

# ENVIRONMENTAL ACTION

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## THE ENDLESS SUMMER

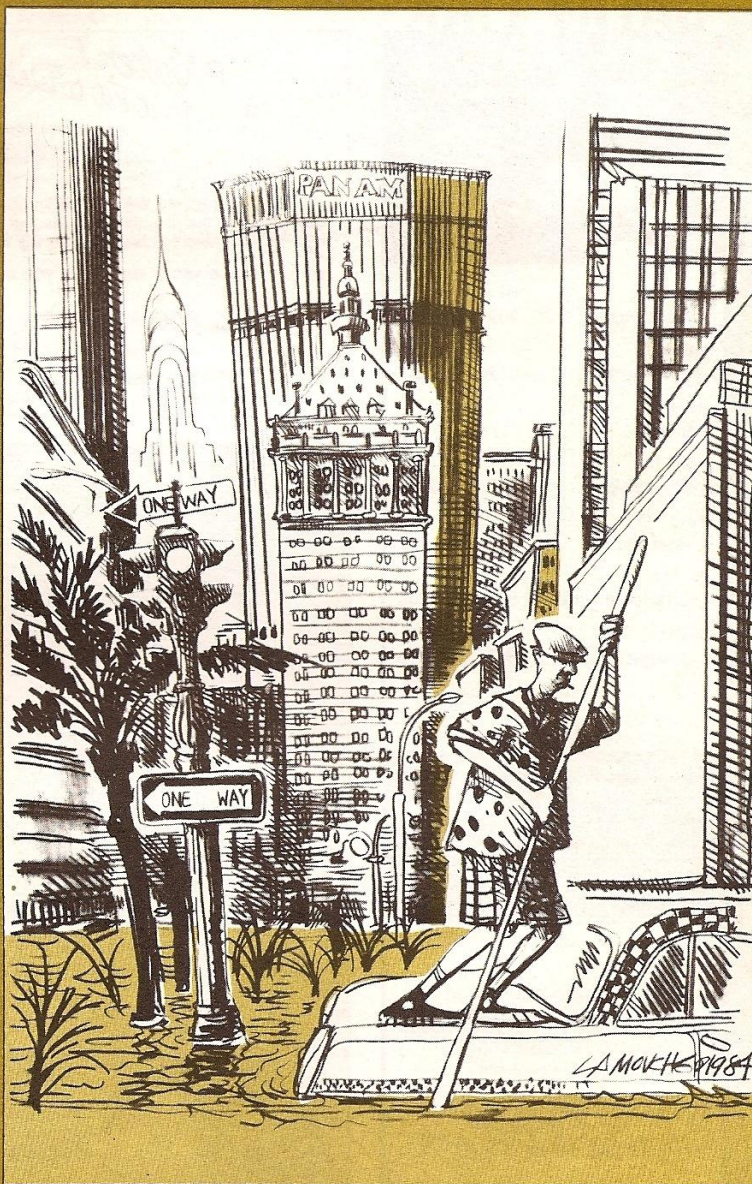
*It's time to do  
more than think about the  
'greenhouse effect'*

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THE CAPE BRETON 15 • ASATs AWAY • HOUSEHOLD TOXICS PICK-UP



# AS THE WORLD WARMS

Francesca Lyman

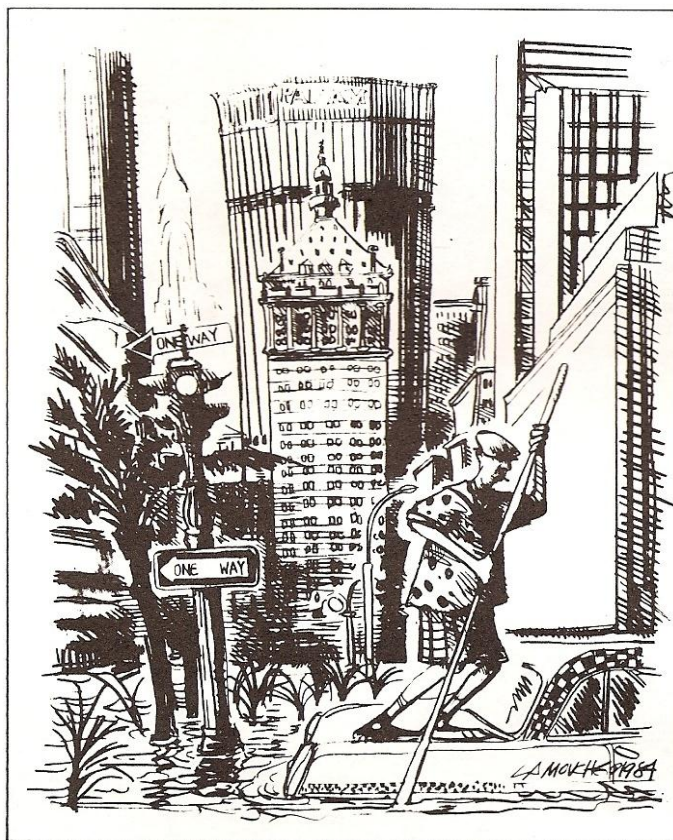
**I**F YOU'VE LOST SLEEP thinking about the nuclear winter, consider for a moment the only slightly less dire "greenhouse effect" summer, which threatens to warm the earth, melt the ice caps and drastically change rainfall and snowfall patterns on earth.

