UPDATED VERSION OF THE NATIONAL STORMWATER QUALITY DATABASE (VERSION 4.0)

ALEX MAESTRE & ROBERT PITT
DEPARTMENT OF CIVIL, CONSTRUCTION, AND ENVIRONMENTAL ENGINEERING
THE UNIVERSITY OF ALABAMA – TUSCALOOSA – ALABAMA

JANE CLARY
WRIGHT WATERS ENGINEERS
DENVER - COLORADO

INTERNATIONAL CONFERENCE ON WATER MANAGEMENT MODELING
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INTRODUCTION

- The National Stormwater Quality Database (NSQD) has been a reference for stormwater background concentrations throughout the United States.
- The database is organized by State, EPA Geographical Region, and Land Use.
- Started in 2001 compiling the results of Phase I NPDES Municipal Separate Sewer Storm Systems in collaboration with the Center of Watershed Protection.
- Current version contains the results of about 9,100 storm sampling events.

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BACKGROUND

- The purpose of the NSQD is to collect Event Mean Concentration (EMC) data and supporting information from previously conducted monitoring programs.
- This data can be used to assist stormwater managers in identifying typical stormwater conditions for their area.
- NSQD has been used by stormwater researchers to identify trends and differences between different sampling methods, land use, geographical location, and other factors.
- Currently managed by the University of Alabama. The database is being transferred to the International Stormwater BMP Database.

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SOURCES OF INFORMATION

- Almost 600 sampling locations, with a median of 10 samples per site (maximum 115). More than 700 new storms were added to this version of the database in addition to reviewing and adding supporting information for the complete dataset. New version include additional information from Colorado (34 sites), California (2 sites), and Kansas (10 sites).
- We also developed and conducted an expanded QA/QC process for the complete dataset. We reviewed and standardized notes, supporting information, and qualifiers for each record.
- Most of the data included in the NSQD was obtained from Phase I NPDES municipal monitoring programs along with several other sources.

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WHAT IS INCLUDED IN THE NSQD?

Source	Total Number of Events	Percentage
Phase I NPDES (MS4)	5707	62.5
EPA's Nationwide Urban Runoff Program (NURP)	1757	19.2
International BMP Database (influent data)	883	9.7
Special Projects (USGS, state programs, and others)	783	8.6
TOTAL	9130	100

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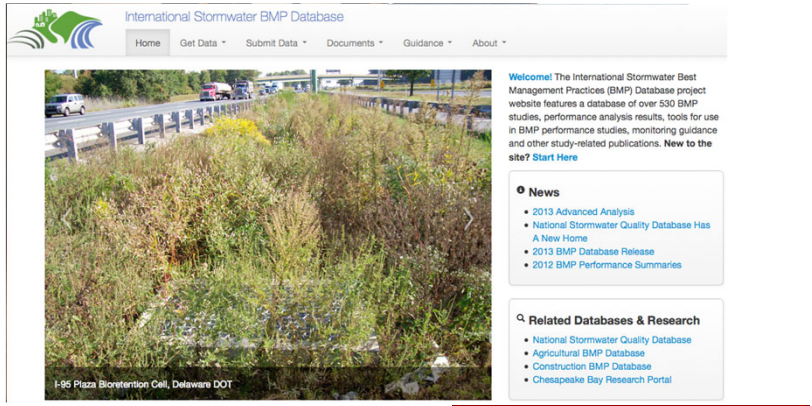

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WHO IS USING THE DATABASE?

- Academic journals and presentations at technical conferences (WEFTEC, EWRI ASCE, LID, International Conference on Water Management Modeling).
- NPDES Phase II municipalities: Chesapeake Bay, State of Michigan.
- Guidance Documents: Urban Drainage and Flood Control District (2008), Center for Watershed Protection (2008)

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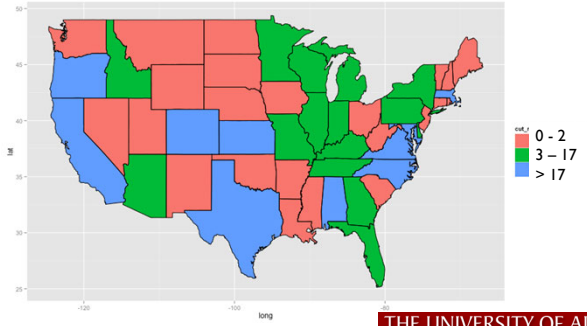
SAMPLING LOCATIONS BY STATE



