

21 Journalistic Cartography on the Web: A Comparison of Print and Online Maps in Seven Major American Newspapers

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Abstract

This chapter compares the use of maps in seven major U.S. newspapers in print and online formats during a two-month sampling period. Recent advances in interactive, multimedia, and web-based cartography offer new possibilities for integrating maps with news stories. This chapter asks how these new technologies are being used and how maps in online and print editions differ. The research found that interactive and multimedia maps are not widely used in online editions and, indeed, online maps are not always well integrated with stories. Furthermore, the disparity in size and resolution between print and online editions leads to a range of compromises involving the absolute and relative sizes of maps, placement on the page, and position with respect to text. Interviews with newspaper staff indicated that lack of staff and time and the separation of production between print and online editions often prevented better integration. Although this study focuses on U.S. newspapers, its findings highlight problems faced by newspapers worldwide in making effective use of online cartography.

21.1 Overview

This paper focuses on how advances in web-based cartography have been employed in online journalism. Over the past decade the news media have moved into the web with major investments in online editions. At the same time, innovations in web cartography and map-server technologies have expanded greatly and offer new possibilities for weaving maps into news reporting. The question we address is the degree to which these two currents of innovation have converged—how web maps are being used in online newspapers, particularly in comparison to their print counterparts. Is online news reporting making use of the latest multimedia and interactive techniques? Are there more maps, and are these maps linked and interlinked with hypertext? Are these maps more closely integrated with news stories or less

so? Our comparison involves examination of the layout, placement, size, and palette of online and print maps, as well as a tabulation and analysis of the interactive and multimedia techniques presently found in online maps. Finally, given the costs of these technologies, what factors are constraining innovation as newspapers struggle financially with declining readership and revenue?

21.2 Background

Monmonier's *Maps with the News* (1989) appeared in the same year as Tim Berners-Lee's "Information Management: A Proposal," the paper that helped set the development of the web in motion. Although Monmonier could not have anticipated the power of the web to undermine some of his predictions about the future of journalistic cartography, he did note that: "Technological innovation in the reproduction and transmission of news pictures did more than help make news maps timely and commonplace. Technological change also altered the look of news maps, with each new technology leaving a characteristic imprint on the cartographic image and its symbols" (Monmonier 1989, 235). Now, well over a decade after the start of the web revolution, Monmonier's question is as pertinent as ever—is the web leaving a distinct imprint on the cartographic images and its symbols?

There are two reasons for considering this issue. First, newspapers remain major providers of maps to the public. Changes in the way maps are presented in online newspapers can have effects on public understanding of news events as well as general levels of map and geographic literacy. Second, the changes provide insight into the impact of new technologies on society and culture. Fiske (1996, 2003), Meyrowitz (1985), and Negroponti (1995) suggest that mass media, television and cyberspace have already had major transformative effects on society. Crystal (2001), for example, maintains that the Internet has created new domains of language use—email, chat rooms, virtual worlds, and web pages—with new and distinctive semantic and grammatical patterns.

We believe that newspapers provide a good starting point for considering whether online cartography is having this broader impact, at least in the domain of mass media. Newspapers were fundamental to the emergence and evolution of mass media from the mid-nineteenth century onward and they have sustained this influential position despite the rise of radio, film, and television (Anderson 1991; Hudson 1994). The innovative role played by newspapers in the past does not, however, imply that they will remain equally influential in cyberspace. Studies of technological innovation suggest that early innovators often fade from leadership through time and this may be especially true of the web. The rapid rise of online media and commerce caught many businesses by surprise in the mid-1990s and left entire industries scrambling for profit-making strategies.

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The issue of online cartography has not attracted much attention in the media literature. Many theorists are interested in the potentially broad effects of online media on society (Foust 2005, Pavlik 2001), but have not focused on cartography. Aspects of online maps and graphics have received little theoretical attention in comparison to issues surrounding the general use of interactive techniques (Rosenberry 2005; Sundar, Kalyanaraman and Brown 2003; Massey and Levy 1999), real-time news reporting, virtual newsrooms, journalistic ethics in online environments, and the rise of blogs. Practical guides and training materials for online journalism sometimes touch on the value of maps, but usually as only one type of graphic (BBC 2005; Dube 2000; McAdams 2003, 2005; Paul and Fiebich 2005; Project for Excellence in Journalism 2006). Despite the upswing in the use of news graphics and visual components in newspapers over the past twenty years—partially in response to the competition provided by *USA Today*, lifestyle magazines, and tabloids—graphics tend to be less important and numerous than photographs (Garcia 1993; Berry 2004). McAdams' (2005) recent book on using the Flash software package to create news stories is up to date in terms of multimedia and interactive techniques, but pays only passing attention to maps.

