

Scientists Call for a Moratorium on Oil Sands Development

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Decisions about the development of the vast oil sands[†] deposits in Alberta and elsewhere in North America are among the biggest we face as Canadians and Americans. Their consequences for our national economies and shared environment will last decades to centuries. These decisions transcend the boundaries of scientific disciplines in ways that challenge accurate summary in media and debate.

We, a diverse group of natural and social scientists from both countries, began talking to each other because concerns about the oil sands reach far beyond our individual fields of research. Based on evidence raised across our many disciplines, we offer a unified voice calling for a moratorium on new oil sands projects. *No new oil sands or related infrastructure projects should proceed unless consistent with an implemented plan to rapidly reduce carbon pollution, safeguard biodiversity, protect human health, and respect treaty rights.* The following ten reasons, each grounded in science, support our call for a moratorium. We believe they should be at the center of the public debate about further development of the oil sands, a carbon-intensive source of non-renewable energy.

Ten Reasons for a Moratorium:

Reason 1. Continued expansion of oil sands and similar unconventional fuels in Canada and beyond is incompatible with limiting climate warming to a level that society can handle without widespread harm.

The latest analyses agree that the warming predicted to occur this century will substantially raise the risk of severe ecological and economic damage, widespread social upheaval, and human suffering (IPCC 2013) and that oil sands expansion is inconsistent with avoiding this outcome (Chan et al. 2010, McCollum et al. 2014, McGlade and Ekins 2014). To address the risks of climate change, Canada has committed to significantly reduce greenhouse gas emissions by 2020 and 2030. Continued investment in oil sands production and infrastructure is not consistent with these targets and undermines broader efforts to reduce CO₂ emissions and control climate warming (Office of the Auditor General of Canada 2012, Environment Canada 2014).[‡] We need a different energy path.

Reason 2. Oil sands should be one of the first fuel sources we avoid using as society moves to non-polluting forms of energy, not the next carbon-intensive source we exploit.

We need reliable energy sources while we develop a new economy around cleaner fuels. Extracting, refining, transporting, and burning oil-sands energy produces among the most greenhouse gases of any transport fuel per unit energy delivered (Brandt 2011, Gordon et al.

[†] Oil sands, tar sands, and bituminous sands are terms used interchangeably to describe a kind of unconventional oil deposit from which bitumen, a highly viscous form of petroleum, is mined from sand, clay, and sandstone.

[‡] Environment Canada (2014) and the Office of the Auditor General of Canada (2012) predict that Canada will miss its greenhouse gas emissions reduction target by 122 million tonnes.

2015). Expansion of oil sands production will exacerbate the problem of carbon pollution and slow the transition to cleaner energy (Unruh 2000).

Reason 3. Current oil sands environmental protections and baseline data are largely lacking, and protections that exist are too seldom enforced.

In Canada, there are few controls and no uniform standards regarding pollution and other impacts from oil sands mining. Water quality monitoring by the Canadian government and industry was poor until recently, so there is little baseline knowledge to evaluate impacts on terrestrial and aquatic life (Environment Canada 2010, Royal Society of Canada 2010, Dillon et al. 2011, RAMP 2011, Jordaan 2012, Kirk et al. 2014).[§] In some cases, the enforcement of existing regulations (such as 2009 Bill 74 that would eliminate liquid tailings) is formally postponed (Energy Resources Conservation Board 2013). Actual rates of development on the ground exceed stated conservation targets (Komers and Stanojevic 2013, Government of Alberta 2012).^{**} Too often, the development of the oil sands is presented as inevitable, while protections for human health and the environment are treated as optional.

Reason 4. Contaminants from oil sands development permeate the land, water and air of the Canadian boreal landscape, and many of these impacts are difficult to mitigate.

Independent studies have demonstrated that mining and processing Albertan oil sands releases carcinogenic and toxic pollutants (e.g., heavy metals, polycyclic aromatic compounds) to the atmosphere from smoke stacks and evaporation, and to groundwater from leaching of tailings ponds. This pollution harms terrestrial and aquatic ecosystems and the species within them (Pollet and Bendell-Young 2000, Gurney et al. 2005, Nero et al. 2006, Gentes et al. 2007, Kelly et al. 2009, Kelly et al. 2010, Landis et al. 2012, Rooney et al. 2012, Kurek et al. 2013, Andrishak and Hicks 2011, Hebert et al. 2013, Galarneau et al. 2014, Parajulee and Wania 2014, Schindler 2014, Schwalb et al. 2015).

