Permeable Pavements

Liv Haselbach lhaselbach@lamar.edu

Misunderstanding/Understanding LID

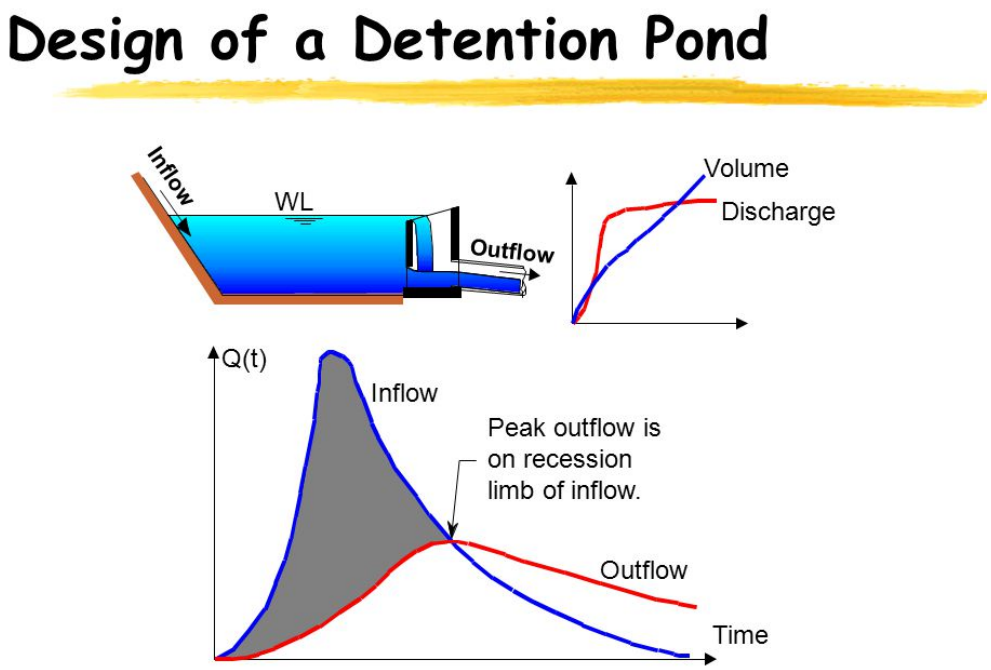
- LID is not just for water quality control.

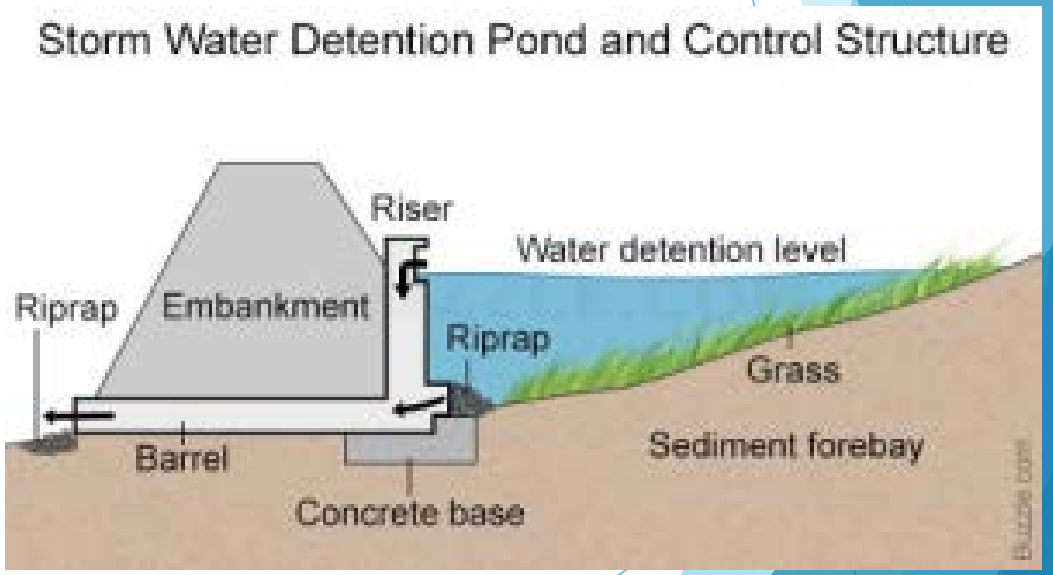
- LID IS MAINLY FOR WATER QUANTITY CONTROL!
  - TO KEEP THE RUNOFF OR DISCHARGES SIMILAR TO PRE-DEVELOPMENT CONDITIONS.
  - And to allow for recharge to aid in drought conditions. LID is not intended to keep water upstream so that reservoirs for water distribution are negatively affected, but rather to keep the normal water flows/storage/etc.

