Article

Metaphors in climate discourse: an analysis of Swedish farm magazines

Therese Asplund

ABSTRACT: *This article examines communicative aspects of climate change, identifying and analysing metaphors used in specialized media reports on climate change, and discussing the aspects of climate change these metaphors emphasize and neglect. Through a critical discourse analysis of the two largest Swedish farm magazines over the 2000–2009 period, this study finds that greenhouse, war, and game metaphors were the most frequently used metaphors in the material. The analysis indicates that greenhouse metaphors are used to ascribe certain natural science characteristics to climate change, game metaphors to address positive impacts of climate change, and war metaphors to highlight negative impacts of climate change. The paper concludes by discussing the contrasting and complementary metaphorical representations farm magazines use to conventionalize climate change.*

Introduction

Communicating climate science has proven difficult. Climate change is sometimes confused with ozone depletion[1,2,3,4] or regarded as equivalent to changes in the weather [2,5,6] and climate change discourse is in general being seen as "confusing, contradictory and chaotic"[7] by the general public. The Intergovernmental Panel on Climate Change (IPCC) defines climate change as "a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer".[8] In common language, "climate change" refers to those changes in climate influenced by human and natural activities. Although climate change and weather are intertwined, climate is generally defined as average weather and climate change refers to the statistics of changes in weather over time.[9] The statistical nature and basis of understanding climate change arguably makes the concept more difficult for non-climate experts to perceive and understand, as it is not easily detected by personal experience.[10] Moreover, the invisible causes and distant impacts of climate changes, as well as the temporal and often geographic distance between cause and effect, make climate change more challenging to communicate than other environmental and sustainability issues.[11,12] Complexity and uncertainty, which may relate to such different aspects as lack of data, inadequate modelling of natural and human complexity, computer capacity limitations and the range of possible future scenarios, add another dimension of puzzling difficulties in climate science communication. Furthermore, as society has increasingly confronted the realities of climate change, climate change has moved from being regarded as a predominantly physical phenomenon to simultaneously being a social phenomenon in which climate change, depending on its political, social, and cultural settings, takes on new meanings.[13]

Unlike most social scientists studying climate change information and communication, this article does not focus on the general public but on audience-specific framings, particularly how climate change has been presented in Swedish farm magazines. The agricultural sector is of special interest, since changes in temperature and precipitation patterns will exert a direct influence on the quantity and quality of agricultural production and the daily life of farmers.[14,15] This paper focuses on the use of communicative tools, especially the use of metaphor, in climate change communication. The questions of interest are as follows: What parts of the metaphors are emphasized? What aspects of climate change do the metaphors stress and neglect? The paper concludes by discussing the sometimes contrasting but also complementary metaphorical representations used to conventionalize and concretize climate change.

Theoretical background: metaphors

People arguably differ in how they learn about abstract, complex phenomena.[10,16,17] While scientists are said to learn via analytic thinking, non-scientists are said to learn from personal experience. Non-scientists typically rely more on readily accessible associative and affective processing of climate-related information. These immediate associations are often mediated through a range of linguistic devices or "discursive figures", for example, analogies, distinctions, stories, metaphors, and prototypical examples,[18] to make the unknown more familiar and graspable.[19] In particular, metaphors are said to structure how we perceive, think, and act, and, by letting us experience one thing in terms of another, metaphors both help us understand unfamiliar abstract phenomena[20] and foster new understandings of what is already known.[21] By linking two conceptual domains, the "source" and "target" domains,[22,24] metaphors let us use what we already know to build an understanding of new subjects. The source domain typically consists of concrete entities that explain a more abstract target domain. The locus of metaphor is in how we conceptualize one mental domain in terms of another;[24] in this way, what is strange and unfamiliar, such as climate change, becomes familiar via this process of metaphorization.

