

# Sport and the Environment

Politics and Preferred Futures

Research in the Sociology of Sport

[vol 13]

Edited by **Brian Wilson and Brad Millington**



# SPORT AND THE ENVIRONMENT

This page intentionally left blank

RESEARCH IN THE SOCIOLOGY OF SPORT  
VOLUME 13

# **SPORT AND THE ENVIRONMENT: POLITICS AND PREFERRED FUTURES**

EDITED BY

**BRIAN WILSON**

*University of British Columbia, Canada*

**BRAD MILLINGTON**

*Brock University, Canada*



United Kingdom – North America – Japan  
India – Malaysia – China

Emerald Publishing Limited  
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2020

Copyright © 2020 Emerald Publishing Limited

**Reprints and permissions service**

Contact: [permissions@emeraldinsight.com](mailto:permissions@emeraldinsight.com)

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

**British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

ISBN: 978-1-78769-030-1 (Print)

ISBN: 978-1-78769-029-5 (Online)

ISBN: 978-1-78769-031-8 (Epub)

ISSN: 1476-2854 (Series)



ISOQAR certified  
Management System,  
awarded to Emerald  
for adherence to  
Environmental  
standard  
ISO 14001:2004.

Certificate Number 1985  
ISO 14001



INVESTOR IN PEOPLE

# CONTENTS

<i>About the Authors</i>	vii
<i>Acknowledgments</i>	xi
<b>Chapter 1: Introducing a Sociological Approach to Sport, Environmental Politics, and Preferred Futures</b>	1
<i>Brian Wilson and Brad Millington</i>	
<b>Chapter 2: Sport, International Development and Sustainable Futures: History, Policy, and Potential</b>	29
<i>Rob Millington, Simon C. Darnell and Tavis Smith</i>	
<b>Chapter 3: Extractives Industry and Sport for Development: How Is Right to Play Promoting Environmental Sustainability in Indigenous Communities in Canada?</b>	47
<i>Nicolien van Luijk, Audrey R. Giles and Lyndsay M. C. Hayhurst</i>	
<b>Chapter 4: Witness, Adventure, and Competing Discourses of the North</b>	67
<i>Bruce Erickson</i>	
<b>Chapter 5: Restor(y)ing Place: Indigenous Land-based Physical Cultural Practices as Restorative Process in Fisher River Cree Nation (<i>Ochékwi Sipi</i>)</b>	85
<i>Moss E. Norman, Michael Hart and Gerald Mason</i>	
<b>Chapter 6: Animals, Sport, and the Environment</b>	103
<i>Kass Gibson</i>	
<b>Chapter 7: Political Ecologies and Environmental Considerations in Stadium Development</b>	123
<i>Kyle S. Bunds, Christopher M. McLeod and Joshua I. Newman</i>	

<b>Chapter 8: Mobility of Sustainability Policy: Sledding Tracks in the Nagano and PyeongChang Olympics</b> <i>Kyong-yim Kim</i>	137
<b>Chapter 9: Surfing and Environmental Sustainability</b> <i>Belinda Wheaton</i>	157
<b>Chapter 10: Reflections on an Attempt to Do “Environmental Sports Journalism”: The Behind-the-Scenes Story of the Documentary <i>Mount Gariwang: An Olympic Casualty</i></b> <i>Liv Yoon and Brian Wilson</i>	179
<b>Chapter 11: Making Our Footprint: Constraints in the Legitimization of Sport Ecology in Practice and the Academy</b> <i>Brian P. McCullough and Timothy Kellison</i>	199
 <i>Index</i>	 217

## ABOUT THE AUTHORS

**Kyle S. Bunds** is an Assistant Professor of Sport and Sustainable Community Development at NC State University. He studies Sport and the Environment, broadly conceived. His research has been published in journals such as *Sustainability*, *Transportation Research Part D*, *Transportation Research Part F*, and *Sociology of Sport Journal*.

