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# Urban Forest Research News Brief

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## New Tree Guide for Cold and Snowy Climate Region

Our Center recently unveiled its newest Tree Guide – ***Northern Mountain and Prairie Tree Guide: Benefits, Costs and Strategic Planting***. The guide was designed for the “cold and snowy” climate region and is the fifth in a series of Tree Guides for the Western United States.

The region extends from Alaska, Western Washington and Oregon, and Northern California on the west, through Idaho and Montana, to the Dakotas and Nebraska on the east. The region extends south through Wyoming, Nevada, Utah and Colorado, to the mountainous areas in New Mexico, Arizona, and Northern California.

**What it Does:** The Guide identifies and describes the benefits and costs of planting trees in the cold and snowy climate region. It also answers a number of questions about the environmental and aesthetic benefits community trees provide:

- What is their potential to improve environmental quality, conserve energy, and add value to communities?
- Where should residential and public trees be placed to maximize their cost-effectiveness?
- Which tree species will minimize conflicts with powerlines, sidewalks, and buildings?

**Research Results:** are reported for green ash, Norway maple, crab apple and Colorado spruce respectively, both street/park and yard trees. Data from these typical species were collected in Fort Collins, Bismarck and Cheyenne and analyzed by computer models to determine the magnitude of benefits throughout the region:

- kWh and BTUs of energy saved through wind reduction or direct shading.
- tons of CO<sub>2</sub> sequestered.
- tons of air pollutants removed by dry deposition or through avoided emissions at power plants.
- gallons of water intercepted.
- property value increase.

The value of each benefit was calculated at 5 year intervals for 40 years using:

- regional market value for electricity and gas.
- regional cost of control for air pollutants.
- treatment and control costs for stormwater.
- effect of trees on sales price of residential properties.

Results reveal a significant benefit for each of the typical species.

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### Estimated annual benefits for a street/park tree 40 years after planting.

#### Large Tree - 54 ft tall, 40 ft spread, 5,960 ft<sup>2</sup> leaf surface area

- Total benefits – \$59
- Total costs – \$18
- Net benefits – \$41

#### Medium Tree - 43 ft tall, 36 ft spread, 3,905 ft<sup>2</sup> leaf surface area

- Total benefits - \$36
- Total costs - \$17
- Net benefits - \$19

#### Small Tree - 28 ft tall, 34 ft spread, 2,350 ft<sup>2</sup> leaf surface area

- Total benefits - \$27
- Total costs - \$15
- Net benefits - \$12

#### Conifer - 44 ft tall, 27 ft spread, 3,520 ft<sup>2</sup> leaf surface area

- Total benefits – \$44
- Total costs – \$18
- Net benefits – \$26

At year 40 the largest single benefit for all trees was stormwater interception with large trees and conifers intercepting over 2000 gallons of water per year. Property value increase was the next largest benefit ranging from \$8 to nearly \$15 per year.

Annual costs are based on a survey of municipal and commercial arborists for planting, pruning, removal/disposal, pest and disease, infrastructure, irrigation, cleanup, liability/legal, and administration.

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Future guides are planned for the San Francisco Bay Area, and the “desert southwest” climate region. The Inland Empire, South Coast, and San Joaquin Valley climate regions of California, and Western Washington and Oregon have already been completed.