As the metaphorical structuring of concepts is partial, meaning that only *parts* of the source domain are used to structure the target domain,[20] a metaphor has used and unused parts. This indicates that certain aspects of the source domain – the explanatory concept – are illuminated while others are hidden. Metaphors are often so common in our daily lives that we do not think of them as metaphors. Hamington[25] argues that, when metaphors become so pervasive that people forget they are metaphors, metaphors become equivalent to what they are describing, introducing an element of misunderstanding that he calls "the metaphoric fallacy". In this process, the significance of aspects of the terms that are not alike starts to grow, and what was originally metaphorically hidden is now ascribed to the target domain. I argue that metaphorical structuring is doubly partial: not only are parts of the source domain applied to the target domain but the metaphor also only partially describes the target concept. For instance, climate change may be communicated in terms of war-like combats but such a description only partially embraces the complexity of climate change. In this way, when a metaphor is used to convey messages concerning climate change, certain aspects of climate change are hidden and neglected by the metaphor used. Therefore, a dominant use of one metaphorical representation of climate change results in a single dominant understanding of climate change. As Rigney[26] has pointed out, while each metaphor may yield important insights, no single metaphor can tell the whole story. This double partiality, involving hidden aspects of both the source and target domains, is central to the present analysis of the use of metaphors in farm magazine coverage of climate change.

Although there seems to be a lack of systematic studies of metaphors used in climate change information and communication, a diverse literature in fact treats metaphor and climate change. For example, Van Koppen et al.[27] suggests a new metaphor, i.e., the flocking of birds, to describe the arrangements of governance structures needed to cope with climate change; as such, it is not a study of metaphor use per se, but an analysis of how governance may be improved. Similarly, Hamblyn[28] argues that lone voices, which the author metaphorically refers to as "climate whistleblowers" and "canaries", have occupied a central position in climate change debates. Furthermore, Norgaard[29] as well as Ladle and Gillson[30] are concerned with the metaphor of nature as a stock versus one taking a more dynamic perspective (i.e., "the flux of nature"). They can conclude that, although the metaphor of nature as a stock is insufficient to capture the unpredictability of climate change,[29] media and the global Internet community still portray climate change using metaphorical representations of stability and balance, thereby missing the importance of flux and change in the natural world.[30] Research into the use of metaphor in climate change communication provides us with insight into the emergence of a new terms, what may be called "carbon compounds", i.e., lexical combinations of at least two roots, such as "carbon finance", "low-carbon diet",[31] "carbon finance", "carbon tax", and "carbon sinner",[32] used in debating climate change mitigation. Furthermore, gold rush, Wild West, and cowboy metaphors are found in business and finance newspapers to make carbon trading and offsetting seem less complex and more familiar.[33] Cohen[34] reflects on the use of military metaphors in climate change discourse, arguing that the process of rhetorical militarization creates opportunities for policy makers to propose greenhouse gas (GHG) emission reduction strategies. The use of the tipping point metaphor has been studied by Russill and Nyssa,[35] who conclude that most mainstream media uses of the terminology predict clear thresholds suggesting abrupt and irreversible changes. Moreover, the success or failure metaphors may depend on

powerful cultural narratives,[36] for example, the Apollo program metaphor in US framing of climate change initiatives and "bridging metaphors" derived from popular culture.[37] The present study complements existing diverse literature on metaphors and climate change with a systematic approach identifying metaphorical representations of climate change.

Methods: identify and analyse metaphors

Information conveyed in farm magazines is central to agricultural decision making, and such magazines are even argued to be "the most important source of information for farmers".[38] Farmers participating in focus group discussions, moderated by the author in 2010, also emphasized the importance of farm magazines as an information source for decision making. The analyses presented here focus on Swedish farm magazines, particularly those with the largest national circulation: ATL – Lantbrukets affärstidning and Land Lantbruk.

News stories for metaphor analysis were chosen by identifying climate change keywords (e.g., climate + change/issue/science/threat, global warming, greenhouse, and carbon dioxide) on the front pages of the two magazines in the years 2000–2009. Relevant news articles identified on the front pages were then selected for further analysis. In total, 113 items from 2000–2009 were studied. Metaphors were searched for in the headline and opening paragraph of each news story, as these often employ a range of linguistic devices to attract readers.[39] The metaphors were identified by closely examining the linguistic choices made by journalists when reporting on climate change. In particular, words and expressions used in a non-literal sense were noted. The analytical process started by reading through the headlines and first paragraphs to establish a general understanding of the meaning. The analysis continued by marking terms with a more basic contemporary meaning in contexts other than the studied one, and finally marked terms as metaphorical if the contextual meaning contrasted with the basic meaning.[40] Uses of more value-laden words, such as good/bad or positive/negative, or words with synonyms that are more value laden were also noted. Recurrent and similar words were then grouped into larger entities depending on their metaphorical representation (see Table 1, column 1). The next sections of the article present the most commonly used metaphors, together with an analysis of the aspects of climate change they highlight as well as an analysis of what aspects of climate change are metaphorically hidden. The analysis of the metaphorical representation of climate change is enabled by contrasting the identified metaphorical perspectives to research into climate change, as represented mainly by the fourth assessment report, *Climate Change 2007*, issued by the Intergovernmental Panel on Climate Change.[9,15,42]

