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À PROPOS DE NOUS

La **Revue Internationale de droit des données et du numérique (RIDDN)/ the International Journal of Digital and Data Law** est une revue universitaire créée et dirigée par Irène Bouhadana et William Gilles au sein de l'IMODEV, l'Institut du Monde et du Développement pour la Bonne Gouvernance publique.

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IMODEV est une organisation scientifique internationale, indépendante et à but non lucratif créée en 2009 qui agit pour la promotion de la bonne gouvernance publique dans le cadre de la société de l'information et du numérique. Ce réseau rassemble des experts et des chercheurs du monde entier qui par leurs travaux et leurs actions contribuent à une meilleure connaissance et appréhension de la société numérique au niveau local, national ou international en en analysant d'une part, les actions des pouvoirs publics dans le cadre de la régulation de la société des données et de l'économie numérique et d'autre part, les modalités de mise en œuvre des politiques publiques numériques au sein des administrations publiques et des gouvernements ouverts.

IMODEV organise régulièrement des colloques sur ces thématiques, et notamment chaque année en novembre les *Journées universitaires sur les enjeux des gouvernements ouverts et du numérique / Academic days on open government and digital issues*, dont les sessions sont publiées en ligne [ISSN : 2553-6931].

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ABOUT US

The **International Journal of Digital and Data Law / Revue Internationale de droit des données et du numérique (RIDDN)** is an academic journal created and edited by Irène Bouhadana and William Gilles at IMODEV, the Institut du monde et du développement pour la bonne gouvernance publique.

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IMODEV is an international, independent, non-profit scientific organization created in 2009 that promotes good public governance in the context of the information and digital society. This network brings together experts and researchers from around the world who, through their work and actions, contribute to a better knowledge and understanding of the digital society at the local, national or international level by analyzing, on the one hand, the actions of public authorities in the context of the regulation of the data society and the digital economy and, on the other hand, the ways in which digital public policies are implemented within public administrations and open governments.

IMODEV regularly organizes conferences and symposiums on these topics, and in particular every year in November the Academic days on open government and digital issues, whose sessions are published online [ISSN: 2553-6931].

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Environmental Transparency in a Digital Era

by **Russell L. WEAVER**, Professor of Law & Distinguished University Scholar, University of Louisville, Louis D. Brandeis School of Law.

Because of the Internet, which has profoundly influenced both society and communication, environmental transparency, and environmental activism, are more possible today than at any point in human history.[1] Centuries ago, before the printing press, mass communication was difficult and slow.[2] Indeed, for most of human history, books and documents were laboriously prepared by hand, and there was no way to quickly create or reproduce written works.[3] Moreover, only a small number of people (usually monks) had the time to write books, and they typically wrote religious texts in Latin.[4] During this period, the absence of books was less critical because many people were illiterate.[5]

With Johannes Gutenberg's development of the printing press in the fifteenth century, the possibilities for effective communication increased dramatically.[6] Gutenberg's invention involved development of a system of movable type[7] that could be used to relatively quickly "compose" pages by assembling the letters into wooden boxes the size of a printed page, and thereby lay-out pages to be printed.[8] The composed pages could then be used to create numerous copies of a page.

Gutenberg's invention represented a dramatic advance in communications technology, altering the "entire fabric of society," because it encouraged literacy, broadened knowledge,[9] and directly

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[1] *See* Russell L. Weaver, From Gutenberg to the Internet: Free Speech, Advancing Technology and the Implications for Democracy (2013); *See also* David Crowley & Paul Heyer, Communication in History: Technology, Culture, Society (5th ed. 2007); Irving Fang, A History of Mass Communication: Six Information Revolutions (1997); Charles T. Meadow, Making Connections: Communication Through the Ages (2002); Russell L. Weaver & Donald E. Lively, Understanding the First Amendment 261-276 (2d ed. 2006).

[2] *See* From Gutenberg to the Internet, *supra* note 1.

[3] *See* A History of Mass Communication, *supra* note 1, at 1-17.

[4] *See* Katie Lula, *Neither Here Nor There But Fair: Finding an International Copyright Legal System Between East and West, Past and Present*, 8 Asian-Pac. L. & Policy J. 96, 101 (2006); Jay H. Perlman & Lawrence T. Greenberg, *The Internet Reformation: Gutenberg and Martin Luther on Wall Street*, 4 Wall Street Lawyer 9 (2000).

[5] *See* A History of Mass Communication, *supra* note 1, at 19-20.

[6] *See* Communication in History, *supra* note 1, at 82.

[7] *See* A History of Mass Communication, *supra* note 1, at 40.

