

Irrigation Resilience and Climate Change Mitigation Through Waste Utilization

Oral presentation abstract

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The economy of Colorado's North Fork valley has been based on coal mining and agriculture for over 100 years. As natural gas and renewables have decreased in price, local coal mines have laid off workers and closed, forcing the region to rely more heavily on its agriculture.

As is the case with many coal deposits, North Fork coal is saturated with methane and other gases. To prevent underground fires, that gas is vented during mining, and the venting continues long after mine closure. This represents a wasted resource and a source of pollution: the climate impact of vented methane is 84 times that of CO₂, and other vented gases have acute toxicity.

The North Fork's agricultural sector has a challenge as well. Much of the local water delivery system is controlled by Paonia Dam and Reservoir, whose storage allows irrigation into the summer months. This storage has been severely diminished by sediment build-up in the reservoir, and sediment flushing harms the downstream ecosystem.

These problems are an opportunity.

Paonia Reservoir sediment is high-quality clay and can be converted with heat from burning the methane into useful ceramics such as brick and tile. This converts the methane and toxic gases into non-toxic carbon dioxide and water, and provides building materials to sell to western Colorado's growing population. Finally, this is an opportunity to grow community between climate scientists, coal miners, farmers, conservationists, and builders.

We believe that utilization of coal mine methane and nuisance sediment will invigorate the local economy, improve air quality, and build alliances amongst otherwise-disparate groups. This talk will focus progress to date in methane and sediment utilization, as well as stakeholder and business considerations.



Figure 1. Left, satellite image showing a grid of methane drainage wells (upper left) and sedimentation (upper right). Right, bowl, brick, and pot made from Paonia Reservoir clay.