

**TABLE OF CONTENTS**

TABLE OF CONTENTS..... i

TABLE OF AUTHORITIES ..... ii

INTERESTS OF AMICI CURIAE ..... 1

SUMMARY OF ARGUMENT ..... 3

DISCUSSION..... 4

    I. INTRODUCTION..... 4

    II. GLOBAL WARMING THREATENS THE PHYSICAL AND CULTURAL  
        SURVIVAL OF ALASKA NATIVES ..... 7

*A. Global Warming Threatens the Subsistence of Alaska Natives* .....10

            1. Thinning and Receding Sea Ice Reduces Subsistence Resources on Arctic  
                Coasts ..... 11

            2. Melting Permafrost Diminishes Subsistence Resources ..... 15

            3. Warming Threatens the Health of the Caribou, a Key Food Source ..... 18

*B. Global Warming Is Endangering the Health and Safety of Alaska Natives* 19

    III. CONCLUSION .....24

Certificate of Compliance with Fed. R. App. P. 32(a) .....26

## **TABLE OF AUTHORITIES**

### **Cases**

*Native Village of Quinhagak v. Lujan*, 35 F.3d 388 (1978) .....11

### **Statutes**

Alaska National Interest Lands Conservation Act (ANILCA), 16 U.S.C. § 3111 *et seq.*.....5, 10, 11

Endangered Species Act, 16 U.S.C. §1539(e) ..... 5

Marine Mammal Protection Act, 16 U.S.C. § 1361 *et seq.*..... 5

Marine Mammal Protection Act, 16 U.S.C. § 1371(b) ..... 5

Migratory Bird Treaty Act, 16 U.S.C. § 712(1)..... 5

### **Other Authorities**

Alaska Native Heritage Center website at <http://www.alaskanative.net/2.asp> (last visited December 13, 2005) ..... 4

Alaska Regional Assessment Group, *Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change* (Dec. 1999). ..... 9

Bruce P. Finney, *et al.*, *Impacts of Climatic Change and Fishing on Pacific Salmon Abundance Over the Past 300 Years*, 290 *Science* (2000). ..... 8

Don Weller, *Effects of Climate Change on Subsistence Communities in Alaska, Assessing the Consequences of Climate Change for Alaska and the Bering Sea Region: Proceedings of a Workshop at the University of Alaska Fairbanks* (Nov. 1999). .....13

Doug O’Hara, *Permafrost is Warming*, *Anchorage Daily News* (Aug. 14, 2005).. .....17

Evon Peter, <i>The People and the Caribou Are One, Voices from the Earth</i> (Spring 2005) .....	10
J.T. Overpeck <i>et al.</i> , <i>Arctic System on Trajectory to New, Seasonally Ice-Free State</i> , 86 <i>EOS</i> (2005). .....	11
Jim Motavalli, <i>Feeling the Heat: Dispatches from the Frontlines of Climate Change</i> (Routledge 2004). .....	14
Jonathan M. Gregory <i>et al.</i> , <i>Threatened Loss of the Greenland Ice Sheet</i> , 428 <i>Nature</i> 6983 (2004). .....	12
Joseph B. Verrengia, <i>In Alaska, an Ancestral Island Home Falls Victim to Global Warming</i> , Associated Press (Sept. 10, 2002). .....	20, 23
Larry D. Hinzman <i>et al.</i> , <i>Evidence and Implications of Recent Climate Change in Northern Alaska and Other Arctic Regions</i> , 72 <i>Climatic Change</i> (2005). .....	6, 8
Margaret Bauman, <i>Conference Attendees Receive an Account of Arctic Warming, Peninsula Clarion</i> (Nov. 30, 2005). .....	4
Margie Ann Gibson & Sallie B. Schullinger, <i>Answers from the Ice Edge: The Consequences of Climate Change on Life in the Bering and Chukchi Seas</i> (Greenpeace U.S.A. 1998). .....	13
Margot Roosevelt, <i>Vanishing Alaska: Global Warming is Flooding Villages Along the Coast. Should They Surrender and Move?</i> <i>Time Magazine</i> (Sept. 27, 2004). .....	8, 21, 23, 24
Matthew Sturm <i>et al.</i> , <i>Meltdown in the North</i> , <i>Scientific American</i> (Oct. 2003). .....	12
Nancy G. Maynard, <i>Final Report: Native Peoples-Native Homelands Climate Change Workshop</i> (1998). .....	15
Nat'l Assessment Synthesis Team, U.S. Global Change Res. Program, <i>Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change</i> (2000). .....	14