[8] *See* Peter Linzer, *From the Gutenberg Bible to Net Neutrality – How Technology Makes Law and Why English Majors Need to Understand It*, 39 McGeorge L. Rev. 1, 4-5 (2008).

[9] *See* A History of Mass Communication, *supra* note 1, at 46 ("Printing further encouraged literacy, broadened knowledge, and involved ordinary people in public affairs to a greater extent than ever before.").

impacted the "world of ideas by making knowledge widely available and creating a space in which new forms of expression could flourish."[10] The printing press is credited with contributing to the Renaissance, the Scientific Revolution, and the Protestant Reformation.[11]

Following the invention of the printing press, and the beginning of the Industrial Revolution, communications technologies changed little for centuries.[12] Printers continued to set type by hand, to use screw presses, and to produce only a relatively small number of pages per hour.[13] Communications did not advance much until the invention of electricity in the nineteenth century; an invention that enabled people to communicate information through electrical impulses.[14] These impulses led to the development of the telegraph in the 1840s, as well as to the development of the telephone, radio, television and satellite networks, and dramatically transformed communication, making nearly instantaneous worldwide communication possible.[15] Electricity also led to the creation of the Internet which has had the most dramatic impact on the ability of the people to communicate with each other.

This short article discuss how the Internet has promoted increased communication and transparency regarding environmental issues. It begins by analyzing the evolution in speech technologies, and the unique role that the Internet plays among those technologies. The second half of the article focuses specifically on the environment, and shows how the Internet has allowed ordinary people to obtain information about environmental conditions, to advocate for environmental change, and to connect with others to promote environmental change.

§ 1 – THE INTERNET AND THE CAPACITY FOR MASS COMMUNICATION

The Internet has been transformative. Prior communications technologies were defined by the fact that they were "controlled" by the elite. Even prior to the fifteenth century, when most writings were undertaken by hand, the ability to write was limited and

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[10] *See* COMMUNICATION IN HISTORY, *supra* note 1, at 82.

[11] *See* Rogelio Lasso, *From the Paper Chase to the Digital Chase: Technology and the Challenge of Teaching 21st Century Law Students*, 43 SANTA CLARA L. REV. 1, 4 n.2 (2002) ("The 17th century became known as 'the century of genius' in large part due to the explosion of creativity and new ideas fueled by printing […] Increased output of printed works led first to the combination of old ideas, and later to the creation of entirely new systems of thought."); George Paul & Jason Baron, *Information Inflation: Can the Legal System Adapt?*, 13 RICH. J. L. & TECH. 1, 8 (2007) ("There has been only one transformative advance in […] writing technology […] The printing press allowed mass production of information and thus contributed to the Renaissance, the Scientific Revolution, and the Protestant Reformation.").

[12] *See* A HISTORY OF MASS COMMUNICATION, *supra* note 1, at 47.

[13] *See Id.*; H.W. BRANDS, THE FIRST AMERICAN: THE LIFE AND TIMES OF BENJAMIN FRANKLIN 20 (2000) (hereafter THE LIFE AND TIMES OF BENJAMIN FRANKLIN).

[14] *See* COMMUNICATION IN HISTORY, *supra* note 1, at 118.

[15] *See* FROM GUTENBERG TO THE INTERNET, *supra* note 1.

controlled by monks because they were literate, and had the time to read and write,[16] but they focused on creating religious works.[17] Although the printing press was revolutionary, in many respects, it did not significantly alter the ability of ordinary people to communicate with each other. The printing press clearly expanded communications possibilities beyond the monks, governmental officials and universities that had previously created written works,[18] and gave private individuals the chance to own the means of communication. Because of its utility, the printing press rapidly spread from Germany to other countries, and dramatically affected communication.[19] Nevertheless, the printing press was not readily accessible by the masses. The owners of printing presses, especially the owners of newspapers, had easy access to the technology, and could easily communicate their ideas to their fellow citizens and could criticize government.[20] The difficulty is that few people had enough money to buy or operate their own printing presses[21] because printing required expensive and specialized printing equipment.[22] Moreover, market forces limited the ability of newspapers to operate profitably.[23]

The net effect is that, even though the press revolutionized speech technology, the elite (*e.g.*, governmental officials, newspapers, universities and the rich who owned and controlled presses) were the primary beneficiaries of the new technology, and were the ones who were the most able to use the printing press to disseminate their ideas. Those who did not own presses could try to persuade the owners or editors of newspapers or magazines to publish their ideas (*e.g.*, by writing op-ed pieces or persuasive articles). However, the editors (and reporters) of newspapers served as "gatekeepers" in the sense that they could decide whether or not to publish the ideas of others, and could reject those ideas that they did not like. A writer could (in theory, at least) pay a newspaper owner to publish his ideas, but few could afford to do so, and the publisher always retained the authority to reject the payment and the publication. The net effect was that ordinary individuals did not have assured access to the print medium for disseminating their ideas. If the gatekeepers of the print media refused a publication request, and the speaker could not afford to pay to publish and distribute them, the speaker was left with only more primitive methods of communication (*e.g.*, speech and handwritten methods).