**Simon C. Darnell** is an Assistant Professor in the Faculty of Kinesiology and Physical Education at the University of Toronto, Canada. His research focuses on the relationship between sport, international development and peacebuilding, the development implications of sports mega events, and the place of social activism in the culture of sport.

**Bruce Erickson** is an Assistant Professor of Geography at the University of Manitoba. His work focuses on the colonial and cultural politics of outdoor recreation and tourism in Canada. He is the author of *Canoe Nation: Nature, Race and the Making of a Canadian Icon*.

**Kass Gibson** is an Associate Professor at Plymouth Marjon University, UK, where he teaches research methods, social theory, and pedagogy. His research uses a range of sociological theories and research methodologies to understand experiences and practices in research, physical activity, and public health.

**Audrey R. Giles** is a Full Professor in the School of Human Kinetics at the University of Ottawa. An applied anthropologist, she conducts primarily community-based research with Indigenous communities. She is interested in the nexus between gender/culture/place.

**Michael Hart** is a citizen of Fisher River Cree Nation, is the Vice Provost of Indigenous Engagement at the University of Calgary. Michael's research interests are focused on Indigenous Knowledges, particularly in relation to Indigenous ways of healing and well-being. He has been involved with the SSHRC-funded Indigenous Wellbeing of Boys and Men project since 2014.

**Lyndsay M. C. Hayhurst** is an Assistant Professor in the School of Kinesiology and Health Science at York University. Her research interests include sport for development and peace, cultural studies of girlhood, postcolonial feminist theory, and corporate social responsibility. She has previously worked for the United Nations Development Programme and Right to Play.



**Timothy Kellison**, PhD, is Director of the Center for Sport and Urban Policy and Assistant Professor at Georgia State University (Atlanta, Georgia USA). His research is primarily focused on sport in urban environments, with special emphasis in sport ecology, public policy, and urban and regional planning.

**Kyoung-yim Kim** is an Assistant Professor of the Practice of Social Science in the Department of Sociology and Women's and Gender Studies at Boston College, USA. Her research focuses on sport's transnational power relations in environmentalism, civic solidarity and activism, labor migration, and media.

**Gerald Mason** is a member of Fisher River Cree Nation. He is a land-based educator at Fisher River High School and is a collaborator on the Indigenous Wellbeing of Boys and Men project. Gerry was recently recognized for his outstanding contributions to youth mentorship with an *Indspire Indigenous Education Award (2015)*.

**Brian P. McCullough**, PhD, is an Associate Professor in the Department of Health and Kinesiology at Texas A&M University (College Station, Texas, USA). He is also the codirector of the Sport Ecology Group. Dr McCullough has published his work in *Sport Management Review*, *Journal of Sport Management*, and *European Sport Management Quarterly*.

**Christopher M. McLeod** is an Assistant Professor in the Department of Kinesiology & Sport Management at Texas Tech University. He studies labor issues and ecology in sport. His research has been published in journals such as *Sociology of Sport Journal* and *Journal of Sport Management*.

**Brad Millington** is an Associate Professor in the Department of Sport Management at Brock University. His research interests lie with sport and sustainability and with health and fitness technologies. He is coauthor of *The Greening of Golf: Sport, Globalization, and the Environment* (with Brian Wilson), and author of *Fitness, Technology & Society: Amusing Ourselves to Life*.

**Rob Millington** is an Assistant Professor in the Department of Kinesiology at Brock University, Canada. His research focuses on how international NGOs such as the United Nations and the International Olympic Committee mobilize sport for sustainable development in policy and practice in both historical and contemporary contexts.

**Joshua I. Newman** is a Professor in the Department of Sport Management at Florida State University. His research manuscripts have been featured in *The Sage Handbook of Qualitative Research*, *Cultural Studies ↔ Critical Methodologies*, *American Behavioral Scientist*, *Journal of Sport and Social Issues*, and *Sociology of Sport Journal*.