Metaphors in farm magazine coverage of climate change

Farm magazine coverage of climate change was rich in metaphorical use. This study identifies greenhouse, game, and war metaphors[*] as the most frequently used metaphors between 2000 and 2009; however, in line with the dramatically higher frequency of articles starting in 2007, most metaphors were employed from 2007 onwards. Each metaphor is presented together with a discussion of the (double) partial structuring of metaphors,[20,25] particularly analysing what parts of the metaphor (the source domain) are highlighted and what aspects of climate change (the target domain) are emphasized or neglected (table 1).

Greenhouse metaphor

> More peas and less soya: the well-informed pig farmer can reduce the *greenhouse effect*
> The environmentally aware pig farmer does not mix soya into feed. More peas in the feed bowl reduce the *greenhouse effect*. (ATL, 7 December 2004; emphasis added)

The greenhouse metaphor is probably the most common metaphor used in climate discourse. The studied farm magazines use the greenhouse concept to ascribe to climate change certain natural science characteristics, and the metaphor is explicitly referred to by terms such as "greenhouse gas" and

---

[*] Climate change was in many cases also discussed and represented in terms of its economic impacts, mainly increased costs to the individual farmer, though these were not conveyed in metaphorical terms.

"greenhouse effect" (see example above). However, the reader is given no guidance on how to understand and interpret the greenhouse concept. The fact that no explanations are offered as to how climate change resembles a greenhouse indicates that the meaning of the metaphor is assumed to be understood. In general, the greenhouse concept refers to increased warmth in the atmosphere, in which GHG are understood, like the glass surrounding a greenhouse, to increase the global mean temperature. Like all metaphors, the greenhouse metaphor highlights certain aspects while neglecting others and, while the greenhouse metaphor explains and simplifies temperature change, it does not fully address the actual energy processes that occur at the molecular scale nor does it address other meteorological phenomena such as precipitation, wind and snow (see table 1). Precipitation is an elementary feature of climate change, and observations indicate that changes are occurring in the amount, intensity, frequency, and type of precipitation,[9] though such aspects are not covered by the greenhouse metaphor as used in the farm magazines. Nor is the occurrence of extreme weather events, such as heat waves, droughts, floods, and hurricanes, included in the metaphoric representation of climate change in terms of a greenhouse. Others argue that, as greenhouses may be seen as protected places where plant growth is luxuriant, this makes it difficult to associate climate change with desertification[43] and negative images such as cyclones, deep freezes, and excessive heat.[44]

Game metaphor

> Farmers are pointed out as *winners* by climate commission
> Despite flooding, storms, and pests, the profits will be greater than the expenses for the farm and forest industries as the climate changes. That was stated by the Commission on Climate and Vulnerability. (ATL, 28 September 2007; emphasis added)

The farm magazines described climate change using words, sentences, and language associated with the game concept, for example, "raise", "challenge", "key role", "winner" (as in the above quotation), and "winning ticket". As used in the farm magazines, the game metaphors conjure up mainly positive climate change effects, for example, higher yields for farmers, increased income, and new climate-related market initiatives, such as climate-labelled milk. Note that associated positive climate change effects were not described as the results of actively responding to climate change, implying that perceived positive effects will come as a result of a business-as-usual scenario and with no behavioural change, such as crop diversification, water management, pest control, or other adaptation measures in agriculture.[15] On the contrary, the game metaphor also, to some extent, identifies farmers as "key players" in the "climate game" to draw attention to the need for mitigation measures. The two contrasting uses of game metaphors highlight different climate change strategies, as one emphasizes GHG emission reduction and calls for individual action while the other singles out the farmer as a winner and implies that no action is needed. In the second sense, the game metaphor stresses aspects with lottery associations, which emphasize chance rather than meeting challenges with great effort.