This lack of research on the use of maps in online news is one reason that we chose, as part of our methodology, to interview members of graphics staffs at the newspapers under study. We wanted to gain a sense of their awareness of current cartographic techniques, their views on the usability of these techniques, and the reasons underlying decisions to use certain types of maps and graphics in their papers.

One important issue beyond the scope of our study is how online and print maps affect reader comprehension and geographical literacy. While several studies have examined overall differences in reader's agenda setting, knowledge acquisition, perception, preferences and use between online and print newspapers (Althaus and Tewksbury 2002; Tewksbury and Althaus 2000; Eveland and Dunwoody, 2001; Hsiang and Lasorsa 1999; Sundar 1999), few attend to the role of graphics and maps (Li 1998). Geographers have been interested since the 1980s in the related issues of the media's ability to inform public opinion and shape attitudes toward environment (Burgess and Gold 1985). Excellent case studies exist relating media and geographical consciousness (Lutz and Collins 1993; Schulten 2001; Stafford 1984) and issues such as perceptions of the cold war and post-cold war politics (Sharp 1993, 1996; Vujakovic 1999), but many issues remain unaddressed (Burgess 1990). There is research indicating that maps and graphics can aid news comprehension (Drew and Grimes 1987; Graber 1990; Griffin and Stevenson 1992, 1994; Peterson 1983; Stark and Hollander 1990), but many large questions remain for future research.

21.3 Method

Effective use of online maps is an issue faced by newspapers worldwide but, in this study, we decided to focus on U.S. newspapers for two reasons. First, a survey of major international newspapers proved impractical for reasons of language and access to print editions of these papers. Our methodology involved comparing the online and print editions as well as interviewing newspaper staff, a strategy that, for us, limited the papers we could study to those in English, French, German, and Spanish. And, even though we had use of the holdings of a major research library, subscriptions were not available to the print editions of all of the major international newspapers that we needed. Second, American newspapers do offer some advantages for a preliminary study of current trends in journalistic cartography. The papers selected were among the first to move into the web and are among those that have invested the most heavily in their web editions. At the same time, we feel that a survey of newspapers in one country like the U.S. does provide a useful snapshot of the state of online journalistic cartography irrespective of nation or language.

The first step in our analysis was the comparison of web and print editions of seven major U.S. newspapers: *USA Today* (Gannett Co., Inc), *The Wall Street Journal* (Dow Jones), *The New York Times* (The New York Times), *Los Angeles Times* (Tribune Co.), *Washington Post* (Washington Post), *The Chicago Tribune* (Tribune Co.), and *The Houston Chronicle* (Hearst Newspapers). These are among the largest circulation newspapers in the U.S. (BurrellesLuce 2005), although four of the largest are in New York City and we sampled only the top two (*The Wall Street Journal* and *The New York Times*). *The Dallas Morning News* is also in the top ten, but was not available in our library.

Data was collected from print and online editions on fourteen different days between October 2005 and January 2006. Since many papers run special features on particular days of the week with varying concentrations of maps, two visits were made on each individual day of the week during the study period. The study period fell just after Hurricanes Katrina and Rita struck New Orleans and the Gulf Coast and at the time of the nomination of supreme court justice Alito; riots in France over the treatment of moslems; and the continuing U.S. occupation of Iraq. Among the information tabulated for each map was: its location with respect to the article; size; use of color; position of map with respect to text; and any interactive features.

To make comparisons, the use of maps and non-photographic graphics were analyzed for all front page stories in the print editions (including their continuation pages) and all the stories featured on the homepage of the newspaper on the day it was sampled. It is impossible to make page-by-page comparisons of print and online editions because they are structured differently. Print editions have a discrete number of pages with the articles clearly bounded and few interlinked stories. The online editions are unbounded and stories from several days or weeks are listed and linked

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together in sections labeled “Related Items” or “Complete Coverage.” On average, however, approximately six articles were surveyed for both online and printed versions during each of the fourteen visits to each newspaper (online and print). The content of online newspapers also changes over the course of a day as breaking news is moved online. Some of the print newspapers also issue several editions in a day, but not the way the online sites are changed. This means that our sampling reflects the use of maps at the time we visited, rather than an average for a day. The advantage of comparing the news on the front page of the print edition with the homepage of the online edition is that their content did overlap considerably, though not perfectly.