- Current non-LID practices such as detention basins have release-rate-rules that might have large impacts downstream, both for erosion and for contributions to enhanced flooding conditions in large events such as with Harvey.
- Whereas for most of the smaller events LID facilities are designed to release similar to natural conditions.

Release Rate Rules

- Detention facilities are designed to release water at certain rates related to storm sizes and associated flows (Qs) from that size storm.



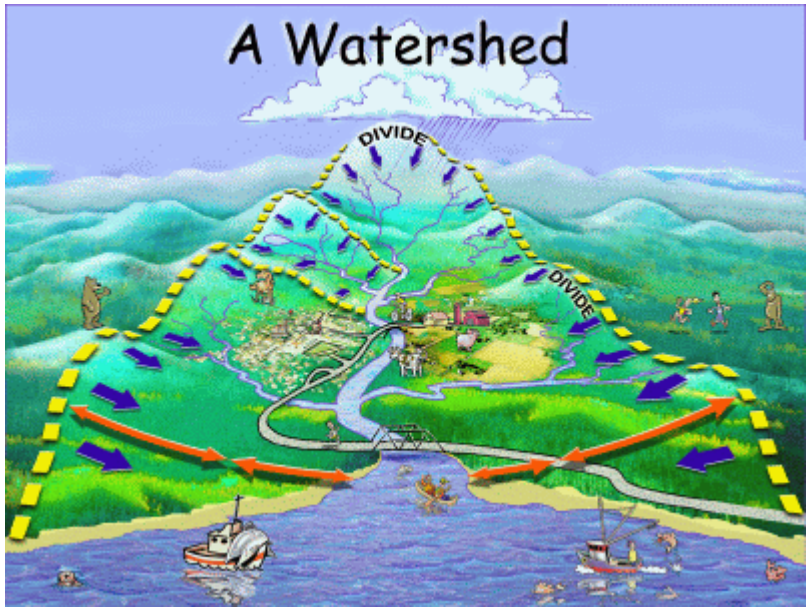


Release Rate Rules

- If the detention pond collects water for a range of frequency storms but releases at the one higher rate for this range, what happens?
- Example: 5-year storm release rate. Erosion.
  - Predevelopment about once every 5-years.
  - Post development…… releases at this rate maybe many times a year!!!!!!!!!!!!!!!!!!! Erosion issues due to less time for bank stabilization and increased erosive forces.

