



**Resources for Stormwater Managers throughout the
Texas Gulf Coast: An Annotated Bibliography**

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Preface

The intent of this bibliography is to make stormwater professionals aware of publications published by the Texas A&M University System that are available at little or no cost.

When enacting or administering stormwater education programs, it can be quite difficult to locate objective, science-based resources that can be used to inform the public of actions they can take to help reduce pollutants in stormwater runoff.

The Texas A&M University System has produced a series of educational and technical resources that focus on stormwater management. These publications and technical materials describe practical methods homeowners can take to lessen pesticide and fertilizer applications to landscapes, thus reducing the potential for nonpoint pollution. These educational resources also present information on water conservation, rainwater harvesting, water quality protection, and other stormwater-related resources. Please note that some of these publications are listed in more than category since they may cover several interrelated stormwater issues.

Several of these publications can be downloaded from the Texas Cooperative Extension Bookstore, on the web at <http://tcebookstore.org>. Once you are at this site, you will have to search by the author's name, the title of the fact sheet, or the subject area to find the exact link to the on-line publication. You can also purchase printed copies of most of these materials from the TCE Bookstore.

This listing only presents materials produced by Texas Cooperative Extension, the Texas Agricultural Experiment Station, the Texas Sea Grant Program, and other units of Texas A&M University. Other organizations have also published excellent resources pertaining to stormwater education resources for the Texas Gulf Coast.

It is hoped that these resources will benefit stormwater managers throughout Texas and the public they serve by helping to increase awareness about how individuals can make informed decisions to best protect coastal water resources.

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1. Landscape Management

Residential and commercial landscapes can be major contributors of nutrients and pesticides that run off in stormwaters. This series of publications describes how homeowners and groundskeepers can develop and maintain beautiful landscapes that will not adversely affect water quality.

“WaterSmart Landscapes for the Upper Gulf Coast: Low Maintenance & Water Resource Friendly,” by John Jacob.

The intent of this very user-friendly publication is to motivate homeowners to substantially lessen pesticide, fertilizer, and water use. The publication provides useful landscaping tips about such topics as how to minimize pesticide use; how to lessen the frequency of pesticide applications; ways to bag and reuse grass clippings; arranging similar landscape plants so that “water-loving” plants are grouped together; and choosing plants with low water use and maintenance needs. The fact sheet identifies ground covers, shrubs, and trees that are ideal for the Texas Gulf Coast, and require minimal water and fertilizer inputs.

Note: This fact sheet was published by Texas Cooperative Extension, the Texas Sea Grant Program, and Clean Water for Armand Bayou. You can download the publication as a PDF file at <http://www.urban-nature.org/publications/pdf/WS-WatersmartBrochure.pdf>.

“Five Tips for Organic Lawn Care on the Upper Texas Gulf Coast,” by John Jacob.

This publication describes the benefits of “organic landscapes”--lawns and landscapes that can look great and function well, but do not require frequent watering and pesticides. The fact sheet discusses how to mow at the right height; the use of organic fertilizers; the use of compost as a soil additive; strategies to avoid overwatering; and how proper use of organic landscape principles can lessen insect pest problems.

Note: This fact sheet was developed by Texas Cooperative Extension and the Texas Sea Grant Program. This publication can be downloaded as a PDF file at <http://www.urban-nature.org/publications/pdf/WS-organicLawnCare.pdf>

B-6088. “Athletic Fields and Water Conservation,” by Gene Taylor, Richard White, Scott Abernathy, and David Smith.

This fact sheet describes how irrigation systems operate and instructs users about how to perform an irrigation audit. Several factors that need to be considered when carrying out a water audit are discussed including soil types, the rooting depth of turfgrasses, water requirements, and environmental conditions that influence water use. The fact sheet presents information about irrigation scheduling based on potential evapotranspiration rates and includes forms used in irrigation audits.

Note: This fact sheet can be downloaded as a PDF file from the Texas A&M University Soil and Crop Sciences Department at <http://soilcrop.tamu.edu>.

B-6153. “Rainwater Harvesting,” by Russell Persyn, Dana Porter, and Valeen Silvy.

This publication presents information on why homeowners should consider harvesting rainwater, describes how rainwater harvesting works, and provides tips for system design and construction. The publication enables homeowners to estimate how much water they can expect to store by using rainwater harvesting and provides advice for system upkeep and maintenance.

Note: This publication was published in 2004. It can be downloaded at <http://tcebookstore.org/>

B-6126. “Keep Your Lawn Alive During Drought,” by James McAfee.

This publication describes irrigation and landscape management measures homeowners can use during various stages of droughts—if water suppliers mandate reduced water use, implement alternate day irrigation programs, require water rationing. Practical advice is given for how to maintain four turfgrass varieties—Buffalograss, Bermudagrass, Zoysiagrass, and St. Augustinegrass—during droughts.

Note: This fact sheet was published in 2002. It can be downloaded at <http://tcebookstore.org>.

B-6125. “Lawn Water Management,” by James McAfee.

This fact sheet presents information for homeowners about how to manage the amount of water applied to lawns. The fact sheet includes such topics as the importance of soil types and other environmental factors; management practices such as fertilization and mowing; and the water requirements and drought tolerances of different turfgrass varieties.

Note: The fact sheet was developed in 2002. It can be downloaded as a PDF file at <http://tcebookstore.org>.

L-5324. “Protecting the Environment Using Integrated Weed Management in Lawns,” by Mary Ketchersid and Paul Baumman.

This fact sheet describes how homeowners and landscape managers can follow the principles of integrated pest management to control weeds in their lawns and landscapes. The publication presents a number of ways to prevent weed problems, including planting adapted turfgrass varieties, managing insects and disease, and employing mechanical means to remove weeds. The fact sheet also discusses how to choose a correct herbicide and how to apply it properly.

Note: The fact sheet was published in 1999. It can be downloaded at <http://tcebookstore.org>.

“Texas Smartscape,” by Dotty Woodson.

