Research Watch

Air Quality

Metals in the atmosphere in Japan. In this study, the data from National Air Surveillance Network for selected crustal elements (Al, Ca, Fe, Mn, Sc, and Ti), anthropogenic elements (As, Cu, Cr, Ni, Pb, V, and Zn), and a marine element (Na) in atmospheric particulate matter were evaluated over Japan from 1974 to 1996. (Var, F., et al. "The Concentration, Trend and Seasonal Variation of Metals in the Atmosphere in 16 Japanese Cities Shown by the Results of National Air Surveillance Network (NASN) From 1974 to 1996", *Atmos. Environ.* **2000,** *34* (17), 2755–2770)

Particulates in Chinese cities. X-ray diffraction and transmission analysis and polarizing optical microscopy were performed on low-volume particulate samples taken during 1998–1999 in the cities of Dongying, Jinan, and Qingdao in Shandong Province and in certain districts in Shanghai and Beijing. (Davis, B. L.; Jixiang, G. "Airborne Particulate Study in Five Cities of China", *Atmos. Environ.* **2000,** *34* (17), 2703–2711)

Biodiversity

Fish faunas similar in United States. Fish faunas across the continental United States have become more similar through time because of widespread introductions of a group of cosmopolitan species intended to enhance food and sport fisheries. (Rahel, F. J. "Homogenization of Fish Faunas Across the United States", *Science* **2000,** *288* (5467), 854–856)

Most diverse communities most likely to be invaded. A direct in situ manipulation of local diversity in a Californian riparian system and a seed addition experiment yielded results that suggest that species loss at small scales may reduce invasion resistance. (Levine, J. M. "Species Diversity and Biological Invasions: Relating Local Process to Community Pattern", *Science* **2000,** 288 (5467), 852–854)

Novel cleanup of explosives

Soils contaminated with high explosives such as TNT, RDX, and HMX pose significant risks to human health and the environment. Although incineration is the most effective remediation method, it is expensive, destroys soil fertility, and generates concern about air emissions. Recently, S. B. Hawthorne and co-workers investigated the use of subcritical water (hot water under sufficient pressure to maintain the liquid state) for treating these explosives-contaminated soils. In laboratory and pilot-scale tests, they achieved greater than 99.9% destruction of TNT and RDX and about 98% destruction of HMX. The authors report that the process is relatively low-cost ($125/ton compared to $125–$210/ton for composting, $220–$650/ton for supercritical water oxidation, and about $1600/ton for incineration), does not require use of any catalysts or additives, involves simple equipment, reaction conditions are easily controlled, and soil decontamination can be performed safely. (*Environ. Sci. Technol.*, this issue, pp 3224–3228)

Biogeochemistry

Ocean iron cycles. The authors incorporate a model of seawater iron geochemically into a global ocean circulation and carbon cycle model and tune it to match the observed ocean iron distribution. (Archer, D. E.; Johnson, K. "A Model of the Iron Cycle in the Ocean", *Global Biogeochem. Cycles* **2000,** *14* (1), 269–279)

Predicting DOC flux. The authors examined the relation between dissolved organic carbon (DOC) flux and soil C:N ratio using 15 biome types, including tropical rain forest, coniferous forests, peatland, deciduous forests, mixed forests, and grasslands. (Aitkenhead, J. A.; McDowell, W. H. "Soil C:N Ratio As a Predictor of Annual Riverine DOC Flux at Local and Global Scales", *Global Biogeochem. Cycles* **2000,** *14* (1), 127–138)

Climate

Ozone increases. Significant increases of total ozone were observed both by the total ozone mapping spectrometer and by the Brewer spectrophotometer in Indonesia in 1994 and 1997, during the El Niño periods, when extensive forest fires were reported in Sumatra Island, the southern part of Borneo Island, and south New Guinea. (Kita, K., et al. "Total Ozone Increase Associated With Forest Fires Over the Indonesian Region and Its Relation to the El Niño–Southern Oscillation", *Atmos. Environ.* **2000,** *34* (17), 2681–2690)

Satellite measurements. Microwave SST retrievals provide insights in a number of areas, including tropical instability waves, marine boundary layer dynamics, and the prediction of hurricane intensity. (Wentz, F. J., et al. "Satellite Measurements of Sea Surface Temperature Through Clouds", *Science* **2000,** *288* (5467), 847–850)

Contaminants

PCBs in a lake. Two dated sediment cores, one taken from the north basin and one from the south basin of Lake