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[16] *See* A HISTORY OF MASS COMMUNICATION, *supra* note 1, at 24.

[17] *Id.*, at 22-23; *see also* Lasso, *supra*, note 11, at 4 n.2.

[18] *See* Richard J. Zecchino, *Could the Framers Ever Have Imagined? A Discussion on the First Amendment and the Internet*, 1999 L. REV. MICH. ST. U. DET. C. L 981, 983.

[19] *See* Peter K. Yu, *Of Monks, Medieval Scribes and Middlemen*, 2006 Mich. St. L. Rev. 1, 7.

[20] *See* THE LIFE AND TIMES OF BENJAMIN FRANKLIN, *supra* note 13, at 168, & 182-184.

[21] Benjamin Franklin, who ultimately settled in Philadelphia, reputedly wanted to settle in New York City. However, he decided that New York could not support another newspaper, or provide him with employment, so he decided to move to Philadelphia. When he eventually landed there, he initially had difficulty finding employment. *See Id.*, at 41-88.

[22] *See Id.*, at 88.

[23] *Id.*, at 41.

The next major advance in speech technology, the telegraph, also did not enable ordinary people. Only the wealthy could afford to have telegraphs in their homes, and even then the device required mastery of the Morse Code.[24] The device was used primarily by government and businesses,[25] especially newspapers who used it to transmit or receive news content.[26] It was difficult for ordinary individuals to send telegrams. They were required to carry to the telegraph office,[27] which would transmit it to a distant telegraph office, and the recipient office would arrange delivery.[28] While the telegraph could be used by ordinary individuals, it was relatively expensive for the time (fifty cents for 10 words).[29] As a result, although the telegraph offered point-to-point communication for the wealthy, it did not enable mass communication.

Radio and television technology, indeed broadcast technology generally, was revolutionary in terms of its speech potential. For the first time, spoken words and pictures could be transmitted very quickly over very long distances, and could be used to reach large audiences simultaneously. However, because of the limited number of airwaves, as well as because of the significant expense necessary to acquire, establish and operate a radio station, few individuals could obtain a broadcast license.[30] Those who did hold licenses effectively became gatekeepers of the technology for those who did not. As with newspapers, radio broadcasters had the authority to decide what would (and, more importantly, would not) be aired.

Television broadcasting was subject to similar limitations. In virtually every country, government has exercised significant control over television broadcasting.[31] In some countries, television broadcasting is either government-owned or government controlled. In the United States, television stations are generally controlled by private individuals rather than being government owned,[32] and television broadcasters are regarded as exercising a public privilege to broadcast even though they been given fairly broad authority to control what is broadcast on their stations.[33] Although ordinary individuals have the right to listen to the broadcasts provided by the owners of television stations, they have not historically had the right to broadcast their own content or ideas over the airwaves except with the permission or consent of the owners of television stations. The net effect was that a non licensee's ability to access the air waves was subject to the whims of those who held the licenses. A non licensee could create an op-ed piece, or might even try to offer an advertisement, but the

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[24] *See* COMMUNICATION IN HISTORY, *supra* note 1, at 119.

[25] *Id.*

[26] *See* A HISTORY OF MASS COMMUNICATION, *supra* note 1, at 81-82.

[27] *See* Tom Standage, *Telegraphy – The Victorian Internet*, in COMMUNICATION IN HISTORY, *supra* note 1, at 132.

[28] *Id.*

[29] *Id.*, at 81.

[30] *See Red Lion Broadcasting Co. v. FCC*, 395 U.S. 367 (1969).

[31] *See* A HISTORY OF MASS COMMUNICATION, *supra* note 1, at 90.

[32] *Id.*, at 158.

[33] *See Red Lion Broadcasting Co. v. FCC*, 395 U.S. 367 (1969); *see also* William Boddy, *Television Begins,* in COMMUNICATION IN HISTORY, *supra* note 1, at 244.

holder of the radio or television license was not required to broadcast either of them.[34] Although some broadcasters allowed (and allow) private individuals to air op-ed pieces, just as some newspapers publish op-eds or letters to the editor, the broadcaster's editor or producer retained discretion about whether to air a particular op-ed. The point is that, during most of the twentieth century, the average individual had few affordable and effective means of mass communication. As before the invention of the printing press, individuals could give speeches, and could draft arguments and position papers, but could not readily or easily harness the communications potential of radio and television in order to communicate their political and social ideas.

