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Pining for Sustainability

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ESSAY

PINING FOR SUSTAINABILITY

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In the legal academic community, there are significant positive signs demonstrating attention to sustainable practices, from course offerings to many day-to-day operations. Scholarly research also reflects this positive trend.[1] Much of this recent scholarship assesses sustainability-focused regulatory and normative efforts to address the impacts associated with a warming planet in marked detail, and there is an additional plethora of writing on the many topics beyond the changing climate that raise sustainability questions.[2]

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I am grateful to Economics Professors Simona Lup Tick of the University of Mississippi and Richard Ball of Haverford College for their assistance. Also, thank you to Professor Keith Hirokawa of Albany Law School for reviewing earlier drafts of this work, as well as to my able research assistant, Sean Jain. Further, thank you to the many journals that participated in the survey associated with this essay. The data and analysis herein are presented merely to encourage ingenuity and continued refinement to the storied arena of the law journal. The author can be reached at tmulvaney@law.txwes.edu.

1. In 2008 no fewer than 1,200 law journal articles published in the United States referenced either "global warming" or "climate change," as compared to just 216 such articles only one decade earlier. *Compare* LexisNexis search by author (Jan. 9, 2010) (Database = "U.S. Law Reviews and Journals, Combined;" Search Query = "global warming" or "climate change;" & date(geq (1/1/08) and leq (12/31/08)), *with* LexisNexis search by author (Jan. 9, 2010) (Database = "U.S. Law Reviews and Journals, Combined;" Search Query = "global warming" or "climate change;" & date(geq (1/1/98) and leq (12/31/98)).

2. For prominent 2008 articles on this subject matter, see, e.g., Elizabeth Burleson, *A Climate of Extremes: Transboundary Conflict Resolution*, 32 VT. L. REV. 477, 477 (2008)

Nonetheless, anecdotal evidence suggests a subtle irony in the

(considering how climate change must become a national security priority); William C.G. Burns, *A Voice for the Fish? Climate Change Litigation and Potential Causes of Action for Impacts under the United Nations Fish Stocks Agreement*, 48 SANTA CLARA L. REV. 605, 607–08 (2008) (evaluating potential for the United Nation's Fish Stocks Agreement to address the threat of climate change); Robin Kundis Craig, *Climate Change, Regulatory Fragmentation, and Water Triage*, 79 U. COLO. L. REV. 825, 825 (2008) (arguing that fragmented regulation of freshwater resources negatively impacts downstream marine ecosystems); Brian H. Curd, *Challenges of Adapting to a Changing Climate*, 26 UCLA J. ENVTL. L. & POL'Y 77, 77–79 (2008) (describing methods of adapting to climate change, using changes in water resources as a case study); Robert DeLay, *Our Post-Kyoto Treaty Climate Change Framework: Open Market Carbon-Ranching as Smart Development*, 17 PENN ST. ENVTL. L. REV. 55, 55–56 (2008) (discussing carbon-ranching, a process by which carbon emissions are "wrangled" out of the air and into the ground to foster soil and plant growth, as a means of mitigating climate change in tropical regions); Ahmed Djoghlaf, *Climate Change and Biodiversity in Polar Regions*, 8 SUSTAINABLE DEV. L. & POL'Y 14, 14–15 (2008) (discussing the role of the Convention of Biodiversity in polar regions); Holly Doremus & Michael Hanemann, *The Challenges of Dynamic Water Management in the American West*, 26 UCLA J. ENVTL. L. & POL'Y 55, 56–57 (2008) (contending adaption to a changing climate will be difficult for the western portion of the United States due to infrastructure and institutional constraints); Jacqueline P. Hand, *Global Climate Change: A Serious Threat to Native American Lands and Culture*, 38 ENVTL. L. REP. 10329, 10337 (2008) (describing how Native American population in Arctic Region will face more immediate threat than general population and suggesting policy makers rely upon tribal knowledge in formulating adaptation policy); Kelley M. Jancaitis, *Florida on the Coast of Climate Change: Responding to Rising Seas*, 31 ENVIRONS: ENVTL. L. & POL'Y J. 157, 161–63 (2008) (noting that Florida serves as a "canary in the coal mine" for measures necessary to prevent, mitigate, and adapt to changing sea levels); Alice Kaswan, *Environmental Justice and Domestic Climate Change Policy*, 38 ENVTL. L. REP. 10287, 10288 (2008) (asserting environmental justice concerns can be incorporated into any cap-and-trade programs without upsetting efficiency); John Kostyack & Dan Rohlf, *Conserving Endangered Species in an Era of Global Warming*, 38 ENVTL. L. REP. 10203, 10203 (2008) (proposing necessary changes to Endangered Species Act to continue to protect biodiversity in a changing climate); Evan Mills, *The Role of U.S. Insurance Regulators in Responding to Climate Change*, 26 UCLA J. ENVTL. L. & POL'Y 129, 129–30 (2008) (offering recommendations on how the National Association of Insurance Commissioners can take a leadership role in the insurance industry's treatment of climate change); James L. Olmsted, *The Global Warming Crisis: An Analytical Framework to Regional Responses*, 23 J. ENVTL. L. & LITIG. 125, 129 (2008) (surveying regional responses to global warming, with a focus on Oregon); David Owen, *Climate Change and Environmental Assessment Law*, 33 COLUM. J. ENVTL. L. 57, 63 (2008) (suggesting California Environmental Quality Act could serve as a model for local agencies to address the impacts of global warming); Christina Ross, et al., *Limiting Liability in the Greenhouse: Insurance Risk-Management Strategies in the Context of Global Climate Change*, 43 STAN. J. INT'L L. 251, 252–54 (2007) (assessing third party claims for property damage after natural disasters linked to climate change and indentifying risk-management strategies to mitigate exposure); J.B. Ruhl, *Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future*, 88 B.U. L. REV. 1, 2 (2008) (discussing unpredictable effect of climate change on ecological systems and impact of the U.S. Fish and Wildlife Service's administration of the Endangered Species Act); Romulo Silveira da Rocha Sampaio, *Seeing the Forest for the Treaties: The Evolving Debates on Forest and Forestry Activities Under the Clean Development Mechanism Ten Years After the Kyoto Protocol*, 31 FORDHAM INT'L L.J. 634, 634–36 (2008) (evaluating the progress and challenges specific to forest and forestry activities since the creation of the Kyoto Protocol's Clean Development Mechanism).

legal academy's ambitious and innovative responses to urgent modern environmental challenges: notwithstanding the intentions behind the trends, the academy has been unable to shake the foundations of its significant environmental footprint resulting from paper usage in the submission, production, and publication phases of the current law journal process. To contextualize the gravity of the charge, this essay offers the results from a survey, taken of the 179 primary U.S. academic law journals, which was intended to explore whether these practices of paper consumption would prove to be systematically revealing or simply an aberration.

The survey results discussed in Part I below reveal substantial paper consumption excesses in the existing law journal system. Though only thirty-three primary law journals responded to the survey, making extrapolation across the general population of all law journals difficult, the aggregate data is illuminating nonetheless. Based upon a very conservative evaluation of the data set, the respondent journals reported printing nearly seventeen million pages of paper in the one-year term of the 2008–2009 editorial boards. Isolated practices proved particularly disconcerting. For instance, one journal reported printing a full, single-sided copy of each of the more than two thousand electronically submitted manuscripts for which authors sought publication offers. Another law journal printed or copied the pages of so many sources cited in published pieces that the stack of source pages measured upwards of three feet *for each published article*.

Part II analyzes the environmental impact of this reported paper consumption, taking into account the post-consumer recycled content of each journal and publisher's chosen paper.

Part III suggests that these paper consumption practices can be viewed as representative of a small, but not insignificant, accessible opportunity for environmental reform. Seizing these types of opportunities could trigger a fundamental paradigm shift toward a more comprehensive, systemic approach to the larger, ongoing substantive debates surrounding environmental sustainability. Such a shift may be useful not only within the law school model but far beyond, to fields such as developmental land use policies, fisheries management, and global energy markets.

I. PAPER USAGE PRACTICES OF THE LAW JOURNALS

Anecdotal evidence of considerable paper usage prompted this research project. For example, in the production stage alone, a journal specializing in environmental law printed more than ten thousand pages on paper containing no recycled content in triple-space on a single-side for an article that ultimately spans just over sixty pages in the final bound edition. The author surveyed the primary law journals in an effort to assess how broadly such uninhibited paper consumption occurs.

