Framing the Issue:
Three Recent UF Studies
Average Daily Water Use by Year Built
2021 Study of Single-Family, Detached Homes in Gainesville, FL

<table>
<thead>
<tr>
<th>Year Built</th>
<th>Water Use (gal./day)</th>
<th>Homes w/ In-ground Irrigation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>0.052</td>
<td>0</td>
</tr>
<tr>
<td>1955</td>
<td>0.085</td>
<td>5</td>
</tr>
<tr>
<td>1960</td>
<td>0.053</td>
<td>0</td>
</tr>
<tr>
<td>1965</td>
<td>0.083</td>
<td>1</td>
</tr>
<tr>
<td>1970</td>
<td>0.144</td>
<td>10</td>
</tr>
<tr>
<td>1975</td>
<td>0.135</td>
<td>20</td>
</tr>
<tr>
<td>1980</td>
<td>0.116</td>
<td>30</td>
</tr>
<tr>
<td>1985</td>
<td>0.110</td>
<td>40</td>
</tr>
<tr>
<td>1990</td>
<td>0.243</td>
<td>50</td>
</tr>
<tr>
<td>1995</td>
<td>0.466</td>
<td>60</td>
</tr>
<tr>
<td>2000</td>
<td>0.542</td>
<td>70</td>
</tr>
<tr>
<td>2005</td>
<td>0.625</td>
<td>80</td>
</tr>
<tr>
<td>2010</td>
<td>0.725</td>
<td>90</td>
</tr>
<tr>
<td>2015</td>
<td>0.857</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>0.857</td>
<td></td>
</tr>
</tbody>
</table>

Dr. Nick Taylor UF/IFAS/PREC H₂OSAV
Nitrogen Leaching in Residential Lawns
2021-22 Alachua County EPD Lysimeter Study

Dr. AJ Reisinger UF/IFAS/SWES
Residential Fertilizer Ordinance Impacts
Using LAKEWATCH Data to Evaluate Water Quality Trends

Dr. Sam Schmidt UF/IFAS/SWES
# Residential Fertilizer Ordinance Impacts

Using LAKEWATCH Data to Evaluate Water Quality Trends

## Ordinance impact on water quality trend

<table>
<thead>
<tr>
<th>Ban Type</th>
<th>Total phosphorus trend</th>
<th>Total nitrogen trend</th>
<th>Chlorophyll a trend</th>
<th>Secchi depth trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>No ban</td>
<td>Small degradation</td>
<td>No change</td>
<td>No change</td>
<td>Small improvement</td>
</tr>
<tr>
<td>Nonseasonal</td>
<td>Small improvement</td>
<td>Small improvement</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Summer</td>
<td>Medium improvement</td>
<td>No change</td>
<td>No change</td>
<td>Medium improvement</td>
</tr>
<tr>
<td>Winter</td>
<td>Large improvement</td>
<td>Large improvement</td>
<td>Large improvement</td>
<td>Large improvement</td>
</tr>
</tbody>
</table>

Dr. Sam Schmidt UF/IFAS/SWES
Florida Land Development
Conventional Practice
Florida Land Development
Oakland Park
Florida Land Development
Oakland Avenue Lot

<table>
<thead>
<tr>
<th></th>
<th>FRONT YARD</th>
<th>SIDE YARD</th>
<th>ALLEY YARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees</td>
<td>minimum of 2 canopy trees and 2 accent trees</td>
<td>minimum of 1 canopy tree and 2 accent trees</td>
<td></td>
</tr>
<tr>
<td>Shrubs</td>
<td>20% minimum</td>
<td>30% minimum</td>
<td>30% minimum</td>
</tr>
<tr>
<td>Groundcover</td>
<td>15% minimum</td>
<td>0% minimum</td>
<td>0% minimum</td>
</tr>
<tr>
<td>Turf</td>
<td>60% maximum</td>
<td>70% maximum</td>
<td>70% maximum</td>
</tr>
</tbody>
</table>

FRONT YARD:
- Trees: minimum of 2 canopy trees and 2 accent trees
- Shrubs: 20% minimum
- Groundcover: 15% minimum
- Turf: 60% maximum

SIDE YARD:
- Trees: minimum of 1 canopy tree and 2 accent trees
- Shrubs: 30% minimum
- Groundcover: 0% minimum
- Turf: 70% maximum

ALLEY YARD:
- Shrubs: 30% minimum
- Groundcover: 0% minimum
- Turf: 70% maximum
Florida Land Development
Conventional Practice
Florida Land Development
Conventional Practice
Florida Land Development
Landscaping Impacts
Landscaping Impacts
Conventional Practice
Landscaping Impacts
Greenhouse Gas Accounting (Groundwater)

Mowing: 15 lbs. CO$_2$e/1000ft$^2$/yr.

