

**Stormwater Runoff Water Quality Newsletter
Devoted to Urban/Rural Stormwater Runoff
Water Quality Management Issues**

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This issue of the Newsletter provides information on the National Research Council (NRC) report entitled, "Urban Stormwater Management in the United States." Information is also provided on several US Government Accountability Office (GAO) reviews of US EPA water quality and Superfund programs, and funding of refuges; and on other recent NRC publications related to the management of water quality in stormwater runoff.

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*Notice: As of November 1, 2008, AOL terminated its "Hometown" web file storage on which we had stored our www.gfredlee.com website and newsletter files. Therefore, the URLs for essentially all of our paper, report, and Newsletter files are being changed; and our website links are being updated. Our website links to previous editions of the Newsletter have been updated. If you encounter problems locating a file, please contact gfredlee@aol.com.*  
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NRC Report Release:

Urban Stormwater Management in the United States

According to the National Academy Press announcement,

"The rapid conversion of land to urban and suburban areas has profoundly altered how water flows during and following storm events, putting higher volumes of water and more pollutants into the nation's rivers, lakes, and estuaries. These changes have degraded water quality and habitat in virtually every urban stream system. To help address this problem, Congress in 1987 amended the Clean Water Act, expanding the U.S. Environmental Protection Agency's (EPA) oversight from about 100,000 point source permittees (wastewater discharged from industries and sewage treatment plants) to more than 500,000 permittees in order to encompass stormwater discharges from municipal areas, industry, and construction sites. Adding to the challenge of more permittees, it is much more difficult to collect and treat stormwater than wastewater. In light of these challenges, EPA asked the National Research Council to review its stormwater program. The report finds that the program will require significant changes if it is to improve the quality of the nation's waters. This report calls for an entirely new permitting structure that would put authority and accountability for stormwater discharges at the municipal watershed level. A number of additional actions, such as conserving natural areas, reducing hard surface cover (e.g., roads and parking lots), and retrofitting urban areas with features that hold and treat stormwater, are recommended."

According to a Associated Press article,

"EPA faulted on waterway pollution from sprawl"

By DINA CAPPIELLO – Oct 15, 2008

<http://ap.google.com/article/ALeqM5ixaJrp5XLiIA-Z4V11sBsl7oOQUQD93R53401>

"WASHINGTON (AP) — The Environmental Protection Agency is failing to stem the pollution washing into waterways from cities and suburbs, the National Academy of Sciences reported

Wednesday. The report's authors urged "radical changes" in how the federal government regulates stormwater runoff so that all waters are clean enough for fishing and swimming.

"The take-home message is the program as it has been implemented in the last 18 to 20 years has largely been a failure," said Xavier Swamikannu, one of the authors and the head of Los Angeles' stormwater program for the California Environmental Protection Agency.

Stormwater runoff is the toxic brew of oil, fertilizers and trash picked up by rain and snowmelt as the water flows over parking lots, roofs and subdivisions. The report said responsibility for managing stormwater must shift from developers to local governments, and permits should be issued on the boundaries of a watershed, rather than state borders. Such a change probably would require a new law and take between five years to 10 years, the report said. While urban areas cover only 3 percent of the U.S., it is estimated that their runoff is the primary source of pollution in 13 percent of rivers, 18 percent of lakes and 32 percent of estuaries.

Current law is ill-equipped to deal with the problem, the authors said. Congress required the EPA in 1987 to start issuing permits under the Clean Water Act to industrial and construction sites. But lawmakers changed the focus on water pollution, from industrial discharges and sewage pipes to runoff, a problem that is much larger and harder to pinpoint. The law is designed to target specific contaminants, when the problem with stormwater often is one of volume. A surge of water after a storm can cause streams to erode and fill waterways with sediment.

Benjamin H. Grumbles, the EPA's assistant administrator for water, said the findings underscored the approaches the EPA is taking. The agency requested the review in 2006, but Grumbles disagreed on Wednesday with the conclusion that the stormwater program was failing. "We want to accelerate the progress on reducing pollution and managing stormwater. We believe sound science, pollution prevention, and watershed protection will ensure continued clean water progress," he said.

This report is available as a prepublication copy at,

http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf. Copies of URBAN STORMWATER MANAGEMENT IN THE UNITED STATES are available from the National Academies Press; on the Internet at, http://www.nap.edu/catalog.php?record_id=12465. This URL site provides the a Summary Report in Brief, Executive Summary as downloadable files and the complete report to be read online at no cost.