A. *The Survey*

Developed with the assistance of Simona Lup Tick, Assistant Professor of Economics at the University of Mississippi, the survey reproduced in Appendix A sought to approximate the paper usage practices of the primary law journals in the United States for the term of the 2008–2009 journal editorial boards (hereinafter "Relevant Term"). The survey, processed through a greenhorn, password-protected survey collection website generically referred to as "Survey Monkey," consisted of thirty-five yes-or-no, multiple choice, and short-answer questions. The author distributed the surveys to 179 primary law journals[3] via e-mail in May of 2009.[4]

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3. Finding the appropriate e-mail addresses to which to send the survey proved a difficult process. While the addresses to which prospective authors should submit manuscripts are readily available, the author sought to avoid those addresses so as not to interfere with, or get lost in the shuffle of, the likely considerable volume entering those mailboxes on a daily basis. Instead, the author sought to find a general inquiry email address or contact the business manager or outgoing Editor-in-Chief directly. However, in many instances, the submission address proved the only available one.

4. The email consisted, in relevant part, of a message either identical or similar to the following:

> Hello journal editors and business managers. . . . I have prepared a one-page survey as part of an ongoing personal research project on paper usage, and the research cannot continue without participation by journals like your own. I kindly ask for five minutes of your time to complete the survey at the Survey Monkey link below. The data gathered herein will be utilized only for academic research purposes, and I assure you that I shall hold as privileged and confidential any information that might identify a respondent journal or individual. To access the survey, click here: http://www.surveymonkey.com/s.aspx?sm=qZQSFgNXnPzzllxBcPTdWg_3d_3d.
>
> Thank you for your candid responses. I welcome any and all comments about the survey.

As noted above, thirty-three primary journals responded to the survey.[5] The respondents represented a welcome split among the four law school tiers, as delineated by *U.S. News & World Report*.[6] While the practices of the respondents are not necessarily reflective of the primary law journal population as a whole, the survey results are instructive nevertheless.

B. *The Results*

The data summarized below is divided into three phases: Submission, Production, and Publication.[7] All journals did not respond to all questions in the survey.[8] Therefore, in certain instances, the author advises the reader of the sample size for the relevant corresponding questions, in addition to providing any other clarifying information about the collection and synthesis of

5. Two weeks after distribution of the survey, the author telephoned all non-respondents, including those with undeliverable email addresses. The journal members and staff personnel with whom the author spoke proved extremely professional, helpful, and generally interested in the topic of this research project, and many soon thereafter completed the survey. In a second round of calls, the author left voice messages where possible. For several reasons, such as primary and specialty journals' utilization of the same voicemail, six specialty journals also completed the survey. While the author appreciates their participation, they are excluded from the data set discussed herein for consistency's sake.

6. Of the respondent journals, nine represented first-tier law schools (top 50), eleven second-tier (51–100), five third-tier, and eight fourth-tier, in accord with the *U.S. News & World Report*'s 2009 Law School Rankings, *available at* http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-law-schools/rankings/ (last visited Feb. 25, 2010). If those journals that did not respond did so because they did not receive or open the e-mail, questioned the authenticity of the project, or feared the author's breaching the confidentiality promise, the author hopes the composition of this essay will encourage them to participate. While the data reported herein reflects that accumulated by July 17, 2009, a new survey for the editorial boards for the 2010–2011 term is available at http://lawreview.richmond.edu/, and journals are encouraged to fill out the survey at their convenience. The survey collection data indicates that the majority of journals took between seven and eight minutes to complete the survey.

7. As referenced above, the data reflects paper usage for the term of the 2008–2009 law journal editorial boards. For the five journals that only could provide information for the spring of 2009, the author doubled all quantitative responses.

8. Further, while the author considers this possibility unlikely in this particular instance, many social scientists have acknowledged that the submitted responses to surveys of this sort may be subject to subconscious or even deliberate misrepresentation. Such misrepresentation could arise where respondents are inclined to put their entity's practices in a more favorable light than reality suggests. *See, e.g.*, Morris H. Hansen & Joseph Waksberg, *Research on Non-sampling Errors in Censuses and Surveys*, 38 REV. INT'L STATISTICAL INST. 317, 319 (1970).

the data set. For a more comprehensive view of the data set, see Appendices B through H.[9]

1. The Submission Phase

Twenty-seven journals denoted the number of articles[10] submitted by authors seeking publication. These journals reported receiving a total of 20,290 article submissions in the Relevant Term.[11] Seventeen of the journals reported printing at least some submissions—articles, as well as notes and comments—in the course of selecting pieces for which they would make publication offers. In sum, the responding journals reported printing an aggregate of 356,624 pages of paper during the Submission Phase of the Relevant Term.[12]

2. The Production Phase

The data in this section is divided into two sub-phases: editing and source-checking. Thirty-two journals reported publishing an aggregate of 795 articles and 294 notes/comments in the Relevant Term.[13] Based upon the journals' responses estimating the average number of times they printed each published article, note, and comment in the editing sub-phase and the average length of

9. As the author has agreed to keep the identities of the respondent journals confidential, the journal names have been replaced with letter codes in the Appendices.

10. Hereinafter, "article" refers to those law journal pieces submitted for publication that are not authored by students.

11. Two journals apparently misinterpreted the question by responding with the number of published articles. As it is difficult to fathom that two primary law journals, one at a school in the second tier and one in the third, made publication offers on every submitted article and all of those offers were accepted, the author did not consider those two responses in computing the average number of submissions. Four other journals did not respond to the question regarding number of submissions. At least one journal indicated it considered this information proprietary.

12. For a comprehensive view of the Submission Phase data, see Appendices C and D.

13. One first-tier law journal did not provide any responses with respect to the Production Phase. Therefore, the figures in this section reflect a sample size of thirty-two.

these pieces,[14] the total printed pages of articles, notes, and comments during the editing sub-phase amounted to 166,883 pages.

With respect to source-checking, the survey asked the journals if they printed sources from each published article, and if so, how high the stack of paper would be per article if those sources were neatly stacked on top of one another.[15] Twenty-seven of these journals provided a numerical response estimating the height of the stack per article.[16] The aggregate stack equates to approximately 1,730,375 pages printed by the respondent journals during the source-checking phase of the Relevant Term.

Adding the printing sums from the editing (166,883 pages) and source-checking (1,730,375) sub-phases, the Production Phase resulted in the printing of approximately 1,897,258 pages of paper in the one-year Relevant Term.[17]

3. The Publication Phase

Twenty-seven journals reported on the number of each issue printed for distribution or other purposes. Based on these responses, the aggregate total of pages printed in the whole-issue distribution portion of the Publication Phase during the Relevant Term amounted to 13,773,956 for reporting journals. Twenty journals also reported on reprint requests.[18] Multiplying the

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14. Several of the thirty-two journals did not estimate the average length of their published articles, notes, and comments. The average length according to the estimates of the other twenty-six journals is forty-five pages for articles and thirty pages for notes and comments, so the author utilized those averages to compute the total pages printed during the editing sub-phase for the journals that did not provide an estimated page length. As some journals responded in number of words, rather than number of pages, when estimating the average length of published pieces, the author converted those responses to page lengths by estimating 500 words per page. For example, the author estimated that a 30,000 word article is 60 pages in print.

15. A one inch stack of standard copy paper is the equivalent of approximately 250 pages of paper.

16. The survey did not inquire about printing during the source-checking sub-phase for published notes and comments. It also did not inquire about double-sided printing in the source-checking sub-phase.

17. For a comprehensive view of the Production Phase data, see Appendix E.

18. Admittedly, the question would have benefitted from clarification, as it did not specify whether "re-prints" referred to full volume copies or individual article copies. In drafting the survey, the author intended to encompass only those individual article copies often requested by authors, and the estimates herein reflect this understanding. One journal reported that a single author ordered 1,000 re-prints of an article. The survey did not compile re-print request information on student notes and comments.

number of reprint requests per piece by the number and length of the articles in each of these journals, the responses indicate that reprint requests resulted in the printing of 615,210 pages of paper during the Publication Phase of the Relevant Term.

The issue distribution printing plus the re-print request printing results in a total paper consumption of 14,389,166 pages for the respondent journals during the Publication Phase of the Relevant Term.[19]

4. Aggregate for the Submission, Production and Publication Phases

To summarize, the respondent journals reported printing 356,624 pages of paper during the Submission Phase, 1,897,258 pages of paper during the Production Phase, and 14,389,166 pages during the Publication Phase of the Relevant Term. In the aggregate, this amounts to 16,643,048 pages of paper printed by the thirty-three respondent primary law journals in the one-year Relevant Term. This figure does not account for the other approximately 146 primary law journals and the 742 specialty law journals in existence,[20] nor does it reflect the paper consumption of any law journals for any years beyond the one-year Relevant Term.[21]

II. ENVIRONMENTAL IMPACTS OF PAPER CONSUMPTION IN THE LAW JOURNAL SYSTEM

Technological advancements in the printing and publishing industries, most notably the development of the high-speed rotary press and improved paper-making processes, drastically reduced printing costs before the dawn of the twentieth century. Today, these advancements, which made it financially feasible to create the inaugural legal periodicals 150 years ago and the countless

19. For a comprehensive view of the Publication Phase data, see Appendix F.

20. For a listing of these journals, see Washington and Lee University School of Law, Law Journals: Submissions and Ranking, http://lawlib.wlu.edu/LJ/index.aspx (last visited Feb. 25, 2010).

