

Sport, the natural environment, and sustainability

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To cite this chapter: Dingle, G. W. (2017). Sport, the natural environment, and sustainability. In R. Hoye & M. Parent (Eds.), *SAGE handbook of sport management* (1st ed., pp. 531-558). Thousand Oaks, USA: SAGE.

To link to this chapter: <http://dx.doi.org/10.4135/9781473957961.n30>.

Abstract

Given the growing body of research pertaining to sport, the natural environment and sustainability, it is an appropriate time to review the orientation and findings of this work, and to identify further avenues for research. This is especially so given the vast amount of literature published across a range of disciplines that document the evidence of significant change to the natural environment on a global scale. Such environmental issues include the multi-dimensional problem of anthropogenic climate change which has led to a complex global web of policy, legislative, commercial and organisational responses, and that of itself has been the subject of a vast body of multi-disciplinary research. In the field of sport, relatively few studies have examined the impact of sport on the natural environment, or the environmental sustainability of current sport management practices. Further, an even smaller body of work has investigated the impact of environmental change on sport. This chapter concludes with a discussion of research questions that reflect gaps in the literature that may guide future research efforts.

Introduction

Environmental problems, especially complex and global ones like anthropogenic climate change that have intertwined scientific, economic, political and social dimensions, are central to the future of humanity. The preponderance of evidence of global environmental problems, as reported in a litany of peer-reviewed academic journals and other scientific publications, portrays an urgent situation with far reaching implications for not just humanity and our many forms of endeavour, but for life more generally on planet Earth. The long-term fate of countless numbers of species are under threat from human activities that are so pervasive, in recent years a new term has been coined to describe the extent, magnitude and duration of such impacts – the “Anthropocene” (Crutzen, 2002; Rockström et

al., 2009, p. 2; Steffen, Crutzen, & McNeill, 2007). The term Anthropocene refers to a new epoch¹ where humans have become the “dominant driver of change to the Earth system”. So profound are the impacts from the “exponential growth of human activities” on such ecosystems, that the notion of what are “safe planetary boundaries” for human activity is now the subject of scientific discussion.

A range of environmental problems illustrate the fundamental human origins to the challenges we face. Perhaps the most notable of these is “anthropogenic” climate change, a phenomenon defined by the Intergovernmental Panel on Climate Change (IPCC) – “the world’s leading authority on climate issues” (Oreskes & Conway, 2010, p. 2) – as “any change in climate over time, whether due to natural variability or as a result of human activity”. Critically, an overwhelming “scientific consensus” (Lewandowsky, Oreskes, Risbey, Newell, & Smithson, 2015; Oreskes, 2004, 2007) amongst the global climate science community attributes the primary causation of climate change to human activities. The institutions that articulate this consensus include the IPCC, the World Meteorological Organisation (WMO), and over thirty national science academies around the world including those in Europe, the United Kingdom, the United States, Canada and Australia (AAS, 2007; AASS, 2009). However, other global environmental problems are also primarily or significantly caused by humans. These include declining availability of fresh water, land degradation, air pollution, the hole in the stratospheric ozone layer, ocean acidification, and the decline of major fisheries (Rockström et al., 2009; Rogers & Laffoley, 2011; UNEP, 2007, 2012). The United Nations Environment Programme (UNEP) asserts that such problems are evidence of “unprecedented environmental change at global and regional levels” (UNEP, 2007, p. 4); that since the 1950’s, humans have “changed ecosystems more rapidly and extensively than in any comparable period of time in human history” (UNEP, 2005), and; that “all components of the environment – land, water, biodiversity, oceans and atmosphere – continue to degrade” (UNEP, 2012, p. 90).

Sport – which may be defined as any activity that is “physical”, involves “competition” and is “structured” according to rules or laws (Nicholson, Kerr, & Sherwood, 2015, p. 4), and which exists across “corporate”, “not-for-profit” and “public” sectors (Hoye, Nicholson, & Smith, 2008; Smith & Stewart, 2010, p. 2) – has since the mid-1980’s been the subject of significant investigation for its relationship with the natural environment and environmental sustainability. Some of the more important publications in this sphere include: Babiak and Trendafilova (2011); Cachay (1993); Chard, Mallen, and Bradish (2013); Mallen and Chard (2011); Mallen, Stevens, Adams, and McRoberts (2010); Mallen, Stevens, and Adams (2011); Pfahl (2010); Spector, Chard, Mallen, and Hyatt (2012); and Trendafilova, Babiak, and Heinze (2013). Yet despite this high quality work, if Slack’s (2003, p. 118) observation that, “one of the indicators of the strength of an academic discipline, or sub-

¹ Readers should note that whether the concept of the “Anthropocene” should be widely adopted as the next major epoch for Planet Earth is currently the subject of debate among geologists (Brown, 2014). If it is, this would mark a consensus position on usage of the term.

discipline, is the quantity and quality of the literature by which it is underpinned”, is taken as a measure of the development of this literature, then the field of sport, the natural environment and environmental sustainability is at a relatively early stage. Indeed, as recently as 2011 in a pivotal publication that surveyed the extant scholarly work in this area up to that point, whilst Mallen, Stevens and Adams (2011, p. 253) acknowledged that it’s “growth” was consistent with the gradual expansion of broader management-environmental sustainability literature since the 1990’s, they also lamented that there was still a “paucity” of published “sport-ES” research.

Nevertheless, given the scale and urgency of environmental issues across the globe and the array of associated research, it is easy to see why calls for “sustainability” (Benn, Dunphy, & Griffiths, 2014; Hoffman & Bazerman, 2007; Linnenluecke & Griffiths, 2013; Mallen & Chard, 2011; UN & Brundtland, 1987) – particularly for organisations – have become common in recent decades². It is therefore easy to understand why there are good reasons to believe that such environmental problems and their primarily human causation also have important implications for sport, sport organisations, and the managers who lead them. Indeed, the importance of the relationship between the natural environment and sport organisations is increasingly recognised by both government sport agencies, and non-government organisations alike (GSA, 2014; IOC, 2012, 2014; MAV & Coverdale, 2007; SE, 2014; SRT, 2009; UNEP, 2014, 2015a, 2015b; WADSR, 2007; WADSR & Greensense, 2012). Two central features of this body of non-academic literature stand out. Firstly, they are based on the recognition that sport organisations, competitions and events directly and indirectly contribute to environmental problems on global and local scales, and that this undermines the “sustainability” of natural ecosystems – the so-called “natural environment”. As a consequence, the concept of sustainability is increasingly viewed by government sport agencies and non-government organisations as a legitimate and important concern for sport organisations, and the stakeholders with which they collaborate. Secondly, although to a lesser extent, it is apparent in this literature that some sport organisations, competitions and events themselves are increasingly at risk from disruptions to the natural environment that are linked to a lack of sustainable thinking and practices by humans in general. That is, there is a growing understanding of the primarily human, or “anthropogenic”, responsibility for the environmental problems that now beset planet Earth.

The recent and comprehensive review by Mallen, Stevens & Adams (2011) of literature concerned with this intersection between sport, the natural environment and sustainability argued that much more research is needed. They highlight that while environmental sustainability (ES) research in the field of sport is a relatively small but growing proportion of the overall body of work within the

² Readers should note that the period from 2005-2014 has been the United Nations Decade of Education for Sustainable Development (UNESCO, 2005).

broader management discipline, there is still a fundamental need for further research in this area. Pointedly, they asserted that, “undoubtedly there is no shortage of research directions for all subfields within sport” (p. 253). Echoing this view, Casper et al. (2012, p. 12) called for “broader examinations into the strategic importance of environmental actions in sport organizations”, while Mallen et al. (2013, p. 8) argue that further research is needed into areas such as “ES communication strategies, best practices in ES integration and methods of ES monitoring and management for successful implementation”. Similarly, Pfahl et al. (2014, p. 23) argue there is more research is needed to “improve our understanding of environmental awareness, knowledge, and actions” in sports such as athletics.

As a result, this chapter has two purposes. First, the aim is to review the extant literature about sport, the natural environment and sustainability with a particular focus on their implications for sport organisations. Second, the aim is to identify priorities for research in these areas in the short-to-medium term. This chapter is therefore presented in three parts. First, an overview of the various conceptualisations of sport, the natural environment and sustainability in its various guises is offered to clarify what these terms mean for research in this field. In this section, particular emphasis is given to sustainability as it pertains to organisations and their management. Second, this chapter reviews the published empirical research in this field so far in this field in order to draw some conclusions about the areas where previous research efforts have been focused, and thirdly, this chapter concludes with a discussion of research questions that reflect gaps in the literature that may guide future research efforts.

Sport, the natural environment and sustainability: The conceptual foundations

Conceptualising the natural environment

The first step in discussing the relationship between sport, the natural environment and sustainability is to conceptualise the “natural environment”. Although no single and universal definition exists, the natural environment is widely understood as “nature”, “natural habitat” or “the part of the Earth that has not been built or formed by humans” (Collin, 2011, p. 143). Alternatively, Parkin (2000) adds breadth to this concept by asserting that the natural environment is the, “biophysical limits” of life on planet Earth consisting of soils, air, water, and ecological systems upon which the social and economic dimensions of such life depend. Parkin (2000) argues that such limits are “resources”, or “natural capital”, that is available for the “progress” of humans but also other species.

Alternatively, other perspectives of the natural environment stem from deeper philosophical understandings of nature such as “deep ecology” (Loland, 2006; Naess, 1990) that reject the “anthropocentric” (i.e. human-centred) view that nature and efforts to achieve its sustainability are

merely a system for providing resources for human use (Brymer, Downey, & Gray, 2009; Gifford, 2007; Vlek & Steg, 2007). Accordingly, when considered from a purely, “anthropocentric or materialistic perspective”, the natural environment is everything that is, “*other* to humankind and valued only for its worth to humanity” (Brymer et al., 2009; Mathews, 2006). However, a fundamental element to understanding the natural environment is the inextricable relationship that humans have with nature. Indeed, Brymer et al. (2009, pp. 196-197), citing Schultz (2002, pp. 61-62), explain that humans often forget we also, “are part of nature”:

“We are born in nature; our bodies are formed of nature; we live by the rules of nature. As individuals, we are citizens of the natural world; as societies, we are bound by the resources of our environment; as a species, our survival depends on an ecological balance with nature”.

This illustrates that, despite “popular perceptions to the contrary” (Brymer et al., 2009), humanity is undeniably a “part of the natural world” as well.

Conceptualising sustainability

Tied to these understandings of the natural environment is the concept of “sustainability” – otherwise known as “sustainable development” (Parkin, 2000) – and discussing this relationship is a necessary next step in understanding its relationship with sport. Whilst indigenous people’s knowledge of the human impacts on the environment date back centuries (Barnhardt & Kawagley, 2005; Prober, O’Connor, & Walsh, 2011), the origins of the sustainable sustainability/sustainable development concepts can be traced back at least as far back as the 1960’s (Dresner, 2002) with the emergence of the “environmental movement” that was concerned with the sustainability of humanity’s consumption of resources offered by nature. This movement was given impetus with the work of environmentalists like Rachel Carson whose seminal work, *Silent Spring* (1962), drew attention to the environmental impacts of the global chemical industry. These concerns were spurred on with the Club of Rome conference that resulted in the book *Limits to Growth* (Meadows, Goldsmith, & Meadows, 1972) that articulated the boundaries of human consumption of natural resources, and which are echoed today in the more recent scientific work of Rockström et al. (2009), Steffen et al. (2007), Steffen et al. (2004), and others.