Cable television,[35] and satellite radio and television, also advanced communication, but also came with gatekeepers. Those technologies have dramatically increased the number of viewing and listening options, sometimes increasing station availability by hundreds of times, and have also expanded the number of perspectives available in the information marketplace. However, they did not dramatically increase the ability of average individuals to access the media or participate in freedom of expression. Increasingly, cable television has been dominated and controlled by large corporations,[36] and many of these corporations own multiple types of media.[37] Even though some cable companies have established local access channels,[38] thereby providing ordinary people with some access to this new medium, the overwhelming majority of the hundreds of cable and satellite channels were and are controlled by media conglomerates.

Today, the dynamics of speech are changing in ways that give ordinary people much greater access to communications technologies, and an enhanced potential for mass communication. The distinguishing feature of the modern era is the Internet which has made mass communication both cheap and affordable. Once again, the change is being driven by technological innovation, including the invention of personal computers (PCs) and the development of the Internet.[39] The personal computer was a dramatic breakthrough in communications technology because it allowed individuals, especially those who could not afford to own or operate printing presses, to quickly and easily create quality content at home using their own equipment.[40] When coupled with a printer, the prices of which had dropped dramatically, the PC enabled ordinary people to print their own content.[41] While people

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[34] *See Columbia Broadcasting System, Inc. v. Democratic National Committee*, 412 U.S. 94 (1973).

[35] *See Turner Broadcasting System, Inc. v. FCC*, 512 U.S. 622 (1994).

[36] *See* A HISTORY OF MASS COMMUNICATION, *supra* note 1, at 203-204.

[37] *Id.*, at 204.

[38] *See* John J. O'Connor, *How Much Access Have We to Public Access?; Television*, The New York Times, Sec. 2, at 17 (Jun. 3, 1973).

[39] The Internet's roots are generally traced back to September 2, 1969. *See* Anick Jesdanun, *Internet at 40: Midlife Crisis? Barriers Threaten, Openness, Growth*, The Courier-Journal, at D5 (Sept. 6, 2009).

[40] *See* George Paul & Jason Baron, *Information Inflation: Can the Legal System Adapt?*, 13 Rich. J. L. & Tech. 1, 9 (2007).

[41] *See id.* at 9.

may have previously been able to create typed documents using typewriters or other techniques, the PC allowed individuals to create high quality documents with exceedingly high quality graphics, and to print the documents that they had created.[42] In addition, they could create multiple copies, and could effectively engage in "desktop publishing."[43] PCs were supplemented by laptop computers,[44] and they were followed by a variety of handheld devices that made text messaging possible.[45] Handheld devices allow individuals to connect to the Internet even though they are away from their PCs, and allow individuals to send e-mails and text messages, surf the web, access Facebook pages, and do other things. Market penetration for the various handheld devices (including cellphones) now includes 96 percent of young people in the United States.[46] Because of these developments, gatekeepers play a much less prominent role in Internet communication. The net effect is that ordinary people possess dramatically enhanced communications possibilities than they have ever possessed before. The Internet complimented personal computers and handheld devices by enabling ordinary individuals with the means for mass distribution of information.[47] With the Internet, ordinary people could bypass traditional methods of communication, and the gatekeepers of those technologies, and distribute content directly to their readers. Indeed, individuals could instantaneously disseminate their ideas all over the world. Not only could individuals send e-mails and create websites, they could also communicate through chat rooms, list serves and blogs. They could also send text messages, and communicate in lots of other (new) ways. Moreover, Internet communications are different from other forms of mass communication because the barriers to access are extremely low. Those who lack the means to buy a computer can gain inexpensive access through a cyber café[48], through a library or university[49], or through a handheld device. Indeed, a number of businesses offer free Internet connections as a way of encouraging business. The end result is that millions upon millions of people now regularly engage in speech and communication through the medium of the Internet.

Unlike the telephone, an e-mail can be distributed to a very large group of people in far-flung places, and the communication can take place instantaneously. Nevertheless, e-mail is now relatively old school. Indeed, new technologies seem to emerge almost daily.

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[42] *See* A HISTORY OF MASS COMMUNICATION, *supra* note 1, at 196.

[43] *See Id.,* at 195-196.

[44] *See* Matt Bai, *D.I.Y. Populism, Left and Right, The New York Times*, at WK.1 (Oct. 31, 2010).

[45] *See Handheld Devices: Most Popular, The New York Times* (Nov. 23, 2010), http://topics.nytimes.com/top/news/technology/products/handhelds/popular.html.

