WHAT CAUSES FLOODING?

NEW UNDERSTANDING ABOUT FLOOD PREVENTION

This handout summarizes information from knowledgeable professionals in the Association of State Floodplain Managers. According to the ASFPM website, "*The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery. ASFPM has become a respected voice in floodplain management practice and policy in the United States because it represents the flood hazard specialists of local, state and federal government, the research community, the insurance industry, and the fields of engineering, hydrologic forecasting, emergency response, water resources, and others.*"

These professional floodplain managers assert that **reliance on FEMA standards and approaches alone will result in <u>increasing</u> amounts of flooding damage.** They identify two major reasons why flooding worsens as areas develop.

- Inadequate floodplain management regulations for new development, which allows the cumulative loss of natural flood storage volume over time
- Increased amounts of high-runoff surfaces, which increases storm water flows in storm drainage systems and streams

INADEQUATE FLOODPLAIN MANAGEMENT REGULATIONS

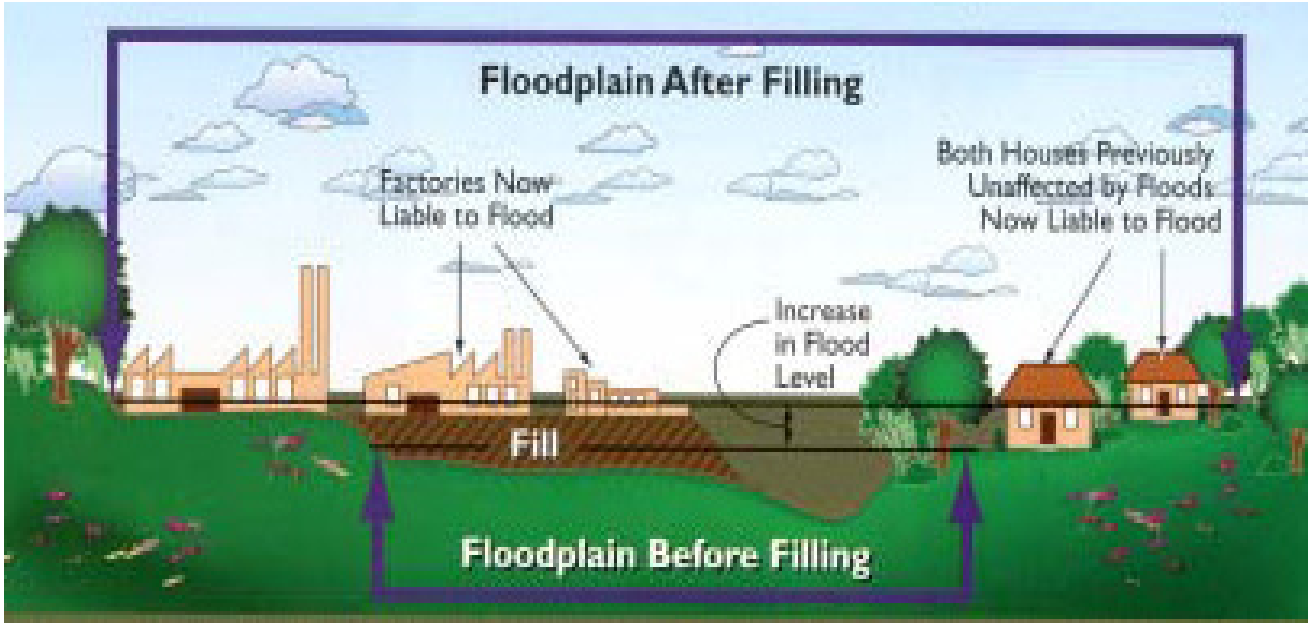


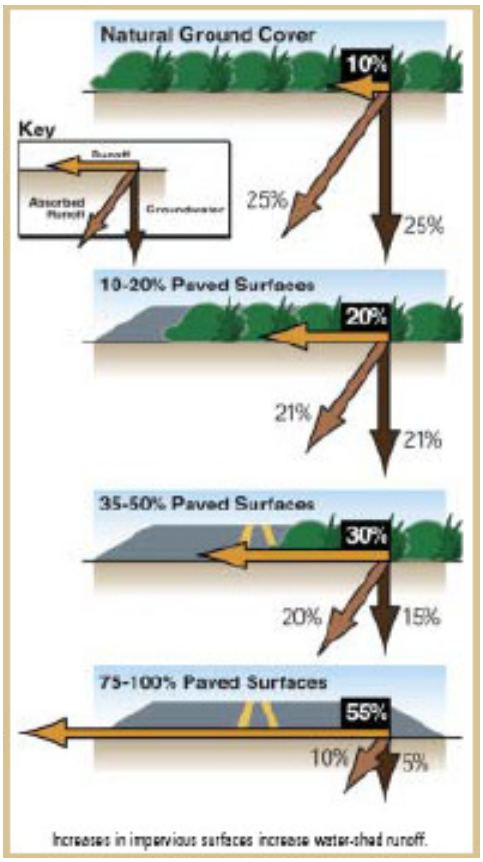
Figure 1. Note the size of the floodplain prior to allowing fill, then compare that to the "future floodplain" that will result as floodwaters are displaced onto areas that previously did not flood. *Source: Association of State Floodplain Managers Website,* **www.floods.org**

Loss of Flood Storage Capacity: The placement of fill-materials in the regulatory floodplain removes flood storage volume and makes flooding worse. This is the major emphasis of ASFPM literature[1]. Figure 1 above illustrates how filling in the floodplain will cause properties that previously had little or no flooding to flood. A healthy floodplain can hold-back part of the volume of floodwaters. That helps to keep flood peaks lower. Allowing fill in the floodplain steals away that capacity. Once fill is placed in the floodplain, it is rarely removed. Thus, these losses of flood storage volume are cumulative. Loss of floodplain storage results in floodwaters being pushed off onto downstream neighbors that have not had prior flooding problems.

