

terpretive films and the use of anthropological films in all levels of education.

The film makers, always ready with a reel or two, showed their work and explained their methods. Methodology, however, is something anthropologists and film makers haven't been able to decide on. Purists, for instance, claim that anthropological films must be straight recording of behavior with little or no interference from the film makers. Three hours of handshaking at a wedding certainly wouldn't make it on prime-time television, but it could be very informative to an anthropologist doing cross-cultural research on greetings. At the other end of the spectrum are the makers of pop anthropology

films—films with popular or commercial appeal in which the maker attempts to photograph as much exotic excitement as possible. Such films can be entertaining but may be worthless to an anthropologist who suspects that scenes may have been staged and that authenticity may have been sacrificed for the sake of the film maker's art (or pocketbook).

There is, of course, a middle ground which says naturally occurring patterns or sequences of behavior can be recorded objectively and fully and then edited either artistically (for popular consumption) or scientifically (for anthropological use).

The fact that these and other prob-

lems were discussed, if not solved, indicates that someone is at least looking for a solution. The film maker and the anthropologist, the artist and the scientist are attempting to get it all together and come up with the body of literature Ruby called for and systematic and valid ways of recording changing civilizations before it is too late. "We all need to see ourselves, as much in the multi-cultural nations of the Western world as in the multi-tribal nations of the developing world. In my opinion," Warner told the film makers and anthropologists, "there is no more powerful instrument for doing so than your work, or the sounds and images of modern anthropological film." □

Biting the bullet in New York Bight

The New York Bight is the most. The 15,000 square miles of water bracketing New York Harbor from Montauk Point, Long Island to Cape May, New Jersey are the most complicated, most trafficked and most polluted large marine area off the United States. And it is about to become the most studied.

As the pilot project for the MESA program, the New York Bight is the subject of a vast five-year Marine Eco-Systems Analysis plan to learn everything possible about the area's waters, in hopes of offering guidance to future developers.

MESA is not a program of research for research's sake. In fact, a fundamental precept of the plan is that its results must be made not only available to, but readily usable by, anyone whose activities will affect the water. Currents, sediments, resident life forms, effluents, manmade events and natural changes are all within the broad MESA bailiwick, with the strongest emphasis on turning the tons of data that will result into workable tools.

The New York Bight is an almost inevitable starting point. Countless studies

have been made of the area—about 130 are going on right now according to Robert Swanson, MESA's acting project manager for the bight investigation—yet a detailed overview is simply nonexistent. To provide one, MESA, run by the National Oceanic and Atmospheric Administration, may spend as much as \$20 million.

Most of the first year's effort will be devoted simply to organizing the mass of existing data on the bight into some coordinated, understandable form. A relatively complete bibliography of past scientific reports is one goal, along with a computerized system for digging out desired kinds of information. An overall interpretive atlas of the bight is also planned, but its final form is uncertain because of the insistence on making sure its data are as usable as possible. "Endless lists of numbers," says one official, "just won't get used."

Also in the first year will be a pilot-within-a-pilot study of an arc about 20 miles long around Ambrose Light near New York Harbor at the apex of the bight. As many as six oceanographic research vessels will collect data on sediments, waste input, dredging effects, circulation patterns, the impact of natural and manmade events and the factors affecting and fish and other sea

