OCEANOGRAPHY

Indonesia Opens the Door for Global Climate Studies

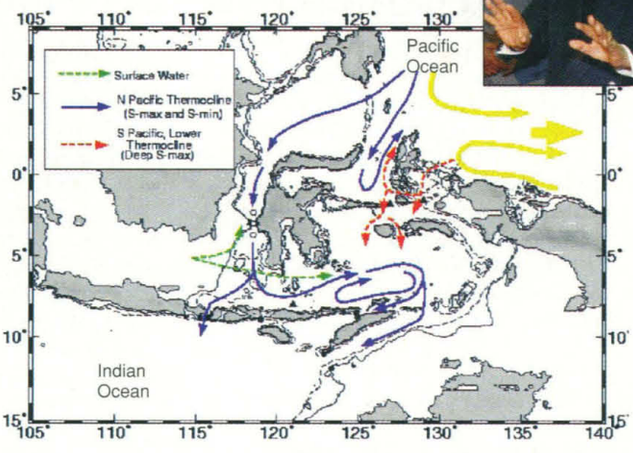
The forest fires that raged out of control in Sumatra and Kalimantan for several months this year have left at least one promising scientific development in their acrid wake. Reacting to international criticism that his country has been slow to take action against the fires and other environmental problems, Indonesia's longtime leader, President Suharto, last month invited the world's scientific community to conduct research on global climate variability in Indonesia. He also pledged financial support for international efforts in climate prediction and mitigation, including a fledgling U.S.–based effort at Columbia University.

"We are pleased to open ourselves and offer the uniqueness of our territory, whether at sea, on land, or in the atmosphere, for scientific studies of climate, weather, and the environment," Suharto told an international conference on global environmental change held 10 to 12 November in Jakarta. Last week, he repeated the promise to world leaders gathered at the Asia Pacific Economic Cooperation summit in Vancouver, Canada.

Suharto's statements herald "a new policy," confirms geophysicist M. T. Zen, senior adviser to State Minister for Research and Technology B. J. Habibie. Indonesia's military has at times been reluctant to allow international research projects among its far-flung islands and within its territorial waters (*Science*, 5 January 1996, p. 23). But Zen says, "The severity of the drought and the extent of the forest fires make it clear that we can no longer look at climate change as a problem that only the wealthy nations can afford to think about. As a maritime continent, Indonesia has a special role to play in improving our understanding of global climate."

Researchers were quick to welcome Suharto's invitation, noting that it opens up a world of possibilities. Indonesia sits at the center of some of the most pressing issues in climate research, including understanding the variability of El Niño, the interaction between the Pacific and Indian oceans, and the conveyer-belt model of ocean circulation. In addition, its geography—some 30,000 islands covering an area the size of the continental United States—makes oceanography a matter of national importance. "It does seem to be a significant change in attitude, and very encouraging," says Kevin Trenberth, head of climate analysis at the National Center for Atmospheric Research in Boulder, Colorado. "It should make researchers very happy," adds Columbia University physical oceanographer Arnold Gordon, head of a 10-year project begun in 1993 to study the interaction of the Pacific and Indian oceans in Indonesia and its impact on global climate. "It's very important that it's coming straight from the top," says Gordon, whose Arlindo project relies on Indonesian vessels and scientists to deploy and reclaim instruments.

SASA KRALJ/AP PHOTO



SOURCE: A. GORDON/LAMONT-DOHERTY EARTH OBSERVATORY

Going with the flow. Suharto's new policy should bolster projects like Arlindo, which is tracking water flow between the Pacific and Indian oceans.

As a first step toward international cooperation, Suharto has proposed Indonesia for core membership in the new International Research Institute for Climate Prediction (IRI), a U.S.–backed effort based at Columbia's Lamont-Doherty Earth Observatory. The institute, begun last spring with a 3-year, $18 million award from the National Oceanic and Atmospheric Administration (NOAA), hopes that governments around the world will eventually pick up the tab for its activities, which include a large modeling team at the Scripps Institution of Oceanography in La Jolla, California.

"NOAA told us it will cost $3 million over 3 years to become a core member of IRI and $1.5 million a year after that," says Zen, "and Habibie has said that's not a problem." The institute, which will break ground in February for a $10 million building on the Columbia campus, is negotiating a similar arrangement with Taiwan, Australia, and Brazil, says IRI director Antonio Moura, a former head of Brazil's weather service. Over the next 2 years, IRI also hopes to ink bilateral agreements with agencies in several countries that will help it, in Moura's words, "go beyond the models to real applications, including demonstration projects that help governments and people deal with the impact of climate change."

In his speech to the Jakarta conference, Habibie also staked out a claim to IRI's first regional center, which Zen said will be called the Indonesia Research Institute for Climate, Environment, and Society. Over the next 6 months, a group of 20 scientists from Indonesia's technology agency, BPPT, will be assembled to form the core of the institute, which will later expand to include researchers at other Indonesian agencies as well as scientists in other countries. Its goal will be to anticipate future El Niño events and recommend ways to mitigate their impact.

"Whether we like it or not, El Niño will be with us on a recurring basis, and it's our job to keep reminding people of what must be done," says Zen. "If we know when it's coming, we can advise people what and when and where to plant, as well as exercise more caution in widespread biomass burning."

Researchers also hope to extend an international program on climate variability and predictability, called Clivar, into the region. The project, which uses an array of million-dollar buoys to measure the interaction of ocean and atmosphere over a time scale ranging from months to decades, is being deployed in the Pacific and Indian oceans. Permission to work in Indonesian waters would plug an important gap in coverage, says Trenberth, co-chair of Clivar's scientific steering committee. A proposed international experiment to measure the effect of air-sea interactions on the South Asian monsoon would also benefit from Indonesia's input, says co-organizer Peter Webster, an atmospheric scientist at the University of Colorado, Boulder. "India has committed buoys and Australia has pledged a ship," he says about the proposal to work in an area west of Sumatra in the Indian Ocean, "but we'd also like Indonesia to be involved."

The wave of concern about climate variability may, of course, peak—and opposition to global collaborations could return—once the forest fires die out, the drought ends, and El Niño recedes. "But there's something to be said for striking while the iron is hot," says Trenberth. "The main thing is to assure Indonesia and other countries that they have more to gain than lose in generating and sharing information on the forces shaping our climate."

–Jeffrey Mervis