

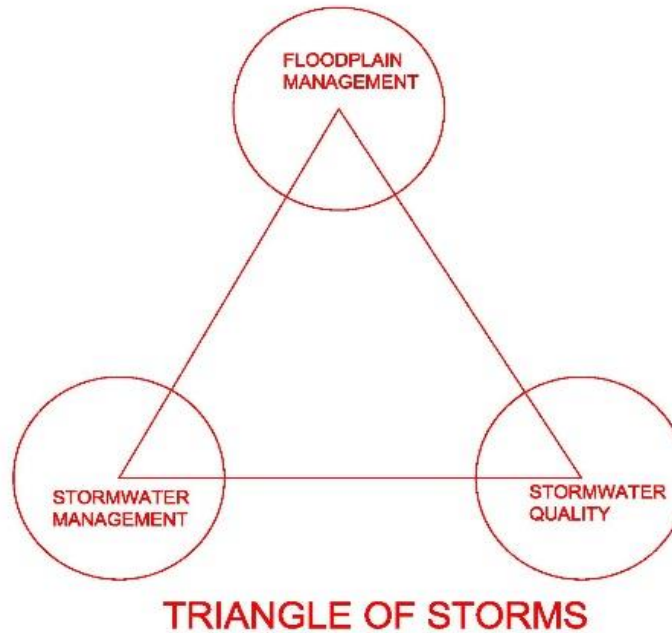


WATER TRIAD

Prepared by Rev. W. B. Smith, P.E. CFM

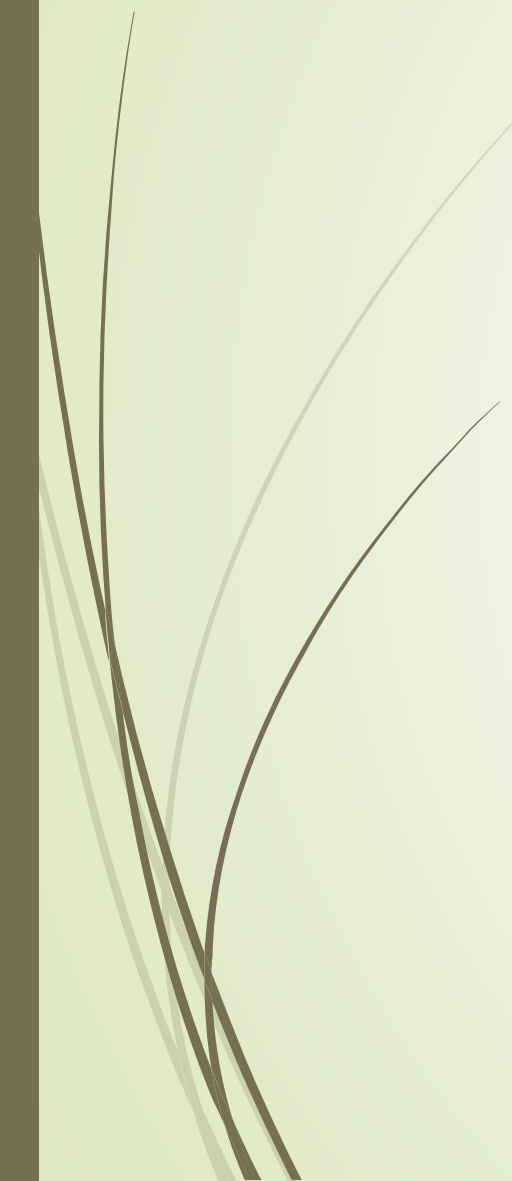
What is a Water Triad?

- Definition: A group or set of three connected people or things.





Floodplain Management



We as Floodplain Administrators and members of the Floodplain Industry know and understand what Floodplain Management is under the National Flood Insurance Program – Flood Insurance and Floodplain Management through permitting, analyses, etc. This applies to designated Special Flood Hazard Areas on the FEMA FIRM panels.



