

ENERGIZE NEW MEXICO IMPACTS 2017

SUBJECT: From the Lab to Real Life: Upscaling algae for wastewater treatment

CATEGORY- Chose U.S./global economy, national security or scientific knowledge: Scientific knowledge & U.S. Economy

NSF AWARD(S): #IIA-1301346 https://www.nsf.gov/awardsearch/showAward?AWD_ID=1301346

OTHER SUPPORTING INFORMATION:

<https://www.nmepscor.org/science/algal-biofuels>

<https://www.theguardian.com/sustainable-business/2015/aug/28/water-wastewater-treatment-algae-rivers-energy-money-profit-las-cruces-new-mexico>

<http://www.sciencedirect.com/science/article/pii/S2211926416302582>

BRIEF SUMMARY OF OUTCOMES - (Why is this award compelling for use as an Impact?):

New Mexico EPSCoR researchers at New Mexico State University deployed a pilot-scale, algal-based wastewater treatment system at the municipal wastewater treatment plant in Las Cruces, NM. The system was able to clean primary wastewater effluent to US Environmental Protection Agency discharge standards for organic carbon, nitrogen, and phosphorus in under 4 days.

THREE REASONS this award outcome impacts U.S./global economy, national security or scientific knowledge:

- Extensive lab and outdoor growth experiments determined the best algae strain to use for wastewater treatment, contributing to knowledge about extremophiles—organisms that can survive harsh conditions such as extreme temperature or toxic environments
- Lab experiments showed, and pilot-scale demonstrations confirm, a mixotrophic algae system (algae that creates energy through photosynthesis *and* consumption) achieves 90% removal of effluent from wastewater
- Using algae can reduce energy costs compared to current wastewater treatment systems, and algae can be harvested after water treatment for use as a fuel

NSF Directorate(s)/Division(s): OIA

State(s): New Mexico