

# Earth Science

## Water, water, way up high

The middle layer of the atmosphere—a remote region far above Earth's surface—has grown significantly sogrier since 1992, according to measurements made by satellite and ground-based instruments.

Atmospheric researchers say they were surprised to find water vapor concentrations climbing by 2 to 3 percent per year at altitudes of 40 to 60 kilometers—the upper stratosphere and lower mesosphere. Gerald E. Nedoluha of the Naval Research Laboratory in Washington, D.C., and his colleagues report their discovery in the Feb. 20 *JOURNAL OF GEOPHYSICAL RESEARCH*. The water vapor readings come from spectrometers located in California and New Zealand and from a sensor on board the Upper Atmosphere Research Satellite.

The stratosphere and upper reaches of the atmosphere are far drier than the lowest layer, the troposphere, home of Earth's weather systems. Water vapor from the troposphere cannot easily leak upward into the stratosphere because the boundary between the two regions, known as the tropopause, is extremely cold. This frigid barrier causes water vapor to condense and fall back into the troposphere.

Researchers think the additional water vapor comes from several sources. A small fraction results when methane is converted into water vapor in the stratosphere, says Nedoluha. Methane concentrations have been climbing in recent years because of pollution.

Another, less certain source of water vapor is the 1991 eruption of Mount Pinatubo. Volcanic gases lofted into the stratosphere helped warm that region, causing it to rise faster than normal. Since the eruption, the rising motion has slowed somewhat, thereby allowing a larger share of the available

methane to be converted into water vapor. That change, coupled with increasing methane pollution, could account for about half of the extra water vapor, he says.

To explain the rest, the researchers suggest that the tropopause over the tropics may have warmed, allowing more water vapor to sneak from the lower atmosphere into the stratosphere. Now they are investigating what could have caused this warming. Pinatubo appears a prime candidate, Nedoluha says. —R.M.


## El Niño keeps clutch on climate

The Pacific Ocean warming known as El Niño has maintained its strength and will continue to skew worldwide weather patterns over the next few months, say forecasters with the U.S. Weather Service's Climate Prediction Center (CPC) in Camp Springs, Md.

The bad boy of meteorology, El Niño heats up the surface waters of the tropical Pacific every 2 to 7 years. The present warm episode began in the spring of 1997 and has affected weather from Alabama to Zimbabwe. The enhanced atmospheric jet stream crossing the Pacific has steered a string of winter storms to California and on across northern Mexico and the U.S. states bordering the Gulf of Mexico, says Vernon Kousky of the CPC.

El Niño has drenched Peru and eastern Africa, while drying out Indonesia and southern Africa. Some computer climate models suggest that El Niño warmth will persist in the Pacific through May, after which the ocean should start to cool. The onslaught of storms could continue over North America into April, the CPC predicted on March 10. —R.M.

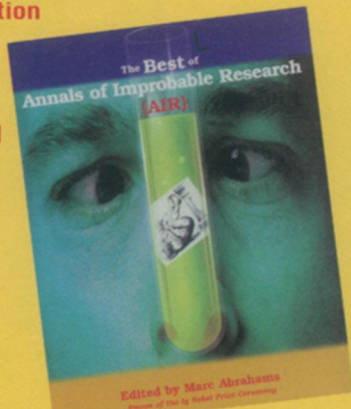
### The Best of Annals of Improbable Research



**D**id someone actually invent the plastic flamingo, or did it evolve from some protoplasmic lawn ornament? It happens that the creator of this ubiquitous cultural icon is a gentleman named Don Featherstone, winner of the 1996 Ig Nobel Art Prize. The First Annual Ig Nobel Prize Ceremony, entering its seventh year (while retaining the "First Annual" part of the title), is itself an invention of Marc Abrahams, editor and big cheese of the science humor magazine, *ANNALS OF IMPROBABLE RESEARCH*.

This book is a not-very-random sampling of some of the juiciest bits that have appeared in the magazine. Abrahams, an editor with a capacity for humor at least equal to pi, begins the collection with the history of the magazine, some brisk interviews with actual, live Nobel laureates, and highlights from Ig Nobel Prize ceremonies past and present. The text features articles, limericks, and lyrics by all kinds of people in a splattering of subject areas. Witness:

- The Effects of Peanut Butter on the Rotation of the Earth**
- Xerox Enlargement Microscopy (HEM)**
- The Taxonomy of Barney**
- A Natural History of the Articulated Lorry**
- How Dead is a Doornail?**
- The Mathematics of Telephone Numbers**
- Mathematics: An Anagrammatical, If Pointless, Tale**
- Gummy Worm on a Sidewalk**



Edited by Marc Abrahams  
winner of the Ig Nobel Prize Ceremony

WH Freeman, 1998, 208 pages  
8 1/2" x 11", paperback, \$14.95

**BooksNow**  
The Virtual Bookstore™

448 East 6400 South, Suite 125  
Salt Lake City, UT 84107

Please send me \_\_\_\_\_ copy(ies) of *The Best of Annals of Improbable Research*. I include a check payable to Books Now for \$14.95 plus \$4.95 postage and handling for the first book (total \$19.90. Add \$2.50 for postage and handling for each additional book. Domestic orders only.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_  
Daytime Phone \_\_\_\_\_  
(used only for problems with order)

**Order by phone for faster service!**

**1-800-266-5766 ext. 1494**

*A service of Science News Books*