

Sustainable Tourism in Svalbard: Balancing economic growth, sustainability, and environmental governance

Commentary

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Abstract

This commentary introduces a methodology and theoretical framework for studying how the tourism industry might balance the competing demands of economic growth and environmental governance. We focus on the “balancing act” Svalbard tourism industry must play among sometimes competing demands of climate change mitigation and emissions from tourism, and of strict Norwegian environmental management policy and demands for increased tourism. While these are specific to Svalbard, the balancing act of competing needs is the core challenge of the UN Sustainability Goals giving this research global and pan-Arctic relevance. Through collaboration between two tourism organisations, the Association of Arctic Expedition Cruise Operators (AECO) and Visit Svalbard and an interdisciplinary team of scientists, we will co-produce knowledge about how to innovate new opportunities while protecting the wilderness, the very backbone of tourism. This collaboration considers how policy, climate change, and local attitudes together may affect the tourism industry and helps to define and develop sustainable tourism operations and products. For instance, tourists may participate in environmental and community-related activities or “micro safaris” rather than a sole focus on charismatic megafauna. Policy discussions about tourism growth need to consider how local and national governments anticipate and navigate rapid social, political, and environmental changes.

Multiple demands on Svalbard tourism

Arctic tourism is growing rapidly and is often seen as an economic opportunity (e.g. Lemelin, Stewart, & Dawson, 2012). However, the directions of future development cannot be taken for granted as the growth takes place in the context of changing geopolitical conditions, growing global interest in the economic potential of the Arctic, and increasing environmental concerns, especially linked to climate change and habitat degradation, and more recently the ongoing COVID-19 pandemic. The action space available to tourism operators may be affected by competing national and local priorities, where meeting economic targets might be overlooked in favour of environmental targets and vice versa. The tourism industry operating from Longyearbyen may create new opportunities as they respond to the ongoing transformative changes of Svalbard’s society and environment, but this will require innovation.

The Norwegian national Svalbard policy has a long-term goal to transition the Archipelago into a sustainable future without coal while continuing to maintain Norwegian presence. The Norwegian sovereignty on Svalbard is anchored in the Svalbard Treaty from 1920 (entered into force in 1925, ratified by 44 countries). At the national level, Svalbard policy contains three key dimensions: (i) environmental policy and management goals stipulated by the Svalbard Environmental Protection Act, (ii) maintaining sovereignty according to the Svalbard Act, and (iii) transforming Svalbard’s economic foundation from coal to tourism, research, and education. The Norwegian Svalbard policy maintains the goal to uphold the Norwegian settlements and preserve the unique environment (Ministry of Justice and Public Security, 2016). The Environmental Policy Act stipulates that environmental concerns shall trump economic interests in case of conflict, while the Svalbard Act prescribes that large areas will remain unchanged for the purposes of research and monitoring. Svalbard policies also address national strategic ambitions, international tolerance (Grydehøj, Grydehøj, & Ackrén, 2012), and international policy goals such as the Paris Agreement and the United Nations Sustainable Development Goals (SDGs) (THE 17 GOALS | Sustainable Development (un.org)).

The Treaty forms the legal basis for Norway’s ambitious environmental management goal of Svalbard being among the best-managed wilderness areas in the world as explicated in the

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Svalbard Environmental Protection Act of 2001. This goal is reiterated in the newly revised regulation on tourism on Svalbard that addresses the protection of nature in the context of the tourism growth (Ministry of Justice and Public Security, 2018). The nationally driven transformation of Svalbard's economy, from coal mining to tourism, research and education, is a balancing act among many economic and environmental priorities (Ministry of Justice and Public Security, 2016). The economic opportunities for the tourism industry are increasingly constrained by the need to take climate change impacts and environmental requirements into account. Svalbard governance and policy require the tourism industry to balance the provision of customers with experiences in a fragile environment against protecting the archipelago from the impacts of global change (ibid.).

Meanwhile, these new regulations express intent rather than offering guidance for tourism operators who are balancing these competing demands in practical terms. This is at times at odds with the goal of increased tourism activities in Longyearbyen where the operators sell wilderness as a product in areas with restricted access. The result may be that compliance with one set of policies may compromise adherence to other policies. The complex regulatory framework thereby creates a challenging action space for tourism operators and decision-makers alike.

The dilemma facing Arctic tourism operators when weighing economic and environmental demands is not specific to this region. Rather, balancing competing economic, societal, and ecological demands cuts to the core of the global challenge of balancing trade-offs within the SDGs (Veland, Gram-Hanssen, Maggs, & Lynch, *in press*). While specific demands depend on local contexts, the responses offer lessons for the Arctic region as well as globally. Indeed, the internal inconsistencies between government policies for economic growth and environmental conservation are more than mere bureaucratic issues specific to Svalbard and reflect fundamental challenges for humanity facing the need to transform to avoid catastrophic climate change and ecosystem loss.