Reason 5. Less than 0.2% of the area affected by Canadian oil sands mining has been reclaimed, and none restored to its original state (Government of Alberta 2014).

The oil sands industry's claim—widely seen in industry advertisements—that its mine sites can be restored to their former natural state is not true. Indeed, the claim is at odds with the industry's own reclamation plans filed with the Alberta government (Rooney et al. 2012). Recently published studies find that intensive disturbances associated with oil sands mining change fundamental biological processes, making it impossible to fully restore the affected wetlands, peatlands, and boreal forest, now or in the future (Foote 2012, Johnson and Miyanishi 2008). Conversion of the boreal forest alongside other disturbances from oil sands development has led to the decline of federally threatened species such as bison and woodland caribou and important subsistence food species such as moose in addition to the ecosystem-wide effects addressed in Reason 4 (Gates et al. 1992, Dyer et al. 2001, McLoughlin et al. 2003, Sorensen et al. 2008, Morgan and Powell 2009, Boutin et al. 2012, Stewart and Komers 2012). The few

[§] Multiple independent expert review panels (Environment Canada 2010, Royal Society of Canada 2010, Dillon et al. 2011, RAMP 2011) have found that the largest monitoring program, the Regional Aquatic Monitoring Program, was unable to definitively assess oil sands industrial impacts due to poor scientific design and lack of data (Kirk et al. 2014).

^{**} For example, in 2012 the Canadian government finalized the Lower Athabasca Regional Plan, which recommended that 22% of the region be set aside for conservation. At current rates of forest disturbance, the 22% threshold will be crossed within the next 2-7 years, and 100% of the region would be disturbed by 2028 (Government of Alberta 2012, Komers and Stanojevic 2013).

attempts to reclaim mined lands have produced landscapes that bear little resemblance to what was there previously and contain only a fraction of the historical biological diversity (Rooney and Bayley 2011, Rooney et al. 2012, Kovalenko et al. 2013).

Reason 6. Development and transport of oil sands is inconsistent with the title and rights of many Aboriginal Peoples of North America.

Rapid expansion of the oil sands in Canada violates or puts at risk nation-to-nation agreements with Aboriginal peoples. In Alberta, oil sands mining is contributing to the degradation and erosion of treaty and constitutionally protected rights by disrupting ecological landscapes critical to the survival of Aboriginal culture, activities, livelihoods, and lifeways (Passelac-Ross and Potes 2007, Foote 2012, ACFN). In the US, proposed infrastructure projects threaten to undermine Treaty agreements between the federal government and Native American tribes (Mufson 2012, Hart 2014). In both countries, contamination of sacred lands and waters, disruption of cultural sites, lack of consultation, and long-term effects of climate change undermine sustainable social, ecological, and economic initiatives involving Aboriginal peoples across the continent and constitute violations of Native sovereignty (Passelac-Ross and Potes 2007, Foote 2012, Mufson 2012, Hart 2014, Irvine et al. 2014, McLachlan 2014, Wohlberg 2014, Athabasca Chipewyan First Nation, Tsleil-Wautath Nation).

Reason 7. What happens in North America will set a precedent for efforts to reduce carbon pollution and address climate warming elsewhere.

The choices we make about the oil sands will reverberate globally, as other countries decide whether or how to develop their own large unconventional oil deposits (Balouga 2012). Strong North American leadership is needed now, because the impacts of current decisions will be felt for decades and centuries.

Reason 8. Controlling carbon pollution will not derail the economy.

Most leading economists now agree that limits on carbon pollution – using mechanisms such as carbon taxes, cap-and-trade systems, or regulations – can facilitate a transition over several decades to low-emission energy without a dramatic reduction in global economic growth (Global Energy Assessment 2012, IPCC 2014, Nordhaus 2014).

Reason 9. Debates about individual pipeline proposals underestimate the full social costs of the oil sands, and existing policies ignore cumulative impacts.

These are not simply business decisions. Responsible policies should address the interwoven, system-wide impacts of oil sands development, from mines and refineries, to pipelines, rail and tanker traffic, to impacts on economies and the global climate system. Current laws, regulations, and policies are not designed to assess cumulative impacts (Johnson and Miyanishi 2008, Office of the Auditor General of Canada 2011).^{††} When oil sands development is viewed as an

^{††} Land use and regulatory decisions are considered lease-by-lease with no single agency responsible for oversight, accounting of cumulative impacts, or information flow. For example, decisions regarding mineral rights are made by Alberta Energy, those for timber by Alberta Sustainable Resource Development, while Alberta Environment decides on water and air impacts, and the National Energy Board decides on pipeline and rail transport of oil sands products (Johnson and Miyanishi 2008).

integrated whole, the costs and benefits of individual decisions can be evaluated responsibly (Chan et al. 2014).

