Science & Society

EPA agrees to shift research emphasis

When Congress created it in 1970, the Environmental Protection Agency (EPA) was expected to conduct long-term investigations into the health of ecosystems — including humans — and their ability to deal with a growing array of pollutants. But a detailed analysis of EPA's research program by the agency's independent science-advisory board concludes these long-term studies — deemed critical to shaping future national environmental policy — are "not being adequately planned or funded at EPA today." A study (with five volumes of appendices) released Sept. 16 by the board offers a 10-point list of detailed recommendations to correct what it terms the "shortsighted" focus of EPA's research policy.

Over the past 18 years, the board notes, EPA's statutorily mandated regulatory responsibilities grew while its research and development (R&D) budget shrunk. To accommodate, the agency increasingly redirected its limited research money to short-term studies aimed at answering questions prompted by its pollution-control responsibilities.

However, the science board notes, many of EPA's current pollution-control activities do not tackle the problems — such as "greenhouse" warming or stratospheric-ozone loss — that pose the greatest risk to public health and the environment. Moreover, points out Alvin Alm, a former EPA deputy administrator and chairman of the committee that authored the study, regulatory solutions have often involved only limiting the discharge of a pollutant, or shifting its allowed release from one sector of the environment (for instance, water) to another (such as land). Instead, he says, long-term research should look at ways to recycle wastes or eliminate their production altogether.

Recommendations his panel offers include:

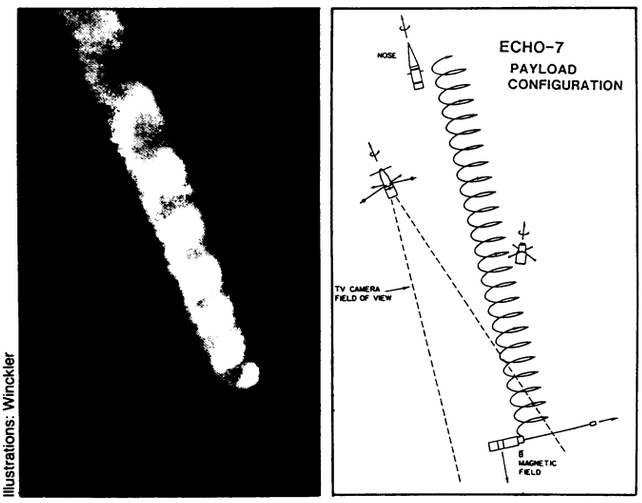
- shifting the focus of environmental protection from the implementation of pollutant controls — such as the catalytic converters on auto tailpipes — to strategies that prevent the generation of pollutants.
- creating an internal R&D-strategy council at EPA to plan long-term studies.
- making the agency's assistant administrator for research a career, civil-service position. No political appointee heading EPA's R&D has stayed for more than three years, Alm notes, and since 1980, no one has held this job for more than two years. Continuity of vision and program balance require that EPA's research leader plan on staying at least five to 10 years, the board contends.
- creating an Environmental Research Institute to monitor ecological trends.
- improving EPA's ability to foresee problems by developing and using new systems to monitor developing contamination of ecosystems and human populations.
- doubling EPA's R&D budget within five years. "If the nation is willing to spend $70 billion per year cleaning up and protecting the environment, then it is reasonable — indeed, barely sufficient — to spend 1 percent of that amount on EPA research," the new study argues. Doubling EPA's research budget would bring its spending up to that 1 percent.

Rep. James H. Scheuer (D-N.Y.), chairman of the House subcommittee overseeing EPA research, says the science board's report and recommendations are "a welcome — if long overdue — affirmation of the importance of environmental research." EPA Administrator Lee M. Thomas agrees "it's an excellent report" and says he endorses "all" its recommendations. In fact, by the report's unveiling he had already begun setting up an R&D-strategy council, had created a pollution-prevention department in the agency's policy office and had begun to look for shortcomings in EPA's ecological monitoring, he says.

Space Sciences

First look at an electron dance

The idea that electrons can become trapped on the lines of a planet's magnetic field and spiral around them, at the same time speeding back and forth between the northern and southern hemispheres along the lines, has for years been a familiar phenomenon in theory and in laboratory demonstrations. Now a group of scientists has obtained what they describe as the first images of such a spiral glowing around one of Earth's own magnetic field lines.



Illustrations: Winckler

In a project called Echo 7, last in a series that began in 1970, a NASA sounding rocket soared aloft from the Poker Flat Research Range in Alaska on Feb. 8. Among the payloads deployed from the rocket during the complex mission was an electron-beam "gun" developed by a team under Perry R. Malcom of the Air Force Geophysical Laboratory at Hanscom Air Force Base in Massachusetts. Also deployed was a low-light television camera, which recorded the images produced as the geomagnetically trapped and spiraling electrons fired in pulses by the gun ionized neutral atoms of the upper atmosphere.

The images, says principle investigator John R. Winckler of the University of Minnesota in Minneapolis, initially showed a diffuse, essentially cylindrical glow as the rocket descended to an altitude of about 120 kilometers from 290 km, with the spiral structure becoming most clearly visible between about 100 and 90 km.

The Echo project is so named because its overall purpose is the study of phenomena such as the aurora borealis and Earth's Van Allen trapped-radiation belts, associated with particles "echoing" along the magnetic field lines between north and south.

Most distant supernova yet seen

About 5 billion years ago, a star exploded into a supernova bright enough to be seen from Earth (5 billion light-years away) for barely a month. Fortunately, Danish astronomer Hans Ulrik Norgaard-Nielsen happened to be studying that part of the sky with the Danish 1.5-meter telescope at the European Southern Observatory in Chile when the supernova's light reached Earth this summer.

The star, the most distant supernova yet detected, is part of a galaxy in a cluster known as AC118, and would not have been recognizable by itself had it not blown up. It was detected by Norgaard-Nielson on Aug. 9, possibly less than a week after the brightening due to its explosion first reached Earth. Spectral measurements were hastily made, and by Sept. 6 the supernova had already faded to a point too faint to see.