21. For a summary of the data for all three phases, see Appendix B. The survey also asked the journals if paper usage, article submissions, and issue length had increased, decreased, or remained flat in the past one year, five years, and ten years. The responses to those questions are evident in Appendix G.

journals that followed,[22] have come full circle, as modern science teaches of the destructive environmental effects of paper usage in the current legal periodical model.

That paper is "recyclable" means little—all paper is recyclable in that at the end of its (first) useful life, the paper will biodegrade or can be recycled. Thus, a "recyclable" label and nothing more generally indicates that paper is virgin stock, meaning that it had no previous commercial use. For that fiber, someone or something cut down a tree.

"Recycled" paper likewise has not necessarily been used before, though it is composed of bits and pieces previously considered waste byproducts of the paper industry. For example, if a paper mill previously cut two inches off the end of a paper roll and discarded it, its use of that scrap to construct additional paper categorizes that paper as "recycled."

Recycled paper with *post-consumer* recycled content is different. Post-consumer fibers are retrieved from paper products that were previously used by consumers and would otherwise have been disposed of at a landfill or in an incinerator.[23] The survey here asked the law journals to specify the percentage of post-consumer recycled content in the paper that they utilize in the Submission and Production Phases and in the paper that their publishers utilize in the Publication Phase.

Only twenty-one of the thirty-three respondent journals answered the survey question regarding the post-consumer recycled content in paper utilized directly by the journal. Two journals reported using paper with no recycled content, eleven reported 1–30% post-consumer recycled content, three reported 31–70% post-consumer recycled content, two reported 71–99% post-consumer recycled content, and three reported 100% post-consumer recycled content.[24]

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22. *See* HELLMUT LEHMANN-HAUPT, THE BOOK IN AMERICA: A HISTORY OF THE MAKING AND SELLING OF BOOKS IN THE UNITED STATES 162–65 (1951); ALFRED M. LEE, THE DAILY NEWSPAPER IN AMERICA: THE EVOLUTION OF A SOCIAL INSTRUMENT 118–21 (1937).

23. *See* Natural Resources Defense Council, NRDC: A Shopper's Guide to Home Tissue Products, http://www.nrdc.org/land/forests/gtissue.asp (last visited Feb. 25, 2010).

24. The author estimated the environmental impacts utilizing the midpoint of the post-consumer recycled content answer choices. For example, the author utilized a mid-

Here, Part II examines the data discussed in Part I to account for these various paper types in assessing the environmental impact of each sector's paper usage practices.[25]

The environmental impact equivalencies are based upon the Environmental Defense Fund's Paper Calculator ("Paper Calculator").[26] A "Paper Task Force" conducted a comprehensive, peer-reviewed study of the lifecycle environmental impacts of paper production and disposal in developing the Paper Calculator.[27] The Paper Calculator assesses environmental impacts of paper choices and practices in the following categories: Wood Use, Net Energy, Greenhouse Gases, Wastewater, and Solid Waste.[28]

Wood Use measures the amount of wood required to produce a given amount of paper.[29] Net Energy takes the total amount of energy required to make the paper over its life cycle, and sub-

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point of 85% for those respondents in the 71–99% category. As copy paper is the largest category in the uncoated commodity printing paper grade and many governments use it for all of their laser printing, fax, and copier needs, this analysis presumes that all paper utilized herein is 8-1/2" x 11" laser bond copy paper. *See* International Paper, Knowledge Center, http://glossary.ippaper.com/default.asp?req=knowledge/article/235 (last visited Feb. 25, 2010) (including laser bond copy paper as a common office and consumer choice). The analysis also presumes the copy paper has a basis weight of twenty pounds, which is the most frequently used copier paper. *See* The Office Guide, Copy Paper—Printer Paper, http://www.theofficeguide.com/copy-paper/ (last visited Feb. 25, 2010). Many law journals are published on much heavier types of paper, contributing to the likelihood that the data reported herein underestimates the environmental impact of the law journal process to a considerable degree.

25. Though only 41% of the twenty journals that answered the questions regarding the journal's paper type reported using paper of 31% post-consumer content or greater in the Submission and Production Phases, the author made the conservative assumption that the thirteen non-respondents utilized paper of 31%–70% post-consumer recycled content in calculating the environmental impacts of the reported paper consumption practices. Though only 25% of respondents that answered the questions regarding their publisher's paper type reported that their publishers used paper of 31% post-consumer content or greater in the Publication Phase, the author made the conservative assumption that the publishers of the non-respondents utilized paper of 31%–70% post-consumer recycled content in calculating the environmental impacts of the given paper consumption practices.

26. *See* Environmental Defense Fund, Paper Calculator 2.0, http://www.edf.org/papercalculator/ (last visited Feb. 25, 2010). The Paper Calculator calculates impacts based on pounds, not sheets, of paper. A ream of paper (500 sheets) weighs five pounds, such that one hundred sheets equals one pound. *See* Neenah Paper, Paper Metric Calculator, http://www.neenahpaper.com/PaperCalculator/index.asp?ft=Home (last visited Feb. 25, 2010).

27. *See* Environmental Defense Fund, Paper Calculator 2.0, *supra* note 26.

28. *Id.*

29. *Id.* The Wood Use figures assume a mix of hardwoods and softwoods six to eight inches in diameter and forty feet tall. *Id.* (citing data from Tom Soder, Pulp & Paper Technology Program, University of Maine, as reported in CLAUDIA G. THOMPSON, RECYCLED PAPERS: THE ESSENTIAL GUIDE 64 (1992)).

tracts an "energy credit" for energy that is created by burning paper (i.e., the methane that decomposing paper creates).[30] Greenhouse Gases are measured in carbon dioxide equivalents.[31] Wastewater measures "the amount of process water that is treated and discharged to a paper mill's receiving waters."[32] Solid Waste includes "sludge and other wastes generated during pulp and paper manufacturing, and used paper disposed of in landfills and incinerators."[33]

According to the Paper Calculator, the paper practices of the respondent journals in the one-year Relevant Term are the aggregate equivalent of destroying 1136 trees, utilizing enough energy to power twenty-four homes for one year, releasing the annual greenhouse gas emissions of thirty-six cars, using the amount of water that could fill more than two Olympic-size swimming pools, and producing enough solid waste to fill nearly five dump trucks. As noted above in Part I, the environmental impacts discussed herein reflect only those paper usage practices of the respondent journals in the 2008–2009 term. These impacts do not account for the other approximately 146 primary law journals and the 742 specialty law journals in existence,[34] nor does it reflect the paper consumption of any law journals for any years prior to the 2008–2009 term.

III. HOW LONG TO SUSTAINABILITY?

The concept of sustainability exposes as myth the notion that protection of environmental resources must give way to economic

30. *See* Environmental Defense Fund, Paper Calculator 2.0, *supra* note 26.

31. *Id.* ("CO_2 from burning fossil fuels and methane from paper decomposing in landfills . . . contribute[s] to climate change by trapping energy from the sun in the earth's atmosphere.").

32. *Id.*

33. *Id.* One scholar recently noted that paper products make up the largest component of municipal solid wastes. *See* Ruth Anne Robbins, *Conserving the Canvas: Reducing the Environmental Footprint of Legal Briefs by Re-Imagining Court Rules and Document Design*, 7 J. ASS'N LEGAL WRITING DIRECTORS (forthcoming 2010) (manuscript at 3) (citing OFFICE OF SOLID WASTE, U.S. ENVTL. PROT. AGENCY, EPA530-R-08-010, MUNICIPAL SOLID WASTE IN THE UNITED STATES: 2007 FACTS AND FIGURES 5–6 (2008), *available at* http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw07-rpt.pdf).

34. *See* Washington and Lee University School of Law, Law Journals: Submissions and Ranking, *supra* note 20.

progress and overall public health and security.[35] Indeed, the United Nations Conference on Environment and Development has defined sustainability as a "socially responsible economic" approach that protects "the resource base and the environment for the benefit of future generations."[36] Studies now indicate cost savings can be realized through behavioral change programs,[37] as well as through scores of cost effective development and purchasing changes.[38]

The pertinent question is how to make this rather unremarkable concept of sustainability operational. These days, one can examine (sometimes electronically, other times in hard-copy self-studies and independent reports) a host of examples of incorporating sustainability into governmental agencies, corporations, and education, from planning[39] to green building.[40] However, such

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35. *See generally* Keith H. Hirokawa, *A Challenge to Sustainable Governments?*, 87 WASH. U. L. REV. 203 (2009).

