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## \*CORRESPONDENCE

Thomas H. Beery  
✉ thomas.beery@hkr.se

<sup>†</sup>These authors have contributed equally to this work and share first authorship

RECEIVED 24 January 2025

ACCEPTED 12 June 2025

PUBLISHED 01 July 2025

## CITATION

Beery TH and Bergstrom RD (2025) A climate of public readiness: climate adaptation action. *Front. Clim.* 7:1566104. doi: 10.3389/fclim.2025.1566104

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# A climate of public readiness: climate adaptation action

Thomas H. Beery<sup>1\*†</sup> and Ryan D. Bergstrom<sup>2†</sup>

<sup>1</sup>School of Natural Sciences, Kristianstad University, Sustainable Multifunctional Landscape group, Kristianstad, Sweden, <sup>2</sup>Department of Geography, University of Minnesota Duluth, Duluth, MN, United States

The discourse surrounding climate change and the adaptation solutions needed to mitigate its impacts is often framed in terms of future time horizons. However, it has become increasingly clear that impacts are occurring today, so public awareness and engagement are critical. Despite the growing recognition of the worsening climate crisis, the gap between public understanding and approval of adaptation strategies remains a significant obstacle to community resilience in many locations. One country where broad-based public support for climate adaptation is emerging is Sweden, and one region within Sweden that is acutely experiencing the immediate impacts of climate change is Skåne. This perspective highlights a critical opportunity for decision-makers in southern Sweden to capitalize on public support to implement adaptation solutions now. While doing so, we argue that while climate adaptation may look different elsewhere, the combination of historical vulnerabilities, climate threats, public support, and governance structures is universal. Thus, the lessons learned in southern Sweden are generalizable to other similar contexts.

## KEYWORDS

climate change, adaptation, mitigation, resilience, public readiness, climate action

## Introduction

Southern Sweden is experiencing significant impacts associated with climate change, as evidenced by a March 2024 podcast from Radio Sweden that highlighted the changing climate realities faced by local communities throughout the southern region of Sweden, Skåne (see [Figure 1](#); [Grusson et al., 2021](#); [Radio Sveriges, dir, 2024](#)). While some municipalities in Skåne have begun adaptation measures to curb the impacts of a changing climate, many regional municipalities are only now recognizing their vulnerability. For example, along the shores of Ringsjön, Skåne's second largest lake, year-round residents and summer cottage owners found their homes underwater due to heavy rains and melting snow that had not been seen in over 50 years ([Krisinformation.se, 2024](#)). Then came the cold,  $-15^{\circ}\text{C}$ , in a region that rarely experiences temperatures that cold, freezing sewage systems and roadways, ultimately leading to the evacuation of residents. Nearby, driven by similar processes and equally devastating consequences, the River Kavlinge was breaching its banks. These events underscore the urgent need to strengthen infrastructure, restore natural protective features, and adopt more adaptive planning decisions to address future flooding events.

Sweden generally views climate change as a serious issue and strives to make progress on climate adaptation in line with the European Climate Law ([European Parliament and Council of the European Union, 2021](#)). This perspective article will consider one region (Skåne) within Sweden and one aspect of climate adaptation, public readiness, to make the case for immediate action on climate adaptation. While climate adaptation strategies may differ across regions in Sweden and globally, several critical factors consistently influence the need for and implementation of such measures. These include historical vulnerabilities, current