In this commentary, we present a study that is in its early stages of investigations. The BalancingAct project (project period 2020–2024) took form through discussions and consultations between two Svalbard tourism organisations, the Association of Arctic Expedition Cruise Operators (AECO) and Visit Svalbard and the interdisciplinary research team. Based on these discussions, our ongoing research on Svalbard (Hovelsrud, Kaltenborn, & Olsen, 2020; Kaltenborn, Østreng, & Hovelsrud, 2020; Kelman, Rauken, & Hovelsrud, 2012; Olsen, Hovelsrud, & Kaltenborn, 2020), and other tourism studies (e.g. Hagen, Vistad, Eide, Flyen, & Fangel, 2012; Saville, 2019; Sisneros-Kidd, Monz, Hausner, Schmidt, & Clark, 2019; Van Bets, Lamers, & van Tatenhove, 2017; Viken, Johnston, Nyseth, & Dawson, 2014; Viken, 2011), we learned that the tourism industry is struggling with cumulative and cascading effects of changes in policy, economy, and environmental conditions, including climate change (see Fig. 1).

Our intention with this commentary is to outline how we address the challenges and opportunities found in the multifaceted landscape of Svalbard tourism.

Svalbard's changing tourism

The Norwegian national policy to further develop the tourism industry creates multiple opportunities on Svalbard including local value creation, development of new organisations, and employment opportunities (SSB, 2018). Growth in tourism and culture

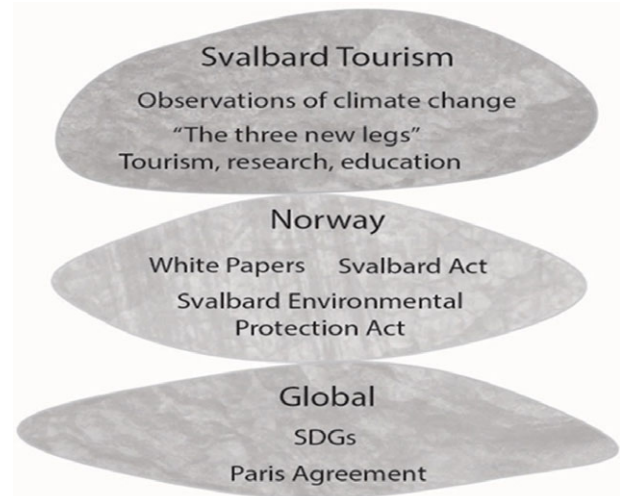


Fig. 1 An illustration of the many and scaled processes that the tourism industry needs to balance.

is reflected in the increased number of guest nights (from 82,831 in 2010 to 162,949 in 2019) (Visit Svalbard, 2020), cruise visitors (from 31,545 in 2010 to 62,342 in 2018) (Epinion, 2019; Port of Longyearbyen, 2018), and increased number of person-years (full-time equivalents) from 291 in 2010 to 518 in 2019 related to accommodation, food service, arts, entertainment, recreation (SSB, 2020). Furthermore, Svalbard tourism trends show a shift from seasonal to year-round tourism, from land-based towards marine based tourism and Longyearbyen increasingly becoming a tourist destination rather than a transit hub (Olsen et al., 2020). The revenues from the different segments of the local tourism industry differ greatly, as do their carbon and environmental footprints.

The tourist boom in Longyearbyen in the past two decades can be explained by the growing interest in the Arctic in general and in Svalbard in particular, by national and local facilitation of tourism, and by easier access because of reduced sea ice cover (Hovelsrud et al., 2020; Palma et al., 2019). With retreating sea ice, the tourism industry offers trips to new and previously inaccessible areas, and the cruise ship season is extended (Bystrowska, 2019; Olsen, Carter, & Dawson, 2019; Stocker, Renner, & Knol-Kauffman, 2020; Øian & Kaltenborn, 2020). On-land tourism increasingly offers year-around attractions. More tourists boost employment and income, but also result in overcrowding and increasing pressure on the environment and infrastructure. There is concern that Longyearbyen will become a mass tourist destination with a rapid growth in year-round visitors (Olsen et al., 2020). This has prompted community responses designed to limit the impact of tourism on the fragile High Arctic environment and on Longyearbyen. This concern is reflected in the plans by the tourism organisations, such as the Master Plan for Tourism on Svalbard (Mimir, 2015) to develop adaptation measures that both meet the demands from increased tourism and from the local population to maintain Longyearbyen as an attractive place to live.

From a climate change perspective, the tourism industry faces a greater diversity of risk than other economic sectors (Scott, Hall, & Gössling, 2019). In Svalbard, tourists often arrive by cruise ships, which is an even more carbon-intensive way of travel than aviation (Walnum et al., 2019). Therefore, mitigation policies may affect Svalbard tourism, which relies on long haul travellers. This is

exemplified by Norway's announcement in November 2020 to prohibit Heavy Fuel Oil for all vessels operating around Svalbard. Increasing ocean temperature, rapid decline in winter sea ice, and other environmental changes influence ecosystem functions (Meier et al., 2014). The ecosystem services such as sea ice, permafrost, flora, and fauna are directly or indirectly affected by climate change (AMAP, 2017b; Hanssen-Bauer et al., 2019; Hovelsrud, Poppel, Oort, & Reist, 2011), thereby affecting the infrastructure and products at the heart of Svalbard tourism. Further, climate change is also causing an emergency response crisis in Longyearbyen due to avalanches threatening homes and thawing permafrost causing severe damage to roads and other infrastructure. Recently, a portion of the Longyearbyen population were evacuated from their homes due to avalanche threats.

