Kealakekua, HI, MLRA Soil Survey Office

Hurricane Maria Relief Efforts in Puerto Rico—Management of Animal Mortality

Purpose

On September 20, 2017, category 4 Hurricane Maria made landfall in Puerto Rico and the U.S. Virgin Islands. It left catastrophic damage on the islands, which affected millions of U.S. citizens. In response, volunteers and aid are provided by Federal agencies and nonprofit organizations. USDA-NRCS is helping farmers recover from the catastrophic losses and restart farming operations through the Environmental Quality Incentives Program (EQIP). An initial assessment by NRCS identified degraded water quality as one of the biggest issues for livestock operations because of potential contamination from high animal mortality. To address animal mortality and the related threat to water quality, the conservation practice standards of Animal Mortality Facility (AMF) and Emergency Animal Mortality Management (EAMM) were applied.

From left to right, the catastrophe recovery team for this effort included Abdiel Santana, soil scientist, PR; Samuel Rios, acting MLRA SSO leader, PR; student volunteer, PR; Manuel Matos, state soil scientist, PR; Alvin Perez, MLRA SSO leader, Tifton, GA; Jacqueline Vega, soil scientist, HI; and Janella Cruz, soil scientist, NY.

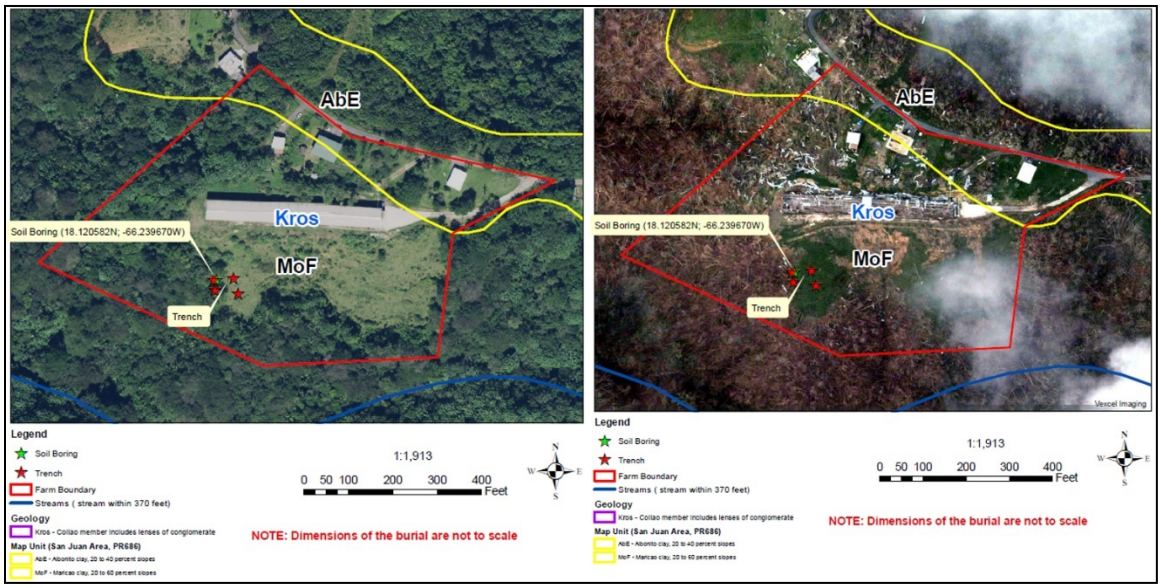
An AMF is an onsite facility for the treatment or disposal of animal carcasses due to routine mortality. The EAMM standard was created for management of animal carcasses from a catastrophic event. The objectives of the EAMM standard are to minimize contamination of surface water and groundwater, odors, and spread of pathogens.

Key Outcomes

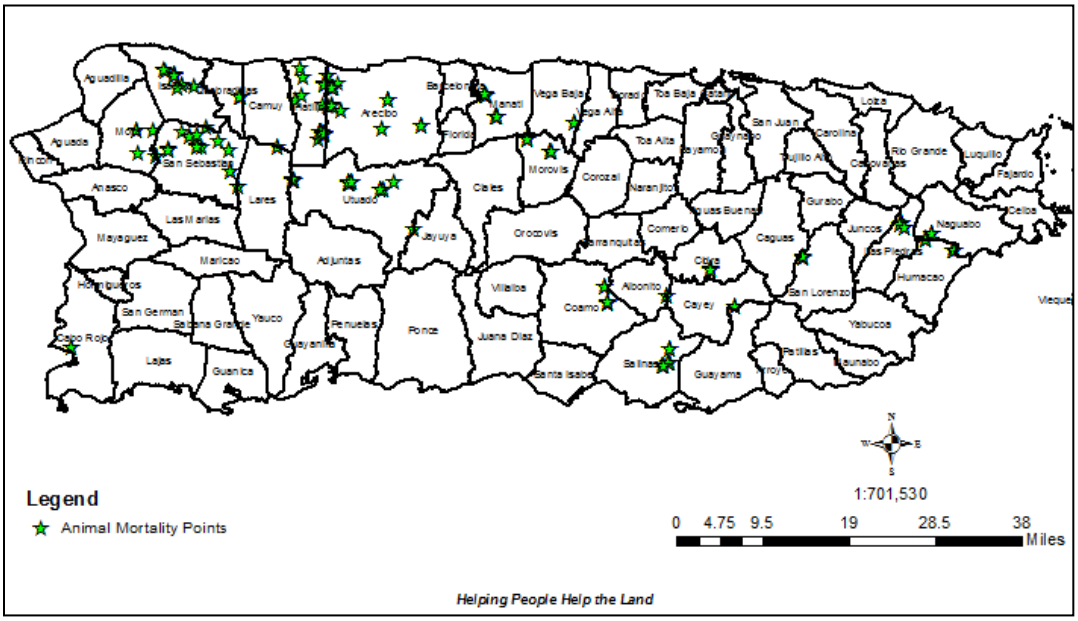
Several steps were needed to establish the parameters of the EAMM standard. Data on known livestock operations in Puerto Rico were researched from NRCS field offices. With that data, a pre-evaluation of each site was conducted. This included use of an ArcMap to determine the location of burial sites, landscape position, slope, soil map units, hydrology, and geology and generation of a soil interpretation report from Web Soil Survey. As a member of the catastrophe recovery team, Jacqueline Vega, NRCS soil scientist from the Kealakekua MLRA Soil Survey Office, then visited customers at the livestock production farms and performed onsite evaluations. Critical information on the dead animals and the burial sites was gathered, and the soil near the reference sites was described following National Cooperative Soil Survey standards. Each description included soil depth and texture, rock fragment

content, clay content, soil plasticity and stickiness, soil permeability, and percent slope. Photographs and GPS coordinates were also included. Potential resource concerns were documented and passed on to NRCS field office staff for follow-up with producers. Comprehensive reports of each site that included observations and recommendations on the suitability of the soils for EAMM were provided to NRCS engineers for evaluation and certification.

Investigations were conducted on 124 farms in 27 municipalities in Puerto Rico in January, February, and March of 2018. Limiting landscape, hydrology, and soil properties were identified and mitigated through system design, thus reducing the risk of water contamination in areas where animal carcasses are disposed.



Aerial view of a poultry farm in Aibonito, Puerto Rico, before and after Hurricane Maria.



Distribution of the animal mortality sites on the main island of Puerto Rico.