The second part of the analysis was to interview one member of a graphics staff (either online or print) at each newspaper who had significant knowledge of the transfer of graphics from the print to online editions. Given the differences in the staffing structure at each newspaper, interviews were semi-structured in order to allow for varying areas of knowledge and expertise. Interviews typically lasted an hour and were designed to gather information and opinions about the use of graphics (including maps) in the online newspapers and the processes underlying the daily publication of these graphics. Questions were asked about staffing and decision making; views about graphic and cartographic production in both online and print formats; software tools used for design and publishing; the use of feedback from staff and readers to improve design; and future directions of online cartography. We were particularly interested in the respondents’ views on the use of web-based cartographic techniques in their papers, although few respondents had significant experience with online maps specifically.

21.4 Results of the Comparisons of Online and Print Editions

Across all of the newspapers, the print editions published 0.9 maps daily and the online editions 0.6 (*Table 21.1*). These averages are small, but indicate that print editions offer more maps than online editions. Only the *Houston Chronicle* and *Wall Street Journal* published slightly more maps in their online editions than in print. There did not appear to be a difference between online and print editions in their use of maps by day of the week or by their use in international, national, and local stories.

The size of the maps in absolute and relative terms differed between print and online editions. When measured on a 17-inch, 1280 x 854 resolution monitor, the online maps were on average 52 percent larger than their print counterparts (*Table 21.2*). The difference is more notable as a percentage of screen and page area. Maps in the online editions occupied an average of 25.6 percent of screen area whereas

Table 21.1 Total number of maps appearing in print and online newspapers

	Total Online Maps	Daily Online Average	Total Print Maps	Daily Print Average	Total All Maps	Daily Average for Both Editions
<i>Chicago Tribune</i>	7	0.5	14	1.0	21	1.5
<i>Houston Chronicle</i>	10	0.7	7	0.5	17	1.2
<i>Los Angeles Times</i>	13	0.9	22	1.6	35	2.5
<i>New York Times</i>	8	0.6	12	0.9	20	1.4
<i>USA Today</i>	9	0.6	15	1.1	24	1.7
<i>Washington Post</i>	7	0.5	18	1.3	25	1.8
<i>Wall Street Journal</i>	7	0.5	5	0.4	12	0.9
Total/Average	61	0.6	93	0.9	154	1.6

Each newspaper was sampled (both in print and online) on fourteen days during the study period.

Table 21.2 Size of maps appearing in print and online newspapers

	Average Online Size (in ²)	Size as Percent of Screen Area	Average Print Size (in ²)	Size as Percent of Page Area
<i>Chicago Tribune</i>	29.0	27.3 %	20.7	7.5 %
<i>Houston Chronicle</i>	16.2	15.2 %	17.0	6.4 %
<i>Los Angeles Times</i>	24.9	23.5 %	18.0	6.2 %
<i>New York Times</i>	33.7	31.7 %	19.4	6.5 %
<i>USA Today</i>	23.5	22.1 %	13.3	4.8 %
<i>Washington Post</i>	48.6	45.7 %	26.8	9.7 %
<i>Wall Street Journal</i>	14.6	13.8 %	9.8	2.9 %
Total/Average	27.2	25.6 %	17.9	6.3 %

Screen dimensions for online editions are based on 17-inch, 1280 x 854 resolution display.

maps in print editions averaged only 6.3 percent of page area. These figures highlight the fact that online maps are less frequent but, when used, are often more visually prominent.