Theoretical and methodological approaches

To study the balancing of competing and sometimes conflicting demands and goals, we approach the societal, economic, and environmental sustainability of Svalbard tourism through the frames of adaptation to multiple stressors and societal transformation to a low-emission society. Adaptation is a context-dependent process shaped by the structure of the community and the exposure-sensitivities to multiple stressors, such as the consequences of climate change and outmigration, and cumulative consequences of change, affecting societal vulnerability (e.g. Hovelsrud & Smit, 2010). Adaptation processes can be reactive or proactive and include barriers, limits, and opportunities across scales (e.g. governance, sectors) and actors (AMAP, 2017a). This means that there is a potential for conflict between the different actors' interests. Nevertheless, recent assessments of adaptation in the Barents Region, where Longyearbyen is located, show that proactive adaptation by local governments and business organisations, such as adaptive responses to avalanche, mudslides, sea level rise, sea ice reduction, and thawing permafrost in practice, is ahead of national guidelines (AMAP, 2017a). Adaptation, whether reactive or proactive, takes many forms depending on the interactive and multiple effects. It may reduce vulnerability (Adger et al., 2009), increase resilience, and enable transformation (Pelling, 2011). Engineering and new infrastructure may be developed to reduce the effects of thawing permafrost and avalanche; other adaptive responses may include new or changed institutional structures, economic mechanisms, and innovations (AMAP, 2017a). These are already at play in Svalbard, evidenced by the multitude of new tourism operators and products adjusted to the more recent climate change effects.

Societal transformation is a concept closely related to adaptation and is taking hold as a theoretical framing for analysing how society can address the call for substantial greenhouse gas emission (GHG) cuts and the implementation of the SDGs (Veland et al. *in press*; Few, Morchain, Spear, Mensah, & Bendapudi, 2017; O'Brien, 2016, 2012). While transformational adaptation may be required where incremental adaptation is insufficient (Kates, Travis, & Wilbanks, 2012), the concept of transformation is unsettled and ambiguous in theory as well as in policy and practice and requires explorative and transdisciplinary research (Scoones, Leach, & Newell, 2015). Major changes, inherent in ambitious sustainability targets, come with trade-offs between different values, groups, and activities, and therefore point to investigations on who prioritises what to understand what transformation may demand of different segments of society. Recent findings show that there is an obvious gap between how

transformation is portrayed and pursued at the international level, at the national sectoral levels, and in locally based sectors (Amundsen & Hermansen, 2020). Understanding and applying local perceptions of societal transformation may be useful for revealing what different local actors view as meaningful and acceptable transformation directions (Karlsson & Hovelsrud, 2020). Transformation necessitates integrated approaches spanning divisions between and within sectors and social groups (Moloney & Horne, 2015), as well as across scales (Kates et al., 2012).

Societal transformation requires large and cross-scale changes (from global to individual) and interconnections in technologies, politics, economic mechanisms, and social values (Kates et al., 2012; O'Brien, 2016). The lack of consistent theories and practices guiding transformation may therefore involve uncertainties in terms of outcomes for sustainability when transferred into policy and practice (Blythe et al., 2018; Leach et al., 2012). In Svalbard, there are two key levels of potentially transformative change: (1) Svalbard's economic and policy portfolio transforming from coal to tourism, research, and education, driven by the Norwegian state; and (2) the tourism industry's responses to multiple pressures and demands, and to the opportunities and challenges that may arise in developing new tourism products both in response to a changing market and to change the traditional tourist demands. Tourism operators have ambitions to expand the tourism industry, shifting its focus from the traditional products of ice and polar bears towards more localised products with a lower carbon footprint, while ensuring that the transition is sustainable. Through the application of two interlinked theoretical perspectives, it is possible to investigate whether the tourism industry's responses are transformational or adaptive or both. This comes with implications for how to develop a sustainable tourism industry.

The World Tourism Organization defines sustainable tourism as taking "full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and the host communities" (UNEP-WTO, 2005, p. 12). We approach sustainability as an interlinked concept where socio-ecological sustainability depends on an acceptable balance, according to public judgement, between pressures and responses in coupled environmental, economic, and socio-cultural domains (Petrov et al., 2016). We understand this balancing act as being to some extent scaled along institutional levels. When national and international governing bodies set targets for sustaining key aspects of societies or the environment (Svalbard Environmental Protection Act), they are potentially placing demands for transformation at other societal levels. The progress towards sustainability is linked to the debates in climate change research on how to conceptually distinguish between adaptation to multiple stressors and societal transformation. We firmly believe that without an understanding of the local perspectives and needs, we cannot develop the theoretical foundations of adaptation and transformation, which after all are inextricably linked to the practical and physical actualities of local context.