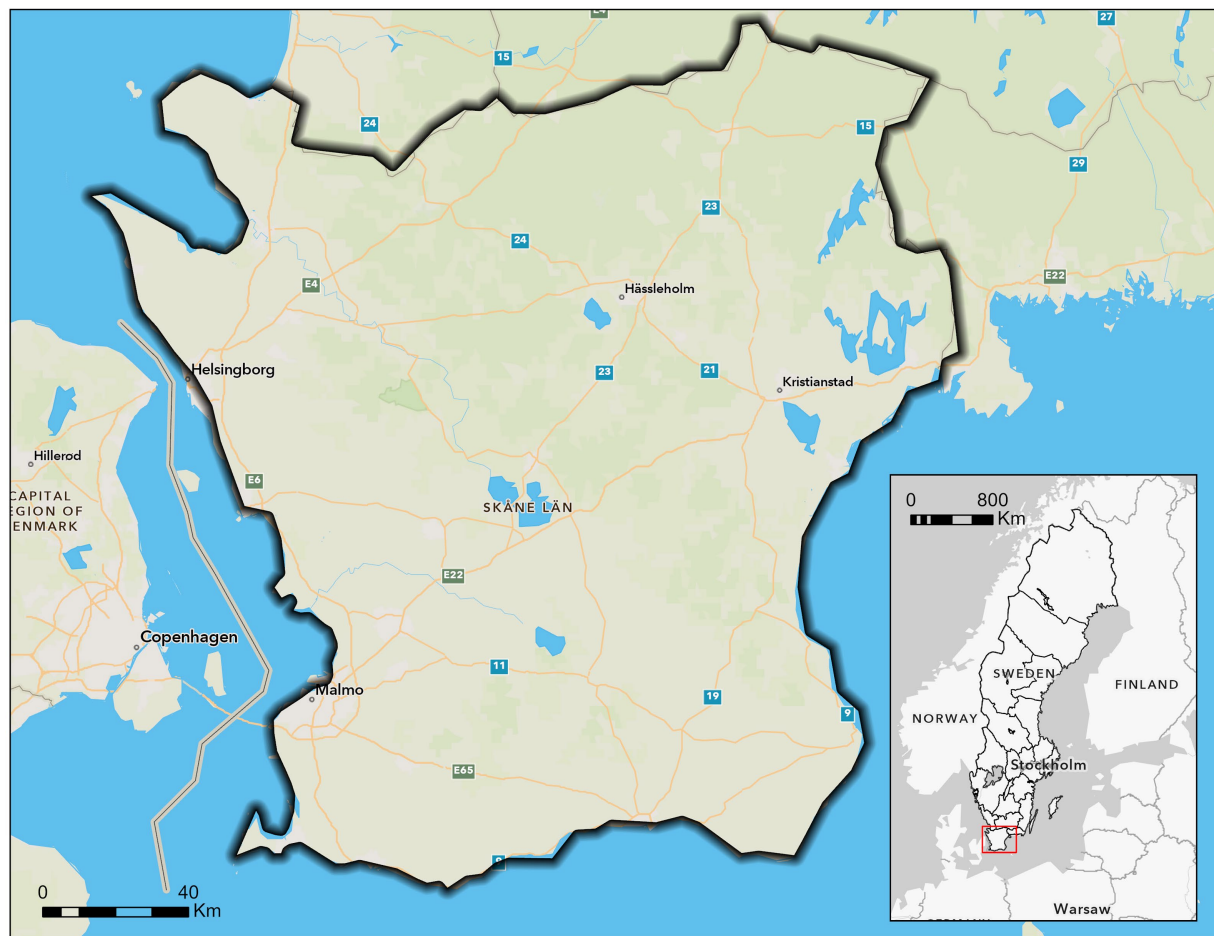


FIGURE 1  
Skåne, Sweden.

climate-related risks, public readiness, and governance structures. Understanding how these factors intersect is essential not only for the effectiveness of local adaptation efforts but also for generating insights that are applicable across diverse regional contexts.

Compared to the rest of Sweden, Skåne has several unique socio-economic challenges that impact its vulnerability (Nilsson, 2017). For example, the region experienced tremendous population growth in 2015 due to net foreign migration, primarily individuals with refugee status (Siöland, 2024). As a result, while the population is getting older, foreign-born residents are comparatively young. Skåne also has the highest level of unemployment in Sweden (76.4 percent employed), while housing deficits occur in 24 of 33 municipalities in the region. Finally, the level of education in Skåne is unevenly distributed, with women having higher education levels than men and only 65 percent of foreign-born residents have completed their education (compared to 90 percent for native-born; Siöland, 2024). These socio-economic challenges not only shape Skåne's overall resilience but also influence how effectively the region can implement climate adaptation strategies.