**Moss E. Norman**, a fourth-generation white settler, is an Assistant Professor in the School of Kinesiology at the University of British Columbia. He is the Principal Investigator on the Indigenous Wellbeing of Boys and Men project,

which was funded by the Social Sciences and Humanities Research Council (SSHRC).

**Tavis Smith** is a PhD candidate in the Faculty of Kinesiology and Physical Education at the University of Toronto, Canada. His research focuses on the relationship between sport, well-being, and social change, sport and sustainability, and the role of sport and recreation in processes of settler colonialism and decolonization.

**Nicolien van Luijk** is a Postdoctoral Research Fellow in the Department of Geography at the University of Ottawa. Her research interests include sport for development, human rights, and sport mega events, and the impacts of climate change on Indigenous communities in Canada.

**Belinda Wheaton** is a Professor in the School of Health, University of Waikato, Aotearoa/New Zealand. Belinda is best known for her research on informal and lifestyle sport cultures including *The Cultural Politics of Lifestyle Sports*, (Routledge, 2013). She is co-editor of *Leisure and the Politics of the Environment* (Routledge, 2014). Belinda is Managing Editor of *Annals of Leisure Research*.

**Brian Wilson** is a Professor in the School of Kinesiology and Director of the Centre for Sport and Sustainability at the University of British Columbia. He coauthored *The Greening of Golf: Sport, Globalization and the Environment* (with Brad Millington), authored *Sport & Peace: A Sociological Perspective*, and coedited *Sport and Physical Culture in Canadian Society* (with Jay Scherer).

**Liv Yoon** is a postdoctoral fellow at the Earth Institute at Columbia University, studying social and political dimensions of climate change. She obtained her PhD at The University of British Columbia in Canada where she studied intersections of environmental politics, communication, and social inequality surrounding an Olympic-related development project.

This page intentionally left blank

## ACKNOWLEDGMENTS

Many thanks are owed to many people who helped make this book possible. We begin, of course, with the authors who generously contributed their expertise and valuable time to the chapters of this collection. We especially appreciate the range of compelling attempts these authors made to bridge analyses of sport-related environmental issues with considerations of “what a preferred future might look like.” As we discuss in our introductory chapter, we think these kinds of efforts are a necessary part of a sociological response to pressing environment-related problems – sport-related and otherwise.

We are also grateful to Kevin Young, the series editor for Emerald Publishing’s *Research in the Sociology of Sport* book series, whose ongoing assistance and engagement with this project has been invaluable to us. The range of supporters at Emerald Publishing also deserves recognition here for their help at the various stages.

Thanks are also owed to several anonymous reviewers who offered incisive and useful feedback on the chapters – feedback that informed our comments to authors and in some cases important chapter revisions.

Finally, and crucially, we offer our immense gratitude to our families (Desirée and Bailey, for Brian; and Katie, Freda and Theo, for Brad) for their support, patience, and love throughout this editing journey and everything else.

This page intentionally left blank

## Chapter 1

# INTRODUCING A SOCIOLOGICAL APPROACH TO SPORT, ENVIRONMENTAL POLITICS, AND PREFERRED FUTURES

Brian Wilson and Brad Millington

What are environmental politics, and what do they have to do with sport? What compelling reasons are there for including sport within broader conversations about environmental issues and how to respond to these issues? What role might sport play in a more environmentally friendly society – and what preferred futures might we imagine, and have been imagined, for environmentally friendly sport?

These are the questions that underlie this book, *Sport and the Environment: Politics and Preferred Futures*. Because this book is couched in the sociology of sport sub-discipline, as part of Emerald Publishing's *Research in the Sociology of Sport* book series, materials included here pertain also, and especially, to key sociological questions around (in)equity, power relations and social and environmental change. Although sociology has not always been an ideal starting place for exploring environmental issues – recognizing that questions about *human* lived experiences and societal structures have usually guided the field, that anthropocentric assumptions have and still underpin prominent sociological theories and research, and that many sociologists have operated 'as though nature didn't matter' (Murphy, 1995, p. 688)<sup>i</sup> – the relatively new field of environmental sociology has evolved considerably in recent years (Young, 2015).

