



Recognizing and Reporting Stormwater Pollution



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Outline

- Stormwater 101
- Impacts of Stormwater Runoff
- LaRC's Water Program
- Illicit Discharge Detection and Elimination (IDDE)
- Reporting Stormwater Pollution
- Additional Resources



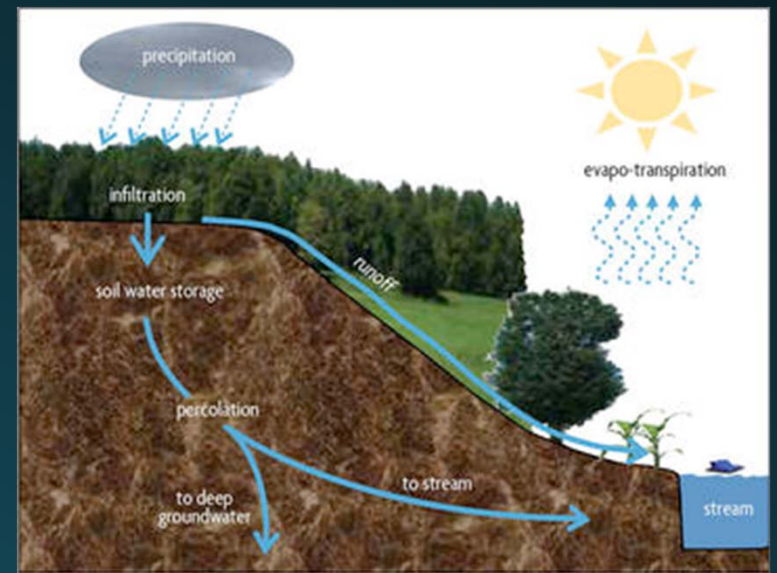
Stormwater

Water that originates during precipitation events and snow/ice melt.



Stormwater *Runoff*

Whatever doesn't soak into the soil or evaporates results in runoff.



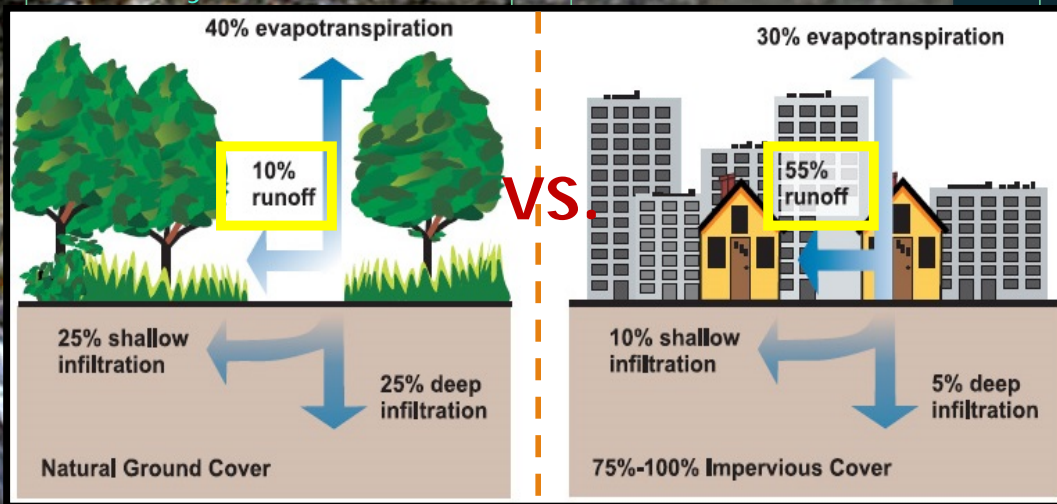
What's the Problem?

