

Conceptualizing Urban Pollution Transport



Summary of a Literature review on urban pollution dynamics – Benjamin Pearson

Introduction - Globally, urban populations have been growing at a high rate while rural populations are stagnating resulting in a rapid rate of urban growth. Urban diffuse pollution has been a complicated problem to address in the urban environment as it has a wide range of sources, with spatially continuous distribution that often does not have an isolated discrete source. Urban diffuse pollution creates risk in the presence of storms with heavy rainfall causing excess runoff. The pollutants contained in stormwater have been studied for five decades and the potential risks they pose to the environment and populations dependent on surface waters is well established. This poster summarises key mechanics of the build-up and wash-off processes of diffuse urban pollution.

Pollution Mechanics

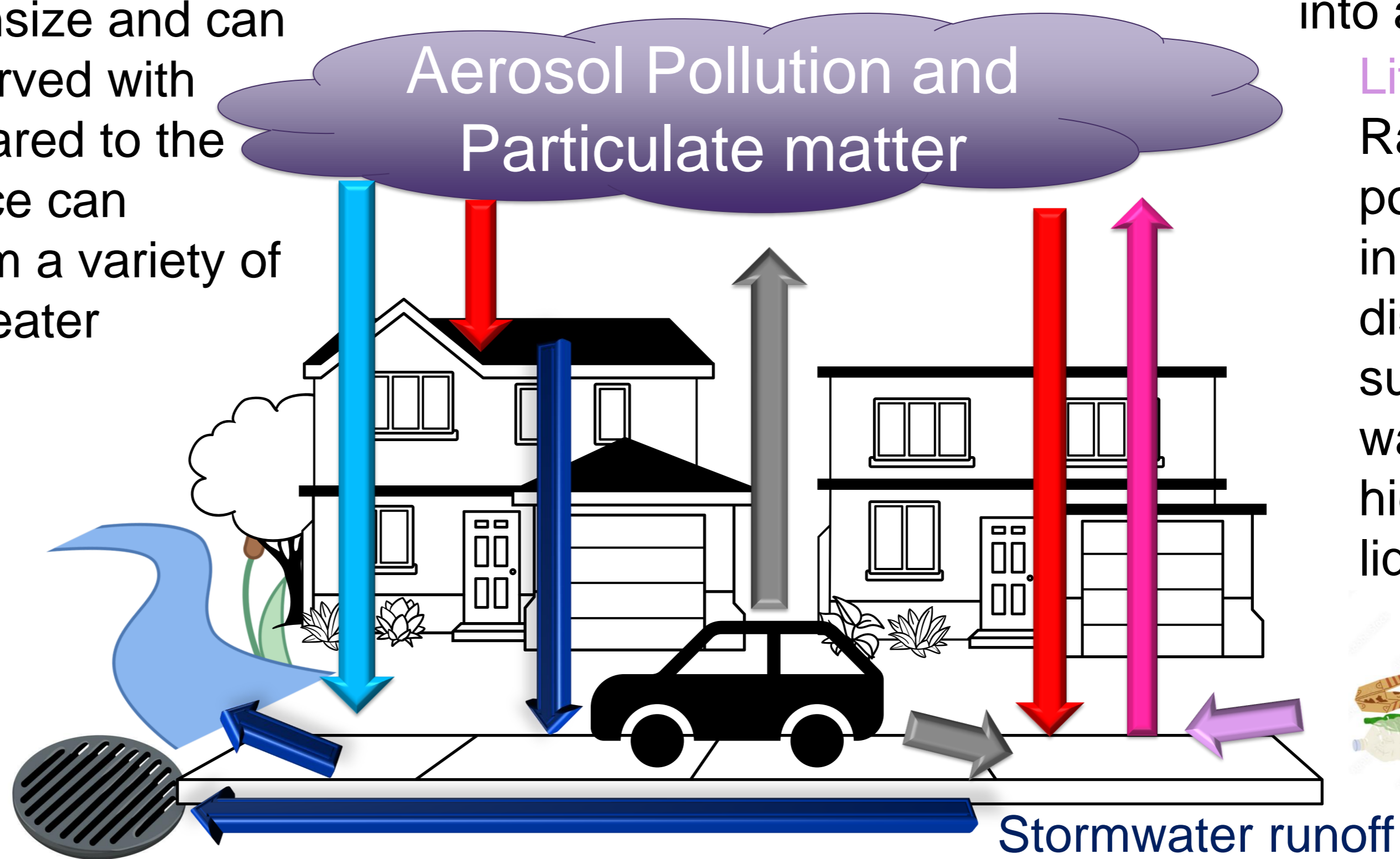
Atmospheric deposition – particulates are suspended in the air. In this state their mobility is dependent on grainsize and can be highly mobile. This is observed with finer dust being roofing compared to the ground. Pollutants on a surface can therefore be accumulated from a variety of sources from the local and greater environment depending.