Acknowledging this, a strength of a sociological perspective on sport-related environmental issues is that it offers an excellent departure point from which to: (1) examine and assess assumptions that underlie status quo responses to environmental issues and sport's relationships with these issues; (2) consider how key decisions on the environment are necessarily *political* decisions, meaning they are

---

**Sport and the Environment**  
**Research in the Sociology of Sport, Volume 13, 1–28**  
Copyright © 2020 Emerald Publishing Limited  
All rights of reproduction in any form reserved  
ISSN: 1476-2854/doi:10.1108/S1476-28542020000013001

influenced by people with diverse views on whether and how pro-environment action should unfold, though they are also affected by non-human factors, like heat, storms, avalanches and floods, that might compel people into action; and (3) imagine what *preferred futures* could look like for relationships between sport and the environment, and consider how sociological analysis and critique may inform and enable strategic attempts to pursue such a future.

In fact, by engaging with questions about sport, politics and preferred futures throughout this book, the aim is to get to the core of one of the most perplexing issues underlying the climate crisis and related environmental problems. The issue is this: *despite knowing that the consequences of not taking environmental issues seriously enough could be cataclysmic, responses to sport-related environmental issues have still been shown in many cases to be surprisingly weak, hollow and half-hearted.* For example, responses from the sport industry commonly prioritize economic concerns over environmental concerns, and place immense faith in innovation- and technology-based responses over less environmentally risky responses (responses like holding fewer sport events overall, and prioritizing only environmentally friendly versions of sport – see [Miller, 2018](#); [Wilson & Millington, 2013, 2015](#)).

Put another way, and while it is clear why, from a shorter-term economic perspective, reducing the number of spectator sport events and encouraging much less sport-related travel have not been prioritized by those mandated to organize, manage and promote sport events, questions remain about *what kind of warning it would take for measures that are truly environmentally friendly to be forced onto the agenda by those who prioritize environmental and public health.* It has already been convincingly argued, for example, that if global warming is not kept below 1.5 °C – a level that would prevent some of the feedback cycles associated with glacial and permafrost melting in the Arctic, rising sea levels and coral reef destruction – that food scarcities, water shortages, extreme weather conditions and other related consequences are likely ([Hoegh-Guldberg et al., 2018](#); [Romm, 2016](#)). The Intergovernmental Panel on Climate Change (IPCC) asserts that urgent, aggressive and unprecedented societal changes are necessary to address climate change if we are to avoid dire environmental consequences for humans and non-humans alike – and thus dire social and economic consequences for humans as well ([Hoegh-Guldberg et al., 2018](#); [Schellnhuber et al., 2012](#)). The World Health Organization states that ‘climate change is expected to cause approximately 250,000 additional deaths per year between 2030 and 2050; 38,000 due to heat exposure in elderly people, 48,000 due to diarrhoea, 60,000 due to malaria, and 95,000 due to childhood undernutrition’ ([WHO Factsheet, n.d.](#); see [WHO, 2014](#)).

*What more do we need to know?* With this question in mind, the argument that underlies this book is that more potent warnings along with more information about existing environmental issues – while still crucial for monitoring and engaging with the diversity and complexity of climate change – would seem to be only part of the answer to the question of ‘what it would take’ for necessary changes in and around sport to take place. Put simply, maybe ‘knowing more’ is not all that is needed.