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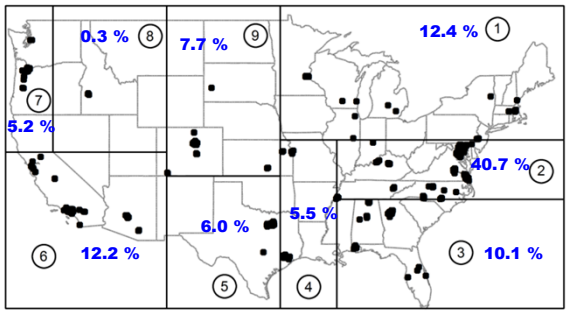
NUMBER OF STORMS BY EPA RAIN REGION



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NEW FEATURES IN VERSION 4.0

- Descriptive Statistics including censored values
  - Average
  - Median
  - Standard Deviation
- Probability Distribution including censored values
  - First Quartile (Q1)
  - Median
  - Third Quartile (Q3)
  - Total of 15 percentile values to represent the complete distribution

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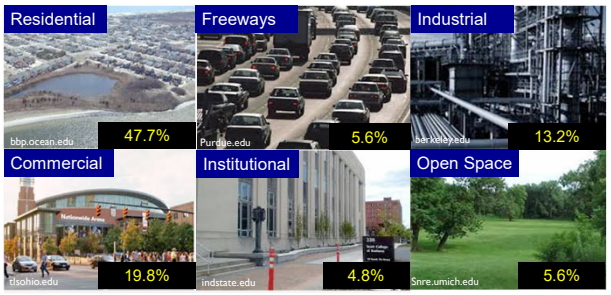
LAND USE DISTRIBUTION



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SITE DESCRIPTIONS

- Narrative about each municipality/site monitoring program
- Aerial photos
- Watershed delineation (if available)
- Parameters collected and period of collection
- Methods used during the water quality analysis
- Each report for each municipality is approximately 7 pages long
- These reports are in progress and will be available on the NSQD website

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SITE DESCRIPTIONS

MS4 NPDES Data – California MS4 Community and Station Profiles

California Department of Transportation

1.0 Introduction

The Caltrans NPDES permit was adopted by the California State Water Resources Control Board on July 15, 1999. In California, EPA has delegated administration of the federal NPDES program to the SWRCB and the nine Regional Water Quality Control Boards. Prior to this date, Caltrans was under permit in all of the areas of California that had been determined to require an MS4 permit with the exception of the Salinas area. These permits were issued individually by each Regional Water Quality Control Board over various time periods from 1990 to 1997. Caltrans requested that the SWRCB adopt a single NPDES permit for storm water discharges from all Caltrans properties, facilities and activities. This permit was issued in 1999, and because the RWQCBs had already issued permits to all areas requiring them, this permit was not considered a new storm water permit, and a Part I and Part II application were not required. Therefore, all of the data included in the Caltrans database was assumed to be long-term monitoring data as opposed to application monitoring data.

The long-term monitoring data sampling protocol described here is broken out into two sections: data collected prior to 2000, and data collected from 2000-2002. Long-term monitoring data collected from 2000-2002 was obtained under the single Caltrans permit and used a standardized sampling strategy for all sites. The data collected prior to 2000 was collected under different permits with more potential for variation in sampling strategies.

Because this is a statewide sampling program, a general description of the area is not available, as rainfall, climate and population vary widely across the state. Further information about individual sampling stations is provided below.

2.0 Sampling Stations

Long-Term Monitoring

The Caltrans database contained storm water data for several hundred sampling sites. After eliminating data from instream sampling stations, BMP sampling stations, dry weather samples, sediment samples, construction site samples, ground water samples, snowfall and snowmelt samples, blanks and duplicates and outfalls that drained mixed use, open space, agricultural or forested catchments, 15 sites remained. Table 1 presents the sites sampled prior to 2000 and Table 2 presents the sites sampled from 2000-2002.