The visual prominence of maps in the online editions was lessened by their placement with respect to articles. In print editions, maps usually appeared adjacent to articles on the front page (22 percent) or nearby in the first section (77 percent). In contrast, none of the online maps appeared on the newspapers' homepages. In fact, the strategies for placing maps with articles are far more varied in the online environment and do not parallel the placement of maps in print editions. Maps were linked from the homepage in 10 percent of the sample. They appeared with the article on an inner page in 44 percent of the sample. In another 44 percent of the sample, maps were one hyperlink away from the article on an inner web page. Online maps commonly appear in pop-up windows and these are either linked from

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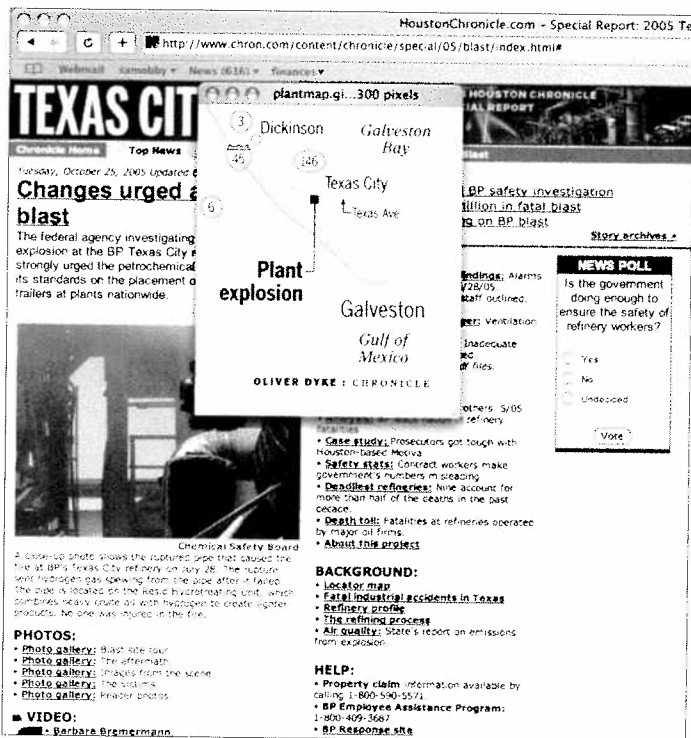


Fig. 21.1 This pop-up map of an explosion at the BP plant in Texas City, viewed on 25 October 2005 in the *Houston Chronicle*, is an example of a relatively common strategy for displaying maps at the reader's request. Here the window has been kept small so that the article and map can be read together, but larger pop-up windows often block underlying text. A disadvantage of the pop-up display of maps is that their links are often listed among a host of related links on the margins of articles, and can be easily overlooked.

the homepage, or quite commonly, from a list of related news items and information adjacent to articles on inner sections of the online news papers (*Figure 21.1*).

Pop-up windows have the advantages of permitting maps to be displayed at larger and more legible sizes than if reduced to fit in-line with an article. The use of pop-ups also simplifies access to maps in complex web page layouts. One further advantage is that pop-up windows allow additional interactive and narrative features to be added to the maps without detracting from the story (*Figure 21.2*). The disadvantage of the pop-up strategy is that, by distancing maps from their stories, the maps lose the textual and graphical context which contributes to their meaning (*Figure 21.3*).

Even when maps appeared adjacent to text in online and print editions, the preferred positions differed. In print editions, the priority position for maps was spread across the full width of the article or, if narrower than the full width, some-

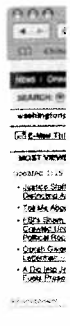


Fig. 21.2 Maps from the online and print editions of the *New York Times* on 6 December 2005. The map of India’s superhighway is used in both editions. However, in the online version the map has been used to organize a three-part multimedia story about the highway and its possible consequences for the spread of disease. This is an example of how maps from print editions are sometimes developed and expanded in the online editions.

where along the top of the article. In contrast, online maps were rarely positioned across the width of the article or at the top. Rather, they appeared to the right and left of the text mid-way down the article.

The use of color was another difference between print and online maps. Color was used in 88.2 percent of the maps that appeared only online on the day of sampling, whereas black and white was used in 61.5 percent of the maps that appeared only in print. Of the maps that appeared in both the print and online editions on the day of sampling, 67.9 percent used the same format in both (that is either color in both, or black and white in both). Only 32 percent changed format, usually a printed black and white map having color added for the web (25 percent).

Only 30 (18.2 percent) of 165 examples of maps and non-photographic graphics had interactive features. This total included only 10 (16.7 percent) of the 60 online maps tabulated in the sample and 20 (18.7 percent) of the non-photographic graphics.