Resuspension – deposited particles can be resuspended by traffic and wind currents. Grainsize plays a significant role in the mobility as smaller particles can be more easily suspended.

Wet deposition – During rainfall particulate matter can be captured in rain fall and add to runoff pollution.

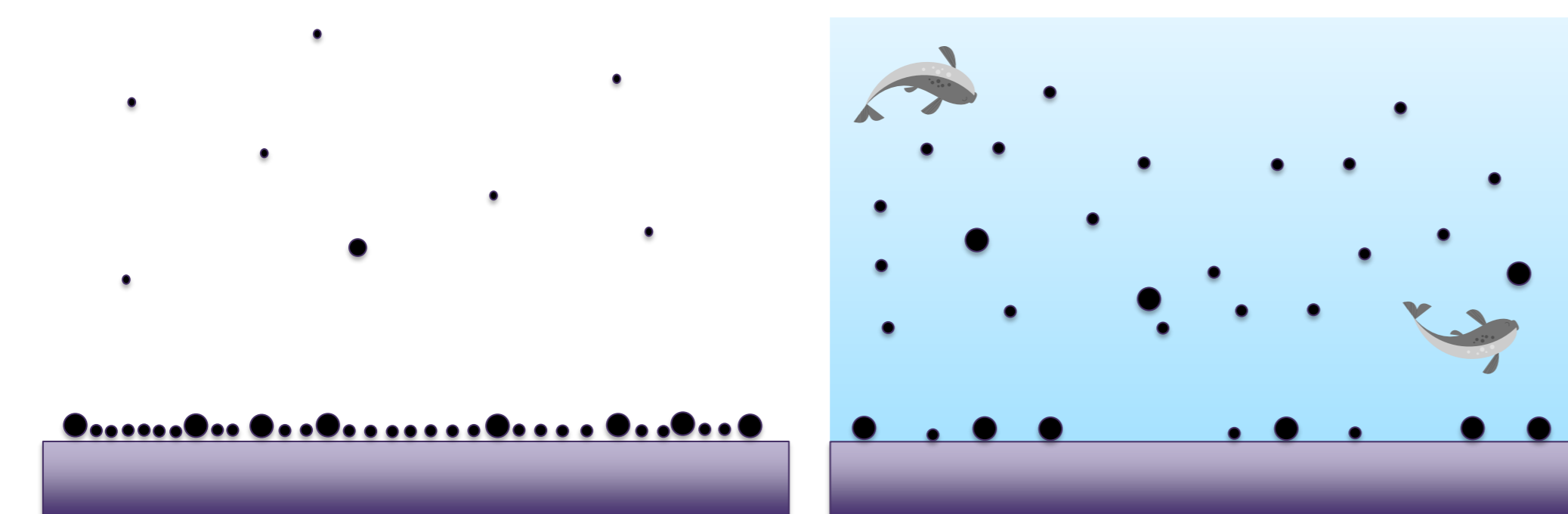
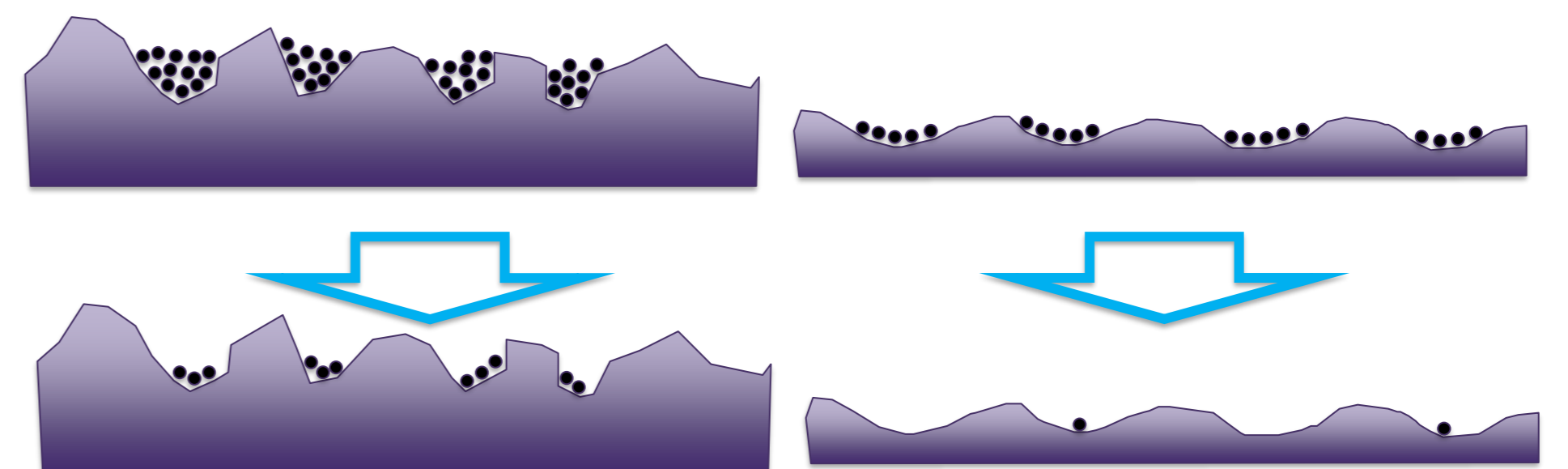
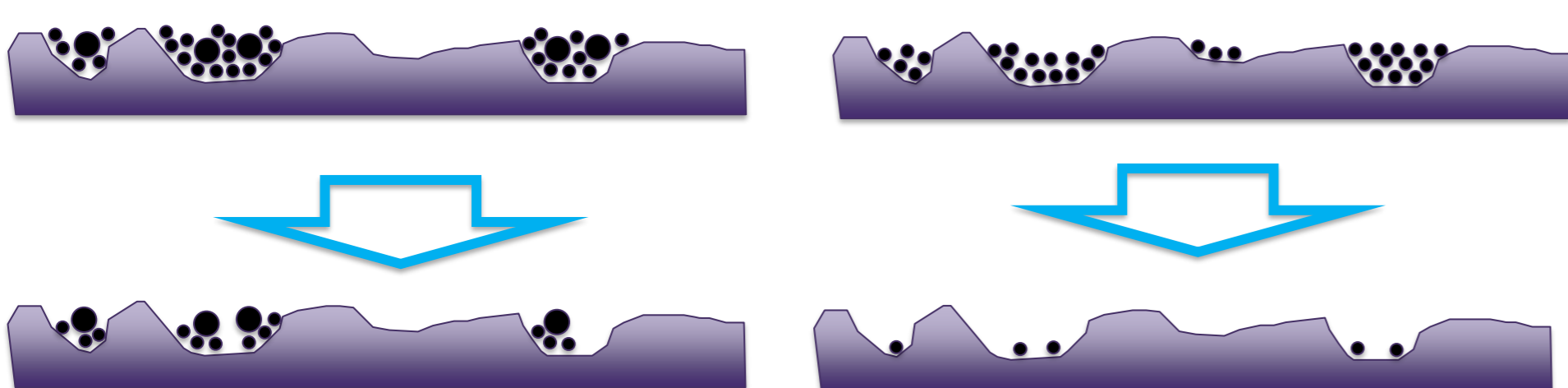
Emissions and material ware are common sources of pollutant which can be deposited onto the ground or released into atmosphere.

