

<b>Program Type:</b> Outreach Lab		<b>Duration:</b> 100 minutes, plus time for cast study development
<b>Standards:</b> <b>SC.912.L.17.20</b> Explain how human activities can impact the environment and the importance of sustainable practices in conserving natural resources.		
<b>Learning Objectives:</b> -Explain the ecological importance of waterfront ecosystems in maintaining environmental balance. -Analyze the role of vegetative buffers in reducing nutrient run off and preventing eutrophication. -Predict the consequences of common landscaping practices on freshwater ecosystems. -Apply Florida Friendly Landscaping (FFL) Principle #9 to recommend sustainable shoreline strategies. -Develop a case study demonstrating how lifestyle changes reduce water pollution in waterfront ecosystems		
<b>Guiding Questions:</b> What ecological functions do waterfront ecosystems serve? How do vegetative buffers reduce pollution and protect aquatic life? Which human activities degrade waterfront ecosystems the most? What signs (biological, chemical, physical) indicate a stressed or healthy shoreline ecosystem? How can personal or community lifestyle choices protect water resources?		
<b>Intended Outcomes</b>		
<b>As a result of the program, what I want my audience to LEARN...</b> Improper waterfront landscaping contributes to runoff, eutrophication, algal blooms, and aquatic ecosystem decline  Native vegetation and reduced chemical inputs protect water quality  Individuals can impact environmental health through daily landscaping choices	<b>As a result of the program, I want my audience to ACT by...</b> Evaluate a simulated waterfront site for environmental damage Propose improvements based on FFL Principle #9  Create a visual redesign of a degraded site with scientific justification  Research and presenting real-world case studies of sustainable change	<b>Assessment: (How will you know your audience has reached your intended outcomes)</b> <i>Formative:</i> Participation in simulation and class discussions, analysis of waterfront health photos, engagement in design challenge  <i>Summative:</i> Design proposal, case study report, exit reflection- "What is one change you could make at home or school to protect a nearby body of water?"
<b>Schedule Layout:</b>		<b>Items Needed:</b>
<b>DAY 1 INTRODUCTION (10 minutes):</b> Deliver a mini lesson on Florida Friendly Landscaping (FFL) Principle #9  Define key concepts: buffer zone, runoff, pollutants and eutrophication  Show images of healthy versus degraded water bodies		FFL Handbook extract on Principle #9 Slide show Photos of waterfronts
<b>GUIDED DISCUSSION (5 minutes):</b> "How do landscaping choices near water impact ecosystems?"		

<b>ACTIVITY: Runoff simulation (20minutes)-</b> Run two simulations- tray with grass/mulch (healthy buffer) and a tray with bare soil (poor buffer)	Trays, soil, grass, mulch Spray bottles, food dye
<b>APPLICATION (15 minutes):</b> Analyze and Identify- In pairs, have students examine simulated photos of water bodies and identify visible signs of harm or protection using a checklist for guided analysis.	Worksheet: Visual analysis checklist
<p><b>DAY 2</b></p> <p><b>Bellwork- Review Day 1 Activities (10 minutes)</b></p> <p><b>Fix the waterfront design challenge (35 minutes):</b> Have student pairs re-design a degraded waterfront scene using notes from FFL Handbook extract on Principle #9. Each pair creates a labeled diagram or sketch of their design showing improvements with short justifications</p> <p><b>Exit Ticket /Reflection (5 minutes):</b> Personal action reflection; connection to home/school</p> <p><b>HOMEWORK/ASSIGNMENT (7 days):</b> Case study development</p>	<p>Redesign sketch sheet</p> <p>Exit ticket prompts</p> <p>Case study template</p>
<b>Details:</b>	
<p><b>Activity Set-Up:</b></p> <ul style="list-style-type: none"> <li>-Set up runoff trays before class.</li> <li>-Prep slide deck and FFL principle #9 excerpt.</li> </ul> <p>Print all student materials: worksheet (1 per student) and case study guide (1 per student).</p> <p><b>Logistics:</b> Invite a guest from UF/IFAS Extension (optional) to give a real-world perspective on FFL applications.</p>	