JORDAN COVE WATERSHED PROJECT

SECTION 319

2007

FINAL REPORT

PREPARED BY JOHN C. CLAUSEN

DEPARTMENT OF NATURAL RESOURCES MANAGEMENT AND ENGINEERING
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF CONNECTICUT, STORRS

University of Connecticut
College of Agriculture and Natural Resources

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ACKNOWLEDGEMENTS

There are numerous individuals who have worked and continue to work on the Jordan Cove Urban Watershed Project. These individuals are acknowledged below by organization.

Aqua Solutions, L.L.C.
Bruce Morton
Stephen Pietrzyk

Connecticut Department of Environmental Protection
Ernie Pizzuto
Paul Stacey
Eric Thomas
Stan Zaremba

Cooperative Extension System
Chester Armold
Karen Filchak

John W. Deering, Inc.
John Deering

D.W. Gerwick Engineering
Don Gerwick

Lombardi Inside/Out L.L.C.
John Lombardi

Town of Waterford
Hank Daniels
Maureen FitzGerald
Dave Martin
Tom Wagner

University of Connecticut
John Alexopoulos
Erik Bedan
Paul Belanger
Jack Clausen
Michael Dietz
John Engdahl
Jennifer Gilbert
Karl Guillard
Mark Hood
Deb Horton
Mary Hull
Tom Morris
Christy O'Neill
Robert Phillips
Dave Schroeder
Coleen Spurlock

U.S. Department of Agriculture Natural Resources Conservation Service
Joe Neafsey
Walt Smith

U.S. Environmental Protection Agency

Mel Coté
Steven Winnett

This project was funded in part by the CT DEP through a US EPA nonpoint source grant under § 319 Clean Water Act. Funds provided through the CT DEP were matched on a 60% Federal to a 40% local basis. The source and distribution of funds are shown below.

Total Project Funding Summary

	Funding Source ($)			
Project Element	Federal	State[1]	Local	Total
Project Management	48,400	NA[2]	6,600	55,000
Land Treatment	151,882	NA	106,675	258,557
Water Quality Monitoring	779,718	540,058	NA	1,319,776
Total	980,000	540,058	113,275	1,633,333

[1]State is match by the University of Connecticut.
[2]Not Applicable

EXECUTIVE SUMMARY

BMP Watershed

The volume of stormwater runoff from the BMP Watershed decreased (-97%) during the construction period and remained lower than expected (-74%) during the post-construction period. During construction, the concentrations of TSS, NO_3-N, NH_3-N, TKN, and TP increased. Following construction, TSS, NO_3-N, TP, and TKN concentrations remained higher than expected but metals decreased. NH_3-N concentrations were also lower but near detection limits. Concentration peaks during construction were associated with turfgrass development. Exports from the BMP watershed generally did not change during the construction period, except for TSS and TP which increased and Zn which decreased. Following construction, exports generally decreased except TSS and TP, which increased.

Traditional Watershed

During construction and following construction, stormwater runoff from the traditional watershed increased. During construction, concentrations either did not change, or for TKN and TP, declined. Following construction, TSS, TKN, and TP concentrations declined. However, exports increased for all variables during both construction and post-construction periods, except for Pb following construction. The increase in flow controlled these export increases. The erosion and sediment controls used during construction appeared to work at this site.

Driveway Runoff Study

Stormwater runoff and mass export of solids, nutrients, and metals was greater from the asphalt than the pavers than the crushed stone driveways. Concentrations of solids, nutrients and metals were lower in runoff from the paver driveways than the asphalt driveways. Concentrations of TP and Pb were lower in runoff from the crushed stone driveways than from the asphalt driveways.

Lawn Nutrient Study

NO_3-N desorbed from AEM strips, soil water NO_3-N concentrations and plant reflectance all indicate that the BMP lawns being monitored have lower values than the non-BMP lawns**.** Soil P concentrations in the BMP watershed were ranked medium during the study.

Household Survey

The survey of residents in the three watersheds revealed little differences among their behaviors. BMP residents mulch their leaves and mow their own lawns compared to the control watershed. No differences in fertilizer habits were observed. There were also no differences in behaviors across years within each watershed.

Conclusions and Recommendations

The BMPs used were able to keep runoff volume and peak at predevelopment levels, which was a project goal. Reduced N and P export goals were also met but TSS export goals were not met. For future projects, cluster designs, LID-based regulations and stormwater disconnects are recommended. Future construction projects should control compaction, maximize undisturbed soils, and use on-site supervision. Earthen berms were and effective BMP. Sediment control for swales and following soil test recommendations are important. Following construction, maintenance of bioretention areas, infiltrating pavers, turf dams, and appropriate grass mixes is needed. Further study is needed of groundwater effects, behavioral social indicators, the economics of LID, and soil testing.

INTRODUCTION

Background

Long Island Sound is an impaired estuary due to low dissolved oxygen (hypoxia), toxic contaminants, pathogen contamination, floatable debris, and habitat degradation (LISS, 1994). Excessive nitrogen is believed to be responsible for hypoxia in the Sound. Nonpoint sources of pollution are estimated to be responsible for 21 % of in-basin human contributions of nitrogen to the Sound; the remaining nitrogen is supplied by point sources such as sewage treatment plants. Boundaries of the Sound transport 20 % of human-caused pollutant loading to the Sound.

Average toxic metal concentrations in Long Island Sound generally do not exceed New York or Connecticut standards except for mercury which exceeds standards occasionally in the East River (LISS, 1994). However, some sediments in western Long Island Sound have elevated concentrations of As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn with respect to the New York guidelines but not the Connecticut guidelines. Also, many urbanized harbors have sediments contaminated with metals. Some portions of Long Island Sound's sediments are higher than the NOAA national high values for PCB, DDT, and Chlordane (LISS, 1994). Urban runoff is believed to be the third major source of toxics following upstream sources (tributaries) and sewage treatment plants.

Pathogen contamination in Long Island Sound has been responsible for 1,440 beach-day closures from 1986 to 1990 (LISS, 1994). Also 73 % of the shellfish beds in New York and 35 % in Connecticut have been classified as "Restricted/Prohibited" due to pathogen contamination from both point and nonpoint sources. However, some closures are due to inadequate monitoring. Urban runoff, including CSO's is believed to be responsible for 47 % of the fecal coliform loading to Long Island Sound (LISS, 1994). Rivers, including upstream point and nonpoint sources add an additional 52 % of bacterial loading.

Floatable debris is found in the Sound, its bays and washed up on beaches. Most debris (74 %) are plastics. This debris is a threat to estuarine life. The floatable debris in the sound comes from stormwater discharges and CSOs, tributaries, and shoreline visitors and boaters. It is believed that 82 % of the debris is from storm sewers and CSOs (LISS, 1994).

Jordan Cove is a small estuary composed of a long (1.75 mi.) narrow (300 ft) neck feeding into an inner Cove (100 ac.) and then an outer Cove (390 ac.) before flowing into Long Island Sound. The inner cove is separated from the outer cove by a large sandbar. Fecal coliform bacteria sampling in the cove since 1990 has indicated that inner Jordan Cove has not met the bacteriological water quality criteria for an "Approved" shellfish growing area of a mean of 14 MPN/100 ml and <10 % of samples exceeding 43 MPN/100 ml. Inner cove samples have had a geometric mean ranging from 26 to 154 MPN/100 ml. Outer Jordan Cove also does not meet the criteria during wet weather conditions. Inner Jordan Cove is currently classified as "Restricted-Relay" for shellfish and outer Jordan Cove could be upgraded to a "Conditionally Approved" area.

Sediment sampling in Jordan Cove in 1994 indicated that certain portions of the Cove have high concentrations of arsenic (> 20 ppm) but no other metals exceed Connecticut guidelines. Water quality sampling in Jordan Cove in September, 1993 found dissolved oxygen concentrations ranged from 8.1 to 4.1 mg/l in bottom waters indicating, at least on a transient basis, depressed dissolved oxygen concentrations in portions of the Cove.

Jordan Brook has been sampled at eight locations since 1993 (EcoScience Laboratory, 1993). Additional sampling was conducted in 1978. Biological sampling of the eight sites was conducted in 1994. Fecal coliform abundance in Jordan Book appears to increase as it flows downstream. Sampling date averages have been 480, 84, and 48 FCU/100 ml. Total phosphorus concentrations average below 0.03 mg/l and nitrate concentrations are below 1 mg/l. The dissolved oxygen in the stream has ranged from 4.8 to 9 mg/l.

Biological sampling in Jordan Brook indicated that disturbance varies along the brook. The uppermost station is most natural and least disturbed. Two of the sites appear to be adversely influenced by siltation. The site below I-95 has an absence of mayflies and stoneflies (Jokinen and Colson, 1994).

The United States Environmental Protection Agency (USEPA) reports that nonpoint sources are responsible for a large portion of the remaining water quality impairments to our nation's waters (USEPA, 1998). Of the 72% of estuaries surveyed, 38% were designated impaired for one or more uses with nutrients being the largest pollutant. Inherent in the urbanization process is land under development. Construction and/or urban runoff were reported as sources of pollution at 14 of the 18 National Estuary sites, including Long Island Sound (USEPA, 1994a).

The Jordan Cove Urban Watershed National Monitoring Program Project was funded, in part, through the Connecticut Department of Environmental Protection (CT DEP) by the U.S. Environmental Protection Agency's (EPA) Section 319 National Monitoring Program (NMP). The Jordan Cove project is the only one of the 24 NMP project's nationwide that studied the effects of residential subdivision development on runoff quality and quantity, and of BMPs (or low impact development practices) designed to mitigate those impacts. The Section 319 NMP was established pursuant to section 319(l) of the federal Clean Water Act (Nonpoint Source Management Programs - Collection of Information). Section 319(l) states that EPA shall collect information and make available: (1) Information concerning the costs and relative efficiencies of best management practices for reducing nonpoint source pollution, and (2) Data concerning the relationship between water quality and implementation of various management practices to control nonpoint sources of pollution. The objectives of the Section 319 NMP are twofold: (1) To scientifically evaluate the effectiveness of watershed technologies designed to control nonpoint source pollution, and (2) To improve our understanding of nonpoint source pollution. To achieve these objectives, the NMP has selected watersheds across the country to be monitored over a 6- to 10-year period to evaluate how improved land management and the application of BMPs reduce water pollution. The results from these projects are being used to assist land use and natural resource managers by providing information on the relative effectiveness of BMPs to control nonpoint source pollution.

Project Description

The Jordan Cove Urban Watershed Section 319 National Monitoring Program Project was a ten year study designed to determine the water quantity and quality benefits through the development of an urban subdivision using pollution prevention BMPs. Stormwater runoff from three watersheds - control, traditional and best management practice (BMP) - was monitored as part of the study. The traditional watershed has been developed using 'traditional' subdivision requirements. The BMP watershed has been developed using a best management practice approach before, during, and after construction. The runoff from these two watersheds was compared to an existing control watershed. Ultimately, the goal was to show that, by using a BMP approach, pre-development hydrologic conditions can be maintained during and after residential development.

OBJECTIVES

The overall objective of the project was to demonstrate the water quantity and water quality benefits of developing urban residential subdivisions with BMP nonpoint source controls. There were a number of specific objectives related to the project:

1. To reduce the amount of runoff and sediment, bacteria, N, and P from residential developments during construction.
2. To reduce the amount of runoff and sediment, bacteria, N, and P exported from residential developments.
3. To demonstrate the use of residential nonpoint source controls for educational purposes.
4. To investigate the effectiveness of individual BMPs including alternative driveway pavement treatments, grassed swales, roof runoff rain gardens, landscaping, reduced site imperviousness, and general good housekeeping practices.

The following quantitative treatment goals were developed consistent with the 6217 Coastal Zone guidance (EPA, 1993).

1. To implement BMPs on 100% of the lots in the BMP portion of the subdivision.
2. To maintain post-development peak runoff rate and volume at levels equal to predevelopment rates.
3. To maintain post-development loading of TSS at levels equal to predevelopment rates.
4. To retain sediment onsite during construction.
5. To reduce nitrogen export by 65%.
6. To reduce bacterial export by 85%.
7. To reduce phosphorus export by 40%.

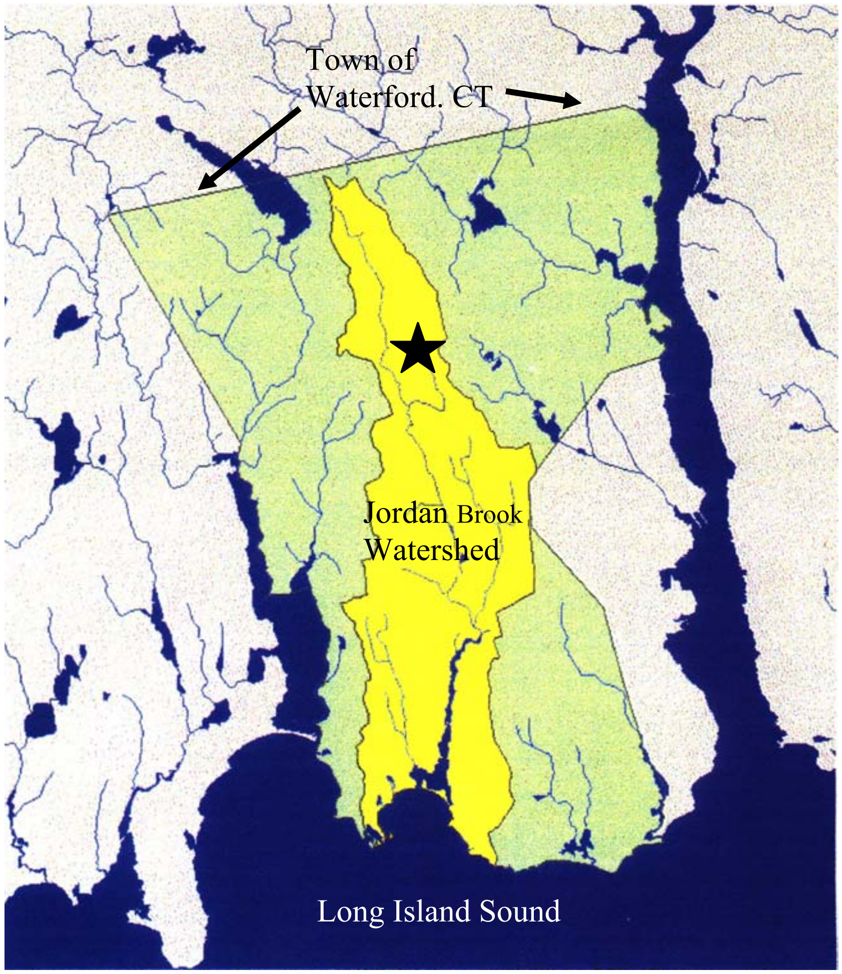


Figure 1. Jordan Cove Watershed showing location of project ★ .

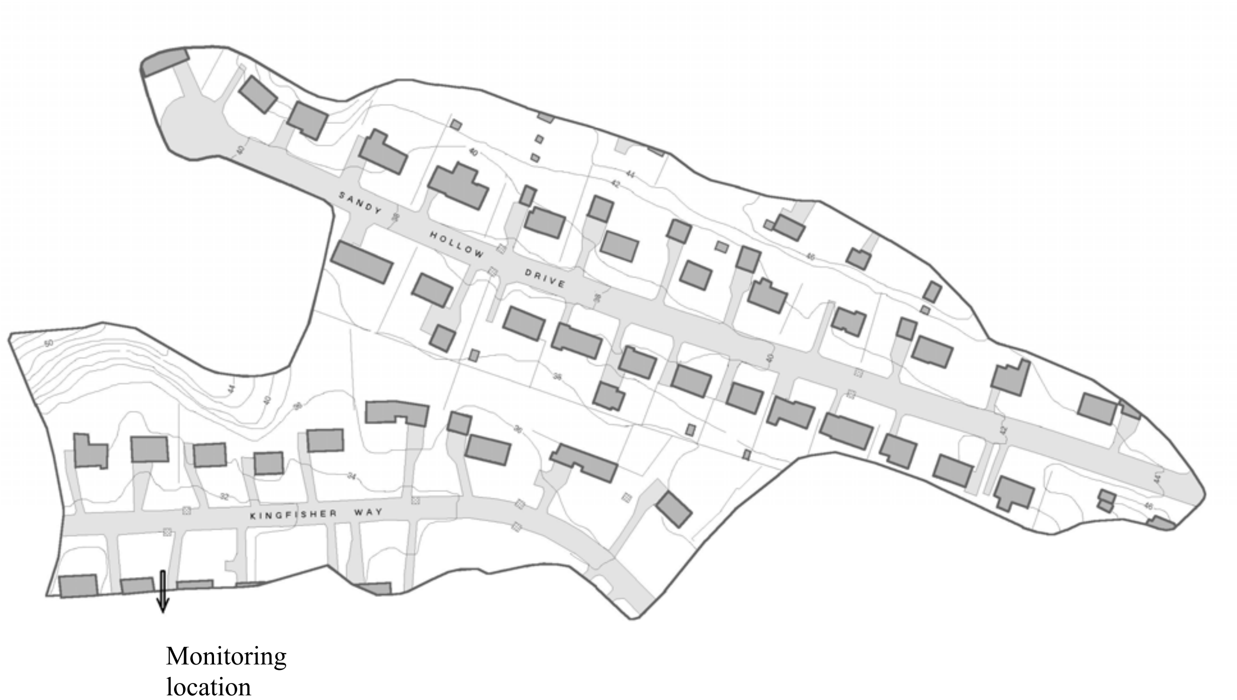
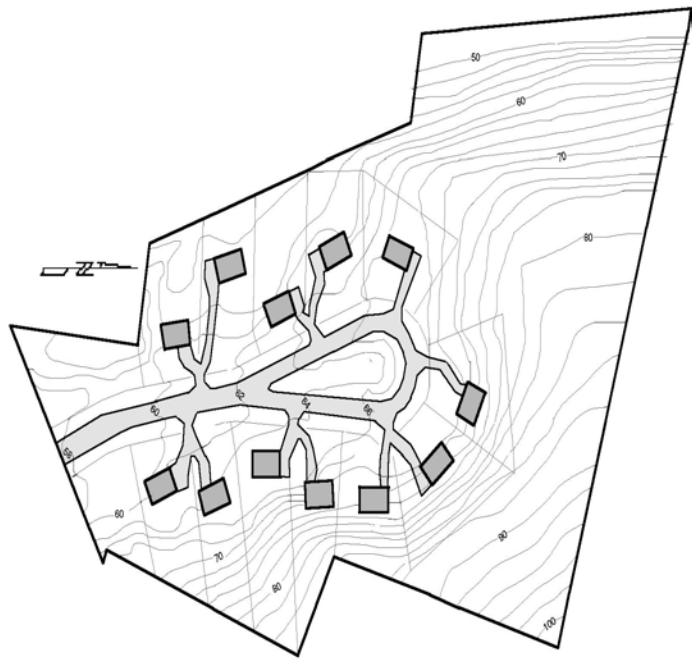


Figure 2. Control watershed subdivision showing monitoring location.

A.



B.

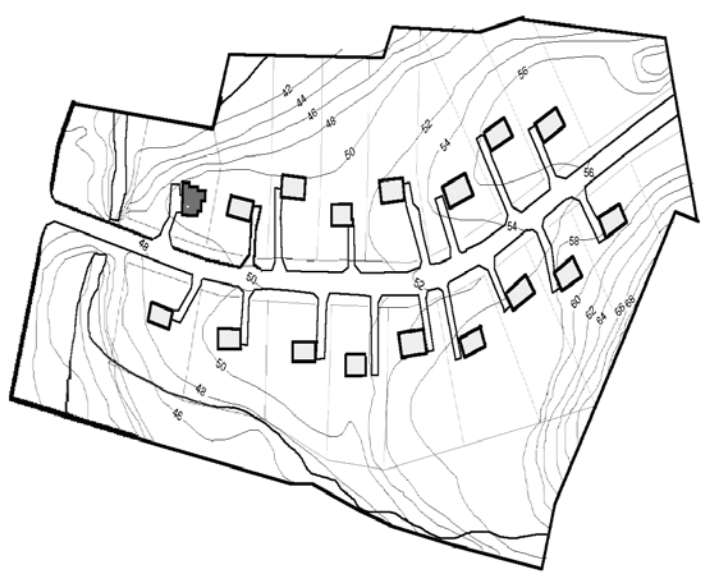


Figure 3. Jordan Cove subdivision showing area A (best management practices) and area B (traditional subdivision).

PROJECT ORGANIZATION AND RESPONSIBILITY

Key personnel associated with the project are identified in Figure 4. John Clausen served as the person directly responsible to EPA for the quality and timely completion of the project. The project was assisted by a University Research Technician II and by several graduate and undergraduate students. All water quality analysis has been conducted in the Department of Natural Resources Management and Engineering Water Quality Lab except for the metal analysis which was conducted by the Environmental Research Institute at the University of Connecticut.

A Project Advisory Committee was established to provide a forum for continuing dialogue on the project. The Committee met twice per year. The following individuals and agencies participated on the advisory committee:

Bruce Morton
Aqua Solutions

Stan Zaremba, Paul Stacey, Ernie Pizzuto, Eric Thomas
Connecticut Department of Environmental Protection

Chester Arnold, Karen Filchak
Cooperative Extension System

Mel Coté, Steve Winnett
U.S. Environmental Protection Agency

John Lombardi
Inside/Out LLC

Tom Wagner, Hank Daniels, Maureen FitzGerald, Dave Martin
Town of Waterford

Jack Clausen, John Alexopoulos, Karl Guillard
University of Connecticut

Heather Crawford
Sea Grant Extension Program

Walt Smith, Joe Neafsey
Natural Resources Conservation Service

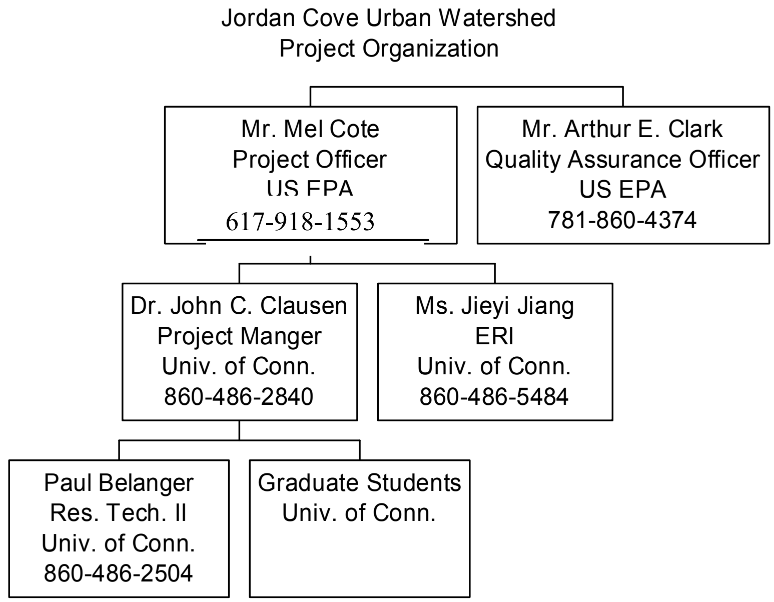


Figure 4. Jordan Cove Watershed project organizational chart.

METHODS

Study Design

The overall study design is the paired watershed approach (Clausen and Spooner, 1993). This approach uses two different time periods consisting of calibration and treatment phases. During calibration, at least two watersheds similar in size and location are monitored over time to determine a hydrologic relationship between them. During the calibration period no land use changes occur and regressions are developed between paired observations. Once a satisfactory relationship has been determined, treatment of one of the watersheds can begin whereupon changes over time can be monitored and new regressions can be developed. Changes between the periods are calculated based on a comparison of predicted values calculated from the regression equations and observed values during the treatment period. There are three watersheds in this study consisting of a control watershed and two treatment watersheds; traditional, and BMP.

The calibration period started at different dates depending on the site, and the treatment period start dates varied also (Table 1).

Project Schedule

Table 1. Jordan Cove Project Schedule.

Watershed	Calibration	Construction	Post-Construction
Control	11/95 -		
BMP	1/18/96 – 3/23/99	3/23/99 – 8/1/02	8/1/02 – 6/30/05
Traditional	8/96 – 10/8/97	10/8/97 – 6/19/03	6/19/03 – 6/30/05

Study Area

The project is located in the town of Waterford, CT (Figure 1). The watersheds studied are located in the drainage basin contributing to a small estuary called Jordan Cove which in turn discharges into the Long Island Sound. The control site is a 5.5 ha. residential watershed containing 43 lots, ranging in size from 15,000 sq ft to 20,000 sq ft, that was developed in 1988 (Figure 2). The traditional site is a subdivision containing 18 lots using ‘traditional’ regulations and construction practices (Figure 3B). Traditional house zoning was used, as was a curb and gutter stormwater collection system. A typical 8.5-m asphalt road was installed. Landscaping and turf is similar to other new subdivisions. Roof runoff was directed to lawn areas or onto driveways. Erosion and sediment controls used during construction were typical of other construction sites statewide. Impervious surface coverage is 32% (Table 2).

The BMP watershed incorporated several pollution prevention measures as part of its design (Figure 3A). The BMP portion of the subdivision is 12 units on 1.7 ha (Table 2). There is 26 %

open space in the entire subdivision, mostly along the periphery. The past use of the property that is being development is a poultry farm in the area to be subdivided using traditional requirements; the BMP area was a closed-out gravel pit. A main feature was the replacement of a traditional 8.5 m. asphalt road and curbs-and gutters, with a 6.1 m- wide concrete paver road and grassed bioretention swales. A bioretention cul-de-sac that allows for detention and infiltration of runoff was constructed in lieu of a conventional paved area. Individual bioretention gardens were incorporated into each lot to detain roof and lot runoff. Several alternative driveway surfaces were installed including asphalt, concrete pavers, and gravel. Houses were constructed in a cluster layout with reduced lawns, low-mow areas, and no-mow areas. Deed restrictions were developed to prevent certain activities during the study and ongoing education programs were used to instruct owners on good housekeeping practices. During construction additional BMPs were used including locating and seeding stockpiles to prevent sediment loss, hay bales, silt fence, earthen berms and basement holes to retain stormwater onsite, and post-storm maintenance. Watershed areas for the traditional and BMP sites varied during land development. A custom grass mixture was developed for the site consisting of 30% perennial ryegrass, 20% Kentucky bluegrass, and 50% chewings fescue and hard fescue.

A comparison of imperviousness among the watersheds indicates that the BMP watershed has less impervious area than the traditional watershed (Table 2). The percentage in road and driveways is also lower for the BMP watershed than the traditional watershed.

The project is located in a climate that is influenced by both continental polar and maritime tropical air masses (Brumbach, 1965). Average annual precipitation is approximately 1,265 mm and distributed uniformly throughout the year. Hurricanes enter the state periodically. Soils on the sites are mapped as Canton and Charlton with an increasingly disturbed urban land classification associated with construction.

Table 2. Characteristics of study watersheds in Waterford, CT.

	Control	Traditional	BMP
Watershed area (ha)	5.5	2.0	1.7
No. of lots	43	17	12
Average lot size (ha)	0.16	0.15	0.10
% Total Impervious	29	32	22
% Buildings	9.6	10.1	8.3
% Driveways	6.7	8.9	6.1*
% Road	12.6	11.8	5.5*
% Sidewalks	NA	0.8	1.1

*Ecostone pavers assumed to be 88% impervious and included in calculations.

Site Development Waivers

Several waivers of the subdivision regulations for the Town of Waterford were obtained as part of the design of this study. These waivers included the reduction of road width from 8.5 to 6 m in the BMP watershed, reducing the curb height from 15 cm to no curb, and allowing paver blocks instead of asphalt. Also the cul-de-sac was modified to allow an oblique form vs a standard 15 m radius, that would have one-way traffic flow, and center depressed island as a bioretention area.

Deed Restrictions

Deed covenants were included in two documents as part of the subdivision. The first document is termed a "Declaration". The declaration is needed to create a common planned community. The declaration also created the Glen Brook Green Association to oversee the common areas and administer the by-laws. The following are relevant sections of the declaration:

Sect 8.2 – Use and Occupancy Restriction for Specific Units

(a) Lots 10 through 21 inclusive are subject to an easement for the construction and maintenance of "Rain Gardens" with overflow connection to the grassed swale and/or detention basin as shown on said map.

(b) Lots 10 through 21 inclusive, and lots 22 through 28 inclusive are subject to an easement for the construction and maintenance of a drainage swale as shown on said map.

(g) All lots are part of a study site under Section 319 National Monitoring Program between the declarant, Federal, State and Local entities including but not limited to U.S. Environmental Protection Agency, Connecticut DEP, University of Connecticut and the Town of Waterford Conservation Commission and Planning and Zoning Commission, Grantees of Units 10 through 21 by the acceptance of a deed to said Unit agree to use their best efforts to cooperate with federal, state, and local officials to implement "best management practices" (BMP) and other storm water control techniques.

(h) The following covenants, easements and restrictions shall apply to Lots 10 through 21 for a period of time no later than ten (10) years from the date hereof (March 19, 1998):

  (1) No structures, fences, posts, mailboxes or other obstructions to water flow shall be placed in any swale or Rain Gardens located on said Lots 10 through 21.
  (2) No filling or alteration to the topography of any swales or Rain Gardens on said Lots 10 through 21 shall be allowed.
  (3) Driveways shall be maintained in original surfaces.
  (4) No impervious additions shall be permitted to any Unit building, including, patios, extension of driveways, provided however that "accessory buildings" as allowed by the Town of Waterford Zoning Regulations will be permitted upon approval by the Town of Waterford.
  (5) Units 10 through 21 are subject to the following BMP's: grass biotentention swale, bioretention gardens, area entitled "Conservation Zone", unit owners shall accept said units subject to the rules, regulations and restrictions as may be issued under the Section 319 National Monitoring Program for said areas.

(i) Plants located in any area of a Unit designated as "low mow area" and plants located in any Rain Garden shall not be disturbed, but in the event of replacement thereof only plants from the approved list attached to the landscaping plan of the subdivision map shall be allowed.

The Bylaws of Glen Brook Green Association, Inc. reaffirm the program in Section 3.11 below:

<u>Section 3.11 – National Monitoring Program</u>. All Unit owners acknowledge and recognize that for a period of ten (10) years from the date of the subdivision approval all lots are part of a study site under Section 319 National Monitoring Program between the Declarant, Federal, State, and Local entities including but not limited to U.S. Environmental Protection Agency, Connecticut DEP, University of Connecticut and the Town of Waterford Conservation Commission and Planning and Zoning Commission. All unit members agree to use their best efforts to cooperate with Federal, State and Local officials in their studies of the subdivision. Unit members will not take any action that will interfere with the restrictions and obligations of Units 10 through 21 to use their best efforts to cooperate with federal, state, and local officials to implement "best management practices" (BMP) and other storm water control techniques. Unit owners acknowledge that Association has the power to levy reasonable fines for any violation of this section (See Section 2.2 [k]). Unit owners agree not to amend these by-laws in any way that

might affect the Section 319 National Monitoring Program unless the Town of Waterford consents in writing.

Monitoring Methods

Precipitation was recorded at the BMP site using a heated tipping bucket rain gauge. Air temperature was continuously monitored to allow separation of snowmelt periods from precipitation events. Stormwater flow was monitored continuously during storm events from the three watersheds using ISCO 4230 bubbler flowmeters. The control monitoring site has a combination rectangular/V-notch weir, installed in a 76 cm. stormwater pipe, discharging into a detention pond. The traditional monitoring site used a 38.1 cm. Palmer-Bowlus flume attached to a stormwater pipe located in a monitoring manhole. During calibration a 45.72 cm. H-flume was used to measure overland flow. A 45.72 cm. H-flume was used at the end of a grassed swale at the BMP monitoring site.

Samples were collected automatically by an ISCO sampler that has been programmed to collect a sample every 500 cu ft of discharge. Collected samples were refrigerated in-situ. Three samples were taken at each flow interval; one is pre-acidified with sulfuric acid for nutrient preservation, the second is pre-acidified with nitric acid for metals analysis, and the third is not acidified. The third sample is intended for suspended sediment analysis. If flow was occurring during the field visit, a grab sample was taken for BOD and fecal coliform analysis.

Collected samples were immediately placed in a cooler with ice packs and transported to the water quality laboratory where they were stored in a refrigerator that has a constant temperature of 4^oC.

Each sample was dated and coded according to site, sample type, station number, and sample sequence. The actual sample containers were labeled only with a sample number for identification and whether the sample is acidified (A) and filtered (F).

Sample Analysis

Acidified composite stormwater samples were analyzed for nitrate+nitrite nitrogen (NO_3/NO_2-N), ammonia-nitrogen (NH_3-N), total Kjeldahl nitrogen (TKN), and total phosphorus (TP) using a Lachat colorimetric flow injection system (USEPA, 1983). Non-acidified samples were analyzed for total suspended solids (TSS) using an approved EPA gravimetric method (APHA, 1989; USEPA, 1983). Acidified unfiltered samples were composited on a monthly basis and analyzed for copper (Cu), lead (Pb), and zinc (Zn) (USEPA, 1983). Grab samples were performed on site visits when stormflow was present and analyzed for fecal coliform bacteria and 5-day biochemical oxygen demand (USEPA, 1983). Sample volumes, preservation methods, and holding times are summarized in Table 3. Analytical methods are summarized in Table 4. Values for mass export (kg/ha/yr) were calculated by the multiplication of weekly cumulative flow and weekly sample concentration and subsequently divided by watershed area.

Maintenance

ISCO pump tubing was cleaned following the collection of 20 samples by removing the tube in place and replacing it with a cleaned tube. Cleaning includes pumping hot tap water through the tubing for at least two minutes, acid washing for two minutes, and rinsing with distilled water for two minutes. An equipment blank was collected every 20 samples by activating the ISCO sampler and running distilled water through the pump tubing into a bottle.

Table 3. Field sampling table for the Jordan Cove Urban Watershed Project.

Parameter	No/yr	Volume	Container	Preservation	Holding Time
Total suspended solids	156	200 ml	Plastic	Cool, 4^oC	7 days
Total phosphorus	156	50 ml	Plastic	Cool, 4^oC H_2SO_4 to pH<2	28 days
Total Kjeldahl-N	156	50 ml	Plastic	Cool, 4^oC H_2SO_4 to pH<2	28 days
Ammonia-N	156	12 ml	Plastic	Cool, 4^oC H_2SO_4 to pH<2	28 days
Nitrate+nitrite-N	156	12 ml	Plastic	Cool, 4^oC H_2SO_4 to pH<2	28 days
Fecal Coliform	156	100 ml	Plastic	Cool, 4^oC	6 hours
BOD	156	300 ml	Plastic	Cool, 4^oC	48 hours
Cu, Zn	156	100 ml	Plastic	Cool, 4^oC HNO_3 to pH<2	6 months
Pb	156	100 ml	Plastic	Cool, 4^oC HNO_3 to pH<2	6 months

Table 4. Laboratory Analysis Methods.

Parameter	Methodology	Detection Limit	EPA[1] Method	Standard Methods[2]
Residue, non-filterable	Gravimetric, dried at 103 - 105°C	4 mg/L	160.2	
Ammonia-N	Colorimetric automated	0.01 mg/L	350.1	
Total Kjeldahl-N	Colorimetric semi-automated	0.1 mg/L	351.2	
Nitrate-nitrite-N	Colorimetric, Cd reduction, automated	0.05 mg/L	353.2	
Total phosphorus	Colorimetric automated	0.005 mg/L	365.4	
Fecal Coliform	Membrane Filter	1 CU/100 mL		9222D
BOD_5	YSI probe	2 mg/L	405.1	5210B
Cu, Zn	Plasma emission spectroscopy	4 ug/L 10 ug/L	200.7	
Pb	Atomic absorption, furnace	1 ug/L	239.2	

[1]U.S. Environmental Protection Agency. 1983. Methods for chemical analysis of water and wastes. EPA-600/4-79-020. Environmental Monitoring and Support Laboratory, Cincinnati, OH.
[2] American Public Health Administration. 1989. Standard methods for the examination of water and wastewater. 17th Ed. APHA. Washington, D.C.

Driveway Study

Study Area

Study driveways were located in the BMP residential watershed. Precipitation during the study period was 14.8% below normal. There were 13 weeks with no precipitation, and therefore no runoff. There was an additional 6 weeks with less that 1 mm of precipitation. Of the six monitored driveways, there were two replicates each of asphalt, UNI group EcoStone ® interlocking concrete pavers, and crushed stone. Five of the driveways were shared and one was for a single home (Figure 5). Driveway watershed areas were calculated using as-built maps and field measurements. Total driveway area ranged from 7 m^2 to 650 m^2. The percent of land cover types in each driveway watershed varied and included driveway, lawn, and landscaped areas, roofs, and steps (Table 5).

Methods

The subdivision was under construction as the study began. Monitoring equipment was installed as each driveway was finished, resulting in unequal sampling periods at each site. The final site was completed in June 2002, providing 12 months during which all six sites were monitored and two years for some sites.

Driveway stormwater runoff was collected in a concrete trench drain (ABT® Inc. Troutman, NC) and volume was measured with a calibrated tipping bucket and mechanical counter. Approximately 0.0007 % of total flow was collected using a flow splitter into one bottle acidified with H_2SO_4 and another that was not acidified. A third bottle acidified with HNO_3 was added to asphalt 1 and paver 1 driveways for metals analysis. A portion of the H_2SO_4 acidified sample was used for metals analysis at the other four sites because there was not enough room for a third bottle. Samples were preserved in the field with ice packs replaced weekly. Precipitation was monitored on-site using a tipping bucket rain gauge. Onsite precipitation was used to calculate runoff coefficients, but rainfall departure from normal was calculated using precipitation measurements made at the Groton CT NCDC station (NOAA 2001, 2002). Acidified composite storm water samples were analyzed for nitrate-nitrogen (NO_3-N), ammonia nitrogen (NH_3-N), total Kjeldahl nitrogen (TKN) and total phosphorus (TP) with a Lachat flow injection analyzer (USEPA, 1983a). Un-acidified samples were analyzed gravimetrically for total residue (TSS) (USEPA, 1983a). Total copper, lead and zinc were determined on monthly composite unfiltered samples using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) methods 200.8 (USEPA, 1991).

Infiltration tests were performed on each driveway annually, using a single ring infiltrometer. A Mariotte column (Bower, 1986) was used to maintain a constant ponding depth in the ring. Data presented is the average final infiltration rate of three tests per driveway in 2002 and two tests per driveway in 2003. A measured volume of stone from each crushed stone driveway was collected in the field, and then re-compacted to its original volume in the lab. Porosity was determined by adding a measured volume of water to the sample. A flowing infiltration test was also conducted in 2003. A metered perforated hose was placed on the driveway approximately 4.5 to 5 meters away from the trench drain. Infiltration was calculated as volume applied minus volume of runoff per unit time.

Driveway concentration, and runoff data were statistically analyzed using SAS version 8.0 software (SAS Institute, Inc. 2001). Data were found to be log-normally distributed, therefore, statistics were preformed on log-transformed data. Means presented are the anti-log of the transformed data. Repeated measures, analysis of variance was used to test for the overall difference among treatments. Seasons were used as the repeated measure. Two forms of runoff depth were analyzed: adjusted and unadjusted. Adjusted runoff depth included differences in watershed land cover. Two separate adjustments were :

a) Runoff depth * (proportion grass/roof), and
b) Runoff depth * proportion grass

These values were log-transformed and analyzed in the same manner as the unadjusted runoff depth data. To check and see if nutrient concentrations were possibly diluted by roof run-on, or concentrated by turf run-on, data were adjusted by watershed land area factors in a similar manner to depth adjustments.

Missing data due to equipment malfunctions, led to ignoring asphalt 2 and crushed stone 2 driveways in weekly pollutant export comparisons. Annual pollutant mass export was calculated from March 2002 – March 2003 for the asphalt 1, paver 1, and crushed stone driveways. Linear regressions were used to determine appropriate approximate values for missing volume data points. Average concentration values were used for missing concentration data. Linear regressions were preformed on logged data to determine if there was a relationship between rainfall and runoff depth for all driveways.

Table 5. Watershed characteristics for the six study driveway sites in Waterford, Ct.

Land Cover Type	Asphalt 1	Asphalt 2	Paver 1	Paver 2	Crushed Stone 1	Crushed Stone 2
Driveway (%)	56	100	22	100	53	37
Turf/landscaped (%)	0	0	63	0	27	13
Roof/steps (%)	44	0	15	0	21	50
Total area (m^2)	390	7	730	80	300	150
Slope (%)	3.3	3.2	4.4	4.7	2.6	4.5

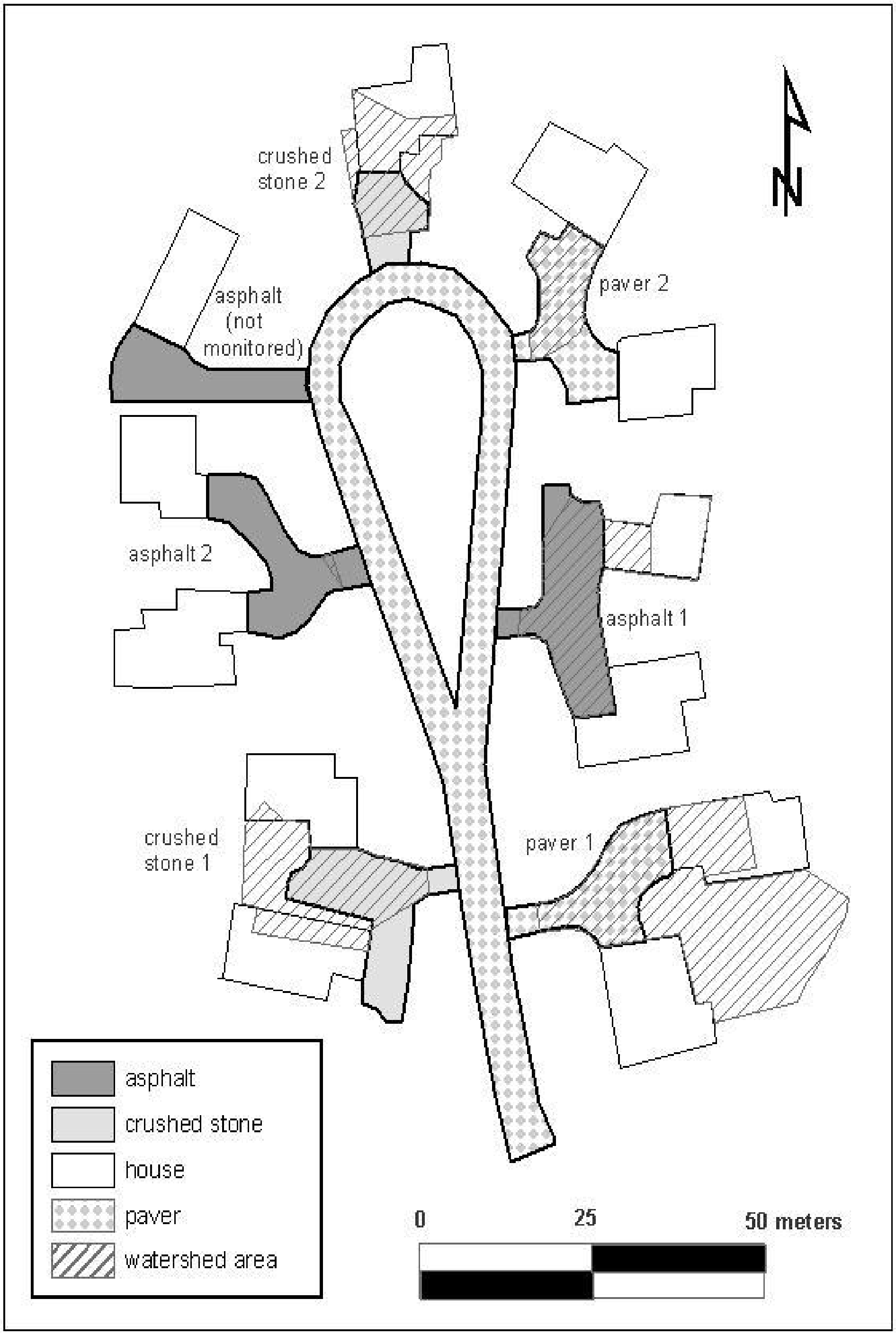


Figure 5. Project area site map including driveway type and watershed areas.

