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Editorial

# The First 36 Years of Science of the Total Environment (STOTEN)

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ABSTRACT

This report provides a brief history of Science of the Total Environment (STOTEN) during the last 36 years and pays tribute to the late Dr. Eric Hamilton who founded and edited the journal for 30 years.

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**This volume is dedicated with appreciation to the memory of Dr. Eric Hamilton, the founding editor of the journal who died on April 27, 2008.**

Volume 400 is a landmark that has been attained by few scientific journals, and testament to the vision of the founding editor and dedicated work of the editors, authors and reviewers. It provides an appropriate milestone to look back at the progress that this journal has made and prognosticate about the future. It marks the end of one-issue-per-week and eighteen-volumes-per-year publication. Starting in 2009, only one volume of STOTEN will be published per year and will contain 24 issues. We will not be celebrating the publication of Volume 500 any time soon.

## 1. In the beginning

The Ashanti proverb, "Do not follow the path but go where there is no path to begin a new trail" is an appropriate metaphor for the idea behind the founding of the *Science of the Total Environment* (STOTEN). During the late 1960s and early 1970s, many journals were started aimed at communicating the results of rapidly growing body of research in the new field of environmental science. These journals were primarily aimed at specialized domains and designed to cater to the needs of de novo environmental experts in established disciplines as well as deal with research on specific environmental media, or provide platform for discussion of environmental policies and technology. The fact that the emerging scientific field is inherently multi-disciplinary was ignored, to a large extent, in the rush to start new journals during the early history of environmental science. The idea of a journal that would provide a holistic umbrage of a field with no boundaries was initially received with some skepticism and resistance, as to be expected. Those were the days before globalization, global warming, global climate change and global cycle of poison became familiar buzz words to the general public. Today, multi-disciplinarity has become a theme with common refrain in almost very journal in environmental science. In contrast,

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STOTEN was created specifically to bridge the gaps between the diverging domains of research, practice and policy developments in the then emerging field of environmental science and this mantra has remained at the root of what STOTEN has done since its inception.

The first issue of STOTEN was published in May 1972 (exactly 36 years ago) with little fanfare (it had no preface or editorial to explain its scope and goals). An Editorial in Volume 3, Issue 1 published in 1974 outlined the broad aim of the new journal as follows:

> "The original scope of the journal was very wide. This was intentional for while the contents of many scientific journals may be related to a specific field of study, it was felt that a journal with too narrow a field of interest would not help to promote the interdisciplinary approach found so essential in the solution of environmental problems."

Although contents may change from one issue to the other, the raison d'etat for STOTEN has remained the promotion of inter-disciplinary research and holistic approach to environmental management.

Despite its inauspicious beginning, the journal did manage to take root quickly, presumably helped by the publication of some impactful papers in applied environmental chemistry (a primary focus predicated by the interests of the editor and editorial board members of the time). The Editorial of Volume 3 contained the following observation: "The journal, which was launched two years ago, is now well-established and is receiving growing support from both contributors and subscribers. The increasing attention being paid to environmental problems all over the world assures us that the journal has an important role to play in providing a focal point for research in this field". And grew the journal did, from one volume in 1972 to two volumes in 1997 and three volumes in 1980. Between 1981 and 1990, the number of volumes per year had increased by 4-fold to 12. The most rapid growth phase, however, occurred between 1991 and 1995 when the publication schedule reached 18 volumes (54 issues) per year.

Most of the papers came from the USA (about 20%) and Western European countries (about 60%). In 1990, for instance, four countries (USA, Great Britain, Germany and Canada) accounted for slightly under 50% of the papers published in the journal (Fig. 1).

The rapid growth in the number of volumes presented a number of challenges, not the least of which was the shortage of high quality papers to fill the pages while maintaining a balanced coverage of key developments in the field. Publication of Special Issues was then introduced aimed at providing in-depth coverage of important topics; these issues soon devolved into a vehicle for conference proceedings which did not particularly enhance the impact factor for the journal which remained below 1.0 during the expansionary phase of STOTEN. Those were the days when the publication schedule was sometimes changed because there were not enough papers to fill the next issue.