Nat'l Res. Council, Nat'l Academy of Sciences, <i>Cumulative Environmental Effects of Oil &amp; Gas Activities on Alaska's North Slope</i> (National Academies Press 2003).	13
Norman A. Chance, <i>The Inupiat and Arctic Alaska: An Ethnography of Development</i> , (Harcourt 1990).	5
Orson P. Smith, & George Levasseur, <i>Impacts of Climate Change on Transportation Infrastructure in Alaska, The Potential Impacts of Climate Change on Transportation, Part II, Regional Case Studies</i> (U.S. Dep't of Transportation, 2001).	20
Sheila Watt-Cloutier <i>et al.</i> , <i>Responding to Global Climate Change: The Perspective of the Inuit Circumpolar Conference on the Arctic Climate Impact Assessment, 2° Is Too Much! Evidence and Implications of Dangerous Climate Change in the Arctic 57</i> (World Wildlife Fund 2005).	8, 10
Susan Joy Hassol, Arctic Council, <i>Impacts of a Warming Arctic: Arctic Climate Impact Assessment</i> (2004)	passim
Thomas R. Karl & Kevin E. Trenberth, <i>Modern Global Climate Change</i> , 302 <i>Science</i> (2003).	6
<i>Threat to North's Cultural Survival</i> , <i>ECO</i> (Dec. 2003).	7
Timothy Egan, <i>Alaska, No Longer So Frigid, Starts to Crack, Burn and Sag</i> , <i>The New York Times</i> (June 16, 2002).	17
U.S. Arctic Research Comm'n, <i>Climate Change, Permafrost, and Impacts on Civil Infrastructure</i> (2003).	15, 16, 17
U.S. Arctic Research Comm'n, <i>The Arctic Ocean and Climate Change: A Scenario For The U.S. Navy 10</i> (2002).	16
U.S. Dept. of Interior, <i>Outer Continental Shelf Oil &amp; Gas Leasing Program: 2002–2007 Final Environmental Impact Statement</i> (April 2002).	12
U.S. General Accounting Office, <i>Alaska Native Villages: Most Are Affected by Flooding and Erosion, But Few Qualify for Federal Assistance</i> (December 2003).	22

U.S. Geological Service, <i>Sea Level and Climate</i> , available at <a href="http://pubs.usgs.gov/fs/fs2-00/">http://pubs.usgs.gov/fs/fs2-00/</a> .....	12
U.S. Geological Service, <i>Status and Trends of the Nation's Biological Resources</i> , <i>Part 2 (Alaska)</i> , available at <a href="http://biology.usgs.gov/s+t/SNT/noframe/ak177.htm">http://biology.usgs.gov/s+t/SNT/noframe/ak177.htm</a> .....	18
Yereth Rosen, <i>Warming Climate Disrupts Alaska Natives' Lives</i> , Reuters (April 16, 2004). .....	11, 22

## **INTERESTS OF AMICI CURIAE**

The Alaska Inter-Tribal Council (AITC) is a statewide, tribally governed, non-profit organization that advocates on behalf of tribal governments throughout the state. AITC promotes indigenous self-determination by providing technical assistance to tribal governments, facilitating inter-governmental and inter-agency communication and collaboration, offering public education regarding Alaska Native cultures and tribal governments, and advocating on behalf of tribal initiatives and self-governance.

Akiak Native Community (Akiak) is a federally recognized tribe. The village of Akiak is comprised of about 300 Eskimo people and is located on the west bank of the Kuskokwim River, 42 air miles northeast of Bethel, on the Yukon-Kuskokwim Delta. The people of Akiak rely heavily on subsistence hunting and fishing activities.

Both AITC and Akiak are greatly concerned about the impacts of global warming on their members. Living in the Arctic and sub-Arctic regions of Alaska, their members experience daily the effects of global warming, including thinning sea ice, increased coastal erosion, melting permafrost, and changes in plant and animal distributions. Global warming is depleting the subsistence resources of the members of AITC and Akiak and threatening their health and safety. As a result, the members of AITC and Akiak have an interest in ensuring that Defendants, and

other power-generating facilities that contribute to global warming through their massive emissions of greenhouse gases, reduce their emissions of CO<sub>2</sub> to the greatest degree possible.

Authority to file this brief is by motion under Fed. R. App. P. 29(b).

## **SUMMARY OF ARGUMENT**

This is a classic case involving trans-boundary pollution. Defendants' facilities collectively emit 650 tons annually of carbon dioxide, the greenhouse gas that is the primary contributor to anthropogenic global warming. Nowhere are the effects of those emissions more severe than in the Arctic. Alaska has been characterized as the "canary in the coalmine" for global warming — polar sea ice is melting, glaciers receding and permafrost melting. At stake is the physical and cultural survival of Alaska's Native people and communities. Reducing the greenhouse gas emissions from Defendants' facilities is a critical step in ensuring the survival of Alaska's Native communities. Thus, we join Appellants in urging this Court to overrule the dismissal of this case and to remand it to the trial court.

## DISCUSSION

### I. INTRODUCTION

*“We are experiencing things in one lifetime that should take five or six generations. . . . We are making do with less (subsistence food) and trying to make the most of it.”*

— Ronald Brower Sr. speaking on behalf of the Inuit Circumpolar Conference (ICC).<sup>1</sup>

Alaska’s Native people comprise eleven distinct cultures. These cultures are generally organized into five cultural groupings that draw upon cultural similarities or geographic proximity: the Athabascan of the Interior and Eastern Alaska, the Yup’ik and Cup’ik of Western Alaska, the Inupiaq and St. Lawrence Island Yupik of the Northern and Northwestern Arctic, the Aleut and Alutiiq of Southcentral Alaska and the Aleutian Islands, and the Eyak, Tlingit, Haida, and Tsimshian of the Southeastern archipelago.<sup>2</sup> The people of these cultures have occupied the land we know as Alaska for thousands of years.<sup>3</sup> They rely upon, and have a sophisticated knowledge of, their natural environment. This physical and spiritual relationship is sometimes encapsulated by the term “subsistence.” Congress has

---

<sup>1</sup> Margaret Bauman, *Conference Attendees Receive an Account of Arctic Warming, Peninsula Clarion* (Nov. 30, 2005). The ICC is an international organization representing about 145,000 Inuit living in the Arctic regions of Alaska, Canada, Greenland and Chukotka, Russia. *Id.*

