QUARTERLY PROGRESS REPORT

January 1, 2017 to March 31, 2017

PROJECT TITLE: Florida Solid Waste Management: State of the State

PRINCIPAL INVESTIGATOR(S): Timothy G. Townsend

AFFILIATION: Professor, University of Florida
Department of Environmental Engineering Sciences

COMPLETION DATE: September 30, 2017 **PHONE NUMBER: 352-392-0846**

PROJECT WEB SITE: http://pages.ees.ufl.edu/townsend/research/hc16/

Work accomplished during this reporting period:

Stakeholder Working Group Meeting

The first Stakeholder Working Group Meeting was conducted on February 10th, 2017, the presentation can be found on the project website and detailed notes from the meeting are outlined below.

Stakeholder Working Group Meeting Notes

- *Historic waste management in Florida*
  - Direction from group: Compare data on historical facility and collection equipment expenditures vs statewide recycling mandates and recycling rates. Include historical WTE facility investments. Provide on a timeline to see how effective these investments were in increasing recycling rates.
  - Direction from group: Compare historical recycling grant awards to counties to historical recycling rates to see if they have made an impact on recycling rates. Provide on timeline with recycling rates.
  - Comment from group: Food waste recycling would have to be mandated or subsidized before it would be implemented at any meaningful scale statewide.
    - Organics recycling facility in Okeechobee has closed. Private companies who have attempted organics recycling are backing out of future organics recycling because of low participation.
    - Other companies are scaling back organics recycling programs
  - Comment from group: Materials reduction composition (e.g. water bottles manufactured with less plastic) requires MRFs to process more material to maintain current recycling rates of that material.

- *Discussion on accuracy of statewide database*
  - Group reached a consensus that:
    - Double counting occurs when municipal recycling programs report what they send to MRFs, since the MRF's also report these numbers.
    - This is usually caught by County recycling coordinators, who then correct the database. A second level of quality control is performed by the FDEP to specifically look for double-counting. This is done by comparing reported tonnages to MRF records.
    - Many county recycling coordinators try to obtain recycling tonnages from non-certified recyclers who do not report their tonnages, however not all of it is found.

        - The group believes that a small amount of double counting is occurring, but it is likely offset by under-reporting by non-certified processors who are reluctant to report their numbers.
    - The group agreed that the 2015 recycling rates and estimated collected tonnages presented by the team in the meeting appeared to be reasonable. The team had to make the following assumptions to refine the data for upcoming alternatives analysis, which the group felt was reasonable:
        - Assumption 1- Using best judgment yard trash and C&D Debris were removed from residential and nonresidential.
        - Assumption 2- A portion of the collected tons for all MSW material components goes to either WTE or LF based on the relative amounts of each.
    - Database does not identify source (residential vs commercial) of yard trash tonnages. County and municipal solid waste directors keep records of residential yard trash pickup from their solid waste collection contracts. One county solid waste director reported their residential program collected 32% of all yard trash reported in their county in 2015. The group seemed to agree that a reasonable statewide assumption for yard trash would be 30/70 residential/commercial distribution. The team will obtain data from solid waste directors around the state to verify this assumption.

- *Discussion on Florida usage of Sustainable Materials Management*
    - Direction from group: Investigate other ways to measure benefit of recycling besides recycled tonnages. Consider using life-cycle analysis (LCA) to measure energy savings, water use reduction, and economic impact. Measure on per-capita basis to account for county size.
    - Direction from group: Investigate new markets for materials with low market demand (e.g. crushed glass as replacement for fly ash in concrete production). There is a current Hinkley Center project to investigate this.
    - Direction from group: Focus on specific major components of the recycling stream that account for the greatest economic and environmental benefit.

