Drought & Change *in the* Mancos Watershed

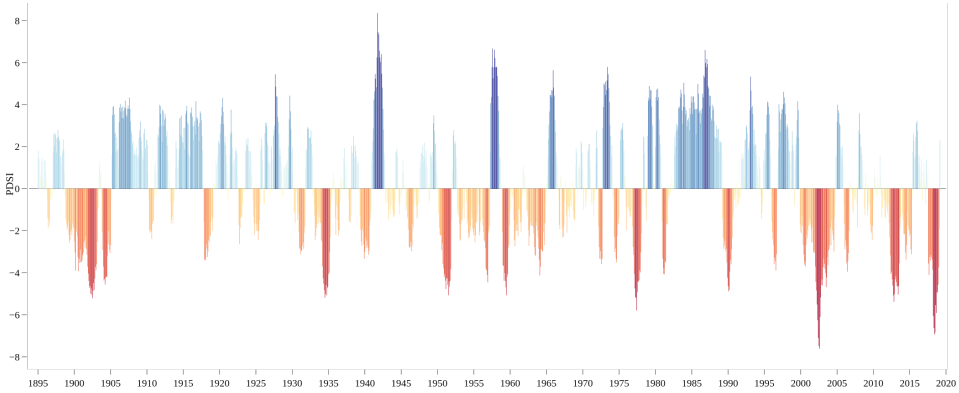
Drought in the Mancos Watershed

In 2018, communities in the Mancos watershed were hit hard by drought. Lesser precipitation and higher than average temperatures impacted farmers, ranchers, subsistence activities, fish and municipal uses in profound ways. According to the U.S. Department of Agriculture, Montezuma County experienced "exceptional drought." And while drought is not new to the Mancos watershed, the increased frequency and severity of drought is indicative of more sweeping changes.

Over the last 30 years, southwest Colorado has warmed significantly. Average temperatures in some places have increased by between 1-3 degrees Farenheit (°F). In addition to warming, experts anticipate that climate change will result in prolonged drought, earlier snowmelt, decreased flows, and more severe wildfire, similar to conditions experienced in 2002, 2012, and 2018.

Following the 2012 drought and the Weber Fire, the Mancos River Resilience Group formed to examine both climate and non-climate related changes—like population growth and changing economies—in the watershed. Our purpose is to identify resources and strategies to prepare for and mitigate the impacts of future droughts. This booklet aims to bring you the latest climate science, inspire dialogue, and promote drought resilience efforts that support all values in the Mancos watershed.

> "Though it's fresh in our memory, the 2018 drought wasn't unique. We experienced similar droughts in 2002 and 2012, and the community understands that drought is part of life here. But droughts like the one in 2018 have a profound impact on the river and those who rely on it, and if we don't prepare for future droughts, those impacts may be intensified."
>
> —GRETCHEN RANK
> Executive Director, Mancos Conservation District



Palmer Drought Severity Index | Montezuma County, CO

How do droughts impact the Mancos Watershed?

The impacts of drought on people living and relying on the Mancos watershed vary widely. For farmers and ranchers, debt, soil health, the price of hay, seniority of water rights and size of land all contribute to the impacts of drought. For the Ute Mountain Ute Tribe, drought creates major challenges for subsistence activities. Temperature, monsoons, and the history of drought heavily influence fish and cottonwood populations. While everyone (and everything) in the Watershed may experience drought differently, the reality is that droughts like those that occurred in 2002, 2012 and 2018 impact everything.

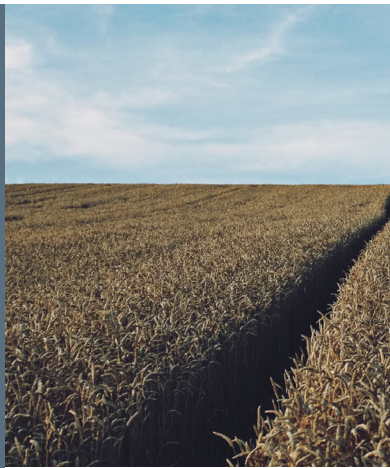
Some ranchers in Mancos estimate **it takes between 7-9 years to recover financially from drought.**

Many **local irrigators let their fields fallow** and sought alternative forms of income in response to the 2018 drought. Some found jobs in nearby towns, and some were forced to sell their land.

Cottonwoods that were already stressed from the 2012 drought were made increasingly vulnerable in 2018.

A survey by CO Parks and Wildlife in 2018 found **very few warm or cold water fish species in the Mancos.** Where there were pools, they were disconnected, posing significant habitat and reproduction challenges.