In 1980, the terms “sustainable”, “sustainable development” and “sustainability” were expressed in the International Union for the Conservation of Nature (IUCN)’s *World Conservation Strategy* in relation to consumption of natural resources for the purpose of human development whilst also protecting the health and diversity of life on Earth (Peattie, 2008). In 1987, the sustainable development/ sustainability concepts were developed further and “widely disseminated” through a report by the World Commission on Environment and Development (WCED), *Our Common Future*³,

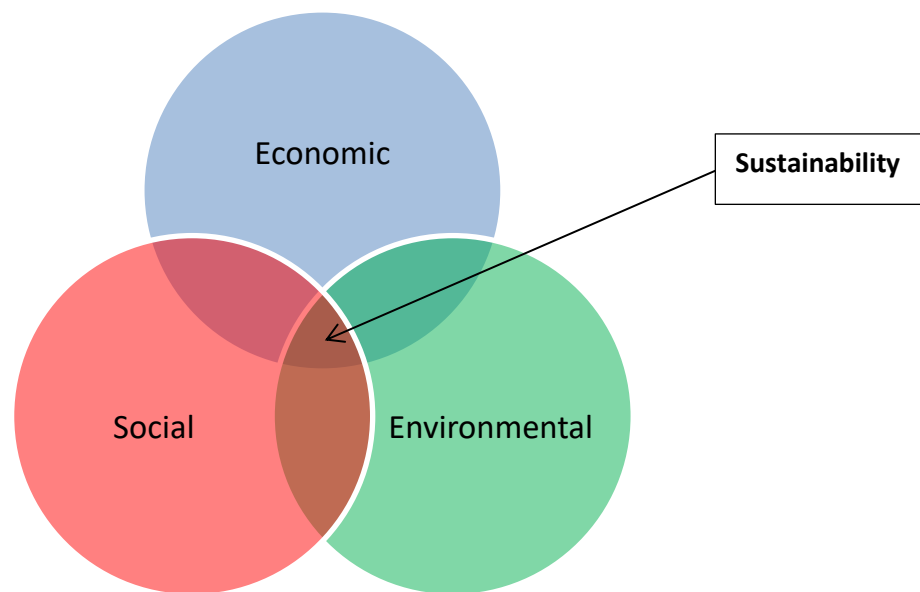
³ The WCED’s *Our Common Future* report is widely known as the “Brundtland Report”, and is so-called after the surname of the Chairperson of the WCED – Gro Harlem Brundtland – the former Prime Minister of Norway.

that presented its “simple and memorable” definition of, “meeting the needs of the present without compromising the ability of future generations to meet their needs” (Peattie, 2008, p. 251; WCED, 1987, p. 37). By 1992, this definition had become widely accepted for the Second United Nations Conference on the Environment and Development held in Rio de Janeiro where 170 nations endorsed a global action plan, *Agenda 21*, for sustainable economic growth that integrated environmental responsibility (Benn et al., 2014).

However, like the concepts of “sport” and the “natural environment”, there is no single definition of sustainability/sustainable development, and to illustrate this point, Parkin (2000) estimates that there are over 200 definitions, while Moscardo et al. (2013) estimate there are over 100 definitions. Parkin (2000, p. 7) defines sustainability as the “capacity for continuance” of a given organism or object, and so as a consequence, sustainability is:

“...therefore a quality. It is an objective, not a process. Something either has or has not got the quality of sustainability – the intrinsic capacity to keep itself going more or less indefinitely. We want the environment to have it, so it can support life”.

Similarly, sustainability has been defined as, “that *state* that results from the *process* of sustainable development” (Benn & Kearins, 2012). However, other definitions emphasise the temporal aspect of sustainability. For example, Meadows, Meadows, & Randers (2004, p. 254) view sustainability as the capacity of societies to, “persist over generations”, and that a “sustainable society” is one that is, “farseeing enough, flexible enough, and wise enough not to undermine either its physical or social systems of support”. However the most common definitions of sustainability are based on three inter-dependent dimensions of life on planet Earth: (1) the natural environment, (2) the economy, and (3) social relationships. Also known as the “three pillars” of sustainability (Wilkinson & Yencken, 2000), they have been “characterized by business...as the ‘triple bottom line’ ” (Parkin, 2000, p. 4). These intersecting dimensions of sustainability are illustrated in Figure 1 below.

Figure 1: The three dimensions of sustainability, the conceptual foundations of the Triple Bottom Line.

In contrast, the “five capitals” perspective of sustainability sees this concept in terms of inter-dependent resources that are available for human development. Evolving from the “four capitals” concept proposed by Ekins, Hillman and Hutchinson’s (1992) and their World Bank research, Parkin’s (2000, p. 7) “five capitals” perspective on sustainability identifies five capitals (resources) that provide “services” or benefits for humans and other species. These capitals are: (1) natural capital; (2) human capital; (3) social capital; (4) manufactured capital, and; (5) financial capital. Each of these capitals is represented by “stock” from which a range of developmental “benefits” flow. Critically, Parkin (2007) stresses that the physical “limits” of planet Earth – its land, water, air and ecological systems – are the “real bottom line”, and that financial capital – typically all important from a conventional economic-centred standpoint – is merely a means of “valuing, owning or exchanging” the other four capitals. The intersections between dimension-based and resource/capital-based understandings of sustainability are illustrated in Table 1 below.

Table 1: Intersections between sustainability dimensions, and the ‘Five Capitals’ model of sustainable development (adapted from Parkin, 2000, p. 7)

| SUSTAINABILITY DIMENSIONS | THE FIVE CAPITALS MODEL | | |
|---------------------------|-------------------------|---|--|
| | TYPES OF CAPITAL | STOCK | FLOW OF BENEFITS |
| 1. Environment | 1. Natural | Soil, water, air, trees, ecological systems, minerals (e.g. coal, iron ore, gold, uranium), crude oil, natural gas. | Energy, food, water, climate, waste disposal. |
| 2. Social | 2. Human | Human intelligence, skills, knowledge, abilities, good health, motivation, spiritual ease. | Work, creativity, innovation, happiness, love. |

| | | | |
|-------------------|------------------------|---|--|
| | 3. Social | Families, communities, relationships, schools, universities, community organisations, trade unions, political & legal systems (e.g. governments). | Nurturing human capital through security, shared goods (e.g. culture, education), trust & inclusion. |
| 3. Economy | 4. Manufactured | Infrastructure (e.g. roads, buildings, public transport, facilities, factories, swimming pools or stadiums), electricity. | Places and resources for living, work & leisure, access, travel, material resources. |
| | 5. Financial | Money, stocks, bonds. | Means of valuing, owning & exchanging the other four capitals. |

The concept of sustainability is based on a number of principles. These principles are: (1) *Equity*, whereby the Earth's natural resources are shared fairly between generations, genders, ethnic groups and nations; (2) *future orientation*, whereby humans think in multi-decadal timeframes that enable the needs of all future citizens to be balanced against those of current ones; (3) *need*, especially for shelter, food, security, and opportunities for development for the poorest citizens on Earth are fundamental to decisions over resource access, use and conservation; (4) *environmental limits to growth*, where it is recognised that the human consumption of the natural resources of planet Earth must stay within such ecological boundaries. These limits include those expressed in laws of conservation and thermodynamics, and; (5) *systems thinking (global environmentalism)*, whereby all humans recognise that the natural environment consists of finite, complex, interdependent, holistic, dynamic and vulnerable ecological systems that if harmed by humans, may disrupt human societies and economic activity (Moscardo et al., 2013; Parkin, 2000; Peattie, 2008).

Conceptualising sustainability for organisations

Translating the various understandings of sustainability into a universal concept for organisations has proved to be as difficult as reducing the concept of sustainability to a single definition. This is in part because of the difficulty of translating even the most widely used WCED/“Brundtland” definition of sustainability into practical measures at the organisational level (Gladwin, Kennelly, & Krause, 1995; Parkin, 2000; Peattie, 2008). Nevertheless, what is clear is that management scholars have been wrestling with sustainability problems associated with mounting evidence of global environmental degradation, and associated potential for organisational disruption, for approximately 50 years (Linnenluecke & Griffiths, 2013). Furthermore, conceptualising sustainability for organisations is especially important because of the central role played by organisations in providing sport across all major levels of sport: professional/elite, semi-professional and community.

Recent scholarly work on the concept of “corporate sustainability” (Benn et al., 2014; Dyllick & Hockerts, 2002; Linnenluecke & Griffiths, 2010, 2013; Linnenluecke, Russell, & Griffiths, 2009;

Wilson, 2003) has been described as having four “distinct conceptual genealogies” comprising literature on: (1) “corporate social performance theory”, that includes all work using the term “corporate social responsibility” (CSR); (2) “stakeholder theory”; (3) a “corporate social performance versus economic performance debate”, and; (4) a “greening of management debate” (Linnenluecke & Griffiths, 2013, p. 383). Furthermore, four important conclusions have been drawn about these conceptual branches of the literature intersecting between sustainability and organisations. Firstly, that they have emerged from a relatively narrow research focus; secondly, that there is very little cross-disciplinary integration with areas such as ecology and environmental science; thirdly, that the extant literature has been strongly focused on “empirically examining the relationship between a firm’s environmental and/or social performance and its financial performance”, and; finally, that there has been little consideration so far of the management implications of climate change (Linnenluecke & Griffiths, 2013, p. 382). Together, Linnenluecke & Griffiths (2013) suggest this means that corporate sustainability is either an “insular field”, or one where empirical analysis of the financial implications of such issues is favoured.

These genealogies of corporate sustainability literature have clear distinctions and origins (Linnenluecke & Griffiths, 2013). Firstly, corporate social performance (CSP) – a firm’s fulfilment of its corporate social responsibilities and other activities with “socially beneficial outcomes” – started with the work of Bowen (1953) and Friedman (1962, 1970). Secondly, stakeholder theory literature is concerned with the influence on firms of societal and stakeholder issues originated with the work of Freeman (1984), but in recent years has broadened to include work arguing that the natural environment is also a stakeholder (Driscoll & Starik, 2004; Haigh & Griffiths, 2009; Phillips & Reichart, 2000). Thirdly, corporate social performance versus economic performance debate is concerned with empirically establishing a link between CSP and corporate financial performance (CFP), and has been debated since the 1970’s (Linnenluecke & Griffiths, 2013; Margolis & Walsh, 2003). Finally, the greening of management debate emerged in the mid-1990’s whereby academic management discourse was broadened by scholars prepared to address the relationship between firms, society and the natural environment. Influential early work in this literature include Gladwin et al. (1995), Shrivastava (1995), and Hart (1995) which paved the way for the development of the “Organizations and Natural Environment” (ONE) division of the Academy of Management Journal, and other influential work such as Bansal and Roth (2000), and Sharma (2000).

Conceptualising sustainable organisations

Just as scholars have debated what sustainability is and what it means for organisations, there is ongoing discussion in the management literature of what defines a sustainable organisation. The phrase “corporate sustainability” itself may be interpreted as one such definition. Linnenluecke & Griffiths (2013, p. 383) assert that regardless of the characteristics of the aforementioned branches of

corporate sustainability literature, the phrase “corporate sustainability” refers to a firm’s engagement with “social and environmental issues” in addition to their “economic activities”, and not just “sustainable competitive advantage” in its narrow economic or financial senses. In contrast, Parrish (2007, p. 12) articulates a more ambitious definition of a sustainable “enterprise” being one that, “...ensures its own capacity to survive and thrive while contributing to the capacity of its stakeholders and the social-ecological system to do the same”. Similarly, Chadee, Weisner and Roxas (2011) assert that a genuinely sustainable organisation has a long-term orientation, and a commitment to contributing to the sustainability of the natural environment as well as economic and social domains of a society. Such definitions emphasise the centrality of the natural environment in the normal functioning of a business equal to its financial and social performance, and are a major departure from understandings of organisations originally articulated by Friedman (1962, 1970) and others that are centred on profitability. Importantly though, such understandings incorporate more recent understanding of the adverse impacts on the natural environment of humans generally, and organisations specifically, and are consistent with the aforementioned “greening of management” thesis.

