ALGAL TURF SCRUBBER PUBLICATIONS

A good summary (Chapter 25) in Walter and Karen Adey's book:

Adey, W. H. and K. Loveland. 2007. Dynamic Aquaria: Building and Restoring Living Ecosystems, Third Edition. Elsevier Publ., Amsterdam.

A good general summary:

Adey, W. H. et al. 2011. Algal turf scrubbing: cleaning surface waters with solar energy while producing a biofuel. Bioscience 61:434-441.

Some of the original work by Walter Adey:

Adey, W. H. and T. Goertemiller. 1987. Coral reef algal turfs: master producers in nutrient poor seas. Phycologia 26:374-386.

From Walter Adey's early work:

Adey, W. et al. 1993. Phosphorus removal from natural waters using controlled algal production. Restoration Ecology 1:29-39.

Adey, W. H. et al. 1996. Purification of industrially contaminated groundwaters using controlled ecosystems. Ecological Engineering 7:191-212.

Craggs, R. J. et al. 1996. A controlled stream mesocosm for tertiary treatment of sewage. Ecological Engineering 6:149-169.

Craggs, R. J. et al. 1996. Phosphorus removal from wastewater using an algal turf scrubber. Water Science and Technology 33:191-198.

Craggs, R. J. 2001. Wastewater treatment by algal turf scrubbing. Water Science and Technology 44:427-433.

From Walter Mulbry's group that focused on dairy wastewater treatment:

Mulbry, W. W. and A. C. Wilkie. 2001. Growth of benthic freshwater algae on dairy manures. Journal of Applied Phycology 13:301-306.

Pizarro, C. et al. 2002. Nitrogen and phosphorus removal using small algal turfs grown with dairy manure. Journal of Applied Phycology 14:469-473.

Kebede-Westhead, E. et al. 2003. Production and nutrient removal by periphyton grown under different loading rates of anaerobically digested flushed dairy manure. J. Phycol. 39:1275-1282.

Kebede-Westhead, E. et al. 2004. Treatment of dairy manure effluent using freshwater algae: elemental composition of algal biomass at different manure loading rates. J. Agric. Food Chem. 52:7293-7296.

Mulbry, W. et al. 2005. Recycling of manure nutrients: use of algal biomass from dairy manure treatment as a slow release fertilizer. Bioresource Technology 96:451-458.

Pizarro, C. et al. 2006. An economic assessment of algal turf scrubber technology for treatment of dairy manure effluent. Ecological Engineering 26:321-327.

Mulbry, W. et al. 2008. Treatment of dairy manure effluent using freshwater algae: Algal productivity and recovery of manure nutrients using pilot-scale algal turf scrubbers. Bioresource Technology 99:8137-8142.

Mulbry, W. et al. 2008. Treatment of dairy and swine manure effluents using freshwater algae: fatty acid content and composition of algal biomass at different manure loading rates. Journal of Applied Phycology 20:1079-1085.

Mulbry, W. et al. 2006. Biofertilizers from algal treatment of dairy and swine manure effluents: characterization of algal biomass as a slow release fertilizer. Journal of Vegetable Science 12:107-125.

Wilkie, A. C. and W. W. Mulbry. 2002. Recovery of dairy manure nutrients by benthic freshwater algae. Bioresource Technology 84:81-91.

Kebede-Westhead, E. et al. 2006. Treatment of swine manure effluent using freshwater algae: Production, nutrient recovery, and elemental composition of algal biomass at four effluent loading rates. Journal of Applied Phycology 18:41-46.

Work around the Chesapeake:

Mulbry, W. et al. 2010. Toward scrubbing the bay: Nutrient removal using small algal turf scurbbers on Chesapeake Bay tributaries. Ecological Engineering 36:536-541.

Kangas, P. and W. Mulbry. 2014. Nutrient removal from agricultural drainage water using algal turf scrubbers and solar power. Bioresource Technology152:484-489.

Adey, W. H. et al. 2013. Algal turf scrubber (ATS) floways on the Great Wicomico River, Chesapeake Bay: productivity, algal community structure, substrate and chemistry. Journal of Phycology 49:489-501.

Ray, N. E. et al. 2015. Nitrogen and phosphorus removal by the algal turf scrubber at an oyster aquaculture facility. Ecological Engineering 78:27-32.

Kangas, P. et al. 2017. High diversity within the periphyton community of an algal turf scrubber on the Susquehanna River. Ecological Engineering 108:564-572.

Work in Arkansas:

Sandefur, H. N. et al. 2011. Seasonal productivity of a periphytic algal community for biofuel feedstock generation and nutrient treatment. Ecological Engineering 37:1476-1480.

Sandefur, H. N. et al. 2014. Hydrodynamic regime considerations for the cultivation of periphytic biofilms in two tertiary wastewater treatment systems. Ecological Engineering. Ecological Engineering 71:527-532.

ATS from other locations:

Sindelar, H. R. et al. 2015. Algae scrubbers for phosphorus removal in impaired waters. Ecological Engineering 85:144-158.

Chen, N. et al. 2015. Nutrient removal at a drinking water reservoir in China with an algal floway. Ecological Engineering 84:506-514.

D'Aiuto, P. E. et al. 2015. Algal turf scrubbers: Periphyton production and nutrient recovery on a South Florida citrus farm. Ecological Engineering 75:404-412.

Mayr, M. et al. 2015. Combating planktonic algae with benthic algae. Ecological Engineering 74:310-318.

Yan, Z. et al. 2018. Flow conditions influence nutrient removal at an artificial lake and a drinking water reservoir with an algal floway. Algal Research 35:245-252.

David Blersch's dissertation papers:

Blersch, D. M. et al. 2013. Autonomous benthic algal cultivator under feedback control of ecosystem metabolism. Environmental Engineering Science 30:53-60.

Blersch, D. M. et al. 2013. Turbulence and nutrient interactions that control benthic algal production in an engineered cultivation raceway. Algal Research 2:107-112.

ATS Potentials:

Calahan, D. et al. 2015. Weeds in the algae garden – A source of biomass for the algae-to-biofuels program. Ecological Engineering 85:275-282.

Calahan, D. et al. 2018. Expanded algal cultivation can reverse key planetary boundary transgressions. Heliyon 4:e00538.

Life Cycle Assessment of ATS:

Colosi, L. M. et al. 2012. Will algae produce the green? Using published life cycle assessments as a starting point for economic evaluation of future algae-to-energy systems. Biofuels 3:129-142.

Zhang, Y. et al. 2013. Environmental and economic assessment of integrated systems for dairy manure treatment coupled with algae bioenergy production. Bioresource Technology 130:486-494.

Higgins, B. T. and A. Kendall. 2012. Life cycle environmental and cost impacts of using an algal turf scrubber to treat dairy wastewater. Journal of Industrial Ecology 16:436-447.