Resources from CH2M HILL's Presentation

Using Wastewater Treatment Technologies to Reduce Nutrient Pollution Impacts on Coral Reefs

A list of resources and references used to develop the presentation that the Reef Resilience Network membership can use to learn more about the topics presented on March 11, 2015 follows.

Onsite Sewage Treatment Disposal Systems

Full-scale Two-stage Passive Biofilter System

Technology Resources

Online References

- Florida Onsite Sewage Nitrogen Reduction Strategies (FOSNERS) studies and projects (floridahealth.gov):
  - *FOSNRS 1: The Florida Onsite Sewage Nitrogen Reduction Strategies (FOSNRS) Study, Project Overview:* http://bit.ly/1DpnQs5
  - *FOSNRS 3: The Performance of a Full-scale 2 Stage Passive Biofilter System:* http://bit.ly/1Bc3a7K
- Sustainable Sanitation and Water Management. 2014. *Septic Tank*. http://bit.ly/1wlTS8A
- Water Environmental Research Foundation (WERF), "When to Consider Distributed Systems in an Urban and Suburban Context" (werf.org): http://bit.ly/1E864cp
- National Onsite Wastewater Recycling Association (NOWRA): http://www.nowra.org/

Video Resource Links

- Texas Cooperative Extension, Texas A&M University System (PublicResourceOrg): Overview of Septic Systems

Case Study References

- Hazen and Sawyer et al. 2010. *Florida Onsite Sewage Nitrogen Reduction Strategies Study: Quality Assurance Project Plan*. Final report. Prepared for Florida Department of Health Division of Environmental Health Bureau of Onsite Sewage Programs. October.
- Hazen and Sawyer. 2014. FOSNRS 3: The Performance of a Full-scale 2 Stage Passive Biofilter System, Presented at Onsite Wastewater Conference. Soil Science Society of America. April 7-8.

Wastewater Stabilization Ponds

Soapberry Wastewater Treatment Plant

Technology Resources

Online References

- Sustainable Sanitation and Water Management (SSWM): http://www.sswm.info/
- United Nations Environment Programme (UNEP)—Environmentally Sound Technologies in Wastewater Treatment (unep.or.jp): http://bit.ly/1uabkMw
- Food and Agriculture Organization of the United Nations, 1992, "Wastewater Treatment and Use in Agriculture" (Section 3.3.1) (fao.org): http://bit.ly/1B0961u

Video Resource Links

- University of Leeds Introduction to Waste Stabilization Ponds I: "Waste Stabilization Pond Design 1 of 7"
- University of Leeds Introduction to Waste Stabilization Ponds II: "Waste Stabilization Pond Design 2 of 7"

Case Study References

- *CReW's Lines* (newsletter of the Caribbean Regional Fund for Wastewater Management), vol. 1, issue 2, Sept. 2012: http://bit.ly/1ChivRT.
- Williams, Bernard. 2013. "Sewage Management in Jamaica: The Past, Present and the Future: A Perspective of Engineers, Designers and Environmentalists." Nov. 3.
- "Soapberry Wastewater Project to Save Kingston Harbour." 2006. Jamaica Information Service. Sept. 17.
- Thompson, Kimone. July 30, 2014. "Scientist Pushes for Treated Effluent to Be Part of Water Resources." Jamaica Observer.
- Nangle, M. 2007. "Sustainable Low-Cost Waste Water Technology For Poor Coastal Communities: A Case Study of White Horses, Pamphret, & Botany Bay Jamaica." Stockholm, Sweden: Royal Institute of Technology.
- Environmental Solutions LTD. 2004. "Environmental Impact Assessment: Soapberry Wastewater Treatment Plant St. Catherine Jamaica." Kingston, Jamaica.

Constructed Wetlands

Constructed Wetland, Antigua, West Indies

Technology Resources

Online References

- Sustainable Sanitation and Water Management, 2012, *Free Water Surface Constructed Wetlands.* http://bit.ly/18wlNaH
- Water and Sanitation Program, 2008, *Constructed Wetlands: A Promising Wastewater Treatment System for Small Localities: Experiences from Latin America*: http://bit.ly/15eJxi3
- Water Environmental Research Foundation (WERF), "When to Consider Distributed Systems in an Urban and Suburban Context" (werf.org): http://bit.ly/1E864cp

Video Resource Links

- "Constructed Wetlands for Wastewater Treatment"

Case Study References

- Morris, G. L. "The Caribbean's Most Beautiful Wastewater Treatment System: Constructed Wetland at Antigua, W.I." Gregory L. Morris Engineering.

