the authority of EPA under future administrations, but is also predicted to result in a significant rise in greenhouse gas emissions that contribute to climate change. "According to a joint study produced last year by Harvard University, Syracuse University and Resources for the Future . . . 18 states and the District of Columbia would see higher greenhouse emissions from the Trump rule. In 19 states, pollutants like sulfur dioxide and nitrogen oxide emissions would rise."⁶³ Even the Administration's own analysis determined that the plan will likely "lead to hundreds more premature deaths and hospitalizations because of that increased air pollution."⁶⁴

Also related to climate change, the Trump Administration's proposal to weaken vehicle emissions and fuel efficiency standards finalized by the Obama Administration would likely affect climate change due to increased

greenhouse gas emissions from vehicles.⁶⁵ This will slow the existing rule's timetable for increased stringency, rescinding a Clean Air Act waiver that allows California to develop stricter vehicle emission standards.⁶⁶

Moving forward, there are reports that the Administration will work to undermine climate science as part of its efforts to impede any efforts to address climate change. Thus,

[a]s a result, parts of the federal government will no longer fulfill what scientists say is one of the most urgent jobs of climate science studies: reporting on the future effects of a rapidly warming planet and presenting a picture of what the earth could look like by the end of the century if the global economy continues to emit heat-trapping carbon dioxide pollution from burning fossil fuels.⁶⁷

II. Filling the Void With Tribal Innovation

The previous section demonstrated both that climate change is an environmental threat facing the globe, including the United States, and that under the current Administration, little is being done to address the problem on a national scale. Given the lack of federal action to address climate change since 2017, it is helpful to consider whether other sovereigns within the United States are engaged in efforts that might prove helpful. The previous part briefly discussed some programs that states are engaging in to address the negative effects of climate change within their territories.⁶⁸ And several states certainly are taking steps to address climate change.⁶⁹

But states are not the only sovereign entities within the United States who are taking steps to address the negative impacts of climate change—tribes are also working in this capacity. This part therefore examines the valuable role that tribes can play as "laboratories" for regulatory innovation, and argues that tribal innovations related to climate change may prove valuable to other sovereigns working in this area in the future.⁷⁰ It then examines what specific innovations tribes have developed in terms of responses to climate change. By demonstrating that tribal governments are capable of such innovation, this section directly challenges the notion that tribal governments are somehow lesser or inferior to other sovereign governments.⁷¹

If other countries follow in Trump's footsteps, the environmental effects could be much graver.

<https://psmag.com/social-justice/americas-exit-from-the-paris-agreement-could-spell-disaster-not-just-for-the-environment-but-also-for-our-economy>.

58. Zhang Yong-Xiang et al., *The Withdrawal of the U.S. From the Paris Agreement and Its Impact on Global Climate Change Governance*, 8 *ADVANCES CLIMATE CHANGE RES.* 213, 214 (2017); see also *Some Progress Since Paris, but Not Enough, as Governments Amble Towards 3°C of Warming*, *CLIMATE ACTION TRACKER*, Dec. 11, 2018 (listing the United States as one of five countries whose stance on climate change mitigation is "critically insufficient"), <https://climateactiontracker.org/publications/warming-projections-global-update-dec-2018/>.

59. Lisa Friedman, *E.P.A. Finalizes Its Plan to Replace Obama-Era Climate Rules*, *N.Y. TIMES*, June 19, 2019, <https://www.nytimes.com/2019/06/19/climate/epa-coal-emissions.html>.

60. *Id.*

61. *Id.*

62. *Id.*

63. *Id.*

64. *Id.*

65. The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks, 83 *Fed. Reg.* 42986 (proposed Aug. 24, 2018) (to be codified at 49 C.F.R. pts. 523, 531, 533, 536, and 537).

66. *Id.*

67. Davenport & Landler, *supra* note 5.

68. See *supra* Part I.

69. Georgetown Law Climate Center, *supra* note 42.

70. Portions of this section of the Article are adapted from Elizabeth Ann Kronk Warner, *Justice Brandeis and Indian Country: Lessons From the Tribal Environmental Laboratory*, 47 *ARIZ. ST. L.J.* 857 (2015).

71. See *supra* notes 21-23 and accompanying text.

Tribes have existed as separate sovereigns since before the founding of the United States,⁷² and, as a result, exist outside of the federal system linking states and the federal government. Because of this different history, the relationship between tribes and the federal government differs from the relationship between states and the federal government. To understand the unique status of tribes, a brief primer is helpful. Tribes generally possess exclusive authority to regulate their citizens and territory, subject to limitations imposed by federal law.⁷³ Tribes may also possess authority to regulate non-Indians under certain circumstances.⁷⁴ The genesis of tribal governmental authority lies within inherent tribal sovereignty.⁷⁵ While states also possess inherent sovereignty, tribal inherent sovereignty has a different origin, and, perhaps more importantly to this discussion, is not constrained by the Constitution to the same extent that states are constrained.⁷⁶

Despite the fact that tribes exist outside of the system of federalism established within the United States, tribes have the capacity to innovate in such a way that their regulatory

innovations, especially as they relate to climate change, may prove useful to other sovereigns.⁷⁷ Over the centuries, scholars have lauded the fact that states possess powers separate and apart from the federal government, just as tribes do.⁷⁸ This system of federalism, where the states and the federal government have separate authority, is generally considered to be a positive attribute of the federal government. For example, Justice Sandra Day O'Connor and legal scholars have explained that there are several advantages of federalism generally.⁷⁹ Federalism may increase public participation in government,⁸⁰ "reduc[e] the threat of tyrannical or oppressive government by dividing power among various entities,"⁸¹ ensure that government is more respon-

72. COHEN'S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2012 ed.) ("Most Indian tribes were independent, self-governing societies long before their contact with European Nations, although the degree and kind of organization varied widely among them."). As evidence that the framers of the Constitution did not envision tribal governments as part of the federal structure, tribes and/or Indians are only mentioned in two places in the Constitution itself: (1) Article I, Section 2, Clause 3 states that "Representatives and direct Taxes shall be apportioned among the several States . . . excluding Indians not taxed"; and (2) Article I, Section 8 states that "Congress shall have the power to regulate Commerce with foreign nations and among the several states, and with the Indian tribes." U.S. CONST. art. 1, §2, cl. 3, §8.
73. See, e.g., *Worcester v. Georgia*, 31 U.S. 515, 555 (1832) (holding that, absent an explicit statement to the contrary, the laws of the state of Georgia did not apply within the Cherokee territory); *Ex parte Crow Dog*, 109 U.S. 556 (1883) (holding that, absent a federal law to the contrary, the tribe possessed the authority to apply criminal punishment within its territory); *Fisher v. District Court*, 424 U.S. 382 (1976) (per curiam) (holding that the tribe possessed jurisdiction over an adoption matter involving solely tribal citizens and residents of the tribe's reservation). Admittedly, over the centuries, numerous federal laws have been enacted to curtail tribal sovereignty. However, a complete discussion of such limitations is beyond the scope of this Article. For our purposes, it is enough to acknowledge that tribal sovereignty persists absent federal limitation.
74. See, e.g., *Montana v. United States*, 450 U.S. 544 (1981) (holding that tribes may regulate non-Indians on non-Indian land located within tribal territory where the non-Indian in question has consented to regulation and when the non-Indian conduct threatens the health, safety, and welfare of the tribal community).
75. COHEN'S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2012 ed.) ("Indian tribes consistently have been recognized, first by the European nations, and later by the United States, as 'distinct, independent political communities,' qualified to exercise power of self-government, not by virtue of any delegation of powers, but rather by reason of their original tribal sovereignty.") (citations omitted). Notably, in some instances, the federal government may delegate authority to tribes. As an example, the "tribes as states" provisions of the various federal environmental statutes delegate authority to tribes in such instances, as discussed below. However, tribal sovereignty pre-dates the formation of the federal government, and, accordingly, the ability of tribes to govern generally does not spring from federal authority but rather inherent tribal sovereignty.
76. Admittedly, tribal sovereignty is constrained by federal plenary power over tribes. *United States v. Kagama*, 118 U.S. 375 (1886). However, unless either Congress or the federal courts have acted to limit tribal sovereignty, the presumption is that tribal sovereignty persists. COHEN'S HANDBOOK OF FEDERAL INDIAN LAW §4.01[1][a] (Nell Jessup Newton et al. eds., LexisNexis 2012 ed.).

77. Or, alternatively, as developed below, even if one views tribes as more limited governments than states, tribal innovations still have the capacity to influence other governments.
78. *Garcia v. San Antonio Metro. Transit Auth.*, 105 S. Ct. 1005, 1028 (1985) (Powell, J., dissenting). Justice Powell also cites James Madison in the *Federalist* No. 45 for the proposition that "The powers delegated by the proposed Constitution to the Federal Government, are few and defined. Those which are to remain in the State Governments are numerous and indefinite. The former will be exercised principally on external objects, as war, peace, negotiation [sic], and foreign commerce . . . The powers reserved to the several States will extend to all the objects, which, in the ordinary course of affairs, concern the lives, liberties and properties of the people; and the internal order, improvement, and prosperity of the State." *Id.* (citations omitted).
79. Gregory v. Ashcroft, 111 S. Ct. 2395, 2399 (1991); Edward L. Rubin & Malcolm Feeley, *Federalism: Some Notes on a National Neurosis*, 41 UCLA L. REV. 903 (1994); Nina Mendelson, *Chevron and Preemption*, 102 MICH. L. REV. 737, 756 (2004) [hereinafter *Chevron and Preemption*]; Nina Mendelson, *A Presumption Against Agency Preemption*, 102 Nw. U. L. REV. 695, 709 (2008) [hereinafter *A Presumption Against Agency Preemption*]. *But cf.* Elizabeth Garrett, *Enhancing the Political Safeguards of Federalism? The Unfunded Mandates Reform of 1995*, 45 U. KAN. L. REV. 1113, 1128, 1178 (1997) ("Indeed, the lack of consensus about the precise values that federalism serves means that arguments based on it are particularly susceptible to opportunistic misuse by people pursuing unrelated agendas.")
80. Garrett, *supra* note 79, at 1129 ("Practically, only at the state and local levels can participation by most citizens consist of more than infrequently voting for representatives; indeed, given the size of most states and complexity of state bureaucracies, participation can often be most vibrant in cities and towns.") (citation omitted); *A Presumption Against Agency Preemption*, *supra* note 79, at 709 ("[F]ederalism, including a state's enactment of its own laws, also may stimulate citizen participation in self-governance, on the theory that it is easier to participate at a level of government closer to one's home.") (citation omitted). This argument has its roots in Madison's *Federalists* Nos. 44 and 46, as [i]n Nos. 44 and 46, Madison had described how this checking function [related to federalism] would work through the states' mobilization of the people: States "will be ever ready to mark the innovation, to sound the alarm to the people, and to exert their local influence in effecting a change of federal representatives." James S. Liebman & Brandon L. Garrett, *Madisonian Equal Protection*, 104 COLUM. L. REV. 837, 893 (2004).
81. Garrett, *supra* note 79, at 1128-29; *Chevron and Preemption*, *supra* note 79, at 757; *A Presumption Against Agency Preemption*, *supra* note 79, at 709 ("[P]reserving a significant degree of autonomy for state governments divides power and can be seen as a part of the Framers' efforts to ensure that no single government institution accumulates too much authority.") (citation omitted).

