



Land

Land use contributes to both emissions and sequestration of our region's GHG emissions. Carbon exists in different forms across our landscape. Soil, plants, water, and other aspects of our region's ecosystem exchange carbon for different uses creating a dynamic state of equilibrium. Land use such as tilling, planting and fertilizing cropland, and grazing livestock releases ecosystem carbon and nitrogen as greenhouse gases into the atmosphere in the form of carbon dioxide and other GHG trace gases such as nitrous oxide and methane. Simultaneously, other forests, vegetation, wetlands, designated open space, and many agricultural practices sequester carbon and increase moisture retention of the land.

In 2019, San Miguel County hired Marc Easter Consulting LLC in tandem with DBA Farm Table & Sky to conduct a land use GHG inventory for the county. Their study provided insights into what changes could improve soil health (water retention and infiltration, nutrient cycling, and crop capacity) and increase GHG emissions and sequestration potential of SMC land. These recommendations helped guide the development of SMC's Payment for Ecosystem Services Program. The PES plan highlights those exciting opportunities for ranchers, agriculturalists, and other land managers to receive monetary compensation for the environmental actions they practice.

Land Use - Forestry

San Miguel County Non-Federal Land Cover

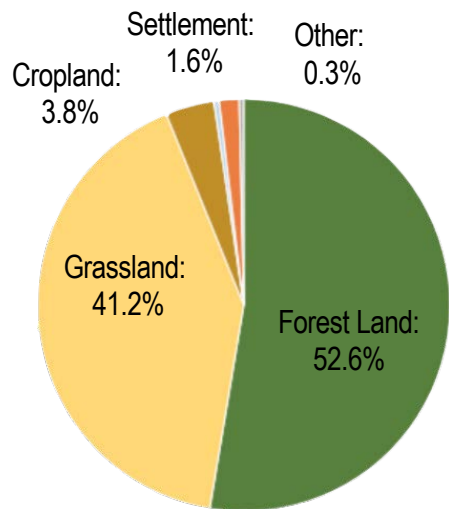


Figure 19

Ouray County Non-Federal Land Cover

