

# The Scariest Man on the Planet

## James Hansen and the Coming Deluge

by NICK WELSH • Photos by PAUL WELLMAN

### ONE FRIDAY AFTERNOON LATE LAST

August, Bruce Caron, a one-time urban anthropologist turned multimedia consultant, was projecting a very scary map on a wall of the University Club, Santa Barbara's citadel of tradition and accomplishment. The map, prepared by UCSB's geography department, was of downtown Santa Barbara. But it showed a very different city from the one we now know. It predicted what Santa Barbara would look like if Greenland's vast prehistoric ice sheets were to melt, causing the world's sea levels to rise about 21 feet. Contemplating this cataclysmic possibility were Santa Barbara Mayor Marty Blum and two well-respected scientists from UCSB's Bren School of Environmental Science: David Lea and Darren Hardy. At first Lea (pronounced Lee),

a soft-spoken paleo-climatologist in his late forties, viewed the diminishing topography with the detached professional curiosity one might expect from a scientist trained to measure the passage of life not in terms of years or even centuries, but in millennia. Caron's map showed the waterfront gone; the railway tracks, the train depot, the airport — all under water. But when Lea discovered how the rising ocean had scooped away much of Milpas Street, his clinical detachment disappeared. On Santa Barbara's Eastside, the waves were predicted to come to rest almost exactly at Alphonse Street, covering — among many other buildings — his favorite Mexican restaurant. "Oh my God!" Lea exclaimed, "Super-Rica's under water! We've got to do something!"

**T**hat end, Lea is spearheading a three-month series of conferences and lectures that will bring together the world's foremost authorities on global warming to the University of California, Santa Barbara. Cosponsored by the Bren School, Arts & Lectures, the Community Environmental Council, *The Santa Barbara Independent*, and an anonymous donor, the series hopes to spark informed political activity as well as illuminate both the complexity and direness of the problem. Though Lea is convinced that global warming can be slowed down significantly — "It's soluble. The planet is not going to be toast. We're not going to burn up" — he nevertheless believes "we have to act and we don't have much time. ... Simple pronouncements about not driving SUVs will not get us down the path we need to go," Lea said.

### Enter James Hansen

Kicking off the lecture series this Monday night with a grim but encouraging talk at UCSB was Dr. James Hansen, the subdued yet alarming head of NASA's Goddard Institute for Space Studies. His work, some of the

earliest on the subject, dates back to 1978. But it was in 1988 that he really made waves, boldly declaring before a Senate subcommittee that he was "99 percent certain" greenhouse gases were responsible for global warming and that human activity was responsible for greenhouse gases. Afterward he told reporters that the nation needed to "stop waffling." Many in the scientific community, even those who agreed with him, were taken aback by the bluntly unequivocal nature of Hansen's statements. "At the time, many of us felt that Hansen went too far in his interpretation of the data," recalled MIT professor Kerry Emanuel, who has since written extensively about how global warming has increased the number and intensity of hurricanes and typhoons. "In hindsight, he was right."

Since then, Hansen's prognostications have grown considerably more dire. "In the past five years, it's become clear to me that the problem is a lot more urgent than we thought," he said Monday night. Unless major steps are taken to curb the release of carbon dioxide and other greenhouse gases within the next 10 years, he is "99 percent certain" that the world as we know it will be forever

changed. "If we go down the business-as-usual path, it will be 5.5 degrees warmer by the end of this century, warmer than it's been in 3 million years," he warned. "If you go back to that time, the sea levels were 80 feet higher." Should that happen, he predicted, hundreds of millions of people would be homeless, the world's weather patterns would be violently scrambled, and about half the planet's species would become extinct.

Trained as an astronomer, not as a climatologist, the 65-year-old Hansen cut his scholarly teeth studying the gaseous composition of Venus's atmosphere. Because the Venusian atmosphere is so rich in carbon dioxide, the heat from the sun stays trapped on the planet. Temperatures hover around 800 degrees. In 1978, he began studying the energy balance of the Earth's atmosphere to determine what effect ozone depletion might have on future temperatures. Many environmentalists were warning that, unless repaired, ozone depletion would trigger the coming of a new ice age. In response to public alarm and political pressure the manufacture of chlorofluorocarbons that caused ozone depletion was systematically

phased out. Hansen harkens back to the success of this global response to a pressing planetary problem as a cause for optimism in the fight against global warming. But with global warming, the problem is vaster in scale and much more diffuse.