Nevertheless, some definitions of the sustainable organisation go beyond these broad understandings. As Weisner (2013) – citing Benn and Dunphy (2004) – notes, a “truly sustaining, responsible and responsive organisation” needs to *change* into one that, “functions as an instrument for the fulfilment of human needs and the support and renewal of the biosphere”. Consistent with this view, “phase models” such as those of Austin (1999) and Hoffman (1999) have articulated the “historical processes by which corporations have move towards supporting ecological [environmental] sustainability” (Benn et al., 2014; Hunt & Auster, 1990). Among the phase models, the “phase model of organisational sustainability” developed by Benn, Dunphy and Griffiths (2014; 2003, 2007) is the most sophisticated conceptualisation of the sustainable organisation, incorporating consideration of how organisations characteristically “treat” their human and natural environmental resources. The model spans six phases that are spread over three sustainability “waves”, and is described as a tool for enabling comparisons between organisations of their commitment to and practice of human and environmental sustainability. The six phases are: (1) *rejection* – where attempts to achieve sustainability are consciously rejected by an organisation in favour of achieving financial profit; (2) *non-responsiveness* – where an organisation is unsustainable through lack of awareness rather than explicit rejection; (3) *compliance* – a focus on reducing the risk of sanctions for failing to meet minimum standards; (4) *efficiency* – seeking competitive advantage by initiating sustainable practices; (5) *strategic proactivity* – where sustainability is an important part of an organisation’s strategy, and; (6) the *sustaining corporation* – where senior management have “strongly internalised” the goal of achieving a sustainable world. Benn et al’s (2014) phase model of organisational sustainability is summarised in Table 2 below.

Table 2: The Phase Model of Sustainability (modified from Benn, S., Dunphy, D. & Griffiths, A. 2014. *Organizational change for corporate sustainability* (3rd ed.). London, U.K.: Routledge)

| LEVEL | ATTITUDINAL FOCUS | HUMAN SUSTAINABILITY | ECOLOGICAL SUSTAINABILITY |
|---|-----------------------|--|--|
| First wave of sustainability | | | |
| Phase 1: Rejection (Theme: “ <i>exploit resources for short-term financial gain</i> ”) | Opposition | Staff & contractors exploited | Environment free to be exploited |
| Phase 2: Non-responsiveness (Theme: “ <i>business-as-usual</i> ”) | Ignorance | Focus on costs, IR & technology Social concerns excluded | Environment risks, costs & opportunities considered irrelevant |
| Second wave of sustainability | | | |
| Phase 3: Compliance (Theme: “ <i>avoid risk</i> ”) | Risk | HR functions comply with legislation but with little integration | Ecological issues attracting strong litigation (law suits) are addressed |
| Phase 4: Efficiency (Theme: “ <i>do more with less</i> ”) | Cost | Staff training & teamwork encouraged for value adding Relations with external stakeholders developed | ISO 14000 integrated with TQM OH&S systems to achieve eco-efficiencies |
| Third wave of sustainability | | | |
| Phase 5: Strategic pro-activity (Theme: “ <i>lead in value-adding and innovation</i> ”) | Competitive advantage | Intellectual & social capital used to develop competitive advantage through product/service innovation CSR for staff training, payment & job descriptions | Environmental strategies used for competitive advantage Organisation uses Global Reporting Initiative |
| Phase 6: The sustaining corporation (Theme: “ <i>transform ourselves: lead in creating a sustainable world</i> ”) | Transformation | Key objectives/goals - the pursuit of equity, human welfare & potential | The organisation works with society toward ecological renewal |

Benn et al’s phase model offers some important insights into what is required at the organisational level for genuine sustainability to be achieved, although it was not developed specifically for sport organisations. Nevertheless, there is no reason why it would not be suited to sport organisations. Whatever the industrial context of an organisation is, achieving a genuine environmentally, socially and economically sustainable organisation however is no easy task. As Peattie (2008, p. 255) notes, the transition through the above phases of sustainability may depend on the appointment of a new chief executive, legislative change, “crisis-driven external stakeholder pressure”, “disruptive market changes”, the failure of organisational sustainability initiatives, or the loss of internal sustainability “champions”. In particular, achieving sustainability depends on the presence of committed internal leadership and processes for effective organisational change.

In summary, the fundamental attributes of the concept of the natural environment are well known, and whilst there are differing interpretations of the concept of sustainability, there is significant common

ground with both dimensional and resource-based perspectives emphasising the need for environmental sustainability. By extension, the concept of corporate sustainability (CS) spans a range of overlapping concepts including corporate social responsibility although it is fundamentally concerned with environmental sustainability, as are definitions and frameworks of sustainable organisations. The definitions of sustainable organisations reviewed here, and especially the phase model of organisational sustainability, offers significant potential for understanding the sustainability of sport organisations. Nevertheless, a major omission of this literature is what these concepts mean in sport contexts, and so this chapter now turns to a related body of work that has contemplated such possibilities.

Sport, the natural environment and sustainability: Some key developments

Just as other industrial sectors have evolved in the last fifty years in response to growing concerns about the health of the natural environment and its potential to disrupt human activities, so too has the sport sector. In the last twenty years, a number of significant sport organisations have acknowledged such concerns and embraced the concept of environmental sustainability (ES). Mallen et al. (2011, pp. 241-242) note a range of “practical developments” have occurred beginning with the 1992 United Nations “Earth Summit” and its call for environmentally “sustainable development” in its *Agenda 21* report (UN, 1992). This influenced subsequent developments including the International Olympic Committee’s (IOC) decision to adopt an “Earth Pledge”; the European Council’s *Sports Charter* (COE, 1992) that committed partner countries to ES; the IOC’s 1996 incorporation of environmental protection in the Olympic Charter (IOC, 2008); the subsequent commitment of Organizing Committee(s) of the Olympic Games (OCOG’s) to environmental protection; the 2000 *European Code for Sustainability in Sport*; the 2003 IOC Olympic Games Global Impact project, and; the 2005 Helsinki World Athletics Championships “ECOMass” program. Consistent with these developments, the relationship between the natural environment and sport organisations has been increasingly acknowledged by both government sport agencies, and non-government organisations, particularly in nations such as England, Canada and Australia (GSA, 2014; IOC, 2012, 2014; MAV & Coverdale, 2007; SE, 2014; SRT, 2009; UNEP, 2014, 2015a, 2015b; WADSR, 2007; WADSR & Greensense, 2012).

Research on sport, the natural environment and sustainability

Early days: 1987-2008

Although research that contemplates the relationship between sport, the natural environment and sustainability has grown in recent years, this body of literature is still relatively rare (Mallen, Adams, Stevens, & Thompson, 2010; Mallen, Stevens, et al., 2010; Tranter & Lowes, 2009). Nevertheless, its relative scarcity is broadly consistent with at least the early stages of non-sport management

environmental sustainability research published in academic journals. As Mallen et al. (2011) note, between 1990 and 1994, the “proportion” of non-sport research published in “top management journals was below 0.003%” but by the year 2000, this proportion had risen to “1.1% of articles in the nine top management journals”. However, a recent study suggests that since 2000, the number of management-sustainability articles has seen “exponential growth” (Cullen, 2014).

A major contribution to the field of environmental sustainability (ES) research in sport is Mallen et al.’s (2011) study of sport-ES literature published during the 21 year period from 1987-2008⁴. Applying a “content analysis” approach to such work, Mallen et al. reviewed 4,639 peer-reviewed articles published in 21 sport-related journals including those in the disciplines of sport management, sport marketing, sport tourism, and sport sociology. From this study population, only 17 articles directly addressed ES, or “0.365%” of the total literature, which indicated a lack of “robust or comprehensive ES research within the sport-related literature”. Given this “extremely small” number of sport-ES articles, a “post-hoc” search for sport-ES research in other literatures identified a further 17 articles for a total of 34 overall. This represents a publication rate of approximately 1.6 per year over the 21 year period. Two major themes across such work were also identified: (1) “*environmental management performance*” (EMP) – which comprises four “sub-themes” (environmental organisational systems, activities, stakeholder disclosure & relationships, and operational countermeasures), and; (2) “*environmental operational performance*” (EOP) – which is concerned with tracking and measuring two further sub-themes (“environmental inputs and environmental outputs”).

Mallen et al.’s (2011) study is an important milestone in the field of research pertaining to sport, the natural environment and sustainability. Aside from being the only study to investigate the sport-ES field up to 2008, it documents in considerable detail the nature of sport-ES research up to this point, and also illustrates just how much work remained to be done. Nevertheless, on a positive note this study also highlighted the significant opportunities available to scholars interested in this area and some key insights into this field. For example, of the 17 publications to emerge from sport-related journals, all of them were qualitative. Furthermore, their study identified 10 categories of this literature that represent varying proportions of the total volume of this work: “commentary (17.5%), case study (17.5%), conceptual (17.5%), document or media analysis (11.5%) and 6% each for definition analysis, content analysis, discourse analysis, survey, interview, and policy analysis”. Of these publications, all fitted within the major theme of EMP with 77% of these (13) fitting within Sub-theme 1 – “Introduction to ES”. Surprisingly, no publications were reported as belonging to “Theme 2” – EOP. Also, some of these articles referred to the “general theme of ES” without having a

⁴ Mallen et al. (2011) use 1987 as the “starting point” for their research because it was the year in which the WCED/“Brundtland Commission” definition of sustainability was developed. This definition is probably still the most widely used one around the world.

specific focus on it which suggests that even amongst this literature, sustainability was not the only topic of interest. Of the 17 papers published outside of sport-related journals, again the clear majority (14) fitted within the major theme of EMP and its Sub-theme 1 – “Introduction to ES”.

Mallen et al’s (2011) study also affords other insights into the nature of sport-ES literature during the period 1987-2008. Firstly, a variety of theoretical perspectives were employed in the sport-ES studies. These are climate change theory; sustainability theory; social theory and power relations, feminist theory, stakeholder theory, system theory, and environmental behaviour theory and commitment. This diversity of theoretical perspectives reflects the wide range of research problems in this field, and indicates that a wide number of lenses will be useful to future scholars. Secondly, nearly one-third of all the sport-ES literature was published in just a single journal – the *International Review for the Sociology of Sport* – which suggests that the sociological dimension of sport-ES problems was a key feature of the sport-ES field for this period.

Mallen et al’s (2011) analysis of the sport-ES literature published in the period 1987-2008 also revealed some important insights into the nature of empirical research in this field up to this time. Firstly, less than 50% of the 17 publications from sport-related journals (8) could be considered empirical work. In addition to being solely qualitative investigations, the *units of analysis* that were the foci of this empirical research were limited to “ecological awareness” (Weiss, Norden, Hilscher, & Vanreusel, 1998), “discourses around nature, sports gender and the environment” (Humberstone, 1998), “IOC environmental policy” (Cantelon & Letters, 2000), “CSR initiatives” in professional sport (Babiak & Wolfe, 2006), Olympic event planning (Lesjø, 2000), and the environmental, social and economic legacy of “mega” sport events (Preuss, 2007). The other empirical studies in this work were case studies (2) where the units of analysis were “events” (Jones, Scott, & Khaled, 2006) and “sustainable tourism” (Busby, 2003). However, the geographic origins of this research are quite narrow as they emerged only from Western Europe and North America.

From this small body of research, it was clear that that a range of knowledge gaps were still evident. Of the research yet to be done as of 2011, Mallen et al. (2011) noted that there was still little was known about “leaders of the sport-ES movement”, “ES strategies” in sport organisations, or what ES means for the “sporting goods” and “sport event” industries. Equally, these authors argued that more research was needed that was “aligned” with the needs of sport-ES practitioners, and that more *theory-testing* and more *theory building* was needed in the sport-ES field. Furthermore, there remained opportunities for focusing empirical research on a variety of “units” and “levels” of analysis. Units of analysis in this area included individuals, organisations and programs, while suitable levels of analysis ranged from international levels, to national and sub-national levels, and to community levels of sport.