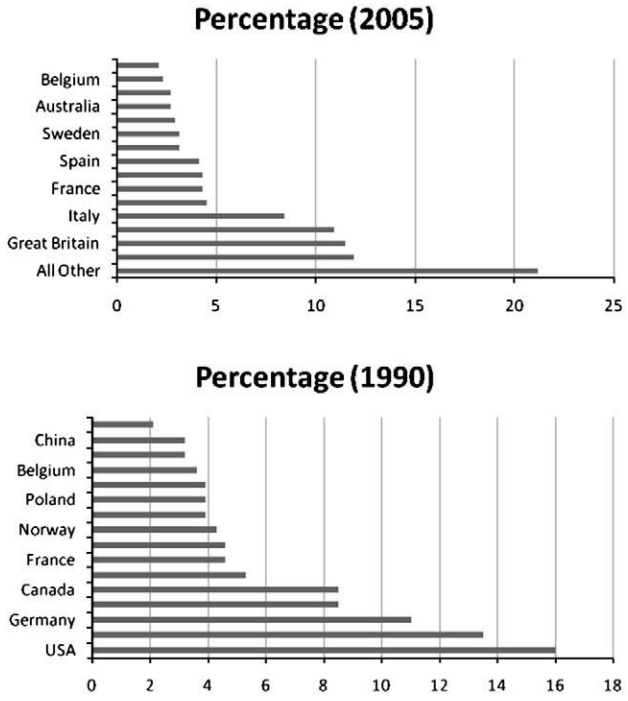


**Fig. 1 – Countries of origin of papers published in STOTEN in 2005 (top) and 1990 (bottom).**

## 2. Steadied growth and development

The next phase in the development of STOTEN occurred between 1994/1995 (when the publication frequency peaked at one-issue-per-week) and 2002/2003. This period was marked by a change in emphasis from making the journal one of the largest to making it one of the best in the field. The quality of the journal needed to be improved. By holding the number of papers fairly constant and with the normal growth in the number of submissions, the enlarged pool of submissions soon made it became possible to be more selective in papers being accepted. Manuscript rejection rate went from about 25% in 1994 to over 40% in 2002. The impact factor crept up from 0.80 in 1996 to 1.54 in 2002 (Fig. 2). The central thrust of the journal on topics associated with air, water, soil and places was broadened to encourage submissions in exposure assessment, risk assessment, risk management and environmental health. Even the cover of the journal was redesigned.

Another phase in the growth and development of the journal began during 2002/2003 with the introduction of electronic editing system (EES) for manuscripts (speeded up and simplified the review process) and a change in editorship of the journal. A number of changes were introduced including appointment of Associate Editors (to handle manuscript review in their areas of expertise), new type face for published articles and a new cover for the journal. These changes have ushered a spectacular growth in number of submissions, from about 600 in 2001 to over 2000 in 2007. This has made it possible to reduce the number of special issues and focusing them on selected topics of critical environmental importance or new areas for the journal. The rejection rate for manuscripts currently stands about 75% and is increasing at a faster rate than the acceptance rate (Fig. 3). The journal is thus facing the problem of success, namely, what should be an optimum rejection rate that would not be too high as to discourage authors from submitting their best work to the journal. The improvement in quality is reflected by the impact factor which

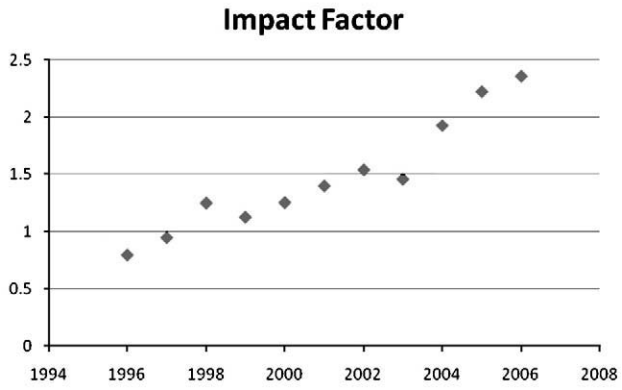


**Fig. 2 Recent trend in the impact factor for STOTEN.**

has increased to 2.36 in 2007 (Fig. 2). Another measure of the journal's impact is the number of full-article downloads which has also increased sharply, from 432,800 in 2004 to 853,800 in 2007. By any of these bibliometric measures, STOTEN can be regarded as an influential journal in its field.

