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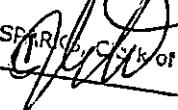
Attorneys for Plaintiffs

MONTANA FIRST JUDICIAL DISTRICT COURT
LEWIS AND CLARK COUNTY

RIKKI HELD, et al., Plaintiffs, v. STATE OF MONTANA, et al., Defendants.	Cause No. CDV-2020-307 Hon. Kathy Seeley DECLARATION OF JACK A. STANFORD IN SUPPORT OF PLAINTIFFS' RESPONSE BRIEF IN OPPOSITION TO DEFENDANTS' MOTION TO PARTIALLY DISMISS FOR MOOTNESS
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FILED

APR 14 2023

ANGIE SPARKS, Clerk of District Court
By  Deputy Clerk

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Pursuant to MCA §1-6-105, Jack A. Stanford hereby declares as follows:

1. I am an expert in the above-entitled action. I am making this declaration in support of Plaintiffs' Response Brief in Opposition to Defendants' Motion to Partially Dismiss for Mootness. I have personal knowledge of the facts I state herein, except as to those stated on information and belief, and if called to testify, I would and could testify competently thereto.

QUALIFICATIONS & EXPERT TESTIMONY

2. I am an expert witness in this case to "render opinions on the adverse impacts of climate change on Montana's freshwater ecosystems, including those that Plaintiffs rely on. First, I describe the interconnectivity of climate, hydrology, geomorphology and ecology of river landscapes, and opine on the fundamental importance of timing and volume of precipitation as drivers of surface and ground water availability (flux). Next, I describe how anthropogenic climate change disrupts biophysical connectivity, thereby causing significant degradation and depletion of Montana's freshwater ecosystems, including lakes, wetlands, rivers, and associated plants and animals." Doc. 222, Expert Report at 1. My opinions were based on "[t]he information available to me, along with my six decades of professional experience and expertise in the field of aquatic ecosystem science," and documents, data, and studies I reviewed in formulating my opinions in this case. Expert Report at 1-2, Attachment 2.
3. I reserved the right to supplement my report should new information become available. Expert Report at 2. One of the purposes of this declaration is to supplement my expert report based on a new Intergovernmental Panel on Climate Change ("IPCC") report.
4. I am Professor Emeritus at the Flathead Lake Biological Station of the University of Montana, where I have worked since 1972. I was the Director and Bierman Professor of Ecology (1980-2016). My academic degrees are: B.S. in Fisheries Science at Colorado State University

(1969); M.S. in Limnology at Colorado State University (1971); Ph.D. in River Ecology at University of Utah (1975). I was Assistant and Associate Professor of Biology at University of North Texas (1974-80). I have trained and graduated 14 Ph.D. and 28 M.S. students and published over 220 scientific papers and books on aquatic ecosystem processes, including influences of human activities. During my 50-year career, my research has been supported by over \$60M in competitive research grants from the U.S. National Science Foundation, the Gordon and Betty Moore Foundation (Palò Alto, CA), the McKnight Foundation (Minneapolis, MN) and many other funders. I was elected Fellow of the American Association for Advancement of Science (2000). I received the Award of Excellence of the Society for Freshwater Science in 2004 and in 2011, I received the Lifetime Achievement Award of the International Society for River Science. My current work focuses on the ecology and conservation of Pacific Rim salmon rivers. I have served on many scientific review boards and currently serve as trustee of Skeena Wild Conservation Trust (Terrace, BC) and the board of the Wild Fish Conservancy (Duvall, WA). I currently reside on the Twisp River, Washington.

5. In my expert report, I concluded that there is a “reasonable degree of scientific certainty that climate change is causing significant degradation and depletion of Montana’s freshwater ecosystems, through direct effects (increasing temperatures, decreasing runoff) and indirect effects associated with water pollution (toxic compounds and excessive nutrient inputs), food web changes mediated by invasive species and habitat degradation caused by increasing frequency of wildfires. These harms to Montana’s freshwater ecosystems directly and indirectly harm these young Plaintiffs’ lives. The only way to stop this degradation and depletion is to substantially reduce concentrations of greenhouse gases in the atmosphere, which requires transitioning energy systems off fossil fuels.” Expert Report at 1.

