

Rachel's Environment & Health News

#18 - Free Computer Program Allows Citizens To Predict Effects Of Chemical Fires And Toxic Spills

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The National Oceanic and Atmospheric Administration (NOAA) is distributing a computer program for APPLE MACINTOSH computers to help fireman and other emergency response personnel manage chemical fires and spills. IT CAN ALSO HELP CITIZENS FORECAST THE DANGERS POSED BY CHEMICAL STORAGE AT FACTORIES IN THEIR CITY OR TOWN. You might call it a "Bhopal predictor program." The program combines information on the hazards of particular chemicals, local street maps, and computer calculations that predict the spread of an airborne plume of toxics after a spill or fire.

It sounds complicated, but after you're got it set up initially, it's a snap to run: you bring up a map on the screen, point to the place where the spill or fire (real or hypothetical) occurred, tell the computer what chemical and how much is involved, then answer a few of questions about the weather at the time (temperature, wind speed and direction) and presto! the computer draws a picture of the cloud of fumes blowing downwind across the map, showing what neighborhoods the toxic cloud reaches and in what concentrations. The computer does all the work and draws a cloud across the map--a picture that anyone can understand.

Another use of the program is for you to say to the computer, "This is the toxic concentration we care about" (one part per million, for example, or 50 or 100 ppm) and it will redraw the map, showing the area on the map where you should expect to find air concentrations equal to or higher than the amount you specified.

City planners can use Cameo to evaluate possible hazards as new factories move into an area or as old factories gear up for new jobs. Armed with information on chemical use at a factory (information now available under many state right-to-know laws--for example, under New Jersey's model law), a city planner can ask, "What would happen if a storage tank ruptured or a valve leaked?" The program will draw pictures of the resulting hazard to residents.

Called CAMEO (computer-aided management of emergency operations), the program can also help communities prepare emergency response plans, as required under recent SARA revisions to the national Superfund law. Under SARA (1986 Superfund Amendments and Reauthorization Act) companies must report their use and storage of toxic chemicals and communities must prepare plans for handling emergencies caused by toxic releases. NOAA says it will modify the CAMEO program so it can easily take data from the reporting forms being developed under SARA now by the U.S. Environmental Protection Agency (EPA).

To set up the system, you need government maps of the area you're concerned about. NOAA set up the system for Seattle and they have 100 maps that show the entire city; they can zoom in on details about industrial plants, down to the location of chemical storage tanks and fire hydrants (but you can put in as much or as little detail as you think you need). The maps can be entered by hand (about one map per day), or they can be entered by a scanner (about one map per minute). A scanner quickly "reads" a map and stores the image in the computer. A high-quality scanner, such as a Scan 300 from Abaton Technology [Santa Monica, CA], lists for \$2495.

The latest version of CAMEO contains information on 2500 individual chemicals, including their common names, trade names, generic names, and common identification numbers (Department of Transportation Number, United Nations ID number, Chemical Abstract Services number, etc. John Robinson of NOAA told us, "We find that people in the field have a spill and they have trouble identifying the chemical--so we've made it as easy as possible. You plug in almost any common identifier for the chemical, and the computer will identify it exactly."

You can also describe an unknown chemical and the computer will help you identify it by smell, color and other characteristics.

When you plug in a particular chemical, CAMEO wants to know

how much of it there is. You can tell it the size of the spill ("a puddle 20 feet by 20 feet") or you can say "an 8000 gallon tank truck, burning"). Based on what it knows about the chemical involved, CAMEO predicts how much of the chemical will get into the air, by evaporation or as smoke, and then calculates where the toxic plume will travel downwind.

The equipment needed to run CAMEO is a Macintosh Plus computer (\$1500 on the 'grey market') with at least a 20 megabyte hard disk (\$800), plus a database program called Business File Vision (\$200). Such a system is well within the means of almost all municipalities and many individuals. A THOUGHTFUL COMMUNITY COULD PURCHASE THE SYSTEM FOR ITS FIREFIGHTERS AND THEN USE IT TO ANSWER "WHAT IF" QUESTIONS FOR LOCAL CITIZEN GROUPS armed with right-to-know data.

NOAA is offering training courses on the computer program's uses and limitations. For further information, contact John Robinson, Hazardous Materials Response Branch, NOAA, U.S. Department of Commerce, 7600 Sand Point Way, NE, Seattle, WA 98115; phone (206) 526-6273.

--Peter Montague

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