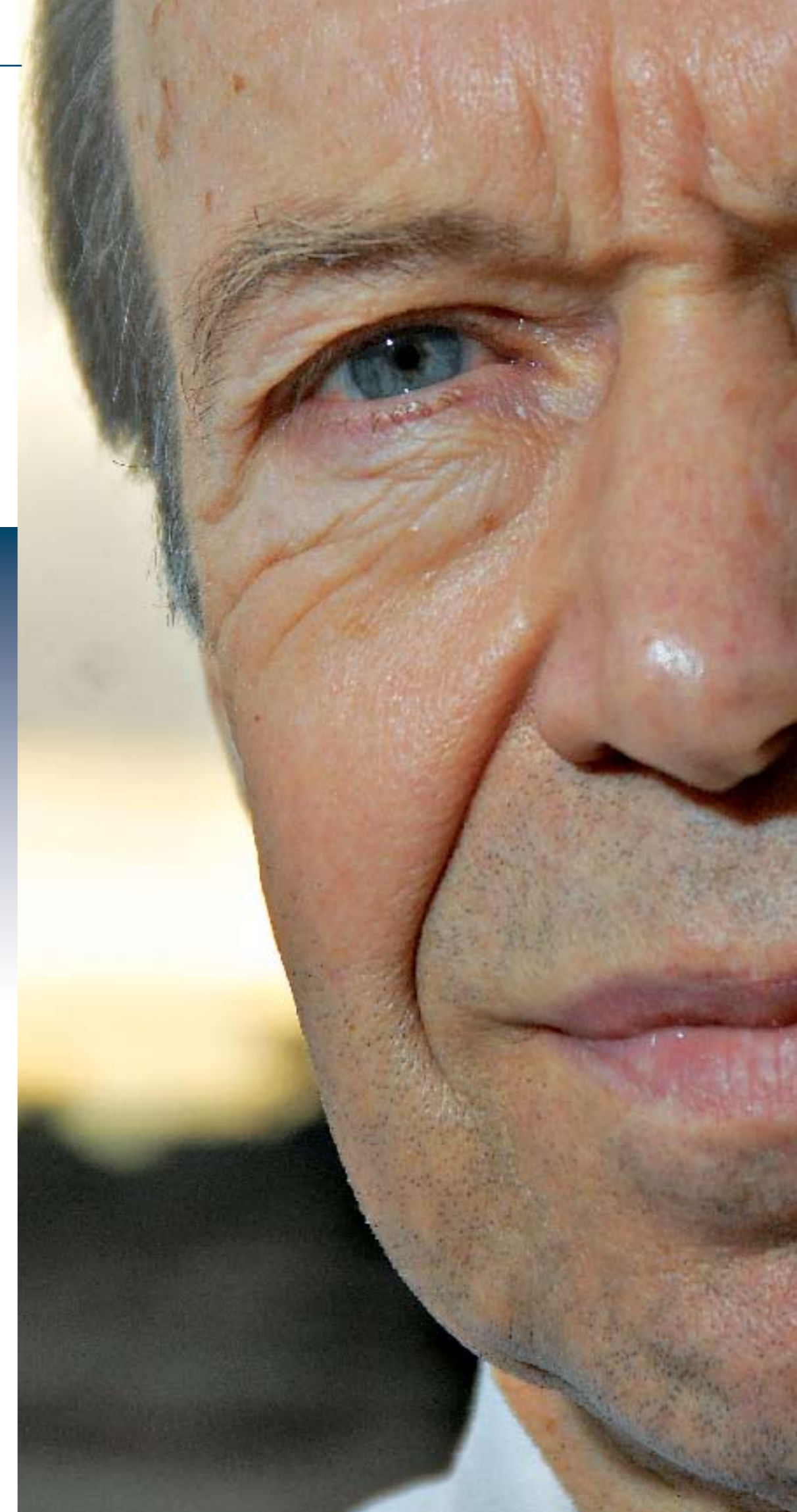
### Avoiding the Consequences

The good news, to the extent that Hansen sees any, is that we can avoid some — though not all — of the most violent and disruptive consequences of our dependence upon carbon-based fuels if we act now. Most of the technology already exists to make this change, he said. "Next, we need to address the huge inefficiency in how we heat our buildings and run our vehicles. All we need are new standards for our new buildings and those being refurbished. And in the process, we have to gradually bring new alternative energy technologies on line." While Hansen has reservations about nuclear power, he insists that nuclear power plants must be part of America's future energy portfolio. "I consider nukes to be better than coal in terms of climate and human health," he said. "It has to be part of the mix."