Table 1. California Department of Transportation Long Term Monitoring Sites Prior to 2000

Site ID	Site Name	Drainage Area (acres)	Landuse	%	Comments
CACTA005	7-01	0.99	Transportation	100	Located in Los Angeles County
CACTA006	7-127	0.99	Transportation	100	Located in Los Angeles County
CACTA007	7-128	0.99	Transportation	100	Located in Los Angeles County
CACTA008	7-201	3.16	Transportation	100	Located in Los Angeles County
CACTA009	7-202	4.18	Transportation	100	Located in Los Angeles County
CACTA010	7-203	0.96	Transportation	100	Located in Los Angeles County
CACTA011	8-01	0.4	Transportation	100	Located in Riverside

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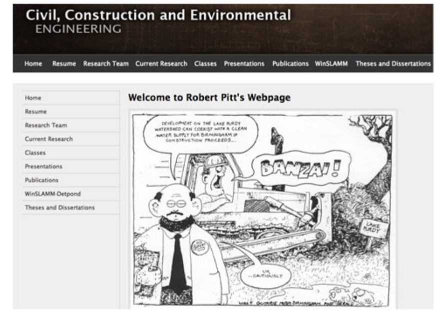
WEBSITE

- Previous versions of the database
- Research articles
- Power point presentations

rpitt.eng.ua.edu



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WEBSITE

Recent Papers and Presentations of National Stormwater Quality Database

Pitt, R., A. Maestre, and R. Morquecho. "Stormwater characteristics as contained in the nationwide MS4 stormwater phase 1 database." Water World and Environmental Resources Conference 2004. Environmental and Water Resources Institute of the American Society of Civil Engineers, Salt Lake City, Utah. July 27 - August 1, 2004. (conference CD-ROM) (1606 Kb)

Maestre, A., Pitt, R. E., and R. Morquecho. "Nonparametric statistical tests comparing first flush with composite samples from the NPDES Phase 1 municipal stormwater monitoring data." Presented at the Stormwater and Urban Water Systems Modeling Conference. Computational Hydraulics, Inc. Toronto, Canada. Feb 2003 (1389 Kb)

Maestre, A., R. Pitt, S.R. Durrans, and S. Chakraborti. "Stormwater quality descriptions using the three parameter lognormal distribution." Presented at the Stormwater and Urban Water Systems Modeling Conference. Computational Hydraulics, Inc. Toronto. February 19 - 29, 2004. (801Kb)

Maestre, A. and R. Pitt. "Identification of significant factors affecting stormwater quality using the National Stormwater Quality Database." In: Stormwater and Urban Water Systems Modeling. Monograph 14. (edited by W. James, K.N. Irvine, E.A. McBean, and R.E. Pitt). CHI. Guelph, Ontario. pp. 287 - 326. 2006 (967Kb)

National Stormwater Quality Database (NSQD). Version 1.1 -- Spreadsheets

NSQD Version 3 Spreadsheet — Excel File

This most recent update on NSQD. It contains contains 8,602 rain events from 104 cities throughout the continental United States, and represents all 9 EPA Rain Zones and 12 land use categories.

Total size: 7.51 Mb, Updated: February 3, 2008, Version 3

NSQD Version 1.1 Spreadsheet — Excel File

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INTERNATIONAL BMP DATABASE WEBSITE

The NSQD is moving to a new website !!

International Stormwater BMP Database

Home Get Data Submit Data Documents Guidance About

National Stormwater Quality Database

Overview

The National Stormwater Quality Database (NSQD) is an urban stormwater runoff characterization database developed under the direction of Dr. Robert Pitt, P.E., of the University of Alabama and the Center for Watershed Protection under support from the U.S. Environmental Protection Agency. Originally released in 2001, followed by several updates, it has recently moved to a new long-term home as a companion project to the International Stormwater BMP Database. The NSQD is being maintained as a separate stand-alone database, serving as an important resource for municipal stormwater managers and researchers who are seeking urban runoff characterization data. The NSQD can be searched for water quality data based on land use, state, and EPA Rain Zone, along with several other criteria. The NSQD can be downloaded from this website, and a new on-line user interface will be developed in the future.