<sup>2</sup> See Alaska Native Heritage Center website at <http://www.alaskanative.net/2.asp> (last visited December 13, 2005).

defined subsistence as “the customary and traditional uses . . . of wild, renewable resources” for food, clothing, sharing, or other customary uses.<sup>4</sup> It also has recognized the importance of Alaska Native subsistence by exempting subsistence activities from federal environmental statutes.<sup>5</sup>

After surviving in a difficult environment for many millennia, Alaska Native cultures face a daunting challenge as anthropogenic climate change threatens drastic changes to Arctic and sub-Arctic ecosystems and to their very existence.<sup>6</sup> The global temperature is rising at an unprecedented rate.<sup>7</sup> According to a recent article in the journal *Science*, the worst of global warming is still to come: There is a 90 percent probability that the warming from 1990 to 2100 will be between 1.7

---

<sup>3</sup> Norman A. Chance, *The Inupiat and Arctic Alaska: An Ethnography of Development*, 17-18 (Harcourt 1990).

<sup>4</sup> Alaska National Interest Lands Conservation Act (ANILCA), 16 U.S.C. § 3113.

<sup>5</sup> *See, e.g.*, Endangered Species Act, 16 U.S.C. §1539(e) (exempting Alaska Natives from take provisions “if such taking is primarily for subsistence purposes”); Marine Mammal Protection Act, 16 U.S.C. § 1371(b) (exempting Alaska Natives from Act’s take provisions if take “is for subsistence purposes”); Migratory Bird Treaty Act, 16 U.S.C. § 712(1) (enabling Secretary of Interior to permit Alaska Natives to take migratory birds and collect their eggs for seasonal subsistence use); Alaska National Interest Lands Conservation Act, 16 U.S.C. § 3114 (establishing subsistence preference for fish and wildlife uses on public lands). The term “take” generally means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill the species protected under the various statutes. *See, e.g.*, Marine Mammal Protection Act, 16 U.S.C. § 1361 (13).

<sup>6</sup> Susan Joy Hassol, Arctic Council, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment 5* (2004) (hereinafter “ACIA report”).

<sup>7</sup> *Id.* at 3.

degrees to 4.9 degrees Celsius, which is likely to produce more frequent heat waves, droughts, extreme precipitation events, and related impacts.<sup>8</sup> The Arctic may be entering a warming period not seen in recent history.<sup>9</sup>

There is an international scientific consensus that most of the warming over the past 50 years is attributable to human activities, primarily the burning of fossil fuels (coal, oil and natural gas).<sup>10</sup> Emissions from these activities increase the concentrations of carbon dioxide, methane, and other heat trapping ("greenhouse") gases in the atmosphere.<sup>11</sup> Since the start of the industrial revolution, the atmospheric carbon dioxide concentration has increased by about 35 percent.<sup>12</sup> As discussed below, the effects of this warming can be seen in changes in the climate, weather, plants and animals, and every aspect of the natural environment, and all of these changes impair the ability of the Native people who know this environment to continue their close reliance on it.

---

<sup>8</sup> Thomas R. Karl & Kevin E. Trenberth, *Modern Global Climate Change*, 302 *Science* 1721 (2003).

<sup>9</sup> Larry D. Hinzman *et al.*, *Evidence and Implications of Recent Climate Change in Northern Alaska and Other Arctic Regions*, 72 *Climatic Change* 252 (2005).

<sup>10</sup> ACIA report, *supra* note 6 at 2.

<sup>11</sup> ACIA report, *supra* note 6 at 2.

<sup>12</sup> *Id.*

## II. GLOBAL WARMING THREATENS THE PHYSICAL AND CULTURAL SURVIVAL OF ALASKA NATIVES

*“Time is running out for the Arctic. We need far-reaching, long-term global commitments to reduce emissions of greenhouse gases if the Arctic is to be protected and if our human rights, particularly our human rights to subsistence, are to be respected.”*

— Sheila Watt-Cloutier, ICC Chair.<sup>13</sup>

For millennia, Alaska Natives have used their sophisticated knowledge of the sea, ice, land, and animals to thrive in a harsh environment. The living resources of the Arctic and sub-Arctic regions of Alaska not only sustain the economic and nutritional viability of Alaska Native communities, they also provide a basis for social identity, spiritual life, and cultural survival.<sup>14</sup> As these communities have observed, the Arctic and sub-Arctic are becoming an environment at risk, threatening their way of life.<sup>15</sup> The sea ice is less stable, weather patterns are unusual, vegetation cover is changing, and particular animals are no longer found in traditional hunting areas during the expected seasons.<sup>16</sup>

Since the 1970s, Alaska Natives also have noticed and reported

---

<sup>13</sup> *Threat to North’s Cultural Survival, ECO 2* (Dec. 2003).

<sup>14</sup> ACIA report, *supra* note 6 at 94.

<sup>15</sup> ACIA report, *supra* note 6 at 94.

