QUARTERLY PROGRESS REPORT

July 1, 2017 to September 30, 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 second Stakeholder Working Group Meeting was conducted on October 5th, 2017, the presentation can be found on the project website and detailed notes from the meeting are outlined below.

Stakeholder Working Group Meeting Notes

- *Discussion on accuracy of statewide database*
  - The group agreed that the 2016 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.
  - The group agreed it was helpful to break down the total waste management and disposition data into the four categories: residential, non-residential, yard trash, and C&D Debris. Also, that it would be helpful for Re-Trac (online waste database server) to include a reporting section for the four categories. Currently 32 states actively use Re-Trac to report and track their waste management and disposition.
  - The group agreed that the residential recycling rate is low because of contamination with curbside recycling.
  - Comment from group: it is difficult to compare other states recycling rates because they do not report or count the same way. Specifically, Florida may count landfill cover and renewable energy as recycling credits but other states might not count those same items as recycling credits.

- *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, landfill space savings, and economic impact.
  - Direction from group: Focus on specific major components of the recycling stream that account for the greatest economic and environmental benefit.
    - Waste-To-Energy and mixed waste processing approaches deliver a small incremental increase in the recycling rate and a high economic cost.

        - Curbside single stream recycling approach requires a high amount of materials to be recycled and an investment in materials recovery facility equipment.
    - Comment from group: the 75% recycling rate goal is an aspirational goal that is not necessarily realistic because it was a value set arbitrary.
    - Direction from group: a cost-benefit analysis that includes achieving the recycling rate through different approaches would provide useful data that can benefit decision making.

County Solid Waste Management Case Study

Five county evaluations were conducted for Alachua, Escambia, Palm Beach, Polk, and Sarasota County that focus on alternatives using sustainable materials management (SMM) principles to achieve Florida 75% recycling rate goal. Data collection for each county's historical solid waste generation rates, demographics, and current collection, processing and disposal practices, and the economic costs were retrieved from the counties and used in the analysis. The case studies aim to assess the magnitude, disposition and costs associated with each County's solid waste management program, and examining alternative waste management strategies to increase the county and statewide recycling rates and to evaluate the economic and environmental burden associated with each alternative strategy. The research was conducted by a UF student under the supervision of a UF faculty member, final reports and a presentation were completed by the student. The results of each case study were presented and reported in a summary document for the individual county and used to provide scientific results and to interpolate missing data gaps for the State of State Hinkley Center project.

Economic Data Collection

The project team lead a data collection effort to obtain the Full Cost Accounting (FCA) data for each county and municipality from 1988 to 2016 by initially contacting solid waste and public works directors directly, however not all required data was retrieved. To obtain additional FCA data the research team traveled to the FDEP offices in Tallahassee in June to manually scan any FCA data available. The data was manually processed and extracted from the scanned documents into a database to be used to interpolate missing economic data gaps in Florida.

Sustainable Materials Management (SMM) Assessment

An analysis of applying SMM principles in Florida's solid waste management was conducted by identifying alternative metrics that are equivalent to the 75% recycling rate. This was done by proposing a baseline that can be used as a metric to compare to the current solid waste management approach and alternative approaches. The metric units were recycling rate (%), greenhouse gas ($MTCO_2E$) and energy savings (mmBTU); the environmental burden metrics were found using the Waste Reduction Model (WARM)- a life-cycle assessment (LCA) model developed by the EPA.

Further evaluation of SMM principles will be incorporated into the project as a measure to assess using SMM metrics as a goal that can potentially be used as a reporting measure and/or to replace the current 75% recycling rate goal. Other metrics will be developed using LCA models such as EPA MSW-DST and openLCA; such metrics include: toxicity, ocean pollution, eutrophication potential, etc. The economic data, MSW mass flow data, and the LCA model metrics will be used to accurately evaluate SMM applicability and appropriateness within Florida's solid waste management. The initial results were discussed and presented to the stakeholder working group and their feedback will be summarized into the whitepaper.

Metrics:

Graduate Students

Name	Rank	Department	Professor	Institution
Malak Anshassi	Master's Student	Environmental Engineering	Townsend	University of Florida

Undergraduate Students

Name	Rank	Department	Professor	Institution
Kevin Kijanka	Undergraduate Research Assistant	Environmental Engineering	Townsend	University of Florida
Madeley Guerrero	Undergraduate Research Assistant	Environmental Engineering	Townsend	University of Florida
Matthew Morse	Undergraduate Research Assistant	Environmental Engineering	Townsend	University of Florida
Matthew Ivers	Undergraduate Research Assistant	Environmental Engineering	Townsend	University of Florida
Edward Galvan	Undergraduate Research Assistant	Environmental Engineering	Townsend	University of Florida

Stakeholder Working Group Meeting: The research team began preparation for the second stakeholder working group meeting scheduled on October 5, 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