

Predicting the fury

The hurricane season is now officially under way, and the National Hurricane Center in Miami is bracing for the annual onslaught. Unpleasant memories of last August's Hurricane Camille—which killed 171 Gulf Coast residents and caused \$1.4 billion damage—linger like a specter in the background. But as Weather Bureau scientists repeat eternally, they don't make the weather. The best they can do is to continue to improve their capabilities of detection and prediction and hope each year that nature will be more sparing.

"In this business there's never a monumental breakthrough," says Arnold L. Sugg, deputy director of the Miami center. "It never seems to work that way. We do try to improve our services a little each year."

Nevertheless, the warning system was a prime focus of a critical investigative staff report of the House Committee on Appropriations, singling out the Hurricane Center's warnings on Camille. Officials of the Environmental Science Services Administration have denied any inadequacy. They contend—with support from the director of the Office of Emergency Preparedness and the Civil Defense director in the area—that the warning system performed in an outstanding manner in the Gulf area and that the forecasts were better than average for Gulf hurricanes. The bulk of the evidence indicates that the populace had adequate warning but did not uniformly heed it.

In any case, this year three specific improvements have been made that should give the Miami center's meteorologists a little more of an edge on a hurricane.

One improvement is a refined hurricane analogy technique called HURRAN. "What this does," says Sugg, "is really milk dry the statistics of a century of hurricanes." HURRAN is a computer program that compares the behavior of an approaching hurricane to the behavior of all hurricanes in the past 100 years having similar location and movements. It then computes the sector of the coastline that historically has a 50-50 chance of being struck.

"The beauty of this statistical approach," Sugg says, "is that it draws a 50 percent probability ellipse. Should the ellipse touch the coast we will announce a hurricane watch. Heretofore, we have never had firm ground rules for defining when to start a watch." The hope is that as much as 36 hours advance-watch notice may be possible—about twice what is now available.

The technique pushes the statistical method of hurricane forecasting to its limit, Sugg believes. Further advances

will have to come by using dynamical approaches, which treat each hurricane as an individual phenomenon in an attempt to gain a physical understanding of its behavior. These techniques are not nearly as well developed.

This year the center will see photos every 23 minutes of the Atlantic Ocean, Gulf of Mexico and Caribbean Sea, taken by the ATS III satellite hovering over the western Atlantic. This represents a significant improvement in detection capability over last year, when photos more often than once a day had to be specially requested through Washington and then retransmitted to Miami. Once-daily photos from the ESSA 8 and 9 satellites will continue to be received directly.

A third innovation this year is the use of standardized flight patterns for the aircraft probing a storm. Previously there was considerable difficulty in comparing data obtained by different aircraft. This year for the first time each plane will probe not only the center but also the quadrants of the storm.

POPULATION AND ENVIRONMENT

Getting together on issues

Twin issues, the population explosion and the environment, have gained a great deal of public and official attention this year. But the shiny new issues seem to have tarnished in recent weeks as Cambodia and student militancy got the headlines.

A Congress on Optimum Population and Environment, held in Chicago this week, was a high-level effort to fuse the population and environment efforts and at the same time to create more public interest. Attending were some 1,000 persons, ranging from high Government officials and eminent scientists to ordinary citizens.

Some schisms were apparent, especially between prophets of doom and those with a more optimistic view, as well as between avid environmentalists and those interested in a broader range of problems.

Said Dr. Paul Ehrlich of Stanford University, a well-known Jeremiah on the population issue: "Together with people of other nations, Americans must decide whether there will be a future for mankind."

But Dr. Raymond Dasmann of the Conservation Foundation was inclined more optimistically: "Human population growth, as such, does not necessarily have adverse effects on environmental quality," he said.

There were pleas, too, for a more



ESSA

Camille: "Never a . . . breakthrough."

Such efforts may help mitigate hurricane death and damage some. But there is little hope for marked improvements until ESSA's hurricane-seeding Project Stormfury (SN: 12/13, p. 551) points the way to modify hurricanes. This year's experiments will be ready to begin near the end of July. Stormfury's director R. Cecil Gentry hopes to be able to seed three or four hurricanes. □

reasoned approach to environmental issues. Because of distorted and alarmist approaches, said Dr. Philip M. Hauser of the University of Chicago, "the problem of credibility may arise and short-run public zeal may turn into longer-run apathy."

There were also arguments that environment and population must supersede the issues of poverty, race and war, as well as counter arguments that insisted the congress must concern itself with a vast range of social problems. Dr. Hugh Iltis, University of Wisconsin botanist, was emotional in a plea to narrow concerns to ecology. "While you are busy saving humanity, the ecosystem is going to go down the drain," he said.

But in an obvious effort to include everybody present—including women's liberation, black and youth groups—the board of the congress finally adopted a resolution with such a broad focus that any earlier direction was lost.

"We dedicate ourselves to improve the lots of those citizens in the United States and the world, who through war, racism and exploitation, have suffered the most severe consequences of environmental deterioration," said the resolution. "The role of women in society" was also listed as a fit subject for concern by the congress. □