

# Land Use 101

## Stormwater Practical

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# Environmental Services

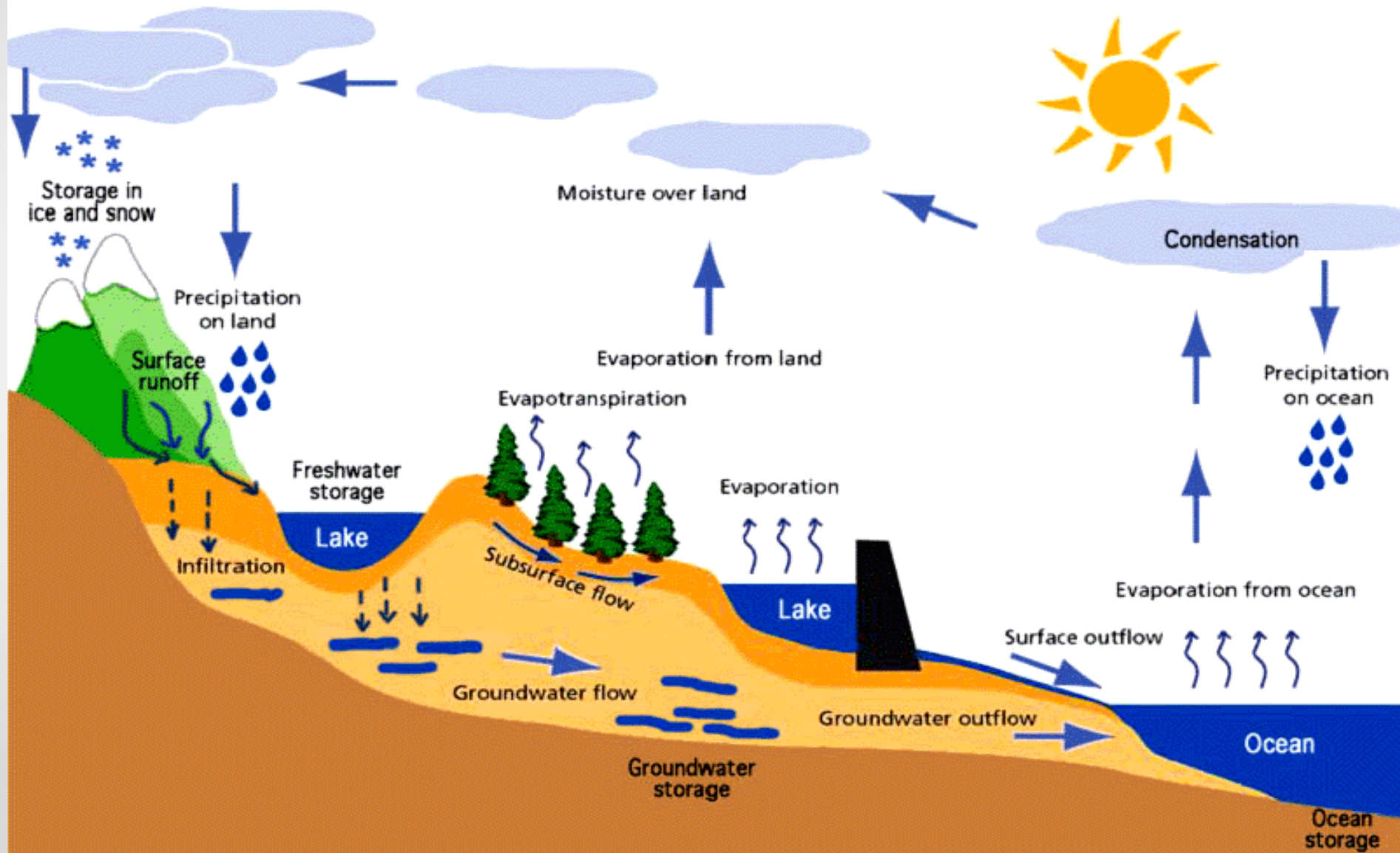
## 3 Branches

- Watershed Management
  - Erosion and sediment control, site plan review, **stormwater management**, flood plain, dam safety, Chesapeake Bay requirements, MS4/environmental permitting, stream restoration, illicit discharge, outreach
- Mosquito Control and Other Forest Pests
  - Monitoring, suppression, spray, outreach
- Construction Services
  - Sign shop, drainage maintenance, small construction projects, Lake Jackson/Bull Run private roads

Stormwater is runoff from rain and snowmelt that flows over impervious surfaces and carries pollutants to the nearest waterway



# Hydrologic Cycle



# Stormwater 101

- Flood protection – life, safety, property (home, belongings, yard)
- 10 year storm > 3” rain should equal pre-development rates, ponds typically overtop for 100 year storm
- Water Quality – first 1” of runoff where we find harmful bacteria, trash, contaminates
- Stream protection – peak flows and long duration storms can “blow out” streams
- Chesapeake Bay Cleanup – requires nitrogen, phosphorus, sediments to be reduced



- Largest U.S. estuary
- Six-state, 64,000 square mile watershed
- 10,000 miles of shoreline (longer than entire U.S. west coast)
- Over 3,600 species of plants, fish and other animals
- Average depth: 21 feet
- \$750 million contributed annually to local economies
- Home to 17 million people
- 77,000 principally family farms
- Declared a “national treasure”