Lawn Nutrient Study

Throughout the control, BMP and traditional watersheds suction cup lysimeters (model 1905L06 slim tube sampler, Soilmoisture Equipment Corp, Goleta, CA), and anion exchange membranes (AEMs) were installed in lawns. Sites were chosen to represent a wide range of fertilizer applications. Water collected in suction cup lysimeters were collected following storm events. AEMs (type 204-U-386) were installed in the lawn surfaces and retrieved periodically and analyzed for NO_3-N. The AEMs were made from vinyl reinforcing fabric embedded with NH_4. Each AEM measured 6.25 X 2.5 cm. To install the strips, a vertical slit is made in the soil with a trowel, following by tamping in. AEM strips were prepared and analyzed for NO_3-N as described in Kopp and Guillard (2002). At sampling periods, spectral reflectance was measured which relates to the color of chlorophyll content of the lawn. This reflectance is used as a measure of lawn quality. Soil samples were also taken for nutrient analysis.

Soil samples were taken from each lot in the BMP watershed from 2002 through 2005 using a soil corer to the first six inches. Soils were analyzed in the Soil Nutrient Analysis Laboratory at the University of Connecticut. Soils were extracted using the modified Morgan method and analyzed for Ca, Mg, P, and K.

Household Survey

A 10-question survey was sent to each resident in the three watersheds each spring since 1999. A copy of the survey is given in the Appendix. The survey is intended to track information that might affect the study results. Questions focus on pets, lawn care, fertilizers, watering, leaf disposal, rain gutters, and car washing. This survey also gives us an opportunity to communicate study results. A gift is often offered to those who complete the questionnaire.

Statistical Analysis

All data were statistically analyzed using SAS version 8.0 software (SAS Institute, Inc., 1999). Analysis of variance (ANOVA) was used to test the significance of the regressions in each period. Analysis of covariance (ANCOVA) was used to test the differences between the two regression slopes and intercepts. Most water quality data were log-normally distributed, and therefore, means presented are anti-logs of log-transformed data. Percent change in flow, concentration, and export was calculated by comparing mean predicted values from the calibration regression equations to observed values using the equation:

$$\%change = \frac{(O - P)}{P} \times 100$$

where O = observed value and P = predicted value.

RESULTS AND DISCUSSION

Precipitation

Rainfall amounts were compared to 24-hour storm event data for Connecticut compiled by Miller et al. (2002) (Table 6). There were five storms greater than the 2 yr – 24 hours storm and one storm greater than the 5 yr-24 hr storm. The distribution of weekly rainfall amounts follows a typical log decay form (Figure 6).

Table 6. 24-hour rainfall by return period and largest storms observed in Jordan Cove.

Return period (yr)	Amount (in)
2	3.35
5	4.35
10	5.2
25	6.4
50	7.8
100	9.2

Date	Observed Amount (in)	Return Period (yr)
6/17/2001	4.46	> 5
10/20/1996	4.21	2-5
6/12/1998	3.79	> 2yr
3/9/1998	3.6	> 2 yr
10/1/2001	1.67	

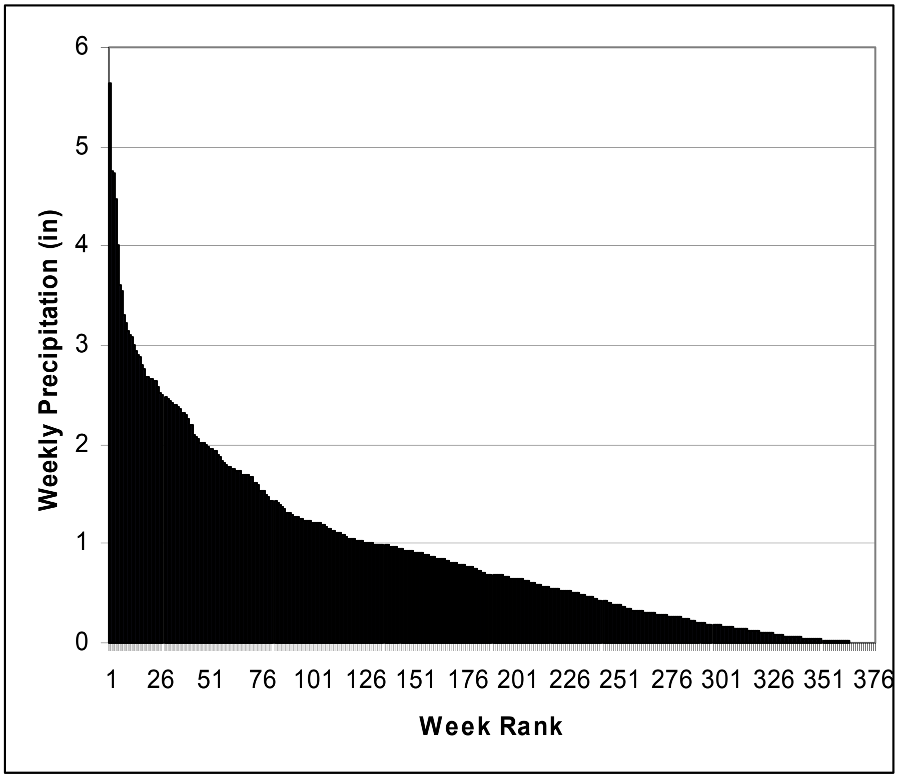


Figure 6. Weekly precipitation observed at the Jordan Cove urban watershed project.

BMP Watershed

<u>Runoff</u>

Weekly flow from the control watershed is given in Figure 7, and from the BMP watershed is shown in Figure 8. Higher flow during calibration than during either construction or post construction periods is evident. During construction, mean weekly flow volume decreased 97 % based on the predicted value using the calibration regression equation and the control value observed during the treatment period (Table 8). The decrease in runoff can be attributed to landform changes that retained water onsite and allowed infiltration to occur after storm events. Specifically, an earthen berm was constructed upstream of the BMP monitoring station which pooled water and obstructed flow to the station for several months during the treatment phase. Additionally, excavations were performed for basements on all lots within a short period, resulting in 'detention basins' that held stormwater onsite. Lastly the fill needed to raise the elevation of the area allowed for higher infiltration than the native soil present before the treatment phase. This fill also raised the surface above the ground water table, which had created a wetland at the site. During the post-construction period, flow decreased 74% as compared to the calibration period (Table 9).

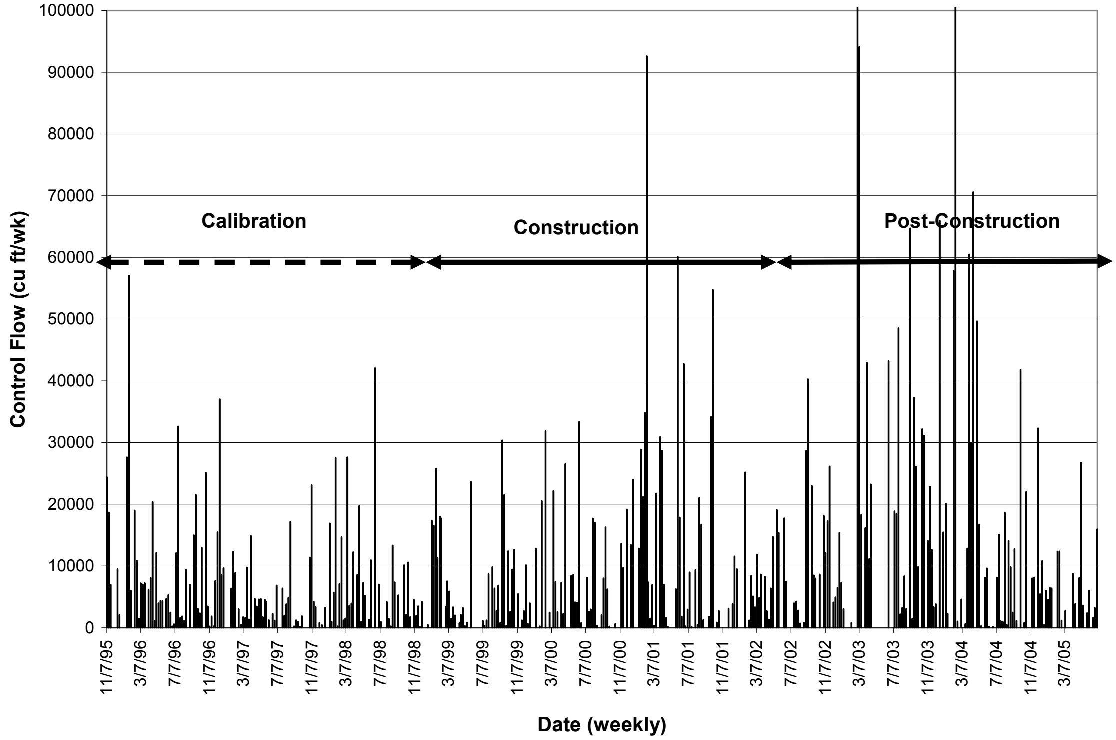


Figure 7. Control watershed weekly flow (Jordan Cove, Waterford, CT).

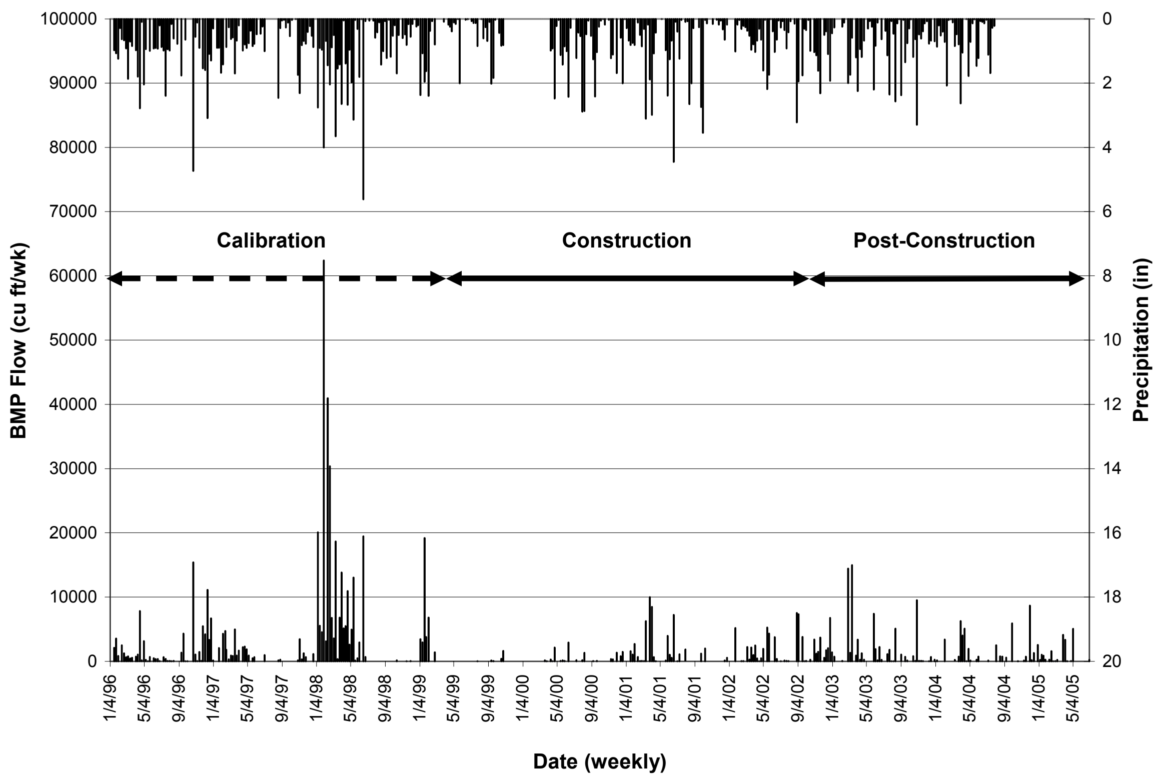


Figure 8. BMP watershed weekly precipitation and flow (Jordan Cove, Waterford, CT).

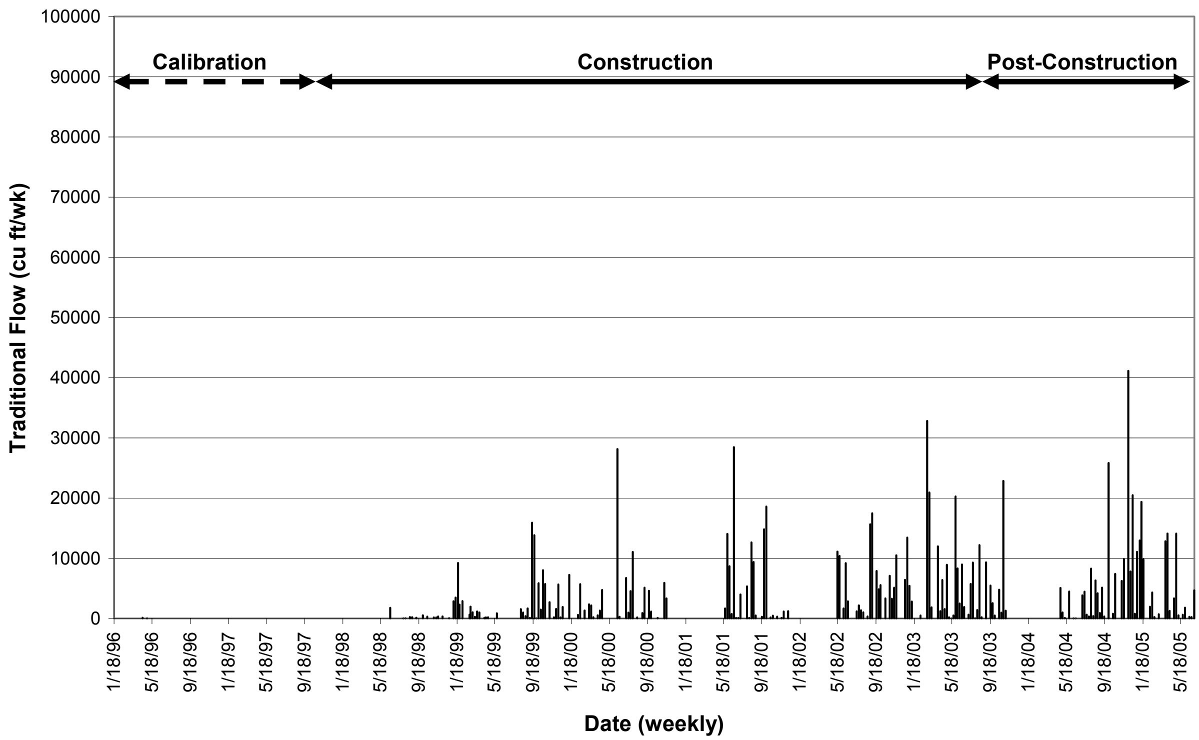


Figure 9. Traditional watershed weekly flow (Jordan Cove, Waterford, CT).

Peak Discharge from the BMP watershed during the construction period was not significantly different from that predicted by the calibration equation (Table 8). During the post-construction period, the peak discharge actually declined by 27% based on the calibration prediction (Table 9).

Infiltration Rates

Mean infiltration rates of the paver road were slow in the first year following installation (Table 7). Infiltration rates increased in following years. A decline was observed in 2004; however, only two sites were used. The infiltration test at the third site was considered unreliable due to observed leakage. The low initial infiltration rate is likely due to clogging of the openings during the construction period.

Table 7. Average (n=3) infiltration rates for the paver road for each year.

Year	Mean Infiltration Rate (cm/hr)
2001	1.0
2002	2.4
2003	2.9
2004	2.1
2005	3.0

Sediment

Concentration. Using ANCOVA, TSS concentrations significantly increased ($P < 0.001$) during construction based on a difference in regression equation intercepts (Table 8). TSS concentrations in stormwater varied through the construction period (Figure 11). Peak TSS concentrations occurred during installation of the permanent monitoring station in March 2000 where slow re-growth of vegetation after seeding was observed. Additional peaks were observed in May 2000 when the swales were constructed. Vegetation was established by September 2000. The swales were reconstructed May 9, 2001, resulting in higher TSS concentrations in runoff. Recent observations of TSS concentrations at the BMP site have indicated lower values.

Following construction, TSS concentrations have remained significantly higher than predevelopment concentrations (Table 9).

Export. During construction, sediment export increased significantly due to residential construction (Table 8). Following construction, TSS export also has increased significantly (Table 9). This increase in TSS export following construction is likely due to the increase in sediment concentrations in flow since flows have decreased.

Nitrogen

Concentration. During the construction period, the concentrations of NO_3-N, NH_3-N, and TKN all increased significantly in runoff from the BMP watershed (Table 8). The increase in NO_3-N concentrations is probably associated with fertilizer applications (Figure 14). During the first two years of the post-construction period, NO_3-N, and TKN concentrations remained higher than expected (Table 9). NH_3-N concentrations declined following construction but values were near detection limits. The higher TKN concentrations were due to higher organic N. Greater nitrogen concentrations would be expected associated with lawn care practices.

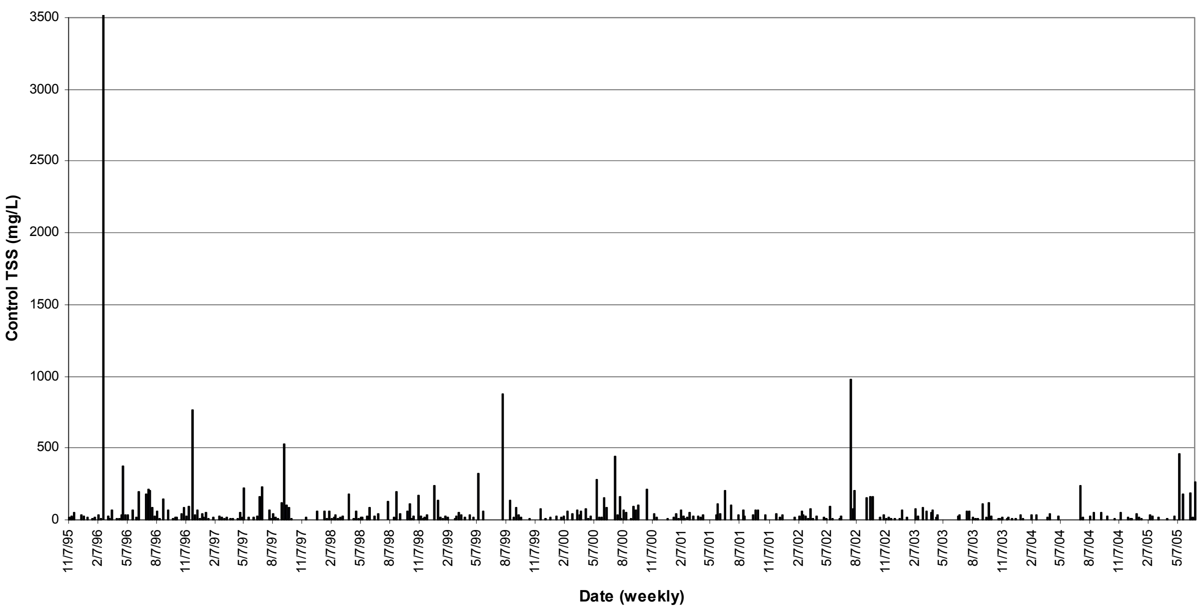


Figure 10. Control watershed TSS concentrations (Jordan Cove, Waterford, CT).

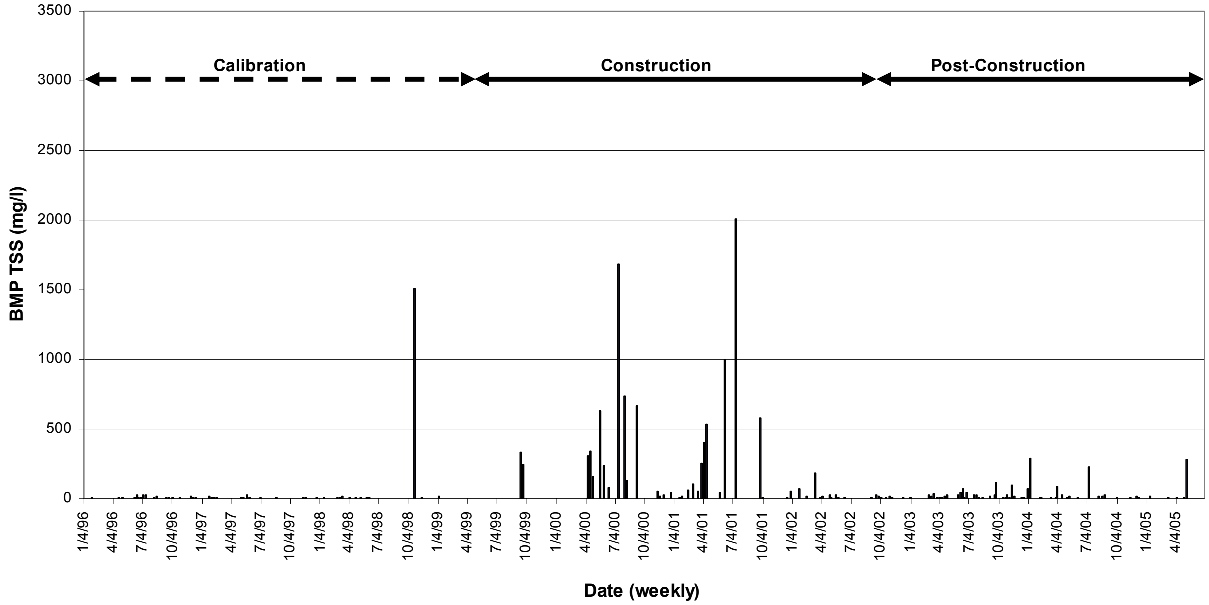


Figure 11. BMP watershed TSS concentrations (Jordan Cove-Waterford, CT).

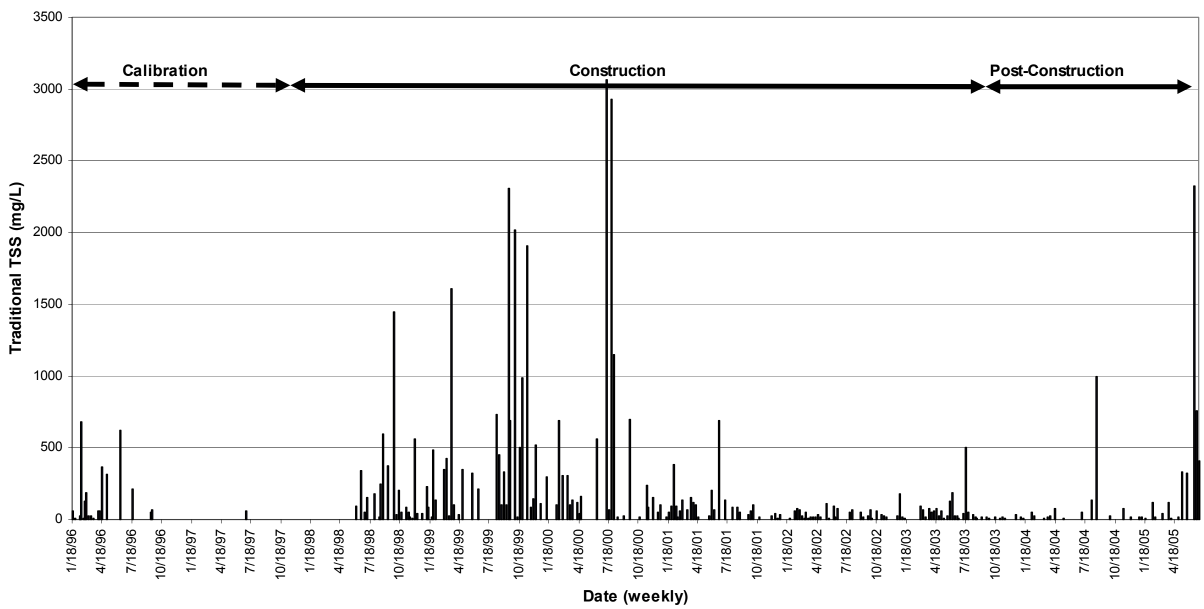


Figure 12. Traditional watershed TSS concentrations during the construction period (Jordan Cove-Waterford, CT).

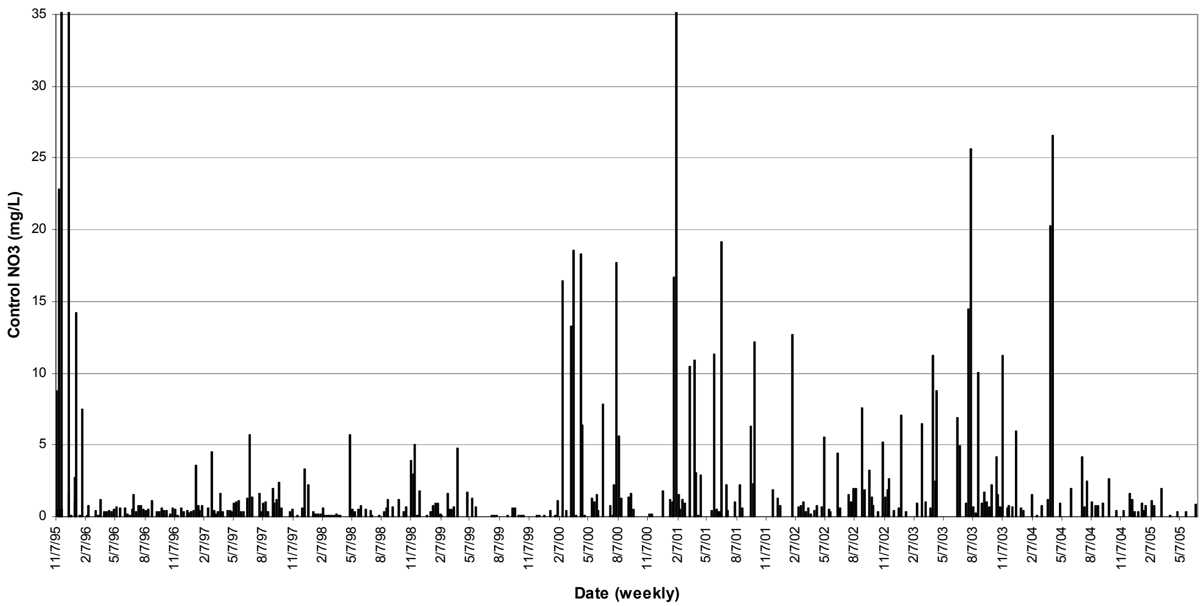


Figure 13. Control watershed NO_3-N concentrations (Jordan Cove-Waterford, CT).

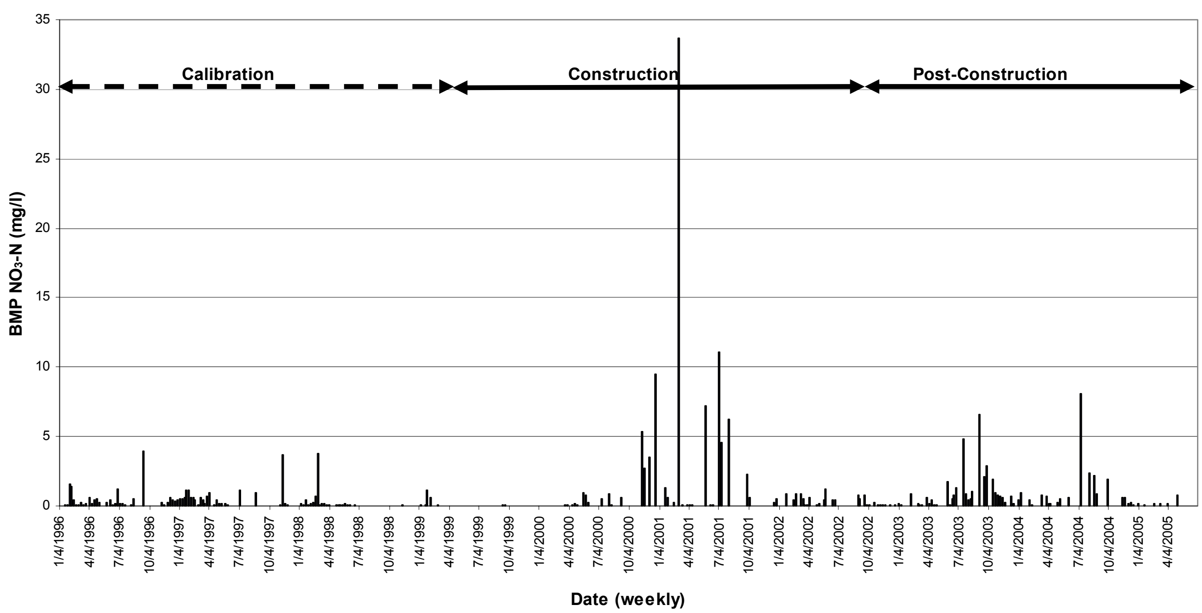


Figure 14. BMP watershed NO_3-N concentrations (Jordan Cove-Waterford, CT).

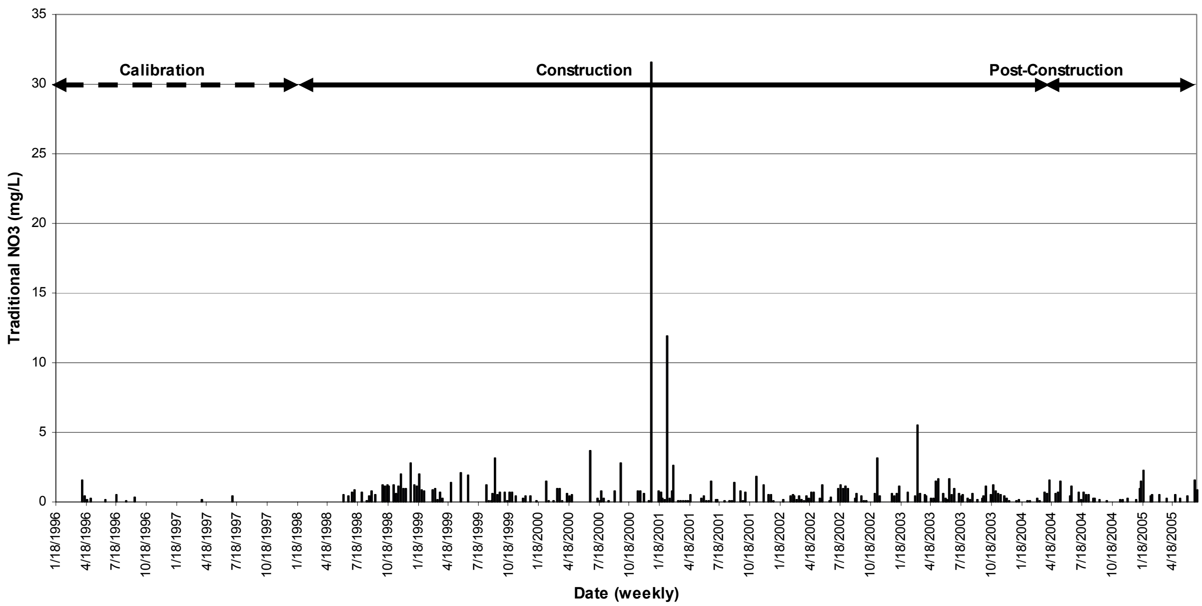


Figure 15. Traditional watershed NO_3-N concentrations (Jordan Cove-Waterford, CT).

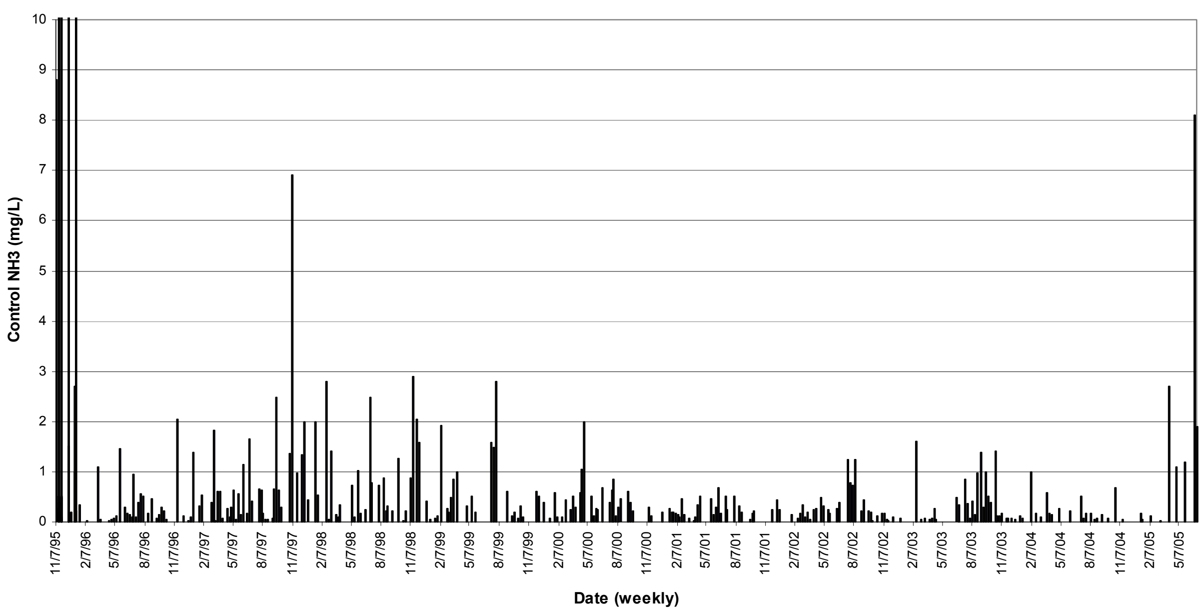


Figure 16. Control watershed NH_3-N concentrations (Jordan Cove-Waterford, CT).

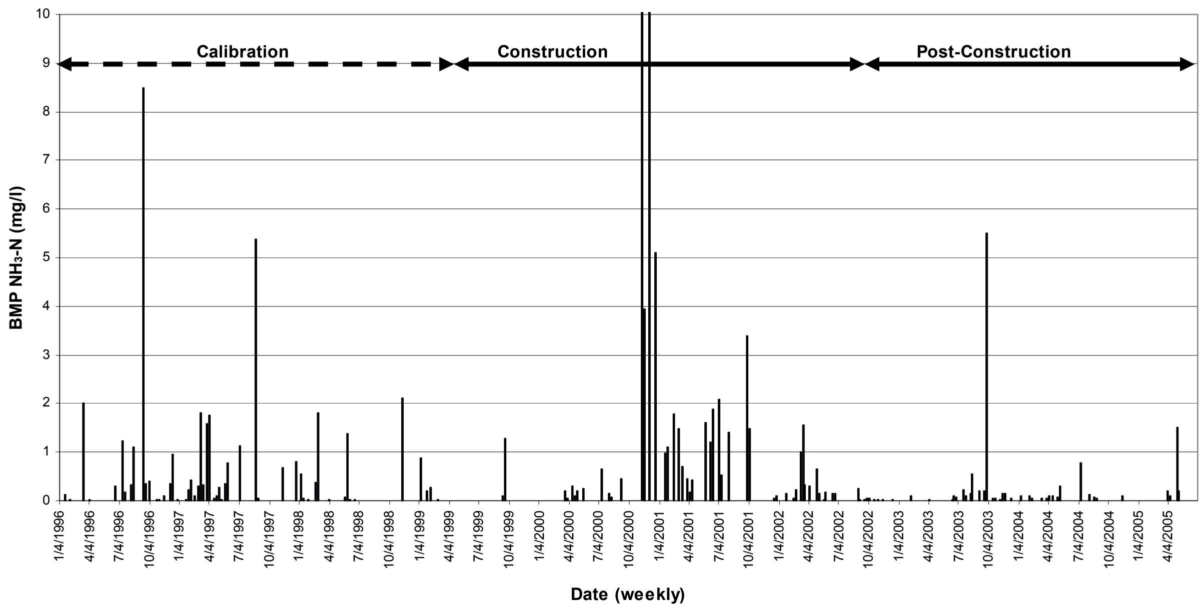


Figure 17. BMP watershed NH_3-N concentrations (Jordan Cove-Waterford, CT).

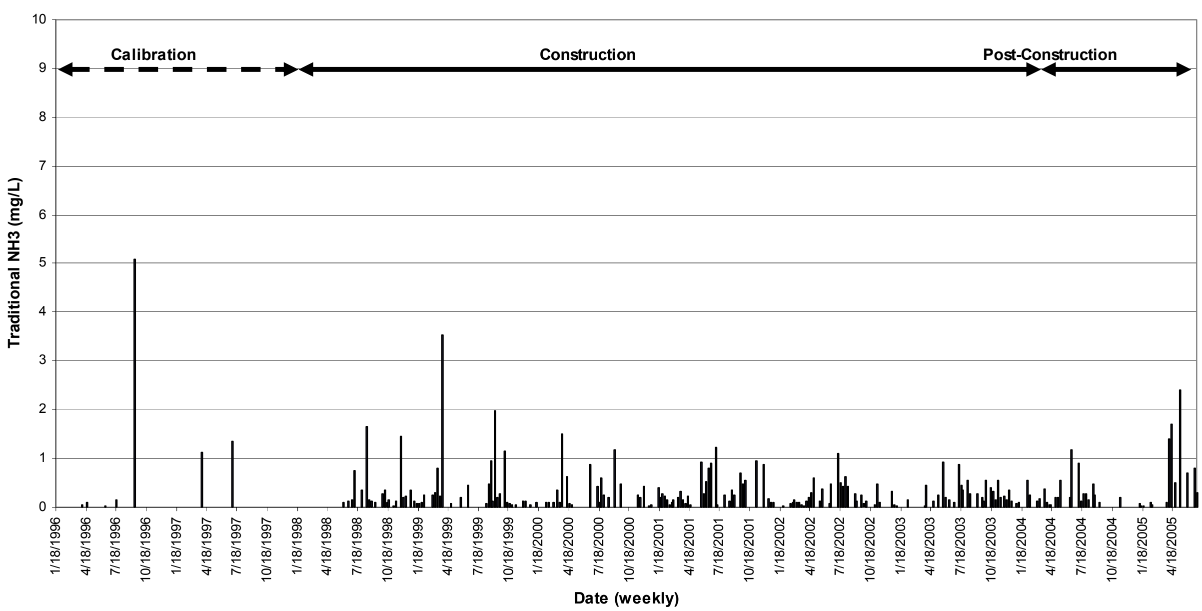


Figure 18. Traditional watershed NH_3-N concentrations (Jordan Cove-Waterford, CT).

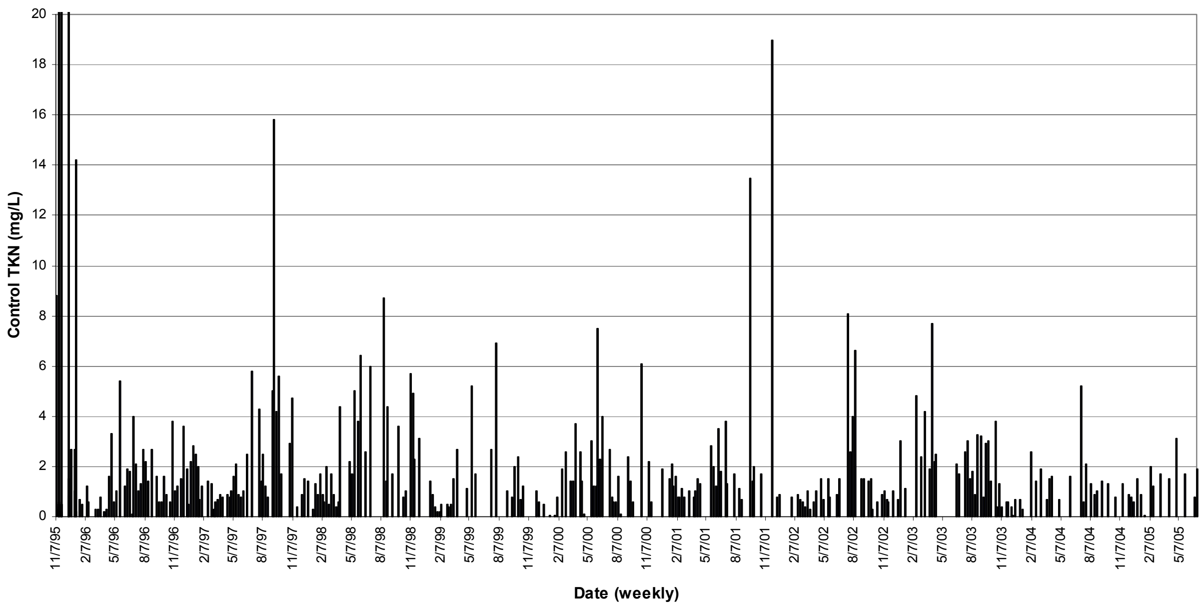


Figure 19. Control watershed TKN concentrations (Jordan Cove-Waterford, CT).

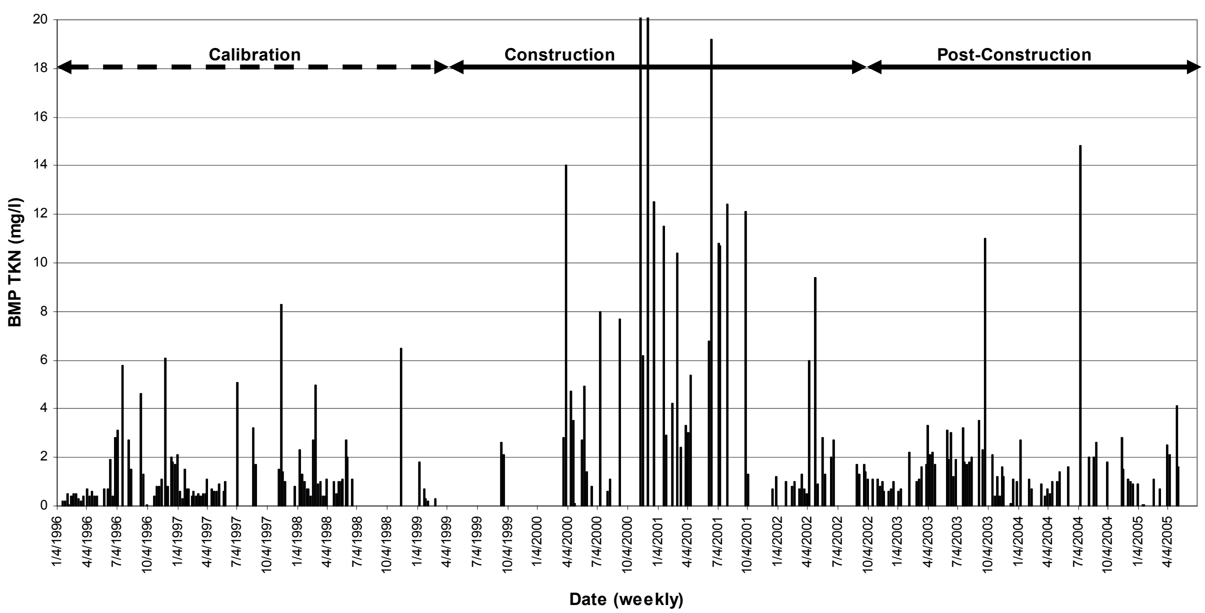


Figure 20. BMP watershed TKN concentrations (Jordan Cove-Waterford, CT).