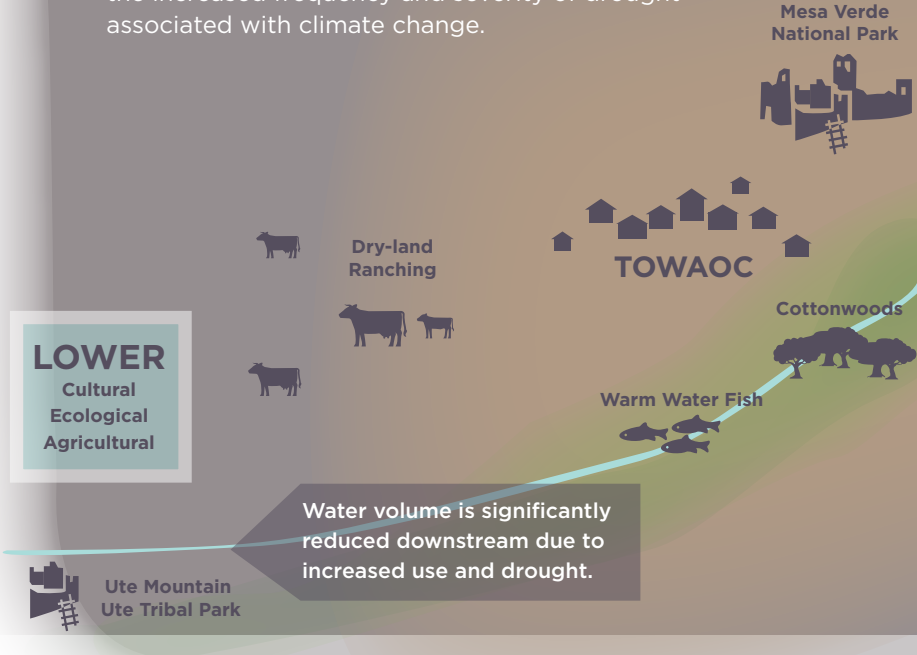
Under hotter climate scenarios, droughts like the one we experienced in 2018 are expected to occur every 5-7 years between 2020 and 2050.



Mancos River Watershed

The Mancos watershed is unique for the diversity of history, terrain, species, cultures, and economic industries it encompasses. More than 2000 years ago, humans first called the Valley home. Now, roughly 2,400 people who live, gather traditional plants and herbs, have small farms and sweeping ranches, brew beer and cider, craft arts and build pack rafts call the town of Mancos home. Downstream, Mesa Verde National Park brings in over half a million people every year. Further downstream, the Ute Mountain Ute Tribe relies on the river for cattle ranching and cultural traditions. Native fish like bluehead and flannel mouth sucker rely on flows in the river, as does a diverse array of wildlife.

As it has for most of its history, the Mancos watershed continues to experience tremendous changes. And, while some of those come in the form of human development and population growth, some of the most significant impacts to the watershed will come from the increased frequency and severity of drought associated with climate change.