Litter leachate – Rainfall causes pollutants found in litter to be dissolved or suspended in water creating a highly polluted liquid.



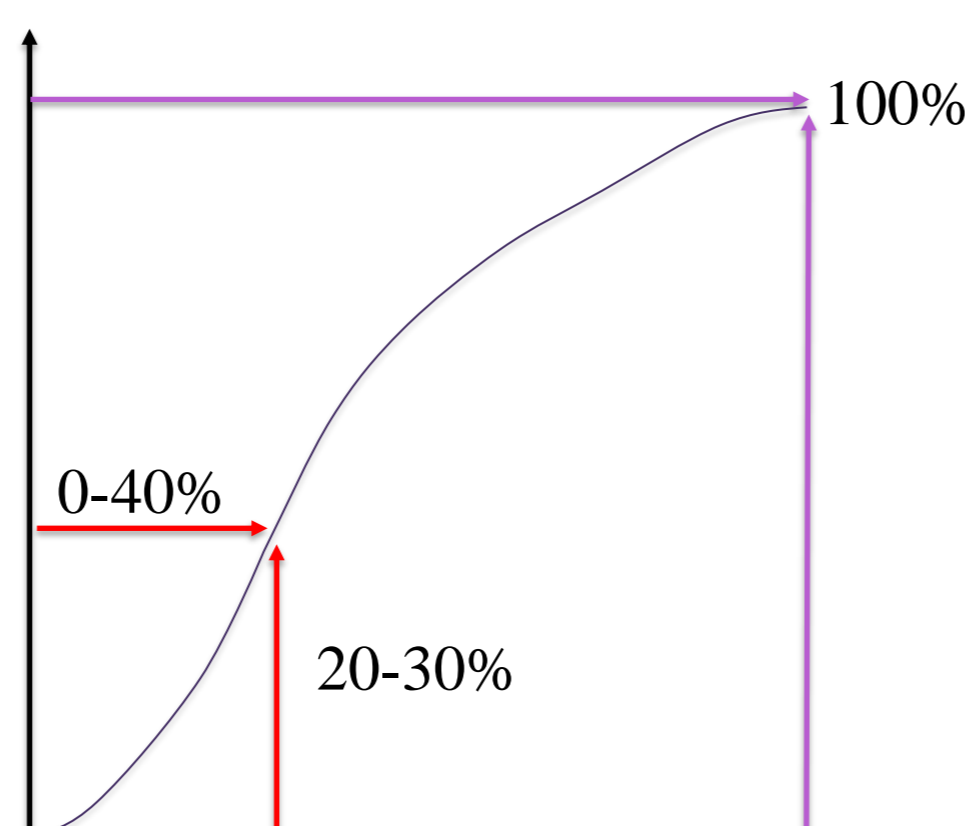
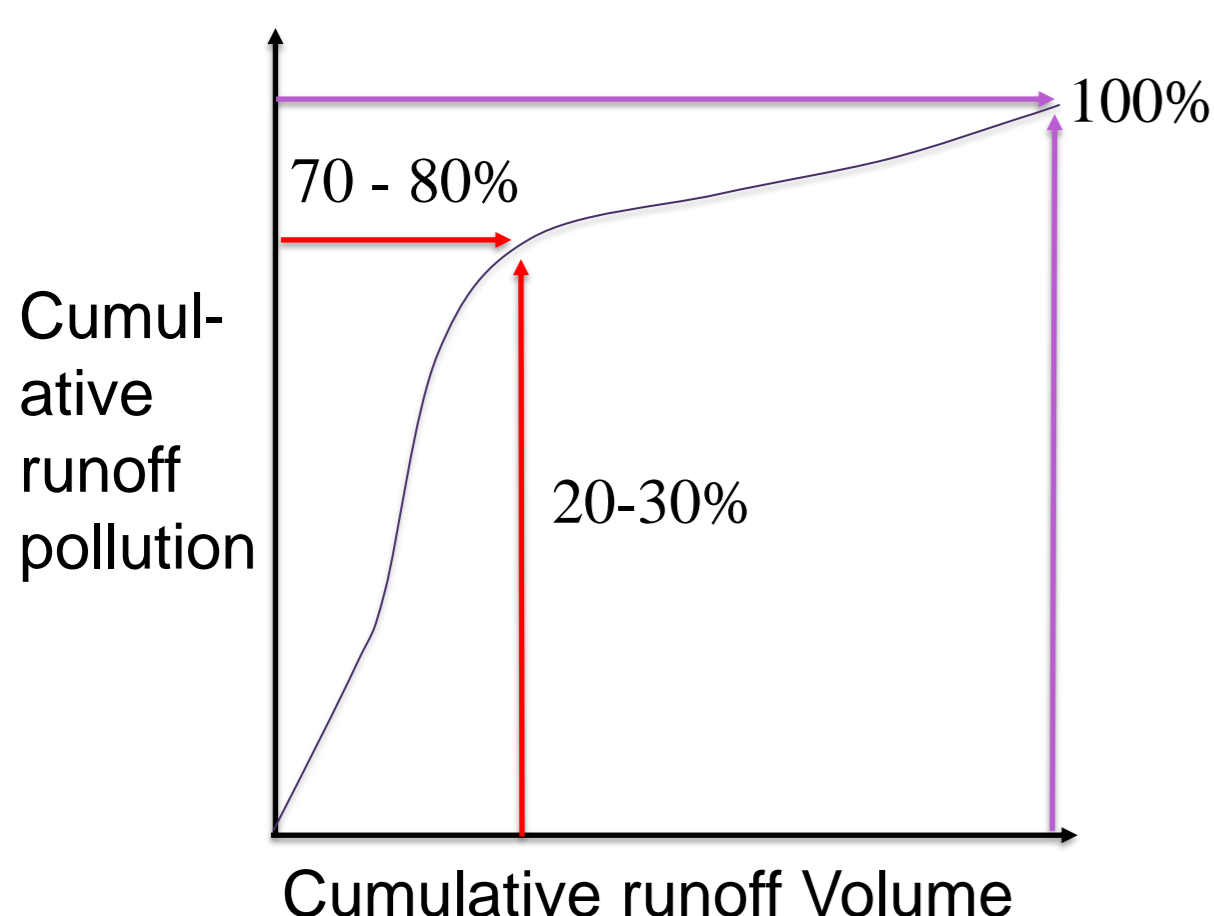
Shielding

Surface Roughness

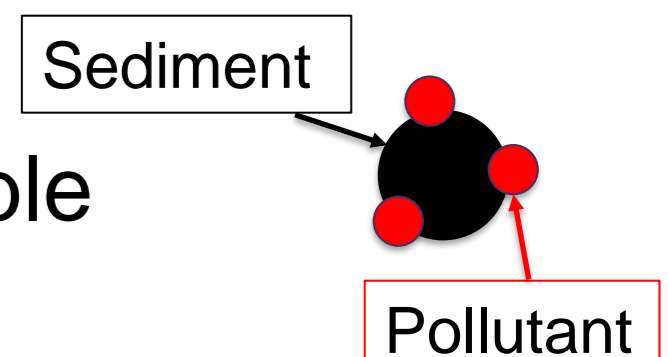


Strong First Flush

Weak First Flush



Suspended solids can act as a pollutant and can transport insoluble pollutants by adsorption



First flush occurs when most of a pollutant (70-80%) is washed-off in the initial flow (20-30%). This process is dependent on surface and rainfall characteristics and not all areas and pollutant have strong first flushes.