Sustaining the Ski Industry:
An Ecological Economic Perspective
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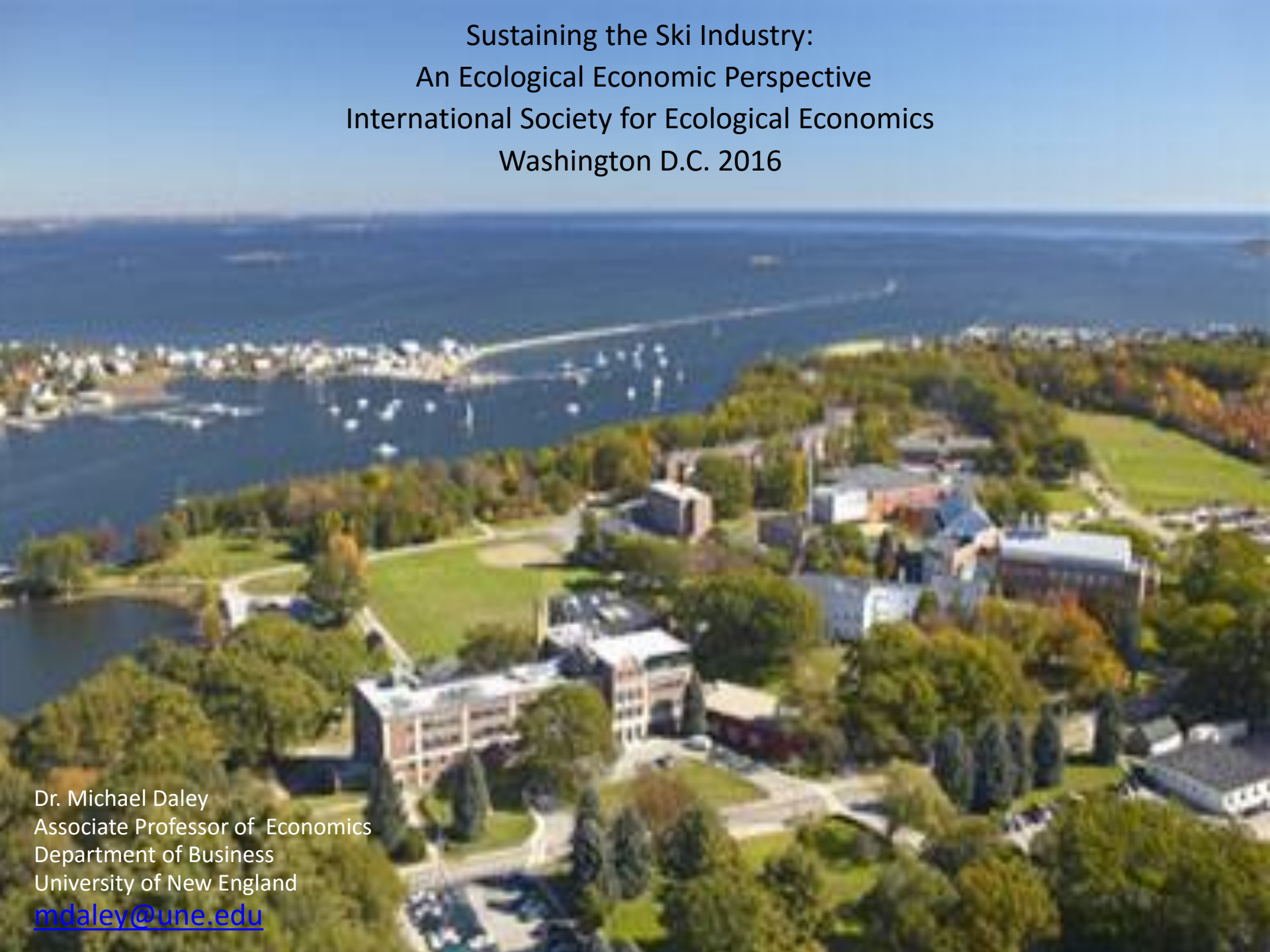

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Abstract

- Owners and management in the ski resort industry do not debate whether winters are warmer and shorter or if natural snow is scarcer than a few decades ago. This is evident in ski markets around the globe. Low and high altitude resorts alike can simply look at records showing increased reliance on snow making activity to open on time, maintain adequate conditions, and avoid closing prematurely. Industry analysis indicates that a decrease in the number of ski operations in high impact areas and a consolidation of ownership in low impact have been underway for nearly three decades and only accelerated in the past decade. To date, efforts to cost effectively combat a decreasing number of ski days with manufactured snow production, a struggle only complicated by a decreasing number of available snow making days, have relied primarily on dramatic improvements in snow making technology, which have lowered unit costs dramatically. However, the potential for reduced ski days resulting from global warming and reduced snow fall, in combination with a slowdown in snow making efficiency could spell serious trouble for an industry already facing steady pressure to maintain profitability and visitor demand. This paper presents a summary review of the ski resort industry's reliance on and relationship with manufactured snow has it has emerged over the past several decades. In contrast to the growth, efficiency, technology intensification model practiced by owners and management over this time frame, this paper argues that to be sustainable over the ski industry must shift focus and treat snow as scarce manufactured capital. In shifting paradigms, the industry must clearly define their scale and scope of snow making activity, cap snow making production, and intensify efforts to preserve and conserve its manufactured capital.