[46] *See* Steve Inskeep, *Survey: 96 Percent of Young Adults Own Cellphones*, National Public Radio, Morning Edition (Oct. 18, 2010),

[47] *See* COMMUNICATION IN HISTORY, *supra* note 1, at 298.

[48] *See* Virginia Heffernan, *The Cybercafe Lives, The New York Times* (Nov. 7, 2008); Ramen Jaleshgari, *At a Café, Internet and Coffee, The New York Times* (Feb. 16, 1997).

[49] *See* Gretchen Ruethling, *Almost All Libraries Offer Free Web Access, The New York Times*, at A14 (Jun. 24, 2005).

The power of the Internet has been enhanced by the development of new forms of social media such as MySpace and Facebook.[50] Included are such Web search and communications devices as listservs, Google, blogs, YouTube, Flickr, Twitter, 3-D panorama, streaming, and other more modern methods of communication. Although Twitter communications involve only 140 characters, nearly 20 million people now use the service (20 million of which are active),[51] producing more than 100 million tweets a day,[52] and two billion tweets per month.[53] In a 24-hour news cycle, in which electronic media can disseminate information quickly, Twitter is even faster, and Tweets can be used by reporters to solicit information from possible sources. By mid-2010, Facebook had more than 500 million users worldwide.[54]

Blogs are becoming commonplace. As one commentator noted, one "of the great things about the political blogosphere is that it is very open and meritocratic. For very little money, anyone can start a blog and post their thoughts on the Web,"[55] and there are lots of other communications options, including online commentary and so-called "viral videos."[56] E-mail has supplemented, if not been eclipsed by, text messaging which has exploded in recent years, and which has created its own societal problems.[57] Oral and visual communication have been enhanced by Skype which allows individuals to make phone calls and convey video over the Internet.[58] Skype is even available now through handheld devices.[59] The Internet is extraordinarily democratic in the sense that individuals are free to write about the issues that move them,[60] and to transmit their ideas to a wide range of other people, without having to invest in printing presses or radio and television stations. In addition, ordinary people are no longer forced to go through the traditional gatekeepers of communication, or the societal norms or personal preferences imposed and enforced by those gatekeepers.[61] Someone who wishes to publish something can simply do so, and can quickly and easily transmit it around the world. As a result, ordinary individuals are beginning to directly communicate with

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[50] *See* Tim Arango, *A Hot Social Networking Site Cools as Facebook Flourishes, The New York Times*, at A1 (Jan. 12, 2011).

[51] *See* Bob Garfield, *Evan Williams*, National Public Radio, On the Media (Nov. 26, 2010), http://www.onthemedia.org/2010/nov/26/evan-williams/transcript/.

[52] *See Id.*

[53] *See* Bob Garfield, *The Point of Twitter*, National Public Radio, On the Media (Nov. 26, 2010), http://www.onthemedia.org/2010/nov/26/the-point-of-twitter/transcript/.

[54] *See* Bob Garfield, *The Facebook Effect*, National Public Radio, On the Media (Aug. 20, 2010), http://www.onthemedia.org/2010/aug/20/the-facebook-effect/transcript/.

[55] *See* Micah Sifry, *The Gatekeepers are Gone*, National Public Radio, Soap Box (Aug. 21, 2008), http://www.npr.org/blogs/sundaysoapbox/2008/08/the_gatekeepers_are_gone.html.

[56] *See* Liane Hansen and Davar Iran Ardalan, *Looking at the Future of "E-Politics,"* National Public Radio (June 29, 2008),

[57] *See* Liz Halloran, *Government Eyes Crackdown on Texting and Driving*, National Public Radio (Nov. 23, 2010), http://www.npr.org/templates/story/story.php?storyId=113325341

[58] *See* Verne G. Kopytoff, *To Match Profit With Popularity, Skype Looks to New Markets, The New York Times*, Business Day, at B1 (Dec. 22, 2010).

[59] *Id.*, at B2.

[60] *See Reno v. American Civil Liberties Union*, 521 U.S. 844 (1997).

[61] *See* Micah Sifry, *supra* note 55.

each other on a scale that has never been seen before, and the result has been a free speech revolution that has affected not only the United States, but the entire world. Through the Internet, ordinary people can now engage in politics from the comfort of their homes, and can reach thousands if not millions of other people. As one commentator noted, "What we are finally seeing […] is a realization of that ideal that Adams and Jefferson and Paine and before him Voltaire and Plato had […] that ideal of having everybody have a shot at participating in this discussion."[62] Political communication is no longer the sole purview of the rich and powerful, but now also resides in the masses.