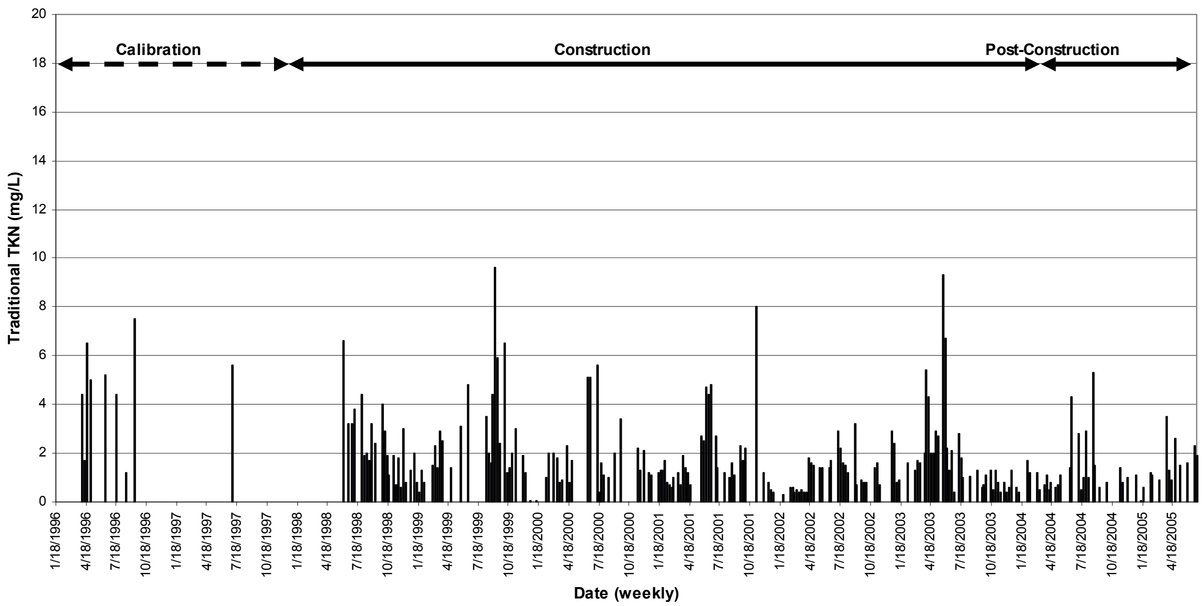


Figure 21. Traditional watershed TKN concentrations (Jordan Cove-Waterford, CT).

Export. During construction, the export of NH_3-N and TKN did not change significantly (Table 8). Following construction, the export of NO_3-N, NH_3-N, and TKN has decreased (Table 9). The flow decrease is responsible for these export decreases observed since concentrations had increased.

Total Phosphorus

Concentration. The concentration of TP increased significantly both during construction and following construction (Tables 8 and 9). The increases during construction are particularly noticeable (Figure 23).

Export. TP export also increased during the construction period and during the first two years of the post-construction period (Tables 8 and 9).

Metals

Concentration. The concentrations of both Cu and Pb increased in stormwater during construction but Zn concentrations did not increase (Table 8). Following the construction period, the concentrations of Pb and Zn decreased and Cu concentrations did not change (Table 98).

Export. There was no change in the export of Cu and Pb during construction at the BMP site, but Zn concentrations declined (Table 8). The export of Pb and Zn decreased following construction, because of both flow and concentration decreased (Table 9).

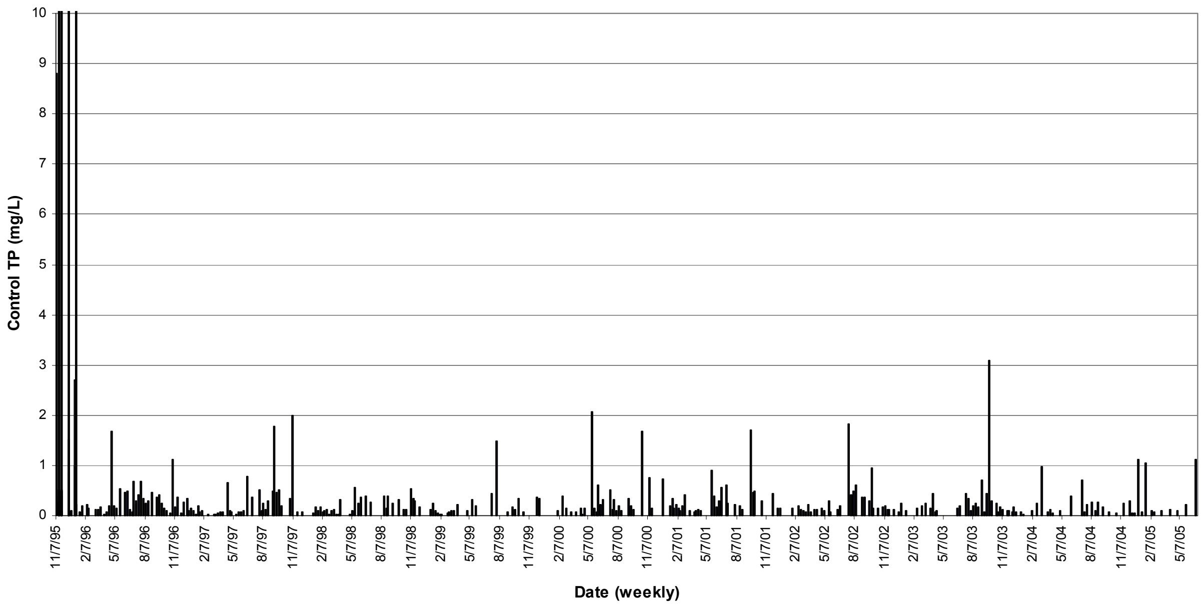


Figure 22. Control watershed TP concentrations (Jordan Cove-Waterford, CT).

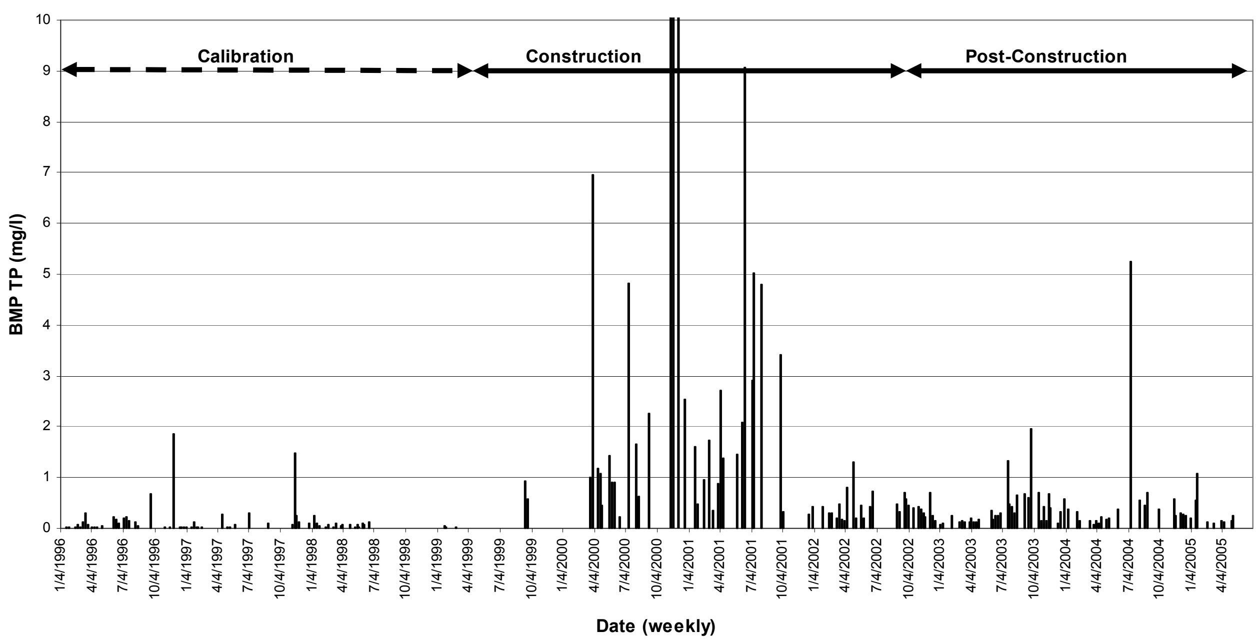


Figure 23. BMP watershed TP concentrations (Jordan Cove-Waterford, CT).

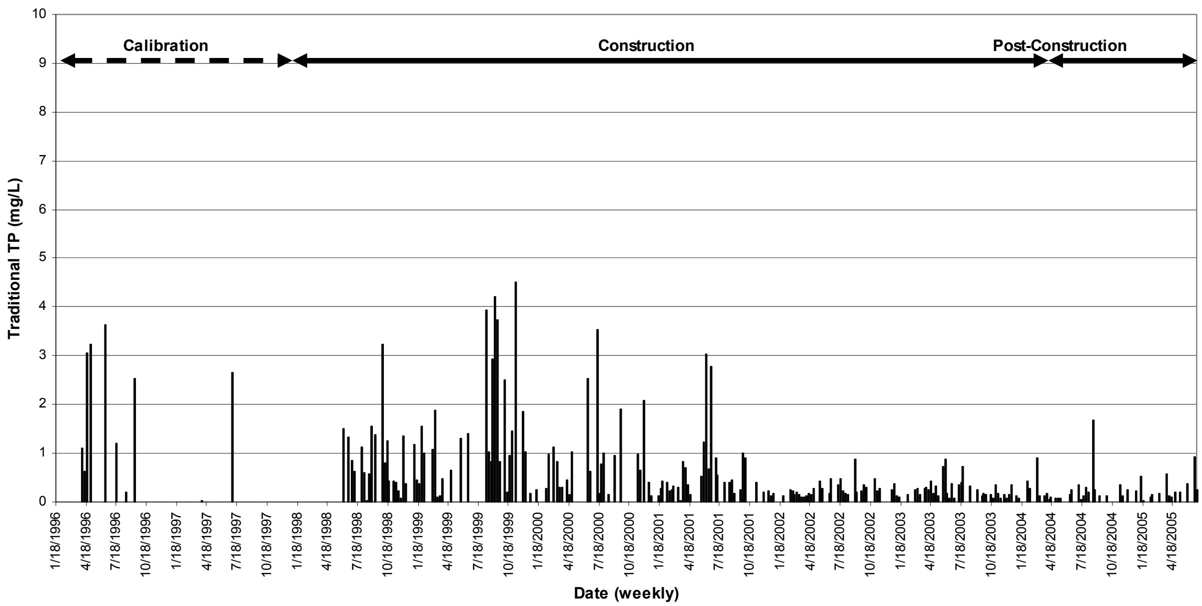


Figure 24. Traditional watershed TP concentrations (Jordan Cove-Waterford, CT).

Traditional Watershed

Runoff

Flow volume increased significantly during construction (Table 10) during construction in the traditional watershed (Figure 9). The major cause of the increase in flow volume was the creation of the asphalt roadway during construction that was directly connected to a curb and gutter stormwater collection system. During the first year of post construction, flow remained higher than expected from the calibration period (Table 11). This increase is evident in the time plot of flow data (Figure 9).

Analysis of individual storm events across watersheds has indicated stormflow response differences among watersheds. For example, as a result of the Sept. 15, 2003 storm, runoff from the BMP watershed has a lag time that was four times that of the traditional watershed (Figure 25). The reduction in peak flow and flow volume are also evident for this storm.

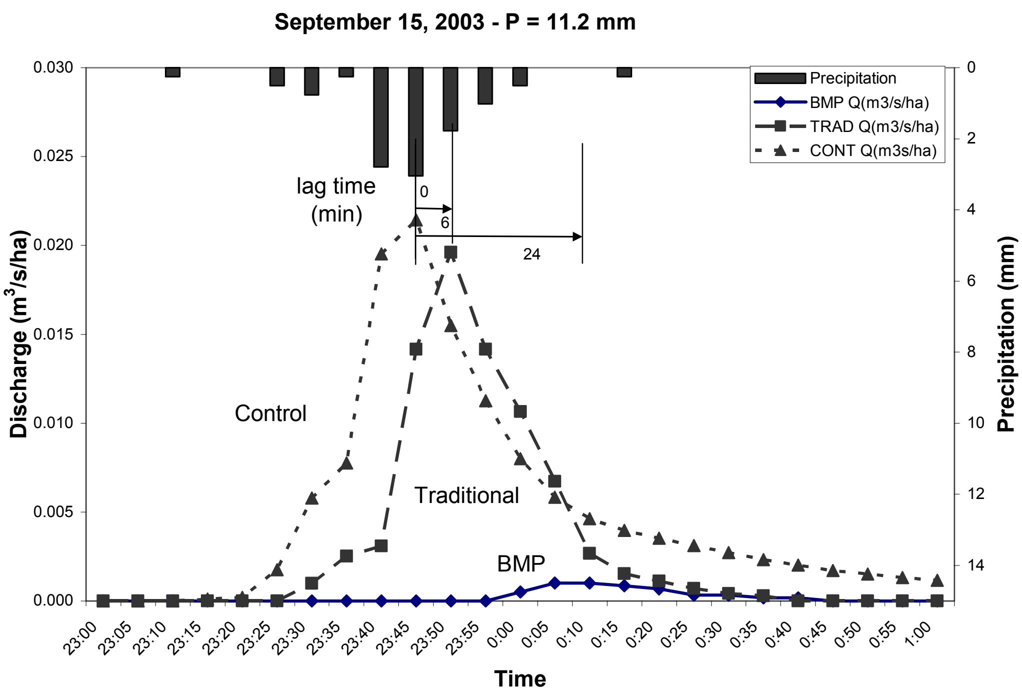


Figure 25. Stormwater hydrographs and precipitation for the Sept. 15, 2003 storm at the Jordan Cove Urban Watershed project.

Sediment

Concentration. There was no change in the concentration of TSS during construction in the traditional watershed (Table 10, Figure 12). This finding indicates that erosion and sediment controls were adequate during construction. Following construction, sediment concentrations have declined as compared to predicted values from the calibration period (Table 11).

Export. The export of TSS increased significantly during and after construction primarily because runoff increased (Table 10 and 11).

Nitrogen

Concentration. The concentration of NO_3-N (Figure 15) and NH_3-N (Figure 18) did not change during construction (Table 10). The concentration of TKN decreased significantly during construction (Figure 21). There is no apparent explanation for this decrease but it would represent a decrease in organic – N concentrations. Less grass clippings in runoff could represent the change. Following construction, the concentrations of NO_3-N (Figure 15) and NH_3-N (Figure 18) did not change (Table 11). Similar to the construction period, the concentration of TKN decreased significantly following construction (Figure 21, Table 11).

Export. The export of NO_3-N, NH_3-N, and TKN all increased significantly during and following construction, primarily due to the increase in flow (Tables 10 and 11).

Phosphorus

Concentration. The concentration of TP decreased during both construction and post-construction periods (Figure 24, Tables 10 and 11) compared to that predicted by the calibration regressions.

Export. The export of TP increased significantly during both the construction and post-construction periods, primarily due to the increase in flow (Tables 10 and 11).

Metals

Concentration. The concentration of Cu, Pb, and Zn did not change during or following construction in the traditional watershed (Tables 10 and 11).

Export. The export of metals increased significantly during and after construction in the traditional watershed, except for Pb which did not increase significantly during the post-construction period (Tables 10 and 11). These increases were associated with the increase in flow.

Table 8. BMP watershed results for the construction period (3/23/99-8/1/02).

Characteristic	Calibration Period Control	Calibration Period BMP	Construction Period Control	Construction Period BMP Observed	Construction Period BMP Predicted	% Change
Stormflow (m^3/wk)	117.8	15.39	95.84	0.36	12.23	-97***
(cm/wk)	0.21	0.17	0.27	0.12	0.17	-29***
Peak discharge (m^3/s/wk)	0.036	0.0057	0.027	0.001	0.004	-26 $^{\text{N.S.}}$
TSS (mg/L)	29	4	34	67	4	1,575***
NO_3-N (mg/L)	0.5	0.2	1.2	0.5	0.2	150***
NH_3-N (mg/L)	0.20	0.05	0.27	0.36	0.07	414***
TKN (mg/L)	1.3	0.9	1.3	3.2	0.9	256***
TP (mg/L)	0.139	0.027	0.164	1.072	0.027	3,870***
BOD (mg/L)	2	1	2	2	2	0
FC (No./100 ml)	14	2	3	2	11	-82$^{\text{N.S.}}$
Cu (ug/L)	10	8	12	23	8	188***
Pb (ug/L)	6	3	5	11	3	267***
Zn (ug/L)	69	88	51	49	81	-40$^{\text{N.S.}}$
TSS (g/ha/wk)	661.2	55.7	1,334.1	1,038.6	81.8	1,170***
NO_3-N (g/ha/wk)	10.4	3.4	44.8	6.8	5.6	21$^{\text{N.S.}}$
NH_3-N (g/ha/wk)	4.5	1.0	10.6	4.7	1.6	194$^{\text{NS}}$
TKN (g/ha/wk)	30.2	13.6	50.5	44.2	20.3	118$^{\text{NS}}$
TP (g/ha/wk)	3.2	0.7	7.1	14.9	1.0	1,390***
Cu (g/ha/mo)	1.077	0.494	1.637	0.734	0.569	29$^{\text{N.S.}}$
Pb (g/ha/mo)	0.621	0.214	0.651	0.354	0.210	69$^{\text{N.S.}}$
Zn (g/ha/mo)	7.064	5.384	7.765	1.590	4.338	-63*

N.S. Not significant
* P value <0.05
** P value <0.01
*** P value <0.001

Table 9. BMP watershed results for the post-construction period (8/2/02-6/30/05).

Characteristic	Calibration Period Control	Calibration Period BMP	Post-construction Period Control	Post-construction Period BMP Observed	Post-construction Period BMP Predicted	% Change
Stormflow (m^3/wk)	117.8	15.4	210.7	8.4	32.6	-74***
(cm/wk)	0.21	0.17	0.40	0.13	0.22	-42***
Peak discharge (m^3/s/wk)	0.0360	0.0057	0.0262	0.0030	0.0041	-27*
NO_3-N (mg/L)	0.5	0.2	1.3	0.4	0.2	+100 *
NH_3-N (mg/L)	0.20	0.05	0.14	0.03	0.06	-50*
TKN (mg/L)	1.3	0.9	1.2	1.3	0.9	+44**
TP (mg/L)	0.139	0.027	0.165	0.291	0.028	+939***
TSS (mg/L)	29	4	24	11	4	+197***
BOD_5 (mg/L)	2.9	2.9	3.1	3.3	3.4	-3 N.S.
Fecal coliform (No/100 mL)	10	62	305	41	790	-95**
Cu (µg/L)	10	8	10	6	8	-25 N.S.
Pb (µg/L)	6	4	2	1	3	-67***
Zn (µg/L)	69	88	40	17	74	-77***
NO_3-N (kg/ha/yr)	0.55	0.18	4.02	0.25	0.34	-26 N.S.
NH_3-N (kg/ha/yr)	0.23	0.05	0.43	0.02	0.08	-71***
TKN (kg/ha/yr)	1.59	0.73	3.99	0.90	1.36	-33*
TP (kg/ha/yr)	0.17	0.04	0.52	0.21	0.06	+249**
TSS (kg/ha/yr)	35	3	75	8	5	+85*
Cu (g/ha/yr)	13	6	21	4	7	-50 N.S.
Pb (g/ha/yr)	7	3	5	0.5	2	-79**
Zn (g/ha/yr)	85	65	87	10	56	-81**
Fecal coliform (No/ha/yr x 10^6)	56	1,893	2,713	39	521	-99**

* P value <0.05
** P value <0.01
*** P value <0.001

Table 10. Traditional watershed results for the construction period (10/8/97 – 6/19/03).

Characteristic	Calibration Period: Control	Calibration Period: Traditional	Construction Period: Control	Construction Period: Traditional Observed	Construction Period: Traditional Predicted	% Change
Stormflow (m^3wk)	113.85	0.10	124.64	22.47	2.26	894***
(cm/wk)	0.20	0.02	0.28	0.33	0.02	+1,550***
Peak discharge (m^3/s/wk)	0.052	0.005	0.028	0.005	0.001	400*
TSS (mg/L)	31	132	32	86	125	-31$^{N.S.}$
NO_3-N (mg/L)	0.9	0.3	0.9	0.5	0.3	66$^{N.S.}$
NH_3-N (mg/L)	0.15	0.08	0.26	0.18	0.16	12$^{N.S.}$
TKN (mg/L)	1.3	4.0	1.4	1.6	4.2	-62***
TP (mg/L)	0.159	1.009	0.158	0.440	0.893	-51*
BOD (mg/L)	2	30	90	73		
FC (No./100 ml	48	10	13	10		
Cu (ug/L)	8	8	13	16	12	33$^{N.S.}$
Pb (ug/L)	6	11	6	7	11	-36$^{N.S.}$
Zn (ug/L)	58	65	61	71	86	-17$^{N..S.}$
TSS (g/ha/wk)	685	47	1,165	4,241	36	11,620***
NO_3-N (g/ha/wk)	11.71	0.20	31.30	25.00	0.33	7,476***
NH_3-N (g/ha/wk)	3.26	0.26	8.96	8.34	0.41	1,934***
TKN (g/ha/wk)	27.40	1.38	49.87	76.21	1.08	6,956***
TP (g/ha/wk)	3.58	0.40	6.08	24.86	0.25	9,844***
Cu (g/ha/mo)	0.826	0.018	1.733	3.317	0.017	19,412***
Pb (g/ha/mo)	0.618	0.036	0.764	1.348	0.036	3,644***
Zn (g/ha/mo)	5.878	0.205	7.975	14.397	0.197	7,208***

N.S. Not significant
* P value <0.05
** P value <0.01
*** P value <0.001

Table 11. Traditional watershed results for the post-construction period (6/19/03 - 6/30/05).

Characteristic	Calibration Period		Post-construction Period			
	Control	Traditional	Control	Traditional		
				Observed	Predicted	% Change
Stormflow (m^3/wk)	113.4	0.1	185.5	60.2	0.1	+102,800***
(cm/wk)	0.20	0.02	0.35	0.33	0.02	+1,550***
Peak discharge (m^3/s/wk)	0.0525	0.0005	0.0246	0.0152	0.0005	+2,829***
NO-N (mg/L)	0.5	0.3	1.1	0.3	0.3	0
NH_3-N (mg/L)	0.15	0.08	0.16	0.15	0.13	+15 N.S.
TKN (mg/L)	1.3	4.0	1.1	1.0	4.1	-76***
TP (mg/L)	0.159	1.009	0.156	0.185	0.885	-79***
TSS (mg/L)	31	132	22	24	114	-79*
BOD (mg/L)	3.2	15.9	3.2	3.4	11.8	-71**
Fecal coliform (No/100 mL)	13	1	234	22	<1	undefined
Cu (µg/L)	8	8	9	8	10	-20 N.S.
Pb (µg/L)	6	11	1	1	1	0
Zn (µg/L)	58	65	36	42	67	-37 N.S.
NO_3-N (kg/ha/yr)	0.61	0.01	3.29	0.83	0.04	+2,181***
NH_3-N (kg/ha/yr)	0.17	0.01	0.48	0.35	0.22	+65***
TKN (kg/ha/yr)	1.42	0.07	3.6	2.4	0.06	+76,361***
TP (kg/ha/yr)	0.186	0.021	0.462	0.412	0.017	+46,582***
TSS (kg/ha/yr)	36	2	64	65	2	+64,323***
Cu (g/ha/yr)	10	0.2	15	18	0.2	+8,900***
Pb (g/ha/yr)	9	0.4	1	2	0.6	+163 N.S.
Zn (g/ha/yr)	82	0.6	55	17	2	+8,650***

N.S. Not significant
* P value <0.05
** P value <0.01
*** P value <0.001

Driveway study

Runoff Depth

Stormwater runoff depth was significantly different among all driveway types (Table 12), with the order of decreasing runoff being asphalt > paver > crushed stone. These results were consistent with findings from other paver research (Pratt et al. 1995). Booth and Leavitt (1999) observed runoff from turfstone as < 1% of total rainfall, which is much less than what was observed for the pavers used in this study. The runoff depth, adjusted for land cover, did not change the significance of the results obtained. There were no seasonal statistical differences for runoff depth from the repeated measures analysis.

Table 12. Mean weekly pollutant concentration in stormwater runoff from asphalt, paver and crushed stone driveways, Waterford, CT.

	Asphalt		Paver		Crushed Stone	
Variable[1]			(mm)			
Depth	1.8	a	0.5	b	0.04	c
			Concentration (mg/l)			
TSS	47.8	a	15.8	b	33.7	a
NO_3-N	0.6	a	0.2	b	0.3	ab
NH_3-N	0.18	a	0.05	b	0.11	a
TKN	8.0	a	0.7	b	1.6	ab
TP	0.244	a	0.162	b	0.155	b
			Concentration (ug/l)			
Cu	18	a	6	b	16	a
Pb	6	a	2	b	3	b
Zn	87	a	25	b	57	ab

[1]Within each variable, means followed by the same letter are not significantly different at α=0.05

Infiltration test results generally supported the runoff depth findings (Table 13). Flowing infiltration tests were similar to single ring tests. However, the crushed stone driveway flowing infiltration results were lower than the single ring infiltration (Table 13). The portion of the driveway closest to the trench drain where the flowing infiltration tests were conducted was compacted compared to the remaining driveway area. Compaction would naturally lower infiltration rates. Table 14 is a compilation of infiltration rates for different soil types and land covers. Infiltration rates measured in this study for paver and crushed stone driveways fall into the rapid infiltration category.

James and Thompson (1997) reported that while runoff from asphalt surfaces equaled 100% of the rainfall, paver runoff only equaled 38-61% of the total rainfall. Clogged pavers have been reported to infiltrate only 1.2 mm/hr when they have become clogged (Kresin et al. 1997). That

Table 13. Average infiltration rates from asphalt, paver, and crushed stone driveways

Test and Year	Asphalt	Paver	Crushed Stone
		cm/hr	
Single ring 2002	0	11.8	11.3
Single ring 2003	0	10.5	9.7
Flowing 2003	0	11.4	6

Table 14. Comparison of infiltration rates.

Category	Infiltration	Reference
	Cm/hr	
Very rapid	>25	Novotny, 2003
Rapid	12.5 – 25.0	“ “
Moderately rapid	6.3 – 12.5	“ “
Moderate	2.0 – 6.3	“ “
Moderately slow	0.5 – 2.0	“ “
Slow	0.12 – 0.5	“ “
Very slow	<0.12	“ “
Non-compacted Sandy soil	38.1	USEPA, 1999
Compacted sandy soils	7.62	“ “
Non-compacted Dry clay	22.4	“ “
All other clay soils	1.8	“ “
Undisturbed forest floor	6.0	Chow, 1964
Oak Hickory forest	7.6	“ “
Unimproved pasture	2.4	“ “

rate is twenty times less than the infiltration rates measured in this study (Table 13).

Pratt et al. (1995) observed that the concrete paver blocks, different from the type used in this study, could absorb the first four to five mm of rainfall within the first minutes of a precipitation event. During this driveway study, it was observed that during the first few minutes of a precipitation event, puddles would begin to form on the asphalt driveways while the pavers would absorb the moisture. During light rainfall events, puddles would not form on paver driveways for up to 30 minutes. The flowing infiltration tests also demonstrated the difference in response time of the driveway types. On the asphalt driveway it took one minute for the flow to discharge. For the crushed stone and paver driveways discharge didn't occur for 20 minutes after application of water.

The runoff coefficient for the crushed stone driveway was less than for the paver and asphalt driveways (Table 15). Figure 26 shows the weekly runoff response to rainfall. The slopes of the regression equations show that asphalt runoff was greater than paver runoff, which was greater than crushed stone runoff (Figure 26). R^2 value for paver ($F=38.0$, $p<0.0001$) and crushed stone driveways ($F=34.5$ $p<0.0001$) may be lower than the asphalt R^2 ($F= 158.7$, $p<0.0001$) due to variable infiltration amounts. As Rushton (2001) observed, for watersheds with pervious areas, rainfall intensity may play an important role in predicting stormwater runoff depth.

Table 15. Comparison of Runoff Coefficients between driveway study and other permeable pavement research.

Pavement type	Runoff Coefficient*	Reference
	%	
Asphalt	40	This study
Paver	24	This study
Crushed Stone	5	This study
Permeable Concrete block	41	Pratt et al. 1995
Asphalt	100	James and Thompson 1997
Paver with 7.6 cm base	38	James and Thompson 1997
Paver with 10.2 cm base	61	James and Thompson 1997
Asphalt, no swale	54	Rushton 2001
Pervious paving with swale	15	Rushton 2001

* Runoff Coefficient = average (runoff depth / rainfall depth)

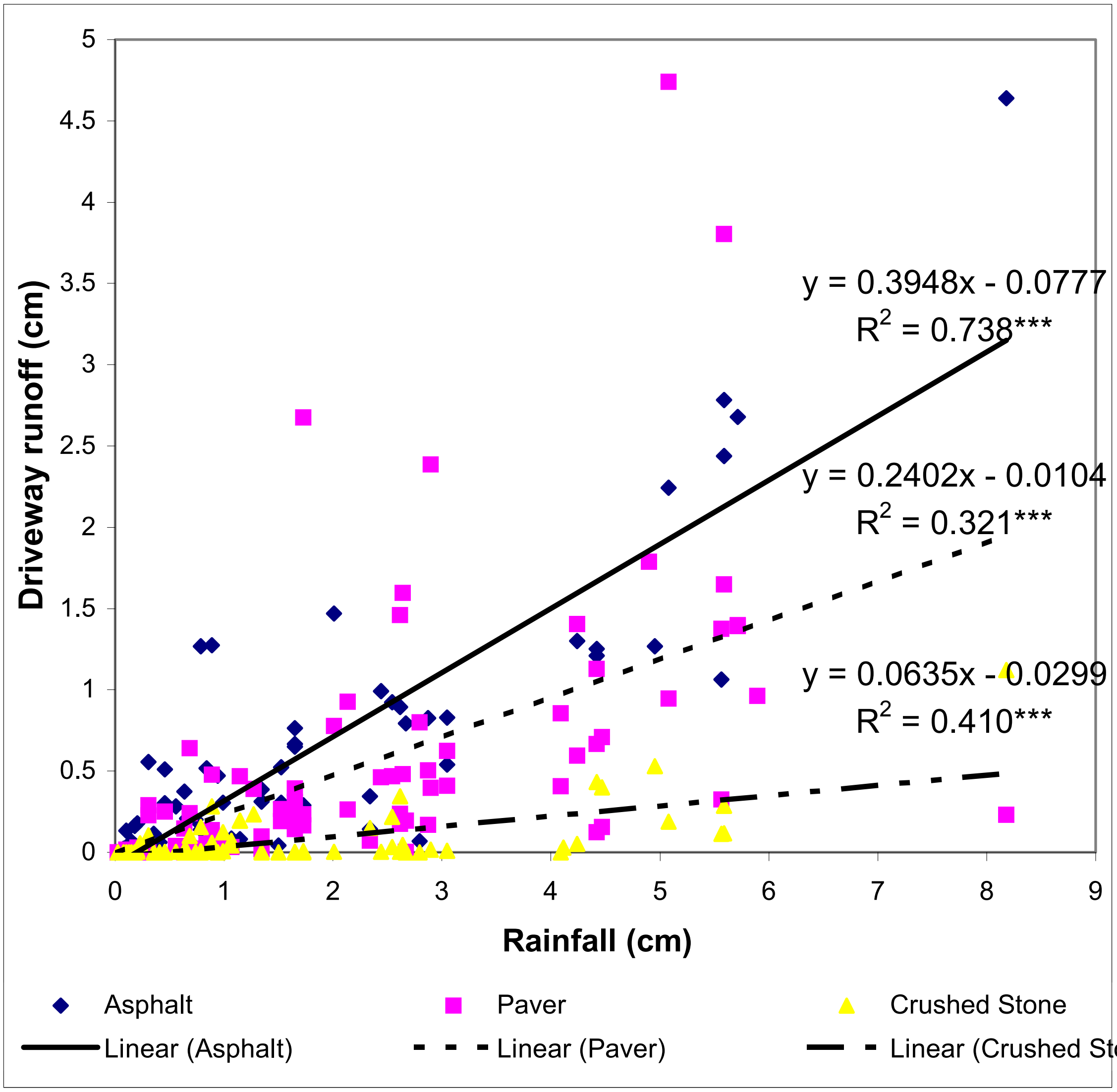


Figure 26. Rainfall runoff regressions. *** Indicates significance at p<0.0001.

Concentration

Runoff from paver driveways contained significantly lower concentrations of measured variables than the asphalt driveways (Table 12). Concentrations in crushed stone runoff were significantly lower than asphalt runoff but not different from paver runoff for TP and Pb. NO_3-N, TKN, and Zn concentrations in crushed stone runoff were not different from either asphalt or paver runoff. TSS, NH_3-N, and Cu, concentrations in crushed stone runoff were not significantly different from that found in asphalt runoff, but higher than that in paver runoff. Though there was not an overall statistical difference between crushed stone and asphalt TKN runoff concentrations, asphalt had a statistically higher TKN concentration than crushed stone in the summer. It was not possible to determine pollutant runoff contributions from the different source areas within each watershed due to the nature of the sampling. Instead, adjustments used to modify depth data were also applied to concentration data to determine if watershed land cover had an effect on runoff pollutant concentration. Adjusted concentration data did not produce any differences in results than the unadjusted data. Data truncated to the final 12 months, to exclude the period when only three driveways were being monitored, did not show any changes in findings.

TSS concentrations observed in this study were lower than the 100 mg/l reported for urban runoff in the NURP study (USEPA 1983b), and the 300 mg/l for asphalt driveways reported by Bannerman et al. (1993). Seasonal results from the repeated measures analysis showed paver TSS concentrations were significantly lower in the fall (4.0 mg/l) than any other season (25.2 mg/l). Crushed stone TSS concentrations in runoff averaged 23.3 mg/l in winter, spring and fall, but were significantly higher in the summer, averaging 111.0 mg/l. These seasonal differences may be due to high TSS in runoff from the crushed stone 2 driveway during the summer of 2002. Erosion in the crushed stone 2 watershed area was high because of poorly established grass on sloped areas that drained onto the driveway.

Bannerman et al. (1993) reported 1.16 mg/l TP in asphalt driveway runoff which is higher than the 0.24 mg/l reported in this study for asphalt driveways. This study's results were similar to Rushton's (2001) findings of 0.11 mg/l TP in asphalt runoff and the EMC of 0.62 mg/l TP in residential runoff reported from the NURP study (USEPA 1983b) for residential watersheds. Driveway's are a critical source area for phosphorus; finding paver runoff to have significantly lower TP runoff concentrations is important for controlling this pollutant. Paver runoff concentrations of both NO_3-N NH_3-N (Table 12) were comparable to those reported by Rushton (2001) of 0.15 mg/l and 0.11 mg/l respectively. This study's asphalt NO_3-N runoff concentration was higher than Rushton's (2001) finding of 0.27 mg/l, but the 0.13 mg/l of NH_3-N in Rushton's (2001) study was similar to this study's results (Table 12).

Metals runoff concentrations were similar to what has been reported in other studies for asphalt and paver driveways (Table 16). Overall, Pb concentrations reported in this study were lower than runoff concentrations reported in other studies (Table 16). Runoff from asphalt and crushed stone driveways had Cu concentrations above all aquatic toxicity thresholds (Table 16). Paver driveway runoff Cu concentrations were greater than saltwater aquatic toxicity limits. Pb concentrations were lower than aquatic toxicity thresholds for all driveway materials. Booth et al. (1999) reported copper concentrations in stormwater infiltrated through Eco-stone pavers to be higher than concentrations measured in runoff in this study. Runoff Pb and Zn concentrations were higher in this study than infiltrated water concentrations reported by Booth et al. (1999)

Table 16. Summary of previous research of concentration results of Cu, Pb and Zn in runoff from various surfaces compared to human consumption and aquatic health guidelines.

Source	Cu	Pb	Zn	Reference
		ug/l		
Pervious asphalt	11.2	20.7	158	Legret and Colandini, 1999
Asphalt driveway	17	17	107	Bannerman et al. 1993
Asphalt parking lot	10.3	4.1	44.8	Rushton 2001
Pervious pavement with swale	3.4	1.25	18.6	Rushton 2001
Grasspave [1]	21.4	0.00	2.5	Booth and Leavitt 1999
Gravel Pave [1]	1.9	0.41	2.0	Booth and Leavitt 1999
Turfstone [1]	1.4	0.00	0.0	Booth and Leavitt 1999
UNI Eco-Stone [1]	14.3	0.62	7.9	Booth and Leavitt 1999
Toxicity to freshwater aquatic life (acute/chronic)	13/9.0	65/2.5	120/120	USEPA 1999a
Toxicity to saltwater aquatic life (acute/chronic)	4.8 /3.1	210 / 8.1	90 / 81	USEPA 1999a
Human Consumption	1300	0 (at tap)	9100	USEPA 1999a

1) subsurface only

Export

Mass export for this study was calculated as kg/ha/yr. Most other studies report export as mass per storm event or mass per multiple storm events. Comparison of non-uniform export data is difficult. Mass export for all variables from asphalt driveways was greater than mass export from paver driveways, which in turn was greater than the export from crushed stone driveways (Table 17). James and Thompson (1997) reported TSS, NO_3, NH_3, TKN, Cu, Pb, Zn export in runoff was greater from an asphalt parking lot than from an Eco-stone paver parking lot in Guelph, Canada. Using the full study data set, repeated measures analysis showed that crushed stone driveways had significantly higher NO_3-N and TKN export in the winter (0.56, 1.46 kg/ha/yr) than in the spring (0.004, 0.01 kg/ha/yr). Paver driveways had significantly greater export of TP in the fall than in the winter and summer (0.05, 0.02 kg/ha/yr). Fall stormwater runoff may be higher in phosphorus in the fall due to increased organic matter decomposition. There is no explanation for why this increase in phosphorus concentration was only observed in paver driveway runoff and not in asphalt or crushed stone runoff.

Table 17. Annual pollutant export from asphalt, paver, and crushed stone driveways, Waterford, CT.

	Asphalt	Paver	Crushed Stone
		Kg/ha/yr	
TSS	230.1	23.1	9.6
NO_3-N	1.78	1.25	0.15
NH_3-N	0.65	0.12	0.03
TKN	13.06	1.08	0.47
TP	0.81	0.25	0.04

Lawn Nutrient Study

The results of soil tests for each lot in the BMP watershed are summarized in Table 18 for 2002-2005. These values are medium high for Ca and K, and medium for Mg and P based on Griffin and Washko (1983). Values given in Table 18 can be converted to mg/kg by dividing by 2. Soil phosphorus by lot and year indicates differences from lot to lot and over time (Figure 27). For example, lot 27 has averaged low in P and lot 23 has averaged high. Over time, it appears that the difference in soil P among lots has become less. Soil P generally declined from 2002 to 2003 and 2004, and then increased again in 2005 (Table 19, Figure 27).

Box plots comparing NO_3-N desorbed from AEM strips, soil water NO_3-N concentrations and plant reflectance all indicate that the BMP lawns being monitored have lower values than the non-BMP lawns (Figure 26).

Table 18. Mean soil test (modified Morgan extractable) results from the BMP watershed 2002-2005.

Variable	Value
pH	6.0
Ca (lb/ac)	1,967
Mg (lb/ac)	113
P (lb/ac)	13
K (lb/ac)	281

Table 19. Mean soil P by year in the BMP watershed.

Year	Soil P (lb/ac)
2002	14.3
2003	13.0
2004	12.9
2005	15.9

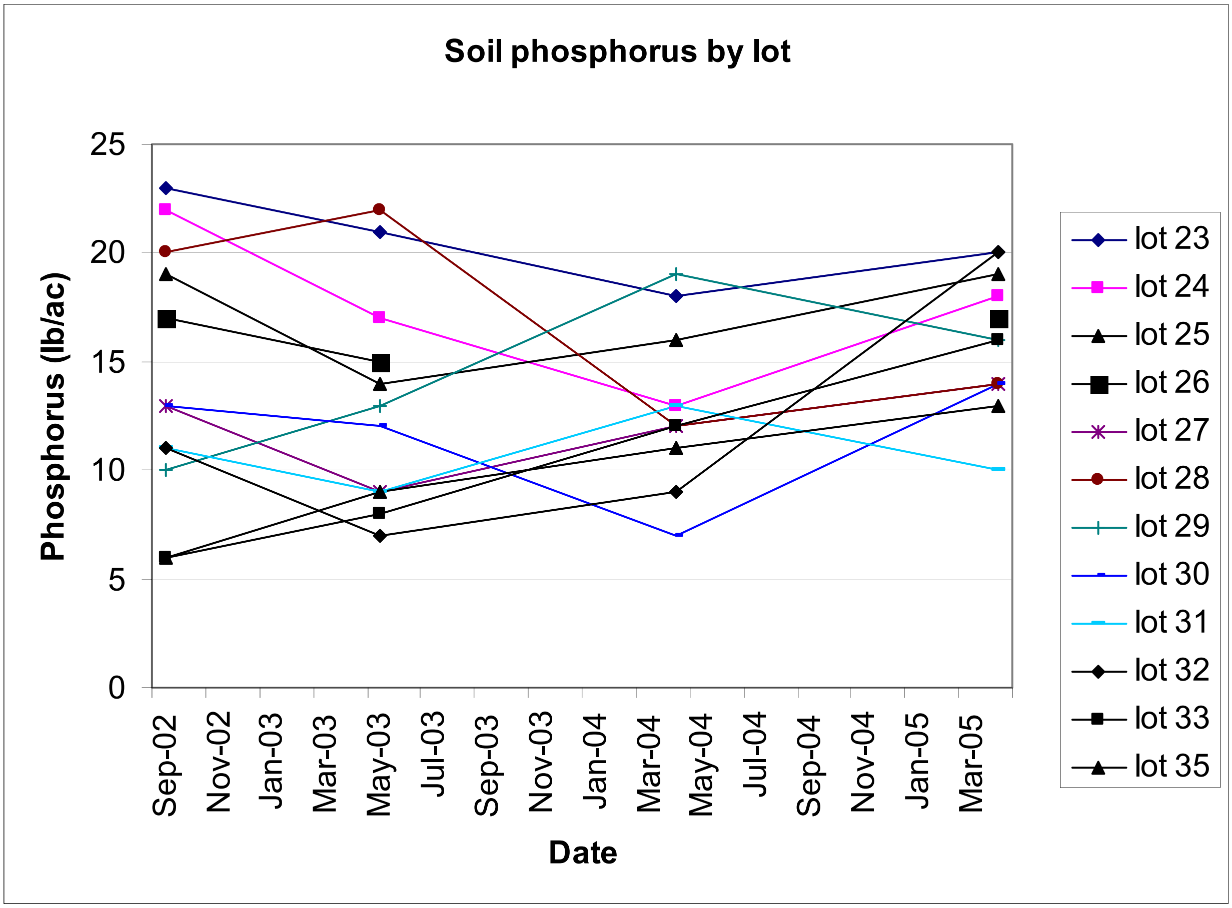


Figure 27. Soil P in the BMP lots 2002-2005.