As a consequence, a sport-ES “research agenda” was needed that would assist further empirical investigation, and publication, in the sport-ES field. Consistent with this idea, a separate publication by Mallen & Chard (2011) proposed a “framework” for debating the future of sport-ES that incorporates six “areas of environmental uncertainty”, and eight “questions for debate”. Mallen et al. (2011) argued that a measure of the future progress of this field would be “special issues” on ES, the introduction of a “dedicated sport journal for ES research”, and the advancement of sport-ES research forums in organisations such as the North American Society for Sport Management (NASM), the European Association for Sport Management (EASM), the Asian Association for Sport Management (ASSM), and the Sport Management Association of Australia and New Zealand (SMAANZ). To assist such progress, there was much to be gained from applying theories, concepts and methods to ES research developed and/or applied in non-sport management research. As a result of harnessing this variety of theoretical, conceptual, methodological, analytical, organisational and journal resources, it was hoped that sport-ES research would move beyond the “infancy stage”.

More recent sport-environmental sustainability literature: 2008-2015

The period since 2008 that was beyond the scope of Mallen et al.’s (2011) study has seen good progress in the sport-ES field for some, but not all, of the indicators identified by these scholars. The first indicator of progress has been the publication of further empirical research since 2008 that addresses some of the knowledge gaps that they identified, and of course Mallen et al.’s (2011) study itself is an exemplar of high quality sport-ES work. Significantly, a literature search conducted for this chapter revealed 51 peer-reviewed sport-ES publications in the period 2008-2015. Beginning with an electronic search of the SPORTDiscus full-text database, 40 sport-ES publications were identified among sport journals since 2008. However, to be consistent with Mallen et al.’s (2011) approach of also searching for sport-ES publications in non-sport journals, the literature search revealed 11 further publications for a combined total of 51. This represents a publication rate of just over 7 per year over this seven year period. While this is a significant increase on the rate of approximately 1.6 per year for the period 1987-2008, it is for a period of only one-third as long. Time will tell if this rate continues, yet it does reflect a significant growth in scholarly sport-ES work since 2008. However, readers of this chapter should note that this finding was not the result of a comprehensive multi-journal investigation of the kind carried out by Mallen et al. (2011). This was beyond the scope of this publication and remains a research opportunity for sport-ES scholars. A summary of the sport-ES publications for the period 2008-2015 is presented in Table 3 below.

Table 3: Sport-ES publications (2008-2015)

| | EMPIRICAL PUBLICATIONS | NON-EMPIRICAL PUBLICATIONS | | | | TOTAL SPORT-ES PUBLICATIONS |
|--|------------------------|----------------------------|--------------------|--------------|-----------------------|-----------------------------|
| | | Conceptual Papers | Literature Reviews | Commentaries | Teaching Case Studies | |

| | | | | | | |
|--------------------|----|----|---|---|---|----|
| Sport journals | 30 | 4 | 1 | 3 | 2 | 40 |
| Non-sport journals | 7 | 2 | 0 | 2 | 0 | 11 |
| TOTALS | 37 | 6 | 1 | 5 | 2 | 51 |
| | | 14 | | | | |

These 51 publications are spread mainly across four categories, as per Mallen et al.'s (2011) approach. These include empirical studies (72%), conceptual papers (12%), literature reviews (2%), and commentaries (10%). Interestingly, a fifth category has emerged that was not present in the period 1987-2008: that of teaching case studies (4%). Of the 40 publications in sport journals, there were 30 empirical studies that included four which were primarily concerned with CSR dimensions, and five case studies. There were also 10 non-empirical articles that consisted of conceptual papers (4), literature reviews (1), commentaries (3), and teaching case studies (2). In comparison, non-sport journals featured 11 sport-ES publications consisting of empirical studies (7), and non-empirical articles (4) comprising two conceptual papers and two commentaries. The pattern of these publications contrasts with those identified for the period 1987-2008 by Mallen et al. (2011) where equal numbers were found in both sport journals (17) and non-sport journals (17), and where the proportion of empirical publications was considerably lower (less than 50%). However, the overall growth in the number of sport-ES research publications suggests that journal editors and reviewers increasingly recognise the significance of such research, and the need to disseminate it. A summary of the sport-ES publications for the period 2008-2015 is presented in Table 4 below.

Table 4: Sport-ES publications in sport journals for the period 2008-2015

| SPORT JOURNALS | | | | |
|----------------|------------------------------------|---|---------------|--|
| Year | Authors | Type of Publication | Methodology | Journal |
| 2008 | Mallen, Bradish & MacLean | Empirical research article | Qualitative | <i>International Journal of Sport Management & Marketing</i> |
| 2008 | Gibson, Lloyd, Bain & Hottell | Commentary | Qualitative | <i>The SMART Journal</i> |
| 2009 | Brymer, Downey & Gray | Empirical research article | Qualitative | <i>Journal of Sport & Tourism</i> |
| 2009 | Tranter & Lowes | Empirical research article | Qualitative | <i>International Journal of Sport Marketing and Sponsorship</i> |
| 2009 | Dingle | Literature review | Qualitative | <i>International Journal of Sport Marketing and Sponsorship</i> |
| 2009 | Girginov & Hills | Commentary | Qualitative | <i>International Journal of Sport Policy</i> |
| 2010 | Mallen, Adams, Stevens & Thompson | Empirical research article | Mixed methods | <i>European Sport Management Quarterly</i> |
| 2010 | Mallen, Stevens, Adams & McRoberts | Empirical research article | Mixed methods | <i>European Sport Management Quarterly</i> |
| 2010 | Dolles & Soderman | Empirical research article (case study) | Qualitative | <i>Journal of Management and Organization</i> |
| 2010 | Otto & Heath | Empirical research article | Qualitative | <i>Journal of Sport & Tourism</i> |
| 2010 | Pfahl | Conceptual paper | Qualitative | <i>International Journal of Sport Management, Recreation and Tourism</i> |
| 2010 | Horton & Zakus | Commentary | Qualitative | <i>The International Journal of the History of Sport</i> |
| 2011 | Jin, Mao, Zhang & Walker | Empirical research article | Quantitative | <i>International Journal of Sport Management & Marketing</i> |
| 2011 | Jin, Zhang, Ma & Connaughton | Empirical research article | Quantitative | <i>European Sport Management Quarterly</i> |
| 2011 | McCullough & Cunningham | Empirical research article | Quantitative | <i>International Journal of Sport Management & Marketing</i> |
| 2011 | Trendafilova & Waller | Empirical research article | Quantitative | <i>International Journal of Sport Management, Recreation and Tourism</i> |
| 2011 | Paquette, Stevens & Mallen | Empirical research article (case study) | Qualitative | <i>Sport in Society</i> |
| 2011 | Mallen, Stevens & Adams | Empirical research article | Qualitative | <i>Journal of Sport Management</i> |
| 2011 | Trendafilova | Empirical research article | Qualitative | <i>LARNet: The Cyber Journal of Applied Leisure and Recreation Research,</i> |
| 2011 | Hassan & O'Kane | Empirical research article | History | <i>International Journal of the History of Sport</i> |
| 2011 | Mallen & Chard | Conceptual paper | Qualitative | <i>Sport Management Review</i> |
| 2012 | Casper, Pfahl & McSherry | Empirical research article | Quantitative | <i>Journal of Sport Management</i> |
| 2012 | Inoue & Kent | Empirical research article | Quantitative | <i>Sport Management Review</i> |
| 2012 | Gibson, Kaplanidou & Kang | Empirical research article (case study) | Qualitative | <i>Sport Management Review</i> |
| 2012 | Pentifallo & Van Wynsberghe | Empirical research article (case study) | Qualitative | <i>International Journal of Sport Policy</i> |
| 2012 | Samuel & Stubbs | Empirical research article (case study) | Qualitative | <i>International Review for the Sociology of Sport</i> |

| | | | | |
|---------------------------|--|----------------------------|----------------|---|
| 2012 | Chard & Mallen | Empirical research article | Qualitative | <i>Sport Management Review</i> |
| 2012 | Spector, Chard, Mallen & Hyatt | Empirical research article | Qualitative | <i>Sport Management Review</i> |
| 2012 | Mallen & Chard | Conceptual paper | Qualitative | <i>Sport Management Review</i> |
| 2012 | Kellison & Mondello | Conceptual paper | Qualitative | <i>Sport Management Review</i> |
| 2013 | Boukas & Ziakas | Empirical research article | Quantitative | <i>International Journal of Sport Management & Marketing</i> |
| 2013 | Krugell & Saayman | Empirical research article | Quantitative | <i>Journal for Research in Sport, Physical Education & Recreation</i> |
| 2013 | McCullough | Empirical research article | Qualitative | <i>International Journal of Sport Management & Marketing</i> |
| 2013 | Trendafilova & Babiak | Empirical research article | Qualitative | <i>International Journal of Sport Management & Marketing</i> |
| 2013 | Trendafilova, Babiak & Heinze | Empirical research article | Qualitative | <i>Sport Management Review</i> |
| 2014 | Pfahl, Casper, Trendafilova, McCullough, & Nguyen | Empirical research article | Qualitative | <i>Communication & Sport</i> |
| 2014 | Nguyen, Trendafilova & Pfahl | Empirical research article | Qualitative | <i>International Journal of Sport Management</i> |
| 2014 | Phillips & Turner | Teaching case study | Not applicable | <i>Sport Management Review</i> |
| 2015 | Fairley, Ruhanen & Lovegrove | Teaching case study | Not applicable | <i>Sport Management Review</i> |
| 2015 | Dolf & Teehan | Empirical research article | Quantitative | <i>Sport Management Review</i> |
| NON-SPORT JOURNALS | | | | |
| 2010 | Oldmeadow & Marinova | Commentary | Not applicable | <i>Environmental Progress & Sustainable Energy</i> |
| 2010 | McCullough & Cunningham | Conceptual paper | Qualitative | <i>Quest</i> |
| 2011 | Minoli & Smith | Commentary | Not applicable | <i>Journal of Environmental Planning and Management</i> |
| 2012 | Johnson-Morgan & Summers | Conceptual paper | Not applicable | <i>International Journal of Organisational Behaviour</i> |
| 2013 | Chard & Mallen | Empirical research article | Qualitative | <i>Sustainability</i> |
| 2013 | Chard, Mallen & Bradish | Empirical research article | Qualitative | <i>Journal of Management and Sustainability</i> |
| 2013 | Mallen, Chard & Sime | Empirical research article | Qualitative | <i>Journal of Management and Sustainability</i> |
| 2013 | Mallen, Chard, Adams & McRoberts | Empirical research article | Qualitative | <i>The International Journal of Sustainability Policy and Practice</i> |
| 2013 | Salome, van Bottenburg & van den Heuvel | Empirical research article | Qualitative | <i>Leisure Studies</i> |
| 2014 | Trendafilova, Kellison & Spearman | Empirical research article | Qualitative | <i>Journal of Facility Planning, Design, and Management</i> |
| 2014 | Trendafilova, McCullough, Pfahl, Nguyen, Casper & Picariello | Empirical research article | Qualitative | <i>Global Journal on Advances in Pure & Applied Sciences</i> |

Of the 30 empirical studies published in sport journals, although most were qualitative, a range of methodologies were evident. These studies were dominated by *qualitative* approaches (26) that used methods such as interviews (e.g. Brymer et al., 2009; McCullough, 2013; Pfahl et al., 2014), case studies (e.g. Gibson, Kaplanidou, & Kang, 2012; Paquette, Stevens, & Mallen, 2011), content analysis (Mallen et al., 2011; Spector et al., 2012), multiple methods (Tranter & Lowes, 2009), and ethnography (Trendafilova, 2011). *Quantitative* studies (9) were the next most common approach and all used some form of survey (Boukas & Ziakas, 2013; Casper et al., 2012; Inoue & Kent, 2012; Jin, Mao, Zhang, & Walker, 2011; Jin, Zhang, Ma, & Connaughton, 2011; Krugell & Saayman, 2013; McCullough & Cunningham, 2011; Trendafilova & Waller, 2011). *Mixed methods* studies (2) also featured (Mallen, Adams, et al., 2010; Mallen, Stevens, et al., 2010).