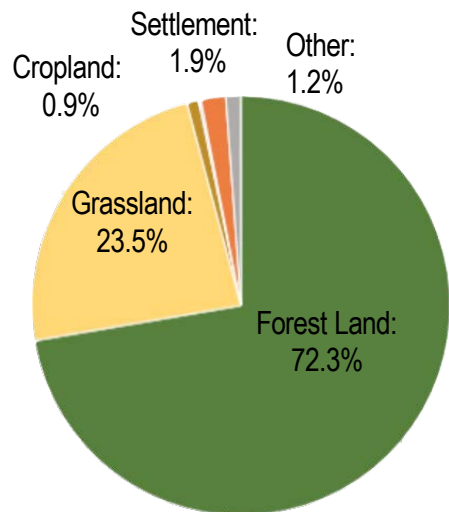


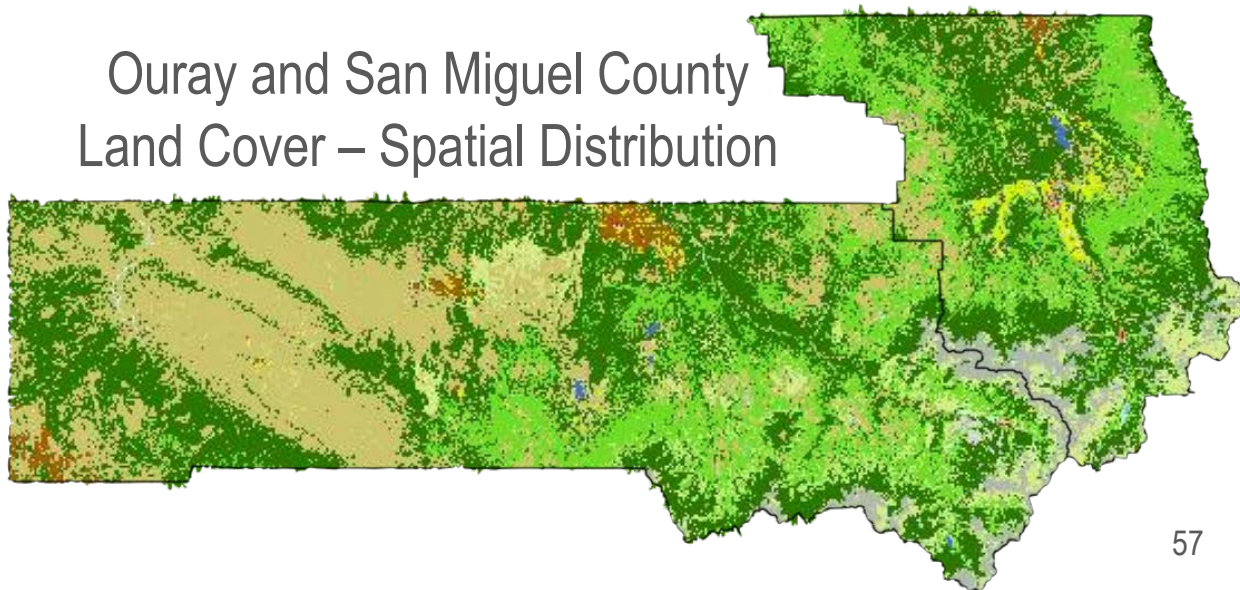
Figure 20

The health, function, and structure of our diverse ecosystems intimately relate to both our economic sustainability and resilience to the stressors of climate change. Changes in vegetation cover due to disturbances or natural succession impact our landscape’s ability to sequester carbon. The following section describes changes in our beloved landscape and the impacts it has on GHG emissions and reductions. Because our municipal and county governments hold little control over federal land practices, we have chosen to exclude federally owned and operated land from our emissions calculations but feel it is important to understand and account for these changes in our goal setting and program creation decisions.

Forests make up the vast majority of our region’s ecosystems (72.3% in Ouray County, 52.6% in San Miguel County) with grasslands constituting most of the remainder (23.5% in OC, 41.2% in SMC). In total, our ecosystems remove around 181,000 mtCO₂e annually from the atmosphere, roughly half of our annual regional emissions. There’s potential through PES and other local land initiatives to increase this sequestering capacity and promote long-term forest health.

Figure 21

Ouray and San Miguel County Land Cover – Spatial Distribution



Land Use – Forest Disturbances

Forest Disturbances as of 2001

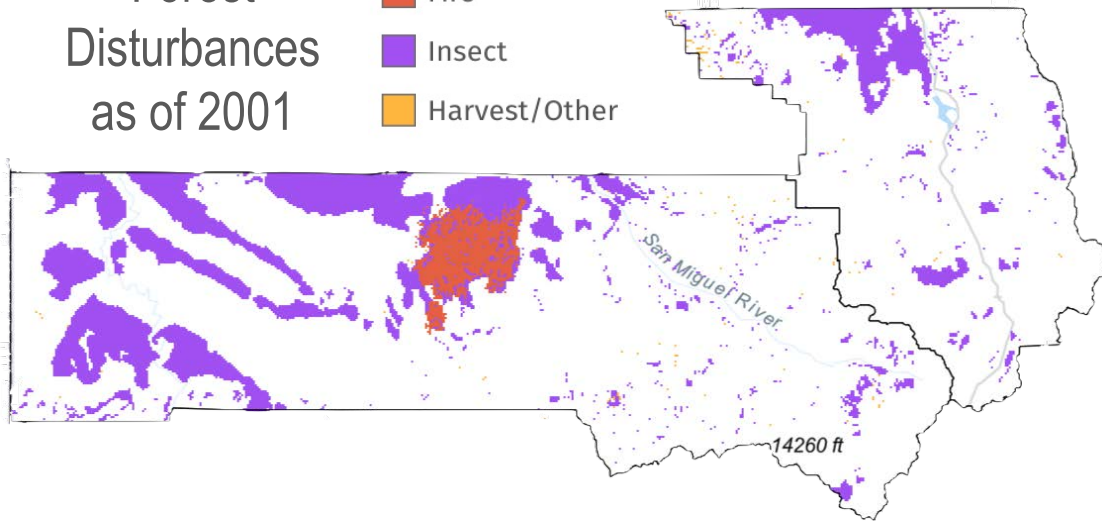
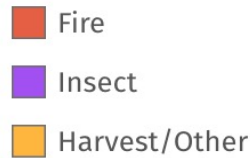