§ 2 – THE INTERNET AND THE ENVIRONMENT

The Internet has had a similar impact on environmental communication. At one point, it was relatively difficult for ordinary individuals to obtain and analyze technical environmental information or engage in environmental advocacy.[63] This work with done largely by large environmental organizations who could afford to hire large staffs.[64] With the advent of the Internet, the calculus has changed. Professor William Gilles is a strong advocate of the idea of "sousveillance" – the idea that members of society can observe the actions of governmental actors and attempt to influence their actions.[65] He describes sousveillance as involving the "increasing tendency of the citizenry to watch, gaze, look and monitor, from the bottom, the practices of their governments, or even more widely, everyone's action thanks to the democratization of ICT tools."[66] In the modern era, sousveillance is possible. As one commentator noted, "Today, one environmental advocate with a 56k modem and a $20 per month Internet account has more power to acquire information, to communicate, and to participate than a whole staff of people did ten years ago."[67]

There are a number of websites, including governmental websites, that allow the public to access environmental information.[68] For example, the United States Environmental Protection Agency (EPA) maintains a website entitled "Envirofacts"[69] that is designed to provide "multi year information about stationary sources of air pollution; large-quantity generators of hazardous wastes;

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[62] *See* Hansen and Ardalan, *supra* note 56.

[63] Keith Harley & Holly D. Gordon, *Public Participation and Environmental Advocacy in the Internet Era*, 16 NAT. RESOURCES & ENVIRONMENT. 296 (2001) ("Ten years ago, the environmental movement inevitably was dominated by environmental organizations that could afford to maintain staffs of scientists, organizers and lawyers. Such organizations could accomplish internally driven policy initiatives, fueled by membership contributions and grants from large foundations.").

[64] *Id.*

[65] William Gilles & Irene Bouhadana, *From the Right to Be Let Alone to the Right to Be Forgotten: How Privacy Is Moving in the Collecting Data Age*, in RUSSELL L. WEAVER, STEVEN I. FRIEDLAND, WILLIAM GILLES & IRENE BOUHADANA, PRIVACY IN A DIGITAL AGE: PERSPECTIVES FROM TWO CONTINENTS ___ (2016) (forthcoming).

[66] *Id.* at ___.

[67] *See* Harley & Gordon, *supra* note 63.

[68] *See id.*

[69] www.epa.gov/enviro

treatment, storage and disposal facilities; Superfund sites ; facilities required to develop Risk Management Plans under the Clean Air Act; facilities that submit Toxic Release Inventory reports characterizing multimedia releases of toxic chemicals; and facilities required to report wastewater discharges pursuant to the Permit Compliance System."[70] Some analysts tout Envirofacts as "one of the best sources of environmental information on the Internet" because it is available in multiple formats, is easy to and can be accessed though a "fill-in-the- blank" form, and " almost all of the information on the site is derived directly from industry self-reporting to the U.S. EPA and/or its state counterparts, pursuant to mandates imposed by law."[71]

Individuals can also access environmental information through private websites. For example, the Right-To-Know Network[72] "offers information from government files about chemical accidents and unpermitted releases, chemical testing and federal civil enforcement action, and also includes other information (*e.g.*, census, environmental, and mapping information).[73] In addition, Environmental Defense maintains the website Scorecard[74] which publishes information in an effort to "encourage and sustain activism." Scorecard focuses on matters "like lead poisoning and runoff from animal lots," and includes "a report card ranking system by which states (and in most cases, smaller geographic areas) and facilities are contrasted with each other." Another website is maintained by the Natural Resources Defense Council's (NRDC) which posts information on its website[75] related to the EPA's Cumulative Exposure Project (CEP).[76] There are other similar websites.[77]

Individuals can also use the Internet to locate scientific and technical information that will help them evaluate the technical environmental information that they find on the EPA website or other sites.[78] For example, the U.S. EPA's Office of Air Quality, Planning and Standards provides the Technology Transfer Network[79]provides a "clearinghouse of the scientific and engineering information used to generate EPA's multiple Clean Air Act activities."[80] The website includes the Maximum Achievable Control Technology (MACT), including emissions and pollution control information reported by industry sector, and the Ozone Transport Assessment Group, which documents "nitrogen oxide

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[70] *See* Harley & Gordon, *supra* note 63, at 297.

[71] *Id.*

[72] www.rtknet.org

[73] *See* Harley & Gordon, *supra* note 63, at 297.

[74] www.scorecard.org

[75] www.nrdc.org/air pollution/cep

[76] *See* Harley & Gordon, *supra* note 63, at 297.