Texas Smartscape is a CD-ROM that aids in landscape planning and maintenance for conserving water and protecting water quality. It was developed by the Tarrant County office of Texas Cooperative Extension. Texas Smartscape teaches consumers how to plant a landscape using native and adapted plants to reduce the amount of water, fertilizer, and pesticides needed to develop and maintain a beautiful landscape.

Notes: The CD can be obtained free of charge by contacting Texas Cooperative Extension in Fort Worth at (817) 884-1944. The Texas Smartscape is online at <http://www.txsmartscape.com>.

B-5052. “Safe Use of Pesticides and Fertilizers at Home,” by Ann Beard.

This fact sheet explains procedures to safely use pesticides and fertilizers and methods to safely use pesticides and fertilizers in residential landscapes.

Note: This fact sheet was developed in 1994. Copies are \$1 each. There are roughly 300 copies available.

L-1793. “Testing Your Soil: How to Collect and Send Samples,” by Tony Provin and John L. Pitt.

Soil tests can be used to estimate the kinds and amounts of soil nutrients available to plants and to determine fertilizer needs. This publication covers the three-step procedure for obtaining sample bags and instructions, collecting composite soil samples, and selecting the proper test to be conducted by the Soil, Water and Forage Testing Laboratory.

Note: This fact sheet was developed in 2002. It sells for \$1.00, and there are more than 4,000 copies in stock. You can download it at <http://tcebookstore.org>.

B-1584. “Xeriscape...Landscape Water Conservation,” by Douglas F. Welsh, William C. Welch and Richard L. Duble.

This fact sheet explains the major components of xeriscapes, including planning, soil preparation, plant selection, maintenance, watering, irrigation systems, mulching and mowing. There are lists of outstanding landscape plants for Texas, with native plants highlighted.

Note: This publication was published in 2001. Single copies sell for \$4.00. You can download the report at <http://tcebookstore.org>

L-5050. “Water Smart--How J.R. Water Saves Water in His Home and Lowers His Water Bill,” by William E. Knoop.

Prepared for use with the “Water Smart” program, this fact sheet points out the importance of conserving water inside the home.

Note: This was published in 1992 and single copies sell for \$1.

L-5053. “Water Smart--How J.R. Waterer saves water and has the greenest lawn in the neighborhood,” by William Knoop.

Prepared for use with the “Water Smart” program, this fact sheet stresses the need to conserve water in managing landscapes.

Notes: This was published in 1992 and single copies sell for \$1.

L-5049. “Seven Water Smart Tips to Lower Your Water Bill and Save Water in Your Home,” by William Knoop.

Prepared for use with the “Water Smart” program, this fact sheet discusses the urgent need to conserve water. The information includes practical tips for using water wisely inside the home.

Notes: This was published in 1992. Single copies cost \$1, and there are 4,000 copies in stock.

Web Site--Water Gardening in Texas

This website discusses a number of principles homeowners can use to develop and plan a water garden, including such issues as site selection, plant life, maintenance, design considerations, construction methods, and wildlife. The website includes a bibliography and references.

Note: The website address is <http://aggie-horticulture.tamu.edu/extension/homelandscape/watergarden/index.html>

2. Water and Watershed Education Programs

Education programs can be a very effective method to engage youth and adults about the importance of stormwater issues. Texas Cooperative Extension has developed several innovative education programs about stormwater and related water resources issues.

4-H 17-1. "Investigating Water," by Ronald Howard, Jr.

This 3-ring binder contains plans for 12 lessons on topics such as "Water in Our Daily Lives," "The Water Cycle," "Amazing Aquifers," "Water and Soil," "Aquatic Ecosystems," and "Water Wise Use." Accompanying each lesson plan are activity and record sheets for hands-on learning experiences. This curriculum is intended for students in about 4th to 8th grades.

Note: This information was published in 2002. Single copies sell for \$50. The material can be downloaded as a PDF at <http://tcebookstore.org>.

SP-136. "Something's Fishy," by Billy Higginbotham.

This notebook and CD program has been used to teach hundreds of Texas students about natural resources, aquaculture, and water resources. This set contains the multi-media program on CD and the teacher's curriculum.

Note: This was published in 2002. It sells for \$49.95

"Resource Manual for the MarshMALLOW (Marsh Management Activities for Learning the Lifestyles of Wildlife) Project," by Russ Miget.

The MarshMALLOW project is a school enrichment program designed to educate youth, teachers, adult volunteers and parents about wetland wildlife and habitat requirements; wetland functions, values, management, and restoration; and the important role wetlands play in our society. Participants learn about wildlife and habitat by adopting wetlands, marshes, and similar habitats, and actively managing these areas to benefit wildlife. Management measures may include constructing levees and drain pipes to control water levels, installing nesting boxes for ducks or perches for birds of prey, planting emergent vegetation, creating or enlarging buffer zones, etc. Information gained from careful observation of changes brought about through management techniques is presented to fellow students and the public through presentations and other means.

Note: A packet of resource materials that support the MarshMALLOW program is available. Contact Russ Miget at r-miget@tamu.edu to learn how to obtain these materials.

3. Septic Systems and On-Site Sewage Facilities (OSSFs)

Septic systems (also known as on-site sewerage facilities or OSSFs) can have a major impact on stormwater runoff quality, as well as water quality in receiving waters. These publications provide homeowners with valuable advice that can be used to plan, build, and manage OSSFS in a manner that will not degrade surface and ground water quality.

Several of these fact sheets can be downloaded from the TCE bookstore, <http://tcebookstore.org>, or from the Texas A&M OSSF website, <http://ossf.tamu.edu>.

B-6029. “TEX-A-SYST: Reducing the Risk of Ground Water Contamination by Improving Household Wastewater Treatment,” by Bill L. Harris, Dennis Hoffman and Frank Mazac, Jr.

Household wastewater treatment systems (septic systems) can contaminate groundwater unless they are properly designed, constructed and maintained. This publication describes various kinds of OSSFs as well as guides the homeowner in assessing their safety.

Note: This fact sheet was published in 1997. It can be downloaded as a PDF file at <http://tcebookstore.org>.

L-5414. “On-Site Wastewater Treatment Systems: Mound Systems,” by Bruce Lesikar and Vance Weynand.