36. Conference on Environment and Development, Rio De Janeiro, Brazil, June 3–14, 1992, *Agenda 21*, ¶ 8.7, U.N. DOC. A/ CONF.151/26 (Aug. 12, 1992), *available at* http://www.un.org/esa/dsd/agenda21/res_agenda21_08.shtml; *see also* U.S. Envtl. Prot. Agency, Basic Information—Sustainability, http://www.epa.gov/Sustainability/basicinfo.htm#sustainability (last visited Feb. 25, 2010).

37. *Id.* Some scholars have suggested that a new legal approach focused on activating personal ethics can encourage the necessary support for modifying the more entrenched behaviors necessary to tackle the larger pressing environmental challenges linked to a changing climate. *See, e.g.*, Hope M. Babcock, *Assuming Personal Responsibility for Improving the Environment: Moving Toward a New Environmental Norm*, 33 HARV. ENVTL. L. REV. 117, 134–36 (2009); Michael P. Vandenbergh, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 VAND. L. REV. 515, 596 (2004); Michael P. Vandenbergh & Anne C. Steinemann, *The Carbon-Neutral Individual*, 82 N.Y.U. L. REV. 1673, 1696–1703, 1707–09 (2007). Polls indicate that individual mindsets most certainly reflect a collection of tacit norms, or ethics, about the role that natural resources should play in the achievement of societal goals. *See* Hope M. Babcock, *Global Climate Change: A Civic Republican Moment for Achieving Broader Changes in Environmental Behavior*, 26 PACE ENVTL. L. REV. 1, 2 (2009). *But see* Jon Gertner, *Why Isn't the Brain Green?*, N.Y. TIMES MAG., Apr. 19, 2009, at 36 (citing Pew Research Center poll where respondents listed climate change last among twenty priorities for the United States in 2009). An approach tying the abstract norm of environmentalism with a concrete norm (i.e., a more specific, supportive norm) such as saving trees, and a specific action, such as reducing paper usage, conceivably could lead to valuable behavioral modifications.

38. *See* Leith Sharp, *Higher Education: The Quest for the Sustainable Campus*, 5 SUSTAINABILITY: SCI., PRAC., & POL'Y 1, 2 (2009), http://ejournal.nbii.org/archives/vol5iss1/editorial.sharp.pdf.

39. *See, e.g.*, John C. Dernbach, *The Essential and Growing Role of Legal Education in Achieving Sustainability*, Widener Law School Legal Studies Research Paper Series no. 09-20 (2009), *available at* http://papers.ssrn.com/5013/papers.cfm?abstract_id=1471344.

40. *See, e.g.*, Keith H. Hirokawa, *At Home with Nature: Early Reflections on Green Building Laws and the Transformation of the Built Environment*, 39 ENVTL. L. 507, 508–09 (2009) ("Green building represents the notion that by consciously employing less waste-

efforts do not yet reflect a methodical perspective that confronts the way institutions are compartmentalized.[41] Some scholars have suggested that only such a "systems-thinking" approach will lead to the deep transformation that preservation of environmental resources demands.[42]

As evident from the survey data analyzed herein, there is room for considerable mitigation of the environmental impacts resulting from the creation and assembly of published legal academic literature.[43] In addition to the long-term environmental benefits for the planet, reducing paper usage might even bear immediate monetary advantages in the form of reduced paper, shipping and energy costs without substantial upfront expenditures.[44] In a "systems-thinking" sense, reforming the law journal structure into a sustainable enterprise, in isolation, could be considered a piecemeal success. On the other hand, these paper consumption practices also can be viewed as representative of but one example

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ful construction methods, designing more efficient building systems, and using more friendly (earth-friendly and human-healthy) materials, the built environment can remove the excesses that characterize our carbon and (more generally) ecological footprint.").

41. *See* Sharp, *supra* note 38, at 6–7.

42. *See* Dernbach, *supra* note 39, at 5 ("While law schools have begun to address sustainable development, they have not done so in any organized or systematic way."); Sharp, *supra* note 38, at 2.

43. There is some positive news in the data set. For example, 88% of respondent journals reported some use of electronic editing programs. Further, three journals retain only electronic versions of sources cited in the published articles. Moreover, approximately one-third of respondents indicated that paper usage at their respective journals has decreased in the past year.

44. *See* THOMAS L. FRIEDMAN, HOT, FLAT, AND CROWDED: WHY WE NEED A GREEN REVOLUTION, AND HOW IT CAN RENEW AMERICA 194 (2008) ("Conservation is not the opposite of consumption." (quoting Glenn Prickett, Conservation International)). Mr. Friedman acknowledges the need for consumption to grow economies, but suggests it should be done in a way that identifies the areas to preserve and developing around them while also eliminating those wasteful practices that evolved not out of necessity or design but habit. *Id.* at 194–95. One Managing Editor suggested in a personal conversation that eliminating paper subscriptions would eliminate a large source of the journal's revenues. However, it likely also would eliminate a large source of the journal's expenditures. One law librarian reported that the thousands of print-formatted journal issues in his law library garner so little usage that those areas never need to be re-shelved. Still, some experiments have shown humans display a frequent dislike for delayed benefits, and thus undervalue promised future outcomes. *See* Gertner, *supra* note 37 ("Given a choice, we usually take $10 now as opposed to, say, $20 two years from now. Environmentally speaking, this means we are far less likely to make lifestyle changes in order to ensure a safer future climate.").

of a "low-hanging fruit"[45] within which reforms could trigger the

45. Professor Michael Vandenbergh cites to the principal types of environmental behaviors within individual control, as identified by social psychologists: consumer, direct, and civic. *See* Vandenbergh & Steinemann, *supra* note 37, at 1696–97. These correspond to, for example, purchasing paper that is of post-consumer recycled content (consumer), changing printing and copying habits (direct), and joining a forest preservation group or voting for a candidate with a strong environmental record (civic). Of course, certain behaviors are more resistant to change than others, especially where there are individual economic, psychic and/or informational barriers. *Id.* at 1697–1701. Professor Vandenbergh classifies changes largely unimpeded by these barriers, which thereby require little effort or sacrifice to enact, as "low-hanging fruits." *Id.* at 1698. *See also* Michael P. Vandenbergh et al., *Individual Carbon Emissions: The Low-Hanging Fruit*, 55 UCLA L. REV. 1701 (2008). Vandenbergh has identified maintaining tire pressure and switching to fluorescent light bulbs as examples of low-hanging fruits. He contends that these behaviors account for at least 1% of the aggregate emissions from individual behavior, whereby changing either one could generate a cumulative reduction of more than forty billion pounds of carbon dioxide. *See* Vandenbergh & Steinemann, *supra* note 37, at 1700. One way to activate the environmental responsibility ethic is through implementation of integrated informational efforts targeted at these "low-hanging fruits." *See generally* RICHARD THALER & CASS SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH AND HAPPINESS 8, 26 (Penguin Books 2009) (discussing the concept of "nudging" people by imparting science-based messages that appeal to cognitive biases). Several studies have linked information on environmental consequences with responsive action, even where the consequences result only from the aggregate of individual doings. *See* Henk Staats et al., *Effecting Durable Change: A Team Approach to Improve Environmental Behavior in the Household*, 36 ENV'T & BEHAV. 341 (2004) (describing environmental information campaign that generated a 7% reduction in water use and a 32% reduction in solid waste generation); *see also* Vandenbergh et al., *supra*, at 1722–23 (noting success of general public information campaigns but suggesting more targeted approaches will reap even more benefits); Vandenbergh & Steinemann, *supra* note 37, at 1709–10 (citing several empirical studies suggesting norm activation affects perception of moral obligations to mitigate environmental harms); Linda Steg et al., *Factors Influencing the Acceptability of Energy Policies: A Test of VBN Theory*, 25 J. ENVTL. PSYCHOL. 415, 423 (2005) (examining environmental norms and beliefs). *But see* Adam Douglas Henry, *Public Perceptions of Global Warming*, 7 HUM. ECOLOGY REV. 25, 29 (2000), *available at* http://www.humanecologyreview.org/pastissues/her71/71henry.pdf (noting difficulties in relaying complex environmental information to the public in an understandable way); Daniel W. Shuman, *The Psychology of Deterrence in Tort Law*, 42 U. KAN. L. REV. 115, 163 (1993) (asserting that accurately educating the public on risks of personal behavior is impossible). Where such information not only makes the target aware of the consequences of continued traditional action but encourages the assumption of personal responsibility to prevent those consequences, activation of the environmental responsibility ethic is most likely. *See* Vandenbergh et al., *supra*, at 1707. This is particularly relevant where social pressures instigate behavioral change by altering perceptions about the likelihood of others adopting actions in accord with that norm, in what some legal scholars have referred to as "norm cascades." *See, e.g.*, *id.* at 1708; Babcock, *Assuming Personal Responsibility*, *supra* note 37; Ellen Lutz & Kathryn Sikkink, *The Justice Cascade: The Evolution and Impact of Foreign Human Rights Trials in Latin America*, 2 CHI. J. INT'L L. 1 (2001); Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903 (1996). For a contemporary example, the Florida anti-smoking information campaign called "Truth" reported significant reductions in the percentage of middle school and high school smokers. *See* Social Marketing Institute, Success Stories, Florida "Truth" Campaign, http://www.social-marketing.org/success/cs-floridatruth.html (last visited Feb. 25, 2010); *see also* Lisa K. Goldman & Stanton A. Glantz, *Evaluation of Antismoking Advertising Campaigns*, 279 J. AM. MED. ASS'N 772 (1998) (discussing national "Truth" informational campaign); Vandenbergh et al., *supra*, at 1722–23 (citing Matthew C. Farrelly et al.,

necessary fundamental paradigm shift towards a more comprehensive, universal approach.