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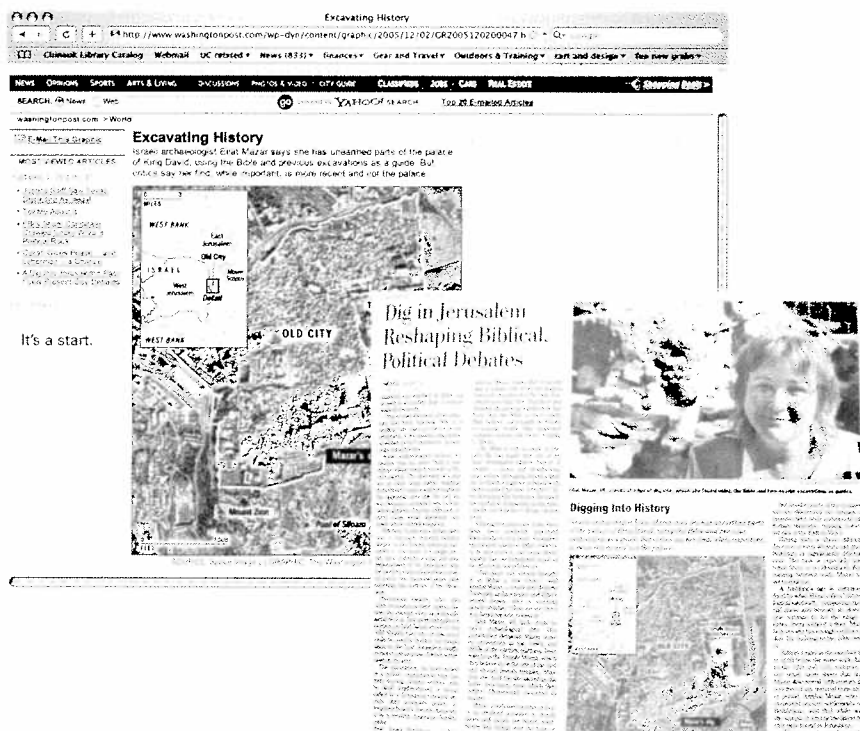


Fig. 21.3 A comparison of online and print versions of a map accompanying a story about an archaeological dig in Jerusalem on 2 December 2005 in the *Washington Post*. The article relies on the map to convey key points, yet in the online version the map has been separated from the article (and photograph). The online map has a short caption, but not nearly the same textual and graphical context as in the print edition. This comparison illustrates the problem of displaying online maps removed from the visual and textual context provided by “complete package” print layouts.

Though few in number, the interactive maps demonstrated interesting features. *Figure 21.2* used a map of India’s superhighway to organize a multimedia narrative about the road and its potential affects, particularly on the spread of disease. The map serves as a visual focus and spatial table of contents for the narrative. *Figure 21.4* demonstrates how interactive maps can be designed to allow viewers to explore casualty data from Iraq both spatially and temporally. More information is available to the online reader than could be plotted on a printed map on the same topic. *Figure 21.5* provides a visual and cartographic overview of the flood damage in New Orleans and then allows readers to explore detailed information about individual parishes and neighborhoods. Finally, *Figure 21.6* provides a way for readers to examine how gasoline prices around the United States were affected by hurricanes Katrina and Rita though, certainly, this particular effect could also be achieved using side-by-side maps.

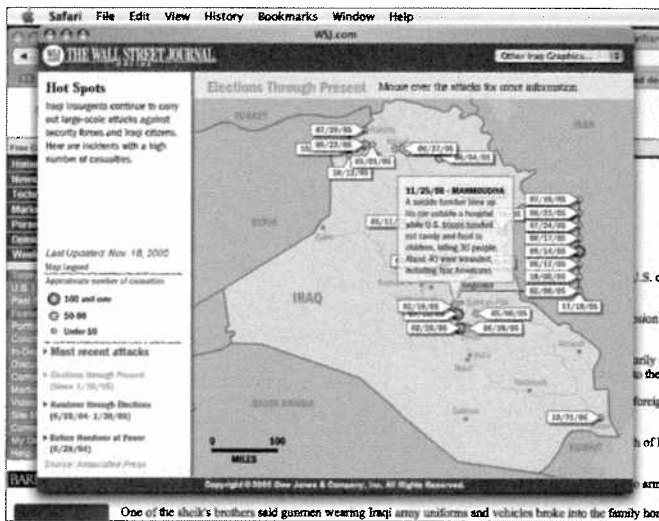


Fig. 21.4 An interactive map of Iraq from the *Wall Street Journal* from 26 November 2005. This map reveals both temporal and spatial patterns of violent attacks by Iraqi insurgents, as well as the approximate number of casualties along with a small pop-up description of the event. Such a map allows the viewer to navigate through the given information as they choose, depending upon the variable or pattern that is of most interest.