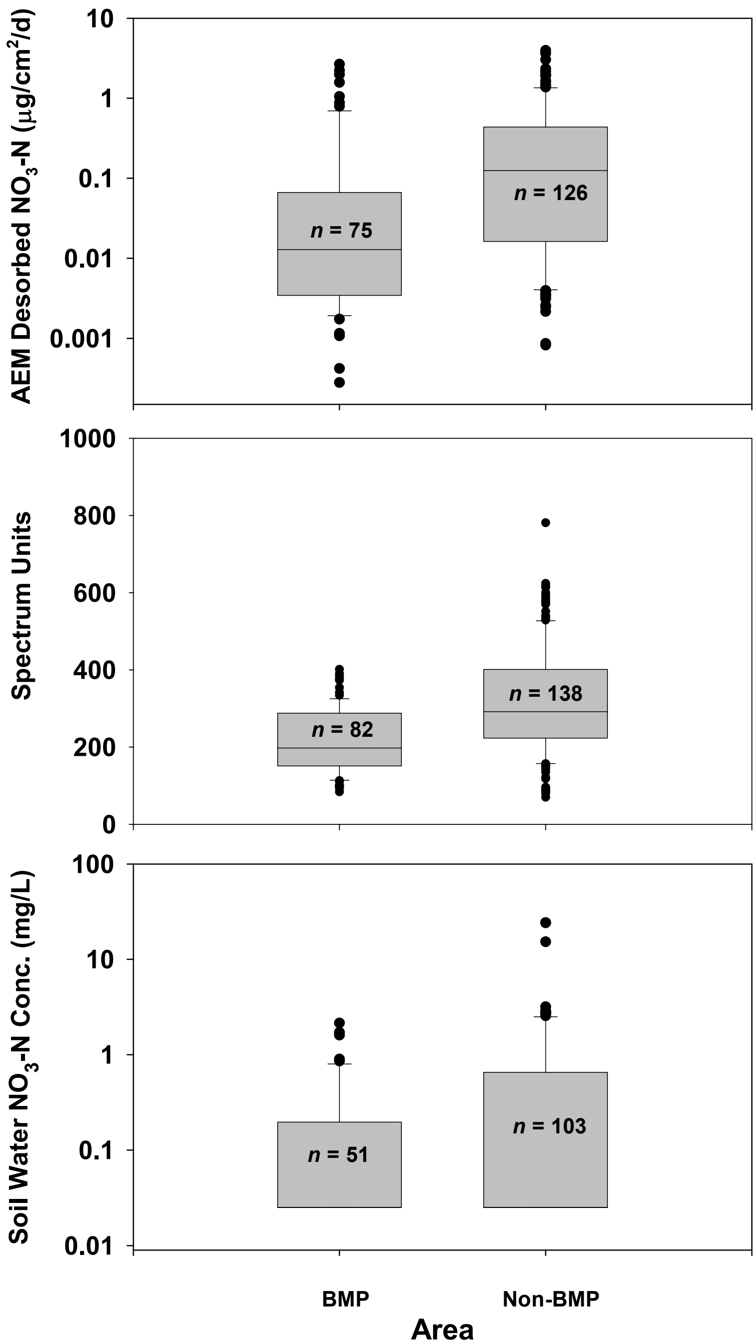


Figure 28. Comparison of the BMP and non-BMP areas for Anion Exchange Membrane desorbed NO_3-N, turf greenness, and soil water NO_3-N concentrations. Whiskers are 10 and 90th percentiles.

Household Survey

The household survey has been conducted approximately annually since 1999, or a year before residents began occupying the traditional watershed (Table 20). Response rates have varied among years and watersheds. Generally, the response rate has fallen off in the control watershed over time. The response rate improved in the BMP watershed this past year.

During 2003-2004, there was no difference among watersheds for the proportion of residents with cats or dogs or how residents handle their pet wastes (Table 21). However, there was a difference among watersheds in how residents disposed of leaves. More bagging of leaves was used in the control watershed and more mulching was used in the BMP and traditional watersheds. There were no significant lawn care practice differences, including fertilizations, among watersheds, except that more residents take care of their own lawns than in the control and traditional watersheds (Table 22). There were differences in lawn watering practices among watersheds (Table 23). More residents do not water in the control watershed and more residents use automatic sprinkling in the traditional watershed. There were no significant differences among watershed in how or where residents wash their cars or where their downspouts drain (Table 23).

Survey results were also compared across years. Generally, there were no differences across years in the control (Tables 24-26), BMP (Tables 27-29), and Traditional (Tables 30-32) watersheds. This generally means that residents are not changing their behavior during the study period. This is an especially important assumption for control watershed residents.

Table 20. Household survey response rates by Jordan Cove watershed and year.

	Watershed		
Year	Control	Traditional	BMP
	---------------------------- % ----------------------------		
1999	82		
2001	56	69	
2002	59	69	58
2003	54	54	58
2004	46	62	75

Table 21. Household survey results for wastes in 2004 by Jordan Cove watershed.

	Control (%)	BMP (%)	Traditional (%)	χ^2
Pets				**2.281** N.S.
Cat	**26**	**0**	**0**	
Dog	**74**	**22**	**62**	
Pet Waste handling				**6.180** N.S.
Compost	**0**	**0**	**0**	
Inside	**21**	**0**	**0**	
Outside	**5**	**40**	**0**	
Trash	**74**	**60**	**100**	
Leaf disposal				**23.902** *
Bag/curb	**45**	**29**	**12**	
Compost	**9**	**35**	**6**	
Mulch/lawn	**23**	**35**	**41**	
Pile on property	**7**	**0**	**24**	
Professional service	**9**	**0**	**18**	
Put in street	**2**	**0**	**0**	
Other	**5**	**0**	**0**	

Table 22. Household survey results for lawn maintenance in 2004 by Jordan Cove watershed.

	Control (%)	BMP (%)	Traditional (%)	χ^2
Lawn Care				**5.987** *
Self	**75**	**100**	**67**	
Professional service	**25**	**0**	**33**	
Lawn Clippings				**13.525** N.S.
Left on lawn	**28**	**14**	**45**	
Compost/garden	**26**	**24**	**10**	
Mulch mower	**44**	**57**	**35**	
Bag - trash	**2**	**5**	**0**	
Other	**0**	**0**	**10**	
Fertilize lawn				**2.557** N.S.
Yes	**85**	**88**	**100**	
No	**15**	**13**	**0**	
Fertilize # of times/yr				**5.861** N.S.
1-2	**48**	**29**	**20**	
3-4	**45**	**71**	**67**	
>4	**7**	**0**	**13**	
Unknown	**0**	**0**	**0**	
How decide fertilizer?				**14.156** N.S.
Bag instructions	**42**	**50**	**53**	
Calibrated spreader	**18**	**25**	**6**	
Past experience	**5**	**15**	**6**	
Professional service	**34**	**0**	**29**	
Soil test	**0**	**10**	**6**	

Table 23. Household survey results for water use and distribution in 2004 by Jordan Cove watershed.

	Control (%)	BMP (%)	Traditional (%)	χ^2
Lawn watering method				17.406 **
Auto sprinkler	4	5	31	
Hand hose	11	16	0	
Manual sprinkler	40	63	50	
Nature	44	16	19	
Rain gutters dump				2.664 N.S.
Driveway	25	33	27	
Foundation drain	4	10	0	
Lawn	71	57	73	
Car wash/year				8.433 N.S.
0	6	29	27	
1-4	45	50	33	
5-10	6	7	13	
11- 20	26	14	13	
>20	16	0	13	
Where wash car				2.665 N.S.
Driveway	87	100	100	
Lawn	13	0	0	

Table 24. Survey results for wastes in the Control watershed.

Control	1999	2001	2002	2003	2004	χ^2
Pets						9.506 N.S.
Cat	55%	54%	29%	33%	20%	
Dog	36%	46%	71%	67%	80%	
Unknown	9%	0%	0%	0%	0%	
Pet Waste handling						8.627 N.S.
Compost	8%	0%	0%	0%	0%	
Inside	23%	11%	8%	27%	13%	
Outside	23%	11%	17%	0%	13%	
Trash	46%	78%	75%	73%	75%	
Leaf disposal						22.597 N.S.
Bag/curb	44%	41%	48%	45%	45%	
Compost	18%	30%	20%	14%	5%	
Mulch/lawn	23%	15%	24%	14%	32%	
Pile on property	3%	11%	0%	5%	9%	
Professional service	5%	4%	0%	14%	5%	
Put in street	0%	0%	8%	5%	0%	
Other	8%	0%	0%	5%	5%	

Table 25. Survey results for lawn maintenance in the Control watershed.

Control	1999	2001	2002	2003	2004	χ^2
Lawn Care						**10.307 N.S.**
Self	79%	91%	74%	84%	67%	
Professional service	15%	9%	26%	16%	33%	
Other	6%	0%	0%	0%	0%	
Lawn Clippings						**7.606 N.S.**
Left on lawn	31%	22%	35%	29%	27%	
Compost/garden	26%	35%	15%	29%	23%	
Mulch mower	31%	35%	42%	43%	45%	
Bag - trash	9%	4%	4%	0%	5%	
Other	3%	4%	4%	0%	0%	
Fertilize lawn						**1.963 N.S.**
Yes	91%	86%	91%	90%	79%	
No	9%	14%	9%	10%	21%	
Fertilize # of times/yr						**6.271 N.S.**
1-2	45%	53%	40%	47%	40%	
3-4	45%	35%	40%	35%	47%	
>4	10%	12%	10%	6%	7%	
Unknown	0%	0%	10%	12%	7%	
How decide fertilizer?						**11.487 N.S.**
Bag instructions	47%	42%	50%	48%	35%	
Calibrated spreader	21%	12%	18%	14%	24%	
Past experience	13%	27%	5%	5%	6%	
Professional service	19%	19%	27%	33%	35%	
Soil test	0%	0%	0%	0%	0%	

Table 26. Survey results for water use and distribution in the Control watershed.

Control	1999	2001	2002	2003	2004	χ^2
Lawn watering method						6.887 $^{N.S.}$
Auto sprinkler	3%	4%	4%	4%	5%	
Hand hose	18%	17%	19%	16%	5%	
Manual sprinkler	45%	50%	38%	48%	30%	
Nature	34%	29%	38%	32%	60%	
Rain gutters dump						2.800 $^{N.S.}$
Driveway	35%	30%	26%	30%	21%	
Foundation drain	0%	3%	4%	4%	4%	
Lawn	65%	67%	70%	67%	75%	
Car wash/year						19.673 $^{N.S.}$
0	0%	0%	18%	6%	7%	
1-4	35%	33%	23%	38%	53%	
5-10	19%	24%	18%	6%	13%	
11- 20	32%	24%	14%	38%	7%	
>20	13%	19%	27%	13%	20%	
Where wash car						4.426 $^{N.S.}$
Driveway	93%	95%	82%	94%	79%	
Lawn	7%	5%	18%	6%	21%	

Table 27. Survey results for wastes in the BMP watershed.

BMP	1999	2001	2002	2003	2004	χ^2
Pets						
Cat			0%	0%	0%	
Dog			0%	100%	100%	
Pet Waste handling						
Compost			0%	0%	0%	
Inside			0%	0%	0%	
Outside			0%	50%	33%	
Trash			0%	50%	67%	
Leaf disposal						0.580 $^{N.S.}$
Bag/curb			40%	25%	33%	
Compost			40%	38%	33%	
Mulch/lawn			20%	38%	33%	
Pile on property			0%	0%	0%	
Professional service			0%	0%	0%	
Put in street			0%	0%	0%	
Other			0%	0%	0%	

Table 28. Survey results for lawn maintenance in the BMP watershed.

BMP	1999	2001	2002	2003	2004	χ^2
Lawn Care						
Self			**100%**	**100%**	**100%**	
Professional service			**0%**	**0%**	**0%**	
Lawn Clippings						**5.384** N.S.
Left on lawn			**40%**	**0%**	**21%**	
Compost/garden			**40%**	**29%**	**21%**	
Mulch mower			**20%**	**71%**	**50%**	
Bag - trash			**0%**	**0%**	**7%**	
Other			**0%**	**0%**	**0%**	
Fertilize lawn						**1.230** N.S.
Yes			**67%**	**86%**	**89%**	
No			**33%**	**14%**	**11%**	
Fertilize # of times/yr						**2.922** N.S.
1-2			**75%**	**33%**	**25%**	
3-4			**25%**	**67%**	**75%**	
>4			**0%**	**0%**	**0%**	
Unknown			**0%**	**0%**	**0%**	
How decide fertilizer?						**3.149** N.S.
Bag instructions			**50%**	**44%**	**55%**	
Calibrated spreader			**50%**	**33%**	**18%**	
Past experience			**0%**	**11%**	**18%**	
Professional service			**0%**	**0%**	**0%**	
Soil test			**0%**	**11%**	**9%**	

Table 29. Survey results for water use and distribution in the BMP watershed.

BMP	1999	2001	2002	2003	2004	χ^2
Lawn watering method						7.464 N.S.
Auto sprinkler			0%	0%	9%	
Hand hose			0%	13%	18%	
Manual sprinkler			57%	50%	73%	
Nature			43%	38%	0%	
Rain gutters dump						3.718 N.S.
Driveway			22%	33%	33%	
Foundation drain			33%	0%	17%	
Lawn			44%	67%	50%	
Car wash/year						5.047 N.S.
0			60%	20%	33%	
1-4			0%	60%	44%	
5-10			20%	0%	11%	
11- 20			20%	20%	11%	
>20			0%	0%	0%	
Where wash car						
Driveway			100%	100%	100%	
Lawn			0%	0%	0%	

Table 30. Survey results for wastes in the Traditional watershed.

Traditional	1999	2001	2002	2003	2004	χ^2
Pets						3.810 N.S.
Cat		33%	0%	0%	0%	
Dog		67%	100%	100%	100%	
Pet Waste handling						4.686 N.S.
Compost		0%	0%	0%	0%	
Inside		0%	40%	0%	0%	
Outside		40%	20%	0%	0%	
Trash		60%	40%	100%	100%	
Leaf disposal						10.416 N.S.
Bag/curb		29%	9%	17%	9%	
Compost		0%	9%	0%	9%	
Mulch/lawn		14%	9%	33%	45%	
Pile on property		14%	36%	33%	18%	
Professional service		29%	18%	17%	18%	
Put in street		0%	0%	0%	0%	
Other		14%	18%	0%	0%	

Table 31. Survey results for lawn maintenance in the Traditional watershed.

Traditional	1999	2001	2002	2003	2004	χ^2
Lawn Care						0.478 N.S.
Self		67%	56%	71%	63%	
Professional service		33%	44%	29%	38%	
Lawn Clippings						15.387 N.S.
Left on lawn		22%	0%	22%	64%	
Compost/garden		0%	0%	11%	9%	
Mulch mower		56%	63%	44%	27%	
Bag - trash		11%	13%	0%	0%	
Other		11%	25%	22%	0%	
Fertilize lawn						2.971 N.S.
Yes		88%	100%	100%	100%	
No		13%	0%	0%	0%	
Fertilize # of times/yr						2.727 N.S.
1-2		14%	25%	14%	25%	
3-4		86%	75%	71%	63%	
>4		0%	0%	14%	13%	
Unknown		0%	0%	0%	0%	
How decide fertilizer?						5.405 N.S.
Bag instructions		40%	43%	63%	44%	
Calibrated spreader		20%	14%	13%	0%	
Past experience		0%	7%	0%	11%	
Professional service		30%	21%	25%	33%	
Soil test		10%	14%	0%	11%	

Table 32. Survey results for water use and distribution in the Traditional watershed.

Traditional	1999	2001	2002	2003	2004	χ^2
Lawn watering method						**8.573** N.S.
Auto sprinkler		**0%**	**22%**	**25%**	**38%**	
Hand hose		**11%**	**11%**	**0%**	**0%**	
Manual sprinkler		**89%**	**56%**	**50%**	**50%**	
Nature		**0%**	**11%**	**25%**	**13%**	
Rain gutters dump						**3.929** N.S.
Driveway		**20%**	**17%**	**14%**	**38%**	
Foundation drain		**10%**	**17%**	**0%**	**0%**	
Lawn		**70%**	**67%**	**86%**	**63%**	
Car wash/year						**11.713** N.S.
0		**0%**	**29%**	**13%**	**43%**	
1-4		**33%**	**29%**	**38%**	**29%**	
5-10		**33%**	**14%**	**0%**	**0%**	
11- 20		**0%**	**14%**	**25%**	**29%**	
>20		**33%**	**14%**	**25%**	**0%**	
Where wash car						
Driveway		**100%**	**100%**	**100%**	**100%**	
Lawn		**0%**	**0%**	**0%**	**0%**	

BMP Costs

Table 33 compares various costs of BMPs as compared to the traditional watershed. In general, BMPs added development costs. Added costs became apparent during the planning and approval stages of the project. Designing the BMPs required more time by the design engineer, which translated into additional costs for each lot. For example, rain gardens were added to each lot plan. The paver driveways were more expensive than traditional asphalt but the crushed stone driveways were cheaper than asphalt. Additional erosion and sediment control costs were assessed for the BMP watershed.

Table 33. Costs comparisons of traditional development and BMP development, Jordan Cove watershed using actual costs.

Activity	Traditional	BMP
Cul-de-sac bioretention	$ 1,275	$ 2,183
Driveway (asphalt)	$ 2,800/lot	
Driveway (paver)		$ 7,896/lot
Erosion & sediment control	$ 322/lot	$ 625/lot
Plantings	$ 500/lot	$ 650/lot
Planning and design	$ 401/lot	$ 808/lot
Road and curb	$ 23,494	$ 102,500
Rain gardens	$ 0	$ 575/lot
Stormwater collection	$ 7,700	$ 3,600

CONCLUSIONS

Residential development has significant adverse impacts on runoff quality and quantity. Typical hydrologic alterations due to construction activities, such as increased runoff volume, were not found in the BMP watershed. On the contrary, a reduction of stormwater runoff was observed. This reduction can be attributed to both excavation of all basements in a relatively short time and proper location of earthen berms to retain and infiltrate stormwater onsite. Decreases in runoff continued in the BMP watershed during the post-construction period. Thus, this project was successful in maintaining predevelopment discharge rates. During the construction phase in the traditional watershed, runoff volume increased by a magnitude of two. That increase in flow continued during the post-construction period.

Concentrations of TSS, NO_3-N, NH_3-N, TKN and TP significantly increased in stormwater runoff at the BMP site during construction and remained higher following construction. The continued TSS and P exports from the BMP watershed could be related to transport from the swales and fertilizer applications in the swales. In contrast, TSS, NO_3-N, and NH_3-N concentrations did not change, and TKN and TP concentrations experienced a significant reduction, during construction in the traditional watershed. Single activities contributed to concentration spikes, and are important. These events included TSS increases during unstabilized soil conditions in the swales and N and P increases following fertilization. During the post-construction period in the traditional watershed, concentrations of TSS, TP, and TKN remained significantly lower than expected.

The mass export of nitrogen species, Cu and Pb did not change in stormwater runoff from the BMP watershed during construction. TSS and TP exports generally increased both during and after construction. Zn export declined in both periods. In contrast, the mass export of sediment, nutrients and metals all increased in stormwater runoff from the traditional watershed during and after construction. These increases were associated with higher discharge from the traditional watershed during and after construction.

The behavior of BMP watershed residents, as determined from annual surveys generally was not different from the residents in the other two traditional watersheds, perhaps indicating that education methods used were not as effective as expected.

Relation to treatment goals

The following treatment goals were established for the BMP watershed. Each goal is assessed as to whether the goal has been achieved.

1. To implement BMPs on 100% of the lots in the BMP portion of the subdivision. – **goal met**.

2. To maintain post-development peak runoff rate and volume at levels equal to predevelopment rates. **– volume and peak rate goal met**

3. To maintain post-development loading of TSS at levels equal to predevelopment rates **– goal not met.**

4. To retain sediment onsite during construction. – **goal not met.**

5. To reduce nitrogen export by 65% - **goal met.**

6. To reduce bacterial export by 85%. **– goal not met.**

7. To reduce phosphorus export by 40%. – **goal met.**

RECOMMENDATIONS

Planning

Cluster Design. The cluster design helped to reduce overall imperviousness, and increase open space. A cluster approach is recommended for future developments.

LID-based Regulations. Because many waivers were required for the construction of this project, an LID ordinance is recommended to facilitate adoption of this approach in other towns.

Disconnect Stormwater. The percentage of impervious coverage has been related to water quality and habitat impairments. As part of the low-impact development approach, disconnection of stormwater sources should be considered at the planning phase. Common disconnects include gutter design (to ensure that downspouts drain to pervious surfaces), road and driveway design. By emphasizing disconnected stormwater, the thresholds identified for water quality impacts from traditional developments may not apply.

Construction

Compaction. Soil compaction due to heavy equipment use of a temporary access road caused problems with infiltration in rain gardens and swales. Therefore, it is recommended that soil compaction be kept to a minimum, and that hard-surface roads are used for access during construction.

Undisturbed Soils. To help maintain the overall infiltration capacity of the soils on the site, it is recommended that as much of the site's soils and vegetation as possible is left undisturbed.

On-site Supervision. Because LID practices are still fairly new and contractors are unfamiliar with their installation, it is recommended that a person versed in installation of LID techniques is on-site during construction. In addition, it is imperative that this person has the ability to make adjustments to the plan in the field, as necessary.

Earthen Berm. The installation of the earthen berm to reduce export of sediment and runoff worked well, and is a recommended construction best management practice.

Grassed Swales. Due to the fact that grassed swales are vegetated systems and are vulnerable to erosion until stabilized, it is recommended that temporary erosion and sedimentation controls are implemented when swales are installed. See the **Connecticut Guidelines for Soil Erosion and Sediment Control (DEP Bulletin 34)** for specific recommendations.

Soil Testing. Contractors are accustomed to applying a starter fertilizer to loam when seeding a lawn. This practice occurred at the site, despite the fact that soil tests showed that no fertilizer was needed. Therefore, it is recommended that a soil test is performed when loam is applied to swales or lawns, and that the contractor follows the recommendations. More broadly, soil tests do not include a test for nitrogen, so even if homeowners or contractors have a soil test done, recommendations for nitrogen application are not provided. It is recommended that a nitrogen test be a component of standard soil testing.

Post-Construction

Education. The intensive one-on-one education methods that are traditionally thought to produce the most effective behavioral changes did not perform as intended. The involvement of a social scientist might be helpful to ascertain appropriate education methods.

Bioretention Maintenance. Maintenance of the cul-de-sac bioretention area resulted in excessive weed trimming with damage to shrubs. It is recommended that proper maintenance techniques be implemented to ensure proper function, aesthetics and plant health. Such techniques include maintenance of flow paths, surface water storage capacity and mulching to reduce weeds and the need for mowing.

Paver Maintenance. Due to the excessive loading of wind-blown fine particles loaded on to the pavers before construction was complete, the infiltrating ability of the roadway was reduced. Therefore, it is recommended that if a pervious surface has high loading of fine particles, the surface should be maintained by vacuum suction and replacement of the infill materials.

Turf Dam. The turf has begun to creep over the edge of the roadway in some places. Some consideration should be given to avoid this growth, as it can channel water down the roadway and prevent it from entering the swale.

Fire Hydrant. The fire hydrant on site was flushed at one point, and the infill material on the roadway was washed out in a large area. It is recommended that if this practice is necessary, care should be taken to direct the flush water away from the roadway and into an area that will not erode.

Seed Mix. A special turf seed mix was used at the site that had low fertilizer, water and maintenance requirements. However, several homeowners reseeded large areas with standard seed. Therefore, it is recommended that the use of the special seed mixture is specified in the homeowners' association documents.

Monitoring

Control. The use of the control watershed was critical in this study to attribute the changes observed to the construction and management practices used, without bias from climatic variations. Therefore, the use of a similar control is advised in future monitoring efforts.

Forested Control. The control used in this project was a previously developed residential area. To make direct comparisons with the pollutant export from undeveloped areas, it would be helpful in future studies to include an undeveloped control.

Sampling Methods. Although the continuous automated sampling used in the project was highly successful, relatively few event-based grab samples were taken. Grab sampling is weather dependent, and is difficult to perform at a remote site. Future projects should consider the proximity of the site if grab sampling is desired. In addition, a local volunteer could be enlisted to aid in collecting samples on evenings or weekends.

Electric Power. Solar panels were used to supply power at various times through the project. However, the ability to connect to the power grid provided more stability and gave more flexibility for sample preservation (i.e., the use of small refrigerators). Future projects should consider connections to the grid when possible.

Further Study

Groundwater Effects. Groundwater monitoring was not performed as part of this study. However, the addition of this type of monitoring would help to answer questions about the fate and transport of pollutants as a result of the LID infiltration practices used, versus traditional stormwater methods.

Social Indicators of Behavior. The intensive education methods used in this study did not provide the expected results. Future watershed studies should include social scientists to better understand the role of humans in a watershed.

Economics of LID. Economists should be involved in LID watershed studies to appropriately assess LID costs and benefits compared to traditional development.

Testing of Soils. Some soil testing was performed as part of this study; however, a more intensive soil testing effort would provide valuable information on the fate and transport of pollutants.

FUTURE PLANS

There are no plans to continue monitoring at the Jordan Cove Urban Watershed Project location. NEMO and other project staff have and will likely continue to provide tours of the study location upon request. Requests for presentations will also be met as long as funding is available for travel. One additional peer reviewed publications is being prepared that deals with the overall results of the project. A complete list of publications and presentations is provided in the Appendix.

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APPENDICES

A. Jordan Cove Watershed Household 10-point survey

B. Project publications

C. Project presentations

D. Jordan Cove water quality and flow data.

JORDAN COVE WATERSHED HOUSEHOLD 10-POINT SURVEY

1. How many pets/what types do you have that go outside? ____________________
1a. How do you handle disposal of pet wastes?
___ Waste is handled inside
___ Waste is left to decompose outside
___ Waste is composted
___ Waste picked up & thrown out with trash
___ Other ____

2. Who takes care of your lawn?
___ Myself/members of family
___ Non-professional paid help (student)
___ Professional lawn care service
___ Other __________________________

3. When your lawn gets cut, what happens to the clippings?
___Left on lawn
___mulched with mower
___ Added to compost or garden
___ Bagged and put in trash
___ Other (please specify) ____

4. Do you fertilize your lawn? ___ Yes ___ No (Go to question 5)

4a. How many times each season do your fertilize your lawn/how much do you apply?

Spring (March-May)	__________ times	__________ pounds
Summer (June-August)	__________ times	__________ pounds
Fall (Sept.-Nov.)	__________ times	__________ pounds
Winter (Dec.-Feb.)	__________ times	__________ pounds

4b. How do you decide how much fertilizer to use?
___ Professional service takes care of fertilizing.
___ Based on soil test
___ Follow the instructions on the bag
___ Based on past experience
___ Use calibrated spreader

5. What lawn watering method do you use?
___ I let nature take its course
___ I water by hand with a hose
___ I use a manual sprinkler with I turn on/off and move myself
___ I have an installed sprinkler in lawn set on ___manual or ___ automatic

6. How do you dispose of leaves in the fall/spring?
___A professional service removes them
___ Pile on my property
___ Mulch them and leave on lawn
___ Add to compost
___ Bag and put at curb
___ Put into street
___ Other (please specify) ____

7. Where do your rain gutters run to?
___ flow on lawn
___ flow on driveway
___ connected to foundation drain
___ other (please specify) __________________________

8. How often do you wash your car at home? (please specify) __________________________

9. Where do you wash your car at home? (please specify) __________________________

10. ___ I would like to receive more information about the Jordan Cove project.

University of Connecticut
Department of Natural Resources Management & Engineering

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Clausen, J. C. 1996. Jordan Cove Project, Ct. Proceedings. NEIWPCC's 7th Annual Nonpoint Source Meeting. Glens Falls, NY May 21-23.

Clausen, J. C. 1996. Plenary Session: The role of watershed projects in regional programs: Jordan Cove, Long Island Sound. Proceedings Fourth National Nonpoint Source Watershed Monitoring Workshop. US EPA. Harrisburg, PA. Sept. 16-20.

Clausen, J. C. 1997. Jordan Cove Urban Watershed. Invited Seminar. U.S. EPA Boston, MA. May 14.

Clausen, J. C. 1997. Jordan Cove Urban Watershed. Invited lecture. Ct. Dept. of Environmental Protection. Hartford. Feb 10.

Clausen, J. C. 1998. Innovative Nonpoint Source Best Management Tour. New England Interstate Water Pollution Control Commission. August 18-19.

Clausen, J. C. 1998. Jordan Cove Project. Proc. Water Quality in the Quinnipiac R. A Symposium on the Impact of Non Point Source Pollution in the Quinnipiac River Watershed. Yale University. Nov. 23.

Enghahl, J. J. and J. C. Clausen. 1998. Residential construction impacts on water quality and quantity in Connecticut. Sixth National Nonpoint Source Monitoring Workshop. Iowa Dept. Nat. Res. Cedar Rapids. IA. Sept 21-24. Abstract.

Clausen, J. C. and J. J. Engdahl. 1999. Impacts of residential construction on water quality and quantity in Connecticut. Seventh National Nonpoint Source Monitoring Workshop. Morro bay, CA. Sept. 12-17. Abstract.

Clausen, J. C. 1999. Study design workshop. Seventh National Nonpoint Source Monitoring Workshop. Morro bay, CA. Sept. 12-17. Abstract.

Clausen, J. C. 2000. Success stories in ecologically friendly development. Maine Water Conference 2000. Augusta, ME April 13.

Clausen, J. C. 2001. Jordan Cove Field Tour. 12th. Annual Nonpoint Source Meeting. New England Interstate Water Pollution Control Commission. May 22-24. Madison, CT.

Clausen, J. C. 2002. Sustainable Development Practices.12th Annual Long Island Sound Summit. NY Botanical Garden. Bronx, NY. April 6.

Clausen, J. C. 2002. Issues and Challenges of Storm Water Infiltration.Storm Water Infiltration & Groundwater Recharge Conference. Southern New England Chapter of the Soil and Water Conservation Society. Worcester, MA May 21.

Clausen, J. C. 2002. Jordan Cove. Storm Water Infiltration & Groundwater Recharge Conference. Southern New England Chapter of the Soil and Water Conservation Society. Worcester, MA May 21

Clausen, J. C. 2002. National Low Impact Development Roundtable. Baltimore, MD. July 25-26.Prince George's Co.

Clausen, J. C. 2003. Innovative Stormwater Management: A case study of Jordan Cove Connecticut Dept. Environ. Prot. Invited presentation Feb. 6.

Clausen, J. C. 2003. Jordan Cove subdivision case study. Low Impact development Conference. The Connecticut Green Building Council. New Haven, CT. Mar. 21.

Clausen, J. C. 2003. Jordan Cove Urban Watershed Section 319 National Monitoring Program Project: A Low Impact Development. 11th National Nonpoint source Monitoring Workshop. Dearborn, MI Sept 8-11.

Clausen, J. C. 2003. Low Impact Development (LID) Storm Water Best management Practices – Do They Work? Connecticut Association of Conservation and Inland Wetland Commissions 26th Annual Meeting. Wallingford, CT. November 15.

Clausen, J. C. 2003. The Jordan Cove Urban Watershed Project: Does Pollution Prevention Work? Mystic Seaport Long Island Sound Environmental Lecture Series. Stamford, CT. April 12.

Clausen, J.C. 2004. Low Impact Design Strategies for Stormwater Management Workshop, Tuckerton, NJ Oct. 27.

Clausen., J.C. 2004. Jordan Cove Watershed Project. 12th National Nonpoint Source Monitoring Workshop. Ocean City, MD.

Clausen, J.C. 2005. Improving Stormwater Quality: A showcase of Innovative Technology and Site Design Mytrle Beach, Feb 2.

Clausen, J.C. 2005. Jordan Cove Urban Watershed NMP. 13th National Nonpoint Source Monitoring Workshop. Raleigh, NC.

Clausen, J.C. 2005. Jordan Cove paired watershed research. Water friendly Landscape Design: A prescription for healthy watersheds. University of Delaware. Keynote Speaker. Oct 21. Newark, DE.

Clausen, J.C. 2006. Jordan Cove Urban Watershed Section 319 National Monitoring Program Project. 17th. Annual Nonpoint Source Pollution Conference, Burlington, VT May 22-24.

Clausen, J.C. 2006. Jordan Cove Urban Watershed Section 319 National Monitoring Program Project. VT DEC. Montpelior, VT. May 25.

Clausen, J.C. 2006. Jordan Cove Urban Watershed Section 319 National Monitoring Program Project. USEPA Boston MA. June 22.

Cote, M. 2000. National Conference on Tools for Urban Water Resource Management and Protection. Chicago, IL February 7.

Cote, M. 2004. Symposium on impacts to coastal systems. Rutgers University, New Jersey. April 7-8.

Cote, M. 2004. 5th Annual Regional Sustainable Development Forum, MIT, Cambridge, MA Oct. 29.

Cote, M. 2005. Massachusetts Low Impact Development Working Group Meeting. Boston, MA November 17.

Cote, M. 2005. Casco Bay Estuary Partnership. Board of Directors Meeting. Portland, ME December 7.

Dietz, M. D. 2007. Jordan Cove Urban Watershed project. NE Chapter Soil and Water Conservation Society Meeting. Sturbridge, MA. February 15.

Dietz, M. D. 2007. Jordan Cove Urban Watershed project. Civil and Environmental Engineering Design Class, University of Connecticut, Storrs, CT. March 5.

Gilbert, J. and J. C. Clausen. 2002 Stormwater runoff quality and quantity from asphalt, paver, and stone driveways. 10th. National Nonpoint Source Monitoring Workshop. Breckenridge, CO Sept. 12-13.

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Control Watershed

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	Concentration (mg/l)						F.C.	station	Depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
504	11/07/95	4422	24382	24382			0.2	0.03	0.2	0.02	14			504	1.26	13.61	25.1	3.76	25.1	2.507	1754.9
504	11/14/95	4509	18662	18662			0.1	0.14	0.6	0.076	18			504	0.96	13.61	9.6	13.43	57.6	7.292	1727.0
504	11/21/95	4537	6972	6972			0.1	0.06	0.2	0.07	4	8	20	504	0.36	13.61	3.6	2.15	7.2	2.509	143.4
504	12/15/95	4599	9503	9503			0.1	0.11	0.6	0.078	4	8	2	504	0.49	13.61	4.9	5.37	29.3	3.811	195.4
504	12/22/95	4837	2073	2073			0.1	0.2	2.7	0.104	28			504	0.11	13.61	1.1	2.13	28.8	1.108	298.4
504	01/04/96													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/11/96													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/18/96	4886	27605	27605			0.1	0.34	0.7	0.066	10	4	128	504	1.42	13.61	14.2	48.25	99.3	9.367	1419.2
504	01/25/96	5111	57043	57043			7.5	0.005	0.5	0.187	13		0	504	2.94	13.61	2199.5	1.47	146.6	54.840	3812.4
504	02/01/96		5985	5985										504	0.31	13.61	0.0	0.00	0.0	0.000	0.0
504	02/08/96	5247					0.1	0.02	1.2	0.21	33			504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/14/96	5251	18997	18997			0.8	0.005	0.6	0.146	12			504	0.98	13.61	78.1	0.49	58.6	14.259	1172.0
504	02/22/96	5299	10848	10848							3544	6	52	504	0.56	13.61	0.0	0.00	0.0	0.000	197651.1
504	02/29/96		1462	1462										504	0.08	13.61	0.0	0.00	0.0	0.000	0.0
504	03/07/96	5342	7188	7188			0.4	0.005	0.3	0.126	26			504	0.37	13.61	14.8	0.18	11.1	4.656	960.8
504	03/14/96	5363	6989	6989			0.1	1.1	0.3	0.12	9			504	0.36	13.61	3.6	39.52	10.8	4.312	323.4
504	03/21/96	5388	7222	7222			1.2	0.05	0.8	0.166	65	2	26	504	0.37	13.61	44.6	1.86	29.7	6.163	2413.4
504	04/04/96	5428	6135	6135	0.58		0.3	0.005	0.2	0.036	10	2	1	504	0.32	13.61	9.5	0.16	6.3	1.135	315.4
504	04/11/96	5451	8032	8032	0.35		0.3	0.005	0.3	0.066	9	1	0	504	0.41	13.61	12.4	0.21	12.4	2.725	371.6
504	04/18/96	5481	20347	20347	2.25		0.4	0.02	1.6	0.183	31	1	6	504	1.05	13.61	41.8	2.09	167.4	19.143	3242.8
504	04/25/96	5533	1115	1115			0.3	0.04	3.3	1.679	374	1	0	504	0.06	13.61	1.7	0.23	18.9	9.625	2143.9
504	05/02/96	5608	12167	12167	1.74		0.5	0.08	0.6	0.196	33			504	0.63	13.61	31.3	5.00	37.5	12.260	2064.2
504	05/09/96	5631	3971	3971			0.7	0.13	1	0.158	32			504	0.20	13.61	14.3	2.65	20.4	3.226	653.3
504	05/16/96		4338	4338										504	0.22	13.61	0.0	0.00	0.0	0.000	0.0
504	05/23/96	5671	4325	4325			0.6	1.46	5.4	0.532	68			504	0.22	13.61	13.3	32.46	120.1	11.829	1512.0
504	06/06/96	5724	4690	4690			0.6	0.3	1.2	0.469	17			504	0.24	13.61	14.5	7.23	28.9	11.308	409.9
504	06/13/96	5745	5312	5312	3.45		0.2	0.18	1.9	0.489	194			504	0.27	13.61	5.5	4.92	51.9	13.354	5298.0
504	06/20/96	5768	2458	2458	0.86		0.1	0.14	1.8	0.125	4			504	0.13	13.61	1.3	1.77	22.7	1.580	50.5
504	06/27/96	5774	239	239			0.5	0.09	0.1	0.07	3			504	0.01	13.61	0.6	0.11	0.1	0.086	3.7
504	07/03/96	5795	561	561	3.7		1.5	0.94	4	0.68	175	2	11700	504	0.03	13.61	4.3	2.71	11.5	1.961	504.7
504	07/11/96	5822	12092	12092	0.67		0.3	0.1	2.1	0.298	216			504	0.62	13.61	18.6	6.22	130.5	18.526	13427.9
504	07/18/96	5833	32615	32615	3.46		0.8	0.4	1	0.407	205			504	1.68	13.61	134.1	67.07	167.7	68.245	34373.8
504	07/25/96	5890	1560	1560			0.8	0.57	1.3	0.693	89			504	0.08	13.61	6.4	4.57	10.4	5.558	713.8
504	08/01/96	5934	1845	1845			0.5	0.5	2.7	0.338	27			504	0.10	13.61	4.7	4.74	25.6	3.206	256.1
504	08/08/96	5985	1116	1116			0.4	0.01	2.2	0.242	56			504	0.06	13.61	2.3	0.06	12.6	1.388	321.3
504	08/15/96	6040	9362	9362	3.51		0.5	0.17	1.4	0.29	8	17	727	504	0.48	13.61	24.1	8.18	67.4	13.958	385.0
504	08/29/96	6084	6935	6935	4.71		1.1	0.47	2.7	0.457	146			504	0.36	13.61	39.2	16.76	96.3	16.294	5205.4
504	09/12/96	6121	14970	14970	7.14		0.3	0.08	1.6	0.353	65			504	0.77	13.61	23.1	6.16	123.1	27.168	5002.5
504	09/19/96	6147	21473	21473	2.08		0.3	0.15	0.6	0.418	4			504	1.11	13.61	33.1	16.56	66.2	46.145	441.6
504	09/26/96	6174	3069	3069			0.6	0.29	0.6	0.246	12			504	0.16	13.61	9.5	4.58	9.5	3.881	189.3
504	10/03/96	6193	2319	2319			0.4	0.23	1.6	0.15	19			504	0.12	13.61	4.8	2.74	19.1	1.788	226.5
504	10/10/96	6217	12998	12998			0.4	0.06	0.9	0.108	13			504	0.67	13.61	26.7	4.01	60.1	7.217	868.7
504	10/24/96	6265	25130	25130	0.67		0.2	0.005	0.6	0.046	44			504	1.29	13.61	25.8	0.65	77.5	5.943	5684.6
504	10/31/96	6309	3443	3443	1.43		0.6		3.8	1.129	85			504	0.18	13.61	10.6	0.00	67.3	19.984	1504.6
504	11/07/96	6329	201	201			0.5		1	0.174	24	12	70	504	0.01	13.61	0.5	0.00	1.0	0.180	24.8
504	11/14/96	6351	1829	1829			0.1	2.04	1.2	0.369	92			504	0.09	13.61	0.9	19.18	11.3	3.470	865.1
504	11/21/96		220	220										504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	11/27/96	6379	7539	7539			0.6		1.5	0.054	763			504	0.39	13.61	23.3	0.00	58.1	2.093	29572.9
504	12/05/96	6403	15479	15479			0.3	0.11	3.6	0.262	33			504	0.80	13.61	23.9	8.75	286.5	20.850	2626.1
504	12/13/96	6426	37031	37031			0.4	0.005	1.9	0.338	64			504	1.91	13.61	76.2	0.95	361.7	64.348	12184.3
504	12/19/96	6452	8565	8565			0.28	0.02	0.5	0.091	12			504	0.44	13.61	12.3	0.88	22.0	4.007	528.4
504	12/26/96	6454	9647	9647			0.3	0.09	2.2	0.155	42			504	0.50	13.61	14.9	4.46	109.1	7.687	2083.0
504	01/02/97	6475					0.4	1.38	2.8	0.109	20			504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/09/97	6498					3.6		2.5	0.033	54			504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/16/97	6523					0.8		2	0.203	7	1	16	504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/23/97	6545	6355	6355			0.4	0.31	0.7	0.068	0			504	0.33	13.61	13.1	10.13	22.9	2.222	0.0
504	01/30/97	6568	12304	12304			0.8	0.54	1.2	0.102	14			504	0.63	13.61	50.6	34.16	75.9	6.452	885.6
504	02/06/97		8897	8897										504	0.46	13.61	0.0	0.00	0.0	0.000	0.0
504	02/14/97		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/18/97	6624	3000	3000			0.6		1.4	0.027	27			504	0.15	13.61	9.3	0.00	21.6	0.416	416.4
504	02/27/97	6648	501	501			4.5	0.38	1.3	0.0025	17			504	0.03	13.61	11.6	0.98	3.3	0.006	43.8
504	03/06/97	6682	1690	1690			0.4	1.83	0.3	0.013	8			504	0.09	13.61	3.5	15.90	2.6	0.113	69.5
504	03/13/97	6723	1598	1598			0.14	0.02	0.6	0.031	20			504	0.08	13.61	1.2	0.16	4.9	0.255	164.3