<sup>16</sup> *Id.*

environmental changes outside the bounds of “normal” variability.<sup>17</sup> They have reported sightings of American robins and salmon, whose normal range does not include the Arctic.<sup>18</sup> Several communities have observed changes in the health and behavior of caribou, a key subsistence species.<sup>19</sup> In the Pribilof Islands, villagers blame global warming along with industrial contaminants for the decline of 20 species, ranging from kelp to sea lions.<sup>20</sup>

Arctic residents also report changes in the abundance of other key subsistence resources. Climate change also may be reducing salmon populations in Alaska.<sup>21</sup> “Salmon and other fish that go up river to spawn make up 60 percent of Alaska Natives’ subsistence resources. Recent declines in these fish populations have thus directly affected the dietary and economic well-being of these people.”<sup>22</sup>

---

<sup>17</sup> Sheila Watt-Cloutier *et al.*, *Responding to Global Climate Change: The Perspective of the Inuit Circumpolar Conference on the Arctic Climate Impact Assessment*, 2° Is Too Much! *Evidence and Implications of Dangerous Climate Change in the Arctic* 57 (World Wildlife Fund 2005) at 59.

<sup>18</sup> Hinzman *et al.*, *supra* note 9 at 286.

<sup>19</sup> *Id.*

<sup>20</sup> Margot Roosevelt, *Vanishing Alaska: Global Warming is Flooding Villages Along the Coast. Should They Surrender and Move?* *Time Magazine* (Sept. 27, 2004).

<sup>21</sup> Bruce P. Finney, *et al.*, *Impacts of Climatic Change and Fishing on Pacific Salmon Abundance Over the Past 300 Years*, 290 *Science* 795, 797 (2000).

<sup>22</sup> ACIA report, *supra* note 6 at 119.

In short, global warming is rearranging their environment.<sup>23</sup>

The weather seems less stable and predictable. From sources of indigenous knowledge across the Arctic come reports that the weather seems more variable, unfamiliar, and is behaving unexpectedly and outside the norm. Experienced hunters and elders who could predict the weather using traditional techniques are now frequently unable to do so. Storms often occur without warning. Wind direction changes suddenly. In many places it is increasingly cloudy. Storms bringing high winds and lightning occur with increasing frequency in some locations. As noted by several elders, “the weather is harder to know.” This presents problems for many activities, from hunting to drying fish, on which Indigenous Peoples depend.<sup>24</sup>

These observations are supported by scientific research. In 2004, the Arctic Council commissioned a report that consolidated the scientific research on Arctic global warming trends, causes and effects.<sup>25</sup> The *Arctic Climate Impact Report* was prepared with the input of nearly 300 scientists, and included the knowledge of elders from Arctic indigenous communities.<sup>26</sup> Among its key findings were that

---

<sup>23</sup> Alaska Regional Assessment Group, *Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change* 7 (Dec. 1999).

<sup>24</sup> ACIA report, *supra* note 6 at 96.

<sup>25</sup> The Council is a high-level intergovernmental forum that addresses the common concerns and the challenges faced by the people and governments of the eight Arctic nations – Canada, Denmark/Greenland/Faroe Islands, Finland, Iceland, Norway, Russia, Sweden, and the United States; six Indigenous Peoples’ organizations – Aleut International Association, Arctic Athabaskan Council, Gwich’in Council International, Inuit Circumpolar Conference, Russian Association of Indigenous Peoples of the North, and Saami Council; and scientific observers.

<sup>26</sup> The six Arctic Indigenous Peoples’ organizations submitted a statement to be included at the beginning of the report. It was rejected as too political. The statement said, in part: *To Arctic Indigenous Peoples climate change is a cultural*

the annual average Arctic temperature has increased at almost twice the rate as that of the rest of the world over the past few decades.<sup>27</sup> The report stated that increasing global concentrations of CO<sub>2</sub> and other greenhouse gases are projected to contribute to additional Arctic warming of about 4 degrees to 7 degrees Celsius over the next 100 years.<sup>28</sup>

**A. Global Warming Threatens the Subsistence of Alaska Natives**

*“The practice of coming out here and being on the land and hunting caribou is not only about feeding our families, because it is all we have to survive from. We don't have Safeways and Wal-Marts and stuff like that in our tribes. But it's also about maintaining our culture and our spiritual relationship with these animals that we've had for time immemorial.”*  
— Evon Peter, Arctic Village, Alaska<sup>29</sup>

The continuation of the opportunity for subsistence uses by rural residents of Alaska is essential to Native physical economic, traditional, and cultural existence.<sup>30</sup> The situation in Alaska is unique in that, in most cases, no practical alternative means exist to replace the food supplies and other items gathered from

---

*issue. We have survived in a harsh environment and if, as a result of global climate change, the species of animals upon which we depend are greatly reduced in number or location or even disappear, we as peoples would also disappear.*  
Watt-Cloutier *et al.*, *supra* note 17.

<sup>27</sup> ACIA report, *supra* note 6 at 10.

<sup>28</sup> ACIA report, *supra* note 6 at 10.

<sup>29</sup> Evon Peter, *The People and the Caribou Are One, Voices from the Earth* (Spring 2005), available at <http://www.sric.org/voices/2005/v6n1/caribou.html>.