In the narrow scholarly publication context, even rather small changes might require stepping outside a comfort zone of normality and routine. Still, this essay submits that a failure in the legal academy to recognize the environmental harms generated by paper consumption practices in the current law journal model will reflect all too accurately on the celebrated environmental proposals printed in them. However, addressing the non-green journal dilemma is possible, and probably can be done rather quickly through a variety of paper recycling, reduction, and elimination measures.[46] Of course, such efforts must take account of the inadvertent environmental and consumptive impacts through the energy required to power the computers, monitors, printers, copiers, and facsimile machines necessary to take such actions. While there may be some initial exertion in the process of adaptation, it is increasingly evident that today's journal staffs matured in a digitally-focused age, and as a result, the transition could be relatively seamless.[47] Notably, any objection based on the scale of this transition is outweighed by the fact that the system is entirely self-perpetuating: editorial boards are replaced annually by the rising law school class, who will require training under either a paper-intensive or reduced-paper model.[48]

But the point, of course, is not to detail the individual practical measures available for a particular journal to reduce its environmental footprint.[49] Rather, this essay seeks to introduce an existing irony in the legal scholarship process as a small exemplar of opportunities for progress in the myriad national and interna-

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Evidence of a Dose-Response Relationship Between "Truth" Antismoking Ads and Youth Smoking Prevalence, 95 AM. J. PUB. HEALTH 425, 425, 428–30 (Mar. 2005)).

46. *See, e.g.*, American Bar Association Section of Environment, Energy, and Resources, The ABA-EPA Law Office Climate Challenge, http://www.abanet.org/environ/climatechallenge/overview.shtml (last visited Feb. 25, 2010).

47. One articles editor reported reviewing article drafts on his iPhone, though only to print them out later.

48. One journal suggested that longstanding administrative staff persons may not be as amenable, from a psychic perspective, to systematic changes.

49. Other scholars have taken on this task in different contexts. *See, e.g.*, Robbins, *supra* note 33, at 2 (suggesting methods for reducing the environmental footprint in the production of legal briefs, including double-pages (i.e., printing two pages per side), condensing line spacing, and adopting court rules that impose word counts).

tional environmental debates, from emerging models for renewable energy to sustainable development strategies.

Conversion to sustainable paper usage practices in the legal academic writing process just might help serve, in a theoretical sense, as a precursor to addressing the larger energy and environmental challenges of the day. This individual and institutional reform could take an incremental step towards a more systemic model of sustainability. "There are no passengers on Spaceship Earth. We are all crew."[50]

50. *See* DANIEL A. VALLERO, PARADIGMS LOST: LEARNING FROM ENVIRONMENTAL MISTAKE, MISHAPS, AND MISDEEDS 367 (2006) (quoting Canadian communications expert and philosopher Marshall McLuhan).

Appendix A: The Survey

This survey seeks to identify the amount of paper utilized in your journal's submission review, production, and publication processes for the one-year term beginning with the election/selection of your journal's editorial board in the Spring of 2008. There is space at the bottom of the survey for you to explain any responses, if necessary. The data herein will be utilized only for academic research purposes by Timothy M. Mulvaney, Visiting Associate Professor of Law, Texas Wesleyan University School of Law. Professor Mulvaney shall hold as PRIVILEGED AND CONFIDENTIAL all information that might identify a respondent. Thank you for your candid responses.

1. What is the full name of your journal? (Again, this information is confidential and will not be publicly distributed in any form that might identify a respondent. Rather, it is necessary to account broadly for important variables such as geographic locale, age and type of journal, etc.)

   _____
   _____

2. If you are unable to provide answers to this survey for the entire term of the editorial board elected/selected in the Spring of 2008, please identify the time frame for which you are answering the questions below (e.g., term of the editorial board elected/selected in the Spring of 2007, only Spring 2008 through December 2008, etc.).

   _____
   _____

3. How many submissions (electronic or otherwise) did your journal receive from authors seeking publication in the relevant term? In your response, do not include the submissions of student Notes/Comments.

   _____
   _____

4. What is the average page length of these submissions referenced in your response to Question No. 3?

   _____
   _____

5. For the submissions referenced in your response to Question No. 3, how many times did your journal print or copy a submission IN FULL during the submission review process? (If your AE and your EIC both reviewed separate printed or copied versions of the same submission, please count that as two prints/copies for purposes of answering this question. Though printing/copying habits may vary by AE, please still give your best estimate. If your journal printed only parts of some submissions, please explain.)

   _____
   _____
   _____

6. If your answer to Question No. 5 is greater than zero, did your journal print/copy those submissions double-sided?
   - ☐ Yes
   - ☐ No
   - ☐ Sometimes (please explain in comment field)

   _____
   _____
   _____
   _____

7. How many student Notes/Comments submissions did your journal receive in the relevant term, whether from students inside or outside your law school?

8. What is the average page length of these Notes/Comments submissions?

9. For the Notes/Comment submissions referenced in your response to Question No. 8, how many times did your journal print or copy each submission during the submission review process? (If you printed only parts of some submissions, please explain.)

10. If your answer to Question No. 10 is greater than zero, did your journal print/copy those submissions double-sided?
    - ☐ Yes
    - ☐ No
    - ☐ Sometimes (please explain in comment field)

11. How many articles did your journal publish in the relevant term?

12. What was the average length of a published article (e.g., 30,000 words)?

13. How many student Notes/Comments did your journal publish in the relevant term?

14. What was the average length of a published student Note/Comment (e.g., 20,000 words)?

15. For all published articles and published student Notes/Comment, approximately how many times per article or Note/Comment did your journal print or copy full drafts during the editing phase (before final printing)? Feel free to explain your response as necessary.

16. If your answer to the previous question is greater than zero, did your journal print/copy these full drafts double-sided?
☐ Yes
☐ No
☐ Sometimes (please explain in comment field)

17. During the editing phase, did your journal print/copy these drafts in single-space, double-space, or triple-space?
☐ single-space
☐ double-space
☐ triple-space
☐ it varies (please explain in comment box below)

18. Did your journal utilize any electronic editing programs (editing via track changes, PDF, etc.)?
☐ yes (feel free to explain in the comment box below)
☐ no

19. Did your journal print/copy portions of any sources cited in the articles?
☐ yes
☐ no

20. If you answered "Yes" to the previous question, and you were to put those printed/copied source pages in a stack, how tall would that stack be for each article, on average (e.g., 3 inches, 6 inches, 1 foot, 3 feet, etc.)?

21. How many issues did your journal produce in the relevant term?

22. What is the average page length of each issue?

23. How many copies of each issue were printed and distributed (including subscription and freely distributed copies)?

24. How many copies of each issue were printed but have not been distributed (e.g., copies retained in law journal storage)?

25. How many re-prints were requested, on average, per article?

26. How many reams of paper did your journal purchase for (and/or utilize in) the relevant term?

27. What type of paper does your journal use?
- ☐ no recycled content
- ☐ 1-30% post-consumer recycled content
- ☐ 31-70% post-consumer recycled content
- ☐ 71-99% post-consumer recycled content
- ☐ 100% post consumer
- ☐ it varies (please explain in the comment box below)

28. What type of paper does the publisher of your journal use?
☐ no recycled content
☐ 1-30% post-consumer recycled content
☐ 31-70% post-consumer recycled content
☐ 71-99% post-consumer recycled content
☐ 100% post consumer
☐ it varies (please explain in the comment box below)

29. In the relevant term, did your journal use more, less, or the same amount of paper than …

	More	Less	About the same	I don't know
…the year before?	☐	☐	☐	☐
…five years before?	☐	☐	☐	☐
…ten years before?	☐	☐	☐	☐

Comment

30. Have submissions increased, decreased, or remained relatively flat in comparison to…

	Increased (add % increase below)	Decreased (add % decrease below)	Remained Flat
…the year before the relevant term?	☐	☐	☐
…five years before?	☐	☐	☐
…ten years before?	☐	☐	☐

% of increase or decrease

31. Did the annual cumulative page-length of your published issues increase, decrease, or remain relatively flat when compared to...