sive to citizens,⁸² and increase experimentation between the units of government.⁸³

It is this last benefit of federalism—the concept of states as laboratories where states may experiment with regulations, and, theoretically, from which other state governments or the federal government will select the best results⁸⁴—that is the focus of this Article. This benefit is national in nature, as other governments potentially benefit from the experimentation.⁸⁵ In 1932, in his dissent in *New State Ice Co. v. Liebmann*, Justice Louis Brandeis famously elaborated on this idea of experiment, explaining:

There must be power in the states and the nation to remould, through experimentation, our economic practices and institutions to meet changing social and economic needs. . . . It is one of the happy incidents of the federal system that a single courageous state may, if its citizens chose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.⁸⁶

In 1985, Justice Harry Blackmun built on Justice Brandeis' ideas, explaining:

The essence of our federal system is that within the realm of authority left open to them under the Constitution, the States must be equally free to engage in any activity that their citizens choose for the common weal, no matter how unorthodox or unnecessary anyone else . . . deems state involvement to be.⁸⁷

82. Deborah J. Merritt, *Federalism as Empowerment*, 47 FLA. L. REV. 541, 548 (1995):

The Supreme Court also has praised state governments as more responsive than Congress to the needs of local citizens. This value of federalism includes two related, but different, benefits. First, the Court has suggested that states are smaller, more homogenous units than our nation, allowing state governments to purpose programs that are better tailored to the distinctive preferences of their citizens. Second, the relative accessibility of state and local government encourages citizens to participate in the governmental process, teaching the lessons of self rule.

(citations omitted); *A Presumption Against Agency Preemption*, *supra* note 79, at 709 (“[W]e may value the authority of states to respond to particular preferences held by their residents.”) (citation omitted).

83. *Gregory*, 111 S. Ct. at 2399; Rubin & Feeley, *supra* note 79.

84. *A Presumption Against Agency Preemption*, *supra* note 79, at 709 (“[S]tate policymaking experiments can be a useful source of information to other states and to the federal government.”). This generally accepted benefit of federalism closely aligns with the benefits of dynamic federalism discussed by Prof. Kirsten Engel. Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159, 177-84 (2006).

85. *Chevron and Preemption*, *supra* note 79, at 767 (arguing that the individual governments will benefit from the flexibility inherent in being a laboratory of governmental experimentation and that the federal government learns and therefore benefits from such experimentation).

86. *New State Ice Co. v. Liebmann*, 52 S. Ct. 371, 386-87 (1932) (Brandeis, J., dissenting). Scholars have concluded that James Madison was the progenitor of Justice Brandeis' famous statement. Liebman & Garrett, *supra* note 80, at 911.

87. *Garcia v. San Antonio Metro. Transit Auth.*, 105 S. Ct. 1005, 1015 (1985). Justice Blackmun goes on to cite Justice Black's concurring opinion in *Helvering v. Gerhardt*, where Justice Black stated that “[t]he genius of our government provides that, within the sphere of constitutional action, the people . . . have the power to determine as conditions demand, what services and functions the public welfare requires.” 304 U.S. 405, 427 (1938) (concurring opinion).

In the same case, Justice Lewis Powell explained in his dissenting opinion that federal regulators are unlikely to understand local realities, and therefore federal statutes and regulations may be unresponsive to such needs.⁸⁸

Given these limitations of federal knowledge and understanding, experimentation at the state level may be necessary to respond to the needs of the local citizenry. One modern scholar analogized experimentation in the federal system as being “akin to natural selection,” where state experimentation will flourish if its citizenry agrees with such experimentation.⁸⁹ Further, in 1999 testimony before Congress, the head of the Council of State Governments acknowledged that states play a role as “laboratories of democracy” and are sources of “innovation.”⁹⁰ In Executive Order No. 13132, Pres. Bill Clinton recognized that states play an important role as “laboratories of democracy,” as states can experiment with different regulations and policies.⁹¹

Given the valuable role states can play as laboratories for regulatory innovation, one must ponder whether tribes are similarly situated for such success in this role. Although states and tribes are different in some regards, such as in the origins of their governing authority and their relationships with the federal government, similarities do exist. Some similarities include defined territories, general regulatory authority over citizens, and governing power that exists outside of the federal government.⁹² Notably, some scholars have argued that although states fulfill an important role in the federal governing structure, “there is no policy reason why other subdivisions of the nation could not fulfill this function [role within federal structure].”⁹³

Now, admittedly, tribes are not “subdivisions of the nation” as they are separate sovereigns existing apart from the United States of America, as explained above.⁹⁴ But given the similarity in governmental function between states and tribes, the possibility exists that tribes may serve,

88. *Garcia*, 105 S. Ct. at 1030-31 (Powell, J., dissenting):

My point is simply that members of the immense federal bureaucracy are not elected, know less about the services traditionally rendered by States and localities, and are inevitably less responsive to recipients of such services, than are state legislatures, city councils, boards of supervisors, and state and local commissions, boards and agencies. It is at these state and local levels . . . that “democratic self-government” is best exemplified.

89. Merritt, *supra* note 82, at 551.

90. *Federalism: Hearings Before the Senate Committee on Governmental Affairs*, 106th Cong. 5 (1999) (testimony of Tommy G. Thompson, Governor, State of Wisconsin, and President, Council of State Governments) (“For when granted the power and flexibility, states and local governments have proven to be the innovators of the ideas and reforms that are improving the lives of all Americans. Throughout our history, state and local governments have acted as the laboratories of democracy.”).

91. *Federalism*, 64 Fed. Reg. 43255, 43255-56 (Aug. 4, 1999).

92. For a general discussion of tribal authority, see COHEN'S HANDBOOK OF FEDERAL INDIAN LAW §4 (Nell Jessup Newton et al. eds., LexisNexis 2012 ed.).

93. Rubin & Feeley, *supra* note 79, at 908-09.

94. In fact, Edward L. Rubin and Malcolm Feeley assert that federalism is not necessarily required to accomplish the goals or benefits of the regime—rather, only a “decentralized regime” is necessary. *Id.* at 909. Accordingly, the fact that tribes are outside of the system of federalism utilized within the United States is not an obstacle to their serving as effective laboratories of regulatory experimentation.

within the American governmental regime, functions similar to states in terms of the benefits associated with federalism. Further, empowering multiple sovereigns to solve the same problem has value, as it creates “alternative actors to solve important problems.”⁹⁵ Such empowerment also increases the potential for experiments to emerge.⁹⁶

Alternatively, even if one were to reject the idea that tribes can function in a manner like states for purposes of reaping the benefits of experimentation, tribal experimentation is still valuable. Even if tribes are seen as being more akin to local governments or municipalities,⁹⁷ the benefits of their legal experimentation cannot be ignored. First, laws enacted on a smaller, regional scale are valuable, as similarly situated communities can learn from a tribe’s successes and failures. Further, the development of soft law can prove incredibly beneficial, and environmental regulators are increasingly looking for innovation in this area. Tribes are certainly developing or have the capacity to develop new forms of soft law, making such developments significant. And finally, norms originally developed on a local scale have the capacity to become binding nationwide.

Take, for example, smoking bans. Banning smoking in public initially started as a result of local efforts, but has become a consistent nationwide phenomenon.⁹⁸ Accordingly, regardless of whether one views tribes as being more like states or local units of government, their environmental legal innovations are worthy of examination. To achieve the benefits of experimentation, it is likely enough that tribes are empowered to experiment and are working toward a goal that other sovereigns, such as states (and perhaps one day the federal government), are working toward.

In addition to potentially serving as regulatory innovators within the climate change sphere, tribal regulations related to climate change also have value as tribal regulations can serve as regulatory safety nets. In terms of a regulatory safety net, Prof. Erwin Chemerinsky explained that “[t]he genius in having multiple levels of government is that if one fails to act, another can step in to solve the problem.”⁹⁹ He went on in his article to give an environmental example—that “[i]f one level of government fails to clean up nuclear waste, another is there to make sure that it is done.”¹⁰⁰ Enacting regulations to counterbalance the negative impacts of climate change is a perfect example of where such a regulatory safety net is necessary, given that the impacts of climate change are profound and real

and the current Administration is not presently addressing them in a comprehensive manner.

The foregoing therefore demonstrates that tribal innovations related to climate change not only benefit the tribal community enacting the regulations, but also have the potential to benefit larger populations within the United States, as tribes can be valuable innovators within the climate change arena. Ultimately, as former EPA Administrator Gina McCarthy explained, “[o]nly through continued partnership with tribes can we truly achieve a cleaner, healthier and more prosperous America today and in future generations.”¹⁰¹

III. Tribal Innovations Related to Climate Change

The previous part demonstrates that, even though tribes exist outside of the federalist system and their sovereign origin comes from their inherent sovereignty rather than the Constitution, tribes can play a valuable role as innovative laboratories of climate change regulation and adaptation plans. With this basis in place, this part presents examples of tribal regulations and adaptation plans related to climate change that may prove beneficial to other sovereigns interested in climate change-related laws, which demonstrates that tribal governments are not somehow lesser or inferior to other sovereign governments. Notably, this part serves as an update to a 2015 article that examined the climate change adaptation plans of four tribes: Confederated Salish and Kootenai Tribes (CSKT), Jamestown S’Klallam Tribe (JSK), Nez Perce Tribe (NPT), and the Swinomish Indian Tribal Community.¹⁰²

Following the discussion of the adaptation plans of these four tribes as they have evolved since 2015, the Article then goes on to discuss potential emerging trends that appeared following a review of their adaptation plans.¹⁰³ This part therefore begins with a discussion of what, if any, additional steps related to climate adaptation these four tribes have taken since 2015. It then expands its scope beyond the original four tribes to examine what steps related to climate change other tribes have taken in the past several years, and presents tribal innovations within the climate change realm that may prove helpful to other sovereigns interested in developing climate change adaptation plans.

This part also serves as an example of “just environmentalism” as articulated by Profs. Brigham Daniels, Michalyn Steele, and Lisa Grow Sun.¹⁰⁴ Just environmentalism examines situations where environmental protection and social justice genuinely conflict. Professors Daniels, Steele, and Grow Sun argue that without full consideration of

95. Merritt, *supra* note 82, at 545 (citing Erwin Chemerinsky, *The Values of Federalism*, 47 FLA. L. REV. 1, 40 (1995)).