Fertilizer: 29 lbs. CO$_2$e/1000ft$^2$/yr.

Pesticides: 1 lbs. CO$_2$e/1000ft$^2$/yr.

Irrigation: 34 lbs. CO$_2$e/1000ft$^2$/yr. (Groundwater)
Florida Land Development
Restoration
Florida Land Development Restoration

- A 5,187-acre master plan entitled to have 8,500 dwelling units.
- The project’s design evolved significantly over its multi-year permitting process.
- Restoration was fully entitled based on its 2009 design to create a mixed-use, transit-oriented community with 3.5 million ft$^2$ of commercial space.
Florida Land Development
Restoration 2006 – Conventional Design
Restoration
Road Infrastructure Impacts
## Restoration Road Infrastructure

### Life Cycle Analysis (50-year life)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>2006 Plan</th>
<th>2009 Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lane miles</td>
<td>186</td>
<td>103</td>
</tr>
<tr>
<td>• Impervious area, sq. ft.</td>
<td>17,000,000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>• Landscaped area, sq. ft.</td>
<td>6,000,000</td>
<td>3,000,000</td>
</tr>
<tr>
<td>• Cost</td>
<td>$383,623,680</td>
<td>$238,180,800</td>
</tr>
</tbody>
</table>

**Initial costs avoided:** $145,442,880

### Emissions:

| • Mtons CO2e per yr.             | 13,031             | 7,176              |

**Metric tons CO2e per yr. avoided:** 5,855
Restoration
Landscaping Impacts
Restoration Landscaping – 2009 Design
Low Impact Design

• Largest lots are 60’ wide
• Compact homes with minimal landscapable areas (375 sq. ft.)
• 75% of lots designed for turf-free landscapes
## Restoration Landscaping – Two Designs
### Annual Resources Accounting

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>2006 Plan</th>
<th>2009 Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape, acres</td>
<td>988</td>
<td>428</td>
</tr>
<tr>
<td>Pesticides, lbs.</td>
<td>2,240</td>
<td>345</td>
</tr>
<tr>
<td>Fertilizer, lbs. N</td>
<td>135,000</td>
<td>18,400</td>
</tr>
<tr>
<td>Mowing, gal. gas</td>
<td>33,000</td>
<td>4,460</td>
</tr>
<tr>
<td>Irrigation, mgal</td>
<td>988</td>
<td>63</td>
</tr>
</tbody>
</table>

- Maintenance costs avoided: ~$4,000,000

### Emissions:

- Mtons CO2e per yr. 11,685 798

- Metric tons CO2e per yr. avoided: 10,887
Landscaping Impacts
Conventional Practice
Mitigating Impacts: Current (Shifting?) Trends
Reducing Landscaping Impacts

*The Villages* (Sumter County)
Reducing Landscaping Impacts
88th Street Cottages (Alachua County) 2019-2020
Reducing Landscaping Impacts

*Sunbridge* Cyrils Drive (Osceola County)
Reducing Landscaping Impacts

*Sunbridge* Base Camp (Osceola County)
Reducing Landscaping Impacts
Sunbridge Weslyn Park – Pulte Homes

April 12, 2022
Reducing Landscaping Impacts

Sunbridge Weslyn Park – David Weekley Homes
Reducing Landscaping Impacts

*Sunbridge* Weslyn Park – David Weekley Homes

October 5, 2022
Reducing Landscaping Impacts

*Wildlight* Forest Park Neighborhood (Nassau County)
Florida Stormwater Rules
Reducing Landscaping Impacts

*Wildlight* Forest Park Neighborhood (Nassau County)