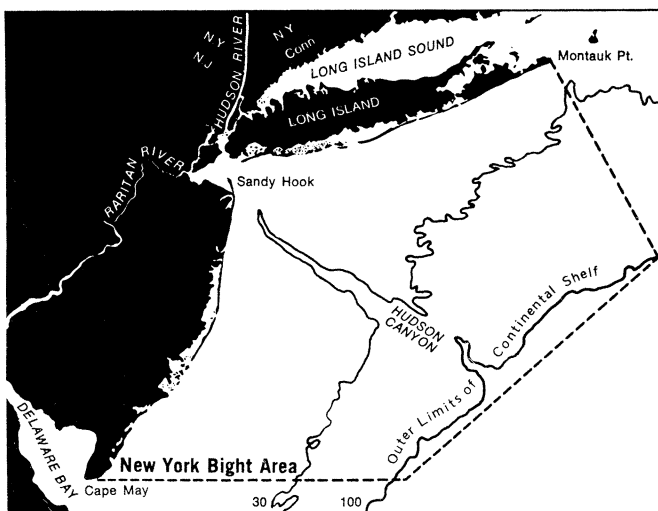
creatures in the area. The localized effort is intended to show the MESA team how to manage their research before they expand to the ponderous matter of the whole bight. These initial results will be in the form of environmental baselines that will be models for the large project. An area subject to regular, strong waves, for example, might be one to be avoided by planners of offshore construction.

Although the MESA group plans to use as much off-the-shelf technology as possible, some new devices are being developed. Current-measuring meters that record less extraneous noise than present ones are being designed, for example, as are coring devices that can collect bottom samples with a minimum of disturbance to the vertical arrangement of sediment layers.

The idea for MESA in its present form was born in the spring of 1971, and began with NOAA evaluating its own member divisions (such as the Marine Fisheries Service and the Environmental Data Center) to see what expertise it already had. The plan was for the New York Bight to be the first of many areas to get the full ecological analysis treatment. The Gulf of Mexico, the Southern California Bight, Delaware Bay and other sites were envisioned as future subjects as MESA progressed.

Limited budgets have afflicted MESA along with everything else, however, and officials these days are less than expansive about predicting the program's spread. At present, the hope is to start a second area study in fiscal 1975, with a similarly detailed analysis running from Prince William Sound in Alaska to Puget Sound in Washington, the shipping route for oil taken from the proposed trans-Alaska pipeline. If funds still hold up, next on the list is southeastern Florida, where the coastal waters interact with the Gulf Stream current.

Meanwhile, the New York Bight project grows. Starting at the end of this month, MESA administrators will begin the process of selecting a cor-



Understanding of everything that affects the ecology of the New York Bight is the goal of the exhaustive pilot project of the MESA program.

NOAA

poration or institution to develop a huge "conceptual model" of the entire bight. This will be a guiding influence for the whole project, giving researchers in the study a way to step back and see how their individual results relate to the broad behavior of the area.

Merely gathering a lot of information about one locale is not difficult. Putting it together so that it means something is. So far the awesome management problems of the New York Bight study are being directly confronted by fewer than 10 people in NOAA's MESA office. "Don't quote me," says one oceanographer, "but I wouldn't try it. My God, what a headache!" □

Making Mars livable: An eternal spring

The human race is eventually going to need room to expand. Even with zero population growth the earth is likely to be too small for the rising expectations of its people. The only place to expand is elsewhere in the solar system, most probably the planet Mars. In a forthcoming issue of ICARUS (Vol. 19, p. 126) Joseph A. Burns and Martin Harwit of Cornell University tell how Mars may be made more habitable.

The method depends on a model of Martian behavior put forward by Carl Sagan, also of Cornell, called the "long winter model." The orbit of Mars goes through a precession cycle that lasts 50,800 years. During part of this period the north pole of Mars points toward the sun at perihelion; during another part the south pole points toward the sun at perihelion. There are parts of the cycle when neither pole points toward the sun at perihelion, and these are called "spring" for reasons which will appear.

Sagan developed his model to account for the apparent evidence of water erosion on Mars discovered by the Mariner 9 space probe. He supposes that during the "winter periods" a lot of ice, mostly carbon dioxide but with some water, is trapped in a large polar cap on the pole away from the sun. During the "spring," which lasts a few thousand years, the ice becomes vapor. This could cause a greenhouse effect with rising temperatures and the holding of an atmosphere as dense as the earth's. Under these conditions biological organisms might emerge from desiccated dormancy and begin to populate the planet.