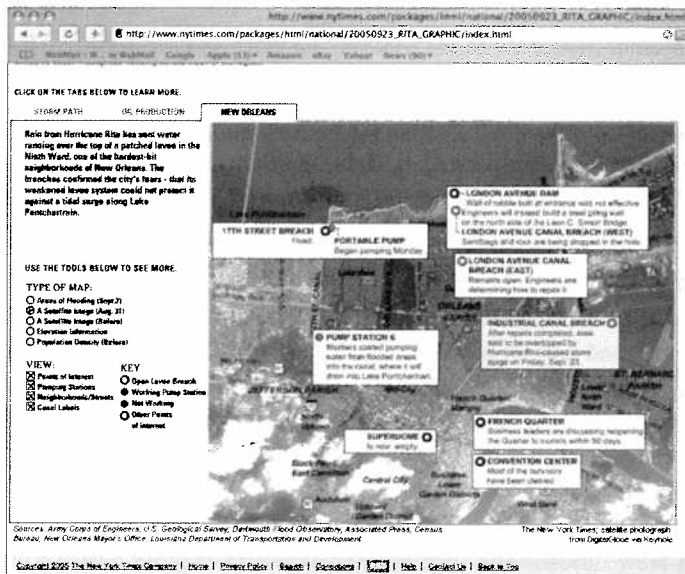


Fig. 21.5 An interactive map from the online edition of the *New York Times* from 29 September 2005. The map allows readers to view detailed information about individual areas of New Orleans. This is an example of how online maps can be used to allow readers access to additional information about stories that would be difficult to include in a print layout.

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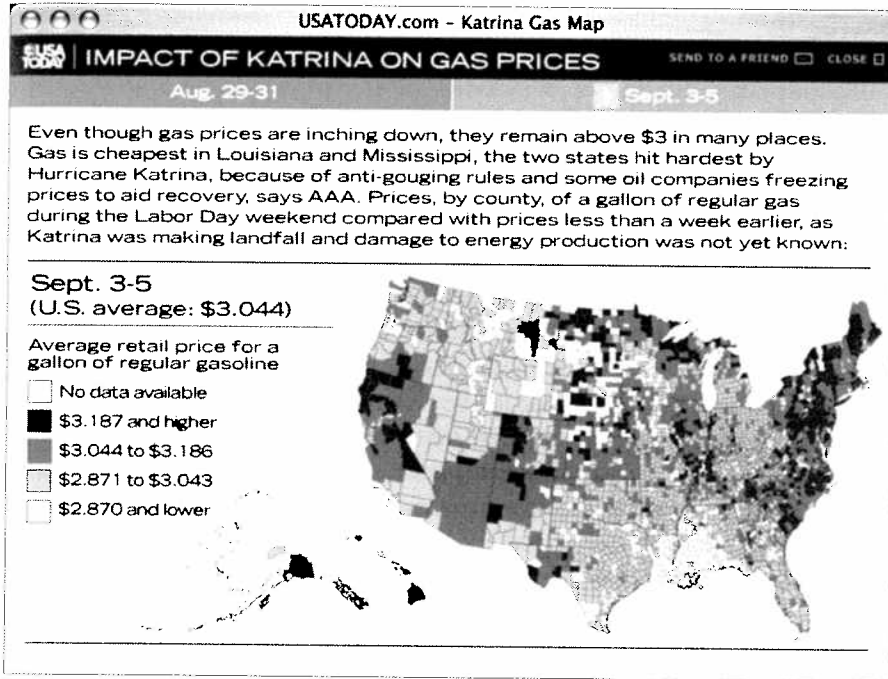


Fig. 21.6 An interactive map of changing gasoline prices from the 29 September 2005 edition of USAToday.com. This is an example of how online maps can allow readers to view and compare changes in data.

21.5 Results of Staff Interviews

The staff for web graphics was reported much smaller than the graphics staff for print editions for every newspaper. While reported print staff size varied from five to fifteen on the low end and twenty-eight to fifty on the high end, the largest web graphics staff was twelve with the rest being less than seven. Moreover, the web staff typically worked on aspects of the website design and maintenance in addition to graphics and maps.