This fact sheet describes how mound systems can be used to treat domestic wastewater in on-site systems. Mound systems can be very useful at sites where shallow or perched groundwater is present. The fact sheet discusses the various components of mound systems, including a pretreatment chamber (usually a septic tank); a pump tank for dosing wastewater; and the use of pressurized distribution systems and mounded drainfields. It also discusses the components of mounds used for wastewater treatment, including the sand layer, the absorption area; layers of sandy loam; and a topsoil cap. The use of geotextile fabric and a low-pressure distribution system are presented,

Note: This fact sheet was published in 2002. An English and Spanish version can be downloaded at <http://tcebookstore.org>.

L-5347. “On-Site Wastewater Treatment Systems: Operation and Maintenance,” by Bruce Lesikar.

This fact sheet provides a basic overview of how onsite wastewater treatment systems work, and describes the functions of septic tanks and drainfields. The fact sheet provides tips for homeowners on maintenance and management issues, including such areas as water conservation, the use of garbage disposals, the need to periodically clean septic tanks, maintaining a grass cover over the drainfield, and several other topics.

Note: This fact sheet was published in 2000. An English and Spanish version can be downloaded at <http://tcebookstore.org>.

L-5346. “On-Site Wastewater Treatment Systems: Pump Tanks,” by Bruce Lesikar and Russell Persyn.

This fact sheet presents information about the components of pump tanks used for onsite wastewater treatment as well as how pump tanks should be designed for wastewater treatment. The fact sheet describes ways to design pump tanks so they are more accessible for routine monitoring, provides tips for homeowners about how to keep pump tanks working, and tells homeowners what to do when alarms sound.

Note: An English and Spanish version of this fact sheet can be downloaded at <http://tcebookstore.org>.

L-5345. “On-Site Wastewater Treatment Systems: Trickling Filters,” by Bruce Lesikar and Russell Persyn.

This fact sheet describes the components of trickling filters used for onsite wastewater treatment. It discusses the ability of trickling filters to reduce contaminants, design considerations, and actions homeowners can take to keep these systems working properly.

Note: An English and Spanish version of the fact sheet can be downloaded at <http://tcebookstore.org>.

L-5344. “On-Site Wastewater Treatment Systems: Tablet Chlorination,” by Richard Weaver and Bruce Lesikar.

This fact sheet describes the proper type of chlorine tablet to use for domestic on-site wastewater treatment systems, and the different types of chlorine used for OSSF systems, disinfecting swimming pools, and other purposes. It explains how to operate and maintain a chlorination device so it works properly to disinfect treated wastewater.

Note: This fact sheet was published in 2000. An English and Spanish version of this fact sheet can be downloaded at <http://tcebookstore.org>.

L-5343. “On-Site Wastewater Treatment Systems: Gravel-Less Pipe,” by Bruce Lesikar.

This fact sheet discusses the use of gravel-less pipe systems that can be used to distribute treated wastewater into the soil. It describes components of gravel-less pipe systems (i.e., treatment devices, the gravel-less pipe, and pipe trenches). Advantages and disadvantages of this technology, maintenance needs, and estimated costs are discussed.

Note: This fact sheet was published in 2000. An English and Spanish version of the fact sheet can be downloaded at <http://tcebookstore.org>.

L-5342. “On-Site Wastewater Treatment Systems: Leaching Chambers,” by Bruce Lesikar and Russell Persyn.

This fact sheet describes how leaching chambers can be used as an alternative to conventional gravel-filled trenches. It describes leaching chambers and leaching chamber trenches, as well as treatment devices, and discusses the advantages and disadvantages of leaching chambers, maintenance needs and estimated costs.

Note: This fact sheet can be downloaded in English or Spanish at <http://tcebookstore.org>.

L-5302. “On-Site Wastewater Treatment Systems: Aerobic Treatment Units,” by Bruce Lesikar.

This fact sheet describes the basic principles of aerobic treatment units used for domestic treatment of on-site wastewater. It includes information about the design, operations and maintenance of these on-site wastewater treatment systems (OSSFs).

Note: This fact sheet was published in 2000 and can be downloaded as a PDF file at <http://tcebookstore.org/pubs/L5302.pdf>. A Spanish language version can be downloaded as a PDF file at <http://tcebookstore.org/tmppdfs/2767908-L5302S.pdf>

L-5230. “On-Site Wastewater Treatment Systems: Constructed Wetlands,” by Bruce Lesikar and Juan Enciso.

This fact sheet presents information about the components of constructed wetlands systems used for onsite wastewater treatment, as well as how these systems should be designed and maintained. It discusses the types of wetlands plants that function well in these systems, and provides advice about how water levels should be managed to promote plant growth and thus enhance treatment.

Note: This fact sheet was published in 1999. It can be downloaded in English or Spanish at <http://tcebookstore.org>.

L-5229. “On-Site Wastewater Treatment Systems: Sand Filters,” by Bruce Lesikar.

This fact sheet describes how sand filters can be used to treat, collect, and distribute domestic wastewater from onsite systems. The fact sheet illustrates the use of intermittent sand filters as well as recirculating sand filters. Information is provided on how these systems treat wastes, system design, and maintenance needs.

Note: This fact sheet was published in 1999. It can be downloaded as a PDF file in English or Spanish at <http://tcebookstore.org>.

L-5237. “On-Site Wastewater Treatment Systems: Subsurface Drip Distribution,” by Bruce Lesikar.

This fact sheet describes the basic components of subsurface drip irrigation systems used for on-site wastewater treatment, including treatment devices, pump tanks, filtering devices, and a drip distribution system. The fact sheet covers such topics as advantages and disadvantages of using subsurface drip, ways to maintain these systems, and estimated costs.

Note: This fact sheet was published in 1999. It can be downloaded in English or Spanish at <http://tcebookstore.org>.

L-5236. “On-Site Wastewater Treatment Systems: Spray Distribution,” by Bruce Lesikar.

This fact sheet describes spray distribution systems that can be used specifically in conjunction with aerobic treatment units and other types of on-site wastewater treatment systems. Components of spray distribution systems are described, including treatment units, disinfecting devices, pump tanks, and sprinkler equipment. The advantages and disadvantages of spray distribution systems, maintenance issues, and estimated costs are described.

