Florida Agriculture & Water Resource Challenges

Rich Budell, Managing Partner
Budell Water Group, LLC

Florida Agricultural Policy Outlook Conference
UF/IFAS Mid-Florida REC, Apopka, Florida
January 28, 2016
Global Agriculture

- World’s largest industry employing over one billion people
- Occupies 50% of the Earth's habitable land
- Uses 69% of the planet's available fresh water
- Only 2.8% of all water on the planet is fresh
  - 75% of which is tied up in ice caps and glaciers
  - Remaining 25% of fresh water is ground water and surface water
  - A whopping 0.7% of all the water on the earth....
- Projected population growth from 7 to 9 billion by 2050
- Food production will have to increase 70%
- Water available for agriculture will decrease
Florida Agriculture

- Occupies over 18 million acres
  - approximately 52% of the state’s total land use
  - most land is unimproved, only 10% irrigated
- Consists of 47,000 private farms
  - generates $100 billion in farm-related economic activity
  - 1 million associated jobs
- Provides for biological diversity, aquifer recharge, flood control, wetland preservation, wildlife habitat
- Farmland provides net economic benefit to the public
  - For every $1.00 paid in property tax agriculture only requires $0.29 in public services
    - Generates $3.5B annually in state and local tax revenues
** To continue to provide these benefits, agriculture needs sufficient & stable water supply
Key Water Resource Issues

- CS/CS/SB 552 Environmental Resources (signed 1/21/2016)
- Waters Of The U.S. regulations (WOTUS)
- Water Quality (s. 403.067 and s. 373.4595 F.S.)
  - Implementation of Best Practices – Provides presumption of compliance with:
    - Total Maximum Daily Loads,
    - Basin Management Action Plans, and
    - Numeric Nutrient Criteria
- Water Quantity (Parts II, VII and new Part VIII of Ch. 373 F.S.)
  - Minimum Flows and Levels
  - Regional Water Supply Plans
    - Florida Statewide Agricultural Irrigation Demand 2015 – 2035 (FSAID II)
  - Alternative Water Supply Development
  - Water Conservation
  - Dispersed Water Management
Water Quality Best Practices – What are they?

- Activity or combination of activities, based on research, field-testing and expert review, to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality in agricultural and urban discharges.
- Nutrient (nitrogen & phosphorus) Management
- Stormwater Management
- Irrigation Management
- Fencing / Buffers near Waterways
### FDACS BMP Enrollment, Statewide, 9/30/2015

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Total NOI Acres</th>
<th># of NOIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus</td>
<td>627,512</td>
<td>3,986</td>
</tr>
<tr>
<td>Cow/Calf</td>
<td>2,678,625</td>
<td>1,588</td>
</tr>
<tr>
<td>Dairy</td>
<td>50,304</td>
<td>27</td>
</tr>
<tr>
<td>Equine</td>
<td>5,179</td>
<td>91</td>
</tr>
<tr>
<td>Fruit/Nut</td>
<td>10,975</td>
<td>323</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>101,075</td>
<td>3</td>
</tr>
<tr>
<td>Nursery</td>
<td>37,682</td>
<td>1,304</td>
</tr>
<tr>
<td>Row/Field Crop</td>
<td>1,292,004</td>
<td>1,608</td>
</tr>
<tr>
<td>Sod</td>
<td>63,841</td>
<td>66</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td><strong>4,867,196</strong></td>
<td><strong>8,996</strong></td>
</tr>
<tr>
<td>Forestry</td>
<td>4,878,169</td>
<td>448</td>
</tr>
<tr>
<td>Forestry - Wildlife</td>
<td>1,540,123</td>
<td>27</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>11,285,488</strong></td>
<td><strong>9,471</strong></td>
</tr>
</tbody>
</table>

### OAWP BMP Enrollment, June 2015

**Commodity, by Parcel**
- Citrus
- Cow/Calf
- Dairy
- Equine
- Fruit/Nut
- Mixed Use
- Nursery
- Row/Field Crop
- Sod
- Land in FFS BMPs

* Florida Forest Service Data

Disclaimer: This map information represents an estimate of the amount and/or location of acreage enrolled in FDACS BMP programs for specific commodities and/or regions of the state. It is not binding, and does not otherwise affect the interests of any persons, including any vested rights or existing uses of real property. The accuracy and reliability of this map information are not guaranteed, and are affected by continual changes in land use, crop production, and other socioeconomic factors. Data current as of September 30, 2015.
The Landscape
Best Practices – What do they look like?
Best Practices - What do they look like?