[77] *Id.* ("Perhaps the best site for obtaining quality, understandable information about potential hazards posed by different chemicals is offered by the Agency for Toxic Substances and Disease Registry (ATSDR), a division of the Centers for Disease Control.").

[78] *Id.*

[79] www.epa.gov/ttn

[80] *See* Harley & Gordon, *supra* note 63, at 297.

(NO$_x$) transportation across the eastern United States."[81] Of course, individuals can also use search engine directories such as the Google Web Directory which "offers numerous subcategories of websites under 'environment,' including ten sites on environmental ethics, seventy-six sites on forests and rainforests, and 385 sites on biodiversity."[82]

In addition to accessing technical and scientific information on the Internet, individuals can also access legal information through such sites as "Findlaw" and the Government Printing Office's "GPO Access."[83] Findlaw[84] "provides a wide array of useful legal documents and links to legal resources for environmental advocates," including the United States Code, the Code of Federal Regulations and *Federal Register* notices, as well as statutes and administrative codes for many states, and some U.S. Supreme Court opinions and lower court information and opinions.[85] "Findlaw also provides links to websites for nonprofit legal groups and information regarding the U.S. House of Representatives, Senate, and Council on Environmental Quality."[86] GPO Access[87] provides many of the same documents available on Findlaw, including a collection of earlier U.S. Supreme Court opinions, as well as "congressional bills and hearing reports, House and Senate reports and *Congressional Records*."[88]

Environmental advocates can also use the Internet to facilitate public participation in permitting, rulemaking, and legislation. For one thing, individuals can now use the Internet to ascertain information regarding ongoing administrative processes. For example, the EPA's rulemaking process can be accessed through the web.[89] On a local level, many states and regional EPA now place online draft permits, public notices, final permits, summary documents, and point-of-contact information online.[90] For example, in Illinois, air permits are posted on a single website.[91]

The Internet also offers public interest advocates a new way to communicate with one another and to organize political constituencies. For example, the Clean Air Network (CAN) is a Washington-based organization that builds coalitions among a wide range of groups from across the country in an effort to promote clean air.[92] The Internet has also enabled the media to advocate for governmental responses to climate change.[93] For example, one blog on the New York Times website advocated in

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[81] *Id.*

[82] *Id.*

[83] *Id.* at 297-298.

[84] www.findlaw.com

[85] *See* Harley & Gordon, *supra* note 63, at 298.

[86] *Id.*

[87] www.access.gpo.gov

[88] *See* Harley & Gordon, *supra* note 63, at 298.

[89] www.epa.gov/fedrgstr

[90] *See* Harley & Gordon, *supra* note 63.

[91] *Id.*

[92] *Id.* at 298.

[93] *See* Daniel Altman, *Blogging and Thinking About the Big Issues: Managing Globalization, International Herald Tribune* 12 (May 30, 2007).

favor of the climate change theory,[94] and another blog discussed ways that ordinary people can combat climate change.[95] The evidence suggests that some blogs have broad readership.[96] In addition, there is evidence that governmental policymakers are aware of what is being written in blogs.[97] For example, governmental policymakers have critiqued information contained in blogs (even though those policymakers might not have been altered or shifted by the blogs).[98]

Of course, like any communications technology, the Internet works both ways. In other words, it can be used not only by environmental activists, but also their opponents, and can be both a source of legitimate information and misinformation.[99] As one commentator noted, although "blog after blog denies climate change is a problem or that people's actions have anything to do with it," but often, "there's no basis behind what is reported."[100] In one instance, computer hackers sought to undermine claims regarding climate change.[101] They did so by breaking into a computer server at a climate research center in Britain, stealing correspondence between U.S. and British researchers, and claiming that the correspondence showed that the case for climate change had been overstated and "attempted to manipulate data."[102] Disclosure of the information created a furor because it was released only weeks before the Copenhagen climate change conference.[103]

Even in China, a country in which the government has engaged in aggressive censorship, the Internet is beginning to significantly reshape society.[104] China now has some 298 million Internet users, as well as some 70 million bloggers,[105] and those bloggers have repeatedly found ways to avoid governmentally-imposed Internet

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[94] *See* Eric Berger, *BLOG: SciGuy: Climate Olympics: Two Compete for the Grandstanding Medal, International New York Times* (Nov. 8, 2015).

[95] *See* Bettina Wassener, *A Fight That Doesn't Need Heroes, International New York Times* 19 (Apr. 8, 2010).

[96] *See* Daniel Altman, *Blogging and Thinking About the Big Issues: Managing Globalization, International Herald Tribune* 12 (May 30, 2007) ("When an editor suggested finding out why so few women left comments by taking the subject on in a post, female "lurkers" immediately made their presence known with varying degrees of indignation.").

