

# How Green Infrastructure Can Reduce Stormwater Runoff in Northern Gulf Communities

By Cristiane Surbeck, PhD, Liya Abera PhD Candidate, and Kristina Alexander, JD

For more details on the findings presented here, see  
**“Determining Implementation Barriers for Green Infrastructure  
for Coastal Flood Control”**



THE UNIVERSITY of  
**MISSISSIPPI**



Two sites were chosen to test how small areas of green infrastructure could reduce stormwater runoff in Northern Gulf communities

Biloxi, MS and  
Orange Beach, AL

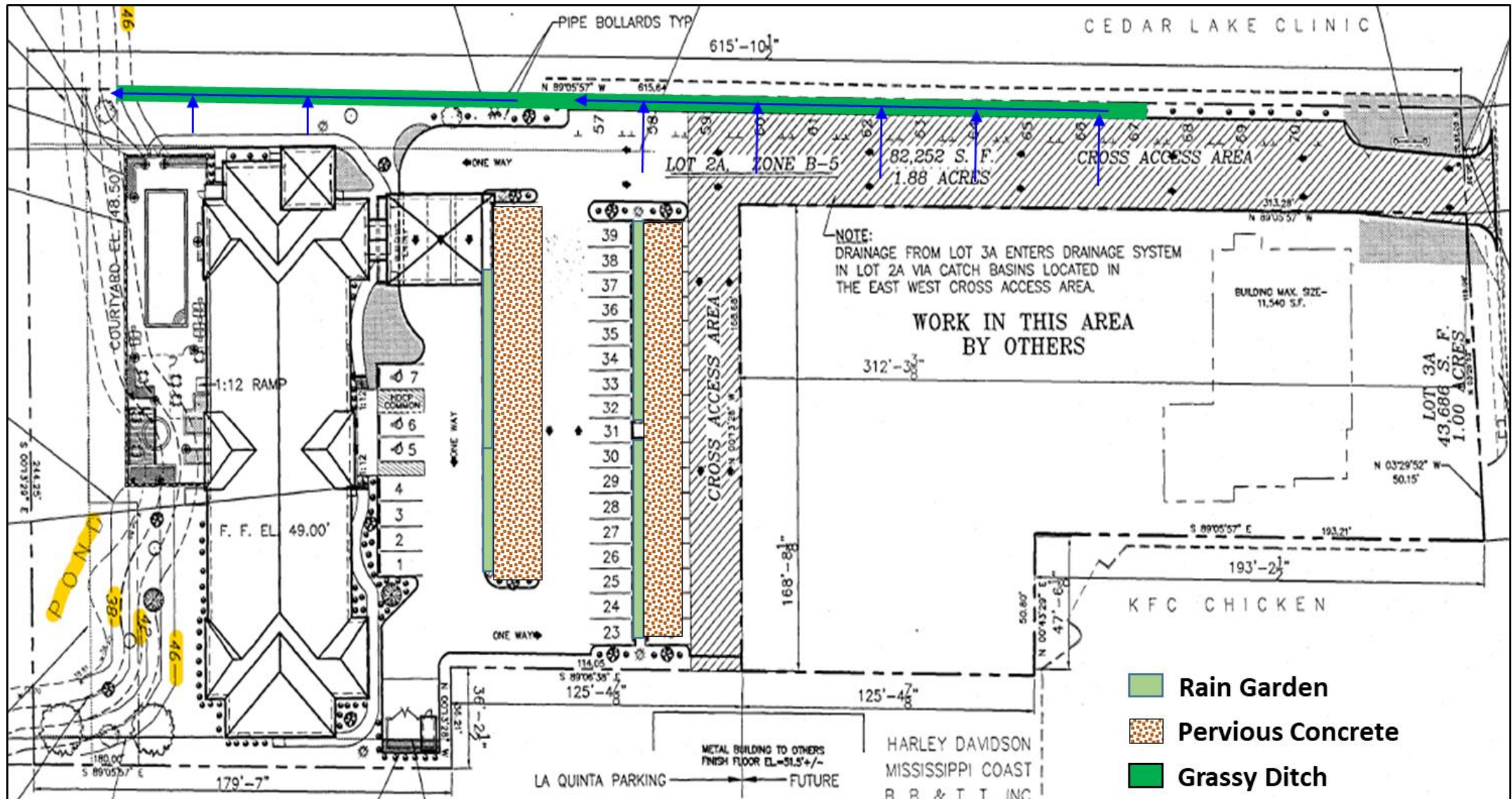
Pre-development runoff rates were compared to rates where the site had the following types of green infrastructure:

- Grassy ditch
- Rain garden
- Permeable pavement

These types of infrastructure were chosen as being practical to use on sites that have high percentages of impermeable structures/pavement.