As discussed in Newsletter Volume 11 Number 6, available at

<http://www.gfredlee.com/newsindex.htm>, the key to developing technically valid, cost-effective water quality management programs for urban and highway stormwater is a proper evaluation of the real, significant water quality impairments caused by constituents in the stormwater runoff. The current approach of trying to evaluate beneficial-use impairments based on an exceedance of a worst-case-based water quality criterion/standard is not reliable. Because of the very high cost of trying to treat urban stormwater runoff to remove pollutants at the point of discharge, the management approach must be based on control of the identified pollutant at the source, i.e., at the point at which it enters the stormwater runoff.

California Runoff Rundown

The "Fall 2008" issue of the Water Education Foundation "California Runoff Rundown" contains an article, "Making Stormwater a Resource, Not a Problem," that provides a discussion of stormwater runoff management issues. This Newsletter is available at,

<http://www.watereducation.org/doc.asp?id=991>

Government Accountability Office (GAO) Reports on US EPA and Other Agency Programs

In a GAO report, “Environmental Enforcement: EPA Needs to Improve the Accuracy and Transparency of Measures Used to Report on Program Effectiveness.”

GAO-08-1111R, September 18 <http://www.gao.gov/cgi-bin/getrpt?GAO-08-1111R>

“As part of its mission to protect human health and the environment, the Environmental Protection Agency’s (EPA) enforcement office maintains civil and criminal enforcement programs to help enforce the requirements of major federal environmental laws such as the Clean Air Act and the Clean Water Act. EPA’s civil and criminal enforcement programs work with the Department of Justice (DOJ), and in some cases states, to take legal actions to bring polluters into compliance with federal laws. While civil enforcement actions require polluters to pay penalties and take other corrective actions, criminal enforcement actions also may include imprisonment.”

“Results in Brief

Total penalties assessed by EPA, when adjusted for inflation, declined from \$240.6 million to \$137.7 million between fiscal years 1998 and 2007. We identified three shortcomings in how EPA calculates and reports penalty information to Congress and the public. Specifically, EPA is:

- *Overstating the impact of the enforcement programs by reporting penalties assessed against violators rather than actual penalties received by the U.S. Treasury.*
- *Reducing the precision of trend analyses by reporting nominal rather than inflation-adjusted penalties, thereby understating past accomplishments.*
- *Understating the influence of its enforcement programs by excluding the portion of penalties awarded to states in federal cases.*

In contrast to penalties, we found that both the value of estimated injunctive relief and the amount of pollution reduction reported by EPA generally increased. The estimated value of injunctive relief increased from \$4.4 billion in fiscal year 1999 to \$10.9 billion in fiscal year 2007, in 2008 dollars. In addition, estimated pollution reduction commitments amounted to 714 million pounds in fiscal year 2000 and increased to 890 million pounds in fiscal year 2007. However, we identified several shortcomings in how EPA calculates and reports this information. We found that generally EPA’s reports do not clearly disclose the following:

- *Annual amounts of injunctive relief and pollution reduction have not yet been achieved. They are based on estimates of relief and reductions to be realized when violators come into compliance.*
- *Estimates of the value of injunctive relief are based on case-by-case analyses by EPA’s technical experts, and in some cases the estimates include information provided by the alleged violator.”*

Concentrated Animal Feeding Operations: “EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern.”

GAO-08-944, September 4. <http://www.gao.gov/cgi-bin/getrpt?GAO-08-944>

Highlights - <http://www.gao.gov/highlights/d08944high.pdf>

What GAO Found

“To more effectively regulate CAFOs, GAO recommends that EPA complete its inventory of permitted CAFOs, reassess the current nationwide air emissions monitoring study, and establish

a strategy and timetable for developing a process-based model for measuring CAFO air emissions. EPA partially agreed with GAO's recommendations.

Because no federal agency collects consistent, reliable data on CAFOs, GAO could not determine the trends in these operations over the past 30 years. However, using USDA data for large farms that raise animals as a proxy for CAFOs, it appears that the number of these operations increased by about 230 percent, going from about 3,600 in 1982 to almost 12,000 in 2002. Also, during this 20-year period the number of animals per farm had increased, although it varied by animal type. Moreover, GAO found that EPA does not have comprehensive, accurate information on the number of permitted CAFOs nationwide. As a result, EPA does not have the information it needs to effectively regulate these CAFOs. EPA is currently working with the states to establish a new national data system.