Specifically, we suggest that it is worth considering – and we asked authors of chapters in this book to consider this too – *how knowledge about sport-related environmental problems might be complemented by attempts to ‘imagine’ what a better future could look like, and the steps we might take to get there.* This imaginative thinking might in one sense inform action on environmental issues, while in another sense it might instil a sense of hopefulness. The latter is important given the view among social movement scholars and others that hope, and a belief that change is possible, are necessary precursors to action for many people (Li & Monroe, 2019; Lueck, 2007; Ojala, 2012). In this case, generating hope is exceedingly important as a way of unsettling and moving through feelings of ambivalence to environmental issues – feelings that may emerge from ongoing exposure to the ominous messages we often see and hear about the state of the world’s environmental problems and the seemingly insurmountable barriers we seem to face in dealing with these problems (Li & Monroe, 2019; Lueck, 2007; Ojala, 2012).

Later in this introductory chapter we will consider a concrete sociological approach to pursuing preferred futures and generating hope for radically positive social and environmental change by drawing from the work of sociologist Erik Olin Wright. At this point, however, and as an invitation to begin thinking about the value of social and environmental ‘dreaming’, we turn initially to intriguing and lively arguments offered by Steven Duncombe in his 2007 book *Dream: Re-imagining Progressive Politics in an Age of Fantasy*. Therein, Duncombe encourages readers to think ambitiously, radically and playfully about what a preferred future looks like and how we might get there. He suggests breaking ties with what might be seen as ‘realistic’ directions and solutions, and aim instead to be inventive and experimental in how we pursue progressive political goals of various kinds, and to consider along the way how we might ethically utilize and incorporate forms of popular culture and spectacle in the process.

Duncombe’s arguments, we think, challenge us to consider how critiques of the status quo might be complemented by attempts to devise alternative forms of political and civic engagement. Of particular relevance to this book, his arguments also compel us to explore the unique and powerful role that cultural forms like sport can play in addressing some of the most pressing issues of our times. It would seem, in light of the environmental issues we currently face, that this kind of thinking is not just an exercise in creativity, but a necessity.

## **INTRODUCING A SOCIOLOGICAL APPROACH TO SPORT, ENVIRONMENTAL POLITICS AND PREFERRED FUTURES: FEATURES OF THIS CHAPTER**

This collection includes chapters that, in different ways, work to enhance understandings of relationships between sport, environmental issues, and politics – and encourage thinking about ‘preferred’ ways to respond to well-known and emergent environmental concerns. As an introduction and departure point, we spend the remainder of this chapter engaging with some of the



core topics in this area of study. We also foreshadow how these topics are dealt with in upcoming chapters.

We begin by answering the question, why sport? Why is it worth focussing on links between sport and environmental issues? To do this, we consider why sport is an interesting topic of study in relation to ‘crises’ more generally, and follow this with an outline of the relationship between sport and the environment, concentrating especially on how environmental issues impact on sport and how sport impacts on the environment.

We next consider some of the sociological tools that can help us better understand how sport industry members and others have responded to environmental concerns, and segue from there to an outline of links between sport, sociology and environmental politics. Following this, we spend time engaging directly with our interest in ‘preferred futures’, drawing especially on Wright’s conception of ‘real utopias’ and his sociological approach to envisioning circumstances and projects that represent ‘the future (we think) we want’. To help illuminate Wright’s hopeful, yet practical, strategy, we offer a short example of a vision for a preferred sporting future that emerged from our own research on golf and environmental issues. We conclude this chapter by introducing the rest of the book.

### *Environmental Issues and Inequities*

First, though, we will establish how many of the environmental issues raised in subsequent chapters can be understood as matters of inequity (following [Maguire, Jarvie, Mansfield, & Bradley, 2002](#)). In the first instance, *intergenerational inequity* refers to how the environment-related activities of current generations may negatively impact future generations – recognizing that future generations have no input in decisions taken in the present, such as whether or not to impose a carbon tax on industry in an effort to limit emissions. There is also *intra-generational inequity*, which refers to how differently positioned social groups are impacted unevenly by environmental changes – recognizing in this case that those with access to more economic and social resources, and with more and better options for geographic mobility, will be better positioned to deal with changes of this kind.