Due to the double partial structuring of metaphors, game metaphors neglect several aspects of climate change (see table 1). First, and as indicated above, many negative effects, such as increased frequency of insect outbreaks, are not covered by the game metaphor. A metaphor that does not include such negative effects risks generating complacency regarding the need for adaptation to such changes, thereby increasing farmer vulnerability to climate change. Second, most articles concern linkages between climate change and Swedish agriculture. Thus, the game metaphor as used in the farm magazines arguably ignores the agricultural sector on a larger global scale and does not place local activities within a global context.

War metaphor

> The meat farmer or the motorist. The sugar cane worker or the wheat grower. Who should be *eliminated*? Who will *save* us from the climate *threat*? Eleven experts submit their climate advice to the government on Monday. (ATL, 31 August 2007; emphasis added)

The studied farm magazines use war metaphors to ascribe to climate change war-like characteristics, climate change being depicted as a "threat" that will "hit" the Earth and result in "loss" and "death". Magazine readers are encouraged to "combat", "eliminate", "save", and "be saved". Describing climate change as a threat not only provides an understanding of climate change as catastrophic and terrible, but

also prescribes threat-related activities. Readers are informed that they can undertake various actions, such as "combating", "surrendering", or even "being saved" (see above quotation). These emotionally loaded words convey widely divergent messages and meanings to the reader; for example, saving others differs greatly from being saved oneself. The implication of a framing that emphasizes saving those who have been negatively affected by climate change, is that most people are cast as inactive, while climate change as an issue seems to coalesce around specific active actors or "heroes". Overall, great emphasis is placed on climate change as a "threat" and "battle", with the use of words invoking "combating" climate change. Such framing, in contrast to one in which being saved is dominant, fosters an idea of humans as not only active in the "climate war" but as initiating direct response action. While the news articles do not specify why climate change is a threat to be combated, the war metaphor suggest mitigation activities in which "fight" and "combat" equal reduced GHG emissions. When the farm magazines instead use words and sentences implying inactivity, e.g. "being saved" it often invokes others', and not the readership's, mitigation responsibilities (see the mention of the "motorist" in the above quotation). Framing climate change in these terms works in two main ways: war-associated images can be used either to highlight heroic efforts or to ascribe responsibility for climate change mitigation to sometimes undefined others. The proposed strategy for reducing climate change is the same, but those responsible for mitigation measures change.

The partial structure of metaphors – that a given metaphor always highlights certain perspectives while hiding others – may help to explain the farm magazines' references to various aspects of war. While these militaristic representations sometimes highlight active agents "fighting" climate change, at other times they may emphasize more passive stances associated with war. Furthermore, by representing climate change as a "threat" that primarily should be "combated", the farm magazines are using war metaphors to direct response behaviour towards mitigation measures. As a result, war metaphors as used in farm magazine coverage of climate change often neglect positive impacts of climate change, for example, higher yields in northern Europe (see table 1).[41]

	What parts of the metaphor are emphasized in the farm magazines? (empirical findings)	What aspects of climate change do farm magazines stress?	What aspects of climate change do farm magazines hide?
Greenhouse metaphor	*The studied farm magazines did not refer to what aspects of a greenhouse climate change should be ascribed.*	Temperature, radiation	- other meteorological phenomena (e.g., precipitation, clouds, wind, snow, and atmospheric pressure) - climate change impacts on natural and social systems (e.g., extreme weather events)
Game metaphor	Raise, challenge, key role, game, winner, winning ticket	- Positive direct and indirect impacts (e.g., higher yields and increased income) - Business-as-usual scenario, mitigation	- Negative impacts on local agriculture (e.g., increased frequency of insect outbreaks) and global agriculture (e.g., warmer and drier conditions resulting in reduced length of growing season) - Adaptation
War metaphor	Threat, climate threat, save, hit, loss, death, eliminate, combat , be saved, battle	- Negative direct and indirect impacts of climate change (e.g., crop damage, higher taxes, and negative image) - Mitigation	- Positive impacts of climate change (e.g., higher yields in northern Europe) - Adaptation

Table 1. Overview of metaphorical structuring of emphasized and hidden climate change characteristics: the first column presents empirical findings regarding aspects ascribed to climate change; the second column presents the contexts of the findings, to examine what aspects of climate change they refer to; and the third column contrasts the metaphorical perspectives to scientific findings regarding climate change, taken mainly from the IPCC's fourth assessment report *Climate Change 2007*.[9,15,42]

Conclusions: contrasting or complementary metaphors?