The trick to making Mars habitable, propose Burns and Harwit, is to prolong the "spring" indefinitely. This is possible because the precession that causes the "seasonal" cycle is governed by two effects: one is the gravitational influence of the other planets; the other

is the gravitational influence of the sun. It turns out that if the solar part of the precession can be altered, the "spring" will remain.

The alteration can be accomplished by bringing enough mass near Mars and putting it into orbit around the planet to cause a counter-torque. Burns and Harwit suggest using an engine driven by sunlight to bring the necessary mass to the proper place. The first candidate considered is the Martian satellite Phobos. But the mathematics indicates that Phobos won't work. The second suggestion is to get mass from the asteroid belt, either in the form of a ring or of a single object. The mass needed is less than one percent of the total mass in the asteroid belt and less than the predicted mass of 10 different asteroids.

It would take time to work out the technology, Burns and Harwit admit, and time to move the requisite mass. But there is time: The next Martian "spring" doesn't start for about 10,000 years. Finally Burns and Harwit make a bow in the direction of those who worry about the ecology of the solar system: "Although there is always something a little repugnant about man pushing his own interests and fixing nature, we believe that—of all possible ways to prolong the spring—the . . . scheme would do the least to directly damage Mars." □

Court releases sewage money

In the latest setback for the Administration over the impounding of congressionally appropriated funds, a Federal judge ordered last week the release of \$6 billion to help build municipal sewage-treatment plants.

U.S. District Judge Oliver Gasch of Washington, D.C., ordered the Environmental Protection Agency to release the funds immediately and begin allocating them to cities across the country. He also ordered that applications be accepted for an additional \$11 billion appropriated for the same purpose over the next two years.

The funds had been appropriated to help cities meet the 1985 goal of having no pollution dumped into the nation's rivers and streams. President Nixon vetoed the bill last October, explaining that "pressure for full funding under this bill would be so intense that funds approaching the maximum authorized amount could ultimately be claimed and paid out," thus stimulating inflation. Congress overrode the veto.

After the appropriated funds were impounded, New York City, and later Detroit, filed suit, claiming the remaining amount would "permit only a token start toward completion" of projects

that have already been approved.

Sen. Edmund Muskie (D-Me.), who had helped fight for the bill during its two rounds through the Congress, called the decision a victory "for the Congress, for the cities, for the American people and for clean water." EPA withheld comment. □

EPA relaxes SO_x standards

The Environmental Protection Agency last week relaxed the secondary emission standards for sulfur-oxide emission from smokestacks, scheduled to go into effect in 1976. Citing "new scientific data," the agency said the original standards had been set lower than necessary.

Primary standards, under terms of the Clean Air Act, are set for protection of human health and safety. Scheduled to go into effect in 1975, these standards were unaffected by last week's ruling. Secondary standards are intended to provide for "general welfare," and their levels have generally depended on damage to vegetation done by pollutants.

The new standards limit emissions to 3.5 parts per million for any three-hour period. The old standards had required concentrations of less than .02 parts per million during continuous operation.

EPA says the standards reduction should not affect most major cities since meeting the three-hour standard would also lower the average concentrations of pollutants. In rural areas, however, where most copper smelters are located, the agency admits it is uncertain of the ruling's effect. □

NCAR granted hail modification permit

The National Center for Atmospheric Research has been granted a permit by the state of Colorado to continue its five-year study of hail modification (SN: 3/20/71, p. 200). The cloud-seeding program began last spring, shortly before the adoption of the Colorado Weather Modification Act of 1972, which requires any such experiments, whether commercial or scientific, to obtain a state permit, which must be preceded by a public hearing. The hearing on the 1973 operations was held on March 29. This year, the aircraft that disperse the silver iodide seeding crystals just beneath the clouds for lifting by updrafts will be augmented by ground-launched rockets, and this should allow the crystals to be released directly within the clouds. □