96. *Id.* at 551.

97. Given most tribes are geographically smaller than states and federal plenary power, as discussed above, it is not uncommon for them to be compared to local governments rather than states themselves.

98. COMMITTEE ON SECONDHAND SMOKE EXPOSURE AND ACUTE CORONARY EVENTS, SECONDHAND SMOKE EXPOSURE AND CARDIOVASCULAR EFFECTS: MAKING SENSE OF THE EVIDENCE, ch. 5 (National Academies Press 2010), http://www.nap.edu/openbook.php?record_id=12649&page=109.

99. Erwin Chemerinsky, *Empowering States: The Need to Limit Federal Preemption*, 33 PEPP. L. REV. 69, 74 (2005).

100. *Id.*

101. U.S. EPA, THE PENOBSCOT RIVER AND ENVIRONMENTAL CONTAMINANTS: ASSESSMENT OF TRIBAL EXPOSURE THROUGH SUSTENANCE LIFEWAYS, i (2015) (EPA-901-R-15-002), <https://www.epa.gov/sites/production/files/2015-12/documents/final-rare-report-august-2015.pdf>.

102. Elizabeth Ann Kronk Warner, *Indigenous Adaptation in the Face of Climate Change*, 21 ENVTL. & SUSTAINABILITY L. 129 (2015).

103. *Id.*

104. Daniels et al., *supra* note 22.

how environmental protection may disproportionately impact the poor and the vulnerable, just environmentalism cannot occur.¹⁰⁵ For example, in the tribal context, many indigenous peoples have been pushed out of areas that served as traditional homelands all in the name of environmental protection.¹⁰⁶ The argument goes that in order to have effective environmental justice, it is necessary to consider the negative externalities on vulnerable populations imposed by environmental protection.¹⁰⁷ Such negative externalities may be exacerbated by the fact that these vulnerable populations may contribute little, if anything, to the underlying environmental problems.¹⁰⁸

As a result of environmental law's not always considering the social justice impacts of environmental protection, some tribal leaders have expressed concern. For example, "Navajo President Joe Shirley Jr. charged, 'Environmentalists are good at identifying problems but poor at identifying feasible solutions . . . Most often they don't try to work with us but against us, giving aid and comfort to those opposed to the sovereign decision-making of tribes.'"¹⁰⁹ President Shirley's statement demonstrates that "even substantial alignment between the needs of the vulnerable and the interests of powerful groups is not the same as the vulnerable being able to access and exercise power on their own behalf."¹¹⁰

Turning to tribal innovations related to climate change adaptation therefore may be an example of just environmentalism. As the following section demonstrates, tribes have the capacity to be and certainly are innovating within the space of adaptation methods to fight the negative impacts of climate change. Through the exercise of this governing authority, tribal governments, who are likely best placed to understand the social justice needs of their communities, are enacting policies and regulations to protect against environmental harms.

A. Reviewing Tribal Efforts Related to Climate Change Since 2015

Since the article *Indigenous Adaptation in the Face of Climate Change*,¹¹¹ which discussed various tribes' climate change adaptation plans, was published, the tribes mentioned have furthered their efforts to adapt to climate change. That article focused on these tribes as they were at the vanguard of tribes experimenting with climate adaptation planning at the time. This section will discuss efforts that the CSKT, JSK, and NPT have taken with regard to climate change

adaptation since that article was published.¹¹² As this section demonstrates, these tribes continue to make significant progress in terms of climate change adaptation planning.

I. The Confederated Salish and Kootenai Tribes

Since creating the CSKT Climate Change Strategic Plan (CSKT Plan) detailed in the 2015 article,¹¹³ the CSKT have continued to further their commitment to climate change adaptation through implementation of the CSKT Plan, ongoing meetings to further the goals of the plan, and by committing to international obligations to combat climate change. First, the CSKT underwent a targeted project to implement the CSKT Plan. In cooperation with the Great Northern Landscape Cooperative and the U.S. Fish and Wildlife Service (FWS), the CSKT implemented their plan during a three-year project from September 2014 through September 2017.¹¹⁴ The project had \$53,000 in funding: \$43,000 from FWS and \$10,000 from the CSKT.¹¹⁵ "Through this effort the CSKT, its [sic] partners, and stakeholders will increase our understanding of regional and global climate change impacts. We will use our combined expertise and knowledge to help the people of the Flathead Nation and surrounding areas adapt and mitigate to climate impacts affecting us all."¹¹⁶

As part of the project, the CSKT "[e]stablish[ed] and maintain[ed] a Climate Change Oversight Committee (CCOC) which . . . [was tasked to] identify 'next steps' in implementation of The Plan, coordinate funding requests and collaboration with regional climate change centers, research centers, academic institutions, and other tribes and agencies within the Crown of the Continent, Regionally and Nationally."¹¹⁷ The CCOC was also tasked to "develop an Implementation Plan (IP) to measure and monitor progress in implementing" the plan.¹¹⁸ The CCOC creates a yearly report summarizing its findings.¹¹⁹ The IP is also updated every year.¹²⁰ As a preliminary step of implementation of the IP, the CCOC organizes a "Need Assessment."¹²¹ Next phases include comprehensively assisting the community in measuring "organizational capacity," evaluating "research and literature," strategizing community education and outreach, providing practical

105. *Id.*

106. *Id.* at 7.

107. *Id.* at 8.

108. *Id.* at 45.

109. *Id.* at 48 (citing Felicia Fonseca, Associated Press, *Coal Conflict: Hope, Navajo Tribes Say Environmentalists Not Welcome on Reservations*, CLEVELAND.COM, Oct. 1, 2009, http://www.cleveland.com/nation/index.ssf/2009/09/coal_conflict_hopi_navajo_trib.html).

110. *Id.* at 50.

111. Kronk Warner, *supra* note 102.

112. The previous article, *Indigenous Adaptation in the Face of Climate Change*, also mentioned the Swinomish Indian Tribal Community. However, there are no updates at the time of writing this Article on their adaptation efforts.

113. Kronk Warner, *supra* note 102.

114. Landscape Conservation Cooperative Network, *Confederated Salish and Kootenai Tribes Climate Change Strategic Planning*, <https://lccnetwork.org/project/confederated-salish-and-kootenai-tribes-climate-change-strategic-planning> (last visited Oct. 15, 2019).

115. *Id.*

116. *Id.*

117. MICHAEL DURGLO JR., PROJECT TITLE: CONFEDERATED SALISH AND KOOTENAI TRIBES CLIMATE CHANGE STRATEGIC PLANNING (2014) (follow "GN-LCC application 4.3.14.doc" hyperlink), <https://www.sciencebase.gov/catalog/item/5485f6e6e4b02acb4f0c7e77> (last modified Aug. 26, 2019).

118. *Id.*

119. *Id.*

120. *Id.*

121. *Id.*

support, and assessing capacities to implement the IP for each sector.¹²²

The project furthered the CSKT's commitment to traditional ecological knowledge (TEK)¹²³ by researching traditional techniques for climate change adaptation and mitigation and by specifically including TEK in its adaptation plan.¹²⁴ The CSKT have also been involved in climate change adaptation efforts that cross jurisdictional boundaries. First, to better understand TEK, the CCOC spoke with several elders from the Salish, Pend Oreille, and Kootenai Tribes.¹²⁵ The IP includes "strategic planning results" from other tribes' adaptation plans, many of which prioritize TEK.¹²⁶ "The CSKT join seven other tribal nations and the Affiliated Tribes of Northwest Indians, or ATNI. . . . Three other Montana tribes, the Blackfeet Nation, the Chippewa Cree Tribe of the Rocky Boy Reservation and the Crow Tribe, are all members of ATNI."¹²⁷ Further, Michael Durglo, the CSKT Environmental Division manager who facilitated the development of the plan, has facilitated monthly meetings that include non-tribal stakeholders.¹²⁸

Further, the CSKT have taken an international stance to combat climate change. After President Trump decided to withdraw the United States from the Paris Agreement, the CSKT signed onto the "We Are Still In" campaign.¹²⁹ The We Are Still In campaign is a pledge by American leaders to continue to uphold the international promise to lower climate change-producing emissions under the Paris Agreement.¹³⁰ The coalition "include[s] over 3,500 representatives from all 50 states, spanning large and small businesses, mayors and governors, university presidents, faith leaders, tribal leaders, and cultural institutions."¹³¹ It is significant that the CSKT signed onto the campaign because they are part of an international effort to bring awareness to climate change and its effects on various people and groups.

In sum, the CSKT have made progress in their climate change adaptation policies. The Tribes are well into the implementation phase of the CSKT Plan by partnering with federal agencies, including FWS. They are utilizing TEK by integrating wisdom from various tribal elders. Their adaptation plan is being executed through the oversight committee, routine meetings,

and training of local leaders to implement their plan. Moving forward, the CSKT have the challenge of fully integrating the IP into their tribal policies, which will require continued funding and cooperation with other organizations and governments.

2. The Jamestown S'Klallam Tribe

Another tribe examined in the earlier article, the JSK,¹³² also continues its work related to climate change. Since the JSK adopted the Climate Vulnerability Assessment and Adaptation Plan in 2013, it has continued to further implement climate change adaptation policies. For example, "the Tribe participated in the development of a regional climate preparedness plan for the North Olympic Peninsula" in the state of Washington.¹³³ The "climate preparedness project" was led by the North Olympic Development Council, along with the Lower Elwah Tribe, the Makah Tribe, and area cities and counties.¹³⁴

This project furthered the Tribe's adaptation efforts by systematically prioritizing adaptation actions by scoring them.¹³⁵ Though states prioritize their efforts in their climate change adaptation plans, this project is unique by having this scoring system as a way to substantiate the JSK's actions.¹³⁶ The plan utilized sea-level projections from 2013 to 2015 to rank area vulnerabilities to climate change.¹³⁷ The data were a useful tool for the Tribe to create more effective vulnerability assessments while implementing its adaptation plan.¹³⁸ "They [then] summed the scores to develop a list of actions for implementation in three different sectors: ecosystems, critical infrastructure, and water supplies."¹³⁹ The project also provided time frames for each

122. *Id.*

123. A commitment unique to tribes that was identified in the 2015 article. Kronk Warner, *supra* note 102.

124. *Id.*

125. *Id.*

126. *Id.*

127. *Id.*

128. AFFILIATED TRIBES OF NORTHWEST INDIANS, TRIBE & FIRST NATION CLIMATE SUMMIT: PRESENTER/MODERATOR BIOS (2017), http://atnitribes.org/climatechange/wp-content/uploads/2017/12/T_FNFForum.COMBINED-BIOS.pdf.

129. Nicky Ouellet, *CSKT Pledges to Uphold Paris Climate Agreement*, MONT. PUB. RADIO, Jan. 29, 2018, <http://www.mtpr.org/post/cskt-pledges-uphold-paris-climate-agreement>.