Interaction between print and online graphic staffs was limited. The majority of newspapers separate the two departments physically—by floor, building, or even by city, in one case. This distance was mentioned by most interviewees as one reason for lack of fluid cooperation and communication on projects. In addition, many newspapers operate their online and print versions as two separate, largely autonomous businesses. The online staff is typically on its own in deciding style, design and content. Finally, timing issues keep the staffs working on a graphic at different times.

Commonly the web staff waits until the print staff hands over a finished graphic and then posts it online, a procedure requiring little interaction between the two staffs.

The interaction that does occur included: a shared corporation-wide server where all graphics are shared, communication through one main intermediary staff member, phone conversations, sharing a database for a particular graphic project, and informal emails of daily notes. A few editors stated that the two staffs were most closely aligned when there were concerns over accuracy of information on in-depth projects.

In general, online graphics production was reported as a combination of reformatting static print graphics for the web, and creating original, web-specific graphics. Along this spectrum, responses varied from almost complete print version transfer (i.e. simply putting print graphics online) to a focus on web-specific creations with unique content. Other production issues specific to online graphics that were mentioned included: 1) no set deadline (but around the clock updating demands); 2) the limited "shelf-life" of an online graphic (often less than 24 hours); 3) more technology-driven graphics (presentation equally important to content), and 4) less staff covering more jobs.

Responses about the difference between online and printed graphic design varied significantly. Two respondents mentioned trying to maintain a consistency with the print design in order to reflect the same tone and sensibility as established by the printed newspaper. On the other hand, two other respondents commented upon their relative freedom from print design standards, emphasizing the difference in audience (likely younger) and media. Such mixed responses suggest that the question of what *can* be done, versus what *should* be done, with online graphic design is very much open to debate.

Respondents mentioned several challenges unique to online graphics. The most common were 1) size (an unlimited space through a small window); 2) low resolution of monitors; 3) the speed at which graphics must be produced to be newsworthy; 4) selection (paring down all the possible content); 5) clarity and simplicity (maintaining high information density through intuitive design); 6) relevancy (keeping graphics highly pertinent to current news); 7) the need for constant updating; and 8) coordination with the print version.

When asked "Do you foresee any changes in web graphics for your newspaper," most respondents mentioned better integration between the print and online editions and between graphics and text. This theme most commonly appeared in terms of staff and production. Online and print graphics staffs are not as well connected as they feel they need to be to create high-quality editions. At the same time, concern was expressed about the efficacy of such integration due to the inherent differences in the print and online papers.

The theme of integration came up also with respect to integrating graphics with articles. Several respondents said they were working to better integrate graphics with articles so as to offer readers a more complete 'package' of information. But

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this effort for integration tends to run counter to the conventional journalistic prioritization of text over graphics. Although the web allows for new integrative ways that graphics and maps can visually be related to the text, newspapers have, for the most part, been hesitant to explore these new design concepts.

When asked to reflect about broader changes in the role of graphics in the media, many respondents mentioned the issues of the increasing importance of the web as a news source. This shift seemed to imply further developments in user-driven navigation within layered graphic databases. Several web staff members discussed the growing demand for dynamically generated graphics, and visual information that is both 'fast' and compelling. All interviewees admitted that in some way they are 'keeping an eye on the competition,' which tended to be the other newspapers included in this study.

On the topic of interactivity, several interviewees discussed the reasons and design principles behind choosing interactivity for a certain graphic. Some of the biggest reasons were the amount of content they had about a particular story; whether the story would have a long shelf life; and whether additional information would be added as the story developed. A major design question was how best to guide readers and entice them to spend time navigating an interactive graphic. One web designer made the point that the layout of interactive components almost necessarily varies by story, making design templates of limited value.

Few trained cartographers are involved in online map production. The most common arrangement is with one staff cartographer for the print version and one web staff member who, among other roles, creates the online maps. This task involves the additional challenge of making maps interactive and dynamic. With the ability to reveal more information in an interactive map, web staff members reported that they would like to have access to richer database sources, whether through the print version or their own in-house resources. What online maps lack in size they can make up in interactive layering or 'depth.'