Note: This fact sheet was published in 1999. It can be downloaded as a PDF file in English or Spanish at <http://tcebookstore.org>.

L-5235. “On-Site Wastewater Treatment Systems: Low-Pressure Dosing,” by Bruce Lesikar.

This fact sheet describes how low-pressure dosing (LPD) systems can treat and distribute domestic wastewater in on-site systems. The fact sheet discusses components of LPD systems, including a series of tanks used to settle out and treat wastewater; a pump tank that doses wastewater to the distribution system; and a system for distributing wastewater to the soil. Advantages and disadvantages of LPD systems, maintenance needs, and estimated costs are also discussed.

Note: This fact sheet was published in 1999. It can be downloaded as a PDF file in English or Spanish at <http://tcebookstore.org>.

L-5234. “On-Site Wastewater Treatment Systems: Conventional Septic Tank/Drain Field,” by Bruce Lesikar.

Conventional septic systems have traditionally been the most commonly used technology for treating wastewater. This publication explains the advantages and disadvantages of conventional septic tanks and drainfields, as well as estimated costs and maintenance requirements.

Note: This was published in 1999. Single copies are \$1. You can download this at <http://tcebookstore.org/pubs/L5234.pdf>. A Spanish language version of this fact sheet was published in 1999 and was written by Lesikar and Juan Enciso. It can be downloaded as a PDF file at <http://tcebookstore.org/tmppdfs/2767908-L5234S.pdf>.

L-5228. “On-Site Wastewater Treatment Systems: Evapotranspiration Beds,” by Bruce Lesikar.

This fact sheet discusses how evapotranspiration (ET) beds can be used for on-site wastewater treatment. It provides information on the design of lined and unlined ET beds; how they provide wastewater treatment; and maintenance needs for homeowners.

Note: This fact sheet was published in 1999. It can be downloaded at <http://tcebookstore.org/pubs/L5228.pdf>. A Spanish language version can be downloaded as a PDF file at <http://tcebookstore.org/tmppdfs/2767908-L5228S.pdf>.

L-5227. “On-Site Wastewater Treatment Systems: Septic Tank/Soil Absorption Field,” by Bruce Lesikar.

For septic tank and soil absorption systems to work properly, homeowners must choose the right kind of system for their household size and soil type, and must maintain them regularly. This publication explains the treatment, design, operation and maintenance of septic tank and soil absorption systems.

Note: This was published in 1999. Single copies are \$1. You can download this at <http://tcebookstore.org/pubs/L5227.pdf>. A Spanish language version of this fact sheet can be downloaded as a PDF file at <http://tcebookstore.org/tmppdfs/2767908-L5227S.pdf>.

TWRI Fact Sheet. “Resources to Replace On-Site Wastewater Treatment Systems in Texas,” by Ric Jensen.

This fact sheet describes resources available to replace failed onsite wastewater treatment systems (OSSFs) and to build install new systems. The programs of several state agencies in Texas are described, as well as resources from federal and local agencies as well as nonprofit organizations.

Note: Single copies of this fact sheet are available free from TWRI. The report can be downloaded as a PDF file at <http://twri.tamu.edu/reports/2001/2001-001/>

B-6098. “On-Site Wastewater Treatment Systems: Alternative Collection Systems,” by Bruce Lesikar.

This fact sheet discusses the relative merits of centralized and decentralized domestic wastewater treatment. It addresses such issues as management and maintenance, cost-effectiveness, and the planning process, and describes the merits of small diameter gravity sewers, small diameter pressure sewers, and vacuum sewers.

Note: This fact sheet was published in 2000. It can be downloaded as a PDF file at <http://tcebookstore.org/pubs/B6098.pdf>. A Spanish-language PDF version can be downloaded at <http://tcebookstore.org/tmpdfs/2767908-B6098S.pdf>.

SP-132. “Overview of Septic Systems” (DVD) by Bruce Lesikar.

SP-129. “Overview of Septic Systems” (VHS),” by Bruce Lesikar.

This 28-minute video on DVD describes the technologies available for managing residential wastewater. It can help homeowners choose the type of system they need.

Note: This DVD and Video were produced in 2002. Single copies of the videotape or the DVD are \$25 each. They can be purchased from the Texas Cooperative Extension bookstore at <http://tcebookstore.org>.

SP-70. “On-Site Wastewater Treatment Systems: Constructed Wetlands,” by Bruce Lesikar.

This video covers the use of constructed wetland technology for domestic onsite wastewater treatment systems.

Note: This video can be purchased for \$15 from the Texas Cooperative Extension bookstore at <http://tcebookstore.org>.

PowerPoint Presentations about OSSFs

Bruce Lesikar of Texas Cooperative Extension has developed PowerPoint presentations about several issues related to onsite wastewater treatment that can be downloaded free of charge. Topics covered by these presentations include: aerobic treatment unit design, conventional drainfields; conventional drainfields; drip distribution systems; evapotranspiration beds; gravel-less pipe; leaching chambers; low pressure dosing; overview of constructed wetlands; pump tanks; pumped drainfields; sand filter design; spray distribution systems, and trickling filter design.

Note: The presentations can be downloaded at <http://ossf.tamu.edu/presentations.htm>

4. Water Rights and Return Flows

Water quality in coastal areas is directly impacted by the amount of water entering bays. These publications may not have direct use in a stormwater education campaign, but could be useful to regional water managers as they assess how differences in freshwater inflow rates may affect the water quality and biology of coastal ecosystems.

“Water for Texas: Increasing Demands, Tough Choices,” by Allan Jones, L.G. Raun, Gene Nelson, and Ric Jensen.

This publication was developed in advance of the 2003 Texas Water Summit. It outlines several water resources issues facing Texas, including meeting future water needs, water marketing and transfers, and providing instream flows. It also presents background information about major water challenges facing Texas, including demand and supply projections, and how the regional planning process is used to set the agenda to resolve water needs in Texas. The publication was used to inform attendees at the 2003 Texas Water Summit of key issues that would be discussed at that event.