130. We Are Still In, *About*, <https://www.wearstillin.com/about> (last visited Oct. 15, 2019).

131. *Id.*

132. Kronk Warner, *supra* note 102, at 151-55.

133. MEGHAN DALTON ET AL., TRIBAL CLIMATE ADAPTATION GUIDEBOOK 107 (2018), <http://www.occri.net/media/1084/tribal-climate-adaptation-guidebook.pdf>.

134. *Id.* at 91; SASCHA PETERSEN ET AL., CLIMATE CHANGE PREPAREDNESS PLAN FOR THE NORTH OLYMPIC PENINSULA (2015).

135. DALTON ET AL., *supra* note 133, at 91; PETERSEN ET AL., *supra* note 134.

136. Some states include prioritization of adaptation efforts in their climate change adaptation plans. However, most do not include systematic scoring to set their priorities. See, e.g., WASHINGTON STATE DEPARTMENT OF ECOLOGY, PREPARING FOR A CHANGING CLIMATE: WASHINGTON STATE'S INTEGRATED CLIMATE RESPONSE STRATEGY 5 (2012) ("[d]evelop[ing] priority recommendations for monitoring efforts and ongoing research needs"); STATE OF OREGON, THE OREGON CLIMATE CHANGE ADAPTATION FRAMEWORK (2010) ("The Climate Change Adaptation Framework is intended to initiate an ongoing process among state agencies, and eventually agency partners, to identify priorities and measures to reduce the vulnerability and promote the resilience of Oregon's citizens, communities, infrastructure, and natural systems."); CALIFORNIA NATURAL RESOURCES AGENCY, 2009 CALIFORNIA CLIMATE CHANGE ADAPTATION STRATEGY 130-34 (2009):

Giv[ing] priority to adaptation strategies that initiate, foster, and enhance existing efforts that improve economic and social well-being, public safety and security, public health, environmental justice, species and habitat protection, and ecological function. When possible, giv[ing] priority to adaptation strategies that modify and enhance existing policies rather than solutions that require new funding and new staffing.

137. DALTON ET AL., *supra* note 133, at 107.

138. *See id.*

139. DALTON ET AL., *supra* note 133, at 91; PETERSEN ET AL., *supra* note 134.

implementation action along with provisions to monitor the progress of such actions.¹⁴⁰

Since the last article, the JSK has continued to engage in efforts to further the Climate Vulnerability Assessment and Adaptation Plan by collaborating with other tribes and organizations to implement and monitor climate change adaptation actions by participating in the regional climate preparedness plan. Moving forward, by using the vulnerability assessments and time frames to create action plans within its own jurisdiction, the JSK can further its adaptation goals. The JSK can engage local JSK leaders and community members with both plans as a road map to further implement its adaptation goals.

3. The Nez Perce Tribe

After the NPT created the Clearwater Subbasin Climate Change Adaptation Plan in 2011, which was explored in the previous article,¹⁴¹ the Tribe continued to engage the community and further its climate change adaptation policies. It has heavily invested in its Climate Change Planning Team staff by hiring several people, including a climate change coordinator and three climate change specialists.¹⁴² Recent additions to the team include Ph.D. students in different areas of forestry and climate change and a cultural anthropologist.¹⁴³ These additions show the Tribe prioritizes its climate change adaptation efforts. Further, the various qualifications and specialties of these team members will assist the Tribe in implementing its adaptation holistically because the team members represent several fields of expertise generating various climate change adaptation solutions.

Additionally, in 2017, the NPT created a survey with 233 participants, who were mostly members of the NPT, to better analyze the tribal community's understanding of climate change, their "level of concern about climate change," and how climate change impacts the community, and to find those in the community who would like to help adapt to climate change.¹⁴⁴ This method of surveying community members is unique from most states' climate change adaptation plans, though there are some states that are reaching out to their community members in similar ways.¹⁴⁵ Further,

[t]he assessment and adaptation planning process includes evaluating environmental, biological, and infrastructure components, and a participatory processes [sic] aimed at engaging and empowering the tribal community in order to inform the development of a robust and inclusive plan. The Community Well-being and Climate Change Survey is the foundation of this participatory process.¹⁴⁶

The survey accomplished the NPT's goals by helping the Tribe to better understand its community. It delivered the following results:

[1] Most respondents appear to have a basic understanding of climate change and see it as a threat to their own lives and tribal resources. Some respondents see it as an immediate threat to their lives; others believe it will impact them at some point in the future. Most agree that climate is currently impacting traditional foods and practices. [2] Respondents are generally concerned about climate change and its impacts, especially on water, weather, fish, and other natural resources. [3] Many respondents have observed local environmental change over time and connect much of it to climate change. [4] A large majority of respondents support tribal governmental action in adapting to climate change impacts, especially providing educational opportunities to community members and developing renewable energy resources. [5] Many respondents are also interested in personal action and engagement, especially educational opportunities and workshops.¹⁴⁷

These results are helpful because they reveal the community's support for the NPT's climate change adaptation goals. Further, because the respondents were concerned about climate change and want to take personal action,¹⁴⁸ the NPT community would most likely be receptive to a community-based action plan to implement the NPT's adaptation plan. Thus, the Tribe can use these results to engage the community with educational opportunities and workshops.¹⁴⁹

making observations and collecting and recording data on climate change and its effects on communities and the environment.

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL, CLIMATE ACTION IN DELAWARE: 2016 PROGRESS REPORT 1 (2016) ("Delaware residents understand the threats of climate change and are ready to act, according to a 2014 survey conducted by the Department of Natural Resources and Environmental Control and Delaware Sea Grant that garnered over 1,500 responses."); NEW YORK STATE CLIMATE ACTION COUNCIL, CLIMATE ACTION PLAN INTERIM REPORT OV-49 (2010):

The Climate Action Council made a determined effort throughout the planning process to integrate input from community-based groups, regional/community focused organizations, and environmental justice (EJ) groups. These groups served as members of Technical Work Groups and of the Integration Advisory Panel; in addition, the council held statewide videoconferences and a series of teleconferences and surveyed community and EJ organizations on proposed policy options.

146. AMBER ZIEGLER ET AL., NI MI'I PUU VOICES ON CLIMATE CHANGE: PRELIMINARY SURVEY RESULTS (2017), https://www.researchgate.net/publication/323295353_Ni_Mi'i_Puu_Voices_on_Climate_Change_Preliminary_Survey_Results.

147. *Id.*

148. *Id.*

149. *See id.*

140. DALTON ET AL., *supra* note 133, at 91; PETERSEN ET AL., *supra* note 134.

141. *See* Kronk Warner, *supra* note 102, at 155-58.

142. NPT Water Resources Division, *Resilience, Sustainability, and Climate Adaptation Planning*, <http://nptwaterresources.org/climate-change-adaptation/> (last visited Oct. 15, 2019).

143. *Id.*

144. NPT WATER RESOURCES DIVISION, NEZ PERCE TRIBE CLIMATE CHANGE AND COMMUNITY WELL-BEING SURVEY: EXECUTIVE SUMMARY (2018), http://nptwaterresources.org/wp-content/uploads/2018/04/NPT-Climate-Survey_Extended-Executive-Summary.pdf.

145. The states of Delaware, New York, and Washington all reached out to their community members as a part of their climate change adaptation plans. *See* WASHINGTON STATE DEPARTMENT OF ECOLOGY, *supra* note 136, at 179, 182:

Support[ing] additional research to identify how people perceive climate risks, what messages resonate with people, and how people learn and respond to information about climate change. . . . [And] [d]evelop[ing] "citizen science" initiatives that engage the public in

The NPT is also working on short-term measures to mitigate climate change.¹⁵⁰ The Tribe has engaged the public by offering education concerning the implications of climate change and steps community members can take to effect change.¹⁵¹ Immediate policies the NPT has encouraged include lessening “the tribe’s Carbon Footprint . . . [through a] Green . . . Transportation System”; decreasing energy usage and utilization of more “Green Energy”; transitioning to consumption of “Green Products”; and generating “Green Jobs, a Sustainable Food Supply, and a hopeful future.”¹⁵² These policies focus on sustainable practices the community can participate in to reduce emissions. Such mitigation strategies can further raise awareness and cooperation within the community.

Another project the NPT has undergone is specifically targeted at “[c]limate adaptation planning for Nez Perce fisheries.”¹⁵³ The NPT recognizes that climate change threatens the existence of fisheries, and thus native fish that hold great cultural significance to the Tribe.¹⁵⁴ The plan focuses on adapting to changing environments to allow for the continuous health and harvesting of native fish species.¹⁵⁵ Further, the plan utilizes both TEK “and modern conservation science.”¹⁵⁶ The three-year project, from 2015 until 2018, included “meetings, workshops, and training opportunities that enhance the capacity of the Nez Perce Tribe to address the effects of climate change on tribal fisheries.”¹⁵⁷ It created a “climate adaptation planning committee within the Nez Perce fisheries program.”¹⁵⁸ Additionally, the project educated the community and NPT officials regarding climate change.¹⁵⁹

The NPT has done well starting to implement the Clearwater Subbasin Climate Change Adaptation Plan by investing in its Climate Change Planning Team, engaging the tribal community through informative surveys and sustainable policies, and by specifically planning to adapt to climate change by creating a plan to protect NPT fisheries. The NPT serves as an example for other tribes as they implement their adaptation strategies by implementing its adaptation plan on several fronts. The NPT has involved various organizations, people with various specialties, engaged in workshops, short-term and long-term projects, and has continued to target a specific vulnerable resource, the Tribe’s fisheries. Though states also focus cli-

mate change adaptation plans on a single resource,¹⁶⁰ the NPT is unique from most states because the Tribe’s focus is directly based on the cultural significance of fisheries to the Tribe. Additionally, by continually creating surveys and metrics, the NPT is ensuring that adaptation strategies will not stagnate in the future.

The CSKT, JSK, and NPT have continued to advance their climate change adaptation plans since the 2015 article was published. These Tribes have implemented their policies and monitored their success, continued research on TEK and the specific needs of individual communities, participated in regional and international partnerships, invested in expert staff and researchers to aid in adaptation efforts, and created additional, more specialized adaptation plans. Having reviewed the progress of the Tribes highlighted in 2015, the next part broadens the scope by discussing other tribal communities’ adaptation plans and their emerging themes.

IV. Beyond 2015: Additional Tribal Climate Change Adaptation Plans—Patterns and Themes

In addition to the work done by the three Tribes highlighted above, various tribes have created and implemented climate change adaptation plans since the predecessor to this Article, *Indigenous Adaptation in the Face of Climate Change*,¹⁶¹ was published. Based on the following, the increased incidence of tribes working on climate change adaptation initiatives suggests that such activities have importance to tribes and are necessary to address the negative impacts of climate change. Having reviewed the actions of the three Tribes previously discussed, it is helpful to broaden the examination to plans adopted by other tribes in the intervening years since the last article was published. These plans represent several patterns and unique themes that have emerged regarding tribal approaches to climate change adaptation.