For decades scientists have warned that the world's temperature will rise as certain gases—particularly carbon dioxide from fossil fuel plants and automobiles—are spewed into the atmosphere. And last fall three government reports predicted that unprecedented and irreversible changes in world climate would be detected and confirmed as early as the 1990s. What's new in all this is that the government is moving to *adapt* to rather than *prevent* these changes.

According to a National Academy of Sciences (NAS) report to Congress issued last October, concentrations of carbon dioxide in the atmosphere will double in about 80 years, raising aver-

age global temperatures and leaving the earth warmer than anytime during the last three million years.

Such a radical change is hard to fathom—perhaps because people can't take too much bad news. So some accounts have tried to cast the weather forecast in the sunniest light. *Vanity Fair* magazine, in a two-page cartoon spread in December, pictured the island of Manhattan as a tropical resort, with monkeys dangling from telephone poles, natives dressed in colorful costumes and sidewalks sprouting palm trees.



Will Manhattan look like Venice in 100 years?

Unfortunately, though, we're in for some rather cataclysmic changes that may take more getting used to than just getting out the old summer wardrobe. The reports predict that the greenhouse will:

- raise temperatures up to 3.6 degrees Fahrenheit by the year 2040 and possibly 9 degrees by 2100.
- cause polar ice to melt and the sea level to rise as much as 7 inches before the year 2000—more during the next 15 years than it's risen during the last century!
- make certain regions war-

mer and drier, altering snowfall and rainfall and disrupting farming and forestry throughout the world, particularly drought-prone areas in North America and Central Asia; possibly forcing abandonment of now productive farming regions that depend on irrigation. The warming, writes NAS, "could severely reduce the quantity and quality of water resources in the Western United States."

Yet despite these rather dramatic findings, the government fails to call for any preventive action. The NAS



study urges "caution, not panic" and that we "adapt" to the changes as they come. It concludes that the next five to ten years would be better spent simply studying the problem further in order to narrow the uncertainties about CO<sub>2</sub> that still exist. The Environmental Protection Agency's (EPA) report, "Can We Delay a Greenhouse Warming?" answers its question by saying, in effect "No, it's too late." Curtailing fossil fuels and moving to more benign fuels, it concludes, would not prevent a warming before the year 2050 because

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***Is the "greenhouse effect" the global environmental disaster scientists have predicted for decades or simply a matter of "changing climate" that we can live with?***

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of the "greenhouse" gases already will have a delayed effect. EPA concludes it's unrealistic to consider banning fossil fuels by the year 2000, but hints that energy policies could prevent the greater warming expected by 2100.

Only EPA's other report, "Projecting Future Sea Level Rise," sounds an alarm, warning that sea level may rise high enough to require erecting seawalls around some cities. It advocates that coastal engineers, water planners and developers take immediate steps to protect all coastal areas from erosion, flooding, storm and other problems connected with sea level rises that are already occurring and will worsen in time.

The future problem looms so large that some critics argue that merely "adapting" amounts to a "do nothing policy" that could prove a costly and irreversible mistake. Instead, environmentalists say, we should seriously consider taking preventive steps now and adopting practices that will help us avoid significant temperature changes—conserving energy and water and developing renewable energy to the greatest extent possible.

