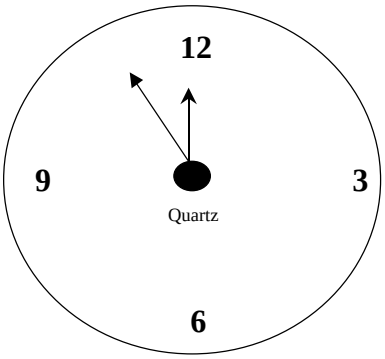
WASHINGTON STATE DEPARTMENT OF ECOLOGY

December 1998

AirLines

Year 2000 Readiness Disclosure

Y2K: A Wrinkle in Time



Picture New Year's Eve, 1999: You're on the edge of your seat, biting your nails, wondering what will happen when the year 2000 computer glitch strikes. Will your heat still work? Will you have water, electricity, or natural gas? Will your car refuse to start? Will your microwave and VCR blow themselves to smithereens or fizzle themselves onto the scrap heap? Will your state's air monitoring equipment work properly? Well, okay, maybe you really haven't thought too much about that last item yet. But we at Ecology's Air Quality Program have thought about it a great deal – as well as a lot of other things that could impact you.

It's hard to say just what will happen to the computer-run systems we all take so for granted when they encounter that double-zero date upon entering a new century. The problem is that computer programs are designed to read the year as two digits rather than four (for example, 89 rather than 1989). When the year 2000 arrives, many computers will incorrectly interpret the "00" to mean "1900," causing them to malfunction. Effects of this problem can range from annoying inconveniences to wide-scale system failures.

It may seem that this is really no big deal – that updating the hardware and modifying the software programs would take care of all the problems. But the problem is not limited to computers. It can extend to any device that contains an embedded chip, a computerized chip with the year programmed into it. Embedded chips are found in a huge variety of non-computer devices, from microwaves to toys to automobiles. Even if these items don't use a date feature, just the presence of an embedded chip can wreak havoc. To make matters worse, the effects of embedded chips are nearly impossible to predict in advance. This is because once installed, embedded chips tend to be forgotten; they are not documented as software programs are. Items you never dreamed contained an embedded chip could suddenly cease to work, or work incorrectly, when January 2000 rolls around.

How do we deal with such a complex issue? On the government side of things, Governor Locke has directed state agencies to find ways to address the year 2000 ("Y2K") issue so that vital public services are not disrupted. Ecology has been working on the computer hardware and software part of the problem since 1995. The agency only recently began researching the effects of embedded chips when it became apparent that they could present even more of a problem than computer systems. It is estimated that there are 40 billion embedded chips in existence. Determining how many of these reside in our systems is one of the tasks facing Ecology.

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Ecology's first step is to identify just what agency programs and equipment could be impacted by Y2K. The agency must then determine which of these programs and equipment are "mission-critical," meaning they are essential for the agency to meet legal obligations or legislative mandates. A mission-critical system is also any system that, if non-functioning, could jeopardize the health, safety, or financial well-being of the citizens or employees of the state.