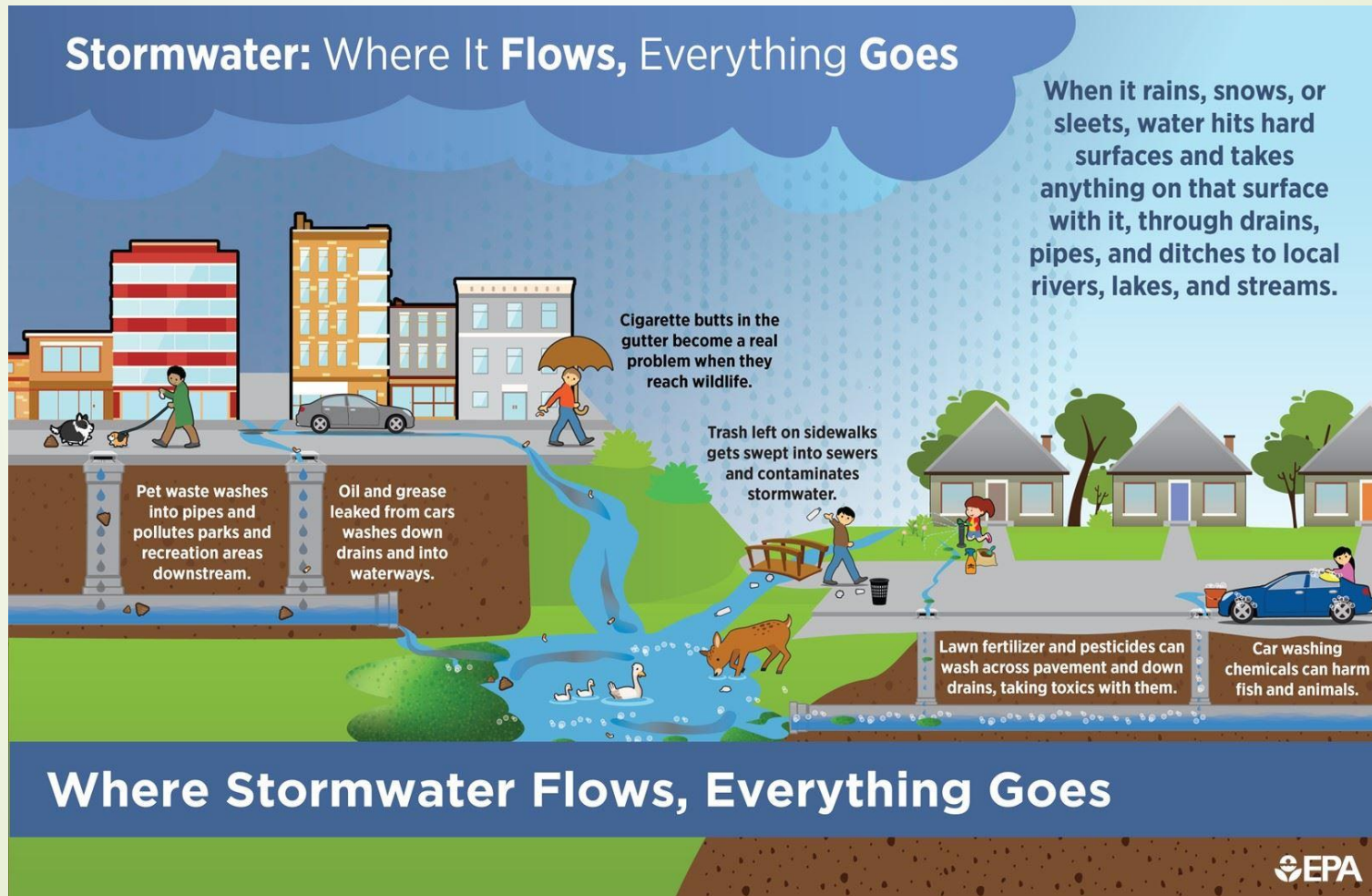
Stormwater Management

Stormwater Management is similar to Floodplain Management except it is normally applied to areas outside the SFHA.

Communities with Stormwater Management programs usually have a Stormwater Ordinance. This allows the Stormwater Manager to issue permits for “development” outside the SFHA.