The Spaceship Earth is for the first time becoming a world of our own making. "Humans are speeding up the cycle by taking the carbon stored in plants over millions of years and burning it in just a century or two," writes climatologist David Burns of the American Association for the Advancement of Science (AAAS). As the sea level rises with the temperature, it will change the very face of the map as coastlines retreat.

Scientists' gravest worry is that the

West Antarctic Ice Sheet could begin to erode, causing a "surging" rise in sea level of "5 to 6 meters in the next several hundred years" and creating unthinkable, widespread flooding. Another cataclysm postulated by one scientist is that Arctic Sea ice could melt, leaving only one pole glaciated—yes, it's all in the report—throwing off the symmetry of the planet and its patterns of air and ocean circulation. When? No one knows, but perhaps as early as 2100.

"There's no environmental problem that compares with the impact of nuclear war, but second to that, CO<sub>2</sub>'s at the top of the list," says Rafe Pomerance of Friends of the Earth.

**M**ore startling than the future changes predicted are those that could happen in our lifetimes.

Ask any hydrologist or water engineer what changes he or she anticipates and you will be in for an earful. Coastal Geologist Orrin Pilkey of Duke University warns that "The problems now faced by beachfront communities" (water level rise, erosion, storms) "may soon be reaching [ports of] major cities."

Jeff Benoit, a coastal geologist with the Massachusetts Office of Coastal Zone Management is worried about when downtown Boston will be underwater—or, rather, when a seawall should be built so it won't be. He's even concerned that Logan National Airport, which is almost at sea level, could have to be relocated. But climatologists are so uncertain about their forecasts he can't make any decisions about the future. "They've got us scared, but there's nowhere we can really go. If they could say this is a sure bet, we could justify spending money to study what and who would be affected."

Given the uncertainties, planners of long-term projects are warned to consider the sea level changes in their designs. But that's rather hard, since "everything in water supply is built on what nature's doing and built on the assumption that nature's not going to change radically," says Bill Andrews of New York's Citizens Union. Common sense might now tell an engineer not to build a hazardous waste site on a low-lying coast, but unfortunately some 1,372 dump sites already lie in flood prone areas. This has prompted EPA to consider sea level rise in future siting and to come up with techniques for "capping" or removing threatened sites.

All the publicity given the reports upon their release last October has awakened even the general public to a

problem that for the most part has been relegated to the realm of climatologists' computer-simulated experiments. EPA has been inundated by 5,000 requests for copies of the report. People concerned have ranged from Minnesota farmers worried that the farm belt will move into Canada, to timber companies worried that their forests won't withstand the climate changes, to people owning real estate in Florida.

Responses to these projected dramatic changes are likely to come slowly since people typically don't act until the problem is upon them. Water planners have seen the points of vulnerability already, but farmers, who respond to weather conditions from year to year, aren't used to planning as far in advance for dry spells and water shortages.

Some say farmers ought to be ready to change their practices, as runoff could be reduced up to 75 percent in some areas. "The irrigation methods they're investing in may be obsolete," suggests an EPA staffer. Although many farmers in the West are already stressed by water shortages, they often can't afford the new equipment—like that used for "drip irrigation." "It's already hard to get farmers to move to low-water utilization crops," says Tom Skirbunt, a staffer for the Water Resources Subcommittee. "It's a question of getting anybody to sacrifice short-term gain for long-term profit."

Scientists forecast serious disruptions in agriculture, possibly the return of "dustbowl" conditions, as well as extreme events from floods to hurricanes to tornadoes. Drought could

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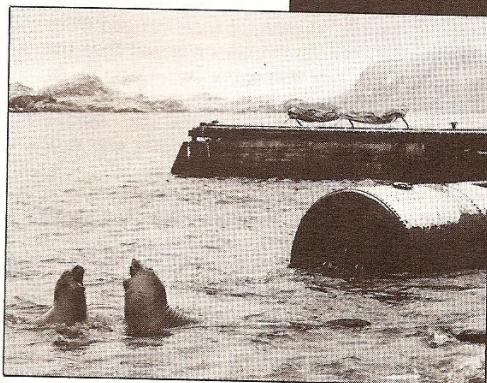
***"There's no environmental problem that compares with the impact of nuclear war, but second to that, carbon dioxide's at the top of the list."***

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threaten areas that depend on irrigation like California and the Colorado Valley, along with parts of the West and Midwest. According to William Nierenberg of Scripps Institution (who directed the NAS study), the pressure on California's central valley is likely to be so bad that "the centers of agriculture could move back to the Northeast."