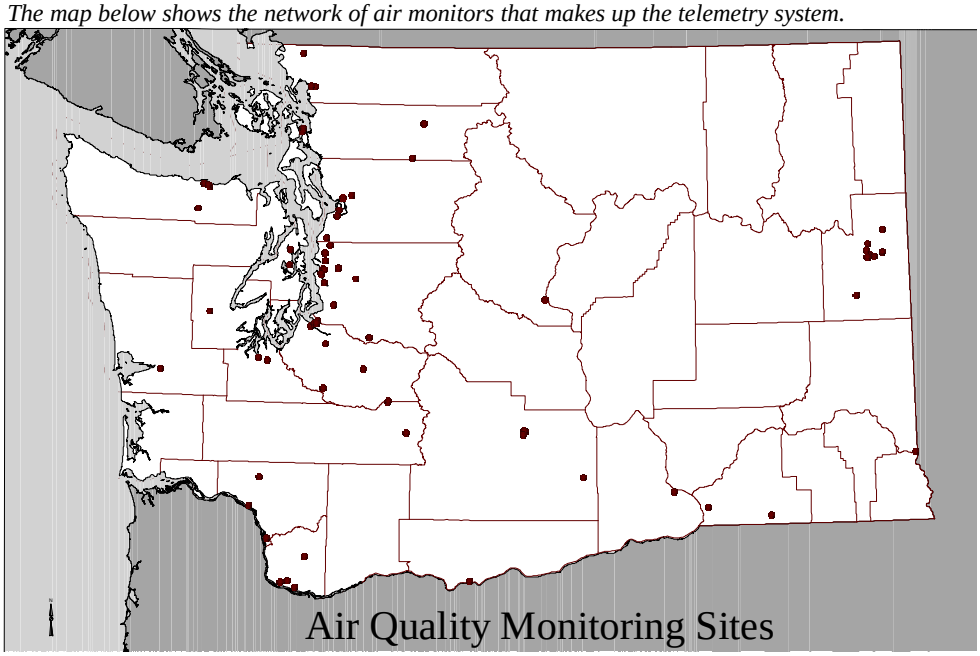
Ecology has identified the air quality telemetry system computer and software as mission-critical for the agency. The telemetry system is a network of air monitors around the state that electronically collects air quality data on a continuous basis. These monitoring sites involve a great deal of equipment. Analyzers measure levels of pollutants in the air 24-hours a day. They transmit this information through machines called data loggers, which then send the data over telephone lines to be stored in a central computer. Strip chart recorders graph air pollutant levels as they occur in order to help verify the accuracy of the data from the analyzers and provide a historic record of pollutant levels. Heating and air conditioning are needed at the sites to keep the equipment at the correct operating temperature.

The data collected by the telemetry system is used to warn of periods when air pollution is near or at unhealthy levels so that Ecology and local agencies can make effective decisions. Typically, when air pollution levels are high in an area, Ecology or the local air quality agency will take some action to reduce the pollution (for example, call a burn ban, ask people in the community to reduce their driving, or warn those with respiratory problems to stay indoors or limit their outdoor activity). However, if any part of the telemetry system does not function properly, or if telephone lines are not working so that data can be transmitted electronically from the monitoring sites to local agencies, neither Ecology nor local agencies may realize when an air pollution problem is occurring.

The telemetry system also provides the federal Environmental Protection Agency (EPA) with information on Washington's air quality. EPA uses this information to determine whether areas of Washington are in violation of federal air quality standards. Because air monitoring data must meet specific criteria for precision, accuracy, and completeness, a malfunction of the telemetry system could force EPA to declare areas of Washington in violation of air quality standards. This could cost industry millions of dollars or have adverse affects on citizens' lifestyles. Some examples of this include: new businesses and industries could be limited or more severe restrictions could be placed on existing facilities; motor vehicle emission checks could be required in more areas; and indoor and/or outdoor burning bans could occur more frequently and in more areas.

Ecology's Air Quality Program is already in the process of updating and improving the telemetry computer system. However, making the system "Y2K compliant" (meaning it will be able to function accurately when the year 2000 arrives) is complicated not only due to its abundance and variety of equipment, but because Ecology is not always in control of the monitoring site surroundings. Some sites are freestanding,

The map below shows the network of air monitors that makes up the telemetry system.



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others are located on top of assorted buildings – and one is even located in a broom closet at a tavern. Even if Ecology's equipment is ready for the year 2000, questions about these sites remain: Can we rely on the buildings where monitors are located to have working heat and air conditioning? How can we be sure that smaller telephone companies serving the site areas will be up and running? And what if one or more sites loses power? Another level of complexity is that some of the data the telemetry system collects must be weighed at a lab in a controlled atmosphere. So, of course, the lab equipment must also be Y2K compliant.

Other public services may experience Y2K problems as well. Ecology is seeking answers to many questions, including: How will embedded chips affect the operation of air pollution control equipment at industries such as pulp mills or aluminum plants? Could a wastewater treatment plant shutdown allow untreated wastewater to spill into Washington's waters? Could spills response be slowed due to Y2K-related systems breakdowns? Ecology is working to develop prevention and response plans to minimize the effects of Y2K on these kinds of public services. Since it is impossible to identify every possible computer and computer chip that could malfunction, contingency planning is a high priority. The worst-case scenarios are considered first, and back-up plans are made for responding to problems. Ecology is working with its customers – for example, the contractor the operates Emission Check stations, and wastewater treatment plant operators – to provide advice and technical assistance.