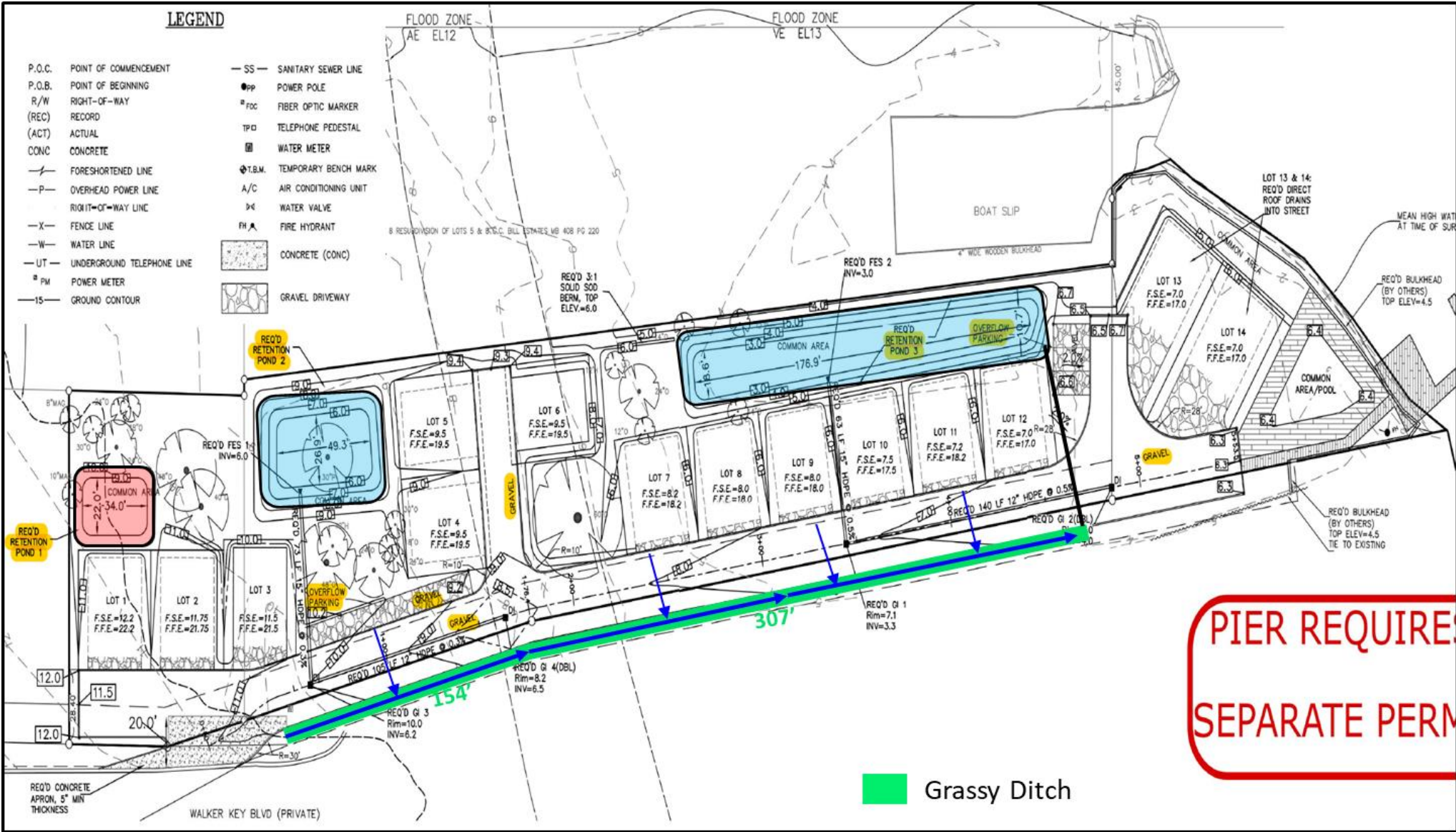


# Biloxi Site: Commercial




- Rain Garden
- Pervious Concrete
- Grassy Ditch

# And a residential site in Orange Beach, AL



**PIER REQUIRED  
SEPARATE PERM**

 Grassy Ditch

Each city requires assessing a different storm when assessing runoff rates and volumes:

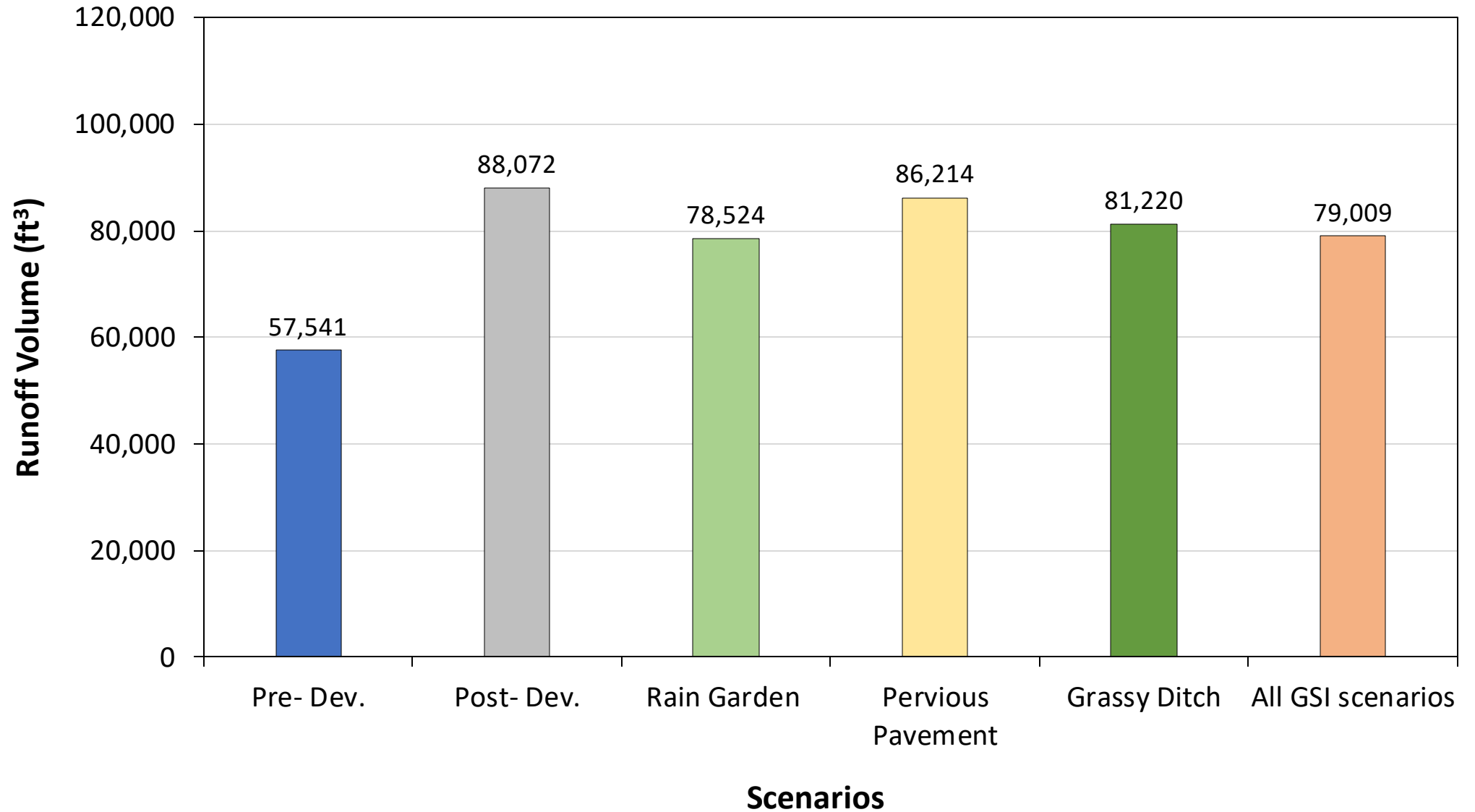
Biloxi – 100-yr design storm

Orange Beach – 25-yr design storm

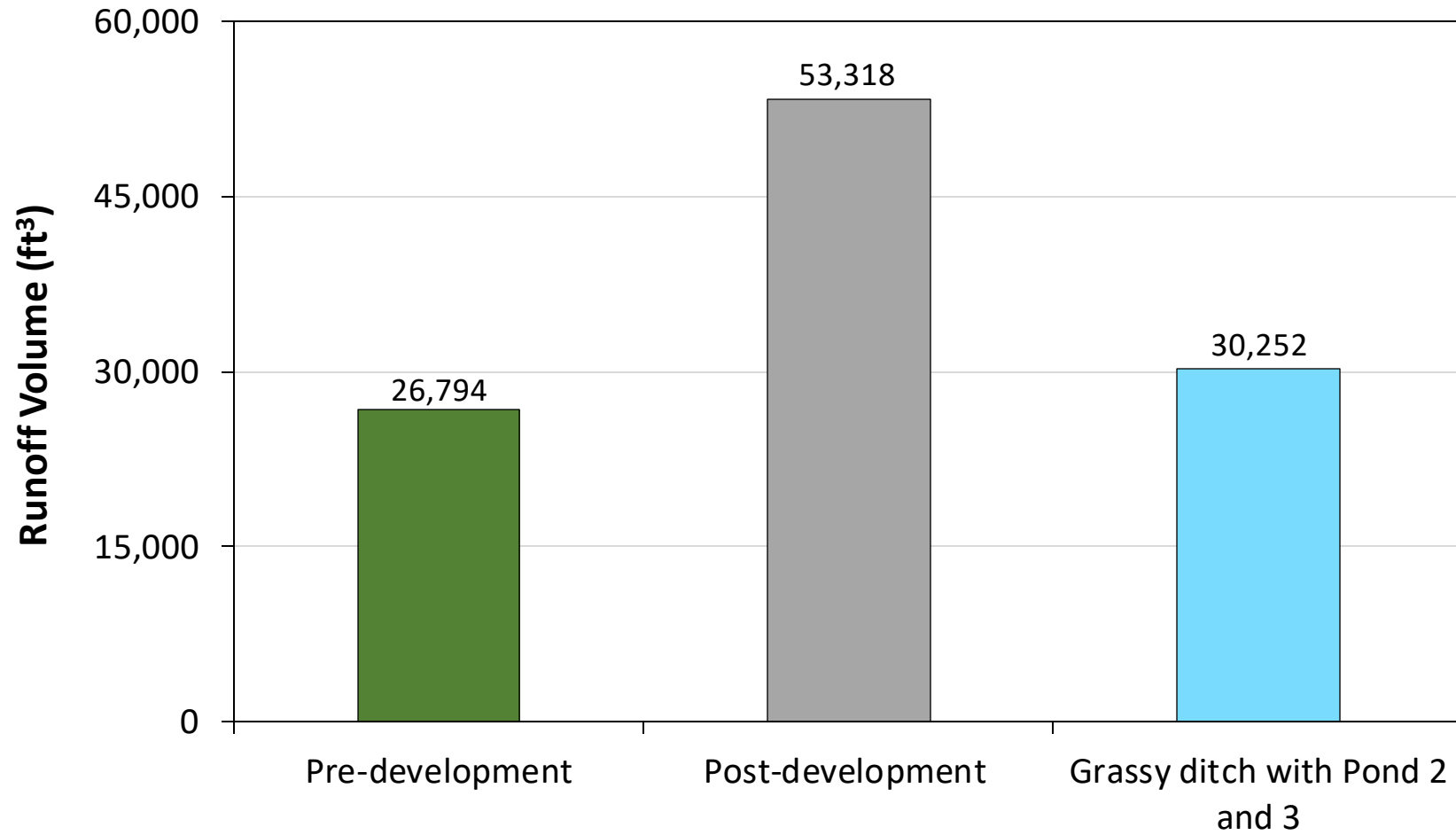
The most effective/practical green infrastructure varies by site. For the commercial site in Biloxi it is a rain garden. For the residential site in Orange Beach it is a grassy ditch.



# Biloxi: 100-yr Design Storm



# Orange Beach: 25-yr Design Storm



These graphs show that green infrastructure alone does not reduce runoff volume to pre-development conditions.

So traditional gray infrastructure is still necessary.



On smaller city sites, a combination of green and traditional infrastructure will be required to reduce runoff to pre-development rates.

Using effective green infrastructure offers ecological benefits that traditional infrastructure does not.

The research reported in this presentation was funded through the U.S. Department of Commerce's National Oceanic and Atmospheric Administration under NOAA Award NA18OAR4170080 and the Mississippi-Alabama Sea Grant Consortium.