If the technology exists, he said, the political leadership decidedly does not. "You can't tell the public, 'Go solve the problem. Go buy new light bulbs. Without leadership it just isn't going to happen.'"

While other scientists have often taken pains to express their conclusions cautiously, Hansen never did. That helped him get his views pasted across the front page of the *New York Times*. As head of NASA's Goddard Institute for Space Studies — which maintains the most extensive temperature records on the planet and runs them through the most sophisticated computerized modeling systems to forecast future temperature trends — Hansen has had a bully pulpit from which to speak his mind. At times, this has landed him in hot water. When Republicans controlled the Senate, Oklahoma Republican James Inhofe chaired the Environment and Public Works Committee. Famous for dismissing global warming as a great "hoax," Senator Inhofe publicly blamed Hansen and his computer programs for much of "the climate porn" and hysteria he believed were corrupting media coverage of the issue.

Hansen fell out of favor with President George W. Bush just before the 2004 election by publicly stating that he'd have to vote for Bush's rival, given Bush's >>>



Dr. James Hansen has been studying factors leading to global warming since 1978. As head of NASA's Goddard Institute for Space Studies, which has the data and hardware to make sophisticated future temperature forecasts, Hansen continues to make controversial conclusions based on scientific findings such as the accelerating melt-rate of the ice sheets in Greenland. Unless the release of carbon dioxide and other greenhouse gases are substantially reduced during the next decade, Hansen said, temperatures may rise 5.5 degrees by the end of the century and sea levels may rise 80 feet.

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— Dr. James Hansen, head of NASA Goddard Institute for Space Studies.

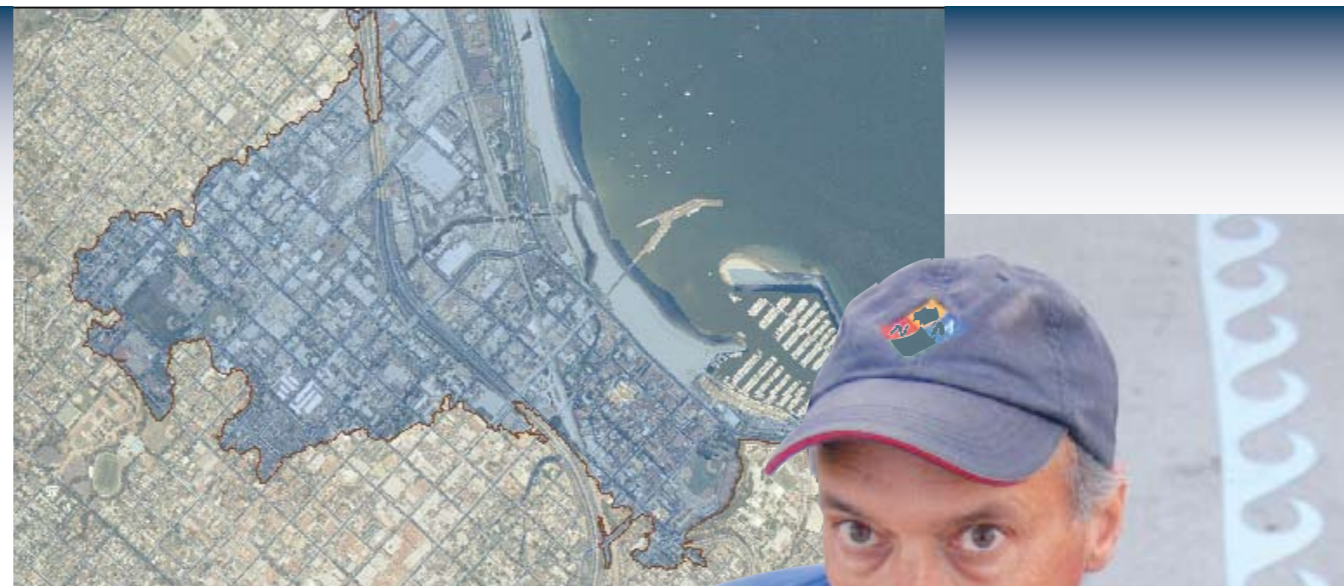
refusal to take seriously the issue of global climate change. The next year Hansen was told he'd have to clear any public pronouncements on policy he might wish to make with a 24-year-old political operative appointed by the White House. Hansen charged censorship; the Bush administration denied it. But in the media uproar, Hansen's youthful handler was terminated after it was revealed he had lied on his résumé. It wasn't Hansen's first run-in with the Bush family. In 1989, during the senior George Bush's administration, Hansen charged that White House officials had inserted changes into the statement he'd prepared for a Senate subcommittee at which he was to testify. That subcommittee was headed by then Senator Al Gore, who had a field day accusing the first Bush White House of trying to whitewash the scientific findings made by one of the nation's top scientists. "Hansen's very low-key. He's very straight. He's from Iowa and you can practically hear the corn growing out his ears," commented Stanford professor Stephen Schneider, who's known Hansen since the 1970s and regards him with competitive affection and professional respect. "But when they try to censor him, he shoves it down their throats."