This could involve requirements for mitigation of added impervious areas.

Stormwater Management





Stormwater Quality

Stormwater Quality may be a newer concept to most floodplain administrators; but not so to stormwater quality administrators.

Stormwater Quality: The quality of stormwater is critical in determining its suitability as an alternative water supply and if we are to use this resource we need to prevent **stormwater pollution**. The water must be fit for the intended purpose and pose no risks to the environment, or to public health and safety.

Some Communities are MS4 (DEQ) and have specific water quality monitoring programs to maintain the quality of downstream discharges.

Stormwater Quality





The Water Triad

So how do these three programs interact?

- As the rain falls (stormwater management) it flows overland or in ditches or culverts and eventually reaches a floodplain (floodplain management). Along the way it picks up oil and grease, trash, contaminants that affect the runoff (stormwater quality).



The Water Triad

With the continuing change in Climate, many lakes, water supply reservoirs, etc. are facing restricted usage. In Oklahoma we have extremes in rainfall in 2023 and now again in 2024. Northwest Oklahoma generally has very limited rainfall as compared with Southeast Oklahoma. In 2023 SE Oklahoma had over 24 inches of rain in 2023. In some parts of the State in 2024 there have already been up to 20 inches of rain to date in 2024.

With potential reduction of rainfall in general, water quality and water quantity, become much more important. Years ago, the phrase “water is more valuable as gold” was prevalent. This may be the same situations decades later.



Stormwater Quality Regulations

The EPA, through DEQ, monitors community stormwater quality for those communities designated as MS4. MS4 is Municipal Separate Storm Sewer System.

In Oklahoma there are 2 MS4 Phase 1 (Tulsa and OKC) and 51 MS4 Phase 2 communities.