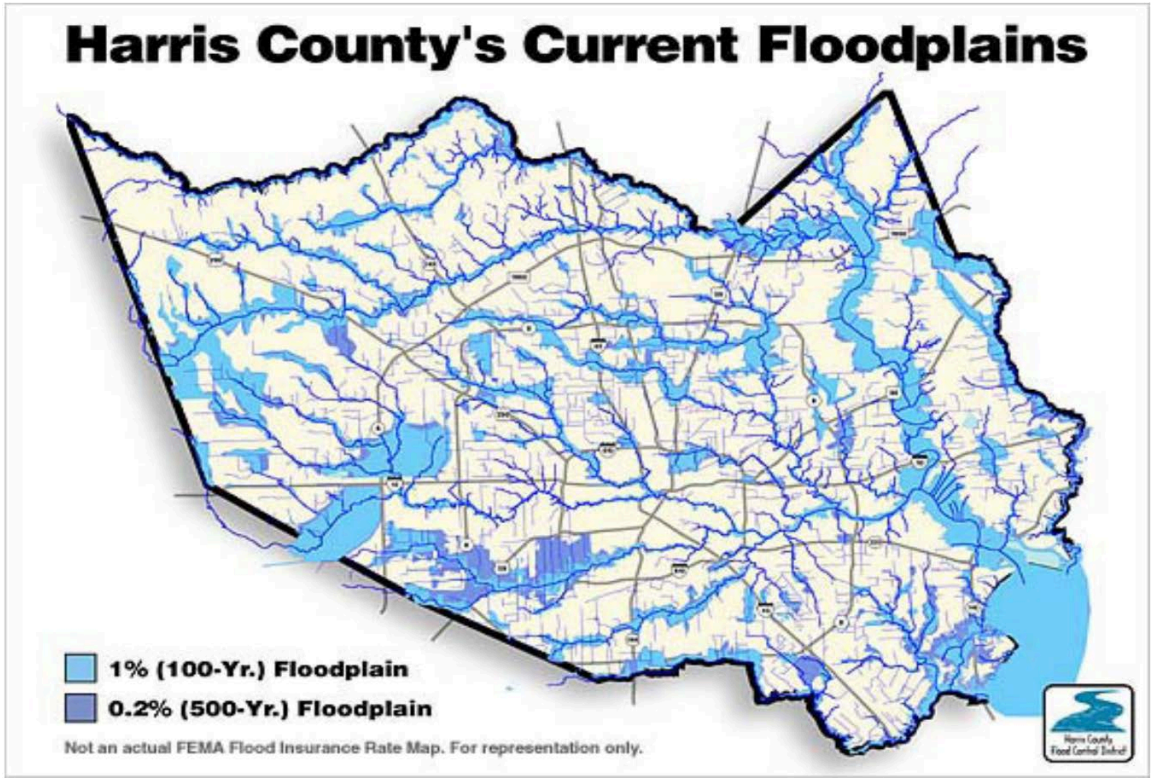
Release Rate Rules

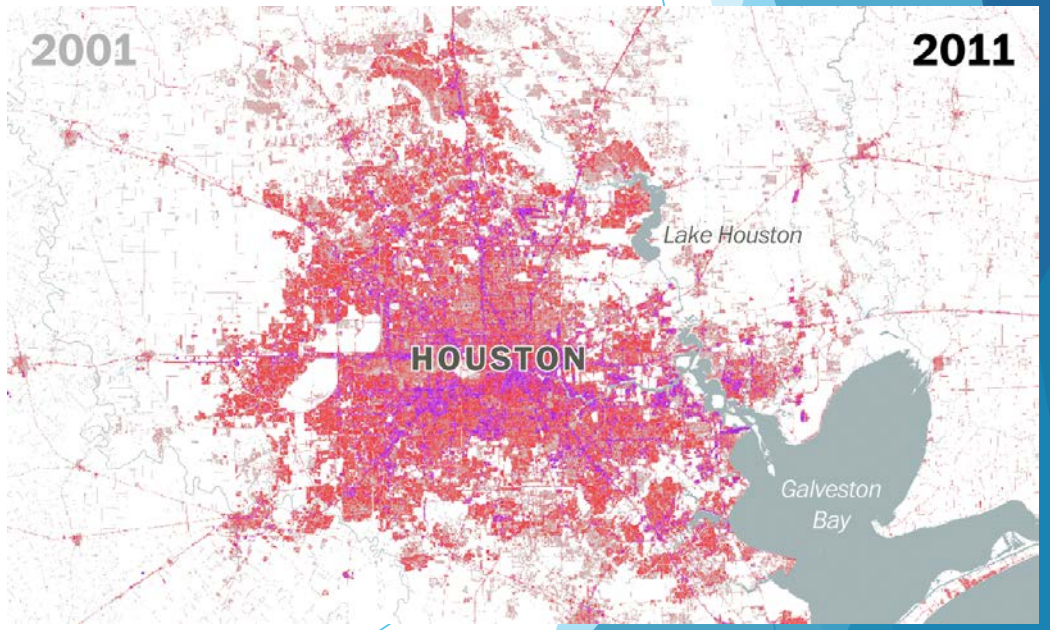
- Detention facilities are designed to release water at certain rates related to storm sizes and associated flows (Qs) from that size storm.
- Example: 5-year storm release rate. Upstream of Harvey where the storm was less than a 5-year storm?