Globally, climate change is causing significant coastal changes, primarily due to rising sea levels, increased storm intensity, and changes in precipitation patterns. Wright and Nichols (2019) described impacts such as coastal erosion, flooding, saltwater intrusion, and impacts on ecosystems and infrastructure. This coastal

challenge is particularly true in Skåne, which is surrounded by a seacoast on three sides. Other basic landscape features in Skåne include expansive agricultural areas, a high degree of urbanization, and diverse ecosystems and biodiversity; for example, Skåne is known for expansive wetlands, such as the Vomb meadows and Kristianstad Vattenrike, which are internationally recognized and protected under the Ramsar Convention for their importance to migratory birds and other wetland species (County Administrative Board of Skåne, 2023; Olsson et al., 2004). These wetland ecosystem services contribute significantly to climate adaptation, including flood protection, ecosystem regulation (Díaz et al., 2018), and cultural services (De Groot et al., 2018; Mitsch et al., 2015; Moomaw et al., 2018). In Southern Sweden, climate-driven disturbances such as rising sea levels, the intensification of storms, flooding and coastal erosion are causing changes in seascapes and landscapes, including habitat destruction and loss of biodiversity.

While local planners in Sweden are beginning to experience the impacts of a changing climate, there has been a great urgency to the calls for climate action from non-government organizations and scientists globally (Andersson et al., 2015; Wamsler and Brink, 2014). Consider the IPCC Sixth Assessment Report (2023) and the United Nations Environment Programme Emissions Gap Report [United Nations Environment Programme (UNEP) 2024];

both reports suggest that immediate and comprehensive mitigation efforts are essential to avert the most severe impacts of climate change and further call for aligning mitigation and adaptation strategies in both the short and long term to enhance resilience. Similarly, the UNEP Adaptation Gap Report [United Nations Environment Programme, 2025], titled “Come Hell and High Water,” indicates a gap between current and necessary adaptation to effectively manage climate risks, with the report calling for a substantial increase in adaptation efforts worldwide.

Simultaneously, a wealth of literature explores the role of public concern in influencing climate adaptation action (e.g., Leiserowitz et al., 2011; Lorenzoni and Pidgeon, 2006; Whitmarsh et al., 2011). We know that broad public support is necessary for the creation and adoption of robust climate action and policy; for example, research by Leiserowitz et al. (2021) highlights public concern about climate change as an essential factor in climate action; they contend that public concern can lead to increased political advocacy and pressure on governments for meaningful climate action. Further, according to the People’s Climate Vote 2024, the global public is ready for climate adaptation action; survey results show high levels of concern for climate change and support for a wide range of climate actions, including climate adaptation [United Nations Development Programme (UNDP), 2024].

Public readiness and a sense of urgency are other key factors supporting climate adaptation (Lenzholzer et al., 2020). While existing climate models focus on multi-decadal timescales (Hoffmann et al., 2023), decision-makers are focused on responding to impacts occurring today (Koskimaa and Raunio, 2023). Thus, a close look at the current state of public readiness, coupled with a sense of urgency, is useful and supportive of the idea that the time is ripe for action on climate adaptation (Demski et al., 2017; Murunga et al., 2022); the IPCC Synthesis Report (IPCC, 2023b) highlights numerous benefits of immediate climate adaptation efforts, including improvement in human health (such as sanitation and water quality outcomes), protection for biodiversity and ecosystems, economic benefits (such as improved infrastructure and sustainable agricultural practices), and reduced vulnerability to climate-related risks.