The amount of manure generated by large farms that raise animals depends on the type and number of animals raised, but large operations can produce more than 1.6 million tons of manure a year. Some large farms that raise animals can generate more raw waste than the populations of some U.S. cities produce annually. In addition, according to some agricultural experts, the clustering of large operations in certain geographic areas may result in large amounts of manure that cannot be effectively used as fertilizer on adjacent cropland and could increase the potential of pollutants reaching nearby waters and degrading water quality.

Since 2002, at least 68 government-sponsored or peer-reviewed studies have been completed that examined air and water quality issues associated with animal feeding operations and 15 have directly linked air and water pollutants from animal waste to specific health or environmental impacts. EPA has not yet assessed the extent to which these pollutants may be impairing human health and the environment because it lacks key data on the amount of pollutants that are being emitted from animal feeding operations.

As a first step in developing air emissions protocols for animal feeding operations, in 2007, a 2-year nationwide air emissions monitoring study, largely funded by industry, was initiated. However, as currently structured, the study may not provide the scientific and statistically valid data it was intended to provide and that EPA needs to develop air emissions protocols. Furthermore, EPA has not established a strategy or timetable for developing a more sophisticated process-based model that considers the interaction and implications of all emission sources at an animal feeding operation.

Two recent federal court decisions have affected EPA's ability to regulate water pollutants discharged by CAFOs. The 2005 Waterkeeper case required EPA to abandon the approach that it had proposed in 2003 for regulating CAFO water discharges. Similarly, the 2006 Rapanos case has complicated EPA's enforcement of CAFO discharges because EPA believes that it must now gather significantly more evidence to establish which waters are subject to the Clean Water Act's permitting requirements".

An Associated Press article on the recent US EPA approach for regulating large livestock feedlots is available at,

<http://www.lasvegassun.com/news/2008/nov/01/epa-curbs-factory-farm-pollution> According to this November 1, 2008 article, "EPA officials said the new requirements call for a "zero discharge standard" and also will require farm operators to develop management plans that prevent the runoff of excessive environmentally damaging nutrients such as nitrogen and phosphorous into lakes and streams."

Wildlife Refuges: "Changes in Funding, Staffing, and Other Factors Create Concerns about Future Sustainability." GAO-08-797, September 22.

<http://www.gao.gov/cgi-bin/getrpt?GAO-08-797>

Highlights - <http://www.gao.gov/highlights/d08797high.pdf>

What GAO Found

Between fiscal years 2002 and 2007, the refuge system experienced funding and staffing level fluctuations, the introduction of several new policy initiatives, and the increased influence of external factors such as extreme weather that threaten wildlife habitat and visitor infrastructure. Although core funding—measured as obligations for refuge operations, maintenance, and fire management—increased each year, inflation-adjusted core funding peaked in fiscal year 2003 at about \$391 million—6.8 percent above fiscal year 2002 funding. Inflation-adjusted core funding ended the period 2.3 percent below peak levels, but 4.3 percent above fiscal year 2002 levels by fiscal year 2007. Core refuge staffing levels peaked in fiscal year 2004 at 3,610 full-time equivalents—10.0 percent above the fiscal year 2002 level—and then declined more slowly than funding levels. By fiscal year 2007, staffing levels fell to 4.0 percent below peak levels, but 5.5 percent above fiscal year 2002 levels. Through fiscal year 2007, the number of permanent employees utilized by the refuge system declined to 7.5 percent below peak levels. During this period, refuge system officials initiated new policies that: (1) reduced staff positions and reallocated funds and staff among refuges to better align staff levels with funding; (2) required refuge staff to focus on a legislative mandate to complete refuge conservation plans by 2012; (3) shifted to constructing a larger number of smaller visitor structures, such as informational kiosks, and fewer large visitor centers to spread visitor service funds across more refuges; (4) increased the number of full-time law enforcement officers and their associated training and experience requirements; and (5) resulted in additional administrative work. During this period, external factors that complicate refuge staffs’ ability to protect and restore habitat quality also increased, including severe storms and development around refuges.

