



SAN DIEGO STATE
UNIVERSITY

College of Engineering – Associate Dean RESEARCH SEMINAR

“Holistic Waste Stream Management from Residences with Energy Production and Nutrient Cycling”

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Thursday, February 12, 2015 – 11:00am-12:00pm
Love Library, Room 431 (please note – room change)

Our current research efforts are assessing the potential of integrating multiple biological processes in the holistic management of liquid and solid waste streams from houses and residential communities. The waste streams and cultivated biomass are processed into biofuels (e.g. biogas and biodiesel) that will significantly contribute to the energy requirements of the house and/or community, and co-products will be incorporated into recycle streams to improve overall process efficiencies and to meet additional resource demands (e.g. clean water, food production). Including water and waste management with the potential for food production and generation of biofuels will augment existing off-grid power technologies (e.g. solar PV, solar thermal, wind) that provide many homeowners with desired energy security, and will extend the sustainability and resource independence of residential communities.

This talk will discuss the conceptual framework for integration of various resource and waste management options and energy demands and sources for singles residences and residential communities. Preliminary results include waste characterization (proximate and ultimate analysis) and biochemical methane potentials (BMPs) that have been used to inform a materials and energy flows demand analysis, as well as algal cultivation, harvesting/dewatering and lipid extraction to assess the potential for nutrient (N, P) cycling. Extensive characterization of a patented mass transfer device for recovery and utilization of carbon dioxide will be presented.

Speaker Bio: Dr. Stuart is a Professor of Civil Engineering at Ohio University where he also serves as Chair of the Faculty Senate’s Finance and Facilities Committee which places him on the Ohio University Board of Trustees Resource Committee, co-Chair of the University Benefits Council, Chair of the Responsibility Centered Management (RCM) Faculty Liaisons, member of the University Budget Planning Council, and member of the University Facilities Planning Advisory Committee. He is currently serving on two master planning efforts including the University Comprehensive Master Plan, is a member of the Council for Research, Scholarship and Creative Activity, and previously co-Chaired the Presidential Advisory Council for Sustainability Planning which resulted in the development of the University’s Sustainability Plan and Climate Action Plan. Dr. Stuart also serves as the Executive Director of the Institute for Sustainable Energy and the Environment and as Director of the Biofuels Research Laboratory. He received his Ph.D. from the Department of Chemical and Biochemical Engineering at Rutgers, the State University of New Jersey.

San Diego State University

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