cally assisted electrospray, most spectra of the tested compounds had the $[M-H]^-$ moiety as their base peaks. Results from selected ion monitoring showed detection limits ranging from 0.01 to 0.03 μg/L with a relative standard deviation of approximately 20%. (*Anal. Chem.* **1995,** *67*(9), 1637–43)

## MONITORING

### Sampling economies

Monitoring programs must balance the costs of frequent sampling against the inaccuracies of minimal sampling. S. Luzzadder-Beach simulated minimum sampling for accurately characterizing groundwater quality in a regional aquifer. Hypothetical groundwater parameters were generated and plotted on a grid, which was sampled at densities ranging from 2.8% to 95% of grid intersections. Statistical and visual comparisons with the original data suggested that sampling densities of 15% were sufficient to approximate the original pattern. (*Environ. Manage. (NY)* **1995**, *19*(3), 383–92)

## POLICY

### Sustainable development

To determine how sustainable development might be achieved, K. F. Wiersum studied the 200-year history of forest management and sustainability. Some conflict in forest management is inherent in the different dynamics of ecosystems and social systems. Ecosystems depend on negative feedback loops that maintain homeostasis, whereas social systems include positive feedback loops that produce time-dependent features. Wiersum concludes that sustainable forestry is possible only with practical regulation of the interaction between social and ecological forces. (*Environ. Manage. (NY)* **1995**, *19*(3), 321–29)

## RISK

### Probabilistic paradigm

Risk assessors need more sophisticated methods to calculate health-based cleanup targets. Currently, most risk assessors use an algebraic, deterministic framework to assess risks such as those from contaminated soil. According to D. E. Burmaster, K. J. Lloyd, and K. M. Thompson, that framework should be replaced by a fully probabilistic paradigm, which incorporates variability and uncertainty. This paradigm can be used with Monte Carlo or Latin hypercube sampling. With probabilistic risk assessments, risk managers decide on the acceptability of risk distributions—such as considering risk distribution acceptable if its 95th percentile falls at or below a risk of 1 in 100,000—instead of point values of risk, where the risk might be 1 in 100,000. (*Hum. Ecol. Risk Assess.* **1995**, *1*(1), 89–100)

### Health effects vs. exposure

To calculate a population risk from exposure to a toxicant based on human data grouped by exposure levels, a relationship must be established between the health effect and exposure and a measure of the distribution of effects within subgroups. D. W. Gaylor, R. L. Kodell, and B. A. Schwetz applied this technique to reduced psychomotor development in infants transplacentally exposed to PCBs. In this study, the total population risk is calculated by summing the risks from each subgroup. The technique also estimates the change in probability of health effects from change in exposure, which assists in making product development or regulatory decisions. (*Hum. Ecol. Risk Assess.* **1995**, *1*(1), 81–88)

### Checking mass spectroscopy database reliability

Because environmental chemists rely so heavily on commercially available mass spectral databases for compound identification, assurance that all information is correct is imperative. John Maney and colleagues report that the mass spectrum of a highly toxic organophosphorus pesticide, tetraethyl pyrophosphate (TEPP), is misidentified in one common database. They compared their dilutions of TEPP and its degradation products against the database standards and found that the spectrum provided for TEPP is actually the spectrum for its degradation product, triethyl phosphate (TEP), a problem that would not be expected for many other compounds. Nevertheless, misidentification could occur for a substance if the substance degrades readily, the degradation product is a compound of industrial or environmental interest, and both substance and product are detectable by the same method. (*Environ. Sci. Technol.* this issue, pp. 2147–49)

## SOIL

### Chlorophenol oxidation

Chlorophenol has been removed from soil by biological degradation. Prompted by recent studies on oxidation and polymerization of phenolic compounds by soil mineral surfaces, M.D.R. Pizzigallo and colleagues examined the effect of manganese and iron oxides on the degradation of different chlorophenols. The degree of oxidation of chlorophenols on manganese and iron mineral surfaces was dependent on several parameters: the quantity and position of the chloro substituents, pH, the metal oxides' surface charge and point of neutral charge, and reactant concentrations. The order of reactivity was birnessite > pyrolusite > ferric oxides. Results support the mechanism of a metal oxide–chlorophenol complex formation followed by phenoxyl radical generation. (*Soil Sci. Soc. Am. J.* **1995**, *59*, 444–52)

### Tracer effects on microbes

Although bromine, chlorine, and pentafluorobenzoic acid (PFBA) are common subsurface water flow tracers, there has been little study of their effects on soil microbial activity. These microbes influence contaminant fate and behavior. P. M. Groffman, A. J. Gold, and G. Howard observed that soil respiration was reduced by bromine and chlorine but increased by PFBA when these tracers were added at concentrations used in field studies. (*Soil Sci. Soc. Am. J.* **1995**, *59*, 478–81)

## TOXICOLOGY

### Screening tests

Screening tests for toxicity to animals and plants are cheaper and faster than definitive acute toxicity