"Farmers are likely to respond almost unconsciously to climate changes," suggests David Burns of the AAAS. "Say a farmer's growing corn under rain-fed agriculture. As it gets drier and drier he may get out of farming or





Melting ice is raising sea level and (inset) threatening fragile polar habitats



move, drill a well to tap more water, or switch to sorghum which takes half the water corn does." Rapid climate changes could also produce pests, by changing "the habitats of vectors," the NAS suggests.

Another worry, Burns says, is that these climate disruptions may force certain wild and genetically "important" species to become extinct. For example, he points out, had the "teo sinte" ancestral strain for corn been lost, plant breeding would have been much harder.

Amid all the gloomy forecasts, though, there is one potentially redeeming factor—that CO<sub>2</sub> taken alone could boost agricultural productivity. Vital to green plants, carbon dioxide combines with water in the sun's light to produce carbohydrates. And there's evidence that plants could use less water with the extra CO<sub>2</sub>, although some species fare better with the added CO<sub>2</sub> than others. Whether this benefit will offset all the other disruptions, however, is pure guesswork and, some say, doubtful.

**M**uch about the way that carbon dioxide works in still up in the air. Scientists depend for their data on complicated and still unreliable information about how carbon dioxide builds up in the atmosphere, where it goes, and how it is dispersed. They make future projections based on rough earthly parameters—anticipated fossil fuel use, energy prices, storm,

volcanoes, the response of glaciers, and so forth. Climatologists need to know much more about the degree to which clouds and oceans might amplify or offset the direct warming from CO<sub>2</sub>, before accurate predictions can be made.

"No one knows the threshold where it becomes dangerous," says Jesse Ausubel, a researcher for the National Academy of Sciences. "I don't think waiting until 1990 is going to be dangerous, but year by year it gets more problematic." By the year 2000 the world will be thinking about it very seriously."

Until then, though, says EPA's Jim Titus, farmers, businessmen and government officials must be content with large uncertainties about sea level and climate change on top of all the other daily uncertainties they face.

The scientific consensus seems to be that as long as we continue to burn fossil fuels, consuming more and more coal—the worst culprit—we'll continue to build up CO<sub>2</sub>. At some point we have to slow it down. If we completely used the earth's stores of oil, gas and coal (if it was all burned and half the carbon remained airborne) we'd raise the CO<sub>2</sub> level at least six or seven times what it is now.

It's surprising, then, that both studies so strongly de-emphasized curtailing fossil fuels and implementing conservation and alternatives. Energy economist Amory Lovins and several other environmentalists, contend that enough is now known to begin taking steps to forestall the problem. "If you want to reduce CO<sub>2</sub> emissions," he says, "energy efficiency is the fastest and cheapest way to do it.

Certainly EPA got it right when it said that if we don't curtail our fossil fuel use, we'll be in trouble. But whether we do that is not a matter of fate but a matter of choice."

Nierenburg of Scripps Institution argues that it's premature to take action. "Going to alternative fuels is the most effective solution," he told *Environmental Action*, but argued that it was "unrealistic." "We could make drastic shifts in our fossil fuel use but at great cost. Photovoltaics," he claims, "has simply not proven to be economical."

But what's "economical" is largely a matter of opinion, not of fact. Both Amory Lovins and Florentin Kraus of Friends of the Earth have taken issue with both studies' projections of energy demand. "By 2050, they projected a 30-fold increase in gross world products!" Lovins exclaimed. "The earth has neither the resource base nor the pollution tolerance to tolerate that."

Environmentalists like Michael Oppenheimer of the Environmental Defense Fund argue that we can't afford not to take action. "It is superficial to conclude that preventive strategies are fruitless," he argues. "The cost of not doing something may be much worse. We should push ahead fast and furiously on developing solar technologies."

Indeed, environmentalists argue, if it takes about 20 years for an energy planning program to get off the ground, and the year 2000 is being mentioned as some kind of hypothetical threshold date, we're already behind. The costs, by then, will be much greater: for public works, building seawalls,



dams, dikes and flood control equipment; for agriculture, irrigation equipment, having to abandon certain farming areas and move to others. Jeff Benoit of Massachusetts has already petitioned the state asking where money for seawalls is going to come from—and whether the “private sector” should be prepared to bear some of the taxpayers’ costs. In the only two studies done so far, EPA has found that seawalls to protect the cities of Galveston, Tex. and Charleston, S.C. would cost \$800 million—each.