# What is the Chesapeake Bay Total Maximum Daily Load (TMDL)?

- Establishes pollution “diet” for amounts of pollutant that a water body can accept and meet water quality standards
- Identifies pollution reductions from sources of nitrogen, phosphorus and sediment across the Bay jurisdictions
- In Virginia, the TMDL is further subdivided into TMDLs for each of the three pollutants for 39 “segmentsheds” or sub watersheds
- Ensures that all pollution control measures needed to fully restore the Bay are in place by 2025

# Flooding



# Flooding



# Uncontrolled Runoff



# Bacteria



# Pet Waste



When our pets leave those little surprises, rain washes all that pet waste and bacteria into our storm drains. And then pollutes our waterways. So what to do? Simple. Dispose of it properly (preferably in the toilet). Then that little surprise gets treated like it should.

# Trash



Sep 24, 2016

# Trash





# Lack of Buffer and Sediment



# Construction Impacts



# People



# People



# People



2015/10/09

# Stormwater History

- 1950/1970 - smaller populations, mainly agriculture, unregulated
- 1972 - Clean Water Act required states and local governments to meet certain standards, flood plain ordinances are developed
- 1980s – Best Management Practices (BMP) for water quality common, stormwater pond era
- 1990s – BMPs choices for new development expanded, Low Impact Development, treat on site
- • 2000's Stormwater as an amenity/resource?

# Stormwater as Amenity



# BMP Retrofit Extended Detention





# Flood Control Sediment Forebay



10/17/2016

# Constructed Wetlands



# Stormwater Ponds require maintenance!

- Who is responsible? County, HOA, business?
- Inspect structures and ponds regularly
- Keep structures free of litter and debris, especially before and after storms
- Consider maintenance schedule
- Document all efforts
- Call County if questions, we can advise!

# Other Stormwater Impacts

# Illicit Discharges

- Discharges of any material into the storm drain system or watercourse other than stormwater
- Construction, use, or maintenance of an illicit connection
- Materials deposited in such a manner or location as to constitute an illicit discharge
- Common examples include oil, paint, pet waste and trash





# Not Allowed

- In general, any discharge of any material into the storm drain system or watercourse other than stormwater
- Construction, use, or maintenance of an illicit connection (washing machine hooked up to storm drain)
- Materials deposited in such a manner or location as to constitute an illicit discharge
- Common examples include oil, paint, pet waste and trash





**NO POLLUTING!**

**¡NO CONTAMINE!**



**DRAINS TO CHESAPEAKE BAY**

# Allowable Discharges

- Natural springs and groundwater
- Air conditioning condensate, foundation drains
- Watering lawns, irrigation water (wasteful)
- Car washing at a residence (on the lawn better)
- Swimming pool water from home pools with chlorine and chemicals removed (how?)

# Dumpster Do's & Don't's

- Containers must be covered at all times
- Do not allow containers to overflow
- Contact your service provider immediately if your containers leak or do not have lids







# HVAC Maintenance

- Direct discharges such as cooling tower and boiler blow down to sanitary sewer
- Cover mechanical equipment and provide containment - especially during maintenance
- Discharge of air conditioner condensate is allowed





# Parking Lots

- Clean up automotive fluids, spills, litter, and landscape waste before they enter the storm drain system
- Sweep parking lots frequently - at least weekly
- Mark storm drain inlets with "No Dumping, No Polluting, Drains to Potomac or Chesapeake"

# Street sweeping as a BMP?



# Cleaning Surfaces

- Wash water may **NOT** be discharged to storm drains
- **IF** you do not use any chemicals  
**AND** are only cleaning surfaces of ambient dirt,  
**THEN** you may direct the wash water to nearby landscaping **OR** contain it onsite and allow it to evaporate
- **IF NOT**, wash water must be collected and discharged to the sanitary sewer



# If cleaning with water and detergent is needed

- Use a mobile washing unit that is self-contained
- **Do not** allow wash water (soapy or not) to discharge to the storm drain system



# Steps for proper cleaning

- Use dry clean up methods first
- Locate storm drains
- Determine where water will pool for collection
- Protect storm drains and collect wash water
- Dispose of water properly
  - Sanitary sewer drain at the job site or contractor's place of business
  - Check with local wastewater treatment plant

# You are responsible for your contractors

*“The Contractor shall take all measures necessary to prevent pollutants from entering storm drains of watercourses. For the purpose of eliminating stormwater pollution, the contractor shall implement effective Best Management Practices (BMPs). BMPs include general good housekeeping practices, appropriate scheduling of activities, operational practices, maintenance procedures and other measures to prevent the discharge of pollutants directly or indirectly to the storm drain system. These BMPs shall be maintained for the duration of the Contractor's work. The Contractor shall also be responsible for proper disposal of all waste materials, including wastes generated by the implementation of BMPs.”*



# A look to the future

- Essential Infrastructure to your business, HOA, home
- Stormwater management ponds and drainage systems will continue to increase
- Added inventory requires additional inspection and maintenance, perhaps yearly
- Systems age
- Restoration efforts are expensive and generally not optional
- Who will pay?

# Stream Restoration





# Questions/Comments

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