Note: This publication was published in 2003. It can be downloaded at <http://agsummit.tamu.edu>.

“The Texas Water Summit: Summary Report and Recommendations,” by Allan Jones, L.G. Raun, Gene Nelson, and Ric Jensen.

This report presents the prioritized rankings from attendees at the 2003 Texas Water Summit about issues related to meeting water demands, providing instream flows, and water marketing and transfers. The report summarizes discussions about these issues during the Summit and lists strategies to deal with these concerns.

Note: This report is on the web at http://agsummit.tamu.edu/water_summit/FinalReport_Water.pdf

“Water Management Strategies: Ranking the Options,” by Ronald Kaiser, Bruce Lesikar, C. Scott Shafer, and Jan Gerston.

This fact sheet was published jointly by Texas Cooperative Extension and the Texas Water Resources Institute. It presents results from a survey of members of 16 regional water planning groups about the strategies they prefer to best meet water resources needs. In this survey, participants were asked to rank the types of water management strategies they preferred as well those that were thought to be most feasible. Some of these strategies respondents considered include cancellation of unused water rights; the purchase and/or lease of water rights; and other water supply and demand management measures. The fact sheet also presents an overview of water planning in Texas.

Note: This fact sheet was published in 2000. You can download a copy at <http://twri.tamu.edu/reports/2002/tr200/tr200.pdf>

“The Handbook of Texas Water Law: Problems and Needs,” by Ronald Kaiser.

This handbook was developed by the Texas Water Resources Institute. It provides an overview of the evolution of surface water law in Texas; drainage water law; groundwater law; and public access to waters. The handbook provides a timeline of the history of Texas water law; a glossary; and a list of suggested readings.

Note: The handbook was published by TWRI in 1992. You can download the report as a PDF file at <http://texaswater.tamu.edu>.

“Untying the Gordian Knot: Negotiated Strategies for Protecting Instream Flows in Texas,” by Ronald Kaiser.

This article focuses on ways to provide and protect instream flows in Texas. The paper also discusses the allocation of waters in Texas rivers and streams as well as the legal, technical, and institutional effectiveness of various mechanisms to protect instream flows.

Note: This article was published in the “Natural Resources Journal” in 1998. You can download it from Kaiser’s website, <http://www.tamu.edu/rakwater>

TR-167. “Legal and Institutional Barriers to Water Marketing in Texas,” by Ronald A. Kaiser and Frederick Boadu.

This report discusses ways Texas can cope with increasing water demands, focusing on management strategies that emphasize institutional change, heightened conservation, and reallocation of existing water supplies. The report describes how water can be reallocated by the cancellation of unused water rights or by the voluntary transfer of water rights between willing buyers and sellers. It discusses how water marketing encourages voluntary transfers rather than forced reallocations, because it moves water from lower valued agricultural uses to higher valued urban uses. The report suggests that water marketing may be a viable water management strategy for Texas. Other states that use water marketing find that it: (1) can provide water to growing cities; (2) is a tool for managing drought; (3) promotes the efficient use of water; (4) promotes water conservation; (5) provides water for environmental and recreational needs and uses; (6) offers an alternative to new reservoir construction; and (7) promotes political harmony among stakeholders.

Note: This technical report was published by TWRI in 1994. A summary of this report is on the web at http://twri.tamu.edu/reports_abstract.php?number=TR-167. You can order a printed copy of the whole report by contacting TWRI at twri@twri.tamu.edu.

“New Perspectives About Water Supply Issues: 1998 Water for Texas Conference Speakers Address Senate Bill 1-related Planning Efforts,” by Ric Jensen.

This issue of the *Texas Water Resources* newsletter describes a variety of water supply options, including wastewater reuse strategies and their potential to influence return flows to downstream areas and their implications for water rights concerns. The newsletter also discusses water availability modeling, weather modification, and the need to balance increasing water supplies with environmental protection.

Note: This issue of the newsletter was published in February 1999. To obtain a copy, contact TWRI at twri@tamu.edu

“A Fresh Look at Freshwater Inflows: New TWDB/TPWD Study Provides Better Methods to Assess Estuary Needs,” by Ric Jensen.

This issue of the *Texas Water Resources* newsletter examines such issues as freshwater inflow trends and changes in associated return flows. The newsletter describes modeling efforts to simulate river flows, water rights, and return flows, as well as research needs.

Note: This issue of the newsletter was published in 1994. You can obtain a copy by contacting TWRI at twri@tamu.edu.

5. Urban Planning and Management

These publications describe broad concepts and practical measures that can be taken to promote smart growth and planning and management concepts that can have the overall effect of reducing stormwater pollution.

B-6158. “Stormwater Management Best Management Practices,” by Russell Persyn, Molly Griffin, and Amy Williams.

This fact sheet presents information on why the public should be concerned about stormwater, and explains how stormwater runoff increases soil erosion and impairs water quality. It takes users through the process of applying for United States Environmental Protection Agency Phase I and Phase II stormwater permits, and outlines the components of EPA-approved Stormwater Pollution Prevention Plans. Practical solutions are presented to deal with stormwater issues related to agricultural, forestry, automotive, and commercial settings. The fact sheet provides answers to frequently asked questions as well as a reference list.

Note: This fact sheet was published in 2005. It can be downloaded from <http://tcebookstore.org>.

B-1654. “The Watershed Management Approach,” by Russell Persyn, Molly Griffin, Amy Williams, and Clint Wolfe.

This fact sheet describes the characteristics of watersheds, and the Environmental Protection Agency watershed management approach. It takes readers through a step-by-step approach to delineate watershed planning units, to identify and work with stakeholders, and to target watersheds that may not be meeting designated uses due to water quality concerns. The fact sheet discusses how to set water quality goals and strategies, how to implement programs to improve water quality, and how to measure the progress of using best management practices and educational programming to improve watershed quality. Methods to collect water quality data from point and nonpoint sources are presented.

Note: This publication was developed in 2004. It is available from <http://tcebookstore.org>.

“To Keep the City Out of the Country, Keep the Country Out of the City,” by John Jacob.

