1. Native to western North America
2. Fossils found in Boulder County suggest conifers of the Front Range have known ‘bark beetles’ for tens of millions of years
3. MPB kills trees to reproduce and periodic epidemics are natural
4. Past epidemics were not found above ~2700 m
5. The current epidemic is something new…

A female selects a tree, and bores through the bark to excavate an egg gallery
She severs resin canals, flooding the gallery and bore hole
The flow may push the beetle out
The resin is ‘toxic’ to the beetles eggs
So the female must work to clear the resin from the gallery

Sometimes the beetles win, sometimes the tree wins
If a mass attack drains enough resin to reduce resin pressure to zero, the tree is doomed.
If resin pressure does not drop to zero, the beetles or their eggs will be killed

The blue stain fungus which initially helped to kill the trees now feeds the larvae
Fungi concentrate nitrogen in their hyphae
With fungi, beetle larvae need only to eat ‘inches’ of tissue
Without fungi, larvae would need to eat ~1-2 meters of tree to get an equivalent amount of nitrogen

Temperature and the Mountain Pine Beetle
Hundreds of insects have responded to climate warming. Now the bark beetle has joined them. Increasing temperatures have made the flight season start earlier, last longer.

The warming temperatures have allowed the beetles to extend their range higher into the mountains and higher in latitude.

Warmer temperatures and a longer season allow the mountain pine beetle to fit in another generation, and that produces an exponential increase in beetles. The more beetles that fly, the more trees get attacked.

This ecosystem is changing, and right now the beetles have gained a substantial advantage.

Will there be any concomitant changes to offset this advantage?