21.6 Discussion

One of the most important findings of this study is that, rather than integrating maps more closely into the narrative of articles, online editions are generally distancing maps further from articles than in print editions and using fewer maps, a finding revealed in previous research on online graphics (Li 1998). Also, unlike the front pages of print editions, none of the online editions placed maps on their homepages. Moving from the page sizes of the print editions to computer screens places a premium on compact design. The result is that maps (as well as photographs and other multimedia resources) have to be linked from articles rather than placed within them. The result is that users have to follow links to see extra material rather

than having it presented with the article. Online maps, when used, tend occupy a larger area of the screen, but the sacrifice is that they are further from the text.

The use of pop-up windows is one of the key design strategies for bringing the maps closer to articles. In many cases this works well (*Figures 21.1, 21.2, 21.4, 21.5, and 21.6*). Unfortunately the pop-up strategy immediately forces readers to navigate two windows simultaneously. Pop-up windows that fill more than half or two-thirds of the screen area often obscure the underlying text. This size limit and the lower resolution of online graphics vis-à-vis print means that pop-up maps must often be highly generalized or simplified which can, in turn, limit their value to the news article. Maps designed especially well for print sometimes will not work at all in online editions.

Perhaps the greatest disadvantage of the pop-up strategy is that it separates maps from their textual and pictorial contexts as in *Figure 21.3*. Print editions have an advantage in being able to present readers with complete packages of materials—text, photos, maps, diagrams, and sidebar information—all within ready scanning distance in a single or double-page spread. The alternatives in online editions are to use a layout of text surrounded by multiple links, or a linear sequencing of materials. Both of these strategies places more demands on readers to follow the train of an article.

At the same time, the pop-up strategy surrounding the article with numerous links is a good way to keep the online structure of information relatively “flat” so that relevant information can be found within one or two hyperlinks. Sites that require users to “drill down” many layers of information are often unsuccessful because readers become lost or frustrated and leave. As one editor noted: “We’ve noticed that the more layers you put in front of somebody, the less clicks they’ll make. If you have a link in the shoulder box of the story you’ll have a lot less clicks [than if the link is right in the story].” Or: “We strive for getting from graphic to article with the least amount of clicks. And [for the] physical location [of the graphic to be] right near the article.”

Within the newspapers studied, there is relatively little use of interactive maps. Those that are used such as those displayed in *Figures 21.2, 21.4, 21.5, and 21.6* are designs that employ interactive elements to aid reader understanding and interest rather than as add-on gimmicks. The interviews provide reasons for this situation. First, adding more maps means an investment of more time and money that is currently unavailable. Second, links between the editorial and graphics staffs of online and print editions tend to be weak. Some web editions try to reproduce print editions, others have some independence. Given the race to keep online editions current, little attention can be spared to focus on how the news can be narrated differently using the unique hypertext features of the web. Third, some of the cartographic technologies that might be of potential interest such as map servers, multimedia techniques, and real-time mapping are very recent and unproven so have not diffused yet into the newsroom.

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A point made by many of the interviewees was that a major barrier to innovation and experimentation is the simple physical distance between the print and online staffs. This distance ranges from a few floors to hundreds of miles. Only one newspaper has already taken steps to face this issue on a newspaper-wide level, with plans to physically integrate the staffs of the online and print editions by having their desks next to each other in the same building.

Certainly some of the examples—interactive and static—point to the potential for a more fluid integration of maps with the online news. The potential of realizing a new type of narrative style keyed to the interactive and multimedia environment of the web is, at present, only just beginning to emerge (Dube 2000, Foust 2005, Paul and Fiebich 2005). Many of the examples we have discussed use interactivity in interesting ways, but are not necessarily well integrated with the stories that they are intended to complement. The staff interviews suggest a clear awareness of the difficulties of creating effective online maps and graphics and that, within the limits of budgets and staffing, improvements are being made. While one solution to the lack of integration is to uphold to the traditional print strategy of using text as the thread around which other materials are arranged, many inventive web-based solutions are possible. New styles of reporting and writing may develop using interactive maps and graphics as key elements of the storyline, rather than as peripheral features. In the shorter term, our research indicates some of the practical cartographic problems that need to be addressed to improve online journalism. And, although our study is confined to U.S. papers, the broad patterns of map usage seem to be mirrored in newspapers in other countries, though a survey at the international level would be a useful next step for comparing online mapping strategies and problems around the world.

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International Perspectives on Maps and the Internet

With 171 Figures

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