This part first highlights common vulnerability assessments and implementation patterns between adaptation plans before discussing themes gleaned from diverse adaptation approaches. These themes include (1) the preservation of culture and value for TEK, (2) multidisciplinary, multisector, multiorganization collaboration, and (3) unique adaptation processes, including narrowly tailored, climate change adaptation plans. The first pattern—preservation of culture and value for TEK—is unique to climate change adaptation plans created by tribes, while

150. Stefanie Krantz, Climate Change Coordinator, NPT Water Resources Division, Climate Change 101: What Can We Do?, Presentation to the Columbia River Inter-Tribal Fish Commission (2017), <http://www.critfc.org/wp-content/uploads/2017/10/Nez-Perce-Tribe-Climate-Presentation.pdf>.

151. *Id.*

152. *Id.*

153. GREAT NORTHERN LANDSCAPE CONSERVATION COOPERATIVE, CLIMATE ADAPTATION PLANNING FOR NEZ PERCE FISHERIES (2019), available at <https://www.sciencebase.gov/catalog/item/5582dc0de4b023124e8f422a>.

154. *Id.*

155. *Id.*

156. *Id.*

157. *Id.*

158. *Id.*

159. *Id.*

160. For example, California has several resource- and topic-specific adaptation plans. See, e.g., generally CALIFORNIA DEPARTMENT OF PUBLIC HEALTH, CLIMATE ACTION FOR HEALTH: INTEGRATING PUBLIC HEALTH INTO CLIMATE ACTION PLANNING (2012) (focusing specifically on public health); STATE OF CALIFORNIA ENERGY COMMISSION, 2012 BIOENERGY ACTION PLAN (2012) (focusing on bioenergy development in California); GOVERNOR’S OFFICE OF PLANNING AND RESEARCH, CALIFORNIA BIODIVERSITY INITIATIVE: A ROADMAP FOR PROTECTING THE STATE’S NATURAL HERITAGE (2018) (focusing on biodiversity).

161. See generally Kronk Warner, *supra* note 102.

states' adaptation plans may also exhibit the second and third themes. Ultimately, this part both demonstrates that patterns are emerging and shows that tribes across the country are increasingly engaging in climate change adaptation planning. This increased engagement in and of itself likely yields fertile innovations from which other sovereigns can learn.

A. Common Vulnerability Assessments and Implementation Patterns

It is first helpful to discuss emerging patterns in tribal adaptation plans. Most climate change adaptation plans have similar stages of development: First, communities conduct vulnerability assessments that determine the gravest threats climate change poses on natural resources.¹⁶² Then, after creating vulnerability assessments, tribal communities create initiatives to implement strategies through continual meetings and trainings.¹⁶³ States also conduct vulnerability assessments,¹⁶⁴ but they usually target specific resources instead of wide-sweeping assessments of all possible vulnerabilities.¹⁶⁵

Vulnerability assessments utilize scientific analysis, community assessments, workshops, analysis of health

concerns caused by climate change, and metrics analyzing how tribes are most vulnerable to climate change.¹⁶⁶ Some communities, like the Lac du Flambeau Tribe, “use a community assessment process to determine the vulnerability of concerns within [the] . . . tribal environment, health, and infrastructure.”¹⁶⁷ Community members often raise awareness of the severity of climate change and its alarming pace. For instance, Yurok community members have documented impacts from climate change that have drastically affected their quality of life and the public health of their community.¹⁶⁸

As the Yurok Tribe Climate Change Adaptation Plan for Water and Aquatic Resources notes, the Yurok territory has been transformed, due to “rising air temperatures, warmer river waters, and increasing drought,” from a territory of abundant natural resources and rivers teeming with fish to a food desert.¹⁶⁹ The territory has seen a “decline in fish populations, the loss of harvesting and gathering sites for terrestrial species such as acorns, and the lack of grocery stores with options for fresh food.”¹⁷⁰ Further, the Tribe has documented a steep decline in water quality, affecting access to drinking water and causing disease.¹⁷¹ “People who once drank water from creeks without second thought are now concerned about possible exposure to *E. coli* and *Giardia*.”¹⁷² These water quality issues raise tribal sovereignty implications by impacting the Yurok community’s “right to ample, safe, and affordable drinking water.”¹⁷³

Other communities decided to start vulnerability assessments by relying first on scientific research on climate change to determine which resources to prioritize. For example, the Blackfeet Nation started its

planning process . . . with a review of climate change trends and predictions . . . of impacts specific to the north-west Montana region. . . . The climate impact predictions were presented at a series of three informational and planning meetings with eight different resource management sectors: agriculture, culture, forestry, fish, wildlife, land and range, water, and human health. The planning team facilitated discussions with the managers and other experts to identify sector-specific impacts within the Blackfeet Nation.¹⁷⁴

Most vulnerability assessments blend both empirical analysis and community knowledge by merging scientific research and concerns within their communities to determine which resources are most vulnerable to climate change. For example, the Upper Snake River Tribes Foun-

162. See, e.g., Lac du Flambeau Tribe, *Lac du Flambeau Resilience Initiative*, <http://www.ldftribe.com/resilience> (last visited Oct. 15, 2019); YUROK TRIBE ENVIRONMENTAL PROGRAM, YUROK TRIBE CLIMATE CHANGE ADAPTATION PLAN FOR WATER & AQUATIC RESOURCES 2014-2018, at iv (2018), http://www.yuroktribe.org/departments/ytep/documents/Yurok_Climate_Plan_WEB.pdf; BLACKFEET NATION, BLACKFEET CLIMATE CHANGE ADAPTATION PLAN 1 (2018), https://bcapwebsite.files.wordpress.com/2018/04/bcap_final_4-11.pdf; U.S. Climate Resilience Toolkit, *Moving Forward Together: Building Tribal Resiliency and Partnerships* [hereinafter *Moving Forward Together*], <https://toolkit.climate.gov/case-studies/moving-forward-together-building-tribal-resiliency-and-partnerships> (last modified June 30, 2017); CRISTINA GONZÁLEZ-MADDUX, INSTITUTE FOR TRIBAL ENVIRONMENTAL PROFESSIONALS, ALASKA NATIVE TRIBAL HEALTH CONSORTIUM: ASSESSING HEALTH IMPACTS AND DOCUMENTING OBSERVED CHANGES 1 (2012), http://www7.nau.edu/itep/main/tcc/docs/tribes/tribes_ANTHC.pdf; KARUK TRIBE DEPARTMENT OF NATURAL RESOURCES, KARUK TRIBE CLIMATE VULNERABILITY ASSESSMENT: ASSESSING VULNERABILITIES FROM THE INCREASED FREQUENCY OF HIGH SEVERITY FIRE 6 (2016), <https://karuktribeclimatechangeprojects.files.wordpress.com/2016/11/final-karuk-climate-assessment1.pdf>.

163. See, e.g., MISSY STULTS ET AL., CLIMATE CHANGE VULNERABILITY ASSESSMENT AND ADAPTATION PLAN: 1854 CEDED TERRITORY INCLUDING THE BOIS FORTE, FOND DU LAC, AND GRAND PORTAGE RESEVERATIONS 13 (2016), [http://www.1854treatyauthority.org/images/ClimateAdaptationPlan_Final-July_2016-optimized\(1\).pdf](http://www.1854treatyauthority.org/images/ClimateAdaptationPlan_Final-July_2016-optimized(1).pdf); GONZÁLEZ-MADDUX, *supra* note 162, at 3-4; Aja Conrad et al., *The Karuk's Innate Relationship With Fire: Adapting to Climate Change on the Klamath*, U.S. CLIMATE RESILIENCE TOOLKIT, Aug. 3, 2018, <https://toolkit.climate.gov/case-studies/karuk%E2%80%99s-innate-relationship-fire-adapting-climate-change-klamath>; AMERICAN SOCIETY OF ADAPTATION PROFESSIONALS, SNAPSHOT: CLIMATE-INFORMED REFORESTATION ON MENOMINEE INDIAN RESERVATION 2 (2017) [hereinafter MENOMINEE REFORESTATION], <https://adaptationprofessionals.org/wp-content/uploads/2015/05/MTE-Snapshot-8-10-17-1.pdf>.

164. See, e.g., MARYLAND COMMISSION ON CLIMATE CHANGE, COMPREHENSIVE STRATEGY FOR REDUCING MARYLAND'S VULNERABILITY TO CLIMATE CHANGE: PHASE II: BUILDING SOCIETAL, ECONOMIC, AND ECOLOGICAL RESILIENCE 2 (2011), https://climatechange.maryland.gov/wp-content/uploads/sites/16/2014/12/ian_report_2991.pdf.

165. See, e.g., CALIFORNIA NATURAL RESOURCES AGENCY, *supra* note 136, at 43 (including vulnerability assessments specifically for “climate-change health outcomes”); WASHINGTON STATE DEPARTMENT OF ECOLOGY, *supra* note 136, at 94 (including a “sea level rise vulnerability assessment”).

166. See Lac du Flambeau Tribe, *supra* note 162; YUROK TRIBE ENVIRONMENTAL PROGRAM, *supra* note 162; BLACKFEET NATION, *supra* note 162; *Moving Forward Together*, *supra* note 162; GONZÁLEZ-MADDUX, *supra* note 162, at 1; KARUK TRIBE DEPARTMENT OF NATURAL RESOURCES, *supra* note 162.

167. Lac du Flambeau Tribe, *supra* note 162.

168. See YUROK TRIBE ENVIRONMENTAL PROGRAM, *supra* note 162.

169. *Id.*

170. *Id.*

171. *Id.*

172. *Id.*

173. *Id.*

174. BLACKFEET NATION, *supra* note 162.

dation's "assessment process began . . . with the creation of localized temperature and precipitation projections . . . [Then] project staff conducted site visits to member tribes' reservations to identify shared climate concerns. . . . [A]fter evaluat[ing] the vulnerability of the shared concerns, . . . staff and leadership convened a vulnerability workshop."¹⁷⁵

As a natural result of vast differences in ecosystems and resources from one community to another, priorities resulting from vulnerability assessments vary greatly. The Alaska Native Tribal Health Consortium (ANTHC) priorities include melting sea and river ice, melting permafrost, and erosion of its coasts.¹⁷⁶ Melting permafrost has caused the ANTHC to find solutions to a looming food security crisis because its communities use permafrost to store perishable food.¹⁷⁷ Comparatively, the Karuk community prioritizes wildfires, drought, pests, and disease as a result of its vulnerability assessment.¹⁷⁸

Therefore, vulnerability assessments are very important because they will be the first practical step for many climate change adaptation plans. By pinpointing climate change vulnerabilities, tribes can then create adaptation policies that address issues of their greatest concern. Other sovereigns, including states, should learn from this innovative process by making vulnerability assessments a fundamental first step in their climate change adaptation plans.¹⁷⁹ Each community is unique and will have different concerns due to climate change. Sovereigns can understand their climate change vulnerabilities by utilizing scientific research and data, traditional knowledge, community assessments and workshops, metrics, and other similar tools.