Relatedly, there is *transfrontier inequity*, which refers to geographic distinctions in the impacts of climate change, and how certain physical regions of the globe are more vulnerable than others to environmental disasters, pollution and forms of ground or air contamination, climate-related food and water shortages, and/or the broader impacts of global warming (e.g. dangerously high heat – see [Romm, 2016](#)). Finally, *interspecies inequity* refers to the impacts of climate change on non-humans of various kinds (plants, animals, ecosystems), and the fact that non-humans do not have a ‘say’ in their plight (at least on equal terms with people).

The relevance of these inequities to issues raised in subsequent chapters, and to sport-related environmental issues more generally, will become evident as you read on.

## WHY SPORT? SEEING SPORTS AS ‘TRANSITIONAL PRACTICES’ AND ‘INDICATOR PRACTICES’ IN A TIME OF ENVIRONMENTAL CRISIS

While there are compelling reasons to include sport in conversations about environmental issues, it is instructive first to consider the meanings that are sometimes attributed to sport in times of crisis (e.g. in moments of unrest or following a catastrophic event).<sup>ii</sup> For example, in the midst of World War II, US President Franklin D. Roosevelt famously sent the ‘green light letter’ to Major League Baseball, encouraging the league to continue play even as the war continued (referred to in [Chidester, 2009](#)). Similarly, following September 11, attendance at sport events was promoted by government officials and others as, on the one hand, a way of ‘getting back to normal’, and on the other hand, a way of demonstrating unity and inciting collective comfort and courage.

As [King \(2008\)](#), [Silk \(2013\)](#) and others have noted, looking closely at sport’s role in moments of crisis reveals efforts at reproducing and promoting dominant societal values. ‘Getting back to normal’ can easily be equated, for example, with ideological aims of promoting the consumption of sport, showcasing hyper-nationalism and, at times, being complicit about sport-military-corporate linkages. Even so, sport spectatorship and participation might well be a form of escape, catharsis, comfort and/or a way of feeling a sense of collective belonging in difficult times.

In this sense, we are reminded here of how scholars have sometimes seen involvement in certain sports – especially sports associated with peak experiences and a high sense of agency – as a response to feelings of disembeddedness and normative uncertainty in risk societies (see [Atkinson & Young, 2008](#)). Said otherwise, the point that sport can give people *something to do*, and a sense that *one is doing something*, in moments of crisis is relevant, we would argue, in the case of the climate crisis. Attending a sport event or participating in a sport activity that has negative environmental impacts would be an ironic response to concerns about environmental problems since doing so would seem to, in a small way at least, make the situation worse. At the same time though, and more positively, there is evidence that sport can, in some ways, be leveraged for environmental good – a point we discuss later on.

With these ideas in mind, we turn here to [Howe’s \(2019\)](#) recent study on the development of wind power in parts of Mexico, where she considers how people seem to cling to particular comfort objects, or ‘transitional objects’, in moments of environmental crisis. In this instance, Howe’s use of ‘transitional object’ is a direct reference to the term that traditionally implies objects like blankets that toddlers cling to as they adapt to difficult transitions of their own. For Howe, this type of clinging was true in her research on transitions to cleaner energy, as she found there was an ongoing, prominent and ironic place for gas fuelled trucks during this transition. With Howe’s research in mind, environmentally impactful sport mega-events might be seen, in similar fashion, as what we will call

*transitional practices* – practices that people also seem to cling to through other transitions. These transitional practices might themselves be in the process of undergoing transitions as sport is made to be more environmentally friendly.

Additionally, and while we do not know for sure what meanings all spectators and participants give to sport, it is at least useful for our purposes to consider what is revealed through a close look at sport during and after moments of crisis. This might show, for example, how sport has ramifications beyond the playing field. It might equally show how sport stands as a barometer of sorts by reflecting what is happening in the wider society.