[97] *Id.*

[98] *Id.* ("While commenters butted heads and shared their knowledge, was anyone in high places reading? Apparently so, as Stephen Adams, a spokesman for Peter Mandelson, the European Union's commissioner for trade, took issue with the headline "Mandelson: Repent, repent!" He had read it as "Mandelson, repent, repent!" After a short offline discussion of punctuation, Adams contributed a substantive response to the blog.").

[99] *See* Lindsay Peterson, *Climate Scientist: Don't Trust Uninformed Blogs, Tampa Tribune* (Feb. 12, 2010).

[100] *Id.*

[101] *See* David Stringer, *Computer Hackers Leak E-mails, Stoke Global Warming Debate, Seattle Times* A9 (Nov. 22, 2009).

[102] *Id.*

[103] *Id.*

[104] *See* Andrew Jacobs & Jonathan Ansield, *For China, "Stability Above All": State Pours Resources Into Monitoring Critics and Quelling Dissent, The International Herald Tribune*, at 6 (Dec. 10, 2010).

[105] *See* Anne Stopper, *China Appears to Tighten Internet Access Around Tiananmen Anniversary,* PBS News Hour (June 1, 2009).

restrictions.[106] The Internet has been vigorously employed by ordinary Chinese people to pressure the Chinese government on environmental issues. For years, the Chinese government has tried to downplay the existence of pollution within the country.[107] As a result, when airline flights are cancelled or delayed due to pollution, airport authorities make no reference to pollution in their announcements, but instead suggest that the cancellations are due to "weather conditions."[108] Likewise, when smog envelopes a city, the government characterizes the haze as "fog, not fumes."[109] These efforts to silence communication are repeatedly being challenged. Although Twitter feeds are blocked in China, U.S. Embassy pollution readings in China are distributed through unblocked sites.[110] Likewise, when the Chinese government claimed that air quality was improving, disbelieving activists purchased air quality monitors, and began posting environmental readings on the Internet.[111] Environmental activists in other Chinese cities did likewise.[112] As pollution data began to mount, Chinese citizens began to demand environmental improvements, and air quality standards were heightened.[113] In one instance, a video about the environment went viral in China.[114] The video received millions of hits within the space of a week,[115] and was ultimately banned by the Chinese government,[116] but not before it created a national stir over Chinese environmental issues.[117]

CONCLUSIONS

The Internet has dramatically transformed communication, including communication related to the environment. It has enabled ordinary people to engage in "sousveillance" in the sense that they can access environmental information from both governmental and private websites. In addition, it has enabled

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[106] *Id.*

[107] *See* Edward Wong, *Anger Rages as Beijing Chokes in a Dark Cloud: Unreported Levels, The International New York Times* 1 (Dec. 7, 2011).

[108] *Id.*

[109] *Id.*

[110] *Id.*

[111] *See* Sharon LaFraniere, *Activists Crack China's Wall of Denial About Air Pollution, The New York Times*, at A4 (Jan. 28, 2012).

[112] *Id.*

[113] *Id.* (The Chinese government decreed "that about 30 major cities must begin monitoring the particulates this year, followed by about 80 more next year. The Ministry of Environmental Protection also promised to set health standards for such fine particulates 'as soon as possible.' ").

[114] *See* Edward Wong, *China Blocks Web Expose on its Air Pollution, International New York Times* 1 (Mar. 7, 2015).

[115] *Id.* ("Under the Dome," a searing documentary about China's catastrophic air pollution, had hundreds of millions of views on Chinese websites within days of its release one week ago.").

[116] *Id.* ("Then on Friday afternoon, the momentum over the viral video came to an abrupt halt, as major Chinese video websites deleted it under orders from the Communist Party's central propaganda department.").

[117] *Id.* ("The startling phenomenon of the video, the national debate it triggered and the official attempts to quash it reflect the deep political sensitivities in the struggle within the bureaucracy to reverse China's environmental degradation, among the worst in the world.").

ordinary people to access the technical information needed to evaluate environmental information, and has provided individuals with the legal information needed to bring legal changes. In short, the Internet has resulted in a shift in the balance of power that "has the potential for profound implications among the regulated community, regulators, and public interest advocates," and that will make it "increasingly difficult for the regulated community to avoid public scrutiny of environmental performance."[118] The Internet has also provided individuals with the means to mobilize environmental activism. Through e-mails, listserves, and a multitude of other Internet devices, individuals have the ability to communicate with each other, to mobilize others, and influence the political process. The net effect is that ordinary individuals have a previously-unavailable capacity to engage in environmental activism.

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[118] See Harley & Gordon, supra note 63, at 297.