Further, communities can communicate with each other regarding the various issues that climate change poses. Instead of reinventing the wheel, communities can learn from each other regarding effective practices to assess climate change vulnerabilities. Moreover, the vulnerability assessment phase is a great opportunity for communities to raise awareness of climate change and its effects on public health, natural resources, and quality of life. Vulnerability assessments provide concrete community-specific analyses and metrics and demonstrate specifically which climate change vulnerabilities each sovereign faces.

After communities assess which of their resources are most vulnerable to climate change, the next step many tribes take is to implement climate change adaptation strategies. To implement these strategies, communities organize regular follow-up meetings, training workshops, and metrics of the effectiveness of their strategies.

One example is the 1854 Treaty Authority's implementation of its climate change adaptation plan. "The 1854 Treaty Authority is an Inter-Tribal Natural Resource Management Organization that manages the off-reservation hunting, fishing and gathering rights of the Grand Portage

and Bois Forte bands of the Lake Superior Chippewa in the territory ceded under the Treaty of 1854."¹⁸⁰ Though the 1854 Treaty Authority does not have full authority over the land it manages, its policies are nonetheless exemplary of tribal climate change adaptation practices because tribal actors are responsible for the adaptation strategies and implementation.¹⁸¹ The Climate Change Adaptation Plan for the 1854 Ceded Territory Including the Bois Forte, Fond du Lac, and Grand Portage Reservations (1854 Ceded Territory Plan) prioritizes

monitor[ing] and evaluat[ing] the effectiveness of . . . [each] action in building resilience. Implementing . . . [adaptation] strategies, monitoring their success and the health and vitality of the natural resources they are designed to protect, and modifying or enhancing those strategies over time will be necessary to help the region build resilience.¹⁸²

As a first step, since publishing its adaptation plan and establishing these implementation priorities, the 1854 Treaty Authority has monitored and reported climate change trends within the territory.¹⁸³ Using its climate change reporting, along with the 1854 Ceded Territory Plan's vulnerability assessment, the 1854 Treaty Authority will make informed adaptations to the changes in climate within the territory.¹⁸⁴

Some tribes utilize community-centric implementation strategies. The ANTHC methodically evaluates climate change adaptation strategies and their effectiveness by creating a network of local environmental observers (LEOs) who monitor critical relevant data and continually communicate their findings with the community.¹⁸⁵ Utilizing webinars, the ANTHC gives LEOs monthly training and support.¹⁸⁶ Further, the observations are filtered through internal quality control protocols.¹⁸⁷ Once they are submitted, these observations are made public.¹⁸⁸ The submissions "include photos, videos, and written accounts"¹⁸⁹ granting the public access to observable documentation of climate change impacts within the ANTHC's territory.¹⁹⁰

[T]he goal is to have LEO participants throughout the state of Alaska chronicling climate-induced changes in the natural environment. This will help to provide critical monitoring data so that communities can track short and long-term shifts in the surrounding environs. The data can ultimately inform adaptation strategies and obviate

180. 1854 Treaty Authority, *Who We Are*, <http://www.1854treatyauthority.org/about-us/who-we-are.html> (last visited Oct. 15, 2019).

181. *See id.*

182. STULTS ET AL., *supra* note 163.

183. *See generally* TANSEY MOORE, 1854 CEDED TERRITORY: CLIMATE SUMMARY 2017-2018 (2019), <http://www.1854treatyauthority.org/management/biological-resources/fisheries/reports.html?id=162&task=document.viewdoc>.

184. *Id.* at 21.

185. GONZÁLEZ-MADDUX, *supra* note 162, at 4.

186. *Id.* at 3.

187. *Id.*

188. *Id.* at 3-4.

189. *Id.* at 3.

190. *Id.* at 3-4.

175. *Moving Forward Together*, *supra* note 162.

176. GONZÁLEZ-MADDUX, *supra* note 162, at 1.

177. *Id.*

178. KARUK TRIBE DEPARTMENT OF NATURAL RESOURCES, *supra* note 162.

179. *See supra* notes 162-65 and accompanying text.

the need for climate change mitigation throughout the global community . . . There are now over 142 trained professionals (LEOs) enrolled in the LEO network. These registered LEOs are actively collecting and reporting data from 84 communities (83 Alaskan communities and 1 community in the Northwest Territories of Canada).¹⁹¹

Additional adaptation strategies include innovative plans to promote resilience. Resilience can be defined as “the ability to adapt to changes, anticipate what might happen next and absorb shocks when they do come along.”¹⁹² States also include resilience as a priority in their adaptation plans.¹⁹³ However, the innovative strategies to promote resilience in many tribes’ adaptation plans are characterized by TEK, as discussed further below.¹⁹⁴

Strategies that foster resilience include strengthening and restoring environments through indigenous burning¹⁹⁵ and carbon sequestration.¹⁹⁶ The Karuk Tribe and other communities utilize “indigenous burning,” which strengthens ecosystems by “restoring grasslands for elk, managing for food sources such as tan and black oak acorns, maintaining quality basketry materials, and producing smoke that can shade the river for fish.”¹⁹⁷ The Menominee Indian Tribe is “[p]lanting tree and plant species . . . [to] increase carbon sequestration and improve wildlife habitat for native species.”¹⁹⁸ These techniques are examples of resilience because they help tribal communities to better absorb the shocks of climate change by strengthening ecosystems and improving wildlife habitats.

The implementation phase is pivotal to create lasting resilience and adaptation for communities. This is because adaptation plans are aspirational until the adaptation strategies are actualized and implemented in the community. Implementation is the “action” phase of adaptation plans where communities can apply their innovative solutions and better adapt to climate change. Thus, though the adaptation strategy and implementation phase should be part of every climate change adaptation plan, it requires resources, innovation, and passion to implement adaptation plans.

191. *Id.*

192. Laurie Goering, *3 Ways to Build Resilience to Climate Change*, WORLD ECON. F., Sept. 25, 2015, <https://www.weforum.org/agenda/2015/09/3-ways-to-build-resilience-to-climate-change/>.

193. *See, e.g.*, WASHINGTON STATE DEPARTMENT OF ECOLOGY, *supra* note 136, at 10-11, 15, 19, 20-22; STATE OF OREGON, *supra* note 136, at 1-2; CALIFORNIA NATURAL RESOURCES AGENCY, *supra* note 136, at 4.

194. *See infra* notes 213-22 and accompanying text. Note that states’ adaptation plans do not focus on TEK, but the state of Pennsylvania utilizes similar methods in its adaptation planning report to promote resilience. *See* PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, PENNSYLVANIA CLIMATE ADAPTATION PLANNING REPORT: RISKS AND PRACTICAL RECOMMENDATIONS 3 (2014):

Some conservation, agriculture and outdoor recreation measures already underway should be reviewed for their potential to help meet the challenges of a changing climate. Cross-cutting examples include use of riparian stream buffers, increasing native plantings, small dam removals and providing areas for refuge and connecting habitat corridors for species migration.

https://drought.unl.edu/archive/plans/Climate/state/PA_2014.pdf.

195. Conrad et al., *supra* note 163.

196. MENOMINEE REFORESTATION, *supra* note 163.

197. Conrad et al., *supra* note 163.

198. MENOMINEE REFORESTATION, *supra* note 163.

This is demonstrated by the plethora of resources, expertise, and innovation tribes must utilize to implement their adaptation strategies, such as communitywide efforts like the LEO Network,¹⁹⁹ multidisciplinary, multisector, and multiorganizational collaboration,²⁰⁰ and innovative strategies that promote resilience like indigenous burning and carbon sequestration.²⁰¹ Other sovereigns can learn from these innovative strategies by focusing on solutions that may go overlooked, like indigenous burning and carbon sequestration, to adapt to climate change. Sovereigns should be encouraged to “think outside of the box” in regard to their adaptation strategies.

B. Common Themes in Tribal Climate Change Adaptation Plans

Having examined various elements of climate change adaptation plans being currently utilized by a variety of tribes and tribal organizations around the country, a handful of themes from tribal climate adaptation plans start to emerge. These themes include (1) the preservation of culture and value for TEK, (2) multidisciplinary, multisector, multiorganization collaboration, and (3) unique adaptation processes, including narrowly tailored, climate change adaptation plans.

A resounding theme of many tribal climate change adaptation plans is the deep connection that conservation of natural resources has with preservation of traditional values and indigenous cultures. This is an innovative insight because it recognizes the value of indigenous ecological traditions instead of the primarily utilitarian philosophy many other sovereigns may choose to adopt. Further, it demonstrates that climate change poses a threat to every aspect of human existence, including cultural traditions, human rights, and societies as we know them. This is a great motivator and reason for other sovereigns to create climate change adaptation plans.

As the 1854 Ceded Territory Plan states: “To the Ojibwe, natural resources are cultural resources. There is no separation between how the bands manage and interact with a resource and how their culture endures: one is dependent on the other.”²⁰² Many adaptation plans have the fundamental theme of preserving culture and traditional values because many native cultural, spiritual, and ceremonial rituals are deeply connected to the very natural resources climate change is threatening.²⁰³ This can be

199. GONZÁLEZ-MADDUX, *supra* note 162, at 3-4.

200. *See infra* notes 218-32 and accompanying text.