Reason 10. A majority of North Americans want their leaders to address climate change, and they are willing to pay more for energy to help make that happen.

Surveys of public opinion over the last two decades have found increasing public support for effective actions to prevent climate change. An overwhelming majority of North Americans now support government action to address climate change, even when these actions result in modest increases to energy costs (Bloomberg 2014; New York Times/Stanford University 2015).

The time is now

We believe the time has come for scientists to speak out about the magnitude and importance of the oil sands issue and to step forward as participants in an informed and international public dialogue. Working together, we can solve the energy problems before us. It is not too late, but the time to act is now.

Signed (Authors in alphabetical order),

Thomas Homer-Dixon, PhD,
Professor, Balsillie School of
International Affairs, University of
Waterloo.

Mark Jaccard[§], PhD, Professor,
School of Resource and
Environmental Management, Simon
Fraser University

Ken Lertzman, PhD, Professor,
School of Resource and
Environmental Management, Simon
Fraser University

Wendy J. Palen, PhD, Professor,
Department of Biological Sciences,
Simon Fraser University

Maureen E. Ryan, PhD, Research
Associate, School of Resource and
Environmental Management and
Department of Biological Sciences,
Simon Fraser University

Anne Salomon, PhD, Professor,
School of Resource and
Environmental Management, Simon
Fraser University

Thomas D. Sisk, PhD, Professor and
Olajos-Goslow Chair of
Environmental Science and Policy,
School of Earth Science and
Environmental Sustainability,
Northern Arizona University

* Laureate, Nobel Prize

§ Fellow, Royal Society of Canada

° Member, US National Academy of Science

^ Recipient, Order of Canada

Co-signed (Signatories in alphabetical order),

John P. Abraham, PhD, Professor of Thermal Sciences, School of Engineering, University of St. Thomas

Kenneth J. Arrow* °, PhD, Professor of Economics Emeritus, Stanford University

Anthony D. Barnosky, PhD, Professor, Department of Integrative Biology, University of California, Berkeley

Suzanne E. Bayley, PhD, Professor Emeritus, Department of Biological Sciences, University of Alberta

Elena Bennett, PhD, Professor, Department of Natural Resource Sciences, School of Environment, McGill University

Fikret Berkes, PhD, Distinguished Professor and Canada Research Chair, Natural Resources Institute, University of Manitoba

Louis Bernatchez[§], PhD, Professor, Department of Biology, Université Laval

Steven Bernstein, PhD, Professor, Department of Political Science, University of Toronto

Jules M. Blais, PhD, Professor, Department of Biology, University of Ottawa

P. Dee Boersma, PhD, Professor, Department of Biology, University of Washington

Michael Byers, PhD, Professor and Canada Research Chair in Global Politics and International Law, University of British Columbia

James M. Byrne, PhD, Professor, Department of Geography, University of Lethbridge

Stephen R. Carpenter[°], PhD, Stephen Alfred Forbes Professor of Zoology, University of Wisconsin-Madison

Kai Chan, PhD, Professor and Canada Research Chair in Biodiversity and Ecosystem Services, University of British Columbia

F. Stuart Chapin III[°], PhD, Professor Emeritus, Institute of Arctic Biology, University of Alaska Fairbanks

Christiane Charest, PhD, Professor, Department of Biology, University of Ottawa

Jonathan Cole[°], PhD, Distinguished Senior Scientist Emeritus, Cary Institute of Ecosystem Studies

Scott L. Collins, PhD, Regents' Professor of Biology, Department of Biology, University of New Mexico

Robert Costanza, PhD, Professor and Chair of Public Policy, Crawford School of Public Policy, Australian

National University

Isabelle Côté, PhD, Professor,
Department of Biological Sciences,
Simon Fraser University

Ashlee Cunsolo Willox, PhD,
Professor and Canada Research
Chair in Determinants of Healthy
Communities, Department of
Nursing and Indigenous Studies,
Cape Breton University

Chris Darimont, PhD, Professor and
Hakai-Raincoast Conservation
Scholar, Department of Geography,
University of Victoria