As always, it seems that the barriers are more political than economic. The NAS study goes out of its way to defuse

the issue of fossil fuels by trying to redefine the problem. “How the issue is named can affect its apparent character,” says the report in passage which should have contained a reference to Orwell’s *Newspeak*. “Defining the problem as the CO<sub>2</sub> problem can focus attention too exclusively on energy and fossil fuels, compared with calling it the water or the rainfall problem or, more evenhandedly, the issue of climate change.” (Indeed, the report is titled “Changing Climate.”)

This attempt to redefine the issue may come from the fact that some scientists would like to have a stronger hand in shaping CO<sub>2</sub> policy, since

many feel the lead agency, DOE, has been dragging its feet. “Having the DOE study the impacts of CO<sub>2</sub> is like having GM study the impacts of auto emissions on human health,” laughs one environmentalist. This year DOE cut funding for CO<sub>2</sub> research despite these new studies being released. Meanwhile, Frederick Koomanoff, director of DOE’s climate program, faults EPA for going as far as it did. It’s premature to do anything now, he feels. “You’d better be in the realm of reality before you start making policy changes,” he says.

But scientists recognize we’re going to have to act soon. As NAS frames the

## The Last Wave

**W**hat will happen if scientists are right about “the greenhouse effect” and the temperature in New York City becomes just like Daytona Beach, Fla.? New York and other cities will probably have many more sweltering hot days. Cities that depend on California and the West for fresh fruits and vegetables, particularly in the winter, could have trouble getting them. But the biggest—and earliest—impact on New York City and other East Coast cities will be the drastic rises in sea level. And in the coming decades, the shoreline of the Atlantic Ocean is likely to look very different.

“It’s bad enough here in the city as it is,” complains Bob Alpern of New York City’s Citizen’s Union, a group devoted to water planning. Alpern fears that “a substantial sea level rise” could inundate Long Island and virtually knock out some low-lying areas like Coney Island, parts of Brooklyn and the Rockaway Peninsula.

Even worse, a substantial sea level rise, Alpern fears, “could produce so much erosion and so much seepage of seawater through the soil that ‘some portion of the Long Island aquifer could be hurt.’ As a consequence, ‘saltwater intrusion could turn wells brackish.’” Already, the city of Brooklyn has had to turn to other reservoirs for its drinking water supply. And Philadelphia, which draws its water from a tidal river, would be even more vulnerable.

But the changes he sees go far beyond New York. The rising sea level will start moving seawater upstream

into rivers. As saltwater fronts move forward, Alpern worries, they could radically throw off delicate estuarine conditions and necessitate the release of precious freshwater supplies to counteract the imbalance. This problem would worsen if the greenhouse affect alters rainfall, shifting water runoff and further taxing water reservoirs.

“I think that this is a very serious problem for the future of American

Pilkey talks animatedly about places like Atlantic City, Daytona Beach, Fort Lauderdale and Miami Beach. These, he says, are victims of “New Jersey-ization,” and by this he doesn’t mean just highrises and highways. In places like this, there’s not only massive condominium development, but when the sea encroaches on them, they build “massive seawalls” to protect them. What happens, typically, is that these seawalls prevent the natural



coastal states,” says coastal geologist Orrin Pilkey of Duke University. “Storms will be more severe and will drive further inland.” Depending on the slope of the land, a small vertical rise could cause a very large horizontal retreat, says Pilkey. A one-foot rise in 40 or 50 years could drive shallow sloping beaches like Kure Beach, N.C. behind the Outer Banks perhaps as much as two miles! Other places Pilkey feels will be hard hit include Wrightsville Beach, N.C.; Virginia Beach, Va.; Ocean City, Md.; and Sea Island, Ga. How bad will it be there? “They will have houses tumbling into the sea—unquestionably!” he explains.

formation of beach. As a result, he says sadly, “People don’t go to these beaches anymore.”