Download the NSQD

The NSQD Version 3.1 (last updated March 2011) can be downloaded in two formats containing the same information:

1. NSQD Version 3.1 Excel Spreadsheet (original format) **Coming Soon**
2. NSQD Version 3.1 Access Database (new format) **Coming Soon**

Papers and Previous NSQD Analyses

During the transition of the NSQD to its new home, additional explanatory information can be accessed here .

NSQD History

In 2001, the University of Alabama and the Center for Watershed Protection were awarded a U.S. Environmental Protection Agency, Office of Water 104(b)3 grant to collect and evaluate stormwater data from a portion of the NPDES (National Pollutant Discharge Elimination System) MS4 (municipal separate storm sewer system) stormwater permit holders. In 2008, the NSQD was updated with additional data under continued 104(b)3 support from the EPA. These stormwater quality data and site descriptions were collected and reviewed to describe the characteristics of national stormwater quality, to provide guidance for future sampling needs, and to enhance local stormwater management activities in areas having limited data. The monitoring data collected over nearly a ten-year period from more than 200

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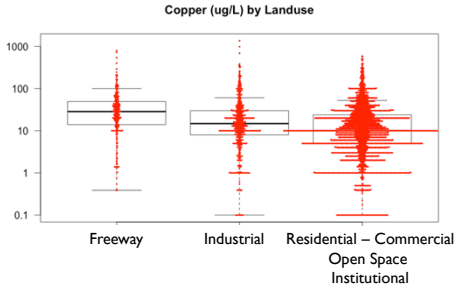
STORMWATER CONSTITUENTS ANALYSIS



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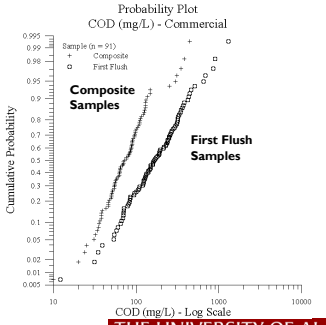
STORMWATER CONSTITUENTS ANALYSIS

First Flush was not observed in open space locations.

It was more likely to occur in sites with high percentage of impervious



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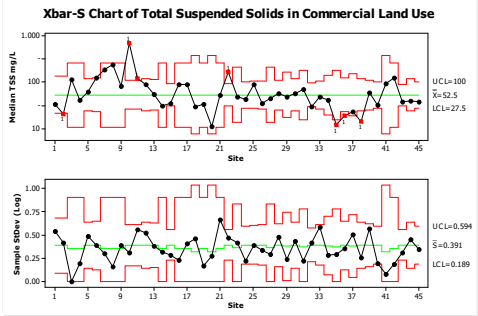
STORMWATER CONSTITUENTS ANALYSIS



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STORMWATER CONSTITUENTS ANALYSIS

869 samples

84% detected

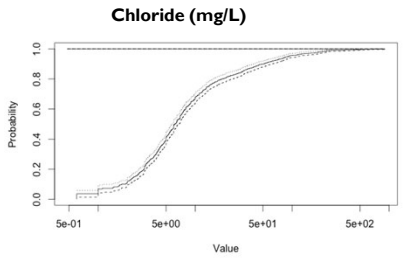
<1 (1%), <2 (6%), <5 (9%)

Average no-censored: 26.39 mg/L

Average censored: 22.58 mg/L

Standard deviation no-censored: 66.50 mg/L

Standard deviation censored: 61.72 mg/L



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SUMMARY

- The NSQD can be used to estimate expected stormwater conditions in areas lacking data. These data can be used to develop monitoring programs such as to identify critical areas needing additional data.
- NSQD can be used for stormwater quality model calibration.
- The database can be used to test common assumptions concerning stormwater characteristics, such as the role of first flush, monitoring methods, geographical location, watershed area, etc.

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CONTACT

Alex Maestre
amaestre@eng.ua.edu

Robert Pitt
rpitt@eng.ua.edu

Jane Clary
clary@wrightwater.com

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