The latter possibility calls to mind Howe's (2019) concept of the 'indicator machine' to describe the role of trucks in her study. Howe (2019) explains what is meant by an 'indicator' in this context:

An indicator, by definition, is not a measure that accounts for quantitative presence. Instead, it is an illustrative example that signals a more generalizable state of being. Indicators reference a thing, a process, a trend, or a movement, but they never presume to explain it. In the domain of biology, an indicator species represents a quality or condition of an environment, a regular and sampleable being that exhibits chemical contamination, biotic disease, or transformed ecological conditions within its body. As indicators, they enable evaluations of biological pasts and probable futures in terms of the present (pp. 75–76).

As an adaptation of Howe's conception of the indicator machine, we suggest here that sport might be seen as an *indicator practice*. Seeing sport this way, we think, can help illuminate a range of important aspects of environmental issues more broadly, including how well or quickly we are adapting to the need for environment-related change; why seemingly 'easy' adaptations (e.g. rethinking sport event hosting) are not as easy as we would think; the progress that has been made (or not) on environmental issues, and the circumstances under which these took place; and what 'comforts', such as environmentally impactful sport participation or spectatorship, seem to be important to people – perhaps even as a *response* to anxieties about problems like climate change.

Of course, while we think that seeing sport as both a 'transitional practice' and an 'indicator practice' has value for illuminating what can be learned by attending to sport's unique and interesting role in society, there are more direct ways that sport is related to environmental issues. We discuss these in the following sections.

## **WHY SPORT? HOW SPORT IS IMPACTED BY ENVIRONMENTAL CHANGE**

Although those who study sport-related environmental issues from a sociological perspective commonly focus on how sport-related events and practices themselves impact the environment (as seen in the next section), there is also an important line of research in this area of study concerned with *how environmental issues are impacting and might impact on sport itself*.

Research in this area often focusses on what might happen to sport in the future if current environmental trends persist. Research in this vein includes a recent

study by [Dan Scott, Robert Steiger, Michelle Rutty, and Yan Fang \(2019\)](#) on the future of the Olympic and Paralympic Winter Games in light of global warming – a study that received a great deal of attention across major media during the 2018 PyeongChang Olympics. [Scott et al. \(2019\)](#) note in their study that, even in low emissions scenarios, several venues that previously hosted the Olympics and Paralympics would be unable to host the Games in the future. Higher emission scenarios, as you would expect, look far worse than low emission ones, while the Paralympics is impacted even more harshly because it occurs after the Olympics, during what is most often a warmer time of year in the Northern Hemisphere where the Games are hosted (i.e. into March). As [Scott et al. \(2019\)](#) state:

In a low-emission scenario, only 13 of 21 locations remain climate reliable for the OWG [Olympic Winter Games] in the 2050s and 12 in the 2080s, whereas only 10 are reliable for the PWG [Paralympic Winter Games] (both in the 2050s and 2080s). The impact of a business-as-usual high-emission scenario is far greater, reducing the number of locations reliable for the OWG to 10 in the 2050s and 8 in the 2080s, with even fewer reliable for PWG (8 in the 2050s and only 4 in the 2080s) (p. 1301).

In some respects, Scott et al.'s point is simple: every city that has hosted the Olympics and Paralympics is now, on average, warmer than it was when it hosted these events in the first place, and as this trend continues, the possibility of hosting the Games will be imperilled. Rising temperatures will also impact the ability of hosts to use snow machines in the absence of naturally occurring snow, as these machines also require lower temperatures. Scott et al.'s research raises important questions about the future of sport in general – including questions about the long-term survival of certain sport events.

Similar concerns were raised in a *Sports Illustrated* magazine cover story from March 2007, entitled 'Sports and Global Warming: As the World Changes, So Do the Games We Play.' The magazine cover featured an image of Major League Baseball pitcher Dontrelle Willis standing knee deep in water in a flooded Dolphin Stadium (since renamed Hard Rock Stadium) in Miami. While the image was of course manipulated for effect (Willis and the Stadium were not underwater!), what the article did was poignantly demonstrate the real possibility that as water levels rise due to warming temperatures and melting glaciers, we may see several major coastline stadiums across the United States and elsewhere under water by the year 2100 (see also [Perkins, Mincyte, & Cole, 2010](#)).