Natural Ground Cover

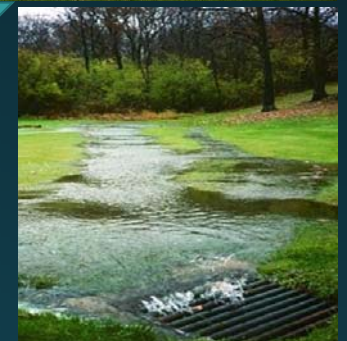
Only 10% runoff

Impervious Cover >75%

55% runoff

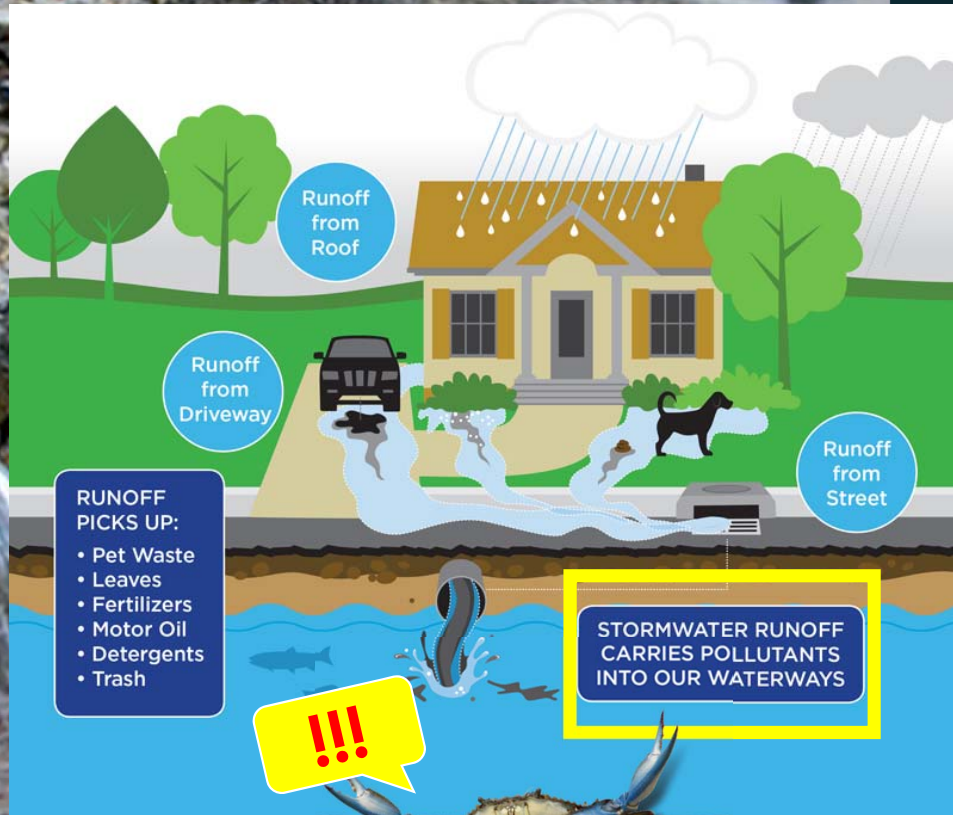


Rate of rainfall > infiltration capacity



Storm sewers are designed to get the water off an area as fast as possible

Where does Stormwater Runoff go?



UNTREATED!



Chesapeake Bay Watershed

- 64,000 square miles
- 11,684 miles of shoreline
- 150 major rivers & streams
- **Home to over 18 million people**
 - Estimated to be 21.4 million by 2040

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Effects of Stormwater Runoff



Water QUALITY

- Runoff **transport** detached soil particles and other pollutants



DID YOU KNOW?

Virginia ranks stormwater runoff as the second most prevalent source of water quality impairment in the state's estuaries.

Agriculture is currently ranked number one, which follows the national trend.

QUANTITY impacts:

Excessive runoff leads to **runoff**



Water Quality Impacts:

Sources of Pollution

Construction



Urban Development



Residential



Industrial/Commercial



Types of Pollutants

Trash

Sediment

Chemicals

Heavy metals

Pathogens

Nutrients

Oil

Grease

Water Quality Impacts:

Excess Sediment

- Shades and kills aquatic vegetation = oxygen reduction
- Buries aquatic organisms
- Absorbs and transports other pollutants
- Negative economic impacts
- EPA estimates 20 – 150 tons of soil/acre/year are lost from construction activities

Suspended Sediment

Deposited Sediment

Excess nutrients

- Leads to algae blooms = 'Dead Zones'
- Algae blooms are a green, brown, or reddish color depending on the type of algae
- When algae blooms die, dissolved oxygen is depleted from the water

Water Quantity Impacts

- Less infiltration leads to **increased runoff volume and velocity**
- Altered stream flows affects water conditions and stream habitat
- Changes to natural contours and depth of streams
- Channel erosion and increased flooding frequencies
- Risks to downstream properties



What's the Solution?

Erosion and Sediment Controls



What's the Solution?

Pollution Prevention Practices



What's the Solution?



Stormwater BMPs

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LaRC's Water Permits

Stormwater Permits (DEQ)

Sanitary Sewer Permit (HRSD)

Environmental Office - Water Program

- Our permits limit or prohibit the amount and type of pollutants that we can put down any drain.
- DEQ and HRSD conduct periodic inspections at LaRC

Water Program staff conduct frequent monitoring/inspections of water leaving Center. We have 16 outfalls where water enters our local creeks.



Stormwater at Your Facility

In your facility, stormwater connections could be:

- Parking lot drains
- Cooling tower blowdown
- Roof drains
- Sump pumps in basement
- Floor drains



LaRC's MS4 Permit

- **Phase II Municipal Separate Storm Sewer System (MS4)**
 - = The Center's general permit for discharging stormwater
- Requires an annual plan that addresses 6 Minimum Control Measures (MCMs):
 - 1) Public Education and Outreach on Stormwater
 - 2) Public Involvement and Participation
 - 3) Illicit Discharge Detection and Elimination
 - 4) Construction Site Stormwater Runoff Control
 - 5) Post Construction Stormwater Management
 - 6) Pollution Prevention and Good Housekeeping



Illicit Discharge Detection and Elimination (IDDE)

Illicit discharge: Any discharge to the stormwater system that is NOT composed entirely of stormwater



Illicit discharges are not allowed on the Center!