In 1989, the National Academy of Sciences proclaimed that global warming would be one of the big problems to plague the 21st century. Around the same time, the United Nations formed the International Panel on Climate Change (IPCC), a group of 2,500 scientists from 134 nations working to see if any consensus could be reached on the subject. The IPCC concluded in a 2001 report that there was a strong link between human activity, increased carbon dioxide readings in the atmosphere, and global warming. In the three reports released by the IPCC since then, the panel has grown increasingly convinced that human activity is responsible for the warming trends.

### The Debate Continues

But as recently as last summer, surveys indicated the American public was evenly split on whether global warming was real. Hansen blames this confusion on the oil industry, which has hired scientific experts to refute global warming, and on the media's insistence on reporting both sides of the story as though the debate were divided evenly. However, there's been a decided shift in the tone of news coverage recently, and global warming is now treated as if it's more of an accepted fact. "Finally, we've reached a point where the actual changes in the world have become sufficiently clear," Hansen said.

In the past 150 years, the amount of carbon dioxide in the atmosphere has increased from about 280



Bruce Caron, shown here with a map of what Santa Barbara would look like if Greenland melts and the sea level rises 21 feet. Caron's not fazed by critics who insist such scenarios are too extreme and that it would take Greenland 1,000 years to melt. "We already plan for 500-year floods and 1,000-year floods. How is this so different?"

parts per million to 379. In that same time, the world temperature has increased by about 1.5 degrees Fahrenheit. Most of that increase, about 1 degree's worth, occurred in the past 30 years. Most of that heat is absorbed by the oceans; as the water warms, its volume increases. As the planet warms, glaciers melt. And these two processes — thermal expansion and glacial melt — cause the sea levels to rise by about 1.5 inches a decade. These numbers, Hansen agrees, don't appear immediately alarming. But the rate of sea level increase has doubled in the past 10 years. And as for the world's temperature, he said, there's another 1 degree Fahrenheit "in the pipeline." That's from the greenhouse gases humans have produced but whose effects have yet to be felt.

And once again, Hansen has moved far out ahead of the curve. Fueling his alarm are two factors. It used to be that paleo-climatologists thought the hottest the world had ever been was 2-3 degrees Celsius warmer than current temperatures. Hansen says new research shows that the hottest temperature was actually 1 degree Celsius warmer than now, or 1.8 degrees Fahrenheit. And when the world was a single Celsius degree hotter, he said, the geologic records indicate the seas were 85 feet higher >>>

## Take Up the Global Warming Debate

**Sitting at the edge of the Pacific Ocean, Santa Barbara will feel the effects of global warming acutely if the predicted rise in sea level takes place. Attend the UCSB Global Warming Science & Society event series and examine the science, controversy, social impacts, political alliances, and every other imaginable aspect of this unimaginable event. Go to [globalwarmingsb.org](http://globalwarmingsb.org) for full information.**

UCSB's College of Engineering hosts an **EMERGING TECHNOLOGIES SUMMIT** this Friday and Saturday (February 9 and 10). Technical and business experts discuss existing market barriers that discourage the use of cleaner burning fuels and which alternatives offer the most promise. For more info, call 893-8107.

