

Bishop, Gary A., Ryan Stadtmuller, Donald H. Stedman, and John D. Ray.
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ABSTRACT

As part of the National Park Service's Temporary Winter Use Plans Environmental Assessment, the University of Denver has been collecting in-use tailpipe emissions data from snowcoaches and snowmobiles in Yellowstone National Park. During the winter of 2006, using a portable emissions monitoring system, tailpipe data were collected from 10 snowcoaches and 2 four-stroke snowmobiles. These vehicles were operated over a standard route within the park, and the snowcoaches all carried identical passenger loads. These snowcoaches were newer in age with more advanced fuel management technology than those studied earlier, and average emissions were lower as a result (120, 1.7, and 11 g/mi for carbon monoxide [CO], hydrocarbons [HC], and oxides of nitrogen [NO_x]). Large emissions variability was still observed despite using a standardized route and equal passenger loading. A comparison between five nearly identically equipped snowcoaches that had CO emissions ranging between 12 and 310 g/mi suggests that snow and road conditions are the most important factors behind the large emissions variability observed between modern snowcoaches. The first comprehensive emission measurements, using a portable emissions measurement system, on two snowmobiles showed that computer-controlled fuel management systems have increased fuel economy (~25 mpg) and are a major reason that emissions from these winter vehicles have dropped so dramatically. Using all of the tailpipe emissions data collected to date shows that the two primary winter vehicles in Yellowstone National Park are now very similar in their per-passenger emissions.