If you have questions about how the Air Quality Program is dealing with the Y2K problem, please contact Bruce Estus, (360) 407-6827.

Lifestyles

If the weather forecasters are to be believed, we may be in for a colder-than-average winter this year, La Niña-style. You may already realize that wintertime air conditions often lead to air inversions – a situation where a layer of warm air settles over an area and traps the cooler air close to the earth, along with all the air pollution it contains. Two of the biggest wintertime air polluters are cars and wood stoves. Here are some ways you can minimize your wintertime contributions to air pollution.

- If you heat with a wood stove or fireplace, pay attention to whether or not an indoor burning ban has been called in your area – and if there is a ban, obey it. The purpose of burn bans is to protect your health and that of your neighbors. If the air is very still and/or foggy, there is probably an air inversion and burning will just add to all the pollution already trapped near the ground. If it's windy, rainy, or snowy, it's probably okay to burn because the pollution is getting dispersed. Check with your local air pollution control agency to be sure.
- When you burn a wood stove or fireplace, burn properly. Use only dry, seasoned wood and burn small, hot fires. Check the smoke coming out of your chimney, and if you can see more than heat waves, increase the air supply to your fire.
- Make sure you have the correct size wood stove for the area you are heating. Too large a stove can create more smoke and waste wood. Also, make sure your stove is properly installed according to model specifications.
- If you have an uncertified wood stove, you will not be able to use it during some burn bans unless it is your only source of heat. You may want to consider replacing it with a cleaner certified stove, or an even cleaner form of heat such as gas, electric, or oil heat.
- Get your car a winter check-up. Makes sure your tires are properly inflated and keep the engine tuned up.
- Drive less. Think about how much more convenient it would be, in snow and ice, to take a bus or ride in a carpool! And walk or bicycle whenever you can.

Almost Live on the Internet

Ecology proudly presents the most up-to-the-moment information available on air quality in Washington. Visit http://airr.ecy.wa.gov/Public/aqn.html on the Internet and see air pollution concentrations monitored by Ecology's Air Quality Program and local air quality agencies. The information is based on the Pollutant Standards Index. The actual measurement is shown above each meter. (*See illustrations on the following page.)*

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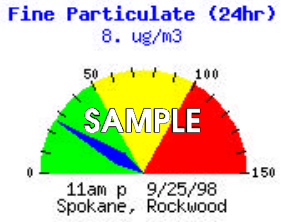

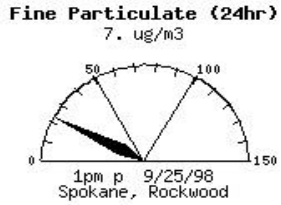

A mouse click on the meter displays a chart showing pollution levels at sites over the past 72 hours. Automated monitors constantly collect the data and feed it via phone line to Ecology's data center in Lacey. Each hour, Ecology's computers sweep through the last 60 minutes of data and update the meters. The updated information is available by 30 minutes past the hour, every hour of the day.

The World Wide Web site only shows data from automated monitors connected to Ecology's telemetry system. These represent only a portion of the state and local air quality monitoring effort, but still provide a good view of air quality in Washington's major population centers. Ecology meteorologist Tim Allen developed and adapted the software that makes the presentation possible. Tom Schuettke, Air Quality's Geographic Information Systems specialist, is the sites's webmaster. Other features on the site include a map that shows the whole state's air quality status at a glance, photo displays of some of the monitoring sites, and background information on air pollution. Visit us soon and let us know what you think!

Update

"Car care" classes are being held in Pierce County through December. As part of a pilot project, employees of 10 to 15 businesses and universities will learn the benefits of car maintenance to both themselves and the environment. The purpose of the project is to develop partnerships between businesses, the community, and Ecology, while also improving air quality.

Air Lines is published quarterly and offers updated information on the Clean Air Washington Act and other Air Quality Program activities. *Air Lines* welcomes your comments. Questions and contributions should be directed to:

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If you have special accommodation needs, please contact Tami Dahlgren, Air Quality Program, (360) 407-6830 (voice); or (360) 407-6006 (TDD only).

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