Water Quality Data Control Watershed

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	Concentration (mg/l)						F.C.	station	Depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
504	03/20/97	6725	9784	9784			0.3	0.6	0.7	0.059	2			504	0.50	13.61	15.1	30.18	35.2	2.968	100.6
504	03/27/97	6767	1336	1336			1.6	0.62	0.9	0.078	12			504	0.07	13.61	11.0	4.26	6.2	0.536	82.4
504	04/03/97	6791	14842	14842	0.87		0.3	0.08	0.8	0.081	5			504	0.76	13.61	22.9	6.10	61.0	6.181	381.5
504	04/10/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	04/17/97	6836	4688	4688			0.4	0.26	0.9	0.660	8			504	0.24	13.61	9.6	6.27	21.7	15.907	192.8
504	04/24/97	6841	3440	3440			0.4	0.1	0.8	0.105	55			504	0.18	13.61	7.1	1.77	14.1	1.857	972.7
504	05/01/97	6877	4573	4573			0.3	0.28	1.0	0.061	17			504	0.24	13.61	7.1	6.58	23.5	1.434	399.7
504	05/08/97	6894	4656	4656			0.9	0.63	1.6	0.008	224			504	0.24	13.61	21.5	15.08	38.3	0.191	5361.9
504	05/15/97	6915	1690	1690			1	0.06	2.1	0.035	2			504	0.09	13.61	8.7	0.52	18.2	0.304	17.4
504	05/22/97	6931	4536	4536			1.1	0.55	0.9	0.066	16			504	0.23	13.61	25.7	12.83	21.0	1.539	373.1
504	05/28/97	6949	4176	4176			0.3	0.15	0.8	0.082	4			504	0.22	13.61	6.4	3.22	17.2	1.760	85.9
504	06/05/97	6967	1209	1209			0.3	1.15	1.0	0.092	19			504	0.06	13.61	1.9	7.15	6.2	0.572	118.1
504	06/12/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/19/97	6980	2224	2224			1.3	0.16	2.5	0.781	23			504	0.11	13.61	14.9	1.83	28.6	8.930	263.0
504	06/26/97	7082	1154	1154			5.7	1.66			165.5			504	0.06	13.61	33.8	9.85	0.0	0.000	981.9
504	07/03/97	7205	6823	6823	8.79		1.4	0.42	5.8	0.358	229			504	0.35	13.61	49.1	14.73	203.5	12.558	8032.8
504	07/10/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/17/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/24/97	7327	6388.64	6388.64			1.66	0.65	4.3	0.52	64.3			504	0.33	13.61	54.5	21.35	141.2	17.079	2111.9
504	07/31/97	7332	1920.14	1920.14			0.36	0.63	1.4	0.106	11			504	0.10	13.61	3.6	6.22	13.8	1.046	108.6
504	08/07/97	7338	3800.72	3800			0.9	0.18	2.5	0.253	41.6			504	0.20	13.61	17.6	3.52	48.8	4.943	812.7
504	08/14/97	7342	4830.23	4830			1	0.04	1.2	0.111	13.6			504	0.25	13.61	24.8	0.99	29.8	2.756	337.7
504	08/21/97	7351	17159.18	16200			0.3	0.06	0.8	0.284	11	4.4	168	504	0.83	13.61	25.0	5.00	66.6	23.653	916.1
504	08/28/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/03/97	7362	228.69	228.7			2	0.08	5	0.477	123			504	0.01	13.61	2.4	0.09	5.9	0.561	144.6
504	09/10/97	7366	1210.21	1210			0.9	0.65	15.8	1.783	530.4			504	0.06	13.61	5.6	4.04	98.3	11.092	3299.5
504	09/17/97	7370	987.71	987.7			1.2	2.48	4.2	0.468	104.4			504	0.05	13.61	6.1	12.59	21.3	2.376	530.1
504	09/24/97	7374	155.75	155.75			2.4	0.64	5.6	0.517	85.71			504	0.01	13.61	1.9	0.51	4.5	0.414	68.6
504	10/01/97	7379	1879.13	1879.13			0.6	0.28	1.7	0.195	8.8			504	0.10	13.61	5.8	2.71	16.4	1.884	85.0
504	10/08/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/15/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/22/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/29/97	7397	11370.62	11370.62			0.3	1.36	2.9	0.338				504	0.59	13.61	17.5	79.50	169.5	19.759	0.0
504	11/05/97	7405	23094.34	23094.34			0.5	6.9	4.7	2.007				504	1.19	13.61	59.4	819.24	558.0	238.292	0.0
504	11/12/97		4215.87	4215.87										504	0.22	13.61	0.0	0.00	0.0	0.000	0.0
504	11/19/97	7434	3351.42	3351.42			0.1	0.98	0.4	0.07	19			504	0.17	13.61	1.7	16.89	6.9	1.206	327.4
504	11/26/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	12/03/97	7445	789.69	789.69			0.6	1.33	0.9	0.064				504	0.04	13.61	2.4	5.40	3.7	0.260	0.0
504	12/11/97	7468	404.36	404.36			3.3	2	1.5	0.004				504	0.02	13.61	6.9	4.16	3.1	0.008	0.0
504	12/18/97													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	12/23/97	7476	3225.4	3225.4			2.2	0.43	1.4	0.0025	61.4	1.5	15	504	0.17	13.61	36.5	7.13	23.2	0.041	1018.1
504	01/08/98	7486	16897.34	16897.34			0.3	0.005	0.3	0.053	2.6			504	0.87	13.61	26.1	0.43	26.1	4.604	225.9
504	01/15/98	7513	981.9	981.9			0.2	2	1.3	0.168	63.2			504	0.05	13.61	1.0	10.10	6.6	0.848	319.0
504	01/22/98	7521	5698.15	5698.15			0.2	0.54	0.9	0.09	6.8			504	0.29	13.61	5.9	15.82	26.4	2.637	199.2
504	01/29/98	7528	27530.78	27530.78			0.2	0.01	1.7	0.17	56.4			504	1.42	13.61	28.3	1.42	240.6	24.062	7982.8
504	02/05/98	7536	241.03	241.03			0.6	0.005	0.9	0.063	6.4	2.62	10	504	0.01	13.61	0.7	0.01	1.1	0.078	7.9
504	02/12/98	7562	7108.24	7108.24			0.1	0.005	0.6	0.091	18	0	0	504	0.37	13.61	3.7	0.18	21.9	3.326	657.8
504	02/19/98	7569	14680.09	14680.09			0.1	2.8	2	0.112	30			504	0.76	13.61	7.5	211.32	150.9	8.453	2264.2
504	02/26/98	7577	1176.07	1176.07			0.1	0.05	0.5	0.028	6.8			504	0.06	13.61	0.6	0.30	3.0	0.169	41.1
504	03/05/98	7589	1510.26	1510.26			0.1	1.4	1.7	0.096	20.4			504	0.08	13.61	0.8	10.87	13.2	0.745	158.4
504	03/12/98	7597	27615	27615			0.1	0.005	0.9	0.118	24.4			504	1.42	13.61	14.2	0.71	127.8	16.753	3464.1
504	03/19/98	7624	3583.67	3583.97			0.2	0.15	0.4	0.029	1.6	1.6	0	504	0.18	13.61	3.7	2.76	7.4	0.534	29.5
504	03/26/98	7635	3929	3929			0.1	0.1	0.6	0.032				504	0.20	13.61	2.0	2.02	12.1	0.646	0.0
504	04/02/98	7645	12216	12216			0.1	0.34	4.4	0.32	175.2			504	0.63	13.61	6.3	21.35	276.3	20.097	11003.2
504	04/09/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	04/16/98	7662	8540.87	8540.87							4.8			504	0.44	13.61	0.0	0.00	0.0	0.000	210.8
504	04/23/98	7671	19754.6	19754.6							55.6			504	1.02	13.61	0.0	0.00	0.0	0.000	5646.8
504	04/30/98	7684	944.68	944.68			5.7		2.2	0.03	5.8			504	0.05	13.61	27.7	0.00	10.7	0.146	28.2
504	05/07/98	7697	7266.3	7266.3			0.5	0.72	1.7	0.1	20.2			504	0.37	13.61	18.7	26.90	63.5	3.736	754.6
504	05/14/98	7716	5205.47	5205.47			0.3	0.09	5	0.561	16.4			504	0.27	13.61	8.0	2.41	133.8	15.013	438.9
504	05/20/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/28/98	7737	1302.93	1302.93	0.54		0.5	1.02	3.8	0.246	26.4			504	0.07	13.61	3.3	6.83	25.5	1.648	176.8
504	06/04/98	7756	10936.71	10936.71	3.21		0.8	0.16	6.4	0.358	84.8			504	0.56	13.61	45.0	9.00	359.9	20.129	4768.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Control Watershed

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	Concentration (mg/l)						F.C.	station	Depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
504	06/11/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/18/98	7777	42054.43	42054.43	8.89		0.5	0.24	2.6	0.378	27.6			504	2.17	13.61	108.1	51.89	562.1	81.726	5967.3
504	06/25/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/02/98	7808	6996.53	6996.53	3.5		0.4	2.49	6	0.257	44			504	0.36	13.61	14.4	89.56	215.8	9.244	1582.7
504	07/09/98	7820	942.32	942.32	0.47		0.1	0.77						504	0.05	13.61	0.5	3.73	0.0	0.000	0.0
504	07/16/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/23/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/30/98	7838	4157.68	4157.68	3.08		0.1	0.72			127			504	0.21	13.61	2.1	15.39	0.0	0.000	2714.6
504	08/06/98	7846	1405.81	1405.81	0.42									504	0.07	13.61	0.0	0.00	0.0	0.000	0.0
504	08/13/98	7860	243.1	243.1	0.12		0.3	0.87	8.7	0.382				504	0.01	13.61	0.4	1.09	10.9	0.477	0.0
504	08/20/98	7870	13317	13317	7.11		0.6	0.22	1.4	0.152	17.7			504	0.69	13.61	41.1	15.06	95.8	10.407	1211.8
504	08/27/98	7887	7367.17	7367.17	4.02		1.2	0.32	4.4	0.378	198			504	0.38	13.61	45.5	12.12	166.7	14.317	7499.3
504	09/03/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/09/98	7896	5269.65	5269.65	2.44		0.7	0.22	1.7	0.243	44			504	0.27	13.61	19.0	5.96	46.1	6.583	1192.0
504	09/16/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/23/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/30/98	7928	10127.89	10127.89	2.82		1.2	1.27	3.6	0.307	58			504	0.52	13.61	62.5	66.13	187.4	15.985	3020.0
504	10/07/98	7943	2097.08	2097.08	4.09						109.5			504	0.11	13.61	0.0	0.00	0.0	0.000	1180.6
504	10/14/98	7951	10547.4	10547.4	1.49		0.3	0.02	0.8	0.11	10.4	3.6	480	504	0.54	13.61	16.3	1.08	43.4	5.965	563.9
504	10/21/98	7971	1734.1	1734.1	0.53		0.7	0.21	1	0.126	22			504	0.09	13.61	6.2	1.87	8.9	1.123	196.1
504	10/28/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/04/98	7992	4477.45	4477.45	1.77		3.9	0.88	5.7	0.537	173			504	0.23	13.61	89.8	20.26	131.2	12.361	3982.3
504	11/12/98	8000	1945.46	1945.46	0.62		3	2.89	4.9	0.329	29			504	0.10	13.61	30.0	28.91	49.0	3.291	290.1
504	11/18/98	8014	3478.11	3478.11	0.77		5		2.3	0.28	7			504	0.18	13.61	89.4	0.00	41.1	5.007	125.2
504	11/25/98	8029	122.69	122.69	0.02		0.1	2.05			20.5			504	0.01	13.61	0.1	1.29	0.0	0.000	12.9
504	12/02/98	8039	4194.68	4194.68	0.86		1.8	1.58	3.1	0.165	33.3			504	0.22	13.61	38.8	34.07	66.9	3.558	718.1
504	12/09/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	12/16/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	12/23/98	8085	487.78	487.78	0.46		0.1	0.41			237.2			504	0.03	13.61	0.3	1.03	0.0	0.000	594.8
504	12/29/98													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/06/99	8102	17369.6	17369.6	7.53		0.3	0.04	1.4	0.116	139			504	0.89	13.61	26.8	3.57	125.0	10.359	12412.5
504	01/13/99	8114	16559.7	16559.7	0.76		0.8		0.9	0.234	19.6			504	0.85	13.61	68.1	0.00	76.6	19.922	1668.6
504	01/21/99	8144	25805	25805	2.25		0.9	0.08	0.4	0.088	6.4			504	1.33	13.61	119.4	10.61	53.1	11.675	849.1
504	01/26/99	8147	11323.4	11323.4	0.78		0.9	0.11	0.2	0.055	28.4			504	0.58	13.61	52.4	6.40	11.6	3.202	1653.3
504	02/04/99	8160	18019.4	18019.4	2.72		0.2	0.01	0.2	0.036	19.6			504	0.93	13.61	18.5	0.93	18.5	3.335	1815.7
504	02/09/99	8164	17701.5	17701.5	0.28		0.1	1.91	0.5	0.033				504	0.91	13.61	9.1	173.82	45.5	3.003	0.0
504	02/16/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/26/99	8190	3415.78	3415.78	0.29		1.6	0.27	0.5	0.043	8.8			504	0.18	13.61	28.1	4.74	8.8	0.755	154.5
504	03/02/99	8196	7528.69	7528.69	0.65		0.5	0.2	0.4	0.078	22.8			504	0.39	13.61	19.4	7.74	15.5	3.019	882.5
504	03/09/99	8205	5880.31	5880.31	0.69		0.5	0.48	0.5	0.086	48			504	0.30	13.61	15.1	14.51	15.1	2.600	1451.1
504	03/16/99	8211	1448.84	1448.84	0.18		0.7	0.84	1.5	0.097	35.2			504	0.07	13.61	5.2	6.26	11.2	0.723	262.2
504	03/23/99		3296.02	3296.02	0.52									504	0.17	13.61	0.0	0.00	0.0	0.000	0.0
504	03/30/99	8236	1989.56	1989.56	0.49		4.8	1	2.7	0.211	14.2			504	0.10	13.61	49.1	10.23	27.6	2.158	145.2
504	04/06/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	04/15/99	8254	746.97	746.97	0.08						32.4			504	0.04	13.61	0.0	0.00	0.0	0.000	124.4
504	04/20/99	8256	2109.02	2109.02	0.43									504	0.11	13.61	0.0	0.00	0.0	0.000	0.0
504	04/27/99	8268	3180.9	3180.9	0.35		1.7	0.32	1.1	0.089	14			504	0.16	13.61	27.8	5.23	18.0	1.455	228.9
504	05/04/99		245.29	245.29	0.11									504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	05/11/99	8280	812.3	812.3	0.91		1.3	0.5	5.2	0.318	326			504	0.04	13.61	5.4	2.09	21.7	1.328	1361.4
504	05/18/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/25/99	8288	23674	23674	1.86		0.7	0.19	1.7	0.198	59			504	1.22	13.61	85.2	23.12	206.9	24.099	7180.9
504	06/01/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/08/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/15/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/22/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/29/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/06/99	8319	1099.36	1099.36	1.24									504	0.06	13.61	0.0	0.00	0.0	0.000	0.0
504	07/13/99	8331	340.58	340.58	0.05		0.1	1.59	2.7	0.447				504	0.02	13.61	0.2	2.78	4.7	0.783	0.0
504	07/20/99	8332	1167.2	1167.2	0.73		0.1	1.48						504	0.06	13.61	0.6	8.88	0.0	0.000	0.0
504	07/27/99	8336	8714.12	8714.12	5.97		0.1	2.8	6.9	1.483	880			504	0.45	13.61	4.5	125.44	309.1	66.439	39424.1
504	08/03/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	08/10/99	8349	9824.07	9824.07	5.46									504	0.51	13.61	0.0	0.00	0.0	0.000	0.0
504	08/17/99	8357	6374.47	6374.47	1.61						137.5			504	0.33	13.61	0.0	0.00	0.0	0.000	4506.1

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Control Watershed

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	Concentration (mg/l)						F.C.	station	Depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
504	08/24/99	8362	2691.15	2691.15	1.79									504	0.14	13.61	0.0	0.00	0.0	0.000	0.0
504	08/31/99	8367	6847.64	6847.64	2.12		0.1	0.6	1	0.062	19.1			504	0.35	13.61	3.5	21.12	35.2	2.183	672.4
504	09/07/99	8371	775.72	775.72	0.37						88.1			504	0.04	13.61	0.0	0.00	0.0	0.000	351.3
504	09/14/99	8386	30349.34	30349.34	4.45		0.6	0.12	0.8	0.176	30.3			504	1.56	13.61	93.6	18.72	124.8	27.461	4727.7
504	09/21/99	8404	21513.5	21513.5	4.25		0.6	0.2	2	0.125	20.1			504	1.11	13.61	66.4	22.12	221.2	13.825	2223.1
504	09/28/99	8417	304.24	304.24	0.27									504	0.02	13.61	0.0	0.00	0.0	0.000	0.0
504	10/05/99	8429	12377.38	12377.38	3.21		0.1	0.07	2.4	0.332	1.1			504	0.64	13.61	6.4	4.45	152.7	21.126	70.0
504	10/12/99	8439	2550.11	2550.11	0.34		0.1	0.31	0.7	0.0025	1.1			504	0.13	13.61	1.3	4.06	9.2	0.033	14.4
504	10/19/99	8445	9432.32	9432.32	0.69		0.1	0.09	1.2	0.07	9.3			504	0.49	13.61	4.8	4.36	58.2	3.394	451.0
504	10/26/99	8466	12661	12661	1.36									504	0.65	13.61	0.0	0.00	0.0	0.000	0.0
504	11/02/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/09/99	8476	5444.18	5444.18	2.32									504	0.28	13.61	0.0	0.00	0.0	0.000	0.0
504	11/16/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/23/99	8502	1172.59	1172.59	0.55						72.4			504	0.06	13.61	0.0	0.00	0.0	0.000	436.5
504	11/30/99	8506	2686.38	2686.38	0.58		0.1	0.6	1	0.372				504	0.14	13.61	1.4	8.29	13.8	5.138	0.0
504	12/07/99	8527	10135.07	10135.07	1.1		0.1	0.52	0.6	0.335	10	2.4	260	504	0.52	13.61	5.2	27.09	31.3	17.455	521.1
504	12/14/99		616.42	616.42	0.12									504	0.03	13.61	0.0	0.00	0.0	0.000	0.0
504	12/21/99	8536	3970.5	3970.5	0.9		0.1	0.38	0.5	0.0025	18.8			504	0.20	13.61	2.0	7.76	10.2	0.051	383.8
504	12/28/99													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/04/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/11/00	8558	12816.84	12816.84	1.75		0.4	0.07	0.05	0.006	27.7			504	0.66	13.61	26.4	4.61	3.3	0.395	1825.2
504	01/18/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/25/00	8573	225.97	225.97	0.08		0.1	0.58	0.05	0.0025	17.7			504	0.01	13.61	0.1	0.67	0.1	0.003	20.6
504	02/01/00	8617	20520.65	20520.65	1.13		1.1	0.1	0.8	0.092	21.7			504	1.06	13.61	116.0	10.55	84.4	9.706	2289.3
504	02/08/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/15/00	8632	31855.08	31855.08	6.42		16.4	0.1	1.9	0.379	57.6			504	1.64	13.61	2685.8	16.38	311.2	62.069	9433.2
504	02/22/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/29/00	8652	2465.89	2465.89	0.52		0.4	0.45	2.6	0.15	43.9			504	0.13	13.61	5.1	5.70	33.0	1.902	556.5
504	03/07/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	03/14/00	8655	22145.92	22145.92	2.93		13.3	0.25	1.4	0.079	69.3			504	1.14	13.61	1514.3	28.46	159.4	8.994	7890.1
504	03/21/00	8666	7426.81	7426.81	1.03		18.6	0.51	1.4	0.009	37.1			504	0.38	13.61	710.2	19.47	53.5	0.344	1416.6
504	03/28/00	8672	2553.14	2553.14	0.57		0.1	0.28	3.7	0.082	56.5			504	0.13	13.61	1.3	3.68	48.6	1.076	741.6
504	04/04/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	04/11/00	8691	7307.45	7307.45	0.92		18.3	0.58	2.6	0.145	74.7			504	0.38	13.61	687.5	21.79	97.7	5.447	2806.4
504	04/18/00	8695	2266.59	2266.59	0.36		6.4	1.05	1.4	0.022	8			504	0.12	13.61	74.6	12.24	16.3	0.256	93.2
504	04/25/00	8701	26566.5	26566.5	2.03		0.1	1.99	0.1	0.142	24.2			504	1.37	13.61	13.7	271.80	13.7	19.395	3305.3
504	05/02/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/09/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/16/00	8734	8417.52	8417.52	3.53		1.3	0.5	3	2.078	278.6			504	0.43	13.61	56.3	21.64	129.8	89.926	12056.5
504	05/23/00	8746	8522.27	8522.27	1.01		1	0.11	1.2	0.149	14			504	0.44	13.61	43.8	4.82	52.6	6.528	613.4
504	05/30/00	8763	4123.53	4123.53	0.63		1.5	0.26	1.2	0.075	14.4			504	0.21	13.61	31.8	5.51	25.4	1.590	305.3
504	06/06/00	8770	4015.81	4015.81	2.83		0.4	0.24	7.5	0.603	154.4	3.7	525	504	0.21	13.61	8.3	4.95	154.8	12.449	3187.7
504	06/13/00	8774	33349.5	33349.5	5.62				2.3	0.208	82.4			504	1.72	13.61	0.0	0.00	394.3	35.662	14127.7
504	06/20/00	8801	765.13	765.13	0.64		7.8	0.69	4	0.32				504	0.04	13.61	30.7	2.71	15.7	1.259	0.0
504	06/27/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/04/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/11/00	8818	8120.43	8120.43	5.1		0.8	0.38	2.7	0.503	444.1			504	0.42	13.61	33.4	15.86	112.7	20.999	18540.3
504	07/18/00	8844	2600.85	2600.85	1.47		0.1	0.64	0.8	0.119	33.8			504	0.13	13.61	1.3	8.56	10.7	1.591	451.9
504	07/25/00	8854	2986.17	2986.17	5.26		2.2	0.84	0.6	0.319	162.7			504	0.15	13.61	33.8	12.90	9.2	4.897	2497.8
504	08/01/00	8857	17692.5	17692.5	1.96		17.7	0.11	0.6	0.096	10.3			504	0.91	13.61	1610.0	10.01	54.6	8.732	936.9
504	08/08/00	8869	17024	17024	7.56		5.6	0.3	1.6	0.203	66.3			504	0.88	13.61	490.1	26.26	140.0	17.767	5802.7
504	08/15/00	8873	317.52	317.52	0.02		1.3	0.47	0.1	0.086	48.6			504	0.02	13.61	2.1	0.77	0.2	0.140	79.3
504	08/22/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/01/00	8890	2062.78	2062.78	0.66						10.1			504	0.11	13.61	0.0	0.00	0.0	0.000	107.1
504	09/08/00	8892	8002.52	8002.52	4.15		1.4	0.62	2.4	0.339	91.2			504	0.41	13.61	57.6	25.51	98.7	13.947	3752.1
504	09/15/00	8895	16271.5	16271.5	6.19		1.6	0.4	1.4	0.192	67	3.5		504	0.84	13.61	133.8	33.46	117.1	16.061	5604.8
504	09/22/00	8910	6201.06	6201.06	3.29		0.5	0.21	0.6	0.122	100.3			504	0.32	13.61	15.9	6.69	19.1	3.889	3197.6
504	09/29/00		200.8	200.8	0.04									504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	10/06/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/13/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/20/00	8938	607.1	607.1	0.12				6.1	1.671	212.5			504	0.03	13.61	0.0	0.00	19.0	5.215	663.2
504	10/27/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/03/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Control Watershed

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	Concentration (mg/l)						F.C.	station	Depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
504	11/10/00	8962	13651.6	13651.6	1.64		0.2	0.28	2.2	0.745	46	3.5	100	504	0.70	13.61	14.0	19.65	154.4	52.287	3228.5
504	11/17/00	8992	9682	9682	0.95		0.2	0.11	0.6	0.153	14.4			504	0.50	13.61	10.0	5.48	29.9	7.616	716.8
504	11/24/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	12/01/00		19155.5	19155.5	1.24									504	0.99	13.61	0.0	0.00	0.0	0.000	0.0
504	12/08/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	12/15/00		13422	13422	1.27									504	0.69	13.61	0.0	0.00	0.0	0.000	0.0
504	12/22/00	9021	24017.5	24017.5	1.15		1.8	0.19	1.9	0.732	11.7			504	1.24	13.61	222.3	23.46	234.6	90.385	1444.7
504	12/29/00													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/05/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/12/01	9050	12,818	12,818			1.2	0.27	1.5	0.192	20.2			504	0.66	13.61	79.1	17.79	98.8	12.652	1331.1
504	01/19/01	9052	28,883.30	28,883.30			1	0.2	2.1	0.35	40			504	1.49	13.61	148.5	29.70	311.8	51.972	5939.7
504	01/26/01	9145	21,202.60	21,202.60			16.7	0.19	1.2	0.154	5.4			504	1.09	13.61	1820.4	20.71	130.8	16.787	588.6
504	02/02/01	9152	34,808.50	34,808.50			383.2	0.18	1.6	0.221	66.1			504	1.79	13.61	68575.1	32.21	286.3	39.549	11828.9
504	02/09/01	9157	92,609	92,609			1.5	0.15	0.8	0.153	26.2			504	4.77	13.61	714.2	71.42	380.9	72.845	12474.1
504	02/14/01	9166	7,363.00	7,363.00			0.5	0.1	0.8	0.104	11.6			504	0.38	13.61	18.9	3.79	30.3	3.937	439.1
504	02/21/01	9172	1,501	1,501			1.2	0.46	1.1	0.194	13.3			504	0.08	13.61	9.3	3.55	8.5	1.497	102.6
504	02/28/01	9183	6,933.60	6,933.60			0.9	0.15	0.8	0.402	50.5			504	0.36	13.61	32.1	5.35	28.5	14.330	1800.1
504	03/07/01		373.5	373.5										504	0.02	13.61	0.0	0.00	0.0	0.000	0.0
504	03/14/01	9198	21,760.20	21,760.20			10.5	0.07	1	0.086	27.4			504	1.12	13.61	1174.6	7.83	111.9	9.621	3065.3
504	03/21/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	03/28/01	9216	30,908.50	30,908.50			10.9	0.03	0.8	0.075	24.2			504	1.59	13.61	1732.0	4.77	127.1	11.918	3845.5
504	04/04/01	9237	28,665.00	28,665.00			3.1	0.09	1	0.101	19.2			504	1.48	13.61	456.8	13.26	147.4	14.884	2829.5
504	04/11/01	9247	6,994.90	6,994.90			0.1	0.33	1.5	0.132	32.7			504	0.36	13.61	3.6	11.87	53.9	4.747	1175.9
504	04/18/01	9255	1,624.50	1,624.50			2.9	0.52	1.3	0.087				504	0.08	13.61	24.2	4.34	10.9	0.727	0.0
504	04/25/01		119.1	119.1										504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	05/02/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/09/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/16/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/23/01	9272	6,251.60	6,251.60			0.4	0.46	2.8	0.904	36.2			504	0.32	13.61	12.9	14.78	90.0	29.055	1163.5
504	05/30/01	9276	60,126.40	60,126.40			11.3	0.15	2	0.391	112.8			504	3.10	13.61	3493.0	46.37	618.2	120.864	34868.3
504	06/06/01	9279	17,840	17,840			0.5	0.28	1.2	0.181	44.7			504	0.92	13.61	45.9	25.68	110.1	16.601	4099.8
504	06/13/01	9287	1,811.80	1,811.80			0.3	0.68	3.5	0.289				504	0.09	13.61	2.8	6.33	32.6	2.692	0.0
504	06/20/01	9291	42,745.50	42,745.50			19.2	0.17	1.8	0.566	206.3			504	2.20	13.61	4219.4	37.36	395.6	124.383	45336.2
504	06/27/01		223.7	223.7										504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	07/04/01	9297	2,952.60	2,952.60			2.2	0.52	3.8	0.615				504	0.15	13.61	33.4	7.89	57.7	9.335	0.0
504	07/11/01	9310	8,976.40	8,976.40			0.4	0.24	1.3	0.251	102.3			504	0.46	13.61	18.5	11.08	60.0	11.583	4721.0
504	07/18/01		170.5	170.5										504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	07/25/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	08/01/01	9322	9,362.90	9,362.90			1	0.51	1.7	0.229	37.7			504	0.48	13.61	48.1	24.55	81.8	11.023	1814.7
504	08/08/01		493.7	493.7										504	0.03	13.61	0.0	0.00	0.0	0.000	0.0
504	08/15/01	9339	21,070.50	21,070.50			2.2	0.32	1.1	0.187	64			504	1.09	13.61	238.3	34.66	119.2	20.257	6932.8
504	08/22/01	9349	16,723.00	16,723.00			0.6	0.2	0.7	0.115	28.3			504	0.86	13.61	51.6	17.19	60.2	9.887	2433.1
504	08/29/01		1,253.50	1,253.50										504	0.06	13.61	0.0	0.00	0.0	0.000	0.0
504	09/04/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/11/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/18/01	9368	1,757.40	1,757.40			6.3	0.04	13.5	1.71	30.7			504	0.09	13.61	56.9	0.36	122.0	15.450	277.4
504	09/25/01	9374	34,169.40	34,169.40			2.3	0.17	1.4	0.472	68.3			504	1.76	13.61	404.0	29.86	245.9	82.915	11998.1
504	10/02/01	9377	54,749	54,749			12.2	0.23	2	0.494	65.7			504	2.82	13.61	3433.9	64.74	562.9	139.046	18492.6
504	10/09/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/16/01		862.4	862.4										504	0.04	13.61	0.0	0.00	0.0	0.000	0.0
504	10/23/01	9395	2,688.70	2,688.70					1.7	0.303	38			504	0.14	13.61	0.0	0.00	23.5	4.188	525.3
504	10/30/01		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/06/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/13/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/20/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/27/01	9412	3,105.70	3,105.70			1.9	0.24	19	0.438	40.6			504	0.16	13.61	30.3	3.83	303.4	6.993	648.2
504	12/04/01													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	12/11/01	9417	3,816.40	3,816.40			1.3	0.43	0.8	0.148	13.3			504	0.20	13.61	25.5	8.44	15.7	2.904	261.0
504	12/18/01	9428	11,545.60	11,545.60			0.8	0.24	0.9	0.153	37.2			504	0.59	13.61	47.5	14.25	53.4	9.082	2208.1
504	12/26/01		9,488.30	9,488.30										504	0.49	13.61	0.0	0.00	0.0	0.000	0.0
504	01/02/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/25/02	9438	25,170.50	25,170.50			12.7	0.15	0.8	0.143	15.4			504	1.30	13.61	1643.4	19.41	103.5	18.505	1992.8
504	02/01/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Control Watershed

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	Concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C. FCU/100ml	station	Depth (cm)	WTRSHED AREA (ac)	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
504	02/08/02	9460	1,179.00	1,179.00							25.3			504	0.06	13.61	0.0	0.00	0.0	0.000	153.4
504	02/15/02	9477	8,417.60	8,417.60			0.7	0.08	0.9	0.205	59.4			504	0.43	13.61	30.3	3.46	38.9	8.872	2570.6
504	02/22/02	9482	5,054.50	5,054.50			0.8	0.16	0.7	0.133	32.4			504	0.26	13.61	20.8	4.16	18.2	3.456	841.9
504	03/01/02	9495	3,291.90	3,291.90			1	0.33	0.6	0.109	26			504	0.17	13.61	16.9	5.58	10.2	1.845	440.0
504	03/08/02	9499	11,877.30	11,877.30			0.3	0.1	0.4	0.075	10.8			504	0.61	13.61	18.3	6.11	24.4	4.580	659.5
504	03/15/02	9511	4,806.80	4,806.80			0.6	0.2	1	0.222	79.1			504	0.25	13.61	14.8	4.94	24.7	5.486	1954.7
504	03/22/02	9519	8,624.00	8,624.00			0.2	0.04	0.3	0.081	5.2			504	0.44	13.61	8.9	1.77	13.3	3.591	230.6
504	03/29/02													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	04/05/02	9534	8,207.20	8,207.20			0.4	0.25	0.6	0.112	21.9			504	0.42	13.61	16.9	10.55	25.3	4.726	924.0
504	04/12/02	9540	2,680.30	2,680.30			0.8	0.26	1	0.114				504	0.14	13.61	11.0	3.58	13.8	1.571	0.0
504	04/19/02		1,314.30	1,314.30										504	0.07	13.61	0.0	0.00	0.0	0.000	0.0
504	04/26/02	9549	6,380.50	6,380.50			0.7	0.49	1.5	0.136	13.6			504	0.33	13.61	23.0	16.07	49.2	4.461	446.1
504	05/03/02	9561	14,731.00	14,731.00			5.5	0.32	0.7	0.097	7.7			504	0.76	13.61	416.5	24.23	53.0	7.346	583.1
504	05/10/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/17/02	9586	19,090.00	19,090.00			0.5	0.24	1.5	0.299	94.1			504	0.98	13.61	49.1	23.55	147.2	29.345	9235.3
504	05/24/02	9594	15,378	15,378			0.3	0.17	0.8	0.079	6.8			504	0.79	13.61	23.7	13.44	63.2	6.246	537.6
504	05/30/02													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/06/02													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/13/02	9625	17718	17718			4.4	0.27	0.9	0.13	11.4			504	0.91	13.61	400.8	24.59	82.0	11.842	1038.4
504	06/20/02	9632	7479.04	7479.04			0.6	0.38	1.5	0.186	25.2			504	0.39	13.61	23.1	14.61	57.7	7.152	969.0
504	06/27/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/04/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/11/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/18/02	9656	3953.23	3953.23			1.5	1.25	8.1	1.823	982.3			504	0.20	13.61	30.5	25.40	164.6	37.051	19964.2
504	07/25/02	9662	4265.7	4265.7			1	0.79	2.6	0.422	76.8			504	0.22	13.61	21.9	17.33	57.0	9.255	1684.3
504	08/01/02	9667	2789.15	2789.15			2	0.72	4	0.486	201.3			504	0.14	13.61	28.7	10.32	57.4	6.969	2886.5
504	08/08/02	9675	670.71	670.71			2	1.23	6.6	0.611				504	0.03	13.61	6.9	4.24	22.8	2.107	0.0
504	08/15/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	08/22/02	9681	828.84	828.84										504	0.04	13.61	0.0	0.00	0.0	0.000	0.0
504	08/30/02	9682	28678	28678			7.6	0.23	1.5	0.359				504	1.48	13.61	1120.5	33.91	221.2	52.930	0.0
504	09/05/02	9689	40268.83	40268.83			1.9	0.45	1.5	0.368	157.3			504	2.07	13.61	393.3	93.16	310.5	76.186	32565.2
504	09/12/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/19/02	9696	23003.08	23003.08			3.2	0.23	1.4	0.29	165.2			504	1.18	13.61	378.4	27.20	165.6	34.296	19536.7
504	09/26/02	9706	8458.73	8458.73			1.4	0.2	1.5	0.937	164.4			504	0.44	13.61	60.9	8.70	65.2	40.747	7149.3
504	10/02/02	9737	7991.82	7991.82			0.8	0.03	0.3	0.14	2.9			504	0.41	13.61	32.9	1.23	12.3	5.752	119.2
504	10/10/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/17/02	9747	8648.35	8648.35			0.3	0.11	0.6	0.154	17.6			504	0.45	13.61	13.3	4.89	26.7	6.847	782.5
504	10/24/02		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/31/02	9761	18150	18150			5.2	0.18	0.9	0.168	32.4			504	0.93	13.61	485.2	16.80	84.0	15.676	3023.3
504	11/07/02	9769	12106.5	12106.5			1.4	0.17	1	0.19	8.1			504	0.62	13.61	87.1	10.58	62.2	11.826	504.1
504	11/14/02	9775	17273.9	17273.9			1.9	0.06	0.7	0.133	17.7			504	0.89	13.61	168.7	5.33	62.2	11.811	1571.9
504	11/21/02	9785	26116	26116			2.6	0.03	0.6	0.122	8.6			504	1.34	13.61	349.1	4.03	80.6	16.380	1154.7
504	12/05/02	9802	4083.06	4083.06			0.4	0.1	1	0.111	11.7			504	0.21	13.61	8.4	2.10	21.0	2.330	245.6
504	12/12/02		4890.47	4890.47										504	0.25	13.61	0.0	0.00	0.0	0.000	0.0
504	12/19/02	9832	6463.36	6463.36			0.6	0.005	0.7	0.064	9			504	0.33	13.61	19.9	0.17	23.3	2.127	299.1
504	12/26/02	9844	15390.7	15390.7			7.1	0.08	3	0.247	64.5			504	0.79	13.61	561.8	6.33	237.4	19.544	5103.6
504	01/02/03		7292.4	7292.4										504	0.38	13.61	0.0	0.00	0.0	0.000	0.0
504	01/10/03	9907	2994	2994			0.3	0.005	1.1	0.096	18.8			504	0.15	13.61	4.6	0.08	16.9	1.478	289.4
504	01/17/03													504	0.00	13.61					
504	01/24/03													504	0.00	13.61					
504	01/31/03													504	0.00	13.61					
504	02/04/03	9926											<20	504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/07/03	9933	819.4	819.4							75.6			504	0.04	13.61	0.0	0.00	0.0	0.000	318.5
504	02/14/03	9944	0	0			0.9	1.61	4.8	0.134	28.4			504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/28/03	9956	113496.7	113496.7			6.5	0.06	2.4	0.185	81.2			504	5.85	13.61	3792.7	35.01	1400.4	107.947	47380.0
504	03/07/03		94107.7	94107.7										504	4.85	13.61	0.0	0.00	0.0	0.000	0.0
504	03/14/03	8	18308	18308			1	0.07	4.2	0.252	62.2			504	0.94	13.61	94.1	6.59	395.3	23.719	5854.5
504	03/20/03													504	0.00	13.61					
504	03/28/03	27	16148.9	16148.9			0.6	0.06	1.9	0.148	50.7			504	0.83	13.61	49.8	4.98	157.7	12.287	4209.3
504	04/03/03	38	42901.5	42901.5			11.2	0.07	7.7	0.432	64.6			504	2.21	13.61	2470.3	15.44	1698.3	95.282	14248.2
504	04/11/03	50	11119.7	11119.7			2.5	0.26	2.2	0.073	13.1			504	0.57	13.61	142.9	14.86	125.8	4.173	748.9
504	04/17/03	71	23208.3	23208.3			8.8	0.06	2.5	0.109	34			504	1.20	13.61	1050.0	7.16	298.3	13.005	4056.7
504	04/25/03													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Control Watershed

Export = (curft/wk)*(mq/L)*(28.317L/cuft)*(1q/10^3mq)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	Concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C. FCU/100ml	station	Depth (cm)	WTRSHED AREA (ac)	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
504	05/02/03													504	0.00	13.61	0.0	0.00		0.000	0.0
504	05/09/03													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/16/03													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/23/03		0	0										504	0.00	13.61					
504	05/26/03	143										2.7	1500	504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/30/03													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/05/03													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/12/03													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/19/03	227	43239.7	43239.7			6.9	0.49	2.1	0.151	23.1			504	2.23	13.61	1533.9	108.93	466.8	33.567	5135.1
504	06/26/03	240					4.9	0.34	1.7	0.188	36			504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/03/03		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/10/03		18862.1	18862.1										504	0.97	13.61	0.0	0.00	0.0	0.000	0.0
504	07/17/03	261	18436.4	18436.4			0.9	0.84	2.6	0.433	61.2			504	0.95	13.61	85.3	79.62	246.4	41.041	5800.7
504	07/24/03	274	48516.5	48516.5			14.491	0.359	3	0.33	63.2			504	2.50	13.61	3614.5	89.54	748.3	82.311	15763.9
504	07/31/03	277	2159.5	2159.5			25.634	0.064	1.5	0.092	1.8			504	0.11	13.61	284.6	0.71	16.7	1.021	20.0
504	08/07/03	289	3236	3236			0.64	0.407	1.8	0.187	15.2			504	0.17	13.61	10.6	6.77	29.9	3.111	252.9
504	08/14/03	313	8338	8338			0.261	0.153	0.876	0.239	8.9			504	0.43	13.61	11.2	6.56	37.6	10.245	381.5
504	08/21/03	321	3061.8	3061.8			10.072	0.964	3.261	0.167	8.8			504	0.16	13.61	158.5	15.17	51.3	2.629	138.5
504	08/28/03													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/04/03	324	64724	64724			0.9	1.38	3.2	0.71	110			504	3.33	13.61	299.5	459.20	1064.8	236.254	36602.8
504	09/11/03	339	1431	1431			1.7	0.28	0.8	0.085	0.7			504	0.07	13.61	12.5	2.06	5.9	0.625	5.1
504	09/18/03	352	37268	37268			1	0.99	2.9	0.435	19.3			504	1.92	13.61	191.6	189.68	555.6	83.345	3697.9
504	09/25/03	355	26091	26091			0.7	0.51	3	3.098	121.3			504	1.34	13.61	93.9	68.41	402.4	415.555	16270.7
504	10/02/03	371	9794	9794			2.2	0.38	1.4	0.301	21.7			504	0.50	13.61	110.8	19.13	70.5	15.156	1092.6
504	10/08/03		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/16/03	385	32175	32175			4.2	1.4	3.8	0.241	4			504	1.66	13.61	694.7	231.58	628.6	39.865	661.7
504	10/23/03	398	31115	31115			1.5	0.12	0.4	0.083	5.2			504	1.60	13.61	239.9	19.20	64.0	13.277	831.8
504	10/29/03	422					0.7	0.12	1.3	0.167	6.3			504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/06/03	428	14072	14072			11.2	0.16	0.4	0.121	13.3			504	0.72	13.61	810.3	11.58	28.9	8.754	962.2
504	11/13/03		22810	22810										504	1.17	13.61	0.0	0.00	0.0	0.000	0.0
504	11/20/03	476	12661	12661			0.6	0.08	0.6	0.102	4.3			504	0.65	13.61	39.1	5.21	39.1	6.639	279.9
504	11/26/03	482	3338	3338			0.8	0.08	0.6	0.086	15.6			504	0.17	13.61	13.7	1.37	10.3	1.476	267.7
504	12/04/03	488	3786	3786			0.7	0.08	0.4	0.063	10.1			504	0.19	13.61	13.6	1.56	7.8	1.226	196.6
504	12/11/03	492							0.05	0.16			300	504	#VALUE!	13.61					
504	12/18/03	496	65974	65974			6	0.04	0.7	0.081	12			504	3.40	13.61	2035.1	13.57	237.4	27.473	4070.1
504	12/31/03	513	15446	15446			0.6	0.11	0.7	0.078	30.1			504	0.80	13.61	47.6	8.74	55.6	6.194	2390.2
504	01/08/04	520	20094	20094			0.4	0.07	0.3	0.026	8.3			504	1.03	13.61	41.3	7.23	31.0	2.686	857.4
504	01/15/04		2269	2269										504	0.12	13.61	0.0	0.00	0.0	0.000	0.0
504	01/22/04		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	01/29/04		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/05/04	543	57846	57846			1.5	1	2.6	0.103	34			504	2.98	13.61	446.1	297.39	773.2	30.631	10111.3
504	02/12/04		156268	156268										504	8.05	13.61	0.0	0.00	0.0	0.000	0.0
504	02/19/04	551	1025	1025			0.1	0.18	1.4	0.249	31.6			504	0.05	13.61	0.5	0.95	7.4	1.312	166.5
504	02/26/04		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	03/04/04	552	4580	4580			0.8	0.1	1.9	0.972				504	0.24	13.61	18.8	2.35	44.7	22.887	0.0
504	03/11/04													504	#VALUE!	13.61					
504	03/18/04		604	604										504	0.03	13.61	0.0	0.00	0.0	0.000	0.0
504	03/25/04	559	12821	12821			1.2	0.59	0.7	0.084	15.1			504	0.66	13.61	79.1	38.89	46.1	5.537	995.3
504	04/01/04	580	60494	60494			20.3	0.16	1.5	0.116	43.7			504	3.12	13.61	6313.4	49.76	466.5	36.077	13590.9
504	04/08/04	587	29936	29936			26.6	0.14	1.6	0.06	0			504	1.54	13.61	4093.8	21.55	246.2	9.234	0.0
504	04/15/04		70556	70556										504	3.63	13.61	0.0	0.00	0.0	0.000	0.0
504	04/22/04													504	#VALUE!	13.61					
504	04/29/04	606	49644	49644			0.9	0.26	0.7	0.095	25.2			504	2.56	13.61	229.7	66.36	178.7	24.246	6431.7
504	05/06/04		16713	16713										504	0.86	13.61	0.0	0.00	0.0	0.000	0.0
504	05/13/04		245.5	245.5										504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	05/20/04		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/27/04		8094	8094										504	0.42	13.61	0.0	0.00	0.0	0.000	0.0
504	06/03/04	638	9626	9626			2	0.22	1.6	0.395				504	0.50	13.61	99.0	10.89	79.2	19.548	0.0
504	06/10/04		148.5	148.5										504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	06/17/04		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/24/04		174.5	174.5										504	0.01	13.61	0.0	0.00	0.0	0.000	0.0
504	07/01/04		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	07/08/04	659	8094	8094			4.2	0.5	5.2	0.714	239.7			504	0.42	13.61	174.8	20.81	216.4	29.711	9974.4