Although the cover image of a deluged stadium is an especially striking part of the *Sport Illustrated* feature, the article's author also points to other impacts of global warming on sport, like the threat to baseball bat production due to the expansion of the ash borer beetle's habitat, and the likelihood that ski seasons will be much shorter into the future as snowfall decreases ([Wolff, 2007](#)). More recently, the non-profit environmental organization Climate Nexus highlighted future-oriented climate concerns that are relevant to sport (see [climatenexus.org/climate-issues/climate-change-and-sports/](http://climatenexus.org/climate-issues/climate-change-and-sports/)). This included concerns pertaining to:

- outdoor hockey rinks in Canada (e.g. see [Patterson, 2015](#)), as climate change impacts the number of days where ice rinks can be maintained;

- fishing, as warming temperatures are making some streams and lakes uninhabitable for some fish (e.g. see [Climate Wisconsin, n.d.](#)), and;
- golf, as coastline golf courses face the same threats noted earlier about rising water levels, and as droughts are increasingly causing problems for superintendents intent on maintaining playable conditions on golf courses (e.g. see [Choudhury, 2013](#); [Weiss, Overpeck, & Stachura, 2008](#)).

What is more, environmental changes are having effects in the present; our concerns are not just future-oriented. For example, [Boykoff and Mascarenhas \(2016\)](#) focus on water issues faced by those competing at the Rio 2016 Olympics in the canoeing, rowing and kayaking events in Lagoa Rodrigo de Freitas and sailing events in Guanabara Bay. Both of these venues were highly polluted. Drawing on findings from [Brooks and Barchfield \(2015\)](#), [Boykoff and Mascarenhas \(2016\)](#) note that these bodies of water were ‘not only a health threat for Olympic athletes, but for everyday Rio residents’ as ‘ingesting only three teaspoons of the polluted water afforded a 99 percent chance of infection by virus (though that did not mean that individual would automatically fall ill)... [including] Hepatitis A’ (p. 6).

Concerns related to air pollution have received similar attention, both in relation to sport mega-events – with major concerns being raised, for example, around highly polluted air around Beijing for the 2008 Olympic and Paralympic Games (see [McLeod, Pu, & Newman, 2018](#); [Vause, 2008](#)) – as well as in relation to outdoor physical activity more generally, in regions where air quality is poor. For example, in Canada, when smoke from forest fires in the province of British Columbia drifted through Vancouver, questions emerged about the safety of outdoor exercise ([Hutchinson, 2017](#)). Experts on physical activity and air pollution recommended that exercisers consider when and where they exercise, since time of day and location matter in terms of the level of impact (see [Giles & Koehle, 2014](#)). As might be expected, outdoor sport events, like two triathlons in parts of British Columbia, were cancelled during this time, and air advisories pertaining to outdoor exercise were issued as far away as Edmonton, Alberta.

Another climate-related issue concerns the impacts of high heat on endurance athletes. This has become a more prominent matter against the backdrop of global warming (see [Primack, 2013](#)). For example, in a response to safety concerns associated with distance running in the heat, the IOC recently changed the marathon location for the 2020 Tokyo Olympic Games, moving the race to the north of Japan, away from what would likely have been a brutally hot course around Tokyo, despite local pressures to keep the original location ([McCurry, 2019](#)). The Climate Nexus site includes other pertinent examples of heat-related problems, including in tennis (see [BBC, 2014a](#); [Garber, 2015](#)) and gridiron football ([Israel, 2012](#)). Concerns have likewise been raised around recent World Cup soccer/football tournaments. During the World Cup in Brazil in 2014, for example, ‘cooling breaks’ were introduced to deal with extreme heat conditions ([BBC, 2014b](#)).