The combination of data detailing climate concerns, coupled with publicly available climate data highlighting historical information, real-time *in situ* data, imagery, and forecast information, including threats and vulnerabilities, provides critical support for decision makers. This perspective aims to show how there is a critical opportunity for decision-makers to take advantage of this climate information to guide decisions and take action on barriers to effective regional climate adaptation. Further, this perspective article will use Skåne to explore public concern for climate adaptation action in Sweden and globally. The focus on Skåne is based on existing regional data and reinforces the importance of viewing climate adaptation at local to regional levels. The reality of the diverse and localized nature of climate impacts, vulnerabilities, and capacities highlights the need for a local-to-regional approach regarding specific climate adaptation actions; effective adaptation strategies must integrate ecological, social, and economic considerations at regional levels to ensure relevance, feasibility, and sustainability (Runhaar et al., 2018; Grecksch and Klöck, 2020; IPCC, 2023a). The transition from public support to political action will not be addressed here; instead, public readiness as a critical factor in the complexity of climate adaptation will

be highlighted as a crucial antecedent to political action (Ballew et al., 2019).

## Vulnerability

Skåne, like every region, has its unique climate vulnerabilities. Understanding Skåne’s vulnerabilities is necessary to understand climate adaptation action. Such understanding requires examining climate trends and future projections, including rising temperatures, changing precipitation patterns, and sea-level increases, while starting with a sense of the historical context that led to the current conditions.

## Skåne from a historical perspective

One challenge in addressing current threats is understanding historic land use patterns, which have shaped the region’s susceptibility to climate impacts. Historically, Skåne underwent extensive land drainage to expand agricultural areas, significantly increasing its susceptibility to flooding (Frias Olguin, 2020; Krug, 1993). Such large-scale drainage reduced the landscape’s natural water absorption and storage capacity. Wetlands naturally act as sponges, absorbing and slowly releasing water; their removal disrupts this balance, potentially resulting in more severe downstream flooding, as was the case along the River Kavlinge in the winter of 2024 (Radio Sveriges, dir, 2024). Additionally, the channelization and covering of streams in Skåne—affecting approximately 1,160 km—further exacerbate flood risks by accelerating water flow and reducing soil absorption time (Steichen, 2024).

## Skåne from a climate change perspective

By 2,100, Skåne is forecasted to undergo significant and cascading climatic changes, including temperature and precipitation changes, storm intensification, and sea-level changes (World Bank Group, 2021). Overall, it is anticipated that Skåne will experience warmer summers, milder winters, earlier springs, and prolonged autumns (Ehrnsten et al., 2011). According to the Swedish Meteorological and Hydrological Institute, a part of the Ministry of Climate and Enterprise, temperatures will increase between 1.6°C and 4.3°C by 2,100 (SMHI, 2024). Prolonged heat events, defined as the number of days above 25°C (currently 4.3 days/year), are anticipated to increase between 4.2 and 14.3 days/year by 2,100, while the number of days above 30°C (currently 2 days/year), may exceed 16 days/year by 2,100 (Ehrnsten et al., 2011; SMHI, 2025). The region is generally experiencing an increasing frequency of droughts as evaluated based on precipitation-evapotranspiration, soil moisture, and streamflow indicators (Canedo Rosso et al., 2025). Such extreme heat and drought events can negatively impact human health and biodiversity, potentially increasing competition for surface and groundwater resources while increasing the threat of non-native species (Birgander and Lindquist, 2020).

Although precipitation amounts vary throughout the year, precipitation within Skåne is forecast to increase between 4 and 11/ mm per month by 2,100. Furthermore, the number of heavy precipitation events, defined as events greater than 10 mm, is predicted

to increase from 2.5 to 6.1 days/year (currently 18 days/year) by 2,100, while the number of days with extreme precipitation (more than 20 mm/day) may increase 2.4 days/year (SMHI, 2025). The changes in precipitation patterns extend not just to amounts but also importantly to seasonality, with the most profound impacts projected to occur in summer (forecasted 45 percent increase) and winter (50 percent increase; Persson et al., 2011). Due to increased precipitation, the region's major waterways are also expected to see changes, with a 20 percent increase in 100-year flow events and a mean water level rise of around 20 cm in places such as Viken, Barsebäck, and Ystad (SMHI, 2025). For example, increased precipitation events and subsequent flooding have already proven detrimental to urban infrastructure in cities such as Malmö (Mobini, 2021), while storm surges from the 2024 extratropical Storm Babet resulted in not just the loss of structures (houses, bridges, docks), but more importantly, the loss of critical coastal biodiversity and habitat (Adell et al., 2025).