201. Conrad et al., *supra* note 163; MENOMINEE REFORESTATION, *supra* note 163.

202. STULTS ET AL., *supra* note 163, at 9.

203. *See, e.g.*, Quinault Division of Natural Resources, *Quinault Climate Change Program*, <http://qlandandwater.org/departments/environmental-protection/climate-change/> (last visited Oct. 15, 2019); SAMISH INDIAN NATION, SAMISH PREPARES FOR CHANGING CLIMATE (2017); YUROK TRIBE ENVIRONMENTAL PROGRAM, *supra* note 162; SHOSHONE-BANNOCK TRIBES FISH AND WILDLIFE DEPARTMENT, CLIMATE CHANGE ASSESSMENT AND ADAPTION PLAN 3, 6 (2017), <https://static1.squarespace.com/static/50c23e29e4b0958e038d6bd6/t/5bc8d77e9140b7e0e8e7e301/1539889050111/Shoshone+Bannock+Tribes+Climate+Change+Assess>

evidenced by the Quinault Indian Nation's climate change program statement:

Tribes have unique rights, cultures, and economies that are, or could be, vulnerable to climate change impacts. For indigenous peoples, the environmental impacts of climate change and some of the proposed solutions threaten ways of life, subsistence, lands rights, future growth, cultural survivability, and financial resources. The natural environment and its resources are deeply intertwined with the culture and economy of the Quinault. The traditional tribal worldview is that the people are a part of nature, not apart from nature. "Place-based" people have developed an intimate relationship with their specific natural environment through history. Their physical, mental, social and spiritual health is directly and uniquely related to the health of the ecosystems of the lands and waters they inhabit.²⁰⁴

The fact that these cultural practices are being threatened by climate change creates uncertainty regarding whether future generations will have access to their ancient traditional practices. As the Samish Indian Nation states:

We want our children and their children to be healthy, prosperous, and enjoy our natural resources and cultural traditions . . . Through our strong connection with the natural world, we are beginning to see changes, such as an increase in extreme weather events and in the number of species struggling to survive and adapt. As a community, we are beginning to think about how these changes impact our culture and traditions, our community facilities and investments, the natural resources that surround and sustain us.²⁰⁵

The threat of climate change to many Native American communities also poses a hazard to ancient practices and worldviews that are still critically important for these communities to survive and to thrive.²⁰⁶ As the Shoshone-Bannock Tribes' Climate Change Assessment and Adaptation Plan states, "[natural resources still] sustain the Tribes' cultural, spiritual, dietary, and economic needs."²⁰⁷ The threat climate change poses to the Tribes directly impacts their well-being.²⁰⁸ As stated by the Yurok Tribe Environmental Program:

Tribal Members worry if they can participate in ceremonies or consume shellfish without risk of poisoning and paralysis when these harmful algal blooms are prevalent. Their health does not just entail the absence of illness or

injury. It is a much broader concept that includes spiritual and emotional as well as physical health and the intricate relationships and shared histories that the Yurok have with their waters, lands, and the species within them. If the river is sick, so are the Yurok . . . Yurok traditional values and practices have consistently been a source of resilience for the Yurok people and have helped the Yurok endure their historic traumas.²⁰⁹

This threat has established a determination to create resiliency to safeguard these critical cultural resources for the years to come.²¹⁰ The philosophy behind many adaptation plans is a philosophy of interrelatedness between natural resources and humanity.²¹¹ This philosophy is evident by well-defined adaptation tenets and by adoption of TEK. For instance, the Blackfeet Nation's adaptation plan states that "[u]nderlying the plan is the Blackfeet understanding that people and nature are one and that people can only be healthy if we ensure the health of the environment we are part of."²¹²

Further, many climate change adaptation plans utilize and promote the use of TEK:

[TEK] refers to the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes the relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for lifeways, including but not limited to hunting, fishing, trapping, agriculture, and forestry. TEK is an accumulating body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (human and non-human) with one another and with the environment. It encompasses the world view of indigenous people which includes ecology, spirituality, human and animal relationships, and more.²¹³

TEK offers holistic adaptation solutions to various climate change issues.²¹⁴ It addresses cultural and spiritual values important to tribal communities and provides innovative adaptation actions.²¹⁵

For example, the traditional use of fire by the Karuk Tribe is both culturally and spiritually important, and it prevents future dangerous wildfires induced by climate change.²¹⁶ As the Karuk Tribe Department of Natural Resources states:

ment+and+Adaptation+Plan+Summary+Report+FINAL-optimized.pdf; Samish Indian Nation, *Climate Change*, <https://www.samishtribe.nsn.us/departments/environment/climate-change> (last visited Oct. 15, 2019).

204. Quinault Division of Natural Resources, *supra* note 203.

205. SAMISH INDIAN NATION, *supra* note 203.

206. *See, e.g.*, YUROK TRIBE ENVIRONMENTAL PROGRAM, *supra* note 162; SHOSHONE-BANNOCK TRIBES FISH AND WILDLIFE DEPARTMENT, *supra* note 203, at 6.

207. SHOSHONE-BANNOCK TRIBES FISH AND WILDLIFE DEPARTMENT, *supra* note 203, at 3.

208. *Id.*

209. YUROK TRIBE ENVIRONMENTAL PROGRAM, *supra* note 162.

210. SHOSHONE-BANNOCK TRIBES FISH AND WILDLIFE DEPARTMENT, *supra* note 203, at 6.

211. *See, e.g.*, BLACKFEET NATION, *supra* note 162, at 1.

212. *Id.*

213. FWS, TRADITIONAL ECOLOGICAL KNOWLEDGE: FOR APPLICATION BY SERVICE SCIENTISTS 1 (2011), <https://www.fws.gov/nativeamerican/pdf/tek-fact-sheet.pdf>.

214. *See, e.g.*, KARUK TRIBE DEPARTMENT OF NATURAL RESOURCES, *supra* note 162, at 7-8 (citations omitted).

215. *See id.*

216. *Id.*

Karuk tribal knowledge and management principles regarding the use of fire can be utilized to reduce the likelihood of high severity fires and thereby protect public as well as tribal trust resources. In particular there is increasing recognition of the importance of indigenous burning as an ecosystem component and restoration technique. Fire is especially important for restoring grasslands for elk, managing for food sources including tan and black oak acorns, maintaining quality basketry materials, producing smoke that can shade the river for fish, and more. Karuk fire regimes generate pyrodiversity on the landscape by extending the season of burn and shortening fire return intervals. The multitude of foods, materials and other products that come from Karuk environments are in turn evidence of the profound diversity of fire regimes that are required to maintain relationships with hundreds of animal, plant, and mushroom species. As Karuk Director of Natural Resources Leaf Hillman puts it, “Fire is a cultural resource.” . . . the Karuk people are working to revitalize the Traditional Ecological Knowledge (TEK) inextricably tied to their ability to physically apply resource management practices. Fire has been a primary tool in Karuk wildland management systems, and the Tribe maintains that the age-old tradition of prescribed burning holds the answer to climate adaptation planning in the Klamath River range.²¹⁷

Many tribal climate change adaptation plans integrate TEK and western science.²¹⁸ This multiprong approach gives tribes the ability to address climate change from various viewpoints and areas of expertise.²¹⁹ For example, the ANTHC’s LEO Network “focuses on, local observations and traditional seasonal time scales, on [synthesizing] climate and health causal chains, and on a broadly participatory framework, which combines Indigenous and Western knowledge systems.”²²⁰ The network’s focus on local observations and timescales is primarily a utilization of TEK, while analyzing climate and health causal chains involves primarily western science.²²¹

Tribal culture and traditional knowledge lay at the center of many tribal climate change adaptation plans. Many tribal communities receive spiritual and physical sustenance from the natural world; the need to protect cultural wealth and identity will be an ongoing theme in climate change adaptation plans. Other communities can learn from tribal adaptation plans by integrating innovative techniques, stemming from TEK, into their adaptation policies.

In addition to incorporating resilience and TEK into their climate adaptation plans, several tribal adaptation plans call for collaboration between tribes, organizations,

and disciplines to efficiently implement climate change adaptation policies.²²² Tribes form partnerships with various governments (including federal agencies, state governments, and other tribes), universities, and professionals in specialties including biology, fire sciences, anthropology, and ecology. Such partnerships may be helpful to tribes because collaborative efforts inherently provide a greater level of expertise and resources. As a result of more expertise and resources, adaptation strategies may be more effective.

Many tribes have worked with universities that assist with research and climate change issues bridging various disciplines. For example, the 1854 Ceded Territory Plan²²³ included collaboration with “Adaptation International, and the Great Lakes Integrated Sciences and Assessment Center at the University of Michigan . . . [that] led the project team’s effort to compile and analyze the most recent and detailed climate information available, including both historic information and downscaled regional climate projections.”²²⁴

Further, the Citizen Potawatomi Nation collaborated with the University of Oklahoma Regional and City Planning Program to produce a climate change vulnerability assessment.²²⁵ The Stillaguamish Tribe worked with the University of Washington’s Climate Impacts Group to develop a list of priority species and habitat types, and specify their level of priority for assessment.²²⁶ The Suquamish Tribe also partnered with the University of Washington. “[T]he Tribe’s shellfish biologists . . . [worked] with University of Washington students and faculty to develop innovative tools for assessing the health of zooplankton populations.”²²⁷ And the Upper Snake River Tribes partnered with the University of Washington, Oregon State

222. Many states also call for collaboration in their adaptation plans. *See, e.g.*, STATE OF OREGON, *supra* note 136, at 81 (“This Climate Change Adaptation Framework is the result of an unprecedented level of collaboration among Oregon state agencies and institutes and offices in Oregon’s University System.”); GOVERNOR’S ACTION TEAM ON ENERGY AND CLIMATE CHANGE, FLORIDA’S ENERGY & CLIMATE CHANGE ACTION PLAN 5 (2008) (“Functional collaborative relationships between the State of Florida and selected federal government agencies entities, other states and countries, and key professional societies should be developed on climate change issues of mutual interest.”), https://drought.unl.edu/archive/plans/Climate/state/FL_2008.pdf; VIRGINIA GOVERNOR’S COMMISSION ON CLIMATE CHANGE, FINAL REPORT: A CLIMATE CHANGE ACTION PLAN 60 (2008) (“Successful response requires coordination and collaboration among federal, state, local authorities, and the private sector.”), http://www.sealevelrisevirginia.net/docs/homepage/CCC_Final_Report-Final_12152008.pdf.

223. STULTS ET AL., *supra* note 163.

224. *Id.* at 9.

225. UNIVERSITY OF OKLAHOMA COLLEGE OF ARCHITECTURE REGIONAL AND CITY PLANNING DIVISION, THE CITIZEN POTAWATOMI NATION CLIMATE CHANGE VULNERABILITY ASSESSMENT 3 (2016) (follow “cprn_climate_change_vulnerability_assessment_final_5.13.2016.pdf” hyperlink), <https://www.sciencebase.gov/catalog/item/5a7c87c7e4b00f54eb231aaf>.

226. *See* MEADE KROSBY ET AL., UNIVERSITY OF WASHINGTON CLIMATE IMPACTS GROUP, STILLAGUAMISH TRIBE NATURAL RESOURCES CLIMATE CHANGE VULNERABILITY ASSESSMENT 6 (2016), <https://cig.uw.edu/wp-content/uploads/sites/2/2014/11/Stillaguamish-Vulnerability-Assessment-2.25.16.compressed.pdf>.

227. Paul Williams, *Suquamish Build Resilience to Ocean Acidification Through Education*, U.S. CLIMATE RESILIENCE TOOLKIT, Jan. 17, 2017 [hereinafter *Suquamish Build Resilience to Ocean Acidification*], <https://toolkit.climate.gov/case-studies/suquamish-build-resilience-ocean-acidification-through-education>.

217. *Id.* (citations omitted).

218. *See, e.g.*, GONZÁLEZ-MADDUX, *supra* note 162, at 2.

