

Methodology for Identifying & Quantifying Metal Pollutant Sources in Stormwater Runoff

OVERVIEW

A new methodology in identifying and quantifying non-point sources of metal pollutants has been successfully demonstrated at selected Navy sites. The new approach addresses Navy installations' struggle with National Pollutant Discharge Elimination System (NPDES) permit requirements for metals in stormwater due to low benchmark values in runoff from industrial areas. In many areas, stormwater runoff from industrial and non-industrial areas are mixed in common stormwater conveyances, making it difficult to pinpoint which entities may be responsible for elevated metals concentrations. Neither Environmental Protection Agency guidance nor visual inspection of point sources of runoff has proven effective at managing the situation. The new metal identification and quantification methodology is illustrated in the flowchart shown in Figure 1.

DESCRIPTION

This Geographic Information System (GIS) based methodology has enabled identification and quantification of metal pollutant sources in stormwater runoff and a colored layer transposed over Naval Base San Diego (NBSD). See Figure 2.

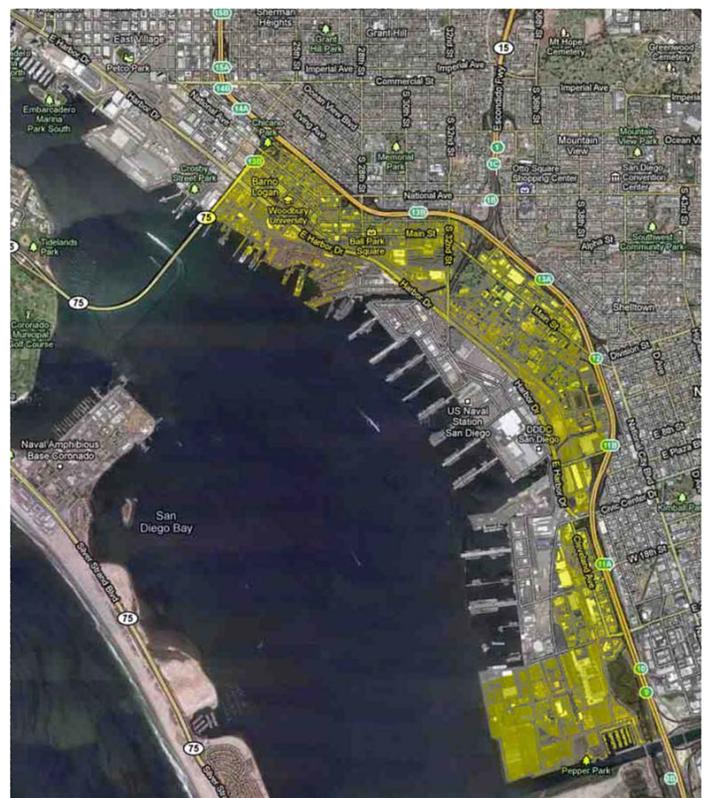


Figure 2: Areas of potential concern for outfalls outside of Navy jurisdiction.

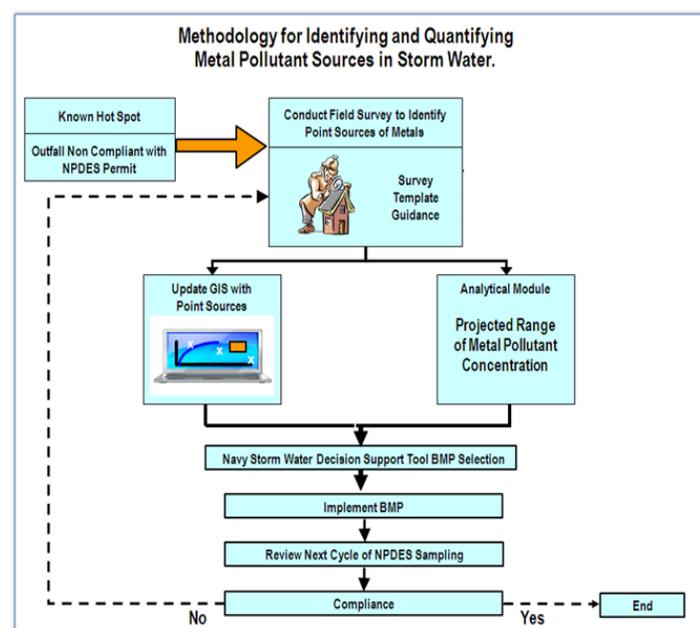


Figure 1: Methodology flowchart for identifying and quantifying stormwater pollutants.

Participants conducted a site characterization to identify potential metal pollutant point sources, particularly for copper and zinc. Using GIS and Global Positioning System (GPS) technologies (see Figure 3), key information such as industrial operations, building materials, parking lots, roadways, outside storage areas, etc. were captured on a survey

template and imported into GIS software in order to calculate broad range estimates of potential metal concentrations, identify potential material sources, and predict which drainage basins need the most attention. The methodology incorporates into a decision support tool that enables selection of appropriate best management practices (BMPs) and/or nonstructural source reduction measures to comply with NPDES permit requirements.

BENEFITS

This project provides a cost effective methodology to identify non-point sources of metal pollutants in stormwater runoff.

Some benefits include:

- Simplifies SWPPP required BMP assessments
- Utilizes existing GIS platform
- Provides a visual analysis (graphical display) of metal pollutant “hotspots”



Figure 3: Handheld GIS/GPS device.

RECOMMENDATIONS

Application of this methodology is recommended as an iterative process where user input can be used for identifying, eliminating, and mitigating point sources of metals in stormwater runoff.

The cost of a handheld GIS/GPS device for use during BMP assessments formatted with BMP checklist is approximately \$10K. The device may also be available for rental.

To acquire more information on the equipment and methodology described, it is recommended interested parties contact the Technology Integrator or Principal Investigator listed below.

The development and validation of the stormwater runoff methodology for identifying metals was made possible by the Navy Environmental Sustainability Development to Integration (NESDI) Program. Please feel free to visit the NESDI web site at www.nesdi.navy.mil. The site is a comprehensive resource of technologies and processes that have been or are being developed, addressing environmental needs identified by Navy personnel to promote Navy operations.

POINTS OF CONTACT

For more specific information about this project, contact:

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