

LITERATURE REVIEW ON STORMWATER OUTREACH PROGRAMS

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APPROACH

- Reviewed 57 literature sources across 5 topics:
 - Fertilizer
 - Pet waste
 - Septic maintenance
 - Car washing
 - Lawn clippings
 - Marina pumpouts
- Studies needed to include before and after survey/ WQ monitoring results OR a control group/paired watershed study.



RESULTS



- Fertilizer Outreach – 24 sources
 - 4 discussed water quality improvements (some measured, some estimated)
 - Focus on awareness/behavior change measurement
- Pet Waste Outreach – 29 sources
 - 4 discussed estimated water quality improvements (estimated based on amount of pet waste collected)
 - Focus on awareness/behavior change measurement
- Septic Tank Outreach – 10 sources
 - Focus on awareness/behavior change measurement
- Car Washing Outreach – 12 sources
 - Focus on awareness/behavior change measurement
- Lawn Clippings Outreach – 12 sources
 - 1 source showed no link between good behavior and water quality
- Marina Pumpout Outreach – 2 sources
 - Focus on awareness/behavior change measurement

FINDINGS

- **Lack of water quality monitoring data to support outreach results.**
 - Although 8 studies discussed water quality, several made *estimates* of water quality reductions based on:
 - Pounds of pet waste picked up at stations.
 - Number of people self-reporting that they pick up pet waste.
 - Number of people self-reporting that they were using less fertilizer.
 - Only a few studies use a paired watershed monitoring approach or direct downstream water quality monitoring to determine changes after outreach.



FINDINGS (CONT.)

- **Lack of consistent, statistically significant behavior change results.**
 - 60% provided no evidence of statistical significance, therefore significance of any reported changes is unknown.
 - 40% used statistical analysis in their evaluation.
 - Some reported statistically significant changes in awareness or behaviors.
 - Analysis is complicated by multiple variables.
- **Lack of data from the Chesapeake Bay watershed.**
 - Only 5 relevant sources from Bay states.
 - Most of the sources came from WA and FL.
- **Not enough monitoring data for expert panel.**

RECOMMENDATIONS

- Link Outreach Efforts to Water Quality Monitoring
- Use Before and After Analysis
- Fertilizer Use Reduction
 - Target commercial applicators
 - Use social norms
 - Focus on proper label reading and soil testing
 - Perhaps link/track fertilizer sales
- Pet Waste Pick Up
 - Pet waste disposal stations, signage, bags, and behavior modeling/intervention
- Septic Tank Maintenance
 - Workshops and inspections
 - Certification of inspectors including DIY inspectors
 - Robust tracking system for systems and maintenance