“Miami Beach has just completed a beach replenishment project at a cost of \$68 million to protect 15 miles of shoreline that’s been touted as the answer for the erosion problem. But it’s nonsense,” Pilkey maintains. “What they’re saying is: ‘Go ahead and build your condos on the beaches. The Corps of Engineers will be right around the corner to help build a seawall. But what they should be saying is ‘Stay off the beach or be prepared to have your houses tumble down in 30 years.’”



issue in its chapter on policy, "we have a choice between conserving fuel and conserving water." It would be more in the interests of a particular region to conserve water, because they could reap the benefits, whereas as conserving energy is thought to be politically unmanageable on an international scale.

EDF's Michael Oppenheimer admits that "the knottiest part of the problem is getting the rest of the world to do something about the greenhouse problem." But, he adds, "It's very premature to assume that such an agreement couldn't be worked out." Suggestions have included having nations curtail CO<sub>2</sub> emissions by taxing fuels, placing export limits on fuels or taxes on coal exports. While NAS stresses that a

Roberts goes on to write that the Russians would have to divert the Ob' River south, at a cost of up to a trillion dollars to effectively irrigate their best farmlands. "I don't buy this winners-losers argument," says FOE's Pomerance. "There will be so much resource disruption. How could it be in anybody's interest?"

The NAS reports almost gleefully on the melting of Arctic ice: "The old dream of a Northwest passage would become a reality." It would open up the Arctic to "navigation, seafloor development, oil and gas drilling" (as well as creating a "less hostile environment" for military tactics.) Nevertheless, the report is quick to add, we would lose these fragile habitats "since" polar regions are among the wilder and more

massive, government-sponsored program of energy conservation that would maximize savings that are already taking place through market forces. Gas consumption in this country declined much more drastically than many could have predicted ten years ago. Despite the Reagan DOE's dismantling of conservation budgets and energy efficiency standards, utilities have made strides. A report by the Investor Responsibility Research Center (IRRC) that surveyed 120 major utilities found that "the virtual stampede to conservation" could reduce the demand for new plants. Some congressional staffers feel that attention to the greenhouse problem will engender more money being spent on conservation.



Picturesque Charleston (left) is one of many coastal cities threatened by rising tides. With a "worst case" 8-meter sea rise, the East Coast (right) would virtually disappear.

global policy on CO<sub>2</sub> might be "possible, there are few examples where a multinational environmental pact has succeeded, the nuclear test ban treaty being the most prominent." Decades may be needed "to achieve even modest progress."

One stumbling block to international cooperation is that there would be presumed "winners" and "losers" as a result of climate changes. The Soviet Union, for example, could stand to become a winner, with parts of Siberia having the potential to become more agriculturally productive. "The Soviet Union's wheat growing regions stand to gain from a growing season about six weeks longer than now," writes climatologist Walter Orr Roberts in The Conservation Foundation newsletter.

Yet it's questionable whether the "greenhouse effect" really would be desirable for any nation on the planet.

pristine environments remaining." We can all guess which scenario will win.

On the other side of the world, Antarctica could also be threatened. Jim Barnes of the Antarctica Project predicts that if the oil companies get their way in getting drilling rights in Antarctica, their activities could threaten the delicate balance of the West Antarctic Ice Sheet.

**C**ontrary to what scientists are willing to advocate, there are lots of actions we could be taking that could alleviate the problem of the "greenhouse effect." They could also help solve problems like pollution, energy spending and waste at the same time.

Many argue that there should be a

Water conservation must become a must for farmers, particularly in the West. "The technology is there," says Tom Skirbunt, a staffer on the Water Resources subcommittee of the Committee on Public Works. "It's a question of getting people to use it." A step in the right direction would be to raise the price of water in areas where it's now artificially low.

Cities must also begin conserving water. "It's difficult to get cities to do it," says Skirbunt, but he says water ought to be metered and incentives created for consumers.

Switching to renewable resources is another solution that these "greenhouse" reports barely scrape the surface of. Decentralized alternative energy systems—particularly wind turbines, small hydro dams and cogeneration—have increased their sales of power to utilities in recent years, according to



the IRRC. And photovoltaics is on the verge of being marketed. Third World countries, rather than following the path of industrialized countries, are already making strides in biogas and solar technologies.

Despite their drawbacks, these reports are right in calling for more study of the greenhouse effect. Scientists need to find out more about how CO<sub>2</sub> works, especially about how other gases contribute to the problem, including nitrous oxide, methane and chlorofluorocarbons. Aerosol fluorocarbons were banned because of their impact on the ozone layer, but non-aerosol fluorocarbons are in everything from refrigerant gases (Freon) to dry cleaning solvents to insulation to electronic circuitry to the foam-blowing

study to see if glass bottles could be made to later double for use as interlocking bricks.