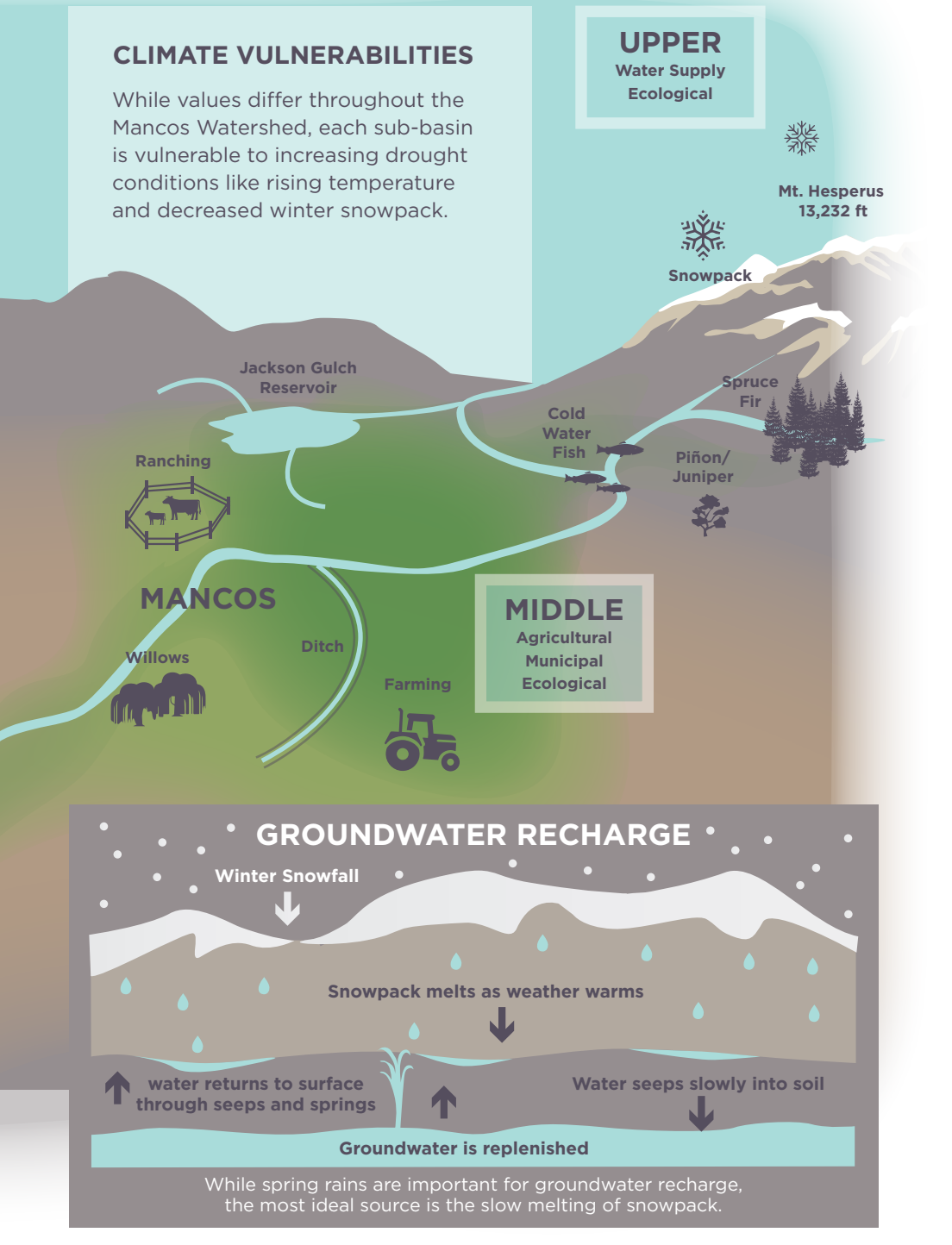


SUBSISTENCE & GATHERING

Warming temperatures have caused changes in the abundance, distribution, and health of wildlife and plants used by Ute Mountain Ute people for food and traditional activities.

CLIMATE VULNERABILITIES

While values differ throughout the Mancos Watershed, each sub-basin is vulnerable to increasing drought conditions like rising temperature and decreased winter snowpack.



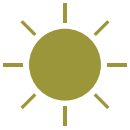
While spring rains are important for groundwater recharge, the most ideal source is the slow melting of snowpack.

How climate change is expected to impact the Mancos Watershed during the next three decades

In order to better understand how a changing climate will impact our future, scientists have developed a range of plausible scenarios based on 70 different climate model projections.

While climate change under each scenario is distinct, several common patterns emerge which could lead to significant impacts in the Mancos Watershed between 2020 and 2050.

In addition to the +2 degree F increase in average temperatures that the Mancos watershed already experienced between 1985 and 2015, **annual temperatures in the area will increase by another 2 to 4 degrees** over the next 30 years.



In winter, **temperatures will increase by 1.5 to 6 degrees**

The **snowline/freezing line will shift up in elevation** by 400 to 1800 feet

Peak spring runoff will occur 10 to 20 days earlier

Summer soil moisture will experience a decrease between -20% and -60%

Frequency and severity of wildfires will increase, and wildfire season could expand by as much as one month

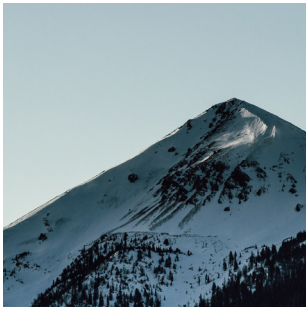
Learn more, get involved, plan and prepare

Planning for drought and the future impacts of climate change can be complicated and overwhelming, but people are taking small measures every day to protect the things they care about. To learn more, visit:

- Mountain Studies Institute website: **http://www.mountainstudies.org/**
- Colorado Natural Heritage Program: **https://cnhp.colostate.edu/ourwork/climate-change/**
- National Climate Change Viewer: **https://www2.usgs.gov/climate_landuse/clu_rd/nccv/viewer.asp**
- North Central Climate Adaptation Science Center: **https://casc.usgs.gov/centers/northcentral**
- NOAA Palmer Drought Index: **https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/**
- National Integrated Drought Information System: **https://www.drought.gov/drought/**
- Drought Index Comparison Portal: **https://climate-scatterplot.space/**

Stay tuned by becoming part of the Mancos River Resilience Group. Sign up at: www.mountainstudies.org/waterandsnowwork/mancos

We are privileged to live in some of the most beautiful and vibrant landscapes on earth. With this privilege comes the responsibility for treating our natural heritage with care. Given the record low precipitation and record high temperatures since 2000, drought has had a major impact on the natural resources that sustain us.



The Mancos River Resilience Group has taken up this challenge. This level of collaborative, inclusive, community-based and science-based stewardship is the key to handing off the gifts we have received to the next generation with a level of resilience that they can build their future on.

—MIKE PRESTON San Juan Basin Roundtable

Mountain Studies Institute

SCIENCE AND EDUCATION IN THE SAN JUANS

Mountain Studies Institute produced this drought and climate education booklet with funding from the Bureau of Reclamation and with support, information and feedback from numerous partners including:

North Central Climate Adaptation Science Center

Wildlife Conservation Society

679 E. Second Avenue, Suite 8 Durango, CO 81301 mountainstudies.org