Figure 22

Forest Disturbances as of 2016

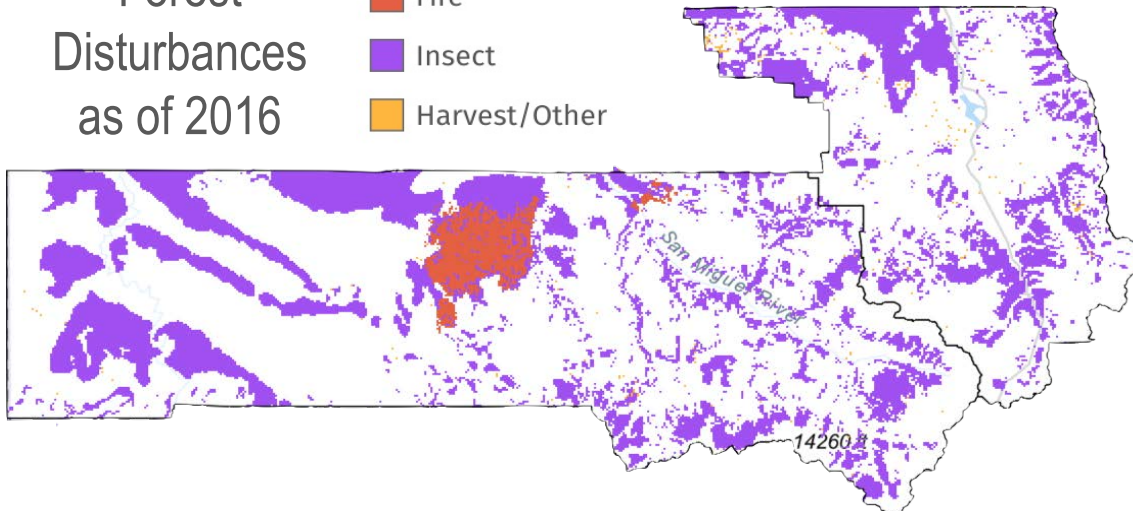
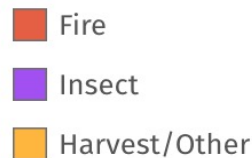


Figure 23

Though most of our region's forests remain healthy year to year, there has been a drastic increase in forest disturbances, specifically insect damage.

From 2001-2010, insect damage impacted roughly 68,000 acres of our region's non-federal lands. The extent of this damage is depicted left on both federal and non-federal land. The GHG inventory accounting covers the emissions and reduction changes from 2011 onward to correlate with our 2010 baseline year.

The primary impacts of insect damage takes three forms.

1. From a GHG perspective; prevents our forests from removing carbon from the atmosphere and produces its own emissions.
2. From a risk perspective; greatly increases the risk of severe forest fires and mudslides.
3. From an ecological perspective; disrupts several ecosystem processes including soil stability, flood control, wildlife habitat, and nutrient exchange. These may produce serious compounding affects, not fully accountable in a GHG inventory.

Land Use Accomplishments



- Areas throughout the region that have been set aside as open space sequester carbon, including [Telluride's Valley Floor](#).
- Land Trusts throughout the region have grown, preserving land and preventing development through conservation easements.
- SMC established and has maintained a Baseline Soil Health Study since 2016, with a plot program study based on 25'x50' plots of land.
- SMC planted the Pollinator Garden at the County's Down Valley park in 2017 and continues with plantings and management of this 7500' garden each year.
- A Rare Plant Study was completed by SMC in 2010.

Payment for Ecosystem Services

San Miguel County is piloting a soil health [Payment-for-Ecosystem-Services \(PES\) Program](#) to develop a protocol to help farmers and ranchers improve their soil and increase the water holding capacity. Soil scientists across the world are studying the effects of increasing soil organic matter and encouraging healthy soil microbes in order to produce healthier and better yields of grass and/or crops for years to come. Increasing the soil's water holding capacity may help ease the effects of droughts as the soil acts more like a sponge, holding onto more of the water that falls. Balanced and healthy microbial activity can increase plant growth and maintain a soil environment which may decrease the opportunity for invasive plants to get established. The pilot program will also explore the levels of carbon that can be sequestered within our local soils. Ideally, this will develop into a way for farmers and ranchers to get paid for ecosystem services centered on soil health. Funding for the program falls under the County's Open Space Commission and includes funding for forest health initiatives, a fen wetland study, and community education.

Land Use Recommendations

OBJECTIVE 1: Increase the GHG sequestration and water retention capacity of land in the region

OBJECTIVE 2: Increase yield and health of crops and livestock through use of regenerative agricultural and ranching practices

OBJECTIVE 3: Increase GHG sequestration capacity of trees and plant life in the region

*Objectives apply to all actions

Action	GHG Reduction Potential				Co-Benefits					Timeline	Partners
Support San Miguel County in implementing their Payment for EcoSystem Services (PES) Program.					=	\$		+		1-3	SMC, agricultural producers, ranchers, landowners
Quantify GHG impacts of carbon sequestration actions and relate them to our GHG emissions inventory.					=	\$		+		3-5	EAP
Increase measures to promote and protect healthy forests.					=	\$		+		Ongoing	SMA, all regional governments
Implement programs, develop incentives and encourage the planting of trees appropriate for specific ecological zones.					=	\$		+		Ongoing	All regional governments, Seas for Trees
Encourage landscaping according to best practices for local ecological zone.					=	\$		+		Ongoing	All regional governments, building departments
Improve wetland protection.					=	\$		+		Ongoing	All regional governments, SMA, TI

KEY