Our survey showed that the quality of habitat management and visitor service programs varied across refuges during our study period. Habitat conditions for key types of species improved about two times more often than they worsened, but between 7 percent and 20 percent of habitats were of poor quality in 2007. Certain habitat problems increased at more than half of refuges during this period, and managers reported that they increased the time spent on certain habitat management activities, such as addressing invasive plants, despite declining staffing levels. However, several managers we interviewed told us that staff were working longer hours without extra pay to get work done, and managers expressed concern about their ability to sustain habitat conditions. While the quality of four key visitor service programs was reported to be stable or improving between fiscal years 2002 and 2007 at the vast majority of refuges, the other two key programs—environmental education and interpretation—were considered poor quality at one-third of refuges in 2007. Changes in the time spent on visitor services varied considerably across refuges, and managers noted that visitor services generally are cut before habitat management activities when resources are limited. Managers are concerned about their ability to provide high-quality visitor services in the future given staffing and funding constraints.”

EPA SCIENCE

New Assessment Process Further Limits the Credibility and Timeliness of EPA's Assessments of Toxic Chemicals

<http://www.gao.gov/cgi-bin/getrpt?GAO-08-1168T>

What GAO Found

“In March 2008, GAO concluded that the IRIS database was at serious risk of becoming obsolete because EPA had not been able to complete timely, credible assessments or decrease its backlog of 70 ongoing assessments—a total of 4 were completed in fiscal years 2006 and 2007. In addition, assessment process changes EPA had recently made, as well as other changes EPA was considering at the time of GAO’s review, would further reduce the credibility and timeliness of IRIS assessments. We concluded the following:

- EPA's efforts to finalize assessments have been thwarted by a combination of factors, including two new OMB-required reviews of IRIS assessments by OMB and other federal agencies and by EPA management decisions, such as delaying some assessments to await new research.
- The two new OMB/interagency reviews of draft assessments involve other federal agencies in EPA's IRIS assessment process in a manner that limits the credibility of IRIS assessments and hinders EPA's ability to manage them. For example, the OMB/interagency reviews lack transparency, and OMB required EPA to terminate five assessments EPA had initiated to help it implement the Clean Air Act.
- The changes to the IRIS assessment process that EPA was considering, but had not yet issued at the time of our review, would have added to the already unacceptable level of delays in completing IRIS assessments and further limited the credibility of the assessments.

EPA issued its revised IRIS assessment process in April 2008. The new process is largely the same as the draft GAO evaluated and does not respond to the recommendations in GAO's March 2008 report. Moreover, some key changes are likely to further exacerbate the productivity and credibility concerns GAO identified. For example, while the draft process would have made comments from other federal agencies on IRIS assessments part of the public record, EPA's new process defines such comments as "deliberative" and excludes them from the public record. GAO continues to believe that it is critical that input from all parties—particularly agencies that may be affected by the outcome of IRIS assessments—be publicly available. In addition, the estimated time frames under the new process, especially for chemicals of key concern, will likely perpetuate the cycle of delays to which the majority of ongoing assessments have been subject. Instead of streamlining the process, as GAO recommended, EPA has institutionalized a process that from the outset is estimated to take 6 to 8 years. This is problematic because of the substantial rework such cases often require to take into account changing science and methodologies.

EPA's progress in completing assessments continues to be slow—only four assessments have been completed in fiscal year 2008. Further, these assessments cover a group of four related chemicals that were processed and peer reviewed together but finalized individually. Little or no progress has been made on assessments of chemicals highlighted in our report, including naphthalene, formaldehyde, and trichloroethylene (TCE).

Subject: "Superfund: Funding and Reported Costs of Enforcement and Administration Activities" GAO-08-841R Superfund Funding and Costs

<http://www.gao.gov/products/GAO-08-841R>

"The Environmental Protection Agency (EPA) estimates that one in four Americans lives within 3 miles of a hazardous waste site. To clean up these highly contaminated sites, the Congress established the Superfund program under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980. EPA, the principal agency responsible for administering the Superfund program, has since identified more than 47,000 hazardous waste sites potentially requiring cleanup actions and has placed some of the most seriously contaminated sites on its National Priorities List (NPL). Through the end of fiscal year 2007, EPA had classified 1,569 sites as NPL sites.¹

Cleanup efforts at NPL sites are typically expensive and can take many years. There are two basic types of cleanup actions: (1) removal actions—generally short-term or emergency cleanups to mitigate threats—and (2) remedial actions—generally long-term cleanup activities.