Activated Sludge

Key Largo Wastewater Treatment District Regional Wastewater Project

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Technology Resources

Resources

Online References

- Food and Agriculture Organization of the United Nations, 1992, "Wastewater Treatment and Use in Agriculture" (Section 3.3.1) (fao.org): http://bit.ly/1B0961u
- National Small Flows Clearinghouse, 2003, "Explaining the Activated Sludge Process," *The Pipeline*, vol. 14, no. 2.

Video Resource Links

- American Water Works Association, 2014, Activated Sludge is 100 Years Old!
- Blacoh University, 2014, Blacoh University Engineer Series: All Things Water Course 1, Activated Sludge

Case Study References

- Aqua-Aerobic Systems, Inc. 2010. Key Largo Incorporates IntelliPro® System With New AquaSBR® System for Enhanced Process Control: http://bit.ly/1B9547h
- Key Largo Wastewater Treatment District. 2015. Budget.
- CH2M HILL. 2000. Monroe County Sanitary Wastewater Master Plan. Monroe County, Florida: http://bit.ly/1wX5MGC

Package Plant

Ave Maria Water Treatment Plant and Water Reclamation Facility

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Technology Resources

Online References

- Blue Water Technologies: http://bit.ly/1E89rQN
- GE Power & Water: http://bit.ly/1ytdfKt
- Pollution Control Systems Inc., 2015, "Wastewater Treatment Package Plants": http://bit.ly/1E2Wrde

Video Resource Links

- Microbac Biomass Engineering (Package Plants/MBR): "Microbac Package Waste Water Treatment Plant"
- AQUALINEWater (Package Plants/MBR): "AQUALINE Water Treatment Technologies Membrane Bio-reactors MBR"

Case Study References

- Interview with Randy Boe/CH2M HILL, January 12, 2015.

Membrane Bioreactors

Resort on St. Thomas, U.S. Virgin Islands

Technology Resources

Online References

- U.S. Environmental Protection Agency, 2007, Wastewater management fact sheet, membrane bioreactors: http://1.usa.gov/1BEodzc

Video Resource Links

- Microbac Biomass Engineering (Package Plants/MBR): "Microbac Package Waste Water Treatment Plant"
- AQUALINEWater (Package Plant/MBR): "AQUALINE Water Treatment Technologies Membrane Bio-reactors MBR"
- GE Water & Process Technology (MBR/Reuse): "Overview of LEAPmbr, GE's next-generation membrane bioreactor"

Case Study References

- GE Power & Water. 2012. "Using Membrane Bioreactors for Wastewater Treatment in Small Communities."

Wastewater Reuse

Bonita Springs Water System Master Plan

Technology Resources

Online References

- National Research Council. 2012. *Water Reuse: Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater*. National Academies Press, Washington, DC: http://www.nap.edu/openbook.php?record_id=1330
- UNEP Caribbean Environment Programme (UNEP CEP), various technical reports: http://bit.ly/1KRh2b1
- Caribbean Regional Fund for Wastewater Management (CReW): http://www.gefcrew.org/
- Longsworth, Sofia, Nov. 9, 2014, "Is Waste-water Reuse Possible in the Caribbean?" Antillean Media Group: http://bit.ly/1C8BiAZ
- *CReW's Lines* (newsletter of the Caribbean Regional Fund for Wastewater Management), vol. 1, issue 2, Sept. 2012: http://bit.ly/1ChivRT
- Pike, Joe, April 13, 2009, "Certified Green in the Caribbean," Travel Agent Central: http://bit.ly/1CxJ3yx

Video Resource Links

- City of Bend, Oregon: "Water Reclamation Facility Virtual Tour"

Case Study References

- Water Design-Build Council. 2013. Bonita Springs Utilities Design-Build Projects. http://bit.ly/1xN4lDH. Accessed March 3, 2015.
- Interview with Randy Boe/CH2M HILL, January 12, 2015.