CSR continued to be a feature of sport-ES research with further qualitative empirical studies (4) where the methods used were interviews (Mallen, Bradish, & MacLean, 2008; Trendafilova & Babiak, 2013; Trendafilova et al., 2013) and historical analysis (Hassan & O'Kane, 2011). Of the seven empirical studies published in non-sport journals since 2008, all were qualitative studies where the methods were content analysis (Chard & Mallen, 2013; Chard et al., 2013; Mallen, Chard, & Sime, 2013), content analysis and interviews (Salome, van Bottenburg, & van den Heuvel, 2013), multiple methods (Mallen, Chard, Adams, et al., 2013) or interviews (Trendafilova, Kellison, & Spearman, 2014). Whilst the emergence of quantitative methods and mixed-methods in sport-ES research is a notable change since 2008, qualitative methods remain the dominant methodological approach to this field.

The 37 empirical studies published across both sport journals and non-sport journals also canvassed a range of units, and levels, of analysis. The largest number of studies was focused on professional-level sport (13) which included professional sport facilities and professional events (e.g. Inoue & Kent, 2012; Mallen, Adams, et al., 2010; McCullough, 2013). A smaller number of studies (10) were focused on the local/community level of sport (e.g. Chard & Mallen, 2012; Gibson et al., 2012; Krugell & Saayman, 2013). Mega sport events (e.g. Pentifallo & VanWynsberghe, 2012; Samuel & Stubbs, 2012) were another level of analysis, whilst university/collegiate sport (Casper et al., 2012; Jin, Mao, et al., 2011; Pfahl et al., 2014) was another (5). The most common units of analysis were sport events (7) and environmental initiatives/programs (6).

An interesting point of comparison between earlier sport-ES research (1987-2008) and more recent work (2008-2015) is the use of theory. Again, a variety of theoretical perspectives were employed in the sport-ES studies for this later work. These perspectives include appreciative theory (Mallen & Chard, 2011); relationship marketing theories (Boukas & Ziakas, 2013); behavioural theories (Jin, Mao, et al., 2011; Jin, Zhang, et al., 2011; McCullough, 2013; Pfahl et al., 2014; Trendafilova &

Waller, 2011); brand theory (Chard & Mallen, 2013; Mallen, Chard, & Sime, 2013), and; CSR theory (Mallen et al., 2008). Consistent with the trend in wider management literature, organisational theories such as institutional theory (McCullough & Cunningham, 2010; Trendafilova et al., 2013), resource-based view (Nguyen, Trendafilova, & Pfahl, 2014) are a feature although others such as multi-level theory of environmental management competence (Mallen, Adams, et al., 2010), and congruence theory (Mallen, Chard, Adams, et al., 2013) are evident. However, the most obvious trend since 2008 is a shift away from sociological theory in favour of marketing and organisational ones⁵.

Another indicator of progress in the sport-ES field since 2008 is that of special issues of journals. As advocated by Mallen et al. (2011), special issues concerned with sport-ES are a mark of progress in the sport-ES field, and in this regard, there has been at least some headway made. In 2011, the *International Journal of Sport Management & Marketing* published a special issue on “Corporate Responsibility, Sustainability and Stewardship within Sport”, which included sustainability in sport as part of its overarching theme. This issue published one empirical sport-ES article that was concerned with the “recycling” behaviours of young baseball spectators (McCullough & Cunningham, 2011), yet, this is the only sport journal so far to have produced a special issue incorporating the sport-ES field⁶. The scarcity of special issues in the sport-ES field suggests that the editorial boards of sport journals are yet to be convinced of the need for such opportunities, and therefore on this measure, very little improvement has been made since 2008.

In summary, this review argues that despite some progress, sport-ES literature field is still at a relatively early stage of development. The history of sport-ES literature may be divided into two significant periods: the foundational literature of 1987-2008, and the more recent literature of 2008-2015 that builds upon the foundational work. It is also clear that the pace of publication has accelerated in the later period, and that a much greater proportion of such literature is empirical research. Some of this growth is from sport marketing scholars, although this is partly offset by a declining proportion of research by sport sociologists. Most sport-ES is focused on sport industry understandings of environmental sustainability, and their efforts to become more sustainable. Most of this research employs a qualitative methodological stance although it is clear that quantitative and mixed methodologies have now emerged among this more recent empirical work. However, while the geographical origins of sport-ES research has broadened beyond Europe and North America to include Africa and Asia, there is still little progress in the way of sport-ES special issues among sport management journals, and no specific sport-ES journal yet exists.

⁵ Since 2008, only two sport-ES publications were published in sport sociology journals (Paquette et al, 2011; Samuel & Stubbs, 2012). This is in stark contrast to the period 1987-2008 when nearly one-third were published in sport sociology journals.

⁶ In 2009, the *Journal of Sport Management* published a special issue on “Corporate Social Responsibility in Sport”, however none of the five publications were primarily focused on sport-ES.

Future research opportunities

Despite the growth in sport-ES literature and research, significant gaps remain in our understanding of sport and environmental sustainability. Mallen & Chard (2011) recommended three broad areas of research. Firstly, the ecological constraints on sport need investigation especially in light of massive human-caused “degradation of the natural environment”. Secondly, “sport environmental citizenship” needs empirical inquiry whereby for each sector of the sport industry, the “paradoxes, uncertainties and trade-offs in sport-ES” would be examined. Thirdly, the “drivers of sport-ES accountability, understanding rationales for directions and procedural changes”, need longer-term research.

The link between CSR and sustainability also needs research. Whilst progress has been made by CSR researchers in the sport-ES field, as Trendafilova et al. (2013) argue, little is known about the role of economic conditions in enabling or constraining sustainable management practices in professional sport. Secondly, as Babiak and Trendafilova (2011) observe, little is known about which CSR efforts aimed at environmental sustainability fit with the broader strategies of professional sport teams and leagues, or about patterns of adoption sustainable CSR practices in sport. Thirdly, there is little understanding of whether the adoption of CSR-driven sustainability practices in sport is in relation to changing social values. Finally, the impact of CSR practices on organisational or individual (e.g. athlete) success in professional sport is not well understood (Babiak & Wolfe, 2009).

Equally, there is limited understanding of what environmental sustainability strategies mean for sport facilities (Mallen & Chard, 2012). As these scholars note, research questions in this area include: What support programs, measurements and reporting is needed for sport to become environmentally sustainable? And, what are the challenges, barriers, and best practices for sport facilities to become environmentally sustainable? For example, the reasons for and against golf facilities participating in voluntary environment programs needs research (Minoli & Smith, 2011). Golf courses are especially important sites for sport-ES inquiry given that they are much criticised for extensive land clearing and water and chemical use (Palmer, 2004; Wheeler & Nauright, 2006). Furthermore, as Trendafilova et al. (2014) note, certification programs such as the Leadership in Energy and Environmental Design (LEED) have emerged in recent years, yet little is known about the application of such frameworks in sport outside of the United States, or their benefits. In addition, given the progress in conceptualising sustainable organisations – such as Benn et al’s (2014) “phase model of sustainability” – there are opportunities to apply such definitions to sport organisations of all kinds.

Similarly, there are significant gaps in knowledge of how sport-ES compares across a range of climatic, cultural, economic, and jurisdictional contexts. As this review noted, whilst the geographic origins of sport-ES research have broadened since 2008, little is known about sport-ES initiatives are affected by varying economic conditions; by different cultural understandings of nature or ES; by

different climate zones, or; by the laws of different nations. Comparative sport-ES research would shed light on how each of these contexts influences sustainability efforts. Furthermore, sport-ES research will benefit from variety of theoretical perspectives. For example, as has been the case in the management discipline, organisational theories such resource-based theory, institutional theory, stakeholder theory, supply chain theory and CSR theory, will offer useful lenses for understanding the organisational problems and opportunities, and enablers and constraints of effective sport-ES initiatives.

Another area that demands research is at the intersection of sport and climate change. The seriousness and urgency of climate change as a sustainability issue is underlined by a vast body of multi-disciplinary literature exceeding 100,000 publications (Grieneisen & Zhang, 2011), and human understanding of it that is underpinned by a clear scientific consensus (Oreskes, 2004; Oreskes & Conway, 2010). This consensus informs calls for global climate action from disciplines as diverse as economics (Garnaut, Howes, Jotzo, & Sheehan, 2008; Stern & Treasury, 2006), medicine (Epstein, 2005; Epstein & Ferber, 2011), and finance including institutions such as the World Bank (Höhne et al., 2013; Schellnhuber et al., 2012) and the International Monetary Fund (IMF, 2008, 2012). As a result, over 500 climate change laws have been introduced around the world in at least 66 nations (Nachmany et al., 2014), with 40 “national” and 20 “sub-national” jurisdictions having placed a “price” on carbon pollution (Höhne et al., 2013, p. 15).

In this scientific, economic and policy context, climate change is a topic worthy of empirical research in the sport-ES field for two reasons. First, sport likely makes a largely indirect contribution to climate change by way of its dependence on energy and transportation systems that rely on fossil fuel-based energy sources that create greenhouse gas (GHG) emissions, and some studies have already explored this relationship (Chard & Mallen, 2012, 2013; McDonald, Stewart, & Dingle, 2014; Otto & Heath, 2010), and the potential for GHG mitigation. Second, some sport is adversely affected by climate change. Whilst there is little empirical research about this, outdoor sports that depend on weather conditions to play sport – such as snow-based sport, or sport played on water-dependent grass playing surfaces – are vulnerable to the impacts of climate change and are therefore important sites for empirical inquiry. For example, given that the vulnerability of the ski industry to climate change is well known (Hennessy et al., 2003; Scott & McBoyle, 2007), snow sports appear to be vulnerable yet little is known about the extent of such vulnerability for specific sports or locations, or what difference adaptive measures might make. Water-dependent sports such as golf and horse racing may also be vulnerable where climates are becoming drier. The regulatory and commercial impacts of carbon pricing on sport also need research.

However, much remains unknown. For example, whilst a range of climate change risk factors for outdoor have been identified (WADSR, 2007), little is known about their impacts. These factors include: (1) increased temperatures; (2) increased evaporation; (3) reduced rainfall; (4) more frequent & extreme weather events, and (5) sea level rise. There is evidence that some of these factors are already causing heightened injury risk for community-level athletes in one country – Australia – where playing surfaces became hardened by a hotter and drier climate in recent years (Swan, Otago, Finch, & Payne, 2008; Townsend et al., 2003). Furthermore, in response, a coalition of major participation sports have already begun adapting to climate change by commissioning the development of artificial turf sport surfaces (Twomey, Otago, Saunders, & Schwarz, 2008). A priority for researchers therefore should be to establish the extent of vulnerability to climate change across the full spectrum of sport, and across a range of levels of analysis. In doing so, this would then enable scholars and industry practitioners to better understand the potential for successful climate change adaptation. Alternatively, the possibility of commercial or participatory opportunities for sport from climate change should also be investigated. As Scott & Jones (2006) assert, a warmer climate for cooler regions may lead to longer seasons for warm-climate sports such as golf. Research into such climate risks however needs to be extended to other nations, climates and segments of the sport industry.

