

## **Waterwise is Climate-Wise**

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As global warming moves to the front burner in many people's minds, the number of reasons to conserve native grasslands and replace turf with natural landscapes just keeps growing. All of us can find opportunities to reduce our greenhouse gas loading, and it turns out that landscape irrigation is a big contributor of greenhouse gases. The energy used to supply municipal water for one irrigated acre is estimated to contribute 1.7 tons of carbon dioxide to the atmosphere each year. (Based on estimates of 16M Btu per acre in Sustainable Landscape Construction and DOE's factor of 212 lbs CO<sub>2</sub> from coal-fired power plants. 212 lbs of CO<sub>2</sub> per MBtu) When other energy uses are added in, it appears that an acre of irrigated, mowed, fertilized lawn may contribute about 2 tons of greenhouse gases each year. Multiply that times the number of acres of maintained landscape in Colorado, and you have a lot of greenhouse gases from power plants generating energy to pump and treat water for landscaping. To put 2 T CO<sub>2</sub> /ac in perspective, that represents about 10% of the average annual CO<sub>2</sub> emissions of 24 tons/year per person; nearly 40% of the Kyoto allowance of 5.4 tons/person; and 85% of the 2.35 tons/person estimate that some scientists believe is actually necessary to control global warming (Sources include Conservation International and Vermont Earth Institute).

The loss of carbon storage in Colorado's native grasses and soils is also a large contributor to the carbon imbalance in existing landscapes. Native grasses can pump up to 20% of their carbon belowground which can result in long-term storage unless disturbed. This is because prairie grasses have evolved an elegant mechanism for survival where in response to defoliation (e.g., from grazing by bison or grasshoppers), they pump carbon, as carbohydrates, into the soil via their roots to encourage microbial population explosions. The plants then cut off the food supply, causing the microbial communities to die and supply the plant with a boost of nitrogen as they decay. In other words, these native grasses grow their own fertilizer. (Some carbon is lost during the respiration of the microbial community, but there is a net storage.) Carbon soil storage is lost, however, if grassland soils are disturbed through tillage or development which causes a large release of carbon to the atmosphere.

Thus, every acre of native grassland that is excavated, paved, built on, irrigated, or planted with turf creates a release of carbon and a loss of our carbon sponge. The time is right for the WaterWise community to get the message to landscapers and green builders who want to be truly green – minimize soil excavation or paving, protect native vegetation, and reduce irrigation – because soil-wise and water-wise landscaping are climate-wise!

Further reading: Underground—How Creatures of Mud and Dirt Shape our World by Yvonne Baskin, 2005.