Extension Resource Efficiency Programs for Residential Housing

Pierce Jones
Program for Resource Efficient Communities
University of Florida
We promote application of design, construction and management practices that minimize environmental degradation and make more efficient use of energy, water and other natural resources in master planned residential communities.
Active on-campus faculty include:
- Glenn Acomb  Landscape Architecture
- Kathy Malone  Environmental Horticulture
- Mark Clark  Soil & Water
- Michael Dukes  Ag & Biological Engineering
- Mark Hostetler  Wildlife Ecology & Conservation
- Tom Ankersen  Law
- Others
Program for Resource Efficient Communities

Extension methods include:
• Continuing education
• Targeted workshops
• Publications
• Consulting
Program for Resource Efficient Communities

Funding mechanisms include:
• Continuing education Registration fees
• Targeted workshops Sponsorships
• Publications For sale
• Consulting Hourly rate
Growth Trends

Context
Growth Trends

Population - Florida:

- 1980 ~10,000,000
- 2005 ~17,000,000
- 2030 ~28,000,000
### Growth Trends

**Building Permits - Florida:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Permits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>~155,000</td>
</tr>
<tr>
<td>2004</td>
<td>~185,000</td>
</tr>
<tr>
<td>2005</td>
<td>~208,000</td>
</tr>
<tr>
<td>2006</td>
<td>~146,000</td>
</tr>
<tr>
<td>2007</td>
<td>~72,000</td>
</tr>
<tr>
<td>2008</td>
<td>~40,000</td>
</tr>
</tbody>
</table>
Growth Trends
Growth Trends
Growth Trends
Growth Trends

South Pasco County
Growth Issues

Water Supply
Water Supply

200,000 Gallon Water Tower
Water Supply

Florida Freshwater Withdrawals
(in million gallons per day)

- Ground water
- Surface water

Source: U.S. Geological Survey

Tampa Bay Water Desalination Facility
BAYONET POINT — "He's in prison for God knows how long because we can't afford to sod the lawn," said his sobbing daughter, Jennifer Lehr.

Prudente has owned a home in the deed restricted community since 1998. The covenants require homeowners to keep their lawns covered with grass.

Free from jail, Joseph Prudente, 66, inspects his new lawn with pride Sunday. Prudente, who says he barely has enough to pay the mortgage, was jailed for having a brown lawn.

By Erin Sullivan, Times Staff Writer
In print: Monday, October 13, 2008
EDITOR’S NOTE: This is the first in a series examining how the region’s drinking water is running low.

BY SUSAN STABLEY

South Florida has run out of natural sources of drinking water and will likely experience halted development due to the problem.

Major real estate projects in the tri-county area must be curbed until alternative sources of water can be developed, according to the state. Already, it has told Miami-Dade County to reject 17 large-scale projects because of drinking water scarcity.

And the creation of alternative water sources will not happen soon. The work will cost of hundreds of millions of dollars and can take decades to complete, according to estimates from regional and local water officials.

“For us to go back into a built environment is a very expensive proposition,” said Doug Yoder, assistant director of Miami-Dade County’s water and sewer department.

Last week, Gov. Jeb Bush vowed to make South Florida confront its water issues before the state will approve any more large projects.

“It makes no sense to develop west and west and west without the adequate development of infrastructure and water supply,” Bush said at the Urban Land Institute’s Symposium on Regional Cooperation on March 17.

See WATER, Page 62
Growth Issues

Water Quality
Water Quality
Water Quality
## Water Quality

2005 Fertilizer Consumption (Tons/yr):

<table>
<thead>
<tr>
<th>County</th>
<th>Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay</td>
<td>1,190</td>
</tr>
<tr>
<td>Nassau</td>
<td>1,540</td>
</tr>
<tr>
<td>Duval</td>
<td>3,970</td>
</tr>
<tr>
<td>St Johns</td>
<td>22,780</td>
</tr>
</tbody>
</table>
### Water Quality

#### 2005 Fertilizer Consumption (Tons/yr):

<table>
<thead>
<tr>
<th>County</th>
<th>Farm</th>
<th>Non-Farm</th>
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</thead>
<tbody>
<tr>
<td>Clay</td>
<td>1,190</td>
<td>5,230</td>
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<tr>
<td>Nassau</td>
<td>1,540</td>
<td>2,040</td>
</tr>
<tr>
<td>Duval</td>
<td>3,970</td>
<td>23,500</td>
</tr>
<tr>
<td>St Johns</td>
<td>22,780</td>
<td>3,480</td>
</tr>
</tbody>
</table>
Water Quality
## Water Quality

### Final Draft LSJRB SWIM Plan Update - May 2008

Table C-5: Nonpoint Sources–Freshwater Nitrogen Load Allocations (as of February 2008)

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Load Allocation</th>
<th>Reduction from Starting Point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-MS4 Stormwater</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hastings</td>
<td>988</td>
<td>28.0%</td>
</tr>
<tr>
<td>Pomona Park</td>
<td>238</td>
<td>0.0%</td>
</tr>
<tr>
<td>Putnam</td>
<td>75,049</td>
<td>21.8%</td>
</tr>
<tr>
<td>St. Johns Non-Urbanized Area</td>
<td>55,972</td>
<td>6.7%</td>
</tr>
<tr>
<td>Welaka</td>
<td>1,850</td>
<td>28.4%</td>
</tr>
<tr>
<td><strong>Other Sources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>429,264</td>
<td>37.2%</td>
</tr>
</tbody>
</table>
Nearly 14,500 tons. Almost 29 million pounds. That’s how much nitrogen and phosphorus is pouring into the lower St. Johns River each year from wastewater treatment plants and stormwater runoff, according to Florida DEP.