Co-production of knowledge has become the new buzzword in the global environmental change literature and is listed as a requirement in many calls for research or assessment proposals. Such co-production underpins the theoretical and methodological approach of our study, where the boundaries between domain of science and non-science ideally will be dissolved and not actively maintained. For co-production of usable knowledge to occur the

boundaries must be kept open and porous in the right places, through communication, translation and mediation, to ensure legitimate, salient, and credible knowledge (e.g. Cash *et al.*, 2003). The concept of co-production, first coined by Elinor Ostrom in the 1970s, has many applications and definitions as outlined in the overview by Bremer and Meisch (2017). They identify two main focal areas in research on co-production of knowledge, descriptive and prescriptive. The first area of co-production of knowledge pertains to the description and analysis of how knowledge is generated and sustained within power relations and social order. The focus is on understanding how the products of science and technology flow across societal boundaries. This descriptive perspective is represented by scholars such as Sheila Jasanoff, Bruno Latour, and Bryan Wynne, who are on a quest to understand how science, technology, and society interact to make and remake each other (Bremer & Meisch, 2017, p. 2). Here we align largely with the second area, which pertains to co-production as deliberate collaboration between different knowledge systems and stakeholder groups towards a common goal of generating knowledge on policy-relevant topic. In practice, this means that the researcher and industry operators in BalancingAct will discuss what we know and how we know the tourism industry and the potential for developing new and sustainable tourism products. The main concern is with the co-production of “demonstrably usable” knowledge for policymaking (Dilling & Lemos, 2011), such as commonalities with transdisciplinary approaches (Hirsch Hadorn *et al.*, 2008). Such deliberate processes for producing actionable knowledge about the combined effects of climatic and societal change therefore include collaboration between different kinds of knowledge systems. By bringing together natural and social scientists and expert practitioners from tourism organisations, all with different knowledge systems and approaches, we can address change, understand policy, and find innovative solutions to sustainability challenges.

Co-production of knowledge is ideally a continuous collaborative and iterative process throughout various stages of a project, from design, data collection, and analysis (Dilling & Lemos, 2011). This approach permeates our study from the initial and subsequent discussions with Visit Svalbard and AECO during which the focus and research questions were developed for the project proposal. This means that the focal points of the project were co-produced at the onset and will in a similar manner be refined as the research develops. Through multiple methods including document analysis, semi-structured interviews, participant observation and scenario development, as well as ongoing conversations among collaborators, research questions, methods, and findings are discussed, reconsidered, and proposed: knowledge exchange between the different scientific disciplines and expert practitioners identifies the scope and content of the document analysis; the interview guide for the semi-structured interviews is a collaborative effort as are decisions on who to interview.

Scenario workshops are a particularly important arena for co-producing knowledge as is based on a participatory scenario approach aimed at facilitating learning across different fields of expertise (Nilsson *et al.*, 2019; Dannevig *et al.*, 2019). Participatory scenario methods identify the main drivers of change, impacts, responses, and solutions. By linking identification of local drivers of change relevant for tourism with an assessment of how these may play out under different conditions at larger scales (Nilsson *et al.*, 2017), narrative scenarios of different sustainable solutions for tourism are co-produced. Attention to surprises and tipping points in the dynamics of the coupled social-ecological

systems ensures relevance for tourism activities (Nilsson *et al.*, 2019). Co-production of knowledge in this way provides a deeper understanding of how to prepare for the future and to discern whether and how the action space emerging in balancing different demands and pressures can be utilised by the tourism operators.

Local perspectives on global challenges: meeting the demands for sustainable tourism

The need to balance the impacts of climate change and habitat degradation with maintaining a viable community on Longyearbyen, while meeting the Paris Agreement emission targets and adhering to the Svalbard Environmental Protection Act is embedded in Svalbard policy, and is shaped by national policy and international agreements such as the SDGs. Meanwhile, decision-makers tasked with implementing these competing priorities have not been given the tools to solve internal inconsistencies among targets. Indeed, this is not a challenge unique to Svalbard, but is common to global communities faced with solving the core challenge of sustainability. As such, this “balancing act” is a tall order for Svalbard tourism operators. Nevertheless, conversation investigating how competing national and local priorities shape the action space available to tourism operators and organisations is a useful starting point for innovation. The action space might be constrained where meeting economic targets through tourism growth negates reaching environmental targets due to trampling or habitat encroachment and vice versa. Co-producing strategies for developing a sustainable tourism sector in Svalbard, as outlined earlier, ensures greater salience, relevance and legitimacy of the findings (Cash *et al.*, 2003; Dannevig & Hovelsrud, 2016; Dannevig *et al.*, 2020), and insights are more likely to be embraced by local actors in future economic development as well as conservation measures.

Given the increasing attention to sustainability and ways to reduce the carbon footprint, BalancingAct creates a platform to think creatively about tourism products that may sensitise visitors to Earth system sustainability and how such products may dissuade carbon-intensive travel in the vulnerable Arctic environments. This is a challenge for tourism organisations and operators who wish to maintain a viable business and at the same time respond to increasing demands of reduced GHGs and ecosystem conservation.