- *Miscellaneous comments from group*
    - County recycling coordinators have the challenging task of regularly educating county participants (households) to only place specific materials into their recycling bins. This task becomes more difficult as the markets for recyclable materials changes and the list of materials to be placed in the bins is modified.
    - Labeling and marketing for curbside recycling materials should be uniform by haulers, counties, and states. They should all be promoting the same message to minimize confusion. This message should be succinct and simplified.
    - The best strategy for commercial corporations (e.g. Publix, Walmart) to benefit solid waste management is for them to come together as a united front to focus on recycling specific materials or to ban specific materials from entering the recycling stream.
    - Single material drop off stations can be used together with curbside recycling to improve recycling efficiency (i.e. remove glass from the curbside recycling stream by creating glass drop off stations).
    - Counties and MRFs should be encouraged to agree on a contract that will ban specific materials from being processed (e.g. straws) to minimize damage to MRF processing machinery.
    - The team should gain an understanding of regional demographics throughout the state (e.g. rural vs urban) since it can impact recycling rates and the type of curbside recycling programs.
    - 30% of glass from MRFs is rejected from mills because it is too small.
    - Rules have changed for C&D Debris recycling numbers:
        - Concrete counts as recycling if used as landfill cover.

        - Recycling includes RAP (reclaimed asphalt pavement). C&D small portion is WTE.
    - Residential collection containers cost as much as collection vehicles.
    - Cardboard recycling is low because it is difficult for participants to place in recycling bins.

Economic Data Collection

The project team will lead a data collection effort to obtain the Full Cost Accounting (FCA) data for each county and municipality from 1988 to 2016 by contacting solid waste and public works directors directly. FCA was chosen because it is a systematic approach for finding, summing, and reporting the actual costs of solid waste management by accounting for past and future outlays, overhead and operating costs. The Full Cost Accounting Rule, 62-708, F.A.C. needed local governments to annually calculate the full cost of their solid waste management services however as of February 16, 2012, local governments are needed to conduct the FCA but they no longer need to send to the state their full cost accounting calculations and documentation of public disclosure.

Evaluation of Alternative Solid Waste Management Goals

The team expanded on the work started in the earlier period to find alternative approaches to recycling rates, such as Sustainable Materials Management. The role of SMM is highlighted as offering a new metric to evaluate Florida's current and future recycling management that can lead to new avenues for solid waste planners to design sustainable solid waste management programs. After applying life-cycle assessment (LCA) models, such as EPA WARM to a specific solid waste management approach, the outputted GHG and energy savings are proposed to replace the current recycling rate metric in Florida.

This analysis evaluated Florida's 75% recycling rate metric by identifying GHG and energy metrics found by estimating the amount of GHG and energy savings associated with three SWM approaches in 2008, that individually achieved a recycling rate of 75%; these three approaches are termed Baselines. Then, based on current solid waste industry and management trends, four SMM Scenarios for 2020 were created to assess how the different waste management strategies progress toward reaching the alternative GHG and energy saving targets of each Baseline.

Work planned for the next reporting period:

County Solid Waste Management Case Study

A detailed individual county evaluations of alternatives for achieving a 75% recycling rate will be performed that is based on each county's historical solid waste generation rates, demographics, and current collection, processing and disposal practices/costs.

The case studies aim to assess the magnitude, disposition and costs associated with the State's solid waste management program. Specific objectives include examining alternative waste management strategies to increase statewide recycling rates and the corresponding economic and lifecycle costs resulted from such strategies. The research will be conducted by a UF student (as a summer research internship) under the supervision of a UF faculty member. The student will visit each county as needed to collect data, tour facilities, and interview solid waste system experts; all other research will be conducted at the University campus.

Metrics:

Name	Rank	Department	Professor	Institution
Malak Anshassi	Undergraduate Student	Environmental Engineering	Townsend	University of Florida

Stakeholder Working Group Meeting: The research team began preparation for the first stakeholder working group meeting scheduled on February 10th, 2017.

Invited Stakeholder Working Group members include:

1. Karen Moore
2. Shannan Reynolds
3. Cory Dilmore
4. Dawn Templin
5. Suzanne Boroff
6. Kim Walker
7. Travis Barnes
8. Ana Wood
9. Alan Altman
10. Sally Palmi
11. Marc Bruner
12. Keith Howard
13. Mary Jean Yon
14. Gene Jones
15. Keyna Cory
16. Ron Beladi
17. Dave Gregory
18. Carlo Lebron
19. Tobin McKnight
20. Kevin Leo
21. Richard Tedder
22. Dawn McCormick
23. Bob Hyres
24. Kim Williams
25. James Suter
26. Kim Brunson
27. Victor Storelli
28. Tim Townsend
29. Steve Laux
30. Malak Anshassi
31. John Schert
32. Jay Bassett
33. Steve Smith