<sup>30</sup> ANILCA § 801(1), 16 U.S.C. § 3111.

the fish and wildlife that supply rural residents dependent on subsistence uses.<sup>31</sup>

“[Fifty] percent of the food for three-quarters of the Native families in Alaska's small and medium villages is acquired through subsistence uses, and 40 percent of such families spend an average of six to seven months of the year in subsistence activities.”<sup>32</sup>

### **1. Thinning and Receding Sea Ice Reduces Subsistence Resources on Arctic Coasts**

*“It looks like winter out there, but if you've really been around a long time like me, it's not winter. . . . If you travel that ice, it's not the ice that we traveled 40 years ago.”*

— Orville Huntington, vice chairman of the Alaska Native Science Commission.<sup>33</sup>

In the Arctic, sea ice is one of the most important climatic variables.<sup>34</sup> Changes in sea ice have enormous environmental, economic, and societal implications.<sup>35</sup> The Arctic is rapidly losing its permanent ice.<sup>36</sup> Within a century, the Arctic Ocean may have ice-free summers.<sup>37</sup>

---

<sup>31</sup> ANILCA § 801(2), 16 U.S.C. § 3111.

<sup>32</sup> *Native Village of Quinhagak v. Lujan*, 35 F.3d 388, 389-90 (citing H.R. Rep. No. 1045, 95th Cong., 2d Sess., at 181 (1978)).

<sup>33</sup> Yereth Rosen, *Warming Climate Disrupts Alaska Natives' Lives*, Reuters (April 16, 2004).

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*

<sup>36</sup> J.T. Overpeck *et al.*, *Arctic System on Trajectory to New, Seasonally Ice-Free State*, 86 *EOS* 312 (2005).

<sup>37</sup> *Id.* at 309.

The Arctic also exerts control over the climate.<sup>38</sup> Much as a spillway in a dam controls the level of a reservoir, the polar regions control the Earth's heat balance.<sup>39</sup> As the Arctic sea ice melts and shrinks, it reflects less sunlight, eventually warming the entire planet's climate.<sup>40</sup> Scientists also are raising alarms about potential melting of the Greenland ice sheet and the Antarctic.<sup>41</sup> If the current pace of melting continues, the seas would rise 10 or more meters, flooding areas inhabited by 25 percent of the U.S. population.<sup>42</sup> The Gulf and East Coast states would experience the brunt of the impacts.<sup>43</sup>

In the Arctic, this melting likely will have devastating consequences for polar bears, ice-dependent seals, walrus, and the Alaska Natives for whom these animals are a primary food source.<sup>44</sup> Sea ice supports an important food web of fish, seabirds, and marine mammals.<sup>45</sup> Phytoplankton blooms at the ice edge feed

---

<sup>38</sup> Matthew Sturm *et al.*, *Meltdown in the North*, *Scientific American* 62 (Oct. 2003).

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> Jonathan M. Gregory *et al.*, *Threatened Loss of the Greenland Ice Sheet*, 428 *Nature* 616 (2004).

<sup>42</sup> U.S. Geological Service, *Sea Level and Climate*, available at <http://pubs.usgs.gov/fs/fs2-00/>.

<sup>43</sup> *Id.*

<sup>44</sup> ACIA report, *supra* note 6 at 8.

<sup>45</sup> U.S. Dept. of Interior, *Outer Continental Shelf Oil & Gas Leasing Program: 2002–2007 Final Environmental Impact Statement* 4-7 (April 2002).

prolific arctic cod, which in turn feed beluga whales, narwhal whales, and harp seals.<sup>46</sup> Polar bears, walrus, and ringed seals use the ice for transportation and as a “floating platform for resting, feeding, and producing their young.”<sup>47</sup>

The Inupiat and Yupik people of Alaska’s Arctic regions know and rely on this sea ice environment, traveling on the ice extensively in search of walrus, bowhead whales, and seals.<sup>48</sup>

Caleb Pungowiyi of Nome recounted the importance of stable ice conditions:

Ice is a supporter of life. It brings the sea animals from the North into our area and in the fall it also becomes an extension of our land. When it freezes along the shore, we go out on the ice to fish, to hunt marine mammals and to travel. . . . When it starts disintegrating and disappearing faster it affects our lives dramatically.<sup>49</sup>

---

<sup>46</sup> Nat’l Res. Council, Nat’l Academy of Sciences, *Cumulative Environmental Effects of Oil & Gas Activities on Alaska’s North Slope* 92 (National Academies Press 2003).

<sup>47</sup> Margie Ann Gibson & Sallie B. Schullinger, *Answers from the Ice Edge: The Consequences of Climate Change on Life in the Bering and Chukchi Seas* (Greenpeace U.S.A. 1998).

<sup>48</sup> Don Weller, *Effects of Climate Change on Subsistence Communities in Alaska, Assessing the Consequences of Climate Change for Alaska and the Bering Sea Region: Proceedings of a Workshop at the University of Alaska Fairbanks* 66 (Nov. 1999).

<sup>49</sup> ACIA report, *supra* note 6 at 24.

Many Arctic communities depend on hunting polar bear, walrus, seals, whales, seabirds and other marine animals.<sup>50</sup> Changes in the species' ranges and availability and the decreased ability to travel safely in changing and unpredictable ice conditions are making people feel like strangers in their own land.<sup>51</sup> The thinning and retreating sea ice also makes it dangerous to hunt walruses, seals and whales.<sup>52</sup> For example, in 1998, whalers from the village of Wainwright had to be rescued after the ice floe they were on broke up and drifted out to sea.<sup>53</sup>

The thinning and receding of sea ice also is decimating subsistence resources:

Gathering food directly from the land and the sea makes the Yupik very careful observers of their surroundings. In recent years, they have noticed that the walrus are thinner, their blubber less nutritious and oil from walrus fat does not burn as bright in their lamps as in times of old. At the same time, they have noticed that there are fewer and weaker seals. The Yupik hunters have had to go farther and farther from shore to reach the ice pack to find the newborn seals that are being fed fish from nearby waters by their parents. Concurrently, scientists have observed that the sea ice over much of the Arctic is thinner and melting back, with the changes encompassing a broader area than that observed by the Yupik earlier.<sup>54</sup>

---

<sup>50</sup> ACIA report, *supra* note 6 at 61.