The use of such different metaphorical images – a greenhouse effect, a battlefield, and a game – invites readers to see the world from more than one angle of vision. On a general level, the farm magazine reader can view climate change through each of the metaphorical lenses, but as they are presented to the reader, for example, in a magazine article, they often emphasize just one or a few aspects of climate change. While each metaphor may yield important insight, no single metaphor can tell the whole story;[26] metaphorical structuring is thus said to be partial,[20] meaning that, when a source domain is applied to a target domain, only certain aspects come into focus.[45] Every metaphoric model is selective, revealing certain aspects while obscuring others.[26] With respect to climate change, the greenhouse metaphor highlights increased warmth in the atmosphere which is just one aspect of climate change, while neglecting other important climate science aspects, such as other meteorological phenomena or even impacts on natural and social systems. Both game and war metaphors were used to stress climate change impacts on agriculture but, while the game metaphors primarily highlighted positive impacts, for example, higher yields and increased income, war metaphors were employed to illuminate negative impacts of climate change, for example, crop damage, higher taxes, and negative image. What the game metaphors stress (for example associated benefits) the war metaphors hide, and vice versa (war metaphors highlight associated negative effects). However, together they indicate that climate change impacts and responses will differ, with some of those affected considered "winners" and others "losers".

As used in the farm magazines, game and war metaphors explicitly or implicitly advocate mitigating GHG emissions (primarily methane). While climate change mitigation measures are framed with words of obligation when war metaphors are employed, the game metaphor allows a more positive understanding of reducing GHG emissions (farmers being "key players"). There is a lack of metaphors that take into account various adaptation options that, in an agricultural context, can range from adjusting practices, such as changing varieties and planting times, to more general policy and institutional changes that facilitate adaptation to climate change.[46] Furthermore, none of the metaphors accounts for the problem of scale. One main challenge in communicating climate change is the lack of immediacy and the temporal and often geographic distance between cause and effect,[11,12] meaning that what I do here and now will probably result in climate change impacts somewhere else at some another time. For more successful climate science communication, the link between causes and impacts on various temporal and geographical scales could be conceptualized through the use of metaphors. As the success of metaphors is suggested to depend on powerful cultural narratives[36] and on "bridging metaphors" derived from popular culture,[37] the metaphors used would have to take into account the cultural context and not necessarily aim for universal understanding.

As demonstrated here, climate change may be understood and conceptualized in various ways depending on the metaphorical representation used. At the same time as the farm magazines provide readers with various interpretations of climate change, they also set up a rhetorical contest between the metaphorical images presented. Is it possible simultaneously to view climate change as a war for life and death stakes, and as a game one can choose to play? Does using these two metaphors result in cognitive confusion or allow for multiple perspectives? The metaphors employed to describe climate change can be interpreted as parallel representations reflecting heterogeneous, complementary ideas or as evidence of a rhetorical mismatch of (dysfunctional) perspectives. The plurality of metaphorical references could constitute a problem at the core of metaphorical language, which aims to build understanding of abstract phenomena and to make comprehensible what is seen as difficult,[20] as the messages conveyed by the metaphors could be perceived as inconsistent and confusing. Such contrasting metaphors may result in conflicts and disputes, according to Schön.[47] On the other hand, the presence of multiple metaphors allows the communication of several parallel representations and worldviews that do not necessarily exclude each other. Consequently, the identified metaphors can open up new perspectives on the issue of climate change, as they allow their users to talk about climate change from several angles. While each metaphor is primarily used to express one perspective on climate change, taken together, the metaphors express a range of interpretations and perspectives. Similarly, Linell[48] distinguishes between monological practices, i.e., when a text tries to impose on the addressee a single authoritative and hegemonic understanding, and dialogically oriented practices. A dialogical utterance, on the other hand, arguably permits a wider range of responses, leaving addressees more or less free to choose their understandings and responses, as can be seen when considering all metaphorical representations together. What effect

such plurality of climate change framing has on actual behaviour cannot be determined on the basis of this analysis, so further study is warranted. However, as metaphorical communication is central to our understanding of experience and to how we act upon that understanding,[24] it follows that the metaphorical references used to describe climate change direct a certain response behaviour. Together with other studies of the use of metaphor in climate change communication, we know that greenhouse, game, and war metaphors circulate together with gold rush, Wild West, and cowboy metaphors[33] and a new category of terms, i.e., "carbon compounds",[31,32] as explanations of climate change, rendering this abstract concept more concrete and easier to grasp.