International policy instruments such as the SDGs provide relevant context for Svalbard as the internal inconsistencies among Svalbard policy targets are replicated in these global efforts to balance needs to achieve human well-being. The SDGs are a comprehensive overview of human needs and contain both synergistic interactions, as well as cascading negative trade-offs vertically through a policy chain (national, regional, local) to the existing environmental governance regime. It is both challenging and urgent to develop policy-relevant insights that address trade-offs among the SDGs, Targets and Indicators early and constructively (Goal 17, Veland, *et al.* *in press*). When implemented in this way, the 17 SDGs are transformative in scope. The ongoing COVID-19 pandemic has created a crisis for the tourism industry, in Svalbard and elsewhere. Yet, this crisis may also be an opportunity for the transformative change needed to solve the sustainability issues that riddle tourism (e.g. significant carbon footprint and wear and tear on habitats), as suggested by Gössling and colleagues (2021). Already, the decision to phase out coal from the Svalbard economy has generated a transformation in the Longyearbyen demographics, generating new influences and potential avenues for

innovation. Insights produced at the local level with local actors (Fuso Nerini et al., 2018; Lynch & Veland, 2018) will help discover ways to innovate within the complex constraints placed on tourism by competing policy, governance, economic, and environmental processes.

The way forward

By combining and co-producing knowledge and data from diverse tourism industry experts and academic disciplines, we are positioned to contribute insights into how Longyearbyen residents view the tourism sector and its broader role in the Svalbard economy, society, and environment. The attitudes of the local community towards current tourism and likely future options are also relevant for developing sustainable tourism products. This includes local perceptions of environmental hazards, human safety and emergency responses, attitudes toward specific tourism development options, relationships with visitors, and environmental orientations. We are approaching the nexus of sustainable tourism and policy demands from an experimental point of view, with the full knowledge that the notion of sustainable tourism is contested in the literature. BalancingAct will test whether it is possible to co-produce knowledge for sustainability, and we expect to move the issue forward, scientifically, and practically.

BalancingAct brings together tourism operators, researchers, and educators that together are responsible for setting up the Svalbard economy's "three new legs" following the cessation of coal. In this collaboration, the development of new tourism products is an explicit goal and the team will organise workshops and pilot potential solutions. For instance, researchers at the University Centre in Svalbard – UNIS have suggested piloting products that expose tourists to aesthetic microscopic organisms common in the oceans surrounding Svalbard in "microscopic safaris." These tourism products offer a centrepiece to teach visitors about ecosystem form and function as well as influences from climate change and pollutants such as plastic. As another example, tourism operators have suggested visitors can become engaged in community-based activities during their visit. They might gather plastic waste along beaches, contribute to organising and hosting community events, participate in data collection for researchers, and so on.

Then came COVID-19

The first set of empirical data emerged in the kick-off meeting for the project, held in Longyearbyen in September 2020. The team members from outside Norway could not travel because of the COVID-19 pandemic. The rest of the team found the town of Longyearbyen on a slow burner. The few restaurants that were open were supported by locals. There were no tourists, save for a group of pensioners from Norway, most hotels were closed, no cruise ships in the harbour and an industry marked by serious concerns for the future. The seriousness of the pandemic for the industry aside, the obvious question of how we study sustainable tourism when there are no tourists has come to the forefront. A major question is what the "new normal" will look like, and whether the COVID-19 pandemic has ushered a tipping point toward a transformed tourism sector. Will a "new normal" affect peoples' attitudes towards tourism? A survey of the attitudes of tourists and residents will produce different findings post-COVID-19, and we wonder what the pandemic will teach us about transformation, resilience, vulnerability, and drivers of change.

Conflict of interest. The authors declare none.