This fact sheet discusses some of the issues involved to help local decision makers make informed choices about urban planning. It describes issues related to runoff and impervious cover, and the implications of high density urban growth on the environment.

The fact sheet describes how the Texas Coastal Watershed Center, a coordinated effort of Texas Sea Grant and Texas Cooperative Extension, is working with the Spatial Sciences Laboratory at Texas A&M University to educate local policy makers about planning and development issues.

Note: The fact sheet can be downloaded from the website of the Texas Coastal Watershed Center at <http://urban-nature.org>

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This TWRI fact sheet describes resources available to replace failed onsite wastewater treatment systems (OSSFs) and to build install new systems. The programs of several state agencies in Texas are described, as well as resources from federal and local agencies as well as nonprofit organizations.

Note: Single copies of this fact sheet are available free from TWRI. The report can be downloaded as a PDF file at <http://twri.tamu.edu>.

• SP-116. “Divining the Future: Groundwater Conservation Districts,” by Bruce Lesikar and Dana Porter.

This videotape depicts methods of managing groundwater in Texas, as well as the roles and responsibilities of groundwater districts.

Note: This videotape was produced in 2001. It can be ordered from <http://tcebookstore.org>.

• B-1612. “Managing Texas Groundwater Resources through Groundwater Conservation Districts,” by Guy Fipps.

Conservation of groundwater resources is a major issue in Texas. This publication explains what groundwater conservation districts are, how they are created and how they operate.

Note: This fact sheet was published in 2002. You can download it as a PDF file at <http://tcebookstore.org>.

• B-6077. “On-Site Wastewater Treatment Systems: Selecting and Permitting,” by Bruce Lesikar.

This fact sheet describes Texas regulations that govern the use of on-site wastewater treatment systems, and step-by-step instructions about how to obtain a permit for an on-site system. It includes tables with data about minimum setback and separation distances for OSSFs; how well various soil types can be used in association with specific on-site systems; and the types of OSSF technologies Texas classifies as standard, non-standard, and proprietary. It describes state and local agencies that work with on-site systems in Texas (i.e., authorized agents, designated representatives, and installers). Contacts for regional offices of State regulatory agencies are included.

Note: This fact sheet was published in 1999. It can be downloaded as a PDF file in English or Spanish from <http://tcebookstore.org>.

L-5319. “Financial Aid for Sewage Disposal Projects,” by Bruce Lesikar.

This brochure offers information on where to obtain financial assistance for wastewater treatment systems, primarily for the Houston-Galveston area. Included are agencies offering assistance, contact information, loan and grant programs, planning and technical assistance programs.

Note: This publication was produced in 1999. It can download it at <http://tcebookstore.org>.

“Creating Regional Water Plans under SB 1—University Researchers, Extensional Personnel, and Graduate Students Contribute to Analyze Water Supplies, Economics, and Policies,” by Ric Jensen.

This newsletter provides background information on Texas Senate Bill 1-related water resources planning efforts, and describes how higher education research is supporting regional water planning groups. Efforts to characterize watersheds, model surface waters, and assess surface and ground water supplies are also discussed.

Note: This issue of the *Texas Water Resources* newsletter was published in August 2001. It can be accessed as an html file on the TWRI website at <http://twri.tamu.edu>.

“New Perspectives About Water Supply Issues: 1998 Water for Texas Conference Speakers Address Senate Bill 1-related Planning Efforts,” by Ric Jensen.

This issue of the *Texas Water Resources* newsletter describes a variety of water supply options, including wastewater reuse strategies and their potential to influence return flows to downstream areas and their implications for water rights concerns. The newsletter also discusses water availability modeling, weather modification, and the need to balance increasing water supplies with environmental protection.

Note: This issue of the newsletter was published in February 1999. It can be downloaded free as a PDF file at <http://twri.tamu.edu>.

“Managing Water Demands: 1998 Water for Texas Conference Emphasizes Education, Pricing, Water Use, by Ric Jensen,

Topics discussed in this newsletter focus on water demands addressed by the agricultural and urban sectors. The potential to reduce water use through water urban and agricultural conservation programs and the effectiveness of educational efforts in lessening water use are discussed. The newsletter explains pricing strategies that encourage reduce water use.

Note: This issue of the newsletter was published in May 1999. It can be viewed on the TWRI website at <http://twri.tamu.edu>.

6. Protecting Water Quality

This series of publications deals with how groundwater and surface water runoff may affect water quality. Recommendations from these publications can be used to protect and safeguard aquifers as well as rivers, streams, and bays. These publications can be easily used as is or adapted for use in stormwater education campaigns.

B-6158. “Stormwater Management Best Management Practices,” by Russell Persyn, Molly Griffin, and Amy Williams.

This fact sheet presents information on why the public should be concerned about stormwater, and explains how stormwater runoff increases soil erosion and impairs water quality. It takes users through the process of applying for United States Environmental Protection Agency Phase I and Phase II stormwater permits, and outlines the components of EPA-approved Stormwater Pollution Prevention Plans. Practical solutions are presented to deal with stormwater issues related to agricultural, forestry, automotive, and commercial settings. The fact sheet provides answers to frequently asked questions as well as a reference list.

Note: This fact sheet was published in 2005. It can be downloaded from <http://tcebookstore.org>.

B-6154. “The Watershed Management Approach,” by Russell Persyn, Molly Griffin, Amy Williams, and Clint Wolfe.

This fact sheet describes the characteristics of watersheds, and the Environmental Protection Agency watershed management approach. It takes readers through a step-by-step approach to delineate watershed planning units, to identify and work with stakeholders, and to target watersheds that may not be meeting designated uses due to water quality concerns. The fact sheet discusses how to set water quality goals and strategies, how to implement programs to improve water quality, and how to measure the progress of using best management practices and educational programming to improve watershed quality. Methods to collect water quality data from point and nonpoint sources are presented.

Note: This publication was developed in 2004. It is available from <http://tcebookstore.org>

B-6029. “Reducing the Risk of Ground Water Contamination by Improving Household Wastewater Treatment,” by B.L. Harris, Dennis Hoffman, and Frank Mazac.