To facilitate such research in the field of sport and environmental sustainability, scholars may benefit from reconceptualising the relationship between organisations and the natural environment. By this it is meant that researchers should ask themselves: *From what perspective of the organisation-natural environment relationship am I approaching sport and sustainability issues?* In response to Mallen et al.'s (2011) call for sport-ES researchers to use non-sport management theoretical perspectives, concepts and methods, a useful conceptualisation for understanding sport-ES research more clearly is “inside-out/outside-in” (Porter & Kramer, 2006; Porter & Reinhardt, 2007). The “inside-out” perspective simply refers to the view that organisations (the “inside”) have an impact on the natural environment in which they operate (the “outside”). Such impacts are usually adverse ones and include direct ones such as pollution of all kinds and land clearing, and indirect ones such as climate change and the hole in the atmospheric ozone layer. Conversely, management scholars should equally be aware that the natural environment (the “outside”) has significant capacity for disrupting organisations (the “inside”) and their activities (Linnenluecke & Griffiths, 2012; Linnenluecke et al., 2013; Linnenluecke, Stathakis, & Griffiths, 2011). Examples of such outside-in impacts include extreme weather events such as hurricanes⁷, floods and droughts that damage buildings, equipment or logistics systems. In a sporting context, examples of this outside-in phenomenon include the

⁷ Readers should note that the term “hurricane” refers to violent storms which have different names in parts of the world outside North America. In Australia they are known as “cyclones”, while in parts of Asia, such storms are known as “typhoons”.

vulnerability of snow-based sport events to climate change such as the 2014 Sochi Olympics (Koch, 2014), and the 2011 flooding of Suncorp Stadium in Australia.

Porter & Kramer (2006) point out that managers and management researchers have typically concentrated on how organisations affect the natural environment (i.e. inside-out) rather than the impacts of the natural environment on organisations (i.e. outside-in). This emphasis on the inside-out perspective is consistent with research concerned with “corporate sustainability”, and more recently, with growing management research (Okereke, Wittneben, & Bowen, 2012) focused on mitigating the direct or indirect greenhouse gas emissions of organisations (Hoffman, 2005; Kolk & Pinkse, 2005, 2011; Weinhofer & Busch, 2013; Weinhofer & Hoffmann, 2010; Wittneben & Kiyar, 2009).

This focus on inside-out research in non-sport management literature is also true for the field of sport-ES research. Of all the sport-ES published so far, there are few examples where the impacts of nature on sport and their organisations have been investigated. The relative absence of such outside-in focused research in sport points to the range of opportunities available to researchers. Such openings may focus on sports, sport organisations and sport events whose sustainability is most vulnerable to the environmental changes canvassed in this chapter. Climate-dependent winter sports, and those that directly depend on water resources, are prime candidates for further sport-ES research.

In conclusion, future research sport-ES can inform better understandings of environmental sustainability for sport, improve understandings of the direct and indirect impacts of sport and sport organisations on the natural environment, better understandings of the impacts of the natural environment on sport, and facilitate improved sport management practices with the ultimate aim of sport becoming genuinely sustainable. This chapter brings up to date our understanding of what sport-ES research has examined to date, and what some possibilities for future research in this field might be.

References:

- AAS. (2007). *Joint science academies' statement: Climate change adaptation and the transition to a low carbon society*. Retrieved December 9, 2011, from <http://science.org.au/policy/climatechange-g8+5.pdf>
- AASS. (2009, October 21). AAAS (American Association for the Advancement of Science) *joins leading scientific organizations in letter to senators reaffirming scientific consensus on climate change*. Retrieved March 10, 2013, from http://www.aaas.org/news/releases/2009/1021climate_letter.shtml
- Austin, J. (1999). Strategic collaboration between non-profits and businesses. *Working Paper. Harvard University*.

- Babiak, K., & Trendafilova, S. (2011). CSR and environmental responsibility: Motives and pressures to adopt green management practices. *Corporate Social Responsibility and Environmental Management*, 18(1), 11-24.
- Babiak, K., & Wolfe, R. (2006). More than just a game? Corporate social responsibility and Super Bowl XL. *Sport Marketing Quarterly*, 15, 214-222.
- Babiak, K., & Wolfe, R. (2009). Determinants of corporate social responsibility in professional sport: Internal and external factors. *Journal of Sport Management*, 23(6), 717-742.
- Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717-736.
- Barnhardt, R., & Kawagley, A. O. (2005). Indigenous Knowledge Systems and Alaska Native Ways of Knowing. *Anthropology & Education Quarterly*, 36(1), 8-23. doi: 10.2307/3651306
- Benn, S., Dunphy, A. P., & Griffiths, A. (2014). *Organizational change for corporate sustainability* (3rd ed.). London, U.K.: Routledge.
- Benn, S., & Dunphy, D. (2004). Human and ecological factors: A systematic approach to corporate sustainability. In H. Cheney, E. Katz & F. Solomon (Eds.), *Sustainability and social science: Round table proceedings* (pp. 95-124). Sydney; Melbourne: Institute for Sustainable Futures; CSIRO Minerals.
- Benn, S., & Kearins, K. (2012). Sustainability and organizational change. In D. Boje, B. Burnes & J. Hassard (Eds.), *Handbook of organizational change* (pp. 535-551). London & New York: Routledge.
- Boukas, N., & Ziakas, V. (2013). Exploring perceptions for Cyprus as a sustainable golf destination: Motivational and attitudinal orientations of golf tourists. *International Journal of Sport Management & Marketing*, 14(1-4), 39-70.
- Bowen, H. R. (1953). *Social responsibilities of the businessman*. New York, USA: Harper.
- Brown, T. (2014). Calling recent human history 'Anthropocene' won't help us solve the problems we face. *The Conversation*. Retrieved from The Conversation website: <http://theconversation.com/calling-recent-human-history-anthropocene-wont-help-us-solve-the-problems-we-face-30387>
- Brymer, E., Downey, G., & Gray, T. (2009). Extreme sports as a precursor to environmental sustainability. *Journal of Sport & Tourism*, 14(2-3), 193-204.
- Busby, G. (2003). The concept of sustainable tourism within the higher education curriculum: A British case study. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 2(2), 48-58.
- Cachay, K. (1993). Sports and environment sports for everyone - Room for everyone? *International Review for the Sociology of Sport*, 28, 311-323.
- Cantelon, H., & Letters, M. (2000). The making of the IOC environmental policy as the third dimension of the Olympic movement. *International Review for the Sociology of Sport*, 35(294-308).
- Carson, R. (1962). *Silent Spring*: Houghton Mifflin.
- Casper, J., Pfahl, M., & McSherry, M. (2012). Athletics Department Awareness and Action Regarding the Environment: A Study of NCAA Athletics Department Sustainability Practices. *Journal of Sport Management*, 26(1), 11-29.
- Chadee, D., Wiesner, R., & Roxas, B. (2011). Environmental sustainability change management in SMEs: Learning from sustainability champions. *International journal of learning and change*, 5(3), 194-207.
- Chard, C., & Mallen, C. (2012). Examining the linkages between automobile use and carbon impacts of community-based ice hockey. *Sport Management Review*, 15(4), 476-484.

- Chard, C., & Mallen, C. (2013). Renewable energy initiatives at Canadian sport stadiums: A content analysis of web-site communications. *Sustainability*, 5(12), 5119-5134.
- Chard, C., Mallen, C., & Bradish, C. (2013). Marketing and environmental sustainability in the sport sector: Developing a research agenda for action. *Journal of Management and Sustainability*, 3(1), 45-62.
- COE. (1992). *Council of Europe Committee of Ministers: Recommendation No. R(92)13REV*. Council of Europe Retrieved from <https://wcd.coe.int/ViewDoc.jsp?Ref=Rec9213&Sector=secCMLanguage=lanEnglish&Ver=rev&BlackColourInternet=9999>
- Collin, P. (Ed.) (2011) *Bloomsbury Dictionary of Environment and Ecology*. London, UK: Bloomsbury Publishers PLC.
- Crutzen, P. J. (2002). Geology of mankind: the Anthropocene. *Nature*, 415, 23.
- Cullen, J. G. (2014). *Sustainability & the Education of Managers: A bibliometric analysis of business, organisational & management research from 1993 to 2012*. NUIM School of Business NUI Maynooth Working Paper. National University of Ireland Maynooth - School of Business. Maynooth, Ireland. Retrieved from <http://eprints.nuim.ie/4789/1/Sustainability%20%26%20the%20Education%20of%20Managers%20%20A%20Bibliometric%20Analysis%20of%20Business,%20Organisational%20%26%20Management%20Research%20from%201993%20to%202012.pdf>
- Dresner, S. (2002). *The principles of sustainability*. London, UK: Earthscan.
- Driscoll, C., & Starik, M. (2004). The primordial stakeholder: Advancing the conceptual consideration of stakeholder status for the natural environment. *Journal of Business Ethics*, 49(1), 55-73.
- Dunphy, D., Griffiths, A., & Benn, S. (2003). *Organisational change for corporate sustainability: A Guide for Leaders and Change Agents of the Future*. London, UK: Routledge.
- Dunphy, D., Griffiths, A., & Benn, S. (2007). *Organizational change for corporate sustainability: A guide for leaders and change agents of the future* (2nd ed.). London, U.K.: Routledge.
- Dyllick, T., & Hockerts, K. (2002). Beyond the business case for corporate sustainability. *Business Strategy and the Environment*, 11, 130-141.
- Ekins, P., Hillman, M., & Hutchinson, R. (1992). *Wealth beyond measure: An atlas of new economics*. London, UK: Gaia Books.
- Epstein, P. R. (2005). Climate change and human health. *The New England Journal of Medicine*, 353(14), 1433-1436.
- Epstein, P. R., & Ferber, D. (2011). *Changing planet, changing health: How the climate crisis threatens our health and what we can do about it*: University of California Press.
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Boston, MA: Pitman.
- Friedman, M. (1962). *Capitalism and Freedom*. Chicago, USA: University of Chicago Press.
- Friedman, M. (1970, September 13). A Friedman doctrine – The social responsibility of business is to increase its profits *New York Times*. Retrieved from <http://www.colorado.edu/studentgroups/libertarians/issues/friedman-soc-resp-business.html>
- Garnaut, R., Howes, S., Jotzo, F., & Sheehan, P. (2008). Emissions in the platinum age: The implications of rapid development for climate-change mitigation. *Oxford Review of Economic Policy*, 24(2), 377-401.
- Gibson, H. J., Kaplanidou, K., & Kang, S. J. (2012). Small-scale event sport tourism: A case study in sustainable tourism. *Sport Management Review*, 15(2), 160-170.