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References

- Adger, N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., ... Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, 93(3), 335–354. doi: [10.1007/s10584-008-9520-z](https://doi.org/10.1007/s10584-008-9520-z)
- AMAP. (2017a). *Adaptation Actions for a Changing Arctic: Perspectives from the Barents Area*. Oslo, Norway: Arctic Monitoring and Assessment Programme (AMAP), pp xiv + 267.
- AMAP. (2017b). *Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2017, Arctic Monitoring and Assessment Programme (AMAP)*. Retrieved from Oslo, Norway, xiv + 269 pp.
- Amundsen, H., & Hermansen, E. A. T. (2020). Green transformation is a boundary object: An analysis of conceptualisation of transformation in Norwegian primary industries. *Environment and Planning E: Nature and Space*, 2514848620934337. doi: [10.1177/2514848620934337](https://doi.org/10.1177/2514848620934337)
- Blythe, J., Silver, J., Evans, L., Armitage, D., Bennett, N. J., Moore, M.-L., ... Brown, K. (2018). The dark side of transformation: Latent risks in contemporary sustainability discourse. *Antipode*, 50(5), 1206–1223. doi: [10.1111/anti.12405](https://doi.org/10.1111/anti.12405)
- Bremer, S., & Meisch, S. (2017). Co-production in climate change research: reviewing different perspectives. *WIREs Climate Change*, 8(6), e482. doi: [10.1002/wcc.482](https://doi.org/10.1002/wcc.482)
- Bystrowska, M. (2019). The impact of sea ice on cruise tourism on Svalbard. *Arctic*, 72, 151–165. doi: [10.14430/arctic68320](https://doi.org/10.14430/arctic68320)
- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., ... Mitchell, R. B. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences*, 100(14), 8086–8091. doi: [10.1073/pnas.1231332100](https://doi.org/10.1073/pnas.1231332100)
- Dannevig, H., Groven, K., Hovelsrud, G. K., Lundberg, A. K., Bellerby, R.G., Wallhead, P., & Labriola, M. (2019). A framework for agenda-setting ocean acidification through boundary work. *Environmental Science and Policy*, 95, 28–37. <https://doi.org/10.1016/j.envsci.2019.02.001>
- Dannevig, H., & Hovelsrud, G. K. (2016). Understanding the need for adaptation in a natural resource dependent community in Northern Norway: issue salience, knowledge and values. *Climatic Change*, 135(2), 261–275. doi: [10.1007/s10584-015-1557-1](https://doi.org/10.1007/s10584-015-1557-1)
- Dannevig, H., Hovelsrud, G. K., Hermansen, E. A. T., & Karlsson, M. (2020). Culturally sensitive boundary work: A framework for linking knowledge to climate action. *Environmental Science & Policy*, 112, 405–413. doi: [10.1016/j.envsci.2020.07.002](https://doi.org/10.1016/j.envsci.2020.07.002)
- Dilling, L., & Lemos, M. C. (2011). Creating usable science: Opportunities and constraints for climate knowledge use and their implications for science policy. *Global Environmental Change*, 21(2), 680–689. doi: [10.1016/j.gloenvcha.2010.11.006](https://doi.org/10.1016/j.gloenvcha.2010.11.006)
- Epinion. (2019). *Cruise study Svalbard. An examination of the economical impact of cruise tourism (expedition- and conventional cruise) in Svalbard*. Retrieved from <https://www.aeco.no/wp-content/uploads/2019/09/2019-Epinion-Cruise-Study-AECO-and-VisitSvalbard-Final-report.pdf>
- Few, R., Morchain, D., Spear, D., Mensah, A., & Bendapudi, R. (2017). Transformation, adaptation and development: Relating concepts to practice. *Palgrave Communications*, 3(1), 17092. doi: [10.1057/palcomms.2017.92](https://doi.org/10.1057/palcomms.2017.92)
- Fuso Nerini, F., Tomei, J., To, L. S., Bisaga, I., Parikh, P., Black, M., ... Mulugetta, Y. (2018). Mapping synergies and trade-offs between energy and the sustainable development goals. *Nature Energy*, 3(1), 10–15. doi: [10.1038/s41560-017-0036-5](https://doi.org/10.1038/s41560-017-0036-5)