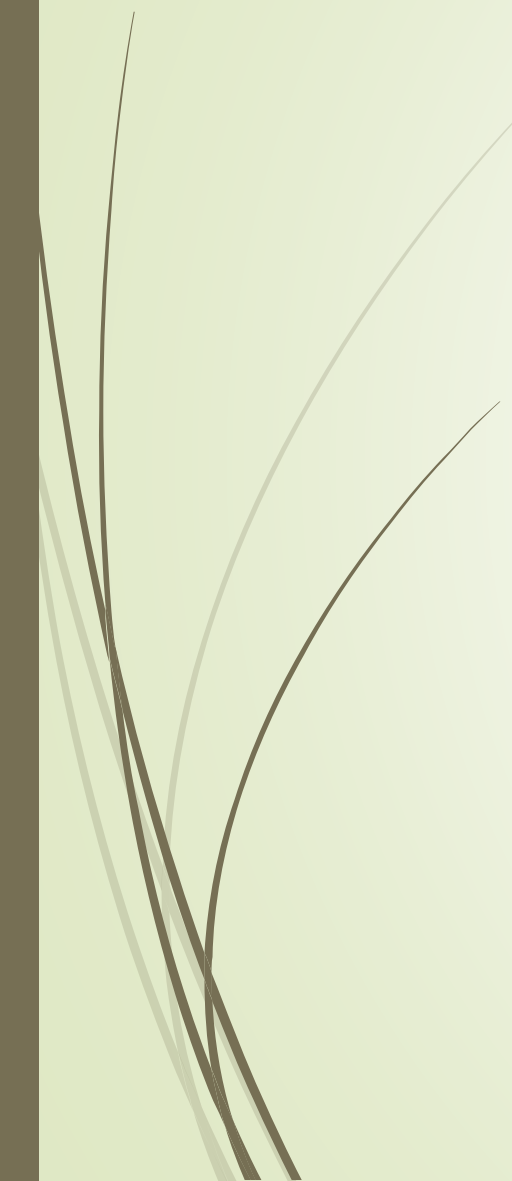


Stormwater Quality Regulations

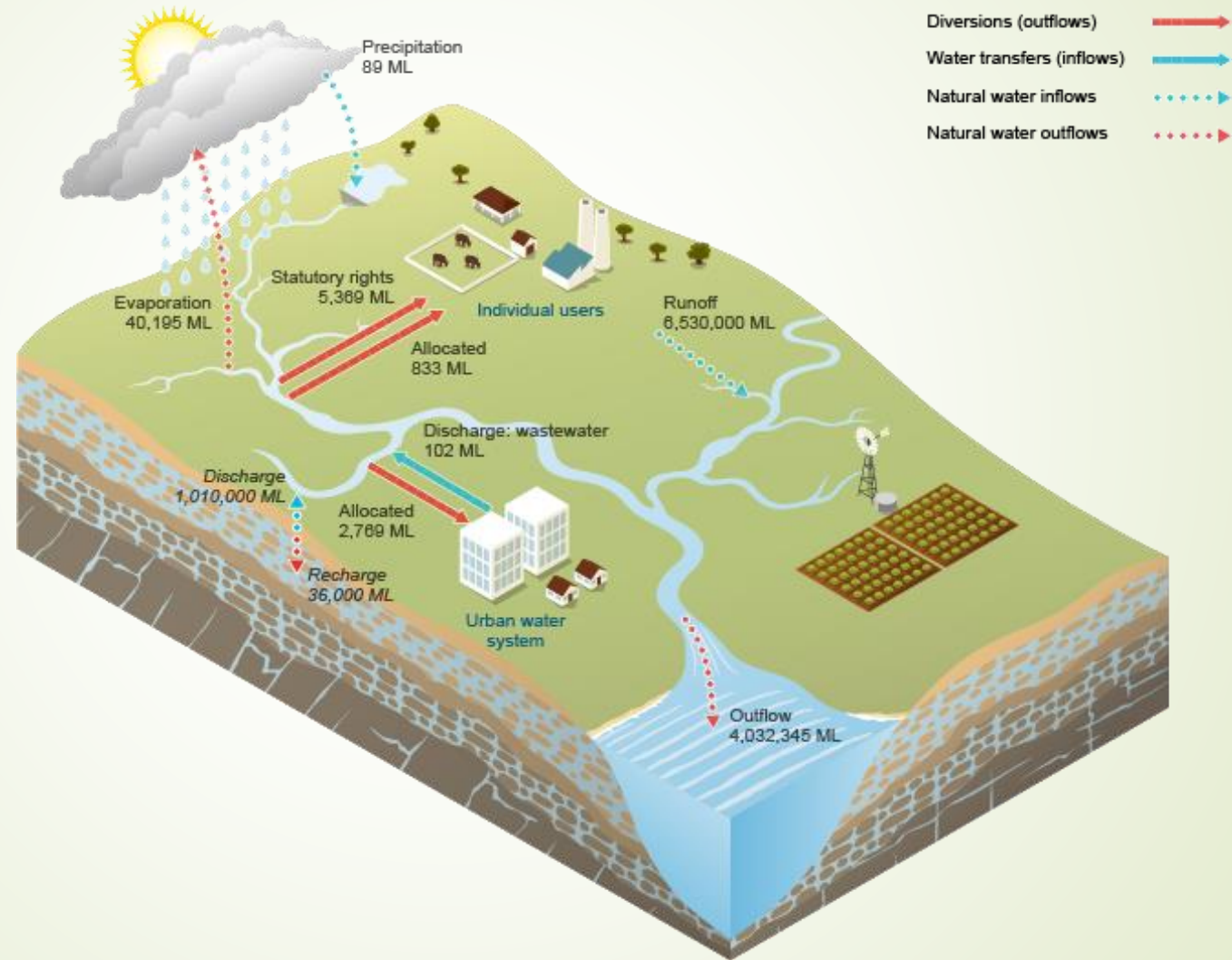
- Stormwater runoff from an urbanized area is commonly transported through Municipal Separate Storm Sewer Systems (MS4s). (Stormwater Management)
- Urbanized areas are associated with different activities that contribute pollutants to stormwater runoff.
- Additionally, urbanized areas are characterized by large amounts of impervious surfaces such as streets, sidewalks, driveways, parking lots, and roof tops.
- Stormwater runoff from impervious surfaces travels faster which results in damage to the waterbodies and causes flooding and hydrologic changes to the receiving waters. (Floodplain Management)
- Elevated pollutant levels can impair waterbodies, degrade biological habitats, and pollute drinking water sources. (Stormwater Quality)