Another step many would regard as extreme, suggests Nierenberg of NAS, would be "to force people to become vegetarians"—and he's dead serious. A vegetarian society would only need one-fifth of the area we now use for cultivation and one-fifth the water, since nearly 60 percent of all farmland goes into producing animal feed. In this way we could save soil and grow back many forests.

At this point, scientists have been unwilling to call for big changes as they have for problems like acid rain. "Everyone's willing to think about it," says NAS's Ausubel. But we're a long way from regulating and taxing fossil

for the inevitable sea rises and weather disruptions. You can help by writing the following key officials:

1. **Donald Hodel**, Secretary of Energy, Washington, D.C. Tell him that money spent to develop synfuels, which emit twice as much CO<sub>2</sub> as coal, should be spent on research to make sure fossil fuels are not the "least cost" energy supply after 2000.
2. **Joseph Cannon**, Assistant Administrator for Air, Environmental Protection Agency, Washington, D.C. Tell him that fluorocarbons are likely to contribute more and more to the warming than CO<sub>2</sub>; that the United States should freeze emissions at their 1980 level as originally proposed and then actively again try to ban aerosols worldwide.
3. **David Stockman**, Director, Office of Management and Budget, Washington, D.C. Tell him that coastal communities could save over a billion dollars by planning for some sea level rise and that the CO<sub>2</sub> research budget should be expanded.
4. **Robert Jantzen**, Director, Fish and Wildlife Service, Washington, D.C. Tell him that the wetlands he is protecting may be underwater in the future so it's even more important to keep these ecosystems unspoiled.
5. **Lt. Gen. J.K. Bratton**, Director, U.S. Army Corps of Engineers. Tell him that the Corps should assess the impact of sea level rise on all their projects' environmental impact statements.
6. **Garrey Carruthers**, Assistant Secretary of Agriculture for Land and Water Resources, Washington, D.C. 20240. Tell him USDA should take immediate actions to make sure farmers aren't relying on water supplies that will dwindle in the future.
7. **Louis Giuffrida**, Director, Federal Emergency Management Agency. Tell them they should be planning to prevent future coastal flood disasters from sea level rises as they do from storms.
8. **Sens. Daniel Moynihan (D-N.Y.) and Robert Stafford (R-Vt.)**. Tell them you support last year's amendment to the Water Resources Development Act requiring the Corps of Engineers to assess sea level impacts in all their projects.
9. Send copies of all the letters you wrote to the officials above, to your elected representatives in Congress, your state legislatures and City and County Councils.
10. **Dr. Gro Harlem Brundtland**, chair of the special commission on environmental perspective, United Nations, Palais des Nations, 1211 Geneva 10, Switzerland. Tell her the greenhouse effect should be a priority to the year 2000 and beyond. ■



*High waves and storms that attack coastal areas along the Atlantic, like Charleston's harbor, will intensify as the sea level rises.*

materials used to make styrofoam cups. And their use is skyrocketing.

Jim Titus of EPA argues that while a ban on fossil fuels may be politically impossible, placing limits on chlorofluorocarbons wouldn't be. "The most cost effective prevention strategy would be curtailing fluorocarbon consumption," he says. "Half of the sea level rise though 2050 will be due to chlorofluorocarbons, not CO<sub>2</sub>," he says.

The last major action is recycling society's wastes so that less materials have to be produced and less energy used to produce them. This is perhaps the hardest to achieve, but hardly impossible. A recent Sierra Club book, *Building for Tomorrow* by Martin Pawley, describes projects throughout the world for using scrap bottles, cans, tires and auto parts as building materials. It tells how, for example, Heineken Breweries commissioned a

fuels, much less launching effective energy and water conservation and recycling programs that would mean getting serious about the idea of a "sustainable" future.

Given the stakes—the stability of the planet—we ought to get started well before it's time to start building another Ark.



## Ten things to do

*We should be supporting efforts to prevent the 9 degree Fahrenheit warming that scientists say is likely to occur by during the next 80 years through concerted actions to conserve energy and switch to alternative technologies. Unless we take action soon, coastal communities, fishermen, farmers will be forced to pay huge costs*