**A Dose of Dust That Quieted An Entire Hurricane Season?**

The 2006 hurricane season was looking grim. Three hurricanes had ripped across Florida during the 2004 season. Four hurricanes, including Katrina, had ravaged the Gulf Coast in 2005. Now meteorological signs were unanimous in foretelling yet another hyperactive hurricane season, the eighth in 10 years. But the forecasts were far off the mark. The 2006 season was normal, and no hurricanes came anywhere near the United States or the Caribbean.

Now two climatologists are suggesting that dust blown across the Atlantic from the Sahara was pivotal in the busted forecasts. The dust seems to have suppressed storm activity over the southwestern North Atlantic and Caribbean by blocking some energizing sunlight, they say. “I think they’re on to something,” says hurricane researcher Kerry Emanuel of the Massachusetts Institute of Technology in Cambridge. Dust “might play a big role” in year-to-year fluctuations in hurricane activity.

As the 2006 season approached, conditions looked propitious for another blustery hurricane season. In particular, there was no sign of El Niño, whose Pacific warming can reach out to the Atlantic and alter atmospheric circulation to suppress hurricanes there. But, unremarked by forecasters, an unusually heavy surge of dust began blowing off North Africa and into the western Atlantic at the 1 June beginning of the official hurricane season. Two weeks later, the surface waters of the western Atlantic began to cool compared with temperatures in the previous season.

Climatologists William Lau of NASA’s Goddard Space Flight Center in Greenbelt, Maryland, and Kyu-Myong Kim of the University of Maryland, Baltimore County, in Baltimore argue in the 27 February issue of *Eos* that the arrival of the thick dust and the subsequent cooling were no coincidence. The dust blocked some sunlight and cooled the surface, they say. That cooling went on to trigger a shift toward less favorable conditions for the formation and intensification of storms in the western Atlantic, they argue. As a result, no storm tracks crossed where nine had passed the previous season.

Lau and Kim find that historically, we have neglected an equally important factor, if not a more important factor: El Niño’s influence on Atlantic storms has in fact prevailed in the eastern tropical Atlantic, as it may have done last year when it put in a surprise appearance beginning in August. But in the west, near the Caribbean and the United States, dust has been the dominant external influence, they found. “We’re not denying El Niño had an impact,” says Lau, but “maybe

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**Broad Institute Given $100 Million**

The already well-heeled Broad Institute in Cambridge, Massachusetts, this week announced a $100 million gift from a wealthy direct marketer to conduct research on severe mental illnesses such as bipolar disorder and schizophrenia. The funding from the Stanley Medical Research Institute will allow the Broad—a joint venture between the Massachusetts Institute of Technology and Harvard University—to create an interdisciplinary center that will draw on the universities’ expertise in neuroscience and genomics. That center, located within the Broad Institute, will be led by Edward Scolnick, a former National Institutes of Health researcher and president of Merck Research Laboratories. The money from the Stanley Institute, founded by the family of Theodore and Vada Stanley, will help Broad researchers apply “the most advanced genomic tools” to the biology of mental illness, says Harvard Provost Steven Hyman.

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**Ganging Up on Jupiter**

A NASA probe heading to Pluto and a European Space Agency (ESA) spacecraft on its way to a comet will team up in coming weeks in an unusual effort to observe Jupiter. ESA’s Rosetta, launched in 2004 and currently in the neighborhood of Mars, will examine the ring of electrically charged particles around the gas giant planet that may stem from volcanic eruptions on its moon Io. Meanwhile, NASA’s New Horizons mission (below) sped past Jupiter last week after leaving Earth in January 2006. As the probe uses the planet’s gravity to slingshot its way to Pluto, the onboard instruments are monitoring the Jupiter system.

The roughly simultaneous observations from the two probes could provide a unique set of data on the planet. “We couldn’t pass up this opportunity to study Jupiter’s meteorology, rings, aurorae, satellites, and magnetosphere,” says New Horizons principal investigator S. Alan Stern of Southwest Research Institute in Boulder, Colorado. The joint effort augurs well for future international cooperation in space science: Stern takes over as NASA’s science chief next month.

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**Storm killer? Dust blown off West Africa may suppress hurricanes in the western Atlantic.**

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**RICHARD A. KERR**
repeatedly creating S-shaped waves that move tailward. Amphibians have a second one, which controls the limbs.