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Control Watershed

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	Concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C. FCU/100ml	station	Depth (cm)	WTRSHED AREA (ac)	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
504	07/15/04	666	15079.5	15079.5			0.7	0.07	0.6	0.062	13.7			504	0.78	13.61	54.3	5.43	46.5	4.807	1062.1
504	07/22/04	676	1043	1043			2.5	0.17	2.1	0.207				504	0.05	13.61	13.4	0.91	11.3	1.110	0.0
504	07/29/04		926	926										504	0.05	13.61	0.0	0.00	0.0	0.000	0.0
504	08/05/04	683	18664	18664	6.02		1	0.18	1.3	0.26	22.9			504	0.96	13.61	96.0	17.27	124.7	24.948	2197.3
504	08/12/04		450	450	0.32									504	0.02	13.61	0.0	0.00	0.0	0.000	0.0
504	08/19/04	720	14047	14047	1.72		0.8	0.06	0.9	0.091	52.7			504	0.72	13.61	57.8	4.33	65.0	6.572	3805.8
504	08/26/04	737	9810	9810	4.93		0.8	0.08	1	0.26				504	0.51	13.61	40.3	4.03	50.4	13.113	0.0
504	09/02/04		2466	2466	2.16									504	0.13	13.61	0.0	0.00	0.0	0.000	0.0
504	09/09/04	757	12783	12783	3.69		0.9	0.15	1.4	0.177	54.6			504	0.66	13.61	59.1	9.86	92.0	11.632	3588.2
504	09/16/04		1124	1124	0.48									504	0.06	13.61	0.0	0.00	0.0	0.000	0.0
504	09/23/04													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	09/30/04	780	41829	41829	3.88		2.6	0.08	1.3	0.072	26.4			504	2.15	13.61	559.1	17.20	279.6	15.483	5677.2
504	10/07/04		2	2	0.01									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	10/14/04		787	787	1.18									504	0.04	13.61	0.0	0.00	0.0	0.000	0.0
504	10/21/04	826	22038	22038	1.43		0.4	0.69	0.8	0.056	7.8			504	1.13	13.61	45.3	78.18	90.6	6.345	883.7
504	10/28/04		0	0	0									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/04/04		0	0	0									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/11/04	835	8004	8004	3.32		0.4	0.06	1.3	0.249	48.4			504	0.41	13.61	16.5	2.47	53.5	10.246	1991.6
504	11/18/04		8154	8154	0.29									504	0.42	13.61	0.0	0.00	0.0	0.000	0.0
504	11/25/04													504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	11/28/04	849										3.1	63	504	#DIV/0!						
504	12/01/04	854										1.9	415	504	#DIV/0!						
504	12/02/04	861	32319	32319	2.9		1.6	0.005	0.9	0.289	21.1			504	1.66	13.61	265.8	0.83	149.5	48.019	3505.9
504	12/09/04	895	5418	5418	0.72		1.2	0.01	0.8	0.05	7.4			504	0.28	13.61	33.4	0.28	22.3	1.393	206.1
504	12/16/04	901	10803	10803	2.71		0.3	0.005	0.6	0.04	10.6			504	0.56	13.61	16.7	0.28	33.3	2.222	588.7
504	12/23/04		470	470	0.2									504	0.02	13.61	0.0	0.00	0.0	0.000	0.0
504	12/30/04	929	5966	5966	1.89		0.3	0.005	1.5	1.12	41.4			504	0.31	13.61	9.2	0.15	46.0	34.352	1269.8
504	01/07/05	933	4518	4518	0.48		0.9	0.17	0.9	0.078	18.2			504	0.23	13.61	20.9	3.95	20.9	1.812	422.7
504	01/13/05	938	6412	6412	0.67		0.4	0.04			7			504	0.33	13.61	13.2	1.32	0.0	0.000	230.8
504	01/14/05	945										3		504	#DIV/0!						
504	01/19/05	948	6378	6378	1.12		0.8	0.005	0.05	1.04				504	0.33	13.61	26.2	0.16	1.6	34.102	0.0
504	01/26/05		0	0	0									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/02/05		0	0	0									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	02/09/05	952	12332	12332	0.5		1.1	0.11	2	0.109	30.4			504	0.64	13.61	69.7	6.97	126.8	6.911	1927.4
504	02/10/05	956										3.7	437	504	#DIV/0!						
504	02/16/05	959	12352	12352	0.88		0.8	0.005	1.2	0.072	22.3			504	0.64	13.61	50.8	0.32	76.2	4.572	1416.1
504	02/23/05		1140	1140	0.33									504	0.06	13.61	0.0	0.00	0.0	0.000	0.0
504	03/02/05		0	0	0									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	03/08/05	972										7.1	310	504	#DIV/0!						
504	03/09/05	975	2740	2740	0.36		2	0.03	1.7	0.093	15.2			504	0.14	13.61	28.2	0.42	23.9	1.310	214.1
504	03/16/05		0	0	0									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	03/23/05		0	0	0									504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	03/28/05	983										1.7	153	504	#DIV/0!						
504	03/30/05													504	#DIV/0!						
504	04/02/05	992										1.6		504	#DIV/0!						
504	04/06/05	997	8775	8775	0.74	0.101	0.1	2.7	1.5	0.128	6.7			504	0.45	13.61	4.5	121.81	67.7	5.774	302.3
504	04/13/05		3875	3875	0.37									504	0.20	13.61	0.0	0.00	0.0	0.000	0.0
504	04/20/05		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	04/27/05	1017	8051	8051	2.117		0.36	1.1	3.1	0.104	23.5	8.7		504	0.41	13.61	14.9	45.53	128.3	4.305	972.7
504	05/04/05		26756	26756	4.555									504	1.38	13.61	0.0	0.00	0.0	0.000	0.0
504	05/11/05	1031	3611	3611	0.264						457.8			504	0.19	13.61	0.0	0.00	0.0	0.000	8498.8
504	05/18/05		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	05/25/05	1038	2370	2370	0.46		0.37	1.2	1.7	0.216	175.7			504	0.12	13.61	4.5	14.62	20.7	2.632	2140.8
504	06/01/05	1040	6027	6027	0.707									504	0.31	13.61	0.0	0.00	0.0	0.000	0.0
504	06/08/05		0	0										504	0.00	13.61	0.0	0.00	0.0	0.000	0.0
504	06/15/05	1049	1577	1577	0.651						184.3			504	0.08	13.61	0.0	0.00	0.0	0.000	1494.2
504	06/22/05	1053	3208	3208	0.464		0.86	8.1	0.8	1.11	16			504	0.17	13.61	14.2	133.59	13.2	18.307	263.9
504	06/30/05	1056	15913	15913	2.276		0.005	1.9	1.9	0.0025	265.7			504	0.82	13.61	0.4	155.44	155.4	0.205	21737.0

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Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	concentration (mg/l)					BOD	F.C. CU/100ml	station	depth cm	WTRSHED AREA (ac)	export (g/ha/wk)				
							NO3	NH3	TKN	TP	TSS						NO3	NH3	TKN	TP	TSS
544	01/18/96													544		0.5054					
544	01/25/96													544		0.5054					
544	02/01/96													544		0.5054					
544	02/08/96													544		0.5054					
544	02/14/96													544		0.5054					
544	02/22/96													544		0.5054					
544	02/29/96													544		0.5054					
544	03/07/96													544		0.5054					
544	03/14/96													544		0.5054					
544	03/21/96													544		0.5054					
544	04/04/96	5430	1	1			1.6	0.04	4.4	1.106	62	14	2	544	0.00	0.5054	0.2	0.01	0.6	0.153	8.6
544	04/11/96	5453	1	1			0.4	0.005	1.7	0.617	62	18	2	544	0.00	0.5054	0.1	0.00	0.2	0.085	8.6
544	04/18/96	5483	135	135	0.06	0.16	0.2	0.1	6.5	3.063	367		0	544	0.19	0.5054	3.7	1.87	121.5	57.248	6859.3
544	04/25/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	05/02/96	5610	31	31	0.01	0.3	0.3	0.005	5	3.233	315			544	0.04	0.5054	1.3	0.02	21.5	13.875	1351.9
544	05/09/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	05/16/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	05/23/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	06/06/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	06/13/96	5747	1	1		0.02	0.2	0.02	5.2	3.644	621			544	0.00	0.5054	0.0	0.00	0.7	0.504	86.0
544	06/20/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	06/27/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	07/03/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	07/11/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	07/18/96	5835	18	18	0.01		0.5	0.14	4.4	1.204	209			544	0.02	0.5054	1.2	0.35	11.0	3.000	520.8
544	07/25/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	08/01/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
544	08/08/96													544	0.00	0.5054	0.0	0.00	0.0	0.000	0.0
545	08/15/96	6009	4	4	0.01		0.1	0.005	1.2	0.19				544	0.01	0.5054	0.1	0.00	0.7	0.105	0.0
545	08/29/96		1	1										545	0.00	0.4557	0.0	0.00	0.0	0.000	0.0
545	09/12/96	6123	2	2	0.01		0.33	5.08	7.5	2.523	51			545	0.00	0.4557	0.1	1.56	2.3	0.775	15.7
545	09/19/96	6149	5	5							71			545	0.01	0.4557	0.0	0.00	0.0	0.000	54.5
545	09/26/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/03/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/10/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/24/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/31/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/07/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/14/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/21/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/27/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/05/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/13/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/19/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/26/96													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/02/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/16/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/23/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/30/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	02/06/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	02/14/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	02/18/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	02/27/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	03/06/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	03/13/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	03/20/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	03/27/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	04/03/97	6793	7.6	7.6	0.02		0.2	1.12		0.029				545	0.01	0.4557	0.2	1.31	0.0	0.034	0.0
545	04/10/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	04/17/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	04/24/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	05/01/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	05/08/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	05/15/97													545		0.4557	0.0	0.00	0.0	0.000	0.0

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Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C. CU/100ml	station	depth cm	WTRSHED AREA (ac)	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
545	05/22/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	05/28/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	06/05/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	06/12/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	06/19/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	06/26/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	07/03/97	7207	11.4	11.4	0.03		0.4	1.35	5.6	2.65	56.9			545	0.02	0.4557	0.7	2.36	9.8	4.639	99.6
545	07/10/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	07/17/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	07/24/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	07/31/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	08/07/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	08/14/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	08/21/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	08/28/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	09/03/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	09/10/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	09/17/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	09/24/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/01/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/08/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/15/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/22/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	10/29/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/05/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/12/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/19/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	11/26/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/03/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/11/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/18/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	12/23/97													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/08/98													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/09/98													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/15/98													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/22/98													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	01/29/98													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	02/05/98													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	02/12/98													545		0.4557	0.0	0.00	0.0	0.000	0.0
545	02/19/98													545		0					
545	02/26/98													545		0					
545	03/05/98													545		0					
545	03/12/98													545		0					
545	03/19/98													545		0					
545	03/26/98													545		0					
545	04/02/98													545		0					
545	04/09/98													545		0					
545	04/16/98													545		0					
545	04/23/98													545		0					
545	04/30/98													545		0					
545	05/07/98													545		0					
545	05/14/98													545		0					
545	05/20/98													545		0					
545	05/28/98													545		0					
545	06/04/98	7758	2.94	2.94	0.01		0.5	0.09	6.6	1.508	90.67			545	0.00	2.619	0.0	0.01	0.5	0.118	7.1
545	06/11/98													545		2.619	0.0	0.00	0.0	0.000	0.0
545	06/18/98	7779	1776.3	1776.3	0.08		0.4	0.13	3.2	1.317	338			545	0.48	2.619	19.0	6.17	151.9	62.500	16040.3
545	06/25/98													545		2.619	0.0	0.00	0.0	0.000	0.0
545	07/02/98	7809	11.68	11.68	0.03		0.7	0.15	3.2	0.848	52.8			545	0.00	2.619	0.2	0.05	1.0	0.265	16.5
545	07/09/98	7821	5.29	5.29	0.02		0.9	0.74	3.8	0.627	154.8			545	0.00	2.619	0.1	0.10	0.5	0.089	21.9
545	07/16/98													545		0.5879	0.0	0.00	0.0	0.000	0.0
545	07/23/98													545		0.5879	0.0	0.00	0.0	0.000	0.0
545	07/30/98	7839	39.68	39.68	0.04		0.7	0.35	4.4	1.125	180			545	0.05	0.5879	3.3	1.65	20.8	5.313	850.1

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Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	CU/100ml		cm	(ac)	NO3	NH3	TKN	TP	TSS
545	08/06/98	7847	60.6	60.6	0.03				1.9	0.606				545	0.07	0.5879	0.0	0.00	13.7	4.371	0.0
545	08/13/98	7861	0.61	0.61			0.1	1.66	2	0.024	20			545	0.00	0.5879	0.0	0.12	0.1	0.002	1.5
545	08/20/98	7871	261.28	261.28	0.09		0.4	0.16	1.7	0.568	243.5			545	0.31	0.5879	12.4	4.98	52.9	17.663	7572.1
545	08/27/98	7888	214.79	214.79	0.1		0.8	0.12	3.2	1.551	596			545	0.26	0.5879	20.5	3.07	81.8	39.649	15236.0
545	09/03/98													545		0.5879	0.0	0.00	0.0	0.000	0.0
545	09/09/98	7897	134.64	134.64	0.08		0.5	0.11	2.4	1.376	374			545	0.16	0.5879	8.0	1.76	38.5	22.050	5993.2
545	09/16/98													545		0.5879	0.0	0.00	0.0	0.000	0.0
545	09/23/98													545		0.5879	0.0	0.00	0.0	0.000	0.0
545	09/30/98	7929	557.89	557.89	0.33		1.2	0.27	4	3.242	1448			545	0.67	0.5879	79.7	17.93	265.6	215.264	96145.2
545	10/07/98	7944	4.21	4.21	0.02		1.1	0.36	2.9	0.797	38			545	0.01	0.5879	0.6	0.18	1.5	0.399	19.0
545	10/14/98	7953	322.45	322.45	0.09		1.2	0.09	1.9	1.246	205	5.6	2640	545	0.38	0.5879	46.1	3.45	72.9	47.818	7867.3
545	10/21/98	7973					1.1	0.14	1.1	0.438	52			545	0.00	0.5879	0.0	0.00	0.0	0.000	0.0
545	10/28/98													545		0.5879	0.0	0.00	0.0	0.000	0.0
545	11/04/98	7993	166.33	166.33	0.04		1.2	0.02	1.9	0.429	88			545	0.20	0.5879	23.8	0.40	37.6	8.493	1742.1
545	11/12/98	8002	196.47	196.47	0.09		0.6	0.13	0.7	0.39	51			545	0.05	2.918	2.8	0.61	3.3	1.837	240.3
545	11/18/98	8015	375.62	375.62	0.08		1.1	0.01	1.8	0.226	21			545	0.09	2.918	9.9	0.09	16.2	2.036	189.1
545	11/25/98	8030	2.22	2.22	0.01		2	1.45	0.6	0.064	5			545	0.00	2.918	0.1	0.08	0.0	0.003	0.3
545	12/02/98	8040	352.42	352.42	0.12		1	0.19	3	1.342	560			545	0.08	2.918	8.5	1.61	25.4	11.341	4732.4
545	12/09/98	8060					1	0.23	0.8	0.368	41			545	0.00	2.918	0.0	0.00	0.0	0.000	0.0
545	12/16/98													545		2.918	0.0	0.00	0.0	0.000	0.0
545	12/23/98	8086	71.07	71.07	0.07		2.8	0.34	1.3	0.003	43.5			545	0.02	2.918	4.8	0.58	2.2	0.004	74.1
545	12/29/98													545		2.918	0.0	0.00	0.0	0.000	0.0
545	01/06/99	8104	2868.6	2868.6	0.35		1.2	0.13	2	1.171	231.1			545	0.69	2.918	82.5	8.94	137.6	80.548	15896.4
545	01/13/99	8115	3505	3505	0.48		1.1	0.07	0.8	0.443	84			545	0.84	2.918	92.5	5.88	67.2	37.232	7059.9
545	01/21/99	8146	9221.2	9221.2	0.54		2	0.08	0.4	0.37	17.2			545	2.21	2.918	442.2	17.69	88.4	81.812	3803.2
545	01/26/99	8149	2334.9	2334.9	0.11		0.9	0.1	1.3	1.56	482.5			545	0.56	2.918	50.4	5.60	72.8	87.342	27014.3
545	02/04/99	8162	2926.2	2926.2	0.12		0.8	0.25	0.8	0.99	136			545	0.70	2.918	56.1	17.54	56.1	69.465	9542.7
545	02/09/99													545		2.918	0.0	0.00	0.0	0.000	0.0
545	02/16/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	02/26/99		651.98	651.98	0.05									545	0.16	2.844	0.0	0.00	0.0	0.000	0.0
545	03/02/99	8197	1978.57	1978.6	0.1		0.9	0.24	1.5	1.089	348			545	0.49	2.844	43.8	11.68	73.0	53.011	16940.1
545	03/09/99	8206	1063.78	1063.8	0.06		1	0.29	2.3	1.875	422			545	0.26	2.844	26.2	7.59	60.2	49.072	11044.6
545	03/16/99	8212	303.09	303.09	0.04		0.2	0.8	1.4	0.101	24.8			545	0.07	2.844	1.5	5.97	10.4	0.753	184.9
545	03/23/99	8220	1160.94	1160.9	0.06		0.7	0.22	2.9	0.137	1606			545	0.29	2.844	20.0	6.28	82.8	3.913	45871.2
545	03/30/99	8237	1018.42	1018.4	0.06		0.3	3.54	2.5	0.482	106			545	0.25	2.844	7.5	88.70	62.6	12.077	2655.9
545	04/06/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	04/15/99	8255	145.83	145.83	0.03						32.8			545	0.04	2.844	0.0	0.00	0.0	0.000	117.7
545	04/20/99		192.37	192.37	0.03									545	0.05	2.844	0.0	0.00	0.0	0.000	0.0
545	04/27/99	8269	210.53	210.53	0.02		1.4	0.07	1.4	0.653	348			545	0.05	2.844	7.3	0.36	7.3	3.382	1802.5
545	05/04/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	05/11/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	05/18/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	05/25/99	8289	888.89	888.89	0.07		2.1	0.21	3.1	1.291	326.8			545	0.22	2.844	45.9	4.59	67.8	28.233	7146.8
545	06/01/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	06/08/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	06/15/99	8307	3.09	3.09	0.01		1.9	0.45	4.8	1.416	211.6			545	0.00	2.844	0.1	0.03	0.4	0.108	16.1
545	06/22/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	06/29/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	07/06/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	07/13/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	07/20/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	07/27/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	08/03/99													545		2.844	0.0	0.00	0.0	0.000	0.0
545	08/10/99	8347	1576.64	1576.6	0.75		1.2	0.08	3.5	3.942	731			545	0.39	2.844	46.5	3.10	135.8	152.909	28355.3
545	08/17/99	8355	1011.86	1011.9	0.15		0.1	0.47	2	1.029	452			545	0.25	2.844	2.5	11.70	49.8	25.617	11252.4
545	08/24/99	8361	400.47	400.47	0.23		0.1	0.95	1.6	0.818	100.5			545	0.10	2.844	1.0	9.36	15.8	8.059	990.2
545	08/31/99	8366	1656.94	1656.9	0.67		0.6	0.13	4.4	2.931	335.1			545	0.41	2.844	24.5	5.30	179.4	119.483	13660.5
545	09/07/99	8380	116.99	116.99	0.11		3.2	1.98	9.6	4.212	101.2			545	0.03	2.844	9.2	5.70	27.6	12.123	291.3
545	09/14/99	8384	15911	15911	2.56		0.5	0.19	5.9	3.734	2311.3			545	3.92	2.844	195.7	74.38	2309.6	1461.693	904770.1
545	09/21/99	8402	13857	13857	1.91		0.7	0.28	2.4	0.835	685.8			545	3.42	2.844	238.6	95.46	818.2	284.669	233803.6
545	09/28/99		54.43	54.43	0.1									545	0.01	2.844	0.0	0.00	0.0	0.000	0.0
545	10/05/99	8421	5882.28	5882.3	2		0.7	1.16	6.5	2.494	2018.3			545	1.45	2.844	101.3	167.88	940.7	360.933	292089.4
545	10/12/99	8438	1502.35	1502.4	0.72		0.1	0.11	1.2	0.207	17.7			545	0.37	2.844	3.7	4.07	44.4	7.651	654.2

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Traditional

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	CU/100ml		cm	(ac)	NO3	NH3	TKN	TP	TSS
545	10/19/99	8443	8052	8052	0.76		0.7	0.08	1.4	0.942	501			545	1.98	2.844	138.7	15.85	277.3	186.612	99249.0
545	10/26/99	8464	5730.72	5730.7	0.89		0.7	0.04	2	1.456	989.2			545	1.41	2.844	98.7	5.64	282.0	205.284	139469.0
545	11/02/99													545	0.00	2.844	0.0	0.00	0.0	0.000	0.0
545	11/09/99	8478	2732.72	2732.7	1.2		0.4	0.05	3	4.512	1910.3			545	0.67	2.844	26.9	3.36	201.7	303.353	128434.3
545	11/16/99													545	0.00	2.844	0.0	0.00	0.0	0.000	0.0
545	11/23/99	8503	230.82	230.82	0.16						89.4			545	0.06	2.844	0.0	0.00	0.0	0.000	507.7
545	11/30/99	8507	1595.12	1595.1	0.35		0.3	0.12	1.9	1.86	145.4			545	0.39	2.844	11.8	4.71	74.6	72.995	5706.1
545	12/07/99	8529	5666.34	5666.3	0.67		0.4	0.13	1.2	1.016	523.6	10.4	240	545	1.40	2.844	55.8	18.12	167.3	141.638	72993.9
545	12/14/99		182.54	182.54	0.05									545	0.04	2.844	0.0	0.00	0.0	0.000	0.0
545	12/21/99	8534	1909.7	1909.7	0.17		0.4	0.05	0.05	0.163	113.7			545	0.34	3.914	13.7	1.71	1.7	5.565	3881.7
545	12/28/99													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	01/04/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	01/11/00	8556	7275.68	7275.7	0.34		0.1	0.09	0.05	0.245	298.9			545	1.30	3.914	13.0	11.71	6.5	31.866	38877.0
545	01/18/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	01/25/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	02/01/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	02/08/00	8619	615.17	615.17	0.08		1.5	0.11	1	0.288	98			545	0.11	3.914	16.5	1.21	11.0	3.167	1077.7
545	02/15/00	8631	5710.18	5710.2	0.24		0.1	0.09	2	0.982	691			545	1.02	3.914	10.2	9.19	204.2	100.243	70537.7
545	02/22/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	02/29/00	8654	1339.13	1339.1	0.08		0.1	0.11	2	1.118	305.1			545	0.24	3.914	2.4	2.63	47.9	26.764	7304.0
545	03/07/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	03/14/00	8656	2360.8	2360.8	0.12		1	0.34	1.8	0.832	306.3			545	0.42	3.914	42.2	14.35	76.0	35.114	12927.0
545	03/21/00	8668	2194.56	2194.6	0.09		1	0.11	0.8	0.312	102.6			545	0.39	3.914	39.2	4.32	31.4	12.240	4025.2
545	03/28/00	8673	226.28	226.28	0.06		0.1	1.5	0.9	0.309	135.9			545	0.04	3.914	0.4	6.07	3.6	1.250	549.7
545	04/04/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	04/11/00	8692	555.87	555.87	0.05		0.6	0.63	2.3	0.452	118			545	0.10	3.914	6.0	6.26	22.9	4.492	1172.6
545	04/18/00	8696	1362.57	1362.6	0.11		0.4	0.07	0.8	0.161	41			545	0.24	3.914	9.7	1.71	19.5	3.922	998.7
545	04/25/00	8702	4774	4774	0.2		0.5	0.06	1.7	1.036	163.9			545	0.85	3.914	42.7	5.12	145.1	88.417	13988.0
545	05/02/00													545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/09/00													545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/16/00													545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/23/00													545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/30/00													545		3.914	0.0	0.00	0.0	0.000	0.0
545	06/06/00	8764										2.6	160	545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	06/13/00	8775	28145	28145	3.1				5.1	2.534	564.5			545	5.04	3.914	0.0	0.00	2566.0	1274.973	284026.2
545	06/20/00	8802	302.81	302.81	0.28		3.7	0.88	5.1	0.638				545	0.05	3.914	20.0	4.76	27.6	3.454	0.0
545	06/27/00	8804												545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	07/04/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	07/11/00	8816	6749	6749	3.1		0.3	0.42	5.6	3.542	3062.8			545	1.21	3.914	36.2	50.67	675.6	427.348	369531.3
545	07/18/00	8845	984.68	984.68	0.75		0.1	0.09	0.4	0.186	69.6			545	0.18	3.914	1.8	1.58	7.0	3.274	1225.2
545	07/25/00	8855	4556	4556	3.1		0.8	0.59	1.6	0.788	2933			545	0.82	3.914	65.2	48.05	130.3	64.181	238885.1
545	08/01/00	8858	11057	11057	1.63		0.3	0.24	1.1	1.015	1147			545	1.98	3.914	59.3	47.44	217.4	200.630	226722.1
545	08/08/00	8870												545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	08/15/00	8874	174.15	174.15	0.08		0.1	0.2	1	0.141	16.8			545	0.03	3.914	0.3	0.62	3.1	0.439	52.3
545	08/22/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	09/01/00	8891	901	901	0.28		0.8	1.19	2	0.945	29.4			545	0.16	3.914	12.9	19.17	32.2	15.221	473.5
545	09/08/00		5134.72	5134.7	1.97									545	0.92	3.914	0.0	0.00	0.0	0.000	0.0
545	09/15/00	8896										11		545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	09/22/00	8909	4633.13	4633.1	2.43		2.8	0.47	3.4	1.905	697.5			545	0.83	3.914	231.9	38.93	281.6	157.784	57771.3
545	09/29/00		1158.25	1158.3	3.1									545	0.21	3.914	0.0	0.00	0.0	0.000	0.0
545	10/06/00		0.07	0.07	0.01									545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	10/13/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	10/20/00	8939	107.39	107.39	0.05						14.5			545	0.02	3.914	0.0	0.00	0.0	0.000	27.8
545	10/27/00													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	11/03/00		2.56	2.56	0.02									545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	11/10/00	8964	5916.21	5916.2	0.95		0.8	0.26	2.2	0.986	234.3	4.5	0	545	1.06	3.914	84.6	27.50	232.7	104.283	24780.4
545	11/17/00	8993	3354	3354	0.67		0.8	0.19	1.3	0.64	89			545	0.60	3.914	48.0	11.39	77.9	38.374	5336.4
545	11/24/00													545		3.914	0.0	0.00	0.0	0.000	0.0
545	12/01/00	9004			1.24		0.6	0.43	2.1	2.086	149.1			545		3.914	0.0	0.00	0.0	0.000	0.0
545	12/08/00													545		3.914	0.0	0.00	0.0	0.000	0.0
545	12/15/00	9015			1.12		0.1	0.02	1.2	0.4	52			545		3.914	0.0	0.00	0.0	0.000	0.0
545	12/22/00	9020			0.94		31.6	0.05	1.1	0.126	103.4			545		3.914	0.0	0.00	0.0	0.000	0.0
545	12/29/00																				

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project
Water Quality Data Traditional

Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C. CU/100ml	station	depth cm	WTRSHED AREA (ac)	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
545	01/05/01																				
545	01/12/01	9051					0.8	0.4	1.2	0.12	15.2			545		3.914	0.0	0.00	0.0	0.000	0.0
545	01/19/01	9054					0.7	0.2	1.3	0.284	53.8			545		3.914	0.0	0.00	0.0	0.000	0.0
545	01/26/01	9147					0.3	0.27	1.3	0.423	90.3			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/02/01	9153					0.2	0.23	1.7		380.6			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/09/01	9158					11.9	0.14	0.8	0.405	90.6			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/14/01	9168					0.3	0.06	0.7	0.214	13.5			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/21/01	9173					0.8	0.09	0.6	0.257	60.6			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/28/01	9185					2.6	0.16	1	0.332	138.8			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/07/01													545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/14/01	9200					0.1	0.19	1.2	0.289	69.5			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/21/01	9210					0.1	0.33	0.7	0.017	4.2			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/28/01	9218					0.1	0.16	1.9	0.82	156.9			545		3.914	0.0	0.00	0.0	0.000	0.0
545	04/04/01	9239					0.1	0.08	1.4	0.705	117.2			545		3.914	0.0	0.00	0.0	0.000	0.0
545	04/11/01	9249					0.1	0.23	1.2	0.343	104.1			545		3.914	0.0	0.00	0.0	0.000	0.0
545	04/18/01	9256					0.5	0.04	0.7	0.139	18.8			545		3.914	0.0	0.00	0.0	0.000	0.0
545	04/25/01													545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/02/01													545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/09/01		0.8	0.8										545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	05/16/01		0.7	0.7										545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	05/23/01	9274	1,660.70	1,660.70			0.3	0.92	2.7	0.536	26.6			545	0.30	3.914	8.9	27.31	80.2	15.913	789.7
545	05/30/01	9277	14,078.00	14,078.00			0.4	0.27	2.5	1.218	201.2			545	2.52	3.914	100.7	67.95	629.2	306.536	50636.3
545	06/06/01	9281	8,706.50	8,706.50			0.1	0.52	4.7	3.026	72.2			545	1.56	3.914	15.6	80.94	731.5	470.984	11237.6
545	06/13/01	9289	769.9	769.9			0.1	0.81	4.4	0.686				545	0.14	3.914	1.4	11.15	60.6	9.442	0.0
545	06/20/01	9292	28,459.00	28,459.00			1.5	0.89	4.8	2.784	691.5			545	5.10	3.914	763.1	452.80	2442.0	1416.387	351807.5
545	06/27/01		106.4	106.4										545	0.02	3.914	0.0	0.00	0.0	0.000	0.0
545	07/04/01	9299	92.4	92.4			0.2	1.22	2.7	0.914				545	0.02	3.914	0.3	2.02	4.5	1.510	0.0
545	07/11/01	9312	4,002.20	4,002.20			0.2	0.06	1.4	0.554	133.8			545	0.72	3.914	14.3	4.29	100.2	39.637	9573.0
545	07/18/01													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	07/25/01													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	08/01/01	9324	5,356.00	5,356.00			0.1	0.24	1.2	0.412	82.5			545	0.96	3.914	9.6	22.98	114.9	39.449	7899.3
545	08/08/01		96.3	96.3										545	0.02	3.914	0.0	0.00	0.0	0.000	0.0
545	08/15/01	9340	12,650.00	12,650.00			0.1	0.12	1	0.413	87.3			545	2.27	3.914	22.6	27.14	226.1	93.397	19742.3
545	08/22/01	9350	9,364.00	9,364.00			0.1	0.35	1.6	0.445	54.3			545	1.68	3.914	16.7	58.59	267.8	74.493	9089.8
545	08/29/01	9364	500.4	500.4			1.4	0.24	1.1	0.184	1			545	0.09	3.914	12.5	2.15	9.8	1.646	8.9
545	09/04/01		0.1	0.1										545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	09/11/01													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	09/18/01	9369	290.3	290.3			0.8	0.71	2.3	0.243	37.9			545	0.05	3.914	4.2	3.68	11.9	1.261	196.7
545	09/25/01	9376	14,850.10	14,850.10			0.1	0.47	1.7	1.005	61.7			545	2.66	3.914	26.5	124.77	451.3	266.802	16379.8
545	10/02/01	9379	18,613.00	18,613.00			0.7	0.56	2.2	0.893	98			545	3.33	3.914	232.9	186.34	732.0	297.140	32608.9
545	10/09/01		1	1										545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	10/16/01		174	174										545	0.03	3.914	0.0	0.00	0.0	0.000	0.0
545	10/23/01	9396	489.9	489.9							14.7			545	0.09	3.914	0.0	0.00	0.0	0.000	128.7
545	10/30/01		0	0										545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	11/06/01	9400	335	335			1.8	0.96	8	0.39				545	0.06	3.914	10.8	5.75	47.9	2.336	0.0
545	11/13/01													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	11/20/01		99.6	99.6										545	0.02	3.914	0.0	0.00	0.0	0.000	0.0
545	11/27/01	9413	1,167.50	1,167.50			1.2	0.87	1.2	0.196	23.8			545	0.21	3.914	25.0	18.16	25.0	4.091	496.7
545	12/04/01													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	12/11/01	9418	1,252.70	1,252.70			0.5	0.18	0.8	0.222	40			545	0.22	3.914	11.2	4.03	17.9	4.972	895.8
545	12/18/01	9429					0.5	0.1	0.5	0.119	10.7			545		3.914	0.0	0.00	0.0	0.000	0.0
545	12/26/01	9435					0.1	0.1	0.4	0.163	37.5			545		3.914	0.0	0.00	0.0	0.000	0.0
545	01/02/02													545		3.914	0.0	0.00	0.0	0.000	0.0
545	01/25/02	9439					0.2	0.03	0.3	0.122	10.3			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/01/02													545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/08/02	9461									63.7			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/15/02	9479					0.4	0.07	0.6	0.254	75.4			545		3.914	0.0	0.00	0.0	0.000	0.0
545	02/22/02	9484					0.5	0.11	0.6	0.215	64.6			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/01/02	9496					0.4	0.14	0.4	0.15	22.9			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/08/02	9501					0.2	0.09	0.5	0.202	11.9			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/15/02	9513					0.4	0.11	0.4	0.152	54.4			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/22/02	9521					0.2	0.06	0.5	0.093	7.1			545		3.914	0.0	0.00	0.0	0.000	0.0
545	03/29/02	9526					0.1	0.03	0.4	0.11	19.5			545		3.914	0.0	0.00	0.0	0.000	0.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project
Water Quality Data Traditional

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	CU/100ml		cm	(ac)	NO3	NH3	TKN	TP	TSS
545	04/05/02	9536					0.4	0.12	0.4	0.122	14.4			545		3.914	0.0	0.00	0.0	0.000	0.0
545	04/12/02	9541					0.3	0.19	1.8	0.166	15.5			545		3.914	0.0	0.00	0.0	0.000	0.0
545	04/19/02	9546					0.7	0.31	1.6	0.142	31			545		3.914	0.0	0.00	0.0	0.000	0.0
545	04/26/02	9551					0.7	0.6	1.5	0.268	16.5			545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/03/02													545		3.914	0.0	0.00	0.0	0.000	0.0
545	05/10/02		0	0										545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	05/17/02	9588	11,130	11,130			0.3	0.12	1.4	0.431	113.9			545	1.99	3.914	59.7	23.88	278.6	85.756	22662.7
545	05/24/02	9596	10,404	10,404			1.2	0.37	1.4	0.28	8.8			545	1.86	3.914	223.2	68.82	260.4	52.078	1636.7
545	05/30/02													545	0.00	3.914	0.0	0.00	0.0	0.000	0.0
545	06/06/02	9618	1680.5	1680.5							92.3			545	0.30	3.914	0.0	0.00	0.0	0.000	2772.9
545	06/13/02	9627	9192.4	9192.4			0.1	0.08	1.4	0.172	14.6			545	1.29	4.99	12.9	10.31	180.5	22.170	1881.9
545	06/20/02	9634	2863.19	2863.19			0.37	0.48	1.7	0.47	78			545	0.40	4.99	14.9	19.27	68.3	18.870	3131.5
545	06/27/02		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	07/04/02													545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	07/11/02	9653	0	0			1	1.1	2.9	0.348				545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	07/18/02	9657	1214.61	1214.61			1.2	0.51	2.2	0.464				545	0.17	4.99	20.4	8.69	37.5	7.903	0.0
545	07/25/02	9663	2190.37	2190.37			1	0.42	1.6	0.221	52.9			545	0.31	4.99	30.7	12.90	49.1	6.788	1624.8
545	08/01/02	9669	1393.86	1393.86			1.1	0.63	1.5	0.186	70.4			545	0.20	4.99	21.5	12.31	29.3	3.635	1376.0
545	08/08/02	9676	1063.47	1063.47			1	0.42	1.2	0.147				545	0.15	4.99	14.9	6.26	17.9	2.192	0.0
545	08/15/02		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	08/22/02		363.74	363.74										545	0.05	4.99	0.0	0.00	0.0	0.000	0.0
545	08/30/02	9684	15688	15688			0.3	0.28	3.2	0.889	53.6			545	2.20	4.99	66.0	61.59	703.9	195.561	11790.9
545	09/05/02	9691	17496	17496			0.6	0.12	0.7	0.208	18.7			545	2.46	4.99	147.2	29.44	171.7	51.029	4587.7
545	09/12/02		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	09/19/02	9698	7879.28	7879.28			0.4	0.25	0.9	0.233	23.5			545	1.11	4.99	44.2	27.62	99.4	25.743	2596.4
545	09/26/02	9708	4867.05	4867.05			0.1	0.08	0.8	0.351	71.4			545	0.68	4.99	6.8	5.46	54.6	23.954	4872.8
545	10/02/02	9739	5560.31	5560.31			0.1	0.12	0.8	0.293	9.5			545	0.78	4.99	7.8	9.36	62.4	22.844	740.7
545	10/10/02		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	10/17/02	9749	3354.23	3354.23							57.8			545	0.47	4.99	0.0	0.00	0.0	0.000	2718.5
545	10/24/02		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	10/31/02	9763	7098.52	7098.52			0.6	0.04	1.4	0.486	30			545	1.00	4.99	59.7	3.98	139.4	48.375	2986.1
545	11/07/02	9771	3314.11	3314.11			3.2	0.48	1.6	0.226	22.5			545	0.47	4.99	148.7	22.31	74.4	10.502	1045.6
545	11/14/02	9777	5132.34	5132.34			0.4	0.1	0.7	0.269	20.8			545	0.72	4.99	28.8	7.20	50.4	19.359	1496.9
545	11/21/02		10510	10510										545	1.48	4.99	0.0	0.00	0.0	0.000	0.0
545	12/05/02													545		4.99	0.0	0.00	0.0	0.000	0.0
545	12/12/02													545		4.99	0.0	0.00	0.0	0.000	0.0
545	12/19/02	9834	6453.49	6453.49			0.6	0.33	2.9	0.243	22.1			545	0.91	4.99	54.3	29.86	262.4	21.989	1999.9
545	12/26/02	9845	13454	13454			0.4	0.04	2.4	0.385	175			545	1.89	4.99	75.5	7.55	452.8	72.632	33014.4
545	01/02/03	9869	5418	5418			0.6	0.02	0.8	0.124	15.6			545	0.76	4.99	45.6	1.52	60.8	9.421	1185.2
545	01/10/03	9909	2825.3	2825.3			1.1	0.01	0.9	0.101	7.2			545	0.40	4.99	43.6	0.40	35.7	4.001	285.2
545	01/17/03																				
545	01/24/03																				
545	01/31/03																				
545	02/04/03	9928											20	545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	02/07/03	9935	504.9	504.9			0.7	0.15	1.6	0.15				545	0.07	4.99	5.0	1.06	11.3	1.062	0.0
545	02/14/03		4	4										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	02/28/03	9958	32828	32828			0.4	0.005	1.3	0.256	94.2			545	4.61	4.99	184.1	2.30	598.4	117.841	43362.0
545	03/07/03	9972	20945	20945			5.5	0.005	1.7	0.269	67.5			545	2.94	4.99	1615.3	1.47	499.3	79.003	19824.3
545	03/14/03	10	1872.5	1872.5			0.6	0.01	1.6	0.152	16			545	0.26	4.99	15.8	0.26	42.0	3.991	420.1
545	03/20/03																				
545	03/28/03						0.5	0.02	2	0.288	79.7			545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	04/03/03	40	12009.3	12009.3			0.4	0.44	5.4	0.299	50.7			545	1.69	4.99	67.4	74.09	909.3	50.350	8537.7
545	04/11/03	52	1247.6	1247.6					4.3	0.261	61			545	0.18	4.99	0.0	0.00	75.2	4.566	1067.1
545	04/17/03	73	6415.6	6415.6			0.3	0.005	2	0.42	75.9			545	0.90	4.99	27.0	0.45	179.9	37.783	6828.0
545	04/25/03	96	1565.6	1565.6			0.3	0.13	2	0.184	24.4			545	0.22	4.99	6.6	2.85	43.9	4.039	535.7
545	05/02/03	119	8956	8956		1.67	1.5	0.005	2.9	0.328	60.1			545	1.26	4.99	188.4	0.63	364.2	41.191	7547.5
545	05/09/03	130	228	228			1.7	0.26	2.7	0.131	9.3			545	0.03	4.99	5.4	0.83	8.6	0.419	29.7
545	05/16/03		35	35										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	05/23/03	146	515	515			0.6	0.92	9.3	0.722	27.9			545	0.07	4.99	4.3	6.64	67.2	5.214	201.5
545	05/26/03	145										1.8	685	545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	05/30/03	177	20291	20291			0.3	0.2	6.7	0.869	123.6			545	2.85	4.99	85.4	56.90	1906.3	247.250	35167.0
545	06/05/03	189	8315	8315			0.2	0.005	2.2	0.171	183.9			545	1.17	4.99	23.3	0.58	256.5	19.938	21441.6
545	06/12/03	208	2513	2513			1.7	0.14	1.3	0.078	25.1			545	0.35	4.99	59.9	4.93	45.8	2.749	884.5