- Gössling, S., Scott, D., & Hall, C. M. (2021). Pandemics, tourism and global change: a rapid assessment of COVID-19. *Journal of Sustainable Tourism*, 29(1), 1–20. doi: [10.1080/09669582.2020.1758708](https://doi.org/10.1080/09669582.2020.1758708)
- Grydehøj, A., Grydehøj, A., & Ackrén, M. (2012). The globalization of the arctic: Negotiating sovereignty and building communities in Svalbard, Norway. *Island Studies Journal*, 7(1), 99–118. Retrieved from <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84871447185&partnerID=40&md5=2240f09e749912f0fd3a2a88d10de037>
- Hagen, D., Vistad, O. I., Eide, N. E., Flyen, A. C., & Fangel, K. (2012). Perspective: Managing visitor sites in Svalbard: from a precautionary approach towards knowledge-based management. *Polar Research*, 31(0). doi: [10.3402/polar.v31i0.18432](https://doi.org/10.3402/polar.v31i0.18432)
- Hanssen-Bauer, I., Forland E. J., Hisdal, H., Mayer, S., Sandø, A. B., & Sorteberg, A. (2019). *Climate in Svalbard 2100 – a knowledge base for climate adaptation*. Retrieved from <https://www.miljodirektoratet.no/globalassets/publikasjoner/M741/M741.pdf>
- Hirsch Hadorn, G., Hoffmann-Riem, H., Biber-Klemm, S., Grossenbacher-Mansuy, W., Joye, D., Pohl, C., ... Zemp, E. (2008). *Handbook of transdisciplinary research*. Dordrecht: Springer.
- Hovelsrud, G. K., Kaltenborn, B. P., & Olsen, J., fe. (2020). Svalbard in transition: adaptation to cross-scale changes in Longyearbyen. *The Polar Journal*, 1–23. doi: [10.1080/2154896X.2020.1819016](https://doi.org/10.1080/2154896X.2020.1819016)
- Hovelsrud, G. K., Poppel, B., Oort, B., & Reist, J. D. (2011). Arctic societies, cultures, and peoples in a changing cryosphere. *Ambio*, 40(1), 100–110.
- Hovelsrud, G. K., & Smit, B. (2010). *Community adaptation and vulnerability in the arctic regions*. Dordrecht, Heidelberg, London, New York: Springer.
- Kaltenborn, B. P., Østreng, W., & Hovelsrud, G. K. (2020). Change will be the constant – future environmental policy and governance challenges in Svalbard. *Polar Geography*, 43(1), 25–45. doi: [10.1080/1088937X.2019.1679269](https://doi.org/10.1080/1088937X.2019.1679269)
- Karlsson, M., & Hovelsrud, G. K. (2020). “Everyone comes with their own shade of green”: Negotiating the meaning of transformation in Norway’s agriculture and fisheries sectors. *Journal of Rural Studies*. doi: [10.1016/j.jrurstud.2020.10.032](https://doi.org/10.1016/j.jrurstud.2020.10.032)
- Kates, R. W., Travis, W. R., & Wilbanks, T. J. (2012). Transformational adaptation when incremental adaptations to climate change are insufficient. *Proceedings of the National Academy of Sciences*, 109(19), 7156–7161. doi: [10.1073/pnas.1115521109](https://doi.org/10.1073/pnas.1115521109)
- Kelman, I., Rauken, T., & Hovelsrud, G. (2012). Local business perceptions of weather impacts on tourism in Svalbard, Norway. *Northern Review* (35). Retrieved from <https://thenorthernreview.ca/nr/index.php/nr/article/view/240>
- Leach, M., Rockström, J., Raskin, P., Scoones, I., Stirling, A. C., Smith, A., ... Olsson, P. (2012). Transforming innovation for sustainability. *Ecology and Society*, 17(2). doi: [10.5751/ES-04933-170211](https://doi.org/10.5751/ES-04933-170211)
- Lemelin, R. H., Stewart, E., & Dawson, J. (2012). An introduction to last chance tourism.. In R. H. Lemelin, E. Stewart, & J. Dawson (Eds.), *Last Chance Tourism Adapting Tourism Opportunities in a Changing World* (pp. 21–27). Abingdon, Oxon, UK: Routledge.
- Lynch, A., & Veland, S. (2018). *Urgency in the anthropocene*. Cambridge, USA: MIT Press.
- Meier, W. N., Hovelsrud, G. K., van Oort, B. E. H., Key, J. R., Kovacs, K. M., Michel, C., ... Reist, J. D. (2014). Arctic sea ice in transformation: A review of recent observed changes and impacts on biology and human activity. *Reviews of Geophysics*, 52(3), 2013RG000431. doi: [10.1002/2013RG000431](https://doi.org/10.1002/2013RG000431)
- Mimir. (2015). Masterplan for Svalbard etter «Hvitebok for reisemålsutvikling». Retrieved from <https://www.visitsvalbard.com/dbimsgs/Masterplan%20Destinasjon%20Svalbard%20mot%202025.pdf>
- Ministry of Justice and Public Security. (2016). *White Paper 32 (2015–2016). Svalbard*. Retrieved from <https://www.regjeringen.no/no/dokumenter/meld.-st.-32-20152016/id2499962/>
- Ministry of Justice and Public Security. (2018). Regulations on tourism, field arrangements and other travel activities in Svalbard. LOV-1925-07-17-11-§4, LOV-2018-06-15-32-§1. Retrieved from <https://lovdata.no/dokument/SF/forskrift/1991-10-18-671>
- Moloney, S., & Horne, R. (2015). Low carbon urban transitioning: From local experimentation to urban transformation? *Sustainability*, 7, 2437–2453.
- Nilsson, A. E., Carson, M., Costs, D. S., Forbes, B. C., Haavisto, R., Karlsdottir, A., ... Pelyasov, A. (2019). Towards improved participatory scenario methodologies in the Arctic. *Polar Geography*, 44(2). <https://doi.org/10.1080/1088937X.2019.1648583>
