



Rich Poirot: Monitoring Air Quality For Public Health And Quality Of Life

For Rich Poirot, analyzing and interpreting data has translated to real, measurable improvements in Vermont's air quality. Poirot, an Air Quality Planner with the Dept. of Environmental Conservation, has been observing air quality in Vermont for 35 years.

When he began in 1978, his challenge was to develop a State Implementation Plan that would assist Vermont in lowering air pollutants to levels specified by the EPA as "acceptable". At that time, Vermont's air exceeded national air quality standards for ozone and particulate matter pollution. Over the years, not only has Vermont been successful in this endeavor but we have generally continued to maintain acceptable readings as epidemiological practices have improved and national standards for acceptable pollution have tightened.

Rich looks at everything from ozone and fine particle pollution to the sulfur dioxide and nitrogen that contribute to acid rain, carcinogenic toxic pollution and even pollutants that affect visibility and other environmental indicators. "I work primarily as a data analyst. I try to find where pollution is coming from, see what the key sources are, and propose effective controls."

In addition to developing state implementation plans and analyzing air quality data, Poirot has also served on the Clean Air Scientific Advisory Committee that advises the EPA on revisions to national air quality standards. He also serves on EPA's Council on Clean Air Compliance Analysis, which reviews periodic studies of the costs and benefits of the Clean Air Act. The most recent of these studies projects benefits - primarily from reduced disease and mortality - of nearly \$2 trillion per year in 2020, exceeding the costs of pollution controls by a factor of 30:1.

Poirot explained to me how forests have a helpful influence on air quality. A higher degree of forestation is protective in a number of ways. "Trees and other plants take up gaseous pollutants through their stomata. These include ozone, sulfur and nitrogen oxides, hydrocarbons, carbon monoxide and carbon dioxide – a powerful greenhouse gas. Trees planted on the sides of a road will filter dust and other motor vehicle pollution and improve air quality of nearby homes. Trees are also affected by air pollution, especially ozone and acid rain. You can see that the incidence of visible ozone injury to trees has dropped in correspondence with dropping atmospheric ozone levels over time."

What causes air pollution, I ask Poirot. He explains that this is widely variable. "Fine particle pollution, for example, peaks during both summer and winter – in warm weather when prevailing winds come from the southwest, Vermont's pollution is primarily transported from upwind regions and includes a lot of sulfate and organic compounds. It also tends to be fairly uniformly distributed across the state. In the winter, we see differences in sites according to their individual characteristics. On cold, still mornings, concentrations of pollutants will be highest in mountain valleys where inversions confine woodstove smoke and vehicle emissions within a fairly shallow volume. If pollutants are trapped within a few hundred meters of the surface, relatively moderate emissions can lead to very high concentrations."

I want to know whether Rich has wisdom to share with the public after 35 years. "A lot of these air quality problems are really us," he opines. "We've finally done a fairly good job going after most of the big, obvious air pollution sources. However how we drive our cars, how we heat our houses, the choices we make all contribute. Increasingly as the larger sources of pollution are reigned in, it is our own activities that are the remaining piece of the puzzle."

What can we do, I want to know. Poirot obliges. "Try to be aware of the consequences of our actions. Plan communities and activities with pollution mitigation in mind. Space-heating and transportation emissions provide unique challenges in a northern, rural state like Vermont. However, new wood stoves are much cleaner and more efficient than they were a few years ago. Motor vehicles with low or zero emissions are increasingly available, and we have seen some terrific recent advances in bus transportation and carpooling options in many areas. Our future air quality is mostly up to us."