

# The Lake Merritt Institute

And *CENTER FOR URBAN RUNOFF AND WATERSHED RESEARCH*

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**WHAT'S A WATERSHED?** “Does it have something to do with sweating” answered one unwary woman? “I think it has something to do with water” said another. “I don’t know” blurted a young girl. “A watershed - hmmm” said a park ranger. “It’s a shed that holds water” said a jogger!

The correct answer as we hope you know, is “All the land that drains into a specific body of water.”



Unfortunately, according to the National Environmental Education & Training Foundation, less than 1 % of the general public knows what a watershed is. Only 14% of the public is familiar with the term non-point source pollution. Only 23% of Americans know that run-off pollution is the number one cause of water pollution in the U.S.

Now consider this: *If people don't understand the watershed concept, they are limited in their understanding of storm drains, flooding, urban runoff and water pollution.* This is citizenship 101 and way too many people don't know it.

The outcome from this lack of knowledge is visible in our polluted waters. In the Gulf of Mexico a dead zone where hardly anything can live covers 6,564 square miles! Dead zones also exist in the Chesapeake Bay, Long Island Sound, Venice Lagoon, the western Gulf of St. Lawrence and numerous other areas, including Lake Merritt. Nearly half of the brown bullhead catfish in the Anacostia River near our nation's capital have liver cancer! *These problems cannot be solved without understanding the watershed concept.*

**WHAT'S A STORM DRAIN?** Unfortunately 69 % of businesses have not heard the term nonpoint source pollution. Many people think that a storm drain is a sewer. Even though we all walk over them buried several feet below us every day, too many people don't understand storm drains. They also don't know why we have them (to prevent flooding); or that they carry street pollution directly (untreated) to public waters. No wonder our watersheds are the now the biggest source of water pollution!

But watersheds are big, complicated places and storm drains are underground and out of sight. How can people be made to understand the watershed and storm drain concepts?

**WHAT'S A GIS?** Imagine now that you could see layers and layers of maps placed over aerial photography showing:

Every type of land Use Zoning	Parks Lawns Forests Vegetation	Buildings Sidewalks Streets Parking Lots	Contours Slopes Topography Creeks	Curb Inlets Storm Drains Sewers Outfalls	Utilities, (underground and above) Soil Types
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Rainfall Runoff Flood zones	Source of litter & pollution Wetlands Water Quality	Zoom in Zoom out Area & distance tools	Data tables Charts Graphs Captions	Photos Contact information Census data	Building setbacks Cost data
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Imagine you are on-line and could click on an individual storm drain or curb inlet and up pops data on its size, how much water it can carry and a photograph of it.

Imagine you could click on four corners of any area (e.g. your roof) and up pops its size and the amount of water that runs off of it into storm drains.

Imagine you could manipulate watershed wide data on the area from which water runs off (impervious surfaces) as fast as the rains falls, carrying street pollution, causing creek erosion and maybe even floods. Imagine you could manipulate watershed wide data on the amount of area where water soaks in (permeable surfaces) causing it to be filtered, cleaned and released slowly to creeks.

Imagine you could develop scenarios of more permeable areas and less runoff to improve environmental quality.

**A WATERSHED GIS:** You have just imagined a watershed GIS (Geographical Information System) the perfect tool to explain watersheds, storm drains and urban runoff.



*An aerial photograph of the Chesapeake Bay. Note polluted runoff at the upper ends of the Potomac, Susquehanna and other rivers.*

*Lake Merritt's creeks often look like this.*

- Now imagine you want to determine where to place a storm drain filter, curb inlet grate, wetland or more permeable surfaces. The GIS will tell you.
- Imagine you want to install devices to slow down rainfall runoff to reduce flooding; improve water quality and limit erosion. The GIS will help you decide where to put them.
- Imagine that you wanted to see how many rain barrels, rain gardens, infiltration swales, wetlands and areas of permeable concrete it would take to reduce runoff by 5, 10 or 20 percent. A watershed GIS could calculate this.

Imagine now how all these improvements would improve Lake Merritt, or any other downstream creek, lake bay or ocean. These are the reasons why the Lake Merritt Institute is seeking funds to create a watershed GIS for Glen Echo Creek, the land that drains into it, and its neighbors. We are seeking funding to create the GIS, measure creek flows and put it all on the internet, just like the City of San Francisco put their city GIS on-line. If you know of any sources for such funding, please contact us. Thank you.