Sea level rise represents an escalating climate-related challenge for coastal regions of Skåne. Since the end of the 19th century, the sea has risen approximately 15 centimeters, and the rate is increasing (SMHI, 2025). Currently, changes in sea level of 0–1 mm/year are occurring, and in the most severe cases, are resulting in beach erosion of up to 1–2 meters annually (Larson and Hanson, 2013). Simultaneously, while land uplift (postglacial rebound) due to the last glacial period continues throughout northern Sweden, it has slowed or stopped in southern Sweden, amplifying sea level rises and thus erosion and flooding events (Government Offices of Sweden, 2009). While sea level rise will differ based on local geography, sea levels are expected to rise on average 1 meter by 2,100, with the highest increases expected in Skanör, Ystad, and Simrishamn. The variability of these changes and their cumulative impacts in Skåne pose challenges for local stakeholders and decision-makers (De Toro et al., 2015; Morel et al., 2020; Sjulgård et al., 2023). Addressing the local impacts of rising seas will require regionally tailored strategies that incorporate both mitigation and long-term resilience planning.

The projected climatic shifts presented in this section underscore the urgent need for adaptive land and water management strategies to safeguard Skåne's ecosystems, agriculture, and public health. The following two sections will consider both barriers to action for these urgent needs and the critical role of public engagement in support of a path forward.

## Barriers to action

Vulnerabilities highlight the need for action, while barriers provide a sense of the challenge. Obstacles to effective climate adaptation in Skåne are significant and include institutional barriers such as fragmented governance, financial barriers such as the cost of projects, and technical barriers such as aging infrastructure (Kristianssen and Granberg, 2021; Rylenius and Wörlund, 2024). Regional and municipal readiness for climate adaptation action in Skåne will provide examples of these challenges.

## Regional and municipal readiness

The County Administrative Board of Skåne coordinates climate adaptation work, providing a basis for knowledge, planning, and

analysis of climate impacts. It also supports municipalities, regional actors, and businesses in climate adaptation work; for example, hydroclimate information is systematically integrated into county planning and risk management to enhance resilience against climate-related hazards (Länsstyrelsen Skåne, n.d.). Despite the County Administrative Board's engagement in climate adaptation, the key focus for understanding climate adaptation in Skåne is municipal-level efforts.

Municipalities are powerful governmental entities in Sweden, holding significant authority and autonomy in governance (Regeringskansliet, Regeringen och, 2004); this significance is primarily based on Sweden's decentralized political system. Given this authority, climate adaptation is best explored at the municipal level (Skåne, 2025), and current evaluations of municipal climate adaptation action are useful (IVL Swedish Environmental Research Institute and Insurance Sweden, 2023). While a handful of municipalities in Skåne are leading Sweden in climate adaptation action, many lag behind. Out of a total of 33 municipalities in Skåne (290 municipalities in all of Sweden), six are ranked in the top 30, with 29 or more points (out of a total of 33 points) in the Swedish Environmental Institute (IVL) climate adaptation rankings. These rankings are a helpful barometer for understanding how municipalities respond to climate change.