	Increased (add % increase below)	Decreased (add % decrease below)	Remained Flat
...the year before the relevant term?	☐	☐	☐
...five years before?	☐	☐	☐
...ten years before?	☐	☐	☐

% of increase or decrease

_____

32. With respect to paper usage, please identify any significant changes in your journal's submission review, production, publication and distribution processes in the past ten years.

_____

_____

33. If necessary, please explain any responses that you were unable to explain above.

_____

_____

Appendix B: Overall Results

Journal[1]	Tier	Total Article Pages Printed During Submission Phase	Total Note/Comment Pages Printed During Submission Phase	Total Pages Printed During Submission Phase	Total Article Pages Printed During Editing[2]	Total Note/ Comment Pages Printed During Editing[3]	Total Pages Printed in Source Check	Total Pages Printed During Production Phase	Total Pages Printed in Issues[4]	Total Pages Printed from Re-print Requests[4]	Total Pages Printed During Publication Phase	Total Pages Printed Across All Phases
A	1	-	-	[illegible]	14000	3640	-	[illegible]	442500	-	[illegible]	460140
B	1	-	-	[illegible]	20925	1050	3875	[illegible]	300000	69750	[illegible]	395600
C	1	99800	-	[illegible]	-	-	-	[illegible]	2716800	117000	[illegible]	2933600
D	1	-	-	[illegible]	6048	3348	13500	[illegible]	448756	33600	[illegible]	505252
E	1	-	-	[illegible]	-	-	-	[illegible]	-	-	[illegible]	[illegible]
F	1	-	6900	[illegible]	-	-	-	[illegible]	-	-	[illegible]	6900
G	1	25980	23800	[illegible]	10320	1188	-	[illegible]	513000	19500	[illegible]	593788
H	1	-	3412.5[5]	[illegible]	1560	306	30000	[illegible]	877500	19600	[illegible]	932378.5[5]
I	1	812.5[5]	59500	[illegible]	-	-	8000	[illegible]	450000	62500	[illegible]	580812.5[5]
J	2	8250	3600	[illegible]	2500	480	600000	[illegible]	18750	15750	[illegible]	649330
K	2	-	-	[illegible]	-	-	21000	[illegible]	300000	-	[illegible]	321000
L	2	5000	2500	[illegible]	4800	1200	48000	[illegible]	805000	16000	[illegible]	882500
M	2	-	-	[illegible]	3200	2400	96000	[illegible]	30000	18000	[illegible]	149600
N	2	-	-	[illegible]	1440	780	-	[illegible]	536250	-	[illegible]	538470
O	2	-	225	[illegible]	1215	360	54000	[illegible]	798000	1500	[illegible]	855300
P	2	1000	-	[illegible]	3000	3000	20000	[illegible]	-	-	[illegible]	27000
Q	2	5000	-	[illegible]	4250	2250	102000	[illegible]	630000	48000	[illegible]	791500
R	2	-	-	[illegible]	1280	360	192000	[illegible]	232400	4600	[illegible]	430640
S	2	920	-	[illegible]	5520	1200	23000	[illegible]	426000	48000	[illegible]	504640
T	2	-	-	[illegible]	1920	600	24000	[illegible]	412500	30600	[illegible]	469620
U	3	-	-	[illegible]	4590	180	102000	[illegible]	220000	-	[illegible]	326770
V	3	2100	900	[illegible]	4725	225	54000	[illegible]	150000	12000	[illegible]	223950
W	3	-	2960	[illegible]	-	-	27000	[illegible]	384000	37000	[illegible]	450960
X	3	9400	500	[illegible]	4440	600	27750	[illegible]	675000	6500	[illegible]	724190
Y	3	-	4900	[illegible]	5200	1260	19500	[illegible]	406000	16200	[illegible]	453060
Z	4	600	-	[illegible]	1296	48	108000	[illegible]	390000	27000	[illegible]	526944
AA	4	80	-	[illegible]	-	6400	-	[illegible]	379500	-	[illegible]	385980
BB	4	64	2392	[illegible]	6600	1400	22000	[illegible]	262500	480	[illegible]	295436
CC	4	60	360	[illegible]	1440	168	-	[illegible]	27500	-	[illegible]	29528
DD	4	360	6400	[illegible]	11440	2200	-	[illegible]	360000	255	[illegible]	380655
EE	4	-	-	[illegible]	1989	702	12750	[illegible]	102000	11375	[illegible]	128816
FF	4	87.5[5]	1000	[illegible]	3640	480	117000	[illegible]	-	-	[illegible]	122207.5[5]
GG	4	-	77760	[illegible]	3000	720	5000	[illegible]	480000	-	[illegible]	566480
Total		**159,514**	**197,109.5**	[illegible]	**130,338**	**36,545**	**1,730,375**	[illegible]	**13,773,956**	**615,210**	[illegible]	**16,643,047.5**[5]

[1] As the author has agreed to keep the identities of the respondent journals confidential, the journal names have been replaced herein with letter codes.

[2] Calculated by multiplying the Number of Articles Published by the Average Length of Articles Published by the Prints Per Article and Note/Comment in the Production Phase. For further detail, see Appendix E.

[3] Calculated by multiplying the Number of Notes/Comments Published by the Average Length of Notes/Comments Published by the Prints Per Article and Note/Comment in the Production Phase. For further detail, see Appendix E.

[4] Totals assume the printing of all issues and re-prints double-sided.

[5] Several entries include a decimal place, e.g., 812.5. While it is unlikely any journals printed, e.g., half pages, these figures reflect the cumulative approximation of the respondents when accounting for double-page and double-sided printing. For example, journal "I" reported an estimated article submission length of 65 pages, which the journal printed double-page, double-sided. This will utilize approximately 16.25 pieces of paper per print. The journal reported printing 50 article submissions. Multiplying 50 by 16.25 yields 812.5 pieces of paper.

- Dashed entries indicate that the respondent either answered "zero" or did not respond to the relevant question.

Appendix C: The Article Submission Phase

Journal[1]	Tier	Journals' Paper Type (% of Post-Consumer Recycled Content)	Number of Article Submissions	Weighted Average Page Length Per Article Submission[2]	Full Article Submission Prints	Total Article Submission Pages Printed
A	1	31-70%[3]	500	50	-	-
B	1	< 31%	1600	-	-	-
C	1	31-70%[3]	2295	40	2495	99800
D	1	< 31%	2000	-	-	-
E	1	100%[4]	-	-	-	-
F	1	31-70%[3]	1600	42	-	-
G	1	< 31%	866	30	866	25980
H	1	31-70%[3]	1500	50	-	-
I	1	31-70%[3]	1500	16.25	50	812.5
J	2	0%	500	55	150	8250
K	2	< 31%	-	50	-	-
L	2	31-70%[3]	500	50	100	5000
M	2	71-99%	1000	40	-	-
N	2	< 31%	-	-	-	-
O	2	< 31%	-	-	-	-
P	2	31-70%[3]	1000	12.5	80	1000
Q	2	< 31%	1,000	50	100	5000
R	2	31-70%	50	40	-	-
S	2	71-99%	1078	40	23	920
T	2	31-70%[3]	430	40	-	-
U	3	< 31%	600	35	-	-
V	3	31-70%[3]	60	17.5	120	2100
W	3	31-70%	200	45	-	-
X	3	100%	235	40	235	9400
Y	3	< 31%	-	-	-	-
Z	4	31-70%[3]	300	30	20	600
AA	4	< 31%	150	40	2	80
BB	4	100%	103	32	2	64
CC	4	< 31%	40	20	3	60
DD	4	31-70%[3]	400	45	8	360
EE	4	0%	-	15	-	-
FF	4	100%	200	17.5	5	87.5
GG	4	31-70%	583	48	-	-
Total			**20,290**		**4,259**	**159,514**

[1] As the author has agreed to keep the identities of the respondent journals confidential, the journal names have been replaced herein with letter codes.
[2] Weighted average incorporates reported double-sided and double-page printing.
[3] Though only 41% of those journals that provided a response to the relevant questions on paper type reported using paper of 31% post-consumer content or greater in the submission and production phases, the author made the conservative assumption that these non-respondent journals utilized paper of 31-70% post-consumer recycled content in calculating the environmental impacts of the reported paper consumption practices.
[4] This journal did not provide any responses sufficient to calculate many of their paper consumption practices.
- Dashed entries indicate that the respondent either answered "zero" or did not respond to the relevant question.