Weather Stations

Observation Wells

Soil Moisture Probe
Water Quality Challenges

- We need to manage our expectations.
- Biological systems do not respond in timeframes that match terms of office or career goals.
- Legacy loads and groundwater travel time lags will be a constant source of frustration.
- Focus on incremental improvement and staying the course.
- We’ve accomplished much – but have a tendency to under appreciate it.
Water Quantity

- Agriculture is second largest user of fresh water in Florida
- Nearly 90% of agricultural water use is for food production
- Access to adequate quantities of fresh water is critical
- Participation in long-range water supply planning
- Commitment to conservation/efficiency (Mobile Irrigation Laboratories)
- Preserving agricultural lands is critical for water storage and treatment, ground water recharge, and wildlife corridors
- In partnership with water management districts to develop alternative water supply projects
- Participate with stakeholders to develop innovative water storage programs on private lands
Water Quantity Challenges

- Agriculture is a “self-supplier” of water and cannot pass on the cost of wells, pumps etc.
- In 2010, domestic supply overtook agriculture as the largest water user.
- By 2030 domestic supply demand will increase by 30% - agricultural supply demand will increase by only 5%.

Competition issues
- Dover/Plant City
- Central Florida Water Initiative
- Lake Okeechobee
- SRWMD/SJRWMD
Why do we plan for water supply?

ss. 373.705(2)(a) F.S. (1997)
It is the intent of the Legislature that:
“Sufficient water be available for all existing and future reasonable – beneficial uses and the natural system, and that the adverse effects of competition for water supplies be avoided.”
2010 Florida Water Demand

Total = 6.4 bgd

- Public Supply: 41%
- Agricultural Self-Supply: 39%
- Recreational Self-Supply: 8%
- I/C/I Self-Supply: 7%
- Domestic Self-Supply: 2%
- Power Generation: 2%

Notes:
- Water demand includes groundwater and surface water.
- I/C/I represents Industrial, Commercial, and Institutional.

Source: Water demand: 2010 demand estimates obtained from Florida Water Management districts
Projected water demand expected to increase 20%

Projected 2010 vs. 2030 Florida Water Demand

<table>
<thead>
<tr>
<th>Category</th>
<th>2010</th>
<th>2030</th>
<th>Growth (mgd)</th>
<th>Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power generation</td>
<td>106</td>
<td>123</td>
<td>171</td>
<td>88%</td>
</tr>
<tr>
<td>Domestic</td>
<td>27</td>
<td>32</td>
<td>5</td>
<td>18%</td>
</tr>
<tr>
<td>I/C/I</td>
<td>83</td>
<td>99</td>
<td>16</td>
<td>18%</td>
</tr>
<tr>
<td>Recreational</td>
<td>147</td>
<td>176</td>
<td>29</td>
<td>29%</td>
</tr>
<tr>
<td>Agricultural</td>
<td></td>
<td>125</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>Public supply</td>
<td></td>
<td>782</td>
<td></td>
<td>30%</td>
</tr>
</tbody>
</table>

Source: Water demand: 2010 demand estimates and 2030 demand projections obtained from Florida Water Management Districts (WMDs).
Agricultural Acreage in Florida

Key Observations

- 2010 Statewide agricultural acreage (irrigated & non-irrigated lands) is 8,613,770 acres
Irrigated Agricultural Acreage in Florida

Key Observations

- In 2010, there were 1,738,961 acres of irrigated Ag lands in Florida.
- Less than 20% of all agricultural lands are irrigated.
Calculating Crop Irrigation Demand

Irrigated Lands Geodatabase
- Crop Type
- Irrigation System Type
- Soil Type
- Water Table Depth

AFSIRS Model

Crop Irrigation Demand

Local Climate Conditions
- Evapotranspiration
- Growing Season
Historical Land in Farms & Irrigated Acreage

Sources:
1997 and 2012 National Ag Census - State Data – Florida
Top producing agricultural counties compete for water

Key Observations

- 5 of the top 15 agricultural producing counties face potential competition for water from public supply
- Demand from public supply in these counties averages over 60% of water demand compared to the overall public supply average of 41%

Sources:
- Water demand: 2010 demand estimates obtained from Florida Water Management districts
- Agricultural value: 2012 data obtained from FDACS marketing department, based on USDA Census, 2012
Irrigated Agricultural Acreage by County

Key Observations

- The top 2 counties in agricultural water demand, Palm Beach and Hendry, use 39% of the total average annual irrigation demand
- Palm Beach: 419,000+ ac, 721 mgd
- Hendry: 194,000+ ac, 294 mgd

10 counties utilize 68% of Florida’s average annual irrigation demand
Water Supply Challenges

- In some areas and at some times, our use of water exceeds the natural systems ability to supply it.
- We won’t run out of water, but we will run out of cheap water.
- We must figure out a way to sustain funding for alternative water supply development.
“We live in a highly industrialized and urban culture, but it is important to remember that there is no such thing as a post-agricultural society. Policy decisions concerning agriculture, our environment, water supply and land use need to reflect this fundamental truth.”

- Timothy Weiskel 1990
Questions?

Rich Budell

Rich@BudellWaterGroup.com

850-519-0115