219. *See, e.g., id.*

220. *Id.* (quoting Michael Brubaker et al., *Climate Change Health Assessment: A Novel Approach for Alaska Native Communities*, 70(3) INT’L J. CIRCUMPOLAR HEALTH 266, 266-73 (2011) (quotations omitted)).

221. *See id.*

University, and Adaptation International to create its vulnerability assessments.²²⁸

The Makah Tribe has hired several specialists to its mitigation planning team and advisors, including a marine ecologist, marine policy fellow, air quality specialist, water quality specialist, wildlife biologist, natural resources policy analyst, and a fisheries biometrician.²²⁹ Likewise,

[the Menominee Indian Tribe] maintains an open-door policy of technical exchange with experts, resulting in cutting-edge forestry practices and new collaborations, including . . . [with] the Northern Institute of Applied Climate Science, and the U.S. Forest Service to reforest areas affected by oak wilt in a way that improved the forest's ability to adapt to changing climate conditions.²³⁰

The tribal community in Selawik, Alaska, has received assistance for its climate change adaptation plan from various tribal consortiums and centers, the city of Selawik, the U.S. Indian Health Service, EPA, and FWS.²³¹ In addition to partnering with these organizations, Selawik's "assessments, which include[d] adaptation recommendations for individual communities, tackle[d] complex health issues that span the fields of both climate science and epidemiology."²³²

Thus, various tribes have benefitted from cooperation and partnerships with universities, federal agencies, and other organizations. Sovereigns can learn from these partnerships by teaming up with other sovereigns and institutions and by integrating various specialists into their adaptation plans.

Though there are many common themes within tribal climate change adaptation plans, there are also some notable differences in how many tribes choose to approach their adaptation efforts. When it comes to the processes of climate change adaptation, tribes may choose to implement adaptation practices through community-based strategies or through broader governmental policies. Moreover, several tribes have chosen adaptation strategies that target specific sectors or issues (including agriculture, fish, forestry, health, water, and wildlife) while others are more general in scope. This diversity of approaches demonstrates that there is not a one-size-fits-all climate change adaptation process. Because no two sovereigns are the same, choosing a unique approach that is tailored to each community's needs may be more effective.

A significant example of a community-based strategy is the ANTHC's LEO Network. The ANTHC has a distinctive adaptation method "both in its data collection meth-

ods and its focus, namely community-based adaptation strategies."²³³ By tasking community members with clear, effective adaptation duties, the Tribe has a robust capability to implement its plan.²³⁴ The ANTHC engages civic leaders and individuals throughout the Alaska area to analyze the best routes for adaptation.²³⁵ The consortium creates climate change health assessments (CCHAs) that advise local leaders on how to adapt to climate change, given each locality's unique circumstances.²³⁶ The ANTHC uses a "vast network of climate change impact 'observers' to develop comprehensive, community-scaled" CCHAs.²³⁷ The CCHAs provide unique adaptation plans for each community, which integrate various specialties, including public health, epidemiology, and climate science, into each plan.²³⁸ The purpose of the CCHAs is to equip local leaders and provide them with "technical input and relevant data" as they create their own adaptation plans.²³⁹

As discussed earlier, the vulnerability assessment phase may lead communities to focus on varied adaptation efforts because of the differences in natural resources across geographical locations.²⁴⁰ Each region will have unique issues they must address due to wide-ranging vulnerabilities to climate change. Further, some communities focus on specific areas of concern,²⁴¹ while others may emphasize more general wide-sweeping protocols.²⁴² The native communities in Selawik, Alaska, specifically targeted community health in their climate change adaptation plan.²⁴³ The strategies for adaptation focus on "health concerns related to food and water security, and community infrastructure including water and sanitation."²⁴⁴ The narrowly tailored approach was in response to the threats climate change poses by causing pollutants in area rivers, buildup of mercury levels in water, and river erosion.²⁴⁵

Likewise, the Menominee Indian Tribe's adaptation strategy is mostly concerned with the issue of deforestation as an effort to be more resilient to climate change by "improv[ing] wildlife habitat for native species."²⁴⁶ Further, the Suquamish Tribe focused its efforts on elementary education to encourage sustainable activity and "develop[ment of] computerized zooplankton imaging and identification tools researchers can use to detect and monitor changes at

228. *Moving Forward Together*, *supra* note 162.

229. Katie Wrubel et al., Makah Tribe, Makah Tribe's Climate Resilience, Adaptation, and Mitigation Planning Presentation 9 (2017), <https://www.energy.gov/sites/prod/files/2017/11/f46/45-makah.pdf>.

230. MENOMINEE REFORESTATION, *supra* note 163, at 1.

231. MICHAEL BRUBAKER ET AL., ANTHC CENTER FOR COMMUNITY HEALTH, CLIMATE CHANGE IN SELAWIK, ALASKA: STRATEGIES FOR COMMUNITY HEALTH 1 (2012), https://anthc.org/wp-content/uploads/2016/01/CCH_AR_052012_Climate-Change-in-Selawik.pdf.

232. GONZÁLEZ-MADDUX, *supra* note 162, at 1.

233. *Id.*

234. *See id.* at 1-2.

235. *Id.* at 2.

236. *Id.* at 1.

237. *Id.*

238. *Id.* at 1-2.

239. *Id.*

240. *See supra* notes 162-79 and accompanying text.

241. *See, e.g.*, BRUBAKER ET AL., *supra* note 231 (focusing on community health); MENOMINEE REFORESTATION, *supra* note 163 (focusing on deforestation); *Suquamish Build Resilience to Ocean Acidification*, *supra* note 227 (focusing on elementary education).

242. *See, e.g.*, BLACKFEET NATION, *supra* note 162, at 1; Wrubel et al., *supra* note 229.

243. *See generally* BRUBAKER ET AL., *supra* note 231.

244. *Id.* at 1.

245. *Id.* at 3.

246. *See generally* MENOMINEE REFORESTATION, *supra* note 163.

the base of the marine food web,” due to the cultural and economic importance of marine wildlife to the Tribe.²⁴⁷

Conversely, the Blackfeet Nation implemented a more comprehensive climate change adaptation plan that focuses on “eight different resource management sectors: agriculture, culture, forestry, fish, wildlife, land and range, water, and human health.”²⁴⁸ Similarly, the Makah Tribe’s strategies were wide-reaching, but most of its themes are focused on reduction of emissions.²⁴⁹ The plan included ensuring fishing fleet engines are more sustainable, changing inefficient woodstoves for efficient newer stoves, rainwater collection, “Carbon Footprint Analysis,” and “restoring eelgrass, trees, and kelp habitats to store carbon.”²⁵⁰ Other strategies that are part of adaptation plans include restoration of habitats and hatcheries,²⁵¹ hazard mitigation, emergency management,²⁵² and keeping timber industries sustainable.²⁵³

Once tribes arrive at the implementation phase of their adaptation plans, most tribes will have differences in the details of their processes. Tribes should be encouraged to find strategies that fit best with the unique needs of their communities and the specific vulnerabilities within each ecosystem. Community-based implementation strategies seem to be particularly effective, as exemplified by the ANTHC’s LEO Network. This is because community-centric plans utilize each community’s own resources on the local level, allow for localized specialization, and produce many stakeholders in their adaptation efforts.

V. Concluding Thoughts: Tribes as Demonstrated Innovators in the Field of Climate Change Adaptation

This Article began by demonstrating that the negative impacts of climate change were real, profound, and already impacting the United States. Despite this reality, however, the Trump Administration has rolled back key Obama-era regulations designed to address the impacts of climate change, and the Administration is not doing much to either replace the climate change-related regulations that were rescinded with revised regulations or to provide comprehensive nationwide leadership on the issue. In this void, other sovereigns, such as states and tribes, are well-

positioned to take the lead in terms of experimenting with climate change-related regulation.

We have demonstrated that, even though tribes are not part of the federalist system, they are still capable of regulatory innovation that may prove helpful to other sovereigns, such as other tribes, states, and the federal government. Given the lack of federal leadership, regulatory innovation related to climate change is especially needed. Because of this need, we went on to examine what steps tribes are taking related to climate change adaptation and mitigation. This examination resulted in a wealth of information related to tribal regulations, in addition to helpful themes and patterns. This in and of itself is valuable to other sovereigns—tribes are enacting regulations related to climate change mitigation and adaptation, and, as a result, other sovereigns may learn from these tribal experiments. Further, the innovative work being done in this space by tribes challenges the stereotype of tribal governments as lesser or inferior.

But are tribal climate change-related regulations different from what other sovereigns, such as states, are doing? Are these tribal experiments truly innovative? They are in several ways.

First, the inclusion of TEK in climate change adaptation plans is one area in which tribes are innovating and where they are creating unique regulations. Traditional adaptation and mitigation strategies promote methods of community resiliency that are effective, utilize years of ecological knowledge, and are more cost-effective than alternative solutions. Thus, other sovereigns can benefit from incorporating TEK into their adaptation strategies.

Tribes also involve their communities in their plans, unlike most states, by surveying and involving community members in the adaptation implementation phase. Other sovereigns may include public awareness and education as an aspect of their plans. But involving community members in the implementation phase can benefit states by creating more community support and by saving resources through a volunteer network.

Further, tribal adaptation plans stand out from plans created by states by promoting the preservation of cultural resources. Climate change impacts countless facets of a society. Thus, cultural resources should be a main priority in adaptation strategies because every culture relies on resources to survive. By acknowledging the importance of cultural resources to adaptation efforts, sovereigns can be better-equipped to address the multifaceted issues involved in adaptation.

Other sovereigns would do well to learn from these tribal innovations, as tribes are providing valuable paths forward in the effort to develop effective climate change adaptation measures.

247. *Suquamish Build Resilience to Ocean Acidification*, *supra* note 227.

248. BLACKFEET NATION, *supra* note 162, at 1.

249. See generally Wrubel et al., *supra* note 229.

250. *Id.* at 20.

251. PUYALLUP TRIBE OF INDIANS, DRAFT: CLIMATE CHANGE IMPACT ASSESSMENT AND ADAPTATION OPTIONS 13-14 (2016), http://puyallup-tribe.com/publicsafety/hazard_mitigation_plan/sec4-met/climatechange/Puyallup%20Climate%20Change%20Impact%20Assessment_2016_July%2013%20v3%20pagesV2.pdf.

252. See *id.*

253. See JERILYN JOURDAIN, MODEL FOREST POLICY PROGRAM, MITIGWAKI IDASHI NIBI (OUR FORESTS AND WATER): A CLIMATE ADAPTION PLAN FOR THE RED LAKE BAND OF CHIPPEWA INDIANS 7 (2014), <http://www.mfpp.org/wp-content/uploads/2011/04/Red-Lake-Forest-Water-Climate-Adaptation-Plan-Final-2014.pdf>.