

Development of an Air Pollutant Emissions Inventory for the Lake Tahoe Basin that Incorporates Current and Future Land Use Scenarios

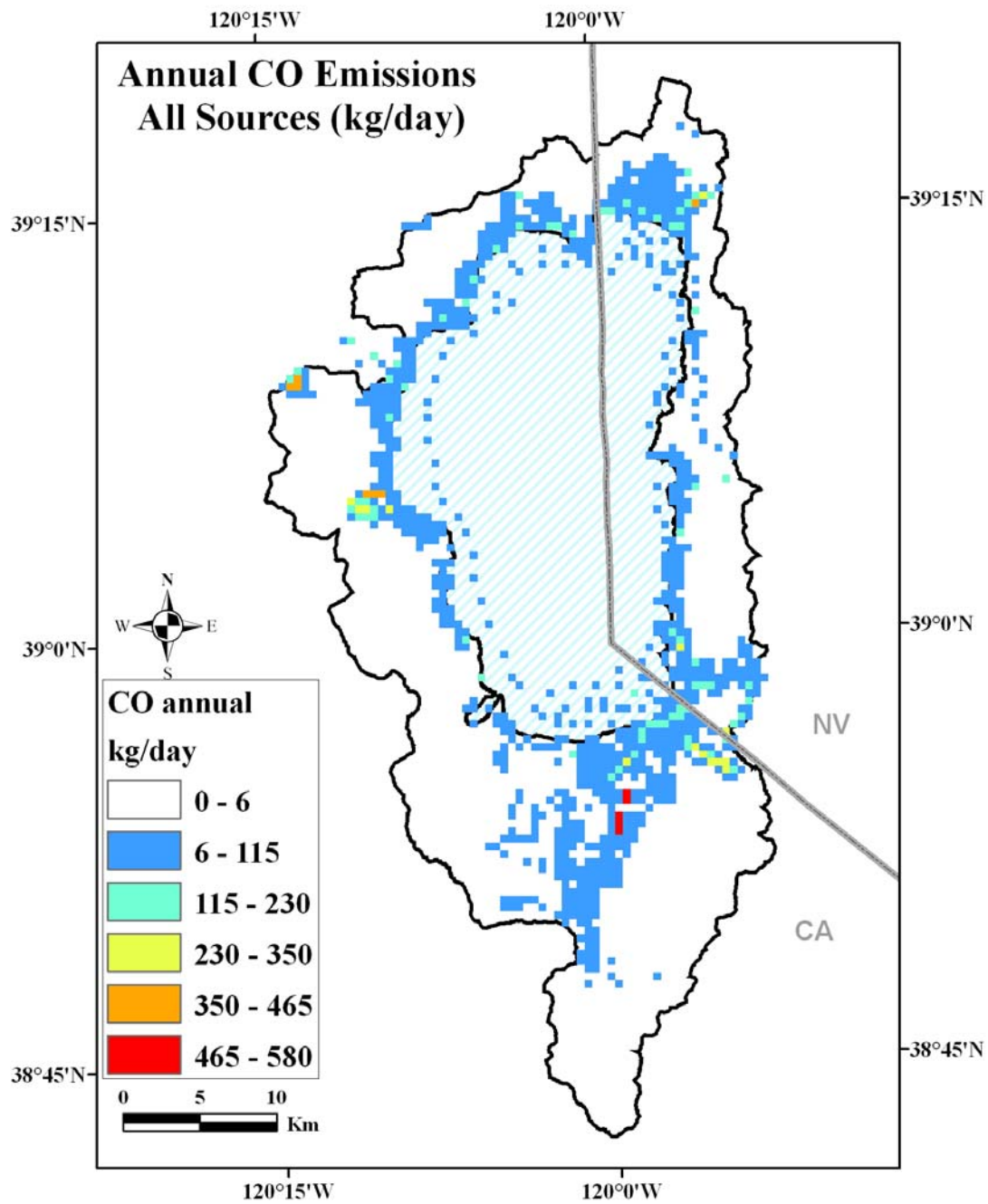
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One of the tools needed to develop an effective strategy to reduce the impact of atmospheric pollutants on Lake Tahoe's water quality and improve air quality in the basin is an emissions inventory. As part of this study, we prepared a baseline emissions inventory that can be used to quantify and evaluate the contribution of various sources to ambient pollutant levels in the Lake Tahoe Basin. In addition to the pollutants commonly included in an inventory (i.e., CO, NO_x, VOCs, PM₁₀, PM_{2.5}, and SO₂) estimates of ammonia (NH₃), phosphorous (P), and phosphate (PO₄) were also developed due to their contribution to the declining water clarity of the lake.

Annual and seasonal inventories were developed. Since air quality models require spatially distributed pollutant emissions (i.e., gridded input), geographically distributed seasonal and temporal emissions estimates were also prepared as part of this work. A further aspect of this project was to develop a GIS-based tool that can be used to update the baseline inventory in order to account for future development and changes in infrastructure.

Based on the inventory results, the major contributors to ambient pollutant are as follows:

- CO: Mobile sources and residential fuel combustion. There is a strong seasonal dependence in the residential fuel combustion source.
- PM₁₀, PM_{2.5}, P, and PO₄: Area wide sources, particularly residential fuel combustion and road dust resuspension. Emissions are significantly higher during the winter period.
- NO_x and NH₃: Mobile sources are the dominant contributor.
- VOCs: Mobile sources, biogenic sources, and area wide sources all contribute to VOC emission. There is a strong seasonal dependence in the biogenic and area wide source contributions



Gridded annual CO emissions (kg/day) for all sources.