<sup>51</sup> *Id.*

<sup>52</sup> Jim Motavalli, *Feeling the Heat: Dispatches from the Frontlines of Climate Change* 108 (Routledge 2004).

<sup>53</sup> *Id.*

<sup>54</sup> Nat'l Assessment Synthesis Team, U.S. Global Change Res. Program, *Climate Change Impacts on the United States: The Potential Consequences of Climate*

As large-scale warming has reduced the ice platforms upon which seals and walrus rest between searches for fish and mussels, they become weakened and less productive and thus provide less sustenance for local Native communities.<sup>55</sup> Ice-dependent seals, including the ringed seal, ribbon seal, and bearded seal, are particularly vulnerable to reductions in sea ice because they give birth and nurse their pups on the ice.<sup>56</sup> They also forage near the ice edge, which is an extremely productive area and especially sensitive to climate change.<sup>57</sup> As the ice melts, the seal and walrus populations will decline.<sup>58</sup>

## **2. Melting Permafrost Diminishes Subsistence Resources**

Permafrost is subsurface material that remains continuously frozen for at least two consecutive years.<sup>59</sup> The permafrost regions occupy approximately 24 percent of the Northern Hemisphere's terrestrial surface.<sup>60</sup> As the climate

---

*Variability and Change* 366, (2000) (citing D. A. Rothrock *et al.*, *Thinning of the Arctic Sea-Ice Cover*, 26 *Geophysical Research Letters* 3469 (1999)).

<sup>55</sup> Nancy G. Maynard, *Final Report: Native Peoples-Native Homelands Climate Change Workshop* 62 (1998) (citations omitted).

<sup>56</sup> ACIA report, *supra* note 6 at 59.

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> U.S. Arctic Research Comm'n, *Climate Change, Permafrost, and Impacts on Civil Infrastructure*, 3 (2003), available at <http://www.arctic.gov/publications.htm>

<sup>60</sup> *Id.* at 5.

differentially warms in summer and winter, the permafrost will become warmer, and the active layer (the layer of soil above the permafrost that annually experiences freeze and thaw) will become thicker.<sup>61</sup>

Thickening of the active layer has two immediate effects.<sup>62</sup> First, decomposed plant material frozen in the upper permafrost thaws, exposing the carbon to microbial decomposition, which can release carbon dioxide and methane to the atmosphere.<sup>63</sup> Second, the ice in the upper permafrost is converted to water.<sup>64</sup> When ice-rich permafrost thaws, the ground surface subsides.<sup>65</sup> Typically, this settlement does not occur uniformly over space, but yields a chaotic surface with small hills and wet depressions known as thermokarst terrain.<sup>66</sup> When thermokarst occurs beneath a road, house, pipeline, or airfield, it can compromise

---

<sup>61</sup> U.S. Arctic Research Comm'n, *The Arctic Ocean and Climate Change: A Scenario For The U.S. Navy*, 10 (2002) available at <http://www.arctic.gov/publications.htm>

<sup>62</sup> U.S. Arctic Research Comm'n, *Climate Change, Permafrost, and Impacts on Civil Infrastructure*, *supra* note 59 at 7.

<sup>63</sup> *Id.* at 8. This thickening of the active layer can facilitate further climate change through the release of greenhouse gases. *Id.* at 19. Because considerable quantities of carbon are sequestered in the upper layers of permafrost, a widespread increase in the thickness of the thawed layer could lead to the release of large quantities of CO<sub>2</sub> and CH<sub>4</sub> to the atmosphere. *Id.* (citations omitted). This in turn would create a positive feedback mechanism that could amplify regional and global warming. *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

these facilities' structural integrity and even lead to collapse.<sup>67</sup> If thermokarst occurs in response to regional warming, large areas can subside and, if near the coast, can be inundated by encroaching seas.<sup>68</sup>

Global warming will likely trigger a new episode of widespread thermokarst development, with serious consequences for most of the engineered works constructed in the Arctic during the twentieth century.<sup>69</sup> Already, melting permafrost has created underground voids that collapse into sinkholes in northern areas such as the city of Fairbanks, has toppled spruce, roller-coaster bike trails, rippled pavement.<sup>70</sup> Homes and buildings are sagging into ruin.<sup>71</sup> Elsewhere, entire forests appear to be sinking or drowning as melting permafrost forces water upward.<sup>72</sup> Alaskans have taken to calling the phenomenon “drunken trees.”<sup>73</sup>

---

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> *Id.* at 13-14.

<sup>70</sup> Doug O'Hara, *Permafrost is Warming*, *Anchorage Daily News* (Aug. 14, 2005), available at <http://www.adn.com/news/environment/story/6815494p-6707211c.html>.

<sup>71</sup> *Id.*

<sup>72</sup> Timothy Egan, *Alaska, No Longer So Frigid, Starts to Crack, Burn and Sag*, *The New York Times* (June 16, 2002), available at [http://nome.colorado.edu/HARC\\_noframes/NYT\\_061302.html](http://nome.colorado.edu/HARC_noframes/NYT_061302.html).