The weakness of the National Flood Insurance Program in addressing this reality is a dominant theme of ASFPM educational materials. According to the ASFPM website, current FEMA-based floodplain management ordinances are worsening flooding because of the following.

Current floodplain management standards allow for: floodwater to be diverted onto others; channel and overbank conveyance areas to be reduced; essential valley storage to be filled; or velocities changed with little or no regard as to how these changes impact others in the floodplain and watershed. ***The net result is that through our actions we are intensifying damage potentials in the nation's floodplains. The current course is one that is not equitable to those whose property is impacted, and is a course that has shown to not be economically sustainable.*** **(emphasis added)**

INADEQUATE STORM WATER REGULATIONS



Another factor that contributes to flooding is the increase in impervious surfaces (e.g., paved areas, rooftops, and compacted soils) that accompanies development; This increases with ALL development in the watershed, whether or not that development occurs in the floodplain. GIS mapping shows that the Upper Cahaba River watershed is presently about 9 or 10% impervious. Watershed scientists have found that the amount of annual runoff to a stream ***doubles*** when a forested watershed becomes urbanized to the point of 10-20% imperviousness and ***triples*** as 20-30% imperviousness is reached (see Figure 2, left.). Thus, the Upper Cahaba River is experiencing much greater runoff volumes than in the past. Improved storm water standards are needed to reduce the amount of hard surfaces needed by development and to promote infiltration of storm water.

As development continues in our communities, sound science tells us that the increased runoff in our storm drainage systems and streams, combined with loss of natural flood storage due to filling of the floodplain, will lead to greater flood damages – unless we strengthen our storm water control and floodplain protection standards.

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[1] *No Adverse Impact: A Toolkit for Common Sense Floodplain Management.* 2003. Association of State Floodplain Managers. See www.floods.org and click on "NAI" near the top of the webpage.