Acknowledgments

Notes and references

1   W. Kempton (1991), *Lay perspectives on global climate change*, Global Environ. Change **1**:183-208.
2   W. Kempton (1997), *How the public views climate change*, Environment: Science and Policy for Sustainable Development **39**: 12-21.
3   R.E. Löfstedt (1991), *Climate change perceptions and energy-use decisions in Northern Sweden*, Global Environ. Change **1**:321-324.
4   A. Bostrom, M.G. Morgan, B. Fischhoff and D. Read (1994), *What do people know about global climate change? 1. Mental models*, Risk Analysis **14**: 959-970.
5   A. Bostrom and D. Lashof (2007), *Weather it´s climate change*, in *Creating a climate for change* (S. Moser and L. Dilling eds.) Cambridge University Press, New York U.S.A.
6   J. Hansen, S. Marx and E. Weber (2004), *The role of climate perceptions, expectations, and forecasts in farmer decision making: The Argentine pampas and south Florida*, International Research Institute for Climate Predictions Technical Report, 04-01.
7   G. Ereaut and N. Segnit (2006), *Warm Words. How are we telling the climate story and can we tell it better?*, Institute for Public Policy Research, London U.K.
8   Intergovernmental Panel on Climate Change (2007), *Synthesis report: Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]*. IPCC, Geneva, Switzerland.
9   S. Solomon (2007), *The physical science basis: Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press, Cambridge, New York U.S.A.
10 E.U. Weber (2010), *What shapes perceptions of climate change?*, Wiley Interdisciplinary Reviews: Climate Change **3**: 332-342.
11 S.C. Moser (2010), *Communicating climate change: history, challenges, process and future directions*, Wiley Interdisciplinary Reviews: Climate Change **1**:31-53.
12 S.C. Moser and L. Dilling (2007), *Creating a climate for change: communicating climate change and facilitating social change*, Cambridge University Press, Cambridge, New York U.S.A.
13 M. Hulme (2009), *Why we disagree about climate change*, Cambridge University Press, Cambridge U.K.
14 Food and Agriculture Organization of the United Nations (FAO) (2008), Climate change adaptation and mitigation: challenges and opportunities in the food sector. *High- Level Conference on World Food Security: - Information Paper HLC/08/INF/2* (available at ftp://ftp.fao.org/docrep/fao/meeting/013/k2545e.pdf.).
15 M.L. Parry, O.E. Canziani, J.P. Palutikof and co-authors (2007), *Impacts, adaptation and vulnerability: Contribution of Working Group II to the fourth assessment report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, U.K., New York U.S.A.
16 S. Moscovici (1984), *The phenomenon of Social Representations.* In *Social Representations*, (R. Farr and S. Moscovici eds.) Cambridge University Press, Cambridge U.K.
17 S.M. Marx et al. (2007), *Communication and mental processes: Experiential and analytic processing of uncertain climate information*, Global Environ. Change **17**: 47-58.
18 I. Marková, P. Linell, M. Grossen and A. Salazar Orvig (2007), *Dialogue in focus groups : exploring socially shared knowledge*, Equinox, London U.K.
19 V. Wibeck (2002), *Genmat i fokus: analyser av fokusgruppssamtal om genförändrade livsmedel*, Linköping University, Sweden.
20 G. Lakoff and M. Johnson (1980), *Metaphors we live by*, University of Chicago Press, Chicago U.S.A.
21 R.H. Brown (1976), *Social Theory as Metaphor - On the Logic of Discovery for the Sciences of Conduct*, Theory Soc. **3**: 169-197.
22 A.N. Katz and T.E. Taylor (2008), *The journeys of life: Examining a conceptual metaphor with semantic and episodic memory recall*, Metaphor Symb. **23**: 148-173.
24 G. Lakoff (1993), *The contemporary theory of metaphor*, in *Metaphor and thought*, (A. Ortony ed.) Cambridge University Press, Cambridge U.K.
25 M. Hamington (2009), *Business is not a Game: The Metaphoric Fallacy*, J. Bus. Ethics **86**: 473-484.
26 D. Rigney (2001), *The metaphorical society: an invitation to social theory*, Rowman & Littlefield Publishers, Lanham, MD.