In contrast, eight municipalities in Skåne scored less than 10 points and placed at the bottom of the ranking (IVL Swedish Environmental Research Institute and Insurance Sweden, 2023). This fragmented context for climate adaptation efforts, i.e., a lack of comprehensive municipal readiness across the region, can be seen as a key barrier to comprehensive climate adaptation in Skåne. Municipalities play a critical role in implementing policy, but climate change impacts do not stop at municipal boundaries; thus, addressing these threats requires a comprehensive regional approach. It is important to note that a comprehensive regional approach also has the potential for supporting various co-benefits, such as sustainability efforts and improving socio-economic well-being. Such co-benefits exist in climate adaptation efforts in Skåne; for example, consider urban stormwater management efforts. These adaptation efforts address increased rainfall and flood risks while protecting infrastructure, improving water quality, and contributing to the recreational value of urban areas (Sang et al., 2021).

## Gateway to action

Often considered a social or behavioral barrier, public readiness as a barrier to climate action does not appear to be a factor in Skåne; in fact the opposite may be true. Residents of Skåne are aware and concerned (Bergstrom and Beery, 2025), providing a foundation for public support (Leiserowitz et al., 2011; Lorenzoni and Pidgeon, 2006; Whitmarsh et al., 2011). The results of recent research, coupled with the EU election polling and final election results, will be presented in this section as a snapshot of public readiness for political action on climate adaptation.

## Political and public readiness

Several indicators point to public awareness of climate change and readiness to support climate adaptation strategies in Sweden. One



such indicator is the results from a recent study of landscape identity and climate change impacts (Bergstrom and Beery, 2025). Using survey methodology as outreach to residents of Skåne, the study considered possible relationships between concern about the effects of climate change, the timeline of climate impacts, and the perceived severity of the impacts. A Pearson's correlation coefficient analysis showed that all three variables (concern, time, and impacts) had positive and significant relationships. These findings led to a multiple linear regression analysis to evaluate how well certain variables predicted the impact on participants' concerns about the combined factors of climate change, using the predictors: (1) perception of the climate change timeline; (2) the severity of climate change impacts; and (3) key demographic factors such as age, gender, education level, household income, and connection to the landscape. Results indicated that this combination of multiple variables was strongly related to how people perceived concern about climate change. The statistical test showed that this relationship was significant, and approximately 60% of the differences in how people viewed their concern about climate change could be explained by these interacting variables (Bergstrom and Beery, 2025).

Given the significant results from the regression analysis, a moderation analysis was then used to examine whether the relationship between two variables (predictor as perceived severity of climate threats and participants' concern as an outcome) changes depending on the level of a third variable, known as the moderator (perceived timeline). Results from Bergstrom and Beery (2025) indicated a clear link between how serious people thought the threat from climate change was and how concerned they felt about its effects. Further, there was a strong link between how people perceived the timeline of the impact of climate change and how serious they believed the threats to be. The relationship between how serious the threats were perceived, and the level of worry was statistically significant (Bergstrom and Beery, 2025). While the specific question of support for climate adaptation efforts was not asked, the level of public concern (coupled with the perception of the severity of and timeline of impacts) indicates public readiness to support adaptation efforts (Leiserowitz et al., 2011; Lorenzoni and Pidgeon, 2006; Whitmarsh et al., 2011).

Another indicator of public readiness for climate adaptation action was also noted in the European Union elections in June 2024. Before the election, polling in each EU nation addressed each member state's top election issue priorities. In Sweden, the top issue for voters was measures to address climate change. This priority was unique to Sweden, with 58% of Swedish voters highlighting this issue's primacy, compared to the EU average of 27%. Interestingly, pre-election polling appeared to capture voter intent; in Sweden, political parties with well-articulated climate policy platforms made gains (Valmyndigheten, 2024). While pre-election polling is not broken down by region within the country, the election results are consistent when comparing Skåne to the national outcomes. Pre-election polling provides a snapshot of behavioral intent, and voting represents environmental behavior (Stern, 2000).

## Discussion

Back along the shores of Lake Ringsjön in southern Sweden in mid-2024, decision-makers began the arduous task of planning how

to limit future flooding events. It did not take long to recognize that their challenges went far beyond preparing for a non-linear climate. Historical drainage of Skåne's wetlands for agriculture and development, river channelization, and stream covering meant that vast stretches of the region were at or near sea level. Once these areas are saturated, it would not take much to flood (Radio Sveriges, dir, 2024). The situation at Ringsjön, from its complex history to the current experience of lake residents, provides insight into the challenge of adaptive response to climate change.