Release Rate Rules

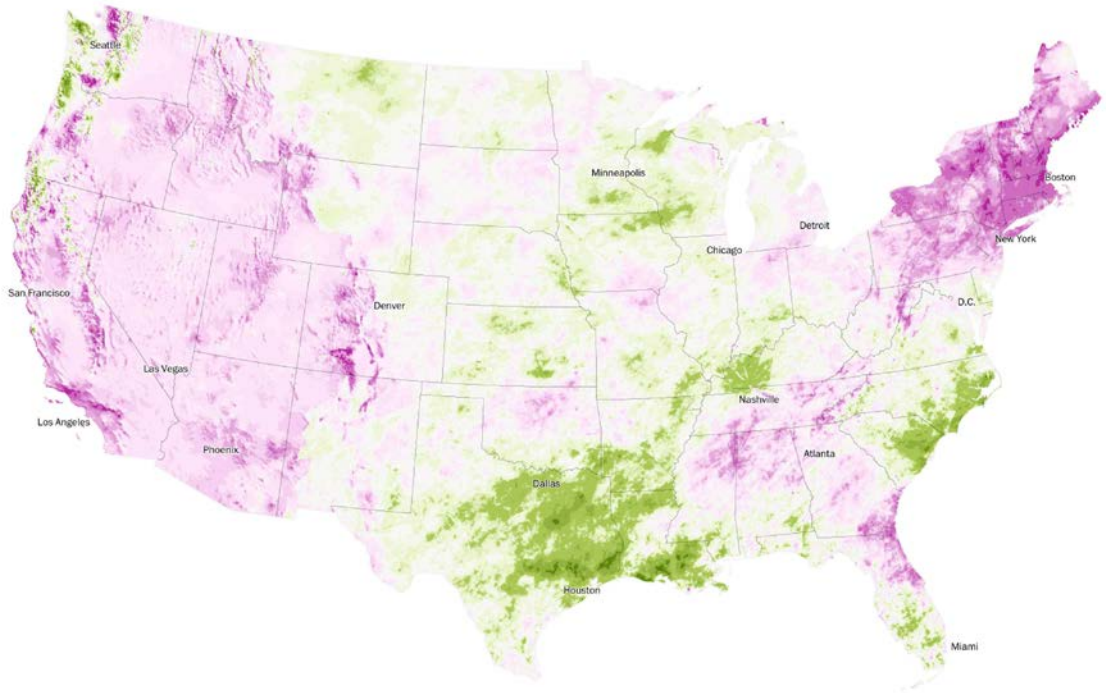
- Detention facilities are designed to release water at certain rates related to storm sizes and associated flows (Qs) from that size storm.
- Example: Release rates upstream of Harvey?
- Growth: https://www.washingtonpost.com/graphics/2017/investigations/harvey-urban-planning/?utm_term=.c578e3c21c11





Release Rate Rules

- Detention facilities are designed to release water at certain rates related to storm sizes and associated flows (Qs) from that size storm.
- Example: Greater than storm release rates upstream of Harvey?
- This is an example of variations from average precipitation in 2016. But think about upstream.



Release Rate Rules

- Detention facilities are designed to release water at certain rates related to storm sizes and associated flows (Qs) from that size storm.
- Example: Greater than storm release rate upstream of Harvey?
- Stream and river flow models are based on the release in an area based on the particular storm there and the average runoff coefficient. But what if development is causing releases upstream at larger storm rates than what falls?