Now, after eight years of work, the DEP is about to finalize a plan requiring at least $450 million in expenditures by Northeast Florida utilities, governments and others to reduce their total nutrient discharge by about 26 percent. Some estimate the true costs at more than $1 billion.

The reductions are part of new Total Maximum Daily Loads (TMDLs) defined for the Lower St. Johns. A TMDL is a specific amount of nutrients the river can carry while still maintaining water quality levels, and for the Lower St. Johns, it’s 11,518 tons of nitrogen and phosphorus.
Growth Issues

Energy
Energy

Unloading Coal Hoppers
Energy
Energy

Estimated annual reductions if all Florida homes permitted in 2005 were ENERGY STAR qualified:

- Energy ~576,000,000 kWh
- Utility bills ~$69,000,000
- CO2 ~1,607,900,000 lbs
Surrounded by foreign officials but no one from the Bush administration, Gov. Charlie Crist warned Thursday that global warming poses such a dire threat to Floridians that the state must take immediate, dramatic and unilateral action.

The first phase of that initiative begins today as Crist signs unprecedented orders intended to help reduce pollution, slow global warming and position the state as a national model—even as the federal government remains on the sidelines.
TALLAHASSEE - Under pressure from Gov. Charlie Crist, a consortium of Florida utilities pulled the plug Tuesday on another controversial coal-fired power plant because of concerns about global warming.

“It’s like a new day is dawning for energy in Florida,” said Susan Glickman of the Southern Alliance for Clean Energy, which opposed the plant.

Crist announced the demise of the coal plant during a news conference unveiling the agenda of his global warming summit in Miami next week, where he promised to “identify specific actions” that Florida can take to combat climate change.

“Good things are happening,” Crist said. “That pleases me, and I think it pleases our fellow Floridians.”
Resource Efficient Development

Madera
(Extension Demonstration Project)
Reduced Impact Site Design
**FLORIDA BUILDING ENERGY RATING GUIDE**

<table>
<thead>
<tr>
<th>Best</th>
<th>$723</th>
<th>Worst</th>
<th>$4149</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$1208</td>
<td></td>
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</tbody>
</table>

31 MBtu | 61.1 MBtu | 214 MBtu

- **Proposed Home**
  - HERS Reference Home
  - Annual Savings: $645.92

As compared with other 2773 square foot, 4 bedroom homes without pool pumps.

**This Home Qualifies for EPA's Energy Star Label**

**This Home Qualifies for an Energy Efficient Mortgage (EEM)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost Basis</th>
<th>Electric Rate:</th>
<th>Gas Rate:</th>
<th>Oil:</th>
<th>LP Gas:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Gainesville Regional Utilities</td>
<td>$0.085/kWh</td>
<td>$1.504/Therm</td>
<td>$1.65/gal</td>
<td>$1.92/gal</td>
</tr>
<tr>
<td></td>
<td>North Default</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Statewide Prices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HERS Score**: 92.8

**Certified Rater**: Arlene Z. Stewart (530)

**Signature**: [Signature]

Date: 6/14/04

This notice is provided to you by an individual certified by the Florida Department of Community Affairs to perform a building energy rating evaluation. Any questions, comments, or complaints regarding the person or Agency performing this service may be directed to the Florida Department of Community Affairs, Building Energy Rating System Program, 5555 Shumard Oak Boulevard, Tallahassee, Florida, 32389-2100, 850-487-1824.

*Note:*
1. HERS Reference Home is constructed to comply with the 1992 CABO Model Energy Code (MCO) at a HERS score of 80 or greater.
2. The home builder must have signed a Memorandum of Understanding with EPA as an Energy Star Homes partner.
Madera

Low Impact Landscape
Gainesville, Florida Residential Energy Intensity for 2006 (kWh/1000sf/year)

Average 10,347

Breckenridge 13,484
Cobblefield 11,855
Broadmoor 11,023
Stillwind 10,239

Mentone 9,739
Capri 10,008
Brookfield 10,046

Granite Park 8,946
Union Street Station 7,744
Madera 5,393
Resource Efficient Development

Restoration
(Direct Consulting)
Restoration

2006 Conventional Site Design
Restoration

2009 Reduced Impact Site Design
Restoration

TRANSIT-READY DESIGN
Water Supply

Restoration DRI Recommendations:

1. Firm water budget specified (95 gal/person/day)
2. Integrated stormwater and reclaimed irrigation water supply system
3. Smart irrigation systems required
4. Use of the “Field Guide to Soil Moisture Sensor Use in Florida”
5. Florida Water Star required
6. Overall compact design – increased proportion of community landscapeable areas
Water Quality

Restoration DRI Recommendations:

1. Source Control – addresses linkage between landscape fertilization practices and water quality impacts
2. Ecologically Enhanced Stormwater Basins – applies an additional layer to the conventional treatment train
3. Overall Compact Design – reduces edge effects and creates opportunity for more effective water treatment in retained natural areas
Energy

Restoration DRI Recommendations:

1. Required use of Energy Star reflective roofing products; Pre-plumbing and Pre-wiring to roof deck for solar thermal and photovoltaics
2. Ductwork and air handlers in conditioned space
3. All residential units will achieve a HERS Index Score of 70 or less to meet the USDOE Builder Challenge program
4. Overall Compact Design – more multi-story and attached housing
Summary

Extension Program Opportunities:
- Conventional development practices are failing
- Tested, better practices are available
- Plenty of room to improve quickly
- Developers are not resistant
- Time is of the essence
Water Quality