**STEVE KOONIN**, chief scientist for British Petroleum — the oil company that's done the most to

take global warming seriously, speaks at UCSB's Corwin Pavilion, Thursday, March 8, 8pm. Koonin will discuss new energy technologies for the coming decades.

**UCSB READS FOR EARTH DAY** is a campus-wide reading endeavor from January 24 to April 22 focused on Elizabeth Kolbert's book *Field Notes from a Catastrophe*. Students received 3,000 free copies on January 25.

Polar bears fly on 125 flags all over downtown during the month of April in the **EARTH DAY FLAG PROJECT** sponsored by S.B. Downtown Organization.

**ELIZABETH KOLBERT**, award-winning *New Yorker* writer and author of *Field Notes from a Catastrophe*, discusses her research into global warming and her travels to Greenland and Alaska. Thursday, April 19, UCSB's Campbell Hall.

**EARTH DAY 2007** is celebrated on April 22 at the Sunken Garden at the S.B. Courthouse. Event features education on the planet's health, and information about global warming and local actions that can be taken to address it.

Scientists and media professionals hash out how the media cover environmental concerns and how that coverage influences and distorts the extent of the problem. **MEDIA AND THE ENVIRONMENT CONFERENCE**, Saturday, April 28, noon to 6pm, UCSB's Corwin Pavilion. For more info, see [www.cftnm.ucsb.edu](http://www.cftnm.ucsb.edu).

## Act Locally, Think Globally: The Sequel

Throughout Santa Barbara, many people, organizations, and institutions are beginning to take matters into their own hands. What follows is a short list of plans and actions intended to slow down global warming and to raise public consciousness.

Bruce Caron, an eco-artist in the style of Christo, has been working behind the scenes at City Hall to get the permits needed to draw a **LIGHT BLUE LINE ON DOWNTOWN** Santa Barbara's streets and sidewalks **SHOWING EXACTLY HOW FAR THE SEA WOULD INTRUDE** if Greenland's ice sheets were to actually melt. (City public works officials are so far lukewarm on this idea.)

Painter Tom Huston recently showed a series of witty works using enlarged reproductions of old Santa Barbara tourist postcards and hand painting the future **POST-GLOBAL WARMING WATERLINE**.

Less whimsically, the City of Santa Barbara just concluded a meticulous audit of its own carbon footprint and will submit the results to the California Climate Registry for final certification. Using those results as a baseline, City Hall has committed to **REDUCING THE CITY'S CARBON EMISSIONS** — in heating and buildings and fueling fleets — dramatically.

More far-reaching yet, the Santa Barbara City Council just took its first steps toward **REVAMPING BUILDING CODES** so that new buildings and remodels would be required to comply with more stringent energy efficiency standards.

In two months, the Community Environmental Council is expected to unveil a detailed **ENERGY AUDIT** for all of Santa Barbara County and a master plan for making it "fossil free" by 2030.

UCSB has jumped in with both feet. Bren School professors and students have been conspiring scientifically during the past two years to **MAKE UCSB A FOSSIL-FREE LEADER** not just in the UC system but in the nation.

In preparation for Earth Day, the university has inaugurated a **CAMPUS-WIDE READ-IN**, in which participants delve into several just-released books chronicling the front lines of global warming.

All of this culminates on Earth Day, April 22, when among other things, the City of Santa Barbara will be festooned with giant flags bearing photographs of **POLAR BEARS**, the charismatic and accessible icon whose habitat is quickly being undone by shorter winters and longer summers.



Santa Barbara artist Tom Huston is more mischievous than grim in his attack on global warming, repainting Santa Barbara tourist postcards to show what the city would look like if the sea level were to rise 21 feet.

than they are today. The record indicates we're now within just one degree of the warmest period on the planet. In other words, whatever wiggle room we thought we had has just dramatically tightened.