This means NO:

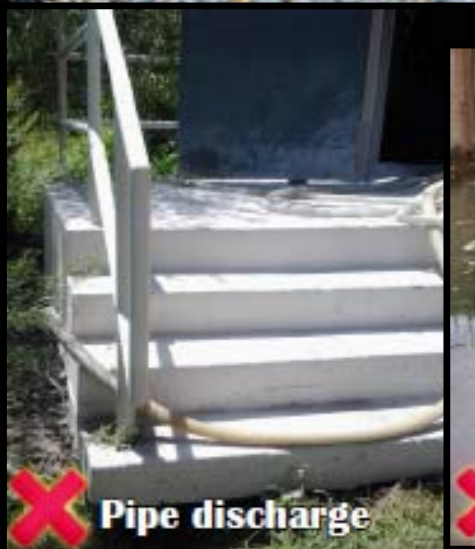
- Oil
- Sediment
- Trash
- Chemicals
- Mop water
- Wash water
- Muddy water
- Grass clippings

Only rain down
the storm drain!



Report illegal dumping!

Recognizing Illicit Discharges



Preventing Stormwater Pollution is our Responsibility

Before the start of any operations that will drain water not covered under our water permits, obtain approval

- LF461 process (Environmental Review Form) <https://gis-www.larc.nasa.gov/LF461>
- This includes power washing or installing new equipment!

Allowable discharges include landscape irrigation, a/c condensate, fire fighting activities

If you're unsure, just ask! 😊



The screenshot shows the NASA Langley Research Center Environmental Project Planning Form (LF461) website. The header includes the NASA logo and the text "NASA Langley Research Center Environmental Project Planning Form" and "NASA Langley Form 461 (Rev. Dec. 2010)". Below the header is a navigation bar with links: Home, Submit New Project, My Projects, Find Project, Projects Under Review, Monitored Projects, Closed Projects, and Ad Hoc Report. The main content area is titled "Submit New Project" and includes a section for "General Project Information". This section contains several fields and options: Project Type (Facilities and Infrastructure Work, Research and Development (R&D) Work), Project Name, Construction/Research Project # (optional), Project Lead Email, NASA POC Email, Alternate POC Email, Project Start Date, Project End Date, Brief Project Description (Scope of Work/Project Documents Must be Attached Prior to Submission), and Work Location (Onsite - In or Near Specific Buildings Below, Onsite - Entire Center, Offsite - Per Project Description).



1st Line of Defense: Prevent Water Pollution

- **Keep outdoor areas clean**

- Keep drum lids closed, be mindful of trash, store equipment with exposed oily/greasy parts in a covered area and off the ground

- **Be careful of what goes down the drain**

- No fats, greases, oils, chemicals, or toxins down ANY drain
- Pour cleaning water in mop sink or wash basin
- Properly dispose of used oil and oily rags

- **Be aware of potential problems**

- Use secondary containment or spill pallets for chemicals and oils
- Don't place liquids near floor drains
- Clean up after yourself, good housekeeping

- **If your facility has a sump pump, ensure facility personnel:**

- Closely monitor any oil bearing equipment for leaks
- Implement good housekeeping practices to prevent oil from entering sumps
- Notify Environmental staff immediately if oil is observed in a sump



LaRC's Stormwater BMPs



- ✓ Bioretention basins (8)
 - 1229, 2101, 2102 & 2103
- ✓ Permeable pavers (5)
 - 1212, 2101, 2102 & 2103
- ✓ Green Roof (1)
 - 2101
- ✓ Tree Box Filters (4)
- ✓ Impervious to green space (multiple)

Now that you know what Illicit Discharges Look Like..

Report it! Let's work together to keep our water clean

- All employees should report any suspected illicit discharges and/or illegal dumping activities by contacting Environmental staff.

Call: Peter Van Dyke 4-7517, Sarat Calamur 4-7479

Email*: peter.vandyke@nasa.gov, sarat.calamur@nasa.gov

*If you choose to report via email, please include as much information as possible.



**Danger to human health, or release to the environment?
Call 911 (land line) or 864-2222 (cell)**



Water Pollution at LaRC Resources

- LaRC Environmental and Energy Management website at <http://environmental.larc.nasa.gov/water/education-and-outreach>
 - This presentation is available online
- Look for quarterly @LaRC articles on a variety of stormwater topics and advertisements for local water-related events
- LPR 8500.1 Environmental and Energy Program Manual
- Standard Practice and Environmental Engineering Branch staff

Questions?

<http://environmental.larc.nasa.gov>

Just remember...

