

Stormwater

General Awareness Training

The Clean Water Act

- Mandates the elimination of Stormwater pollution within 3 categories:
 - Industrial
 - Construction
 - **Municipal** (*cities*)
 - Universities are considered small (**Phase II**), **Municipalities** (*non-traditional*) that must regulate their own **Separate Storm Sewer Systems** (MS4).
 - CSUDH is treated just like a City

Stormwater Terms

- **BMP** – Best Management Practice
- **MS4** - Municipal Separate Storm Sewer System
- **Stormwater** - water that originates during precipitation events and snow/ice melt.
- **TMDL** - Total Maximum Daily Load the amount of a pollutant discharged into a waterbody without causing it to become impaired.
- **Urban Runoff** - is surface runoff of stormwater created by urbanization. This runoff is a major source of urban flooding and water pollution.
- **Watershed** - A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place.

Dominguez Channel Watershed (834 square miles)

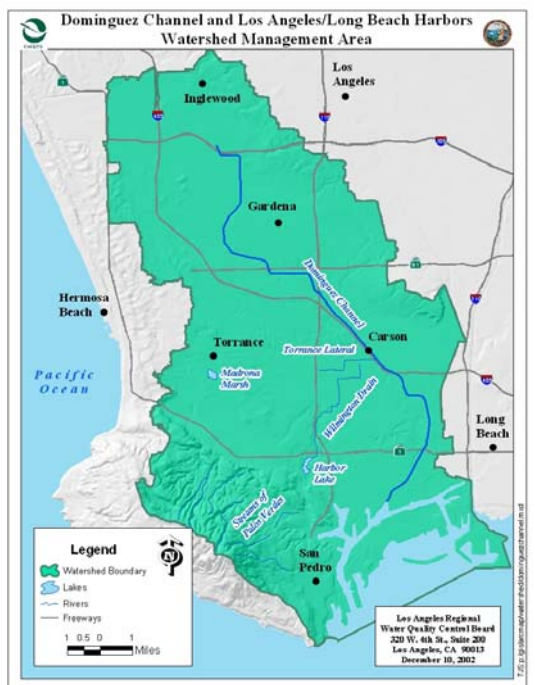
CSUDH is located in the southeast area of the Dominguez Channel Watershed. Dominguez Channel is to the Southwest and the Los Angeles Watershed is to the East.

Avalon Blvd Storm Drain the campus from the west and south to the Channel.

Did you know -

One (1) inch of rain over the Dominguez Channel Watershed is almost

260,000,000 gallons of water.
That's almost 400 Olympic size pools with only 1 inch of rain.



Discharges Allowed

Operations

- Emergency Fire fighting
- Agricultural storm water runoff
- Flow from landscape irrigation
- Discharge authorized by a permit issued by the Regional Water Quality Control Board

Natural water source

- Potable water source
- Flow from landscape irrigation
- Non-commercial vehicle washing
- Drainage from de-chlorinated swimming pools
- Air conditioning condensation
- Foundation drain, crawl space pump, or footing drain
- Uncontaminated groundwater
- Flow from a riparian habitat, diverted stream, natural spring or wetland

All discharges other than clean, clear stormwater are considered an...

ILLEGAL DISCHARGE

Sources of Stormwater Pollution

- Road and street operation and maintenance
 - Paving, surfacing, resurfacing, or saw cutting may pollute stormwater runoff or discharge to the storm drain system or watercourses.
- Landscape maintenance
 - Fertilizer, herbicide, pesticide application and vegetation removal may contribute pollutants to the storm drain system
- Fountain, pools maintenance
 - Chlorine or chloramine used as a disinfectant, discharged to the storm drain system, can be toxic to aquatic life.
 - Pollutants of concern are chemical algaecides that are added to control algae mainly for aesthetic reasons

Sources of Stormwater Pollution

- Plaza, sidewalk and parking lot maintenance
 - Pollutants on sidewalks, plazas and other traffic areas are typically due to animal waste, littering, and vehicle use.
- Water, sewer, drainage system operations and maintenance
 - Excavation stockpiles and sewage overflows have the potential to contribute to stormwater pollution
- Waste disposal handling
 - Improper storage and handling of wastes can enter stormdrains
- Maintenance Yard
 - Dispensing of fuel
 - Loading, unloading, handling and storage of materials
 - Vehicle and equipment parking, maintenance and cleaning areas

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How Does Maintenance Affect Stormwater Quality?