Gretchen Daily^o, PhD, Bing
Professor in Environmental Science
and Director, Center for
Conservation Biology, Stanford
University

Lawrence Dill^s, PhD, Professor
Emeritus, Department of Biological
Sciences, Simon Fraser University

Peter J. Dillon^s, PhD, Professor,
Environmental and Resource
Studies, Chemistry, Trent University

Simon Donner, PhD, Professor,
Department of Geography,
University of British Columbia

Nicholas K. Dulvy, PhD, Professor
and Canada Research Chair in
Marine Biodiversity and
Conservation, Department of
Biological Sciences, Simon Fraser
University

Jérôme Dupras, PhD, Professor,
Department of Natural Sciences,
Researcher, Institut des sciences de

la forêt tempérée, Université du
Québec en Outaouais

Anne H. Ehrlich, Honorary
Doctorate, Senior Research Scientist
Emerita, Department of Biological
Sciences, Stanford University

Paul R. Ehrlich^o, PhD, Bing
Professor of Population Studies and
President, Center for Conservation
Biology, Stanford University

James Estes^o, PhD, Professor,
Ecology and Evolutionary Biology,
University of California, Santa Cruz

Dr. Marie-Josée Fortin, Professor
Dept of Ecology & Evolutionary
Biology, University of Toronto

Jerry F. Franklin, PhD, Professor,
College of Forest Resources,
University of Washington

Leah Gerber, PhD, Professor and
Director, Center for Biodiversity
Outcomes, School of Life Sciences,
Arizona State University

Andrew Gonzalez, PhD, Professor,
Department of Biology, McGill
University

Stephanie J. Green, PhD, Research
Associate, Department of Zoology,
Oregon State University

Nick M. Haddad, PhD, William Neal
Reynolds Professor of Biological
Sciences, North Carolina State
University

Elizabeth A. Hadly, PhD, Paul S. and

Billie Achilles Professor in
Environmental Biology, Stanford
University

James Hansen^o, PhD, Former
Director, NASA Goddard Institute
for Space Studies; Director of
Climate Science, Awareness and
Solutions Program, Columbia
University Earth Institute

Kathryn Harrison, PhD, Professor of
Political Science, University of
British Columbia

John Harte, PhD, Professor, Energy
and Resources Group, University of
California, Berkeley

Danny Harvey, PhD, Professor,
Department of Geography,
University of Toronto

Sarah E. Hobbie^o, PhD, Professor,
Department of Ecology, Evolution
and Behavior, University of
Minnesota

Matthew J. Hoffmann, PhD,
Professor, Department of Political
Science, University of Toronto

C.S. (Buzz) Holling^{s ^}, PhD,
Emeritus Professor, University of
Florida

David W. Inouye, PhD, Professor
Emeritus, Department of Biology,
University of Maryland

David Keith, PhD, Gordon McKay
Professor of Applied Physics, School
of Engineering and Applied Sciences,
Harvard University

Stefan Kienzle, PhD, Professor,
Department of Geography,
University of Lethbridge

Karen Kohfeld, PhD, Professor and
Canada Research Chair in Climate,
Resources and Global Change,
School of Resource and
Environmental Management, Simon
Fraser University

Petr Komers, PhD, Adjunct
Professor, Department of Biological
Sciences, University of Calgary

Joshua Kurek, PhD, Professor,
Department of Geography and
Environment, Mount Allison
University

René Laprise, PhD, Professor,
Département des sciences de la Terre
et de l'atmosphère, Université du
Québec à Montréal

Dana Lepofsky, PhD, Professor,
Department of Archaeology, Simon
Fraser University

Simon A. Levin^o, PhD, George M.
Moffett Professor of Biology,
Department of Ecology and
Evolutionary Biology, Princeton
University

Gene E. Likens^o, PhD, Founding
President Emeritus, Cary Institute of
Ecosystem Studies

Shaun Lovejoy, PhD, Professor,
Physics Department, McGill
University

Thomas E. Lovejoy, PhD, Professor,
Environmental Science and Policy,
George Mason University

Michael E. Mann, PhD,
Distinguished Professor of
Meteorology and Director of Earth
System Science Center, The
Pennsylvania State University

Shawn Marshall, PhD, Professor and
Canada Research Chair in Climate
Change, Department of Geography,
University of Calgary

Damon Matthews, PhD, Professor,
Geography, Planning and
Environment, Concordia University