STOTEN has now become a truly global journal. In 1990, ten countries accounted for 76% of all the papers published in the journal (Fig. 1). By 2005, submissions were being received from over 100 countries in every part of the world. The designation "All Other Countries" (with less than 10 papers for the year) was responsible for 21% of the published papers in 2005 compared to 8.5% in 1990 (Fig. 1). While the number of published papers from Canada, United States and Europe has remained significant, the contributions from China, India and other Asian countries have increased significantly. This is a good thing. Environmental pollution has become a serious problem in many developing countries and it is encouraging that STOTEN is venue of choice for studies conducted in those parts of the world. A number of changes have recently been made in the continuing effort to enhance the quality of the journal. Starting in 2009, only one volume will be published per year — should reduce cost and simplify the production process. Language editing has been introduced as a function of the EES; this initiative is expected to improve the papers from non-English speaking authors. To deal

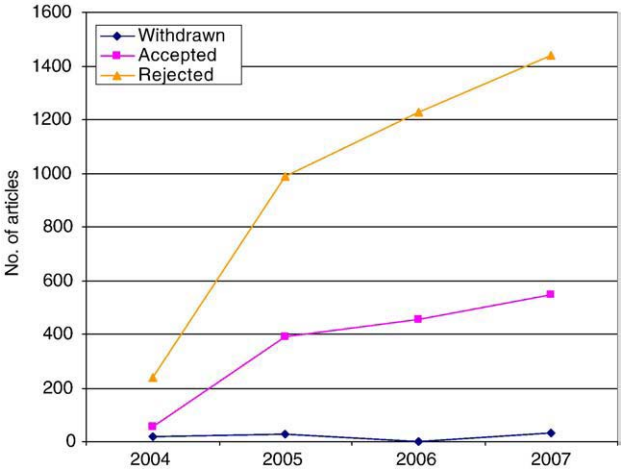


**Fig. 3 Recent trends in the number of articles published versus rejected by STOTEN.**

**Table 1 – Key/index words (used over 30 times) in 1994/95 and 2004/05**

| Key terms/words | Total use 1994/5 | Total use 2004/5 |
|---|---|---|
| Acid mine drainage | 2 | 30 |
| Aerosol | 27 | 30 |
| Agriculture/agricultural | 51 | 49 |
| Air pollution/air pollutants/air quality | 457 | 194 |
| Algae | 32 | 24 |
| Aluminum | 77 | 15 |
| Arctic | 108 | 32 |
| Arsenic | 30 | 72 |
| Atmosphere/atmospheric | 56 | 115 |
| Bacteria | 30 | 46 |
| Bioaccumulation | 51 | 119 |
| Biodegradation | 48 | 10 |
| Biological monitoring | 91 | 30 |
| Cadmium | 112 | 61 |
| Cesium-137 | 120 | 20 |
| Canada | 53 | 14 |
| Chernobyl | 48 | 0 |
| Chromium | 35 | 4 |
| Climate/climate change/ climatology | 24 | 41 |
| Cobalt | 85 | 3 |
| Contamination | 24 | 75 |
| Copper | 76 | 39 |
| Ecosystem | 86 | 40 |
| Environmental engineering | 0 | 52 |
| Environmental exposure | 93 | 17 |
| Environmental impact assessment | 144 | 81 |
| Environmental monitoring | 248 | 17 |
| Estuaries | 30 | 31 |
| Exhaust gas | 31 | 5 |
| Fish/fisheries | 52 | 37 |
| Food contamination | 47 | 10 |
| Forest/forestry | 78 | 23 |
| Groundwater | 30 | 44 |
| Heavy metals | 112 | 129 |
| Humic acid/humic substances | 31 | 6 |
| Iron | 43 | 26 |
| Italy | 47 | 2 |
| Lake | 48 | 43 |
| Lead pollution/lead poisoning | 164 | 138 |
| Lichens/mosses | 46 | 11 |
| Lung | 37 | 1 |
| Manganese | 34 | 13 |
| Marine | 85 | 68 |
| Mercury | 71 | 127 |
| Metal/metals | 73 | 52 |
| Mucilage | 29 | 51 |
| Nickel | 55 | 4 |
| Nitrogen/nitrate/nitrogen oxides | 54 | 58 |
| Nuclear | 44 | 6 |
| Occupational exposure/ disease | 125 | 7 |
| Oceans/oceanography | 7 | 51 |
| Organochlorine compounds | 53 | 36 |
| Ozone | 30 | 19 |
| Particulate emission | 0 | 43 |
| Particulate matter | 21 | 55 |
| Pesticides | 42 | 37 |
| Phosphorus | 12 | 56 |
| Plants | 81 | 42 |