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project

Water Quality Data Traditional

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	CU/100ml		cm	(ac)	NO3	NH3	TKN	TP	TSS
545	06/19/03	229	8981	8981			0.5	0.005	2.1	0.371	21.9			545	1.26	4.99	63.0	0.63	264.5	46.721	2757.9
545	06/26/03	241	1942	1942			1	0.11	0.4	0.074	6			545	0.27	4.99	27.2	3.00	10.9	2.015	163.4
545	07/03/03		0	0											0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	07/10/03	260	668	668			0.6	0.87	2.8	0.342	46.8			545	0.09	4.99	5.6	8.15	26.2	3.203	438.4
545	07/17/03	263	5729	5729			0.4	0.46	1.8	0.393	502			545	0.80	4.99	32.1	36.95	144.6	31.571	40327.0
545	07/24/03	276	9305	9305			0.536	0.359	1	0.729	50.2	4.4		545	1.31	4.99	69.9	46.84	130.5	95.117	6549.9
545	07/31/03		83	83										545	0.01	4.99	0.0	0.00	0.0	0.000	0.0
545	08/07/03	291	1412	1412			0.263	0.552			30.4			545	0.20	4.99	5.2	10.93	0.0	0.000	601.9
545	08/14/03	315	12216	12216			0.176	0.287	1.068	0.314	18.2			545	1.72	4.99	30.1	49.16	182.9	53.786	3117.6
545	08/21/03	322	201.7	201.7			0.644	0.0005			9.9			545	0.03	4.99	1.8	0.00	0.0	0.000	28.0
545	08/28/03													545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	09/04/03	326	9332	9332			0.2	0.28	1.3	0.25	16.3	4.5	100	545	1.31	4.99	26.2	36.64	170.1	32.714	2132.9
545	09/11/03		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	09/18/03	354	5503	5503			0.3	0.19	0.6	0.125	15.3			545	0.77	4.99	23.1	14.66	46.3	9.645	1180.6
545	09/25/03	357	2540	2540			0.4	0.13	0.7	0.173	11.2			545	0.36	4.99	14.2	4.63	24.9	6.162	398.9
545	10/02/03	372	524	524			1.1	0.56	1.1	0.138	3.4			545	0.07	4.99	8.1	4.11	8.1	1.014	25.0
545	10/08/03		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	10/16/03	387	4802	4802			0.5	0.39	1.3	0.154	18.5			545	0.67	4.99	33.7	26.26	87.5	10.369	1245.7
545	10/23/03	400	964	964			1.2	0.32	0.5	0.081	1.7			545	0.14	4.99	16.2	4.33	6.8	1.095	23.0
545	10/29/03	424	22887	22887			0.8	0.16	1.3	0.363	11			545	3.21	4.99	256.7	51.35	417.2	116.495	3530.2
545	11/06/03	430	1301	1301			0.6	0.55	0.8	0.164	14.1			545	0.18	4.99	10.9	10.03	14.6	2.992	257.2
545	11/13/03	445					0.5	0.19	0.4	0.082	4.8			545		4.99	0.0	0.00	0.0	0.000	0.0
545	11/20/03													545		4.99	0.0	0.00	0.0	0.000	0.0
545	11/26/03	483					0.4	0.23	0.8	0.147				545		4.99	0.0	0.00	0.0	0.000	0.0
545	12/04/03	489					0.3	0.15	0.4	0.073				545		4.99	0.0	0.00	0.0	0.000	0.0
545	12/11/03	491					0.1	0.36	0.6	0.152		4.5	120	545		4.99	0.0	0.00	0.0	0.000	0.0
545	12/18/03	498					0.01	0.13	1.3	0.343	33.7			545		4.99	0.0	0.00	0.0	0.000	0.0
545	12/31/03	515					0.1	0.08	0.6	0.136	13.1			545		4.99	0.0	0.00	0.0	0.000	0.0
545	01/08/04	522					0.2	0.11	0.4	0.068	6.7			545		4.99	0.0	0.00	0.0	0.000	0.0
545	01/15/04													545		4.99	0.0	0.00	0.0	0.000	0.0
545	01/22/04													545		4.99	0.0	0.00	0.0	0.000	0.0
545	01/29/04													545		4.99	0.0	0.00	0.0	0.000	0.0
545	02/05/04	545					0.1	0.55	1.7	0.431	48.3			545		4.99	0.0	0.00	0.0	0.000	0.0
545	02/12/04	547					0.1	0.26	1.2	0.271	27			545		4.99	0.0	0.00	0.0	0.000	0.0
545	02/19/04													545		4.99	0.0	0.00	0.0	0.000	0.0
545	02/26/04													545		4.99	0.0	0.00	0.0	0.000	0.0
545	03/04/04	553					0.3	0.13	1.2	0.896				545		4.99	0.0	0.00	0.0	0.000	0.0
545	03/11/04	558					0.1	0.18	0.5	0.121	10.6			545		4.99	0.0	0.00	0.0	0.000	0.0
545	03/18/04													545		4.99	0.0	0.00	0.0	0.000	0.0
545	03/25/04	561					0.7	0.38	0.7	0.125	15.2			545		4.99	0.0	0.00	0.0	0.000	0.0
545	04/01/04	582					0.6	0.11	1.1	0.163	27			545		4.99	0.0	0.00	0.0	0.000	0.0
545	04/08/04	589					1.6	0.05	0.5	0.043	0.3			545		4.99	0.0	0.00	0.0	0.000	0.0
545	04/15/04	597					0.01	0.04	0.8	0.092	80			545		4.99	0.0	0.00	0.0	0.000	0.0
545	04/22/04													545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	04/29/04	608	5103	5103			0.6	0.21	0.6	0.071	2.7			545	0.72	4.99	42.9	15.03	42.9	5.080	193.2
545	05/06/04	610	1003	1003			0.7	0.19	0.7	0.077	2.9			545	0.14	4.99	9.8	2.67	9.8	1.083	40.8
545	05/13/04	628	114	114			1.5	0.56	1.1	0.076	7.2			545	0.02	4.99	2.4	0.90	1.8	0.121	11.5
545	05/20/04		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	05/27/04		4527	4527										545	0.64	4.99	0.0	0.00	0.0	0.000	0.0
545	06/03/04													545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	06/10/04	644	20	20			0.4	0.2	1.4	0.146				545	0.00	4.99	0.1	0.06	0.4	0.041	0.0
545	06/17/04	645	40	40			1.1	1.18	4.3	0.258				545	0.01	4.99	0.6	0.66	2.4	0.145	0.0
545	06/24/04		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	07/01/04		0	0										545	0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	07/08/04	661	3837	3837			0.7	0.9	2.8	0.357	49.7			545	0.54	4.99	37.7	48.42	150.6	19.208	2674.0
545	07/15/04	667	4457	4457			0.2	0.13	0.5	0.06	3.4			545	0.63	4.99	12.5	8.12	31.2	3.750	212.5
545	07/22/04	677	669	669			0.7	0.27	1	0.133				545	0.09	4.99	6.6	2.53	9.4	1.248	0.0
545	07/29/04	678	380	380			0.5	0.28	2.9	0.313				545	0.05	4.99	2.7	1.49	15.5	1.668	0.0
545	08/05/04	685	8284	8284	2.41		0.5	0.16	1	0.2	140.5				1.16	4.99	58.1	18.59	116.2	23.232	16320.4
545	08/12/04		390	390	0.39										0.05	4.99	0.0	0.00	0.0	0.000	0.0
545	08/19/04	722	6322	6322	0.93		0.3	0.48	5.3	1.68	995.6				0.89	4.99	26.6	42.55	469.8	148.928	88257.8
545	08/26/04	739	4204	4204	2.51		0.3	0.24	1.5	0.259					0.59	4.99	17.7	14.15	88.4	15.268	0.0
545	09/02/04		962	962	0.73										0.14	4.99	0.0	0.00	0.0	0.000	0.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project
Water Quality Data Traditional

Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	concentration (mg/l) NO3	concentration (mg/l) NH3	concentration (mg/l) TKN	concentration (mg/l) TP	concentration (mg/l) TSS	BOD	F.C. CU/100ml	station	depth cm	WTRSHED AREA (ac)	export (g/ha/wk) NO3	export (g/ha/wk) NH3	export (g/ha/wk) TKN	export (g/ha/wk) TP	export (g/ha/wk) TSS
545	09/09/04	758	5113	5113	1.91		0.2	0.09	0.6	0.117					0.72	4.99	14.3	6.45	43.0	8.388	0.0
545	09/16/04		380	380	0.22										0.05	4.99	0.0	0.00	0.0	0.000	0.0
545	09/23/04														0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	09/30/04	782	25847	25847	2.27		0.1	0.005	0.8	0.131	23.6				3.63	4.99	36.2	1.81	289.9	47.478	8553.3
545	10/07/04		0	0	0.05										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	10/14/04		807	807	1.69										0.11	4.99	0.0	0.00	0.0	0.000	0.0
545	10/21/04		7422	7422	1.02										1.04	4.99	0.0	0.00	0.0	0.000	0.0
545	10/28/04		0	0	0										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	11/04/04		0	0	0										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	11/11/04	837	6242	6242	3.1		0.2	0.19	1.4	0.344	72.9				0.88	4.99	17.5	16.63	122.5	30.109	6380.6
545	11/18/04	843	9849	9849	0.73		0.2	0.005	0.8	0.119	1.1				1.38	4.99	27.6	0.69	110.5	16.434	151.9
545	11/25/04														0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	11/28/04	851										3.5	30								
545	12/01/04	856										2.5	23								
545	12/02/04	863	41157	41157	2.2		0.3	0.01	1	0.246	12.8				5.78	4.99	173.1	5.77	577.1	141.969	7387.0
545	12/09/04		7821	7821	0.83										1.10	4.99	0.0	0.00	0.0	0.000	0.0
545	12/16/04		20512	20512	1.47										2.88	4.99	0.0	0.00	0.0	0.000	0.0
545	12/23/04		798	798	0.59										0.11	4.99	0.0	0.00	0.0	0.000	0.0
545	12/30/04	931	11076	11076	1.22		0.2	0.01	1.1	0.232	19.8				1.56	4.99	31.1	1.55	170.8	36.032	3075.1
545	01/07/05	934	12974	12974	0.69		1	0.07			18.6				1.82	4.99	181.9	12.73	0.0	0.000	3383.8
545	01/13/05	940	19400	19400	0.76		1.5	0.03	0.05	0.528	0				2.73	4.99	408.0	8.16	13.6	143.631	0.0
545	01/14/05	947										1.7									
545	01/19/05	950	9819	9819	0.91		2.3	0.02	0.6	0.036	11.7				1.38	4.99	316.7	2.75	82.6	4.957	1610.9
545	01/26/05		0	0	0.15										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	02/02/05		0	0	0										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	02/09/05	953	1951	1951	0.15		0.4	0.09	1.2	0.096	118.1				0.27	4.99	10.9	2.46	32.8	2.626	3230.9
545	02/10/05	958										1.7	0								
545	02/16/05	961	4329	4329	0.67		0.5	0.06	1.1	0.144	17.4				0.61	4.99	30.4	3.64	66.8	8.741	1056.2
545	02/23/05		269	269	0.11										0.04	4.99	0.0	0.00	0.0	0.000	0.0
545	03/02/05		0	0	0										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	03/08/05	974										6.1	30								
545	03/09/05	977	741	741	0.1		0.5	0.005	0.9	0.173	46.3				0.10	4.99	5.2	0.05	9.4	1.798	481.1
545	03/16/05		0	0	0										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	03/23/05		0	0	0										0.00	4.99	0.0	0.00	0.0	0.000	
545	03/28/05	985										2.3	100								
545	03/30/05	990	12847	12847	1.393		0.24	0.1	3.5	0.579	115.5				1.80	4.99	43.2	18.01	630.5	104.302	20806.4
545	04/02/05	994										2.4									
545	04/06/05	999	14094	14094	0.768		0.01	1.4	1.3	0.115	10.3				1.98	4.99	2.0	276.68	256.9	22.727	2035.6
545	04/13/05	1002	1266	1266	0.226		0.02	1.7	0.9	0.095	3.8				0.18	4.99	0.4	30.18	16.0	1.686	67.5
545	04/20/05		0	0											0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	04/27/05	1019	3346	3346	1.144		0.56	0.5	2.6	0.202	19.8	9.3			0.47	4.99	26.3	23.46	122.0	9.477	929.0
545	05/04/05		14095	14095	2.73										1.98	4.99	0.0	0.00	0.0	0.000	0.0
545	05/11/05	1032	562	562	0.114		0.3	2.4	1.5	0.204	334				0.08	4.99	2.4	18.91	11.8	1.608	2632.1
545	05/18/05		0	0											0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	05/25/05	1039	662	662	0.16						323.9				0.09	4.99	0.0	0.00	0.0	0.000	3006.6
545	06/01/05	1042	1813	1813	0.669		0.4	0.7	1.6	0.383					0.25	4.99	10.2	17.80	40.7	9.737	0.0
545	06/08/05		0	0	2.145										0.00	4.99	0.0	0.00	0.0	0.000	0.0
545	06/15/05	1050	297	297	0.463						2326				0.04	4.99	0.0	0.00	0.0	0.000	9686.8
545	06/22/05	1054	250	250	0.084		1.6	0.8	2.3	0.921	758.2				0.04	4.99	5.6	2.80	8.1	3.229	2657.9
545	06/30/05	1057	4679	4679	0.351		0.84	0.3	1.9	0.258	406.3				0.66	4.99	55.1	19.68	124.7	16.927	26657.1

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project BMP=537
Water Quality Data BMP=537

537=bmp

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
537	01/04/96													537		5.758	0.0	0.00	0.0	0.000	0.0
537	01/11/96													537		5.758	0.0	0.00	0.0	0.000	0.0
537	01/18/96	4887	3495	2120	0.72	0.98	0.1	0.13	0.2	0.017	3	3	26	537	0.26	5.758	2.6	3.35	5.2	0.438	77.3
537	01/25/96	5112	4322	3552	0.08	1.07	0.1	0.005	0.2	0.030	9		5	537	0.43	5.758	4.3	0.22	8.6	1.295	388.5
537	02/01/96	5160	3424	856	5.42	1.24	1.6	0.03	0.5	0.01	0			537	0.10	5.758	16.6	0.31	5.2	0.104	0.0
537	02/08/96	5248				0.29	1.4	0.005	0.05	0.0025	0			537	0.00	5.758					
537	02/14/96	5252	3070	2493	0.02	0.64	0.4	0.005	0.4	0.019	2			537	0.30	5.758	12.1	0.15	12.1	0.576	60.6
537	02/22/96	5300	1638	1274	5.42	0.67	0.1	0.005	0.5	0.08	0.33	3	20	537	0.16	5.758	1.5	0.08	7.7	1.239	5.1
537	02/29/96	5321	2365	656	0.05	0.92	0.1	0.005	0.5	0.03	1		3	537	0.08	5.758	0.8	0.04	4.0	0.239	8.0
537	03/07/96	5343	3376	786	0.02	1.87	0.3	0.005	0.3	0.13	2			537	0.10	5.758	2.9	0.05	2.9	1.242	19.1
537	03/14/96	5364	877	453	4.9	0.71	0.1	2.02	0.2	0.312	1			537	0.06	5.758	0.6	11.12	1.1	1.717	5.5
537	03/21/96	5389	2097	561	0.06	0.85	0.2	0.005	0.4	0.074	3	3	627	537	0.07	5.758	1.4	0.03	2.7	0.504	20.5
537	04/04/96	5429	2514	750	0.07	0.98	0.6	0.02	0.7	0.031	1	3	7	537	0.09	5.758	5.5	0.18	6.4	0.283	9.1
537	04/11/96	5452	3692	1085	0.03	1.8	0.2	0.005	0.4	0.015	1	2	8	537	0.13	5.758	2.6	0.07	5.3	0.198	13.2
537	04/18/96	5482	61104	7820	0.34	2.79	0.4	0.005	0.6	0.0314	9	2	14	537	0.95	5.758	38.0	0.48	57.0	2.984	855.2
537	04/25/96	5534	10361	153	0.11	0.1	0.5	0.005	0.4	0.008	4	1	1	537	0.02	5.758	0.9	0.01	0.7	0.015	7.4
537	05/02/96	5609	17239	3152	0.11	2.05	0.3	0.005	0.4	0.059	5			537	0.38	5.758	11.5	0.19	15.3	2.260	191.5
537	05/09/96		4084	238	0.04	0.94								537	0.03	5.758	0.0	0.00	0.0	0.000	0.0
537	05/16/96		819	25	0.02									537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	05/23/96	5672	6035	696	0.02	1	0.3	0.005	0.7	0.0025	4			537	0.08	5.758	2.5	0.04	5.9	0.021	33.8
537	06/06/96	5725	4259	490	0.03	0.92	0.4	0.005	0.7	0.217	13			537	0.06	5.758	2.4	0.03	4.2	1.292	77.4
537	06/13/96	5746	3768	365	0.05	0.91	0.1	0.005	1.9	0.182	22			537	0.04	5.758	0.4	0.02	8.4	0.807	97.6
537	06/20/96	5767	1821	373	0.02	0.93	0.2	0.29	0.4	0.108	5			537	0.05	5.758	0.9	1.31	1.8	0.490	22.7
537	06/27/96	5775	1224	50	0.02	0.21	1.2	0.005	2.8	0.0025	7			537	0.01	5.758	0.7	0.00	1.7	0.002	4.3
537	07/03/96	5796	747	4	0.01	0.88	0.2	0.005	3.1	0.204	26	2	8000	537	0.00	5.758	0.0	0.00	0.2	0.010	1.3
537	07/11/96	5823	4333	643	0.02	0.99	0.2	1.23		0.217	22			537	0.08	5.758	1.6	9.61	0.0	1.696	171.9
537	07/18/96	5834	391	391	0.03	2.4	0.1	0.17	5.8	0.145	4			537	0.05	5.758	0.5	0.81	27.6	0.689	19.0
537	07/25/96		3178	110	0.07	0.95								537	0.01	5.758	0.0	0.00	0.0	0.000	0.0
537	08/01/96		179	84	0.02	0.99								537	0.01	5.758	0.0	0.00	0.0	0.000	0.0
537	08/08/96	5986	49	36	0.07	0.16	0.05	0.32	2.7	0.137	13			537	0.00	5.758	0.0	0.14	1.2	0.060	5.7
537	08/15/96	6041	83	82	0.08	0.62	0.53	1.1	1.5	0.04	15	21	3900	537	0.01	5.758	0.5	1.10	1.5	0.040	14.9
537	08/29/96		14	13	0.01	0.78								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	09/12/96	6122	1360	1360	0.49	1.77	4	8.5	4.6	0.0025	7			537	0.17	5.758	66.1	140.48	76.0	0.041	115.7
537	09/19/96	6148	4337	4337	0.42		0.01	0.34	1.3	0.676	6			537	0.53	5.758	0.5	17.92	68.5	35.627	316.2
537	09/26/96		40	40	0.03	0.65								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	10/03/96	6194	44	44	0.01		0.03	0.4	0.05	0.0025	5			537	0.01	5.758	0.0	0.21	0.0	0.001	2.7
537	10/10/96	6218									0.5			537		5.758					
537	10/24/96	6266	15718	15386	5.42	4.74	0.01	0.03	0.4	0.0025	7			537	1.87	5.758	1.9	5.61	74.8	0.467	1308.8
537	10/31/96	6310	3970	1075	0.12	0.56	0.01	0.02	0.8	0.022	3			537	0.13	5.758	0.1	0.26	10.5	0.287	39.2
537	11/07/96	6330	2790	78	0.01	0.12	0.3	0.005	0.8	0.0025	2	6	170	537	0.01	5.758	0.3	0.00	0.8	0.002	1.9
537	11/14/96	6352	2850	1459	5.42	0.9	0.1	0.1	1.1	0.023	3			537	0.18	5.758	1.8	1.77	19.5	0.408	53.2
537	11/21/96		765	90	0.01									537	0.01	5.758	0.0	0.00	0.0	0.000	0.0
537	11/27/96	6380	5657	5443	0.4	1.54	0.3		6.1	1.85	14			537	0.66	5.758	19.8	0.00	403.5	122.364	926.0
537	12/05/96	6404	6587	4228	0.62	1.6	0.6	0.36	0.8	0.0025	8			537	0.51	5.758	30.8	18.50	41.1	0.128	411.0
537	12/13/96	6427	16768	11108	0.35	3.09	0.43	0.95	2	0.025	5			537	1.35	5.758	58.0	128.23	270.0	3.375	674.9
537	12/19/96	6453	9711	3341	0.22	1.09	0.35	0.005	1.8	0.015	1			537	0.41	5.758	14.2	0.20	73.1	0.609	40.6
537	12/26/96	6455	14140	6684	0.25	1.3	0.4	0.03	1.7	0.014	4			537	0.81	5.758	32.5	2.44	138.1	1.137	324.9
537	01/02/97	6476	543	135	5.42	0.3	0.5	0.005	2.1	0.023	2			537	0.02	5.758	0.8	0.01	3.4	0.038	3.3
537	01/09/97	6499					0.55	0.005	0.6	0.002	4			537		5.758					
537	01/16/97	6524				0.9	0.6	0.01	0.3	0.014	0	1	148	537		5.758					
537	01/23/97	6546	7781	2093	0.29	0.9	1.1	0.03	1.5	0.128	20			537	0.25	5.758	28.0	0.76	38.2	3.256	508.7
537	01/30/97	6569				1.68	1.1	0.23	0.7	0.014	5			537		5.758					
537	02/06/97	6604	8587	4300	0.44	1.42	0.6	0.42	0.7	0.022	7			537	0.52	5.758	31.4	21.95	36.6	1.150	365.8
537	02/14/97	6623	4717	4717			0.6	0.005	0.4	0.017	10			537	0.57	5.758	34.4	0.29	22.9	0.974	573.2
537	02/18/97	6625	6111	1832	0.12	0.88	0.4	0.11	0.6	0.007	1			537	0.22	5.758	8.9	2.45	13.4	0.156	22.3
537	02/27/97	6649	2993	339	0.03	0.26	0.1	0.29	0.4	0.0025	1			537	0.04	5.758	0.4	1.19	1.6	0.010	4.1
537	03/06/97	6683	4024	925	0.03	0.63	0.6	1.82	0.5	0.008	1			537	0.11	5.758	6.7	20.46	5.6	0.090	11.2
537	03/13/97	6724	3923	833	0.17	0.58	0.4	0.33	0.4	0.0025	1			537	0.10	5.758	4.0	3.34	4.0	0.025	10.1
537	03/20/97	6726	7785	4955	0.35	1.7	0.2	0.005	0.5	0.012	0.5			537	0.60	5.758	12.0	0.30	30.1	0.723	30.1

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project BMP=537
Water Quality Data BMP=537

537=bmp

Export = (curft/wk)*(mq/L)*(28.317L/cuft)*(1q/10^3mq)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C.	station	depth	WTRSHED AREA	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
			(cf)	(cf)	(cfs)	(in)							FCU/100ml		(cm)	(ac)					
537	03/27/97	6768	3635	909	0.12	0.68	0.7	1.58	0.5	0.010	2			537	0.11	5.758	7.7	17.45	5.5	0.110	22.1
537	04/03/97	6792	1681	1681		0.21	1	1.77	1.1	0.0025	2			537	0.20	5.758	20.4	36.16	22.5	0.051	40.9
537	04/10/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	04/17/97	6837	5531	2212	0.1	0.99	0.1	0.04	0.7	0.280	2			537	0.27	5.758	2.7	1.08	18.8	7.526	53.8
537	04/24/97	6842	5329	2317	0.08	0.8	0.4	0.09	0.6	0.011	3			537	0.28	5.758	11.3	2.53	16.9	0.310	84.5
537	05/01/97	6878	4637	1885	0.12	0.91	0.2	0.28	0.6	0.016	6			537	0.23	5.758	4.6	6.41	13.7	0.366	137.4
537	05/08/97	6895	3074	903	0.16	0.76	0.2	0.03	0.9	0.02	11			537	0.11	5.758	2.2	0.33	9.9	0.219	120.7
537	05/15/97					0.37								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	05/22/97	6932	608.99	472	0.01	0.85	0.2	0.34	0.6	0.063	25			537	0.06	5.758	1.1	1.95	3.4	0.361	143.4
537	05/28/97	6950	799.9	666	0.03	0.78	0.1	0.77	1.0	0.011	7			537	0.08	5.758	0.8	6.23	8.1	0.089	56.7
537	06/05/97					0.48								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	06/12/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	06/19/97					0.47								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	06/26/97					0.24								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	07/03/97	7206	988	988	0.47	1.01	1.12	1.12	5.1	0.305	8.9			537	0.12	5.758	13.4	13.45	61.2	3.662	106.9
537	07/10/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	07/17/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	07/24/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	07/31/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	08/07/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	08/14/97													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	08/21/97	7352	147.15	147.15	0.02	2.46	1.0	5.38	3.2	0.0025	6.3	6.3	1900	537	0.02	5.758	1.8	9.62	5.7	0.004	11.3
537	08/28/97	7357	269.68	269.68	0.05	0.29	0.02	0.05	1.7	0.09	0.9			537	0.03	5.758	0.1	0.16	5.6	0.295	2.9
537	09/03/97					0.05								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	09/10/97					0.03								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	09/17/97					0.27								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	09/24/97					0.12								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	10/01/97					0.54								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	10/08/97					0.04								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	10/15/97					0								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	10/22/97					0.01								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	10/29/97		167.6	167.6	0.06	1.75								537	0.02	5.758	0.0	0.00	0.0	0.000	0.0
537	11/05/97	7406	3446.29	3446.29	0.37	2.31	0.1	0.005	1.5	0.083	2.5			537	0.42	5.758	4.2	0.21	62.8	3.476	104.7
537	11/12/97	7429	318.76	318.76	0.3	0.82	3.7	0.69	8.3	1.485	12.8			537	0.03	7.319	11.3	2.10	25.3	4.525	39.0
537	11/19/97	7435	1252.26	1252.26	0.08	0.69	0.2	0.005	1.4	0.254	5.2			537	0.12	7.319	2.4	0.06	16.8	3.041	62.3
537	11/26/97	7440	643.95	643.95	0.07	0.77	0.1	0.005	1	0.117	1			537	0.06	7.319	0.6	0.03	6.2	0.720	6.2
537	12/03/97					0.41								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	12/11/97					0.23								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	12/18/97					0.53								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	12/23/97	7477	1148.49	1148.49	0.17	0.88	0.01	0.81	0.8	0.099	6.1	5.2	2600	537	0.11	7.319	0.1	8.89	8.8	1.087	67.0
537	01/08/98	7487	20869	20091.24	5.42	2.76	0.2	0.56	2.3	0.256	0.4	1.9	500	537	1.92	7.319	38.4	107.56	441.8	49.171	76.8
537	01/15/98	7514	8226.8	5562.45	5.42	0.91	0.1	0.06	1.3	0.09	6.6			537	0.53	7.319	5.3	3.19	69.1	4.786	351.0
537	01/22/98	7522	118905.29	4538.72	5.42	0.96	0.4	0.005	1	0.038	1	2.7	24	537	0.43	7.319	17.4	0.22	43.4	1.649	43.4
537	01/29/98	7529	74281.57	62409.52	5.42	4.01	0.1	0.02	0.7	0.01	0.4			537	5.98	7.319	59.7	11.93	417.6	5.966	238.7
537	02/05/98	7537	64784.57	3126.73	5.42	0.69	0.2	0.005	0.7	0.01	1.4	2.47	224	537	0.30	7.319	6.0	0.15	20.9	0.299	41.8
537	02/12/98	7563	251845.82	40975.38	5.42	1.45	0.3	0.005	0.4	0.022	0.8	0	1	537	3.92	7.319	117.5	1.96	156.7	8.618	313.4
537	02/19/98	7570	552325.19	30367.64	5.42	2.05	0.7	0.38	2.7	0.074	2.4			537	2.91	7.319	203.2	110.32	783.9	21.484	696.8
537	02/26/98	7578	12254	6763.74	0.79	0.89	3.8	1.81	5	0.0025	7.6			537	0.65	7.319	245.7	117.04	323.3	0.162	491.4
537	03/05/98	7590	6722.2	3564.02	0.27	0.51	0.1	0.005	0.9	0.017	10.4			537	0.34	7.319	3.4	0.17	30.7	0.579	354.4
537	03/12/98	7598	49941	18687.37	5.42	3.66	0.2	0.005	1	0.091	16			537	1.79	7.319	35.7	0.89	178.7	16.257	2858.4
537	03/19/98	7625	17585.25	369.23	5.42	1.55	0.2	0.005	0.4	0.0025	3.2	1.7	17	537	0.04	7.319	0.7	0.02	1.4	0.009	11.3
537	03/26/98	7636	13781	6836.71	0.22	1.42	0.1	0.005	0.4	0.038				537	0.65	7.319	6.5	0.33	26.1	2.484	0.0
537	04/02/98	7646	18081	13853.97	1.2	2.65	0.1	0.03	1.1	0.087	4.6			537	1.33	7.319	13.2	3.97	145.7	11.523	609.2
537	04/09/98		5131.7	5131.7		0.05								537	0.49	7.319	0.0	0.00	0.0	0.000	0.0
537	04/16/98		9320.57	5497.51	0.34	1.39								537	0.53	7.319	0.0	0.00	0.0	0.000	0.0
537	04/23/98	7672	16331	10944.23	1.67	2.68	0.1	0.005	1	0.069	7.6			537	1.05	7.319	10.5	0.52	104.6	7.219	795.2
537	04/30/98	7685	5170.86	2598.57	0.09	0.96	0.1	0.005	0.5	0.01	1.6			537	0.25	7.319	2.5	0.12	12.4	0.248	39.7
537	05/07/98	7698	8279.74	4945.93	0.24	1.98	0.1	0.005	1	0.02	7.6			537	0.47	7.319	4.7	0.24	47.3	0.946	359.4
537	05/14/98	7717	17365	13011.94	0.45	3.14	0.1	0.005	1	0.067	3.2			537	1.25	7.319	12.4	0.62	124.4	8.334	398.1

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project BMP=537
Water Quality Data BMP=537

537=bmp

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
537	05/20/98	7725	4038.18	132.55	0.16	0.04	0.2	0.08	1.1	0.026	1.3			537	0.01	7.319	0.3	0.10	1.4	0.033	1.6
537	05/28/98	7738	1919.34	472.63	0.04	0.32	0.1	1.37	2.7	0.093	4.4			537	0.05	7.319	0.5	6.19	12.2	0.420	19.9
537	06/04/98	7757	3275.23	2946.29	3.21	1.81	0.1	0.02	2	0.068	7.6			537	0.28	7.319	2.8	0.56	56.3	1.915	214.1
537	06/11/98					0.01								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	06/18/98	7778	19472	19451.97	2.2	5.62	0.1	0.02	1.1	0.123	1.6			537	1.86	7.319	18.6	3.72	204.6	22.873	297.5
537	06/25/98		691.82	691.82		0.07								537	0.07	7.319	0.0	0.00	0.0	0.000	0.0
537	07/02/98													537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	07/09/98					0.06								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	07/16/98													537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	07/23/98					0.06								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	07/30/98					0.59								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	08/06/98		0.01	0.01		0.42								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	08/13/98					0.11								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	08/20/98					1.43								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	08/27/98					1.01								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	09/03/98		0.02	0.02		0.07								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	09/09/98					1.22								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	09/16/98					0.03								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	09/23/98		2.6	2.6		1.18								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	09/30/98					0.53								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	10/07/98					0.2								537	0.00	7.319	0.0	0.00	0.0	0.000	0.0
537	10/14/98	7952	160.52	160.52	0.02	1.7								537	0.02	5.758	0.0	0.00	0.0	0.000	0.0
537	10/21/98	7972	15.99	15.99		0.51					1507			537	0.00	5.758	0.0	0.00	0.0	0.000	292.8
537	10/28/98													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	11/04/98		0.21	0.21		0.6								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	11/12/98	8001	0.07	0.07	0.01	0.49	0.1	2.1	6.5	0.0025	5			537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	11/18/98		32.37	32.37		0.81								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	11/25/98		0.02	0.02		0.17								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	12/02/98		70.9	70.9	0.01	0.56								537	0.01	5.758	0.0	0.00	0.0	0.000	0.0
537	12/09/98		0.1	0.1		0.16								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	12/16/98					0.01								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	12/23/98		0.16	0.16		0.24								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	12/29/98					0.2								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	01/06/99	8103	3427.9	3427.9	0.88	2.37	0.1	0.87	1.8	0.0025	20.2			537	0.42	5.758	4.2	36.24	75.0	0.104	841.4
537	01/13/99		2945.6	2945.6	5.42	1.07								537	0.36	5.758	0.0	0.00	0.0	0.000	0.0
537	01/21/99	8145	19210	19210	5.42	1.96	0.1		0.7	0.049				537	2.34	5.758	23.3	0.00	163.4	11.438	0.0
537	01/26/99	8148	3813.3	3813.3	0.26	1.63	1.1	0.2	0.3	0.016	2			537	0.46	5.758	51.0	9.27	13.9	0.741	92.7
537	02/04/99	8161	6814.8	6814.8	0.68	2.4	0.6	0.28	0.2	0.01	3.6			537	0.83	5.758	49.7	23.19	16.6	0.828	298.1
537	02/09/99					0.38								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	02/16/99					0.07								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	02/26/99	8191	1399.22	1399.22	5.42	0.8	0.1	0.02	0.3	0.02	0.4			537	0.17	5.758	1.7	0.34	5.1	0.340	6.8
537	03/02/99													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	03/09/99													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	03/16/99													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	03/23/99													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	03/30/99		1.13	1.13		0.09								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	04/06/99													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	04/15/99		1.12	1.12		0.18								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	04/20/99		0.82	0.82		0.25								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	04/27/99		0.56	0.56		0.39								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	05/04/99		0.87	0.87		0.11								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	05/11/99		1.02	1.02		0.16								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	05/18/99		1.15	1.15		0.01								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	05/25/99					2.01								537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	06/01/99													537	0.00	5.758	0.0	0.00	0.0	0.000	0.0
537	06/08/99													537		0					
537	06/15/99		0.03	0.03		0.03								537		0					
537	06/22/99					0.02								537		0					
537	06/29/99													537		0					

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project BMP=537
Water Quality Data BMP=537

537=bmp

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C. FCU/100ml	station	depth (cm)	WTRSHED AREA (ac)	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
537	07/06/99		0.04	0.04	0.02	0.07								537		0					
537	07/13/99		0.19	0.19		0.13								537		0					
537	07/20/99		0.68	0.68		0.13								537		0					
537	07/27/99		18.92	18.92	0.04	0.85								537		0					
537	08/03/99													537		0					
537	08/10/99		0.02	0.02		0.01								537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	08/17/99		1.53	1.53		0.61								537	0.01	0.1142	0.0	0.00	0.0	0.000	0.0
537	08/24/99		0.29	0.29		0.26								537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	08/31/99	8368	6.03	6.03	0.01	0.69								537	0.04	0.1142	0.0	0.00	0.0	0.000	0.0
537	09/07/99		0.18	0.18		0.1								537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	09/14/99	8383	121.22	121.22	0.05	2.02	0.1	0.1	2.6	0.924	335.5			537	0.74	0.1142	7.4	7.43	193.1	68.627	24918.1
537	09/21/99	8401	72.11	72.11	0.04	1.84	0.1	1.28	2.1	0.566	241.7			537	0.44	0.1142	4.4	56.55	92.8	25.007	10678.7
537	09/28/99		0.04	0.04		0.03								537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	10/05/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	10/12/99		2.6	2.6		0.44								537	0.02	0.1142	0.0	0.00	0.0	0.000	0.0
537	10/19/99		419.37	419.37	0.06	0.84								537	2.57	0.1142	0.0	0.00	0.0	0.000	0.0
537	10/26/99		1638.07	1638.07	0.15	0.82								537	10.05	0.1142	0.0	0.00	0.0	0.000	0.0
537	11/02/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	11/09/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	11/16/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	11/23/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	11/30/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	12/07/99											2.5	5000	537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	12/14/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	12/21/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	12/28/99													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	01/04/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	01/11/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	01/18/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	01/25/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	02/01/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	02/08/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	02/15/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	02/22/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	02/29/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	03/07/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	03/14/00													537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	03/21/00	8669	167	167	0.08		0.1	0.21	2.8	1.01				537	1.02	0.1142	10.2	21.49	286.5	103.344	0.0
537	03/28/00	8675	19	19	0.01		0.1	0.05	14	6.962				537	0.02	0.5486	0.2	0.12	33.9	16.871	0.0
537	04/04/00													537	0.00	0.5486	0.0	0.00	0.0	0.000	0.0
537	04/11/00	8693	300.3	300.3	0.04	0.99	0.1	0.29	4.7	1.175	310			537	0.38	0.5486	3.8	11.11	180.0	45.004	11873.4
537	04/18/00	8698	34.6	34.6		0.92	0.2	0.11	3.5	1.07	341			537	0.21	0.1142	4.2	2.33	74.2	22.683	7229.0
537	04/25/00	8704	2143	2143	0.23	2.48	0.1	0.21	0.1	0.451	156.2			537	13.15	0.1142	131.3	275.73	131.3	592.170	205093.1
537	05/02/00		1.06	1.06	0.04	0.23								537	0.01	0.1142	0.0	0.00	0.0	0.000	0.0
537	05/09/00		0.07	0.07		0.04								537	0.00	0.1142	0.0	0.00	0.0	0.000	0.0
537	05/16/00	8733	97.88	97.88	0.1	1.13	1	0.24	2.7	1.423	627.7			537	0.60	0.1142	60.0	14.39	161.9	85.339	37643.8
537	05/23/00	8747	175.06	175.06	0.01	1.43	0.8	0.005	4.9	0.897				537	1.07	0.1142	85.8	0.54	525.6	96.212	0.0
537	05/30/00	8762	110.52	110.52	0.02	0.86	0.3	0.005	1.4	0.892	239.6			537	0.68	0.1142	20.3	0.34	94.8	60.402	16224.7
537	06/06/00	8771	14.97	14.97	0.01	1.01						10.4	12178	537	0.09	0.1142	0.0	0.00	0.0	0.000	0.0
537	06/13/00	8777	2913.93	2913.93	1.6	2.43			0.8	0.216	78.6			537	0.30	6.855	0.0	0.00	23.8	6.425	2337.8
537	06/20/00		0.05	0.05		0.28								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	06/27/00	8805												537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	07/04/00													537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	07/11/00	8817	210	210	0.14	1.22	0.5	0.65	8	4.833	1682.4			537	0.02	6.855	1.1	1.39	17.1	10.360	3606.2
537	07/18/00		3.7	3.7		0.43								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	07/25/00		8	8	0.02	0.54								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	08/01/00	8859	182.14	182.14	0.01	2.89	0.9	0.14	0.6	1.669	736			537	0.02	6.855	1.7	0.26	1.1	3.103	1368.3
537	08/08/00	8871	1318.14	1318.14	0.84	2.87	0.1	0.08	1.1	0.632	133.8			537	0.13	6.855	1.3	1.08	14.8	8.503	1800.2
537	08/15/00		0.01	0.01		0.48								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project BMP=537
Water Quality Data BMP=537

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Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
537	08/22/00		0.05	0.05		0.06								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	09/01/00		1	1		0.53								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	09/08/00	8894	51.23	51.23	0.03	1.26	0.6	0.46	7.7	2.256	662.8			537	0.01	6.855	0.3	0.24	4.0	1.180	346.6
537	09/15/00	8897				2.42								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	09/22/00		90.1	90.1	0.01	1.04								537	0.01	6.855	0.0	0.00	0.0	0.000	0.0
537	09/29/00		0.16	0.16		0.25								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	10/06/00		1	1	0.02	0.06								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	10/13/00					0.01								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	10/20/00		0.05	0.05	0.02	0.18								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	10/27/00													537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	11/03/00		2.34	2.34		0.03								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	11/10/00	8963	346	346	0.08	1.23	5.4	17.16	32.7	22.438	49		8713	537	0.04	6.855	19.1	60.60	115.5	79.244	173.1
537	11/17/00	8994	313	313	0.08	1.11	2.7	3.95	6.2	18.374	21.9			537	0.03	6.855	8.6	12.62	19.8	58.702	70.0
537	11/24/00													537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	12/01/00	9003	1366.97	1366.97	0.21	1.69	3.5	12.55	22.4	18.824	23.8			537	0.14	6.855	48.8	175.11	312.5	262.650	332.1
537	12/08/00													537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	12/15/00		801	801	0.15	0.59								537	0.08	6.855	0.0	0.00	0.0	0.000	0.0
537	12/22/00	9019	1510.61	1510.61	0.04	2.01	9.5	5.11	12.5	2.534	44.1			537	0.15	6.855	146.5	78.79	192.7	39.072	680.0
537	12/29/00		0.04	0.04		0.01								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	1/5/2001					0.29								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	01/12/01					0.68								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	01/19/01	9053	1,603.00	1,603.00		0.81	1.3	0.97	11.5	1.618	9.4			537	0.16	6.855	21.3	15.87	188.2	26.474	153.8
537	01/26/01	9146	1,056.50	1,056.50		0.75	0.6	1.1	2.9	0.47	16.4			537	0.11	6.855	6.5	11.86	31.3	5.068	176.9
537	02/02/01		2,687.30	2,687.30		0.81								537	0.27	6.855	0.0	0.00	0.0	0.000	0.0
537	02/09/01					-								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	02/14/01	9167	695.8	695.8		0.12	0.3	1.79	4.2	0.948	62.7			537	0.07	6.855	2.1	12.71	29.8	6.733	445.3
537	02/21/01		73	73		0.5								537	0.01	6.855	0.0	0.00	0.0	0.000	0.0
537	02/28/01	9184	103	103		0.86	33.7	1.49	10.4	1.731	105.2			537	0.01	6.855	35.4	1.57	10.9	1.820	110.6
537	03/07/01		70.1	70.1		0.32								537	0.01	6.855	0.0	0.00	0.0	0.000	0.0
537	03/14/01	9199	6,272.10	6,272.10		3.11	0.1	0.7	2.4	0.352	48.6			537	0.64	6.855	6.4	44.81	153.6	22.535	3111.4
537	03/21/01		0.4	0.4		0.18								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	03/28/01	9217	10,005.00	10,005.00		1.89	0.1	0.44	3.3	0.872	254.4			537	1.02	6.855	10.2	44.93	337.0	89.051	25980.1
537	04/04/01	9238	8,472.60	8,472.60		2.99	0.1	0.18	3	2.705	404.4			537	0.87	6.855	8.6	15.57	259.4	233.932	34973.1
537	04/11/01	9248	633.9	633.9		1.08	0.1	0.42	5.4	1.392	537			537	0.06	6.855	0.6	2.72	34.9	9.007	3474.6
537	04/18/01		28.3	28.3		0.43								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	04/25/01					0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	05/02/01					0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	05/09/01		0.2	0.2		0.01								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	05/16/01		0.3	0.3		0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	05/23/01	9273	132.3	132.3		0.98	7.2	1.62		1.462	43.6			537	0.01	6.855	9.7	2.19	0.0	1.974	58.9
537	05/30/01		3,960.40	3,960.40		2.39								537	0.40	6.855	0.0	0.00	0.0	0.000	0.0
537	06/06/01	9280	1,033.50	1,033.50		1.26	0.1	1.2	6.8	2.089	1,003			537	0.11	6.855	1.1	12.66	71.7	22.037	10580.8
537	06/13/01	9288	540.6	540.6		0.68	0.1	1.89	19.2	9.079				537	0.06	6.855	0.6	10.43	105.9	50.098	0.0
537	06/20/01		7,253.40	7,253.40		4.46								537	0.74	6.855	0.0	0.00	0.0	0.000	0.0
537	06/27/01		0	0		0.09								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	07/04/01	9298	24	24		0.4	11.1	2.09	10.8	2.924				537	0.00	6.855	2.7	0.51	2.6	0.716	0.0
537	07/11/01	9311	1,115.40	1,115.40		1.24	4.6	0.54	10.7	5.025	2,013			537	0.11	6.855	52.4	6.15	121.8	57.210	22918.2
537	07/18/01		0.1	0.1		0.04								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	07/25/01		0	0		0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	08/01/01	9323	1,836.20	1,836.20		0.1	6.2	1.4	12.4	4.802				537	0.19	6.855	116.2	26.24	232.4	90.001	0.0
537	08/08/01		0.4	0.4		0.08								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	08/15/01					2.66								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	08/22/01					2.01								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	08/29/01		0.1	0.1		0.29								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	09/04/01		0	0		0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	09/11/01					0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	09/18/01		0.2	0.2		0.26								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	09/25/01	9375	1206.6	1206.6		2.75	2.3	3.38	12.1	3.415	575			537	0.12	6.855	28.3	41.63	149.0	42.059	7081.7
537	10/02/01	9378				3.55	0.6	1.48	1.3	0.319	9.5			537	0.00	6.855	0.0	0.00	0.0	0.000	0.0