### Melting Ice Sheets

The other new development that's convinced Hansen that we're quickly running out of time is the fate of Greenland and portions of Antarctica, the only remaining repositories of ice sheets on the planet. Recent scientific reports indicate that Greenland, for example, is melting three times faster than it was five years ago. While five years is not much of a baseline, Hansen has seized upon recent satellite studies that show what's happening inside Greenland's ice sheets as a cause for intense concern. The new studies indicate that Greenland's melting water bores deep into the ice sheets. When this water pools deep within the ice sheet, it laps away at the edges of



Too hot for words? Dr. James Hansen discusses the implications of global warming trends with Dr. Ralph Keeling of Scripps Institute. Keeling's father, James Keeling, was the first scientist to actually begin measuring the amount of carbon dioxide in the earth's atmosphere, beginning in 1958, and is now famous for the Keeling Curve.

the pool, further accelerating the melting of the ice sheet from within. "We used to think it would take 1,000 years for Greenland's ice sheets to melt. I don't believe that anymore. Now I think they can melt within a century or two," he said. "Once we get that started, we're really in trouble."

A longtime Hansen adversary, Dr. Patrick Michaels, a climatologist and prominent global warming "skeptic," noted that Hansen is alone in his conviction that Greenland might melt in a matter of centuries unless drastic changes are implemented.

**'Hansen's very low-key. He's very straight. He's from Iowa and you can practically hear the corn growing out of his ears. But when they try to censor him, he shoves it down their throats.'**

— Stanford professor Stephen Schneider, describing James Hansen and efforts by both Bush administrations to mute his alarms.

Hansen — who described Michaels as more of a "contrarian" than a skeptic — acknowledged that his theories have not been embraced by the broader scientific community. Part of the problem, he said, stems from the fact that so much of global warming science is based on computer modeling, and no computer model currently exists to reflect the sort of swift cataclysmic transformation Hansen envisions for Greenland. "We can calculate thermal expansion quite accurately. We can monitor glacier loss. But when it comes to these two ice sheets, it's a very hard problem. There are very big disagreements about how vulnerable these ice sheets are."

Because of this, Hansen was upset with the most recent report from the International Panel on Climate Change — six years in the works. While it is far

more emphatic than any of the three prior reports in linking human activity with global warming, it actually reduces its projections for temperature increase and sea level rise from those released in 2001. "They left out Greenland and Antarctica. They couldn't figure out how to model it, so they left it out," he said. "I think they should have at least warned this could be a very important part of the problem, but we don't know what to do about it."

Ironically, at the same time Hansen is criticizing the results of the IPCC report for understating the problem, a paper he co-authored with five other scientists was published in *Science* magazine defending the IPCC against charges that it had exaggerated the scope and impact of global warming. According to the *Science* article, the IPCC proved to be spot-on accurate in projecting the rate of increase in world carbon dioxide emissions and very close when it came to predicting global temperature increases, but was barely in the ballpark when it came to anticipating the rate of sea level increase. The study found that the IPCC had consistently underestimated the sea level increase, and only its more extreme scenarios came close to getting it right. While these findings don't necessarily prove Hansen's case about Greenland and Antarctica, they seem to jibe with it. "I think I can see what's happening. I don't think the public or the policy makers realize certain fundamental things about how close we are to really getting in trouble," he said. "We no longer have the luxury of waiting until we've convinced everyone. We've run out of time."

Does Hansen entertain the possibility that he might be wrong? When asked, he noted that he'd been reminded of an article he'd written for *Science* back in 1981. In it, he made several predictions about the consequences of global warming, and like his testimony before the Senate in 1988, it aroused the wrath of his scientific peers. He predicted, for example, that the legendary Northwest Passage — the fabled ice-choked shipping lane connecting the Atlantic and the Pacific oceans — would soon open as the ice gave way with the advent of longer summers and shorter winters. Sure enough, in 2000, several ships were able to cross the passage because of thinner ice. And he was impressed at how close he was in describing the dramatic cooling effects a major volcanic eruption — Mt. Pinatubo in 1991 — would have. "I'm kind of amazed at how accurate it turned out to be." ■