- Gifford, R. (2007). Environmental psychology and sustainable development: expansion, maturation and challenges. *Journal of Social Issues*, 63(1), 199-212.
- Gladwin, T. N., Kennelly, J. J., & Krause, T.-S. (1995). Shifting paradigms for sustainable development: Implications for management theory and research. *Academy of Management Review*, 20(4), 874-907.
- Grieneisen, M. L., & Zhang, M. (2011). The current status of climate change research. *Nature Climate Change*, 1(2), 72-73.
- GSA. (2014). *Green Sports Alliance*. Retrieved 26 September, 2014, from <http://greensportsalliance.org/>
- Haigh, N. L., & Griffiths, A. (2009). The natural environment as a primary stakeholder: The case of climate change. *Business Strategy and the Environment*, 18(6), 347.
- Hart, S. L. (1995). A natural resource-based view of the firm. *Academy of Management Review*, 20(4), 986-1014.
- Hassan, D., & O'Kane, P. (2011). The great race across the Sahara: A history of the Paris to Dakar Rally and its impact on the development of corporate social responsibility within motor sport. *International Journal of the History of Sport*, 28(2), 268-280.
- Hennessy, K., Whetton, P., Smith, I., Bathols, J., Hutchinson, M., & Sharples, J. (2003). *The Impact of Climate Change on Snow Conditions in Mainland Australia*. Victoria, Australia: CSIRO Atmospheric Research.
- Hoffman, A. J. (1999). Institutional evolution and change: Environmentalism and the U.S. chemical industry. *Academy of Management Journal*, 42(4), 351-371.
- Hoffman, A. J. (2005). Climate change strategy: The business logic behind voluntary greenhouse gas reductions. *California Management Review*, 47(3), 21-46.
- Hoffman, A. J., & Bazerman, M. H. (2007). Changing practice on sustainability: Understanding and overcoming the organizational and psychological barriers to action. In S. Sharma, M. Starik & B. W. Husted (Eds.), *Organizations and the sustainability mosaic: Crafting long-term ecological and societal solutions* (pp. 84-105). Cheltenham, U.K.: Edward Elgar Publishing Limited.
- Höhne, N., Klein, N., Gilbert, A., Jung, M., Borkent, B., Lam, L., . . . Warnecke, C. (2013). *Mapping carbon pricing initiatives: Developments and prospects*. Washington, DC: World Bank and Ecofys.
- Hoye, R., Nicholson, M., & Smith, A. (2008). Unique aspects of managing sport organizations. In C. Wankle (Ed.), *Sage handbook of 21st century management* (pp. 501-509). London: Sage Publications.
- Humberstone, B. (1998). Re-creation and connections in and with nature. *International Review for the Sociology of Sport*, 33, 381-392.
- Hunt, C. B., & Auster, E. R. (1990). Proactive environmental management: Avoiding the toxic trap. *Sloan Management Review*, 31(2), 7-18.
- IMF. (2008). *The fiscal implications of climate change*: (F. A. Department, Trans.) (pp. 53). Washington, DC: World Bank.
- IMF. (2012). *Fiscal policy to mitigate climate change: A guide for policymakers*. In R. de Mooij, M. Keen & I. Parry (Eds.). Washington, DC: World Bank.
- Inoue, Y., & Kent, A. (2012). Investigating the role of corporate credibility in corporate social marketing: A case study of environmental initiatives by professional sport organizations. *Sport Management Review*, 15(3), 330-344.

- IOC. (2008). *Environmental sustainable development*. Retrieved October 3, 2011, from http://www.multimedia.olympic.org/pdf/en_report_842.pdf
- IOC. (2012). *Sustainability through sport: Implementing the Olympic Movement's Agenda 21* (pp. 102). Geneva, Switzerland: International Olympic Committee.
- IOC. (2014). *IOC Sport and Environment Commission*. Retrieved 26 September, 2014, from <http://www.olympic.org/sport-environment-commission?newstab=0&tab=3>
- Jin, L., Mao, L. L., Zhang, J. J., & Walker, M. B. (2011). Impact of green stadium initiatives on donor intentions toward an intercollegiate athletic programme. *International Journal of Sport Management and Marketing*, 10(1), 121-141.
- Jin, L., Zhang, J. J., Ma, X., & Connaughton, D. P. (2011). Residents' perceptions of environmental impacts of the 2008 Beijing green Olympic Games. *European Sport Management Quarterly*, 11(3), 275-300.
- Jones, B., Scott, D., & Khaled, H. A. (2006). Implications of climate change for outdoor event planning: A case study of three special events in Canada's National Capital region. *Event management*, 10(1), 63-76.
- Koch, W. (2014). *Olympians speak out on climate change as Sochi warms up*. Retrieved 29 October, 2014, from <http://www.usatoday.com/story/news/nation/2014/02/12/olympians-speak-out-climate-change/5395837/>
- Kolk, A., & Pinkse, J. (2005). Business responses to climate change: Identifying emergent strategies. *California Management Review*, 47(3), 6-20.
- Kolk, A., & Pinkse, J. (2011). Multinational enterprises and climate change strategies. In A. Verbeke & H. Merchant (Eds.), *Handbook of Research on International Strategic Management*: Edward Elgar.
- Krugell, W., & Saayman, M. (2013). Running a greener race: Willingness-to-pay evidence from the Old Mutual Two Oceans Marathon in South Africa. *South African Journal for Research in Sport, Physical Education & Recreation*, 35(1), 53-70.
- Lesjø, J. H. (2000). Lillehammer 1994: Planning, figurations and the "green" winter games. *International Review for the Sociology of Sport*, 35(3), 282-293.
- Lewandowsky, S., Oreskes, N., Risbey, J. S., Newell, B. R., & Smithson, M. (2015). Seepage: Climate change denial and its effect on the scientific community. *Global Environmental Change*, 33, 1-13.
- Linnenluecke, M. K., & Griffiths, A. (2010). Corporate sustainability and organizational culture. *Journal of World Business*, 45(4), 357-366.
- Linnenluecke, M. K., & Griffiths, A. (2012). Assessing organizational resilience to climate and weather extremes: Complexities and methodological pathways. *Climatic Change*.
- Linnenluecke, M. K., & Griffiths, A. (2013). Firms and sustainability: Mapping the intellectual origins and structure of the corporate sustainability field. *Global Environmental Change*, 23(1), 382-391.
- Linnenluecke, M. K., Griffiths, A., & Winn, M. I. (2013). Firm and industry adaptation to climate change: a review of climate adaptation studies in the business and management field. *Wiley Interdisciplinary Reviews: Climate Change*.
- Linnenluecke, M. K., Russell, S. V., & Griffiths, A. (2009). Subcultures and sustainability practices: The impact on understanding corporate sustainability. *Business Strategy and the Environment*, 18(7), 432-452.
- Linnenluecke, M. K., Stathakis, A., & Griffiths, A. (2011). Firm relocation as adaptive response to climate change and weather extremes. *Global Environmental Change*, 21(1), 123-133.

- Loland, S. (2006). Olympic Sport and the Ideal of Sustainable Development. *Journal of the Philosophy of Sport*, 33(2), 144-156.
- Mallen, C., Adams, L., Stevens, J., & Thompson, L. (2010). Environmental sustainability in sport facility management: A delphi study. *European Sport Management Quarterly*, 10(3), 367-389.
- Mallen, C., Bradish, C. L., & MacLean, J. (2008). Are we teaching corporate citizens? Examining corporate social responsibility and sport management pedagogy. *International Journal of Sport Management & Marketing*, 4(2/3), 5-5.
- Mallen, C., & Chard, C. (2011). A framework for debating the future of environmental sustainability in the sport academy. *Sport Management Review*, 14(4), 424-433.
- Mallen, C., & Chard, C. (2012). "What could be" in Canadian sport facility environmental sustainability. *Sport Management Review*, 15(2), 230-243.
- Mallen, C., Chard, C., Adams, L., & McRoberts, S. (2013). Congruence in sport event environmental policy, formulated strategy and implementation. *The International Journal of Sustainability Policy and Practice*, 8(2), 1-11.
- Mallen, C., Chard, C., & Sime, I. (2013). Web Communications of environmental sustainability initiatives at sport facilities hosting Major League Soccer. *Journal of Management and Sustainability*, 3(3).
- Mallen, C., Stevens, J., Adams, L., & McRoberts, S. (2010). The assessment of the environmental performance of an international multi-sport event. *European Sport Management Quarterly*, 10(1), 97-122.
- Mallen, C., Stevens, J., & Adams, L. J. (2011). A content analysis of environmental sustainability research in a sport-related journal sample. *Journal of Sport Management*, 25(3), 240-256.
- Margolis, J. D., & Walsh, J. P. (2003). Misery loves companies: rethinking social initiatives by business. *Administrative Science Quarterly*, 48, 268-305.
- Mathews, F. (2006). Beyond modernity and tradition: A third way for development? *Ethics and the Environment*, 11(2).
- MAV, & Coverdale, S. (2007). *Strategies for managing sports surfaces in a drier climate*. In M. A. o. Victoria (Ed.). Melbourne, Victoria: Municipal Association of Victoria (MAV).
- McCullough, B. P. (2013). Identifying the influences on sport spectator recycling behaviours using the theory of planned behaviour. *International Journal of Sport Management & Marketing*, 14(1-4), 146-168.
- McCullough, B. P., & Cunningham, G. (2011). Recycling intentions among youth baseball spectators. *International Journal of Sport Management & Marketing*, 10(1/2), 104-120.
- McCullough, B. P., & Cunningham, G. B. (2010). A conceptual model to understand the impetus to engage in and the expected organizational outcomes of green initiatives. *Quest*, 62(4), 348-363.
- McDonald, K., Stewart, B., & Dingle, G. (2014). Managing multi-purpose leisure facilities in a time of climate change. *Managing Leisure*, 19(3), 212-225.
- Meadows, D. H., Goldsmith, E. I., & Meadows, P. (1972). *The limits to growth* (Vol. 381). London, UK: Earth Island Limited.
- Meadows, D. H., Meadows, D. L., & Randers, J. (2004). *Limits to growth: The 30-Year update*. Vermont, USA: Chelsea Green Publishing Company.
- Minoli, D. M., & Smith, M. T. (2011). An exploration of golf and voluntary environmental programmes. *Journal of Environmental Planning and Management*, 54(7), 871-889.

- Moscardo, G., Lamberton, G., Wells, G., Fallon, W., Lawn, P., Rowe, A., . . . Kershaw, W. (Eds.). (2013). *Sustainability in Australian Business: Principles and Practice*. Milton, Qld: Wiley.
- Nachmany, M., Fankhauser, S., Townshend, T., Collins, M., Landesman, T., Matthews, A., . . . Setzer, J. (2014). *The GLOBE climate legislation study: A review of climate change legislation in 66 countries* (pp. 683). London, UK: GLOBE International and the Grantham Research Institute, London School of Economics.
- Naess, A. (1990). *Ecology, community and lifestyle: Outline of an ecosophy*. Cambridge, UK: Cambridge University Press.
- Nguyen, S., Trendafilova, S., & Pfahl, M. (2014). The natural-resource-based view of the firm (NRBV): Constraints and opportunities for a green team in professional sport. *International Journal of Sport Management*, 15(4), 485-517.
- Nicholson, M., Kerr, A., & Sherwood, M. (2015). *Sport and the media* (2nd ed.). Oxford, UK: Taylor & Francis.
- Okereke, C., Wittneben, B. B. F., & Bowen, F. (2012). Climate change: Challenging business, transforming politics. *Business & Society*, 51(1), 7-30.
- Oreskes, N. (2004). The scientific consensus on climate change. *Science*, 306(5702), 1686.
- Oreskes, N. (2007). The scientific consensus on climate change: How do we know we're not wrong? In J. F. C. DiMento & P. M. Doughman (Eds.), *Climate Change: What It Means for Us, Our Children, and Our Grandchildren* (pp. 65-95): MIT Press.
- Oreskes, N., & Conway, E. M. (2010). *Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. London: Bloomsbury Publishing.
- Otto, I., & Heath, E. T. (2010). The potential contribution of the 2010 Soccer World Cup to climate change: An exploratory study among tourism industry stakeholders in the Tshwane metropole of South Africa. *Journal of Sport & Tourism*, 14(2-3), 169-191.
- Palmer, C. (2004). More than just a game: The consequences of golf tourism. In B. Ritchie & D. Adair (Eds.), *Sports tourism: Interrelationships, impacts and issues* (pp. 117-134). Clevedon, U.K.: Channel View Publications.
- Paquette, J., Stevens, J., & Mallen, C. (2011). The interpretation of environmental sustainability by the International Olympic Committee and Organizing Committees of the Olympic Games from 1994 to 2008. *Sport in Society*, 14(3), 355-369.
- Parkin, S. (2000). Sustainable development: The concept and the practical challenge. *Civil Engineering*, 138(November), 3-8.
- Parkin, S. (2007). *Forum for the Future*. [presentation]. Forum for the Future. London, UK. Retrieved from <http://www.raeng.org.uk/publications/other/sara-parkin>
- Parrish, B. (2007). Designing the sustainable enterprise. *Futures: The Journal of Policy, Planning and Futures Studies*, 39(7), 1-18.
- Peattie, K. (2008). Toward sustainable organizations in the 21st century. In C. Wankle (Ed.), *Sage handbook of 21st century management* (pp. 250-260). London, UK: Sage Publications.
- Pentifallo, C., & VanWynsberghe, R. (2012). Blame it on Rio: Isomorphism, environmental protection and sustainability in the Olympic Movement. *International journal of sport policy*, 4(3), 427-446.
- Pfahl, M. (2010). Strategic issues associated with the development of internal sustainability teams in sport and recreation organizations: A framework for action and sustainable environmental performance. *International Journal of Sport Management, Recreation and Tourism*, 6(c), 37-61.