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Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total (cf)	Storm (cf)	Qp (cfs)	Precip. (in)	concentration (mg/l) NO3	NH3	TKN	TP	TSS	BOD	F.C. FCU/100ml	station	depth (cm)	WTRSHED AREA (ac)	export (g/ha/wk) NO3	NH3	TKN	TP	TSS
537	10/09/01		2,006.20	2,006.20		0.04								537	0.21	6.855	0.0	0.00	0.0	0.000	0.0
537	10/16/01		0	0		0.14								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	10/23/01		3.65	3.65		0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	10/30/01		0	0		0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	11/06/01		0	0		0.16								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	11/13/01		0	0		0								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	11/20/01		0	0		0.03								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	11/27/01		0	0		0.18								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	12/04/01		0.18	0.18		0.06								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	12/11/01		9.3	9.3		0.33								537	0.00	6.855	0.0	0.00	0.0	0.000	0.0
537	12/18/01	9430	130.5	130.5		0.65	0.3	0.06	0.7	0.278	5			537	0.01	6.855	0.4	0.08	0.9	0.370	6.7
537	12/26/01	9434	548.9	548.9		0.18	0.5	0.1	1.2	0.419	54.4			537	0.06	6.855	2.8	0.56	6.7	2.348	304.8
537	01/02/02		0	0		0								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	01/25/02	9440	5200	5200		1.02	0.9	0.15	1	0.42	69.4			537	0.88	4.12	79.5	13.25	88.3	37.091	6128.9
537	02/01/02		0	0		0.18								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	02/08/02		2.4	2.4		0.04								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	02/15/02	9478	70.4	70.4		0.32	0.4	0.04	0.8	0.306	21.3			537	0.01	4.12	0.5	0.05	1.0	0.366	25.5
537	02/22/02	9483	57.6	57.6		0.22	0.9	0.23	1	0.309				537	0.01	4.12	0.9	0.22	1.0	0.302	0.0
537	03/01/02		0.2	0.2		0.26								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	03/08/02	9500	2,238	2,238		0.37	0.9	1	0.7	0.19	3			537	0.38	4.12	34.2	38.01	26.6	7.222	114.0
537	03/15/02	9512	281.3	281.3		0.53	0.5	1.56	1.3	0.488	184.5			537	0.05	4.12	2.4	7.45	6.2	2.331	881.4
537	03/22/02	9520	2,154.50	2,154.50		0.96	0.1	0.32	0.7	0.188	4.1			537	0.37	4.12	3.7	11.71	25.6	6.879	150.0
537	03/29/02	9525	961	961		0.79	0.1	0.005	0.5	0.156	5.7			537	0.16	4.12	1.6	0.08	8.2	2.546	93.0
537	04/05/02	9535	2,464.60	2,464.60		1.03	0.6	0.29	6	0.811	17.7			537	0.42	4.12	25.1	12.14	251.1	33.946	740.9
537	04/12/02		461.6	461.6		0.68								537	0.08	4.12	0.0	0.00	0.0	0.000	0.0
537	04/19/02		19.4	19.4		0.31								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	04/26/02	9550	484.6	484.6		0.65	0.1	0.65	9.4	1.31	26			537	0.08	4.12	0.8	5.35	77.4	10.781	214.0
537	05/03/02	9562	1,955.00	1,955.00		1.61	0.2	0.14	0.9	0.206	5.7			537	0.33	4.12	6.6	4.65	29.9	6.840	189.3
537	05/10/02		0.6	0.6		0.03								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	05/17/02	9587	5,256.60	5,256.60		2.19	0.4	0.03	2.8	0.445	22.1			537	0.89	4.12	35.7	2.68	250.0	39.727	1972.9
537	05/24/02	9595	4,305.70	4,305.70		1.74	1.2	0.17	1.3	0.199	6.3			537	0.73	4.12	87.7	12.43	95.1	14.552	460.7
537	05/30/02					0.01								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	06/06/02					0.39								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	06/13/02	9626	3782.4	3782.4		1.03	0.4	0.14	2	0.43	6.5			537	0.64	4.12	25.7	8.99	128.5	27.622	417.5
537	06/20/02	9633	396.26	396.26		0.65	0.4	0.16	2.7	0.73	2			537	0.07	4.12	2.7	1.08	18.2	4.913	13.5
537	06/27/02		6.38	6.38		0.05								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/04/02		0	18		0.27								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/11/02		14.56	14.56		0.07								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/18/02		117.74	117.74		0.35								537	0.02	4.12	0.0	0.00	0.0	0.000	0.0
537	07/25/02		83.31	83.31		0.92								537	0.01	4.12	0.0	0.00	0.0	0.000	0.0
537	08/01/02	9668	73.85	73.85		0.42								537	0.01	4.12	0.0	0.00	0.0	0.000	0.0
537	08/08/02		0.75	0.75		0.08								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	08/15/02		0	0		0								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	08/22/02		0	0		0.15								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	08/30/02	9683	7543.5	7543.5		3.22	0.8	0.24	1.7	0.472	3.8			537	1.28	4.12	102.5	30.75	217.8	60.469	486.8
537	09/05/02	9690	7327.17	7327.17		1.95	0.5	0.03	1.3	0.321	4.5			537	1.25	4.12	62.2	3.73	161.8	39.945	560.0
537	09/12/02		0	0		0								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	09/19/02	9697	3798.19	3798.19		1.76	0.8	0.02	1.7	0.698	23.7			537	0.65	4.12	51.6	1.29	109.7	45.025	1528.8
537	09/26/02	9707	19.48	19.48		0.31	0.1	0.05	1.4	0.571	19.5			537	0.00	4.12	0.0	0.02	0.5	0.189	6.5
537	10/02/02	9738	101.8	101.8		0.35	0.1	0.04	1.1	0.451	5.3			537	0.02	4.12	0.2	0.07	1.9	0.780	9.2
537	10/10/02		0	0		0.04								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	10/17/02	9748	268.96	268.96		1	0.3	0.02	1.1	0.401	6.4			537	0.05	4.12	1.4	0.09	5.0	1.832	29.2
537	10/24/02					0								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	10/31/02	9762	3396.95	3396.95		1.04	0.1	0.02	1.1	0.424	14.3			537	0.58	4.12	5.8	1.15	63.5	24.461	825.0
537	11/07/02	9770	1194.27	1194.27		1.14	0.1	0.01	0.8	0.366	5.4			537	0.20	4.12	2.0	0.20	16.2	7.423	109.5
537	11/14/02	9776	1493.7	1493.7		1.62	0.1	0.03	1	0.311	1			537	0.25	4.12	2.5	0.76	25.4	7.889	25.4
537	11/21/02	9786	3704	3704		2.32	0.1	0.005	0.6	0.224	2.3			537	0.63	4.12	6.3	0.31	37.7	14.091	144.7
537	12/05/02	9803	550	550		0.5	0.1	0.01	0.6	0.703	1.8			537	0.09	4.12	0.9	0.09	5.6	6.567	16.8
537	12/12/02	9810	1735.49	1735.49		0.39	0.01	0.02	0.7	0.246	5.5			537	0.30	4.12	0.3	0.59	20.6	7.251	162.1

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project BMP=537
Water Quality Data BMP=537

537=bmp

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
537	12/19/02	9833	2056.14	2056.14		1.1	0.1	0.005	1	0.161	1.8			537	0.35	4.12	3.5	0.17	34.9	5.622	62.9
537	12/26/02		6761.5	6761.5		1.93								537	1.15	4.12					0.0
537	01/02/03	9868	1387	1387		0.45	0.2	0.005	0.6	0.065	7.2			537	0.24	4.12	4.7	0.12	14.1	1.531	169.6
537	01/10/03	9908	748.2	748.2		0.27	0.1	0.005	0.7	0.088	0.7			537	0.13	4.12	1.3	0.06	8.9	1.118	8.9
537	01/17/03		0	0											0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	01/24/03		0	0											0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	01/31/03		0	0											0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	02/04/03	9927											<20	537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	02/07/03	9934	86.1	86.1		0.25	0.9	0.11	2.2	0.254	3.2			537	0.01	4.12	1.3	0.16	3.2	0.371	4.7
537	02/14/03		0	0		0.12								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	02/28/03	9957	14435	14435		2	0.2	0.005	1	0.122	24			537	2.46	4.12	49.0	1.23	245.2	29.908	5883.6
537	03/07/03	9971	1327.6	1327.6		1.74	0.1	0.005	1.1	0.152	16.4			537	0.23	4.12	2.3	0.11	24.8	3.427	369.8
537	03/14/03	9	14971	14971		0.59	0.1	0.005	1.6	0.125	33.6			537	2.55	4.12	25.4	1.27	406.8	31.782	8542.9
537	03/20/03		9	9											0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	03/28/03	28	919	919		1.2	0.6	0.005	1.7	0.137	8.6			537	0.16	4.12	9.4	0.08	26.5	2.138	134.2
537	04/03/03	39	3371.9	3371.9		2.25	0.2	0.02	3.3	0.196	7.3			537	0.57	4.12	11.5	1.15	189.0	11.224	418.0
537	04/11/03	51	251.3	251.3		0.94	0.4	0.005	2.1	0.126	6.8			537	0.04	4.12	1.7	0.02	9.0	0.538	29.0
537	04/17/03	72	1264	1264		1.19	0.1	0.005	2.2	0.125	21.6			537	0.22	4.12	2.1	0.11	47.2	2.683	463.7
537	04/25/03	95	272.1	272.1		0.68	0.1	0.01	1.7	0.172	27.1			537	0.05	4.12	0.5	0.05	7.9	0.795	125.2
537	05/02/03													537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	05/09/03		0	0		0.3								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	05/16/03		0	0		0.07								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	05/23/03		3	3		0.25								537	0.00	4.12					
537	05/26/03	144										5.3	920	537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	05/30/03	178	7405	7405		2.2	1.8	0.005	3.1	0.36	27.4			537	1.26	4.12	226.4	0.63	389.9	45.274	3445.8
537	06/05/03	190	1932	1932		0.84	0.1	0.005	1.9	0.181	40.2			537	0.33	4.12	3.3	0.16	62.3	5.939	1319.0
537	06/12/03	207	178	178		0.12	0.5	0.02	3	0.252	67.3			537	0.03	4.12	1.5	0.06	9.1	0.762	203.4
537	06/19/03	228	2246	2246			0.8	0.11	1.2	0.258	10.4			537	0.38	4.12	30.5	4.20	45.8	9.841	396.7
537	06/26/03	242	235	235		0.64	1.3	0.07	1.9	0.306	45			537	0.04	4.12	5.2	0.28	7.6	1.221	179.6
537	07/03/03		0			0								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/10/03		2	2		0.38								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/17/03	262	1143	1143		1.14	4.8	0.23	3.2	1.322	24.7			537	0.19	4.12	93.2	4.46	62.1	25.662	479.5
537	07/24/03	275	1810	1810		2.36	0.922	0.108	1.8	0.487	25.2		8600	537	0.31	4.12	28.3	3.32	55.3	14.970	774.6
537	07/31/03	278	21	21		0.07	0.452	0.01	1.7	0.429	7.2			537	0.00	4.12	0.2	0.00	0.6	0.153	2.6
537	08/07/03	290	18	18		0.47	0.517	0.146	1.8	0.298				537	0.00	4.12	0.2	0.04	0.6	0.091	0.0
537	08/14/03	314	5109	5109		2.57	1.016	0.543	2.006	0.656	8.6			537	0.87	4.12	88.2	47.11	174.1	56.919	746.2
537	08/21/03		0	0		0.14								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	08/28/03					0.01								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	09/04/03	325	1063	1063		2.38	6.6	0.19	3.5	0.674	17.7	3	100	537	0.18	4.12	119.1	3.43	63.2	12.168	319.5
537	09/11/03		2	2		0.03								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	09/18/03	353	704	704		1.35	2.1	0.2	2.3	0.602	23.7			537	0.12	4.12	25.1	2.39	27.5	7.198	283.4
537	09/25/03	356	145	145		0.76	2.9	5.5	11	1.957	112.8			537	0.02	4.12	7.1	13.54	27.1	4.819	277.8
537	10/02/03		0	0		0.3								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	10/08/03		0	0		0.02								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	10/16/03	386	806	806		1.19	1.9	0.05	2.1	0.691	8.8			537	0.14	4.12	26.0	0.68	28.7	9.459	120.5
537	10/23/03	399	95	95		0.64	1	0.05	0.4	0.152	6.7			537	0.02	4.12	1.6	0.08	0.6	0.245	10.8
537	10/29/03	423	9528	9528		3.3	0.8	0.005	1.2	0.422	27			537	1.62	4.12	129.5	0.81	194.2	68.286	4369.0
537	11/06/03	429	85	85		0.49	0.7	0.02	0.4	0.146	10.5			537	0.01	4.12	1.0	0.03	0.6	0.211	15.2
537	11/13/03	444	88	88		0.62	0.6	0.16	1.6	0.672	97.2			537	0.01	4.12	0.9	0.24	2.4	1.004	145.3
537	11/20/03	477	51	51		0.39	0.3	0.14	1.2	0.39	14.7			537	0.01	4.12	0.3	0.12	1.0	0.338	12.7
537	11/26/03		0	0		0.14								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	12/04/03		1	1		0.08								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	12/11/03	490	41	41		0.77	0.7	0.04	0.1	0.091	6.8	3	57	537	0.01	4.12	0.5	0.03	0.1	0.063	4.7
537	12/18/03	497	676	676		0.68	0.2	0.005	1.1	0.324	10.3			537	0.12	4.12	2.3	0.06	12.6	3.720	118.2
537	12/31/03	514	258	258		0.7	0.4	0.005	1	0.578	72.4			537	0.04	4.12	1.8	0.02	4.4	2.533	317.2
537	01/08/04	521	165	165		0.87	1	0.11	2.7	0.377	290.9			537	0.03	4.12	2.8	0.31	7.6	1.056	815.2
537	01/15/04		1	1		0.21								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	01/22/04		0	0		0.52								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	01/29/04		0	0		0.4								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0

Jordan Cove Urban Watershed Section 319 National Monitoring Program Project BMP=537
Water Quality Data BMP=537

537=bmp

Export = (curft/wk)*(mg/L)*(28.317L/cuft)*(1g/10^3mg)* (1/ac*.4047 ha/ac)

Station	Date	Lab No.	Total	Storm	Qp	Precip.	concentration (mg/l)						F.C.	station	depth	WTRSHED AREA	export (g/ha/wk)				
			(cf)	(cf)	(cfs)	(in)	NO3	NH3	TKN	TP	TSS	BOD	FCU/100ml		(cm)	(ac)	NO3	NH3	TKN	TP	TSS
537	02/05/04	544	3424	3424		0.72	0.4	0.1	1.1	0.326	4.7			537	0.58	4.12	23.3	5.82	64.0	18.957	273.3
537	02/12/04	546				2.08	0.1	0.06	0.7	0.156	5.2			537		4.12					
537	02/19/04		0	0		0.04								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	02/26/04		1	1		0.02								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	03/04/04		0	0		0.11								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	03/11/04	557	227	227		0.85	0.8	0.06	0.9	0.162	5.6			537	0.04	4.12	3.1	0.23	3.5	0.625	21.6
537	03/18/04		0	0		0.48								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	03/25/04	560	734	734		0.79	0.7	0.06	0.4	0.078	7.5			537	0.12	4.12	8.7	0.75	5.0	0.972	93.5
537	04/01/04	581	6269	6269		2.63	0.2	0.1	0.7	0.147	85.3			537	1.07	4.12	21.3	10.65	74.5	15.651	9081.6
537	04/08/04	588	4021	4021		1.05	0.2	0.005	0.5	0.108	0			537	0.68	4.12	13.7	0.34	34.1	7.375	0.0
537	04/15/04	596	5108	5108			0.01	0.1	1	0.238	23			537	0.87	4.12	0.9	8.67	86.7	20.646	1995.2
537	04/22/04		17	17		0.01								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	04/29/04	607	1952	1952		1.78	0.3	0.07	1	0.169	9.7			537	0.33	4.12	9.9	2.32	33.2	5.603	321.6
537	05/06/04	609	119	119		0.72	0.5	0.29	1.4	0.204	13.4			537	0.02	4.12	1.0	0.59	2.8	0.412	27.1
537	05/13/04		0	0		0.14								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	05/20/04		0	0		0.02								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	05/27/04		248	248		1.47								537	0.04	4.12	0.0	0.00	0.0	0.000	0.0
537	06/03/04	639	758	758		1.22	0.6	0.005	1.6	0.386	10.6			537	0.13	4.12	7.7	0.06	20.6	4.969	136.5
537	06/10/04		0	0		0.07								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	06/17/04		0	0		0.1								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	06/24/04		0	0		0.14								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/01/04		0	0		0.03								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/08/04	660	139	139		1.12	8.1	0.79	14.8	5.249	232.1			537	0.02	4.12	19.1	1.86	34.9	12.391	547.9
537	07/15/04					1.69								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/22/04		0	0		0.28								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	07/29/04		0	0		0.22								537	0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	08/05/04	684	2515	2515	0.79	2.1	2.36	0.12	2	0.557	16.2				0.43	4.12	100.8	5.13	85.4	23.791	691.9
537	08/12/04		0	0	0.01	0.17									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	08/19/04	721	772	772	0.19	1.73	2.2	0.08	2	0.454	15.2				0.13	4.12	28.8	1.05	26.2	5.952	199.3
537	08/26/04	738	738	738	0.16	1.05	0.9	0.05	2.6	0.692	26.7				0.13	4.12	11.3	0.63	32.6	8.673	334.6
537	09/02/04		1	1	0	0.34									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	09/09/04		596	596	0.22	1.54									0.10	4.12	0.0	0.00	0.0	0.000	0.0
537	09/16/04		3	3	0	0.32									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	09/23/04														0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	09/30/04	781	5900	5900	0.42	4.75	1.9	0.01	1.8	0.378	7.3				1.00	4.12	190.4	1.00	180.4	37.876	731.5
537	10/07/04		0	0	0	0.01									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	10/14/04		0	0	0	0									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	10/21/04		41	41	0	2.64									0.01	4.12	0.0	0.00	0.0	0.000	0.0
537	10/28/04		0	0	0	0.01									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	11/04/04		0	0	0.01	0.02									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	11/11/04	836	138	138	0.11	1.5	0.6	0.09	2.8	0.587	10.9				0.02	4.12	1.4	0.21	6.6	1.376	25.5
537	11/18/04	842	731	731	0.04	1.41	0.6	0.005	1.5	0.254	1.5				0.12	4.12	7.4	0.06	18.6	3.153	18.6
537	11/25/04														0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	11/28/04	850										7.3	237								
537	12/01/04	855										2.8	30								
537	12/02/04	862	8684	8684	2.54	2.93	0.2	0.005	1.1	0.312	18.4				1.48	4.12	29.5	0.74	162.2	46.014	2713.7
537	12/09/04	896	179	179	0.03	0.75	0.3	0.005	1	0.264	8.5				0.03	4.12	0.9	0.02	3.0	0.803	25.8
537	12/16/04	902	1302	1302	0.32	1.21	0.1	0.005	0.9	0.246	0.8				0.22	4.12	2.2	0.11	19.9	5.440	17.7
537	12/23/04		0	0	0.02	0.54									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	12/30/04	930	2567	2567	0.24	1.2	0.2	0.005	0.9	0.208	0.8				0.44	4.12	8.7	0.22	39.2	9.068	34.9
537	01/07/05		229	229	0.02	1.31									0.04	4.12	0.0	0.00	0.0	0.000	0.0
537	01/13/05	939	1053	1053	0.08	1.3			0.05	0.552	14.4				0.18	4.12	0.0	0.00	0.9	9.872	257.5
537	01/14/05	946										3.5									
537	01/19/05	949	876	876	0.07	0.66	0.1	0.005	0.05	1.09					0.15	4.12	1.5	0.07	0.7	16.216	0.0
537	01/26/05		261	261	0.02	1.37									0.04	4.12	0.0	0.00	0.0	0.000	0.0
537	02/02/05		8	8	0	0.09									0.00	4.12	0.0	0.00	0.0	0.000	0.0
537	02/09/05		258	258	0	0.67									0.04	4.12	0.0	0.00	0.0	0.000	0.0
537	02/10/05	957										2.5	0								
537	02/16/05	960	1587	1587	0.12	1.29	0.2	0.005	1.1	0.119	1.8				0.27	4.12	5.4	0.13	29.6	3.207	48.5

Jordan Cove Metals Data

Export = (cuft/mo)*(mg/L)*(28.317L/cuft)*(1mg/10^3ug)*(1/ac*.4047 ha/ac)

control =504, bmp=537, trad = 544 or 545

				concentration - ug/L -				mass export - mg/ha/mo -		
Date	Station	Flow	Precip.	Cu	Pb	Zn	WTSHD AREA (ac)	Cu	Pb	Zn
Feb-96	504	37292	2.72	5	13	48	13.61	959	2492	9203
Mar-96	504	21399	2.85	9	15	33	13.61	990	1650	3630
Apr-96	504	35629	7.73	2	5	13	13.61	366	916	2381
May-96	504	24801	2.95	2	4	37	13.61	255	510	4718
Jun-96	504	12699	2.68	21	13	94	13.61	1371	849	6137
Jul-96	504	46828	5.18	15	10	60	13.61	3611	2407	14445
Aug-96	504	19258	1.73	28	8	66	13.61	2772	792	6534
Sep-96	504	39512	5.7	5	3	15	13.61	1016	609	3047
Oct-96	504	43890	7.28	7	5	248	13.61	1579	1128	55959
Nov-96	504	9789	2.69	32	45	245	13.61	1610	2265	12330
Dec-96	504	70722	7.64	14	9	44	13.61	5090	3272	15998
Jan-97	504	18659	3.22	16	9	70	13.61	1535	863	6715
Feb-97	504	12398	2.56	7	1	80	13.61	446	64	5099
Mar-97	504	14408	5.41	7	3	27	13.61	519	222	2000
Apr-97	504	22970	2.86	7	3	19	13.61	827	354	2244
May-97	504	19631	2.76	3	5	53	13.61	303	505	5349
Jun-97	504	4587	2.15	5	12	78	13.61	118	283	1839
Jul-97	504	15132	1.47	10	6	109	13.61	778	467	8480
Aug-97	504	25790.14	4.42	5	4	51	13.61	663	530	6762
Sep-97	504	2582.36	0.97	19	2	288	13.61	252	27	3824
Oct-97	504	13249.75	2.07	10	2	50	13.61	681	136	3406
Nov-97	504	30661.63	4.89	40	10	616	13.61	6305	1576	97103
Dec-97	504	4419.45	3.62	5	15	107	13.61	114	341	2431
Jan-98	504	51108.17	6.95	11	13	57	13.61	2890	3416	14977
Feb-98	504	23205.8	5.34	18	2	43	13.61	2147	239	5130
Mar-98	504	36637.9	6.6	12	2	42	13.61	2260	377	7911
Apr-98	504	41456.2	7.73	12	2	69	13.61	2558	426	14706
May-98	504	13774.7	6.18	10	1	45	13.61	708	71	3187
Jun-98	504	52991.14	6.81	12	2	70	13.61	3269	545	19070
Jul-98	504	12096.5	1.64	16	10	70	13.61	995	622	4353
Aug-98	504	22333.08	2.57	20	13	77	13.61	2296	1493	8841
Sep-98	504	15397.54	3.01	13	10	66	13.61	1029	792	5225
Oct-98	504	14378.58	3.03	11	8	49	13.61	813	591	3622
Nov-98	504	10023.7	1.28	11	11	84	13.61	567	567	4329
Dec-98	504	4682.5	1.05	44	36	293	13.61	1059	867	7053
Jan-99	504	71057.7		20	15	71	13.61	7306	5480	25937
Feb-99	504	39136.7		9	2.5	253	13.61	1811	503	50905
Mar-99	504	20143.42		12	9	57	13.61	1243	932	5903
Apr-99	504	6036.9		9	2.5	29	13.61	279	78	900
May-99	504	24731.6		24	21	92	13.61	3052	2670	11698
Jun-99	504						13.61	0	0	0
Jul-99	504	11321.3		68	64	272	13.61	3958	3725	15831
Aug-99	504	25737.33		25	8	68	13.61	3308	1059	8998
Sep-99	504	52942.8		20	5	66	13.61	5444	1361	17964
Oct-99	504	37020.8		14	2.5	38	13.61	2665	476	7232
Nov-99	504	9303.2		33	7	45	13.61	1578	335	2152
Dec-99	504	14722		6	1	32	13.61	454	76	2422
Jan-00	504	13042.8		14	1	121	13.61	939	67	8114
Feb-00	504	54841.6		17	9	55	13.61	4793	2538	15507
Mar-00	504	32125.87		6	1	27	13.61	991	165	4459
Apr-00	504	36140.5		24	11	58	13.61	4459	2044	10777
May-00	504	21063.3		33	22	114	13.61	3574	2382	12345
Jun-00	504	38130.4		24	12	74	13.61	4705	2352	14506
Jul-00	504	13707.5		48	17	129	13.61	3383	1198	9091
Aug-00	504	35034		16	1	44	13.61	2882	180	7925
Sep-00	504	32738.7		15	10	44	13.61	2525	1683	7406
Oct-00	504						13.61	0	0	0
Nov-00	504	23333.6		7	10	50	13.61	840	1200	5998
Dec-00	504	56595		5	10	32	13.61	1455	2910	9311
Jan-01	504	62904		5	3.5	87	13.61	1617	1132	28135
Feb-01	504	5967		5	3.5	28	13.61	153	107	859
Mar-01	504	53042		5	3.5	20	13.61	1363	954	5454

Jordan Cove Metals Data

Export = (cuft/mo)*(mg/L)*(28.317L/cuft)*(1mg/10^3ug)*
(1/ac*.4047 ha/ac)

control =504, bmp=537, trad = 544 or 545

				concentration - ug/L -				mass export - mg/ha/mo -		
Date	**Station**	**Flow**	**Precip.**	**Cu**	**Pb**	**Zn**	**WTSHD AREA (ac)**	**Cu**	**Pb**	**Zn**
Apr-01	504	37404		5	3.5	20	13.61	961	673	3846
May-01	504	66378		15	3.5	117	13.61	5119	1194	39927
Jun-01	504	62621		15	7	73	13.61	4829	2254	23502
Jul-01	504	12100		21	8	77	13.61	1306	498	4790
Aug-01	504	48904		10	4	44	13.61	2514	1006	11062
Sep-01	504	35927		19	5	122	13.61	3509	924	22534
Oct-01	504	58300		11	10	60	13.61	3297	2997	17984
Nov-01	504	3106		14	4	64	13.61	224	64	1022
Dec-01	504	24850		9	3.5	35	13.61	1150	447	4471
Jan-02	504	25171		6	3.5	60	13.61	776	453	7764
Feb-02	504	14651		14	8	44	13.61	1055	603	3314
Mar-02	504	35643		11	2.5	32	13.61	2016	458	5864
Apr-02	504	18582		11	2.5	28	13.61	1051	239	2675
May-02	504	49199		9	2.5	37	13.61	2276	632	9359
Jun-02	504	25197		10	2.5	35	13.61	1295	324	4534
Jul-02	504	8219		20	30	117	13.61	845	1268	4944
Aug-02	504	32967		19	7	95	13.61	3220	1186	16101
Sep-02	504	71730		34	17	126	13.61	12538	6269	46465
Oct-02	504	34790		9	2.5	28	13.61	1610	447	5008
Nov-02	504	55496		6	2.5	40	13.61	1712	713	11412
Dec-02	504	30828		6	10	33	13.61	951	1585	5230
Jan-03	504	10286		7	13	35	13.61	370	687	1851
Feb-03	504	114316		27	8	105	13.61	15868	4702	61710
Mar-03	504	128565		12	6	30	13.61	7932	3966	19829
Apr-03	504	77230		8	5	55	13.61	3176	1985	21838
May-03	504						13.61	0	0	0
Jun-03	504	43239.7	0.64	15	5	60	13.61	3334	1111	13338
Jul-03	504	69112.4	3.57	14	9	127	13.61	4974	3198	45125
Aug-03	504	14635.8	3.18	13	0.5	62	13.61	978	38	4665
Sep-03	504	129514	4.52	27	15	82	13.61	17978	9988	54599
Oct-03	504	40909	5.15	9	6	27	13.61	1893	1262	5679
Nov-03	504	30071	1.02	6	0.5	18	13.61	899	77	2777
Dec-03	504	85206	1.46	2	0.5	18	13.61	876	219	7721
Jan-04	504	20094	0.87	2	0.5	5	13.61	207	52	517
Feb-04	504	58871	0.76	13	0.5	45	13.61	3824	151	13667
Mar-04	504	17401	0.9	21	0.5	173	13.61	1887	45	15487
Apr-04	504	90430	3.68	6	0.5	21	13.61	2975	232	9897
May-04	504						13.61	0	0	0
Jun-04	504						13.61	0	0	0
Jul-04	504	25143	3.34	26	0.5	41	13.61	3361	65	5300
Aug-04	504	42971	5.05	16	0.5	53	13.61	3535	110	11709
Sep-04	504	58202	6.95	5	0.5	26	13.61	1496	150	7780
Oct-04	504	22827	2.66	2	0.5	25	13.61	235	59	2934
Nov-04	504	16158	2.93	10	0.5	39	13.61	831	42	3240
Dec-04	504	22657	3.70	8	0.5	24	13.61	932	58	2796
Jan-05	504	17308		11		28	13.61	979	0	2491
Feb-05	504	24684		15		39	13.61	1904	0	4949
Mar-05	504	2740		18		69	13.61	254	0	972
Apr-05	504	16826		5		30	13.61	433	0	2595
May-05	504	5981		10	6	27	13.61	307	184	830
Jun-05	504	26725		10		41	13.61	1374	0	5633
Feb-96	537	5279	2.72	2	4	79	5.758	128	257	5068
Mar-96	537	1800	2.85	2	2	32	5.758	44	44	700
Apr-96	537	9808	7.73	2	3	21	5.758	238	358	2503
May-96	537	4111	2.95	100	35	96	5.758	4996	1748	4796
Jun-96	537	1278	2.68	10	3	32	5.758	155	47	497
Jul-96	537	1148	5.18	9	5	45	5.758	126	70	628
Aug-96	537	215	1.73	6	2	15	5.758	16	5	39
Sep-96	537	5737	5.7	5	2	275	5.758	349	139	19172

Jordan Cove Metals Data

Export = (cuft/mo)*(mg/L)*(28.317L/cuft)*(1mg/10^3ug)*(1/ac*.4047 ha/ac)

control =504, bmp=537, trad = 544 or 545

				concentration - ug/L -				mass export - mg/ha/mo -		
Date	Station	Flow	Precip.	Cu	Pb	Zn	WTSHD AREA (ac)	Cu	Pb	Zn
Oct-96	537	16505	7.28	17	11	70	5.758	3410	2206	14040
Nov-96	537	7078	2.69	26	20	44	5.758	2236	1720	3784
Dec-96	537	25361	7.64	14	2	83	5.758	4315	616	25579
Jan-97	537	2228	3.22	15	7	78	5.758	406	190	2112
Feb-97	537	6471	2.56	7	1	4	5.758	550	79	315
Mar-97	537	622	5.41	7	1	17	5.758	53	8	128
Apr-97	537	6210	2.86	7	2	27	5.758	528	151	2038
May-97	537	3926	2.76	4	5	41	5.758	191	239	1956
Jun-97	537		2.15				5.758	0	0	0
Jul-97	537	988	1.47	5	3	69	5.758	60	36	828
Aug-97	537	416.83	4.42	5	2	32	5.758	25	10	162
Sep-97	537		0.97				5.758	0	0	0
Oct-97	537		2.07				5.758	0	0	0
Nov-97	537	2561.26	4.89	5	2	313	7.319	122	49	7664
Dec-97	537	1148.49	3.62	11	2	339	7.319	121	22	3722
Jan-98	537	92601.93	6.95	10	5	811	7.319	8853	4426	717965
Feb-98	537	81233.49	5.34	9	2	434	7.319	6989	1553	337044
Mar-98	537	29457.3	6.6	11	12	444	7.319	3098	3379	125037
Apr-98	537	32894.3	7.73	10	2	198	7.319	3145	629	62266
May-98	537	18563.05	6.18	13	13	60	7.319	2307	2307	10648
Jun-98	537	22747.2	6.81	6	2	41	7.319	1305	435	8916
Jul-98	537		1.64				7.319	0	0	0
Aug-98	537		2.57				7.319	0	0	0
Sep-98	537		3.01				7.319	0	0	0
Oct-98	537		3.03				7.319	0	0	0
Nov-98	537		1.28				5.758	0	0	0
Dec-98	537		1.05				5.758	0	0	0
Jan-99	537	26451.2		10	2.5	3917	5.758	3214	804	1259045
Feb-99	537	8214		7	2.5	751	5.758	699	250	74961
Mar-99	537						5.758	0	0	0
Apr-99	537						5.758	0	0	0
May-99	537						5.758	0	0	0
Jun-99	537						0			
Jul-99	537						0			
Aug-99	537	6		36	47	117	0.1142	132	173	430
Sep-99	537	193.3		19	9	37	0.1142	2250	1066	4382
Oct-99	537						0.1142	0	0	0
Nov-99	537						0.1142	0	0	0
Dec-99	537						0.1142	0	0	0
Jan-00	537						0.1142	0	0	0
Feb-00	537						0.1142	0	0	0
Mar-00	537	186		117	201	323	0.1142	13334	22906	36810
Apr-00	537	2477.9		37	40	80	0.5486	11693	12642	25283
May-00	537	383.5		71	84	172	0.1142	16683	19738	40415
Jun-00	537	2928.9		24	21	54	6.855	718	628	1614
Jul-00	537	210		143	128	338	6.855	307	274	725
Aug-00	537	1500.3		68	24	91	6.855	1041	368	1394
Sep-00	537	51.2		208	213	508	6.855	109	111	265
Oct-00	537						6.855	0	0	0
Nov-00	537	659		15	10	39	6.855	101	67	262
Dec-00	537	2877.6		14	10	44	6.855	411	294	1292
Jan-01	537	2660		5	3.5	10	6.855	136	95	272
Feb-01	537	2559		5	3.5	5	6.855	131	91	131
Mar-01	537	16348		47	3.5	14	6.855	7843	584	2336
Apr-01	537	9135		27	9	50	6.855	2518	839	4662
May-01	537	4093		15	3.5	18	6.855	627	146	752
Jun-01	537	8828					6.855			
Jul-01	537	1140		140	88	417	6.855	1629	1024	4852
Aug-01	537	1837					6.855			
Sep-01	537	1207		36	16	95	6.855	444	197	1170
Oct-01	537	2010		8	4	43	6.855	164	82	882
Nov-01	537	0					6.855			

Jordan Cove Metals Data

Export = (cuft/mo)*(mg/L)*(28.317L/cuft)*(1mg/10^3ug)*(1/ac*.4047 ha/ac)

control =504, bmp=537, trad = 544 or 545

				concentration - ug/L -				mass export - mg/ha/mo -		
Date	**Station**	**Flow**	**Precip.**	**Cu**	**Pb**	**Zn**	**WTSHD AREA (ac)**	**Cu**	**Pb**	**Zn**
Dec-01	537	689		9	3.5	42	6.855	63	25	295
Jan-02	537	5200		10	3.5	36	4.12	883	309	3179
Feb-02	537	130		11	2.5	37	4.12	24	6	82
Mar-02	537	5635		11	2.5	29	4.12	1053	239	2775
Apr-02	537	3430		12	2.5	25	4.12	699	146	1456
May-02	537	11518		10	2.5	25	4.12	1956	489	4890
Jun-02	537	4184		13	2.5	44	4.12	924	178	3127
Jul-02	537						4.12	0	0	0
Aug-02	537	7618		24	2.5	60	4.12	3105	323	7763
Sep-02	537	11145		10	2.5	16	4.12	1893	473	3028
Oct-02	537	3768		7	2.5	26	4.12	448	160	1664
Nov-02	537	2688		5	2.5	5	4.12	228	114	228
Dec-02	537	10554		2.5	2.5	5	4.12	448	448	896
Jan-03	537	2135		5	0.5	7	4.12	181	18	254
Feb-03	537	14521		5	1	22	4.12	1233	247	5425
Mar-03	537	17218		4	0.5	8	4.12	1170	146	2339
Apr-03	537	5159		4	1	15	4.12	350	88	1314
May-03	537	7405	2.2	7	0.5	16	4.12	880	63	2012
Jun-03	537	4591	4.52	2	0.5	15	4.12	156	39	1170
Jul-03	537	2953	3.5	9	0.5	19	4.12	451	25	953
Aug-03	537	5109	2.57	2	0.5	25	4.12	174	43	2169
Sep-03	537	1767	3.73	8	0.5	60	4.12	240	15	1801
Oct-03	537	10429	5.13	7	0.5	25	4.12	1240	89	4428
Nov-03	537	139	1.01	15	22	60	4.12	37	53	142
Dec-03	537	975	2.15	11	0.5	36	4.12	186	8	595
Jan-04	537	0								
Feb-04	537	3424	2.8	5	0.5	21	4.12	293	29	1218
Mar-04	537	961	1.64	2	0.5	17	4.12	33	8	277
Apr-04	537	17350	5.46	5	0.5	5	4.12	1523	147	1473
May-04	537	119	0.72	2	0.5	12	4.12	4	1	25
Jun-04	537	758	1.22	8	0.5	14	4.12	101	6	179
Jul-04	537	139	3.34	29	0.5	60	4.12	68	1	142
Aug-04	537	4025	5.05	14	0.5	21	4.12	957	34	1435
Sep-04	537	6500	6.95	2	0.5	26	4.12	221	55	2870
Oct-04	537	41	2.66				4.12	0	0	0
Nov-04	537	869	2.93	6	0.5	24	4.12	89	7	354
Dec-04	537	4048	3.70	6	0.5	5	4.12	412	34	344
Jan-05	537	1929		9		13	4.12	295	0	426
Feb-05	537	1587		8			4.12	216	0	0
Mar-05	537	4355		13		10	4.12	961	0	740
Apr-05	537	3428		5		18	4.12	291	0	1048
May-05	537	5056				15	4.12	0	0	1288
Jun-05	537						4.12			
Feb-96	544		2.72				0.5054	0	0	0
Mar-96	544		2.85				0.5054	0	0	0
Apr-96	544	136	7.73	2	7	70	0.5054	38	132	1318
May-96	544	31	2.95	19	16	290	0.5054	82	69	1245
Jun-96	544	2	2.68	24	37	111	0.5054	7	10	31
Jul-96	544	20	5.18	14	15	96	0.5054	39	42	266
Aug-96	545	5	1.73				0.5054	0	0	0
Sep-96	545	7	5.7	5	8	57	0.4577	5	9	61
Oct-96	545	4	7.28				0.4577	0	0	0
Nov-96	545		2.69				0.4577	0	0	0
Dec-96	545		7.64				0.4577	0	0	0
Jan-97	545		3.22				0.4577	0	0	0
Feb-97	545		2.56				0.4577	0	0	0
Mar-97	545		5.41				0.4577	0	0	0
Apr-97	545		2.86	7	1	8	0.4577	0	0	0
May-97	545		2.76				0.4577	0	0	0

Jordan Cove Metals Data

Export = (cuft/mo)*(mg/L)*(28.317L/cuft)*(1mg/10^3ug)*(1/ac*.4047 ha/ac)

control =504, bmp=537, trad = 544 or 545

				concentration - ug/L -				mass export - mg/ha/mo -		
Date	**Station**	**Flow**	**Precip.**	**Cu**	**Pb**	**Zn**	**WTSHD AREA (ac)**	**Cu**	**Pb**	**Zn**
Jun-97	545	11.4	2.15	5	34	52	0.4577	9	59	91
Jul-97	545		1.47				0.4577	0	0	0
Aug-97	545		4.42				0.4577	0	0	0
Sep-97	545		0.97				0.4577	0	0	0
Oct-97	545		2.07				0.4577	0	0	0
Nov-97	545		4.89				0.4577	0	0	0
Dec-97	545		3.62				0.4577	0	0	0
Jan-98	545		6.95				0.4577	0	0	0
Feb-98	545		5.34				0.4577	0	0	0
Mar-98	545		6.6				0			
Apr-98	545		7.73				0			
May-98	545		6.18				0			
Jun-98	545	1779.24	6.81	27	23	202	2.619	1283	1093	9602
Jul-98	545	56.56	1.64	21	12	110	0.5879	141	81	740
Aug-98	545	537.28	2.57	35	26	160	0.5879	2238	1663	10231
Sep-98	545	692.53	3.01	53	33	190	0.5879	4368	2720	15660
Oct-98	545	326.66	3.03	20	24	304	0.5879	778	933	11819
Nov-98	545	740.64	1.28	5	4	33	2.918	89	71	586
Dec-98	545	423.46	1.05	16	22	76	2.918	162	223	772
Jan-99	545	17929.7		37	23	2612	2.918	15908	9888	1122988
Feb-99	545	2926.2		6	2.5	37	2.918	421	175	2596
Mar-99	545	5524.8		22	19	100	2.844	2990	2583	13593
Apr-99	545	356.4		22	22	101	2.844	193	193	886
May-99	545	888.9		15	13	95	2.844	328	284	2078
Jun-99	545						2.844	0	0	0
Jul-99	545						2.844	0	0	0
Aug-99	545	4645.9		137	38	187	2.844	15659	4343	21374
Sep-99	545	29885		66	48	199	2.844	48527	35292	146316
Oct-99	545	21167.4		67	42	150	2.844	34892	21873	78117
Nov-99	545	4558.7		54	46	151	2.844	6056	5159	16936
Dec-99	545	7576		17	1	61	2.844	3169	186	11370
Jan-00	545	7275.7		40	27	113	3.914	5203	3512	14698
Feb-00	545	7664.5		36	21	106	3.914	4933	2877	14524
Mar-00	545	4781.6		14	1	82	3.914	1197	85	7009
Apr-00	545	6692.4		22	10	105	3.914	2632	1196	12562
May-00	545						3.914	0	0	0
Jun-00	545	28447.8		43	29	203	3.914	21868	14748	103238
Jul-00	545	12289.7		99	51	286	3.914	21751	11205	62835
Aug-00	545	11231.15		83	56	213	3.914	16665	11244	42766
Sep-00	545	5534.1		51	68	220	3.914	5046	6727	21765
Oct-00	545						3.914	0	0	0
Nov-00	545	9270.2		14	35	68	3.914	2320	5800	11269
Dec-00	545	64609		8	10	48	3.914	9240	11550	55441
Jan-01	545	62724		10	3.5	51	3.914	11213	3925	57187
Feb-01	545	132691		12	10	47	3.914	28465	23721	111489
Mar-01	545	60779		13	3.5	30	3.914	14125	3803	32596
Apr-01	545	38170		12	3.5	31	3.914	8188	2388	21153
May-01	545	15740		38	3.5	54	3.914	10693	985	15195
Jun-01	545	38069		49	31	45	3.914	33347	21097	30625
Jul-01	545	4935		12	1.5	57	3.914	1059	132	5029
Aug-01	545	27967		9	1.5	73	3.914	4500	750	36497
Sep-01	545	15140		9	1.5	80	3.914	2436	406	21653
Oct-01	545	19278		25	1.5	32	3.914	8616	517	11028
Nov-01	545	1602		11	1.5	76	3.914	315	43	2177
Dec-01	545	22057		28	5	72	3.914	11041	1972	28390
Jan-02	545	22651		5	1.5	32	3.914	2025	607	12958
Feb-02	545	22308		17	8	70	3.914	6780	3190	27916
Mar-02	545	127611		9	2.5	33	3.914	20532	5703	75283
Apr-02	545	168920		9	2.5	35	3.914	27178	7549	105692
May-02	545	21534		10	2.5	35	3.914	3850	962	13474
Jun-02	545	13736		11	2.5	40	4.99	2119	482	7704
Jul-02	545	3405		15	2.5	83	4.99	716	119	3963

Jordan Cove Metals Data

Export = (cuft/mo)*(mg/L)*(28.317L/cuft)*(1mg/10^3ug)*
(1/ac*.4047 ha/ac)

control =504, bmp=537, trad = 544 or 545

				concentration - ug/L -				mass export - mg/ha/mo -		
Date	**Station**	**Flow**	**Precip.**	**Cu**	**Pb**	**Zn**	**WTSHD AREA (ac)**	**Cu**	**Pb**	**Zn**
Aug-02	545	18509		9	2.5	70	4.99	2336	649	18167
Sep-02	545	30242		6	2.5	17	4.99	2544	1060	7209
Oct-02	545	16013		8	2.5	26	4.99	1796	561	5838
Nov-02	545	18956		5	5	32	4.99	1329	1329	8506
Dec-02	545	25823		10	10	41	4.99	3621	3621	14846
Jan-03	545	8243		3	2	18	4.99	347	231	2081
Feb-03	545	33337		13	4	85	4.99	6077	1870	39734
Mar-03	545	22818		9	6	31	4.99	2880	1920	9919
Apr-03	545	21238		6	3	25	4.99	1787	893	7445
May-03	545	29990	2.75	9	0.5	60	4.99	3785	210	25231
Jun-03	545	17296	0.84	2	0.5	20	4.99	485	121	4851
Jul-03	545	9305	2.36	11	0.5	48	4.99	1435	65	6263
Aug-03	545	13829.7	3.18	8	0.5	47	4.99	1551	97	9114
Sep-03	545	14835	3.73	6	0.5	44	4.99	1248	104	9153
Oct-03	545	29177	5.43	8	0.5	41	4.99	3273	205	16774
Nov-03	545	885	0.62	5	0.5	51	4.99	65	6	636
Dec-03	545	66322	2.15	10	0.5	47	4.99	9564	465	44046
Jan-04	545	25203	0.87	2	0.5	28	4.99	707	177	9892
Feb-04	545	106613	2.8	6	0.5	61	4.99	8467	747	91382
Mar-04	545	27482	1.75	13	0.5	79	4.99	4944	193	30624
Apr-04	545	172344	5.46	2	0.5	20	4.99	4833	1208	47709
May-04	545						4.99	0	0	0
Jun-04	545	40	0.1				4.99	0	0	0
Jul-04	545	9343	3.34	8	0.5	28	4.99	1048	66	3668
Aug-04	545	19200	5.05	120	63.0	572	4.99	32307	16961	153996
Sep-04	545	32302	6.95	2	0.5	19	4.99	906	226	8606
Oct-04	545	8229	2.66				4.99	0	0	0
Nov-04	545	16091	2.93	7	0.5	24	4.99	1579	113	5415
Dec-04	545	111107	3.70	8	0.5	22	4.99	12464	779	34275
Jan-05	545	42193		8		31	4.99	4733	0	18341
Feb-05	545	6280		13		31	4.99	1145	0	2730
Mar-05	545	13588		29		71	4.99	5525	0	13528
Apr-05	545	18706				26	4.99	0	0	6820
May-05	545	1224				36	4.99	0	0	618
Jun-05	545									