<sup>73</sup> *Id.*

### 3. Warming Threatens the Health of the Caribou, a Key Food Source

*“Sometimes when they’re supposed to show up, they don’t show up. Sometimes they show up when they’re not supposed to show up. . . . We’ve got 15 villages in Northeast Alaska and North Yukon Territory, and some in Northwest Territory, where the same people are depending on one caribou herd. We’re caribou people . . . and we all depend on that same herd that migrates through our villages.”* — Sarah James, Arctic Village, Alaska<sup>74</sup>

Native peoples in more than 25 villages — more than 5,000 households — in northwestern Alaska depend on the Western Arctic caribou herd for subsistence.<sup>75</sup> Caribou are also a feature of Alaska Native mythology, spirituality and cultural identity.<sup>76</sup>

Anthropogenic warming, however, is projected to reduce the traditional forage for caribou herds, which in turn could lead to reduction in the size of caribou herds.<sup>77</sup> Caribou depend on the availability of abundant tundra vegetation and good foraging conditions, especially during the calving season.<sup>78</sup> Vegetation changes caused by climate change, along with rising sea levels, are projected to shrink the tundra area to its lowest extent in the past 21,000 years, greatly reducing

---

<sup>74</sup> ACIA report, *supra* note 6 at 73.

<sup>75</sup> U.S. Geological Service, *Status and Trends of the Nation’s Biological Resources, Part 2 (Alaska)*, available at <http://biology.usgs.gov/s+t/SNT/noframe/ak177.htm> (hereinafter “USGS report”).

<sup>76</sup> ACIA report, *supra* note 6 at 71.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.* at 70.

the breeding area for many birds and the grazing areas for many land animals.<sup>79</sup>

Freeze-thaw cycles and freezing rain are also projected to increase.<sup>80</sup> Ice crust formation from freeze-thaw events affects most Arctic land animals by encapsulating their food plants in ice, severely limiting forage availability and sometimes killing the plants.<sup>81</sup> This freeze-thaw effect has caused caribou populations to crash dramatically, and these crashes are happening more frequently.<sup>82</sup> As the caribou herds face increasing trouble, the communities that rely on them for subsistence are forced to reduce their harvest to ensure the sustainability of the herds.

### ***B. Global Warming Is Endangering the Health and Safety of Alaska Natives***

*“The storms are getting more frequent, the winds are getting stronger, the water is getting higher and it’s noticeable to everyone in town. If we get 12 to 14 foot waves, this place is going to get wiped out in a matter of hours. We’re in panic mode because of how much ground we’re losing. If our airport gets flooded out, there goes our evacuation by plane.”* — Robert Iyatunguk, erosion coordinator for Shishmaref<sup>83</sup>

The effects of global warming are also posing health, safety, and security problems for Alaska Native communities. For example, the thinning and receding

---

<sup>79</sup> *Id.* at 46.

<sup>80</sup> *Id.* at 70.

<sup>81</sup> *Id.* at 68.

<sup>82</sup> *Id.* at 69.

<sup>83</sup> *Id.* at 80.

sea ice is making subsistence hunts more dangerous. People are forced to travel farther across rough, open seas to reach the ice where the animals are found. These trips are more dangerous and costly.<sup>84</sup> Nor is the ice reliable once it is reached, as pieces often break off and float away in the midst of a hunt. In 2002, more than 100 stranded hunters from the Inupiat community of Shishmaref had to be rescued by air when the ice on which they were hunting drifted far from shore.<sup>85</sup>

Melting permafrost also threatens the security of Arctic communities. Permafrost stabilizes the ground, buttressing shorelines against fierce Arctic storms.<sup>86</sup> As the permafrost warms and thaws, that buffer dissolves, and shorelines erode.<sup>87</sup> This effect is compounded by the retreat of the sea ice, which has a calming influence on the often rough seas.<sup>88</sup>

In Shishmaref, retreating sea ice and thawing permafrost have exposed the village to erosion from Arctic storms, which are fiercer and more frequent than in

---

<sup>84</sup> Joseph B. Verrengia, *In Alaska, an Ancestral Island Home Falls Victim to Global Warming*, Associated Press (Sept. 10, 2002).

<sup>85</sup> *Id.*

<sup>86</sup> Orson P. Smith, & George Levasseur, *Impacts of Climate Change on Transportation Infrastructure in Alaska, The Potential Impacts of Climate Change on Transportation, Part II, Regional Case Studies 6* (U.S. Dep't of Transportation, 2001).

<sup>87</sup> *Id.* at 5-6.

<sup>88</sup> *Id.* at 7; ACIA report, *supra* note 6 at 80.

the past.<sup>89</sup> In this village, which sits on a narrow barrier island on the Chukchi Sea, several homes have collapsed over a bluff and others teeter on its edge. The village's 600 residents watched as one end of their village has been eaten away, losing as much as 15 meters of land overnight in one storm.<sup>90</sup> In the past 30 years, 100 to 300 feet of coastline has washed away, half of it since 1997.<sup>91</sup>

The absence of sea ice also deprives the residents of their means of traveling to the mainland to hunt moose and caribou as they normally would do by early November.<sup>92</sup> Nowadays the inlet is open water in autumn.<sup>93</sup>

Shishmaref is not an anomaly. At Point Hope, a bowhead-whaling village that dates from 600 B.C., flooding seawater threatens the airport runway and a seven-mile evacuation road.<sup>94</sup> "During storms, some people begin to panic," town official Rex Rock told *Time Magazine*.<sup>95</sup>

---

<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

<sup>91</sup> Roosevelt, *supra* note 20.