THE REPEAL OF THE ENERGY POLICY ACT

6. I have been made aware that the State of Montana repealed its State Energy Policy Act, one of the statutes that the Plaintiffs referenced in their Complaint. In my expert report, I made the following statement about this statute: “At a time when Montana is already experiencing significant harms due to anthropogenic climate change, the state should be moving away from climate-damaging fossil fuel energy resources, not promoting fossil fuels as an energy resource[] if it wants to protect the aquatic ecosystems of the state and the natural and cultural ecosystem services they provide.” Expert Report at 10. I also said: “the provisions of Montana’s State Energy Policy, which call for the increasing use and production of fossil fuels, are contrary to the clear scientific understanding and human need to address climate change in order to protect Montana’s aquatic ecosystems, which Plaintiffs rely on for their well-being and survival, and future generations will to.” Expert Report at 15.
7. The repeal of the Energy Policy Act does not change any of my opinions contained in my expert report because how anthropogenic climate change harms Montana’s freshwater ecosystems is not dependent on any specific policy or law. Expert Report at 9-15. Rather, any policies on the part of Montana that “call for the increasing use and production of fossil fuels, are contrary to the clear scientific understanding and human need to address climate change in order to protect Montana’s aquatic ecosystems” Expert Report at 15.
8. As described in the Complaint, the State of Montana still has policies in place that call for increasing use of fossil fuels. Complaint ¶¶ 118-20. I have received no new information that suggests the State of Montana has changed its energy policy such that it addresses climate change. Therefore, all opinions contained within my expert report remain accurate.

THE IPCC’S NEW SYNTHESIS REPORT

9. One additional piece of information that has come out since I finished my expert report is the *Summary for Policymakers* for the Synthesis Report of the IPCC Sixth Assessment.¹ I have reviewed this Report and believe it bolsters many of the conclusions contained in my expert report. Specifically:

- “Climate change has caused substantial damages, and increasingly irreversible losses, in terrestrial, freshwater, cryospheric, and coastal and open ocean ecosystems (*high confidence*). Hundreds of local losses of species have been driven by increases in the magnitude of heat extremes (*high confidence*) with mass mortality events recorded on land and in the ocean (*very high confidence*). Impacts on some ecosystems are approaching irreversibility such as the impacts of hydrological changes resulting from the retreat of glaciers, or the changes in some mountain (*medium confidence*) and Arctic ecosystems driven by permafrost thaw (*high confidence*).” IPCC Summary for Policymakers at A.2.3.
- “Continued emissions will further affect all major climate system components. With every additional increment of global warming, changes in extremes continue to become larger. Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation, and very wet and very dry weather and climate events and seasons (*high confidence*).” IPCC Summary for Policymakers at B.1.3.
- “In the near term, every region in the world is projected to face further increases in climate hazards (*medium to high confidence*, depending on region and

¹ Intergovernmental Panel on Climate Change, *Summary for Policymakers, in Synthesis Report of the IPCC Sixth Assessment Report (AR6) (2023)*, available at <https://www.ipcc.ch/report/ar6/syr/>.

hazard), increasing multiple risks to ecosystems and humans (*very high confidence*)." IPCC Summary for Policymakers at B.2.1.

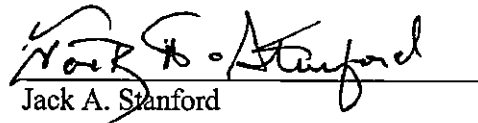
- "Hazards and associated risks expected in the near-term include . . . biodiversity loss in land, freshwater and ocean ecosystems (*medium to very high confidence, depending on ecosystem*) . . ." IPCC Summary for Policymakers at B.2.1.
- "Loss of ecosystems and their services has cascading and long-term impacts on people globally, especially for Indigenous Peoples and local communities who are directly dependent on ecosystems, to meet basic needs (*high confidence*)." IPCC Summary for Policymakers at B.2.4.
- "Climate change is a threat to human well-being and planetary health (*very high confidence*). There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all (*very high confidence*)." IPCC Summary for Policymakers at C.1.
- "Continued emissions will further affect all major climate system components, and many changes will be irreversible on centennial to millennial time scales and become larger with increasing global warming. Without urgent, effective, and equitable mitigation and adaptation actions, climate change increasingly threatens ecosystems, biodiversity, and the livelihoods, health and wellbeing of current and future generations." IPCC Summary for Policymakers at C.1.3.
- "Deep, rapid, and sustained mitigation and accelerated implementation of adaptation actions in this decade would reduce future losses and damages related to climate change for humans and ecosystems (*very high confidence*)." IPCC Summary for Policymakers at C.2.1.

- “Delayed mitigation action will further increase global warming and losses and damages will rise and additional human and natural systems will reach adaptation limits (*high confidence*).” IPCC Summary for Policymakers at C.2.2.

10. This new IPCC Report bolsters the conclusions contained in my expert report that: “1) there is ample evidence that anthropogenic climate change is unambiguously occurring and impacting the state of Montana with a high degree of scientific certainty; 2) that the range of variation in the river networks (e.g., water temperatures, river levels, and timing for peak runoff) is now being routinely exceeding the long-term range in variation that has existed for the past 500 years; and 3) direct and indirect harm and degradation to freshwater ecosystems, including native organisms, is very apparent to a high degree of scientific certainty. The rivers and fisheries that these youth Plaintiffs depend on for their health, safety, and well-being are already experiencing significant degradation as a result of warming temperatures, caused by anthropogenic climate change.” Expert Report at 15.

Pursuant to MCA §1-6-105, I declare under penalty of perjury and under the laws of the state of Montana that the foregoing is true and correct.

Executed this 10th day of April, 2023 in Twisp, Washington.



Jack A. Stanford