Appendix D: The Note and Comment Submission Phase

Journal[1]	Tier	Journals' Paper Type (% of Post-Consumer Recycled Content)	Number of Note/ Comment Submissions	Weighted Average Page Length Per Note/Comment Submitted[2]	Full Note/Comment Submission Prints	Total Note/Comment Submission Pages Printed
A	1	31-70%[3]	25	35	-	-
B	1	< 31%	18	45	-	-
C	1	31-70%[3]	-	-	-	-
D	1	< 31%	200	-	-	-
E	1	100%[4]	-	-	-	-
F	1	31-70%[3]	100	23	300	6900
G	1	< 31%	140	10	2380	23800
H	1	31-70%[3]	39	17.5	195	3412.5
I	1	31-70%[3]	100	17.5	3400	59500
J	2	0%	40	30	120	3600
K	2	< 31%	30	30	-	-
L	2	31-70%[3]	50	50	50	2500
M	2	71-99%	50	30	-	-
N	2	< 31%	57	30	-	-
O	2	< 31%	18	12.5	18	225
P	2	31-70%[3]	350	45	-	-
Q	2	< 31%	75	40	-	-
R	2	31-70%	10	50	-	-
S	2	71-99%	-	-	-	-
T	2	31-70%[3]	26	25	-	-
U	3	< 31%	100	20	-	-
V	3	31-70%[3]	30	15	60	900
W	3	31-70%	40	37	80	2960
X	3	100%	25	20	25	500
Y	3	< 31%	35	20	245	4900
Z	4	31-70%[3]	12	20	-	-
AA	4	< 31%	50	30	-	-
BB	4	100%	52	23	104	2392
CC	4	< 31%	6	20	18	360
DD	4	31-70%[3]	80	20	320	6400
EE	4	0%	50	22	-	-
FF	4	100%	80	12.5	80	1000
GG	4	31-70%	72	36	2160	77760
Total			**1,960**		**9,555**	**197,109.5**

[1] As the author has agreed to keep the identities of the respondent journals confidential, the journal names have been replaced herein with letter codes.
[2] Weighted average incorporates reported double-sided and double-page printing.
[3] Though only 41% of those journals that provided a response to the relevant questions on paper type reported using paper of 31% post-consumer content or greater in the submission and production phases, the author made the conservative assumption that these non-respondent journals utilized paper of 31-70% post-consumer recycled content in calculating the environmental impacts of the reported paper consumption practices.
[4] This journal did not provide any responses sufficient to calculate many of their paper consumption practices.
- Dashed entries indicate that the respondent either answered "zero" or did not respond to the relevant question.

Appendix E: The Production Phase

Journal[1]	Tier	Journals' Paper Type (% of Post-Consumer Recycled Content)	Number of Articles Published	Average Length of Articles Published	Number of Notes/ Comments Published	Average Length of Notes/ Comments Published	Prints Per Article and Note/ Comment	Total Article Pages Printed[4]	Total Note/ Comment Pages Printed[5]	Does the Journal Print Sources?	Source Stack Per Article	Total Stack in Source-Check	Total Pages Printed In Source Check	Total Pages Printed During Production Phase
A	1	31-70%[2]	25	80	13	40	7	14000	3640	Yes	-	-	-	17640
B	1	< 31%	31	45[3]	7	10	15	20925	1050	Yes	0.5	15.5	3875	25850
C	1	31-70%[2]	26	60	12	40	-	-	-	Yes	-	-	-	-
D	1	< 31%	12	56	12	31	9	6048	3348	Yes	4.5	54	13500	22896
E	1	100%[6]	-	-	-	-	-	-	-	-	-	-	-	-
F	1	31-70%[2]	40	50	16	28	-	-	-	Yes	-	-	-	-
G	1	< 31%	43	40	9	22	6	10320	1188	Yes	-	-	-	11508
H	1	31-70%[2]	60	26	17	18	1	1560	306	Yes	2	120	30000	31866
I	1	31-70%[2]	8	70	12	25	-	-	-	Yes	4	32	8000	8560
J	2	0%	50	50	12	40	1	2500	480	Yes	48	2400	600000	602980
K	2	< 31%	14	45[3]	8	30[3]	-	-	-	Yes	6	84	21000	21000
L	2	31-70%[2]	32	30	12	20	5	4800	1200	Yes	6	192	48000	54000
M	2	71-99%	16	40	16	30	5	3200	2400	Yes	24	384	96000	101600
N	2	< 31%	16	45[3]	13	30[3]	2	1440	780	No	-	-	-	2220
O	2	< 31%	27	45[3]	12	30[3]	1	1215	360	Yes	8	216	54000	55575
P	2	31-70%[2]	10	60	12	50	5	3000	3000	Yes	8	80	20000	26000
Q	2	< 31%	17	50	10	45	5	4250	2250	Yes	24	408	102000	108500
R	2	31-70%	32	40	9	40	1	1280	360	Yes	24	768	192000	193640
S	2	71-99%	23	40	5	40	6	5520	1200	Yes	4	92	23000	29720
T	2	31-70%[2]	16	40	8	25	3	1920	600	Yes	6	96	24000	26520
U	3	< 31%	34	45[3]	2	30[3]	3	4590	180	Yes	12	408	102000	106770
V	3	31-70%[2]	18	35	1	30	7.5	4725	225	Yes	12	216	54000	58950
W	3	31-70%	12	40	12	40	-	-	-	Yes	9	108	27000	27000
X	3	100%	37	40	10	20	3	4440	600	Yes	3	111	27750	32790
Y	3	< 31%	26	20	9	14	10	5200	1260	Yes	3	78	19500	25960
Z	4	31-70%[2]	36	36	4	12	1	1296	48	Yes	12	432	108000	109344
AA	4	< 31%	24	45[3]	4	30[3]	-	-	6400	Yes	-	-	-	6400
BB	4	100%	22	60	7	40	5	6600	1400	Yes	4	88	22000	30000
CC	4	< 31%	16	30	2	28	3	1440	168	No	-	-	-	1608
DD	4	31-70%[2]	22	26	11	10	20	11440	2200	Yes	-	-	-	13640
EE	4	0%	17	30	9	20	3.9	1989	702	Yes	3	51	12750	13441
FF	4	100%	13	70	2	60	4	3640	480	Yes	36	468	117000	121120
GG	4	31-70%	20	50	6	40	3	3000	720	Yes	1	20	5000	8720
Total			**795**	**45**	**294**	**30**	**135.4**	**130,338**	**36,545**		**264**		**1,730,375**	**1,897,258**

[1] As the author has agreed to keep the identities of the respondent journals confidential, the journal names have been replaced herein with letter codes

[2] Though only 41% of those journals that provided a response to the relevant questions on paper type reported using paper of 31% post-consumer content or greater in the submission and production phases, the author made the conservative assumption that these non-respondent journals utilized paper of 31-70% post-consumer recycled content in calculated the environmental impacts of the reported paper consumption practices.

[3] These journals did not estimate the average length of their published articles and or notes/comments. The average length according to the estimates of the other respondent journals is forty-five pages per article and thirty pages per note/comment.

[4] Calculated by multiplying the Number of Articles Published by the Average Length of Articles Published by the Prints Per Article and Note/Comment in the Production Phase.[5] Calculated by multiplying the Number of Notes/Comments Published by the Average Length of Notes/Comments Published by the Prints Per Article and Note/Comment in the Production Phase.

[6] This journal did not provide any responses sufficient to calculate many of their paper consumption practices.

- Dashed entries indicate that the respondent either answered "zero" or did not respond to the relevant question.