Stormwater Quality Regulations

- Discharges from MS4s are regulated under the Clean Water Act and OPDES Act as point source discharges.
 - MS4 regulations were developed and implemented in two phases.
 - Implementation of **MS4 Phase I** began in the early 1990s and required **medium** and **large** cities or certain counties with populations of 100,000 or more to obtain NPDES permit coverage for their stormwater discharges.
 - The **MS4 Phase II** regulations became effective on March 23, 2003, and required regulated small MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by DEQ, to obtain permit coverage for their stormwater discharges.
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Stormwater Quality Regulations





Stormwater Management

As more “development” occurs in the watershed, stormwater runoff increases.

As non-mitigated stormwater increases, the flows into the floodplain increase, causing the Base Flood Elevation (1% or 100-Yr Regulatory Flood) to rise and the floodplain limits to enlarge.

As stormwater runs through the storm drainage system, streets, drainage channels, etc. contaminants are picked up causing contamination to the lands between the point of contact and the downstream floodplains. All the excess rainfall from the point of contact with the earth flows downhill through flow paths (bar ditches, culverts, storm drainage systems until it eventually reaches the floodplain creeks or rivers, or wetlands, and eventually to the oceans.

Each conveyance system can impact the water quality if it is contaminated.



The Water Triad

So, do you know how these three programs interact?

So, what can you as a community do to mitigate these impacts?

Floodplain Management:

Be proactive in your Floodplain Management – through permitting and monitoring – the local floodplain administrator is the “Floodplain Cop”. Their duty is for any development to comply with the local floodplain ordinance, FEMA FIRM panels, and Flood Insurance Study (FIS). The local community may have “higher standards” than the NFIP and as such may have requirements that are specific to the community.

Coordinate with the local Stormwater Coordinator and/or Stormwater Quality Coordinator and/or the person issuing Building Permits. Get to know the local utilities, City/County road crews, those who are in the field every day and see what is going on in the community.

You are the Floodplain Cop!!



You have regulatory authority and enforcement capabilities for violations, including fines and imprisonment (based on your ordinance and grounded in state statute)



The Water Triad

So, do you know how these three programs interact?

So, what can you as a community do to mitigate these impacts?

Stormwater Management:

Adopt a Stormwater Management Ordinance and develop a Stormwater Management Program. This allows a Stormwater Coordinator to issue permits for any development in the community to assure that there is not an increase in stormwater runoff that would affect the downstream property owners, or cause an increase in the flows in the designated floodplain; thus causing increased flooding in the Special Flood Hazard Area.

Communities that have developed a Stormwater Management program are able to create a stormwater utility fee for reimbursement of cost of permitting, evaluations, site inspections, etc.

Coordinate with the local Floodplain Administrator and/or Stormwater Quality Coordinator and/or the person issuing Building Permits. Get to know the local utilities, City/County road crews, those who are in the field every day and see what is going on in the community.



The Water Triad

So, do you know how these three programs interact?

So, what can you as a community do to mitigate these impacts?

Stormwater Quality:

Be proactive in Stormwater Quality – OKR10 Construction Best Management Practices, be cognizant of stormwater quality issues. Initiate a pro-active stormwater quality through a resolution. Create a stormwater quality program that requires compliance with erosion and sediment control during and after a construction project; periodically monitor the water quality of the downstream discharges (this doesn't have to be an MS4 community requirement); observe on-going construction activities in the community. Be diligent and observant.

Coordinate with the local Floodplain Administrator and/or Stormwater Coordinator and/or the person issuing Building Permits. Get to know the local utilities, City/County road crews, those who are in the field every day and see what is going on in the community.



OFMA Mentoring Program

► For more information on OFMA's Mentoring, please contact:

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The Water Triad

➤ Questions or comments

