Hydromodification Control & Low Impact Development Implementation Charette Materials

Why Should I be Concerned about Hydromodification?

The term hydromodification is used to describe the alteration of the natural flow of water through a landscape. Disturbing and compacting soils, changing the vegetation cover, adding impervious surfaces, and altering drainage patterns limit the natural hydrologic cycle processes of absorption, infiltration, and evapotranspiration, and increase the volume and frequency of runoff. Hydromodification causes stream channel instability, degraded water quality, changes in groundwater recharge processes, and riparian and aquatic habitat impacts.

Projected growth on the Central Coast, and the remaining landscape available for urbanization, provides us with a widely recognized opportunity to propose a meaningful and efficient intervention in the way we build new communities, and redevelop existing ones.

While scientific research over the past 20 years has brought a much greater understanding of hydromodification, only in the last decade have water quality regulatory programs (e.g., stormwater, wetland, etc.) attempted to regulate hydromodification impacts. Early efforts focused on matching pre- and post-development peak flows for large storms Subsequent efforts have revealed innovative policy and program strategies which aim to encourage or require Low Impact Development.

Human influence changes significant elements of a watershed's hydrologic processes and functions such as stormwater runoff, but also infiltration, subsurface flow, aquifer recharge, stream flow, and evapotranspiration. These hydrologic changes have resulted in adverse impacts to receiving waters and the beneficial uses of those systems. To improve our protection of receiving waters, we need to address the broader suite of hydrologic functions and processes in a watershed. As part of its Vision of a Healthy Watersheds, the Water Board has identified several desired conditions that are necessary to protect the water quality of the region's lakes, streams, rivers, and ocean. The Water Board has described the desired conditions of healthy watersheds as "the physical attributes and processes that are characteristic of watersheds possessing the essential water quality condition of physical and biological integrity" (Central Coast Water Quality Control Board, July 10, 2008). The Water Board has defined the following attributes of a healthy watershed:

A. Rainfall surface runoff at pre-development levels,
B. Watershed storage of runoff, through infiltration, recharge, baseflow, and interflow, at pre-development levels,
C. Watercourse geomorphic regimes within natural ranges (stream banks are stable within natural range; sediment supply and transport within natural ranges), and
D. Optimal riparian and aquatic habitats (including: stream flow, in-channel, water column, and biotic conditions). (ibid)

The challenge becomes how to translate these watershed function objectives into reasonable and clear requirements that municipalities, developers, and others can use to protect water resources. The Municipal Stormwater Permit requires municipalities to develop performance measures and in some cases, numeric criteria, to manage stormwater. Development of these measures and criteria requires substantial knowledge of urban hydrologic processes; appropriate use of LID techniques; and an understanding of technical, policy and regulatory issues related to implementing municipal stormwater control requirements.

The regional joint effort to develop hydromodification criteria will take into account the broader watershed hydrologic perspective and propose the development of measures and/or criteria that meet healthy watershed objectives. Additionally, because there is a need to link criteria to actual receiving water benefits, the joint effort will emphasize the development of performance-based criteria. These performance-based criteria will assist municipalities and developers in translating watershed management objectives into easily understandable performance requirements for new and redevelopment.