Tools such as climate services (climate-related data, information, and knowledge), including public readiness, can be critical for decision-making to address these climate challenges in Skåne and beyond (World Meteorological Organization, 2025; Swart et al., 2021). For example, a 2022 study (European Investment Bank, 2023) found that 64% of Swedish residents favored stricter measures to impose change on the public, including taxation on products and services that resulted in increased greenhouse gas emissions. By leveraging public awareness and concern (as evidenced by surveys, election polling, and voting results) coupled with detailed climate change data, decision-makers in Skåne have the climate information they need to be empowered to take meaningful action on behalf of climate adaptation; now the challenge lies in turning this information into coordinated municipal and regional action. Furthermore, Skåne's vulnerability makes immediate action both imperative and urgent. However, as Rylenius and Wörlund (2024) have found, serious challenges abound, including identifying who is responsible for adaptation actions, who should pay for actions, and determining if actions have a meaningful impact. While climate services provide valuable insights, translating data into action remains challenging.

Emergency response, as noted by the United Nations Framework Convention on Climate Change (UNFCCC), is one rational approach to climate adaptation action (Chapagain, 2023), but another, more proactive approach is the idea of resilience, i.e., bouncing forward from disruption to a more stable state (Beery, 2020; Grove, 2018); climate adaptation has the potential to make life better for people through both risk reduction/preparation and innovation to serve human well-being now and into the future. Consider efforts to cool cities and address the public health concerns of urban heat islands (Gago et al., 2013) or projects that promote climate adaptation and outdoor recreation development (Beery, 2019; O'Toole et al., 2019). These examples highlight measures that provide opportunity or protection immediately while simultaneously building resilience against future disruption.

Another important co-benefit of climate adaptation is the potential to support biodiversity efforts. In Skåne, biodiversity conservation is of special climate adaptation interest, given the opportunity to combine excess water management and support for biodiversity conservation. For example, the LIFE Coast Adapt project (Region Skåne, 2023; European Commission, 2024) applied nature-based solutions to help mitigate flooding while improving habitats for various species. Collaborations between the Lund, Lomma, and Staffanstorps municipalities created over 80 wetlands that mitigate eutrophication, reduce flood risks, and promote biodiversity and recreational opportunities (Ekström et al., 2025). Another example can be found in the efforts of the Kristianstad Vattenrike Biosphere Reserve in northeast Skåne to support climate adaptation while managing wetlands, including the specific outcomes of groundwater

recharge, increased forest yields, reduced forest fire risks, and support for biodiversity (Kristianstads Vattenrike, 2021).

In conclusion, this article has presented a key combination of factors to support climate adaptation action: public awareness/concern and detailed climate change data. In addition, concerns about serious barriers to action have been acknowledged, such as fragmented governance in a municipal/regional context. Despite the barriers, this is a critical moment for decision-makers to leverage opportunity. Decision makers must act now to take advantage of public readiness and initiate coordinated municipal and regional climate adaptation efforts. Such efforts have the potential to support emergency preparedness for climate change disruption while improving life for residents of Skåne now and into the future. The public is ready for climate adaptation in Skåne; decision-makers must seize this moment to overcome existing barriers and act.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Ethics statement

The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and institutional requirements.

## Author contributions

TB: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration,

Supervision, Writing – original draft, Writing – review & editing. RB: Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing – original draft, Writing – review & editing.

## Funding

The author(s) declare that no financial support was received for the research and/or publication of this article.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

## Generative AI statement

The author(s) declare that Gen AI was used in the creation of this manuscript. We enlisted the use of Generative AI for reference checking (ChatGPT4.0). Additionally, grammar checking was conducted using grammarly generative AI.

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