Appendix F: The Publication Phase

Journal[1]	Tier	Publishers Paper Type (% of Post-Consumer Recycled Content)	Number of Issues	Average Length of Issues	Total Published Pages	Issues Printed and Distributed	Issues Printed but Not Distributed	Total Issues Printed	Total Pages Printed in Issues[2]	Re-print Requests/ Article	Total Pages Printed from Re-print Requests[2]	Total Pages Printed During the Publication Phase
A	1	31-70%[3]	5	300	1500	550	40	590	442500	-	-	442500
B	1	31-70%[3]	5	300	1500	360	40	400	300000	100	69750	369750
C	1	31-70%[3]	16	240	3840	1350	65	1415	2716800	150	117000	2833800
D	1	< 31%	4	329	1316	622	60	682	448756	100	33600	482356
E	1	-	-	-	-	-	-	-	-	-	-	-
F	1	31-70%[3]	4	500	2000	-	-	-	-	-	-	-
G	1	31-70%[3]	4	380	1520	550	125	675	513000	25	19500	532500
H	1	31-70%[3]	6	450	2700	600	50	650	877500	70	19600	897100
I	1	31-70%[3]	4	250	1000	900	-	900	450000	50	62500	512500
J	2	0%	5	300	1500	-	25	25	18750	50	15750	34500
K	2	31-70%[3]	3	400	1200	400	100	500	300000	-	-	300000
L	2	31-70%[3]	4	350	1400	1,000	150	1150	805000	50	16000	821000
M	2	31-70%[3]	4	300	1200	-	50	50	30000	50	18000	48000
N	2	31-70%[3]	4	275	1100	825	150	975	536250	-	-	536250
O	2	31-70%[3]	3	800	2400	650	15	665	798000	5	1500	799500
P	2	31-70%[3]	6	300	1800	-	-	-	-	-	-	-
Q	2	< 31%	4	300	1200	1,000	50	1050	630000	75	48000	678000
R	2	31-70%	4	280	1120	400	15	415	232400	10	4600	237000
S	2	71-99%	4	300	1200	670	40	710	426000	150	48000	474000
T	2	31-70%[3]	3	250	750	900	200	1100	412500	40	30600	443100
U	3	31-70%[3]	4	250	1000	400	40	440	220000	-	-	220000
V	3	31-70%[3]	3	200	600	350	150	500	150000	50	12000	162000
W	3	31-70%	3	320	960	700	100	800	384000	50	37000	421000
X	3	100%	4	375	1500	850	50	900	675000	25	6500	681500
Y	3	< 31%	4	350	1400	560	20	580	406000	25	16200	422200
Z	4	31-70%[3]	4	300	1200	500	150	650	390000	50	27000	417000
AA	4	31-70%[3]	6	230	1380	250	300	550	379500	-	-	379500
BB	4	31-70%[3]	3	250	750	500	200	700	262500	2	480	262980
CC	4	< 31%	2	250	500	100	10	110	27500	-	-	27500
DD	4	31-70%[3]	4	225	900	700	100	800	360000	1	255	360255
EE	4	0%	4	150	600	300	40	340	102000	25	11375	113375
FF	4	71-99%	3	200	600	-	-	-	-	-	-	-
GG	4	31-70%[3]	3	320	960	950	50	1000	480000	50	-	480000
Total					**42,596**	**16,937**	**2,385**	**19,322**	**13,773,956**	**1,203**	**615,210**	**14,389,166**

[1] As the author has agreed to keep the identities of the respondent journals confidential, the journal names have been replaced herein with letter codes.
[2] Totals assuming journals print issues and reprints double-sided.
[3] Though only 25% of those journals that provided a response to the relevant questions on paper type reported that their publishers used paper of 31% post-consumer content or greater in the publication phase, the author made the conservative assumption that the publishers of the non-respondents utilized paper of 31-70% post-consumer recycled content in calculating the environmental impacts of these paper consumption practices.
- Dashed entries indicate that the respondent either answered "zero" or did not respond to the relevant question.

Appendix G: Summary Environmental Impact

Aggregating the total tonnage of all paper utilized in the five categories of post-consumer recycled content yields the following results:

Percentage of Post-Consumer Recycled Content	Total tons of paper used in Submission, Production, and Publication Phases
0%	3.89
15%	10.293
50%	61.606
85%	3.031
100%	4.395

Inserting the above total tonnages into the Environmental Defense Fund's Paper Calculator reveals the following environmental impacts:

Lifecycle Environmental Impact based on Aggregate Data[1]

Wood Use	162 tons
Net Energy	2,165 million BTU's
Greenhouse Gases	392,764 lbs CO_2 equivalent
Wastewater	1,383,131 gallons
Solid Waste	130,552 pounds

[1] *See* Environmental Defense Fund, Paper Calculator 2.0, http://www.edf.org/paper calculator/ (last visited Feb. 25, 2010). The definitions of the terms in this chart, as well as the relevant equivalencies of the stated impacts, are discussed *supra* notes 10–21 and accompanying text.

Appendix H: Respondents' Assessment of Current versus Past Paper Usage

Journal[1]	Tier	Journal's Paper Type	Publisher's Paper Type	Paper Usage vs. 1 Year Ago	Paper Usage vs. 5 Years Ago	Paper Usage vs. 10 Years Ago	Submissions vs. 1 Year Ago	Submissions vs. 5 Years Ago	Submissions vs. 10 Years Ago	Issue Length vs. 1 Year Ago	Issue Length vs. 5 Years Ago	Issue Length vs. 10 Years Ago
A	1	31-70%[2]	31-70%[3]	Don't know	Don't know	Don't know	Flat	-	-	-	-	-
B	1	< 31%	31-70%[3]	Same	Less	Less	Flat	Flat	-	Decreased	Increased	Increased
C	1	31-70%[2]	31-70%[3]	-	-	-	Flat	-	-	Flat	-	-
D	1	< 31%	< 31%	Less	Less	Less	Decreased	Decreased	Decreased	Decreased	Decreased	Decreased
E	1	100%[4]	-	-	-	-	-	-	-	-	-	-
F	1	31-70%[2]	31-70%[3]	Less	Less	Less	-	-	-	-	-	-
G	1	< 31%	31-70%[3]	Same	Don't know	Don't know	Increased	Increased	Increased	Flat	Flat	Flat
H	1	31-70%[2]	31-70%[3]	Less	Less	Don't know	Flat	Flat	Flat	Flat	Flat	Flat
I	1	31-70%[2]	31-70%[3]	Less	Don't know	Don't know	Increased	-	-	Increased	Flat	Decreased
J	2	0%	0%	Less	Less	Less	Flat	Flat	Flat	Increased	Increased	Increased
K	2	< 31%	31-70%[3]	Less	Less	Less	Increased	Increased	Increased	Increased	Increased	Increased
L	2	31-70%[2]	31-70%[3]	Less	Don't know	Don't know	Flat	Flat	Flat	Flat	Flat	Flat
M	2	71-99%	31-70%[3]	Same	Don't know	Don't know	-	-	-	Flat	-	-
N	2	< 31%	31-70%[3]	Same	Less	-	Flat	Flat	-	Flat	Flat	-
O	2	< 31%	31-70%[3]	Less	Less	Less	Increased	Increased	Increased	-	Increased	Increased
P	2	31-70%[2]	31-70%[3]	-	-	-	-	-	-	-	-	-
Q	2	< 31%	< 31%	Same	More	More	Flat	Increased	Increased	Decreased	Flat	Flat
R	2	31-70%	31-70%	Less	Don't know	Don't know	Flat	Increased	Increased	Flat	Flat	Flat
S	2	71-99%	71-99%	More	More	More	Increased	Decreased	Decreased	Flat	Flat	Flat
T	2	31-70%[2]	31-70%[3]	Less	-	-	Increased	Increased	Increased	Decreased	Flat	Increased
U	3	< 31%	31-70%[3]	Don't know	Don't know	Don't know	Increased	Increased	Increased	Flat	Decreased	Decreased
V	3	31-70%[2]	31-70%[3]	Same	Same	Don't know	-	Flat	Flat	Flat	Flat	Flat
W	3	31-70%	31-70%	Same	Same	Less	Increased	Increased	Increased	Increased	Increased	Increased
X	3	100%	100%	Same	Less	Less	Flat	Increased	Increased	Flat	Flat	Flat
Y	3	< 31%	< 31%	Same	Same	Same	Flat	Flat	Flat	Flat	Flat	Flat
Z	4	31-70%[2]	31-70%[3]	Same	Less	Don't know	Flat	Increased	Increased	Flat	Flat	Flat
AA	4	< 31%	31-70%[3]	Don't know	Don't know	Don't know	-	-	-	-	-	-
BB	4	100%	31-70%[3]	Don't know	Don't know	Don't know	Increased	Increased	Increased	Flat	Flat	Flat
CC	4	< 31%	< 31%	Don't know	Don't know	Don't know	Flat	Flat	Flat	Flat	Flat	Flat
DD	4	31-70%[2]	31-70%[3]	Less	Less	Less	Increased	Increased	Increased	Increased	Flat	Increased
EE	4	0%	0%	Don't know	Don't know	Don't know	Flat	Flat	Flat	Flat	Flat	Flat
FF	4	100%	71-99%	Same	Don't know	Don't know	Flat	Flat	Flat	Flat	Flat	Flat
GG	4	31-70%	31-70%[3]	Less	Don't know	Don't know	-	-	-	-	-	-

[1] As the author has agreed to keep the identities of the respondent journals confidential, the journal names have been replaced herein with letter codes.

[2] Though only 41% of those journals that provided a response to the relevant questions on paper type reported using paper of 31% post-consumer content or greater in the submission and production phases, the author made the conservative assumption that these non-respondent journals utilized paper of 31-70% post-consumer recycled content in calculating the environmental impacts of the reported paper consumption practices.

[3] Though only 25% of those journals that provided a response to the relevant questions on paper type reported that their publishers used paper of 31% post-consumer content or greater in the publication phase, the author made the conservative assumption that the publishers of the non-respondents utilized paper of 31-70% post-consumer recycled content in calculating the environmental impacts of these paper consumption practices.

[4] This journal did not provide any responses sufficient to calculate many of their paper consumption practices.

- Dashed entries indicate that the respondent either answered "zero" or did not respond to the relevant question.

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