Table 1 (*continued*)

| Key terms/words | Total use 1994/5 | Total use 2004/5 |
|---|---|---|
| Pollution exposure | 1 | 31 |
| Pollution transport | 52 | 0 |
| PCB | 44 | 39 |
| Radiation | 36 | 3 |
| Radioactive contamination | 99 | 5 |
| Radioassay | 42 | 0 |
| Radioisotopes | 44 | 15 |
| Risk assessment | 29 | 31 |
| River | 32 | 58 |
| Sea water/sea pollution | 66 | 9 |
| Sediment | 48 | 101 |
| Soil pollution | 158 | 63 |
| Surface water | 10 | 31 |
| Sweden | 30 | 1 |
| Trace elements | 51 | 35 |
| Traffic | 102 | 38 |
| United Kingdom | 47 | 2 |
| United States | 49 | 3 |
| Urban areas | 60 | 11 |
| Water analysis | 38 | 2 |
| Water pollution | 206 | 57 |
| Water quality | 46 | 38 |
| Zinc | 69 | 33 |

with the growing flow of manuscripts, the number of handling Associate Editors has steadily been increased (currently stands at 10) — to reduce the workload and improve the quality of scientific review of manuscripts.

The earliest editorial (Volume 3, Issue 1) noted that the "journal will also provide an outlet for papers dealing with applications of known or new techniques and methods of chemistry and biochemistry to environmental problems. Studies on pollution of the air, water, soil and various aspects of human nutrition will be covered. Papers on environmental medicine will be considered when the effects of abnormalities in the level and distribution of chemical elements and compounds are given prominence". The bibliometric statistics of key index worlds show that the contents and scope of the journal have been evolving over time especially in the last few years (Table 1). Papers published prior to the mid-1990s reflected the concerted effort of the period to document, monitor and assess the fate and behavior of various pollutants in air, water and soils. In recent years, emphasis has been shifting away from "baseline monitoring" of pollutants in environmental media to papers that focus more on environmental processes or apply the field data in risk assessment, exposure assessment, risk management, and policy development. Evolving coverage of new research domains no doubt are necessary to maintain the trans-disciplinary flavor of the journal. Some topics, however, have persisted as attractive areas of research including lead pollution/poisoning, cadmium pollution/toxicity, sediment pollution, water pollution, nitrogen cycle and PCB (Table 1).

## 3. Dr. Eric Ishmael Hamilton — an appreciation

STOTEN has had two Editors-in-chief throughout its history. Dr. Eric Hamilton served as the Editor-in-chief for 30 years, from 1972 to 2001. Dr. Jerome Nriagu was an Associate Editor (1983 to 1991), Editor (1991 to 2001) and Editor-in-chief (2002 to present). The stability in editorship has enabled the journal to maintain its strategic objectives but flexible approach to the environmental literature. Articles for this volume were being prepared when Dr. Hamilton passed away (on April 27, 2008) and it is a fitting tribute to dedicate this volume to him for 30 years of distinguished contributions and hard work on the journal. Throughout his life, Eric showed a passion for and intense interest in protecting the environment for humankind. His fertile mind and creative approach made him an innovator and a pioneer in the study of toxic contaminants using the whole ecosystem approach. He left an enviable research record marked by an interesting and sophisticated blending of the theoretical and practical. He was a versatile and gifted thinker able to cross disciplinary boundaries to make significant contributions in widely divergent fields. Dr. Hamilton founded STOTEN to provide a venue for broad-based research on the environment and human health, distinct from other journals that dealt with specialized subjects. The multi-disciplinary nature of this volume and the international make-up of the authors should have received his nod of approval.

While some would applaud the good work of the Editors, Associate Editors and Editorial Board on the scientific content, others might congratulate the publisher for providing the resources that have kept the journal going and growing. Much of the credit, however, belongs to our distinguished group of authors and reviewers who have given generously of their time and talent and the readers who use the articles.

## 4. STOTEN in coming years

It is a remarkable feat that STOTEN weathered the adverse effects of economic depressions and the large changes which took place in science and environmental movement during the early years of its existence and has prospered. A gaze into the crystal ball suggests that the future for STOTEN will remain bright. Interest in the environment remains strong in most countries and the growing realization of the influence of the physical environment on human health is a matter of universal concern. Environmental research remains vibrant, fueled by advances in analytical methods and increasing sophistication in statistical and epidemiological procedures. New research frontiers are constantly being created, in environmental "omics" (genomics, proteomics, metallomics, etc), gene–environment interactions, and environmental nanoparticles, just to name but three. Environmental pollution and the consequences for human and ecosystem health will likely remain a major issue for decades to come and STOTEN expects to remain an important venue for communicating the research needed to deal with the problem.