Maintenance practices which remove sediment, trash and debris from roadways and storm drains can help prevent flooding and related damage and erosion.



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Non-Stormwater Discharges

Wash water from non-stormwater discharges needs to be **diverted from the storm drain system.**

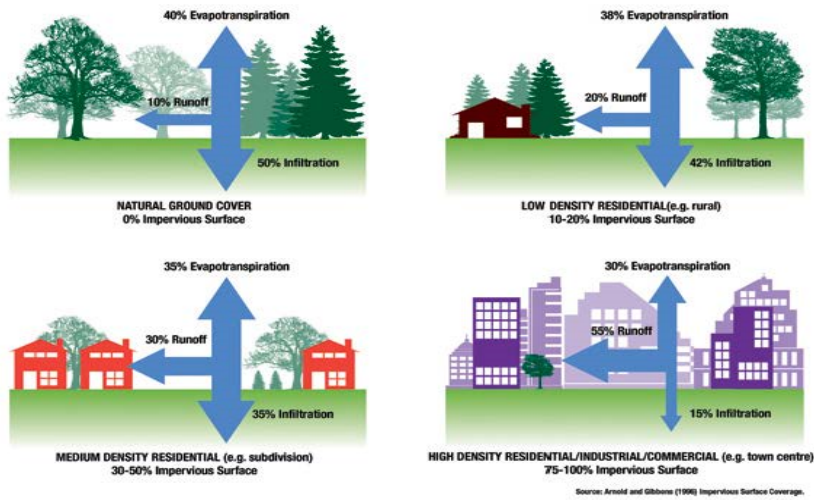
Vehicle washing	Pavement washing	Parts washing
Tank draining	Building washing	Material washing
Process wash water	Grease interceptor	Leaking trash container

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Urban Runoff

- **Urban Runoff** is surface runoff of stormwater created by urbanization.
- It is high volume, fast moving water that can overwhelm storm drain systems causing flooding.
 - Prompted the conversion of the LA River to Flood Control Channels
- Fast moving water picks up trash and debris and carries it down river.
 - it “washes” everything along the way picking up surface contaminants

Urbanization and Runoff



Effects of Urban Runoff



Total Maximum Daily Load - **TMDL**

- The amount of a pollutant discharged into a waterbody without causing it to become impaired.

Pollutants of Concern

- **Trash**
 - Sediment, debris, vegetation and litter from the influence of human beings on nature
- **Nutrients (nitrogen and phosphorus)**
 - Lawn fertilizers, atmospheric deposition, automobile exhaust, soil erosion, animal waste, detergents
- **Bacteria and Viruses**
 - Leaky sanitary sewer lines, sanitary sewer cross-connections, animal waste, septic systems
- **Metals**
 - Automobiles, atmospheric deposition, industrial areas, soil erosion, corroding metal surfaces, combustion processes

Best Management Practices (BMP's)

- A BMP is a method used to prevent or control stormwater runoff and / or the discharge of pollutants in stormwater runoff.
- Types of BMP's
 - Structural: Physical Devices
 - Procedural: Activities/Practices
- BMP awareness and usage is everyone's responsibility.

Examples of Structural BMPs

- Equipment/vehicle rinsing area (wash rack)
- Storm drain inserts/silt fences
- Bioswales
- Oil Separators



Examples of Procedural BMPs

- Containerize all trash and garbage
 - Keep dumpsters closed when not being actively filled
- General Housekeeping
 - Keep areas around the buildings/ structures clean.
- Fertilizer, herbicide and insecticide application
- Keep sediment out of storm drains
 - Cover exposed dirt piles to prevent erosion
- Maintain all equipment to ensure proper operations.