In 2003, Cabelguen and his colleagues discovered the region of the salamander’s midbrain that fires off signals to these two central pattern generators. When the researchers gently stimulated this part of the brain electrically, they caused the limbs to move as if walking. As they gradually increased the applied current, neural activity in the limbs sped up until finally the nerve cells shut down. At this point, the amphibian’s limbs stopped moving and the body started undulating much faster, as in swimming.

Ijspeert’s group developed a mathematical model of this transition, from which they concluded that the limbs’ central pattern generator interfered with the other neural network’s ability to set up the S-waves. This interference produced the slower body bending necessary for walking. Only when the limb’s central pattern generator was shut down was the salamander’s other network of nerve cells free to fire as fast as needed to generate swimming or, on land, crawling.

Ijspeert then built *Salamandra robotica* to test the mathematical model’s predictions. About 85 centimeters from snout to tail tip and with four rotating legs and six movable joints along her body, she is powered by 10 motors instead of muscles. Using a remote control, Ijspeert and his graduate student Alessandro Crespi sent signals of varying strength to *Salamandra*.

As in Cabelguen’s experiments, less intense signals caused the robot to walk. With stronger signals, the legs sped up. But with the strongest signals, the legs stopped moving and *Salamandra* began slithering. “This close correspondence suggests that the researchers may have accurately recreated some of the actual neural control mechanisms salamanders use,” says John Long, a biomechanist at Vassar College in Poughkeepsie, New York. The results, Long and others say, suggest that early animals didn’t need to invent completely new neural pathways to expand their locomotor repertoire.

Some researchers think this simple mechanism is not the whole story, however. Robert Full, an integrative biologist at the University of California, Berkeley, says Ijspeert and his colleagues “definitely need not only to include motion in their analyses but also the mechanics of the body and an understanding of the environment.” Nonetheless, says Long, the robot is “the best I’ve seen in terms of combining, coordinating, and alternating different vertebrate propulsive mechanisms.” If nothing else, adds Miriam Ashley-Ross, a functional morphologist at Wake Forest University in Winston-Salem, North Carolina, “I think that more collaborations between bio-mechanists and neuroscientists and experts in computer modeling will start up and flourish, spurred on by this paper.”

—ELIZABETH PENNISI

**The Continuation Saga (Cont.)**

It’s been more than a year since the U.S. Patent and Trademark Office (PTO) proposed limiting add-on patent applications, which allow additional information to be submitted on existing applications. PTO says so-called continuations are hurting patent quality and drowning examiners in paper (*Science*, 28 July 2006, p. 425). The proposal was met with a firestorm of attacks during a public comment period last year. Some biomedical scientists say continuations are necessary to keep patent applications up to date. “There must be some kind of hellacious political pressure on some numbats at the PTO, because almost every one of those public comments was resoundingly negative,” wrote lawyer Mark Perdue of Storm LLP in Dallas, Texas, on the popular Patently-O blog last summer.

PTO Director Jon Dudas disagrees. “We’re being very thoughtful about this,” he told *Science*. “People don’t want to change.” He says he expected the backlash when he proposed the limits. He hasn’t decided when to issue a final decision on the rules. Another Dudas initiative, a pilot project to allow the public to rate technical information to help examiners with software patents, is expected to go online soon.

—ELI KINTISCH

**Different Ways to Compete**

When it comes to improving U.S. innovation, some legislators are thinking big whereas others say that small is better. This week, Senate Majority Leader Harry Reid (D–NV) led a bipartisan coalition of senators endorsing the America COMPETES Act, a sprawling bill drawn from the recommendations of a 2005 National Academies report on how to strengthen the U.S. scientific enterprise (*Science*, 21 October 2005, p. 423). The proposal would authorize a doubling of funding for the National Science Foundation (NSF) and the Department of Energy’s (DOE’s) Office of Science and support a raft of programs to train more scientists and improve science and math education at all grade levels. Reid said he plans a floor vote on the bill, whose provisions would cost $16 billion over 4 years, sometime next month.

Meanwhile, the House Science and Technology Committee last week approved a measure to expand early career and graduate training programs at NSF and DOE and monitor the need for research instrumentation across the government. The bill (H.R. 363) addresses a tiny slice of what the Senate legislation covers, but the panel’s chair, Representative Bart Gordon (D–TN), believes that narrowly focused legislation stands a better chance of passage by Congress.

—JEFFREY MERVIS