27 C. van Koppen, A.P.J. Mol and J.P.M. van Tatenhove (2010), *Coping with Extreme Climate Events: Institutional Flocking*, *Futures* **42**:749-758.
28 R. Hamblyn (2009), *The whistleblower and the canary: rhetorical constructions of climate change*, *Journal of Historical Geography* **35**:223-236.
29 R.B. Norgaard (2010), *Ecosystem services: From eye-opening metaphor to complexity blinder*, *Ecol. Econ.* **69**:1219-1227.
30 R.J. Ladle and L. Gillson (2009), *The (im) balance of nature: a public perception time-lag?*, *Public Understanding of Science* **18**: 229-242.
31 B. Nerlich and N. Koteyko (2009), *Carbon reduction activism in the UK: Lexical creativity and lexical framing in the context of climate change*, *Environmental Communication: A Journal of Nature and Culture* **3**: 206-223.
32 N. Koteyko, M. Thelwall and B. Nerlich (2010), *From carbon markets to carbon morality: Creative compounds as framing devices in online discourses on climate change mitigation*, *Sci. Commun.* **32**: 25-54.
33 B. Nerlich and N. Koteyko (2010), *Carbon gold rush and carbon cowboys: a new chapter in green mythology?*, *Environmental Communication: A Journal of Nature and Culture* **4**: 37-53.
34 M.J. Cohen (2011), *Is the UK preparing for "war"? Military metaphors, personal carbon allowances, and consumption rationing in historical perspective*, *Clim. Change* **104**: 199-222.
35 C. Russill and Z. Nyssa (2009), *The tipping point trend in climate change communication*, *Global Environ. Change* **19**: 336-344.
36 A.L. Fletcher (2009), *Clearing the air: the contribution of frame analysis to understanding climate policy in the United States*, *Environmental Politics* **18**: 800-816.
37 S. Ungar (2000), *Knowledge, ignorance and the popular culture: climate change versus the ozone hole*, *Public Understanding of Science* **9**: 297-312.
38 S.D. Brunn and K.B. Raitz (1978), Regional Patterns of Farm Magazine Publication, *Economic Geography* **54**: 277-290.
39 D. Reah (1998), *The language of newspapers.* Routledge, London, New York.
40 Pragglejaz Group (2007), *MIP: a method for identifying metaphorically used words in discourse*, *Metaphor and Symbol* **22**: 1-39.
42 B. Metz (2007), *Mitigation of climate change: contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, New York.
43 M.S. Carolan (2006), *The values and vulnerabilities of metaphors within the environmental sciences*, *Soc. Nat. Resour.* **19**: 921-930.
44 D.C. Lake (2001), *Waging the war of the words: Global warming or heating?*, *Canadian Journal of Environmental Education* **6**: 52-57.
45 Z. Kövecses (2002), *Metaphor: a practical introduction*, Oxford University Press, New York.
46 W.E. Easterling et al. (2007), *Food, fiber and forest products*, in Parry et al. (eds), *Climate change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press, Cambridge, United Kingdom and New York, NY U.S.A.
47 M. Schön (1993), *Generative metaphor: A perspective on problem-setting in social policy*, in *Metaphor and Thought* (A. Ortony ed.) Cambridge University Press, Cambridge U.K.
48 P. Linell (2009), *Rethinking language, mind, and world dialogically interactional and contextual theories of human sense-making*, Information Age Pub., Charlotte, NC U.S.A.

Author

Therese Asplund is a Ph.D. candidate at Water and Environmental Studies, Linköping University, Sweden. She is currently involved in research into climate change communication, in particular, climate change representations in the agricultural sector. E-mail: therese.asplund@liu.se.