Among other efforts, EPA may respond to and provide technical support for emergency actions, collect and analyze site data, and design and construct remedies, or oversee the work of others. However, the parties responsible for contributing to the contamination of a hazardous waste site are also primarily responsible for conducting or paying for the cleanup of the site. Responsible parties include current or former owners or operators of a site or the generators and transporters of the hazardous substances. CERCLA authorizes EPA to compel the responsible parties to clean up contaminated sites and also allows EPA to conduct cleanups and then seek reimbursement from the responsible parties. One of EPA's goals is ensuring that, to the extent possible, parties who are responsible for the contamination perform or pay for cleanup actions. In some cases, however, parties cannot be identified or may be unwilling or financially unable to perform the cleanup; we previously found that the number of NPL sites without viable responsible parties may be increasing.² In these cases, EPA can assume responsibility for site cleanup and seek reimbursement from any responsible parties that can be identified. The states may also play a significant role in cleaning up hazardous waste sites. Most states have established programs to help address hazardous waste sites, although many states have limited capacity to address costly and complex sites.

The Superfund trust fund has received revenue from four major sources: taxes on crude oil and certain chemicals, as well as an environmental tax assessed on corporations based upon their taxable income; appropriations from the general fund; fines, penalties, and recoveries from responsible parties; and interest accrued on the balance of the fund. The contribution of each of these sources changes from year to year, although trends are evident when comparing the composition of trust fund revenue during the periods before and after the expiration of Superfund's taxes. For fiscal years 1981 through 1995, after which Superfund-related taxing authority expired, taxes accounted for about 68 percent of trust fund revenues; appropriations from the general fund for 17 percent; interest for 9 percent; and fines, penalties, and recoveries for 6 percent. In contrast, from fiscal years 1996 through 2007, taxes accounted for about 6 percent of trust fund revenues; appropriations from the general fund for about 59 percent; interest for about 16 percent; and fines, penalties, and recoveries for about 19 percent. Each year, appropriations laws stipulate the level of the annual EPA Superfund program appropriation from the trust fund, and, regardless of the balance of the fund, EPA can only expend what is appropriated. For fiscal years 1981 through 2007, the Congress appropriated an annual average of \$1.2 billion in nominal terms to EPA's Superfund program, although the annual level of appropriated funds has declined in recent years when adjusted for inflation. The balance of the trust fund also declined from \$4.7 billion at the start of fiscal year 1997 to \$173 million at the start of fiscal year 2007. In addition to setting an overall level of funds available for EPA's Superfund program, the Congress has transferred portions of EPA's Superfund appropriation to other agencies or programs that support site cleanup. For fiscal years 1999 through 2007, EPA spent 77 percent of its Superfund monies on remedial and removal activities and almost all of the rest on enforcement and administration activities. During this period, overall program expenditures declined nearly 30 percent in constant dollars, from \$1.8 billion in fiscal year 1999 to \$1.3 billion in fiscal year 2007, mostly due to a decline in expenditures for remedial activities. Enforcement expenditures made up the largest portion of expenditures after site cleanup activities for fiscal years 1999 through 2007. EPA's annual enforcement expenditures fell from \$243 million to \$187 million over this period, but they consistently accounted for between 13 percent and 15 percent of total Superfund expenditures. Superfund

program administration costs also declined from fiscal year 1999 through fiscal year 2007, from \$143 million to \$132 million. Although declining in constant dollars, these costs increased from 8 percent to 10 percent of total Superfund expenditures during this period.”

1This number includes those sites on the NPL as well as those deleted from the NPL.

2GAO, Superfund Program: Current Status and Future Fiscal Challenges, GAO-03-850 (Washington, D.C.: July 31, 2003).

National Research Council National Academy Press announced,

Sediment Dredging at Superfund Megasites: Assessing the Effectiveness (2007)

Board on Environmental Studies and Toxicology, This publication is available through,

<http://books.nap.edu/openbook.php?isbn=0309109779>

Sediment Dredging at Superfund Megasites: Assessing the Effectiveness (Free Executive Summary) is available at, <http://www.nap.edu/catalog/11968.html>

ISBN: 978-0-309-10973-4, 316 pages, 6 x 9, (2007)

This report concludes that dredging as an approach for remediation of contaminated sediments has not been demonstrated to be an effective approach for contaminated sediment remediation. Please consult the report for further information.