
SUMMARY:
BEST PRACTICES FOR INCORPORATING GREEN STORMWATER INFRASTRUCTURE (GSI)

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The Mississippi-Alabama Sea Grant Consortium awarded a grant to a team from the University of Mississippi¹ to assess the costs and efficacies of green stormwater infrastructure (GSI) when used on 5-acre or smaller sites in the Northern Gulf of Mexico. In general, studies point to three obstacles to implementing GSI: technical, financial, and regulatory. The team developed Best Practices for Northern Gulf of Mexico Municipalities to Incorporate Green Stormwater Infrastructure in Municipal Ordinances. This is a summary of those recommendations.

1. **Ensure consistency among city ordinances.** Use identical terms throughout ordinances – flooding, land use, and stormwater – as well as within each section. A court may find that imprecise wording means an ordinance is vague or ambiguous. Ensure that standards such as for design storms are the same and that terms and materials are described uniformly. For example, it is better to use *permeable* consistently rather than sometimes using *porous* or *pervious*. Define terms.
2. **Impose different stormwater requirements based on topography.** Development in an area that is naturally lower than surrounding areas will offset a greater amount of stormwater than will in a level area. Accordingly, ordinances for building in that bowl-shaped area should require greater stormwater runoff offsets and limit fill. Additionally, cities should impose stricter standards than those offered by FEMA for building in floodways which allow increasing the base flood elevation by up to 1 foot in those areas (*see* FEMA, [Model Code-Coordinated Ordinances § 105.3\(2\)](#)).
3. **Employ GSI wholistically to reduce stormwater runoff.** Stormwater ordinances should establish a preference for GSI to reduce runoff rather than requiring only gray infrastructure. GSI also should be part of other sections of city ordinances such as by incorporating GSI elements into landscape requirements in land use ordinances.
4. **Establish engineering standards for GSI.** Properly designed and located GSI is most effective. For example, ordinances should require that plans for retention/detention ponds include a qualified assessment of the water table, topography, and runoff data prior to the city's approval. Additionally, greater results are achieved from GSI by establishing infiltration standards for materials and landscaping elements.
5. **Make long-term maintenance and enforcement obligations clear and permanent.** To address cities' concern that ongoing maintenance of GSI is performed, cities should require property owners to file an easement with the deed establishing that ownership and maintenance of stormwater facilities run with the land, and include a covenant to allow a city to act to repair – without notice in emergencies – and recoup its expenses, including labor, from the responsible property owner.
6. **Do not exempt single-family and duplex residential development from stormwater compliance.** While residential areas have a lower percentage of impermeable areas per site, residential areas may make up a significant portion of a municipality. Therefore, cities should not limit GSI only to commercial, multi-family residential, or within an approved subdivision plan. Employing this recommendation would expand the reach of typical stormwater ordinances.

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7. **Address stormwater as if it is a preventable nuisance.** Extend Best Management Practices requirements to ongoing maintenance of stormwater facilities, addressing more than detention/retention facilities. Cities should establish enforceable consequences for systems that fail and cause increased runoff.

8. **Modify existing requirements to allow for informal GSI.** Many ordinances require curbs in parking lots, maximum parking density, and irrigation systems for landscaping. These requirements, and others, can be modified to improve stormwater resilience and to make planned GSI systems work more efficiently. For example, curbs in parking lots should not block water from reaching landscaped areas, irrigation systems should have moisture sensors.