**IT IS BEING DONE ELSEWHERE:** Several jurisdictions across the country have realized the value of the GIS tools, and have created some very useful applications. Specifically:

- The University of Rhode Island Cooperative Extension Service uses the analysis tools of GIS maps to identify site specific locations where the risk of pollution movement is greatest. The program is called MANAGE (Method for Assessment, Nutrient-loading And Geographic Evaluation of watersheds). This tool identifies potential pollution sources using water quality risk indicators such as percent impervious cover, riparian characteristics and estimated nutrient loading. A workshop called “*Using Computer-Generated Maps in Project Review*” is given to local towns. This is what we want to do at Lake Merritt.
- In Washington County, Wisconsin, several high schools use the West Bend GIS Map Server at <http://arcims.ci.west-bend.wi.us/website/westbend/startadminf.asp> and the Wisconsin DNR Webview at <http://maps.dnr.state.wi.us/imf/dnrinf.jsp?site=webview> to study watersheds and best management practices to improve water quality. Using the free “Long Term Hydrologic Impact Assessment (L-THIA) Program” available at [www.ecn.purdue.edu/runoff/lthianew/](http://www.ecn.purdue.edu/runoff/lthianew/) they employ GIS tools to make estimates of changes in water quality and quantity based on proposed land use changes, such as a new shopping center. If high school students can do it, we can!
- Nearby Cities, including Salinas and San Francisco have GIS applications. Across the Bay, city planners formerly had to dig through three file drawers whenever (several hundred times a year) someone wanted parcel specific information on flood zones. Now they just hold the phone in one hand, the mouse in another, access the GIS and tell the folks what they want to know. In Salinas, officials report a huge cost savings from their intranet (in-house) GIS.

**THE FUTURE IS NOW:** When characteristics of “The Perfect Watershed” were listed in our October, 2004 newsletter we had no idea that some of them could come true so soon. But for three urban trout streams in Duluth, MN, a website is available that delivers real-time values of flow, temperature, turbidity and conductivity from sensors in the water. Now they can go on line and check out how their stream is doing!

And, the National Environmental Education & Training Foundation has developed *Earth Gauge*, a free environmental information service designed for television and radio meteorologists. Brief, tailored environmental information and a viewer action tip are e-mailed weekly to broadcasters, helping them explain the environmental implications of weather events (such as urban runoff). Earth Gauge is currently distributed to the Weather Channel and broadcast meteorologists in six test markets and will be expanded in the fall. So, as predicted, we are seeing the beginning of a marriage between the weather and our local water resources.

**PERALTA STARTS WORK:** The Peralta Service Corporation, a subsidiary of the Unity Council, has begun to assist us in cleaning the Lake. Under a sub-contract with the Institute, they will be removing trash on Mondays and Wednesdays. Combined with our regular Tuesday, Thursday, Friday and Saturday events, the Lake will be cleaned 5-6 days a week. When it rains hard, that may not be enough; so we encourage anyone to use the “U-Clean-It” boxes whenever they see trash in the Lake.

**GEOMATRIX STARTS WORK:** Geomatrix Consultants of Oakland has begun weekly measurements of oxygen, temperature and salinity in both surface and bottom waters at two stations in Lake Merritt. Working under a sub-contract with the Institute, their data will compare water quality next to the pilot aeration site and at a central Lake location 1,000 feet away. We expect to document how the bubblers mix oxygen deficient bottom waters with oxygen rich surface waters.

**COMING SOON IN THIS NEWSLETTER:** Information about Rain Gardens, Roof Gardens, and Rain Barrels. These popular devices slow down the flow of urban runoff and save water. Not only that, they look good too! We will tell you about a Kentucky program that sponsored rain barrels as art, a roof garden in San Francisco and how to build a rain garden in your neighborhood.

**DOG POETRY – It’s Raining: Do You Know Where Your Dog Waste Is?**

If taking care of number two is number one to you,  
Then picking up your doggy doo should matter lots to you.

Doogies don’t just fade away or fertilize the grass;  
Lawn sausages will keep for weeks releasing noxious gas.

About the time you think they’re gone, they’ve only just begun,  
Emitting bad bacteria and foul things one by one.

Campylo bacteria and E. coli are bad;  
Giardia may sound like fun but it will make you sad.

The rains, they come and wash the dung just as it turns ripe,  
Down a swirling storm drain and out into a pipe.

The pipe goes on for miles and miles or further it may seem,  
And then it pumps the poopie out, right into a stream!

Nuggets don’t belong in streams where salmon try to swim;  
Some day that fish could be our meal on a hungry whim.

So scoop the poop and bag it and place it in the trash;  
Your doggo doo reflects on you, it’s what your puppy passed!

This is #91 of 101 reasons to pick up pet waste as published by the Surface Water Management division of the Snohomish County, Washington Public Works Department. They are piloting several approaches to reduce pollution in streams, rivers and lakes from pet waste. Using CBSM (community based social marketing) techniques, they conducted an initial assessment, identified the desired behaviors, defined and profiled their target audience, identified barriers to the behaviors, and developed strategies to achieve their objectives. For more information contact Dave Ward at [dave.ward@co.snohomish.wa.us](mailto:dave.ward@co.snohomish.wa.us) or 425-388-3464, extension 4667.

More than 126,000 dogs live in Snohomish County. That’s an entire city’s worth of raw sewage sitting in their backyards. Hmmm, how many dogs live in the Lake Merritt watershed? So scoop the poop, bag it, and place it in the trash. *Clean yards. Clean Streets. And Clean Shoes!!!*

For more details, go to [www.petwaste.surfacewater.info](http://www.petwaste.surfacewater.info).

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