BMPs: Vehicle and Equipment Maintenance

- Drain fluids from wrecked vehicles – use drip pans
- When possible, perform maintenance activities inside
- Use dry cleanup methods for spills instead of a hose
- Wash vehicles and equipment only in designated areas



BMPs: Outdoor storage

- Cover storage area with a roof to protect from rainfall
- Provide secondary containment (berms, liners, containment pallets)
- Follow Spill Prevention and Countermeasure Plan (SPCC) for facility
- If possible, store materials indoors or cover with a tarp



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BMPs: General Field Activity



Protect stormdrain inlets and open manholes during road repairs to prevent slurry mixes, dust and debris from entering the storm drains.



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BMPs: General Field Activity

Cover stockpiles with a tarp, away from drainage courses
to prevent materials from being washed into streams



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BMPs: General Field Activity

Avoid using water to cleanup.

Mechanically or hand sweep dust and debris following all activities.

DO NOT wash residue into the storm drain system



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BMPs: Management of Pesticides, Herbicides and Fertilizers

- Apply pesticides and herbicides in accordance with California Department of Pesticide requirements
- Read and follow manufacturer's label requirements before each application
- Reduce sprinkler over spray into gutter
- Utilize less hazardous alternatives such as insecticidal soaps and horticultural oils as much as possible



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BMPs: What To Do in Case of a Spill

Follow spill response guidelines.

Safety First - Don't Take Risks

- Protect drains and storm sewers
- Stop the spill at its source
- Contact RM/EHOS
- Spread absorbent material
- Dispose of the spilled material appropriately (coordinate with RM/EHOS)



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Facility Inspection

Inspections should ensure the following conditions:

- Materials are properly contained, stored, and disposed of
- Areas where there are leaking vehicles, equipment, and materials – cover and contain
- Spills, leaks, and drips have been cleaned up
- Absorbent materials have been provided where they might be needed

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Stormwater - Grounds

- The Grounds department has an important role in the University's Storm Water Program.
 - A section of the State Permit is dedicated to this topic
 - F.5.f POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR PERMITTEE OPERATIONS PROGRAM
 - Pesticide, Herbicide and Fertilizer Application
 - New Landscape Design and Maintenance Management

Stormwater - Grounds

- Evaluate pesticides, herbicides and fertilizers and application activities
 - On-going evaluation of the types, amounts and inventory
- Impact of these materials on Storm Water
 - Nutrients (in our case fertilizers)
- Best Management Practice(s)
 - Application Activities

Best Management Practices Fertilizers, Herbicides and Pesticide

- Grass clippings and leaves
 - Clippings and leaves are mulched (not collected)
 - Removed from “hard scape” after service
 - Scheduled street sweeping
- Pesticide and fertilizer application
 - No application when two (2) or more consecutive days have a greater than 50% chance of rain
 - Monitor weather forecasts October – April
 - Limit use of pesticides and fertilizers

Best Management Practices Fertilizers, Herbicides and Pesticide

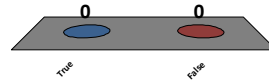
- Fertilizer application near storm drains
 - Prevent application within 25 feet of storm drains and catch basins
 - Stop application through equipment controls
 - Cover storm drains during application
 - Apply at the minimum effective rate
- Disposal of unused products
 - Contact RM/EHOS for proper disposal of all products
- Minimize irrigation run-off

Review

- Storm Water BMP's
 - Cover storm drain openings or turn off application
 - Do not apply fertilizers or pesticides when there is a 50% chance of rain
 - Keep clippings and leaves out of drains
- Pollutants of Concern
 - Trash, Nutrients (fertilizers), Bacteria and Metals
- ***Goal – reduce the amount of storm water runoff and improve the quality of runoff***

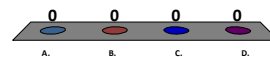
Under stormwater regulations, CSUDH is categorized the same as a city with respect to stormwater management?