This fact sheet discusses how the choice of on-site wastewater treatment systems and management techniques used by homeowners can affect the risk of ground water contamination. The fact sheet presents information on such issues as how water use and conservation affect system performance; the quality of wastewater produced by these systems; and provides suggestions of how consumers should deal with failing systems.

Note: The fact sheet can be downloaded from the web by clicking on the publications link at <http://soilcrop.tamu.edu>.

“The Gulf of Mexico Repair Kit,” by John Jacob.

Contrary to what many people think, dangers to the Gulf of Mexico came not from major industrial operations or shipping accidents but from fertilizers, pesticides, motor oil and garbage that run off lawns and streets into storm drains, streams, bayous and canals. This postcard-size flip chart, based on an earlier publication by the Tampa Bay National Estuary Program, offers tips on landscaping, water conservation, native shrubs and trees, hazard-free cleaning supplies, and debris-free boating. Household chemical collection days are listed for the Gulf States.

Note: This 16 page publication was published by Texas Sea Grant in 1996. It is meant for age groups in grades 7-12. It can be ordered for free from the Texas Sea Grant Program. Information about this publication can be viewed online at <http://www.onegulf.org/>

B-6025. “TEX-A-SYST: Reducing the Risk of Ground Water Contamination by Improving Pesticide Storage and Handling,” by B.L. Harris, Dennis Hoffman and Frank Mazac Jr.

Proper pesticide management is important to preventing groundwater contamination. This publication contains helpful information about pesticide storage facilities, mixing and loading practices, and spill cleanup. A chart lists pesticides according to their leachability.

Notes: This publication was developed in 1997. Single copies are available for \$1.50 and there are 5,200 copies in stock. This publication can be downloaded at <http://tcebookstore.org>.

B-6026. “TEX-A-SYST: Reducing the Risk of Ground Water Contamination by Improving Fertilizer Storage and Handling,” by Bill L. Harris, Dennis Hoffman, Frank J. Mazac Jr., and Ann Kantor.

Fertilizer is a major source of ground water contamination. This publication emphasizes the best management practices for storing fertilizers in new and existing facilities. It includes information on safe mixing and loading of fertilizers, spill cleanup, and container disposal.

Notes: This fact sheet was published in 1997, and single copies sell for \$1.25. You can download this as a PDF at <http://tcebookstore.org/pubs/B6026.pdf>.

B-6028. “TEX-A-SYST: Reducing the Risk of Ground Water Contamination by Improving Hazardous Waste Management,” by Bill Harris, Dennis Hoffman, Frank Mazac, Jr., and Ann Kantor.

Products such as paints, solvents, adhesives, oils, cleaners, batteries, pesticides and wood preservatives are commonly used in households and on farms, but they can be hazardous to groundwater if handled improperly. This publication explains proper methods of using, storing and disposing of hazardous materials.

Notes: This fact sheet was published in 1997. The fact sheets can be downloaded at <http://tcebookstore.org>.

E-176. “What’s In My Water?” by Tony Provin and John Pitt.

This 15-page fact sheet presents a thorough discussion of various contaminants that are commonly found in groundwater and drinking waters. The publication presents information about the sources of these elements; why these pollutants should be of concern; treatment methods available to homeowners and water systems, and state and federal regulatory standards. It also contains a glossary that defines important terms related to water quality and provides a list of useful web links.

Note: This publication was published in 2003. It can be downloaded at <http://tcebookstore.org>.

E-103. “Your Actions Can Help Protect Our Drinking Water,” by Janie Harris.

This publication offers advice on how to protect our drinking water supply by properly selecting, storing, using and disposing of household hazardous products.

Note: This fact sheet was published in 2001. The publication is free and can be downloaded at <http://tcebookstore.org>.

B-6050. “Pesticide Properties that Affect Water Quality,” by Douglas Stevenson, Paul A. Baumann and John A. Jackman.

This fact sheet describes pesticide properties that affect water quality, and how pesticide management programs can lessen pollution risks. Information is shown on pesticide classes, formulations, toxicity, doses, effective doses, persistence, volatility, water solubility, and soil adsorption. This publication interprets those characteristics and explains the interaction of chemicals with surface and ground waters.

Notes: This publication was developed in 1997. It can be downloaded at <http://tcebookstore.org>.

TAMU-SG-01-501. Clean Texas Marina Guidebook.

This publication describes a partnership to encourage marinas, boatyards, and boaters to use simple innovative solutions to keep Texas’ coastal and inland water resources clean. The guidebook includes recommendations about stormwater management and several other related topics.

Note: This is on the web at <http://www.cleanmarinas.org>

7. Water Conservation/ Rainwater Harvesting

Water conservation has the potential to improve stormwater quality. If landscapes are heavily irrigated, it is likely that pesticides and lawn care chemicals may runoff into streams and coastal waters. If water conservation is practiced, and combined with measures to reduce chemical inputs to lawns and landscapes, then perhaps potential runoff problems could be lessened.

“WaterSmart Landscapes for the Upper Gulf Coast: Low Maintenance & Water Resource Friendly,” by John Jacob.

The intent of this publication is to motivate homeowners to lessen pesticide, fertilizer, and water use. The publication provides useful landscaping tips about such topics as how to minimize pesticide use; how to lessen the frequency of pesticide applications; ways to bag and reuse grass clippings; arranging similar landscape plants so that “water-loving” plants are grouped together; and choosing plants with low water use and maintenance needs. The fact sheet identifies ground covers, shrubs, and trees that are ideal for the Texas Gulf Coast, and require minimal water and fertilizer inputs.

Note: This fact sheet was published by Texas Cooperative Extension, the Texas Sea Grant Program, and Clean Water for Armand Bayou. You can download the publication at <http://www.urban-nature.org>.

“Water Conservation: How Does Your Home Check Out?” by Janie Harris.

This comprehensive fact sheet covers a wide range of topics related to indoor and household water conservation, including how to save water and avoid waste in plumbing, laundry, personal care, food preparation, dishwashing, meal service, household cleaning, and house plants. Conservation outside the home (landscaping and car washing) is covered. The fact sheet discusses how consumers should be water conscious when they make purchases of appliances and other water using devices.