- Pfahl, M., Casper, J., Trendafilova, S., McCullough, B. P., & Nguyen, S. N. (2014). Crossing boundaries: An examination of sustainability department and athletics department collaboration regarding environmental issues. *Communication & Sport*. doi: 0.1177/2167479513519253
- Phillips, R. A., & Reichart, J. (2000). The environment as a stakeholder? A fairness-based approach. *Journal of Business Ethics*, 23(2), 185-197.
- Porter, M. E., & Kramer, M. R. (2006). Strategy and society: The link between competitive advantage and corporate social responsibility. *Harvard Business Review*, 84(12), 78-92.
- Porter, M. E., & Reinhardt, F. L. (2007). A strategic approach to climate. *Harvard Business Review*, 85(10), 22-26.
- Preuss, H. (2007). The conceptualization and measurement of mega sport event legacies. *Journal of Sport & Tourism*, 12, 207-227.
- Prober, S. M., O'Connor, M. H., & Walsh, F. J. (2011). Australian Aboriginal peoples' seasonal knowledge: a potential basis for shared understanding in environmental management. *Ecology and Society*, 16(2), 12.
- Rockström, J., Steffen, W., Noone, K., Persson, Å., III Chapin, F. S., Lambin, E., . . . Foley, J. (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society*, 14(2).
- Rogers, A. D., & Laffoley, D. d. A. (2011). *International Earth System Expert Workshop on Ocean Stresses and Impacts: Summary Report* (I. P. o. t. S. o. t. Ocean, Trans.). Oxford: Oxford University.
- Salome, L. R., van Bottenburg, M., & van den Heuvel, M. (2013). 'We are as green as possible': Environmental responsibility in commercial artificial settings for lifestyle sports. *Leisure Studies*, 32(2), 173-190.
- Samuel, S., & Stubbs, W. (2012). Green Olympics, green legacies? An exploration of the environmental legacies of the Olympic Games. *International Review for the Sociology of Sport*, 48(4), 485-504.
- Schellnhuber, H.-J., Hare, W., Serdeczny, O., Adams, S., Coumou, D., Frieler, K., . . . L., W. (2012). *Turn down the heat: Why a 4°C warmer world must be avoided* (pp. 106). Washington, DC: The World Bank.
- Schultz, P. W. (2002). Inclusion with nature: The psychology of human-nature relations. In P. Schmuck & P. W. Schultz (Eds.), *Psychology of sustainable development* (pp. 61-78). Boston, USA: Kluwer Academic.
- Scott, D., & Jones, B. (2006). The impact of climate change on golf participation in the Greater Toronto Area (GTA): A case study. *Journal of Leisure Research*, 38(3), 363-380.
- Scott, D., & McBoyle, G. (2007). Climate change adaptation in the ski industry. *Mitigation and Adaptation Strategies for Global Change*, 12(8), 1411-1431.
- SE. (2014). *Green clubs*. Retrieved 26 September, 2014, from <http://www.sustainableclubs.co.uk/green-clubs/>
- Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*, 43(681-697).
- Shrivastava, P. (1995). The role of corporations in achieving ecological sustainability. *Academy of Management Review*, 20(4), 936-960.
- Slack, T. (2003). Sport in the global society: Shaping the domain of sport studies. *The International Journal of the History of Sport*, 20(4), 118-129.

- Smith, A., & Stewart, B. (2010). The special features of sport: A critical revisit. *Sport Management Review*, 13(1), 1-13.
- Spector, S., Chard, C., Mallen, C., & Hyatt, C. (2012). Socially constructed environmental issues and sport: A content analysis of ski resort environmental communications. *Sport Management Review*, 15(4), 416-433.
- SRT. (2009). *Sport and Recreation Tasmania Strategic Plan 2009-2014* Hobart, Tasmania: Sport and Recreation Tasmania Retrieved from http://tasded.clients.squiz.net/_data/assets/pdf_file/0003/41079/Sport_and_Recreation_Tasmania_Strategic_Plan_2009-14.pdf.
- Steffen, W., Crutzen, P. J., & McNeill, J. R. (2007). The Anthropocene: Are humans now overwhelming the great forces of Nature? *Ambio*, 36, 614–621.
- Steffen, W., Sanderson, A., Tyson, P. D., Jäger, J., Matson, P. A., Moore III, B., . . . Wasson, R. J. (2004). *Global change and the Earth system: A planet under pressure.*, 336.
- Stern, N. H., & Treasury, G. B. (2006). *Stern review on the economics of climate change*. London, UK: H.M. Treasury.
- Swan, P., Otago, L., Finch, C., & Payne, W. (2008). The policies and practices of sports governing bodies in relation to assessing the safety of sports grounds. *Journal of Science and Medicine in Sport*, 12, 171-176.
- Townsend, M., Mahoney, M., Jones, J., Ball, K., Salmon, J., & Finch, C. (2003). Too hot to trot? Exploring potential links between climate change, physical activity and health. *Journal of Science and Medicine in Sport*, 6(3), 260-265.
- Tranter, P. J., & Lowes, M. (2009). The crucial ‘where’ of motorsport marketing: Is motorsport now a “race out of place”? *International Journal of Sport Marketing and Sponsorship*, 11(1), 60-79.
- Trendafilova, S. (2011). Sport subcultures and their potential for addressing environmental problems: The illustrative case of disc golf. *LARNet: The Cyber Journal of Applied Leisure and Recreation Research*, 13(1), 1-14.
- Trendafilova, S., & Babiak, K. (2013). Understanding strategic corporate environmental responsibility in professional sport. *International Journal of Sport Management and Marketing*, 13(1), 1-26.
- Trendafilova, S., Babiak, K., & Heinze, K. (2013). Corporate social responsibility and environmental sustainability: Why professional sport is greening the playing field. *Sport Management Review*, 16(3), 298-313.
- Trendafilova, S., Kellison, T. B., & Spearman, L. (2014). Environmental sustainability in sport facilities in East Tennessee *Journal of Facility Planning, Design and Management*, 2(1).
- Trendafilova, S., McCullough, B. P., Pfahl, M., Nguyen, S. N., Casper, J., & Picariello, M. (2014). Environmental sustainability in sport: Current state and future trends. *Global Journal on Advances in Pure & Applied Sciences*, 3, 9-14.
- Trendafilova, S., & Waller, S. N. (2011). Assessing the ecological impact due to disc golf. *International Journal of Sport Management, Recreation and Tourism*, 8, 35-64.
- Twomey, D., Otago, L., Saunders, N., & Schwarz, E. (2008). *Development of standards for the use of artificial turf for Australian football and cricket*. Ballarat: University of Ballarat.
- UN. (1992). *UN, Agenda 21: Report of the United Nations conference on environment and development: Rio declaration on environment and development*. In U. Nations (Ed.). Rio de Janeiro: United Nations Department of Economic and Social Affairs.
- UN, & Brundtland, G. H. (1987). *96th Plenary meeting, United Nations General Assembly. Report to the World Commission on the Environment and Development*. New York, USA: United Nations.

- UNEP. (2005). *Overview of the Millenium Ecosystem Assessment*. Retrieved October 3, 2014, from <http://www.unep.org/maweb/en/About.aspx#14>
- UNEP. (2007). *Global environmental outlook 4: Environment for development*. New York: United Nations Environment Programme.
- UNEP. (2012). *Keeping track of our changing environment: From Rio to Rio+20 (1992-2012)*. (pp. 111). Nairobi, Kenya: Division of Early Warning and Assessment (DEWA), United Nations Environment Programme (UNEP).
- UNEP. (2014). *UNEP launches Green Passport Initiative to reduce environmental impacts of 2014 World Cup in Brazil* Retrieved 30 September, 2014, from <http://www.unep.org/newscentre/default.aspx?DocumentID=2788&ArticleID=10866>
- UNEP. (2015a). *Impact of sport on the environment*. Retrieved 26 September, 2014, from http://www.unep.org/sport_env/impactSport_Env.aspx
- UNEP. (2015b). *Impact of the environment on sport*. Retrieved 26 September, 2014, from http://www.unep.org/sport_env/impactEnv_Sport.aspx
- UNESCO. (2005). *United Nations decade of education for sustainable development (2005-2014): International implementation scheme*. Paris, France: United Nations Educational, Scientific and Cultural Organisation (UNESCO).
- Vlek, C., & Steg, L. (2007). Human behaviour and environmental sustainability: Problems, driving forces, and topics. *Journal of Social Issues*, 63(1), 1-19.
- WADSR. (2007). *Climate change is no longer just a concept: How climate change could affect sport and recreation now and in the future*. Perth, WA: Western Australia Department of Sport and Recreation (WADSR) Retrieved from http://www.dsr.wa.gov.au/assets/files/Research/Climate_Change.pdf.
- WADSR, & Greensense. (2012). *Environmental sustainability pack for sport and recreation organisations in Western Australia*. Perth, WA: Western Australia Department of Sport and Recreation (WADSR) Retrieved from <http://www.dsr.wa.gov.au/assets/files/Sustainability/Sustainability%20Pack.pdf>.
- WCED. (1987). *Our common future (The Brundtland Report)* (pp. 247). Oxford, UK: World Commission on Environment and Development.
- Weinhofer, G., & Busch, T. (2013). Corporate strategies for managing climate risks. *Business Strategy and the Environment*, 22(2), 121-144.
- Weinhofer, G., & Hoffmann, V. H. (2010). Mitigating climate change: How do corporate strategies differ? *Business Strategy and the Environment*, 19(2), 77-89.
- Weiss, O., Norden, G., Hilscher, P., & Vanreusel, B. (1998). Ski tourism and environmental problems. *International Review for the Sociology of Sport*, 33(4), 367-379.
- Wheeler, K., & Nauright, J. (2006). A green game? A global perspective on the environmental impact of golf. *Sport in Society*, 9(3), 427-443.
- Wiesner, R. (2013). Human resources and sustainability. In G. Moscardo, G. Lamberton, G. Wells, W. Fallon, P. Lawn, A. Rowe, J. Humphrey, R. Wiesner, B. Pettitt, D. Clifton, M. Renouf & W. Kershaw (Eds.), *Sustainability in Australian business: Principles and practice* (pp. 343-366). Milton, Queensland: John Wiley & Sons.
- Wilkinson, D., & Yencken, D. (2000). *Resetting the Compass: Australia's Journey Towards Sustainability*. Collingwood, Australia: CSIRO Publishing.
- Wilson, M. (2003). Corporate sustainability: what is it and where does it come from? *Ivey Business Journal*, 67, 1-5.

Wittneben, B. B. F., & Kiyar, D. (2009). Climate change basics for managers. *Management Decision*, 47(7), 1122-1132.