- O’Brien, K. L. (2016). Climate change and social transformations: Is it time for a quantum leap? *WIREs Climate Change*, 7(5), 618–626. doi: [10.1002/wcc.413](https://doi.org/10.1002/wcc.413)
- O’Brien, K. (2012). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography*, 36(5), 667–676. doi: [10.1177/0309132511425767](https://doi.org/10.1177/0309132511425767)
- Øian, H., & Kaltenborn, B. P. (2020). Turisme på Svalbard og i Arktis. Effekter på naturmiljø, kulturminner og samfunn med hovedvekt på cruiseturisme. NINA Rapport 1745. Norsk institutt for naturforskning.
- Olsen, J., Carter, N., & Dawson, J. (2019). Community perspectives on the environmental impacts of Arctic shipping: Case studies from Russia, Norway and Canada. *Cogent Social Sciences*, 5(1). doi: [10.1080/23311886.2019.1609189](https://doi.org/10.1080/23311886.2019.1609189)
- Olsen, J., Hovelsrud, G. K., & Kaltenborn, B. P. (2020). Increasing shipping in the arctic and local communities’ engagement: A case from Longyearbyen on Svalbard. In E. Pongrácz, V. Pavlov, & N. Hänninen (Eds.), *Arctic marine sustainability: arctic maritime businesses and the resilience of the marine environment* (pp. 305–331). Cham: Springer International Publishing.
- Palma, D., Varnajot, A., Dalen, K., Basaran, I. K., Brunette, C., Bystrowska, M., ... Ronge, T. A. (2019). Cruising the marginal ice zone: Climate change and Arctic tourism. *Polar Geography*, 42(4), 215–235. doi: [10.1080/1088937X.2019.1648585](https://doi.org/10.1080/1088937X.2019.1648585)
- Pelling, M. (2011). *Adaptation to climate change: from resilience to transformation*. London: Routledge.
- Petrov, A. N., BurnSilver, S., Chapin, F. S., Fondahl, G., Graybill, J., Keil, K., ... Schweitzer, P. (2016). Arctic sustainability research: Toward a new agenda. *Polar Geography*, 39(3), 165–178. doi: [10.1080/1088937X.2016.1217095](https://doi.org/10.1080/1088937X.2016.1217095)
- Port of Longyearbyen (Producer). (2018). Statistics Port of Longyearbyen 2006–2017. 01/2018.
- Saville, S. M. (2019). Tourists and researcher identities: Critical considerations of collisions, collaborations and confluences in Svalbard. *Journal of Sustainable Tourism*, 27(4), 573–589. doi: [10.1080/09669582.2018.1435670](https://doi.org/10.1080/09669582.2018.1435670)
- Scoones, I., Leach, M., & Newell, P. (2015). *The politics of green transformations*. Routledge.
- Scott, D., Hall, C. M., & Gössling, S. (2019). Global tourism vulnerability to climate change. *Annals of Tourism Research*, 77, 49–61. doi: [10.1016/j.annals.2019.05.007](https://doi.org/10.1016/j.annals.2019.05.007)
- Sisneros-Kidd, A. M., Monz, C., Hausner, V., Schmidt, J., & Clark, D. (2019). Nature-based tourism, resource dependence, and resilience of Arctic communities: Framing complex issues in a changing environment. *Journal of Sustainable Tourism*, 27(8), 1259–1276. doi: [10.1080/09669582.2019.1612905](https://doi.org/10.1080/09669582.2019.1612905)
- SSB. (2018). *More FTEs despite less activity within coal mining in 2017*. Statistics Norway Retrieved from <https://www.ssb.no/en/virksomheter-foretak-og-regnskap/artikler-og-publikasjoner/more-ftes-despite-less-activity-within-coal-mining-in-2017>
- SSB. (2020). *Antall årsverk i utvalgte næringer på Svalbard*. Statistics Norway Retrieved from <https://www.ssb.no/svalbard/faktaside/svalbard>
- Stocker, A. N., Renner, A. H. H., & Knol-Kauffman, M. (2020). Sea ice variability and maritime activity around Svalbard in the period 2012–2019. *Scientific Reports*, 10(1), 17043. doi: [10.1038/s41598-020-74064-2](https://doi.org/10.1038/s41598-020-74064-2)
- UNEP-WTO. (2005). *Making Tourism More Sustainable. A Guide for Policy Makers*. United Nations Environment Programme and World Tourism Organization. Retrieved from <http://www.unep.fr/shared/publications/pdf/DTIx0592xPA-TourismPolicyEN.pdf>
- Van Bets, L. K. J., Lamers, M. A. J., & van Tatenhove, J. P. M. (2017). Collective self-governance in a marine community: Expedition cruise tourism at Svalbard. *Journal of Sustainable Tourism*, 25(11), 1583–1599. doi: [10.1080/09669582.2017.1291653](https://doi.org/10.1080/09669582.2017.1291653)

- Veland, S., Gram-Hanssen, I., Maggs, D., & Lynch, A.** (in press). Can the Sustainable Development Goals harness the means and the manner of transformation? *Sustainability Science*.
- Viken A.** (2011). Tourism, research, and governance on Svalbard: A symbiotic relationship. *Polar Record*, 47(243), 335–347.
- Viken, A., Johnston, M., Nyseth, T., & Dawson, J.** (2014). Responsible tourism governance. A case study of Svalbard and Nunavut. In *Tourism destination development: Turns and tactics* (pp. 245–261).
- Visit Svalbard.** (2020). *Statistikk fra Visit Svalbard AS*. Visit Svalbard Retrieved from <https://www.visitsvalbard.com/dbings/Statistikk%20gjester%20Svalbard%202007-2018%20per%20august.pdf>
- Walnum, H. J., Gössling, S., Simonsen, M., Iversen, N., Hem, L. E., Dybedal, P., & Jacobsen, J. K. S.** (2019). Sustainable cruises: Understanding and optimizing people, planet and profit. VF-rapport 2/2019, Vestlandsforskning.