<sup>92</sup> ACIA report, *supra* note 6 at 80.

<sup>93</sup> *Id.*

<sup>94</sup> *Id.*

<sup>95</sup> *Id.*

An investigation by the General Accounting Office, an investigative arm of Congress, found that 184 out of 213 (86.4 percent) Alaska Native villages experience some level of flooding and erosion.<sup>96</sup> The GAO report stated that:

Native villages on the coast or along rivers are subject to both annual and episodic flooding and erosion. Various studies and reports indicate that coastal villages in Alaska are becoming more susceptible to flooding and erosion in part because rising temperatures cause protective shore ice to form later in the year, leaving the villages vulnerable to fall storms . . . In addition, villages in low-lying areas along riverbanks or in river deltas are susceptible to flooding and erosion caused by ice jams, snow and glacial melts, rising sea levels, and heavy rainfall.<sup>97</sup>

The cost of relocating these villages is expected to be high.<sup>98</sup> For example, the Army Corp of Engineers estimates that the cost to relocate Kivalina, which has a population of about 385, could range from \$100 million to \$400 million.<sup>99</sup> There are 20 other Alaska villages that are candidates for relocation because of severe erosion.<sup>100</sup>

---

<sup>96</sup> U.S. General Accounting Office, *Alaska Native Villages: Most Are Affected by Flooding and Erosion, But Few Qualify for Federal Assistance*, 2-3 (December 2003) (hereinafter “GAO report”).

<sup>97</sup> *Id.* at 3.

<sup>98</sup> *Id.*

<sup>99</sup> *Id.* at 4.

<sup>100</sup> Rosen, *supra* note 33.

Kivalina and Shishmaref are located on barrier islands that are continuously shrinking due to chronic erosion.<sup>101</sup> The village of Kivalina lies on a barrier island that is both overcrowded and shrinking from chronic erosion.<sup>102</sup> Surrounded by the Chukchi Sea and the Kivalina Lagoon, the village has no further room for expansion.<sup>103</sup> Chronic erosion has further exacerbated overcrowding.<sup>104</sup> Several homes are currently in danger of falling into the lagoon.<sup>105</sup> On the seaside of the island, fall storm surges create annual coastal flooding and beach erosion.<sup>106</sup> Portions of the island have been breached before, and it is believed that the right combination of storm events could flood the entire village at any time.<sup>107</sup>

Shishmaref residents have voted to leave the community their families have inhabited for the past 4,000 years and move to a site called Tin Creek, 12 miles away.<sup>108</sup> Unfortunately they lack the many millions it would cost.<sup>109</sup> For now, Shishmaref and the three other Alaska Native villages the federal government has

---

<sup>101</sup> GAO report, *supra* note 96 at 29.

<sup>102</sup> *Id.*

<sup>103</sup> *Id.* at 29-30.

<sup>104</sup> *Id.* at 30.

<sup>105</sup> *Id.*

<sup>106</sup> *Id.*

<sup>107</sup> *Id.*

<sup>108</sup> ACIA report, *supra* note 6 at 80; Roosevelt, *supra* note 20.

<sup>109</sup> Verrengia, *supra* note 84 at 5.

found to be in “imminent danger” will remain where they are, exposed to the consequences of global warming.<sup>110</sup>

### III. CONCLUSION

The changes taking place in Alaska as a result of global warming are among the most dramatic on Earth, even though only a small portion of the world’s greenhouse gas emissions originate there. The dramatic destruction of the Arctic provides an early warning for the rest of the world of the devastation that is likely to occur if industrialized nations and the industries that drive them fail to significantly curb their emissions of greenhouse gases. Reducing the greenhouse gas emissions from facilities such as the power plants that Defendants operate is a critical step in ensuring the survival of Alaska’s Native communities. Thus, we urge this Court to overrule the dismissal of this case and to remand it to the trial court.

---

<sup>110</sup> Roosevelt, *supra* note 20; GAO report, *supra* note 96 at 4.

Respectfully submitted,

---

---

Ronald A. Shems  
Shems, Dunkiel, Kassel & Saunders PLLC  
9 College Street  
Burlington, VT 05401  
(802) 860-1003  
Attorney for *Amici* Alaska Inter-Tribal  
Council and Akiak Native Community

---

Rebecca L. Bernard (Alaska Bar No.  
0105014)  
Frances M. Raskin (D.C. Bar. No. 480874)  
TRUSTEES FOR ALASKA  
1026 West 4th Avenue, Suite 201  
Anchorage, AK 99501  
(907) 276-4244  
Counsel for *Amici* Alaska Inter-Tribal  
Council and Akiak Native Community

Dated:

**Certificate of Compliance with Fed. R. App. P. 32(a)**

*Certificate of Compliance with Type-Volume Limitation,  
Typeface Requirements and Type Style Requirements*

1. This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) because this brief contains 6,342 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii).
2. This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief is comprised of a proportionally spaced typeface, *i.e.*, the Microsoft Word version of Times New Roman 14 point type.

---

Ronald A. Shems  
Shems, Dunkiel, Kassel & Saunders PLLC  
9 College Street  
Burlington, VT 05401  
(802) 860-1003  
Attorney for *Amici* Alaska Inter-Tribal  
Council and Akiak Native Community

Dated: