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Prospects for environmental communication based on 25 years of newspaper coverage of climate change and eutrophication in Finland

Abstract

Research on long-term media coverage of environmental issues has focused predominantly on English-speaking industrialized countries and on single isolated topics. This article presents a comparative analysis of the Finnish newspaper coverage of climate change and eutrophication from 1990–2014. The coverage of eutrophication showed an annual cycle with summertime peaks strongly influenced by local conditions and domestic news sources. The coverage of climate change had three distinctive peaks, influenced by several factors including international climate policy negotiations, domestic energy debates, and mild and snowless winter weather. The prospects for building public awareness of environmental issues through media representations are discussed.

Keywords: Climate change; Environmental communication; Eutrophication; Mass media, Press coverage

Introduction

Just before the upsurge of public climate debate that occurred in most industrialized countries around 2006, the Finnish environmental philosopher Dr Leena Vilkka published a controversial op-ed in the main national newspaper of Finland, *Helsingin Sanomat*. She asserted that the climate change was just a passing trend in environmental protection that would soon vanish from the public and policy agenda (Vilkka, 2006). Many disagreed and critical rejoinders were published.

The polemic style employed by Dr Vilkka diverted attention away from her key point. She addressed media coverage of climate change as an example of short-term attention cycles created by the dynamics of the media. Her main argument was that media coverage directed towards isolated environmental issues – one after another – may direct public and policy attention away from the underlying long-term root causes of wide-ranging environmental changes. This concern echoed the seminal proposition by Downs (1972), that media discussion of ecological issues is characterized by cycles that end with the post-problem stage where the environmental problem – whether solved or not – recaptures public interest only sporadically.

The ‘issue attention model’ created by Downs (1972) as well as other models (Hilgartner & Bosk, 1988; Mazur, 1998; Carvalho & Burgess 2005; Holt & Barkemeyer, 2012) proposed to explain and interpret the dynamics of environmental coverage have been tested in several empirical studies. These studies have typically been based on data describing a single environmental issue. Studies comparing two or several environmental issues are hard to find and recent literature includes only a few contributions aiming to capture the long-term development of the coverage of all environmental issues. Exceptions include the study by Djerf-Pierre (2013) based on written descriptions of the contents of two Swedish TV news reports and the study of framings of environmental issues in U.S. newspapers by Grantham and Viera (2014).

The aim of this article is 1) to compare the evolution of the media coverage of two different but persisting environmental problems, namely climate change and water eutrophication, 2) to identify the key factors influencing the national-level media coverage of these issues and 3) to draw lessons for advancing public awareness of environmental issues through media representations. Reporting from the Finnish newspaper, *Helsingin Sanomat*, is used as an illustrative case.

Both climate change and eutrophication are long-term environmental changes caused by multiple human actions and actors. They are characterized by various feedbacks that may amplify or attenuate the changes, sometimes after long time lags involving ecological thresholds and points of no return (Hughes et al., 2013). They affect human well-being through different mechanisms and routes, ranging from short term local nuisances to long-term global sustainability challenges.

The media coverage of climate issues has been intensively studied, especially through English-language newspapers (Boykoff, 2009; Olausson & Berglez, 2014) whereas only a handful of studies have focused on the media coverage of eutrophication (e.g. Peuhkuri, 2004, Lyytimäki, 2007; Jönsson, 2011) or media coverage of water issues more generally (e.g. Schmid et al., 2007; Hurlimann & Dolnicar, 2012; Wei et al., 2015). The media coverage of climate change (Lyytimäki & Tapio, 2009; Lyytimäki, 2011) and eutrophication (Lyytimäki, 2012a) in Finland up to 2010 has been described in earlier separate studies. This paper takes these studies as a starting point. New data describing more recent developments from 2011 onwards and a comparison of these issues are presented, focusing mainly on the relative visibility of the issues in public debate. Factors explaining the changes in the coverage are discussed in light of issue attention model.

Context, method and material

Finland is an affluent Nordic country with a relatively cold climate and sparse habitation. In wintertime, the whole country is normally covered with snow. In summertime, weather is usually mild and severe heat waves or droughts occur only rarely. The population is 5.5 million, with over one million living in the metropolitan area of the capital Helsinki, on the southern coast. There are almost 190,000 lakes in Finland, most of them small and shallow and thus vulnerable to eutrophication. The semi-enclosed Baltic Sea that surrounds Finland to the south and west is also ecologically highly vulnerable due to shallow and cold brackish water (Eloranta, 2004; HELCOM, 2013). Water protection has been a key area of the Finnish environmental policy especially since the 1962 Water Act. Climate change has entered the political arena more lately. Finnish climate policies have been relatively unambitious and strongly connected with energy policy and the need for energy in heavy industry (Kerkkänen, 2010).

The analysis presented here focuses on the most widely read newspaper in the country, *Helsingin Sanomat* (HS). It can be characterized as a high quality or prestige newspaper. HS's circulation has declined in recent years but it still stands at about 285,000 printed copies, and the number of daily digital subscriptions has increased to 164,000 (MAF, 2015).

HS's digital online archive (<http://www.hs.fi/arkisto>) provides the longest time series available for this study, containing news material published by the newspaper from 1990 onwards. This study combines data from two datasets. The first one consists of the years 1990–2010 and it is freely available for research purposes from the Finnish Social Science Archive (<http://www.fsd.uta.fi/en/>). The methods of data collection have been explained in detail elsewhere (Lyytimäki, 2012b). The data describing the years 2011–2014 was collected for this study using a similar data collection strategy.

In order to produce data that enables meaningful international comparison, the selection of keywords describing climate debate followed, as far as possible, the choices made in other studies (e.g. Boykoff, 2009; Boyce & Lewis, 2009; Wang et al., 2015). In the Finnish language, the term global warming has no widely used direct translation. Therefore, the search strategy used for climate coverage included the terms 'climate change' and 'warming of the climate'. Furthermore, news items mentioning compound words

including the term ‘greenhouse’ were included. This search string covered expressions such as ‘greenhouse effect’ and ‘greenhouse gases’ (Table 1).

The data on eutrophication was collected with search strings including the terms ‘eutrophication’ and ‘blue-green algae’ (a term commonly used to describe *Cyanobacteria*). Other search strings tested produced either too narrow a sample, or included too many irrelevant hits (Lyytimäki, 2012b). Difficulties in outlining well-functioning search strategies related to eutrophication have also been encountered in the Swedish newspaper analysis of environmental risks in the Baltic Sea (Jönsson, 2011), and in the U.S. newspaper analysis of river water quality (Schmid et al., 2007). This suggests that international comparisons of the media treatment of eutrophication should be carried out with special caution.

Table 1. Search strategies for identifying news items describing climate change or eutrophication

Search term in English	Search strings for 1990–2010	Search strings for 2011–2014
Climate change	ilmastonmuutos	ilmastonmuu*
Warming of the climate	ilmaston lämpeneminen not ilmastonmuutos not kasvihuone	ilmaston lämpeneminen not ilmastonmuu* not kasvihuone*
Greenhouse (effect, gas)	kasvihuone* not ilmastonmuutos not kasvihuone	kasvihuone* not ilmastonmuu* not kasvihuone
Eutrophication	rehevöityminen or rehevöityä	rehevöit*
Blue-green algae	sinilevä not rehevöityminen not rehevöityä	sinilev* not rehevöit*

Note: The search engine was renewed between the two datasets. The new search engine does not take into account the inflections of words in the Finnish language. Therefore wildcards (*) were used and the resulting irrelevant hits were removed manually.

The appearance of the newspaper was overhauled and the structure reorganized several times during the 25 year study period. The most radical transformation, from broadsheet to tabloid, occurred on January 8, 2013. The overall number of news items published has changed over the years as well. In order to allow for meaningful comparison between time periods, this study mainly focuses on the relative proportion of news items on a monthly basis. The monthly number of all articles published in the paper was available from the HS online archive. Focus on relative proportions generates a clear picture of the overall visibility of environmental issues in public debate. Focus on monthly changes allows an analysis of short-term changes in news coverage, including the identification of focusing events or critical discourse moments (Birkland, 1998; Gamson, 1992).

The search included news items mentioning climate issues or eutrophication only passingly. The inclusion of such items gives an opportunity to study how widely the environmental issue is addressed as a side topic in other debates. A coding based on the titles was used to identify whether the main focus of the news item was on the environmental issue studied, on some other environmental issue, or on other issue entirely (Lyytimäki, 2012b). The coding scheme remained at a general level since the purpose was to generate an overall picture capturing the longitudinal development of the news. The overall number of news items was relatively high, which made it unfeasible to employ a time-consuming content analysis scheme based on expert elicitation of the full content of the news items (Krippendorff, 2004). The titles do not necessarily correspond well to the text or illustrations of the actual article. However, even in these cases the titles are relevant since they attract people to pay attention to the article, frame the issue and guide interpretation.

Results

The sample of climate coverage consists of 10,229 newspaper items and the sample of eutrophication coverage consists of 2,471 items. These figures indicate that both of the issues have gained considerable public visibility (Fig. 1). However, the proportion of news items mentioning climate issues was about 0.5% of all news published during the study period. The proportion of coverage of eutrophication remained at 0.1% of all news.

The samples also included news items mentioning climate or eutrophication issues only passingly. A quarter (26.5%) of the news items in the climate sample actually focused on climate change or climate policies. A slightly larger share (27.7%) focused on other environmental or energy issues and mentioned climate issues as a side topic. Finally, almost half (45.8%) of the items in the climate sample focused on issues entirely outside the environmental genre. Thus, the results confirm earlier observations that the climate debate spans a variety of different issues and almost all parts of society (Kerkkänen, 2010; Lyytimäki 2011).

The coverage of eutrophication was more focused, as 39.8% of the news items mentioning the terms eutrophication or blue-green algae actually focused on water eutrophication or related policies. This proportion almost equaled the proportion of news items focusing on other environmental issues and mentioning eutrophication or blue-green algae as a side-topic (41.7%). Less than a fifth (18.5%) of the items in the eutrophication sample focused on issues outside the environmental genre. Thus, eutrophication of water appears to be an issue that is discussed mainly inside the environmental debate.

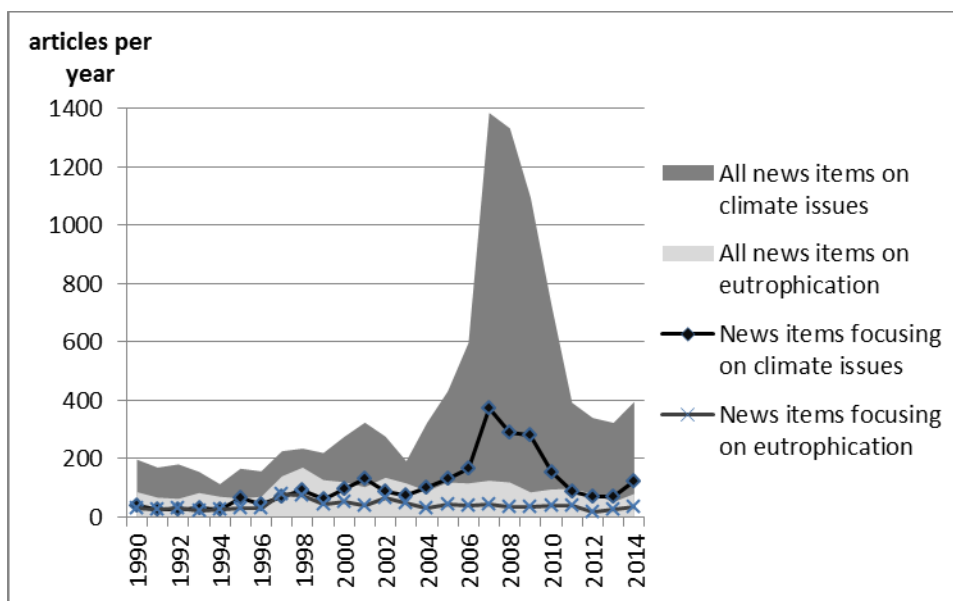


Figure 1. Overview of the development of news coverage focusing on and mentioning climate or eutrophication issues by the newspaper Helsingin Sanomat.

During the 1990s, the absolute number of news items focusing on the eutrophication was at about the same level as the number of news items focusing on climate issues (Fig 1.). This reflects the strong historical emphasis on water protection by the Finnish environmental administration and society (Laakkonen et al., 1999). Around the Millennium and, in particular, during 2006–2010, coverage focusing on climate issues clearly outpaced coverage focusing on eutrophication.

During the most intense phase of the climate debate (2007–2009) there were three distinctive peaks (Fig 2.). The first peak of January–February 2007 was related to debates over domestic energy policy and EU climate and energy policies, as well as the high-profile expressions of concern from influential business leaders and the Prime Minister. An exceptionally mild and snowless winter provided journalists with additional motivation to report about climate issues (Lyytimäki & Tapio, 2009). The second peak occurred during early 2008. It was also partially explained by mild winter weather and reports on

international climate policy. The third peak in late 2009 was related to the UNFCCC Copenhagen climate meeting (Kumpu, 2015). The visibility of climate ‘sceptics’ remained low despite the critique raised against mainstream climate scientists before the Copenhagen meeting (Lyytimäki 2012b, p.36; Maibach et al., 2012).

Climate reporting generally followed the idea of different phases of debate as postulated by the issue attention model (Downs, 1972). However, the first years of the sample were not a pre-problem stage since the first peak of news coverage of climate issues has already occurred in the late 1980s (Suhonen, 1994). Instead, this period can be interpreted as the post-problem phase of the first cycle of climate debate. The development during the last five years of the sample can be interpreted as the post-problem phase following the intense debate of 2007–2009.

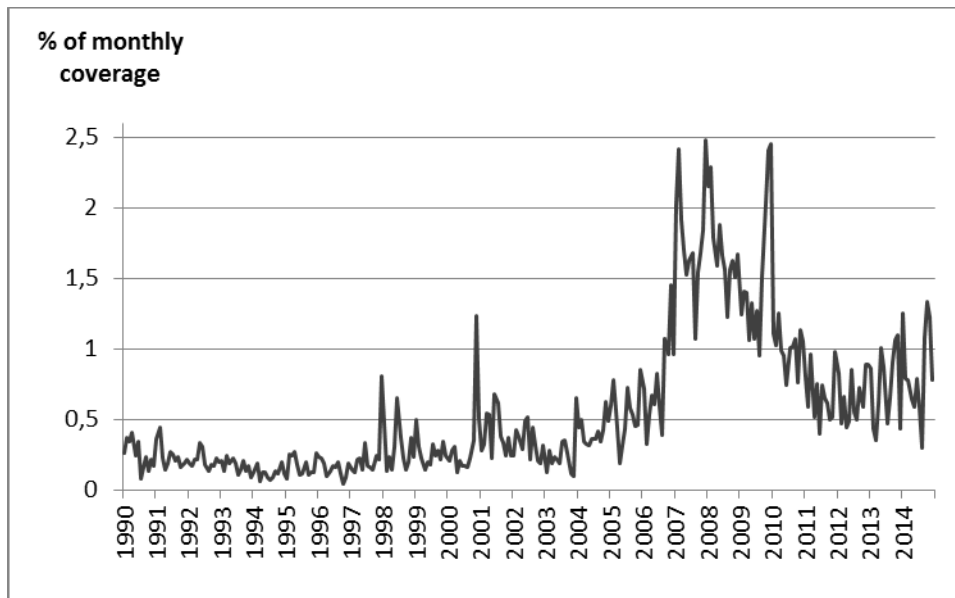


Figure 2. Monthly coverage of climate issues by the newspaper Helsingin Sanomat.

Exceptionally large algal blooms of the summer of 1997 were a clear focusing event of the reporting of eutrophication. The algal occurrences provided the newspaper with dramatic visual material, and the nuisances and potential health risks caused by the potentially toxic algae were widely debated. Environmental authorities were criticized for unpreparedness and inadequate communication. This alarmed discovery phase increased public interest towards the issue (Peuhkuri, 2004; Lyytimäki, 2007). Instead of the linear phases suggested by the Issue-Attention Model (Downs, 1972), the coverage of eutrophication was characterized by cyclical annual oscillation and a shift between two main phases (Fig 3). The annual variation is largely explained by natural conditions, with ice-covered watercourses during the wintertime and occasional algal blooms during the summertime (Eloranta, 2004).

The increase of coverage after the summer of 1997 is partially explained by increased provision of information. Partially as a reaction to the critique, a national algal monitoring and communication network was established in 1998 (Lepistö et al., 1998). This network has provided, and continues to provide up-to-date information about the summertime algal situation. Since 2011 it has utilized a wiki-based online platform (www.jarviwiki.fi) that first focused on inland waters and since 2014 has also included coastal areas (Kotovirta et al. 2014). The national communication network has provided journalists with a steady flow of press releases and other easy-to-use news material (Lyytimäki, 2012b). An additional factor explaining the summertime peaks is the lack of other newsworthy domestic issues during the holiday season (Lyytimäki, 2007).

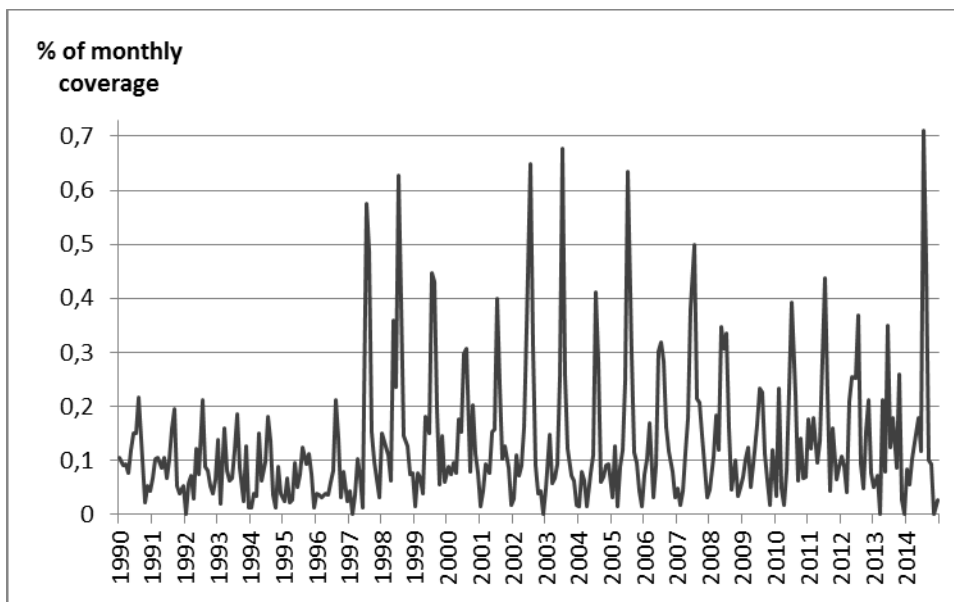


Figure 3. Monthly coverage of eutrophication by the newspaper Helsingin Sanomat.

The general level labels under which the issues are debated changed during the study period. In the early 1990s climate issues were discussed under the label ‘greenhouse effect’. During 1990–1995, the terms ‘greenhouse effect’ or ‘greenhouse gas’ were mentioned almost three times more often than the term ‘climate change’. Around the millennium, both terms were used equally often. Since then, the less technical and more versatile term ‘climate change’ has been the dominant label in the Finnish climate debate.

The proportion of coverage on eutrophication in terms of algal problems increased during the study period. During 1990–1996, less than a quarter (24.3%) of eutrophication news mentioned blue-green algae. During the period 1997–2014 the proportion increased to 49.2%. This was largely because the national algal monitoring program collected and disseminated information about the algal situation. The news of algal occurrences highlighted short-term weather patterns, namely sunny, warm and windless weather, as a key regulating factor in eutrophication (Lyytimäki 2012a).

Eutrophication was predominantly framed as a local and domestic issue, with very few articles published as foreign news (Fig 4). This was mainly because news stories about the state of the Gulf of Finland, an eastern extension of the Baltic Sea, were published as domestic news. The eastern parts of the Gulf of Finland are strongly affected by discharges from St. Petersburg and adjacent areas in Russia. The economic implications of eutrophication were rarely addressed and the issue raised only occasional interest in the letters to the editor. Climate debate showed a very different profile. Climate issues were raised up as newsworthy topic in most of the sections of the newspaper. The major exception was the sports pages, despite some news items mentioning, for example, the problems caused by the warming of the climate for the winter sports. Science news explaining the concept of the ‘greenhouse effect’ was published in particular during the first years of the sample. As the climate debate has matured, the focus has shifted from describing the issue towards policy implications (Lyytimäki, 2011; Kumpu, 2015). The coverage of eutrophication remained to be focused on algal occurrences, i.e. the state of the environment. Therefore, the shift towards reporting focusing on societal responses was less pronounced in eutrophication news.

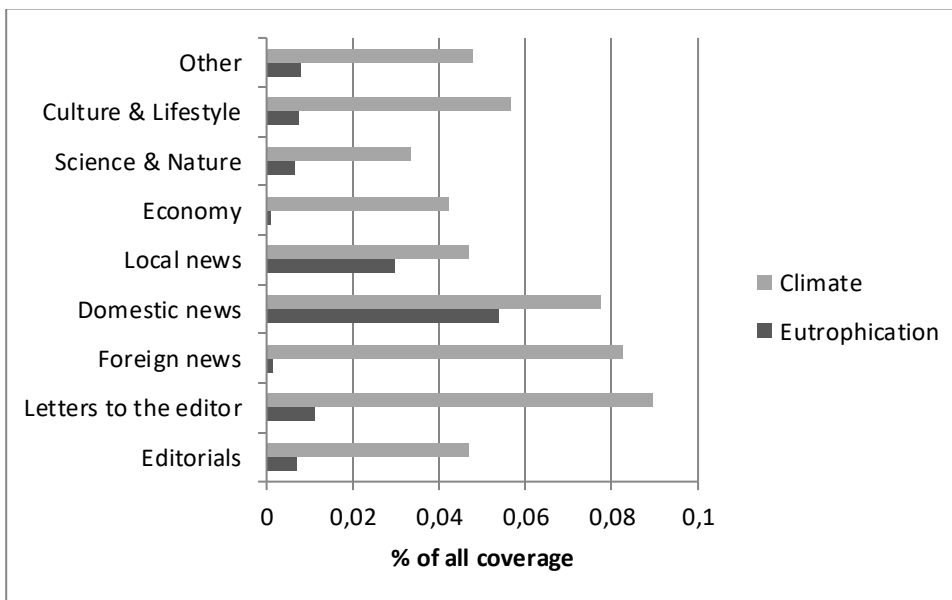


Figure 4. Coverage of news on climate issues and eutrophication by newspaper section from the newspaper Helsingin Sanomat, 1990–2014.

Prospects for building public awareness of environmental issues

Environmental issues are typically long-term processes spanning decades and centuries or even longer timeframes. The media representations, on the other hand, often direct focus on short-term, dramatic and tangible events of immediate interest. The key task for environmental communication is to bridge these two ends of the temporal spectrum in a way that informs and motivates the relevant actors in order to reach environmental and sustainability goals. As the development of the coverage of eutrophication and climate change indicate, such a task is not an easy one.

First, the overall amount of coverage of these prominent environmental issues has been relatively low, suggesting that the overall visibility of environmental issues is low if compared with coverage focusing on other issues, such as the economy, sports or celebrities. Climate change has arguably been the most widely discussed environmental topic during the 2000s but the climate coverage only momentarily exceeded 2.0% of the monthly news flow of HS. Notably, this includes the news items mentioning climate issues only passingly. Low visibility of eutrophication, especially during the winter months, also indicates the difficulties of keeping environmental issues high on the public agenda. This is worrisome since even though the availability of information from mass media does not guarantee increased awareness or action, it serves as one constituent for them (Boykoff et al., 2015; Wibeck, 2014).

Second, characteristics of environmental changes make it difficult to create news framings and narratives empowering and activating people. On the one hand, reporting focusing on the easily observable symptoms of environmental change, such as temporary algal occurrences or exceptionally mild winter weather, may shift public attention away from the long-term driving forces and from the underlying systemic relationships (Peuhkuri, 2004; Tapio and Willamo, 2008). On the other hand, potential solutions are often portrayed in a distanced manner, as highlighted by the climate coverage of international level policy negotiations about future greenhouse gas reduction targets (Kerkkänen, 2010; Kumpu, 2015). Furthermore, even though previous studies have indicated that about a half of the environmental coverage by HS addresses potential responses to the environmental problems (Suhonen 1994, p. 94) and that over half of the national and regional level newspaper reporting focusing on eutrophication addresses activities aimed at mitigating algal problems (Lyytimäki 2007), this reporting on responses is often overshadowed by the frames of ‘doom and gloom’ (Ereaut and Segnit, 2006).

Third, related to previous point, coverage focusing on environmental degradation fails to give information about constituents of good environmental status. Impressions of poor or degraded environmental condition as a normal situation are created, for example, by news items implying that algal occurrences

are inevitable result of sunny and windless weather (Lyytimäki 2012a). Likewise, intensive climate reporting during winter months taking the snowless winter weather as a reference point presents such situations as a new norm. Thus, environmental reporting may contribute to shifting baseline syndrome and create generational amnesia about past environmental conditions (Papworth et al., 2009).

Fourth, the rapid change of the news media industry makes it in many ways more difficult to maintain high quality environmental reporting focusing not only on immediate concerns and controversies but also on the root causes and complex interactions of environmental changes. Staff cutbacks, declining subscription rates and increasing competition are challenges even in countries such as Finland, where traditional printed newspapers still hold considerable market shares (MAF, 2015). Furthermore, the results from this study, together with earlier studies (Suhonen, 1994; Djerf-Pierre, 2013), suggest that media, public and policy attention to environmental issues decreases in periods of economic recession. Dire situation of the media industry is reflected by the increased use of press material produced by research institutions and other information providers (Juntunen, 2011). This provides some possibilities for environmental research organizations to increase the public visibility of environmental issues with their materials. However, financial constraints of the research institutions lead to outreach activities increasingly based on short-term projects (Lyytimäki et al., 2013). Also this makes it more difficult to maintain a sustained flow of information of environmental issues.

The analysis of the environmental coverage provides some glimpses of hope. Perhaps the brightest one is the increasing role of citizen science and media reporting based on it. In Finland this is exemplified by the voluntary participation of citizens in the national algal monitoring and communication network. During the past few years in particular, possibilities for participation have widened due to the introduction of mobile phone applications and a collaborative wiki-based online information platform (Kotovirta et al., 2014). The data collected by citizens can be reliable enough and – as often emphasized – it can complement expert observations (Kyba et al., 2013; Bonney et al., 2014; Kotovirta et al., 2014).

Citizen participation has implications far beyond providing a more comprehensive database for researchers. For media reporting, it can provide topical information that is easy to connect to the everyday life of the people. Data on algal situation published by the HS is one example of such information. This case exemplifies also some of the risks of the citizen science approach. Citizen observations focusing on the symptoms environmental problems easily lead to news reporting emphasizing the state of the environment instead of possible management options. In turn, this may lead to public apathy rather than action (Ereaut and Segnit, 2006). This calls for environmental communication connecting the citizen science data with management actions such as local level lake restoration projects (Rotko et al., 2006). Such communication may provide interesting opportunities for overcoming the obstacles of public awareness and engagement (Wibeck, 2014).

Conclusions

This study highlighted the different long-term patterns of media attention given to persistent environmental issues. Environmental coverage was found to be characterized by relatively low overall levels of reporting and momentary peaks caused by different factors. The coverage of eutrophication showed an annual cycle with summertime peaks influenced mainly by weather conditions and a national-level communication program, and possibly also by a lack of news competition during the holiday season. The coverage of climate change in Finland had three distinctive peaks, influenced by several factors, such as of international climate policy negotiations, domestic energy debates, and mild and snowless winter weather.

Media attention to climate issues has declined considerably since 2009, but recent data indicates that public attention may be again increasing both in Finland and internationally (Wang et al., 2015). It is obvious that climate change is not just a passing environmental trend. Ups and downs of media coverage are likely also in the future, but climate change will remain a major global challenge of the 21st century.

Likewise, eutrophication is an environmental problem characterized by long-term ecological processes and intensively fluctuating media coverage.

Results from this study confirm earlier studies (Kotovirta et al., 2014) suggesting that national level long-term communication programs utilizing citizen science and connected to science-based official monitoring programs can make an important contribution to media reporting and the public agenda. Not everyone is likely to become a citizen scientist, but through media reporting locally based citizen science can foster public engagement and support awareness-building far beyond the people actively participating. Future research should explore the intersections between citizen participation and environmental communication, aiming to build public understanding not only of isolated environmental issues but also of the interconnections between different environmental issues.

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