Overview

- Academics and the ski resort industry have been slow to respond:
  - Despite climate change being identified as the major threat to tourism in the twenty-first century (United National World Tourism Organization, United Nations Environment Program & World Meteorological Organization (UNWTO-UNEPWMO, 2008), there is limited research on how climate change affects the tourism industry and how the tourism industry is responding. (Gossling & Hall, 2006b; Scott, 2011; Scott & Becken, 2010; Wolfsegger, Gossling & Scott, 2008).
  - Only around 2% of academic tourism research examines any aspects of climate change – be it impacts, mitigation and/or adaptation (Scott, 2011; Weaver, 2011).
  - The tourism sector is at least 5–7 years behind other industries in climate change research (Wolfsegger et al., 2008).
  - The global ski tourism industry is a multibillion dollar industry employing thousands of people with much at stake in responding to this challenge.
- This slow response is ironic given the sensitivity of tourism to climate change and the fact that predicted changes in a range of climatic variables will have significant implications.

Adaptation

- The Industry Strategy is to adapt with snow making technology and product diversification
  - A recent review of the publicly available literature of climate change impacts and adaptation in the Australian Alps found that snowmaking and diversification to year-round tourism were the two primary adaptation strategies favored by the tourism industry (Morrison & Pickering, 2011).
  - Data suggests that snowmaking will bolster the industry until 2050. If correct, this gives alpine resorts the time to develop different seasonal products and not just winter products.
  - “If we can do that, we can still remain viable. If we can’t, the alpine resorts will become ghost towns” (Morrison & Pickering, 2013).

Stakeholders – “no limits”

- Four type stakeholders - tourism industry, conservation managers, researchers, local government did not express concern about economic or technological limits to snowmaking (Morrison & Pickering, 2013). Why:
  - The perception that climate change will have a serious impact on tourism and that the perception that tourism adaptation strategies will not work in the longer term (social, economic and physical limits) is more detrimental to tourism than the actual impacts of climate change. (Morrison & Pickering, 2013)
  - This is seen throughout the tourism industry, where companies do not broadcast their vulnerability to guests, insurers or investors but discretely adapt or sell off high-risk assets (Scott, 2011).
  - Weaver’s 2011 opinion: Can sustainable tourism survive climate change? *Journal of Sustainable Tourism, 19*(1), 5–15. Weaver’s thesis that sustainable tourism’s current expanding engagement with climate change may not necessarily be conducive to the interests of tourism sustainability.
  - Alternatively, it may be the result of shorter-term thinking and planning by the tourism industry (more focused on immediate business survival) compared with longer-term planning by other stakeholders (see Brouder & Lundmark, 2011)

Stakeholders

- All other stakeholders believed that the tourism industry will soon (if not already) experience significant economic limits in terms of snowmaking costs (electricity, water, infrastructure) and social constraints (public opinion and competition for water and electricity) (Morrison & Pickering, 2013).

Low Pressure Snow Gun

Low Pressure Snow Gun

Technology, Efficiency, Growth Model

- Ski Resort Industry's application of manufactured snow has developed along the lines of a Technology, Efficiency, Growth model or paradigm.
  - Dramatic reductions in the unit cost of snowmaking has occurred over the past 30 years. The technology can now be deployed at lower pressures, which reduces energy usage per volume of snow. It also allows snow to be blown at a higher temperature.
  - Unit cost reductions translated to an every widening scope of coverage - most resorts aim for 100% of trail, guaranteed opening and closing dates, rapid response to rain events impacting peak school vacation periods.
  - Reliance on snowmaking is driven by trending warming which has been occurring since the early 1980s.
  - The demand for snowmaking caused total costs to rival total labor costs in terms of resort operations.
  - In addition, major resorts have had the added pressure of meeting demands of the real estate corporations. Condo owners provide a major source of dependable revenues through season pass purchases.

Scale, Diversification, Efficiency

- The Ski Industry needs to view manufactured snow more clearly as scarce manufactured capital

- The business model could learn from applying concepts contained in ecological economic thinking – specifically prioritizing scale over efficiency.

  - Annual snowmaking should be viewed in terms of a rigid self imposed cap on the volume of manufactured snow.

  - Sugarloaf, for example, does employ a soft strategy that implies a cap on total snowmaking. It is revealed in most winters when the snow guns get turned of in late January for the rest of the winter.

- In the east, the winters of 2012 & 2015, which were a combined disaster in terms of limited snow fall and warmer that average temperature, provided a glimpse of what the future might look like.

Conserve Using Modern Technology

- A new vision of deploying and conserving manufactured snow is needed that adopts a more sustainable business model:
  - Take advantage of state-of-the-art weather forecasting
  - Deploy technology to conserve snow
  - Selective trail application
  - Manage real estate holders expectations
  - Customized services such a resort terrain parks
  - Urban services