Gordon McBean^{§ ^}, PhD, Professor
and Director, Centre for
Environment and Sustainability,
Department of Geography,
University of Western Ontario

Christian Messier, Ph.D.
Professor, Département des sciences
biologiques, Université du Québec à
Montréal, and Département des
sciences naturelles, Université du
Québec en Outaouais

David R. Montgomery, Professor of
Geomorphology, Department of
Earth and Space Sciences, University
of Washington

Arne Mooers, PhD, Professor,
Department of Biological Sciences,
Simon Fraser University

Harold A. Mooney^o, PhD, Paul S.
Achilles Professor of Environmental
Biology, Woods Institute for the
Environment, Stanford University

Barry R. Noon, PhD, Professor,
Department of Fish, Wildlife, and
Conservation Biology, Colorado
State University

Gordon H. Orians^o, Professor
Emeritus, Department of Biology,
University of Washington

Sarah P. Otto^{§ o}, PhD, Professor,
Director, Centre for Biodiversity
Research, University of British
Columbia

Robert T. Paine^o, PhD, Professor
Emeritus, Department of Biology,
University of Washington

Paul Paquet, PhD, Adjunct
Professor, Department of
Geography, University of Victoria

Edward A. Parson, PhD, Dan and
Rae Emmett Professor of
Environmental Law, University of
California, Los Angeles

Catherine Potvin, PhD, Professor and
Canada Research Chair in Climate
Change Mitigation and Tropical
Forests, Trottier Institute for Science
and Public Policy, McGill University

Mary E. Power^o, PhD, Professor,
Department of Integrative Biology,
University of California, Berkeley

H. Ronald Pulliam, PhD, Regents'
Professor Emeritus, Odum School of
Ecology, University of Georgia

Lynne Quarmby, PhD, Professor,
Department of Molecular Biology
and Biochemistry, Simon Fraser
University

Peter H. Raven^o, President Emeritus,
Missouri Botanical Garden

Mary Reid, PhD, Professor,
Biological Sciences and
Environmental Science Program,
University of Calgary

Rebecca C. Rooney, PhD, Professor,
Department of Biology, University
of Waterloo

Benjamin D. Santer^o, PhD,
Atmospheric Scientist, Lawrence
Livermore National Laboratory

Daniel E. Schindler, PhD, Professor
and Harriet Bullitt Chair in
Conservation, School of Aquatic and
Fishery Sciences, University of
Washington

David W. Schindler^{s o ^}, PhD,
Killam Memorial Professor of
Ecology, Department of Biological
Sciences, University of Alberta

William H. Schlesinger^o, PhD,
President Emeritus, Cary Institute of
Ecosystem Studies

Dolph Schluter^s, PhD, Professor and
Canada Research Chair, Department
of Zoology, University of British
Columbia

Jonathan B. Shurin, PhD, Professor,
Behavior and Evolution, Division of
Biological Sciences, University of
California, San Diego

John P. Smol^{s ^}, PhD, Professor and
Canada Research Chair in
Environmental Change, Department
of Biology, Queen's University

Brian Starzomski, PhD, Ian
McTaggart-Cowan Professor, School
of Environmental Studies, University
of Victoria

Thomas W. Swetnam, PhD, Regents'
Professor, Laboratory of Tree-Ring
Research, University of Arizona

Joshua Tewksbury, PhD, Professor,
Department of Biology, University
of Washington, and Director, Luc
Hoffmann Institute

Nancy Turner^{s ^}, PhD, Distinguished
Professor and Hakai Professor in
Ethnoecology, School of
Environmental Studies, University of
Victoria

Peter Vitousek^o, PhD, Clifford G.
Morrison Professor in Population
and Resource Studies, Department of
Biology, Stanford University

Andrew Weaver^s, PhD, Lansdowne
Professor, School of Earth and
Ocean Sciences, University of
Victoria

Gail Whiteman, PhD, Professor and
Rubin Chair of Sustainability,
Lancaster University, UK

David S. Wilcove, PhD, Professor,
Woodrow Wilson School and
Department of Ecology and
Evolutionary Biology, Princeton
University

George M. Woodwell^o, PhD,
Distinguished Scientist, NRDC

Founder and President Emeritus
Woods Hole Research Center

Erika S. Zavaleta, PhD, Professor,
Pepper-Giberson Chair,
Environmental Studies, University of
California, Santa Cruz

Kirsten Zickfeld, PhD, Professor,
Department of Geography, Simon
Fraser University

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