Note: This fact sheet was published in 2004. It can be downloaded as a PDF from <http://fcs.tamu.edu>.

“Top 5 Water-Saving Tips,” by Janie Harris.

These bill inserts are ideal for water utilities to use as posters or bill stuffers. They inform customers of the need to fix water leaks, to replace old showerheads and toilets, to purchase appliances that do not waste water, to adopt water-conserving behaviors, and to utilize resource-efficient lawn and landscape watering practices.

Note: These materials can be downloaded as PDF files at <http://fcs.tamu.edu>.

TWR TR 269. “Urban Water Conservation Along the Rio Grande,” by Valeen Silvy, Ronald Kaiser, Bruce Lesikar, and Craig Runyan.

This technical report describes results of a telephone survey of water utilities in Texas and New Mexico that covered such issues as per capita water use, the presence of conservation plans, and related issues. Data from the survey provide insights into the extent to which communities that were surveyed utilized such practices as leak detection, residential water audits, incentives for water efficient landscapes, pricing structures that encourage conservation, and educational programs. Charts that show which practices have been adopted by selected cities in Texas and New Mexico are presented.

Note: This report can be downloaded at <http://texaswater.tamu.edu>.

B-1584. “Xeriscape...Landscape Water Conservation,” by Douglas F. Welsh, William C. Welch and Richard L. Duble.

You can make your landscape both beautiful and water-efficient by xeriscaping. Topics covered include planning, soil preparation, plant selection, maintenance, watering, irrigation systems, mulching and mowing. Lists of outstanding landscape plants for Texas are presented and native plants are highlighted.

Note: This publication was published in 2001. It can be downloaded at <http://tcebookstore.org>.

L-5050. “Water Smart--How J.R. Waterer Saves Water in His Home and Lowers His Water Bill,” by William E. Knoop.

Prepared for use with the Water Smart program, this flyer points out the importance of conserving water. A cartoon approach is used to show tips for efficient water use inside the home.

Note: This was published in 1992. It can be downloaded at <http://tcebookstore.org>.

L-5053. “Water Smart--How J.R. Waterer Saves Water and Has the Greenest Lawn in the Neighborhood,” by William Knoop.

Prepared for use with the Water Smart program, this flyer stresses the need to conserve water. A cartoon approach is used to show tips for wise water use in caring for the landscape.

Notes: This was published in 1992. It can be downloaded at <http://tcebookstore.org>.

L-5347. “On-Site Wastewater Treatment Systems: Operation and Maintenance,” by Bruce Lesikar.

This fact sheet provides a basic overview of how onsite wastewater treatment systems work, and describes the functions of septic tanks and drainfields. The fact sheet provides tips for homeowners on maintenance and management issues, including such areas as water conservation, the use of garbage disposals, periodically cleaning the septic tank, maintaining a grass cover over the drainfield, and several other topics.

Note: This fact sheet was published in 2000. It can be downloaded as a PDF file at <http://tcebookstore.org/pubs/L5347.pdf>

B-6153. “Rainwater Harvesting,” by Russell Persyn, Dana Porter, and Valeen Silvy.

This 36-page publication presents information on why homeowners should consider harvesting rainwater, describes how rainwater harvesting works, and provides tips for system design and construction. The publication enables homeowners to estimate how much water they can expect to store by using rainwater harvesting and provides advice for system upkeep and maintenance.

Note: This publication was published in 2004. It can be downloaded at <http://tcebookstore.org/tmppdfs/2767908-B6153.pdf>. Copies can also be purchased at <http://tcebookstore.org>.

8. Wetlands

Wetlands are important resources that have the potential to negate some of the adverse effects of stormwater runoff. Natural wetlands systems can filter out stormwater pollutants thus improving coastal water quality. Man-made or constructed wetlands also serve to treat pollutants and can be designed and managed to deal with specific types of contaminants. Natural wetlands are fragile ecosystems that can be adversely affected if stormwater pollutants are not treated and run off to these water bodies.

“Texas Coastal Wetlands,” by John Jacob, Daniel Moulton, and Ricardo Lopez.

This report includes numerous color photographs. The book discusses such issues as wetlands protection, major threats to wetlands (i.e., urban and suburban sprawl and agricultural development, among others); how Texas wetlands were formed over time; and the role of climate processes in influencing the composition of different types of wetlands systems. The book defines coastal wetlands and provides a compelling case about why the public should care about the maintenance and preservation of these ecosystems.

Note: This is a joint publication of Texas Cooperative Extension, the Texas A&M University Sea Grant Program, the Texas Parks and Wildlife Department, and the Galveston Bay Estuary Program. The report can be viewed in html format at <http://www.texaswetlands.org>. Printed copies can be obtained while supplies last by contacting John Jacob at jjacob@tamu.edu.

SP-105. “Wetland and Coastal Resources Information Manual for Texas” (2nd edition), by Will E. Cohen , Katherine L. Terry and Darrin W. Bauer.

This comprehensive manual was developed to help individuals, agencies and organizations that manage wetlands.

Note: This was published in 2000 and the bound version sells for \$25. There are 20 copies in stock.

“Resource Manual for the MarshMALLOW (Marsh Management Activities for Learning the Lifestyles of Wildlife) Project,” by Russ Miget.

The MarshMALLOW project is a school enrichment program designed to educate youth, teachers, adult volunteers and parents about wetland wildlife and their habitat requirements; wetland functions, values, management, and restoration; and the important role wetlands play in our society. Participants learn about wetland wildlife and their habitat by adopting a small wetland, or other wet area like a small pond, tank or flooded field, and actively managing it for a wildlife species of their choosing. Management measures may include constructing levees and drain pipes to control water levels, installing nesting boxes for ducks or perches for birds of prey, planting emergent vegetation, creating or enlarging buffer zones, etc. Information gained from careful observation of changes brought about through management techniques is presented to

students and the public through assembly presentations, civic club talks, and newspaper interviews.

Note: A packet of resource materials that support the MarshMALLOW program are available by contacting Russ Miget at rmiget@falcon.tamucc.edu.