- A. True
- B. False



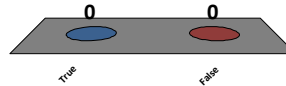
The Clean Water Act mandates the elimination of Stormwater pollution within 3 categories. Which is **not** one of the categories?

- A. Construction
- B. Industrial
- C. Municipal
- D. Retail



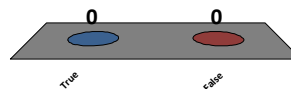
The term Urban Runoff is best described as surface runoff of stormwater created by urbanization.

- A. True
- B. False



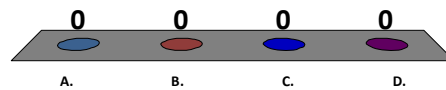
Water moving within the flood control is generally slow and is not likely to pick up trash or other debris?

- A. True
- B. False



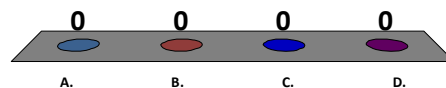
What is Stormwater Runoff?

- A. Any type of drainage
- B. Precipitation that flows over the ground and is deposited into drainage systems or waterways
- C. Water from firefighting activities
- D. Irrigation overflows



What does BMP stand for?

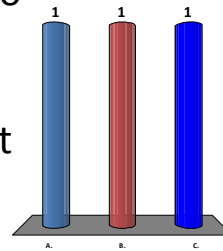
- A. Best Management Practice
- B. Better Management Priorities
- C. Better Management Procedure
- D. None of the above



The term “Total Maximum Daily Load” or TMDL is:

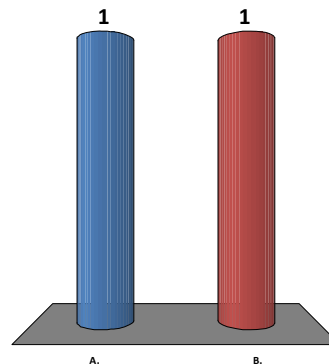
- A. The amount of trash that can be picked upon on a single day on campus
- B. The amount of a pollutant discharged into a waterbody without causing it to become impaired
- C. The amount of debris that our street sweepers can pick up during one shift

Response Counter



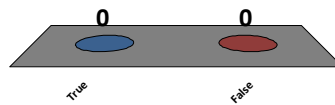
There is no issue with washing down the lot area of Physical Plant because the water flows downhill to the storm drain.

- A. True
- B. False



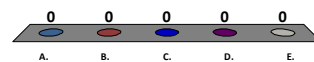
In general, Stormwater receives treatment to remove pollutants before being discharged into a waterway

- A. True
- B. False



What are our Pollutants of Concern?

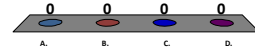
- A. Trash
- B. Bacteria and Viruses
- C. Nutrients (Fertilizers)
- D. Metals
- E. All of the above



A Stormwater Best Management Practice (BMP) is not to apply fertilizers within 25 feet of a storm drain.

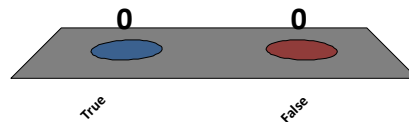
What are two (2) ways this can be done.

- A. Cover the drain opening
- B. It's not a Storm Water BMP
- C. Stop the flow of fertilizer
- D. A. and C.



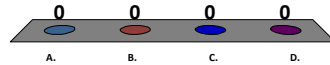
A Stormwater Best Management Practice (BMP) is to apply fertilizers when there is a 50% change of rain?

- A. True
- B. False



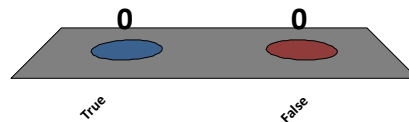
What is a BMP for leaves and grass clippings?

- A. Blow them into the planters
- B. Sweep them in to curb openings and catch basins
- C. Mulch the leaves and clippings while mowing
- D. None of the above



Fertilizer is not Pollutants of Concern?

- A. True
- B. False



Any BMP to use?

